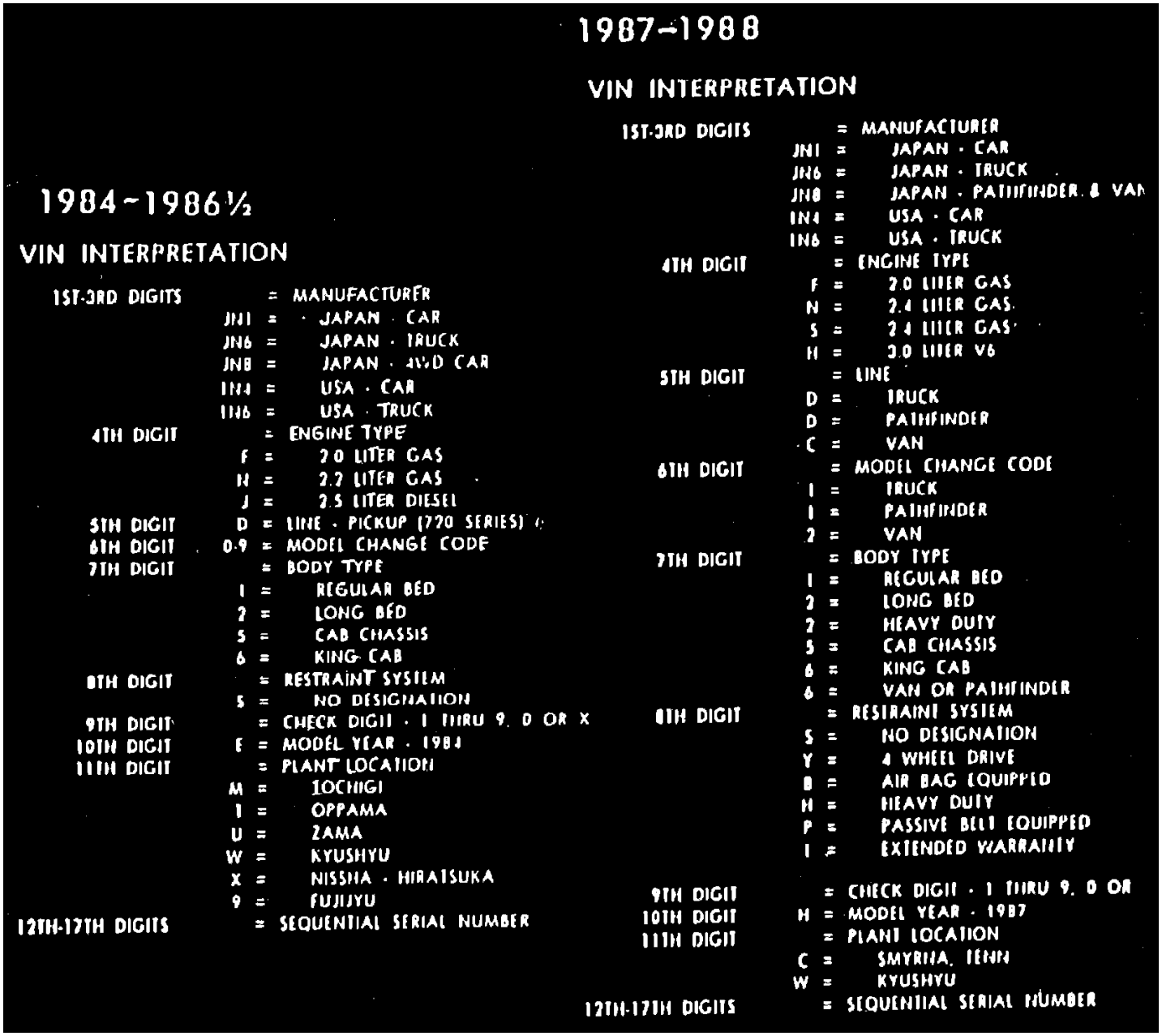


NISSAN TRUCKS

Powertrain Management: Application and ID
Emission System Application Chart

CA18ET,200SX	CECS,ECCS,EEC,EGR,IMVC,MRFS,TWCC
CA20E,200SX	AIR,CECS,EEC,EGR,IMVC,MRFS,STCS,TWCC
CA20E,Stanza	CECS,EEC,EGR,MRFS,STCS,TWCC
CA20E,Stanza Wagon	AIR④,CECS,EEC,EGR,IUC,MRFS, SPCS,STCS,TWCC
CD17,Sentra	CECS,EGR,FSC,HAEC
E16S,Pulsar,Federal	AFR,AIR,CECS,CES,ECC,EEC,EGR,FSS, ISC,MHS,STCS,TWCC
E16S,Pulsar,California	AFRC,AIR,CECS,ECC,EEC, EGR,FSS,MHS,STCS,TWCC
E16S,Sentra,Federal	AFRC,AIR,CECS,CES,ECC,EEC,EGR,FSS,ISC,MHS,STCS,TWCC
E16S,Sentra,California	AFRC,AIR,CECS,ECC,EEC, EGR,FSS,MHS,STCS,TWCC
SD25,Pickup	CECS,EGR
VG30E,Maxima	AIR,BCDD,CECS,ECCS,EEC,EGR,MRFS,SSCC
VG30E,300ZX	CECS,ECCS,EEC,EGR,IUC,MRFS,SSCC
VG30ET,300ZX	CECS,ECCS,EEC,EGR,ISC,MRFS,SSCC
Z20,Pickup	AFRC,ATC,BCDD,CECS,DECS,ECC,EEC,EGR,ESC,FSS,MHS,TWCC
Z24,Pickup	AFRC,ATC,BCDD,CECS,ECC,EEC,EGR,FSC,FSS,HAEC①②,MHS,SPCS,STCS③,TWCC
Z24i,Pickup	CECS,ECCS,EEC,EGR,SSCC

Fig Application Charts

①—Except Calif. Models
②—High Altitude Models
③—Except Camper
④—4 Wheel Drive Models
AFRC—Air/Fuel Ratio Control Sys.
AIR—Air Injection Valve System
ATC—Automatic Temp Control Air Cleaner
BCDD—Boost Controlled Decel Device
CECS—Crankcase Emission Control System
CES—Cold Enrichment System
DBCC—Dual Bed Catalytic Conv.
DCS— Decel Control System
DECS—Detonation Control System
ECC—Electronically Controlled Carburetor
ECCS—Electronic Concentrated Engine Control System
EEC—Evap. Emission System
EGR—Exhaust Gas Recirc System
EITC—Electronic Ig. Timing Control
FSC—Fuel Supply Control System
FSS—Fuel Shut-Off System
HAEC—High Alt. Emission Control System
IMVC—Intake Manifold Vacuum Control System
ISC—Idle Speed Control
IUC—Idle Speed-Up Control
MHS—Mixture Heating System
MRFS—Mixture Ratio Feedback System
SPCS—Spark Plug Switching Control System
SSCC—Single Stage Cat. Conv.
STCS—Spark Timing Control Sys.
TWCC—Three-Way Cat. Conv.

Fig Application Charts

Powertrain Management: Application and ID
Engine System Identification

To identify an engine by the manufacturer's code, follow the four steps designated by the numbered blocks.

V.I.N.
PLATE LOCATION:

Cars-Chassis number appears on plate attached to instrument panel visible through windshield.

Trucks-Chassis number stamped on right or left hand frame side member and on plate engine compartment of late models.

(1) MODEL YEAR IDENTIFICATION:

1986-90-10th character of V.I.N.

1990-L
1989-K
1988-J
1987-H
1986-G

1985-81-Cannot be determined from vehicle markings, except on emission label.

(2) ENGINE CODE LOCATIONS:

1990-86-4th character of V.I.N.

1985-82 Pickup-Left side of engine block.

310-Upper front engine of engine block.

1985-81 All other Models-Upper right side of engine block. May also appear on plate attached to left side of engine bulkhead or left front wheelhouse visible when hood is raised.

	3 ENGINE		4 ENGINE IDENTIFICATION			
			DISPL.			
YEAR	CODE	CYL.	liters	cc	Fuel System	HP
	P (E16)	4	1.6	1597	2V	69
	S (CD17)	4	1.7 D	1680 D	MFI	55
	C (CA18)	4	1.8 T	1809 T	MFI	120
	F (Z20)	4	2.0	1952	2V	N/A
	P, H (CA20)	4	2.0	1974	MFI	97, 102†
	N (Z24)	4	2.4	2389	2V	103
	N (Z24)	4	2.4	2389	TBI	106
	J (SD25)	4	2.5 D	2488 D	MFI	70
	H (VG30E)	6	3.0	2960	TBI or MFI	152, 160†
	C (VG30ET)	6	3.0 T	2960 T	MFI	200

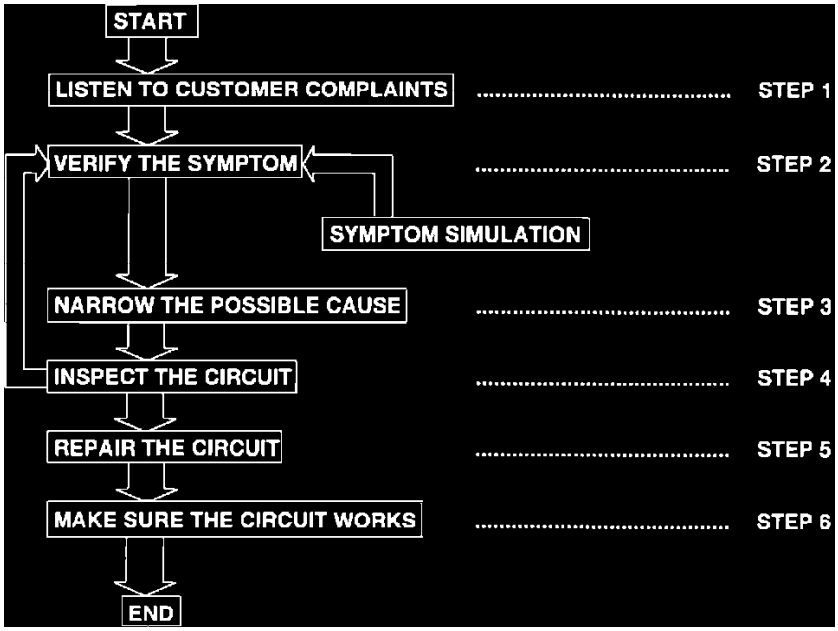
D-Diesel. T-Turbo. TBI-Throttle Body Injection.
MFI-Multiport Fuel Injection. 2V-Two Venturi Carburetor.
† Engine horsepower varies with model installation.

Fig. 5 Engine Identification

(3) ENGINE CODE:

(4) ENGINE IDENTIFICATION:

Vehicle: Flow of Diagnosis



STEP 1 Listening To The Customer.

Listening to the customer and documenting the conditions which exist when the problem occurs is critical to properly diagnosing an electrical incident. It may also be important to determine if the car has had any accessories recently installed or if any service work (collision repair, etc.) has been recently performed.

STEP 2 Verify the parameters of the incident.

Whenever possible, you should operate the complete system to verify the customers comments. Try to confirm the symptom(s) and under what conditions the incident occurs.

STEP 3 Get the proper diagnosis materials together.

Before beginning the diagnosis, make sure you have all of the necessary information. Along with these Fix Tips you should have the Power Supply Routing information. You should make sure you have a thorough understanding of how the system operates. Based upon the customers comments and your knowledge of the circuit operation, you should be able to identify which component(s) could cause the incident.

STEP 4 Inspect the system.

Inspect the system to find the cause of the symptom. Start the diagnosis by determining the location of the electrical units involved. Inspect each component to verify that it is mechanically free to operate and that all connectors and harnesses are securely connected and properly routed. Systematically check the circuits involved, using the Harness Layouts and Power Supply Routing. Determine which circuit is the cause of the incident and whether it is a wiring problem or a component problem.

STEP 5 Repair or replace.

Repair or replace the incident component or electrical circuit.

STEP 6 Verify the system works properly under all conditions.

Once you have repaired the circuit or replaced a component you need to operate the system in all modes and particularly under the circumstances which resulted in the customers initial complaint.

Vehicle: Testing and Inspection Procedures

Recommended Tools and Equipment

USE

A Digital Multimeter DMM (10 megaohm input impedance) . It can safely be used to diagnose and test most vehicle systems.

DON'T USE

Test lights. They are not recommended due to the possibility of damage to the computer or air-bag circuits.

BE PREPARED

Before attempting to diagnose a circuit for an open or a short, it is important that you:

1. Have the proper reference material available:

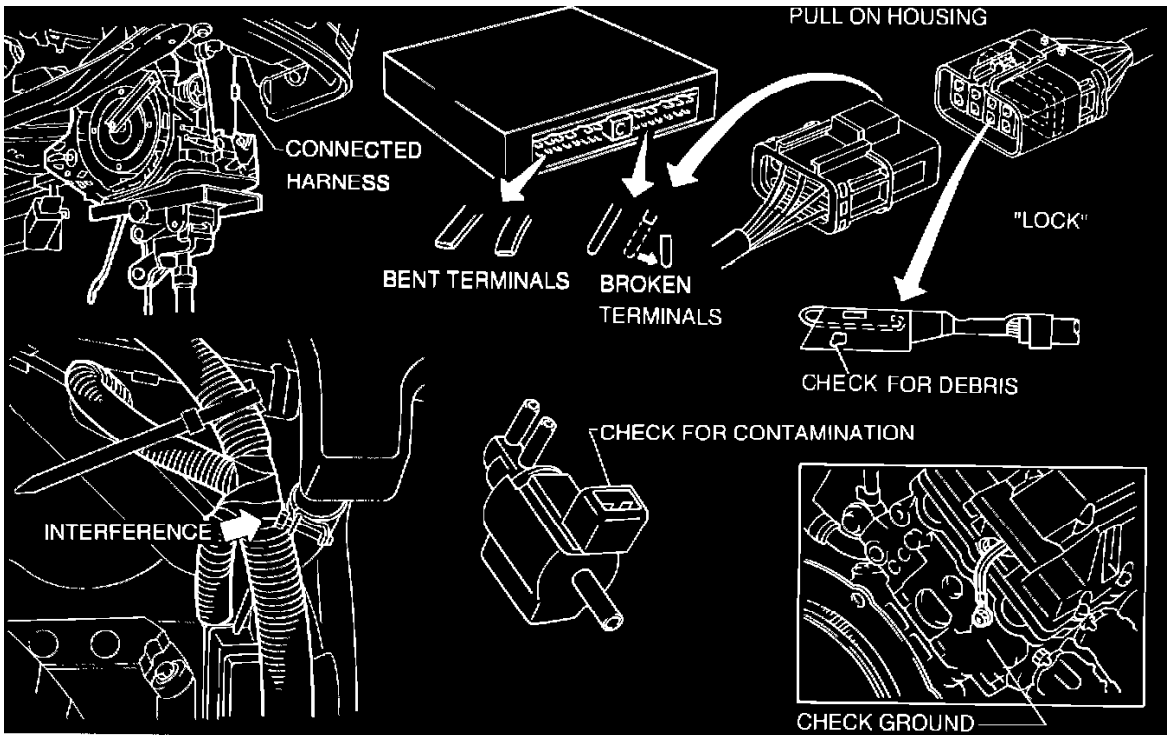
   ^ Power Supply Routings
   ^ Applicable Wiring Diagrams
   ^ Troubleshooting Information

2. Understand how the system works.
3. Have a good understanding of what condition you are diagnosing:

   ^ Situation when the problem occurs. (weather, loads, etc.)
   ^ What systems interact with the one you are diagnosing?
   ^ Is it intermittent or a consistent problem?

4. Have proper equipment to perform the diagnosis such as a digital voltmeter, alligator clips, and probe leads.

Examples of Common Electrical Incidents



The illustration shows some, but not all, areas to check for common electrical incidents.

Ground Inspection

WHY INSPECT GROUND CONNECTIONS

Ground connections are very important to the proper operation of electrical and electronic circuits. They are often exposed to moisture and can get a corrosive film of rust on the exposed metal.

A loose or corroded ground can alter a circuit. Many computer controlled circuits operate in the 5 volt range and can be seriously affected by a voltage change as low as one tenth (0.1V) of a volt. A poor or corroded ground can easily affect the circuit by that amount.

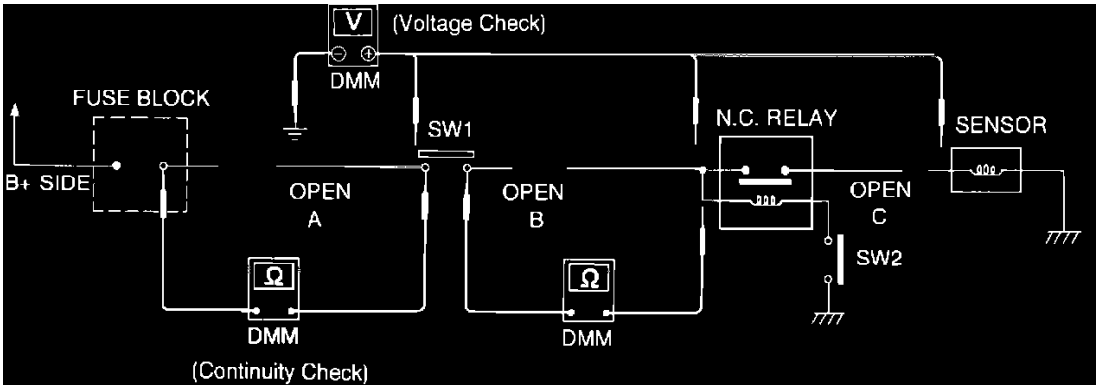
HOW TO INSPECT GROUND CONNECTIONS

^ Remove the ground bolt screw or clip.
^ Inspect all mating surfaces for tarnish, dirt, rust, etc.
^ Clean as required to assure good contact.
^ Reinstall bolt or screw securely.
^ Inspect for "add-on" accessories which may be interfering with the ground circuit.
^ If several wires are crimped into one ground eyelet terminal, check for proper crimps. Make sure all of the wires are clean, securely fastened and providing a good ground path.

VOLTAGE DROP TEST RESULTS

A good ground connection will have approximately 0.1 Volts or less voltage drop. For more details, refer to **VOLTAGE DROP TESTS.**

Testing For Opens



PREPARATION

Before you begin your testing and diagnosis, you should sketch a schematic of the system. This will help you to logically walk through the diagnosis process. Drawing the sketch will also reinforce your working knowledge of the system. Refer to the attached drawing for a sample schematic

There are two types of tests you can use for tracking down an open circuit: the Continuity Check using an ohmmeter or Voltage Check using the voltmeter. Either test, properly done, will yield good results.

USING THE CONTINUITY CHECK METHOD

NOTE: Make sure to always start with the DMM at the highest resistance level.

1. Disconnect the battery negative cable.
2. Start at one end of the circuit and work your way to the other end. (At the fuse block in this example)
3. Connect one probe of the DMM to the fuse block terminal on the load side.
4. Connect the other probe to the fuse block (power) side of SW1. Little or no resistance will indicate that portion of the circuit has good continuity. If there were an open in the circuit, the DMM would indicate an over limit or infinite resistance condition. (point A)
5. Connect the probes between SW1 and the relay. Little or no resistance will indicate that portion of the circuit has good continuity. If there were an open in the circuit, the DMM would indicate an over limit or infinite resistance condition. (point B)
6. Connect the probes between the relay and the sensor. Little or no resistance will indicate that portion of the circuit has good continuity. If there were an open in the circuit, the DMM would indicate an over limit or infinite resistance condition. (point C)

USING THE VOLTAGE CHECK METHOD

1. Connect one probe of the DMM to a known good ground.
2. Begin probing at one end of the circuit and work your way to the other end.
3. With SW1 open, probe at SW1 to check for voltage.

   If voltage: open is further down the circuit than SW1.
   If no voltage: open is between fuse block and SW1 (point A).

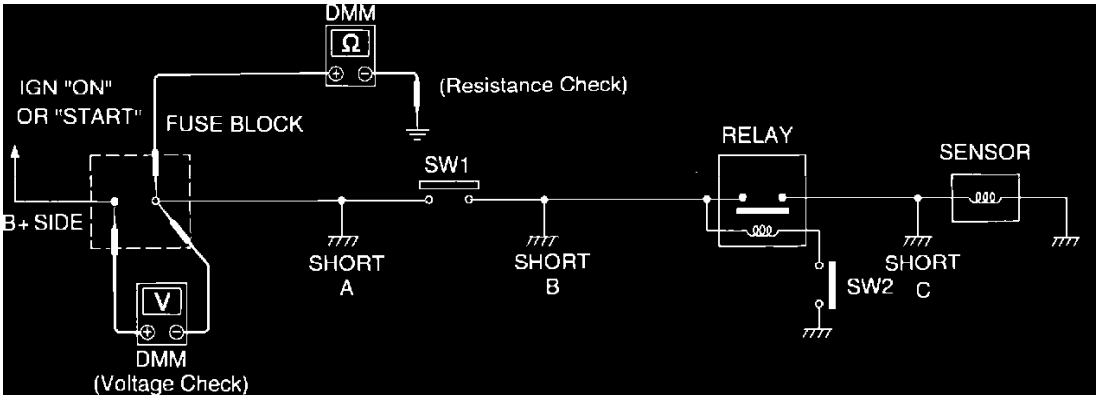
4. Close SW1 and probe at relay.

   If voltage: open is further down the circuit than the relay.
   If no voltage: open is between SW1 and relay (point B).

5. Close the relay and probe at the sensor.

   If voltage: open is further down the circuit than the sensor.
   If no voltage: open is between relay and sensor (point C).

Testing For Shorts



PREPARATION

Before you begin your testing and diagnosis, sketch a schematic of the system. This will help you to logically walk through the diagnosis process. Drawing the sketch will also reinforce your working knowledge of the system. Refer to the attached drawing for a sample schematic

There are two types of tests you can use for tracking down a short circuit: the Resistance Check using an ohmmeter or Voltage Check using the voltmeter. Either test, properly done, will yield good results.

RESISTANCE CHECK METHOD

1. Disconnect the battery negative cable and remove the blown fuse.

2. Disconnect all loads (SW1 open, relay disconnected and sensor disconnected) powered through the fuse.

3. Connect one probe of the ohmmeter to the load side of the fuse terminal and the other probe to a known good ground.

4. With SW1 open, check for continuity.

   If continuity: short is between fuse terminal and SW1 (point A).
   If no continuity: short is further down the circuit than SW1.

5. With SW1 closed, relay disconnected and probes at the load side of fuse terminal and ground check for continuity.

   If continuity: short is between SW1 and the relay (point B).
   If no continuity: short is further down the circuit than the relay.

6. With SW1 closed, relay contacts jumped with jumper wire and probes at the load side of fuse terminal and ground check for continuity.

   If continuity: short is between relay and sensor (point C).
   If no continuity: check sensor, retrace steps.

VOLTAGE CHECK METHOD

1. Remove the blown fuse and disconnect all loads (i.e. SW1 open, relay disconnected and sensor disconnected) powered through the fuse.

2. Turn the ignition key to the ON or START position and verify battery voltage at the B+ side of the fuse terminal (one lead on the B+ terminal side of the fuse block and one lead on a known good ground).

3. With SW1 open and the DMM leads across both fuse terminals, check for voltage.

   If voltage: short is between fuse block and SW1 (point A).
   If no voltage: short is further down the circuit than SW1.

4. With SW1 closed, relay and sensor disconnected and the DMM leads across both fuse terminals, check for voltage.

   If voltage: short is between SW1 and the relay (point B).
   If no voltage: short is further down the circuit than the relay.

5. With SW1 closed, relay contacts jumped with fused jumper wire check for voltage.

   If voltage: short is down the circuit of the relay or between the relay and the disconnected sensor (point C).
   If no voltage: retrace steps and check power to fuse block.

Voltage Drop Tests

PURPOSE OF THE VOLTAGE DROP TEST

Voltage Drop Tests are often used to find components or circuits which have excessive resistance. A voltage drop across closed contacts or wiring indicates excessive resistance.

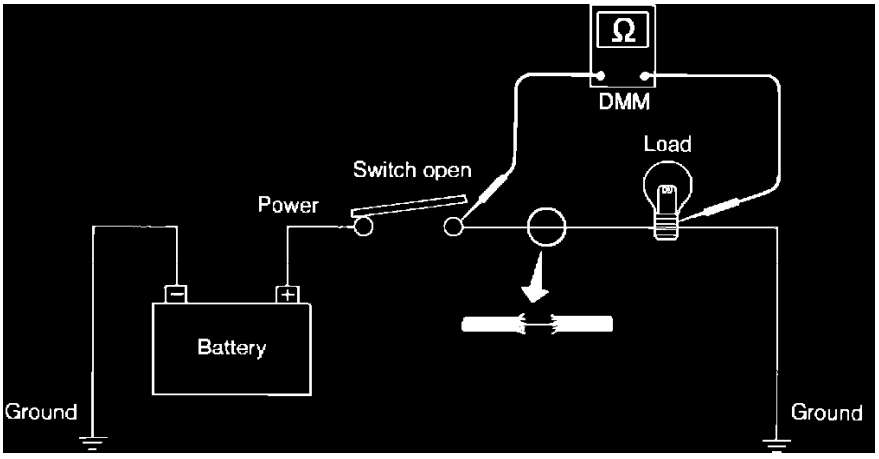
CAUSE OF CIRCUIT VOLTAGE DROP

A voltage drop in a circuit is caused by a resistance when the circuit is in operation. Part of the available voltage is used by the resistance resulting in less available voltage for other loads (lights, motors, etc).

Unwanted high resistance can be caused by:

^ Undersized Wiring (single strand example)
^ Corrosion On Switch Contacts
^ Loose Wire Connections Or Splices.

EXAMPLE OF AN INCORRECT CIRCUIT TEST



Check the wire in the illustration. If an ohmmeter is used to measure resistance (circuit off), the single strand of wire still making contact would give a reading of 0 ohms. This would normally indicate a good circuit. But when the circuit operates, the wire will not be able to carry enough current and the bulb will be dim. Using a proper Voltage Drop test will show this wire to have high resistance.

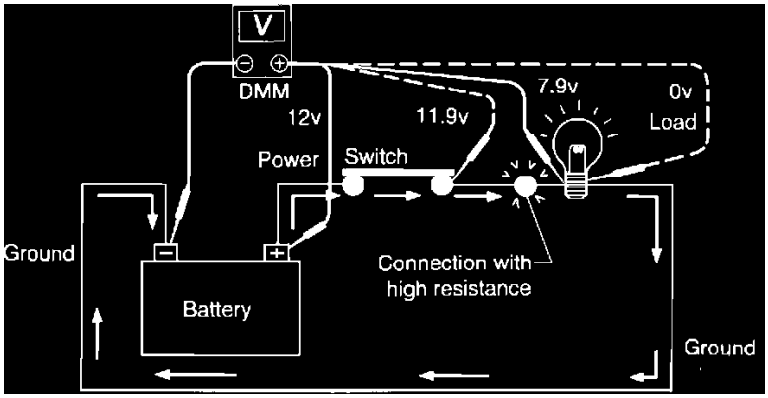
EXAMPLES OF CORRECT CIRCUIT TESTS

Measuring Voltage Drop - Accumulated Method

1. Connect the voltmeter across the connector or part of the circuit you want to check. The positive lead of the voltmeter should be closer to power and the negative lead closer to ground.

2. Operate the circuit

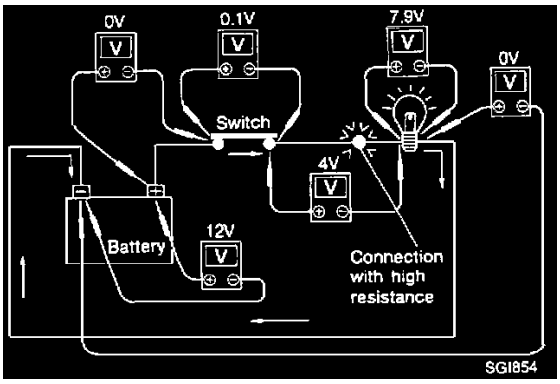
3. The voltmeter will indicate how many volts are being used to "push" current through that part of the circuit.



NOTE: In the illustration there is an excessive 4.1 volt drop between the battery and the bulb.

Measuring Voltage Drop - Step By Step

A step by step voltage drop test can be used to identify a component or wire which is operating under too much resistance. It is most useful in isolating excessive drops in low voltage/current systems such as those in Computer Controlled Systems..



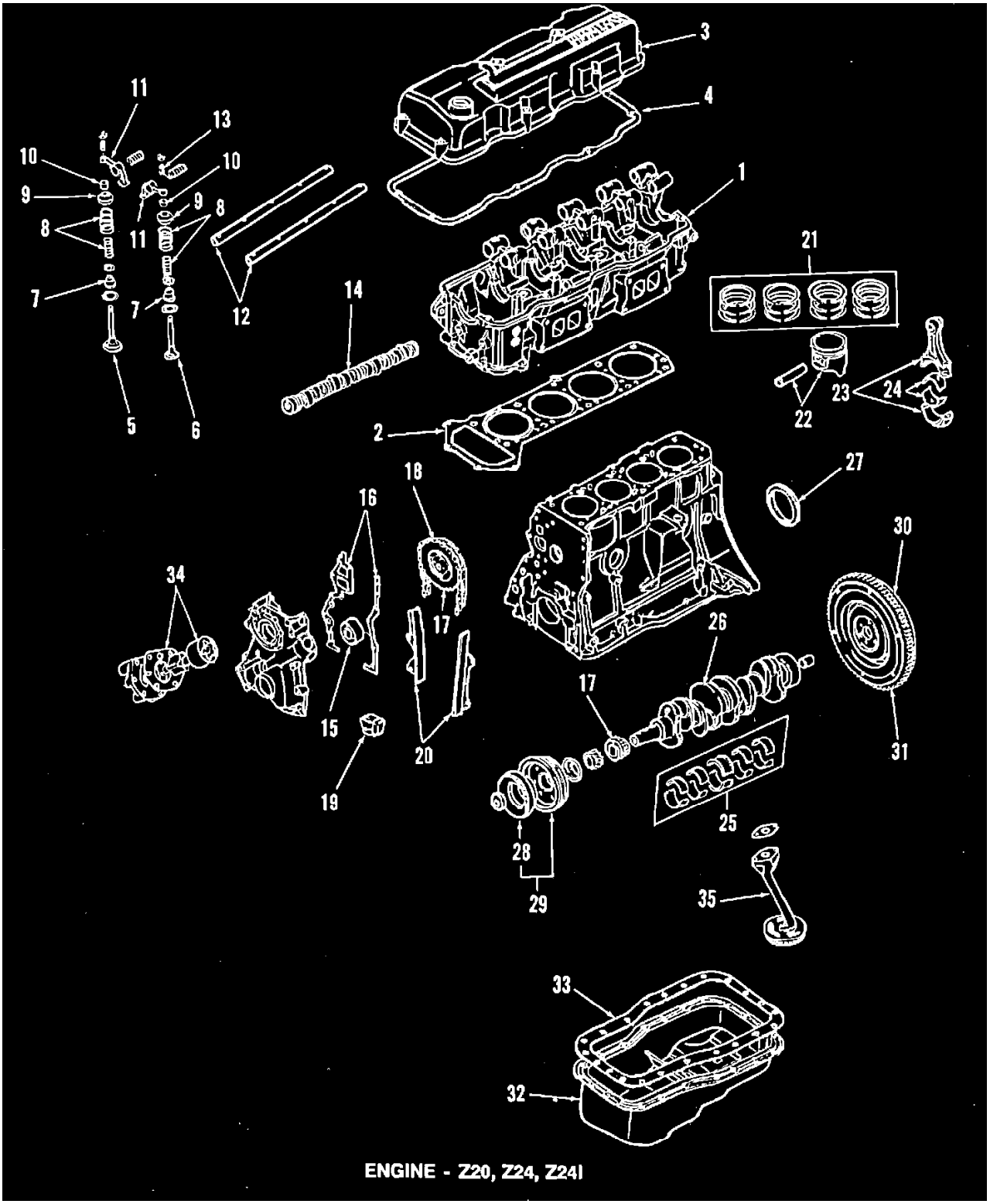
Circuit Inspection

1. Connect the voltmeter as described in illustration, starting at the battery and working your way around the circuit.

2. An unusually large voltage drop will indicate a component or wire that needs to be repaired. As you can see in the illustration above, the poor connection causes a 4 volt drop.

The chart that follows illustrates some maximum allowable voltage drops. These values are given as a guideline, the exact value for each component may vary.

COMPONENT	VOLTAGE DROP
Wire	<.001 volts
Ground Connections	Approx. 0.1 volts
Switch Contacts	Approx. 0.3 volts
Starter Solenoids	Approx. 0.5 volts



Engine

Air/Fuel Mixture: Adjustments

Prior to adjusting idle mixture ratio, check and, if necessary, adjust ignition timing and curb idle speed as previously described. Do not attach any hoses disconnected during idle speed adjustment.

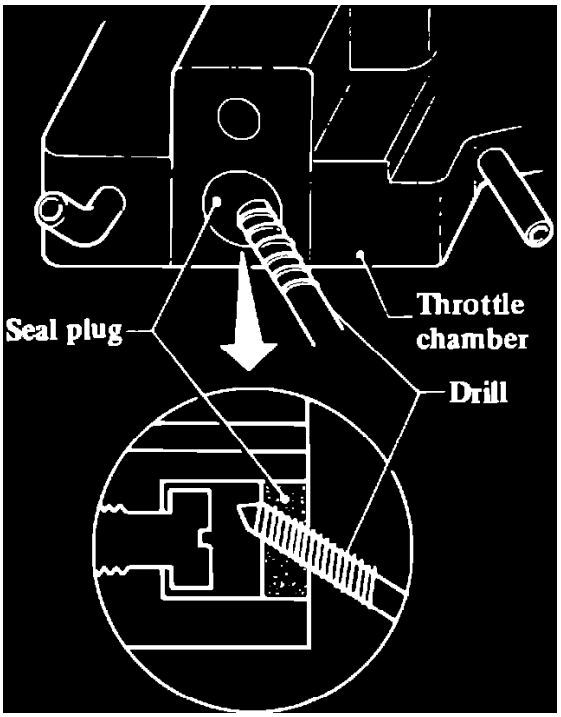


Fig. 3 Mixture adjusting screw seal plug removal

1. Race engine several times, then return engine to idle and measure CO percentage, which should meet the following specifications: 1985-86 Pickup all, less than 4%; 1985-86 Pulsar and Sentra and 1987 Sentra except Calif., 1-5%; 1987 Sentra Calif., 3-7%.
2. If CO percentage is not within specifications, check vacuum hoses for proper connections and inspect carburetor and intake manifold mountings for air leaks. If air leaks are found, correct as necessary and recheck CO percentage. If no air leaks are found, proceed to step 3.
3. Stop engine and remove carburetor.
4. Remove seal plug from carburetor, **Fig. 3,** then reinstall carburetor.
5. Run engine until normal operating temperature is reached, then race engine several times under no load.
6. Run engine at idle speed and turn mixture adjusting screw to adjust CO percentage to the following specifications: 1985-86 Pulsar and Sentra and 1987 Sentra except Calif., 2-4%; 1985-86 Pickup, .3-2%; 1987 Sentra Calif., 4-6%.
7. Recheck idle speed, then install new idle adjusting screw seal plug.

Idle Speed: Adjustments
Fast Idle Adjustment

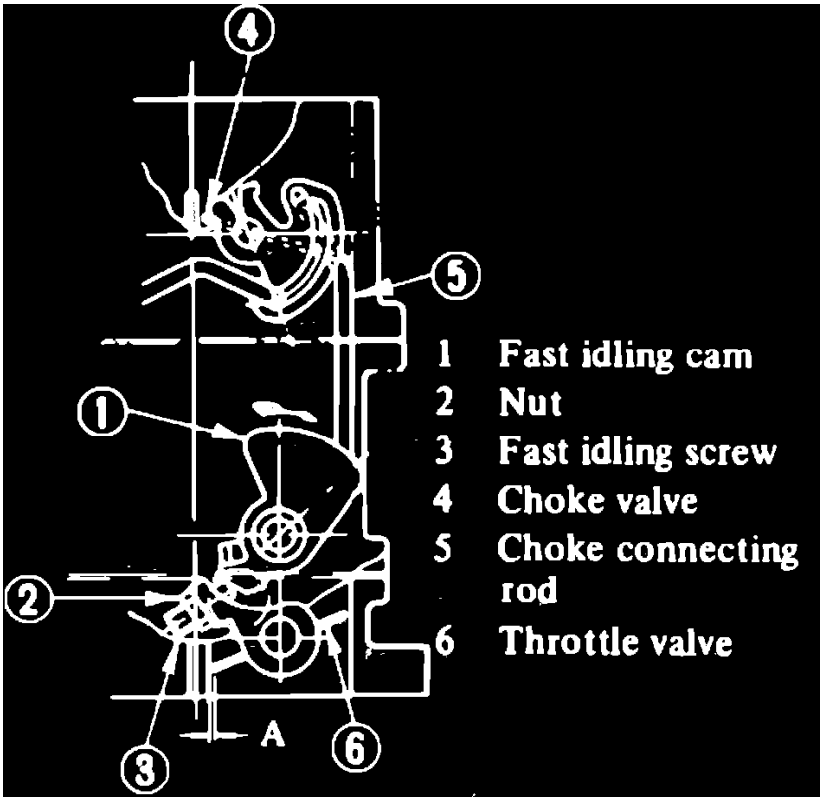
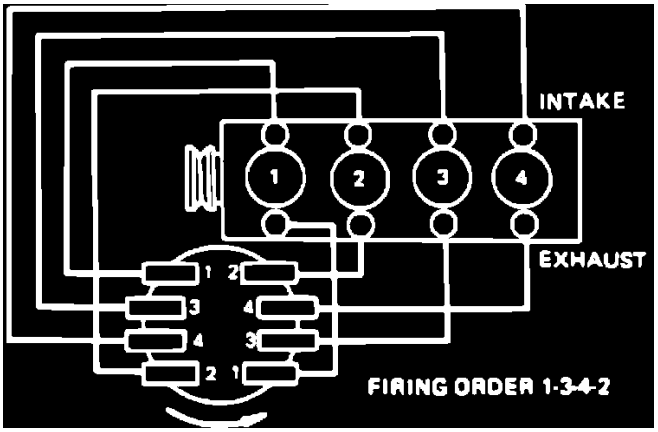


Fig. 2 Fast idle adjustment.

1. Run engine until normal operating temperature is reached.
2. Set fast idle arm on second step of fast idle cam and check fast idle speed.
3. Adjust fast idle speed as necessary by turning fast idle screw, **Fig. 2.**



Firing Order

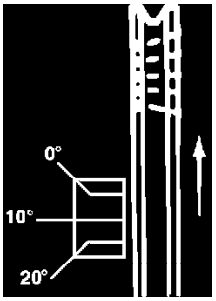


Fig. 5 Timing Mark

Distributor: Service and Repair
Distributor Service Models W/O Crank Angle Sensor

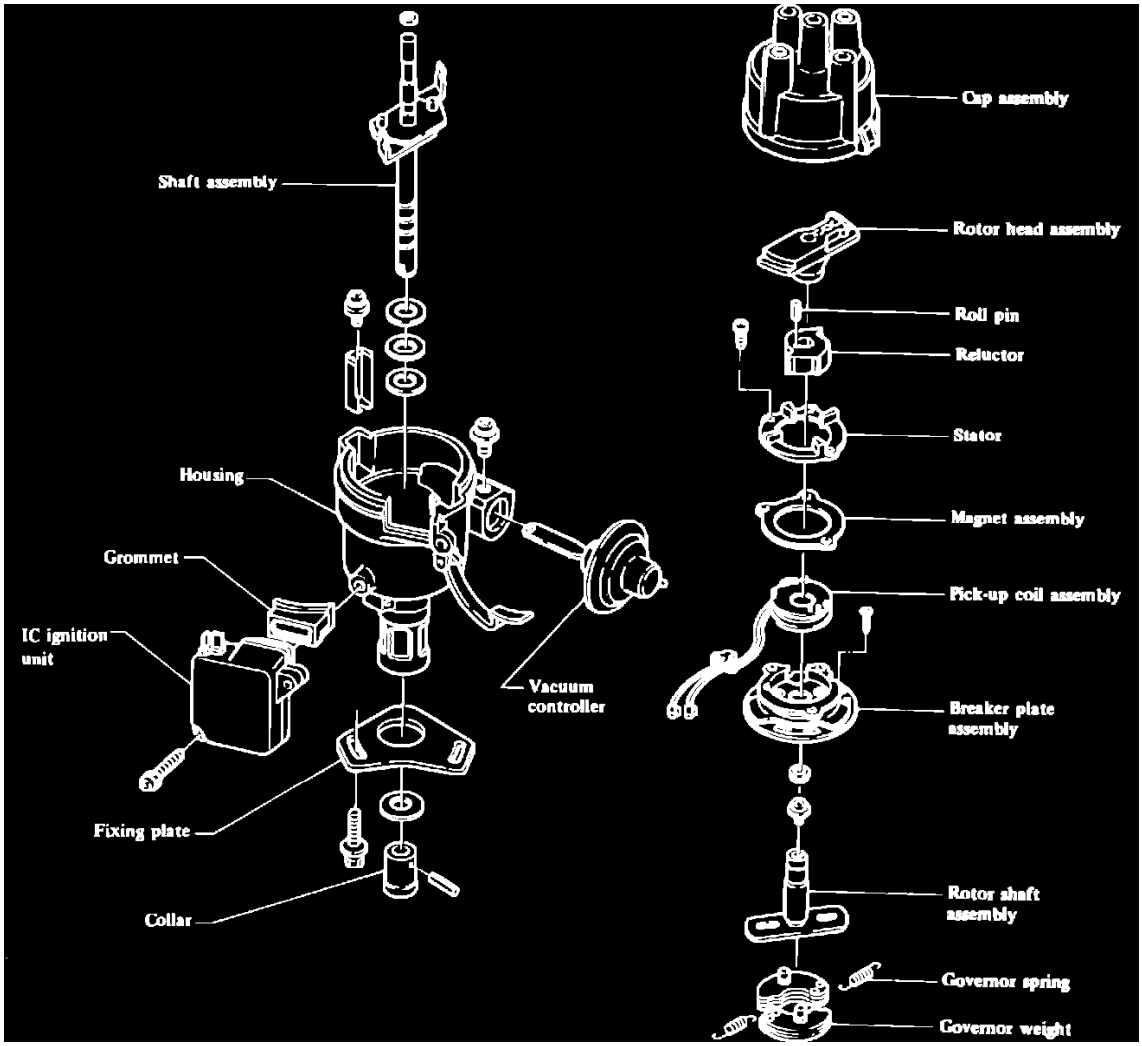


Fig. 11 Exploded view of IC type distributor with external IC unit (typical)

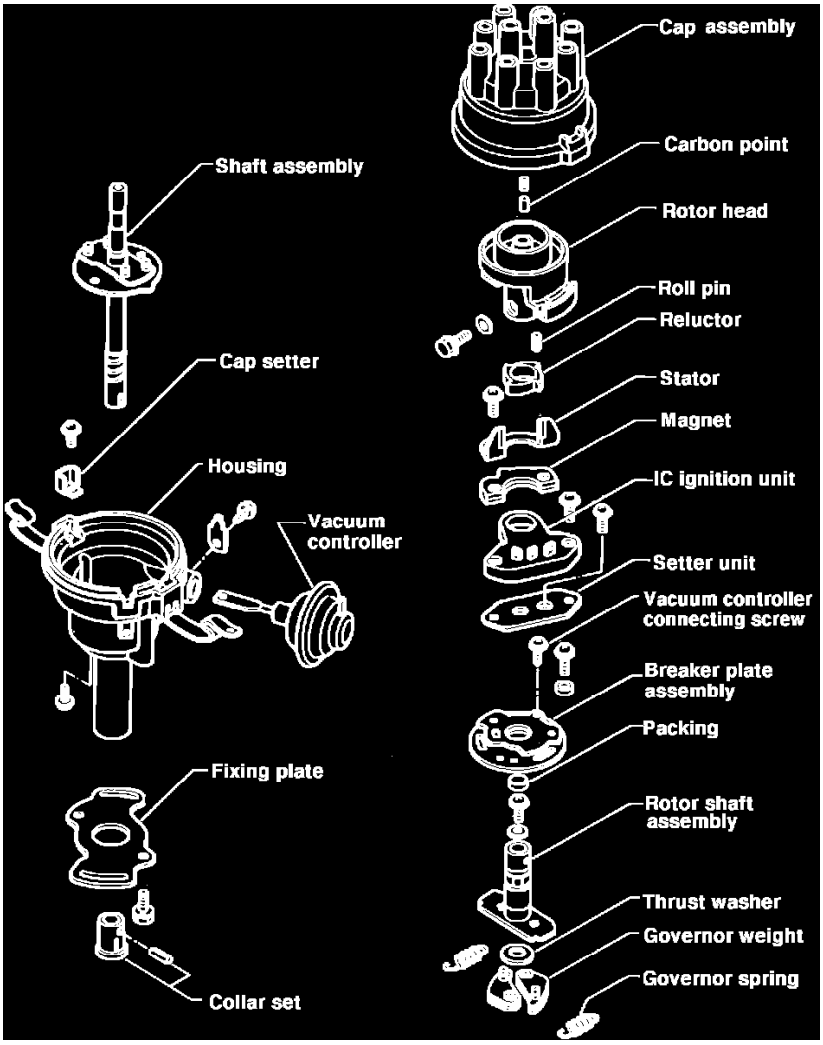


Fig. 12 Exploded view of IC type distributor with internal IC unit (typical)

1. Remove distributor cap and rotor, **Figs. 11 and 12.**
2. Remove IC ignition unit.
3. Remove stator and magnet hold-down screws, then remove stator and magnet assembly.
4. Remove vacuum advance unit.
5. Using 2 pry bars or suitable puller, remove reluctor from shaft.
6. Remove roll pin, then remove pickup coil assembly.
7. Remove breaker plate setscrews, then remove breaker plate.
8. Remove drive gear roll pin, then remove drive gear from shaft.
9. Remove rotor shaft and driveshaft assembly.
10. Mark rotor shaft to driveshaft relationship, then remove packing from top of rotor shaft, remove rotor shaft setscrew and the rotor shaft.
11. Mark relationship of one governor spring to its bracket and one governor weight to its pivot pin, then remove the governor springs and weights.
12. Reverse procedure to install, noting the following:
    a. Lubricate governor weight pivot points.
    b. Clean mating surfaces between IC ignition unit and distributor housing.
    c. All parts marked for relationship should be assembled in their original positions.
    d. Using a new roll pin, ensure reluctor is properly aligned on rotor shaft.

Distributor: Service and Repair
Distributor Replace

REMOVAL

1. Mark position of No. 1 tower of distributor cap on distributor housing.
2. Remove distributor cap.
3. Crank engine to align rotor with No. 1 mark on housing.
4. Place a mark between distributor housing and engine.
5. Remove distributor retaining bolt and the distributor. **Do not crank engine when distributor is removed from engine.**

INSTALLATION

1. Align rotor with No. 1 mark on housing.
2. If engine was cranked when distributor was removed from engine, crank engine until No. 1 cylinder is on compression stroke and the timing marks align on the pulley and front cover.
3. Install distributor into engine, aligning all index marks made during removal.
4. Loosely install distributor retaining bolt.
5. Adjust ignition timing and tighten distributor retaining bolt.

Spark Plug: Specifications

	Spark Plug Model No.	Spark Plug Gap
Intake Side	BPR6ES	0.031-0.035 in
Exhaust Side	BPR5ES	0.031-0.035 in

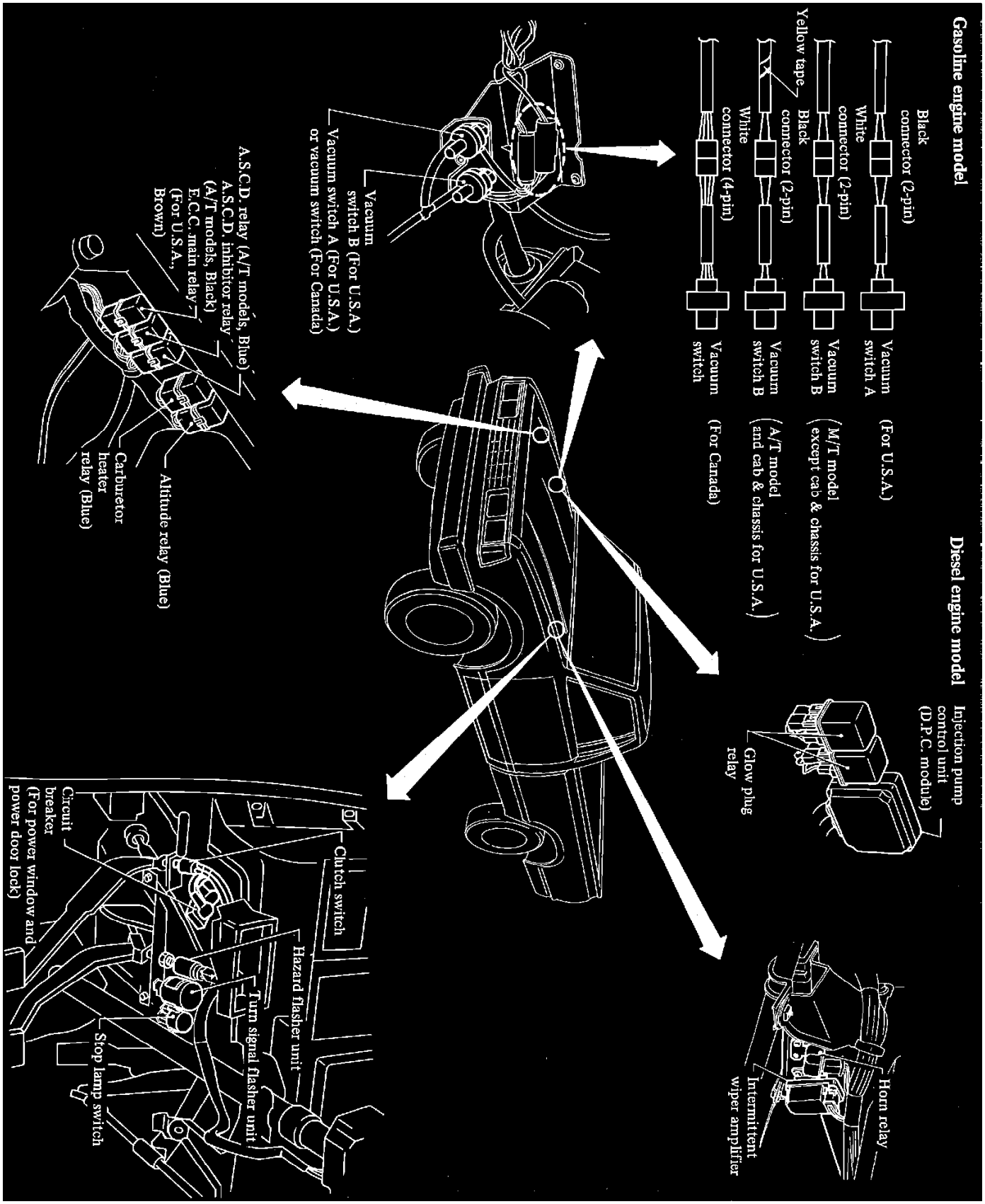


Fig. 438 Electrical Unit Locations (Engine Compartment). Exc. Fuel Injected Engine

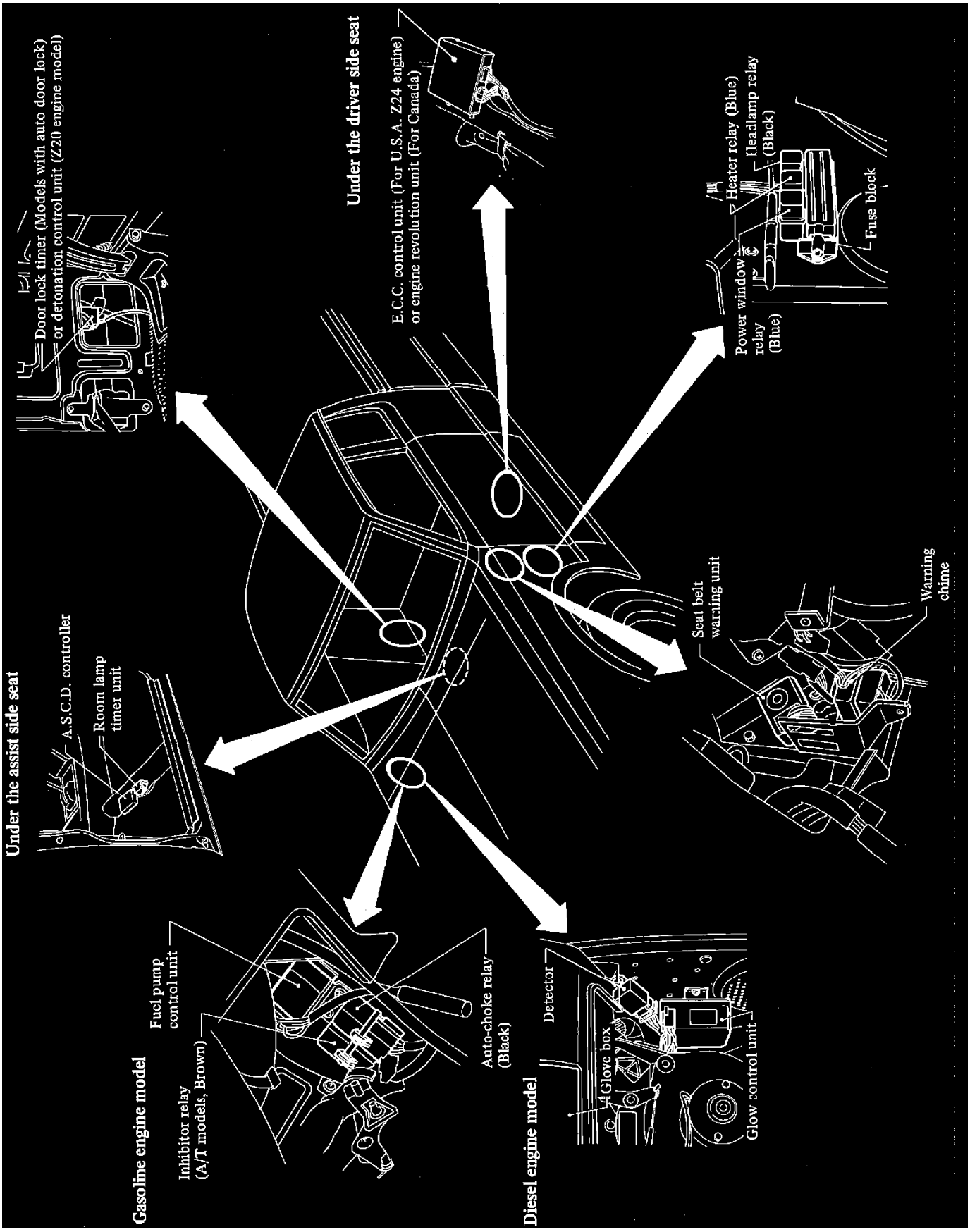
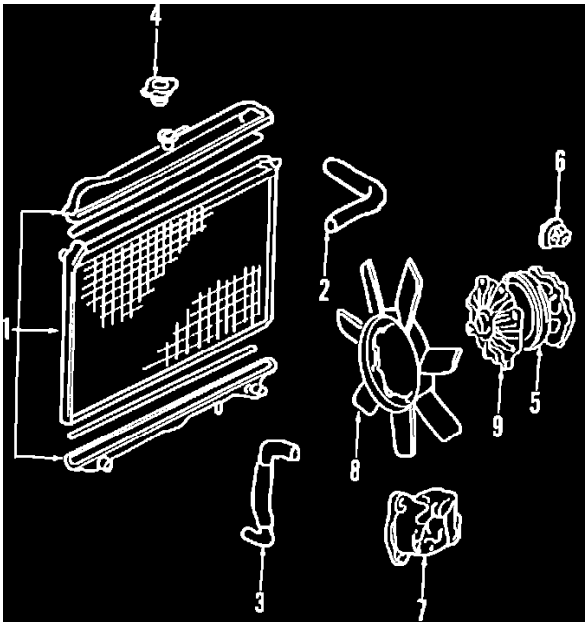


Fig. 439 Electrical Unit Locations (Passenger Compartment). Less Fuel Injected Engine



Cooling System

Heater Core: Service and Repair

1. Disconnect battery ground cable and drain cooling system.
2. On models with A/C, disconnect heater hoses in engine compartment.
3. Remove screws securing console and remove console.
4. Remove steering column shroud and package, if equipped.
5. Disconnect speedometer cable, antenna lead and wiring harness connectors to instrument panel.
6. Remove 3 bolts securing instrument panel at base of windshield, remove bolt securing panel bracket above parking brake handle, and remove bolt inside glove box.
7. Remove 2 bolts securing instrument panel at each end, then remove instrument panel assembly.
8. On models without A/C:
   a. Remove duct to bower housing and disconnect control cable at air intake door.
   b. Disconnect heater hoses at heater unit, taking care not to drip coolant in passenger compartment.
9. On models with A/C, remove air intake housing as outlined in ``Blower Motor, Replace," and remove bolts securing evaporator case.
10. Remove bolts securing heater case and remove case and control as an assembly.
11. Set temperature control lever in COLD position, disconnect control cables, and remove control assembly.
12. Disconnect control rod at water valve and heater hoses at heater core.
13. Remove screws securing water valve and remove valve and hoses.
14. Remove clips securing heater case, separate case and remove heater core.
15. Reverse procedure to install, then adjust controls.

Engine - Coolant Temperature Sensor/Switch: Testing and Inspection

Water temperature sensor test

Tester	Leads to Pins (+)	Leads to Pins (–)	Notes	Should read
Ohm-meter	8	16	20° C (68° F) or above	Below 2.9 kΩ
			Below 20° C (68° F)	2.1 kΩ or above

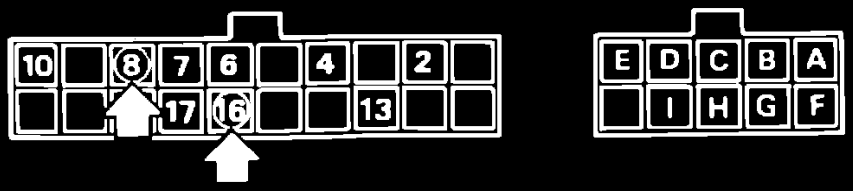


Fig. 18 Water temperature switch test

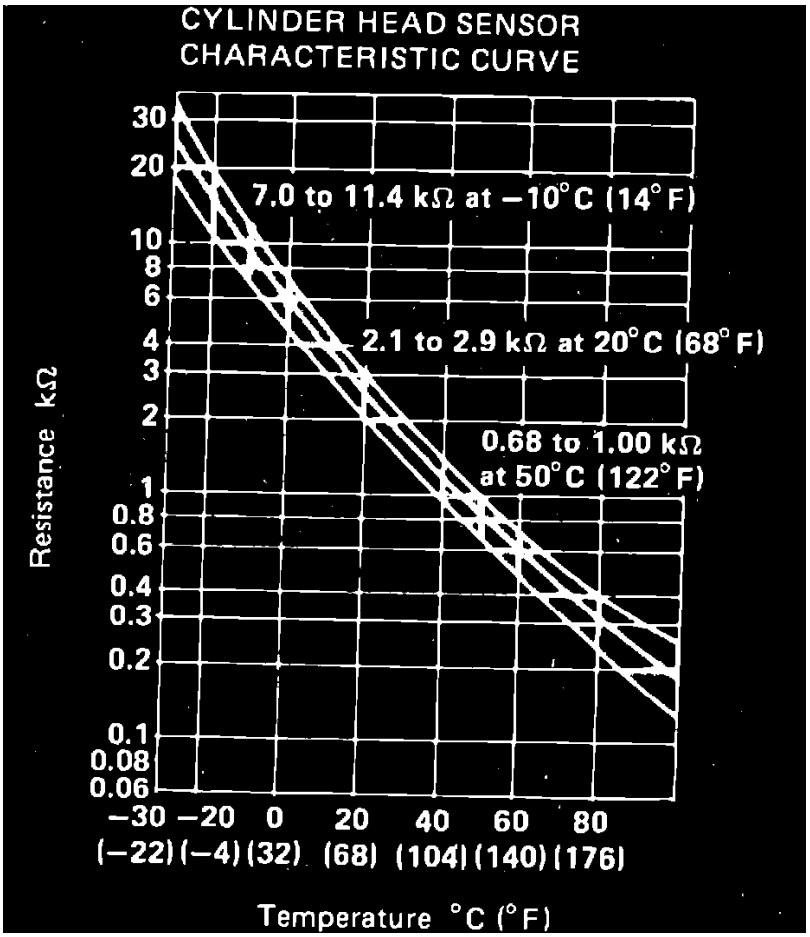
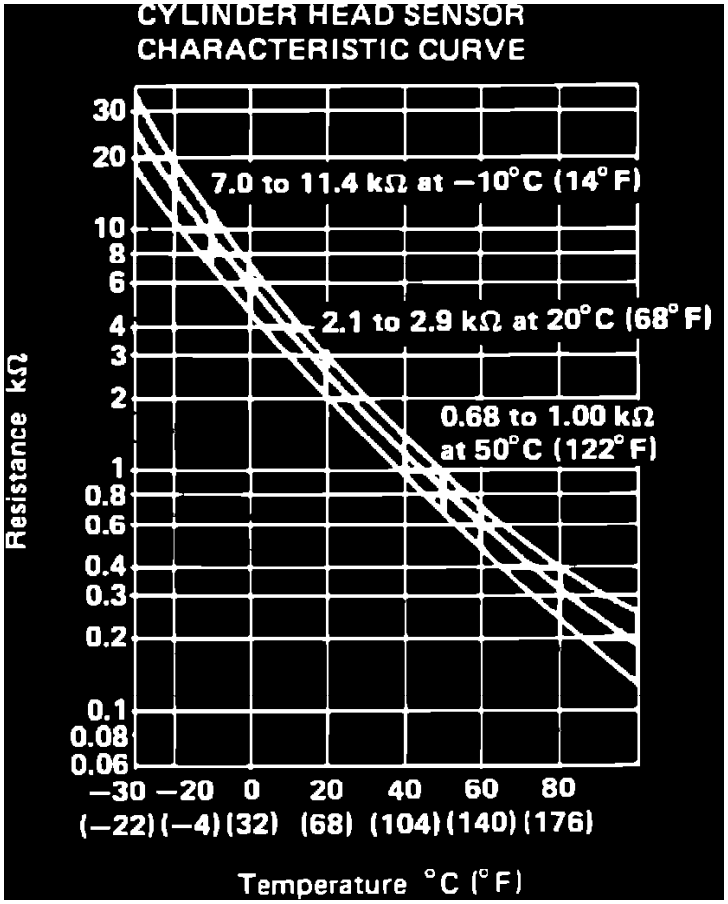


Fig. 19 Water temperature sensor resistance specifications

Perform water temperature sensor test as illustrated in **Fig. 18.** If resistances are not as specified, check sensor as follows:

1. Position water temperature sensor in a container of water and measure resistance when heated to various temperatures, **Fig. 19.**
2. If resistance readings are within specifications, check sensor harness and correct as necessary. If readings are not within specifications, replace sensor.

Coolant Temperature Sensor/Switch (For Computer): Description and Operation



Water temperature sensor graph.

A water temperature sensor, threaded into the intake manifold water jacket, monitors changes in water temperature and transmits a corresponding signal to the ECC control unit. The sensor houses a thermistor whose resistance decreases in response to a rise in temperature.

Multi-Function Thermal Sensor / Switch: Service and Repair

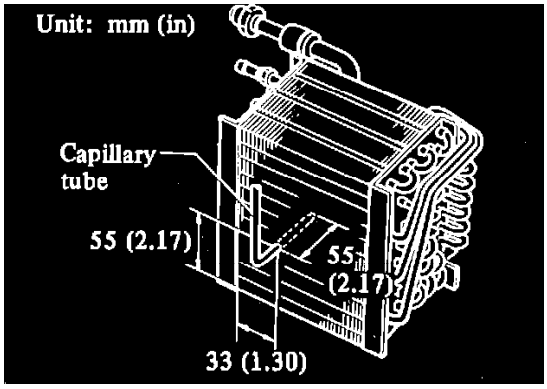


Fig. 28 Thermostatic switch sensor installation.

1. Remove and separate evaporator case as outlined in ``Evaporator and Expansion Valve, Replace."
2. Remove screws securing thermo control switch to upper case and remove switch.
3. Install switch and insert switch sensor tube into evaporator core as specified, **Fig. 28.**
4. Reverse procedure to install evaporator assembly.

Catalytic Converter: Description and Operation

Single Stage Converter

The catalytic converter accelerates the chemical reaction of hydrocarbons (HC) and carbon monoxide (CO) in the exhaust gas, and changes them into harmless carbon dioxide (CO2) and water (H2O).

The chemical reaction process requires the proper amount of air. This air, called secondary air, is supplied by the air injection system through a check valve or through an air induction valve, or is absorbed from excess air in the unburned portion of the air-fuel mixture.

By means of a chemical rea1~ion process as it passes through the catalytic converter, the excess air in the air-fuel mixture (which has not been burned during the combustion process) is utilized to minimize H and CO emissions.

The exhaust gas which is left unburned during combustion process is gradually oxidized with excess oxygen, and is converted into harmless carbon dioxide (C02) and water (H2O). The catalytic converter, located in the exhaust line, further cleans exhaust gases through catalytic action, and changes residual hydrocarbons (HC) and carbon monoxide (CO) contained in the exhaust gas into carbon dioxide (CO2) and water (H20) before the exhaust gas is discharged to the atmosphere.

The catalytic converter on 1975 models is provided with a warning device whose warning lamp, located on the instrument panel, lights if the temperature rises abnormally. Except for the 260Z, 1975 models are also equipped with a catalyzer protector.

Catalytic Converter: Description and Operation

Three Stage Converter

The three way catalytic converter utilizes a catalyst to accelerate the recombustion of HC and CO and a catalyst to reduce NOx in the exhaust gas, changing them into harmless CO2, H2O, and N2.

A mixture ratio feedback system maintains mixture ratios at the "stoichiometric" point--the point at which the converter works most efficiently.

In this system, an exhaust gas sensor monitors oxygen content in the exhaust and signals the ECU to alter the air/fuel mixture--maintaining the "stoichiometric" level.

Ignition System: Description and Operation
Spark Plug Switching Control System

Description

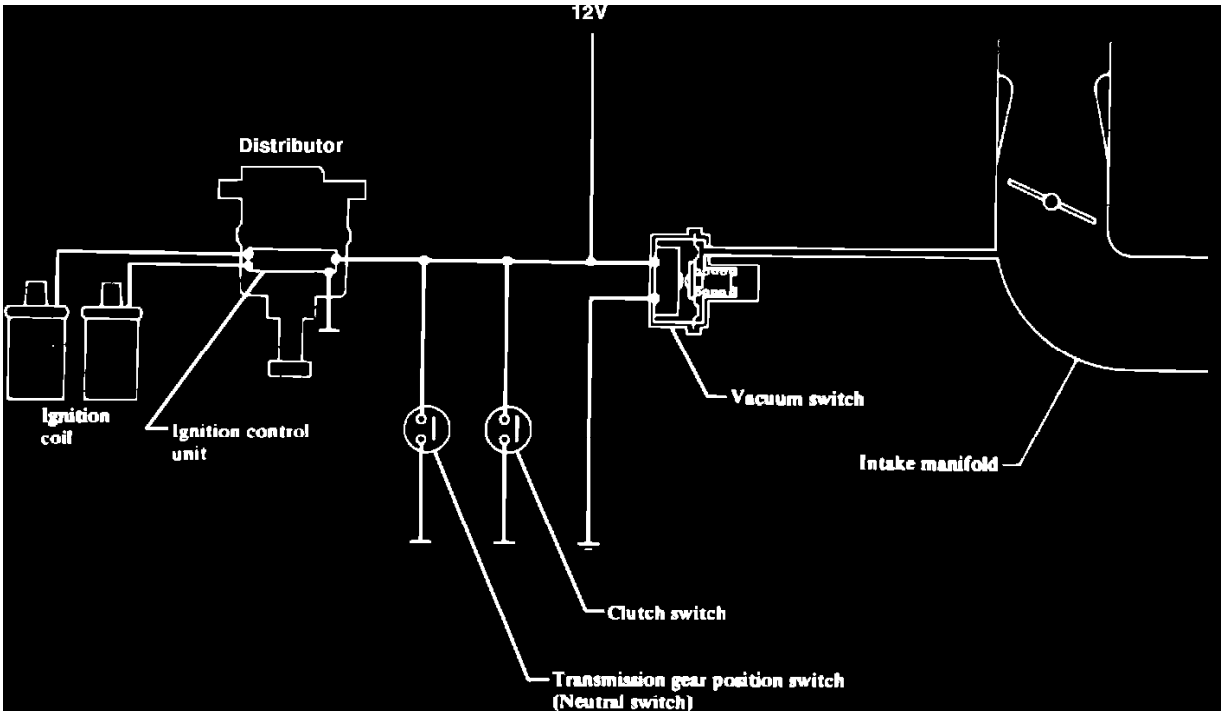


Fig. 38 Spark plug switching control system.

This system, **Fig. 38,** is designed to change the ignition system from 2-plug ignition to 1-plug ignition during heavy load driving conditions in order to reduce engine noise. This system also functions to advance ignition timing by a specified value during 1-plug ignition.

This system is composed of an ignition control unit, which is installed in distributor and has a switching function which allows it to change from 2-plug ignition to 1-plug ignition, and a vacuum switch which senses the intake manifold vacuum. Neutral and clutch switches are also used as auxiliary control devices.

Testing

1. Disconnect a clutch switch harness connector.
2. Disconnect a vacuum hose from vacuum switch and connect a proper vacuum hose and suitable vacuum source to vacuum switch.
3. Connect timing light to the exhaust side of high tension cable.
4. Apply vacuum of 5.91 inches Hg to vacuum switch and start engine.
5. Reduce vacuum gradually and check that timing light does not brighten and dim when vacuum reaches approximately 3.15 inches Hg. If it does, check individual components and replace as necessary.
6. Connect timing light to intake side of high tension cable and apply vacuum of 5.91 inches Hg to vacuum switch.
7. Reduce vacuum gradually and check that spark timing advances. If not, replace IC unit in distributor.

Ignition System: Description and Operation
Description

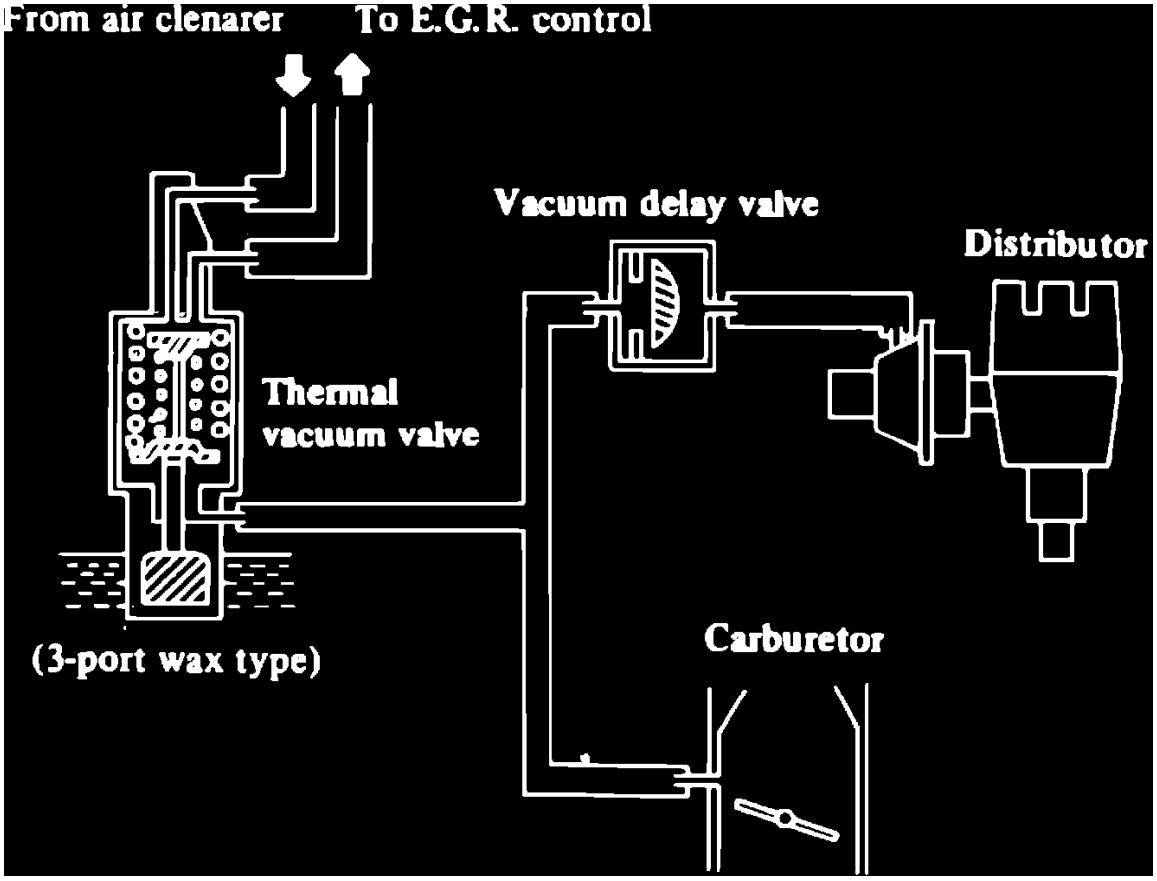


Fig. 25 Vacuum controlled spark timing control system. (Typical)

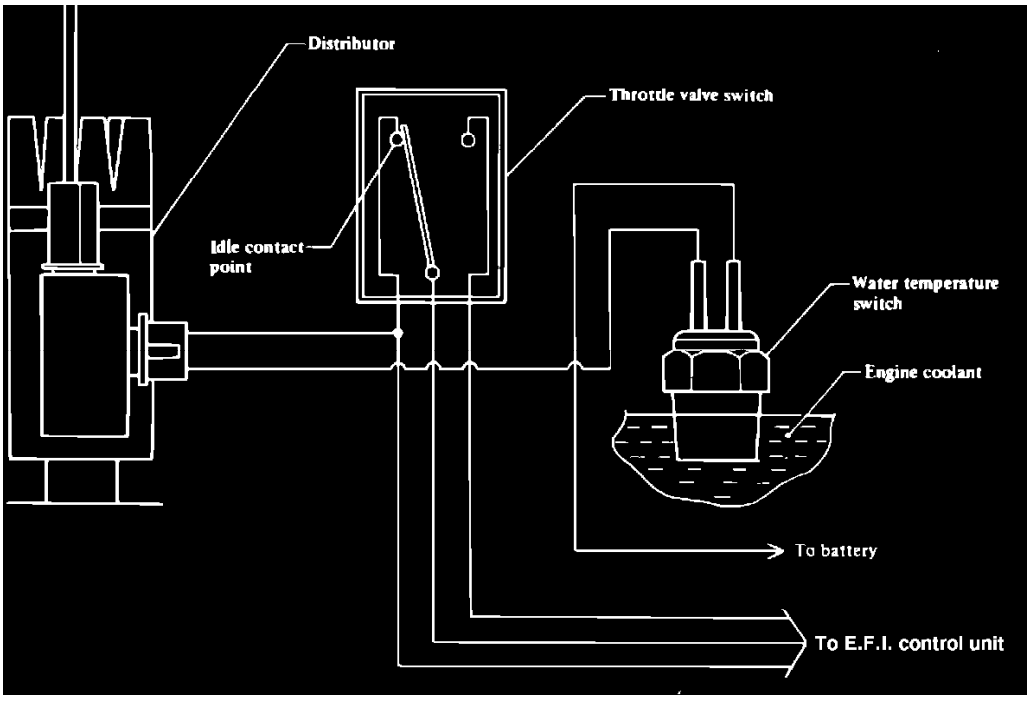


Fig. 26 Electrically controlled spark timing control system. (Typical)

Refer to **Figs. 25 and 26** for typical spark timing control systems. Complete system schematics are located in ``Vacuum Hose Routings."

The spark timing control system is designed to control distributor vacuum advance in order to reduce HC and NOx emissions. The thermal vacuum valve opens and closes in response to coolant temperature, causing the spark timing control vacuum line to be exposed or closed to the atmosphere. When the valve opens, air enters the vacuum signal line, preventing distributor vacuum advance.

The vacuum control valve is installed on the distributor vacuum line. When carburetor venturi vacuum exceeds a pre-determined value, air is bled to distributor vacuum line and the spark timing is retarded slightly.

Ignition System: Description and Operation

Testing

1. Ensure vacuum hoses are properly routed and distributor vacuum controller functions properly.
2. Install timing light and check ignition timing when engine is cold.
3. Check that timing retards, then advances as engine warms up.
4. If timing does not change as specified, replace thermal vacuum valve and check vacuum control valve as follows:
    a. Disconnect vacuum control valve side of venturi vacuum hose from valve.
    b. Apply vacuum to valve and check that timing retards.
    c. If timing does not retard, replace vacuum control valve.

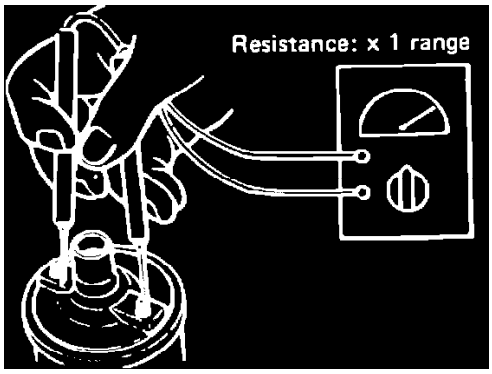
Thermal Vacuum Valve

1. Remove thermal vacuum valve, then inhale air from port of spark timing control system.
2. Valve should be open between 59 and 140°F and close at all other temperatures.

Ignition Coil: Testing and Inspection

Note: This vehicle could have two different types of ignition coils. Be sure to identify which type you are working on before testing.

Early type is a conventional style coil.



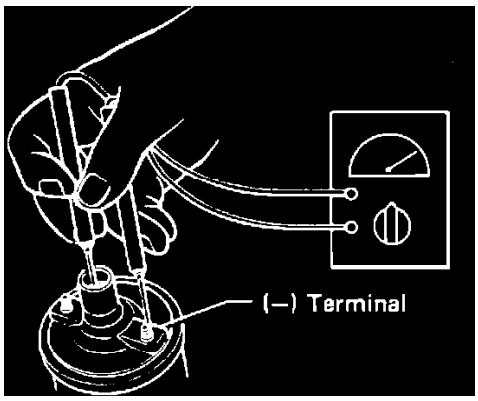
Ignition Coil Primary Circuit

1. Be sure ignition is "**OFF**".
2. Remove coil wire from coil.

Primary Circuit

3. Connect ohmmeter as shown. Reading should be approximately:

   1.0 - 1.2 ohms



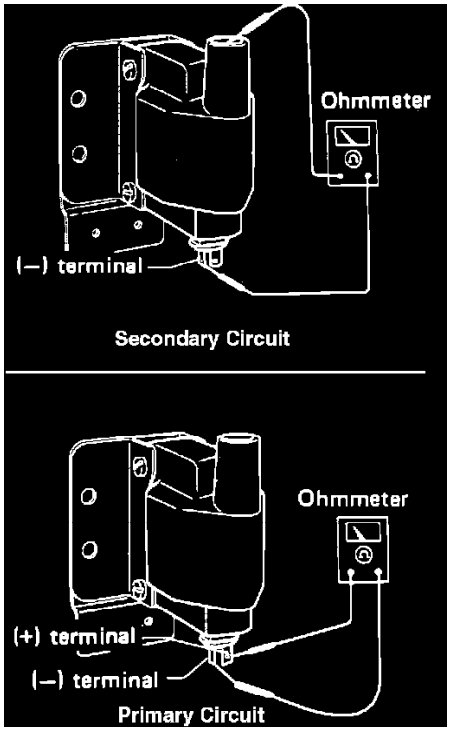
Ignition Coil Secondary Circuit

Secondary Circuit

4. Connect ohmmeter as shown. Reading should be approximately:

   7,300 - 11,000 ohms

Late type is a molded coil.



Ignition Coil Circuit Testing.

1. Be sure ignition is "**OFF**".
2. Remove coil wire from coil.

Primary Circuit

3. Connect ohmmeter as shown. Reading should be approximately:

   .8 - 1.0 ohms

Secondary Circuit

4. Connect ohmmeter as shown. Reading should be approximately:

   8,000 - 12,000 ohms

Detonation Sensor: Description and Operation

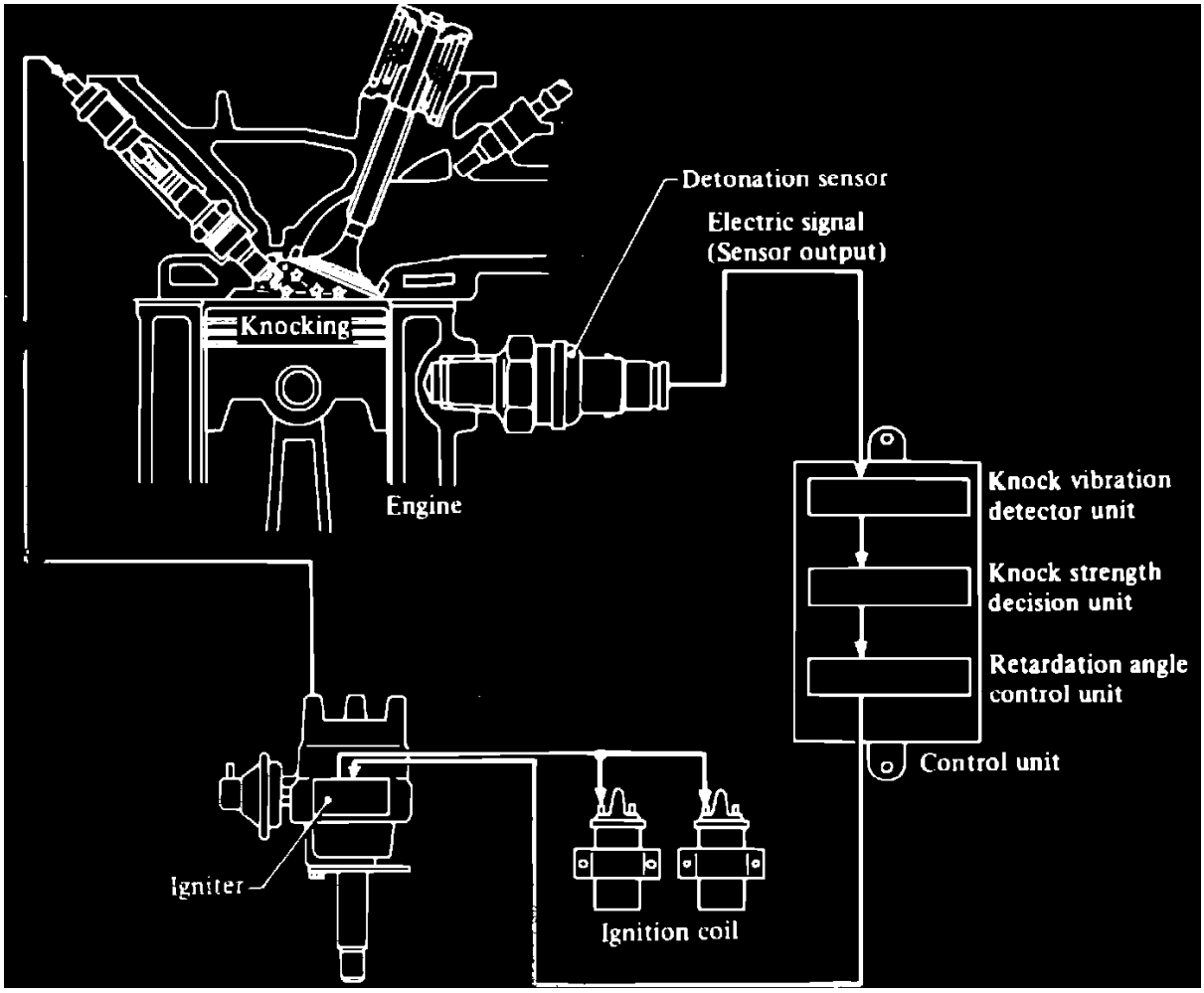


Fig. 44 Detonation control system.

This system, **Fig. 44,** incorporates a detonation sensor to monitor detonation in each combustion chamber and send a corresponding signal to the control unit. The detonation control unit, located under the driver's seat, varies ignition timing to minimize detonation.

Detonation Sensor: Testing and Inspection

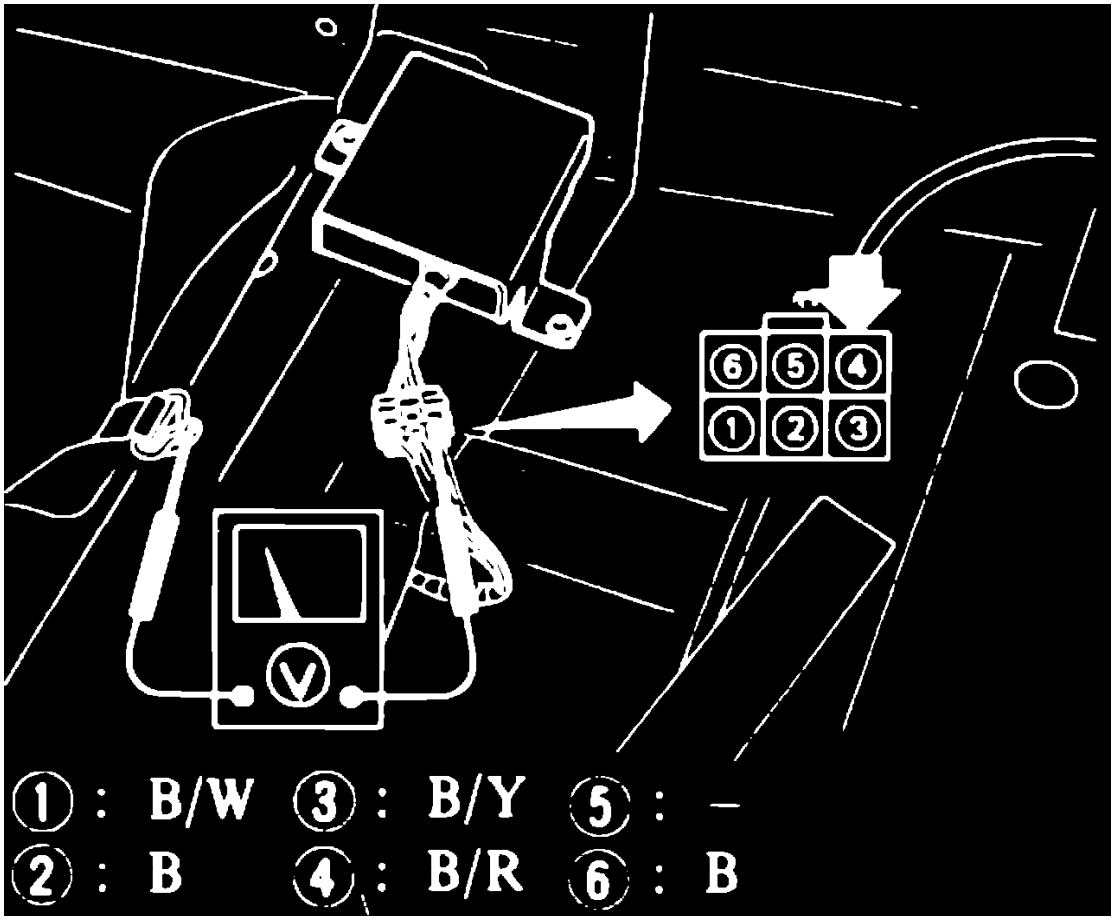


Fig. 45 Detonation control unit test

1. Run engine at idle until normal operating temperature is reached.
2. Disconnect detonation sensor electrical connector with engine idling.
3. Slowly increase engine speed and check ignition timing with a suitable timing light.
4. If timing retards 10° when engine speed increases more than 2000 RPM, replace detonation sensor.
5. If timing does not retard, measure voltage between detonation control unit terminal No. 4, **Fig. 45,** and ground with engine running above 2000 RPM. If voltage measures .4-.7 volts, proceed to step 6. If voltage does not measure .4-.7 volts, check distributor and wiring harness and repair as necessary.
6. Measure voltage between detonation control unit terminal No. 3 and ground with engine running above 2000 RPM. If voltage does not measure 3.7-3.8 volts, replace detonation control unit.

Ignition Switch: Service and Repair

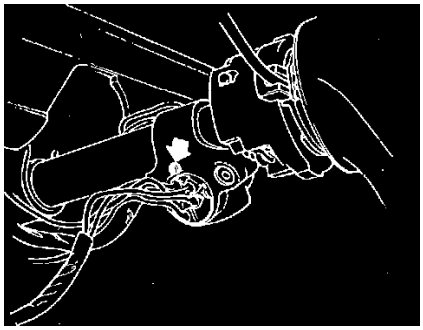
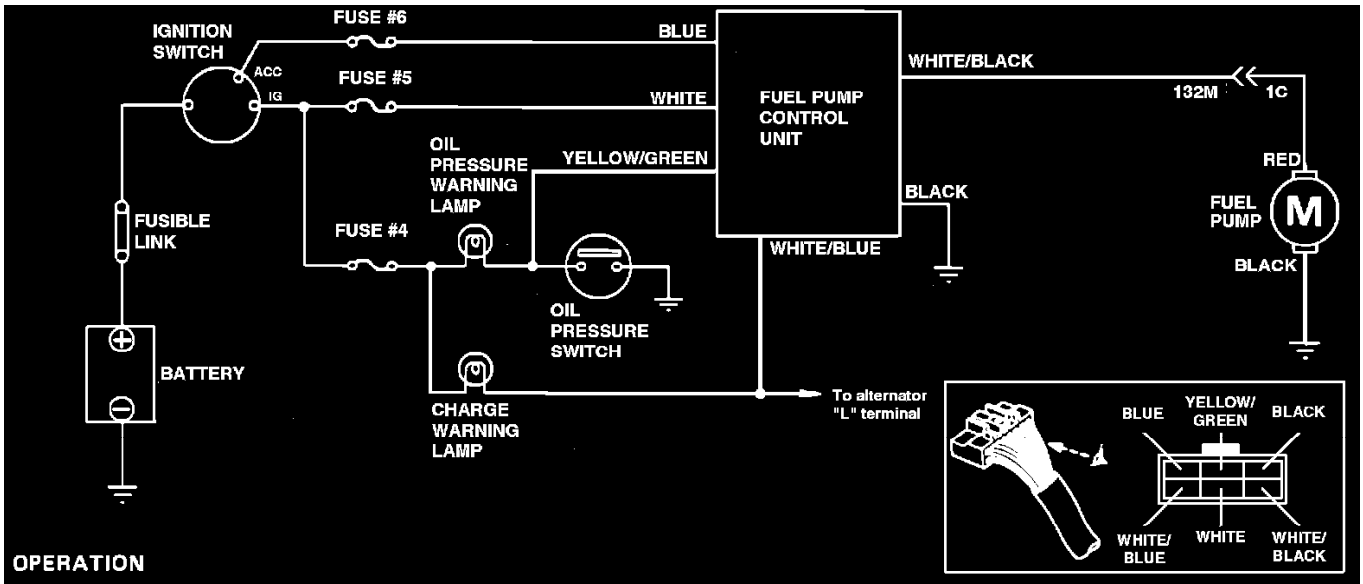


Fig. 2 Ignition switch replacement

1. Remove the four upper and lower shell cover retaining screws, then the shell covers.
2. Disconnect electrical connectors from switch.
3. Remove switch retaining screw from steering lock, **Fig. 2.**
4. Remove switch.
5. Reverse procedure to install.

Fuel Delivery and Air Induction: Testing and Inspection

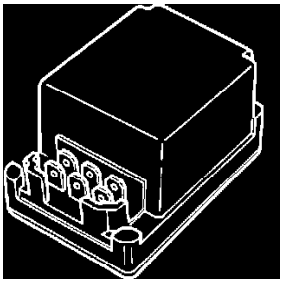
NOTE: This test assumes that the vehicle does not start or has an intermittant stalling problem that is fuel related.



OPERATION

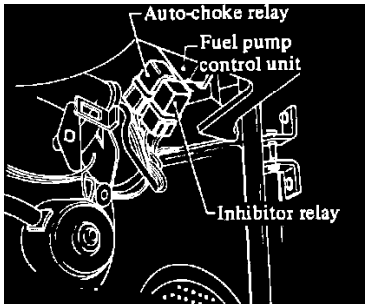
Ignition switch position	Engine	Alternator	Oil pressure	Fuel pump
OFF	Stopped	Not generating	No pressure	Not operating
ACC				
ON				
START	Cranking	Not generating	Low pressure	Operating
		Generating		
ON	Running	Not generating	Normal	
		Generating		
		Failure		
		Generating	Failure	

Fuel Pump Control Circuit And Operation



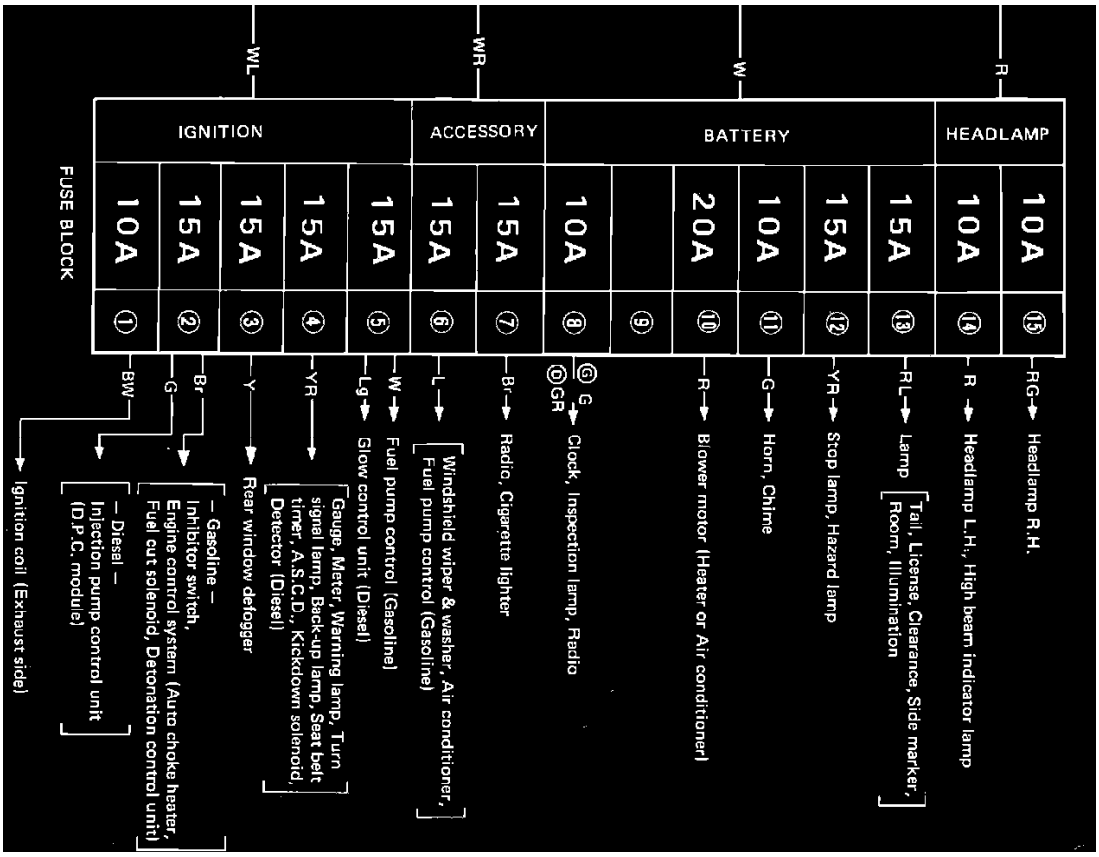
Fuel Pump Control Unit

To test the fuel pump, control relay and associated circuit, proceed as follows:

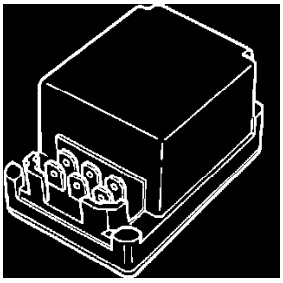


Relay Location

1. With the key in the START position, tap on the fuel pump control unit (located to the right of the glove box) and listen for the sound of the fuel operating.
   a. If the fuel pump operates, check the connection at the control unit. If the connections are OK, replace the fuel pump control unit.
   b. If the fuel pump does not operate, continue with the remainder of the test.



Fuse Locations



Fuel Pump Control Unit

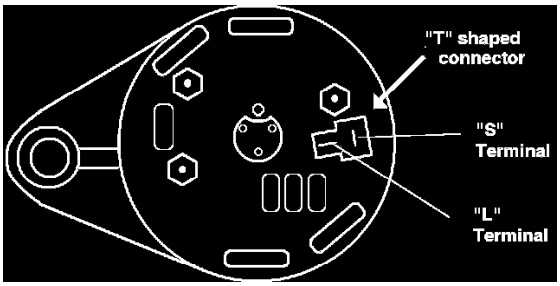
2. Check the following fuses: 4, 5 and 6. All of these fuses supply power to the fuel pump control unit.
   a. Replace any shorted fuses and recheck fuel pump operation. If the fuses do not have power supplied to them when the key is in the ON position, check the ignition switch and the fuse links at the battery.

3. Turn the key to the ON position.
4. Using a volt meter, back probe the BLUE wire at the control unit.
   a. If battery voltage does exist, proceed to next step.
   b. If battery voltage does not exist, check for an open in the BLUE wire between the control unit and fuse 6.

5. Using a volt meter, back probe the WHITE wire at the control unit.
   a. If battery voltage does exist, proceed to next step.
   b. If battery voltage does not exist, check for an open in the WHITE wire between the control unit and fuse 5.

6. Using an ohm meter, back probe the YELLOW/GREEN wire at the control unit.
7. Turn the key to the START position for approximately 20 seconds and check for continuity between the wire and ground.
   a. If continuity exists, proceed to next step.
   b. If continuity does not exist, check the oil pressure switch (it should close, providing the ground signal once oil pressure builds) also check for continuity between the the oil pressure switch harness terminal and the WHITE wire at the control unit.

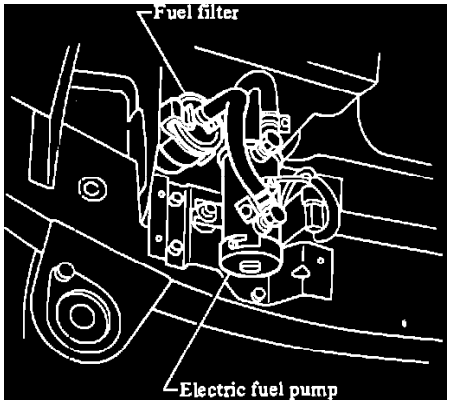
8. Turn the key to the OFF position.



Alternator Terminals

9. Disconnect the "T" shaped connector on the alternator.
10. Using an ohmmeter, check for continuity between the "L" terminal (leg of the "T") harness connector at the alternator and the WHITE/BLUE wire at the control unit.
    a. If continuity exists, proceed to next step.
    b. If continuity does not exist, repair the open WHITE/BLUE wire.

11. Reconnect the alternator "T" connector.

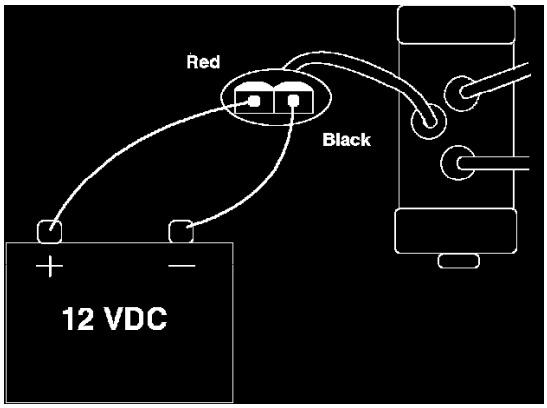


Fuel Pump Location

12. Disconnect the fuel pump control unit and the the fuel pump connectors (located on the R.H. frame rail).
13. Using an ohm meter, check for continuity between the BLACK wire at the control unit connector and ground.
    a. If continuity exists, proceed to next step.
    b. If continuity does not exist, repair the open BLACK wire.

14. Using an ohm meter, check for continuity between the BLACK wire at the fuel pump connector and ground.
    a. If continuity exists, proceed to next step.
    b. If continuity does not exist, repair the open BLACK wire.

15. Using an ohm meter, check for continuity between the WHITE/BLACK wire at the control unit connector and the RED wire at the fuel pump.
    a. If continuity exists, proceed to next step.
    b. If continuity does not exist, repair the open wire between the fuel pump and the control unit (the wire routes through connectors 132M/1C under the carpet below the passengers seat).



Fuel Pump Test

16. Using a 12vdc power supply, apply voltage to the fuel pump as shown. Replace the fuel pump if it does not operate.

Altitude Compensator: Description and Operation

Air density becomes thinner at higher altitudes. Therefore, the carburetor produces too rich an air/fuel mixture at higher altitudes. The altitude compensator automatically corrects air/fuel ratio to an optimum mixture.

When vehicle is operated in a high altitude environment, the bellows in the compensator extends, causing the lever attached to the bellows to push up the needle. When the needle is pushed up the air passage becomes wider, allowing larger amounts of air to flow from the altitude compensator to the carburetor, thereby thinning the air/fuel mixture.

Carburetor: Description and Operation
Open-Loop Control

The air/fuel ratio solenoid is controlled by open loop control under the following conditions for improved driveability:

a. When battery voltage is less than or equal to 10 volts.
b. When engine speed is less than 400 RPM.
c. When coolant temperature is less than 122'F on vehicles with manual transmission or less than 140'F on vehicles with automatic transmission.
d. When output voltage is less than 200-300 millivolts.
e. During deceleration when fuel shut-off system is in operation.
f. When engine speed is greater than or equal to 3600 RPM on MPG models or greater than or equal to 3425 RPM on other models (engine revolution switch off).

On 1984-85 Federal Pulsar and Sentra models, the solenoid is controlled by open loop control under the following conditions:

a. When engine speed is less than 400 RPM and the starter switch is ON.
b. When coolant temperature is less than 185'F and intake air temperature is less than 59'F.
c. When coolant temperature is less than 140'F and intake air temperature is greater than or equal to 59'F.
d. When hot restarting with exhaust gas sensor output voltage less than 200-300 millivolts and coolant temperature greater than or equal to 140'F.
e. During deceleration, when fuel shut-off system is in operation.
f. When engine speed is greater than or equal to 4150 RPM.
g. On models with manual transmission, when intake manifold vacuum is less than 2.36 inches Hg at full throttle.
h. When coolant temperature is greater than or equal to 221~F and intake air temperature is greater than or equal to 149'F.

During open loop control, air/fuel ratio is determined by the E.C.C. control unit.

Carburetor: Description and Operation
Closed-Loop Control

This system controls air/fuel ratio precisely to the stoichiometric point so that the three way catalyst can minimize all exhaust emissions simultaneously. The system uses the exhaust gas sensor, located in the exhaust manifold, to give an indication of whether air/fuel mixture is leaner or richer than stoichiometric point. The sensor transmits a nonlinear voltage to the E.C.C. control unit. The control unit adjusts the feedback pulse width according to sensor voltage so that mixture ratio will be within the narrow window of the three-way catalyst. This system becomes open during engine warm-up until the sensor reaches operating temperature.

Carburetor: Adjustments

Choke Unloader, Adjust

1. Close choke valve completely.
2. Hold choke valve by stretching a rubber band between choke piston lever and stationary part of carburetor.
3. Pull throttle lever until fully open.
4. Adjust clearance between choke valve and carburetor body to specifications by bending unloader tang.

Concealment Plug Removal

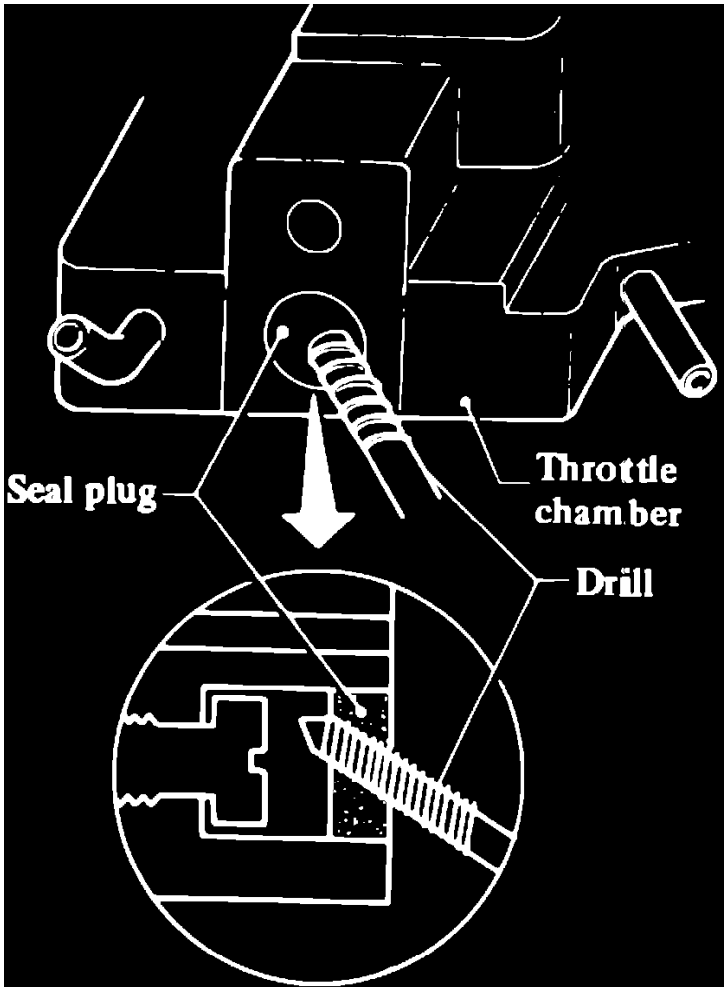


Fig. 16 Concealment plug removal

1. Remove carburetor from vehicle.
2. Drill a hole in plug, then pry plug out of bore, **Fig. 16.**
3. Blow shavings out of bore with compressed air.
4. Reverse procedure to install.

Electronic Controlled Carburetor (ECC)

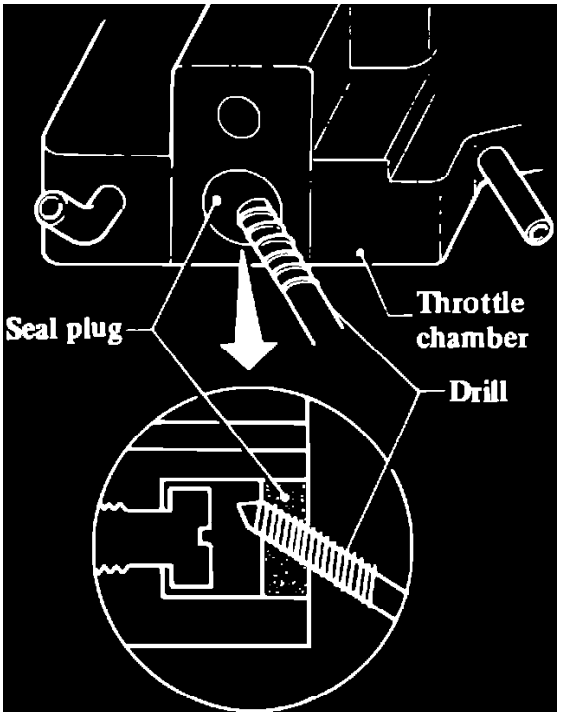


Fig. 3 Mixture adjusting screw seal plug removal

NOTE: Prior to testing ensure timing is within mfg. specifications. Disconnect air-fuel ratio solenoid harness connector (single wire connector on the E.C.C. harness near the air cleaner) and disable the air injection system, if equipped. Remember to reconnect all items after testing is complete and recheck idle speed.

1. Race engine several times, then return engine to idle and measure CO percentage, which should meet the following specifications: 1983-86 Pickup all, less than 4%.
2. If CO percentage is not within specifications, check vacuum hoses for proper connections and inspect carburetor and intake manifold mountings for air leaks. If air leaks are found, correct as necessary and recheck CO percentage. If no air leaks are found, proceed to step 3.
3. Stop engine and remove carburetor.
4. Remove seal plug from carburetor, **Fig. 3,** then reinstall carburetor.
5. Run engine until normal operating temperature is reached, then race engine several times under no load.
6. Run engine at idle speed and turn mixture adjusting screw to adjust CO percentage to the following specifications: 1983-86 Pickup, .3-2%.
7. Recheck idle speed, then install new idle adjusting screw seal plug.

Fast Idle Speed (Off-Vehicle), Adjust

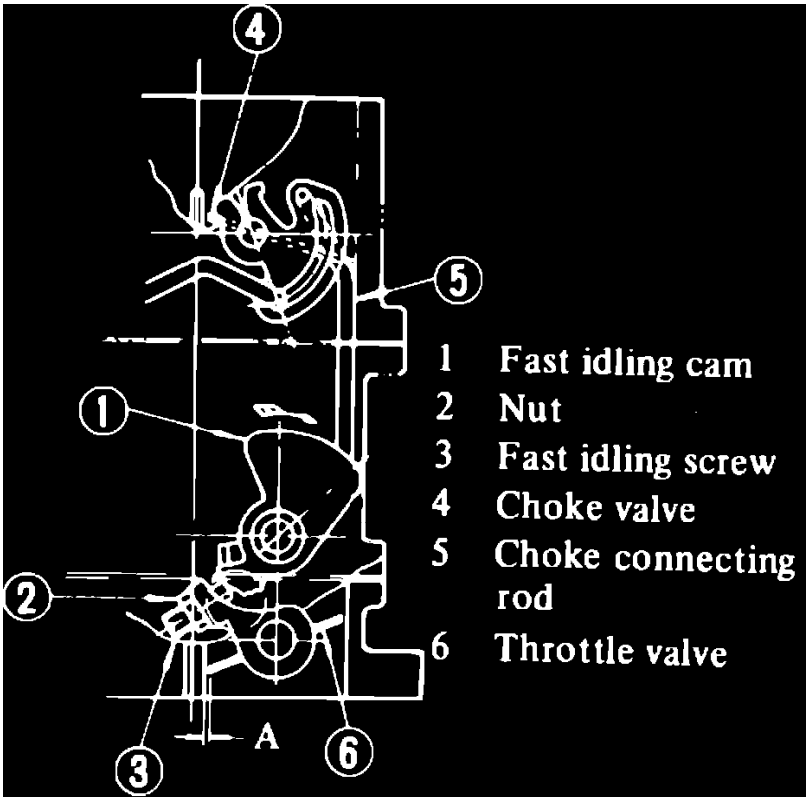


Fig. 15 Fast idle adjustment.

1. Place fast idle screw on second step of fast idle cam.
2. Turn fast idle adjusting screw until dimension ``A," **Fig. 15,** is according to specifications.

Float & Fuel Level, Adjust

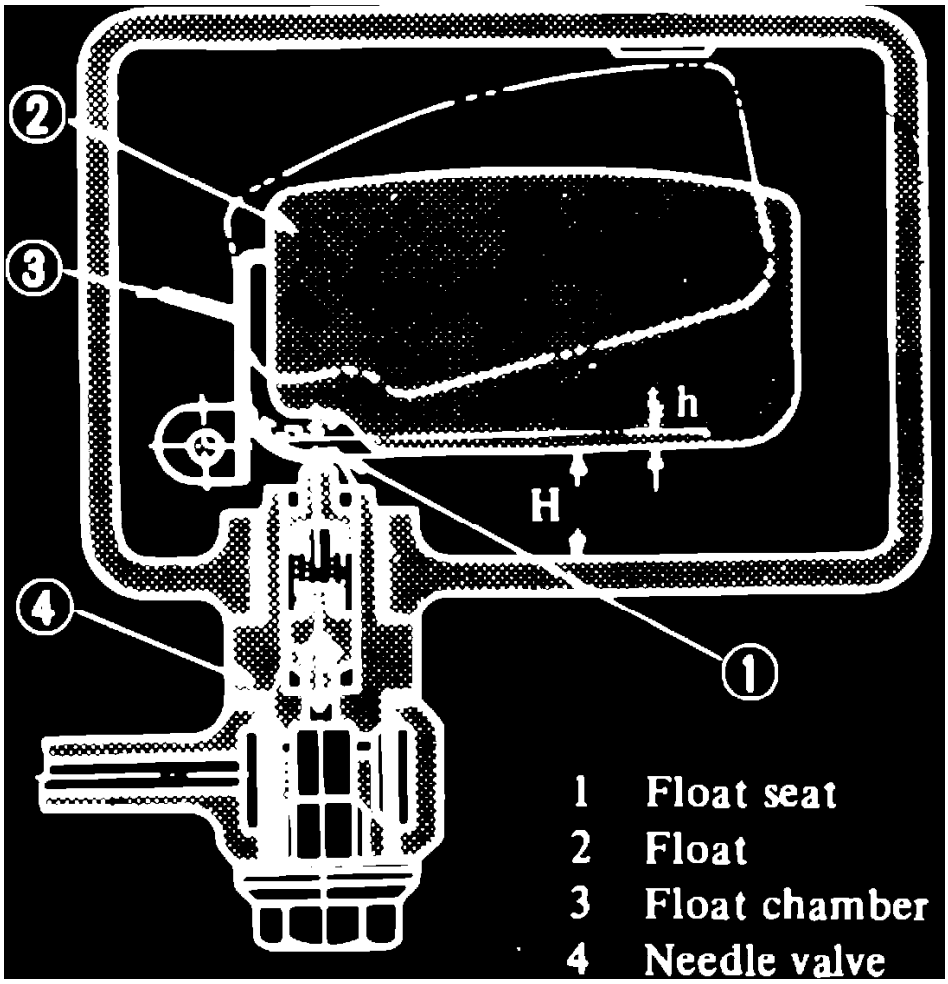


Fig. 10 Float level adjustment.

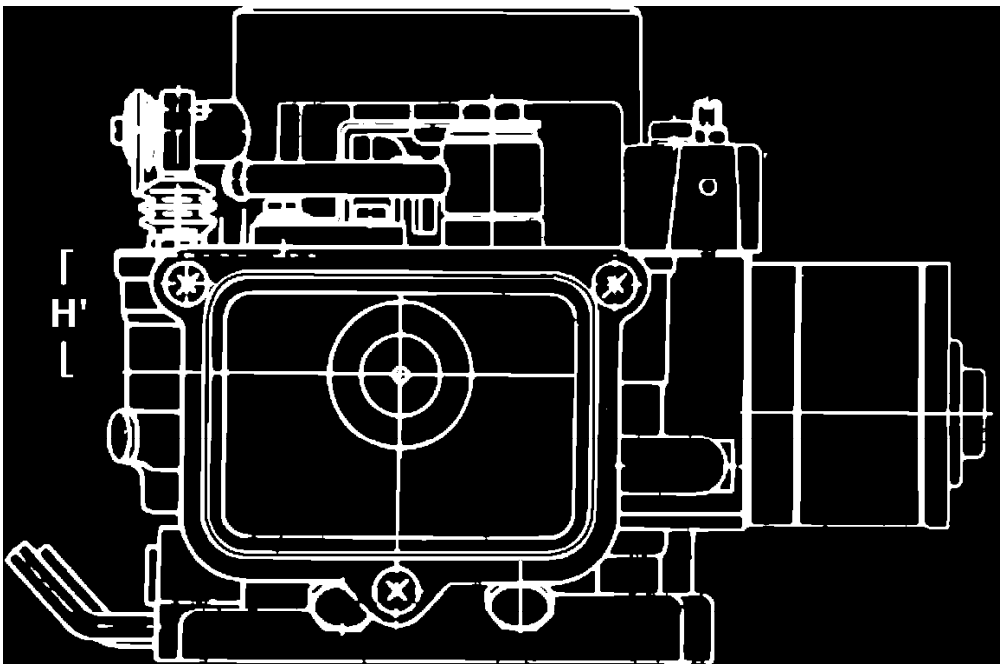


Fig. 11 Fuel level adjustment.

1. With engine idling, visually check fuel level through sight window of float chamber. Fuel level is correct if it is at indicator point. If fuel level is not correct proceed to the next step.

2. Invert float chamber to allow float to come into contact with needle valve, and measure clearance ``H," **Fig. 10.** Clearance should be as listed in the specifications chart. The top float position can be adjusted by bending float seat.
3. Adjust bottom float position so that clearance ``h" between float seat and needle valve stem, **Fig. 10,** is as listed in the specifications chart when float is fully raised. Bend float stopper as required.
4. After adjustments in steps 1 and 2 have been made, make sure that when fuel is delivered to the float chamber, the fuel level is maintained at .91 inch, **Fig. 11.**

Idle Mixture Ratio, Adjust

Prior to adjusting idle mixture ratio, check and, if necessary, adjust ignition timing and curb idle speed as previously described. Do not attach any hoses disconnected during idle speed adjustment.

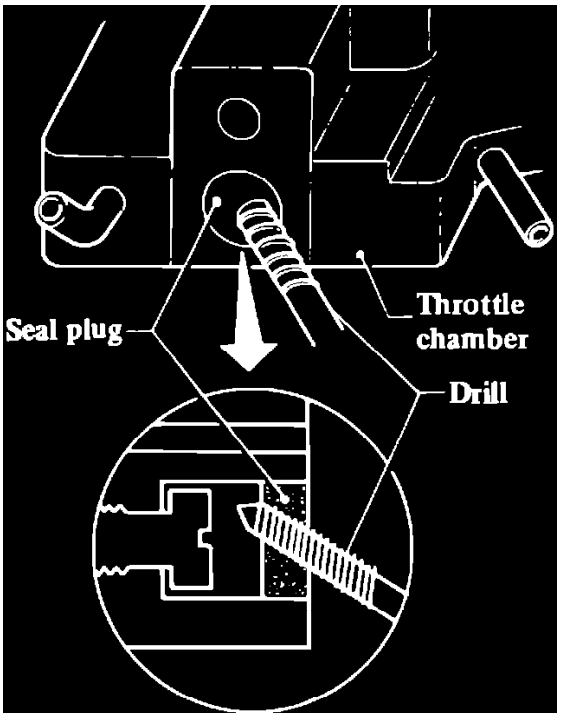


Fig. 3 Mixture adjusting screw seal plug removal

1. Race engine several times, then return engine to idle and measure CO percentage, which should meet the following specifications: 1985-86 Pickup all, less than 4%; 1985-86 Pulsar and Sentra and 1987 Sentra except Calif., 1-5%; 1987 Sentra Calif., 3-7%.
2. If CO percentage is not within specifications, check vacuum hoses for proper connections and inspect carburetor and intake manifold mountings for air leaks. If air leaks are found, correct as necessary and recheck CO percentage. If no air leaks are found, proceed to step 3.
3. Stop engine and remove carburetor.
4. Remove seal plug from carburetor, **Fig. 3,** then reinstall carburetor.
5. Run engine until normal operating temperature is reached, then race engine several times under no load.
6. Run engine at idle speed and turn mixture adjusting screw to adjust CO percentage to the following specifications: 1985-86 Pulsar and Sentra and 1987 Sentra except Calif., 2-4%; 1985-86 Pickup, .3-2%; 1987 Sentra Calif., 4-6%.
7. Recheck idle speed, then install new idle adjusting screw seal plug.

Primary & Secondary Throttle Valve Interlock Opening, Adjust

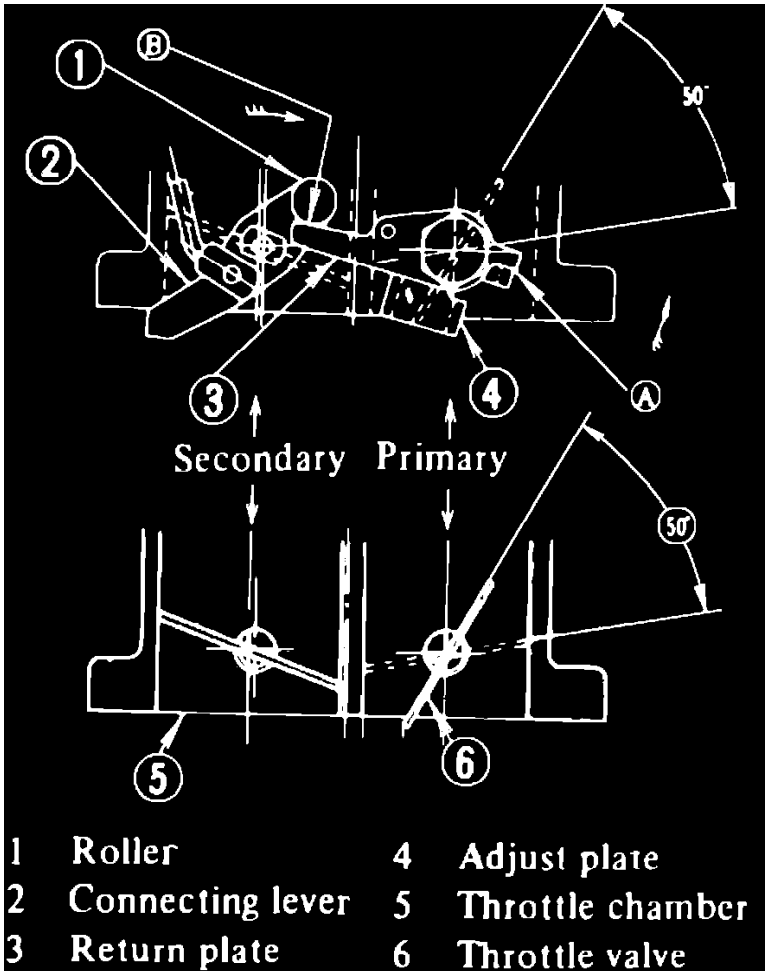


Fig. 14 Interlock opening adjustment.

When primary throttle valve is opened 50° the adjust plate integrated with throttle valve is in contact with return plate at ``A," **Fig. 14.**

When throttle valve is opened further, locking arm is detached from secondary throttle arm, permitting secondary system to start operation.

Linkage between primary and secondary throttles will function properly if distance between throttle valve and inner wall of throttle chamber is as listed in the specifications chart.

Adjustment is made by bending connecting link.

Vacuum Break, Adjust

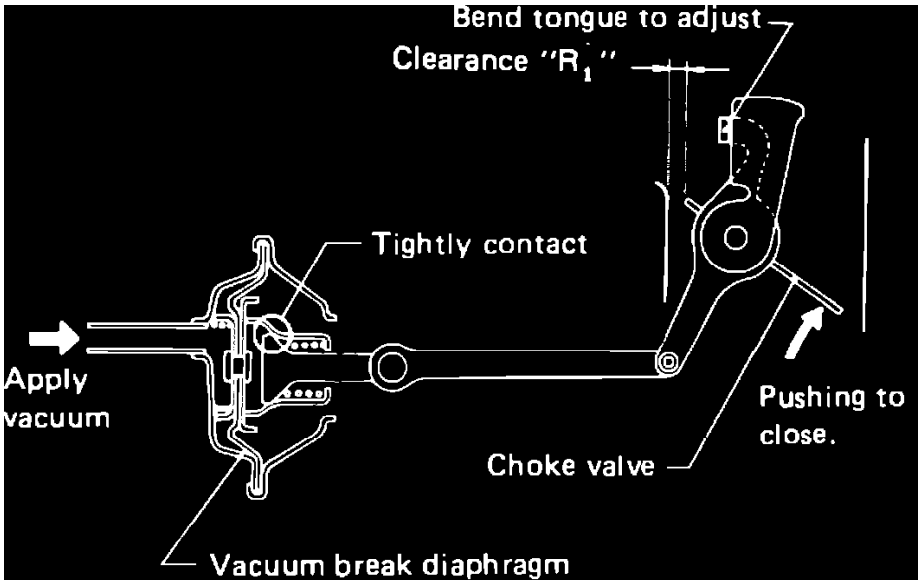


Fig. 12 Vacuum break adjustment, below 41F ambient temperature.

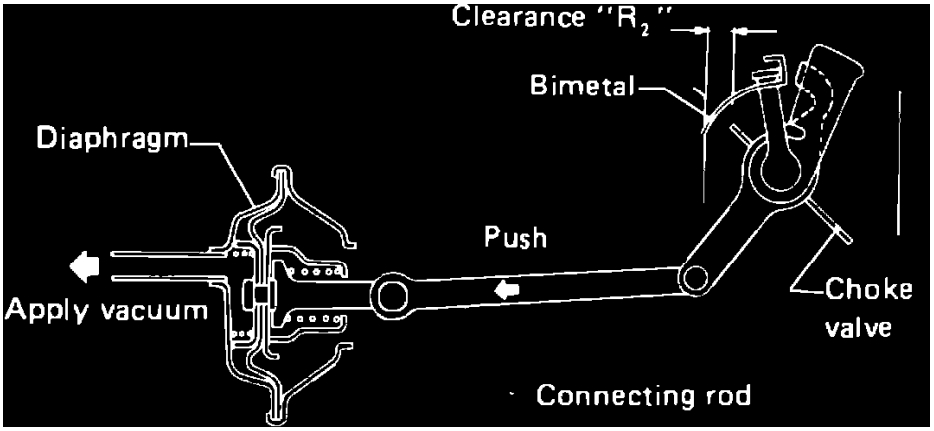


Fig. 13 Vacuum break adjustment, above 68F ambient temperature.

1. Disconnect vacuum hose and apply vacuum to breaker to full stroke position.
2. With ambient temperature below 41°F, measure clearance R1, **Fig. 12,** with choke valve closed and adjust to specifications by bending tongue.
3. With ambient temperature above 68°F, measure clearance R2, **Fig. 13,** with connecting rod pushed and adjust to specifications.

Carburetor: Service and Repair

Disassembly

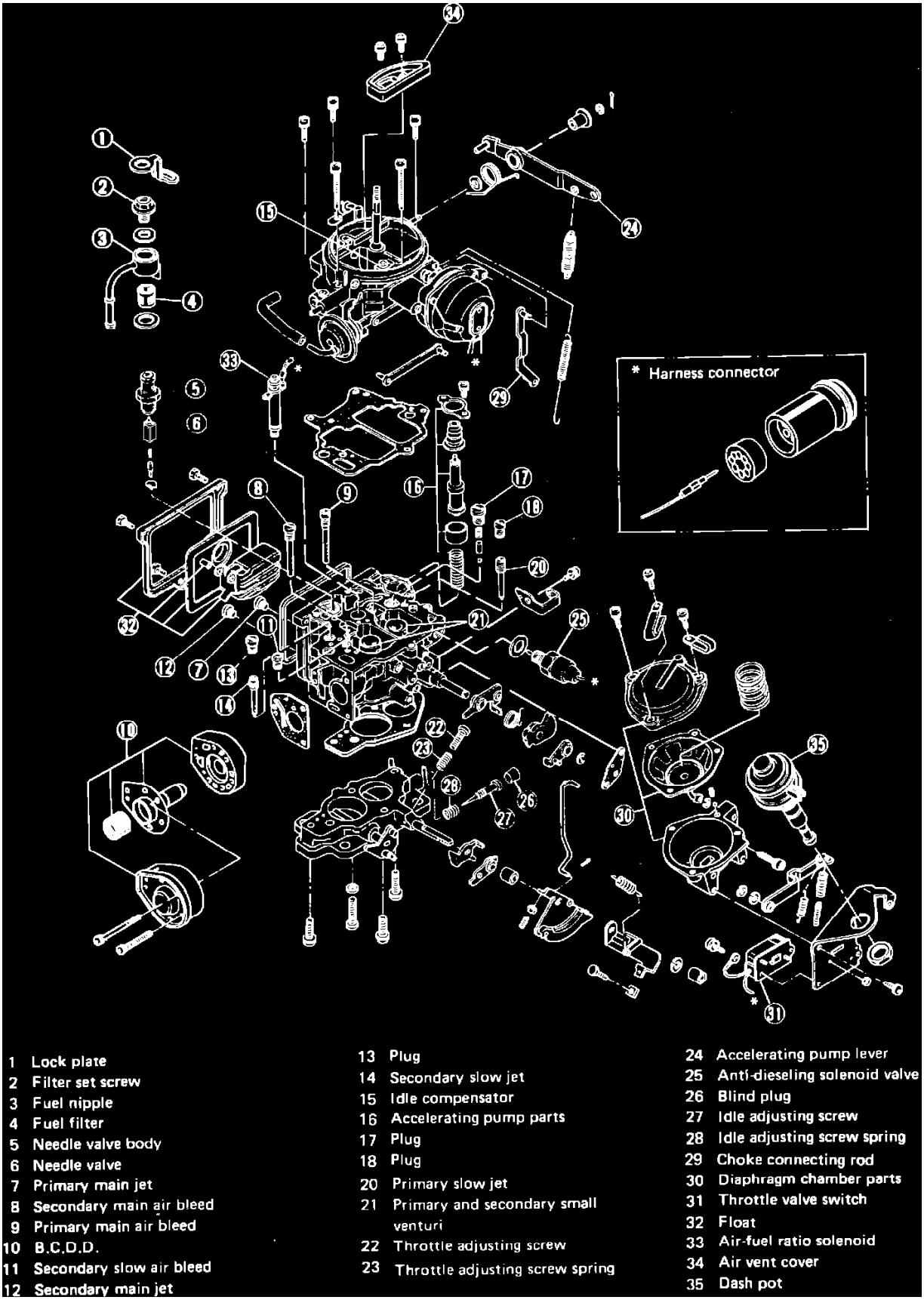


Fig. 2 DFP-342/384 carburetor exploded view.

1. Disconnect accelerator pump and choke connecting rods, returns springs and vacuum break hose, then remove springs and hose, **Fig. 2.**
2. Remove air vent cover and screws securing choke chamber to main body.
3. Remove choke chamber and gasket, taking care not to damage air/fuel solenoid harness.
4. Remove accelerator pump levers, springs and washers from choke chamber, noting installation position for assembly. **Further disassembly of choke chamber is not required unless choke components must be repaired or replaced.**
5. Disconnect actuating link, then remove secondary throttle diaphragm capsule, bracket and throttle switches as an assembly.

6. Remove fast idle cam, secondary throttle lock-out levers and springs, noting installation position for assembly.
7. Remove screws securing throttle chamber to body, then the throttle chamber and gasket.
8. Remove accelerator pump and choke links from throttle levers, noting position for assembly.
9. Remove concealment plug, turn idle mixture screw clockwise until lightly seated recording number of turns necessary, then remove mixture adjusting screw and spring. **Further disassembly of throttle chamber is not required unless component replacement is necessary.**

10. Remove anti-dieseling solenoid and BCDD assembly from carburetor body.
11. Remove screws securing accelerator pump piston retainer, piston assembly and spring.
12. Remove fuel inlet bolt, filter screen, and the needle valve and seat assembly.
13. Remove screws securing float bowl cover retainer, retainer and cover, and the float.
14. Remove air/fuel mixture solenoid assembly.
15. Remove main jet well plug retainer and the plugs.
16. Record calibration valve and installation position, then remove metering jets and air bleeds, taking care not to damage or distort calibrated orifices and keeping components in order for assembly.
17. Remove accelerator pump discharge ball plug, spring, weight and discharge check ball.

Carburetor: Service and Repair
Cleaning & Inspection

1. Clean components with suitable solvent and blow dry with compressed air noting the following:
   a. Do not immerse accelerator pump, vacuum diaphragms, composition float, electrical components (including mixture solenoid) or plastic bushings in solvent as they will be damaged.
   b. Do not pass drills or wires through calibrated orifices as they will be damaged.
   c. Ensure that solvent and all foreign material is removed from carburetor passages and that sealing surfaces are free from old gasket material.
2. Inspect components and replace any that are damaged, distorted or excessively worn.
3. Check choke and throttle shafts for looseness and free operation, and repair or replace as needed.
4. Inspect idle mixture needle and replace if damaged or grooved.
5. Inspect float and replace if damaged or saturated with fuel.
6. Inspect accelerator pump and vacuum diaphragms and replace if damaged or hardened.

Carburetor: Service and Repair

Assembly

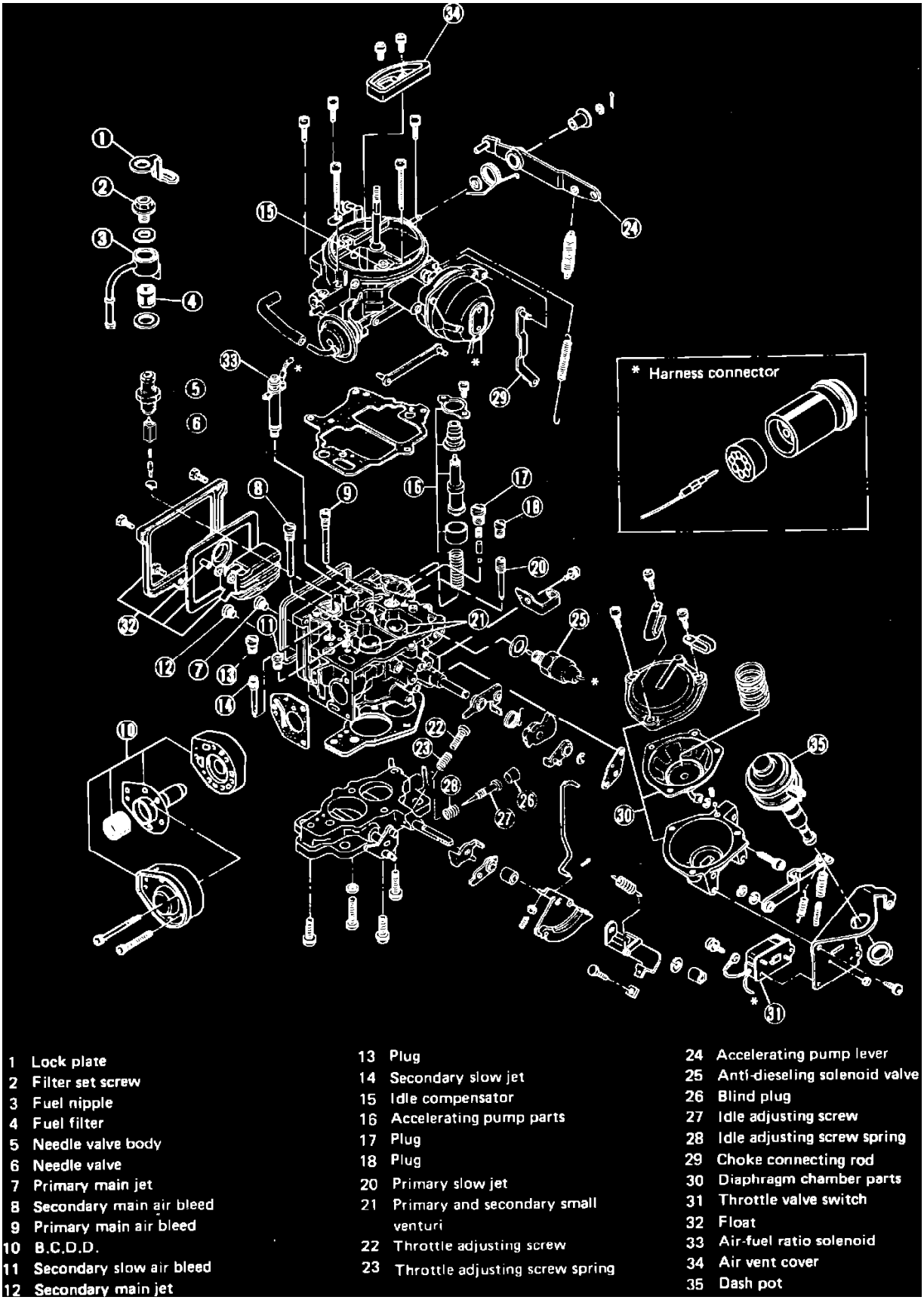


Fig. 2 DFP-342/384 carburetor exploded view.

Reverse disassembly procedure to complete assembly, ensuring that calibrated components are installed in proper position, **Fig. 2.** Use new gaskets, seals and sealing washers, and perform adjustments, as outlined, during assembly. Prior to installation ensure that all linkages, levers and return springs are properly installed and adjusted. Install idle mixture screw in position recorded during disassembly, adjust mixture as outlined in appropriate tune up section, then install new concealment plug.

Carburetor Float: Adjustments

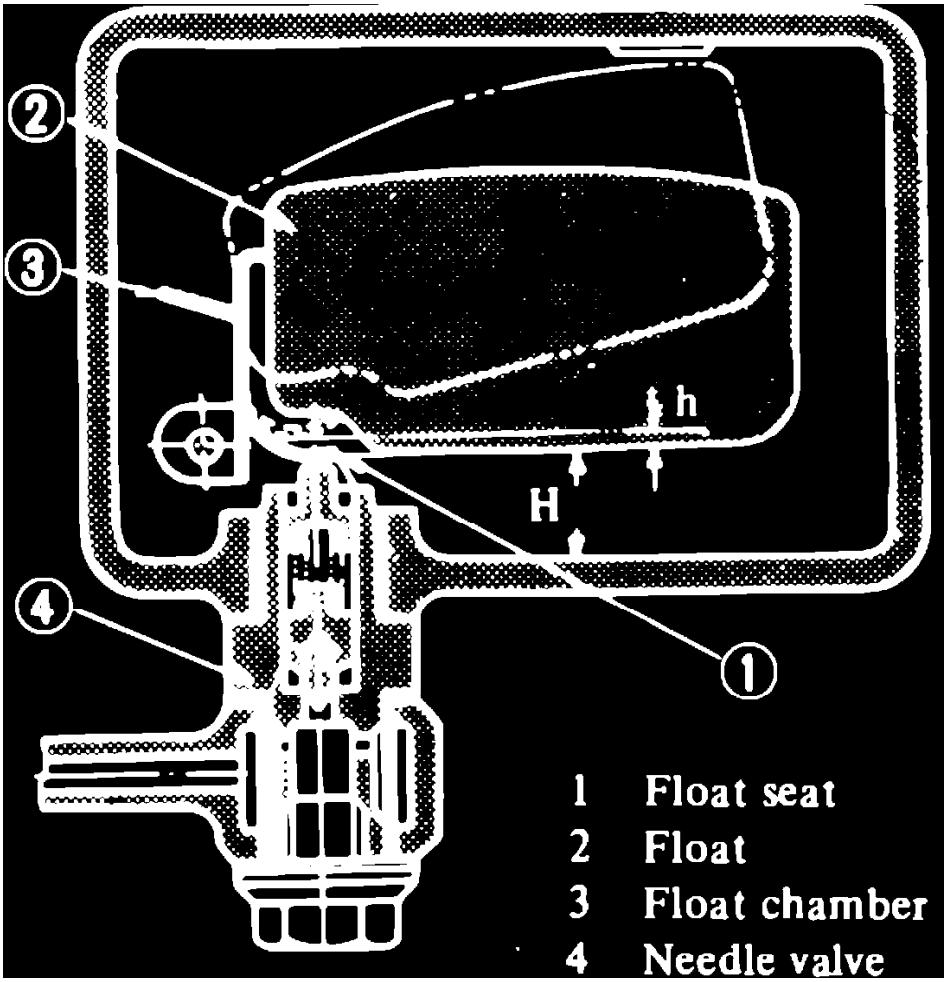


Fig. 10 Float level adjustment.

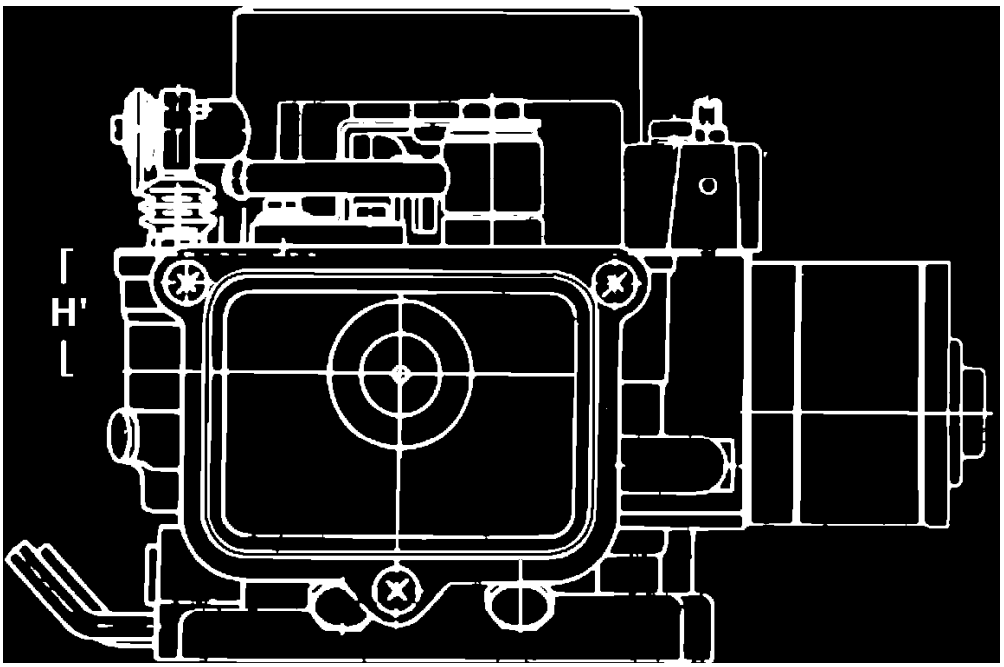


Fig. 11 Fuel level adjustment.

1. With engine idling, visually check fuel level through sight window of float chamber. Fuel level is correct if it is at indicator point. If fuel level is not correct proceed to the next step.
2. Invert float chamber to allow float to come into contact with needle valve, and measure clearance ``H," **Fig. 10.** Clearance should be as listed in the specifications chart. The top float position can be adjusted by bending float seat.
3. Adjust bottom float position so that clearance ``h" between float seat and needle valve stem, **Fig. 10,** is as listed in the specifications chart when float is fully raised. Bend float stopper as required.
4. After adjustments in steps 1 and 2 have been made, make sure that when fuel is delivered to the float chamber, the fuel level is maintained at

.91 inch, **Fig. 11.**

Choke Plate: Adjustments

1. Close choke valve completely.
2. Hold choke valve by stretching a rubber band between choke piston lever and stationary part of carburetor.
3. Pull throttle lever until fully open.
4. Adjust clearance between choke valve and carburetor body to specifications by bending unloader tang.

Choke Pull-off: Adjustments

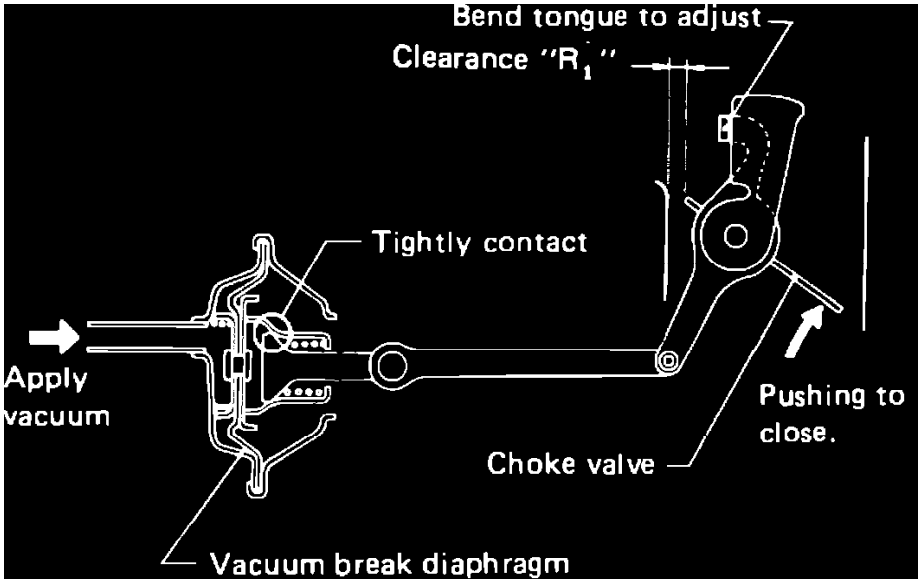


Fig. 12 Vacuum break adjustment, below 41F ambient temperature.

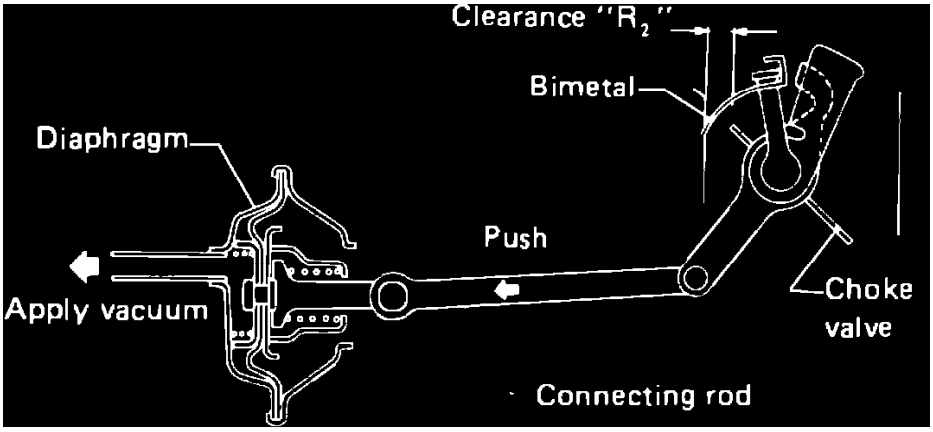


Fig. 13 Vacuum break adjustment, above 68F ambient temperature.

1. Disconnect vacuum hose and apply vacuum to breaker to full stroke position.
2. With ambient temperature below 41°F, measure clearance R1, **Fig. 12,** with choke valve closed and adjust to specifications by bending tongue.
3. With ambient temperature above 68°F, measure clearance R2, **Fig. 13,** with connecting rod pushed and adjust to specifications.

Throttle Plate - Carb.: Adjustments

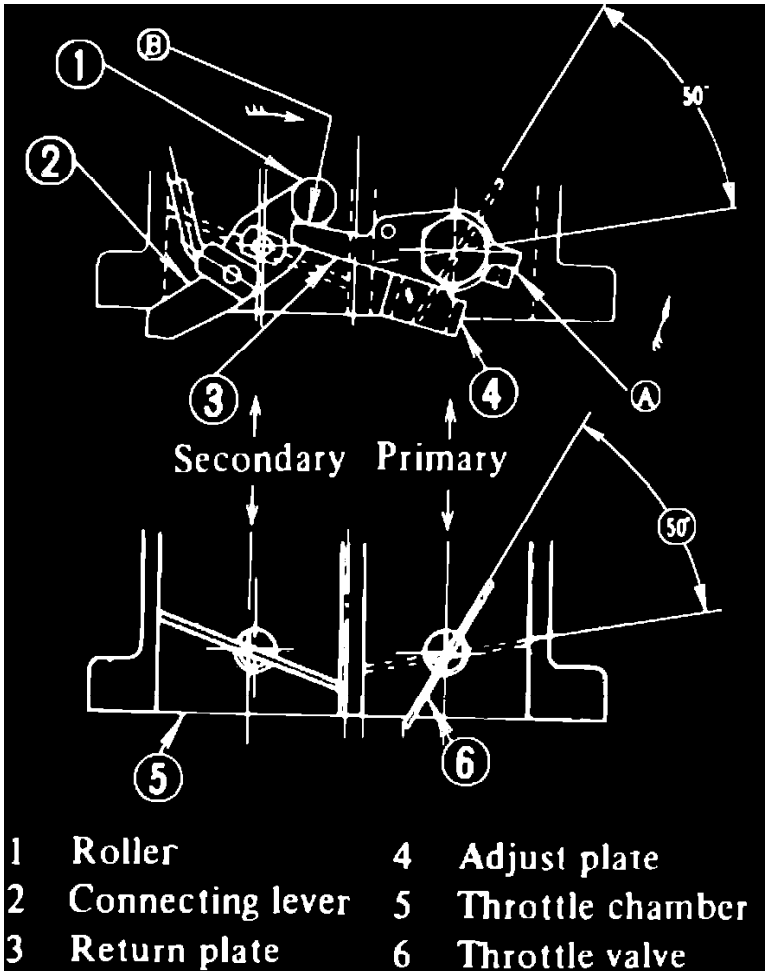


Fig. 14 Interlock opening adjustment.

When primary throttle valve is opened 50° the adjust plate integrated with throttle valve is in contact with return plate at ``A," **Fig. 14.**

When throttle valve is opened further, locking arm is detached from secondary throttle arm, permitting secondary system to start operation.

Linkage between primary and secondary throttles will function properly if distance between throttle valve and inner wall of throttle chamber is as listed in the specifications chart.

Adjustment is made by bending connecting link.

Fuel Shut-off Solenoid: Testing and Inspection

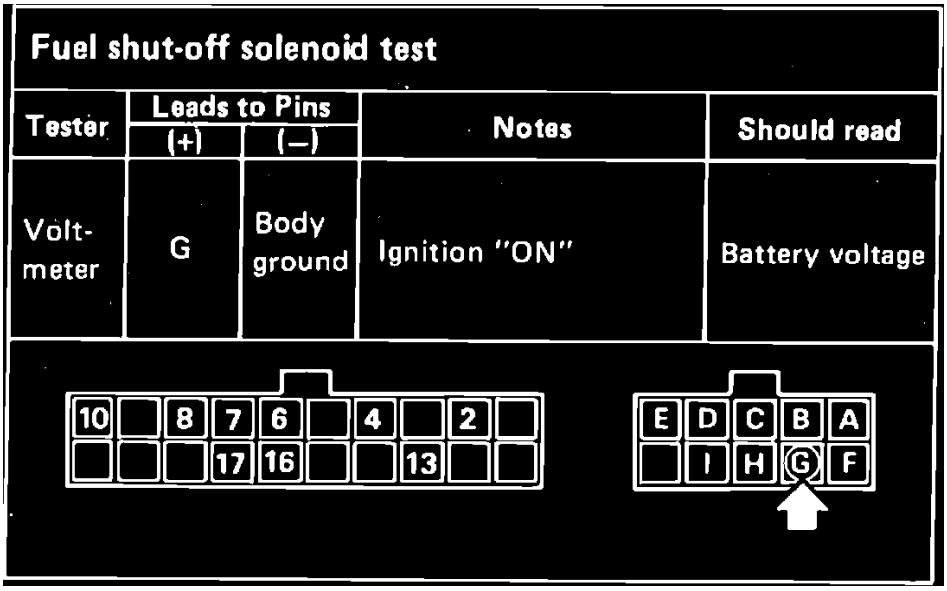


Fig. 24 Anti-dieseling solenoid circuit test

Perform anti-dieseling solenoid circuit test as illustrated in **Fig. 24.**

Fuel Tank: Description and Operation

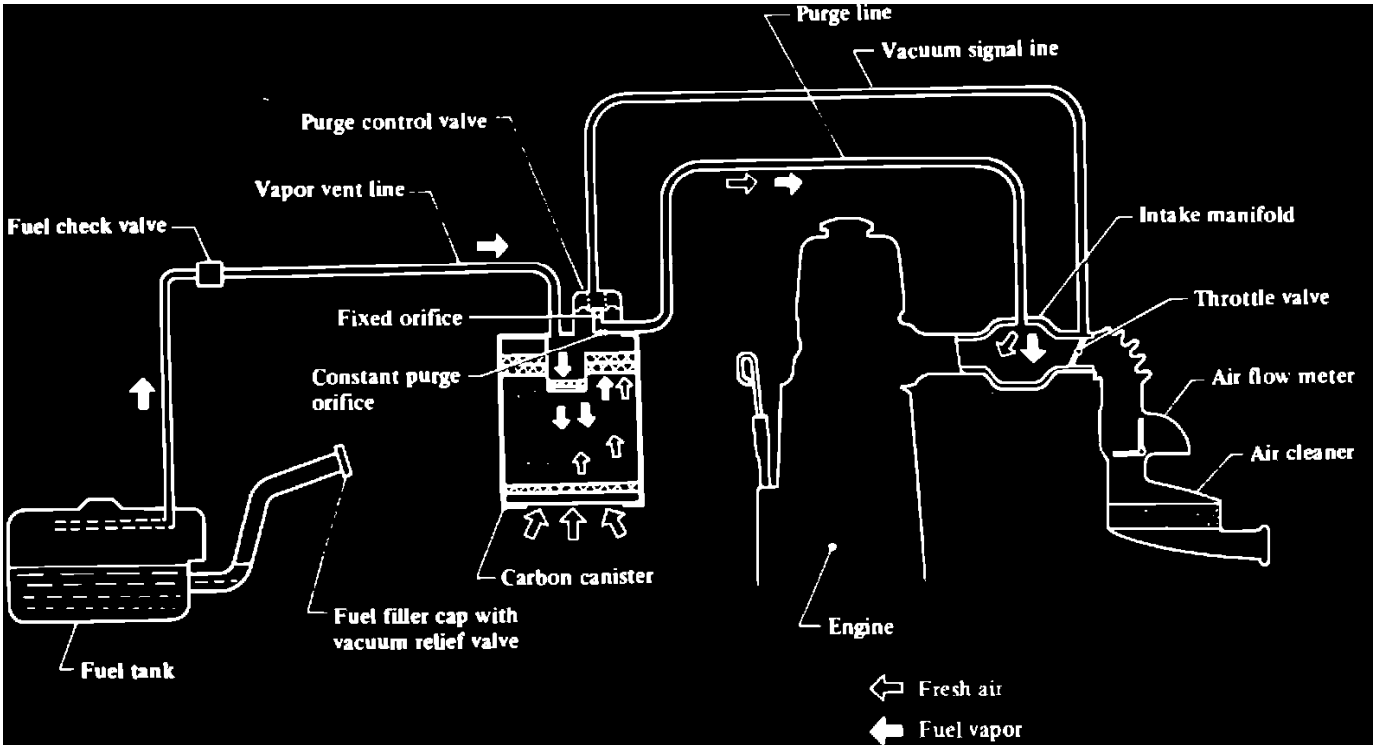


Fig. 37 Evaporative emission system. (Typical)

Refer to **Fig. 37** for a typical evaporative emission system. Complete system schematics are located in ``Vacuum Hose Routings."

This system reduces hydrocarbon emissions from the fuel system by the use of activated charcoal in the carbon canister. With engine off, fuel vapor from the fuel tank is led into the carbon canister for storage.

The canister retains the vapor until it is purged by air drawn through the purge line to the intake manifold when the engine is running. With engine at idle, the purge control valve is closed but a small amount of air flows into the intake manifold through the constant purge orifice. As the engine speed increases and the ported vacuum rises, the purge control valve opens and the vapor is drawn into the intake manifold through the fixed orifice and the constant purge orifice. On high altitude except Calif. models, the vapor in the carburetor float chamber is led into the canister through the outer vent line because the vent switching valve is normally open.

Auxiliary Air Control (AAC) Valve: Adjustments

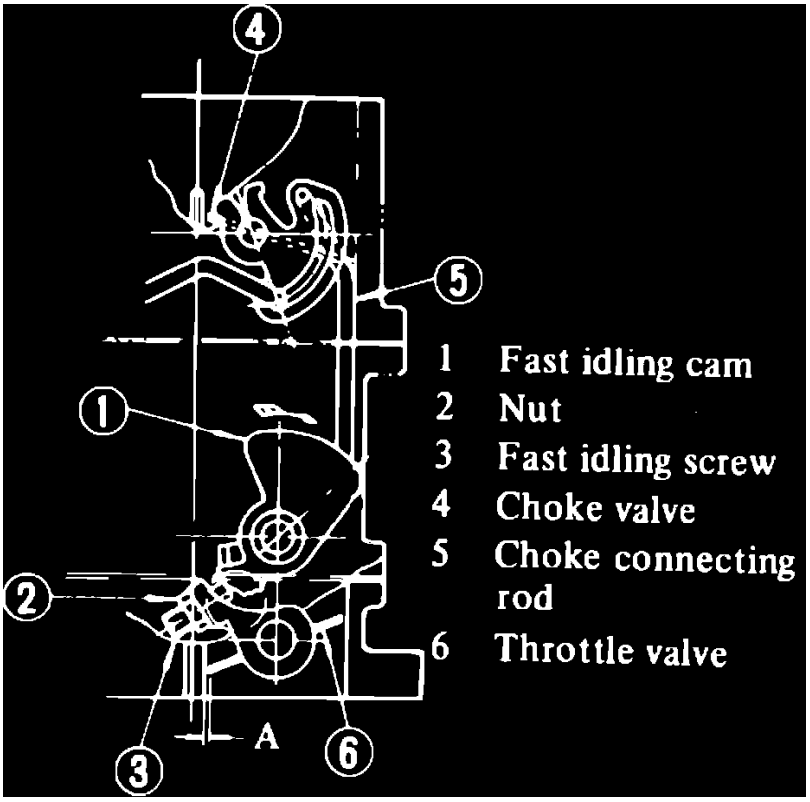


Fig. 15 Fast idle adjustment.

1. Place fast idle screw on second step of fast idle cam.
2. Turn fast idle adjusting screw until dimension ``A,'' **Fig. 15,** is according to specifications.

Throttle Position Switch: Description and Operation
Full Throttle Vacuum Switch, Carbureted

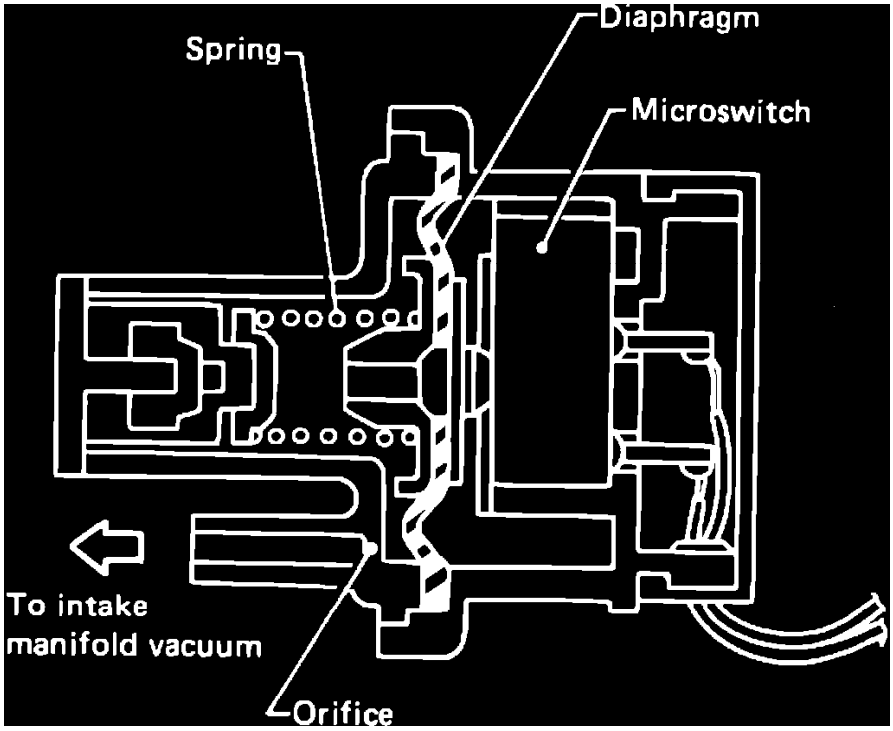


Fig. 5 Full throttle vacuum switch

The full throttle vacuum switch, **Fig. 5,** senses low intake manifold vacuum and transmits a corresponding electric signal to the ECC control unit. The vacuum switch turns on when intake manifold decreases around full throttle or under heavy load.

Throttle Position Switch: Testing and Inspection

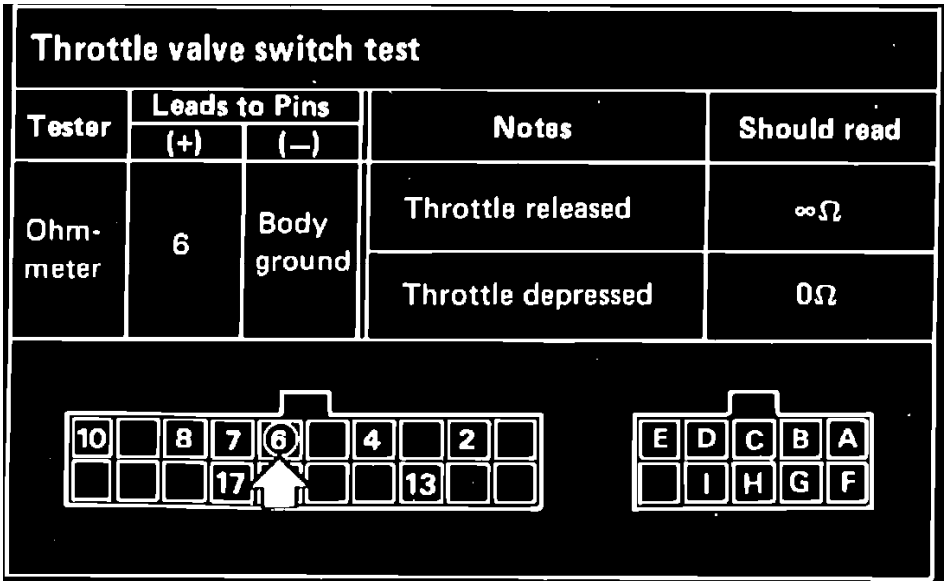


Fig. 12 Throttle valve switch test

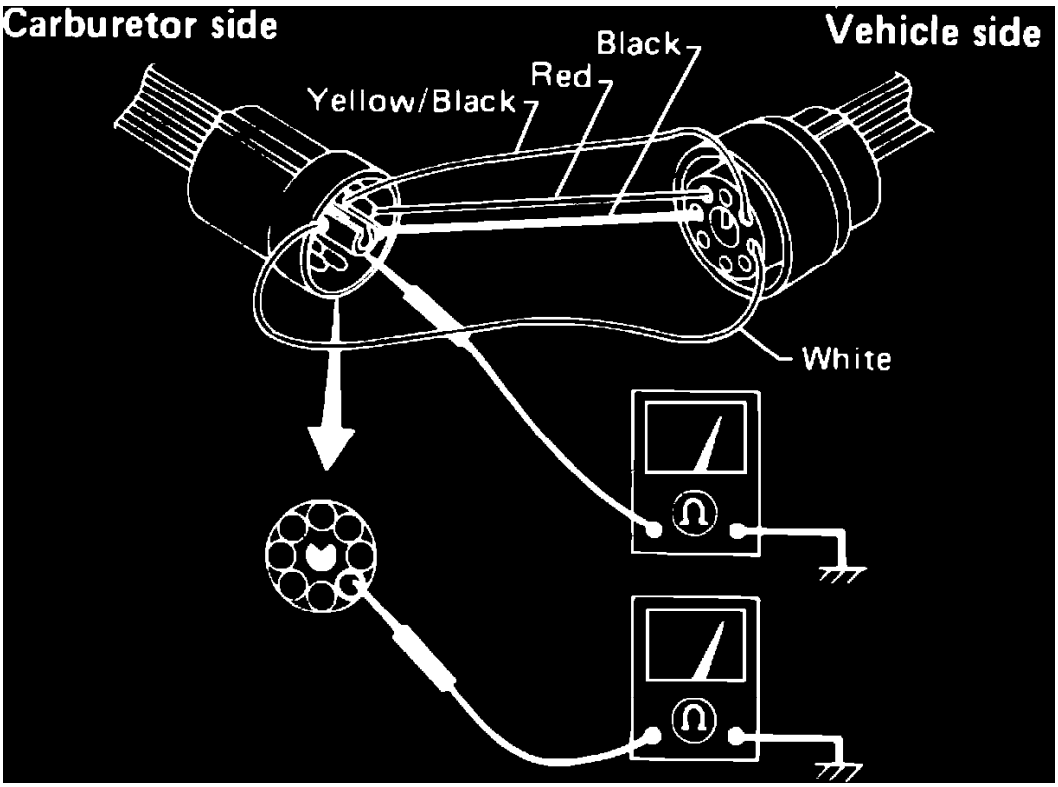


Fig. 13 Throttle valve switch check

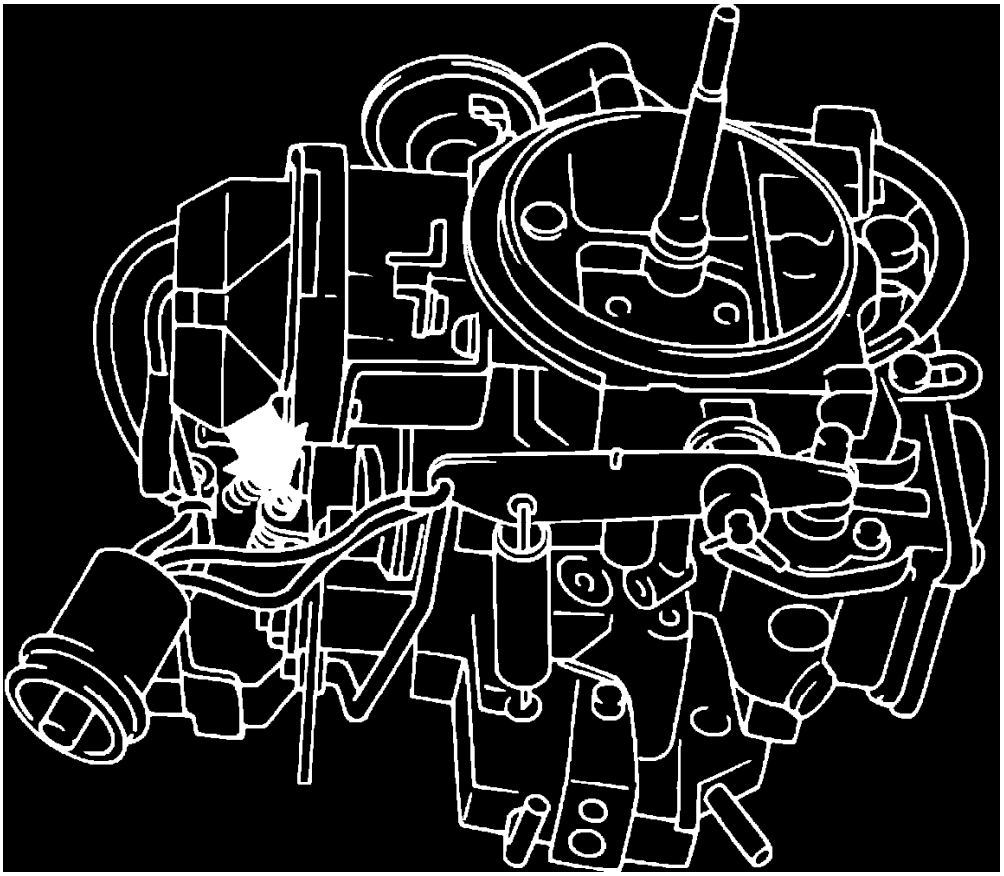


Fig. 14 Throttle valve switch adjustment

Perform throttle valve switch test as illustrated in **Fig. 12.**

Prior to testing, ensure choke valve is fully open. If resistances are not as specified, check and adjust throttle valve switch as follows:

1. Disconnect throttle valve switch electrical connector from carburetor.
2. Connect jumper wires between air/fuel ratio and anti-diesel solenoid terminals, **Fig. 13.**
3. Ensure continuity does not exist between throttle valve switch electrical connector and ground, **Fig. 13.**
4. Run engine at approximately 2000 RPM and ensure continuity exists between throttle valve switch electrical connector and ground.
5. Gradually decrease engine speed to 1300-1400 RPM on 1985 models, or 1150-1450 RPM on 1986 models and ensure circuit continuity breaks.
6. If circuit continuity is not broken at specified engine speed, adjust throttle valve switch as follows:
   a. Manually open the throttle to hold engine speed at approximately 1350 RPM on 1985 models, or 1250-1350 RPM on 1986 models. **Do not use idle speed screw.**
   b. Slowly turn adjusting screw, **Fig. 14,** in either direction until ohmmeter indicates an open circuit.
   c. Recheck adjustment, then adjust idle speed if necessary.

Emission Control Systems: Description and Operation
General System Description

Mixture ratio and intake manifold boost vary in vehicles operated at high altitudes because of the thinner air, causing increases in exhaust emissions. In order to decrease emissions, certain devices have to be added or altered. An altitude compensator must be added to control mixture ratio and, on some models, a canister must be added to reduce vapor in carburetor float chamber.

Emission Control Systems: Description and Operation
Air/Fuel Ratio Control System

Open-Loop Control

The air/fuel ratio solenoid is controlled by open loop control under the following conditions for improved driveability:

a. When battery voltage is less than or equal to 10 volts.
b. When engine speed is less than 400 RPM.
c. When coolant temperature is less than 122'F on vehicles with manual transmission or less than 140'F on vehicles with automatic transmission.
d. When output voltage is less than 200-300 millivolts.
e. During deceleration when fuel shut-off system is in operation.
f. When engine speed is greater than or equal to 3600 RPM on MPG models or greater than or equal to 3425 RPM on other models (engine revolution switch off).

On 1984-85 Federal Pulsar and Sentra models, the solenoid is controlled by open loop control under the following conditions:

a. When engine speed is less than 400 RPM and the starter switch is ON.
b. When coolant temperature is less than 185'F and intake air temperature is less than 59'F.
c. When coolant temperature is less than 140'F and intake air temperature is greater than or equal to 59'F.
d. When hot restarting with exhaust gas sensor output voltage less than 200-300 millivolts and coolant temperature greater than or equal to 140'F.
e. During deceleration, when fuel shut-off system is in operation.
f. When engine speed is greater than or equal to 4150 RPM.
g. On models with manual transmission, when intake manifold vacuum is less than 2.36 inches Hg at full throttle.
h. When coolant temperature is greater than or equal to 221~F and intake air temperature is greater than or equal to 149'F.

During open loop control, air/fuel ratio is determined by the E.C.C. control unit.

Closed-Loop Control

This system controls air/fuel ratio precisely to the stoichiometric point so that the three way catalyst can minimize all exhaust emissions simultaneously. The system uses the exhaust gas sensor, located in the exhaust manifold, to give an indication of whether air/fuel mixture is leaner or richer than stoichiometric point. The sensor transmits a nonlinear voltage to the E.C.C. control unit. The control unit adjusts the feedback pulse width according to sensor voltage so that mixture ratio will be within the narrow window of the three-way catalyst. This system becomes open during engine warm-up until the sensor reaches operating temperature.

Emission Control Systems: Testing and Inspection
Air/Fuel Ratio Control System

General Information

This system is tested during the complete diagnostic test of electronically controlled carburetor engine.

Engine Revolution Switch & Relay

1. Start engine and run until it reaches operating temperature.
2. Turn off engine and disconnect E.C.C. 20-pin connector.
3. Start engine and check continuity between terminals No. 7 and No. 12 of E.C.C. 20-pin connector. There should be no continuity below and continuity above approximately 3600 RPM.
4. If not within specification, repair or replace as necessary.

Emission Control Systems: Testing and Inspection
Fuel Shut Off System Testing

Description

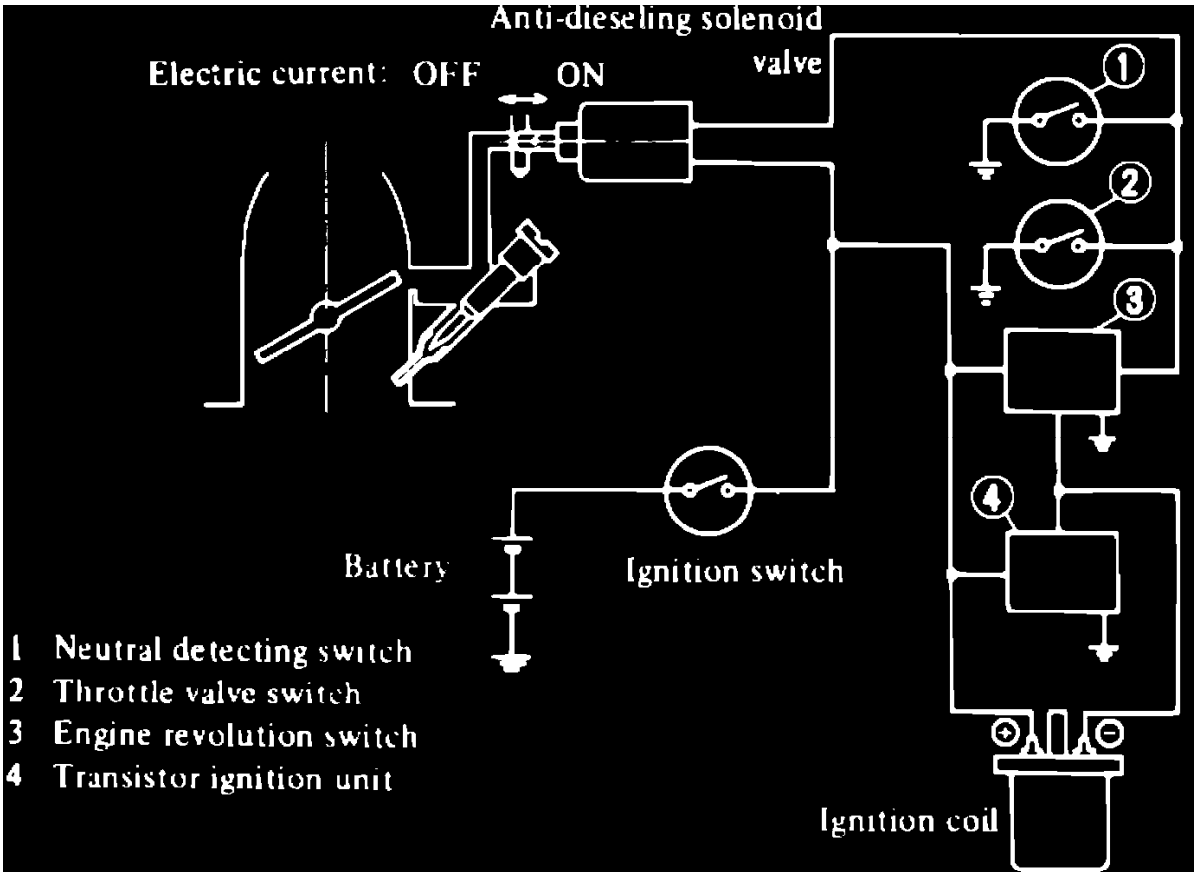


Fig. 34 Fuel shut-off system (Typical)

Refer to **Fig. 34** for a typical fuel shut-off system. Complete system schematics are located in ``Vacuum Hose Routings."

This system shuts off fuel supply during deceleration to reduce fuel consumption and help prevent a temperature rise in the catalytic converter during long periods of deceleration.

When manifold vacuum increases above a predetermined value during deceleration, the vacuum switch sends a signal to the anti-dieseling solenoid valve which shuts off fuel supply. When manifold vacuum drops below the predetermined value, this system is deactivated. This system is also controlled by the clutch switch, neutral switch, and inhibitor switch so that fuel is not cut off during certain conditions even if manifold vacuum is high enough to operate system.

Testing

1. Visually inspect fuel shut-off system and replace any broken or damaged switches.
2. With engine running at 2500-3000 RPM, test each switch for proper operation.

Emission Control Systems: Testing and Inspection
High Altitude Emission Control System

Description

Mixture ratio and intake manifold boost vary in vehicles operated at high altitudes because of the thinner air, causing increases in exhaust emissions. In order to decrease emissions, certain devices have to be added or altered. An altitude compensator must be added to control mixture ratio and, on some models, a canister must be added to reduce vapor in carburetor float chamber.

Installation & Modification

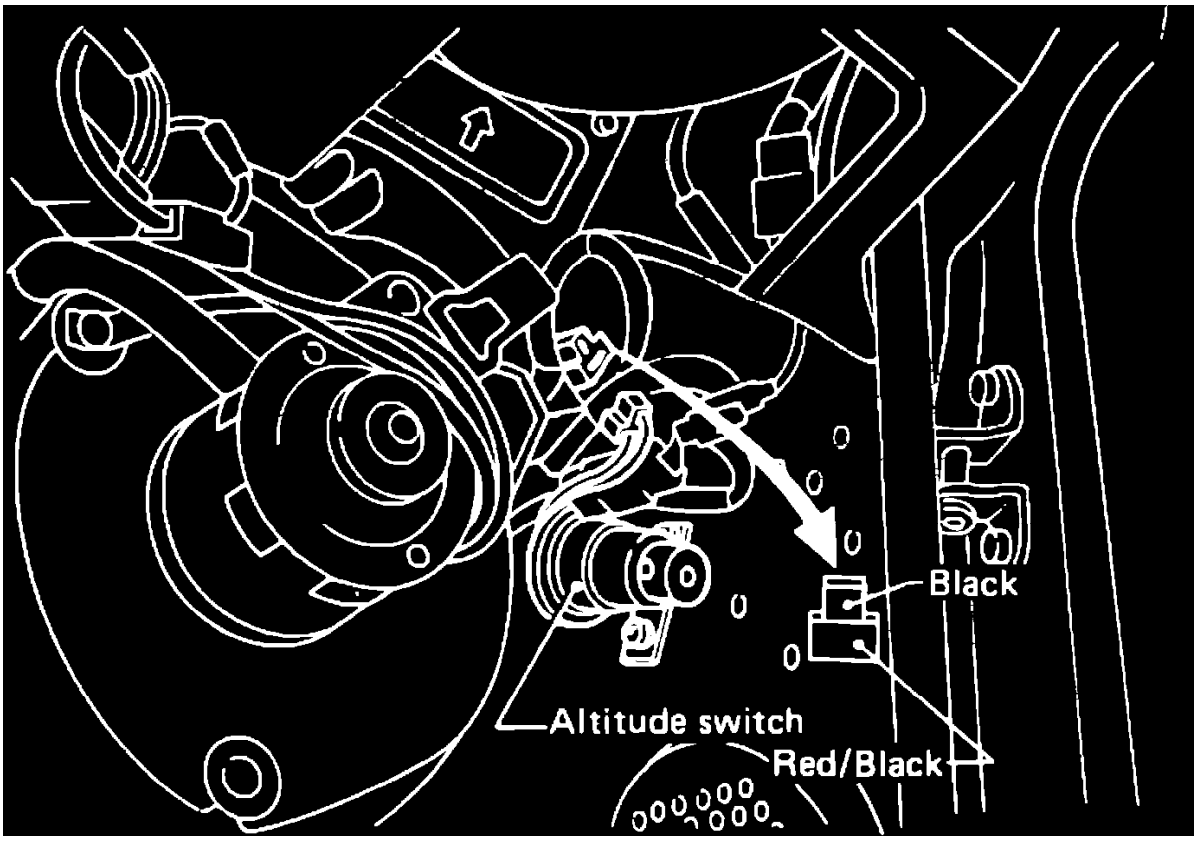


Fig. 39 Installing altitude switch.

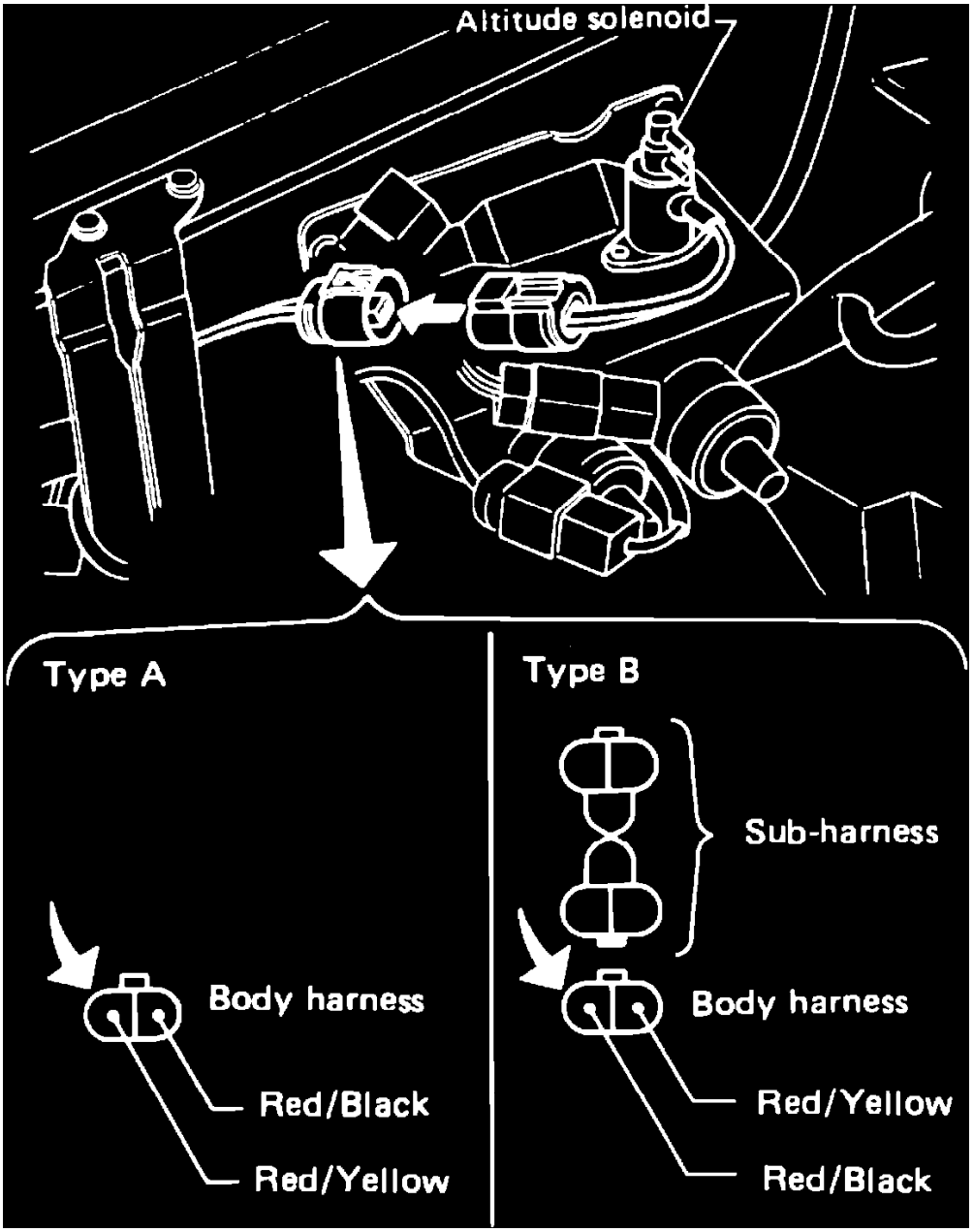


Fig. 40 Identifying altitude solenoid valve connector.

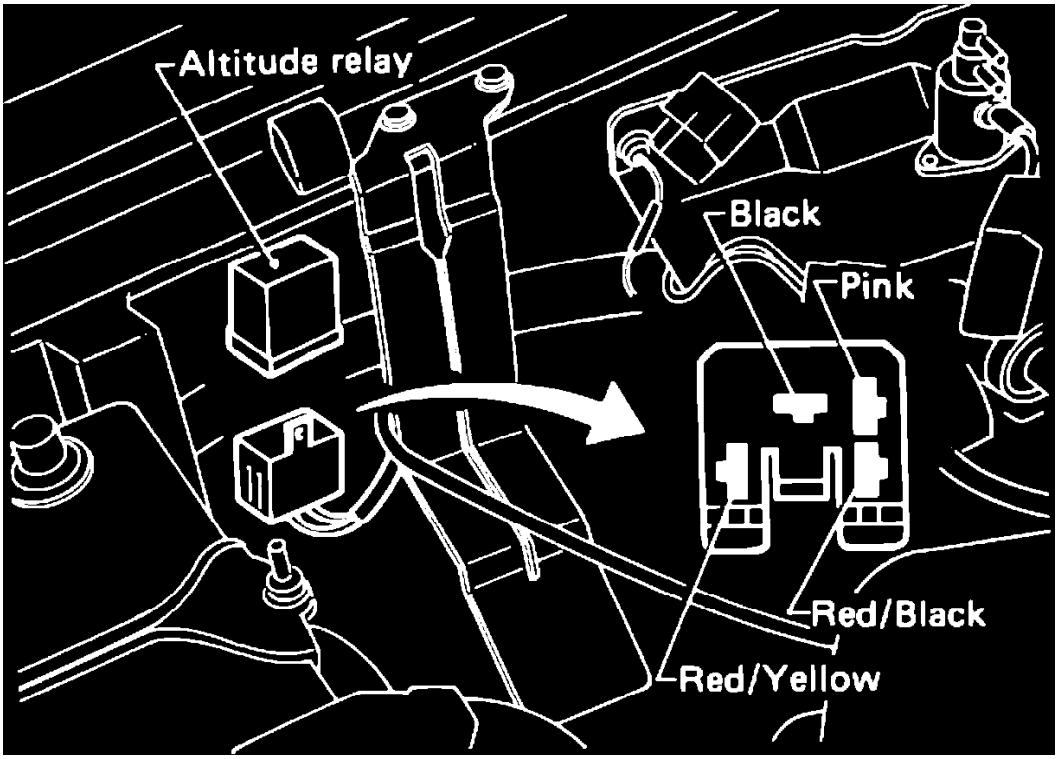


Fig. 41 Installing altitude relay.

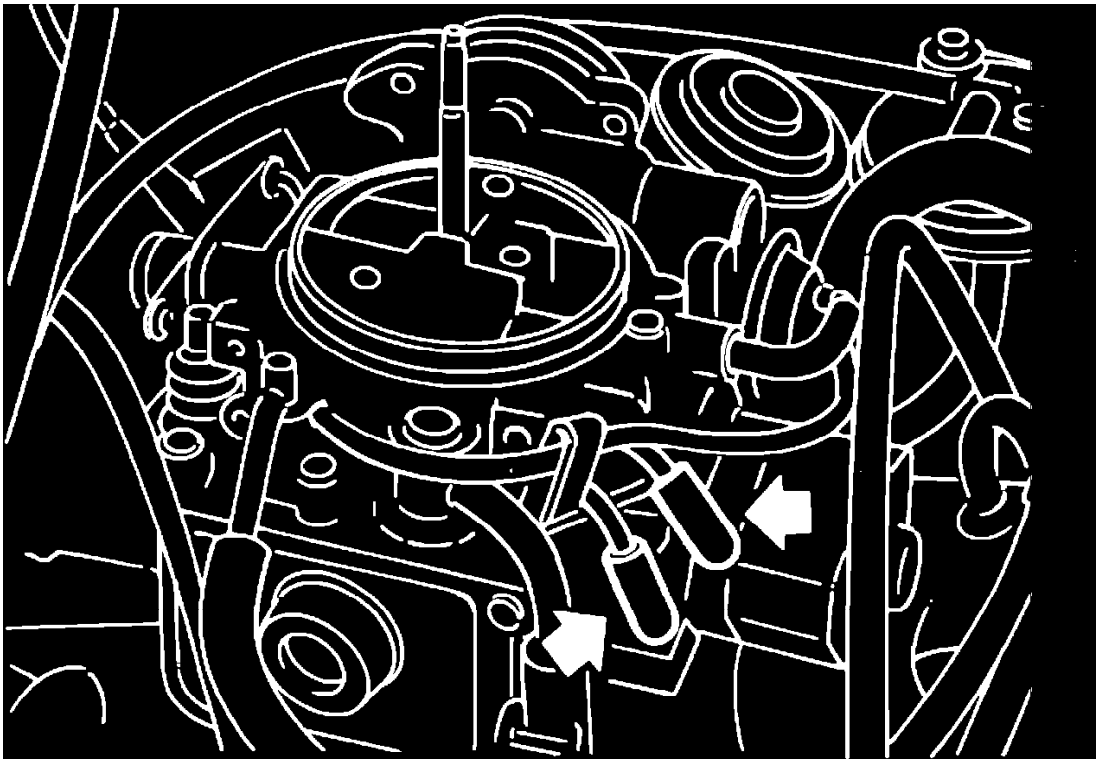


Fig. 42 Removing rubber caps from carburetor altitude compensation lines

1985-86 PICKUP w/CARBURETED ENGINE

1. Install altitude switch on righthand side of dash, **Fig. 39,** and connect electrical connector.
2. Identify altitude solenoid valve electrical connector, **Fig. 40,** then install altitude solenoid valve and secure connector. **Use sub-harness on type B connector only.**
3. Install altitude relay, **Fig. 41.**
4. Remove rubber caps from altitude compensation lines on carburetor, **Fig. 42,** and connect lines to altitude solenoid.
5. Start engine and check air and vacuum lines for leaks.
6. If there are no leaks, start engine and run until normal operating temperature is reached, then check idle speed and adjust as necessary.

Emission Control Systems: Service and Repair

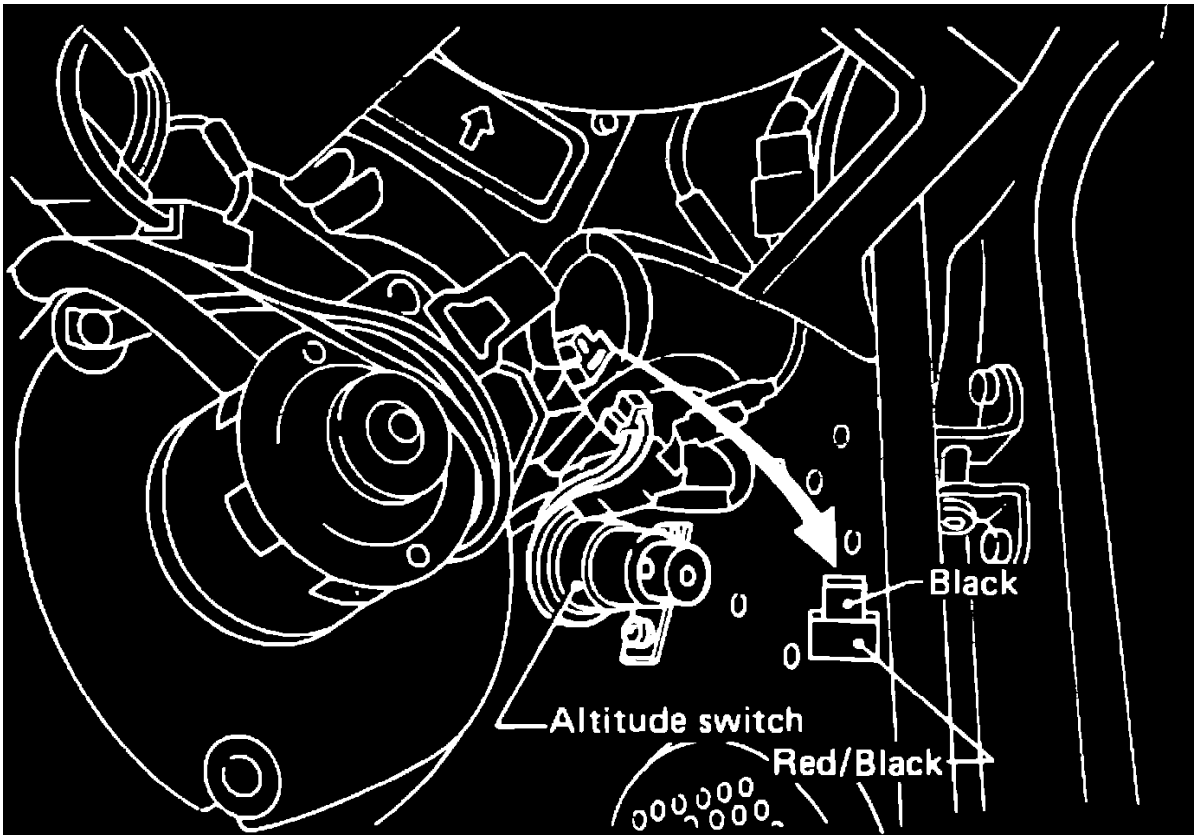


Fig. 39 Installing altitude switch.

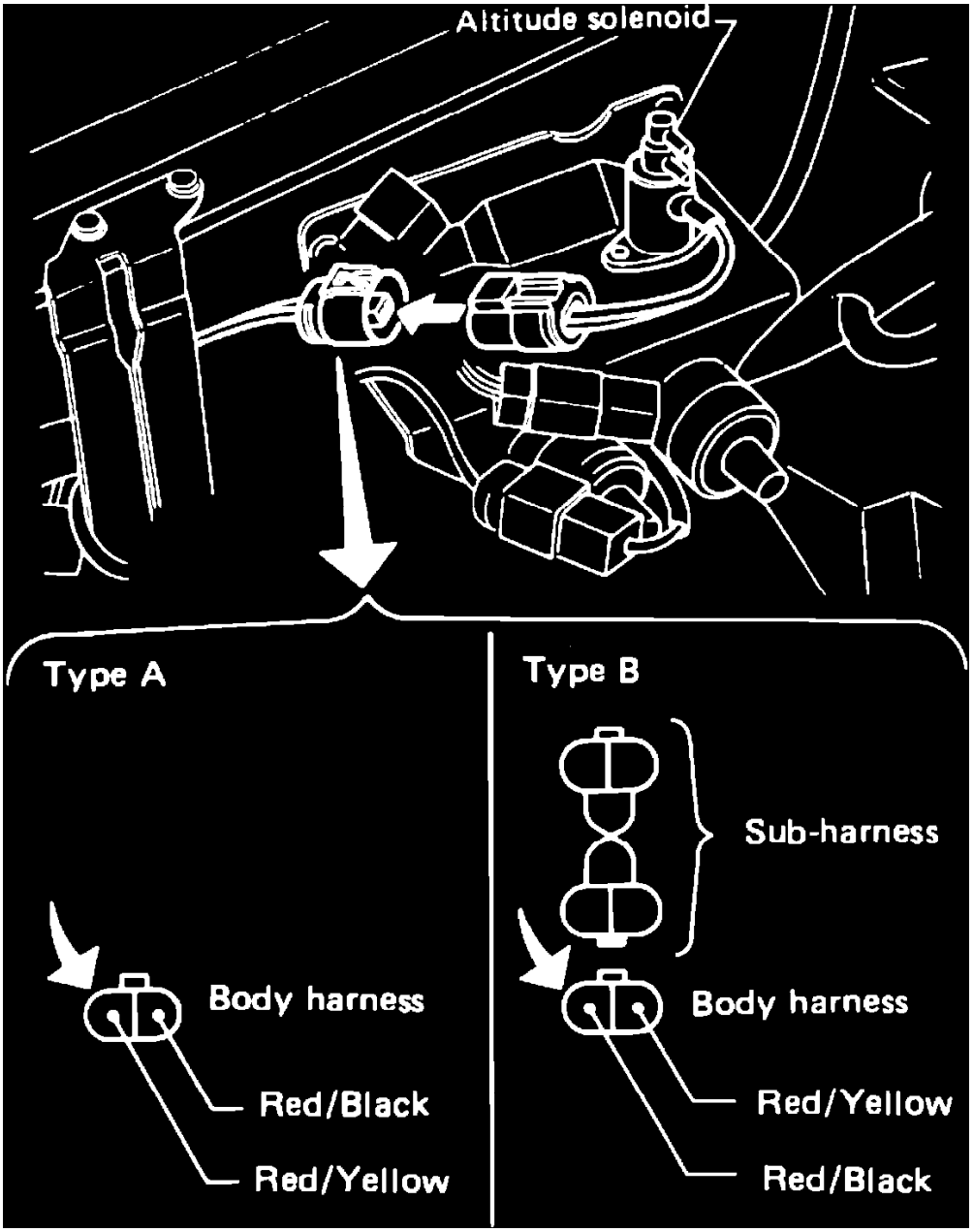


Fig. 40 Identifying altitude solenoid valve connector.

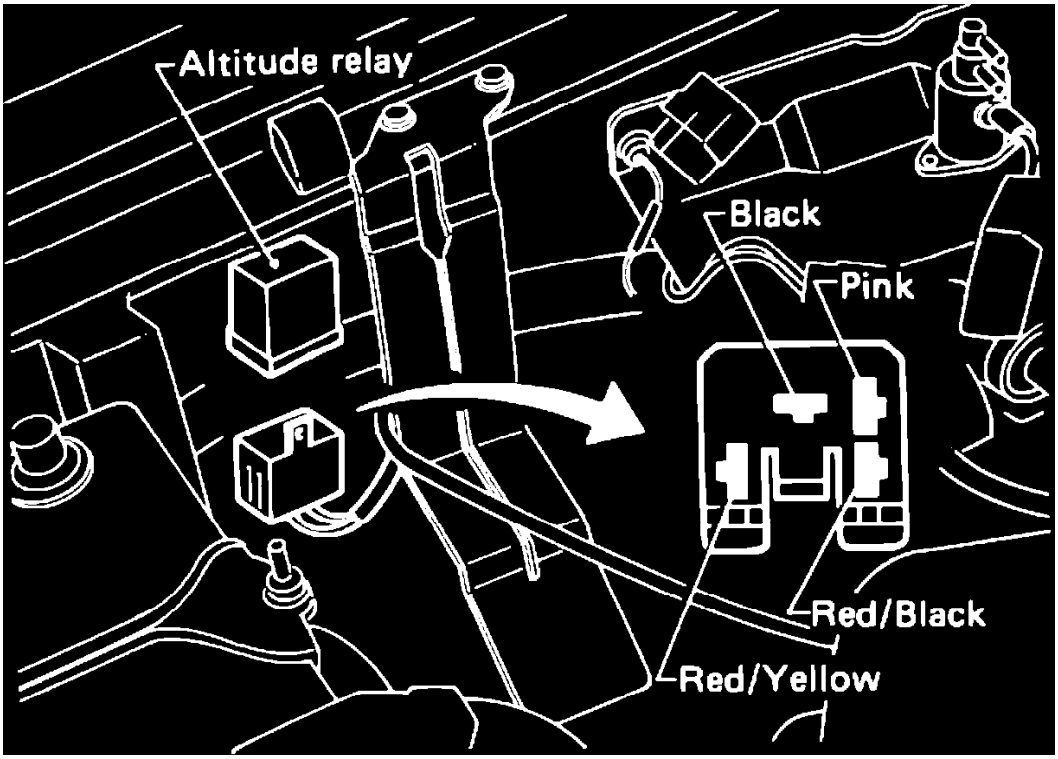


Fig. 41 Installing altitude relay.

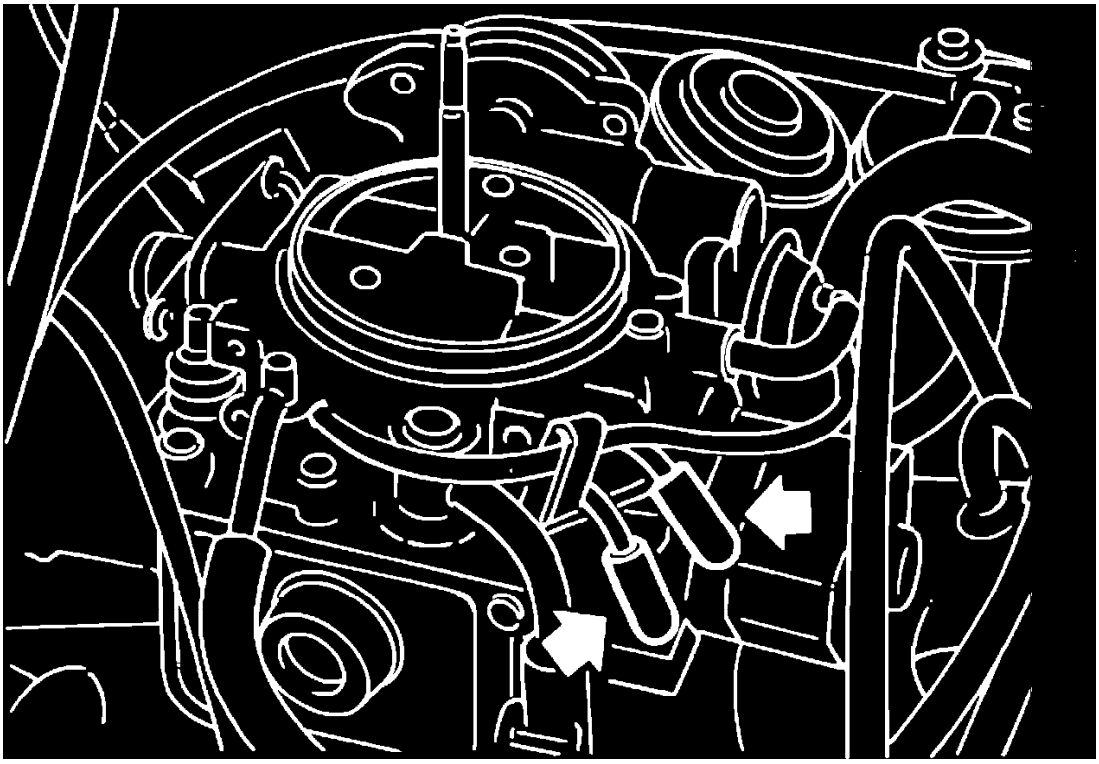


Fig. 42 Removing rubber caps from carburetor altitude compensation lines

1985-86 PICKUP w/CARBURETED ENGINE

1. Install altitude switch on righthand side of dash, **Fig. 39,** and connect electrical connector.
2. Identify altitude solenoid valve electrical connector, **Fig. 40,** then install altitude solenoid valve and secure connector. **Use sub-harness on type B connector only.**
3. Install altitude relay, **Fig. 41.**
4. Remove rubber caps from altitude compensation lines on carburetor, **Fig. 42,** and connect lines to altitude solenoid.
5. Start engine and check air and vacuum lines for leaks.
6. If there are no leaks, start engine and run until normal operating temperature is reached, then check idle speed and adjust as necessary.

Thermal Vacuum Valve: Testing and Inspection

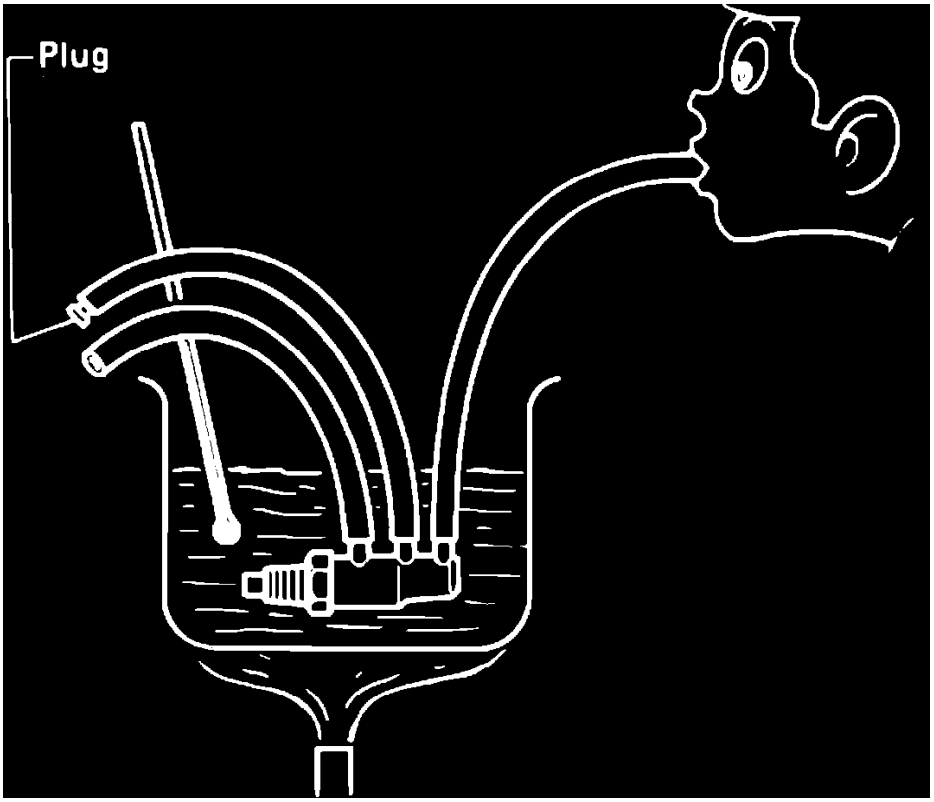


Fig. 54 Thermal vacuum valve test

1. Drain a portion of engine coolant, then remove thermal vacuum valve from engine.
2. Inhale air from air cleaner side port, **Fig. 54.** Ensure valve opens at temperatures between 59°F and 140°F and is closed at all other temperatures. **Do not allow water to get inside valve.**

Deceleration Valve: Description and Operation

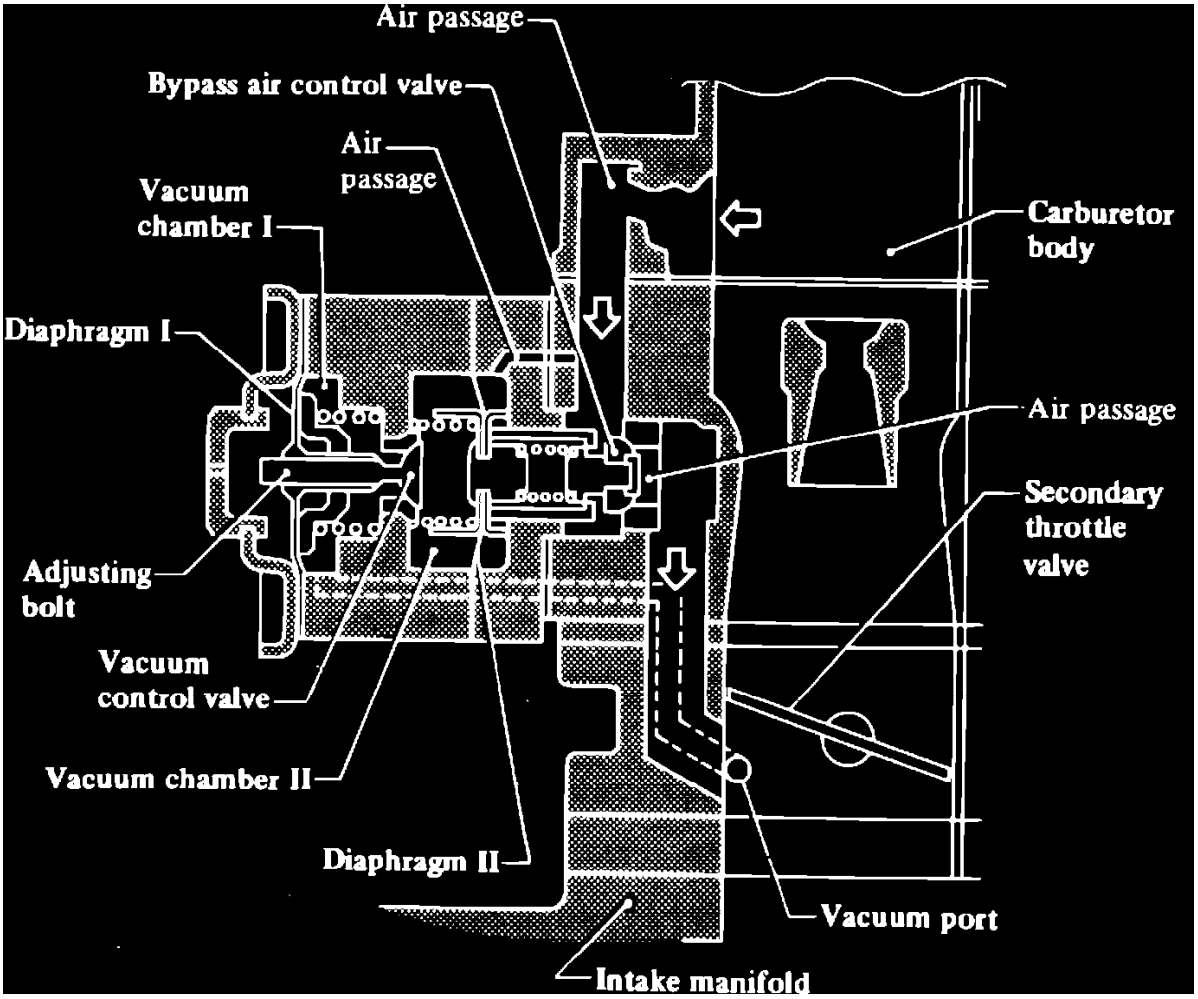


Fig. 33 Boost controlled deceleration device.

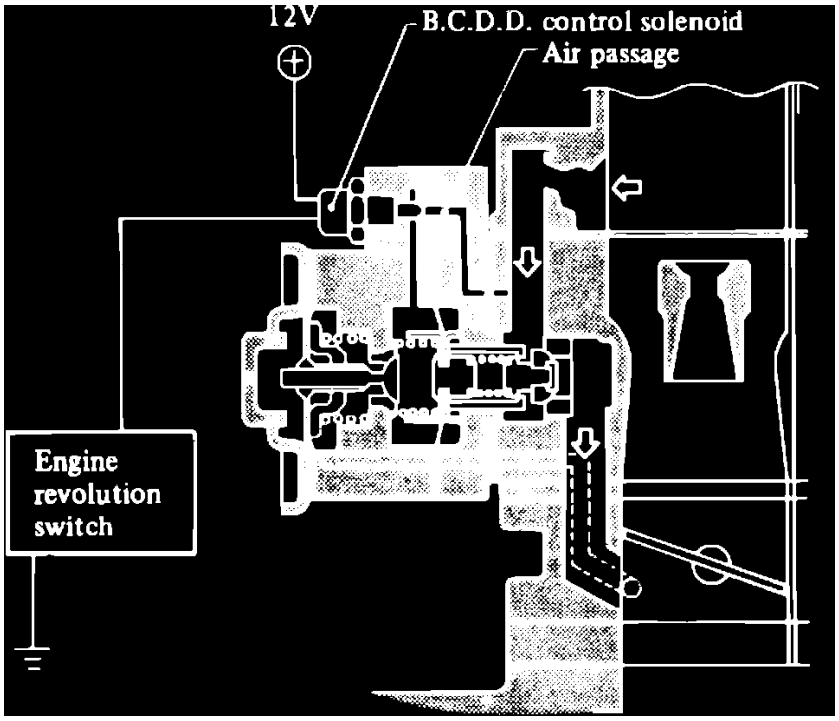


Fig. 86 Boost controlled deceleration device.

This system, **Fig. 33 & 86,** acts to reduce oil consumption when intake manifold vacuum increases to an extremely high level during deceleration. This system consists of a boost control unit, made up of a boost control valve and diaphragm, which acts as a manifold vacuum sensor, and a bypass air control unit, made up of a bypass air control valve and diaphragm, which acts as an actuator.

The boost control unit senses the manifold vacuum. When the level of the manifold vacuum exceeds a predetermined value, the boost control valve opens and transmits manifold vacuum to the air bypass control unit. The manifold vacuum then pulls diaphragm II and opens the bypass air

control valve, causing air to be bypassed to the intake manifold. Upon completion of air bypass, manifold vacuum is lowered. This results in the closing of the boost control valve and then the closing of the air control valve. This system operates in a tightly controlled circuit to keep manifold vacuum very close to predetermined value during deceleration.

Deceleration Valve: Testing and Inspection
Boost Controlled Deceleration Device

Vacuum Control Valve

VACUUM CONTROL VALVE

1. Disconnect air regulator side of air hose connecting 3-way connector to vacuum control valve.
2. Check that vacuum control valve operates when engine speed is decreased from 3500-4000 RPM to idle, by placing fingers on end of hose.
3. If there is no vacuum at end of hose, replace vacuum control valve.

BCDD Operation

1. Place gear shift lever in neutral position and connect rubber hose between vacuum gauge and intake manifold.
2. With engine at operating temperature, adjust idle to specification.
3. With engine under no load, increase engine speed to 1500-2000 RPM, then quickly close throttle valve.
4. Manifold vacuum pressure should abruptly rise to 23.62 inches Hg or above, then gradually decrease to a certain level and stay there for a while. This is the operating pressure. In most cases it will drop to idle pressure.
5. Check that bypass air control valve pressure is within specified range which should be (at sea level) 22.83-24.41 inches Hg.
6. If it is lower than specified level, turn adjusting screw counterclockwise until correct adjustment is made. If it is higher turn adjusting screw clockwise.
7. Race the engine and check for adjustment.
8. If engine speed cannot be reduced to idle when checking BCDD operating pressure, turn adjusting screw counterclockwise until BCDD operating pressure is on high vacuum side, .98 inch Hg from specified pressure, then turn adjusting screw 1/4 turn clockwise so that BCDD operating pressure drops .98 inch Hg.
9. If BCDD operating pressure is still not accurately determined, turn adjusting screw counterclockwise so that BCDD operating pressure is on high vacuum side, 1.97 inches Hg from specified pressure, then turn adjusting screw 1/2 turn clockwise.
10. Boost control unit operating pressure should be correctly set within specified range even if engine speed cannot be decreased to idle.

Deceleration Valve: Adjustments

BCDD ADJUSTMENT

1. Connect rubber hose between vacuum gauge and intake manifold, then run engine until it reaches operating temperature and set idle to specification.
2. Run engine under no load. Increase engine speed from idle to 2000 RPM and quickly close throttle valve.
3. Manifold vacuum pressure should rise abruptly to 24.02 inches Hg or above and gradually decrease to a certain level and remain there temporarily. This is the operating pressure. In most cases it will drop to idle pressure.
4. Check that bypass air control valve operating pressure is 22.82-24.22 inches Hg. If it is not within specified range, turn adjusting screw until proper adjustment is attained.
5. Race engine and check for adjustment, readjusting as necessary.
6. If engine speed cannot be decreased to idle when checking operating pressure, turn adjusting screw counterclockwise so that operating pressure is on high vacuum side, .98 inch Hg from specified value.
7. Turn adjusting screw 1/4 turn clockwise so that operating pressure drops .98 inch Hg.
8. If operating pressure still cannot be clearly determined, turn adjusting screw counterclockwise so that operating pressure is on high vacuum side, 1.97 inches Hg from specified value.
9. Turn adjusting screw 1/2 turn clockwise.
10. If BCDD does not operate in steps 6 or 8, replace BCDD unit.

Early Fuel Evaporation (EFE): Description and Operation

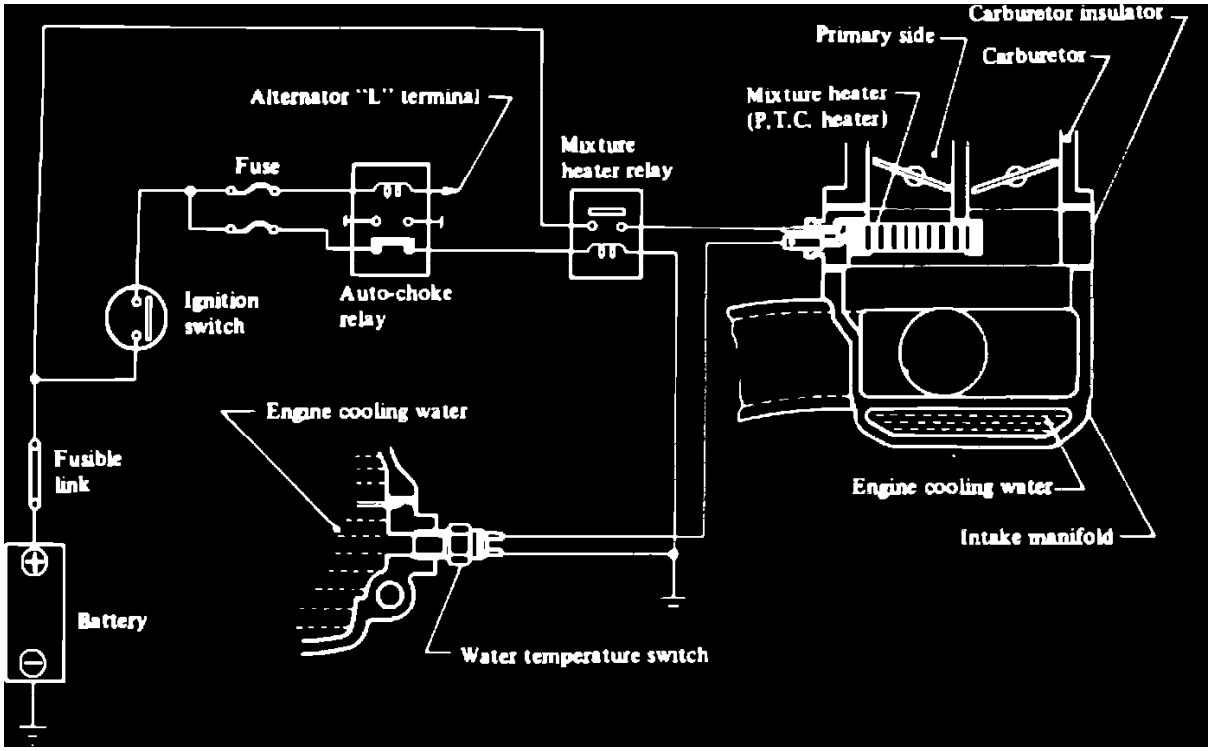
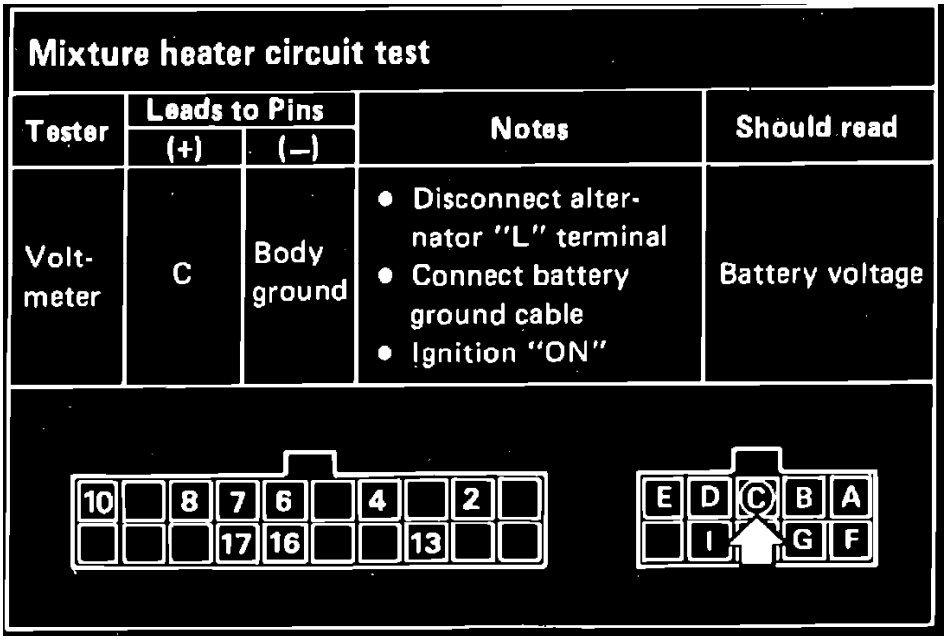


Fig. 43 Mixture heating system. (Typical)

This system incorporates a positive temperature coefficient heater, installed between the carburetor and intake manifold, to reduce emissions and improve driveability during engine warm up. When the engine is started, this heater is electrically energized and heats the air/fuel mixture that passes through it. When the engine is warm the water temperature switch cuts off current to the heater.

Positive Temperature Coefficient (PTC) Heater: Testing and Inspection



Mixture heater circuit test

Tester	Leads to Pins (+)	Leads to Pins (–)	Notes	Should read
Volt-meter	C	Body ground	• Disconnect alternator "L" terminal • Connect battery ground cable • Ignition "ON"	Battery voltage

Fig. 29 Mixture heater circuit test

Perform mixture heater circuit test as illustrated in **Fig. 29.** If voltage is not as specified, check harness, automatic choke relay and mixture heater relay and repair or replace as necessary.

Emissions Maintenance Light: Service and Repair California

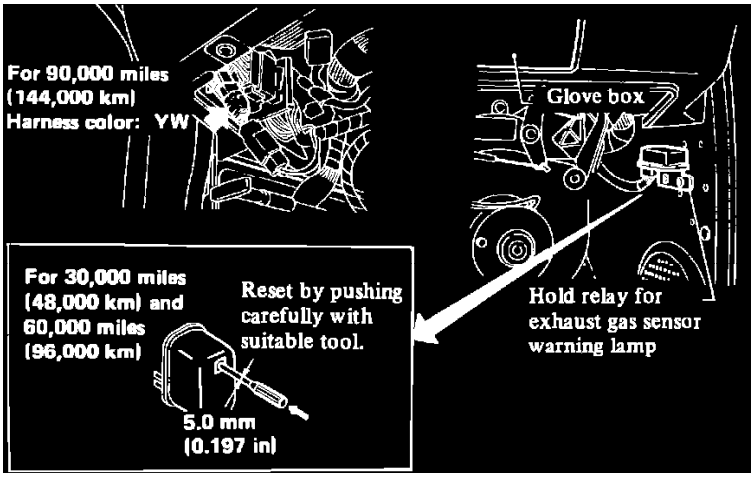


Fig. 8c Maintenance Reminder Light Reset

After the vehicle has been operated for 30,000 miles the oxygen sensor warning light located on the instrument panel will come on, indicating that the oxygen sensor should be checked.

After verifying oxygen sensor operation, reset the warning light by resetting the hold relay at 30 and 60 thousand miles and disconnecting the wire above the hood release at 90,000 miles, **Fig. 8c**.

Emissions Maintenance Light: Service and Repair
Federal

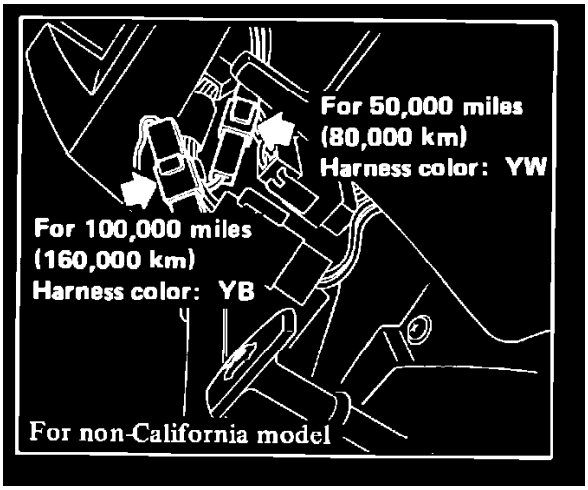


Fig. 8b Oxygen Sensor Warning Light Harness

After the vehicle has been operated for 50,000 miles on 1985-86 Federal Pickup, the oxygen sensor warning light located on the instrument panel will come on, indicating that the oxygen sensor should be checked.
After verifying oxygen sensor operation, reset the warning light by disconnecting the appropriate wire located above the hood release, **Fig. 8b**.

Canister Purge Control Valve: Description and Operation

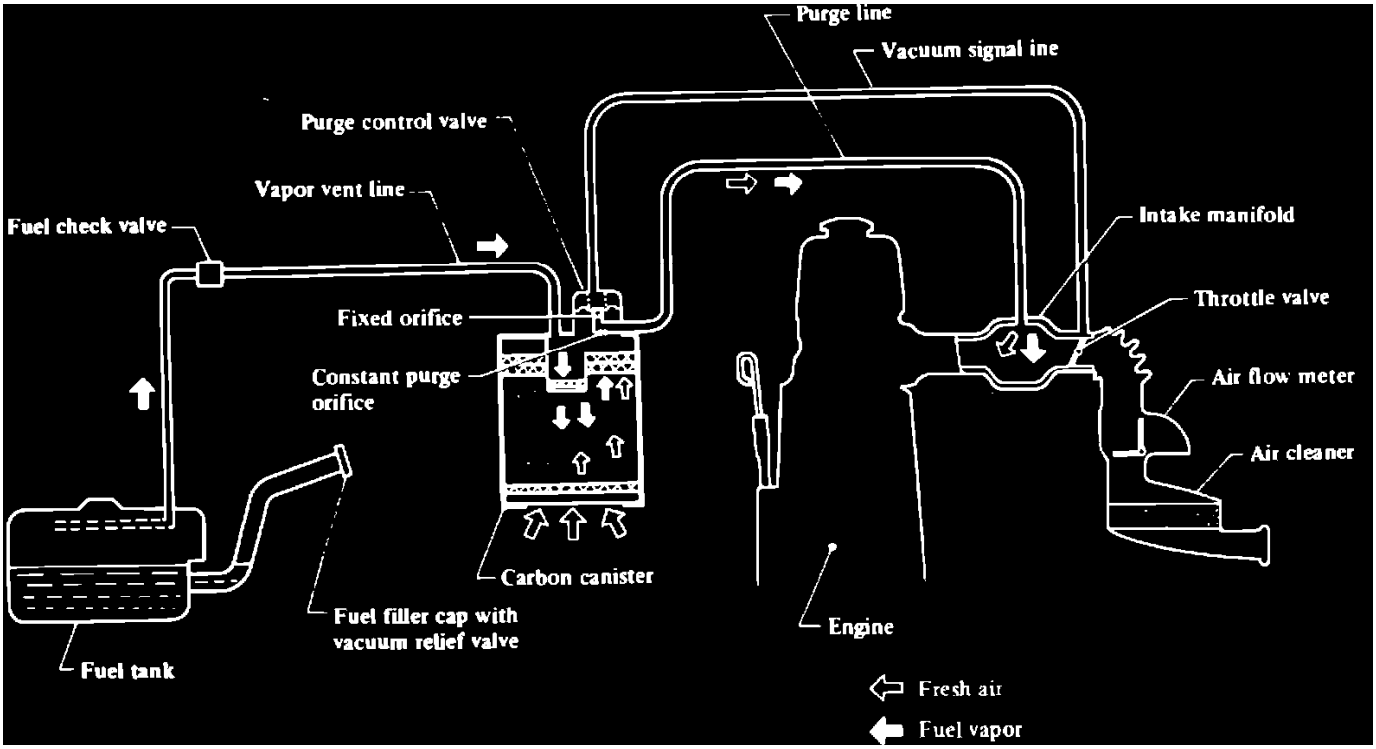


Fig. 37 Evaporative emission system. (Typical)

Refer to **Fig. 37** for a typical evaporative emission system. Complete system schematics are located in ``Vacuum Hose Routings."

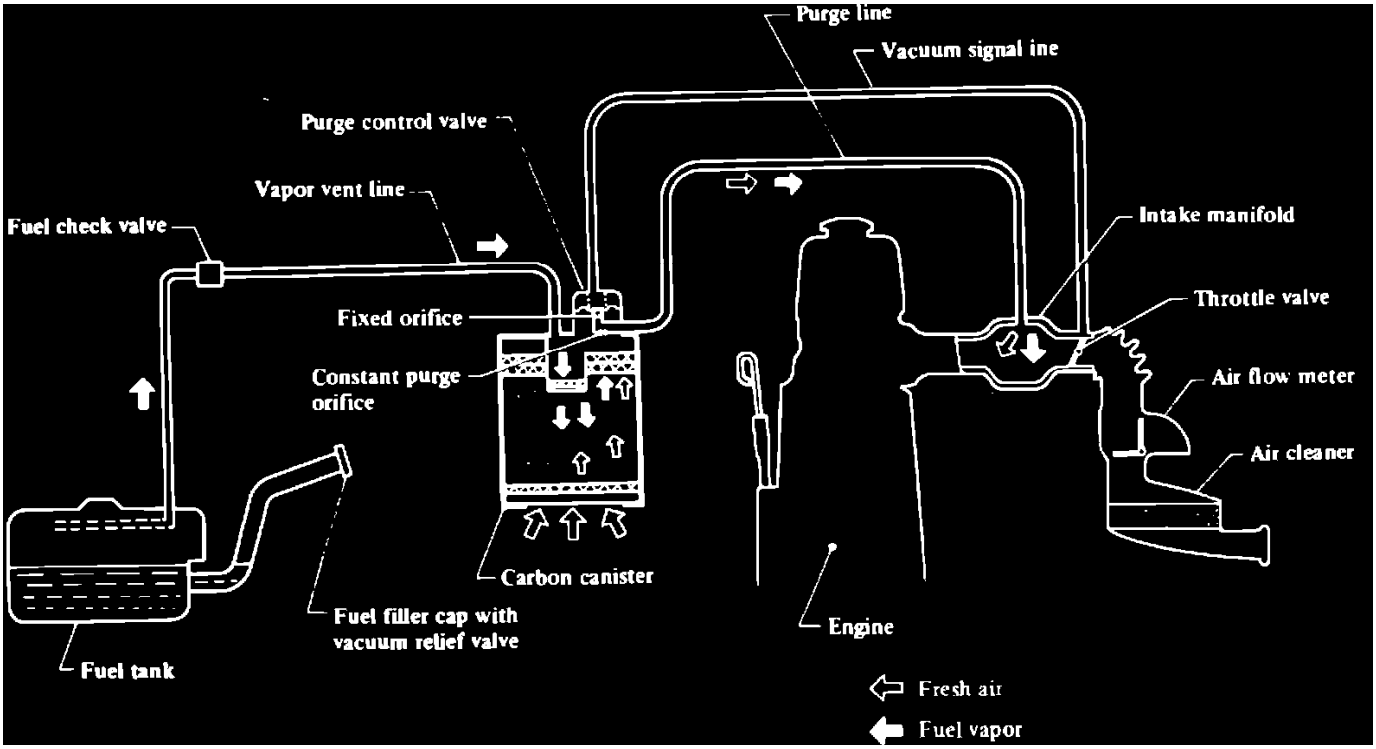
This system reduces hydrocarbon emissions from the fuel system by the use of activated charcoal in the carbon canister. With engine off, fuel vapor from the fuel tank is led into the carbon canister for storage.

The canister retains the vapor until it is purged by air drawn through the purge line to the intake manifold when the engine is running. With engine at idle, the purge control valve is closed but a small amount of air flows into the intake manifold through the constant purge orifice. As the engine speed increases and the ported vacuum rises, the purge control valve opens and the vapor is drawn into the intake manifold through the fixed orifice and the constant purge orifice. On high altitude except Calif. models, the vapor in the carburetor float chamber is led into the canister through the outer vent line because the vent switching valve is normally open.

Canister Purge Control Valve: Testing and Inspection

1. Check for fuel vapor leakage in the distributor vacuum line at diaphragm of carbon canister purge control valve.
   a. Disconnect rubber hose in line between ``T'' connector and carbon canister ``T'' connector.
   b. Inhale air into opening of rubber hose running to vacuum hole in carbon canister and ensure that there is no leak.
2. If there is a leak, remove top cover of purge control valve and check for dislocated or cracked diaphragm. If necessary, replace diaphragm assembly which consists of a retainer, diaphragm, and spring.

Evaporative Emission Control Canister: Description and Operation



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Thermal Vacuum Valve - EVAP: Testing and Inspection

Year & Model	Opening Temperature Degrees °F	Closing Temperature Degrees °F	Leak Degrees °F
1985–86 Stanza	Below 140	Above 140	—
1985–86 Pulsar & Sentra (1985–86 Calif. only) With Gasoline Engine	Below 122①	Above 122②	—
1985–86 200SX	Below 140③	Above 140④	—

①—Two port type, above 122.
②—Two port type, below 122.
③—Two port type, above 140.
④—Two port type, below 140.

Fig. 21 Thermal vacuum valve operating specifications

Year & Model	Opening Temperature Degrees °F	Closing Temp Degrees °F	Leak Degrees °F
1982 210 & 1982–86 Stanza & 1982–84 Pickup With Gasoline Engine	Below 140	Above 140	—
1982–83 200SX	Below 104	Above 104	—
1982–84 280ZX, 810 & Maxima	Below 131 Above 203	131–203	—
1982 310, 1982–86 Sentra (1985–86 Calif. only) With Gasoline Engine & 1983–86 Pulsar (1985–86 Calif. only)	Below 122①	Above 122②	—
1982–83 Pickup With Diesel Engine	Above 77–86	Below 77–86	—
1984–86 200SX	Below 140③	Above 140④	—

①—Two port type, above 122.
②—Two port type, below 122.
③—Two port type, above 140.
④—two port type, below 140.

Fig. 62 Thermal vacuum valve operating specifications.

1. Drain coolant from engine, then remove valve.
2. Apply vacuum to valve and make sure valve opens or closes in response to engine coolant temperature as specified, **Fig. 21 & 62. Do not allow water to get inside thermal vacuum valve.**

Exhaust Gas Recirculation: Description and Operation

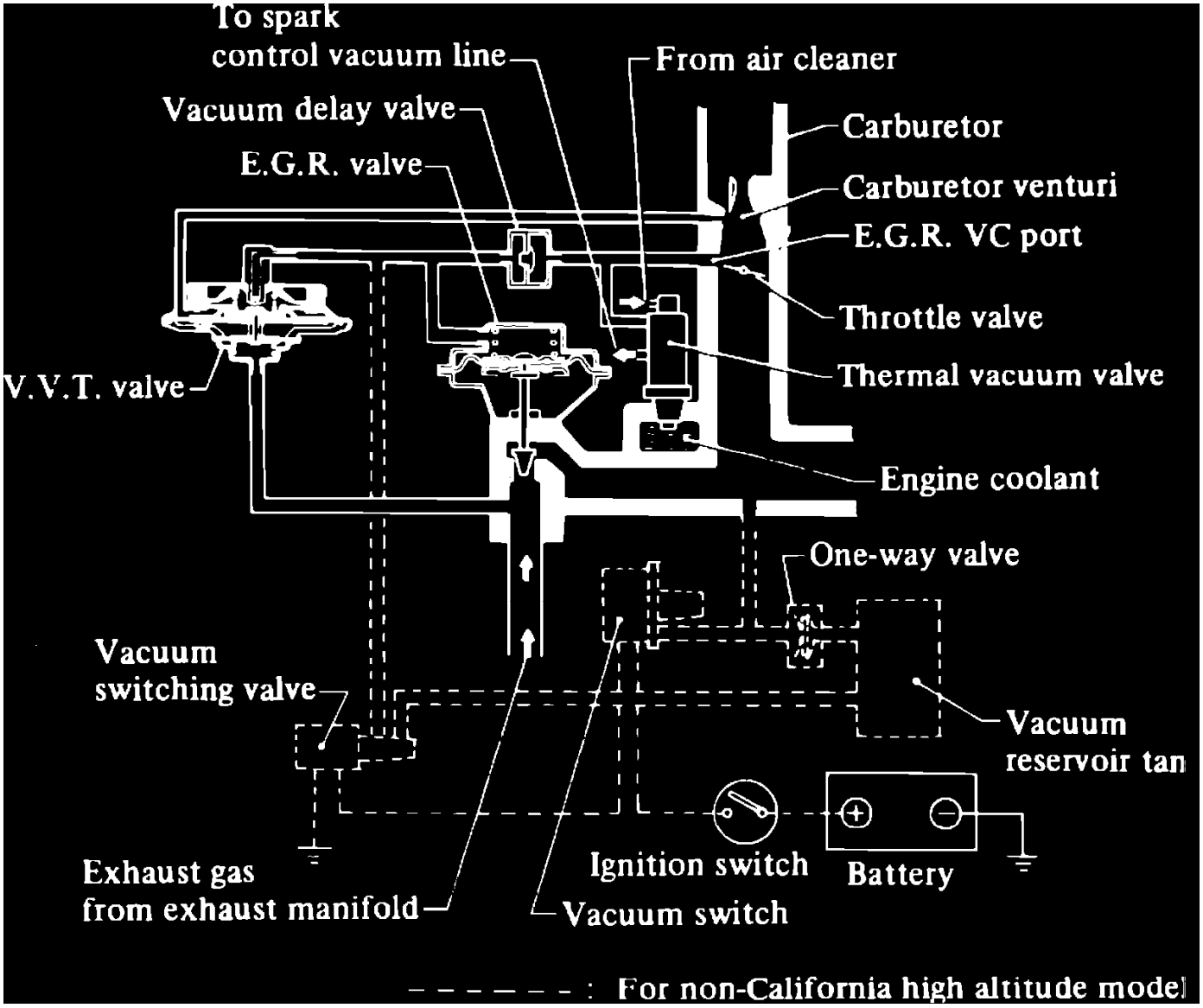


Fig. 5 Gasoline engine exhaust gas recirculation system (typical)

GASOLINE ENGINES

In the exhaust gas recirculation system, **Fig. 5,** (complete system schematics are located in ``Vacuum Hose Routings'') a part of the exhaust gas is returned to the combustion chamber to lower spark flame temperature during combustion. This results in a reduction of the nitrogen oxide content in the exhaust gas.

Components used in this system vary according to year and model. The main component is the EGR control valve which controls the quantity of exhaust gas allowed to enter the combustion chamber.

Exhaust Gas Recirculation: Testing and Inspection
EGR System Control Test

1. With engine off, inspect EGR control valve for binding or sticking by moving valve diaphragm. Clean, correct, or replace as necessary.
2. With engine running at operating temperature, check EGR control valve operation when engine speed is raised from idling to 2000-3000 RPM.
3. If valve is malfunctioning, make a thorough visual check of vacuum hoses for EGR control system and replace or correct as necessary.
4. Apply vacuum to EGR control valve and check that it moves to full-up position. Plug hose with applied vacuum. Valve should remain open for at least 30 seconds. If not, replace valve.
5. Disconnect an EGR solenoid valve connector and remove vacuum hose between VCM and EGR control valve.
6. Using vacuum gauge, check vacuum with battery voltage applied to connector. Switch should come on at .39-.79 inch Hg and should shut off at about 4.72 inches Hg. If valve does not operate to specifications, replace VCM.
7. Check system wiring.
8. Disconnect 20-pin connector and measure resistance between terminal 4 and ground. If resistance is 38-42 ohms, replace control unit.
9. If resistance is not 38-42 ohms, disconnect connector of VCM solenoid valve for EGR control and check resistance between each terminal of connector.
10. If resistance is now 38-42 ohms, check harness and repair or replace as necessary.
11. If resistance is not 38-42 ohms, replace VCM.

Exhaust Gas Recirculation: Testing and Inspection
Exhaust Gas Recirculation System (EGR)

Water temperature °C (°F)	T.V.V. operation	B.P.T. valve		E.G.R. control system
		Exhaust gas pressure kPa (mmH_2O, inH_2O)	Operation	
Below 50 (122)	Open	Any condition		Not actuated
Above 50 (122)	Closed	Below 0.294 - 0.392 (30 - 40, 1.18 - 1.57)	Open	Not actuated
		Above 0.294 - 0.392 (30 - 40, 1.18 - 1.57)	Closed	Actuated

Fig. 121 Exhaust Gas Recirculation (EGR) Operation, Exc. Cab & Chassis Model

Water temperature °C (°F)		T.V.V. operation	B.P.T. valve		E.G.R. control system
Z24 for non-California	M.P.G. model & Z24 for California		Exhaust gas pressure kPa (mmH_2O, inH_2O)	Operation	
Below 55 (131)	Below 60 (140)	Open	Any condition		Not actuated
Above 55 (131)	Above 60 (140)	Closed	Below 0.206 - 0.265 (21 - 27, 0.83 - 1.06)	Open	Not actuated
			Above 0.206 - 0.265 (21 - 27, 0.83 - 1.06)	Closed	Actuated

Fig. 120 Exhaust Gas Recirculation (EGR) Operation, MPG Model and Cab & Chassis Only

EGR Backpressure Transducer: Description and Operation

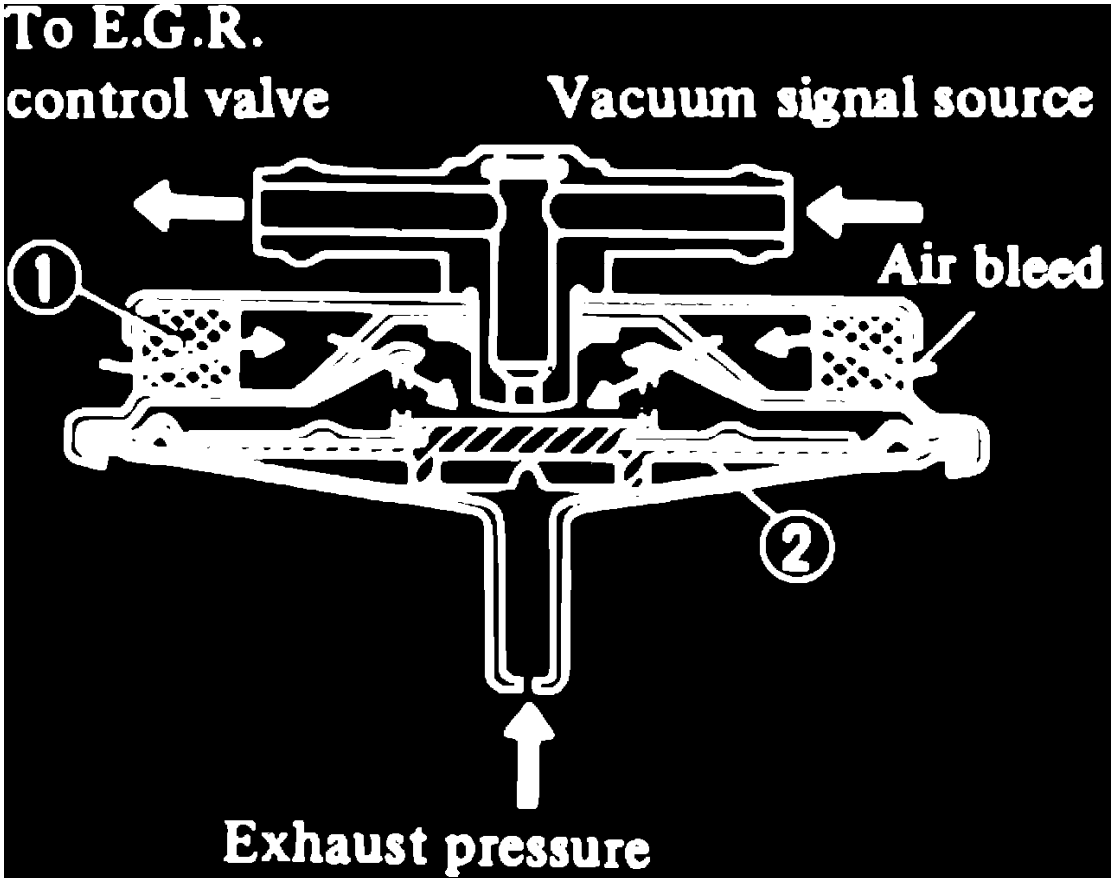


Fig. 14 Back pressure transducer valve.

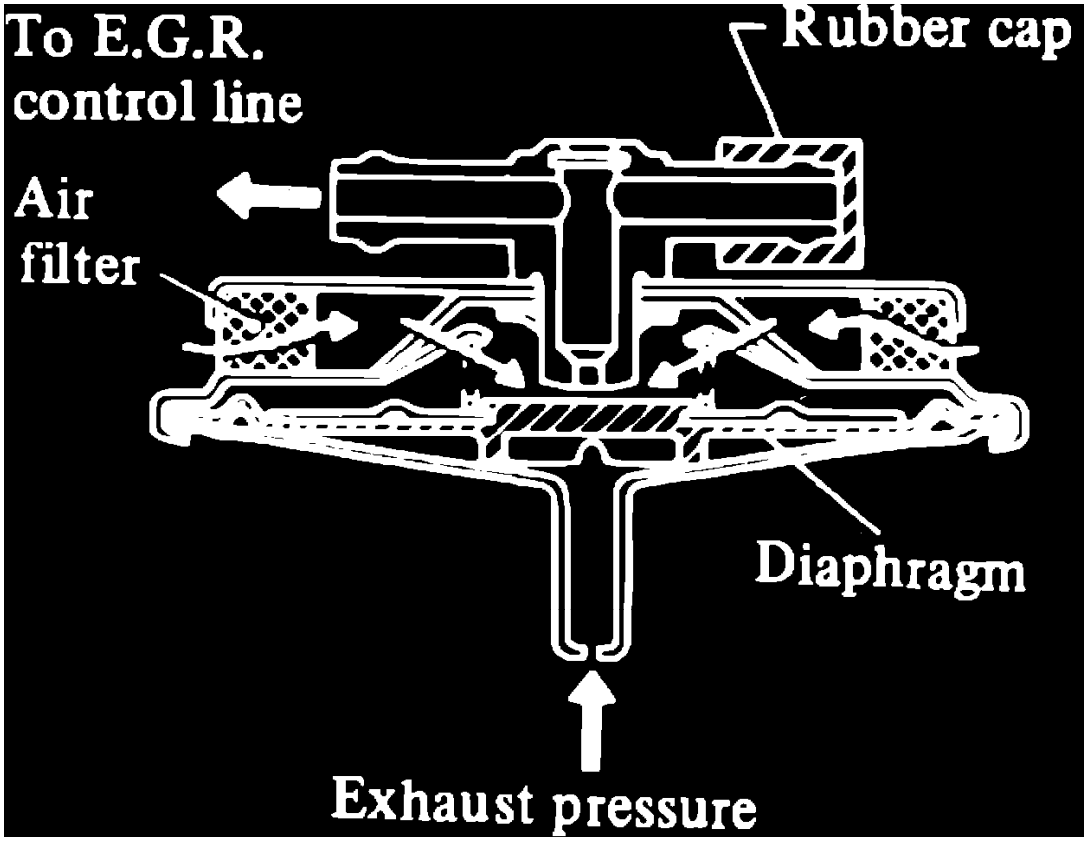


Fig. 15 Back pressure transducer valve.

This valve, **Figs. 14 and 15,** monitors exhaust pressures to activate the diaphragm. The valve controls vacuum applied to the EGR control valve. This allows the operation of the EGR control valve to be controlled by engine operating conditions.

EGR Control Solenoid: Description and Operation

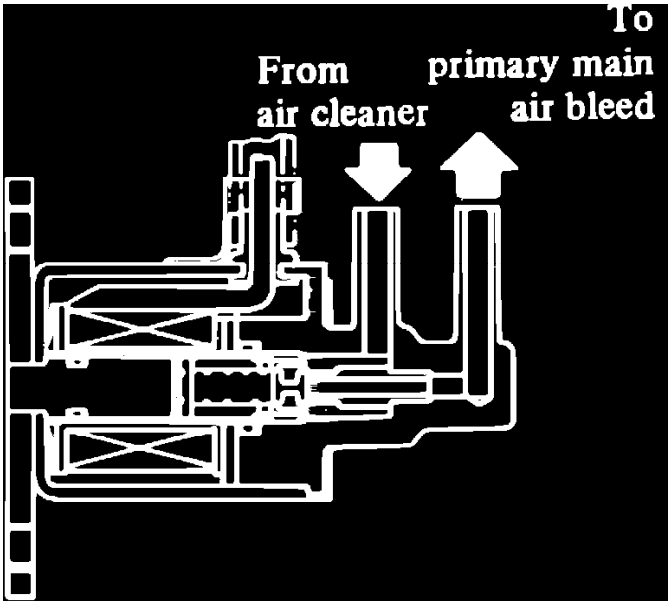


Fig. 52 Vacumm switching valve.

This valve is activated by current from the vacuum switch for the purpose of supplying vacuum to the EGR control valve from the vacuum reserve tank.

EGR Control Solenoid: Testing and Inspection
Vacuum Switching Valve

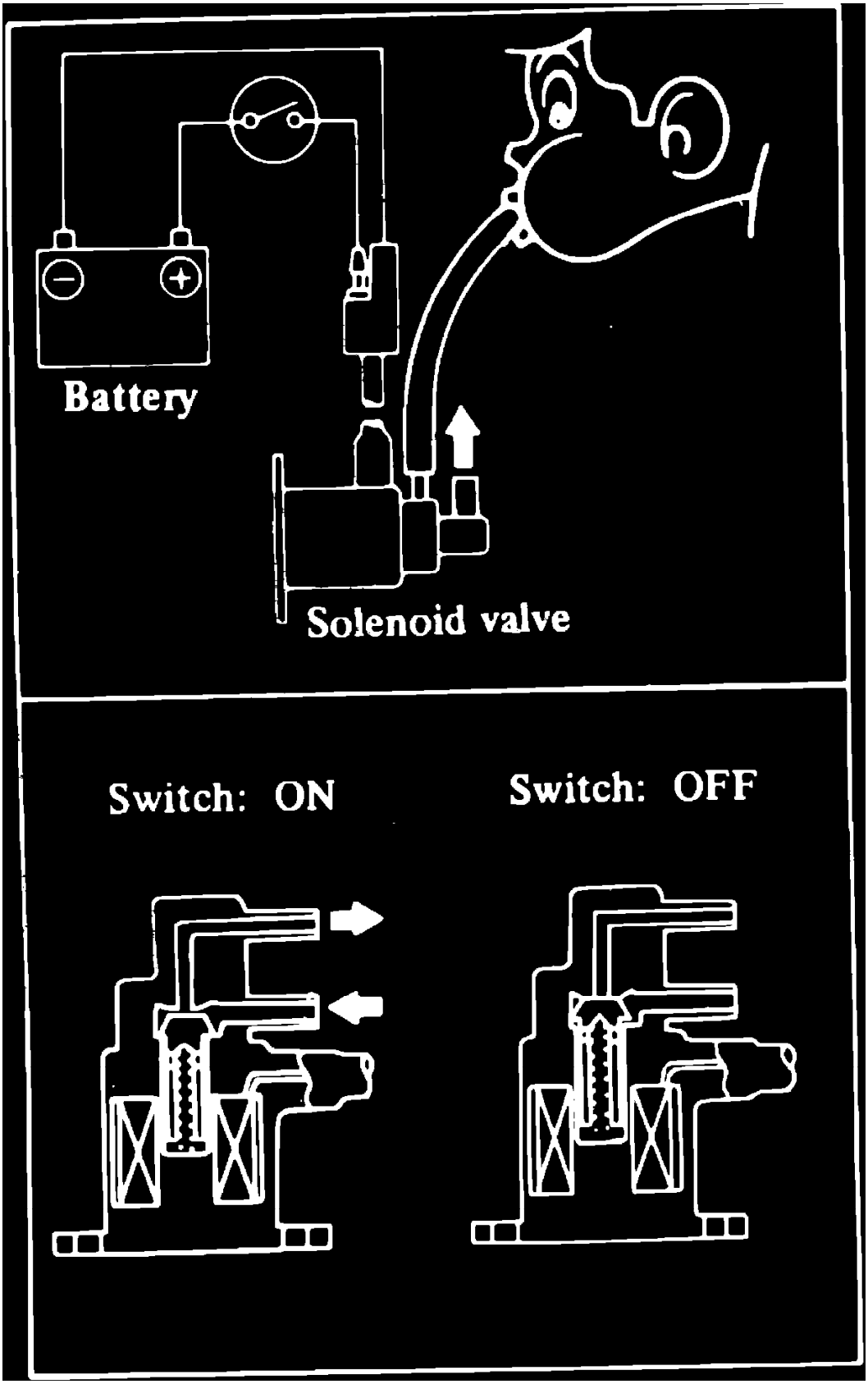


Fig. 22 Vacuum switching valve air flow

1. Remove both hoses and harness, solenoid attaching screws and remove valve.
2. Operate solenoid valve with battery voltage to determine if air flows through valve properly, **Fig. 22.**

EGR Control Solenoid: Testing and Inspection
Vacuum Cut or Control Solenoid Valve

1. Disconnect electrical connector from valve and ensure resistance across valve terminals measures approximately 30-40 ohms.
2. Disconnect vacuum hoses from valve.
3. Check valve port openings. With battery voltage applied to the valve, air should flow freely between two upper ports. Without battery voltage applied, air should flow freely between center and lower ports.

EGR Valve: Description and Operation

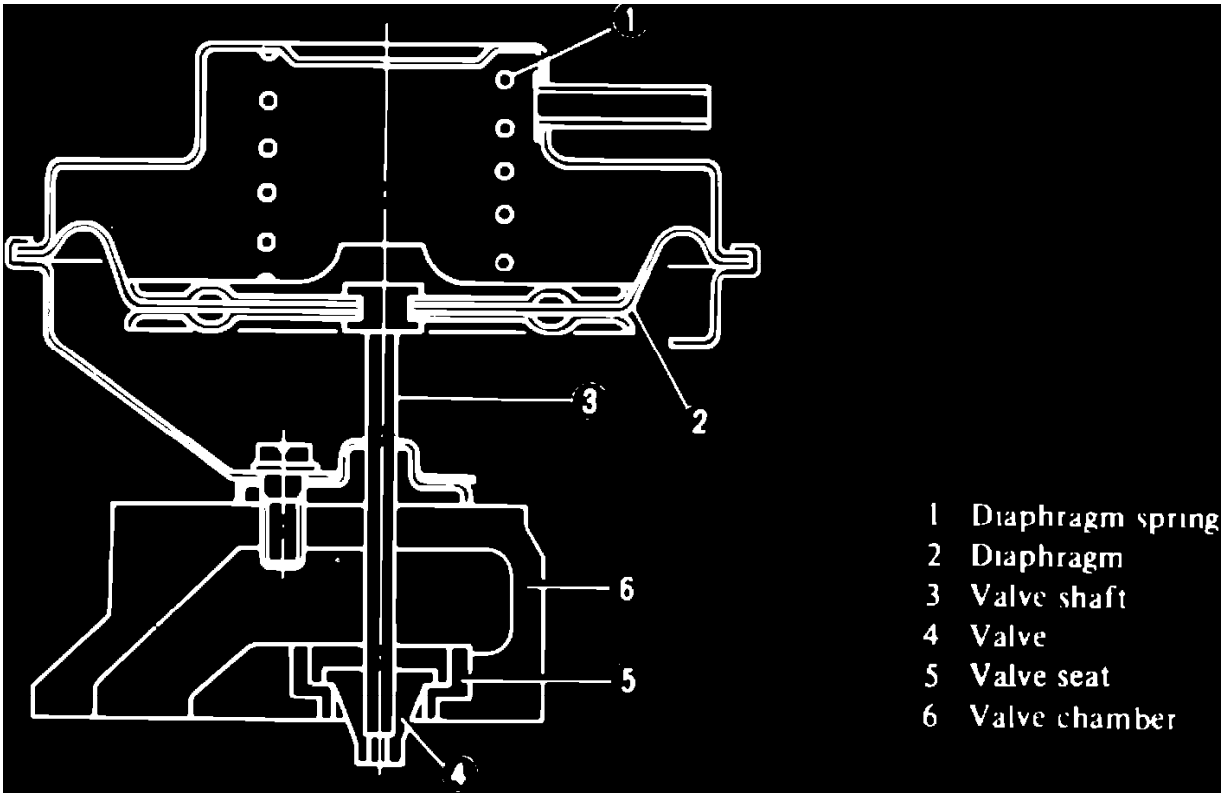


Fig. 6 EGR control valve.

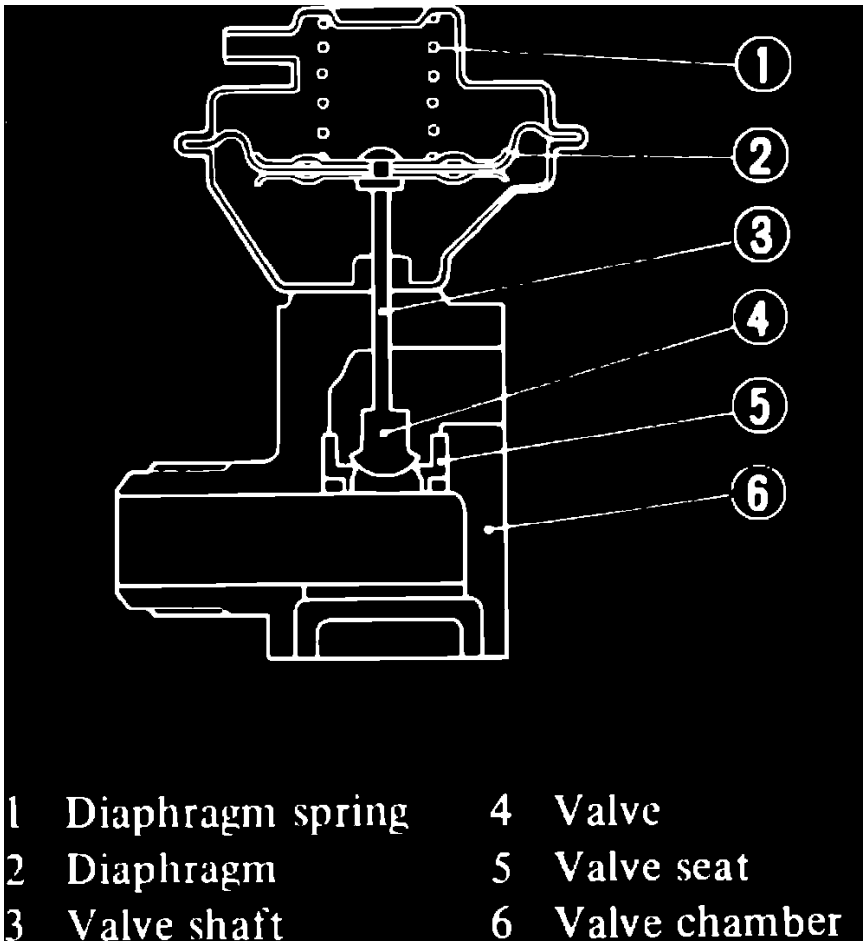


Fig. 7 EGR control valve.

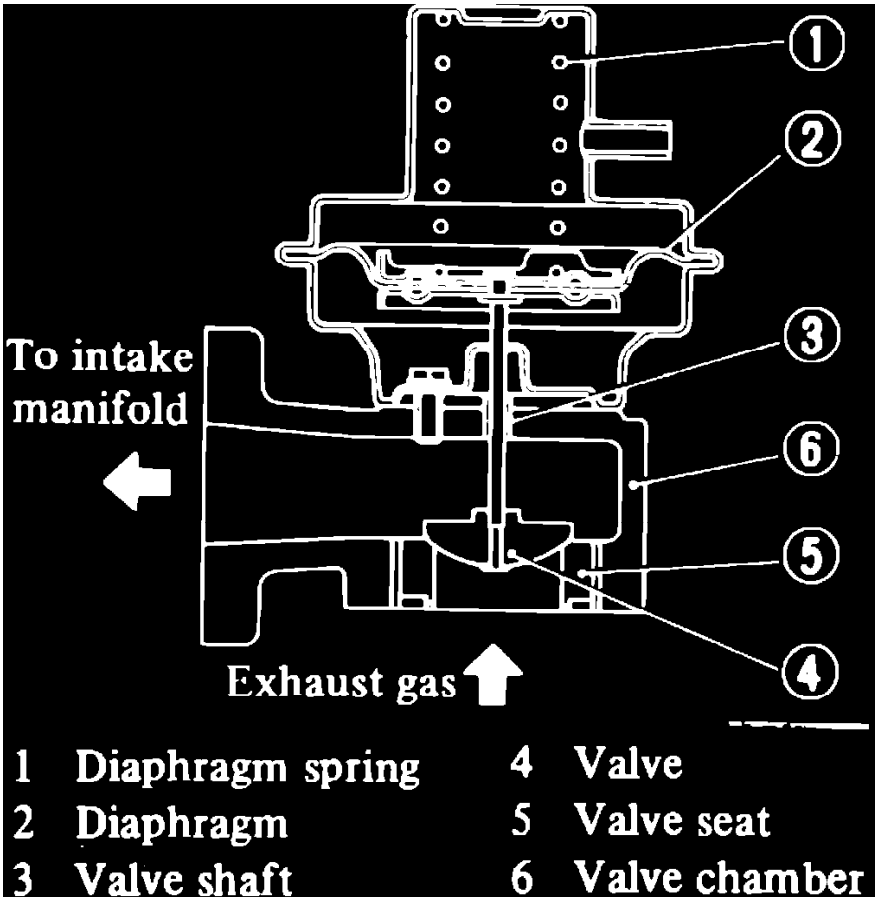


Fig. 8 EGR control valve.

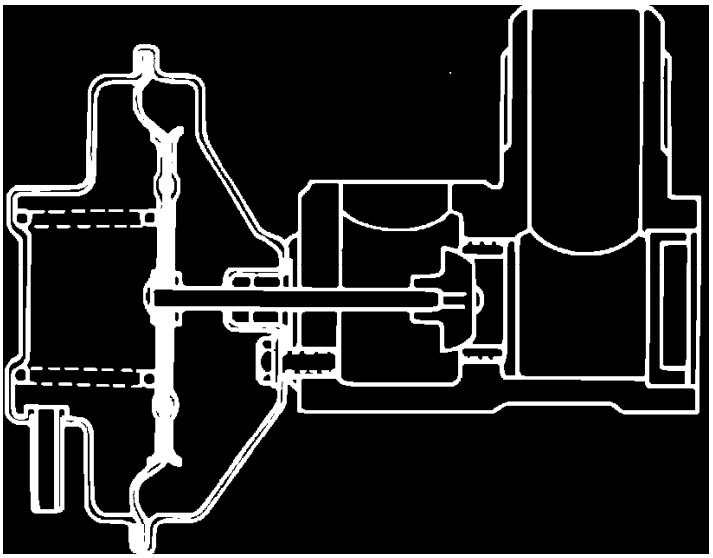


Fig. 9 EGR control valve.

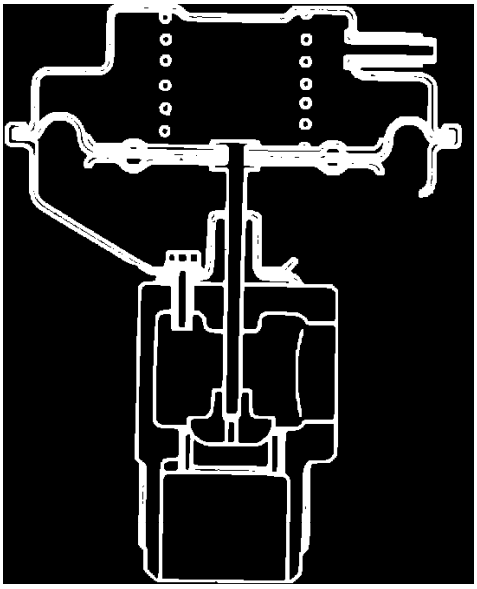


Fig. 32 EGR control valve.

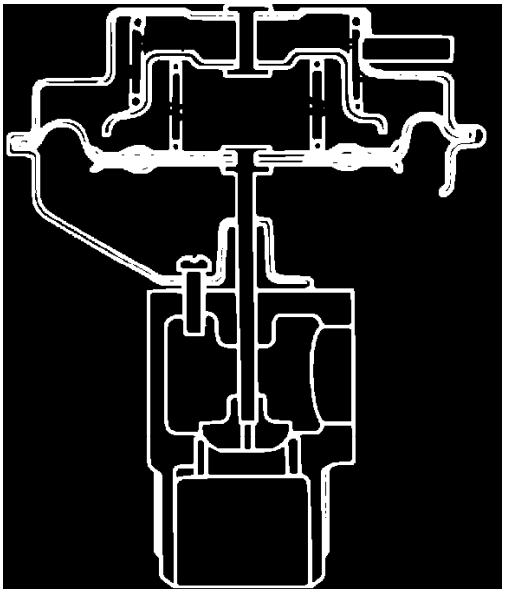


Fig. 33 EGR control valve.

This valve, **Figs. 6 through 9, 32 and 33,** controls the quantity of exhaust gas recirculated to the intake manifold. It is operated by vacuum created by the opening of the carburetor throttle valve except on vehicles with diesel engines.

On Pickups equipped with diesel engines, the vacuum is created in response to a sub-venturi vacuum signal that is amplified by a vacuum amplifier.

On Maximas and Sentras equipped with diesel engines, the vacuum is applied in response to the operation of the solenoid valve.

EGR control valve construction and type vary according to year, model, transmission type and vehicle destination. For identification purposes, the part number is stamped on the top of the valve.

Exhaust Pressure Regulator Vacuum Valve: Description and Operation
Vacuum Control Modulator

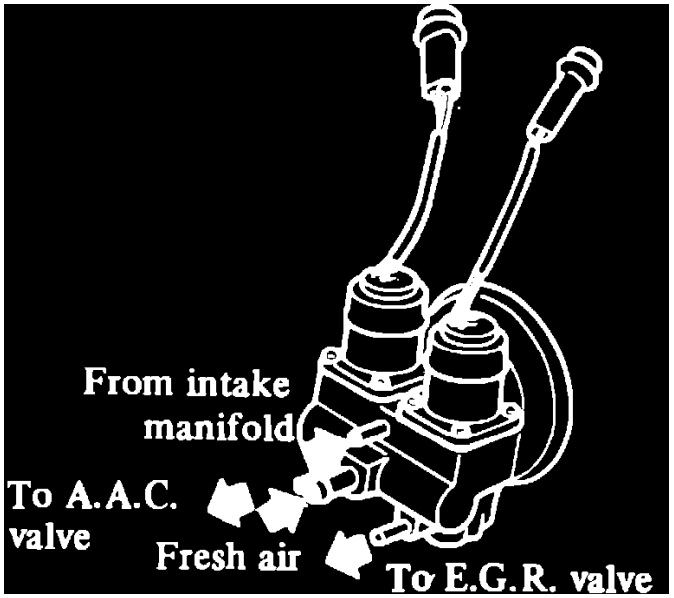


Fig. 49 Vacuum control modulator.

The vacuum control modulator is composed of a pressure regulator and solenoid valve. Intake manifold vacuum is used as the vacuum source for the pressure regulator. The passage leading to the atmosphere is controlled by solenoid valves. The vacuum control modulator provides vacuum to the EGR valve and AAC valve following the electrical signal from the control unit.

Exhaust Pressure Regulator Vacuum Valve: Description and Operation
Vacuum Control Valve

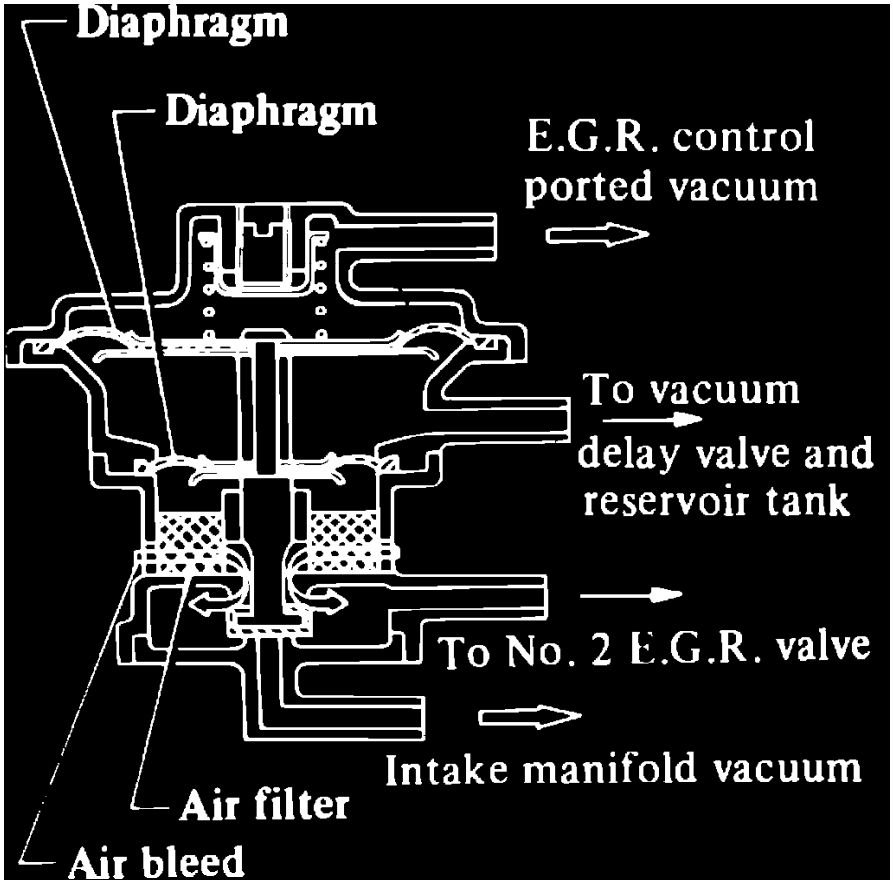


Fig. 17 Vacuum control valve. (Typical)

During rapid acceleration, the vacuum control valve, **Fig. 17,** monitors vacuum in the reservoir and engine vacuum. The control valve serves to activate a second EGR control valve when there is a sudden drop in the vacuum signal.

Thermal Vacuum Valve (TVV): Description and Operation

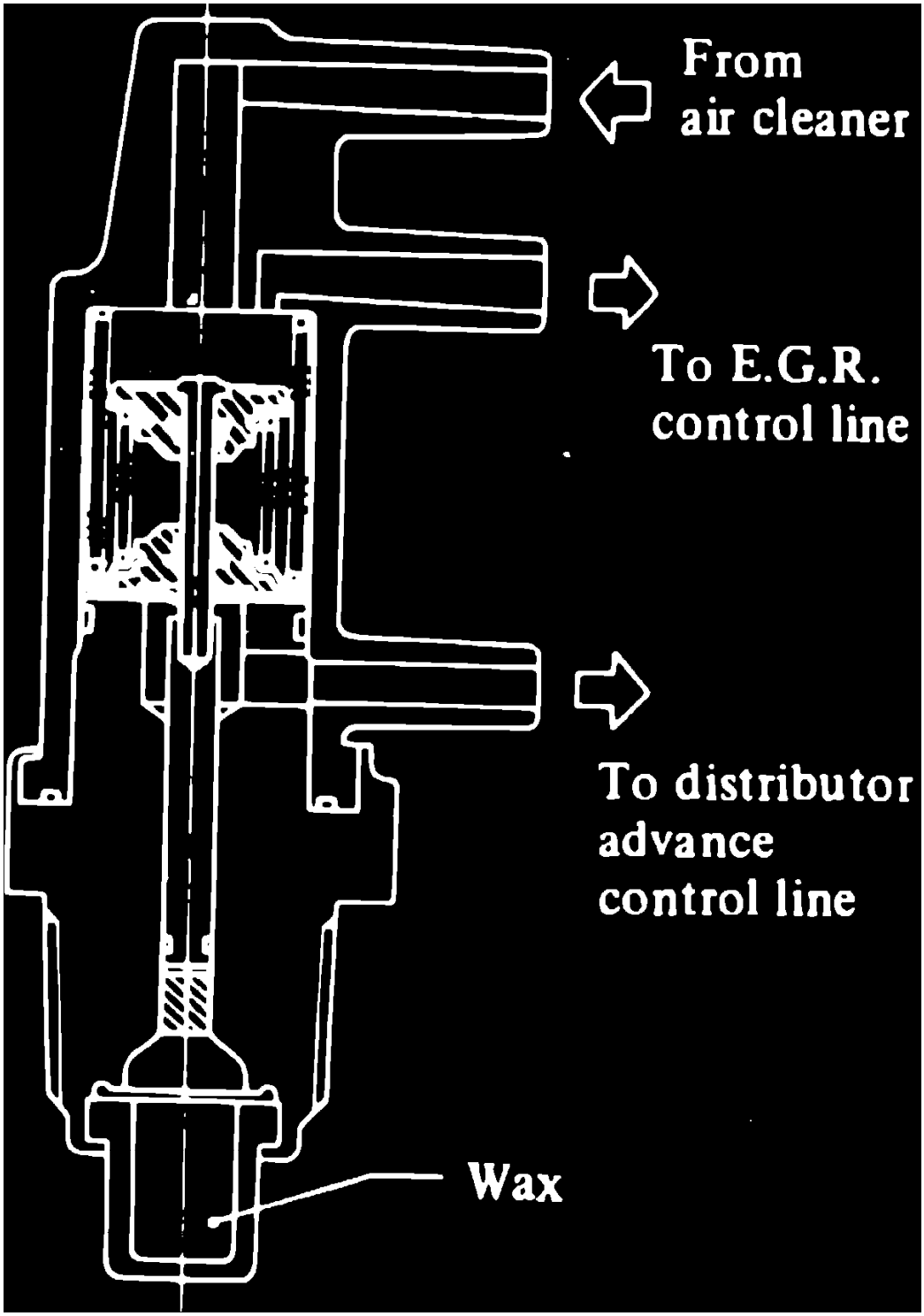


Fig. 12 Thermal vacuum valve. 1985-86 200SX exc. turbocharged & Pickup w/carbureted engine

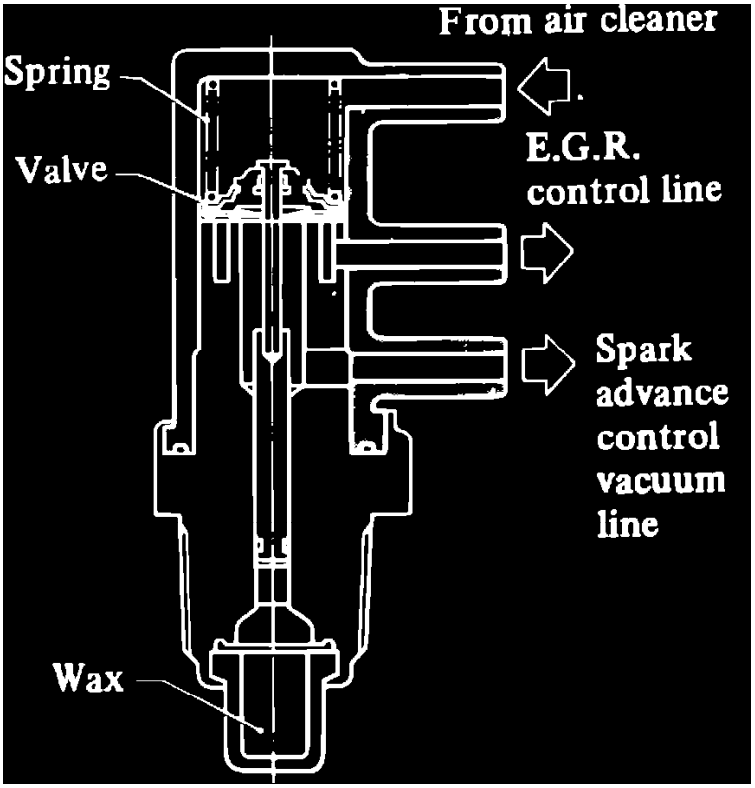


Fig. 40 Thermal vacuum valve.

These valves, **Figs. 12,& 40.** are attached to the thermostat housing and monitor the temperature of the engine coolant. The valve shaft is propelled by the thermal expansion force of wax which depends on temperature. This action closes or opens the valve, causing the EGR control vacuum line to be closed or exposed to the atmosphere. When the valve opens, air from the carburetor vacuum signal line is introduced and, because the venturi vacuum transducer valve and EGR valve diaphragm are exposed to the atmosphere, the EGR operation will not function.

Thermal Vacuum Valve (TVV): Testing and Inspection

Year & Model	Opening Temperature Degrees °F	Closing Temperature Degrees °F	Leak Degrees °F
1985–86 Stanza	Below 140	Above 140	—
1985–86 Pulsar & Sentra (1985–86 Calif. only) With Gasoline Engine	Below 122①	Above 122②	—
1985–86 200SX	Below 140③	Above 140④	—

①—Two port type, above 122.
②—Two port type, below 122.
③—Two port type, above 140.
④—Two port type, below 140.

Fig. 21 Thermal vacuum valve operating specifications

Year & Model	Opening Temperature Degrees °F	Closing Temp Degrees °F	Leak Degrees °F
1982 210 & 1982–86 Stanza & 1982–84 Pickup With Gasoline Engine	Below 140	Above 140	—
1982–83 200SX	Below 104	Above 104	—
1982–84 280ZX, 810 & Maxima	Below 131 Above 203	131–203	—
1982 310, 1982–86 Sentra (1985–86 Calif. only) With Gasoline Engine & 1983–86 Pulsar (1985–86 Calif. only)	Below 122①	Above 122②	—
1982–83 Pickup With Diesel Engine	Above 77–86	Below 77–86	—
1984–86 200SX	Below 140③	Above 140④	—

①—Two port type, above 122.
②—Two port type, below 122.
③—Two port type, above 140.
④—two port type, below 140.

Fig. 62 Thermal vacuum valve operating specifications.

1. Drain coolant from engine, then remove valve.
2. Apply vacuum to valve and make sure valve opens or closes in response to engine coolant temperature as specified, **Fig. 21 & 62. Do not allow water to get inside thermal vacuum valve.**

Vacuum Amplifier: Description and Operation

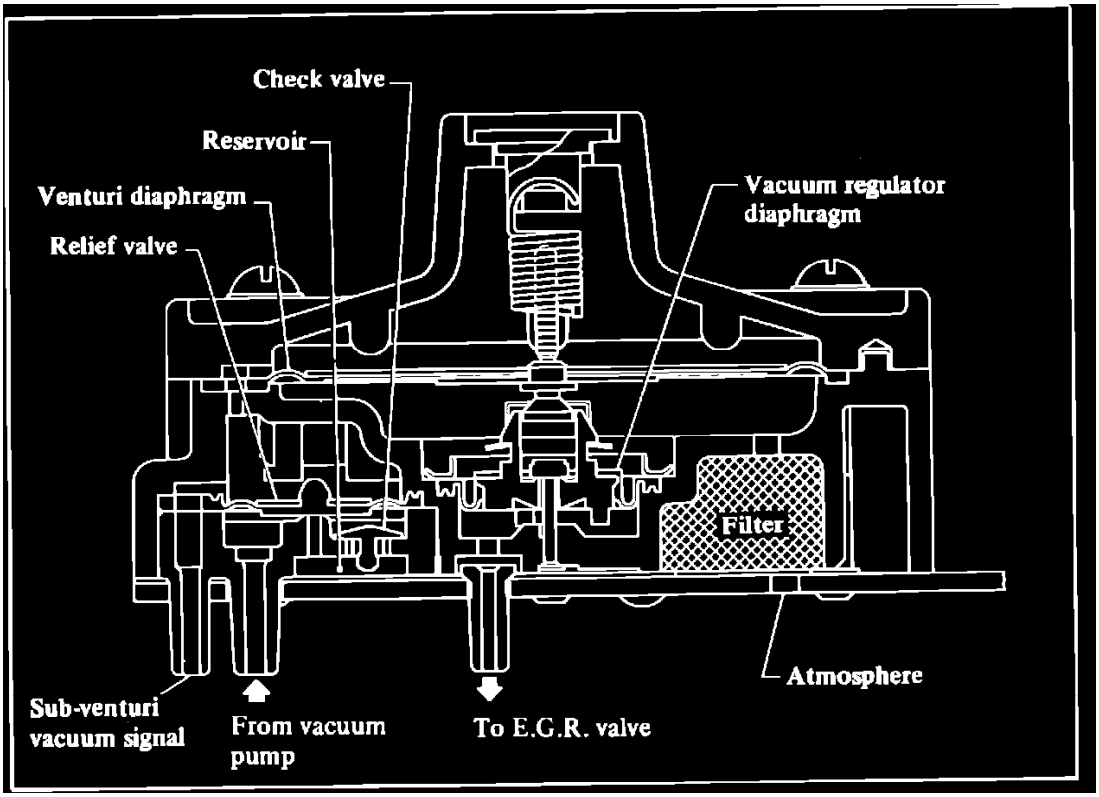


Fig. 55 Vacumm amplifier.

The vacuum amplifier which receives a weak vacuum signal produced in sub-venturi, activates the venturi diaphragm. This controls the output vacuum admitted to the EGR control valve.

Vacuum Check Valve: Description and Operation

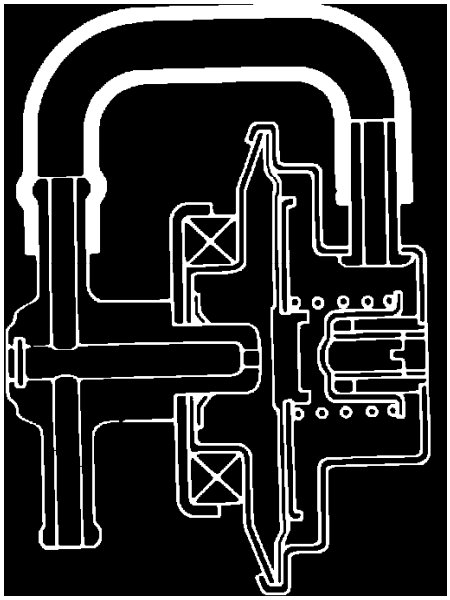


Fig. 54 Check valve.

The check valve is located on the VVT valve bracket in the venturi ported vacuum line. This valve prevents the vacuum acting on the VVT valve from increasing excessively and activates the EGR system properly.

Vacuum Control Flap Switchover Valve: Description and Operation

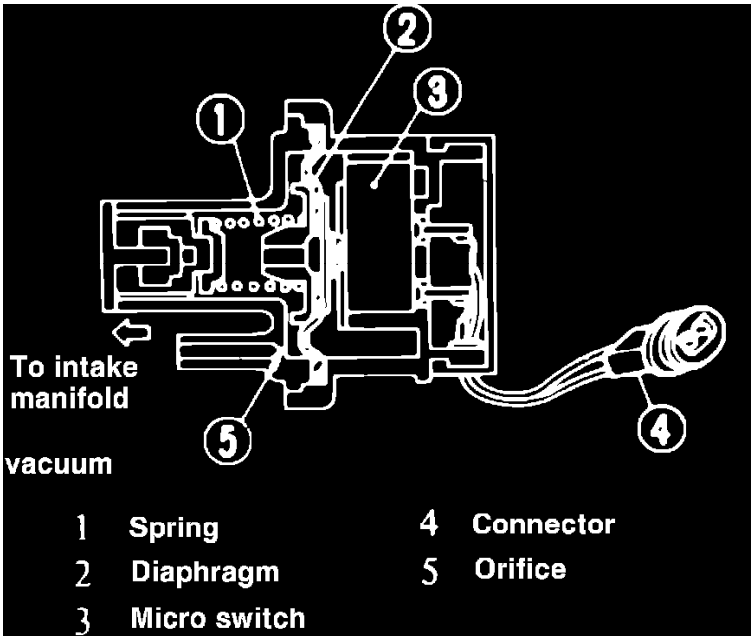


Fig. 53 Vacuum switch.

When intake manifold vacuum increases during deceleration, this switch is activated, interrupting the electrical signal which is sent to the vacuum switching valve.

Vacuum Delay Valve: Description and Operation

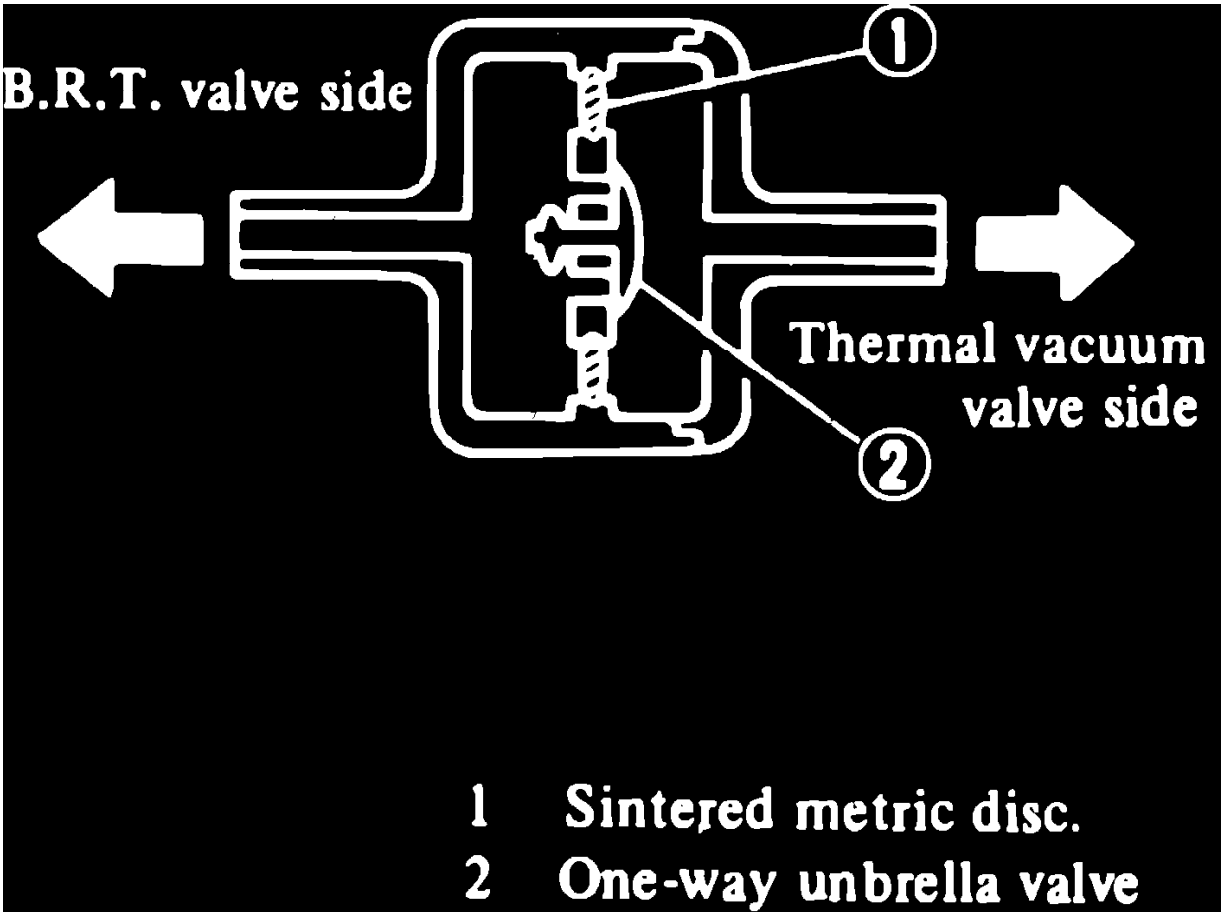


Fig. 16 Vacuum delay valve (typical)

This valve, **Fig. 16,** prevents a rapid vacuum drop of the EGR control line. The valve is designed for one-way operation and consists of a one-way umbrella valve and a sintered steel fluidic restricter.

Positive Crankcase Ventilation: Description and Operation

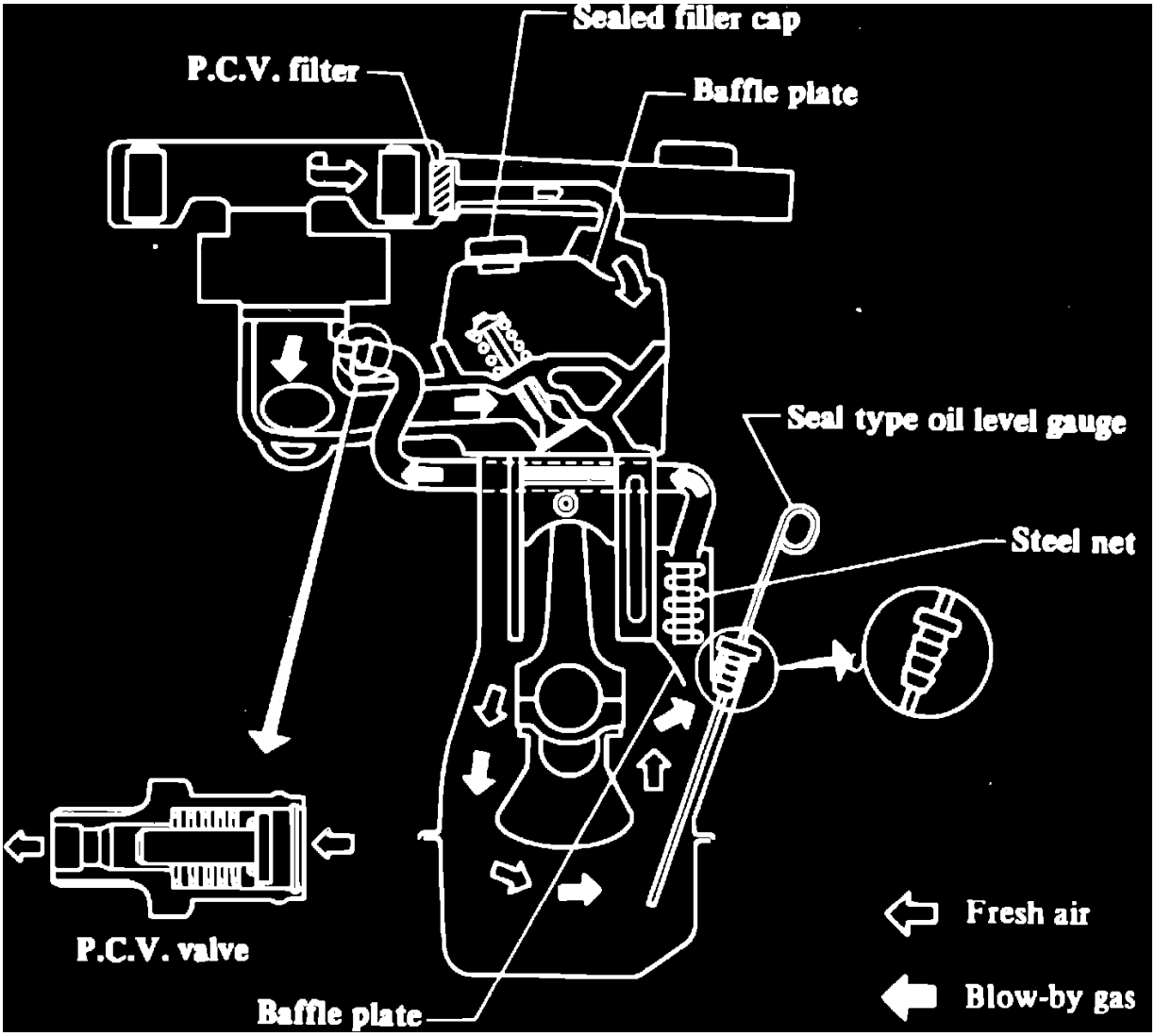


Fig. 2 Positive crankcase ventilation system (typical)

NON-TURBOCHARGED GASOLINE ENGINES

This system returns blow-by gas to both the intake manifold and carburetor air cleaner, **Fig. 2** (complete system schematics are located in ``Vacuum Hose Routings'').

The positive crankcase ventilation (PCV) valve is provided to conduct crankcase blow-by gas to the intake manifold.

During partial throttle operation of the engine, the intake manifold sucks the blow-by gas through the PCV valve.

Normally, the capacity of the valve is sufficient to handle any blow-by and a small amount of ventilating air.

The ventilating air is then drawn from the dust side of the carburetor air cleaner, through the tube connecting carburetor air cleaner to rocker cover, into the crankcase.

Under full-throttle condition, the manifold vacuum is insufficient to draw the blow-by flow through the valve, and its flow goes through the tube connection in the reverse direction.

On engines with an excessively high blow-by some of the flow will go through the tube connection to carburetor air cleaner under all conditions.

TURBOCHARGED GASOLINE ENGINES

This system is used to prevent blow-by gasses from entering the atmosphere, by returning the blow-by gasses created in the crankcase into the engine's intake system.

During engine operation when intake manifold is maintained, blow-by gasses flow into the intake manifold through the PCV valve located in the blow-by lower hose. When the turbocharger is in operation and positive pressure is present in the intake manifold, blow-by gasses flow through the blow-by upper hose, preventing an abnormal rise in crankcase pressure.

Positive Crankcase Ventilation: Testing and Inspection

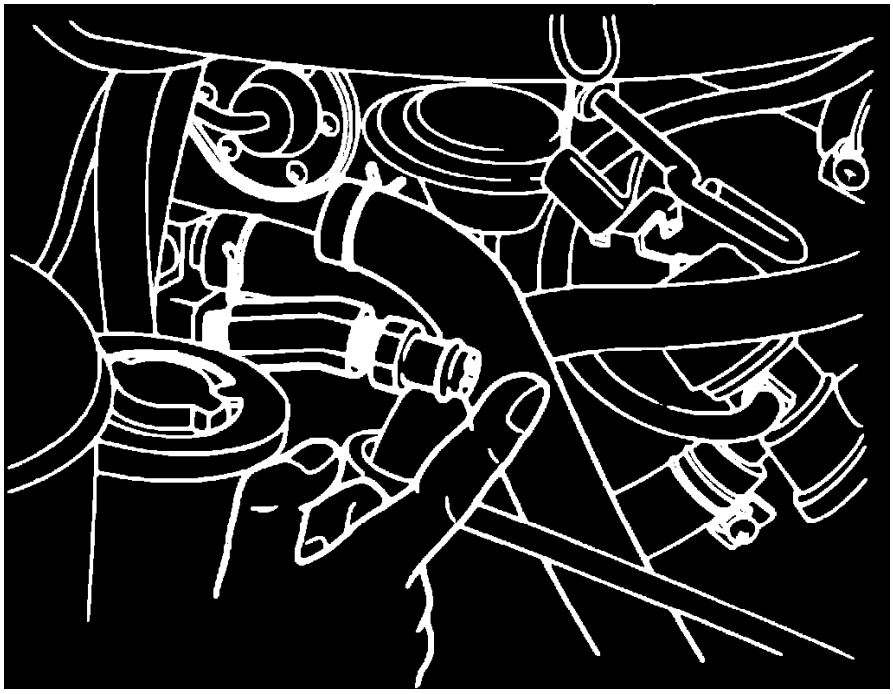


Fig. 3 Testing PCV valve (typical)

With engine running at idle, remove the ventilator hose from PCV valve; if the valve is working, a hissing noise will be heard as air passes through the valve and a strong vacuum should be felt immediately when a finger is placed over valve inlet, **Fig. 3.**

Thermostatic Air Cleaner: Description and Operation

The air cleaner removes dust and dirt from the air before it enters the carburetor and muffles the noise created by air intake into the engine. When underhood air temperature is low, the automatic temperature control system maintains suction air at a specified temperature to enable lean carburetion calibration, thereby reducing the emission of hydrocarbons. This system also enhances warm-up characteristics of the engine and helps to eliminate carburetor icing.

This system consists of a fresh air duct, hot air duct, air inlet pipe, vacuum motor, air control valve, temperature sensor, blow-by gas filter, and air filter. An idle compensator is incorporated into the air cleaner housing and operates independently to provide smooth engine operation during idle. There are also various vacuum hoses routed to the housing which connect to independent emission control systems.

This system is controlled by the inlet air temperature and the load condition of the engine. The inlet air temperature is detected by the sensor and the vacuum motor is activated by intake vacuum.

When underhood air temperature is low the sensor air bleed valve remains closed, establishing vacuum passage between the intake manifold and vacuum motor. At this time, intake manifold vacuum activates the air control valve to introduce hot air into the air cleaner through the hot air duct on the exhaust manifold. When vacuum is minimal or when the engine is operating under a heavy load, the air control valve opens fully regardless of the air temperature around the sensor to introduce the cooler air for increased engine power.

When underhood air temperature is high, the sensor air bleed valve opens fully to shut off vacuum passage between the intake manifold and vacuum motor. Due to the force of the vacuum motor spring, the air control valve closes the hot air pipe of the air cleaner and introduces the cooler air.

When ambient temperature around the sensor causes it to partially open air bleed valve, air control valve operation is controlled by intake manifold vacuum. When the air control valve is partially open, both hot and cold air are introduced into the air cleaner as a mixture.

Thermostatic Air Cleaner: Testing and Inspection

1. Check that vacuum hoses are securely connected and properly routed, then check them for cracks or distortion.
2. Allow engine to cool.
3. With engine off, disconnect fresh air duct and place a mirror at end of air cleaner inlet pipe to check if air control valve is open. If not check air control valve linkage.
4. Disconnect vacuum motor inlet vacuum hose and apply vacuum to vacuum motor, confirming that valve moves.
5. With hot air inlet in open position, pinch off vacuum hose. Valve should remain open for at least 30 seconds. If not, replace vacuum motor.
6. Start engine and run at idle then immediately check that air control valve is closed.
7. If valve is not closed, disconnect vacuum motor hose and check for vacuum at end of hose.
8. If vacuum is weak or nonexistent check vacuum hoses for leakage. If vacuum hoses are good, replace sensor.
9. Check that air control valve gradually opens to cold air inlet side as engine warms up.

Computers and Control Systems: Description and Operation
Electronic Controlled Carburetor System (ECCS)

Air Fuel Ratio Control

The air/fuel ratio is controlled by either closed-loop or open-loop control, depending on coolant temperature, engine RPM, battery voltage, exhaust gas sensor signal, manifold vacuum and various other parameters depending on application.

During open-loop control, the air/fuel ratio is determined by the ECC control unit. The open-loop control mode will be activated under the following conditions:

1. When starting engine.
2. On all models, when engine is cold.
3. When exhaust gas sensor is not activated.
4. When operating engine under heavy load.
5. During deceleration.
6. When engine is running at idle.

Closed-loop control operation is designed to maintain the air/fuel ratio precisely to the stoichiometric point so that the three-way catalyst can minimize all exhaust emissions simultaneously. The system used the exhaust gas sensor, located in the exhaust manifold, to give an indication of whether air/fuel mixture is leaner or richer than the stoichiometric point. The sensor transmits a nonlinear voltage to the ECC control unit. The control unit adjusts the feedback pulse width according to sensor voltage so that mixture ratio will be within the narrow window of the three-way catalyst. This system becomes open during engine warm-up until the sensor reaches operating temperature.

Fuel Shutoff System, Carbureted

This system shuts off fuel supply during deceleration to reduce fuel consumption and help prevent a temperature rise in the catalytic converter during long periods of deceleration.

When manifold vacuum increases above a predetermined value during deceleration, the vacuum switch sends a signal to the anti-dieseling solenoid valve which shuts off fuel supply. When manifold vacuum drops below the predetermined value, the system is deactivated. The system is also controlled by the clutch switch, neutral switch and inhibitor switch so that fuel is not cut off during certain conditions even if manifold vacuum is high enough to operate system.

General System Description, Carbureted

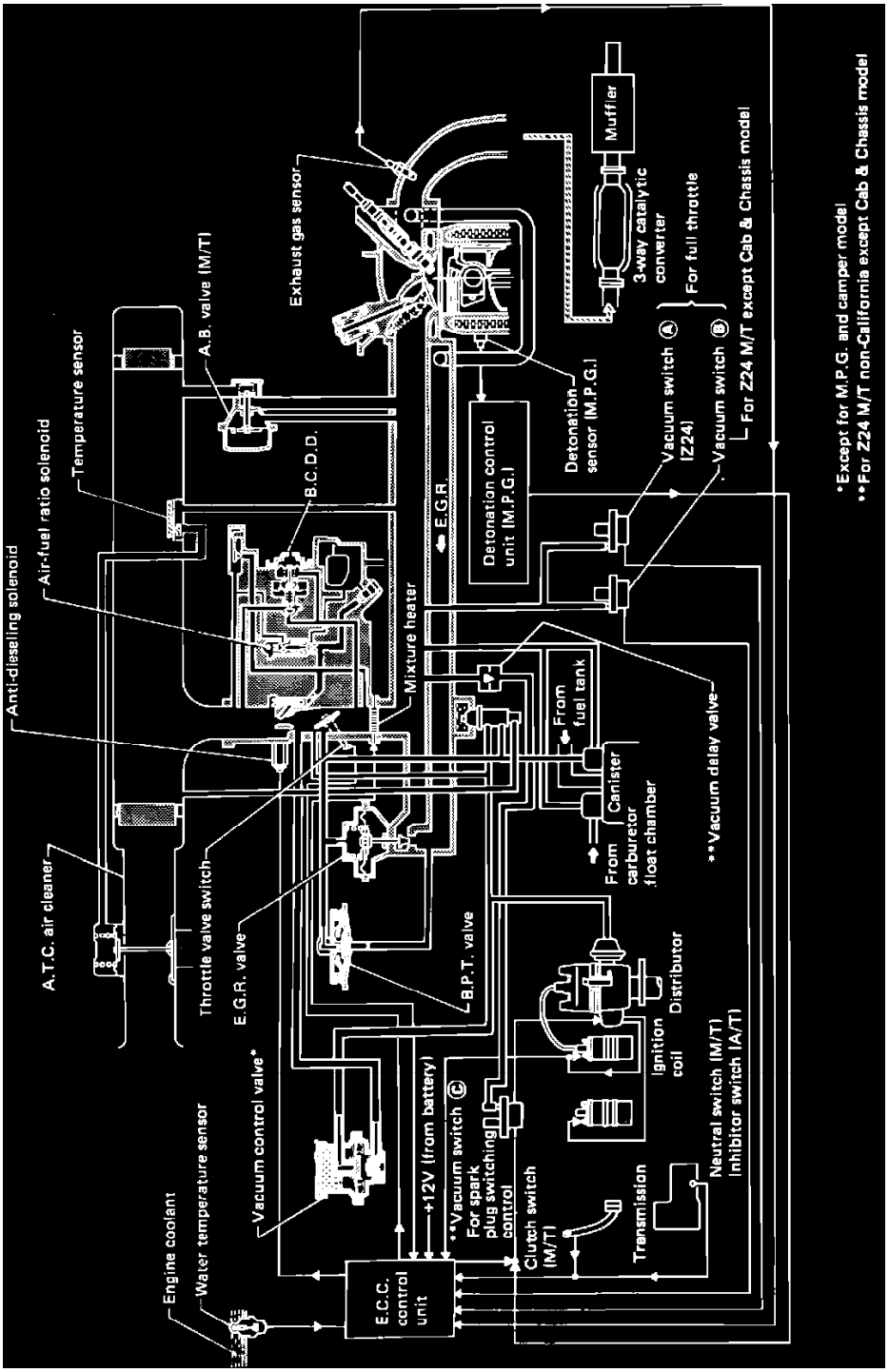


Fig. 2 Electronic Controlled Carburetor (ECC) System.

The Electronic Controlled Carburetor (ECC) System provides optimum emission control, fuel economy and driveability under a wide range of operating conditions. The system uses a microcomputer (ECC control unit) to control the air/fuel ratio control system, fuel shut-off system and idle-up system. The mixture heating and spark plug switching control systems are also operated by the control unit.

Mixture Heating System, Carbureted

This system provides for rapid warm up of the air/fuel mixture by means of a heater which is electrically controlled by the water temperature switch. The system improves cold engine starting ability.

Computers and Control Systems: Description and Operation
Engine Control Components Description

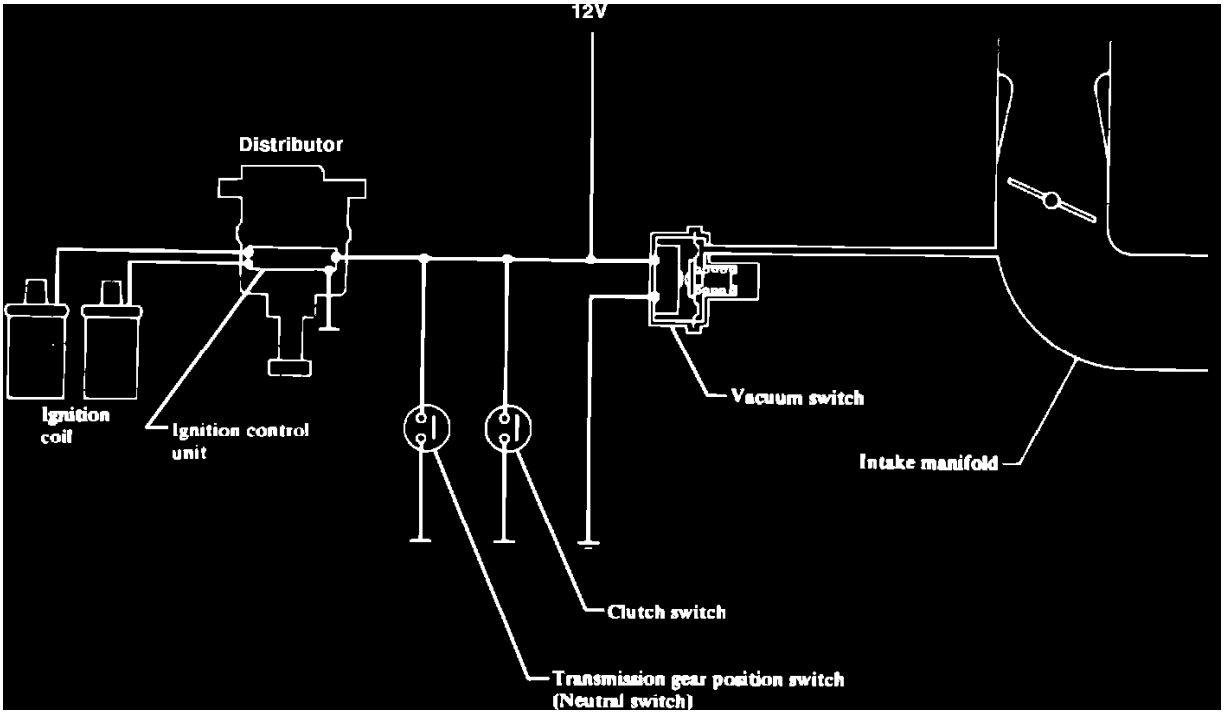


Fig. 38 Spark plug switching control system.

This system, **Fig. 38,** is designed to change the ignition system from 2-plug ignition to 1-plug ignition during heavy load driving conditions in order to reduce engine noise. This system also functions to advance ignition timing by a specified value during 1-plug ignition.

This system is composed of an ignition control unit, which is installed in distributor and has a switching function which allows it to change from 2-plug ignition to 1-plug ignition, and a vacuum switch which senses the intake manifold vacuum. Neutral and clutch switches are also used as auxiliary control devices.

Altitude Switch: Testing and Inspection

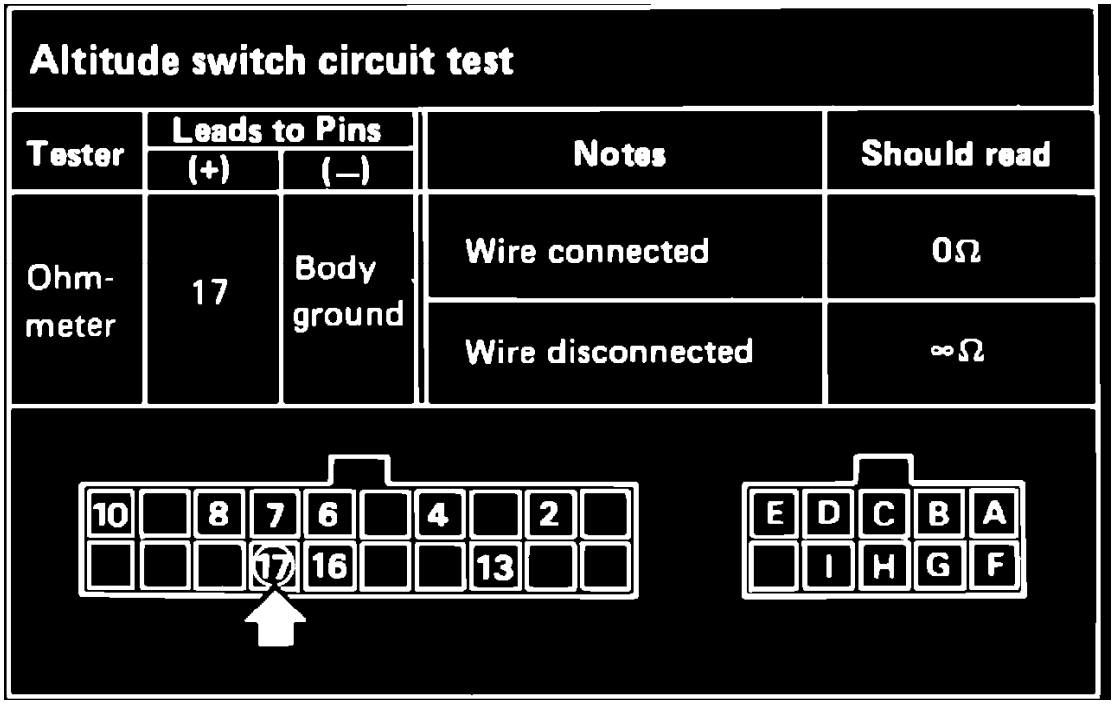


Fig. 26 Altitude switch circuit test

Perform altitude switch circuit test as illustrated in **Fig. 26.** Prior to testing, disconnect electrical connector from altitude switch, then connect jumper wire between harness connector terminals, connect battery ground cable and turn ignition on.

Clutch Switch: Testing and Inspection

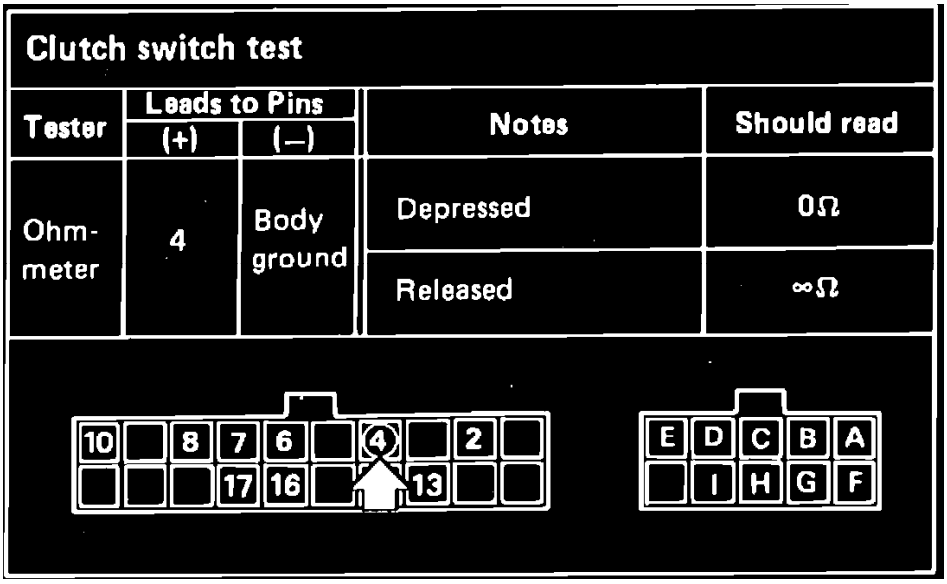


Fig. 11 Clutch switch test

Perform clutch switch test as illustrated in **Fig. 11.** Prior to testing, shift transaxle to any position except Neutral.

Electronic Carburetor Control (ECC) Unit: Description and Operation
Electronic Control Module

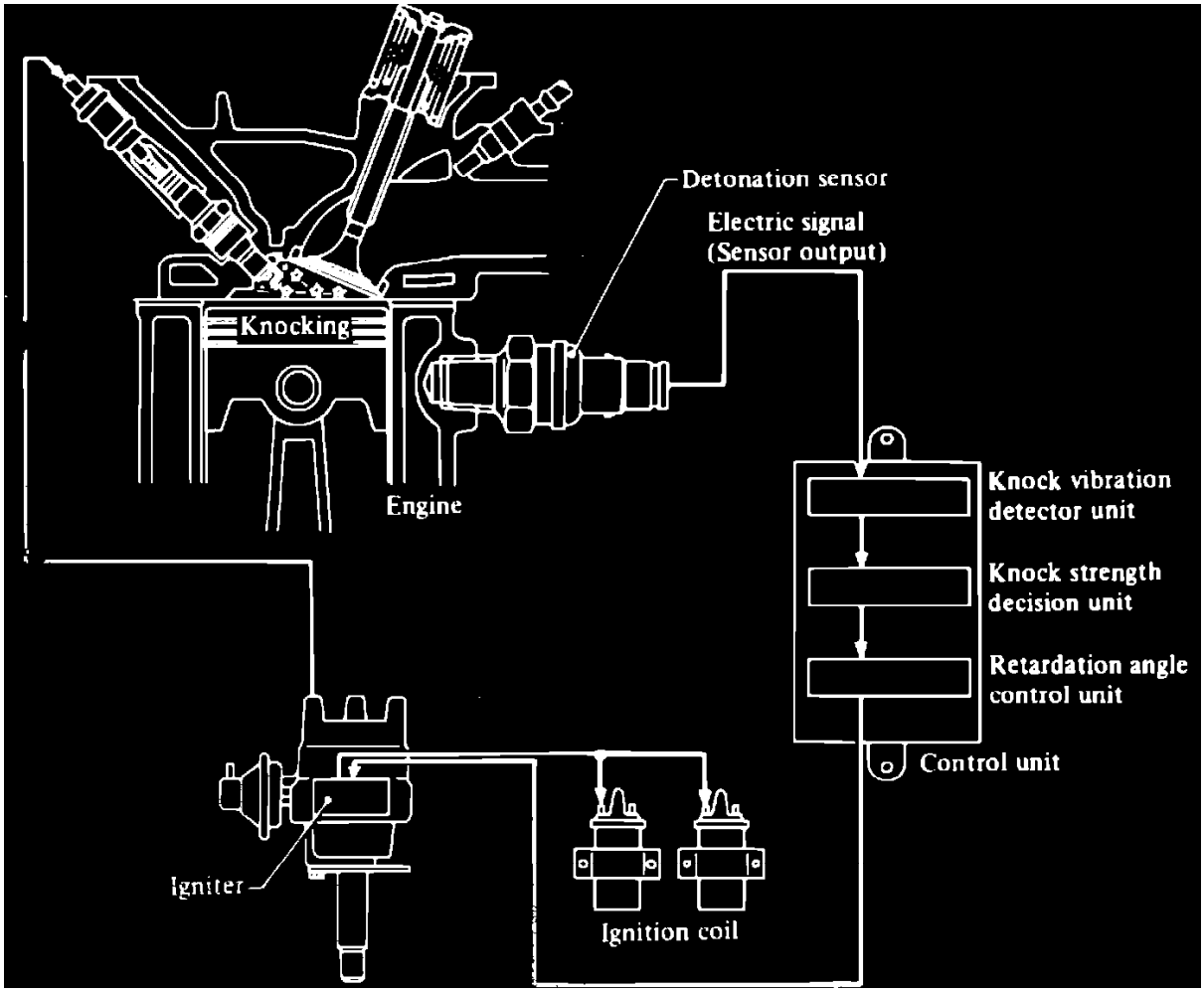


Fig. 44 Detonation control system.

This system, **Fig. 44,** incorporates a detonation sensor to monitor detonation in each combustion chamber and send a corresponding signal to the control unit. The detonation control unit, located under the driver's seat, varies ignition timing to minimize detonation.

Electronic Carburetor Control (ECC) Unit: Description and Operation
Electronic Controlled Carburetor (ECC)

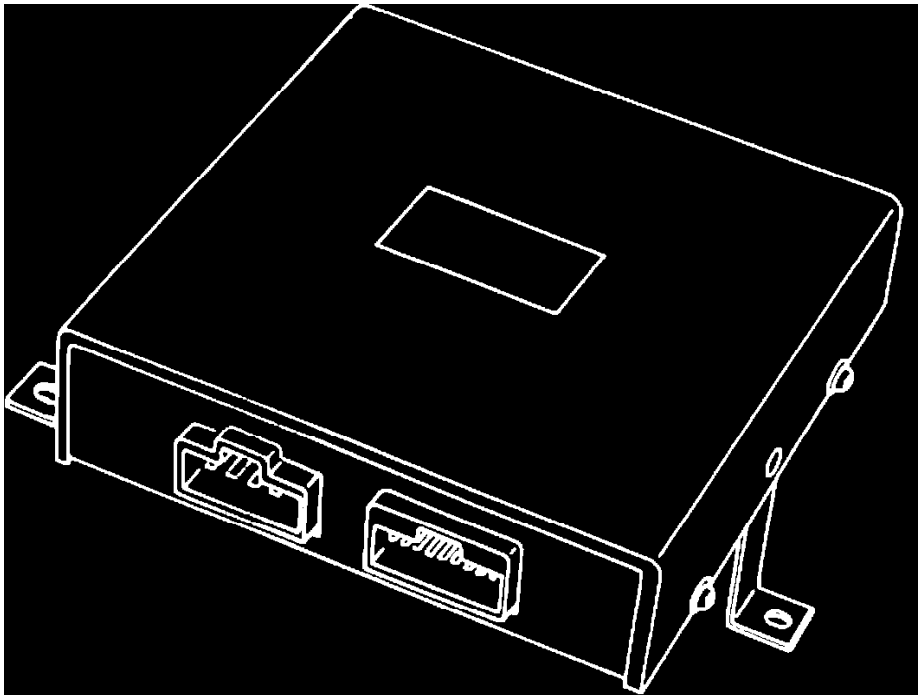


Fig. 3 ECC control unit

The ECC control unit, **Fig. 3,** consists of a microprocessor with input, output and power supply connectors and an exhaust gas sensor monitor lamp. The control unit controls the feedback pulse width and fuel shutoff operation.

Electronic Carburetor Control (ECC) Unit: Testing and Inspection

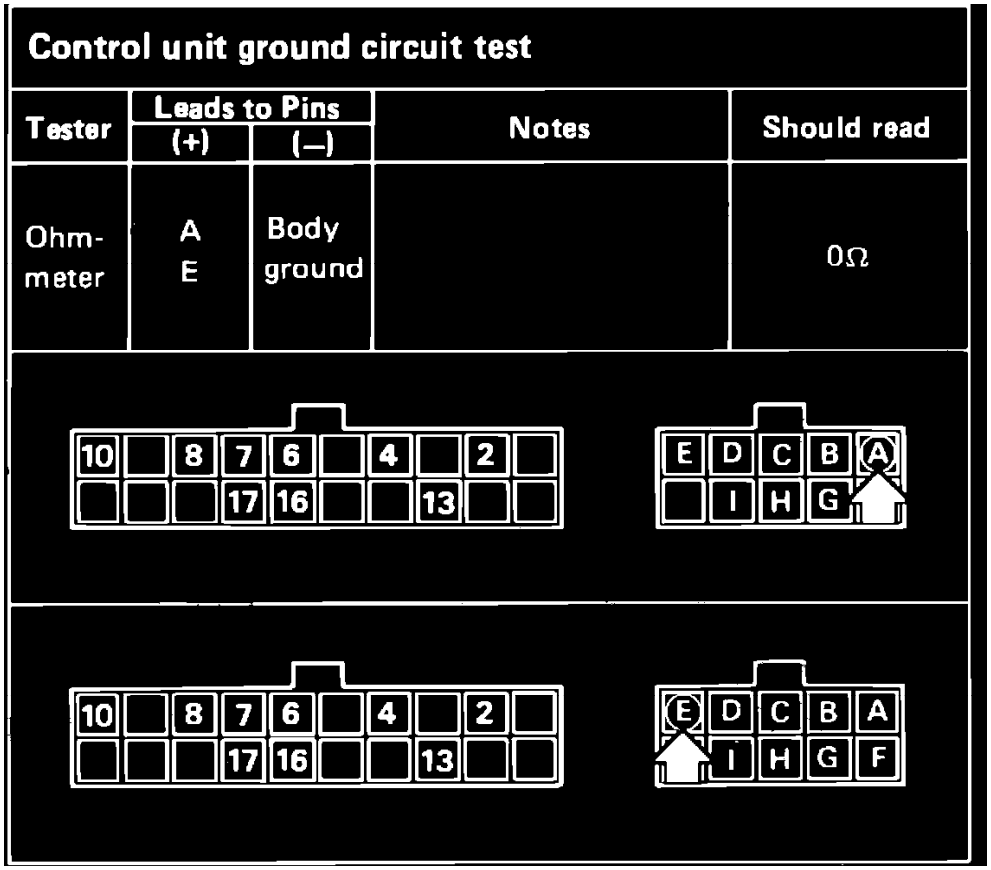


Fig. 21 Control unit ground circuit test

Perform control unit ground circuit test as illustrated in **Fig. 21.** if resistance is not as specified, check harness and repair as necessary.

Air-Fuel Mixture Solenoid: Testing and Inspection

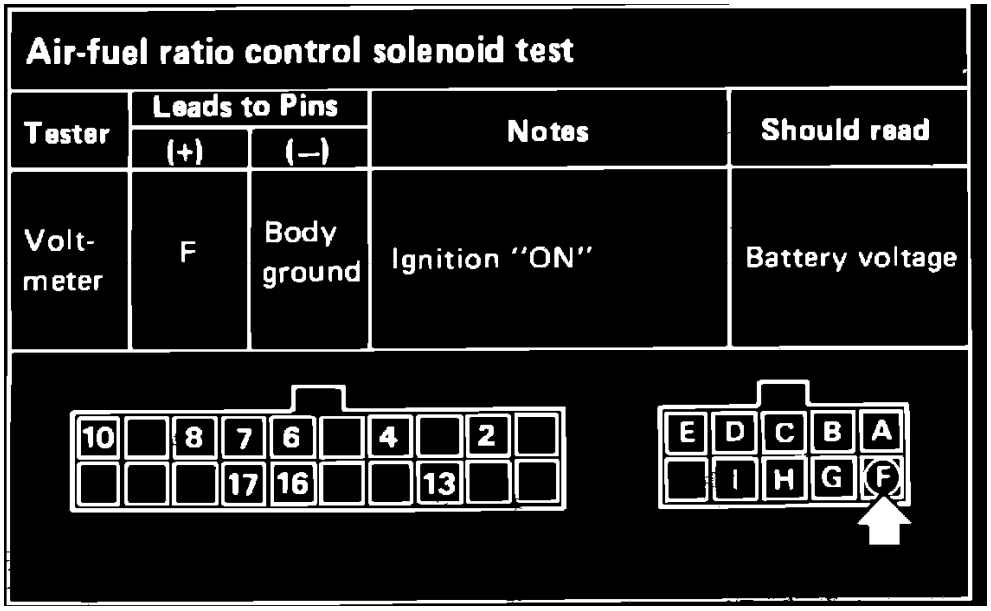


Fig. 23 Air/fuel ratio control solenoid test

Perform air/fuel control solenoid test as illustrated in **Fig. 23.**

Air/Fuel Ratio Control Solenoid Valve: Description and Operation
Open-Loop Control

The air/fuel ratio solenoid is controlled by open loop control under the following conditions for improved driveability:

a. When battery voltage is less than or equal to 10 volts.
b. When engine speed is less than 400 RPM.
c. When coolant temperature is less than 122'F on vehicles with manual transmission or less than 140'F on vehicles with automatic transmission.
d. When output voltage is less than 200-300 millivolts.
e. During deceleration when fuel shut-off system is in operation.
f. When engine speed is greater than or equal to 3600 RPM on MPG models or greater than or equal to 3425 RPM on other models (engine revolution switch off).

On 1984-85 Federal Pulsar and Sentra models, the solenoid is controlled by open loop control under the following conditions:

a. When engine speed is less than 400 RPM and the starter switch is ON.
b. When coolant temperature is less than 185'F and intake air temperature is less than 59'F.
c. When coolant temperature is less than 140'F and intake air temperature is greater than or equal to 59'F.
d. When hot restarting with exhaust gas sensor output voltage less than 200-300 millivolts and coolant temperature greater than or equal to 140'F.
e. During deceleration, when fuel shut-off system is in operation.
f. When engine speed is greater than or equal to 4150 RPM.
g. On models with manual transmission, when intake manifold vacuum is less than 2.36 inches Hg at full throttle.
h. When coolant temperature is greater than or equal to 221~F and intake air temperature is greater than or equal to 149'F.

During open loop control, air/fuel ratio is determined by the E.C.C. control unit.

Air/Fuel Ratio Control Solenoid Valve: Description and Operation
Closed-Loop Control

This system controls air/fuel ratio precisely to the stoichiometric point so that the three way catalyst can minimize all exhaust emissions simultaneously. The system uses the exhaust gas sensor, located in the exhaust manifold, to give an indication of whether air/fuel mixture is leaner or richer than stoichiometric point. The sensor transmits a nonlinear voltage to the E.C.C. control unit. The control unit adjusts the feedback pulse width according to sensor voltage so that mixture ratio will be within the narrow window of the three-way catalyst. This system becomes open during engine warm-up until the sensor reaches operating temperature.

Oxygen Sensor: Description and Operation
Electronic Controlled Carburetor (ECC)

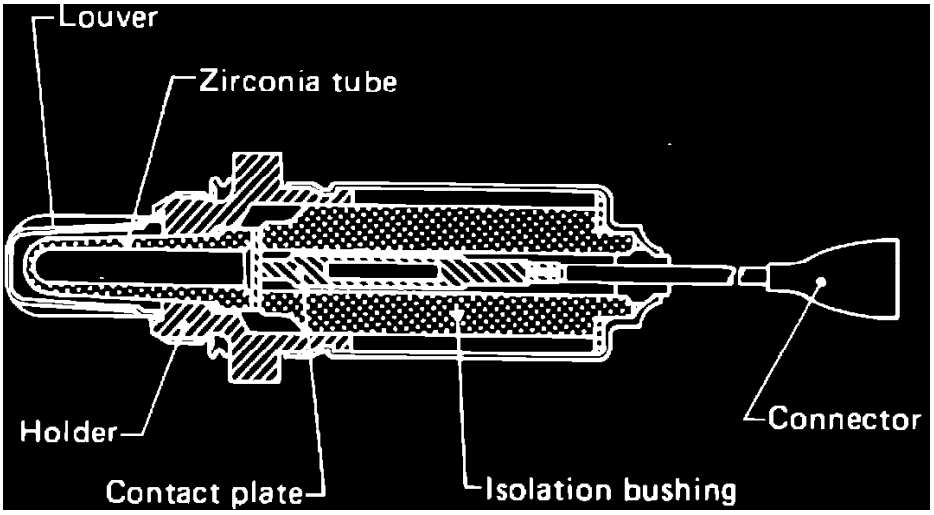


Fig. 4 Exhaust gas sensor

The exhaust gas sensor, **Fig. 4,** is located in the exhaust manifold and monitors density of oxygen in the exhaust gas stream. The closed end of the sensor tube is exposed to exhaust gasses. The tubes outer surface contacts the exhaust gas and the inner surface contacts the air.

Oxygen Sensor: Description and Operation
Exhaust Gas Sensor

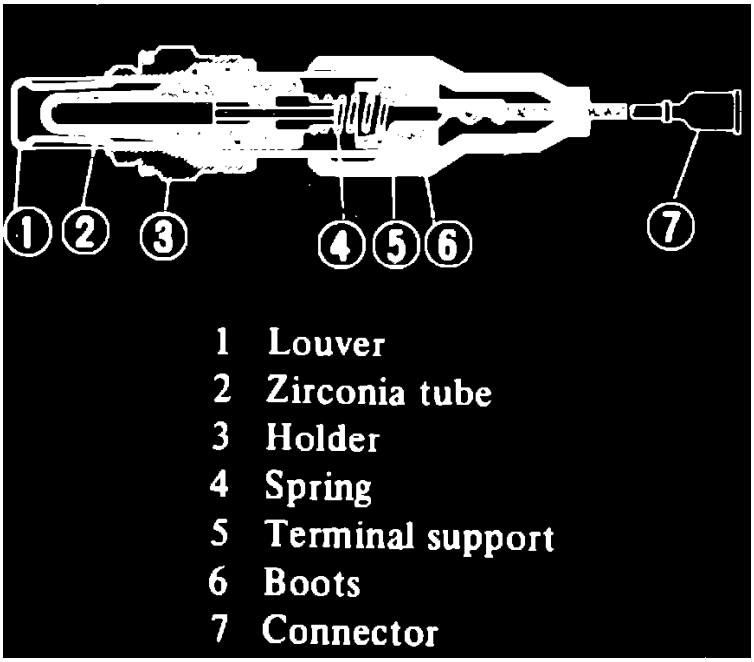
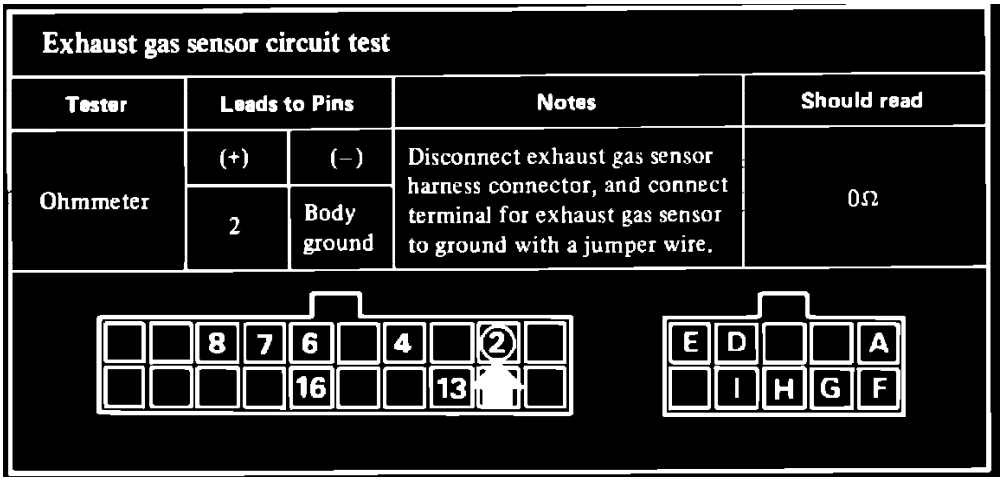


Fig. 31 Exhaust gas sensor

The exhaust gas sensor, **Fig. 31,** consists of a closed end tube of ceramic zirconia contained in an open ended holder. Porous platinum electrodes cover the inner and outer surfaces of the tube. The closed end and outer surface of the tube contact the exhaust gasses, while the inner surface of the tube contacts air. The electrical signal is generated corresponding to the difference between the oxygen pressure at the outer surface (exhaust gas) and the oxygen pressure at the inner surface (air), which remains constant. The electrical signal is monitored by the fuel system, which adjusts air/fuel ratios accordingly.

Oxygen Sensor: Testing and Inspection



Exhaust gas sensor circuit test

Tester	Leads to Pins		Notes	Should read
Ohmmeter	(+)	(–)	Disconnect exhaust gas sensor harness connector, and connect terminal for exhaust gas sensor to ground with a jumper wire.	0Ω
	2	Body ground		

Fig. 20 Exhaust gas sensor circuit test

Perform exhaust gas sensor circuit test as illustrated in **Fig. 20.** Prior to testing, disconnect electrical connector from sensor and ground the sensor.

Neutral Switch: Testing and Inspection

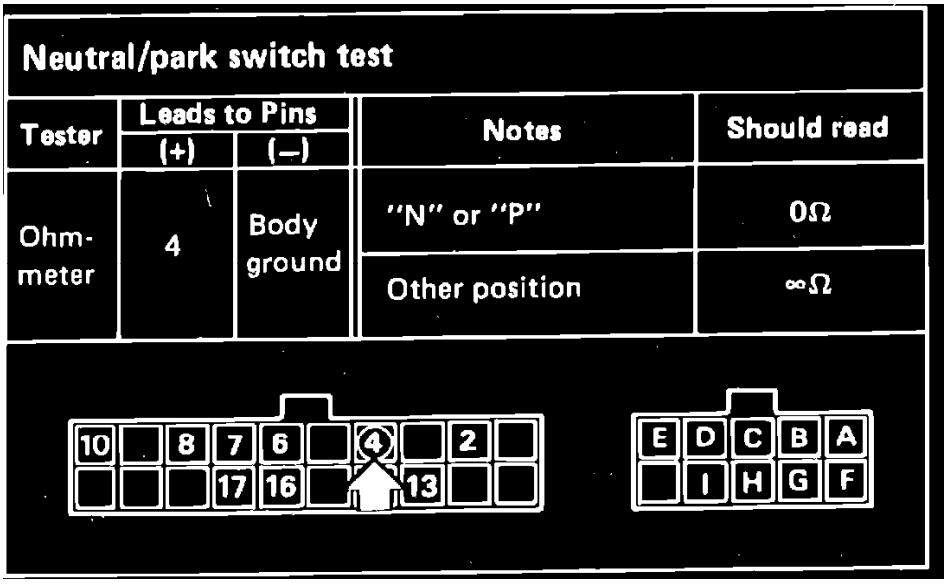
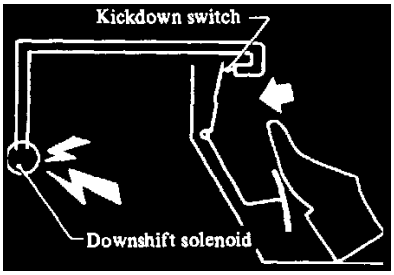


Fig. 10 Neutral/park switch test

Perform neutral/park switch test as illustrated in **Fig. 10.**

Kickdown Switch: Testing and Inspection



INSPECTION:

When the pedal is fully depressed, a click can be heard just before the pedal bottoms out.

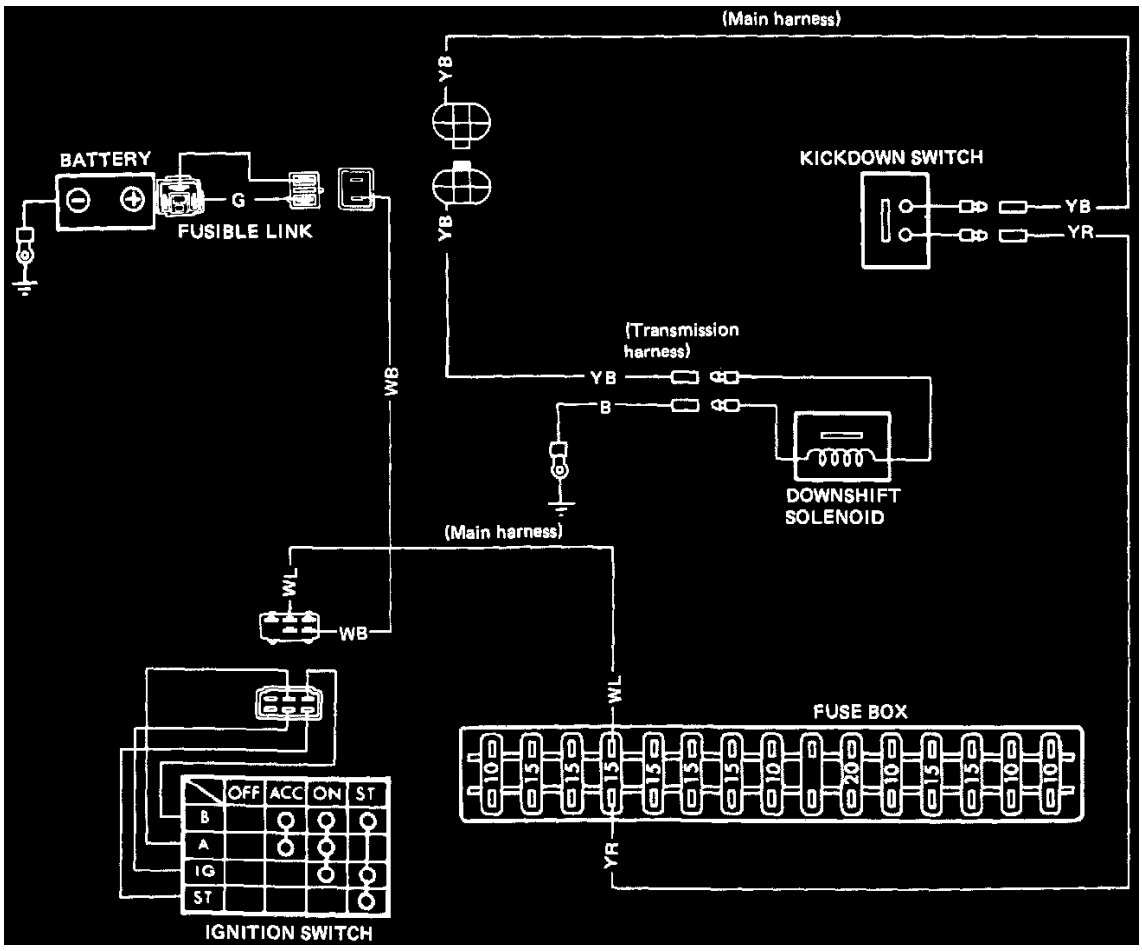
- If the click is not heard, loosen the locknut and extend the switch until the pedal lever makes contact with the switch and the switch clicks.
- Do not allow the switch to make contact too soon.
- This would cause the transmission to downshift on part throttle.

DIAGNOSIS:

Switch can be heard clicking, and the transmission still does not kickdown:

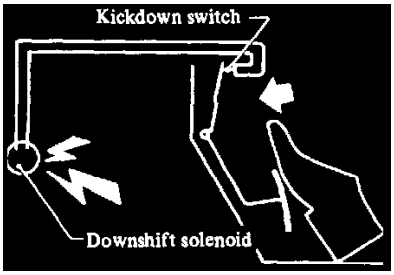
- Check the continuity of the switch using a continuity tester.
- Also check for available current.

The car upshifts at approximately 66 and 110 km/h (40 and 68 MPH) only. The kickdown switch may be internally shorted. (When the switch is shorted, there is continuity through the switch in any position).



CIRCUIT DIAGRAM

Kickdown Switch: Adjustments



KICKDOWN SWITCH ADJUSTMENT

The kickdown switch is located at the upper post of the accelerator pedal, inside the car. When the pedal is fully depressed, a click can be heard just before the pedal bottoms out.

- If the click is not heard, loosen the locknut and extend the switch until the pedal lever makes contact with the switch and the switch clicks.
- Do not allow the switch to make contact too soon.
- This would cause the transmission to downshift on part throttle.

Automatic Transmission/Transaxle: Application and ID

IDENTIFICATION NUMBER

The identification number can be found on a plate attached to the right side of the transmission case. The number consists of a model code and a production code.

TRANSMISSION MODEL **L3N71B**

MODEL CODE **X6365**

PRODUCTION CODE EXAMPLE:

7 6 0 1 2 3 4

7 **Last figure of the model year.**

6 **Month of production.**
[1: Jan., 2: Feb.,.....]
[X: Oct., Y: Nov., Z: Dec.]

01234 **Serial production number for the month**

Automatic Transmission/Transaxle: Testing and Inspection

ENGINE DOES NOT START IN N OR P

1. Faulty ignition switch or starter motor.
2. Improperly adjusted manual linkage.
3. Defective inhibitor switch or wiring.
4. Defective lock-up solenoid (E4N71B).
5. Defective lock-up control unit and/or sensors (E4N71B).

ENGINE STARTS IN RANGES OTHER THAN N OR P

1. Improperly adjusted manual linkage.
2. Defective inhibitor switch or wiring.

NOISE IN N OR P

1. Incorrect oil level.
2. Incorrect throttle pressure (3N71B).
3. Incorrect line pressure (L3N7B, L4N71B, E4N71B).
4. Defective oil pump.

VEHICLE MOVES WHEN SHIFTING INTO P, OR PARKING GEAR DOES NOT DISENGAGE WHEN SHIFTING OUT OF P

1. Improperly adjusted manual linkage.
2. Parking linkage does not disengage.

DRIVE IN N

1. Improperly adjusted manual linkage.
2. Improper oil.
3. Defective manual valve.
4. Defective forward clutch (rear).

NO DRIVE IN R, BUT DRIVE IN D, 2, & 1 (CLUTCH SLIPS, POOR ACCELERATION)

1. Incorrect oil level.
2. Improperly adjusted manual linkage.
3. Incorrect throttle pressure (3N71B).
4. Incorrect line pressure (L3N71B, L4N71B, E4N71B).
5. Defective manual valve.
6. Damaged seals.
7. Defective low and reverse brake.
8. Defective high-reverse clutch (front).
9. Defective forward clutch (rear).
10. Leaking oil passages.
11. Damaged or missing high-reverse clutch (front) check ball.

VEHICLE BRAKES WHEN SHIFTING INTO R

1. Improper oil.
2. Damaged seals.
3. Defective band servo.
4. Defective forward clutch (rear).
5. Defective band brake (3N71B, L3N71B).
6. Defective 2nd band brake (L4N71B).
7. Defective parking linkage.

HARSH SHIFT BETWEEN N & D

1. Improperly adjusted idle speed.
2. Defective vacuum diaphragm or piping.
3. Incorrect throttle pressure (3N71B).
4. Incorrect line pressure (L3N71B, L4N71B, E4N71B).
5. Defective manual valve.
6. Defective forward clutch (rear).

NO DRIVE IN D, BUT DRIVE IN 2, 1, & R

1. Improperly adjusted manual linkage.

2. Incorrect throttle pressure (3N71B).
3. Incorrect line pressure (L3N71B, L4N71B, E4N71B).
4. Defective manual valve.
5. Defective one-way clutch.
6. Incorrect oil level.

NO DRIVE IN D, 1, & 2, BUT DRIVE IN R (CLUTCH SLIPS, POOR ACCELERATION)

1. Incorrect oil level.
2. Improperly adjusted manual linkage.
3. Improper oil.
4. Incorrect throttle pressure (3N71B).
5. Incorrect line pressure (L3N71B, L4N71B, E4N71B).
6. Defective manual valve.
7. Damaged seals.
8. Engine or brake malfunction.
9. Defective forward clutch (rear).
10. Leaking oil passages.
11. Defective high-reverse clutch (front).

SLIPPING CLUTCHES OR BRAKES

1. Incorrect oil level.
2. Improperly adjusted manual linkage.
3. Incorrect throttle pressure.
4. Incorrect line pressure (L3N71B, L4N71B, E4N71B).
5. Improper oil.
6. Defective manual valve.
7. Defective vacuum diaphragm or piping.
8. Damaged seals.
9. Defective oil pump.
10. Leaking oil passages.

EXCESSIVE CREEP

1. Improperly adjusted idle speed.

NO CREEP

1. Incorrect oil level.
2. Improperly adjusted manual linkage.
3. Improperly adjusted idle speed.
4. Improper oil.
5. Defective manual valve.
6. Defective oil pump.
7. Leaking oil passages.
8. Defective forward clutch (rear).
9. Defective high-reverse clutch (front).
10. Defective direct clutch (E4N71B).

NO 1-2 UPSHIFT

1. Improperly adjusted manual linkage.
2. Defective vacuum diaphragm or piping.
3. Defective kickdown solenoid, switch, or wiring.
4. Improper oil.
5. Defective manual valve.
6. Defective governor.
7. Damaged seals.
8. Defective band servo.
9. Defective band brake (3N71B, L3N71B).
10. Defective 2nd band brake (L4N71B, E4N71B).
11. Leaking oil passages.

NO 2-3 UPSHIFT

1. Improperly adjusted manual linkage.
2. Defective vacuum diaphragm or piping.
3. Defective kickdown solenoid, switch, or wiring.
4. Improper oil.

5. Defective manual valve.
6. Defective governor.
7. Damaged seals.
8. Defective band servo.
9. Defective high-reverse clutch (front).
10. Leaking oil passages.
11. Damaged or missing high-reverse clutch (front) check ball.

DELAYED UPSHIFTS

1. Defective vacuum diaphragm or piping.
2. Defective kickdown solenoid, switch, or wiring.
3. Incorrect throttle pressure (3N71B).
4. Incorrect line pressure (L3N71B, L4N71B, E4N71B).
5. Improper oil.
6. Defective manual valve.
7. Defective governor.
8. Leaking oil passages.

UPSHIFT FROM 1 DIRECTLY TO 3

1. Improper oil.
2. Defective manual valve.
3. Damaged seals.
4. Defective governor.
5. Defective band brake (N371B, L3N71B).
6. Defective 2nd band brake (L4N71B, E4N71B).
7. Leaking oil passages.

HARSH 1-2 UPSHIFT

1. Defective vacuum diaphragm or piping.
2. Engine stall RPM not within specifications.
3. Improper oil.
4. Defective manual valve.
5. Defective band servo.
6. Defective band brake (3N71B, L3N71B).
7. Defective 2nd band brake (L4N71B, E4N71B).
8. Defective lock-up solenoid (E4N71B).
9. Defective lock-up control unit and/or sensors (E4N71B).
10. Defective lock-up control valve (E4N71B).
11. Defective torque converter (E4N71B).

HARSH 2-3 UPSHIFT

1. Defective vacuum diaphragm or piping.
2. Incorrect throttle pressure (3N71B).
3. Incorrect line pressure (L3N71B, L4N71B, E4N71B).
4. Defective manual valve.
5. Damaged seals.
6. Defective band servo.
7. Defective high-release clutch (front).
8. Defective lock-up solenoid (E4N71B).
9. Defective lock-up control unit and/or sensors (E4N71B).
10. Defective lock-up control valve (E4N71B).
11. Defective torque converter (E4N71B).

SLIPPING 1-2 SHIFT

1. Incorrect oil level.
2. Improperly adjusted manual linkage.
3. Defective vacuum diaphragm or piping.
4. Incorrect throttle pressure (3N71B).
5. Incorrect line pressure (L3N71B, L4N71B, E4N71B).
6. Improper oil.
7. Defective manual valve.
8. Damaged seals.
9. Defective band servo.
10. Defective band brake (3N71B, L3N71B).
11. Leaking oil passages.

12. Defective 2nd band brake (E4N71B).

SLIPPING 2-3 SHIFT

1. Incorrect oil level.
2. Improperly adjusted manual linkage.
3. Defective vacuum diaphragm or piping.
4. Incorrect throttle pressure (3N71B).
5. Incorrect line pressure (L3N71B, L4N71B, E4N71B).
6. Improper oil.
7. Defective manual valve.
8. Damaged seals.
9. Defective band servo.
10. Defective high-reverse clutch (front).
11. Leaking oil passages.
12. Damaged or missing high-reverse clutch (front) check ball.

VEHICLE BRAKES DURING 1-2 UPSHIFT

1. Improper oil.
2. Defective manual valve.
3. Defective low and reverse brake.
4. Defective high-reverse clutch (front).
5. Defective one-way clutch.

VEHICLE BRAKES DURING 2-3 UPSHIFT

1. Improper oil.
2. Defective band servo.
3. Defective manual valve.
4. Defective band brake (3N71B, L3N71B).
5. Defective 2nd band brake (L4N71B, E4N71B).

VEHICLE CANNOT REACH MAXIMUM SPEED

1. Incorrect oil level.
2. Improperly adjusted manual linkage.
3. Improper oil.
4. Incorrect throttle pressure (3N71B).
5. Incorrect line pressure (L3N71B, L4N71B, E4N71B).
6. Engine stall RPM not within specifications.
7. Defective band servo.
8. Defective manual valve.
9. Malfunctioning engine or brakes.
10. Defective band brake (3N71B, L3N71B).
11. Defective 2nd band brake (L4N71B, E4N71B).
12. Defective low and reverse brake.
13. Defective forward clutch (rear).
14. Defective high-reverse clutch (front).
15. Defective oil pump.
16. Defective torque converter (E4N71B).

NO 2-1 OR 3-1 DOWNSHIFT

1. Defective vacuum diaphragm or piping.
2. Improper oil.
3. Defective manual valve.
4. Defective governor.
5. Damaged seals.
6. Defective band servo.
7. Defective band brake (3N71B, L3N71B).
8. Defective 2nd band brake (L4N71B, E4N71B).
9. Defective one-way clutch.

HARSH DOWNSHIFTS

1. Improperly adjusted manual linkage.
2. Defective vacuum diaphragm or piping.
3. Defective kickdown solenoid, switch or wiring.
4. Incorrect throttle pressure.

5. Incorrect line pressure (L3N71B, L4N71B, E4N71B).
6. Defective manual valve.
7. Defective governor.
8. Leaking oil passages.
9. Defective accumulator (E4N71B).

NO KICKDOWN

1. Defective kickdown solenoid, switch or wiring.
2. Defective vacuum diaphragm or piping.
3. Improper oil.
4. Defective manual valve.
5. Defective governor.
6. Defective band brake (3N71B, L3N71B).
7. Defective 2nd band brake (L4N71B, E4N71B).
8. Leaking oil passages.

IMPROPER KICKDOWN

1. Improperly adjusted manual linkage.
2. Defective vacuum diaphragm or piping.
3. Incorrect throttle pressure (3N71B).
4. Incorrect line pressure (L3N71B, L4N71B, E4N71B).
5. Defective governor valve.
6. Defective governor.
7. Damaged seals.
8. Defective high-reverse clutch (front).
9. Leaking oil passages.
10. Improper oil (E4N71B).

SLIPPING 3-2 DOWNSHIFT

1. Defective vacuum diaphragm or piping.
2. Incorrect throttle pressure (3N71B).
3. Incorrect line pressure (L3N71B, L4N71B, E4N71B).
4. Improper oil.
5. Defective manual valve.
6. Damaged seals.
7. Defective band servo.
8. Defective high-reverse clutch (front).
9. Defective band brake (3N71B, L3N71B).
10. Defective 2nd band brake (L4N71B, E4N71B).
11. Leaking oil passages.
12. Damaged or missing high-reverse clutch (front) check ball.

NO DRIVE IN ANY RANGE

1. Incorrect oil level.
2. Improperly adjusted manual linkage.
3. Incorrect throttle pressure (3N71B).
4. Incorrect line pressure (L3N71B, L4N71B, E4N71B).
5. Improper oil.
6. Defective manual valve.
7. Damaged seals.
8. Defective oil pump.
9. Leaking oil passages.
10. Defective parking linkage.
11. Defective lock-up control unit and/or sensors (E4N71B).
12. Defective lock-up solenoid (E4N71B).
13. Defective lock-up control valve (E4N71B).

NOISE IN D, 2, 1 & R

1. Incorrect oil level.
2. Incorrect throttle pressure (3N71B).
3. Incorrect line pressure (L3N71B, L4N71B, E4N71B).
4. Defective forward clutch (rear).
5. Defective oil pump.
6. Defective one-way clutch.
7. Defective planetary gear.

8. Defective torque converter (E4N71B).

NO 3-2 DOWNSHIFT WHEN SHIFTING TO 2

1. Improperly adjusted manual linkage.
2. Incorrect throttle pressure (3N71B).
3. Incorrect line pressure (L3N71B, L4N71B, E4N71B).
4. Improper oil.
5. Defective manual valve.
6. Defective band servo.
7. Defective band brake (3N71B, L3N71B).
8. Defective 2nd band brake (L4N71B, E4N71B).
9. Leaking oil passages.

2-1 DOWNSHIFT OR 2-3 UPSHIFT IN 2

1. Improperly adjusted manual linkage.
2. Incorrect throttle pressure.
3. Incorrect line pressure (L3N71B, L4N71B, E4N71B).
4. Defective manual valve.

NO 3-2 DOWNSHIFT WHEN SHIFTED TO 1

1. Improperly adjusted manual linkage.
2. Incorrect throttle pressure (3N71B).
3. Incorrect line pressure (L3N71B, L4N71B, E4N71B).
4. Improper oil.
5. Defective manual valve.
6. Defective governor.
7. Damaged seals.
8. Defective band servo.
9. Defective high-reverse clutch (front).
10. Defective band brake (3N71B, L3N71B).
11. Defective 2nd band brake (L4N71B, E4N71B).
12. Leaking oil passages.

NO ENGINE BRAKE IN 1

1. Improperly adjusted manual linkage.
2. Incorrect throttle pressure (3N71B).
3. Incorrect line pressure (L3N71B, L4N71B, E4N71B).
4. Improper oil.
5. Defective manual valve.
6. Damaged seals.
7. Defective low and reverse brake.
8. Leaking oil passages.

1-2 OR 2-3 UPSHIFT IN 1

1. Improperly adjusted manual linkage.
2. Defective manual valve.
3. Leaking oil passages.

NO 2-1 DOWNSHIFT IN 1

1. Incorrect oil level.
2. Improperly adjusted manual linkage.
3. Improper oil.
4. Defective manual valve.
5. Defective governor.
6. Defective band servo.
7. Damaged seals.
8. Defective low and reverse brake.
9. Leaking oil passages.

HARSH 2-1 SHIFT IN 1

1. Defective vacuum diaphragm or piping.
2. Engine stall RPM not within specifications.
3. Improper oil.

4. Defective manual valve.
5. Defective low and reverse brake.

OIL SHOOTS OUT OR WHITE SMOKE IS EMITTED FROM EXHAUST PIPE DURING OPERATION

1. Improper oil level.
2. Incorrect rear lubrication.
3. Defective vacuum diaphragm or piping.
4. Improper oil.
5. Incorrect throttle pressure (3N71B).
6. Incorrect line pressure (L3N71B, L4N71B, E4N71B).
7. Engine stall RPM not within specifications.
8. Defective manual valve.
9. Damaged seals.
10. Defective high-reverse clutch (front).
11. Defective band brake (3N71B, L3N71B).
12. Defective 2nd band brake (L4N71B, E4N71B).
13. Defective low and reverse brake.
14. Defective oil pump.
15. Leaking oil passages.
16. Defective one-way clutch.
17. Defective planetary gear.
18. Defective direct clutch (E4N71B).
19. Defective forward clutch (rear).
20. Defective torque converter (E4N71B).

FOUL ODOR AT FILL PIPE

1. Incorrect oil level.
2. Improper oil.
3. Defective forward clutch (rear).
4. Defective direct clutch (L4N71B).
5. Defective high-reverse clutch (front).
6. Defective band brake (3N71B, L3N71B).
7. Defective O.D. band brake (L4N71B, E4N71B).
8. Defective 2nd band brake (L4N71B, E4N71B).
9. Defective low and reverse brake.
10. Defective oil pump.
11. Leaking oil passages.
12. Defective one-way clutch.
13. Defective planetary gear.
14. Defective torque converter (E4N71B).

TRANSMISSION OVERHEATS

1. Incorrect oil level.
2. Improper rear lubrication.
3. Incorrect line pressure.
4. Engine stall RPM not within specifications.
5. Improper oil.
6. Defective manual valve.
7. Damaged seals.
8. Defective band servo.
9. Defective high-reverse clutch (front).
10. Defective band brake (3N71B, L3N71B).
11. Defective 2nd band brake (L4N71B, E4N71B).
12. Defective low and reverse brake.
13. Defective oil pump.
14. Leaking oil passages.
15. Defective one-way clutch.
16. Defective planetary gear.
17. Defective O-ring in input shaft (3N71B, L3N71B).
18. Clogged lock-up orifice in oil pump cover (3N71B, L3N71B).
19. Defective torque converter.
20. Defective O.D. band servo (E4N71B).
21. Defective direct clutch (E4N71B).
22. Defective forward clutch (rear) (E4N71B).
23. Defective O.D. band brake (E4N71B).

NO 3-2 DOWNSHIFT (3N71B, L3N71B)

1. Defective vacuum diaphragm or piping.
2. Improper oil.
3. Defective manual valve.
4. Defective governor.
5. Damaged seals.
6. Defective band servo.
7. Defective high-reverse clutch (front).
8. Defective band brake.
9. Leaking oil passages.

HIGH DOWNSHIFT POINT BETWEEN 3-2 & 2-1 (3N71B, L3N71B)

1. Improperly adjusted manual linkage.
2. Defective vacuum diaphragm or piping.
3. Defective kickdown solenoid, switch, or wiring.
4. Incorrect throttle pressure (3N71B).
5. Incorrect line pressure (L3N71B).
6. Defective manual valve.
7. Defective governor.
8. Leaking oil passages.

TORQUE CONVERTER NOT LOCKED UP (L3N71B, L4N71B)

1. Clogged governor tube.
2. Defective governor.
3. Incorrect line pressure.
4. Defective O-ring in input shaft.
5. Defective oil pump.
6. Defective lock-up control valve.
7. Clogged lock-up orifice in oil pump cover.
8. Defective torque converter.

SLIPPING LOCK-UP PISTON (L3N71B, L4N71B)

1. Incorrect line pressure.
2. Defective O-ring in input shaft.
3. Clogged lock-up orifice in oil pump cover.
4. Defective oil pump.
5. Defective torque converter.

LOCK-UP POINT TOO HIGH OR TOO LOW (L3N71B, L4N71B)

1. Clogged governor tube.
2. Defective governor.
3. Defective lock-up control valve.

NO DRIVE IN R, D, 2 & 1 (L3N71B, L4N71B)

1. Defective lock-up control valve.
2. Defective torque converter.

NO 3-4 UPSHIFT (L4N71B, E4N71B)

1. Improperly adjusted manual linkage.
2. Defective vacuum diaphragm or piping.
3. Defective kickdown solenoid, switch, or wiring.
4. Improper oil.
5. Defective manual valve.
6. Defective governor.
7. Damaged seals.
8. Defective band servo.
9. Defective O.D. band brake.
10. Leaking oil passages.

UPSHIFT FROM 2 DIRECTLY TO 4 (L4N71B, E4N71B)

1. Improper oil.
2. Defective manual valve.
3. Damaged seals.

4. Defective governor.
5. Defective forward clutch (rear).
6. Leaking oil passages.
7. Defective high-reverse clutch (front) (E4N71B).

HARSH 3-4 UPSHIFT (L4N71B, E4N71B)

1. Defective vacuum diaphragm or piping.
2. Incorrect line pressure.
3. Defective manual valve.
4. Damaged seals.
5. Defective band servo (L4N71B).
6. Defective O.D. band brake.
7. Defective O.D. band servo (E4N71B).
8. Defective lock-up solenoid (E4N71B).
9. Defective lock-up control unit and/or sensors (E4N71B).
10. Defective lock-up control valve (E4N71B).
11. Defective torque converter (E4N71B).

SLIPPING 3-4 UPSHIFT (L4N71B, E4N71B)

1. Incorrect oil level.
2. Improperly adjusted manual linkage.
3. Defective vacuum diaphragm or piping.
4. Incorrect line pressure.
5. Improper oil.
6. Defective manual valve.
7. Damaged seals.
8. Defective band servo.
9. Defective O.D. band brake.
10. Leaking oil passages.

VEHICLE BRAKES DURING 3-4 UPSHIFT (L4N71B, E4N71B)

1. Improper oil.
2. Defective manual valve.
3. Defective direct clutch.
4. Defective high-reverse clutch (front).

NO 4-3 DOWNSHIFT (L4N71B, E4N71B)

1. Defective vacuum diaphragm or piping.
2. Improper oil.
3. Defective manual valve.
4. Defective governor.
5. Damaged seals.
6. Defective direct clutch.
7. Defective high-reverse clutch (front).
8. Defective O.D. band brake.
9. Leaking oil passages.
10. Defective power shift switch (E4N71B).
11. Defective O.D. cancel solenoid (E4N71B).
12. Defective lock-up solenoid (E4N71B).
13. Defective O.D. cancel valve (E4N71B).

NO 3-2 OR 4-2 DOWNSHIFT (L4N71B, E4N71B)

1. Defective vacuum diaphragm or piping.
2. Improper oil.
3. Defective manual valve.
4. Defective governor.
5. Damaged seals.
6. Defective band servo.
7. Defective high-reverse clutch (front).
8. Defective 2nd band brake.
9. Leaking oil passages.
10. Defective O.D. band brake.

HIGH DOWNSHIFT POINT FROM 4-3, 3-2 & 2-1 (L4N71B, E4N71B)

1. Improperly adjusted manual linkage.
2. Defective vacuum diaphragm or piping.
3. Defective kickdown solenoid, switch or wiring.
4. Incorrect line pressure.
5. Defective manual valve.
6. Defective governor.
7. Leaking oil passages.
8. Defective lock-up control unit and/or sensors (E4N71B).

SLIPPING 4-3 DOWNSHIFT (L4N71B, E4N71B)

1. Defective vacuum diaphragm or piping.
2. Incorrect line pressure.
3. Improper oil.
4. Defective manual valve.
5. Damaged seals.
6. Defective band servo.
7. Defective direct clutch.
8. Defective high-reverse clutch (front).
9. Defective O.D. band brake.
10. Leaking oil passages.
11. Damaged or missing high-reverse clutch (front) check ball.

SHIFTS TO OVERDRIVE WITH O.D. CANCEL SWITCH ON (L4N71B, E4N71B)

1. Defective O.D. cancel switch or wiring.
2. Defective O.D. cancel solenoid.
3. Defective O.D. cancel valve.

O.D. CANCEL SWITCH NOT ILLUMINATED WITH IGNITION SWITCH AT ON (L4N71B, E4N71B)

1. Defective O.D. cancel switch or wiring.
2. Defective O.D. indicator switch.

O.D. CANCEL SWITCH NOT ILLUMINATED WITH TRANSMISSION IN OVERDRIVE (L4N71B, E4N71B

1. Defective O.D. cancel switch or wiring.
2. Defective O.D. indicator switch.

NO LOCK-UP IN ANY RANGE (E4N71B)

1. Defective lock-up solenoid.
2. Defective lock-up control unit and/or sensors.
3. Defective torque converter.
4. Defective lock-up control valve.

NO LOCK-UP IN 4 (L4N71B)

1. Defective governor.
2. Defective O.D. band servo.
3. Defective lock-up control valve.
4. Defective O.D. band brake.

HARSH SHIFT CHANGING FROM LOCK-UP OFF TO ON (E4N71B)

1. Improper oil.
2. Incorrect line pressure.
3. Defective governor.
4. Defective lock-up control unit and/or sensors.
5. Defective lock-up control valve.
6. Defective O.D. brake band.

NO KICKDOWN IN 4 (E4N71B)

1. Defective kickdown solenoid, switch, or wiring.
2. Defective vacuum diaphragm or piping.
3. Improper oil.
4. Defective control valve.
5. Defective governor.

6. Defective high-reverse clutch (front).
7. Defective direct clutch.
8. Leaking oil passages.

IMPROPER KICKDOWN IN 4 (E4N71B)

1. Improperly adjusted manual linkage.
2. Defective vacuum diaphragm or piping.
3. Incorrect line pressure.
4. Improper oil.
5. Defective control valve.
6. Defective governor.
7. Damaged seals.
8. Defective O.D. brake band.
9. Leaking oil passages.

SHIFT PATTERN DOES NOT CHANGE (E4N71B)

1. Defective vacuum diaphragm or piping.
2. Defective O.D. cancel switch.
3. Defective kickdown solenoid, switch, or wiring.
4. Defective O.D. cancel solenoid.
5. Engine stall RPM not within specifications.
6. Defective lock-up control unit and/or sensors.
7. Defective control valve.
8. Defective O.D. cancel valve.

O.D. CANCEL SWITCH NOT ILLUMINATED WITH TRANSMISSION IN OVERDRIVE (E4N71B)

1. Defective O.D. cancel switch.
2. Defective lock-up control unit and/or sensors.

POWER SHIFT SWITCH NOT ILLUMINATED WHEN SHIFT PATTERN TURNED TO POWER (E4N71B)

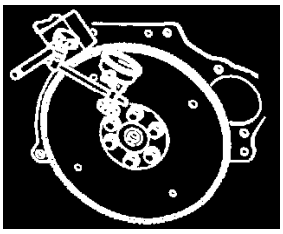
1. Defective O.D. cancel switch.
2. Defective lock-up control unit and/or sensors.

Automatic Transmission/Transaxle: Service and Repair

Transmission Installation

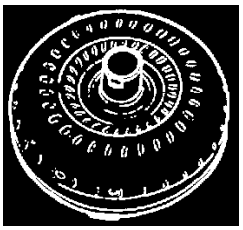
INSTALLATION:

Installation of automatic transmission in car is in reverse order of removal. However, observe the following installation notes.

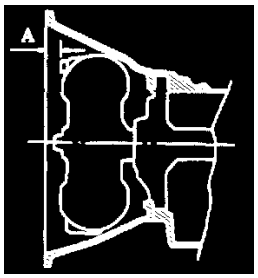


1. Drive plate runout:
   - Turn crankshaft one full turn and measure drive plate runout with indicating finger of a dial gauge rested against plate.

   Maximum allowable runout: 0.5 mm (0.020 in)



2. Installation of torque converter:
   Line up notch in torque converter with that in oil pump.
   - Be extremely careful not to put undue stress on parts when installing torque converter.



3. When connecting torque converter to transmission, measure distance "A" to be certain that they are correctly assembled.

   Distance "A": More than 35.0 mm (1.378 in)

4. Bolt converter to drive plate.
   - Align chalk marks painted across both parts during disassembly process.
5. After converter is installed, rotate crankshaft several turns and check to be sure that transmission rotates freely without binding.
6. Pour recommended automatic transmission fluid up to correct level through oil charge pipe.
7. Connect manual lever to shift rod. Operation should be carried out with manual and selector levers in "N".
8. Connect inhibitor switch wires.
   - Adjust Inhibitor Switch as necessary.
   - Inspect and adjust switch as above whenever it has to be removed for service.
9. Check inhibitor switch for operation:
   - Starter should operate only when selector lever is in "P" and "N" positions (it should not operate when lever is in "D", "2", "1" and "R" positions).
   - Back-up lamp should also light when selector lever is placed in "R" position.
10. Check fluid level in transmission.
11. Move selector lever through all positions to be sure that transmission operates correctly.
    - With hand brake applied, run engine at idle. Without disturbing the above setting, move selector lever through "N" to "D", to "2", to "1" and to "R". A slight shock should be felt by hand gripping selector each time transmission is shifted.

12. Verify engine idle speed.
13. Check to be sure that line pressure is correct.
14. Perform stall test.

Automatic Transmission/Transaxle: Service and Repair

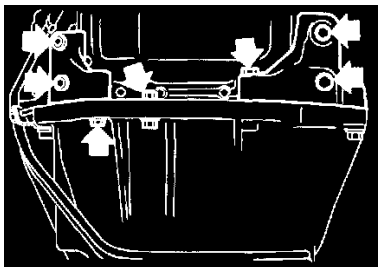
Transmission Removal

REMOVAL:

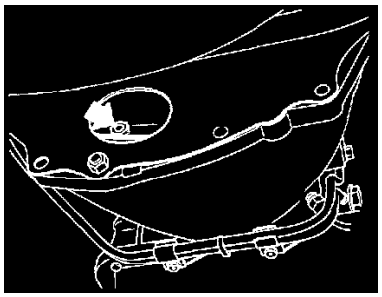
In dismounting the automatic transmission from a car, proceed as follows:

1. Disconnect battery ground cable from terminal.
2. Jack up car and support it on safety stands. We recommend a hydraulic hoist or open pit be utilized, if available.
   - Observe all safety regulations.
3. Remove propeller shaft.
   - Plug up the opening in the rear extension to prevent oil from flowing out.
4. Disconnect front exhaust tube.
5. Disconnect selector range lever from manual shaft.
6. Disconnect wire connections at inhibitor switch.
7. Disconnect vacuum tube from vacuum diaphragm, and wire connections at downshift solenoid.
8. Disconnect speedometer cable from rear extension.
9. Disconnect oil charging pipe. 10. Disconnect oil cooler inlet and outlet tubes at transmission case.
11. Disconnect governor tube at converter housing and transmission case.
12. Support engine by locating a jack under oil pan with a wooden block used between oil pan and jack. Support transmission by means of a transmission jack.

    CAUTION: Do not place the jack under the oil pan drain plug.



13. Remove gussets.



14. Detach converter housing dust cover.
    - Remove bolts securing torque converter to drive plate.
    - Before removing torque converter, inscribe chalk marks on two parts so that they may be replaced in their original positions at assembly.
15. Remove rear engine mount securing bolts and crossmember mounting bolts.
16. Remove starter motor.
17. Remove bolts securing transmission to engine.
    - After removing these bolts, support engine and transmission with jack, and lower the jack gradually until transmission can be removed and take out transmission under the car.
    - Plug up openings such as oil charging pipe, oil cooler tubes, etc.

      CAUTION: Take care when dismounting transmission not to strike any adjacent parts.

Band: Adjustments

BRAKE BAND ADJUSTMENT:

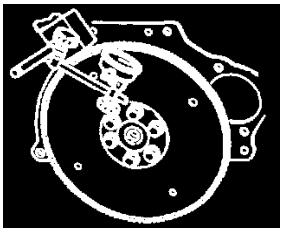
Proper brake band adjustment results in smooth shifting between 1st & 2nd and 2nd & 3rd. Although the adjustment is very simple, it is important to use an accurate torque wrench.

1. Loosen locknut.
2. Torque band servo piston stem to **12 - 15 N.m(1.2 - 1.5 kg.m, 9 - 11 ft-lb).**
3. Back off band servo piston stem two complete turns.

   CAUTION: Do not back off EXCESSIVELY on adiusting stem as anchor block m.y fall out of place.

4. Tighten locknut to approximately **20 N.m (2 kg-m, 14 ft-lb)** while holding band servo piston stem stationary.

Drive Plate: Testing and Inspection

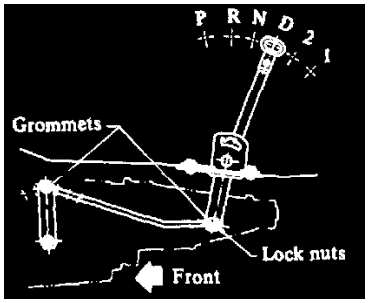


Drive Plate Runout Inspection

- Turn crankshaft one full turn and measure drive plate runout with indicating finger of a dial gauge rested against plate.

  Maximum allowable runout: 0.5 mm (0.020 in)

Shift Linkage: Adjustments



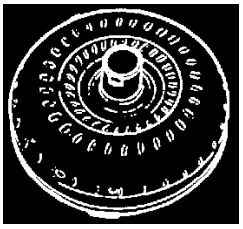
MANUAL LINKAGE ADJUSTMENT

The adjustment of the manual linkage is an important adjustment of the automatic transmission. Move the shift lever from the "P" range to "Range 1". you should be able to feel the detents in each range.

If the detents cannot be felt or the pointer indicating the range is improperly aligned, the linkage needs adjustment.

1. Place shift lever in "D" range.
2. loosen locknuts and move shift lever until "D" is properly aligned and car is in "D" range.
3. Tighten locknut.
   - Recheck "P" and "Range 1" positions. As a safety measure, be sure you can feel full detent when shift lever is placed in "P".
   - If you are unable to make an adjustment, grommets may be badly worn or damaged and should be replaced.

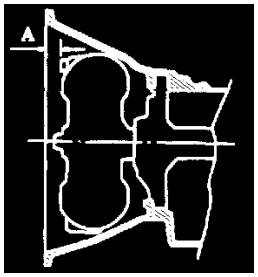
Torque Converter: Service and Repair



Installation of Torque Converter:

Line up notch in torque converter with that in oil pump.

- Be extremely careful not to put undue stress on parts when installing torque converter.



When connecting torque converter to transmission, measure distance "A" to be certain that they are correctly assembled.

Distance "A": More than 35.0 mm (1.378 in)

Bolt converter to drive plate.

- Align chalk marks painted across both parts during disassembly process.

After converter is installed, rotate crankshaft several turns and check to be sure that transmission rotates freely without binding.

Vacuum Diaphragm: Adjustments

VACUUM DIAPHRAGM ROD ADJUSTMENT

The vacuum diaphragm and the length of its diaphragm rod help determine the shift patterns of the transmission. It is essential that the correct length rod be installed.

1. Disconnect vacuum hose at vacuum diaphragm and remove diaphragm from transmission case.

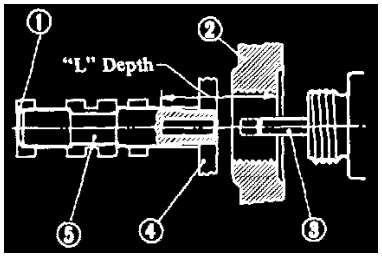


Illustration index:

1. Note seated valve body
2. Transmission case wall
3. Diaphragm rod
4. Valve body side plate
5. Vacuum throttle valve

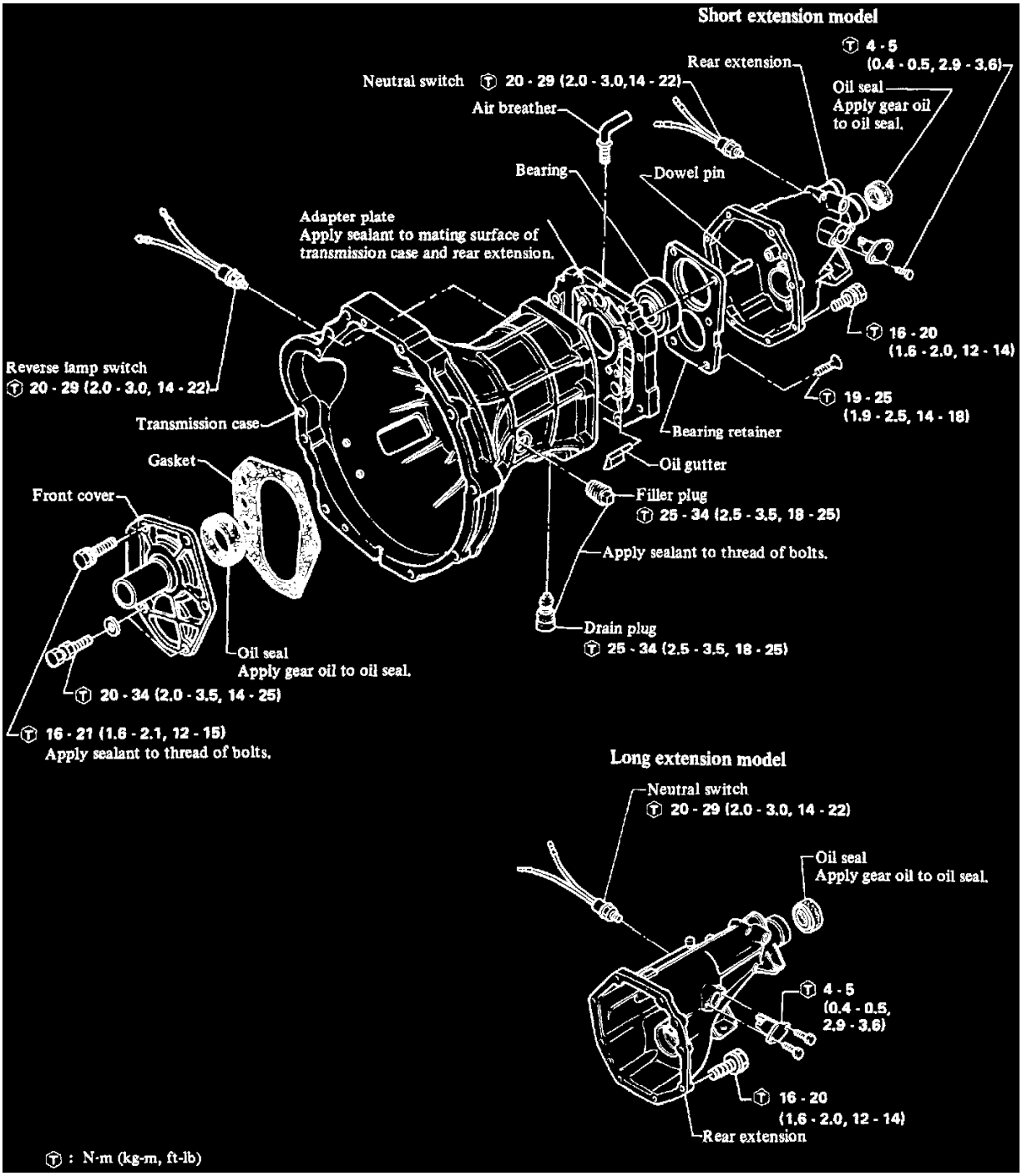
2. Using a depth gauge, measure depth "L".
   - Be sure vacuum throttle valve is pushed into valve body as far as possible.

Measured depth "L" mm (in)	Rod length mm (in)	Part number
Under 25.55 (1.0059)	29.0 (1.142)	31932 - X0103
25.65 - 26.05 (1.0098 - 1.0256)	29.5 (1.161)	31932 - X0104
26.15 - 26.55 (1.0295 - 1.0453)	30.0 (1.181)	31932 - X0100
26.65 - 27.05 (1.0492 - 1.0650)	30.5 (1.201)	31932 - X0102
Over 27.15 (1.0689)	31.0 (1.220)	31932 - X0101

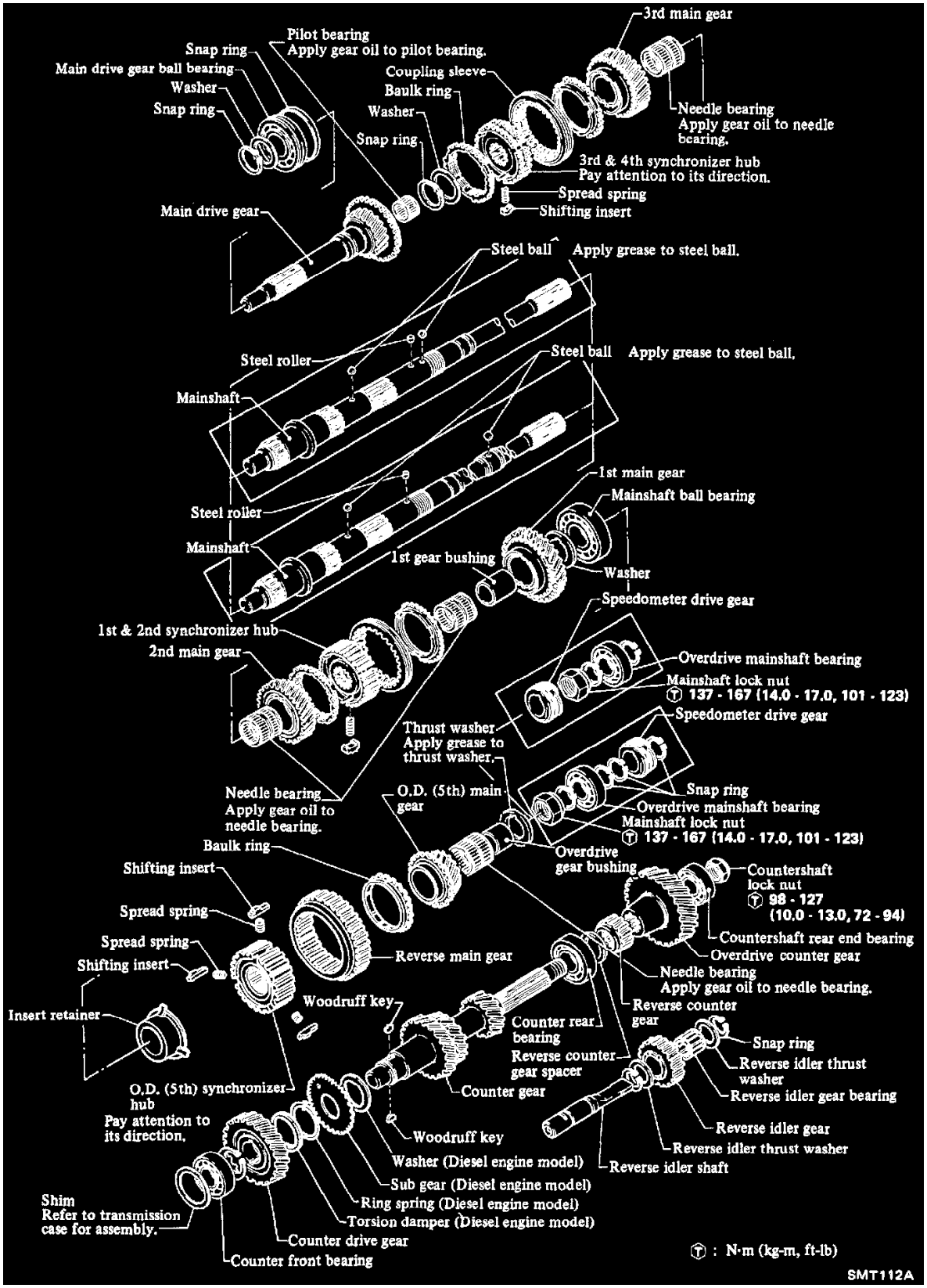
Vacuum Diaphragm Rod Selection

3. Check "L" depth with chart and select proper length rod.

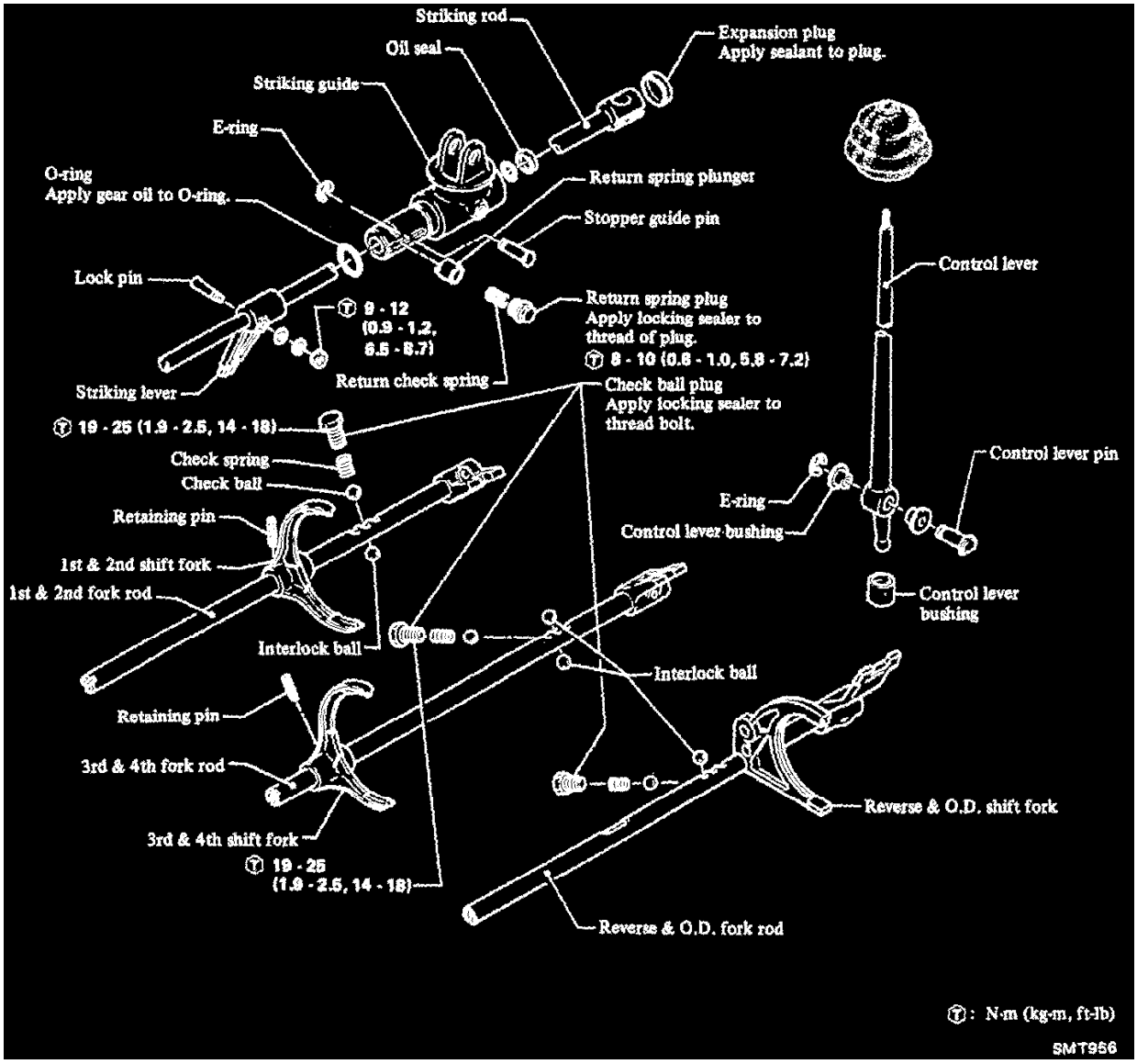
Vacuum diaphragm rod selection:



FS5W71B Transmission



FS5W71B Transmission



FS5W71B Transmission

Manual Transmission/Transaxle: Service and Repair

1. Disconnect battery ground cable.
2. Disconnect accelerator wire.
3. Raise and support vehicle. Make sure that safety is insured.
4. Remove propeller shaft.
5. Disconnect front exhaust tube.
6. Disconnect wires from Reverse (back-up) lamp, Neutral, Top, and O.D. gear (if equipped) switches.
7. Disconnect speedometer cable.
8. Remove clutch operating cylinder.
9. Remove starter motor.
10. Support transmission with a transmission jack.
11. Remove console box.
12. Place transmission control lever in neutral position and remove E-ring and control lever.
13. Loosen rear engine mount securing nuts and remove crossmember.
14. Remove bolts securing transmission to engine.
15. Support engine and transmission with jacks, and slide transmission rearward away from engine and remove transmission from the vehicle.
16. Reverse procedure to install.

Clutch Pedal Assembly: Adjustments

HYDRAULIC OPERATED CLUTCH

The clutch hydraulic system must be bled whenever a clutch line has been disconnected or when air has entered the system. The bleed valve is located on the clutch operating cylinder.

Model	Year	Clutch Pedal Adjustment	
		Pedal Height In. (mm)	Pedal Freeplay In. (mm)
200SX	1984-85	7.60-7.99 (193-203)	.04-.06 (1-1.5)
	1986-88 ⑤	7.44-7.83 (189-199)	.04-.12 (1-3)
	1987-88 ⑥	7.72-8.11 (196-206)	.04-.12 (1-3)
300ZX	1984-88	7.68-8.07 (195-205	.04-.12 (1-3)
Maxima	1984 ③	6.69-7.09 (170-180)	.04-.20 (1-5)
	1984 ②	6.89-7.28 (175-185)	.04-.20 (1-5)
	1985	6.73-7.13 (171-181)	.04-.20 (1-5)
	1986-88	6.73-7.13 (171-181)	.04-.12 (1-3)
Pathfinder	1987-88 ⑦	8.94-9.33 (227-237)	.039-.059 (1-1.5)
	1987-88 ⑧	9.29-9.69 (236-246)	.039-.059 (1-1.5)
Pickup	1984-85	7.05-7.44 (179-189)	.04-.20 (1-5)
	1986	7.05-7.44 (179-189)	.04-.06 (1-1.5)
	1986½-88 ⑦	8.94-9.33 (227-237)	.039-.059 (1-1.5)
	1986½-88 ⑧	9.29-9.69 (236-246)	.039-.059 (1-1.5)
Stanza Wagon	1986-88	9.29-9.69 (236-246)	.04-.12 (1-3)

①—Diesel engine.
②—With clutch damper.
③—Less clutch damper.
④—Gasoline engine.
⑤—CA18ET & CA20E engines.
⑥—VG30E engine.
⑦—VG30i engine.
⑧—Z24i engine.

Fig. 12 Clutch pedal height & freeplay specifications.

SPECIFICATION TABLE

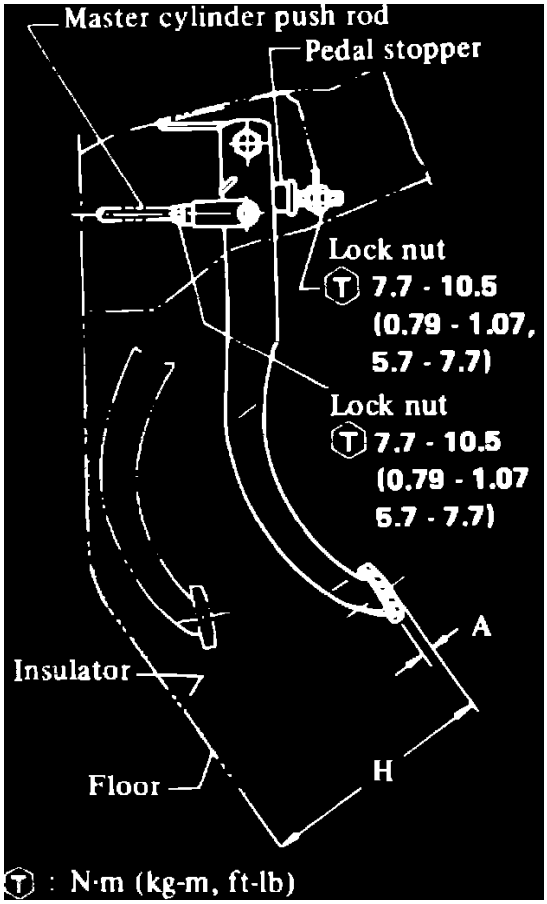


Fig. 9 Clutch pedal free travel & height adjustment. 1982-86 Pickup

1. Measure clutch pedal height from floor panel to center of clutch pedal, **Fig. 9,** dimension H. Clutch pedal height should be as specified. Adjust clutch pedal height by adjusting the pedal stopper. After completing adjustment, tighten locknut.
2. Measure clutch pedal freeplay as shown in **Fig. 9,** dimension A. Clutch pedal freeplay should be as specified. Adjust clutch pedal freeplay by rotating the clutch master cylinder inward or outward until the specified freeplay is obtained. After completing freeplay adjustment, tighten locknut. Clutch pedal freeplay is the sum of play between the clevis pin and clevis pin hole and play between the piston and piston rod.
3. After the above adjustments have been completed, cycle clutch pedal several times to ensure that clutch linkage operates smoothly without binding.

Differential Assembly: Service and Repair

Disassembly

1. Remove rear cover and scribe alignment marks between side bearing caps and carrier, then remove side bearing caps, side bearing adjuster, if equipped, and differential case.
2. Using suitable tools, remove drive pinion nut, companion flange and drive pinion.
3. Pry out oil seal, being careful not to scratch seal bore, then remove front pinion bearing inner race.
4. Drive out pinion bearing outer race.
5. Remove collapsible spacer and washer from drive pinion, as required.
6. Press out rear bearing inner race.

DIFFERENTIAL CASE

1. Using suitable tool, remove side bearing inner race.
2. Remove ring gear.
3. On models with 2 pinion type differential, proceed as follows:
   a. Drive out pinion mate shaft lock pin from ring gear side.
   b. Remove pinion mate shaft, pinion mate gears, side gears and thrust washers, marking gears and thrust washers so that they can be installed in original position.
4. On models with 4 pinion type differential, proceed as follows:
   a. Scribe alignment marks on both LH and RH differential case, then separate LH and RH cases.
   b. Remove side thrust washers, side gear, thrust block if equipped, pinion mate thrust washer, pinion mate gear and pinion mate shaft.

Differential Assembly: Service and Repair
Side Bearing Preload & Final Assembly, 190 Model Axle

1. The required thicknesses of the left and right adjusting washers can be obtained from the following formulas: T1 = A - C + D + E H + .18 mm; T2 = B - D + F + H + .15 mm; where T1 = required thickness of left side washer in millimeters, T2 = required thickness of right side washer in millimeters, A & B = figures marked on gear carrier, C & D = figures marked on differential case, E & F = side bearing measurements as determined in step 2 and H = figure marked on ring gear.

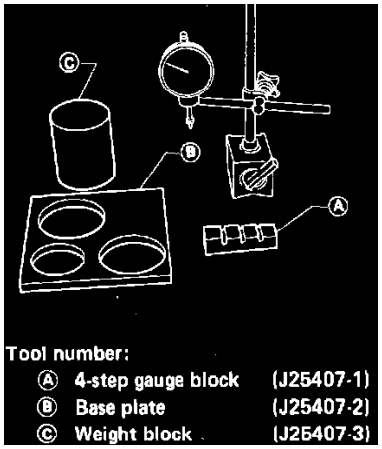


Fig. 11 Side bearing thickness measuring tools

2. Calculate how far under standard thickness of 20 mm the side bearings are using tools J25407-1, J25407-2 and J25407-3 or equivalents, **Fig. 11** as follows:
   a. Set weight block, 4 step gauge block and dial indicator on base plate.
   b. Adjust dial indicator to zero.
   c. Carefully slide 4 step gauge block and weight block out from under dial indicator.
   d. Lubricate side bearing and place side bearing on base plate, ensuring that base plate has recess in it and that bearing will turn freely when positioned over recess.
   e. Place weight block on side bearing.
   f. Slide dial indicator onto weight block.
   g. Rotate weight block several times to ensure that bearing is properly seated.
   h. Read dial indicator. Indicator should read .10-.30 mm. **If needle fluctuates erratically, bearing is either dirty or defective and should be cleaned or replaced as necessary.**
   i. Measurement obtained for left side bearing is measurement E, step 1 and measurement obtained for right side bearing is measurement F.
3. Press in front and rear bearing outer races.
4. Install selected pinion height adjusting washer in drive pinion and press in rear bearing outer race.
5. Place pinion front bearing inner race in gear carrier.
6. Apply suitable lubricant to cavity at sealing lips of oil seal, then install front oil seal.
7. Install drive pinion washer, collapsible spacer and drive pinion in gear carrier.
8. Install companion flange and hold firmly, then insert pinion into companion flange.
9. Temporarily tighten pinion nut until there is no axial play. **Ensure that threaded portion of drive pinion and pinion nut are free from oil or grease.**
10. Tighten pinion nut by degrees until preload is 9.5-13.9 inch lbs.
11. Install differential case assembly with side bearing outer races into gear carrier.
12. Align mark on bearing cap with mark on gear carrier and install bearing cap on gear carrier.
13. Measure ring gear to drive pinion backlash with dial indicator. If backlash is less than .0059-0079 inch, decrease thickness of left shim and increase thickness of right shim by same amount. If backlash exceeds .0059-.0079 inch, increase thickness of right shim and decrease thickness of left shim by same amount. **Never change the total amount of shims to prevent changing bearing preload.**
14. Check total preload, which should be 10-19 inch lbs. If preload is too great, remove same amount of shims from each side. If preload is too small, install same amount of shims on each side.
15. Recheck ring gear to drive pinion backlash and check run out of gear. If backlash varies excessively in different places, foreign matter may be trapped between ring gear and differential case.
16. If backlash varies greatly and ring gear run out is .0031 inch or less, the hypoid gear set or differential case needs to be replaced.

Differential Assembly: Service and Repair
Side Bearing Preload & Final Assembly, 200 Models Axle

1985-86 2WD Pickup w/Dual Rear Wheels & 4WD Pickup

1. The required thicknesses of the left and right adjusting washers can be obtained from the following formulas: T1 = A - C + D + E H + 2.05; T2 = B - D + F + G + H + 1.95; where T1 = required thickness of left side washer in millimeters, T2 = required thickness of right side washer in millimeters, A & B = figures marked on carrier housing, C & D = figures marked on gear carrier, E & F = side bearing measurements as determined in step 2, G = carrier spacer measurement as determined in step 3 and H = variation number (+ or -) marked on ring gear.

Fig. 40 Side bearing thickness measuring tools

2. Calculate variables E and F using tool kit no. J-25407-01, **Fig. 40,** as follows:
   a. Attach dial indicator to base plate.
   b. Place weight block on base plate and gauge block on weight block.
   c. Adjust dial indicator to zero with its tip resting on weight block.
   d. Slide gauge block out from under dial indicator, then lift weight block and position bearing and race under weight.
   e. Turn weight to seat bearing and note dial indicator's drop from zero.
   f. Dial indicator reading is variable E for left side bearing or F for right side bearing.
3. Measure thick left carrier spacer, using a micrometer. Add this measurement to 8.10 mm to determine variable G.
4. Press in front and rear bearing outer races.
5. Adjust pinion height.
6. Lubricate front bearing with gear oil and place it in gear carrier.
7. Apply suitable lubricant into cavity between lips of new oil seal, then install seal into carrier, ensuring that seal is flush with end of carrier.
8. Place washer and new collapsible spacer on drive pinion, then lubricate rear bearing with gear oil and insert drive pinion in gear carrier.
9. Insert companion flange and hold it firmly, then insert drive pinion into companion flange.
10. Temporarily tighten pinion nut until there is no axial play. **Ensure that threaded portion of drive pinion and pinion nut are free from oil grease.**
11. Tighten pinion nut by degrees until preload is 9.5-14.8 inch lbs.
12. Torque drive pinion nut to 94-217 ft. lbs. If preload is not within specifications after torquing pinion nut, replace collapsible spacer.
13. Install differential case assembly, side bearing outer races and side bearing adjusting washer and spacer into differential carrier.
14. Install side bearing caps, aligning scribe marks made during disassembly, and torque bolts to 65-72 ft. lbs.
15. Check backlash of ring gear with dial indicator. If backlash is less than .0051-.0071, decrease thickness of left side bearing adjusting washer and increase thickness of right side bearing adjusting washer by same amount. If backlash is greater than .0051-.0071 inch, decrease thickness of right side bearing adjusting washer and increase thickness of left side bearing adjusting washer by same amount.
16. Check total preload. If preload exceeds 10-20 inch lbs., replace side bearing adjusting washers with thinner ones of same thickness of each side. If preload is less than 10-20 inch lbs., replace side bearing adjusting washers with thicker ones of same thickness on each side.
17. Check run out of ring gear with dial indicator. Run out should be not more than .0020 inch.
18. If backlash varies excessively in different places, foreign matter may be trapped between ring gear and differential case.
19. If backlash varies greatly when run out of ring gear is within specifications, the hypoid gear set or differential case must be replaced.

Differential Assembly: Service and Repair
Side Bearing Preload & Final Assembly, H233B Model Axle

1. Press in front and rear bearing outer races, then install selected drive pinion adjusting washer in drive pinion and press in rear bearing outer race.
2. Place pinion front bearing inner race in gear carrier.
3. Apply suitable lubricant to cavity at sealing lips of oil seal, then install front oil seal.
4. Install drive pinion spacer, pinion bearing adjusting shim and drive pinion in gear carrier.
5. Install companion flange into drive pinion.
6. Temporarily torque pinion nut to 145-181 ft. lbs. **Ensure that threaded portion of drive pinion and pinion nut are free from oil or grease.**
7. Measure pinion bearing preload. Preload should be 4-9 inch lbs. **When checking preload, turn drive pinion several times in both directions to seat bearings.**
8. Install differential case assembly with side bearing outer races into gear carrier.
9. Position side bearing adjusters on gear carrier with threads properly engaged, then lightly screw in adjusters.
10. Align mark on bearing cap with mark on gear carrier and install bearing cap on gear carrier. **Do not tighten cap attaching bolts at this point.**
11. Tighten both right and left side bearing adjusters alternately, then measure ring gear backlash with dial indicator. Backlash should be .0059-.0079 inch. If backlash is not as specified, adjust right and left side bearing adjusters by tightening them alternately until specified backlash is obtained.
12. Check total preload, which should be 9-17 inch lbs. If preload is not as specified, adjust right and left side bearing adjusters by tightening them alternately until specified preload is obtained.
13. Torque side bearing cap bolts to 69-76 ft. lbs., then place lock finger in position to prevent adjuster rotation during operation.
14. Recheck backlash and ring gear run out of gear. If backlash varies excessively in different places, foreign matter may be trapped between ring gear and differential case.
15. If backlash varies greatly and ring gear run out is .0031 inch or less, the hypoid gear set or differential case needs to be replaced.

Differential Carrier: Service and Repair

Reverse ``Disassembly'' procedure to assemble and note the following:

Models w/2 Pinion Type Differential

1. Assemble pinion mates, side gears, thrust washers, and thrust block, if equipped, in differential case.
2. Install pinion shaft to differential case so that it meets lock pin holes.
3. Adjust pinion mate-to-side gear backlash or the clearance between the rear face of side gear and thrust washer to proper thickness by selecting side gear thrust washer.
4. Lock pinion shaft lock pin using a punch after it is secured into place.
5. Apply oil to gear tooth surfaces and thrust surfaces and check if they turn properly.
6. Apply suitable locking compound to ring gear attaching bolts, then place ring gear on differential case and install bolts and lock washers. Torque bolts to 58-72 ft. lbs. on models with 10 mm bolts and 98-112 ft. lbs. on models with 12 mm bolts, then bend up lock washers, if equipped.

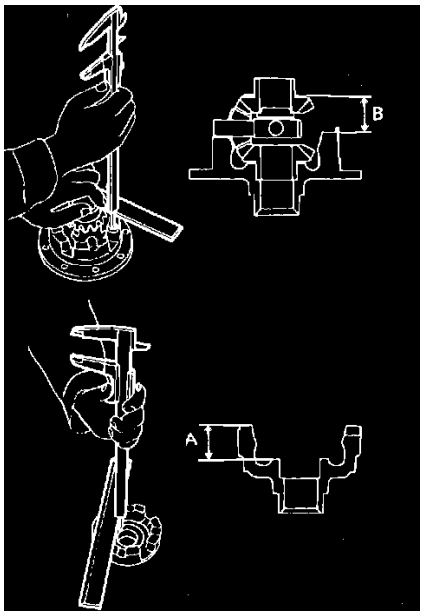


Fig. 28 Checking clearance between side gear thrust washer & differential case. 4 pinion type axles

Models w/4 Pinion Type Differential

1. Measure clearance between side gear thrust washer and differential case, **Fig. 28.** Clearance (A) and (B) should be .0039-.0079 inch.
2. If clearance is not as specified, adjust by installing correct side gear thrust washer.
3. Apply suitable gear oil to gear tooth surfaces and thrust surfaces, then install thrust washer, pinion mate shaft, pinion mate gear, pinion mate thrust washer, thrust block if equipped and side gear in differential case.
4. Assemble LH and RH differential case, then the ring gear on differential case.
5. Apply suitable locking compound on ring gear attaching bolts, then install bolts. Torque attaching bolts in a criss-cross pattern to 58-69 ft. lbs. on H233B model axle, 51-58 ft. lbs. for 10 mm bolts on C200 model axle and 98-112 ft. lbs. for 12 mm bolts on C200 model axle.
6. Press side bearing inner race on differential case using suitable tools.

Pinion Gear: Service and Repair
Drive Pinion Height, 190 Model Axles

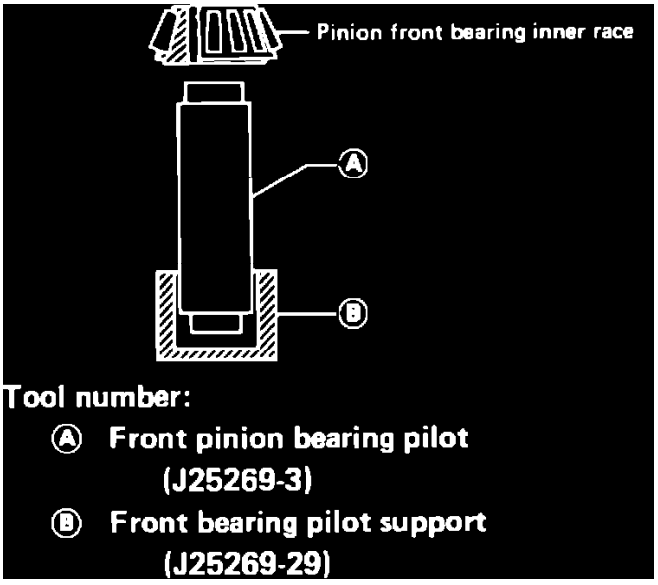


Fig. 32 Installing rear pinion bearing pilot & gauge plate on hex head long bolt

1. Install rear pinion bearing pilot into gauge plate and slide over hex head long bolt, **Fig. 32.**
2. Install pinion rear bearing inner race in gear carrier, then slide hex head long bolt and gauge plate through bearing.

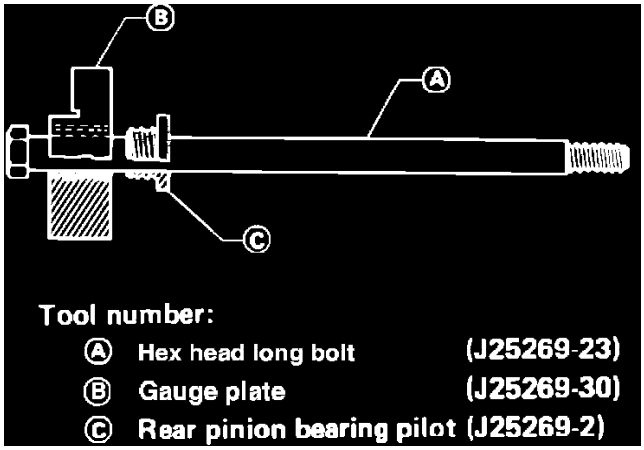


Fig. 33 Assembling front bearing pilot support assembly

3. Stand front bearing pilot support on workbench with appropriate side up and assemble front pinion bearing pilot and front bearing in inner race, ensuring that all parts are seated, **Fig. 33.**
4. Slide assembly from step 3 over hex head long bolt into gear carrier, then install and finger tighten support nut, ensuring that all parts turn freely and are properly aligned.
5. Carefully tighten support nut until preload of 5.2-8.7 inch lbs. on 200SX or 8.7-11.3 inch lbs. on Pickup is obtained.

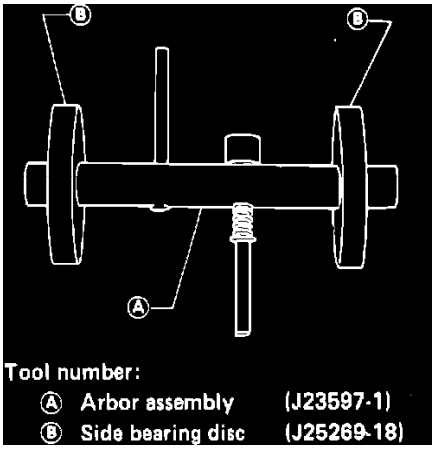


Fig. 34 Arbor assembly with side bearing discs

6. Install two side bearing discs with arbor assembly, ensuring that arbor turns freely, **Fig. 34.**

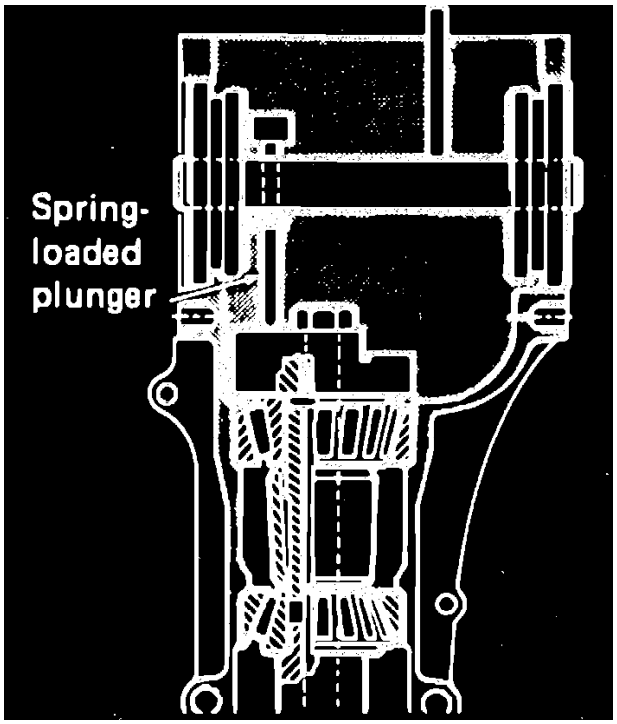


Fig. 22 Installing Arbor Assembly With Discs Into Differential Carrier

7. Place side bearing discs with arbor assembly on gear carrier, lifting spring loaded plunger and placing it on face of gauge plate, **Fig. 22.**
8. Install bearing caps.

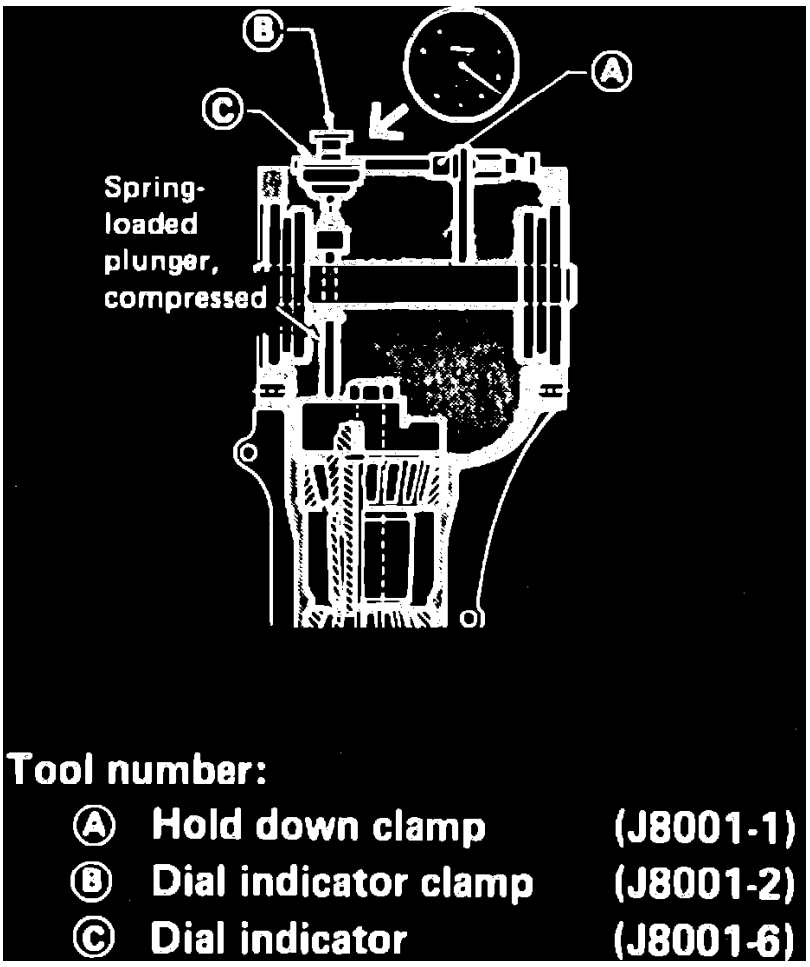


Fig. 23 Installing Dial Indicator

9. Install dial indicator and tighten hold down clamp, **Fig. 23.**
10. Zero dial indicator by rotating arbor Land plunger back and forth and noting highest deflection, then set dial indicator at zero.

11. Rotate gauge plate until plunger falls off of gauge plate and read dial indicator.

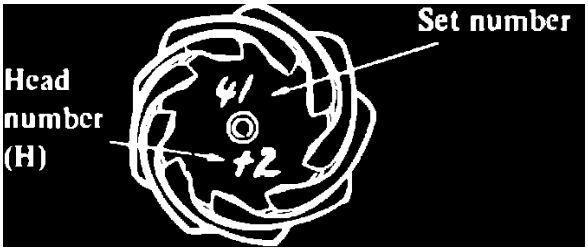


Fig. 17 Drive pinion marking

12. Note head number on drive pinion head, **Fig. 31.**
13. Add dial indicator reading to 2.50 mm. Pickup with H190-ML, 2 mm.
14. If drive pinion head number is plus (+), subtract if from sum obtained in step 13. If drive pinion head number is minus (-), add it to sum obtained in step 13.
15. Total obtained in step 14 is required thickness of pinion washer. If washer of calculated thickness is not available, use washer whose thickness is closest to calculated value.

Pinion Gear: Service and Repair
Drive Pinion Height, 200 Model Axle

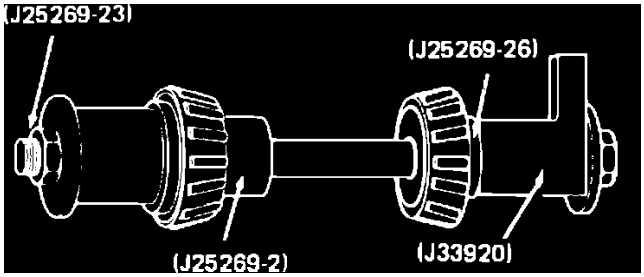


Fig. 35 Pinion height adjusting tools installation

1985-86 2WD Pickup w/Dual Rear Wheels & 4WD Pickup

1. Position rear bearing inner race on dummy shaft and install in carrier.
2. Assemble pinion and tools shown in **Fig. 35.**

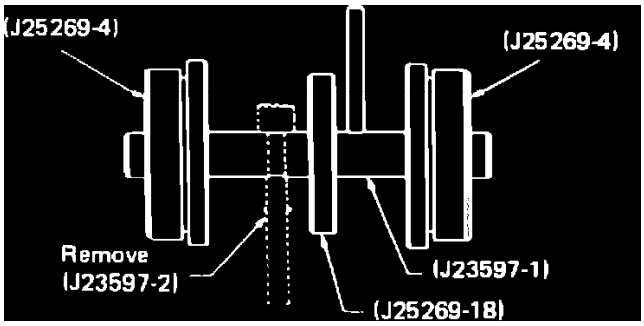


Fig. 36 Arbor assembly w/side bearing discs

3. Assemble side bearing discs to arbor, **Fig. 36.**
4. Position arbor assembly into differential housing and secure it by torquing side bearing cap bolts to 65-72 ft. lbs.
5. Measure clearance between pinion height block and arbor gauge using a suitable feeler gauge and note measurement.
6. Add 2.7 mm (.108 inch) to measurement obtained in step 5.

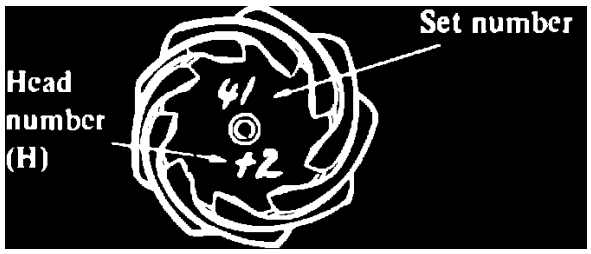


Fig. 17 Drive pinion marking

7. Note number on drive pinion head, **Fig. 31.** If drive pinion head number is plus (+), subtract it from sum obtained in step 6. If drive pinion head number is minus (-), add it to sum obtained in step 6.
8. Total obtained in step 7 is required thickness of pinion washer. If pinion is unmarked, or marked zero, use total obtained in step 6.

Pinion Gear: Service and Repair
Drive Pinion Height & Preload W/H233B Model Axle

1. Ensure all parts are clean and that bearings are well lubricated.
2. Assemble pinion gear bearings into pinion preload shim selector tool J-34309, noting the following:
   a. Front pinion bearing -- Ensure front pinion bearing is secured tightly against gauge anvil J-34309-2, then turn front pinion bearing pilot J-34309-5 to secure bearing in position.
   b. Rear pinion bearing -- Rear pinion bearing pilot J-34309-8 is used to center rear pinion bearing only. Lock bearing to assembly with rear pinion bearing locking seat J-34309-4.
3. Position pinion preload shim selector tool J-34309-1 gauge screw assembly with pinion rear bearing inner cone installed into final drive housing.
4. Assemble front pinion bearing inner cone and gauge anvil J-34309-2 together with gauge screw J-34309-1 in final drive housing.
5. Ensure pinion height plate J-34309-16 will turn a full 360°, then hand tighten the two sections.
6. Turn assembly several times to seat bearings, then measure turning torque at end of gauge anvil. Turning torque should be 4-9 inch lbs.
7. Place pinion height adapter J-34309-12 onto gauge plate and hand tighten. **Ensure all machined surfaces are clean.**
8. Place solid pinion bearing adjusting spacer squarely into recessed portion of gauge anvil and rest its end on gauge screw J-34209-1.
9. Using a suitable feeler gauge, select correct thickness of pinion bearing preload adjusting washer. **The exact measurement obtained with feeler gauge is thickness of adjusting shim required.**
10. Install side bearing discs J-25269-18 and arbor into side bearing bores.
11. Install bearing caps and cap attaching bolts. Torque attaching bolts to 69-76 ft. lbs.
12. Using a suitable gauge, select standard pinion height adjusting washer thickness by measuring gap between pinion height adapter J-34309-12 and arbor.
13. Add or subtract head number on drive pinion head, **Fig. 31,** to measurement found in step 10 to determine the optimum pinion height adjusting washer thickness. **The head number on drive pinion head is in millimeters.**
14. Remove pinion preload selector tool J-34309 from final drive housing.

Axle Shaft: Service and Repair
Pickup Less Dual Rear Wheels

1. Raise and support rear of vehicle and remove rear wheel.
2. Disconnect parking brake cable and brake hydraulic line. Plug end of hydraulic line to prevent fluid loss and entrance of dirt.
3. Remove nuts securing backing plate to axle housing and remove brake drum.
4. With a suitable puller, pull axle and backing plate assembly away from axle housing.
5. Replace oil seal in axle tube.

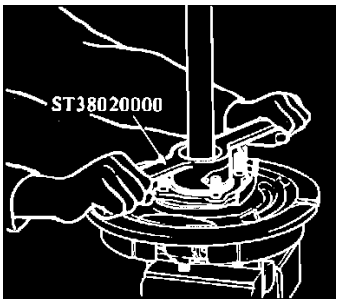


Fig. 1 Removing Rear Axle Bearing Locknut. Pickup Less Dual Rear Wheels

6. Support axle assembly in a vise, **Fig. 3,** and bend lock washer away from bearing locknut.
7. Remove bearing locknut using proper tool, **Fig. 3.**

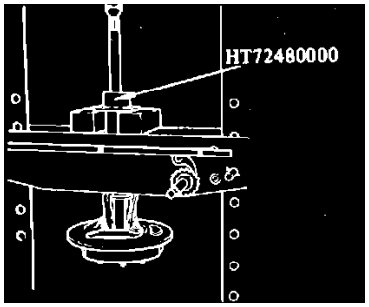


Fig. 1 Removing rear axle shaft. Exc. independent suspension (Typical)

8. Remove wheel bearing, bearing cage and backing plate from axle using tool as shown in **Fig. 1.**
9. Replace oil seal in bearing cage.
10. Place bearing cage and backing plate assembly and bearing spacer on axle shaft. Install bearing cone using a brass drift.

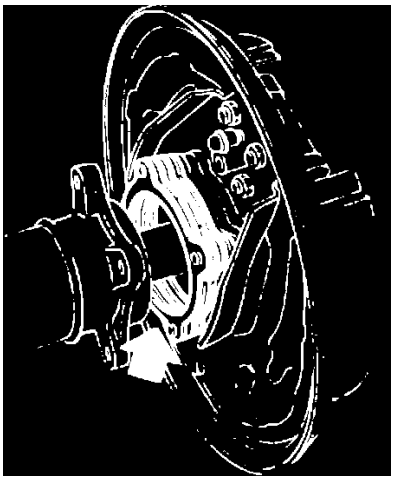


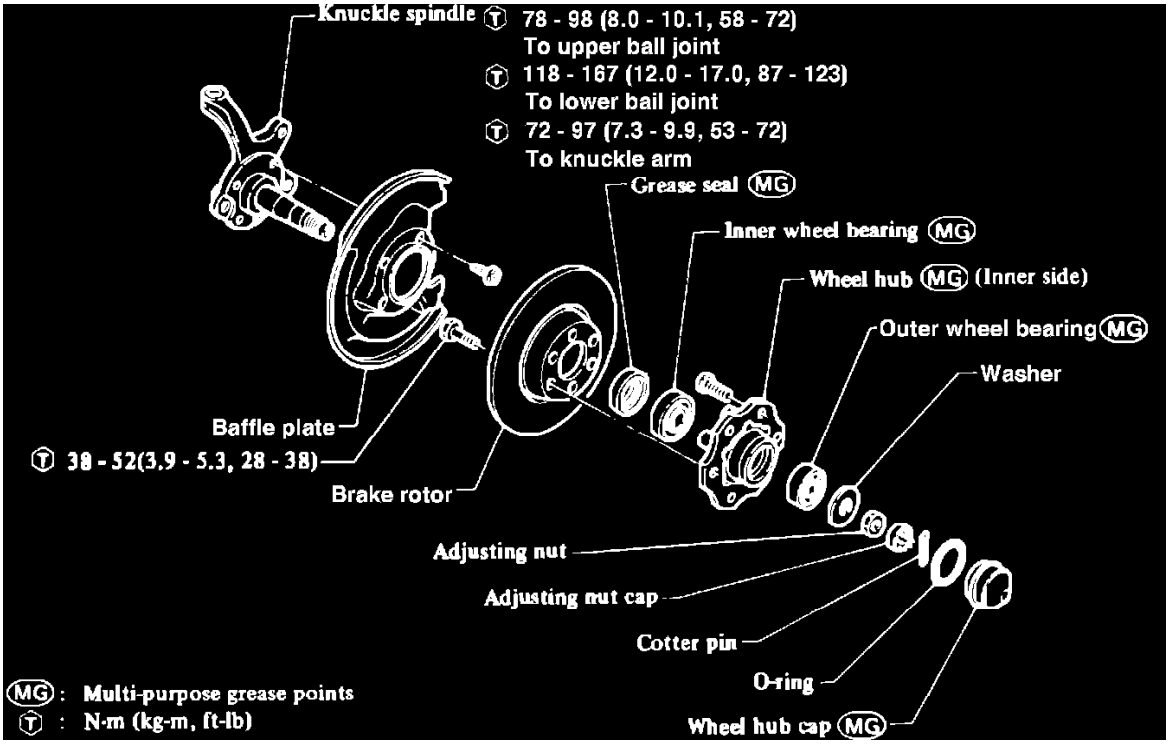
Fig. 4 Rear axle bearing installation. Pickup less dual rear wheels

11. Adjust axle endplay to specification in ``Rear Axle Specification" chart by applying case end shims, **Fig. 4.**
12. To install axle, reverse removal procedure.

Axle Shaft: Service and Repair
Pickup W/Dual Rear Wheels

1. Raise and support rear of vehicle and remove rear wheels.
2. Disconnect parking brake cable and brake hydraulic line. Plug end of hydraulic line to prevent fluid loss and contamination.
3. Remove backing plate-to-axle housing attaching nuts, then the brake drum.
4. Slide axle shaft out of axle housing.
5. Unfasten lock washer from rear wheel bearing nut.
6. Remove rear wheel bearing nut, inner bearing outer race, grease seal and outer bearing outer race. Discard grease seal.
7. Reverse procedure to install. Adjust axle endplay to specifications in ``Rear Axle Specifications'' chart.

Wheel Bearing: Service and Repair
Hub, Rotor and Wheel Bearing



Exploded View 2WD

2WD PICKUP

Removal

1. Block rear wheels, then raise and support vehicle.
2. Remove wheel and tire assembly.
3. Remove caliper.
4. Remove wheel hub and wheel bearing, **Fig. 22.**
5. Remove cotter pin, adjusting cap and wheel bearing nut.
6. Remove wheel hub and rotor.
7. Separate outer wheel bearing inner race and washer.
8. Separate rotor from hub assembly.
9. Remove inside wheel bearing outer race, grease seal and outside wheel bearing outer race.
10. Remove spindle and arm.

Inspection

Inspect all removed components for excessive wear and/or damage. Replace worn and/or damaged components as required. Lubricate all components using suitable grease.

Installation

Reverse procedure to install. Adjust wheel bearing preload as follows:

1. Tighten wheel bearing locknut to 25-29 ft. lbs.
2. Turn wheel hub several times in both directions to seat wheel bearing correctly.
3. Again tighten tighten bearing locknut to 25-29 ft. lbs.
4. Turn back wheel bearing locknut 45°.
5. Install adjusting cap and a new cotter pin. Align cotter pin slot by loosening nut approximately 15° or less. **Do not exceed 15°.**
6. Measure wheel bearing preload and axial endplay. Axial endplay should be 0 inch (as measured at the wheel hub bolt). With a new grease installed, preload obtained should be 2.2-6.4 lbs. With a used grease seal installed, preload obtained should be 2.2-5.3 lbs.
7. Repeat steps 1 through 6 until correct bearing preload is obtained.

Wheel Bearing: Service and Repair
Locking Hub

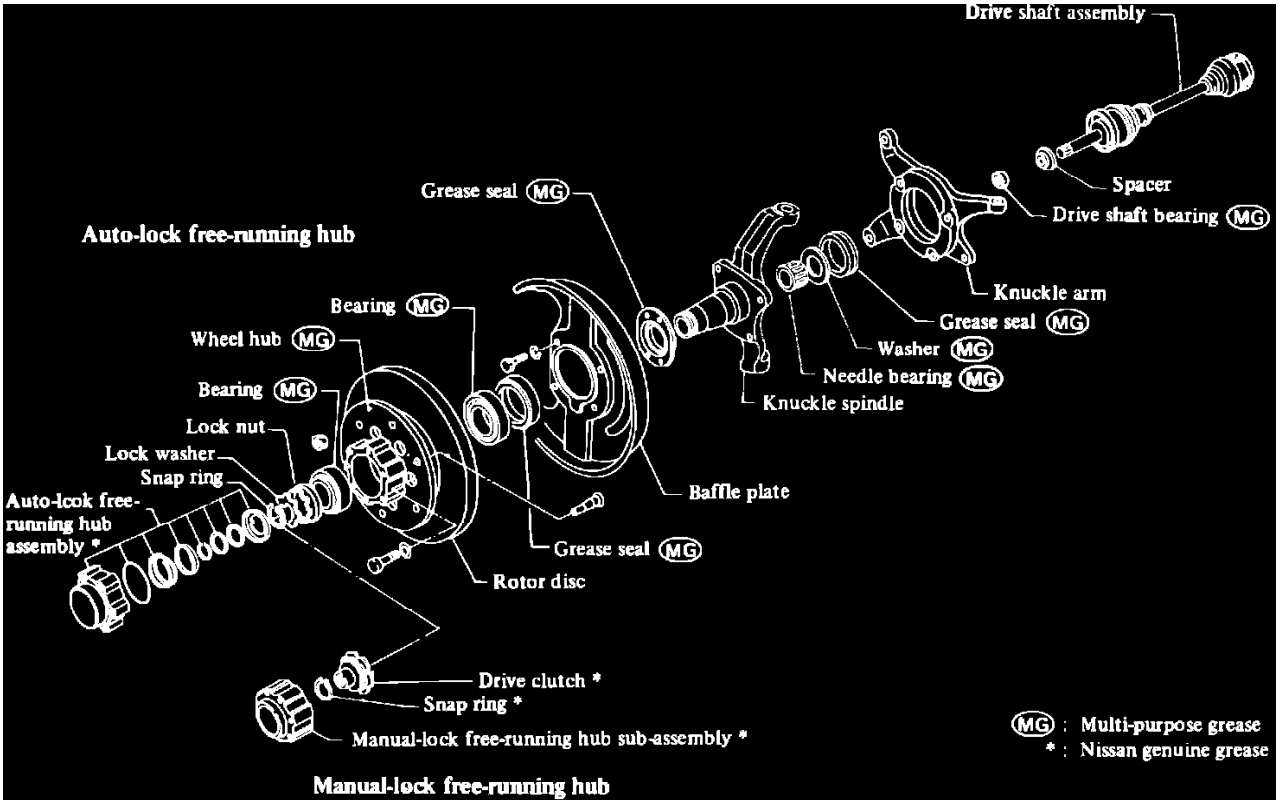


Fig. 2 Front axle exploded view. 1985-86 4WD Pickup

1. Raise and support front of vehicle.
2. Support axle case with a suitable jack and remove wheel and tire assembly.
3. Remove locking hub attaching bolts and the hub, **Fig. 2.**
4. On models with manual hub, remove snap ring and drive clutch, then the second snap ring, lock washer and wheel bearing locknut, **Fig. 2.**

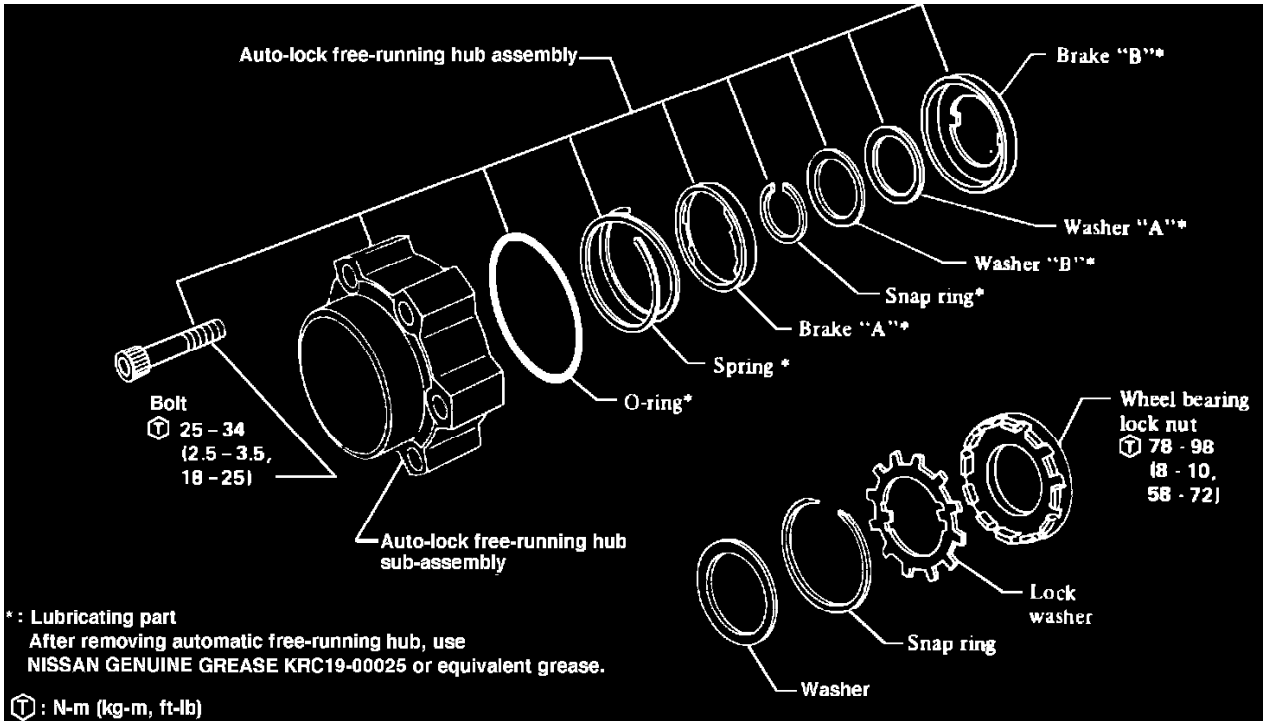


Fig. 3 Exploded view of automatic locking hub assembly. 1985-88 4WD Pickup

5. On models with automatic hub, proceed as follows:
   a. Remove washers and snap ring, **Fig. 3.**
   b. Remove large snap ring, lock washer and wheel bearing locknut.

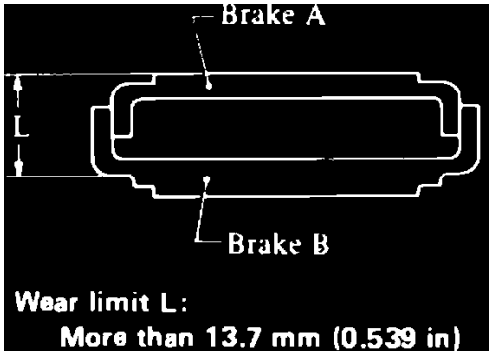


Fig. 4 Typical brake set thickness measurement. Models w/automatic locking hub

6. Reverse procedure to assemble and install. On automatic hub, ensure brake A and B set does not measure less than .539 inch thick, **Fig. 4.**

Wheel Bearing: Service and Repair
Hub, Bearing & Knuckle

REMOVAL

1. Raise and support front of vehicle and remove wheel.
2. Disconnect brake caliper assembly and position aside. Do not allow brake line to support weight of caliper.
3. Remove locking hub assembly as outlined.
4. On 1984-86 models, disconnect tie rod using suitable tool.
5. On all models, support lower control arm with suitable jack to relieve spring tension, then remove steering knuckle to knuckle arm attaching bolt.
6. Remove upper and lower ball joint-to-link attaching nuts.
7. Separate steering knuckle from upper and lower links, then remove knuckle and hub assembly from vehicle.

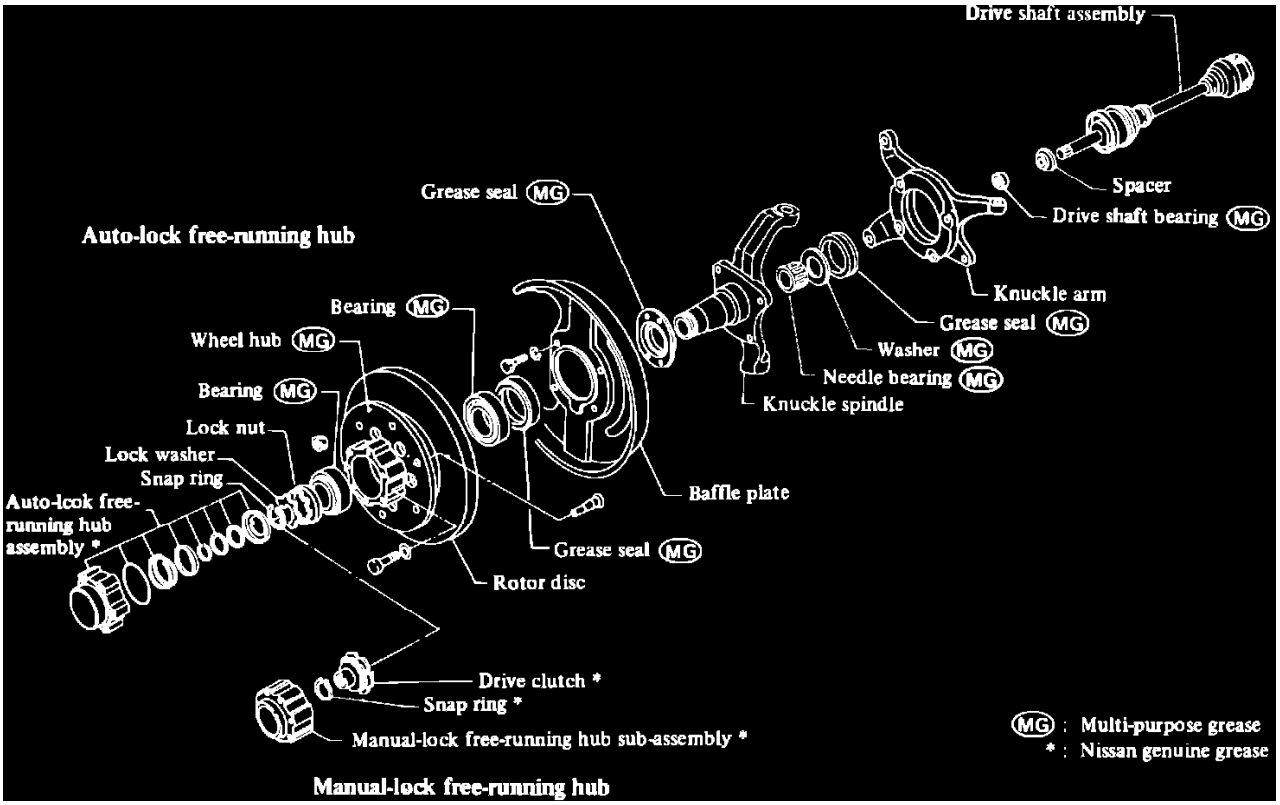


Fig. 2 Front axle exploded view. 1985-86 4WD Pickup

DISASSEMBLY & INSPECTION

1. Remove snap ring, lock washer and front wheel locknut, **Fig. 2.**

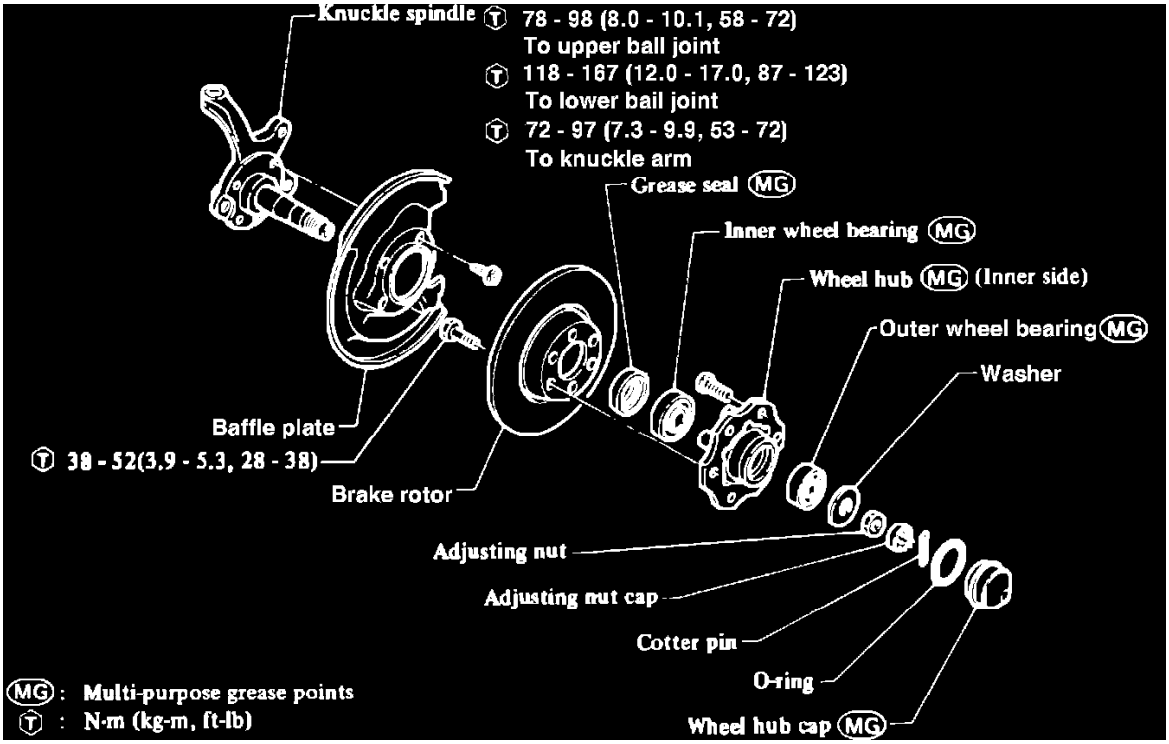
2. Separate hub from steering knuckle.
3. Scribe matching marks between hub and rotor, then separate rotor from hub.
4. Remove and discard inner grease seal from back plate.
5. Remove inner wheel bearing using a suitable drift.
6. Clean bearing with suitable solvent and dry with compressed air.
7. Inspect components for wear or damage and replace as necessary. Check wheel hub and steering knuckle for cracks by magnetic particle or penetrating dye test method.

ASSEMBLY & INSTALLATION

Assemble wheel hub and steering knuckle in reverse order of disassembly. During assembly and installation, note the following:

1. Install rotor aligning matching marks, then torque bolts to 36-51 ft. lbs. on 1984-86 models.
2. Install wheel hub and steering knuckle in reverse order of removal.
3. Adjust wheel bearing preload as outlined under ``Wheel Bearings, Adjust."
4. When installing locking hub, select snap ring which will provide .004-.012 inch endplay at drive axle.

Wheel Hub: Service and Repair



Exploded View 2WD

2WD PICKUP

Removal

1. Block rear wheels, then raise and support vehicle.
2. Remove wheel and tire assembly.
3. Remove caliper.
4. Remove wheel hub and wheel bearing, **Fig. 22.**
5. Remove cotter pin, adjusting cap and wheel bearing nut.
6. Remove wheel hub and rotor.
7. Separate outer wheel bearing inner race and washer.
8. Separate rotor from hub assembly.
9. Remove inside wheel bearing outer race, grease seal and outside wheel bearing outer race.
10. Remove spindle and arm.

Inspection

Inspect all removed components for excessive wear and/or damage. Replace worn and/or damaged components as required. Lubricate all components using suitable grease.

Installation

Reverse procedure to install. Adjust wheel bearing preload as follows:

1. Tighten wheel bearing locknut to 25-29 ft. lbs.
2. Turn wheel hub several times in both directions to seat wheel bearing correctly.
3. Again tighten tighten bearing locknut to 25-29 ft. lbs.
4. Turn back wheel bearing locknut 45°.
5. Install adjusting cap and a new cotter pin. Align cotter pin slot by loosening nut approximately 15° or less. **Do not exceed 15°.**
6. Measure wheel bearing preload and axial endplay. Axial endplay should be 0 inch (as measured at the wheel hub bolt). With a new grease installed, preload obtained should be 2.2-6.4 lbs. With a used grease seal installed, preload obtained should be 2.2-5.3 lbs.
7. Repeat steps 1 through 6 until correct bearing preload is obtained.

Propeller Shaft: Service and Repair

REMOVAL

1. Raise and support front of vehicle and remove wheel.
2. Remove locking hub assembly as outlined.
3. Remove lower ball joint attaching nuts and shock absorber lower mounting bolt.
4. Remove bolts securing driveshaft to differential carrier, then the driveshaft assembly from vehicle. Do not remove boots. **Turn steering wheel fully to the left when removing left hand driveshaft, or fully to the right when removing right hand driveshaft.**

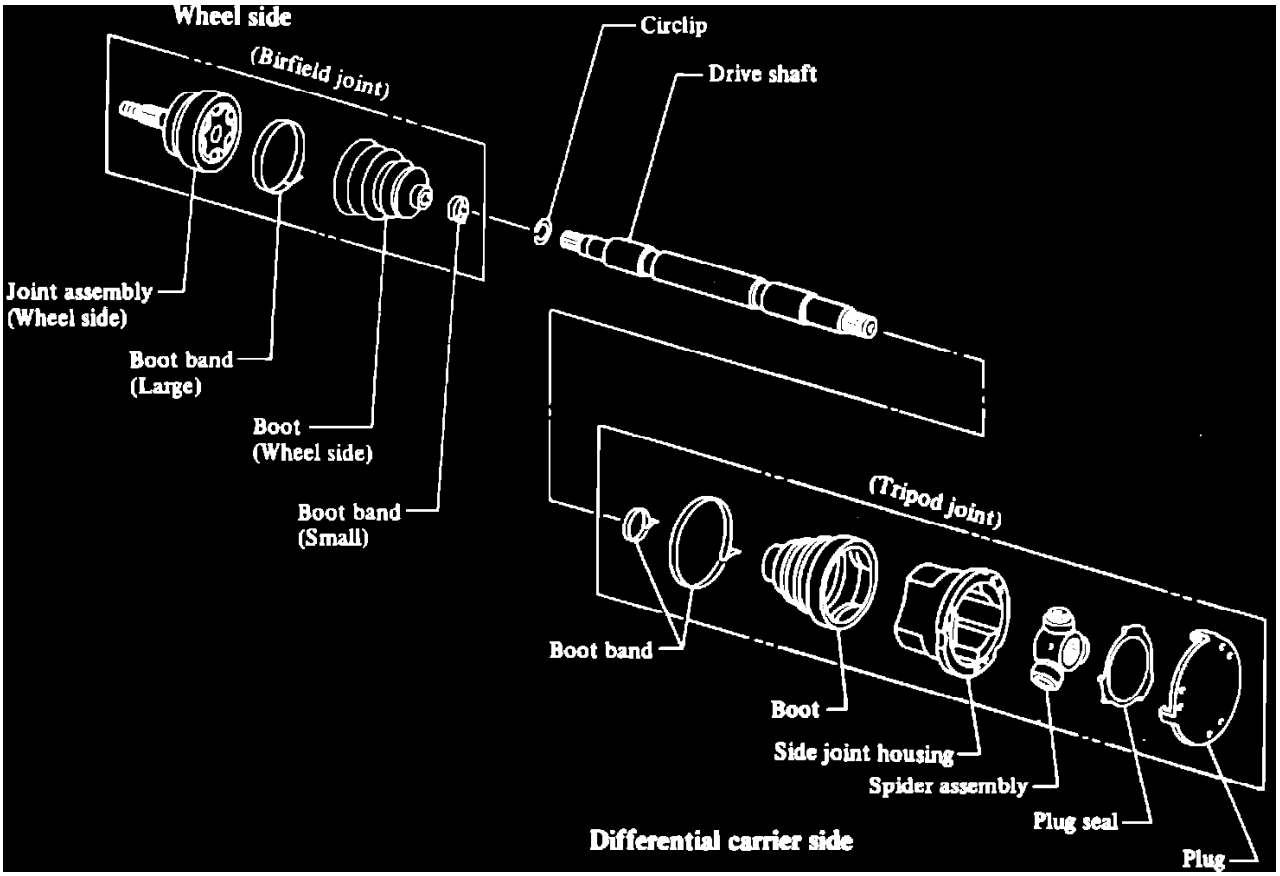


Fig. 6 Driveshaft exploded view. Pathfinder & 4WD Pickup

DISASSEMBLY

1. Install driveshaft in suitable soft-jawed vise.
2. Remove plug, then the plug seal, **Fig. 6.**
3. Remove and discard boot bands.
4. Move boot and the slide joint housing toward wheel side of driveshaft and scribe an alignment mark on the spider assembly and shaft.
5. Remove spider assembly from shaft, using suitable press.
6. Remove boot and boot bands.
7. Disassemble wheel side of driveshaft as follows:
   a. Remove and discard boot bands.
   b. Scribe an alignment mark on driveshaft and joint assembly for assembly reference.
   c. Remove joint assembly and boot from driveshaft, **Fig. 6.**

INSPECTION

1. Clean all components in suitable solvent and dry with compressed air.
2. Inspect all components for wear or damage and replace parts as necessary.

ASSEMBLY

1. On 1984-88 models, assemble wheel side of driveshaft as follows:
   a. Install boot and new small boot band onto driveshaft.
   b. Install joint assembly with new circlip and gently tap into position. Ensure reference marks made during disassembly are aligned.

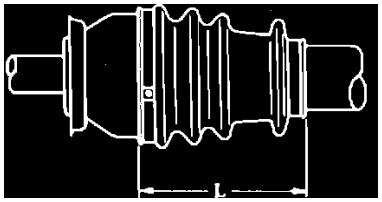


Fig. 7 Driveshaft outer boot installation. Pathfinder & 4WD Pickup

2. On all models, pack joints with suitable grease, then install boot and new large boot band on wheel side of shaft. Adjust boot length L, **Fig. 7**, to 3.82 inches on 1984-86 models or 3.78-3.86 inches on 1986-1/2-88 models.
3. Install boot, new boot bands and slide joint housing onto driveshaft.
4. Install driveshaft in suitable soft-jawed vise.
5. Install spider assembly, referring to alignment mark made during disassembly.
6. Caulk serrations of driveshaft equally at three places, then pack spider assembly with suitable grease. **Do not caulk areas which were previously caulked. Make sure that each caulking is applied to two serrations and is at least .04 inch wide.**
7. Install new large boot band, then the plug seal and plug.
8. Caulk plug at three places using dummy bolts.

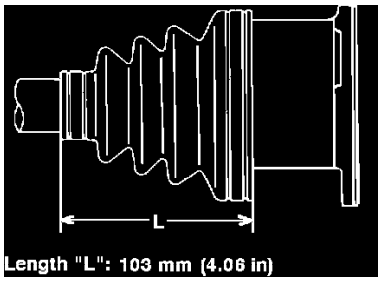


Fig. 8 Driveshaft inner boot installation. Pathfinder & 4WD Pickup

9. Adjust boot length L, **Fig. 8,** to 4.06 inches, on 1984 models, 3.58 inches on 1985-86 carbureted models, 3.98 inches on 1986 fuel injected models or 4.02-4.09 inches on 1986-1/2-88 models.

INSTALLATION

1. Apply suitable grease to copper portion of wheel bearing support.
2. Install spacer on driveshaft with concave side facing shaft.
3. Reverse removal procedure to install shaft, then check endplay using suitable dial indicator.
4. Select snap ring of correct thickness to adjust driveshaft endplay to .004-.012 inch.

Vehicle: Specifications

Standard Battery, Canada

Standard Battery, Canada

BCI Group Number	25
Cranking Performance	435 A

Standard Battery, Except Canada

Standard Battery, Except Canada

BCI Group Number	25
Cranking Performance	380 A

Optional Battery, Except Canada

Optional Battery, Except Canada

BCI Group Number	25
Cranking Performance	435 A

Engine	Year	Sensor	Resistance Ohms @ deg. F/C
VG30	1984-89	Fuel	800-10,000 @ 14/–10 2300-2700 @ 68/20 700-900 @ 122/50 300-330 @ 176/80
CA18 Turbo, CA20	1984-89	Manifold Air	8000-10,000 @ 14/–10 2300-2700 @ 68/20 700-900 @ 122/50 300-330 @ 176/80
E15 Turbo, E16 2V All, Z20, L24, KA24	1981-90	Manifold Air	7000-11,400 @ 14/–10 2100-2900 @ 68/20 680-1000 @ 122/50 250-400 @ 176/80
All, as equipped	1987-90	Exhaust Gas	77,000-94,000 @ 212/100

Fig. 2 Temperature Sensors

Engine	Year	Windings	Resistance (ohms)
A12A Canada	1981-82	Primary	1.08-1.32
		Secondary	8200-12,400
MA12	1984-85	Primary	1.00-1.30
		Secondary	7300-11,000
Z20, Z22	1981-82	Primary	1.04-1.27
		Secondary	7300-11,000
Z20	1983-86	Primary	0.84-1.02
		Secondary	8300-12,600
E15, E16	1981-86	Primary	1.04-1.27
		Secondary	7300-11,000
E16, GA16	1987-89	Primary	0.84-1.02
		Secondary	8200-12,400
Z24 2V	1984-86	Primary	1.05-1.27
		Secondary	8400-12,600
Z24 FI	1986	Primary	0.8-1.0
		Secondary	7600-11,400

Resistance (ohms @ 68° F or 20° C).

Fig. 2 Ignition Coil Specifications

Engine	Year	Sensor	Resistance Ohms @ deg. F/C
VG30	1984-89	Fuel	800-10,000 @ 14/–10 2300-2700 @ 68/20 700-900 @ 122/50 300-330 @ 176/80
CA18 Turbo, CA20	1984-89	Manifold Air	8000-10,000 @ 14/–10 2300-2700 @ 68/20 700-900 @ 122/50 300-330 @ 176/80
E15 Turbo, E16 2V All, Z20, L24, KA24	1981-90	Manifold Air	7000-11,400 @ 14/–10 2100-2900 @ 68/20 680-1000 @ 122/50 250-400 @ 176/80
All, as equipped	1987-90	Exhaust Gas	77,000-94,000 @ 212/100

Fig. 2 Temperature Sensors

Engine	Year	Resistance (ohms)	Air Gap (in./mm)
All w/EI ex. Hall Effect	1981-86	—	.012-.020/.30-.50
MA12	1984-85	970-1170	—

Fig. 4 Distributor Pickup Specifications

Manual Transmission

Manual Transmission

Non-California Models	Starter Number	S114-426
	Brush Spring Tension	71 oz

	Free Speed Test Note: Maximum amps. Minimum RPM. At 12 Volts.	60 A at 7000 rpm
California Models	Starter Number	S114-348
	Brush Spring Tension	71 oz
	Free Speed Test Note: Maximum amps. Minimum RPM. At 12 Volts.	60 A at 7000 rpm
1986 1/2 Models	Starter Number	S114-304 Or S114-446
	Brush Spring Tension	64 oz
	Free Speed Test Note: Maximum amps. Minimum RPM. At 12 volts.	100 A at 3900 rpm

Automatic Transmission

Automatic Transmission

Non-California Models	Starter Number	S114-427
	Brush Spring Tension	71 oz
	Free Speed Test Note: Maximum amps. Minimum RPM. At 12 Volts.	60 A at 6000 rpm
California Models	Starter Number	S114-295
	Brush Spring Tension	71 oz
	Free Speed Test Note: Maximum amps. Minimum RPM. At 12 Volts.	60 A at 6000 rpm
1986 1/2 Models	Starter Number	S114-304 Or S114-446
	Brush Spring Tension	64 oz
	Free Speed Test Note: Maximum amps. Minimum RPM. At 12 volts.	100 A at 3900 rpm

System Operating Voltage

System Operating Voltage

Voltage Setting	14.4-15 V at 68 deg F Note: Test Temperature

	1986	1986 1/2
Caster Angle	+ 5/6 to +1 5/6 deg	- 2/15 to + 13/15 deg
Caster Angle Desired	+1 1/3 deg	+ 1/2 deg
Camber Angle	0 to +1 deg	- 1/12 to + 11/12 deg
Camber Angle Desired	+ 1/2 deg	+ 1/2 deg
Toe	Note: Radial tires, .08-.16 in.; bias tires, .20-.28 in.	Note: Radial tires, .08-.16 in.; bias tires, .16-.24 in.
King Pin Inclination	+9 in	+9 1/12 in

Band, A/T

Brake Band Adjustment

Torque Servo Piston Stem to: ..... 12 - 15 N.m (9 - 11 ft-lb)
Back off ..... Two Complete Turns
Torque Locknut to: ..... 20 N.m (14 ft-lb)

Air Bleeder Screw	5 - 7 ft.lb

Maximum Inner Diameter	Single Rear Wheels	10.06 in
	Dual Rear Wheels	8.72 in
Maximum Radial Runout		0.0047 in

Pad Minimum Thickness	0.079 in

GENERAL SPECIFICATIONS

Carburetor

Destination	California		Non-California			Canada		
Engine	Z24		Z24		Z20	Z24		
Class	2WD & 4WD	Camper	2WD & 4WD	Camper	M.P.G.	2WD	Camper	4WD
Carburetor model	2WD M/T & 4WD: DFP384-5 2WD A/T: DFP384-6	DFP384-13	2WD M/T & 4WD: DFP384-7 2WD A/T: DFP384-8	DFP384-22	DFP342-11	M/T: DCR384-7 A/T: DCR384-8	DCR384-16	DCR384-26
Outer diameter mm (in) Primary	34 (1.34)				32 (1.26)	34 (1.34)		
Secondary	38 (1.50)				34 (1.34)	38 (1.50)		
Large venturi diameter mm (in) Primary	25 (0.98)				24.1 (0.949)	25 (0.98)		
Secondary	35 (1.38)				32 (1.26)	35 (1.38)		
Main jet Primary	#94				#96	#107	#110	#111
Secondary	#170	#165	#170	#165	#155	#170		
Main air bleed Primary	#75				#95	#75		
Secondary	#60				#60	#60		
Slow jet Primary	#50				#48	#50		
Secondary	#100	#60	#100	#60	#100	#100		
Slow air bleed Primary	#145				#145	#175		
Secondary	#0				#0/#60	#0		
Power jet	—					#50	#40	
Solenoid controlled fuel orifice	#100					—		
Solenoid controlled slow air bleed	#220					—		

Nissan-Datsun Truck PL720 2WD L4-1952cc 2.0L SOHC (Z20)

Carburetor

	M/T	A/T
Fuel level adjustment mm (in) Top float position "H"	7.2 (0.283)	
Bottom float position "h"	1.5±0.2 (0.059±0.008)	
Fast idle adjustment (at 2nd cam step) Fast idle speed rpm	Z24: 2,400±200 Z20: 2,800±200	2,800±200
Gap between throttle valve and carburetor body mm (in)	Z24: 0.78±0.07 (0.0307±0.0028) Z20: 0.83±0.07 (0.0327±0.0028)	0.94±0.07 (0.0370±0.0028)
Vacuum break adjustment Gap between choke valve and carburetor body "R" mm (in)	U.S.A. Z24: 2.25±0.15 (0.0886±0.0059) [Below 5°C (41°F)] 3.40±0.30 (0.1339±0.0118) [Above 20°C (68°F)] Z20: 1.95±0.15 (0.0768±0.0059) [Below 5°C (41°F)] 3.42±0.30 (0.1346±0.0118) [Above 20°C (68°F)] Canada 2WD standard: 1.90±0.15 (0.0748±0.0059) [Below 5°C (41°F)] 2.62±0.30 (0.1031±0.0118) [Above 20°C (68°F)] 4WD & Camper: 2.00±0.15 (0.0787±0.0059) [Below 5°C (41°F)] 2.75±0.30 (0.1083±0.0118) [Above 20°C (68°F)]	
Choke unloader adjustment mm (in) Gap between choke valve and carburetor body	2.45±0.4 (0.0965±0.0157)	
Interlock opening of primary and secondary throttle valves mm (in)	Z24: 8.37±0.5 (0.3295±0.0197) Z20: 7.88±0.5 (0.3102±0.0197)	
Dashpot adjustment (without loading) rpm	1,800±200 (Except Canada)	1,500±200

		1986	1986 1/2
Carrier Type		Note: 2WD with single rear wheels, removable; 2WD with dual rear wheels and 4WD, integral.	Note: 4WD w/Z24i engine, integral; exc. 4WD w/Z24i engine, removable.
Ring Gear & Pinion Backlash	Method	Shim	Note: With VG30i engine, threaded adjuster; with Z24i engine, shim.
	Adjustment	Note: Differential carrier models R180 and C200, .005-.007; models H190A and H190-ML, .006-.008 in.	Note: VG30i engine, .006-.008 in.; Z24i engine, .005-.007 in.
Pinion Bearing Preload	Method	Note: Differential carrier model R180, solid spacer and washer; models C200,H190A and H190-ML, collapsible spacer.	Note: VG30i engine, Adjusting Spacer & Washer; Z24i engine, Collapsible Spacer.
	Adjustment	Note: Differential carrier models R180, 7.8-14.8 in lb.; models H190A and H190-ML,9.5-13.9 in lb.; model C200, 9.5-14.8 in lb.. All with seal installed.	Note: With seal installed: VG30i engine, 4.3-8.7 in lb.; Z24i engine w/2WD,9.5-13.9 in lb.; Z24i engine w/4WD, 9.5-14.8 in lb.
Differential Bearing Preload	Method	Shim	Note: With VG30i engine, threaded adjuster; with Z24i engine, shim.
	Adjustment	---	---

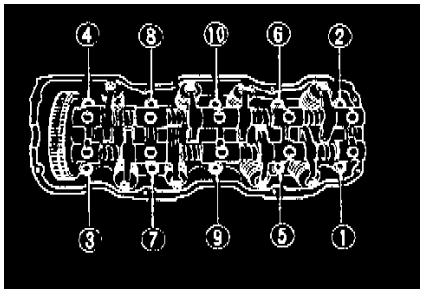
Distributor Advance

Distributor Advance

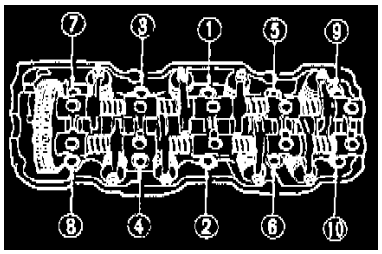
		D4R82-12	D4R82-24	D4N83-16	D4N84-04	D4N84-06
Centrifugal Advance	Advance Starts	0 deg at 700 rpm	0 deg at 700 rpm	0 deg at 600 rpm	0 deg at 500 rpm	0 deg at 650 rpm
	Intermediate Advance	5 deg at 1300 rpm	5 deg at 1300 rpm	---	4 deg at 1200 rpm	5 deg at 1200 rpm
	Full Advance	13 deg at 2200 rpm	13 deg at 2600 rpm	10.5 deg at 1900 rpm	6 deg at 2200 rpm	9.5 deg at 2400 rpm

Vacuum Advance	Vacuum to Start Plunger	9.3 in Hg	9.3 in Hg	2.76 in Hg	9.3 in Hg	2.76 in Hg
	Max. Advance	10 deg at 8.27 in hg	5.5 deg at 5.91 in hg	12.5 deg at 11.81 in hg	15 deg at 11.02 in hg	5 deg at 6.69 in hg
		D4N84-17	D4N84-18	D4N84-19	D4N85-01	D4N85-02
Centrifugal Advance	Advance Starts	0 deg at 600 rpm	0 deg at 600 rpm	0 deg at 600 rpm	0 deg at 650 rpm	0 deg at 650 rpm
	Intermediate Advance	---	---	---	7 deg at 1345 rpm	7 deg at 1345 rpm
	Full Advance	10.5 deg at 1900 rpm	10.5 deg at 1900 rpm	10.5 deg at 1900 rpm	9.5 deg at 2100 rpm	9.5 deg at 2100 rpm
Vacuum Advance	Vacuum to Start Plunger	2.76 in Hg	3.94 in Hg	2.76 in Hg	3.15 in Hg	3.15 in Hg
	Max. Advance	9.5 deg at 9.06 in hg	9.5 deg at 9.06 in hg	9.5 deg at 9.06 in hg	10 deg at 9.84 in hg	7.5 deg at 7.87 in hg

Torque Specifications



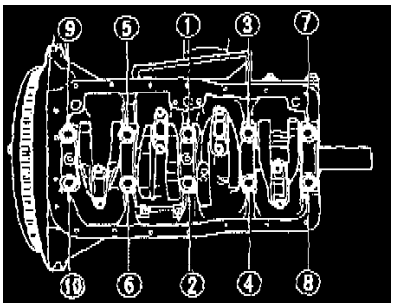
Cylinder Head Bolt Removal Sequence



Cylinder Head Bolt Torque Sequence

Tightening procedure:

1. Tighten all bolts to **29 Nm (22 ft-lb)**.
2. Tighten all bolts to **78 Nm (56 ft-lb)**.
3. Loosen all bolts completely.
4. Tighten all bolts to **29 Nm (22 ft-lb)**.
5. Tighten all bolts to **74 to 83 Nm (54 to 61 ft-lb)** or if you have an angle wrench, turn all bolts **90 to 95 degrees** clockwise.
   a. After engine has been operated for several minutes, retighten if necessary.
   b. When performing normal maintenance and inspection, first loosen each cylinder head bolt slightly, then tighten to a torque of **74 to 83 Nm**



Crankshaft Main Bearing Cap Bolt Torque Sequence

TIGHTENING TORQUE

Z20 & Z24

Unit		N·m	kg-m	ft-lb
Engine front side				
Front cover bolt	M8	10 - 16	1.0 - 1.6	7 - 12
	M6	4 - 10	0.4 - 1.0	2.9 - 7.2
Chain guide bolt		6 - 10	0.6 - 1.0	4.3 - 7.2
Chain tensioner bolt		6 - 10	0.6 - 1.0	4.3 - 7.2
Water pump bolt	M6	4 - 10	0.4 - 1.0	2.9 - 7.2
	M8	10 - 16	1.0 - 1.6	7 - 12
Crank pulley bolt		118 - 157	12 - 16	87 - 116
Engine right side				
Water inlet bolt		10 - 16	1.0 - 1.6	7 - 12
Water outlet bolt		10 - 16	1.0 - 1.6	7 - 12
Intake manifold bolt and nut		16 - 21	1.6 - 2.1	12 - 15
Alternator bracket bolt		39 - 59	4.0 - 6.0	29 - 43
Alternator to bracket bolt		36 - 50	3.7 - 5.1	27 - 37
Alternator to adjusting bar bolt		8 - 11	0.8 - 1.1	5.8 - 8.0
Engine mounting bracket bolt (Same for left side)		30 - 40	3.1 - 4.1	22 - 30
Carburetor nut		12 - 18	1.2 - 1.8	9 - 13

Unit	N·m	kg-m	ft-lb
Engine left side			
Distributor support bolt	4 - 8	0.4 - 0.8	2.9 - 5.8
Exhaust manifold bolt and nut	16 - 21	1.6 - 2.1	12 - 15
E.G.R. tube nut	34 - 44	3.5 - 4.5	25 - 33
E.A.I. tube nut	34 - 44	3.5 - 4.5	25 - 33
Air conditioner compressor bracket bolt	44 - 54	4.5 - 5.5	33 - 40
Engine top side			
Cylinder head bolt	Refer to Torque Sequence.		
Cylinder head to front cover bolt	4 - 8	0.4 - 0.8	2.9 - 5.8
Rocker shaft bracket bolt	15 - 25	1.5 - 2.5	11 - 18
Camshaft sprocket bolt	118 - 157	12 - 16	87 - 116
Rocker cover bolt	1 - 3	0.1 - 0.3	0.7 - 2.2
Spark plug	20 - 29	2.0 - 3.0	14 - 22
Rocker arm nut	16 - 22	1.6 - 2.2	12 - 16
Engine bottom side			
Main bearing cap bolt	44 - 54	4.5 - 5.5	33 - 40
Connecting rod big end nut	44 - 54	4.5 - 5.5	33 - 40
Oil strainer bolt	10 - 16	1.0 - 1.6	7 - 12
Oil pan bolt	5 - 7	0.5 - 0.7	3.6 - 5.1
Oil pan drain plug	20 - 29	2.0 - 3.0	14 - 22
Oil pump bolt	11 - 15	1.1 - 1.5	8 - 11
Gusset to cylinder block bolt	43 - 58	4.4 - 5.9	32 - 43
Engine rear side			
Flywheel bolt (M/T)	137 - 157	14.0 - 16.0	101 - 116
Drive plate bolt (A/T)	137 - 157	14.0 - 16.0	101 - 116

Bore	3.35 in.
Stroke	3.39 in.
Compression Ratio	9.4
Net Brake Horsepower	---
Net Torque	---

System Specifications

For torque specifications, refer to Engine Specifications.

See: Mechanical Specifications/Engine/System Specifications/Torque Specifications

Rod Bearing Clearance	.0005-.0021 in

Connecting Rod Cap Bolts	37 ft.lb

Main Cap Torque

Main Cap Torque

Main Bearing Cap Bolts	33-40 ft.lb

Rod Journal Diameter	1.9670-1.9675 in
Main Journal Diameter	2.3599-2.3604 in
Main Bearing Clearance	.0008-.0024 in
Crankshaft Endplay	.002-.007 in

Vibration Damper Or Pulley	109 ft.lb

System Specifications

For torque specifications, refer to Engine Specifications.
See: Mechanical Specifications/Engine/System Specifications/Torque Specifications

Intake	Hot	0.012 in
Exhaust	Hot	0.012 in

Valve Seat Angle	45 deg

Installed Height	Note: Inner, 1.38 in. ; outer, 1.57 in.
Valve Spring Pressure	Note: Inner, 57 lbs @ .98 in. ; outer, 115 lbs @ 1.18 in.

Valve Stem Clearance	Intake	.0008-.0021 in
	Exhaust	.0016-.0029 in
Valve Stem Diameter	Intake	.3136-.3142 in
	Exhaust	.3128-.3134 in
Valve Face Angle		45.5 deg

Belt Deflection

Belt Deflection

Deflection Limit	Alternator Belt	0.63 in
	A/C Compressor Belt	0.51 in

	P/S pump Belt	0.63 in
Adjusted Deflection	Alternator Belt	0.35-0.43 in
	A/C Compressor Belt	0.31-0.39 in
	P/S pump Belt	0.39-0.47 in

Drain Plug	14 - 22 ft.lb

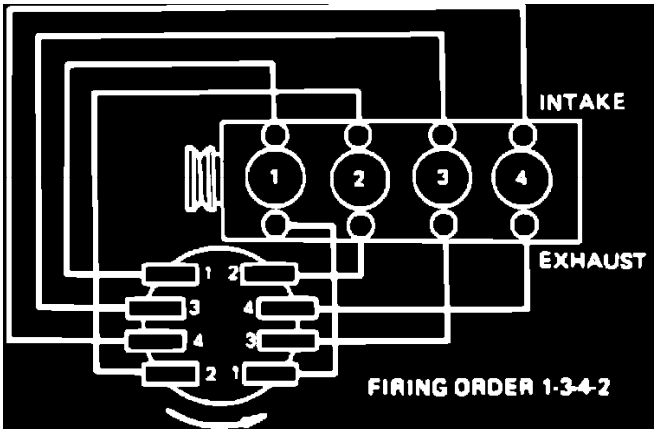
Intake Manifold

For torque specifications, refer to Engine Specifications.
See: Mechanical Specifications/Engine/System Specifications/Torque Specifications

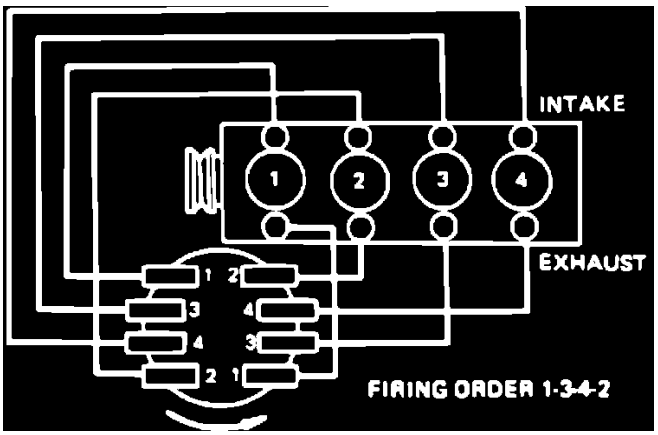
Oil Pan Attachment Bolts	4.4 ft.lb

Exhaust Manifold

For torque specifications, refer to Engine Specifications.
See: Mechanical Specifications/Engine/System Specifications/Torque Specifications



Firing Order



Firing Order

Measurement Specifications

Drive Plate Runout
Maximum ..... 0.5 mm (0.020 in)

Torque Specifications

For torque specifications, refer to Engine Specifications.
See: Mechanical Specifications/Engine/System Specifications/Torque Specifications

Flywheel to Crankshaft Bolts	109 ft.lb

YEAR	REFRIGERANT CAPACITY LBS	REFRIGERANT OIL			COMPRESSOR CLUTCH AIR GAP INCHES	CHARGING VALVE LOCATION HIGH / LOW	BELT TENSION mm / inches
		VISCOSITY	TOTAL SYSTEM CAPACITY OUNCES	COMPRESSOR OIL LEVEL			
82	2.20	2	3 6.10 4 5.10	1	3 .012-.020 4 .020-.031	—	8-12 5/16 - 9/16
83	2.20	2	5	1	6	—	10
84	2.40	2	8.50	1	.012-.024	—	10
85	2-2.40	2	8.50	1	.012-.024	—	10
86	2-2.40	2	8.50	1	.012-.024	—	9
87	2-2.40	2	8.50	1	.012-.024	7 / 8	7-9 9/32 - 3/8
88	1.8-2.0	500	6.80	1	.012-.024	7 / 8	7-9 9/32 - 3/8

1. Oil level cannot be checked refer to "TOTAL CAPACITY"
2. SUNISO 5GS or equivalent.
3. Diesel engine.
4. Gas engine.
5. Hitachi MJ167 Compressor, 5.10 oz.
   York VR470a Compressor, 6.10 oz.
6. Hitachi MJ167 Compressor, .020-.031 inches
   York VR470a Compressor, .012-.020 inches
7. In High pressure line
8. In Low pressure line
9. Z24 engines 8-10 mm or 3/16-7/16 inches
   VG30 engines 7-9 mm or 9/32-3/8 inches
10. Z engines 7-10 mm or 5/16-7/16 inches
    SD engines 8-12 mm or 5/16-9/16 inches

Fig. 5 Specifications

YEAR	REFRIGERANT CAPACITY LBS	REFRIGERANT OIL			COMPRESSOR CLUTCH AIR GAP INCHES	CHARGING VALVE LOCATION HIGH / LOW	BELT TENSION mm / inches
		VISCOSITY	TOTAL SYSTEM CAPACITY OUNCES	COMPRESSOR OIL LEVEL			
82	2.20	2	3 6.10 4 5.10	1	3 .012-.020 4 .020-.031	—	8-12 5/16 - 9/16
83	2.20	2	5	1	6	—	10
84	2.40	2	8.50	1	.012-.024	—	10
85	2-2.40	2	8.50	1	.012-.024	—	10
86	2-2.40	2	8.50	1	.012-.024	—	9
87	2-2.40	2	8.50	1	.012-.024	7 / 8	7-9 9/32 - 3/8
88	1.8-2.0	500	6.80	1	.012-.024	7 / 8	7-9 9/32 - 3/8

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6. Hitachi MJ167 Compressor, .020-.031 inches
   York VR470a Compressor, .012-.020 inches
7. In High pressure line
8. In Low pressure line
9. Z24 engines 8-10 mm or 3/16-7/16 inches
   VG30 engines 7-9 mm or 9/32-3/8 inches
10. Z engines 7-10 mm or 5/16-7/16 inches
    SD engines 8-12 mm or 5/16-9/16 inches

Fig. 5 Specifications

Manual Transmission	700 +/- 100 rpm

USA	5 +/- 2 deg BTDC

CANADA	5 +/- 2 deg BTDC

	Spark Plug Model No.	Spark Plug Gap
Intake Side	BPR6ES	0.031-0.035 in
Exhaust Side	BPR5ES	0.031-0.035 in

Vacuum Diaphragm, A/T

Vacuum Diaphragm Rod Selection

UNIT ..... mm (in)

Measured Depth **[1]** ..... Rod Length / Part Number
- Under 25.55 (1.0059) ..... 29.0 (1.142) / 31932-X0103
- 25.65 - 26.05 (1.0098 - 1.0256) ..... 29.5 (1.161) / 31932-X0104
- 26.15 - 26.55 (1.0295 - 1.0453) ..... 30.0 (1.181) / 31932-X0100
- 26.65 - 27.05 (1.0492 - 1.0650) ..... 30.5 (1.201) / 31932-X0102
- Over 27.15 (1.0689) ..... 31.0 (1.220) / 31932-X0101

[1] Refer to **Adjustments** for illustration of measured depth.

Wheel Fastener

1987-92 Pickup..... 87-108 ft/lbs
1987-92 Pathfinder..... 87-108 ft/lbs
1987-91 Pickup (Dual Wheels)..... 166-203 ft/lbs
1983-86 Pickup (Steel Wheels)..... 87-108 ft/lbs

At cranking speed, engine warm, throttle open.

Engine	Year	PSI	Maximum Variation PSI
A12, A14, A15	1981-82	178-192	*
MA12, E15, E16, GA16	1982-90	142-181	14
E15 Turbo	1983	158	*
CA16, CA18 DOHC	1987-89	156-185	14
CD17	1984-87	427-469	†
CA18 Turbo, CA20	1982-89	128-171	14
L24, L28	1981-84	128-171	*
LD28	1981-83	356-455	*
SD25	1983-87	356-427	*
Z20, Z22, Z24	1981-89	128-171	*
KA24 240SX	1989-90	142-192	14
KA24 Stanza, Axxess	1989-90	146-175	14
VG30 ex. Turbo	1984-89	128-179	14
Turbo	1984-89	121-169	14

* Lowest cylinder pressure must be more than 80% of highest cylinder pressure.
† Minimum pressure, 284 psi.

Fig. 2 Compression Pressure Specifications

Equipment Hookup & Adjustment Procedures

Preferred setting is the midpoint of ranges given.

With engine warm, turn idle speed adjusting screws to obtain specified rpm.

Allow engine to warm up, race engine several times. With Fuel Injection, disconnect fast idle control device (FICD). Adjust throttle screw to obtain

Carbureted

To set fast idle, open throttle valve and set to specified step of cam. Adjust fast idle screw to specification.

To set AC speed-up, turn AC on and set blower to high. Adjust speed-up device adjusting screw to specification.

		SLOW		FAST		
Engine/Model	Year	Man. Trans.	Auto. Trans.	Man. Trans.	Auto. Trans.	Step of Cam
Z20	1983	500-700	—	—	—	—
AC speed-up	1983	900	—			
Z20	1984-86	600-800	—	—	—	—
AC speed-up	1984-86	800-900	—			
SD22	1981	600	—	—	—	—
w/Power Steering	1981	700	—	—	—	—
SD22	1982-83	650-800	—	—	—	—
AC speed-up	1982-83	900	—			
Z20E	1981	650-850	600-800 D	—	—	—
AC speed-up†	1981	900	1000 N			
Z20S	1981	500-700	500-700 D	—	—	—
AC speed-up	1981	800	800 N			

Fig. 14 Idle Speed W/O Computer Control Specifications

		Pressure	
Engine	Year	PSI	RPM
Carburetted & TBI:			
All 2V	1981-87	2.8-3.8	idle
1597cc TBI	1987-88	14	idle
1597cc	1989-90	34	idle
2389cc (early)	1986	14	idle
(late)	1986-89	36	idle
2960cc TBI	1986-89	36	idle

All carburetted & TBI, measured at fuel inlet fitting on unit.

Fig. 7 Fuel System Pressure Specifications

		Pressure	
Engine	Year	PSI	RPM
Carburetted & TBI:			
All 2V	1981-87	2.8-3.8	idle
1597cc TBI	1987-88	14	idle
1597cc	1989-90	34	idle
2389cc (early)	1986	14	idle
(late)	1986-89	36	idle
2960cc TBI	1986-89	36	idle

All carburetted & TBI, measured at fuel inlet fitting on unit.

Fig. 7 Fuel System Pressure Specifications

Normal A/C System Pressures

Normal A/C System Pressures

	Ambient Temperature (F)	System Pressure
Normal High Side Pressure	80	150-170 psi
	90	175-195 psi
	95	185-205 psi
	100	210-230 psi

	105	230-250 psi
	110	250-270 psi

Release Pressure	13 psi

Opening Temperature	180 F

Fluid Capacity	5 7/8 qt (US) Note: Approximate, make final check with dipstick.

Fluid Capacity	5 7/8 qt (US) Note: Approximate, make final check with dipstick.

YEAR	REFRIGERANT CAPACITY LBS	REFRIGERANT OIL			COMPRESSOR CLUTCH AIR GAP INCHES	CHARGING VALVE LOCATION HIGH / LOW	BELT TENSION mm / inches
		VISCOSITY	TOTAL SYSTEM CAPACITY OUNCES	COMPRESSOR OIL LEVEL			
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83	2.20	2	5	1	6	—	10
84	2.40	2	8.50	1	.012-.024	—	10
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6. Hitachi MJ167 Compressor, .020-.031 inches
   York VR470a Compressor, .012-.020 inches
7. In High pressure line
8. In Low pressure line
9. Z24 engines 8-10 mm or 3/16-7/16 inches
   VG30 engines 7-9 mm or 9/32-3/8 inches
10. Z engines 7-10 mm or 5/16-7/16 inches
    SD engines 8-12 mm or 5/16-9/16 inches

Fig. 5 Specifications

Includes Engine and Reservoir Tank.

Manual Transmission	With Heater	10 3/4 qt (US)
	Without Heater	10 qt (US)
Automatic Transmission	With Heater	10 qt (US)

	Without Heater	9 1/4 qt (US)

Rear (H190)	USA	2 5/8 pt (US)
	CANADA	3 1/8 pt (US)
Dual Wheel Models (C200)		2 3/4 pt (US)

Rear (H190)	USA	2 5/8 pt (US)
	CANADA	3 1/8 pt (US)
Dual Wheel Models (C200)		2 3/4 pt (US)

Engine Oil

Gasoline engine..... **SG**
Diesel engine..... **SE/CC, SE/CD, SF/CC, SG/CD, CD**
CAPACITY, Refill:
Van..... **3.7 liters 3.9 quarts**
1984-85 Pickup:
2WD..... **3.6 liters 3.8 quarts**
4WD..... **3.8 liters 4.0 quarts**
Diesel..... **4.8 liters 5.1 quarts**
1986 early 4-cyl:
2WD..... **3.2 liters 3.4 quarts**
4WD..... **3.5 liters 3.7 quarts**
Diesel..... **4.8 liters 5.1 quarts**
1986 late-89 Pickup, Pathfinder:
4cyl:
2WD..... **3.3 liters 3.5 quarts**
4WD..... **3.8 liters 4.0 quarts**
V6:
2WD..... **3.6 liters 3.8 quarts**
4WD..... **3.0 liters 3.2 quarts**
1990-92:
2WD..... **3.5 liters 3.7 quarts**
4WD..... **2.9 liters 3.1 quarts**

Diesel..... **6.7 liters 7.1 quarts**

Capacity shown is without filter. When replacing filter, additional oil may be needed

Gasoline engines:

Above 50°F (10°C)..... 20W-40, 20W-50
Above 0°F (-18°C)..... 10W-30*, 10W-40
Below 60°F (16°C)..... 5W-30*, 10W-30
All temperatures..... 5W-30*

Diesel engines:

Above 32°F (0°C)..... 30
Above 20°F (-7°C)..... 15W-40
Above 0°F (-18°C)..... 10W-30*
Below 60°F (16°C)..... 5W-30*
*1986-89, 10W-30 preferred; 1990-92 5W-30 preferred

Fuel Tank Capacity	Note: Standard wheel base, 13 1/4 gals.; long wheel base,

	16 7/8 gals. Standard wheel base 4WD, 15 7/8 gals.; long wheel base 4WD 19 7/8 gals.

Refill Capacity	4.5 qt (US)

Refill Capacity	4.5 qt (US)

Refrigerant Type	R-12
Refrigerant Capacity	2.0-2.4 lb (US)

Refrigerant Oil Type	SUNISO 5GS
Refrigerant Oil Capacity	8.6 oz (US)

System Specifications

TYPE:
1986-89..... **GL-4**
1990-92..... **AF**

See the Transmission manual for viscosity
CAPACITY, Refill:
1984-861/2 Pickup..... **1.4 liters 3.0 pints**

19861/2-89 Pickup, Pathfinder..... **2.2 liters 4.8 pints**

1990-92 Pickup, Pathfinder..... **2.2 liters 4.8 pints**

Fluid - Transfer Case

TYPE:
1986-89..... **GL-4**
1990-92..... **AF**

See the Transmission manual for viscosity
CAPACITY, Refill:
1984-861/2 Pickup..... **1.4 liters 3.0 pints**

19861/2-89 Pickup, Pathfinder..... **2.2 liters 4.8 pints**

1990-92 Pickup, Pathfinder..... **2.2 liters 4.8 pints**

Fluid Type	Nissan Brake Fluid or DOT 3

Fluid Type	Nissan Brake Fluid or DOT 3

YEAR	REFRIGERANT CAPACITY LBS	REFRIGERANT OIL			COMPRESSOR CLUTCH AIR GAP INCHES	CHARGING VALVE LOCATION HIGH / LOW	BELT TENSION mm / inches
		VISCOSITY	TOTAL SYSTEM CAPACITY OUNCES	COMPRESSOR OIL LEVEL			
82	2.20	2	3 6.10 4 5.10	1	3 .012-.020 4 .020-.031	—	8-12 / 5/16 - 9/16
83	2.20	2	5	1	6	—	10
84	2.40	2	8.50	1	.012-.024	—	10
85	2-2.40	2	8.50	1	.012-.024	—	10
86	2-2.40	2	8.50	1	.012-.024	—	9
87	2-2.40	2	8.50	1	.012-.024	7 / 8	7-9 / 9/32 - 3/8
88	1.8-2.0	500	6.80	1	.012-.024	7 / 8	7-9 / 9/32 - 3/8

1. Oil level cannot be checked refer to "TOTAL CAPACITY"
2. SUNISO 5GS or equivalent.
3. Diesel engine.
4. Gas engine.
5. Hitachi MJ167 Compressor, 5.10 oz.
   York VR470a Compressor, 6.10 oz.
6. Hitachi MJ167 Compressor, .020-.031 inches
   York VR470a Compressor, .012-.020 inches
7. In High pressure line
8. In Low pressure line
9. Z24 engines 8-10 mm or 3/16-7/16 inches
   VG30 engines 7-9 mm or 9/32-3/8 inches
10. Z engines 7-10 mm or 5/16-7/16 inches
    SD engines 8-12 mm or 5/16-9/16 inches

Fig. 5 Specifications

Anti-Freeze	Ethylene Glycol Base

API Classification		API SF Grade

		Energy Conserving Oils.
Oil Viscosity	Temperatures Below 32 deg F	5w-30
	Temperatures Above 0 deg F	10w-30 or 10w-40

Recommended Fluid	Nissan ATF Or DEXRON ATF

Fluid Type	API GL-5
Viscosity	SAE 80w-90

Fluid Type	API GL-4
Fluid Viscosity	SAE 75w-90 Or 80w-90

Fluid Specifications-Combined

Fluid Specifications-Combined

Recommended Fluid	DEXRON II ATF

YEAR	REFRIGERANT CAPACITY LBS	REFRIGERANT OIL			COMPRESSOR CLUTCH AIR GAP INCHES	CHARGING VALVE LOCATION HIGH / LOW	BELT TENSION mm / inches
		VISCOSITY	TOTAL SYSTEM CAPACITY OUNCES	COMPRESSOR OIL LEVEL			
82	2.20	2	3 6.10 4 5.10	1	3 .012-.020 4 .020-.031	—	8-12 / 5/16 - 9/16
83	2.20	2	5	1	6	—	10
84	2.40	2	8.50	1	.012-.024	—	10
85	2-2.40	2	8.50	1	.012-.024	—	10
86	2-2.40	2	8.50	1	.012-.024	—	9
87	2-2.40	2	8.50	1	.012-.024	7 / 8	7-9 / 9/32 - 3/8
88	1.8-2.0	500	6.80	1	.012-.024	7 / 8	7-9 / 9/32 - 3/8

1. Oil level cannot be checked refer to "TOTAL CAPACITY"
2. SUNISO 5GS or equivalent.
3. Diesel engine.
4. Gas engine.
5. Hitachi MJ167 Compressor, 5.10 oz.
   York VR470a Compressor, 6.10 oz.
6. Hitachi MJ167 Compressor, .020-.031 inches
   York VR470a Compressor, .012-.020 inches
7. In High pressure line
8. In Low pressure line
9. Z24 engines 8-10 mm or 3/16-7/16 inches
   VG30 engines 7-9 mm or 9/32-3/8 inches
10. Z engines 7-10 mm or 5/16-7/16 inches
    SD engines 8-12 mm or 5/16-9/16 inches

Fig. 5 Specifications

Vehicle: Locations

A - Z Component List

Altitude: Forward RH Side of Engine Compartment
A.S.C.D.: Forward RH Side of Engine Compartment
A.S.C.D. Inhibitor: Forward RH Side of Engine Compartment
Auto-Choke: Rear RH Side Of Engine Compartment
Carburetor Heater: Forward RH Side of Engine Compartment
E.C.C.: Forward RH Side of Engine Compartment
Electronic Injection: Forward RH Side Of Engine Compartment
Fuel Pump: Rear RH Side Of Engine Compartment
Glow Plug: Rear RH Side Of Engine Compartment
Headlamp: On Fuse Panel Bracket
Heater: On Fuse Panel Bracket
Horn: Rear LH Side Of Engine Compartment
Inhibitor: Rear RH Side Of Engine Compartment
Power Window: On Fuse Panel Bracket

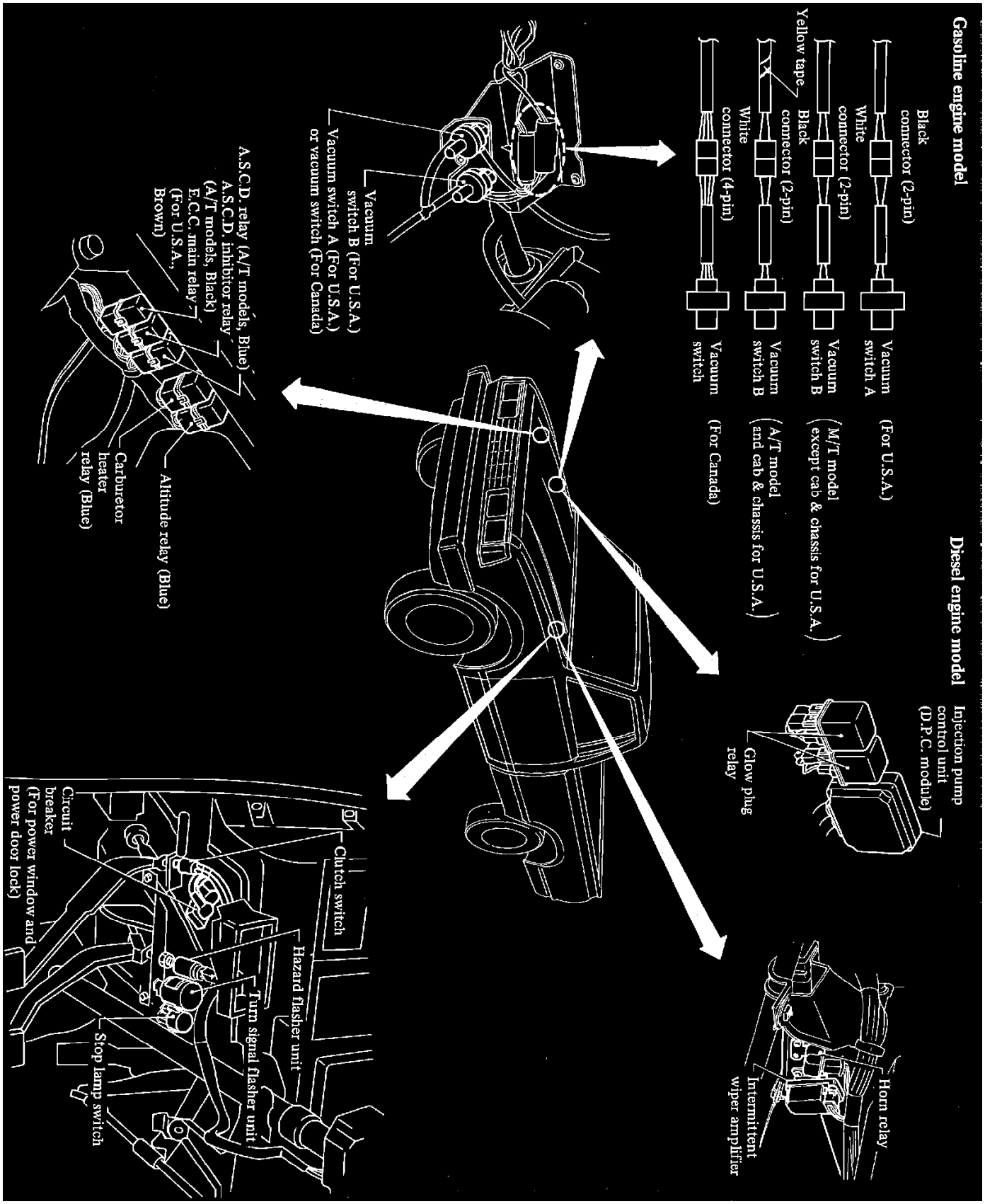


Fig. 438 Electrical Unit Locations (Engine Compartment). Exc. Fuel Injected Engine

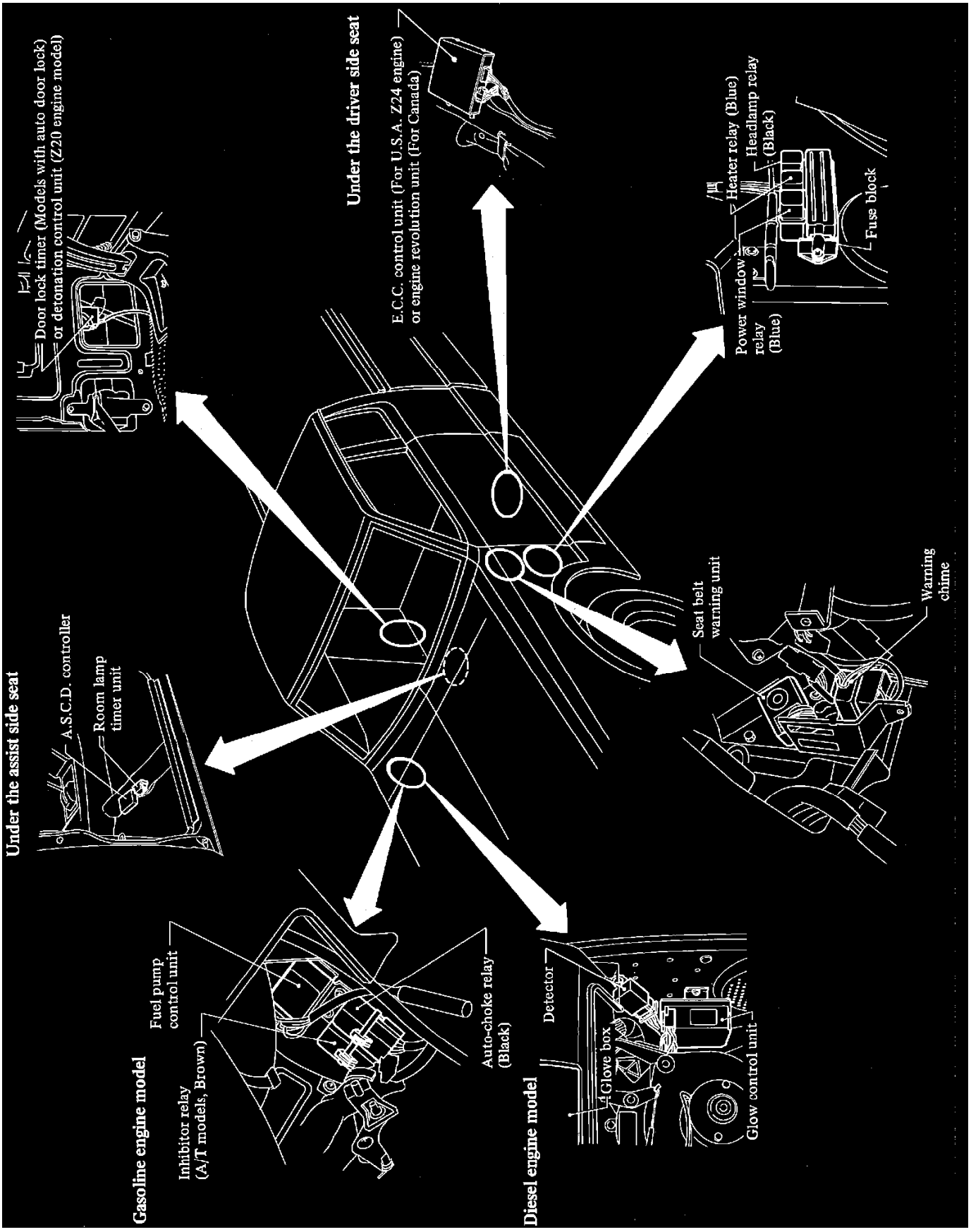
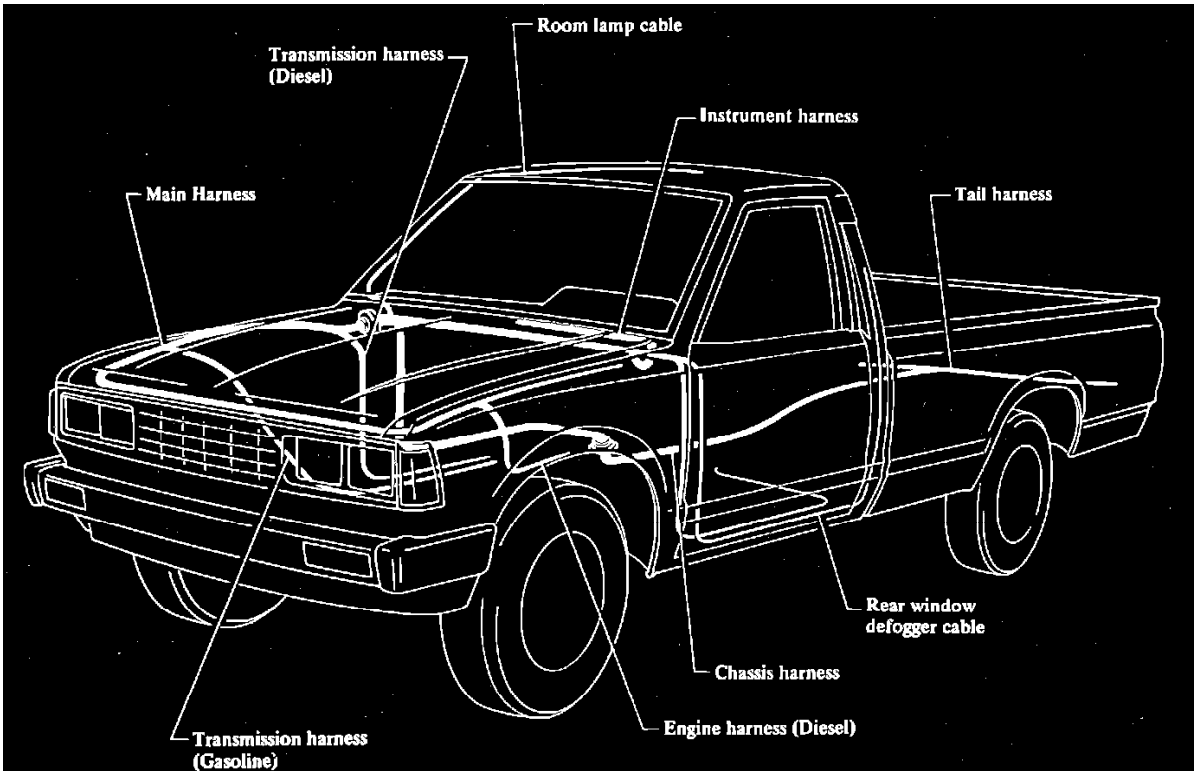


Fig. 439 Electrical Unit Locations (Passenger Compartment). Less Fuel Injected Engine

Harness Locations

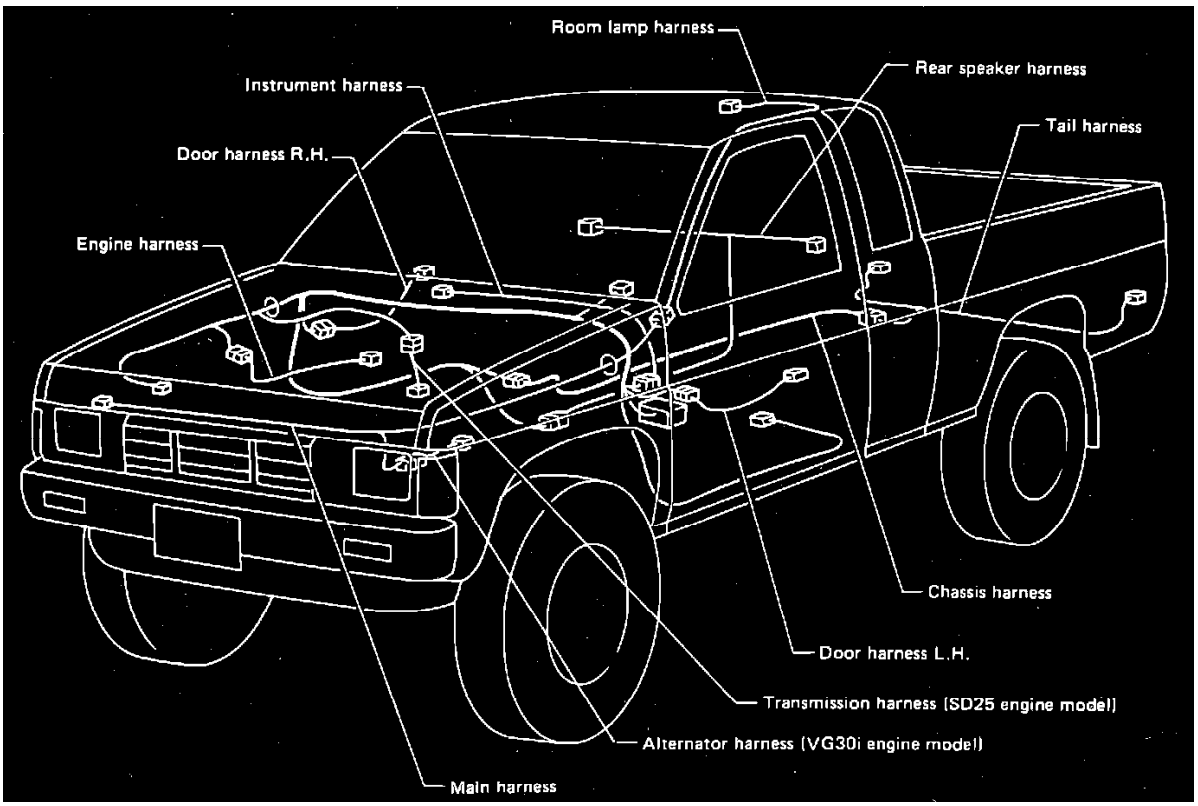
Nissan-Datsun Truck PL720 2WD L4-1952cc 2.0L SOHC (Z20)



Chassis Harness Sections.

On Chassis

Applicable to: 1982-86 Pickup

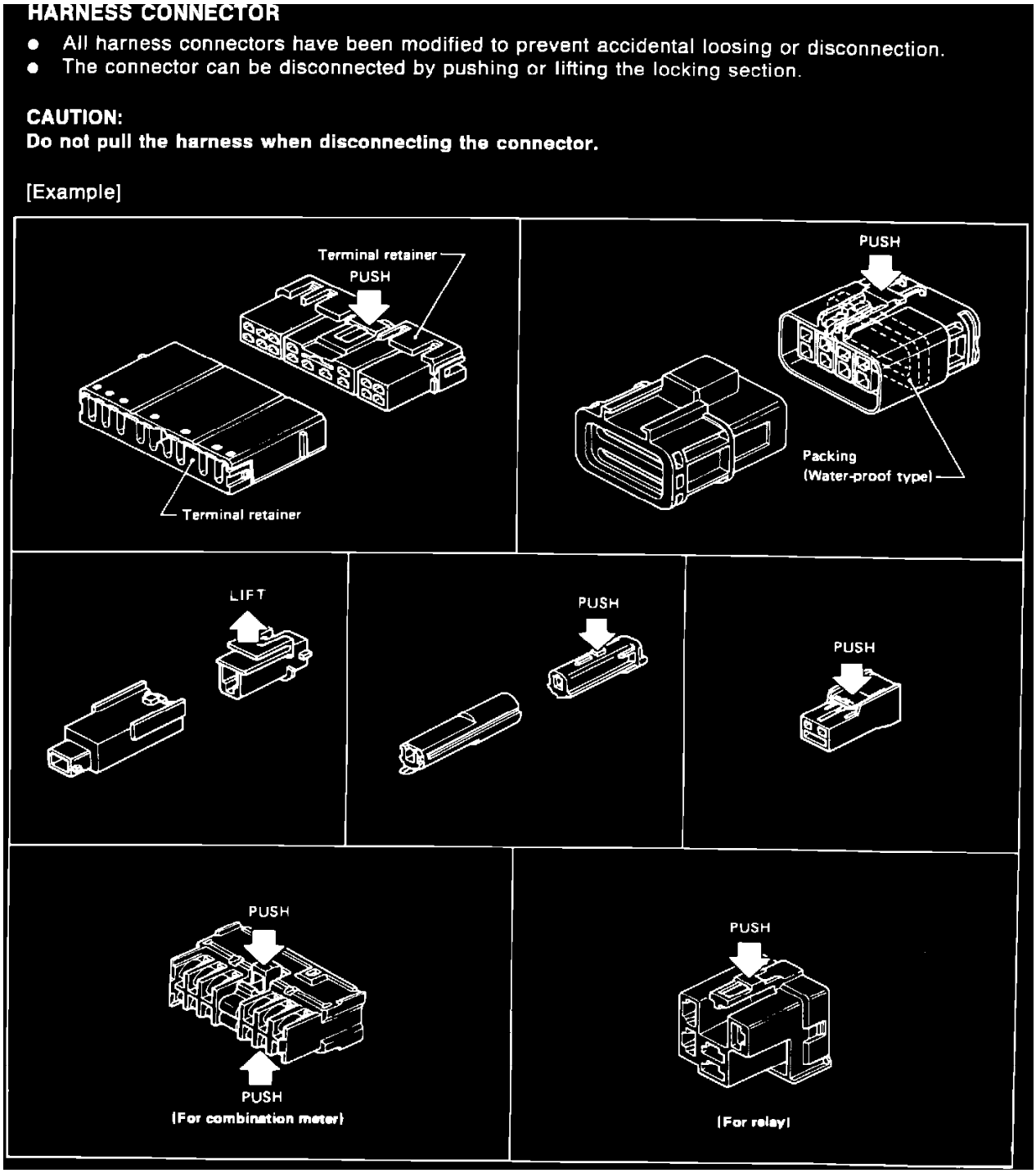


Chassis Harness Sections.

On Chassis

Applicable to: 1986(1/2) Pickup

Vehicle: Diagrams

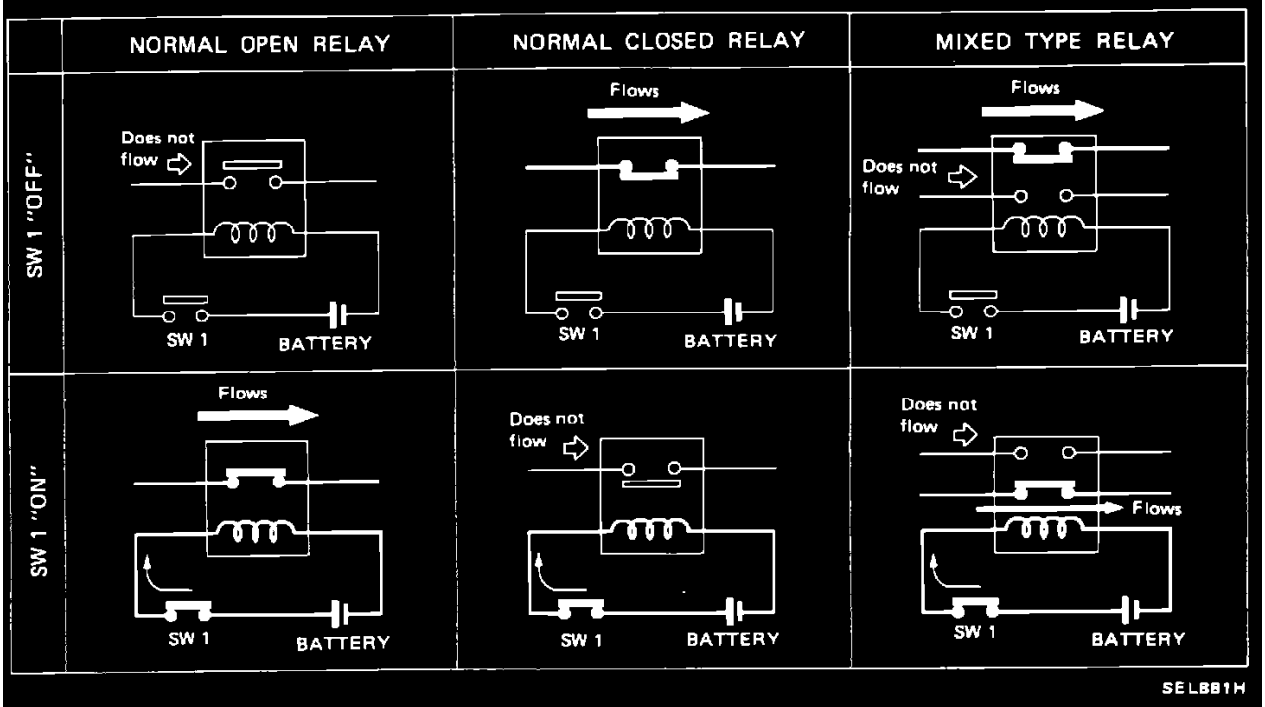


Connector Information

Description

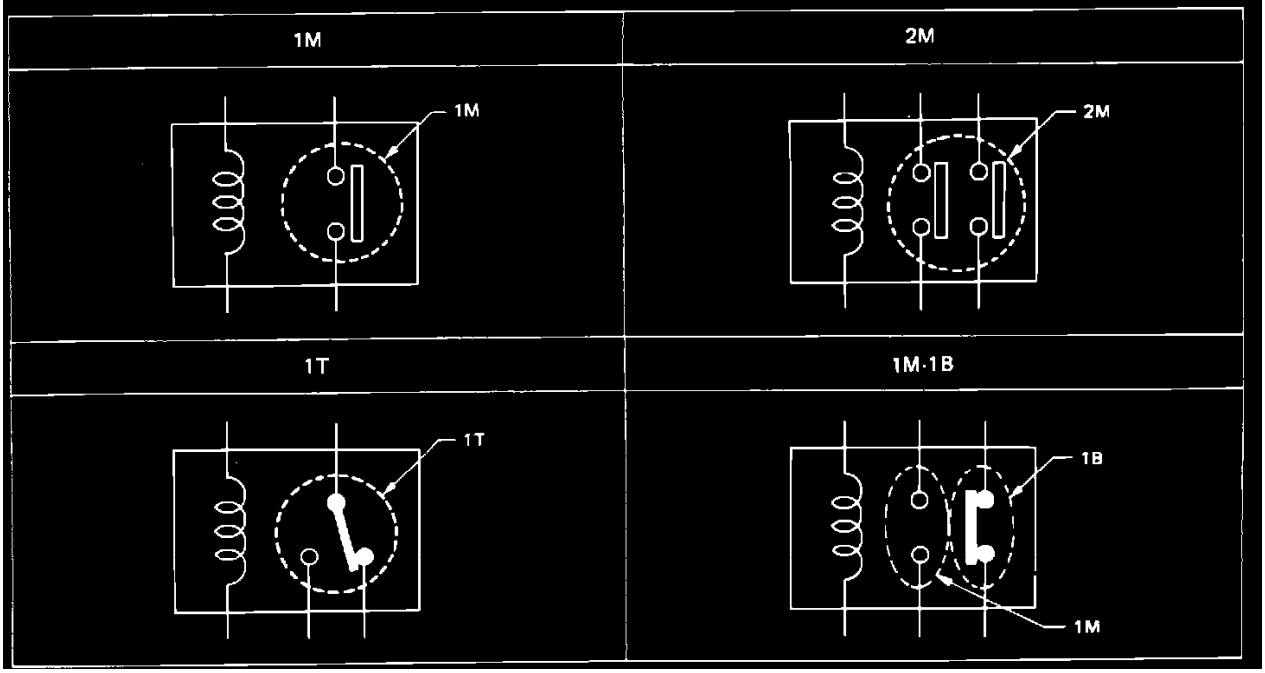
NORMAL OPEN, NORMAL CLOSED AND MIXED TYPE RELAYS

Relays can mainly be divided into three types: normal open, normal closed and mixed type relays.

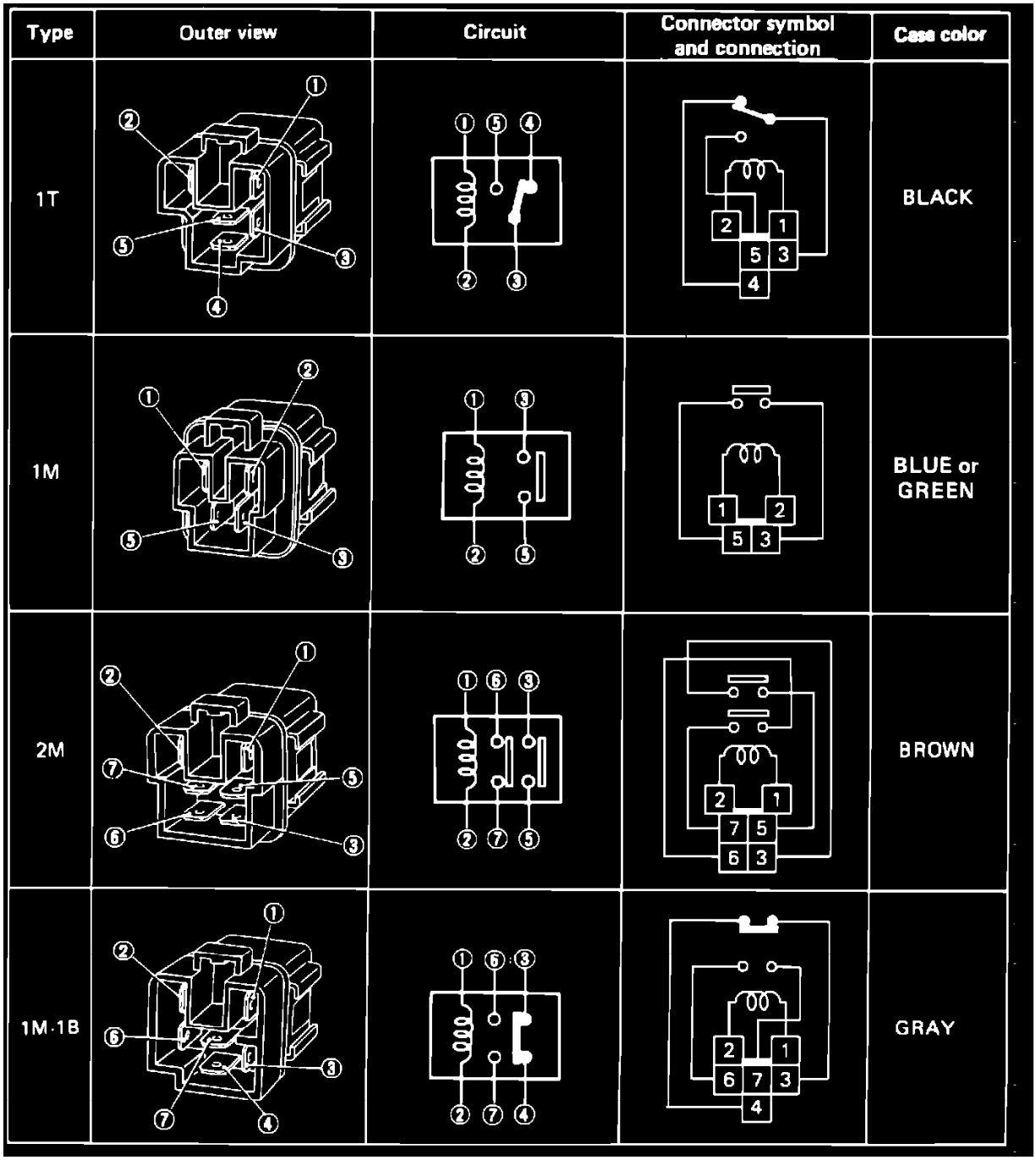


TYPE OF STANDARDIZED RELAYS

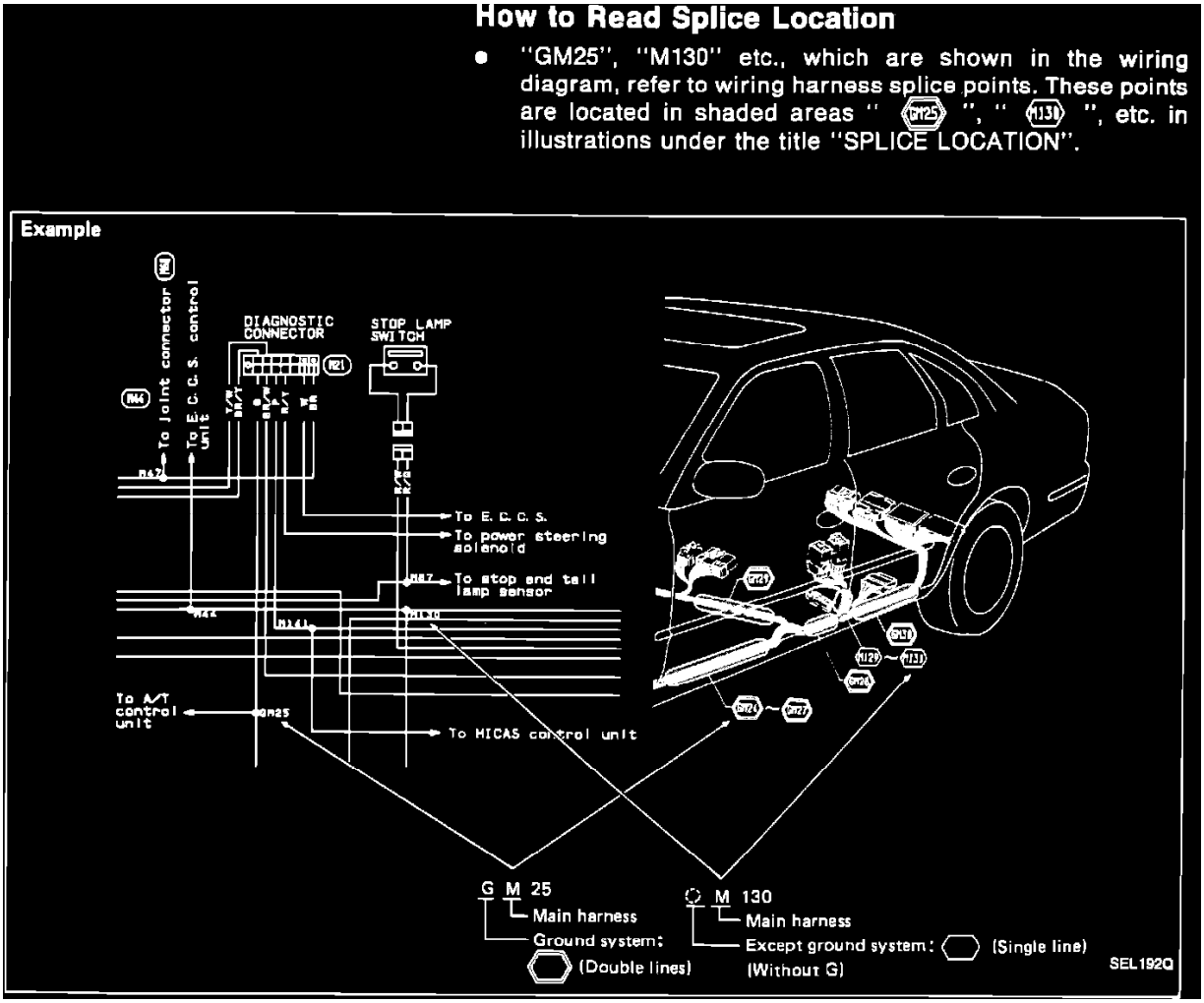
1M ..... 1 Make
1T ..... 1 Transfer
2M ..... 2 Make
1M·1B ..... 1 Make 1 Break



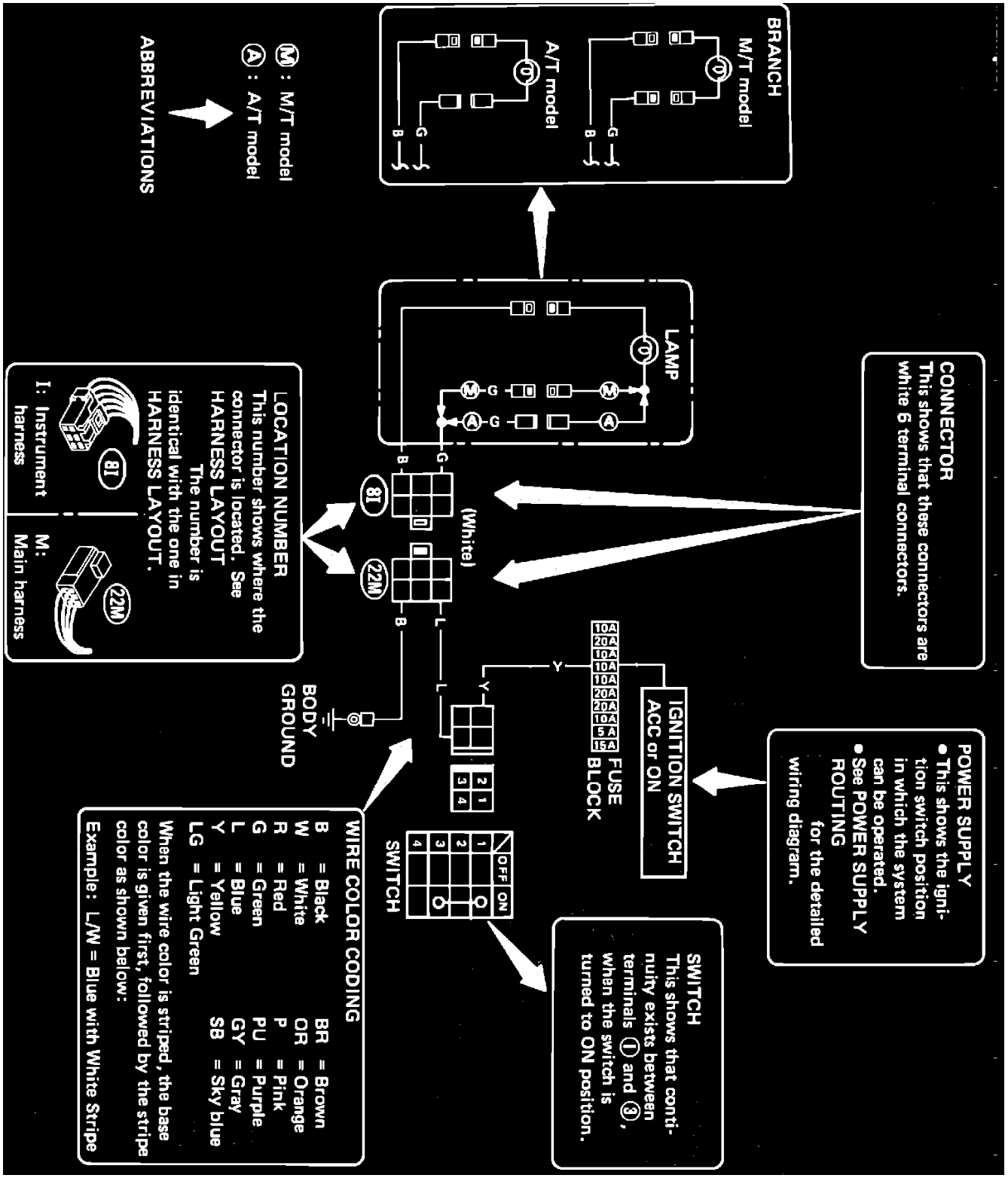
Standardized Relay Description And Explanations



Standardized Relay Description And Explanations



How To Read Splice Information



Symbol Identification

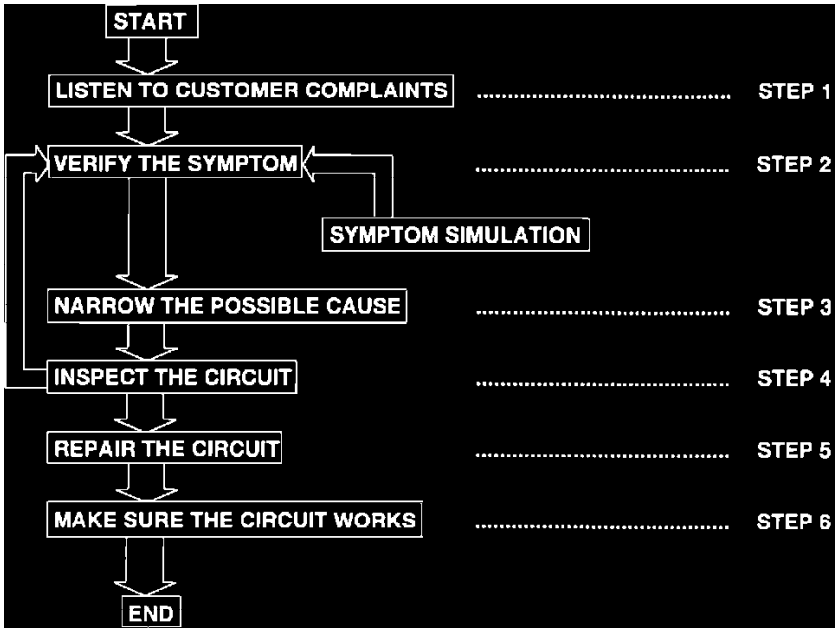
Wire Color Code Identification

- **B:** Black
- **BR:** Brown
- **CH:** Dark Brown
- **DG:** Dark Green
- **G:** Green
- **GY:** Grey
- **L:** Blue
- **LG:** Light Green
- **OR:** Orange
- **P:** Pink
- **PU:** Purple
- **R:** Red
- **SB:** Sky Blue
- **W:** White

Y: Yellow

When the wire color is striped, the base color is given first, followed by the stripe color as shown below:
Example: L/W = Blue with White stripe.

Flow of Diagnosis



STEP 1 Listening To The Customer.

Listening to the customer and documenting the conditions which exist when the problem occurs is critical to properly diagnosing an electrical incident. It may also be important to determine if the car has had any accessories recently installed or if any service work (collision repair, etc.) has been recently performed.

STEP 2 Verify the parameters of the incident.

Whenever possible, you should operate the complete system to verify the customers comments. Try to confirm the symptom(s) and under what conditions the incident occurs.

STEP 3 Get the proper diagnosis materials together.

Before beginning the diagnosis, make sure you have all of the necessary information. Along with these Fix Tips you should have the Power Supply Routing information. You should make sure you have a thorough understanding of how the system operates. Based upon the customers comments and your knowledge of the circuit operation, you should be able to identify which component(s) could cause the incident.

STEP 4 Inspect the system.

Inspect the system to find the cause of the symptom. Start the diagnosis by determining the location of the electrical units involved. Inspect each component to verify that it is mechanically free to operate and that all connectors and harnesses are securely connected and properly routed. Systematically check the circuits involved, using the Harness Layouts and Power Supply Routing. Determine which circuit is the cause of the incident and whether it is a wiring problem or a component problem.

STEP 5 Repair or replace.

Repair or replace the incident component or electrical circuit.

STEP 6 Verify the system works properly under all conditions.

Once you have repaired the circuit or replaced a component you need to operate the system in all modes and particularly under the circumstances which resulted in the customers initial complaint.

Recommended Tools and Equipment

USE

A Digital Multimeter DMM (10 megaohm input impedance) . It can safely be used to diagnose and test most vehicle systems.

DON'T USE

Test lights. They are not recommended due to the possibility of damage to the computer or air-bag circuits.

BE PREPARED

Before attempting to diagnose a circuit for an open or a short, it is important that you:

1. Have the proper reference material available:

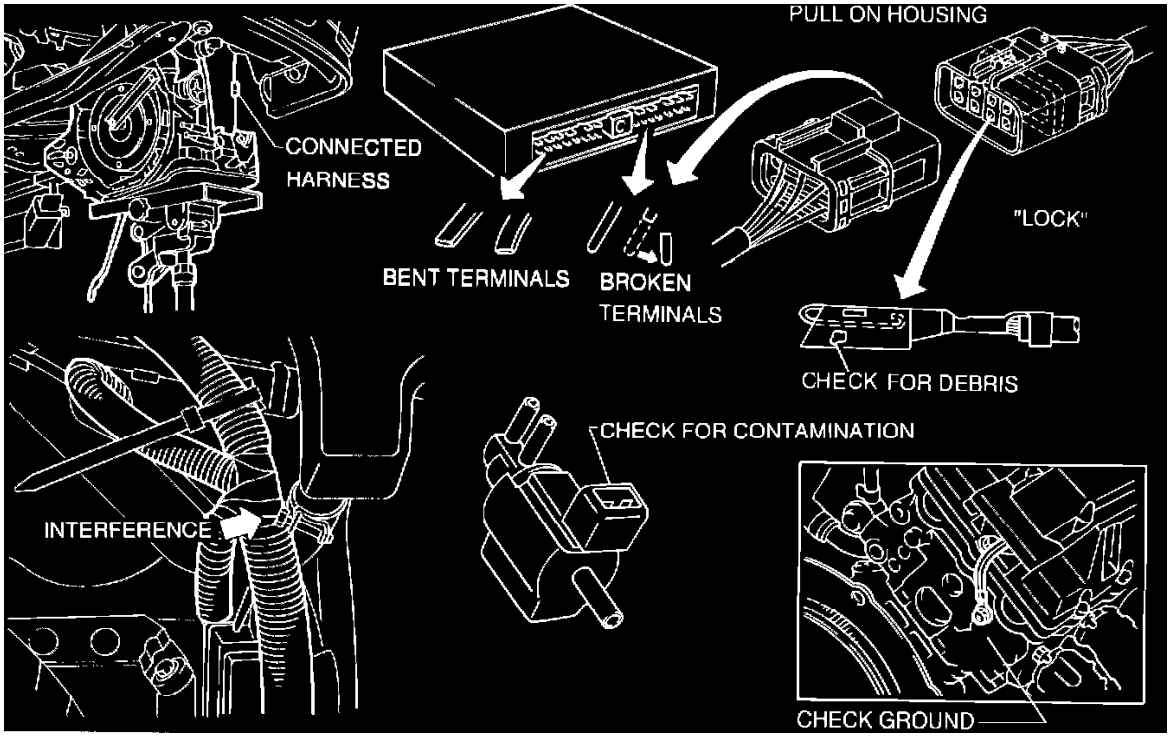
   ^ Power Supply Routings
   ^ Applicable Wiring Diagrams
   ^ Troubleshooting Information

2. Understand how the system works.
3. Have a good understanding of what condition you are diagnosing:

   ^ Situation when the problem occurs. (weather, loads, etc.)
   ^ What systems interact with the one you are diagnosing?
   ^ Is it intermittent or a consistent problem?

4. Have proper equipment to perform the diagnosis such as a digital voltmeter, alligator clips, and probe leads.

Examples of Common Electrical Incidents



The illustration shows some, but not all, areas to check for common electrical incidents.

Ground Inspection

WHY INSPECT GROUND CONNECTIONS

Ground connections are very important to the proper operation of electrical and electronic circuits. They are often exposed to moisture and can get a corrosive film of rust on the exposed metal.

A loose or corroded ground can alter a circuit. Many computer controlled circuits operate in the 5 volt range and can be seriously affected by a voltage change as low as one tenth (0.1V) of a volt. A poor or corroded ground can easily affect the circuit by that amount.

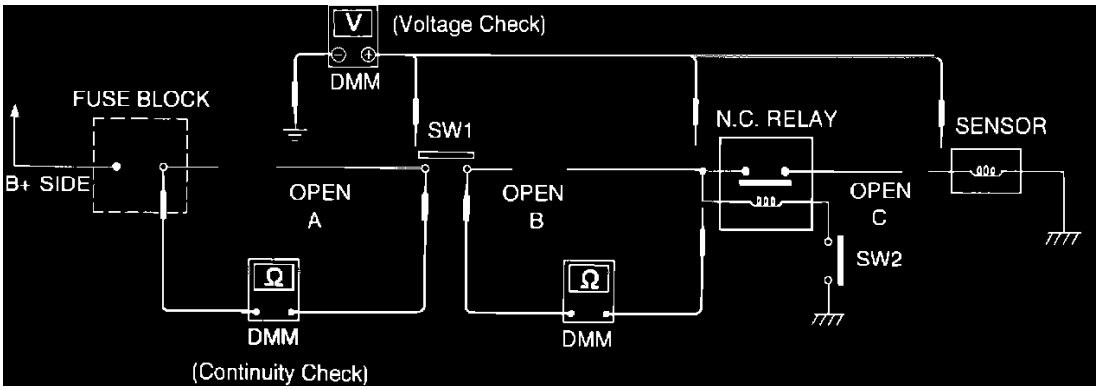
HOW TO INSPECT GROUND CONNECTIONS

^ Remove the ground bolt screw or clip.
^ Inspect all mating surfaces for tarnish, dirt, rust, etc.
^ Clean as required to assure good contact.
^ Reinstall bolt or screw securely.
^ Inspect for "add-on" accessories which may be interfering with the ground circuit.
^ If several wires are crimped into one ground eyelet terminal, check for proper crimps. Make sure all of the wires are clean, securely fastened and providing a good ground path.

VOLTAGE DROP TEST RESULTS

A good ground connection will have approximately 0.1 Volts or less voltage drop. For more details, refer to **VOLTAGE DROP TESTS.**

Testing For Opens



PREPARATION

Before you begin your testing and diagnosis, you should sketch a schematic of the system. This will help you to logically walk through the diagnosis process. Drawing the sketch will also reinforce your working knowledge of the system. Refer to the attached drawing for a sample schematic

There are two types of tests you can use for tracking down an open circuit: the Continuity Check using an ohmmeter or Voltage Check using the voltmeter. Either test, properly done, will yield good results.

USING THE CONTINUITY CHECK METHOD

NOTE: Make sure to always start with the DMM at the highest resistance level.

1. Disconnect the battery negative cable.
2. Start at one end of the circuit and work your way to the other end. (At the fuse block in this example)
3. Connect one probe of the DMM to the fuse block terminal on the load side.
4. Connect the other probe to the fuse block (power) side of SW1. Little or no resistance will indicate that portion of the circuit has good continuity. If there were an open in the circuit, the DMM would indicate an over limit or infinite resistance condition. (point A)
5. Connect the probes between SW1 and the relay. Little or no resistance will indicate that portion of the circuit has good continuity. If there were an open in the circuit, the DMM would indicate an over limit or infinite resistance condition. (point B)
6. Connect the probes between the relay and the sensor. Little or no resistance will indicate that portion of the circuit has good continuity. If there were an open in the circuit, the DMM would indicate an over limit or infinite resistance condition. (point C)

USING THE VOLTAGE CHECK METHOD

1. Connect one probe of the DMM to a known good ground.
2. Begin probing at one end of the circuit and work your way to the other end.
3. With SW1 open, probe at SW1 to check for voltage.

   If voltage: open is further down the circuit than SW1.
   If no voltage: open is between fuse block and SW1 (point A).

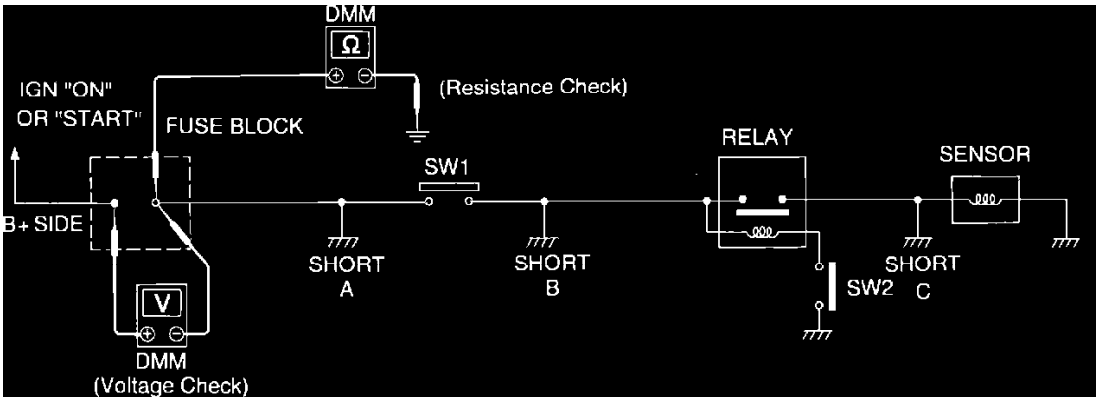
4. Close SW1 and probe at relay.

   If voltage: open is further down the circuit than the relay.
   If no voltage: open is between SW1 and relay (point B).

5. Close the relay and probe at the sensor.

   If voltage: open is further down the circuit than the sensor.
   If no voltage: open is between relay and sensor (point C).

Testing For Shorts



PREPARATION

Before you begin your testing and diagnosis, sketch a schematic of the system. This will help you to logically walk through the diagnosis process. Drawing the sketch will also reinforce your working knowledge of the system. Refer to the attached drawing for a sample schematic

There are two types of tests you can use for tracking down a short circuit: the Resistance Check using an ohmmeter or Voltage Check using the voltmeter. Either test, properly done, will yield good results.

RESISTANCE CHECK METHOD

1. Disconnect the battery negative cable and remove the blown fuse.

2. Disconnect all loads (SW1 open, relay disconnected and sensor disconnected) powered through the fuse.

3. Connect one probe of the ohmmeter to the load side of the fuse terminal and the other probe to a known good ground.

4. With SW1 open, check for continuity.

   If continuity: short is between fuse terminal and SW1 (point A).
   If no continuity: short is further down the circuit than SW1.

5. With SW1 closed, relay disconnected and probes at the load side of fuse terminal and ground check for continuity.

   If continuity: short is between SW1 and the relay (point B).
   If no continuity: short is further down the circuit than the relay.

6. With SW1 closed, relay contacts jumped with jumper wire and probes at the load side of fuse terminal and ground check for continuity.

   If continuity: short is between relay and sensor (point C).
   If no continuity: check sensor, retrace steps.

VOLTAGE CHECK METHOD

1. Remove the blown fuse and disconnect all loads (i.e. SW1 open, relay disconnected and sensor disconnected) powered through the fuse.

2. Turn the ignition key to the ON or START position and verify battery voltage at the B+ side of the fuse terminal (one lead on the B+ terminal side of the fuse block and one lead on a known good ground).

3. With SW1 open and the DMM leads across both fuse terminals, check for voltage.

   If voltage: short is between fuse block and SW1 (point A).
   If no voltage: short is further down the circuit than SW1.

4. With SW1 closed, relay and sensor disconnected and the DMM leads across both fuse terminals, check for voltage.

   If voltage: short is between SW1 and the relay (point B).
   If no voltage: short is further down the circuit than the relay.

5. With SW1 closed, relay contacts jumped with fused jumper wire check for voltage.

   If voltage: short is down the circuit of the relay or between the relay and the disconnected sensor (point C).
   If no voltage: retrace steps and check power to fuse block.

Voltage Drop Tests

PURPOSE OF THE VOLTAGE DROP TEST

Voltage Drop Tests are often used to find components or circuits which have excessive resistance. A voltage drop across closed contacts or wiring indicates excessive resistance.

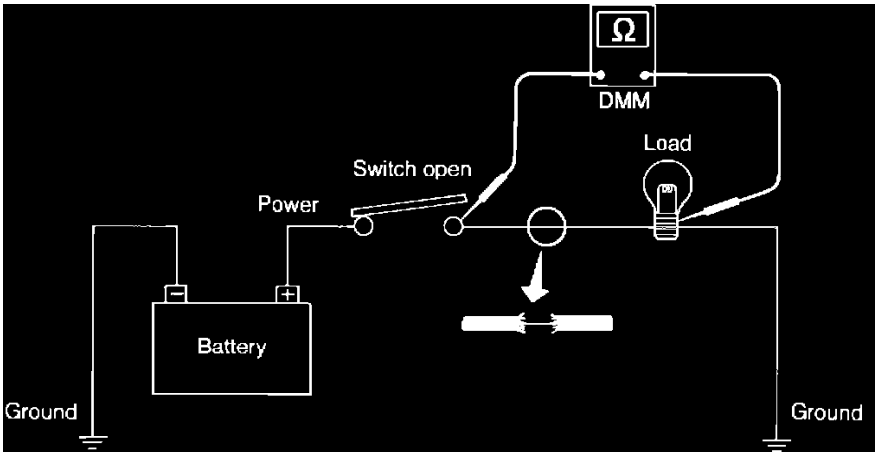
CAUSE OF CIRCUIT VOLTAGE DROP

A voltage drop in a circuit is caused by a resistance when the circuit is in operation. Part of the available voltage is used by the resistance resulting in less available voltage for other loads (lights, motors, etc).

Unwanted high resistance can be caused by:

^ Undersized Wiring (single strand example)
^ Corrosion On Switch Contacts
^ Loose Wire Connections Or Splices.

EXAMPLE OF AN INCORRECT CIRCUIT TEST



Check the wire in the illustration. If an ohmmeter is used to measure resistance (circuit off), the single strand of wire still making contact would give a reading of 0 ohms. This would normally indicate a good circuit. But when the circuit operates, the wire will not be able to carry enough current and the bulb will be dim. Using a proper Voltage Drop test will show this wire to have high resistance.

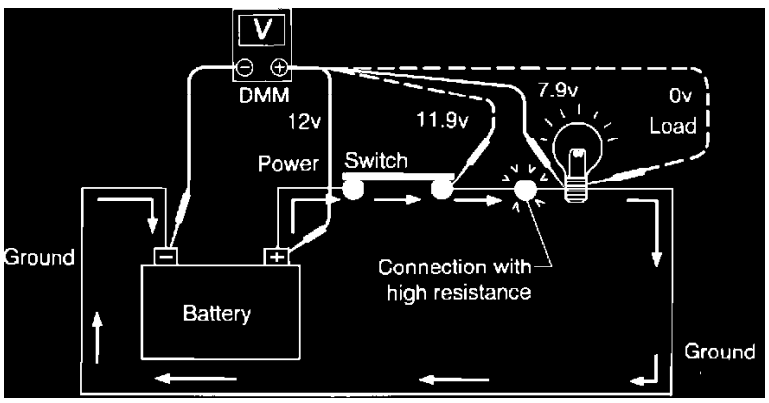
EXAMPLES OF CORRECT CIRCUIT TESTS

Measuring Voltage Drop - Accumulated Method

1. Connect the voltmeter across the connector or part of the circuit you want to check. The positive lead of the voltmeter should be closer to power and the negative lead closer to ground.

2. Operate the circuit

3. The voltmeter will indicate how many volts are being used to "push" current through that part of the circuit.

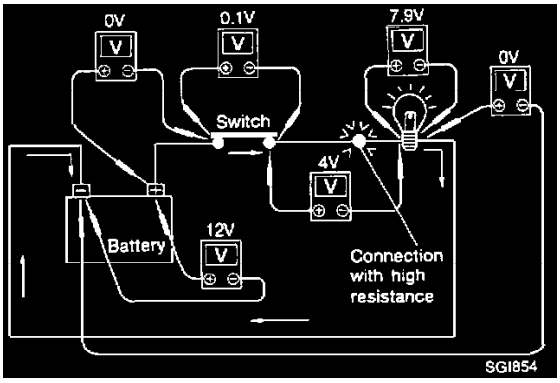


NOTE: In the illustration there is an excessive 4.1 volt drop between the battery and the bulb.

Measuring Voltage Drop - Step By Step

A step by step voltage drop test can be used to identify a component or wire which is operating under too much resistance. It is most useful in

isolating excessive drops in low voltage/current systems such as those in Computer Controlled Systems..



Circuit Inspection

1. Connect the voltmeter as described in illustration, starting at the battery and working your way around the circuit.

2. An unusually large voltage drop will indicate a component or wire that needs to be repaired. As you can see in the illustration above, the poor connection causes a 4 volt drop.

The chart that follows illustrates some maximum allowable voltage drops. These values are given as a guideline, the exact value for each component may vary.

COMPONENT	VOLTAGE DROP
Wire	<.001 volts
Ground Connections	Approx. 0.1 volts
Switch Contacts	Approx. 0.3 volts
Starter Solenoids	Approx. 0.5 volts

Heating and Air Conditioning

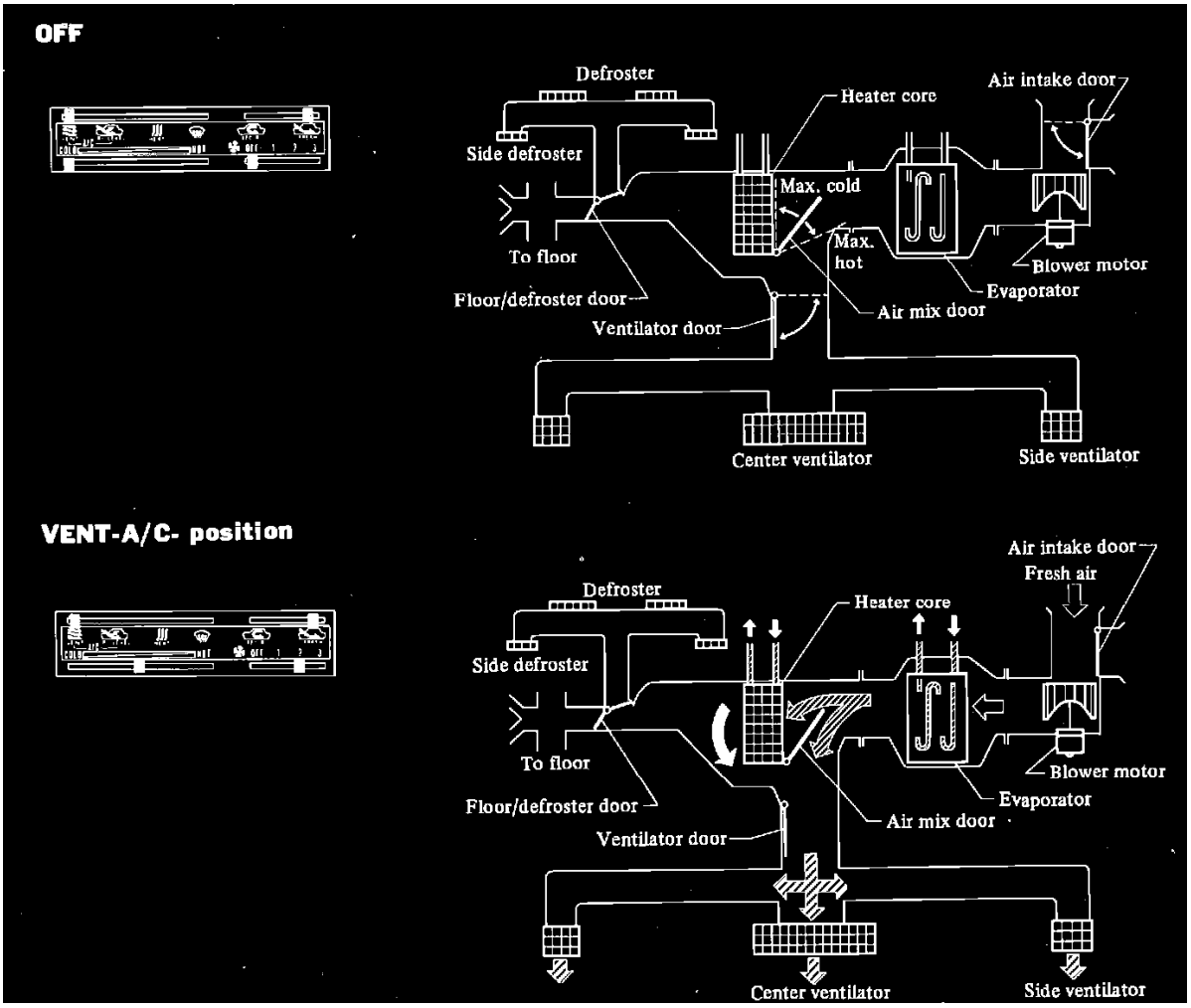


Fig. 7 Air flow & A/C operation

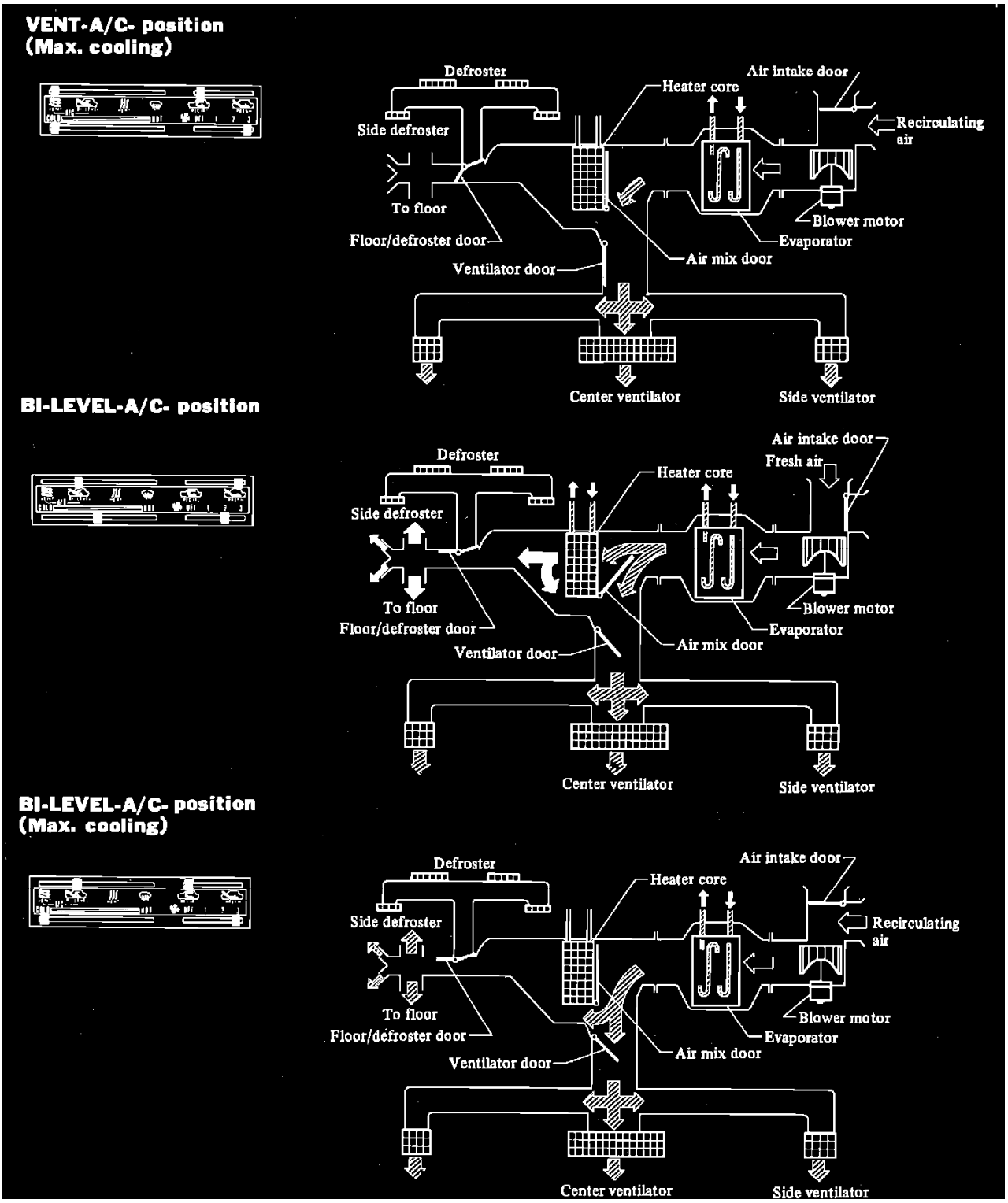


Fig. 7 Air flow & A/C operation

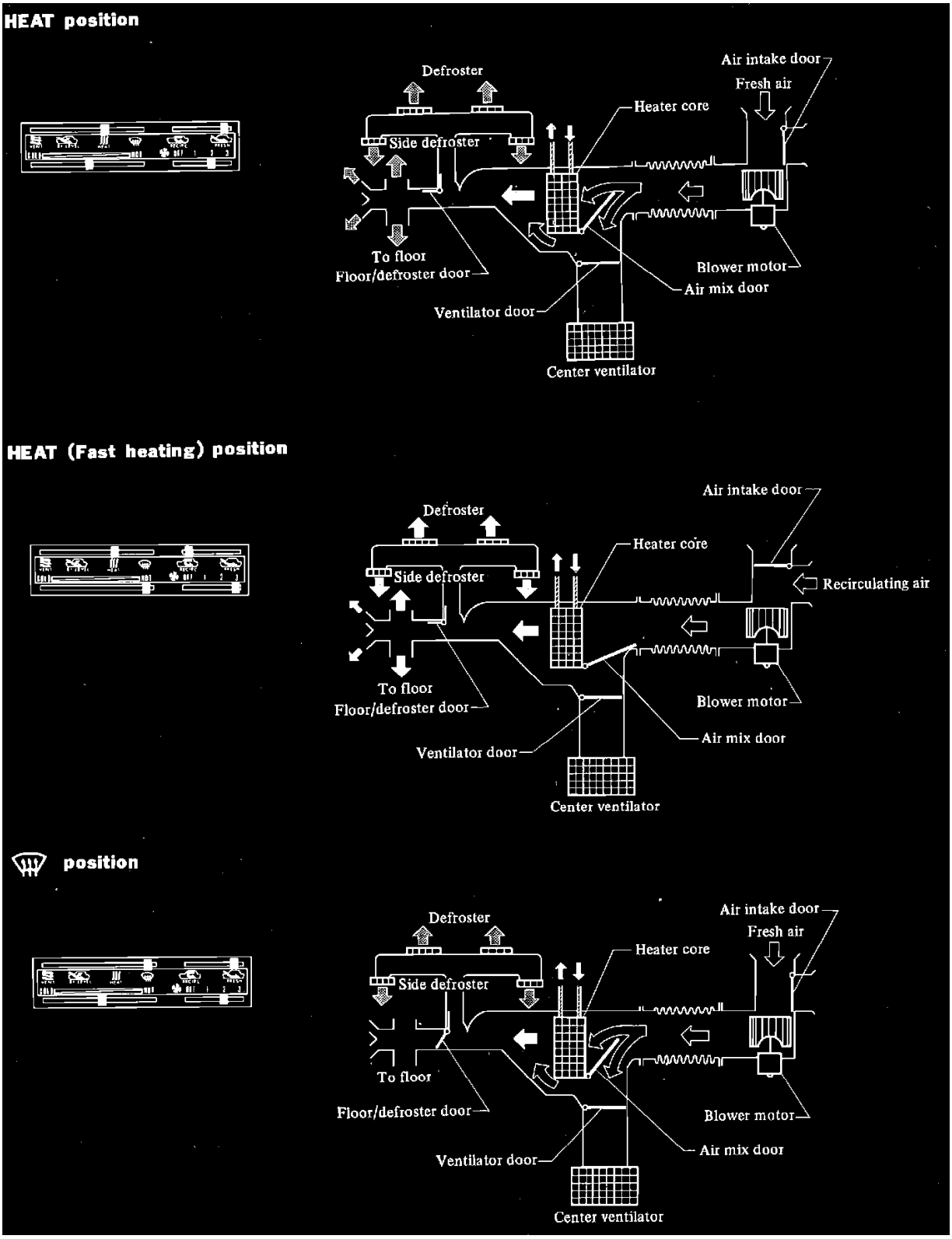


Fig. 7 Air flow & A/C operation

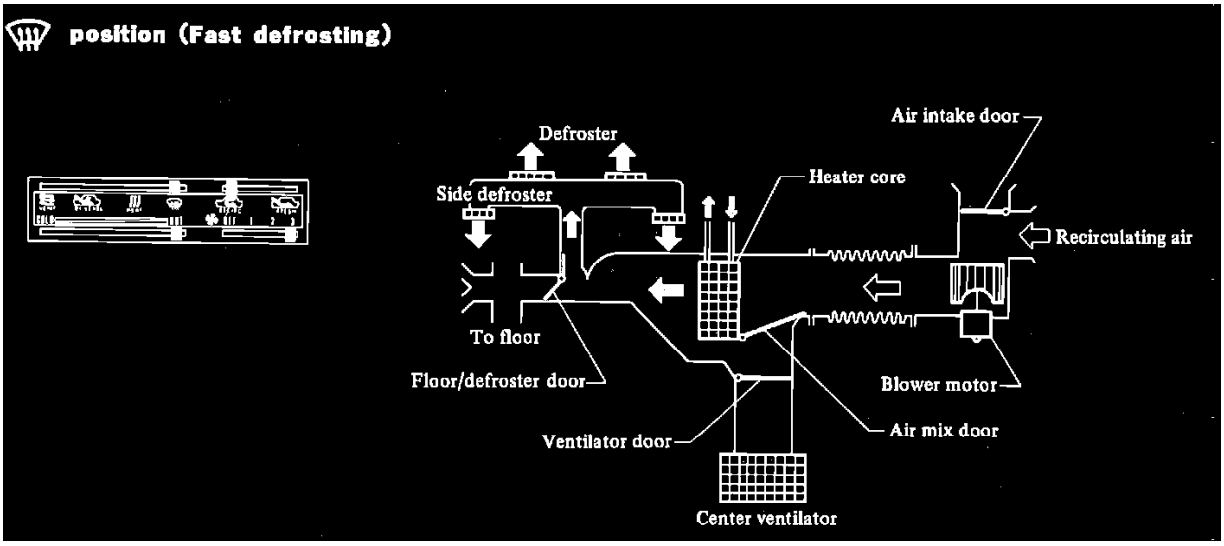
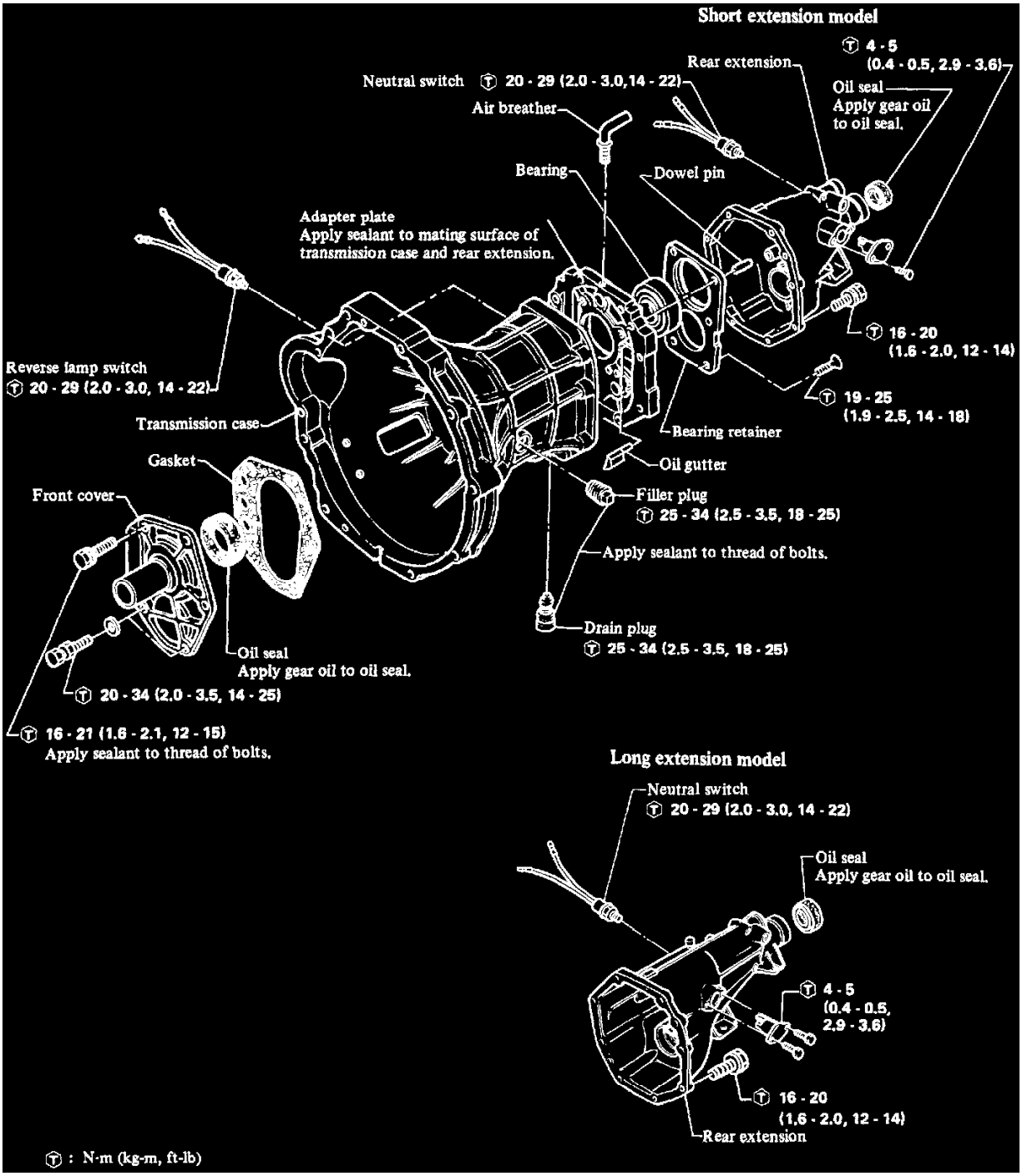
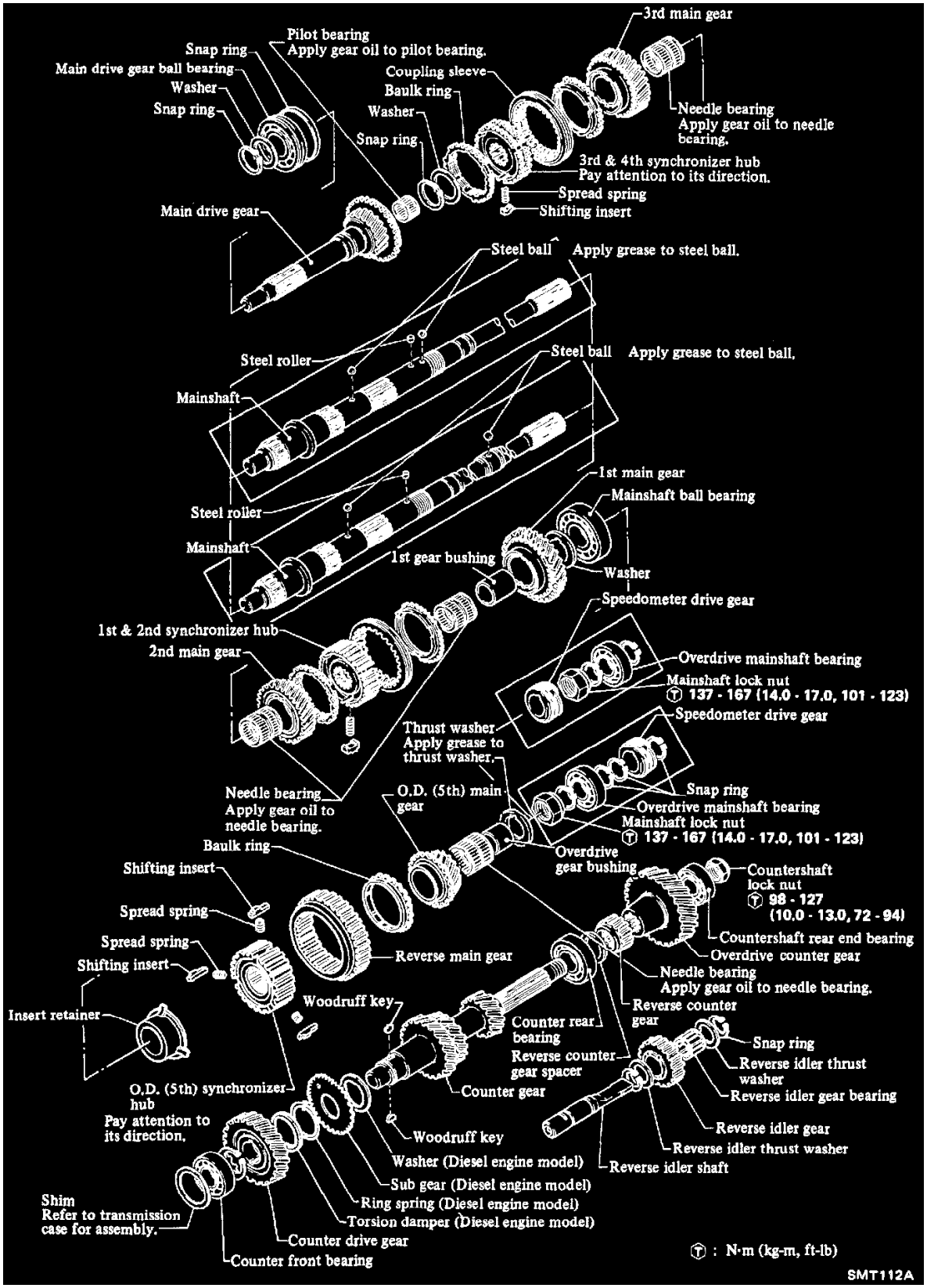


Fig. 7 Air flow & A/C operation

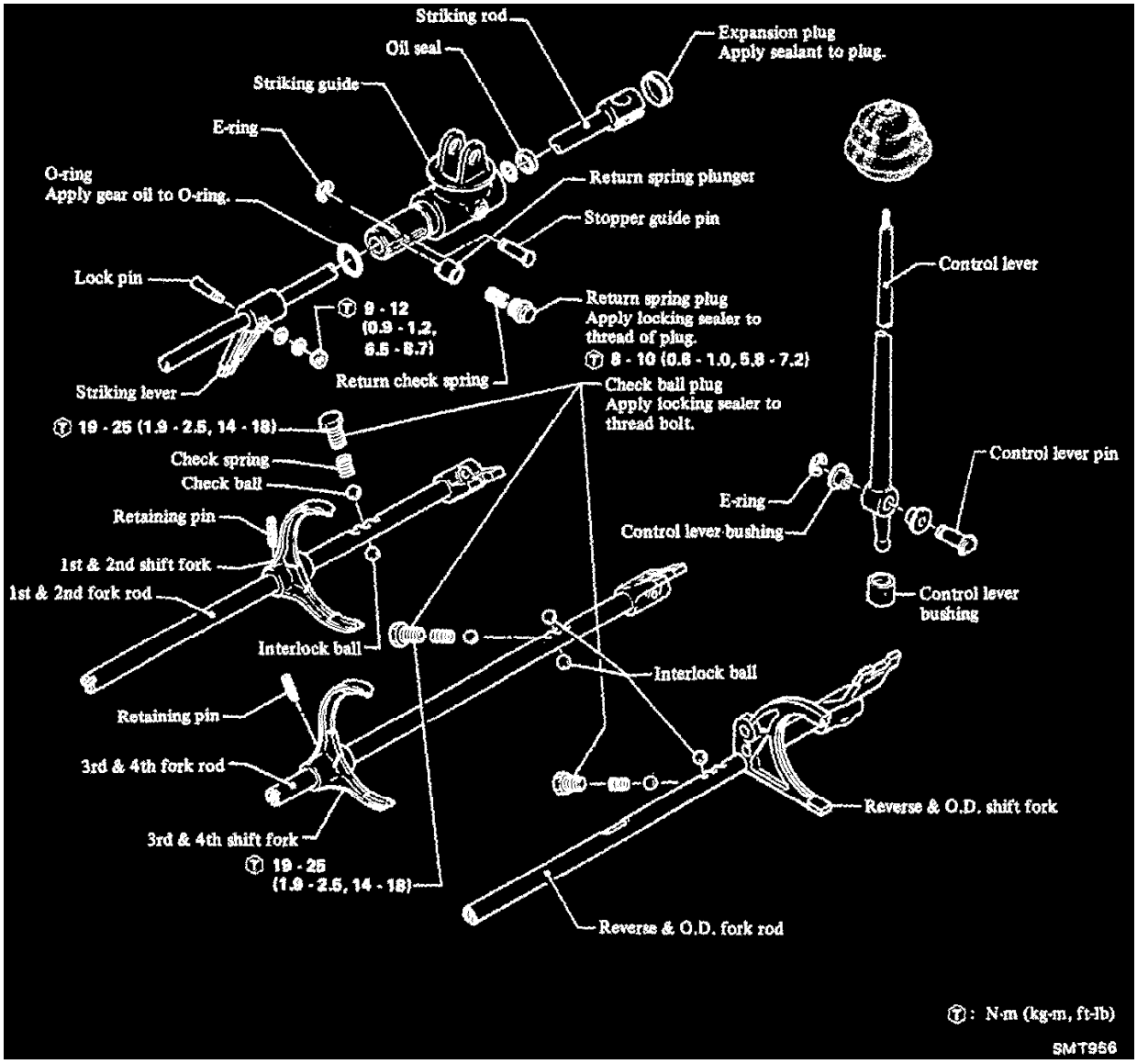
Check that air is discharged from correct outlets as specified in the air flow and operation charts, **Fig. 7.**



FS5W71B Transmission



FS5W71B Transmission



FS5W71B Transmission

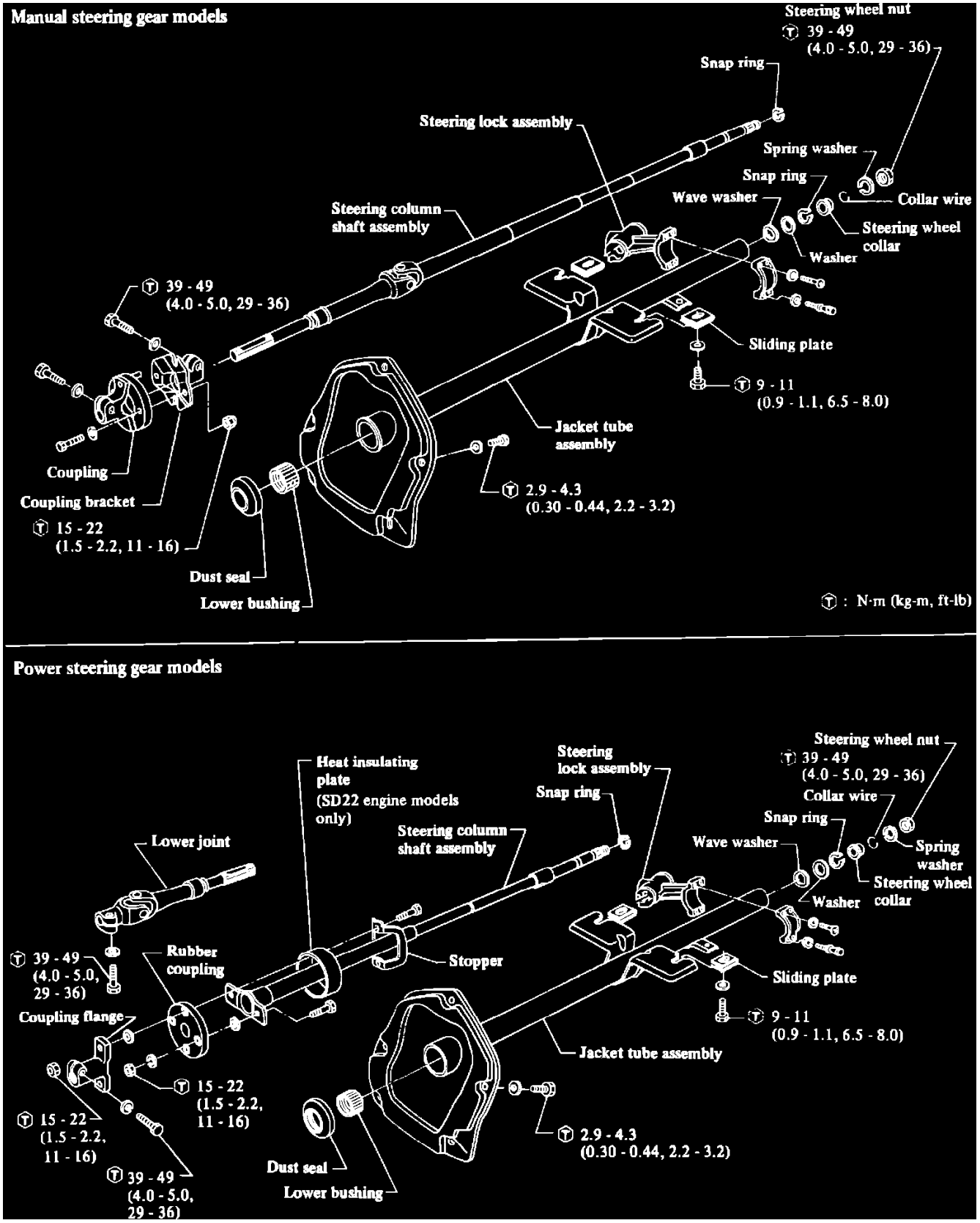


Fig. 6 Exploded view of steering column. 1982-86 Pickup less tilt column

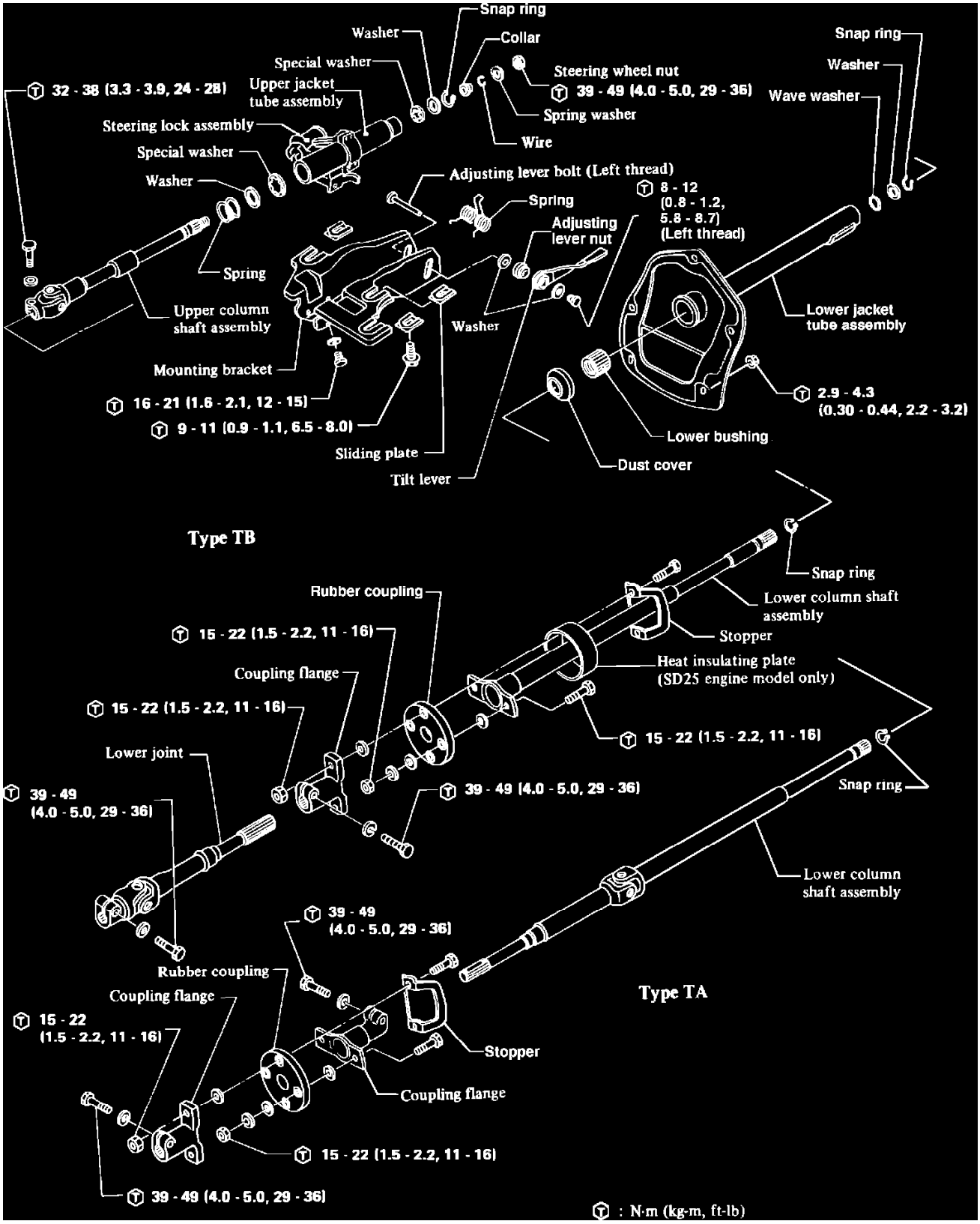


Fig. 7 Exploded view of steering column. 1982-86 Pickup w/tilt column

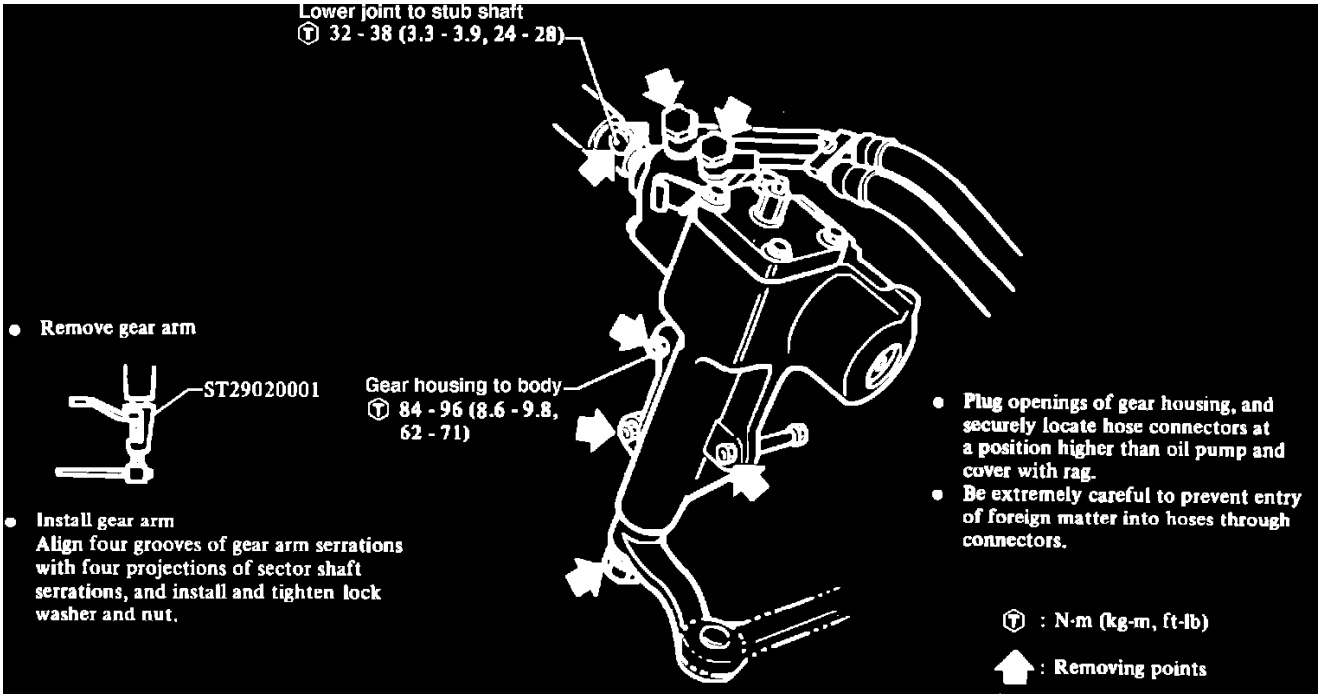


Fig. 14 Typical power steering gear replacement. 1982-86 Pickup

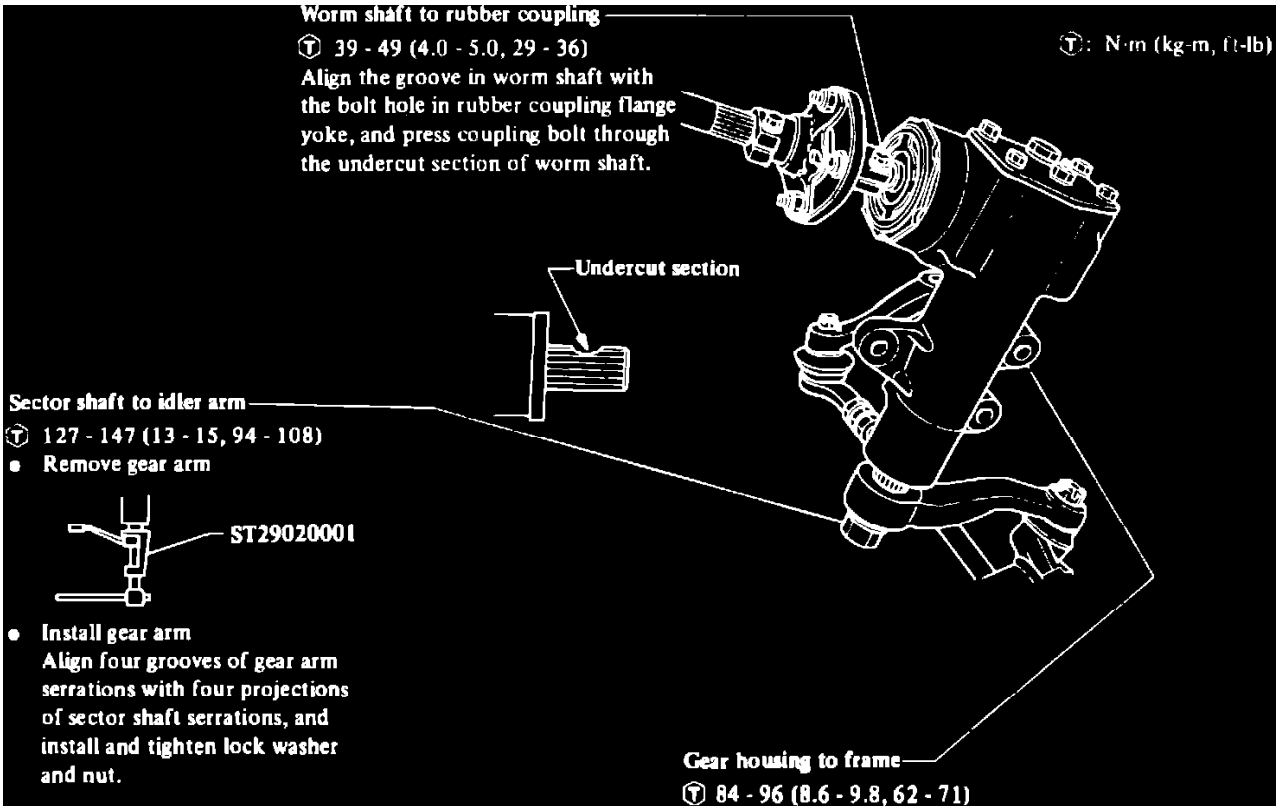


Fig. 12 Typical manual steering gear replacement. Pathfinder & Pickup

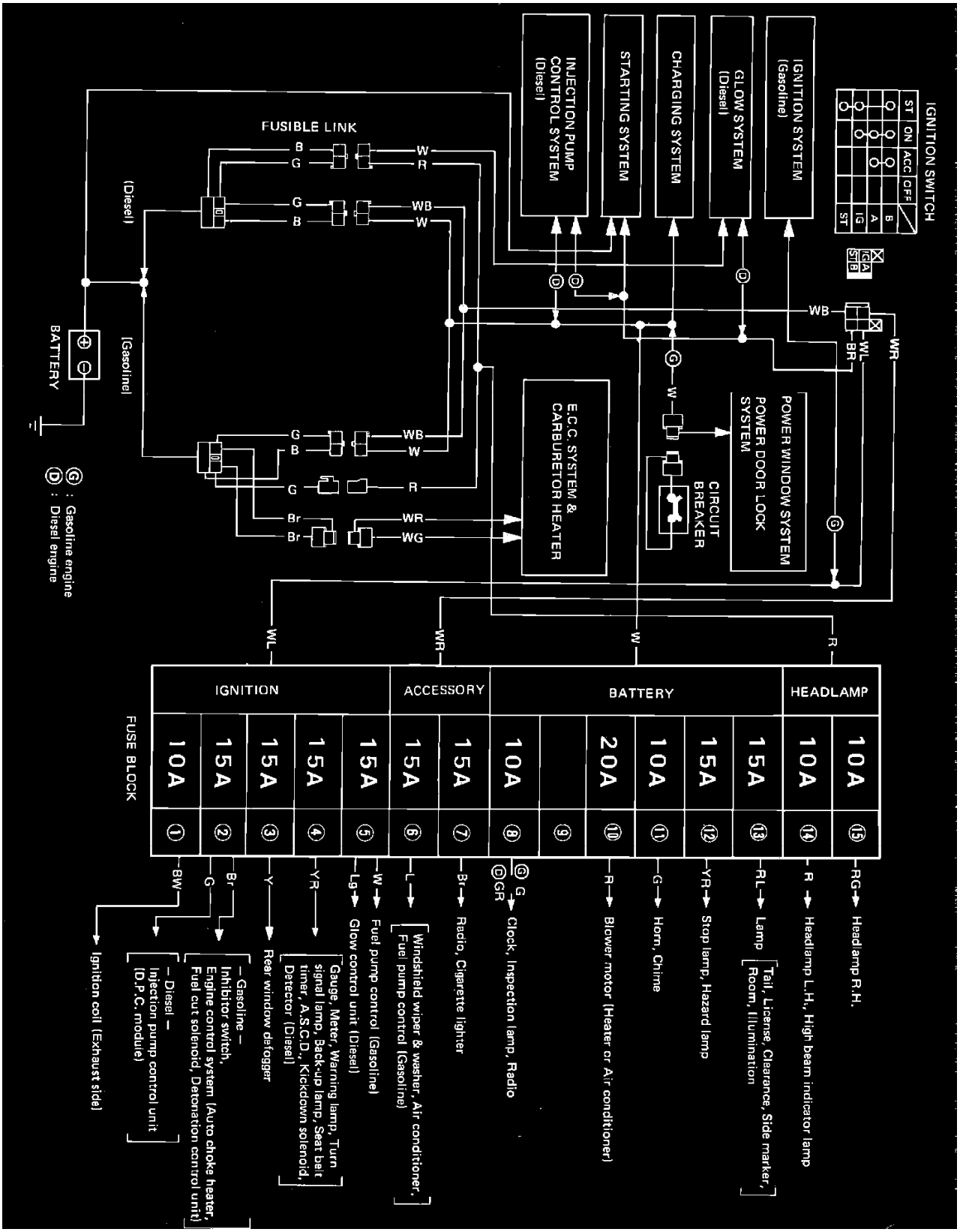


Fig. 436 Fuse Panel & Power Distribution. Exc. Fuel Injected Engine

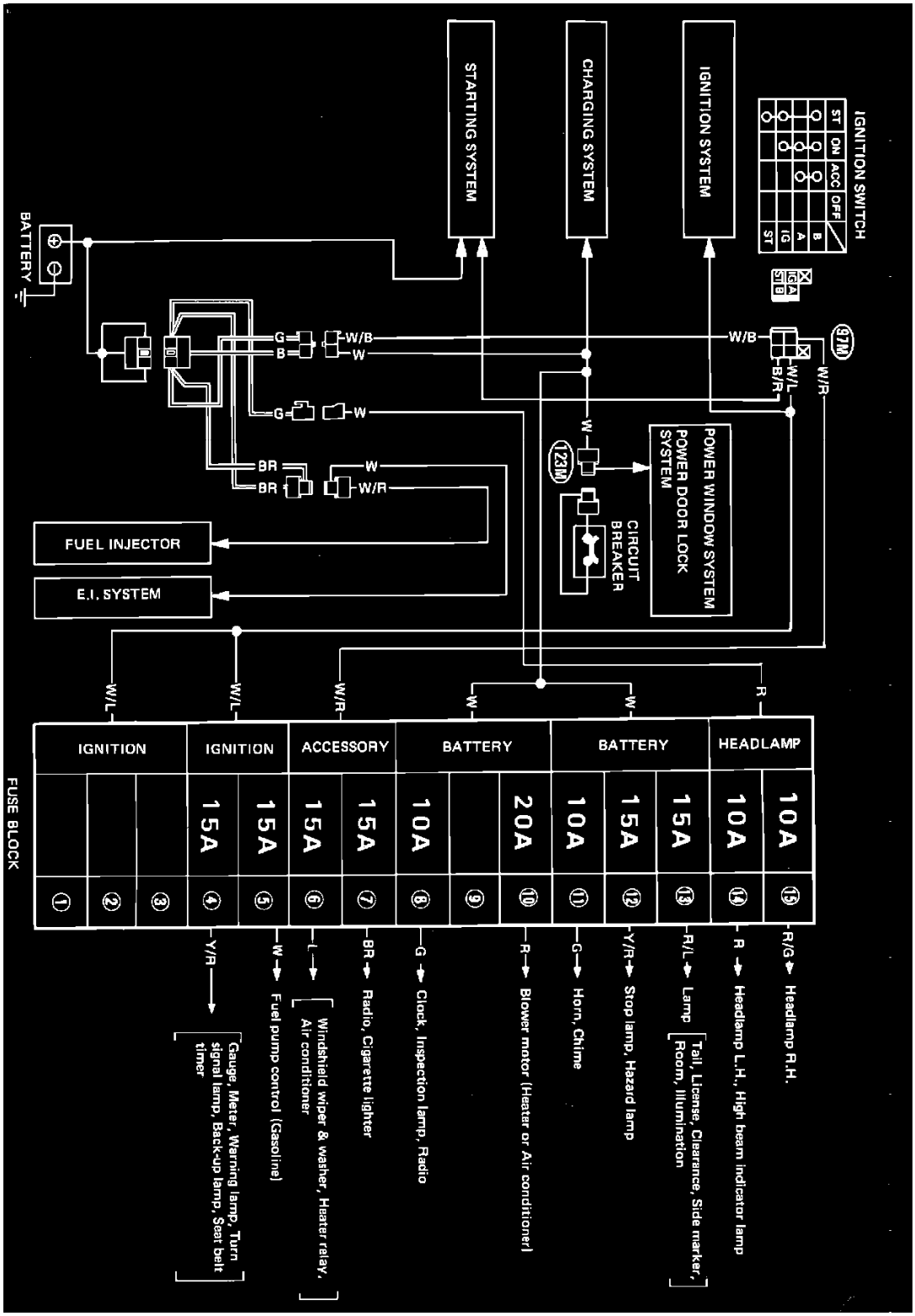


Fig. 437 Fuse Panel & Power Distribution. W/Fuel Injected Engine

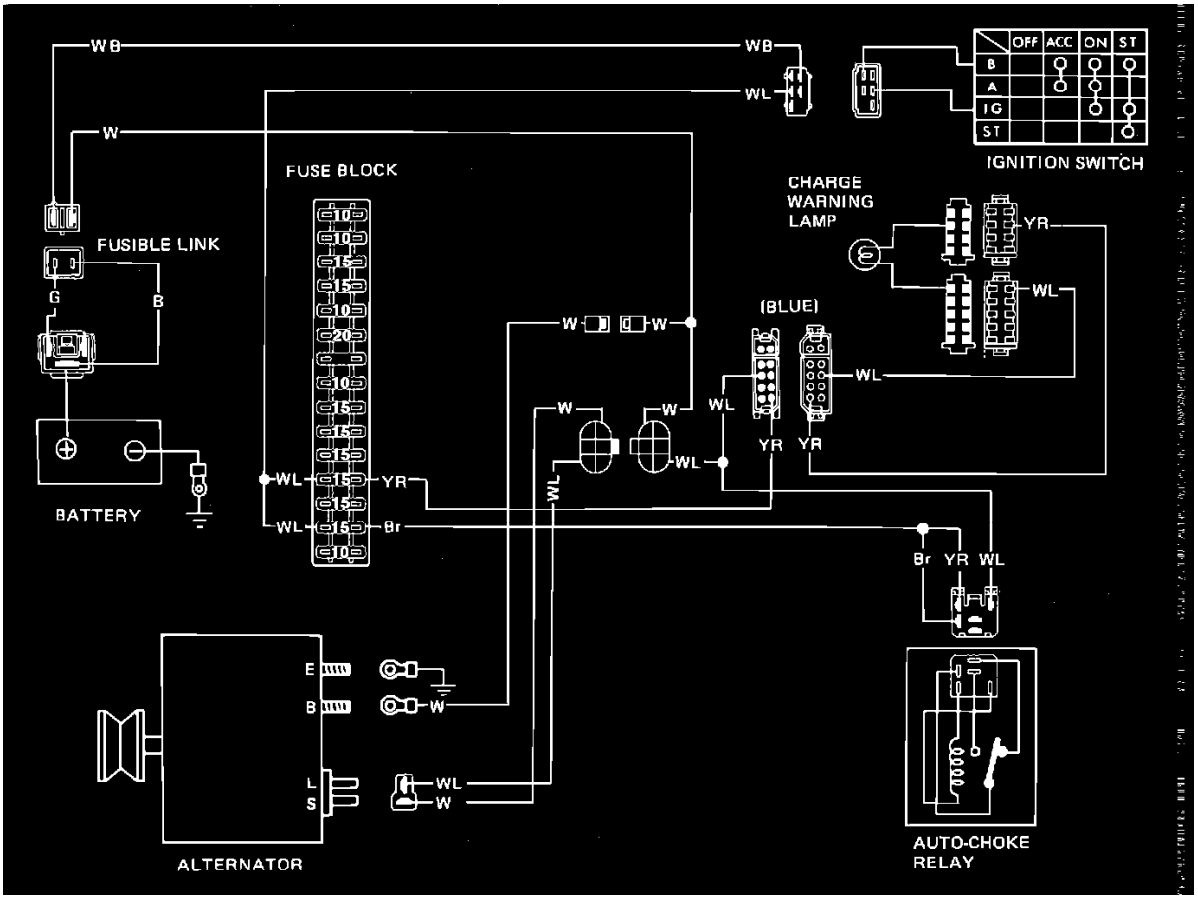


Fig. 448 Charging System Wiring Circuit. W/Gasoline Engine Less Fuel Injection

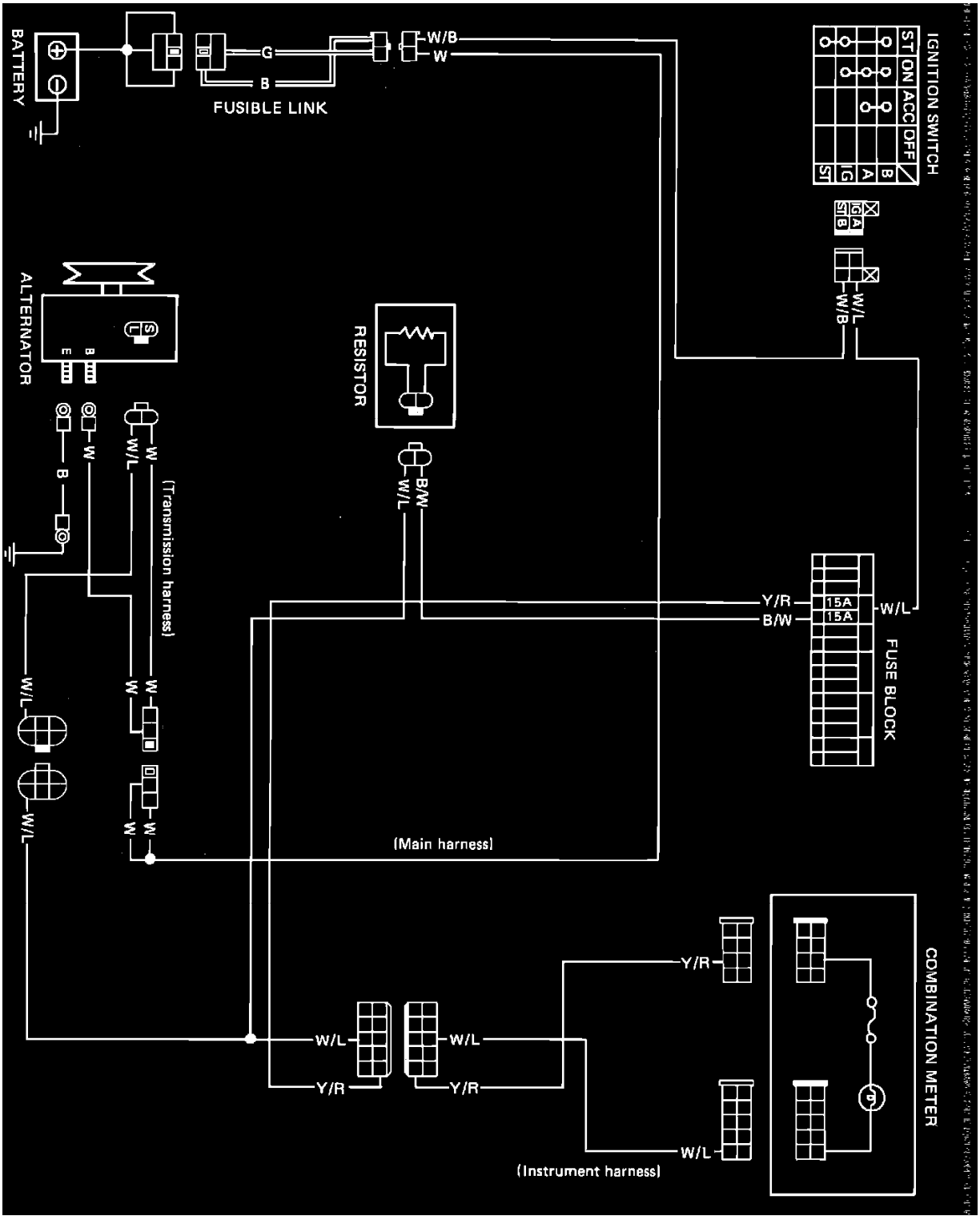


Fig. 449 Charging System Wiring Circuit. W/Gasoline Engine & Fuel Injection

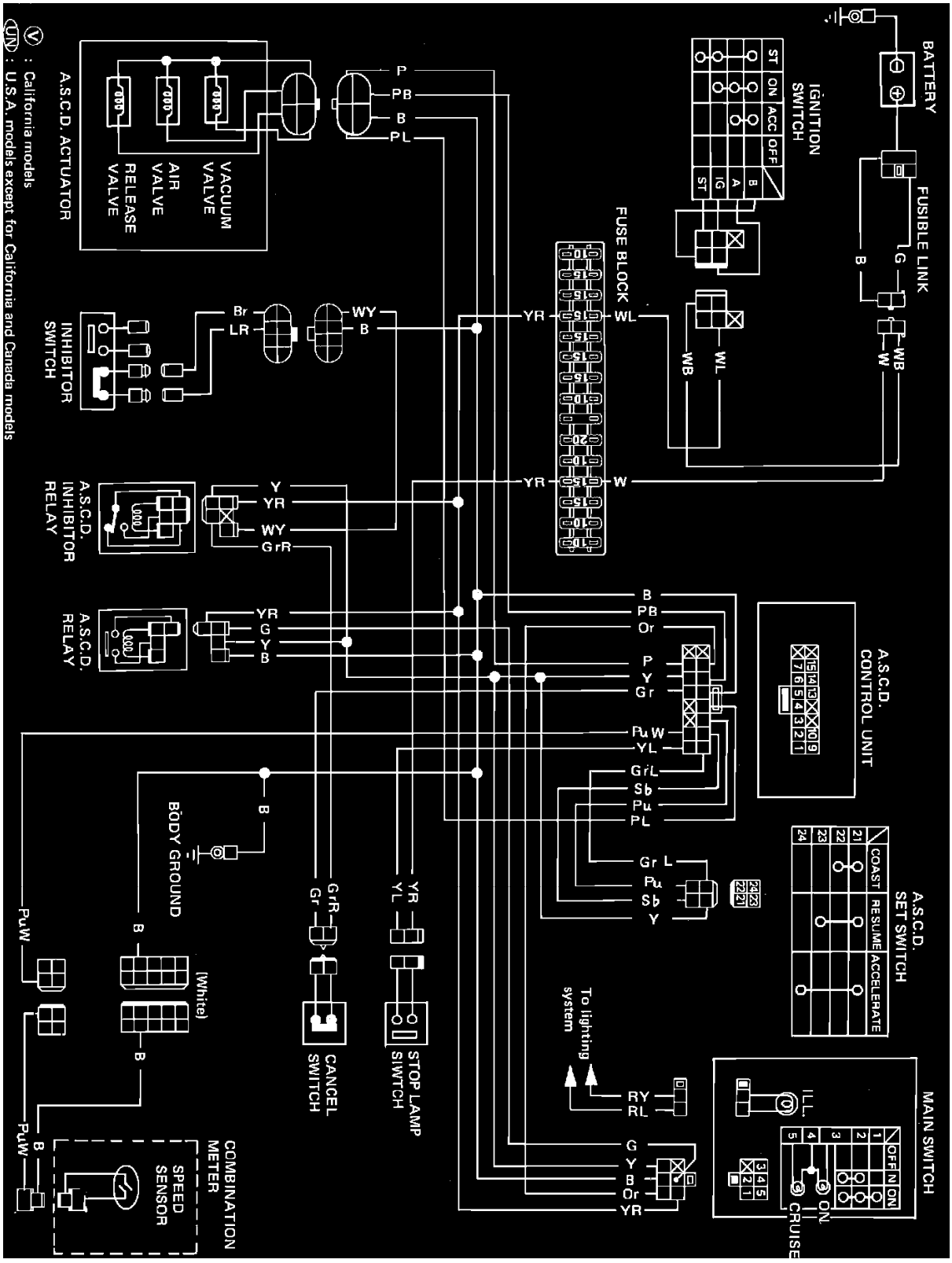


Fig. 445 Automatic Speed Control Device Wiring Circuit

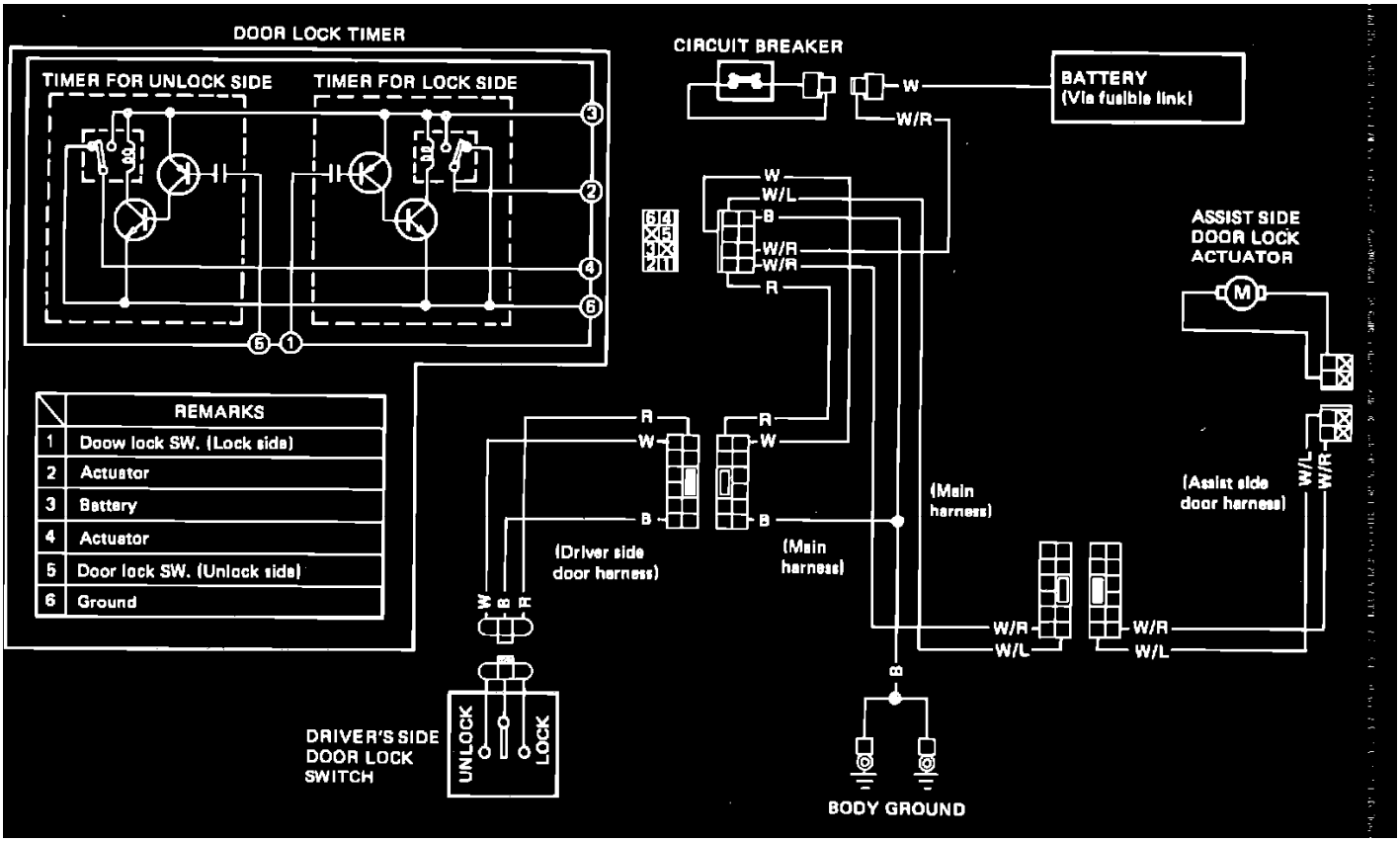


Fig. 468 Power Door Lock Wiring Circuit

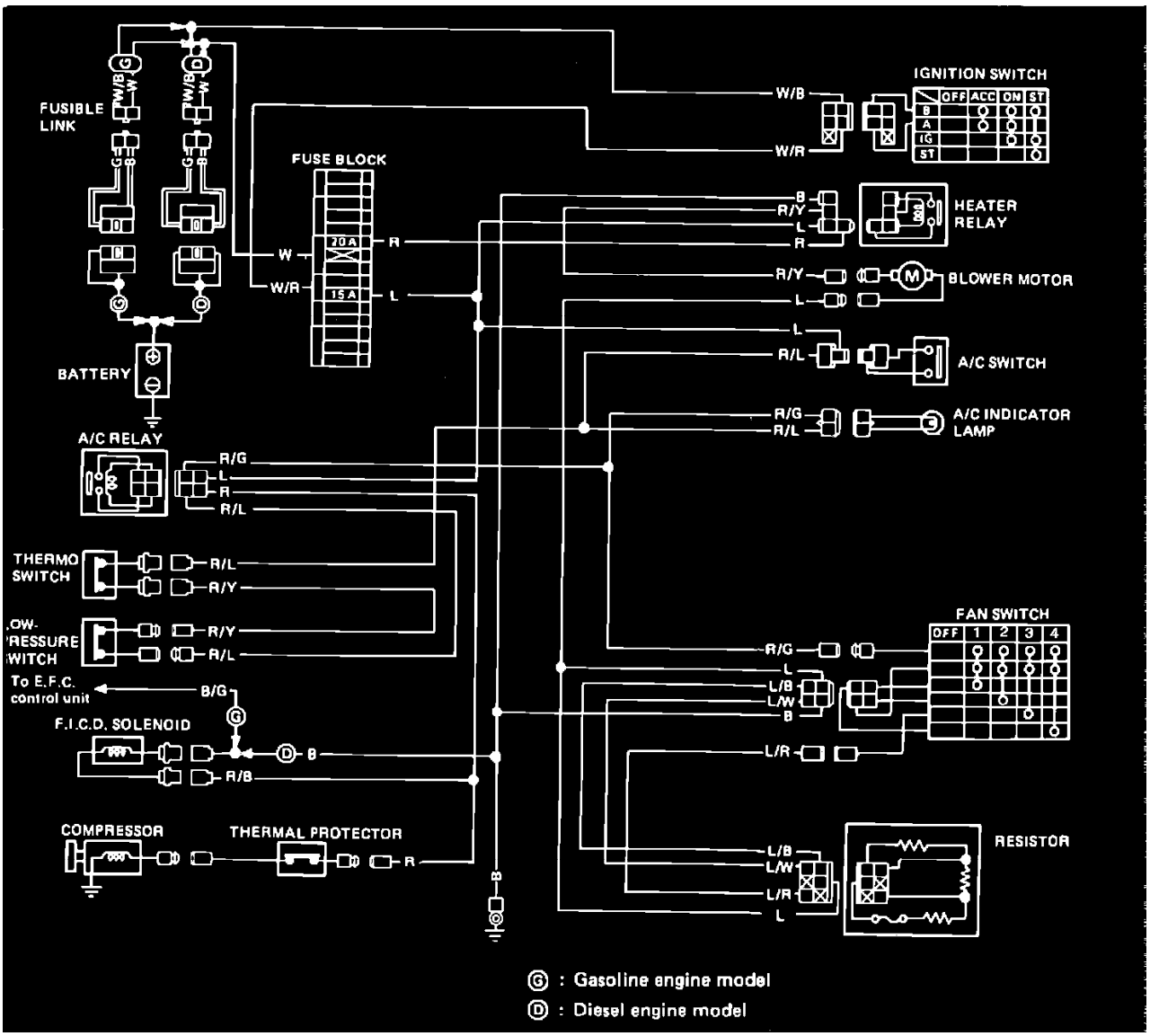


Fig. 443 Air Conditioning Wiring Circuit. Exc. Fuel Injected Engine

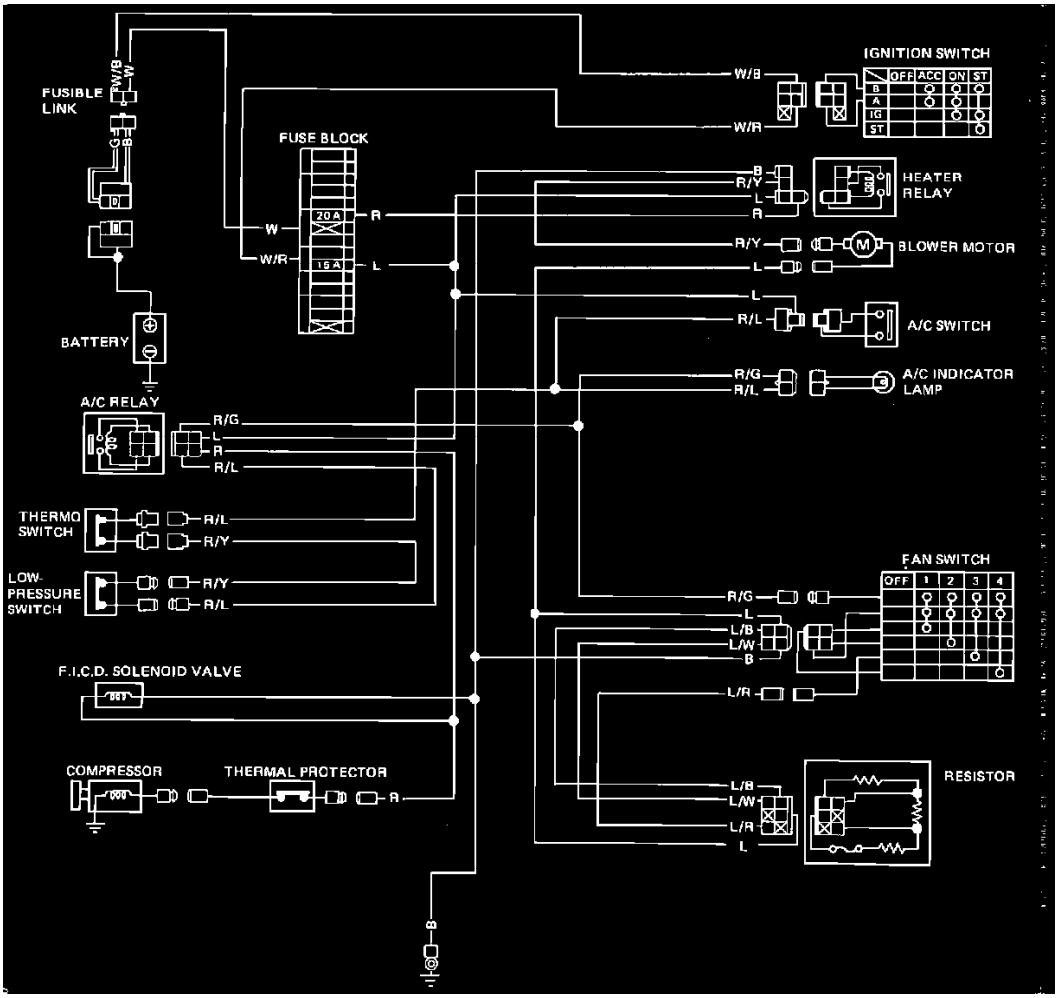


Fig. 444 Air Conditioning Wiring Circuit. W/Fuel Injected Engine

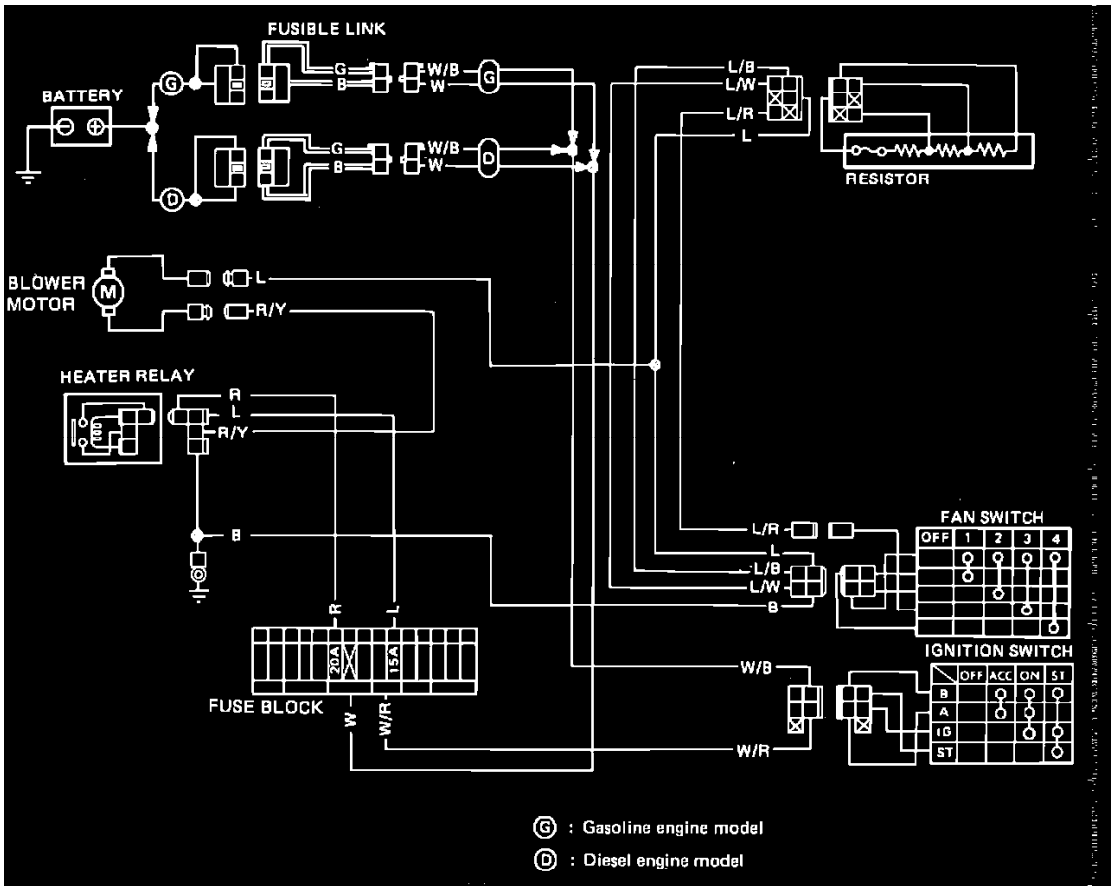


Fig. 461 Heater Wiring Circuit

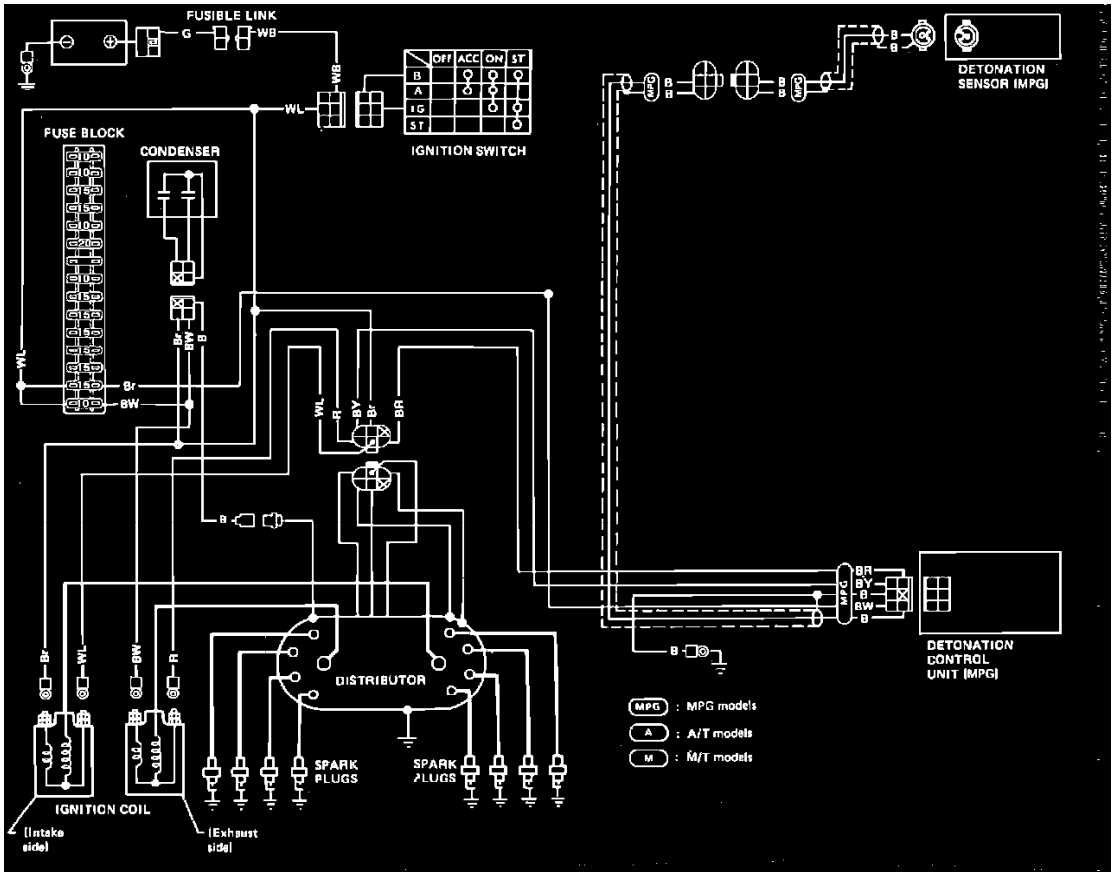


Fig. 462 Ignition System Wiring Circuit

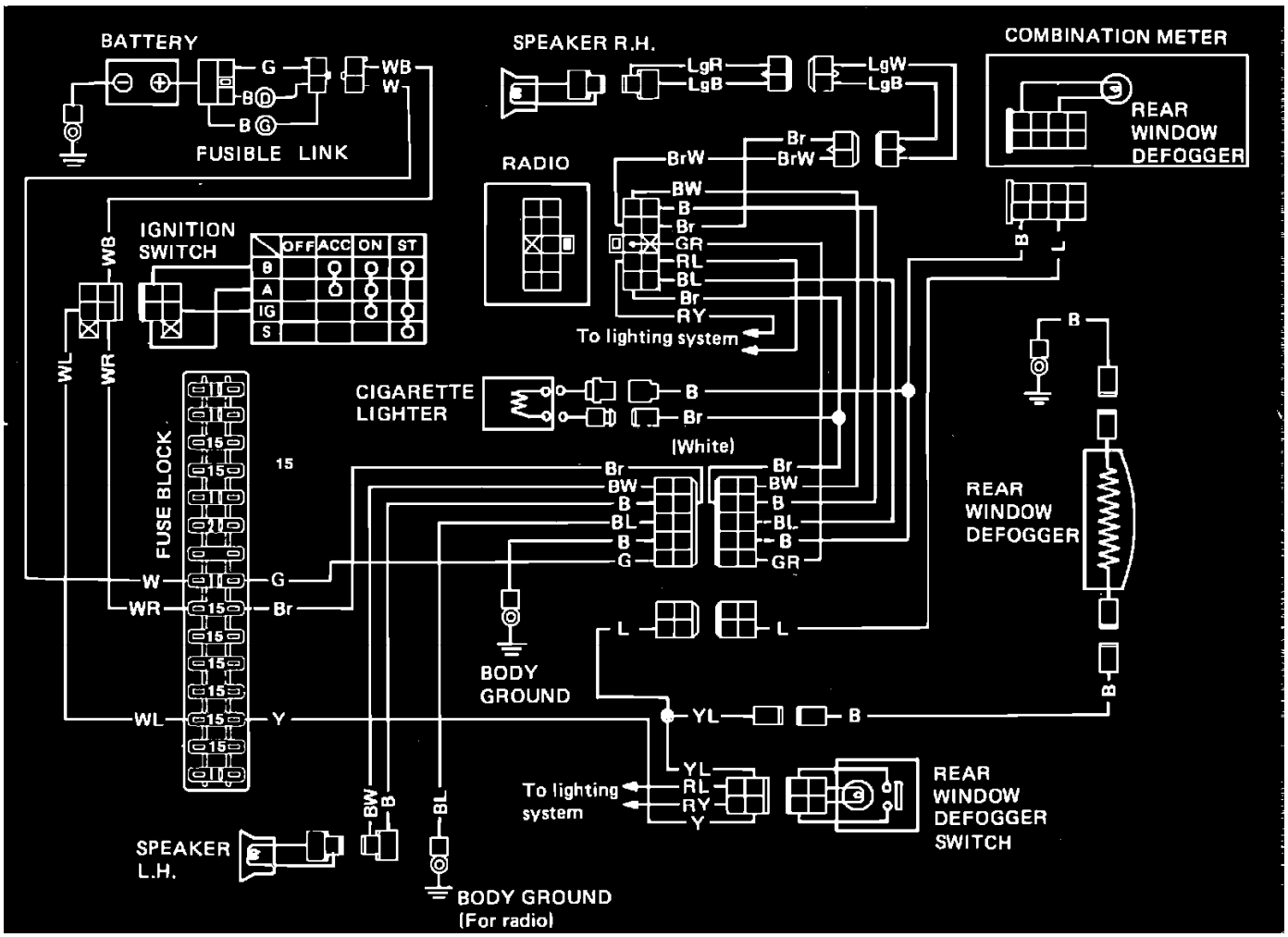


Fig. 450 Cigarette Lighter, Radio & Raer Window Defogger Wiring Circuit

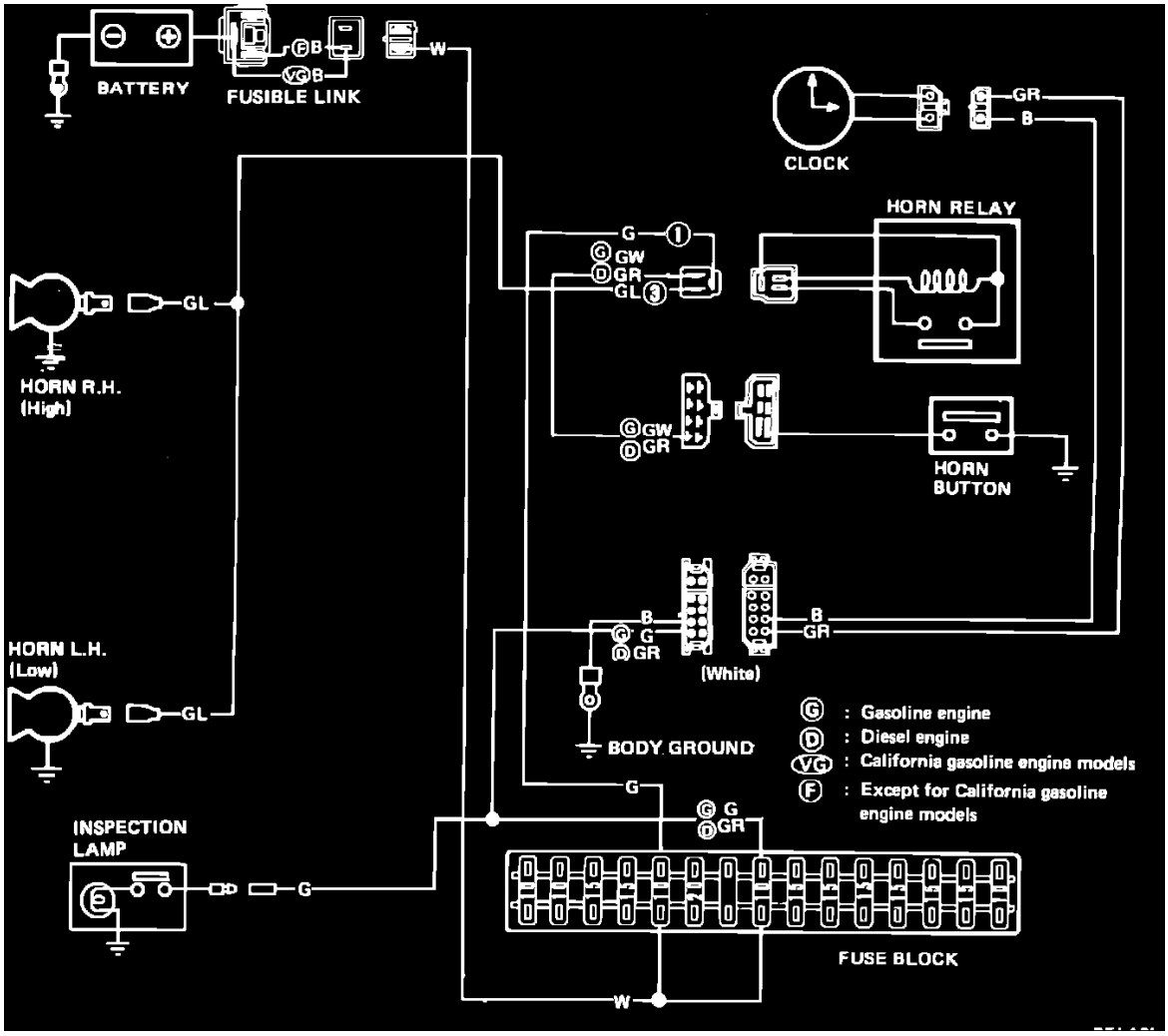


Fig. 325 Clock, Horn & Inspection Lamp Wiring Circuit.

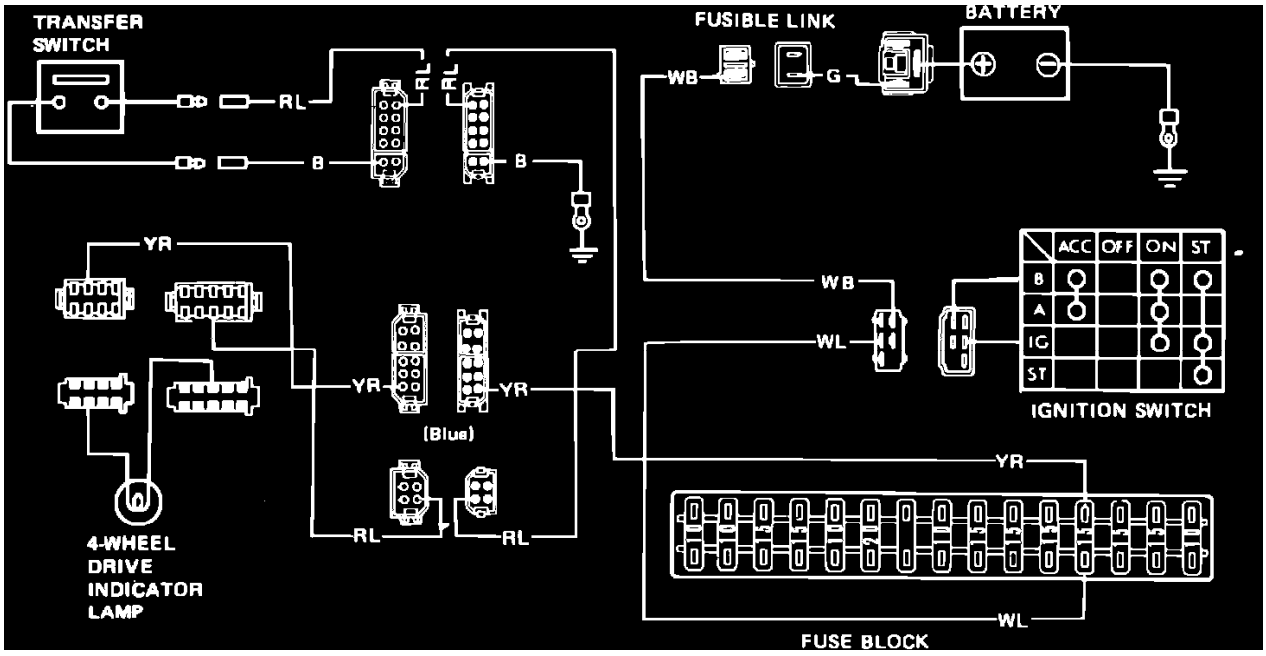


Fig. 329 Four Wheel Drive Indicator Lamp Wiring Circuit.

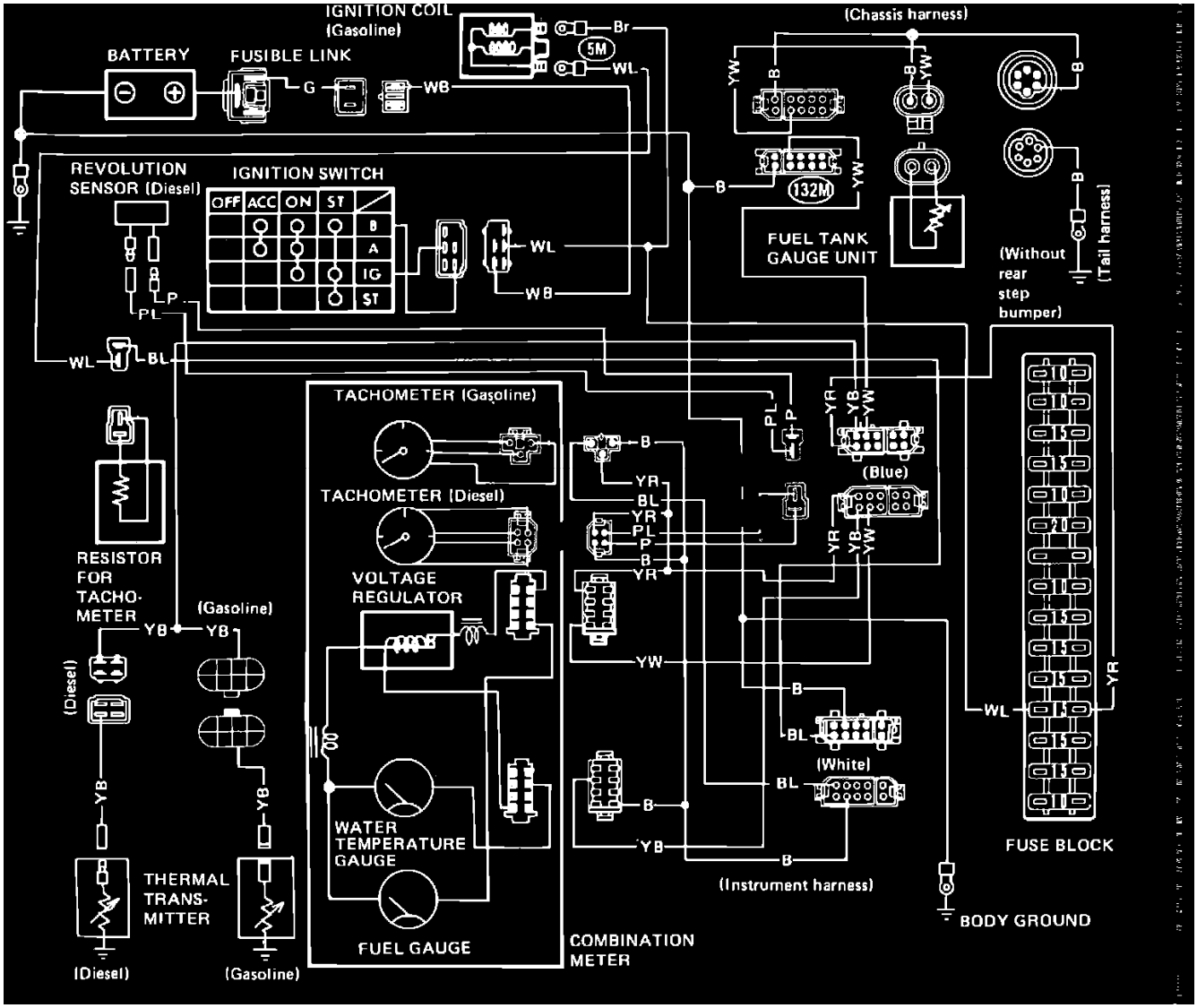


Fig. 457 Gauges & Meter Wiring Circuit

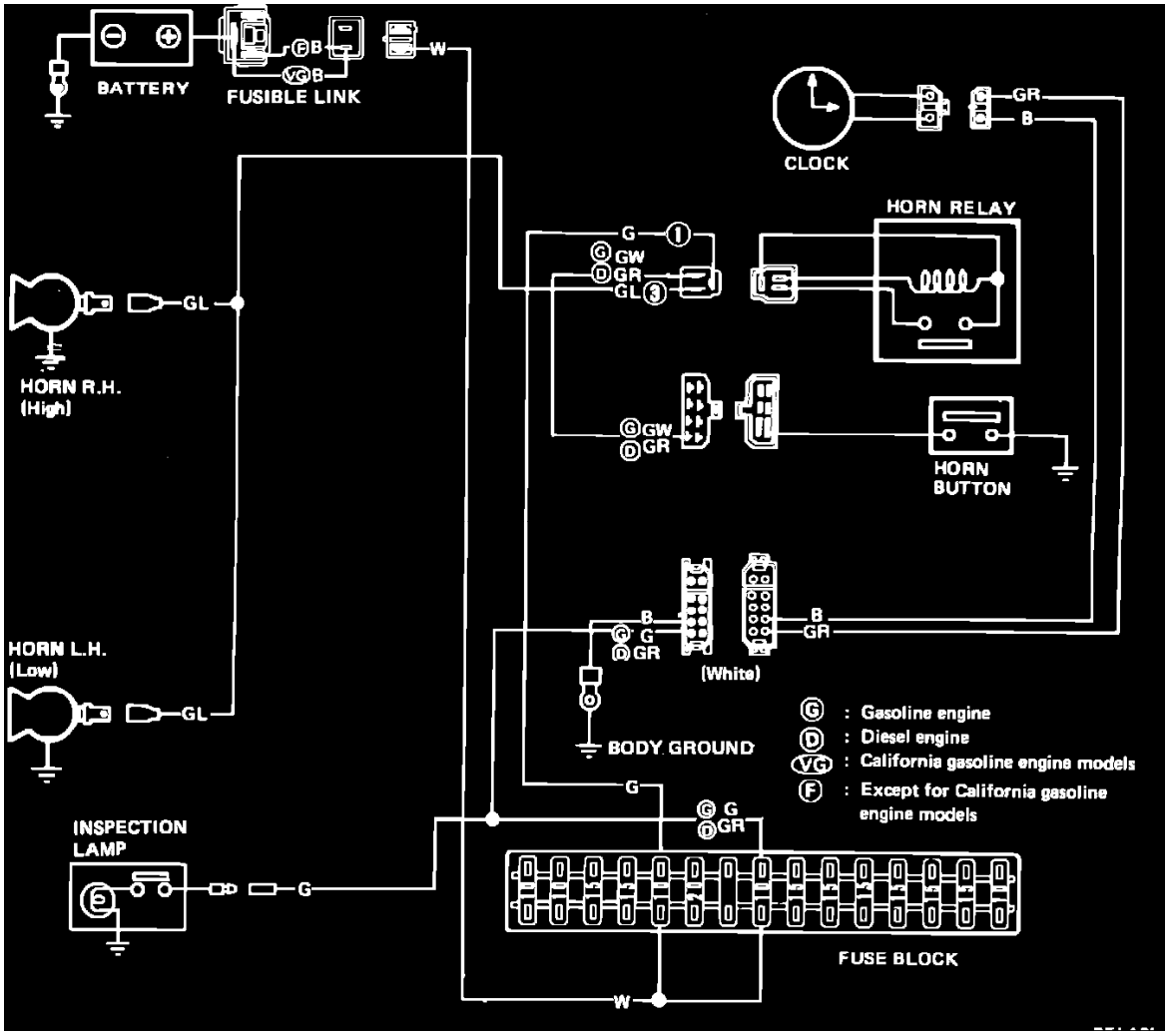


Fig. 325 Clock, Horn & Inspection Lamp Wiring Circuit.

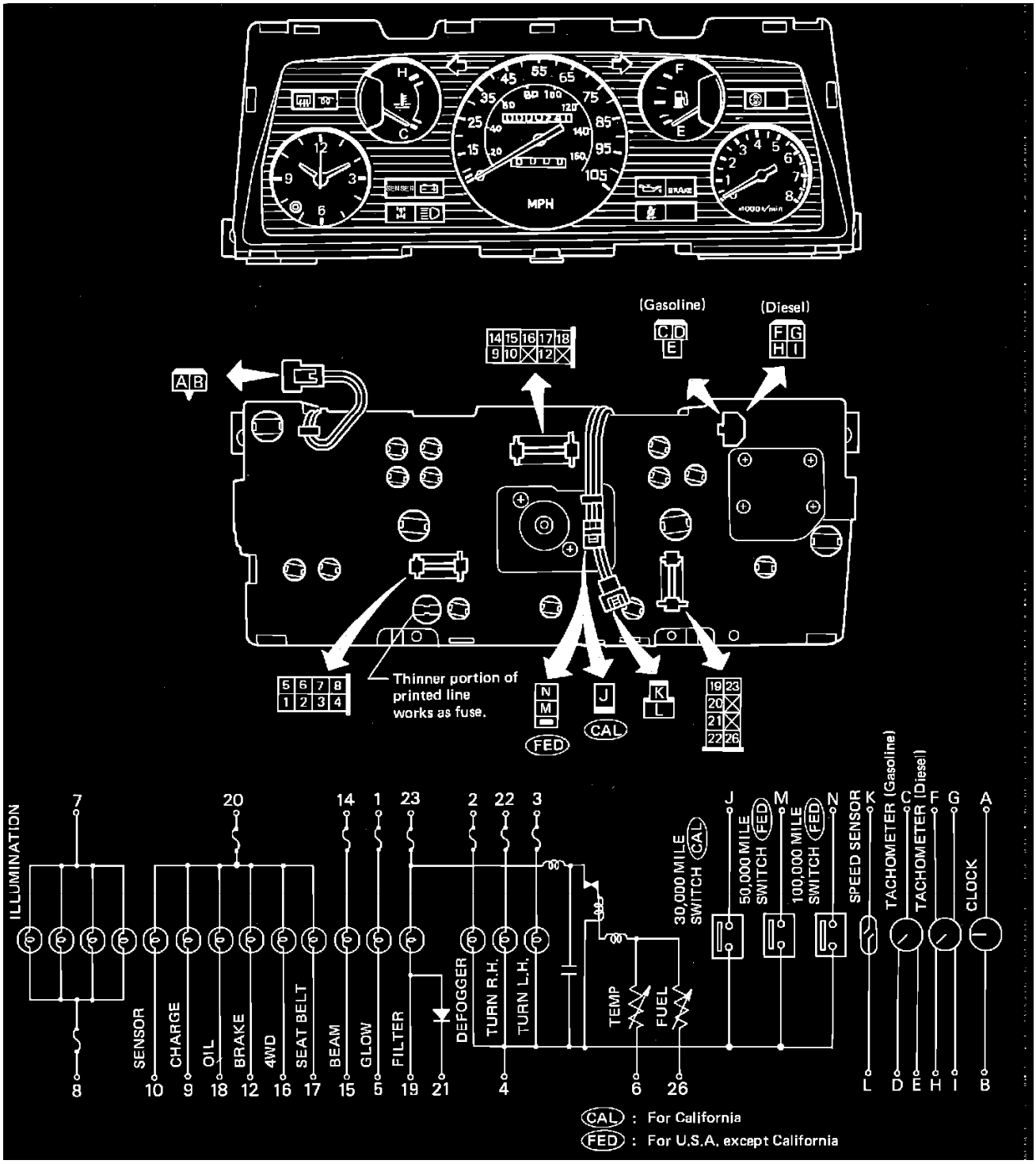


Fig. 442 Instrument Panel Printed Circuit

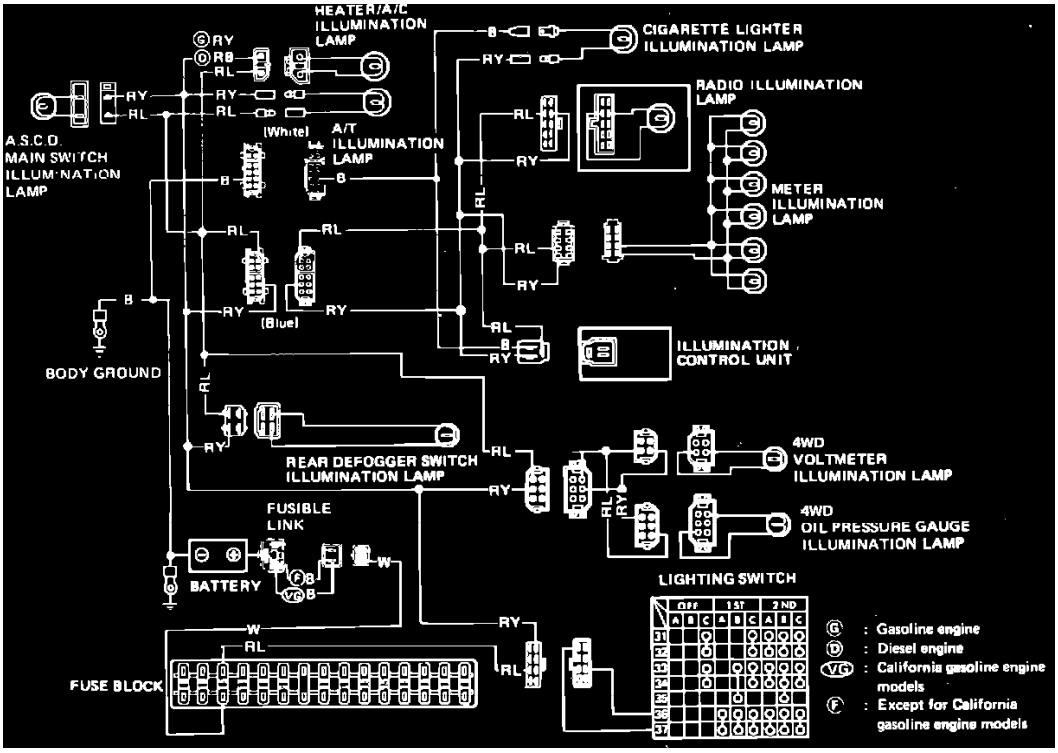


Fig. 337 Instrument Panel Illumination Wiring Circuit.

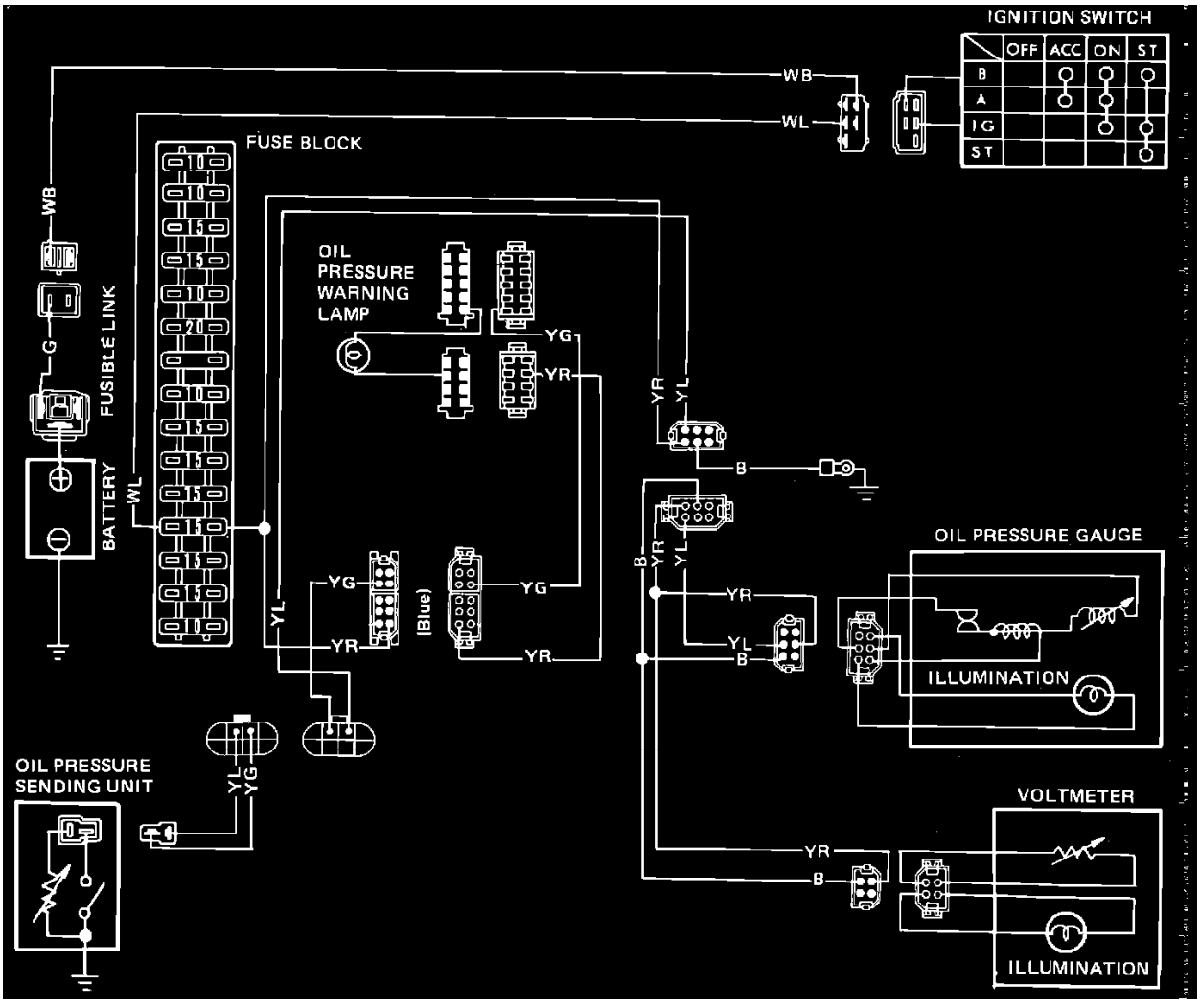


Fig. 467 Oil Pressure Gauge & Voltmeter Wiring Circuit

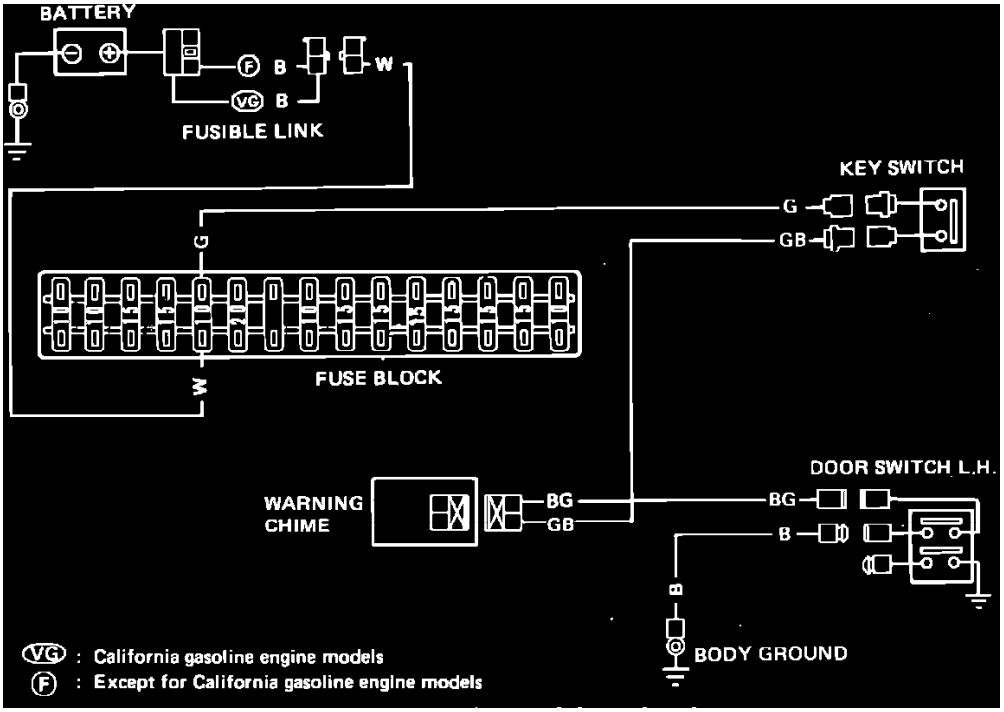


Fig. 342 Warning Chime Wiring Circuit.

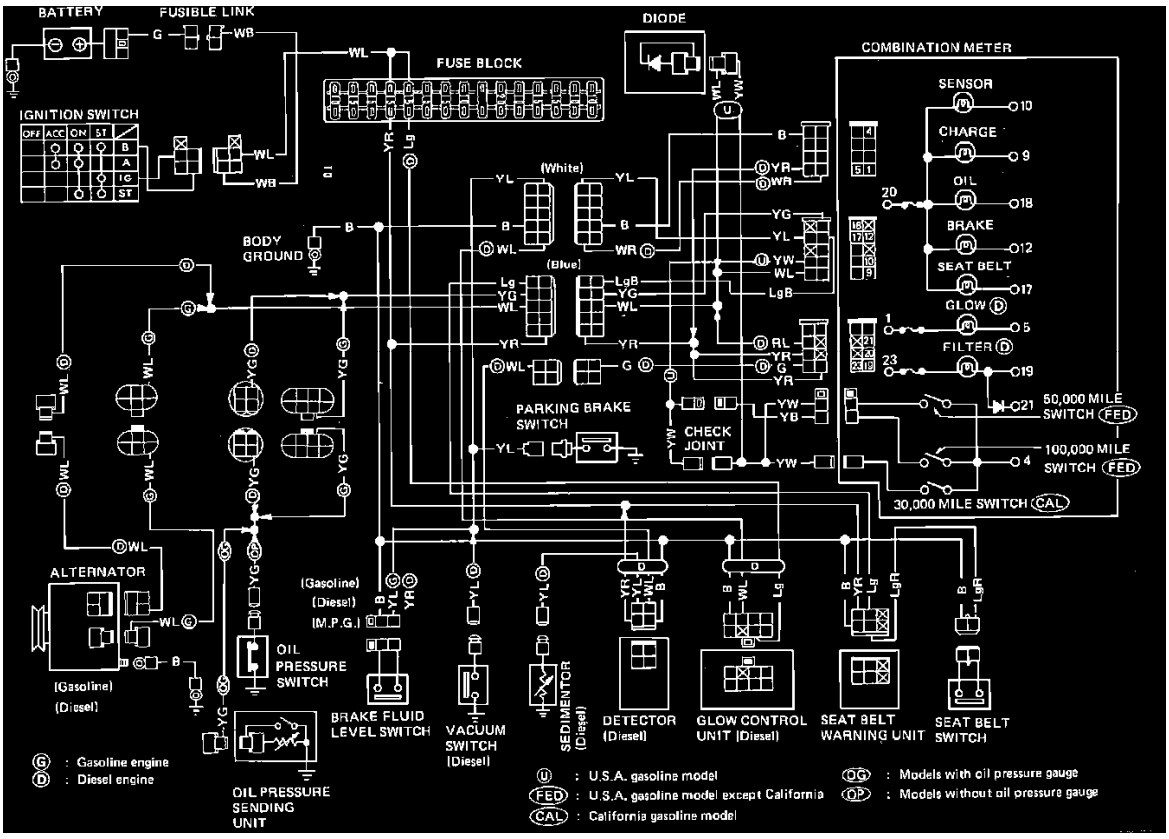


Fig. 473 Warning Lamp Wiring Circuit

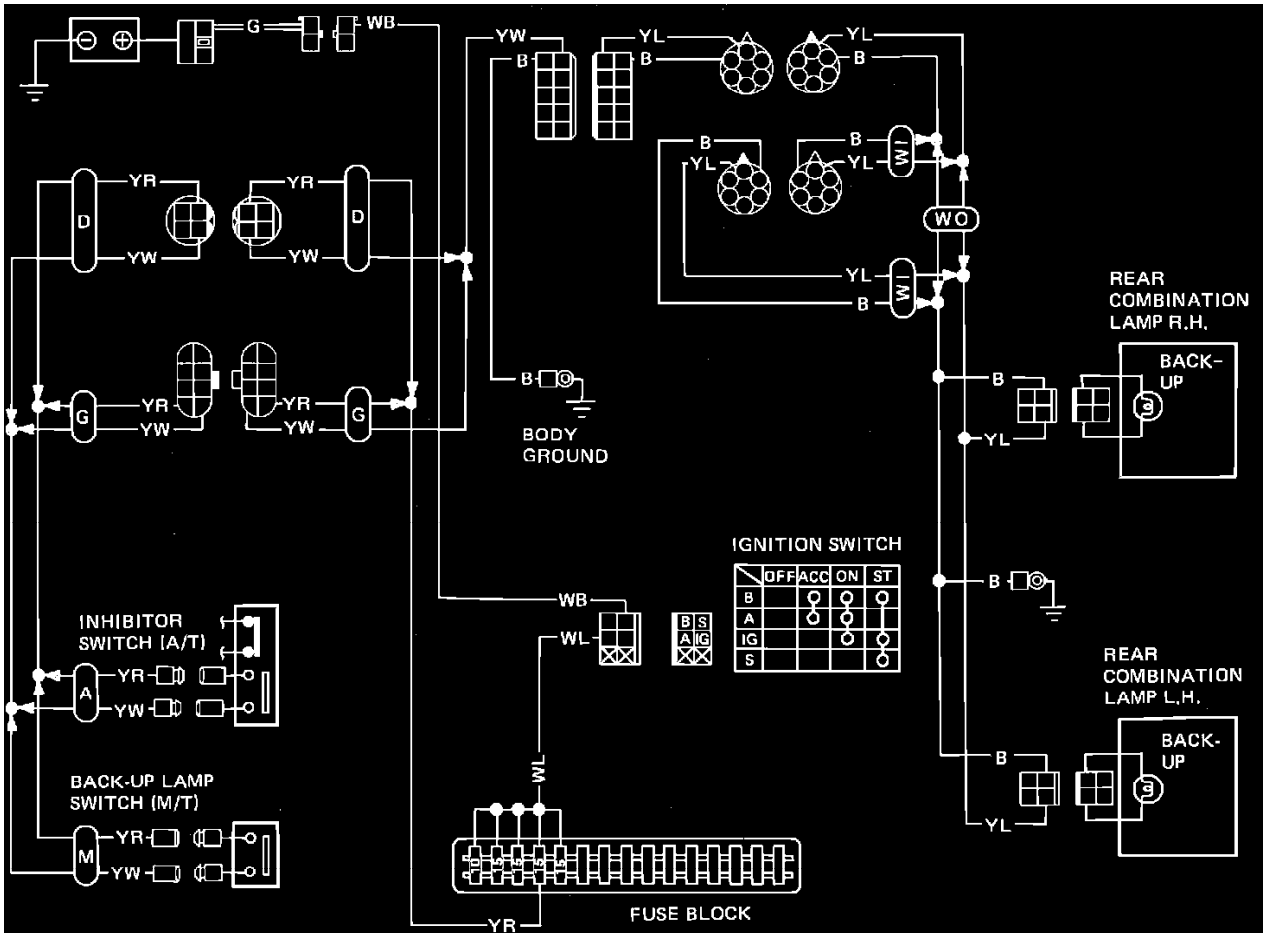


Fig. 446 Backup Lamp Wiring Circuit

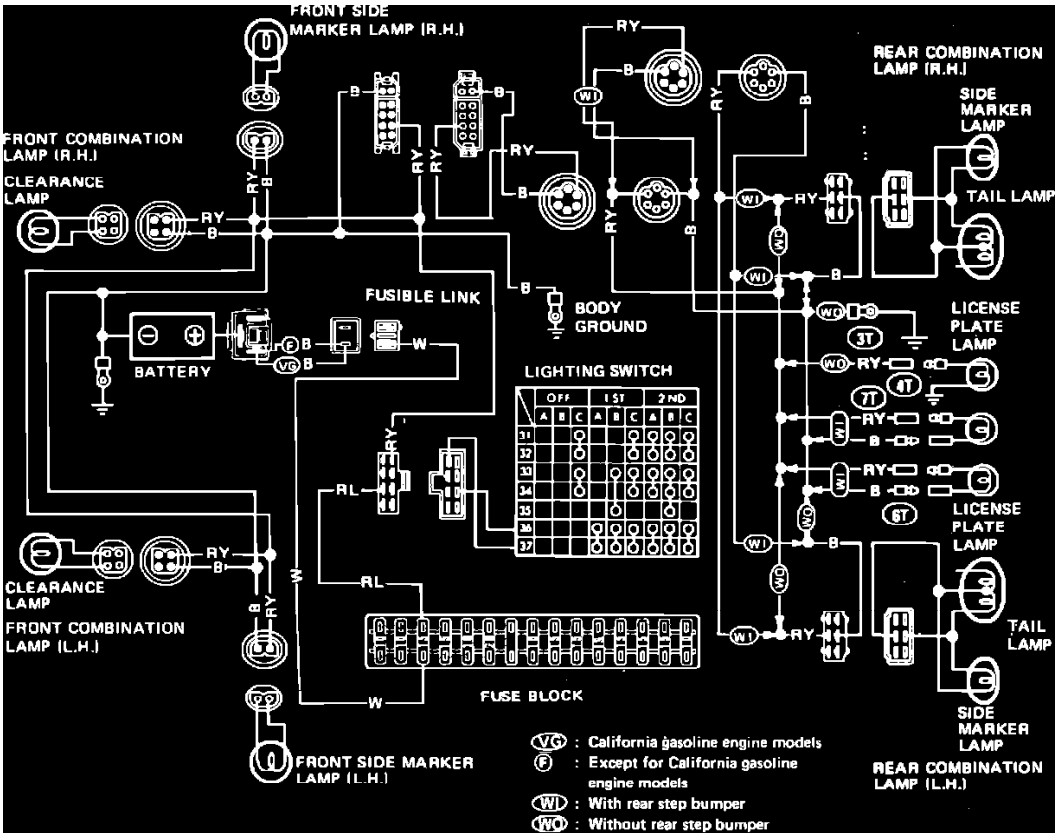


Fig. 324 Clearance, License Plate, Side Marker & Tail Lamp Wiring Circuit.

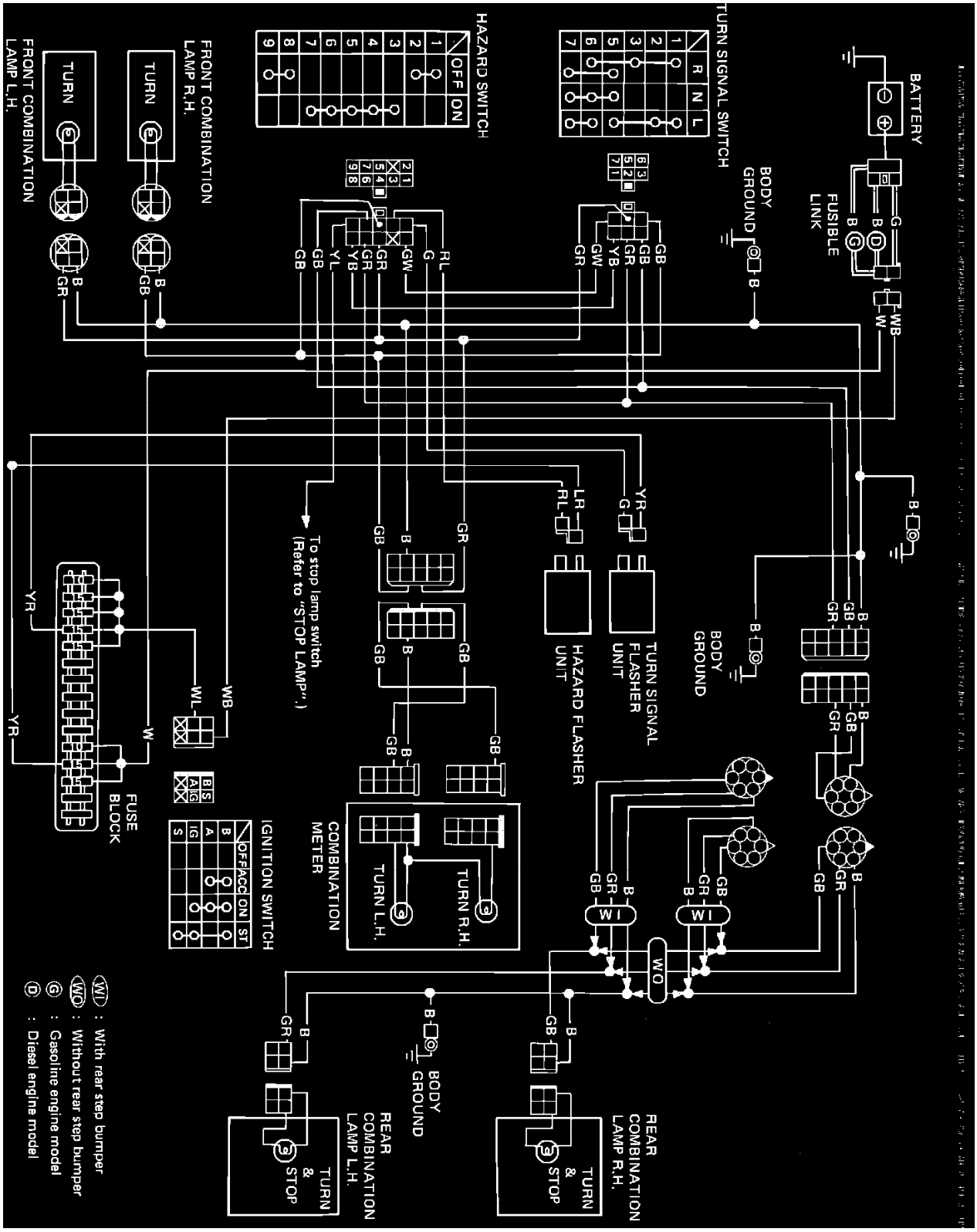


Fig. 459 Hazard Warning & Turn Signal Lamp Wiring Circuit

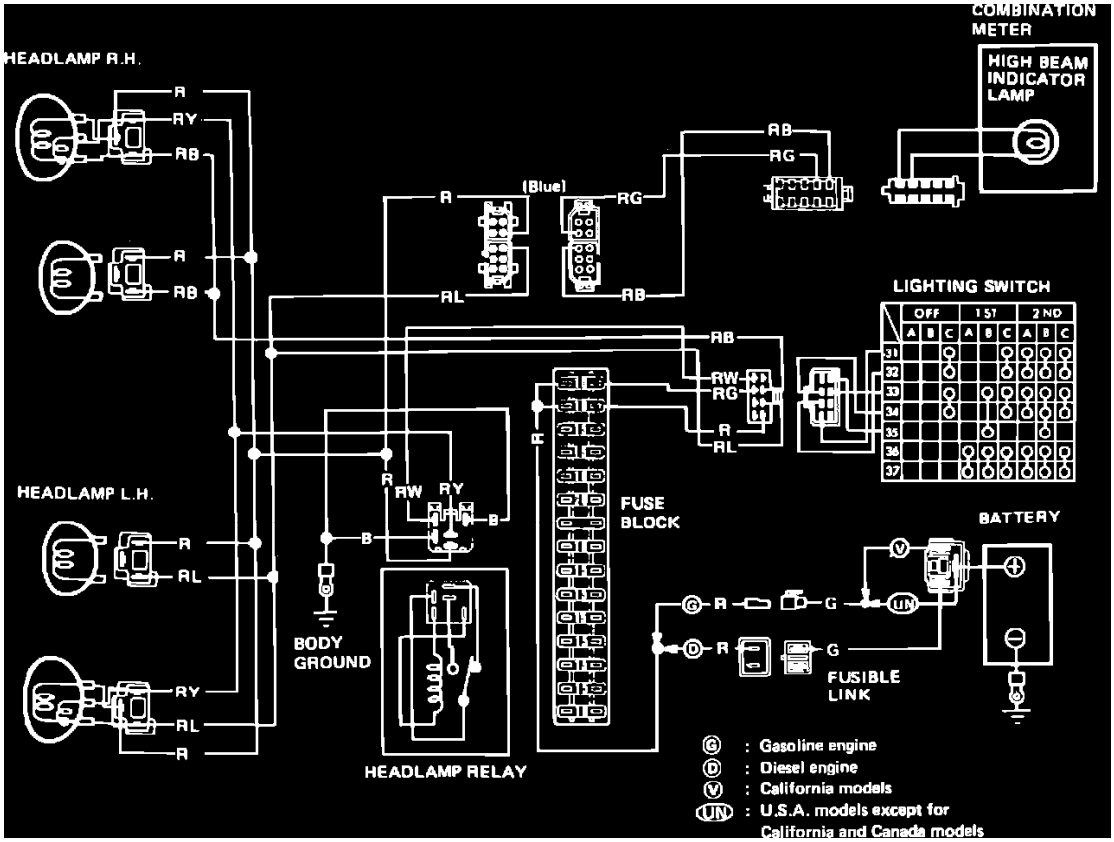


Fig. 333 Headlamp Wiring Circuit.

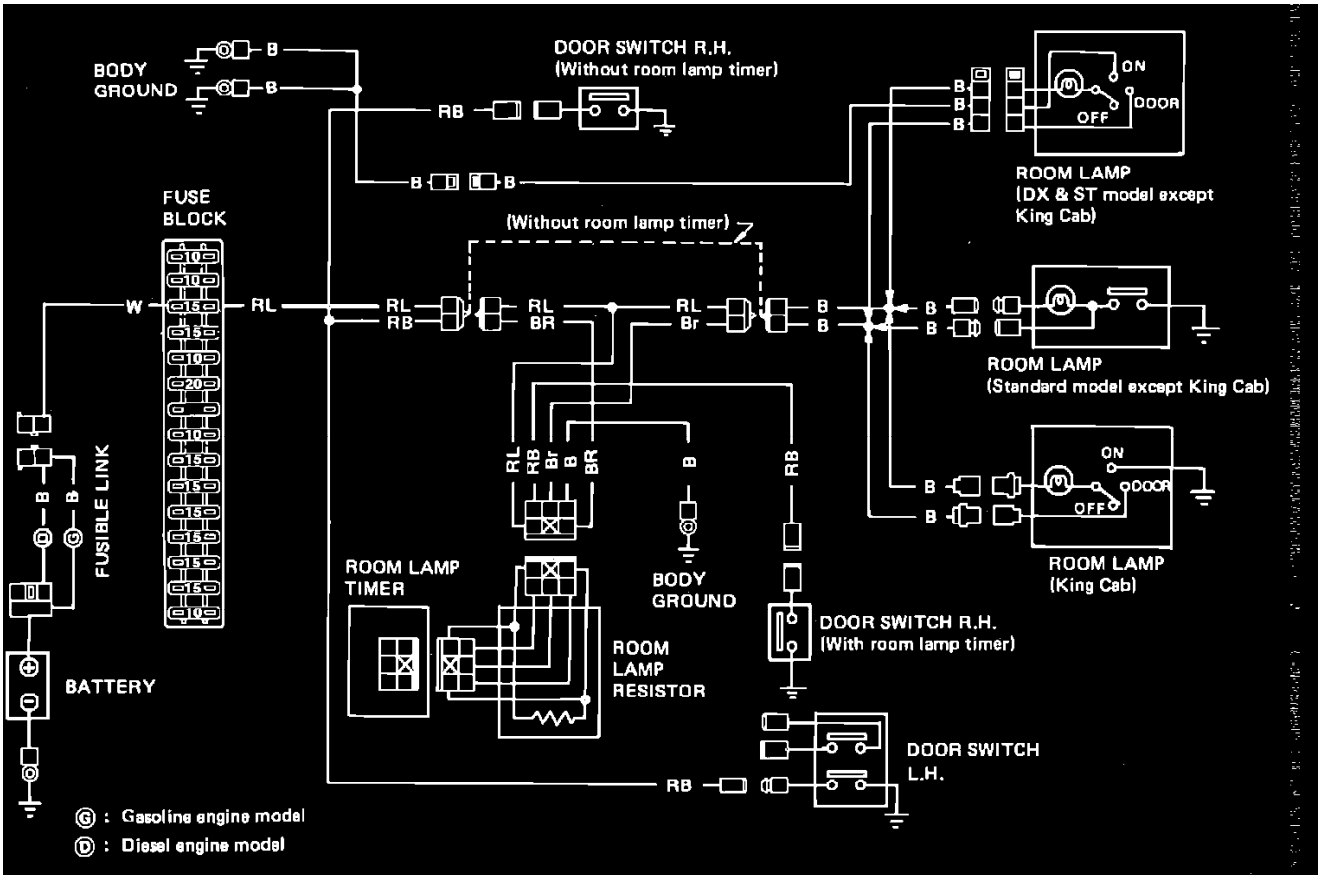


Fig. 466 Interior Lamp Wiring Circuit

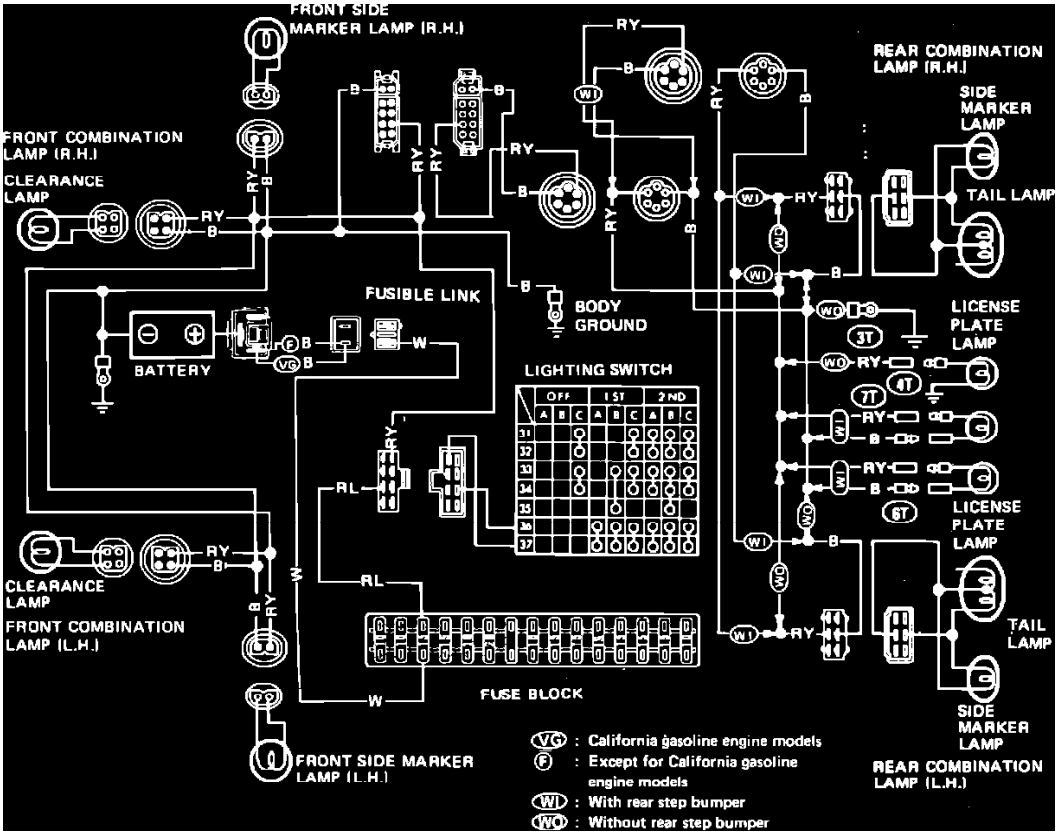


Fig. 324 Clearance, License Plate, Side Marker & Tail Lamp Wiring Circuit.

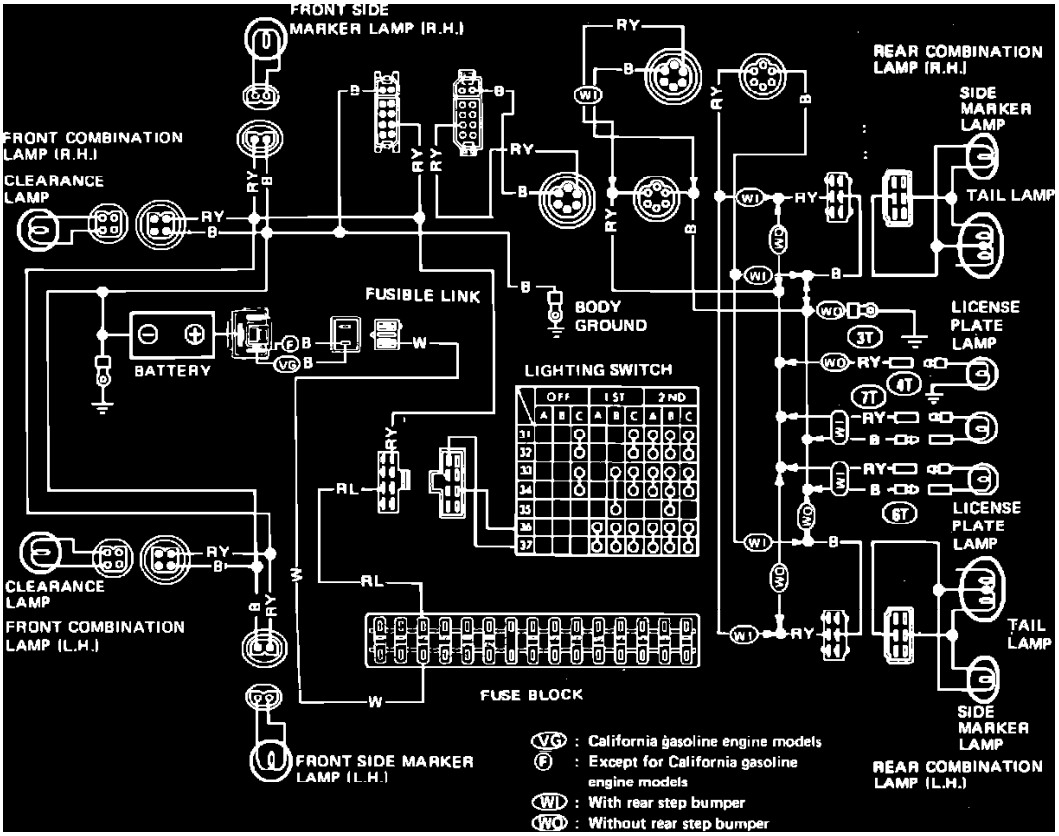


Fig. 324 Clearance, License Plate, Side Marker & Tail Lamp Wiring Circuit.

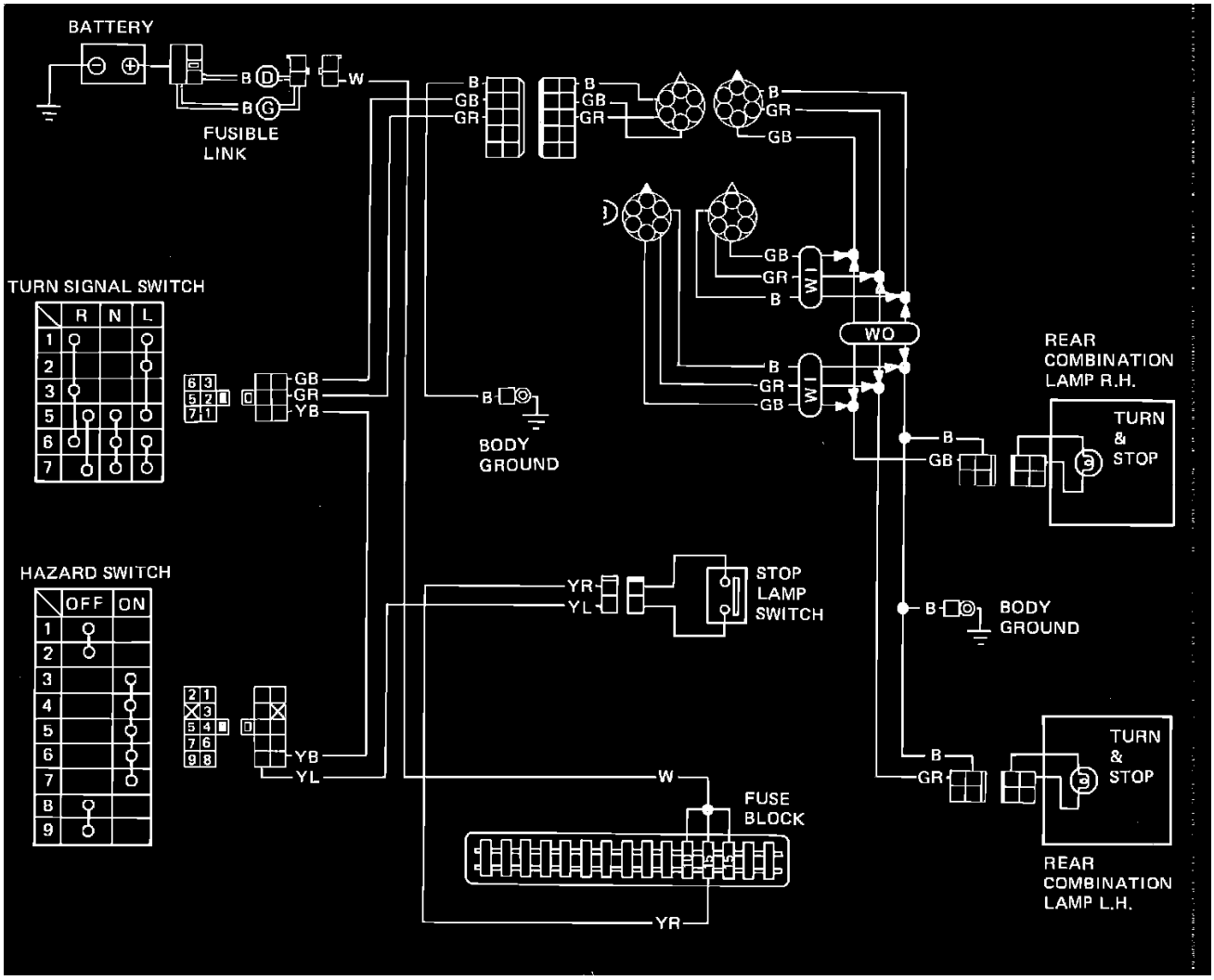


Fig. 471b Stop Lamp Wiring Circuit

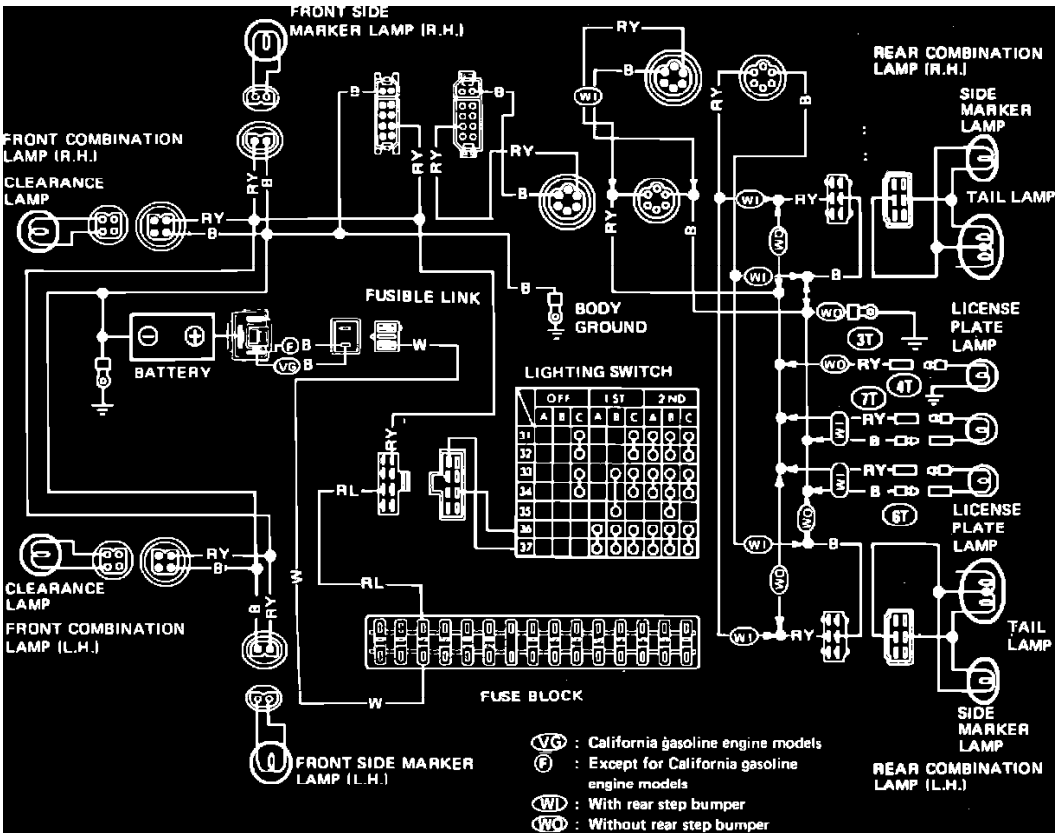


Fig. 324 Clearance, License Plate, Side Marker & Tail Lamp Wiring Circuit.

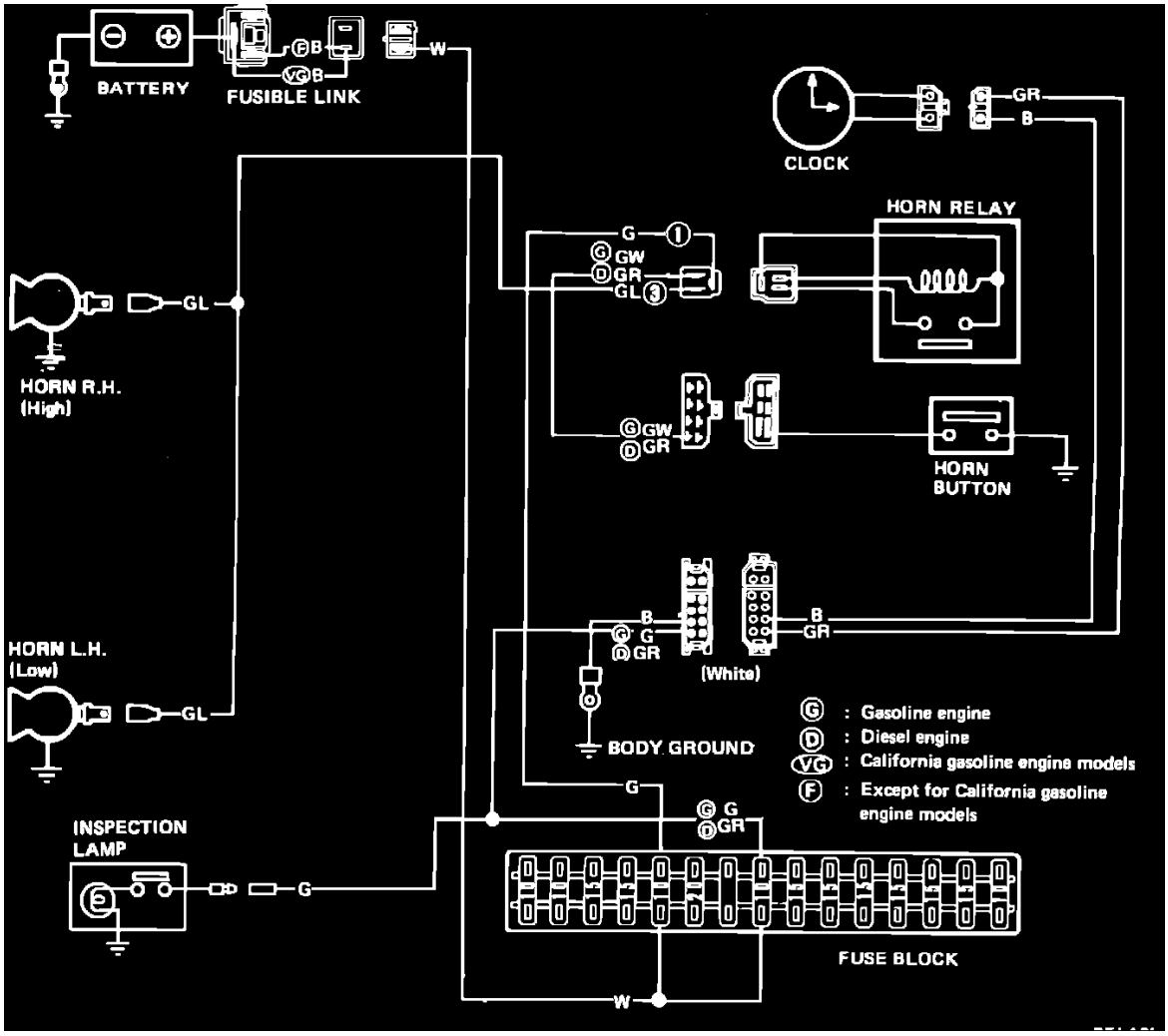


Fig. 325 Clock, Horn & Inspection Lamp Wiring Circuit.

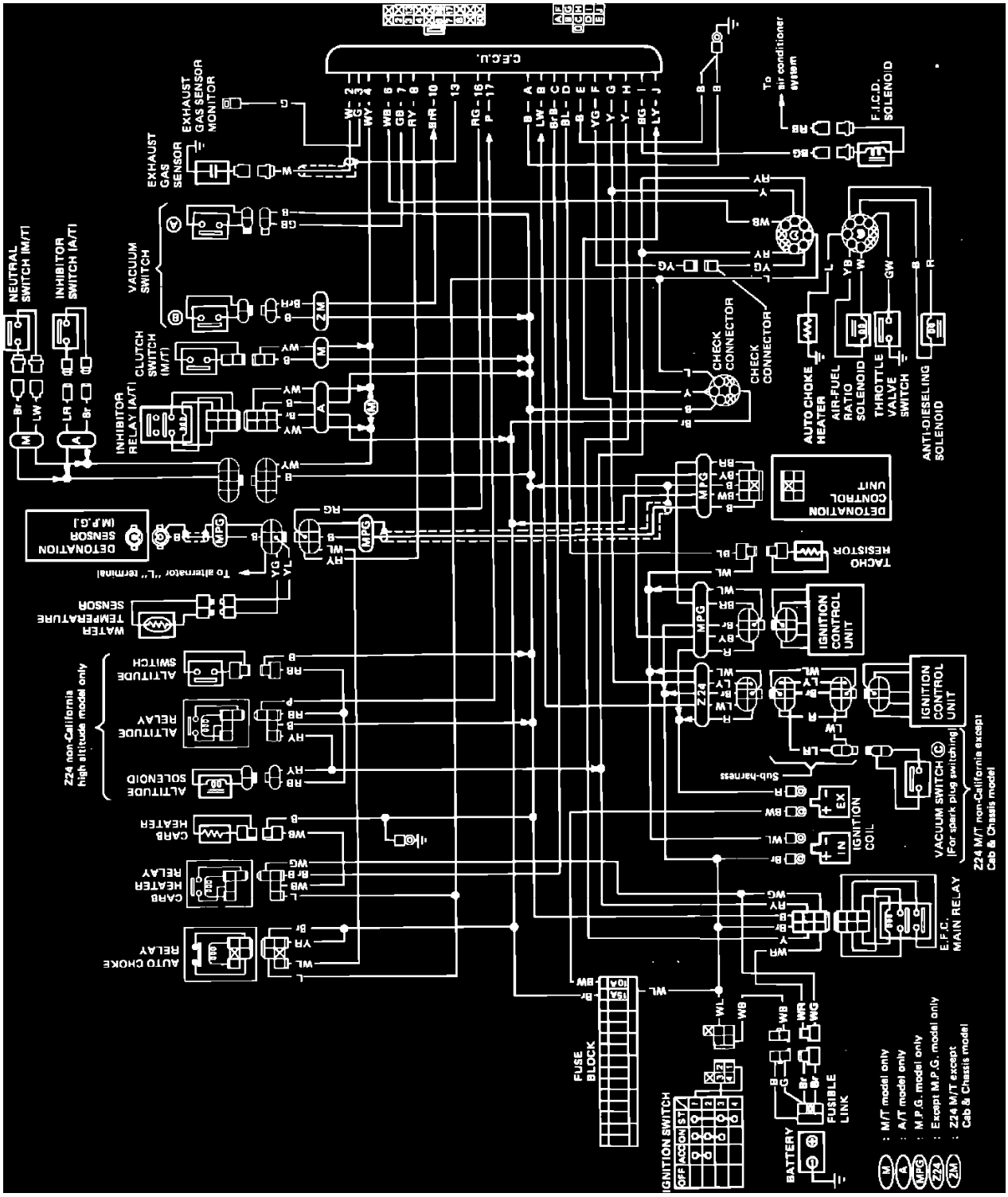


Fig. 120 ECC Wiring Diagram

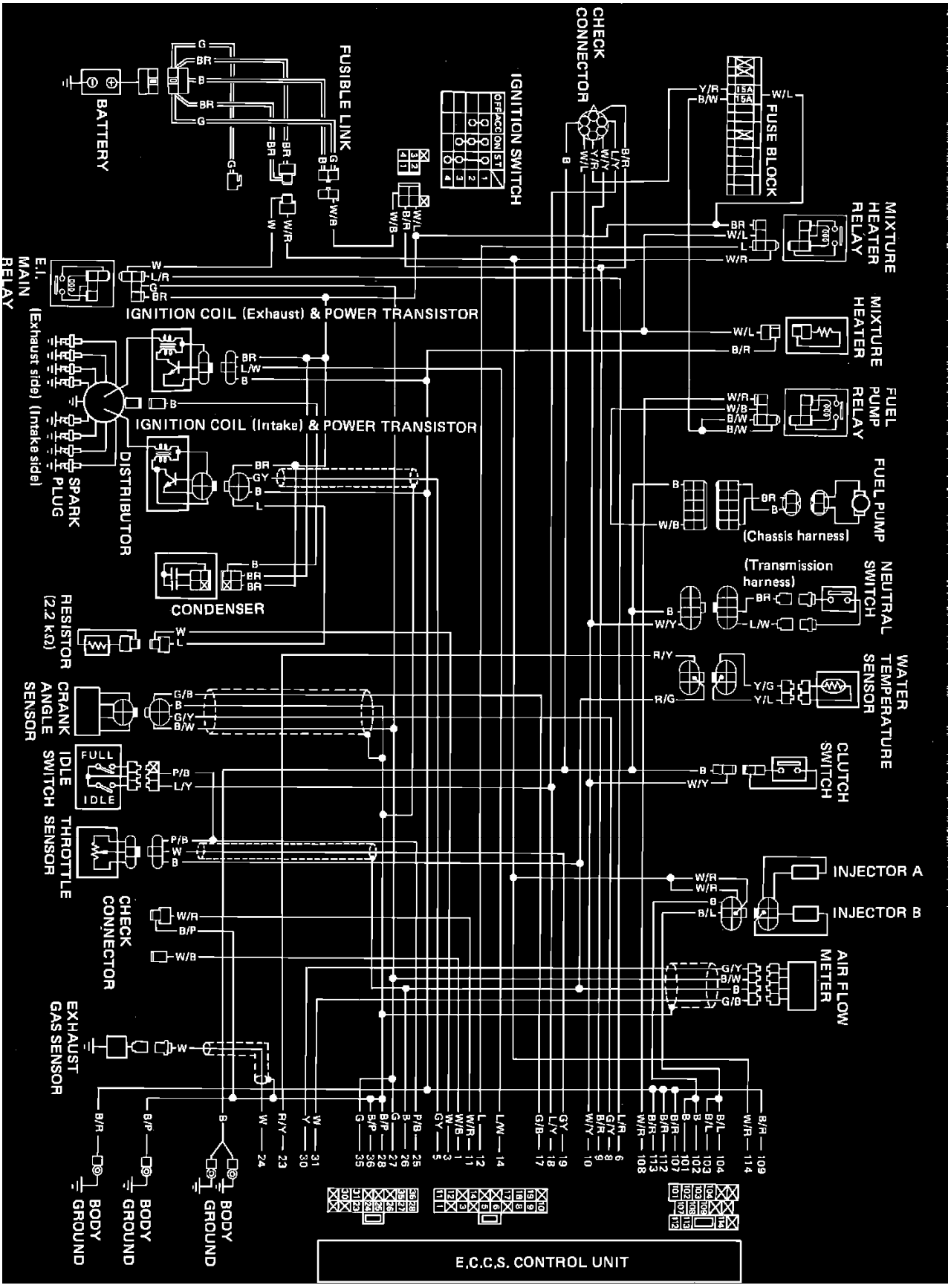
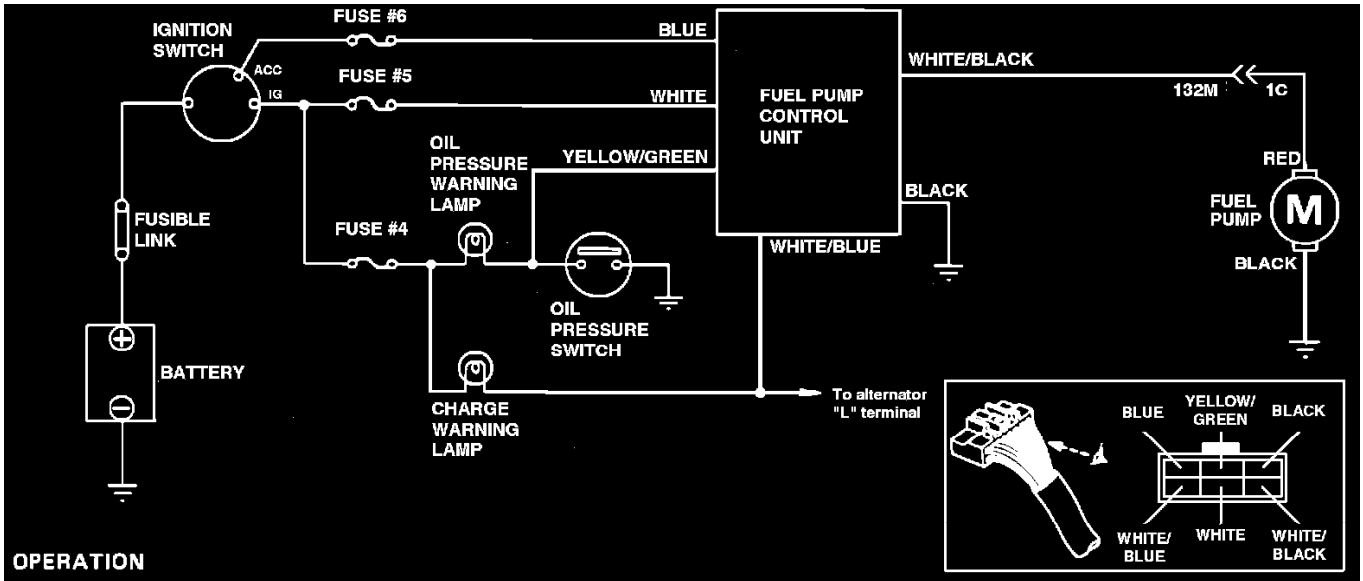


Fig. 455 Emission Control System Wiring Circuit. W/Gasoline Engine & Fuel Injection



OPERATION

Ignition switch position	Engine	Alternator	Oil pressure	Fuel pump
OFF	Stopped	Not generating	No pressure	Not operating
ACC				
ON				
START	Cranking	Not generating	Low pressure	Operating
		Generating		
ON	Running	Not generating	Normal	
		Generating		
		Failure		
		Generating	Failure	

Fuel Pump Control Circuit And Operation

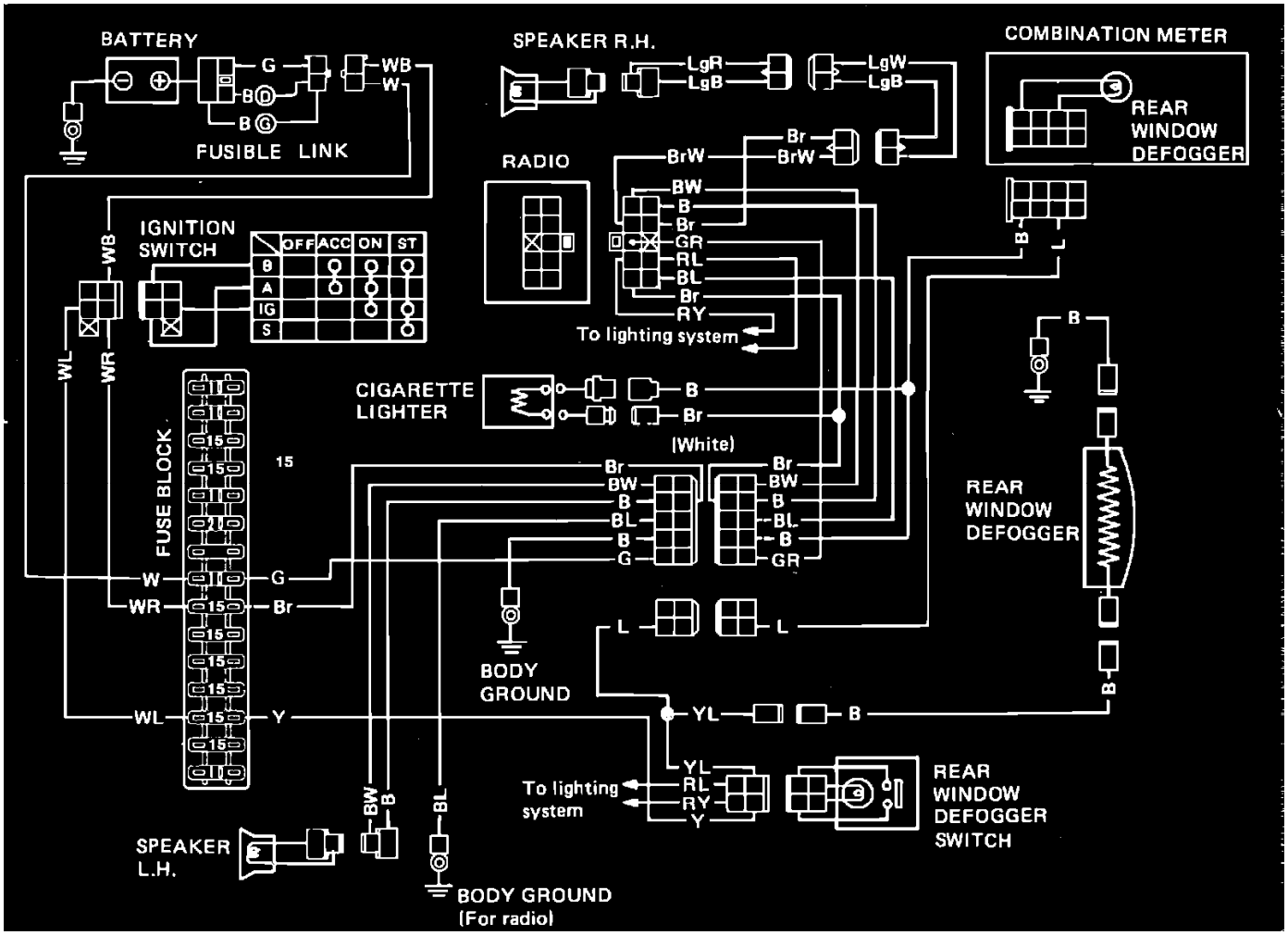


Fig. 450 Cigarette Lighter, Radio & Raer Window Defogger Wiring Circuit

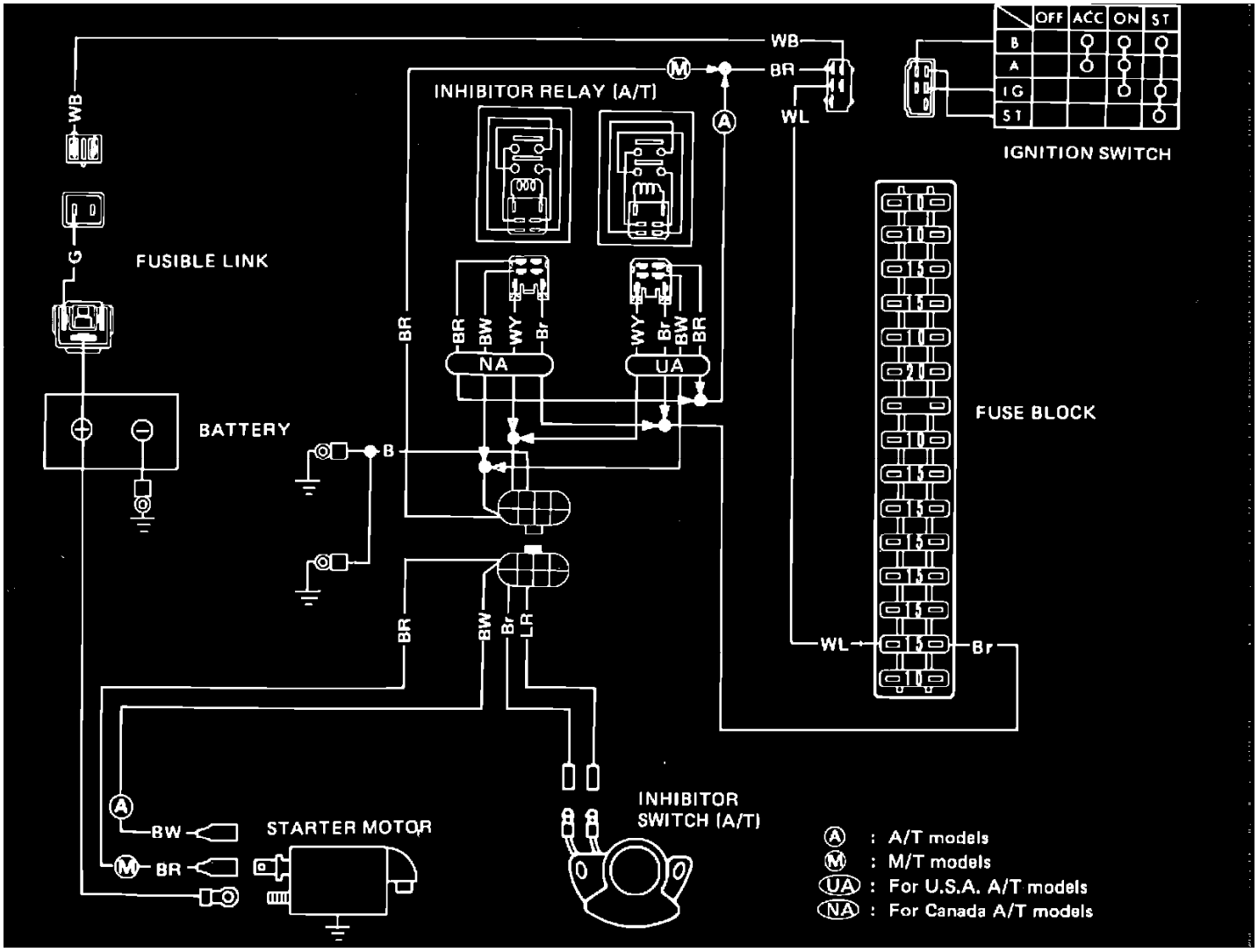


Fig. 471a Starter Wiring Circuit. W/Gasoline Engine

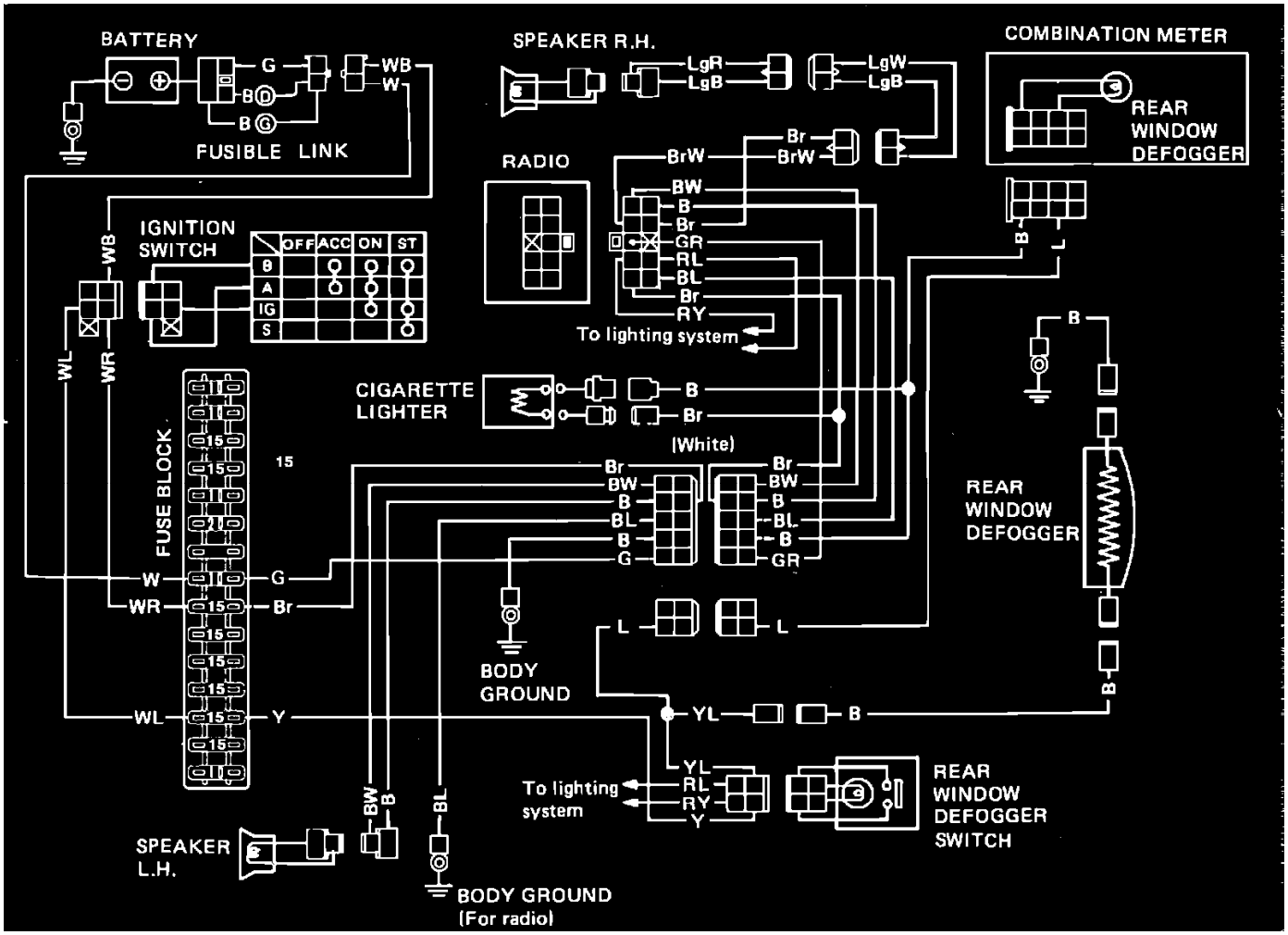


Fig. 450 Cigarette Lighter, Radio & Raer Window Defogger Wiring Circuit

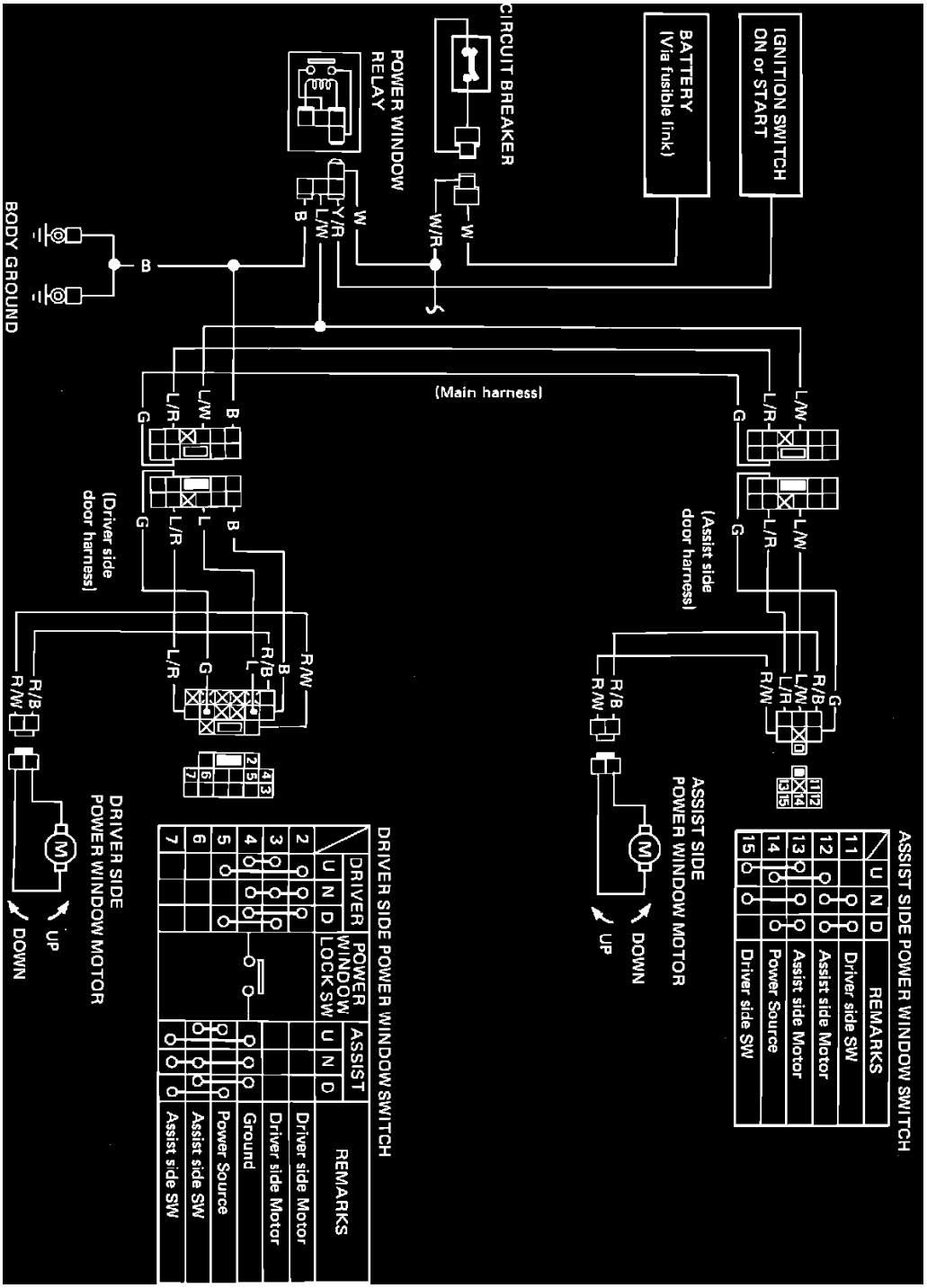


Fig. 469 Power Window Wiring Circuit

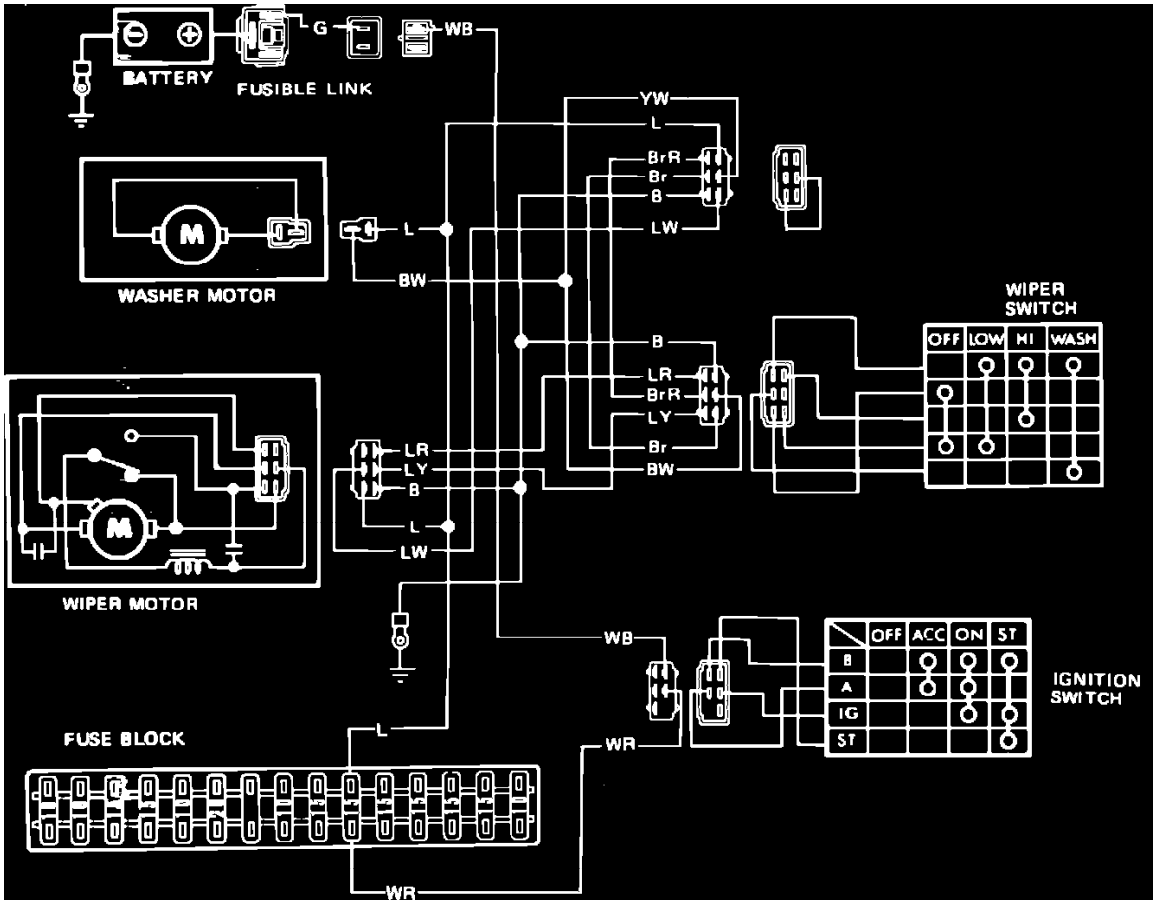


Fig. 344 Windshield Wiper & Washer Wiring Circuit. Less Intermittent Wipers

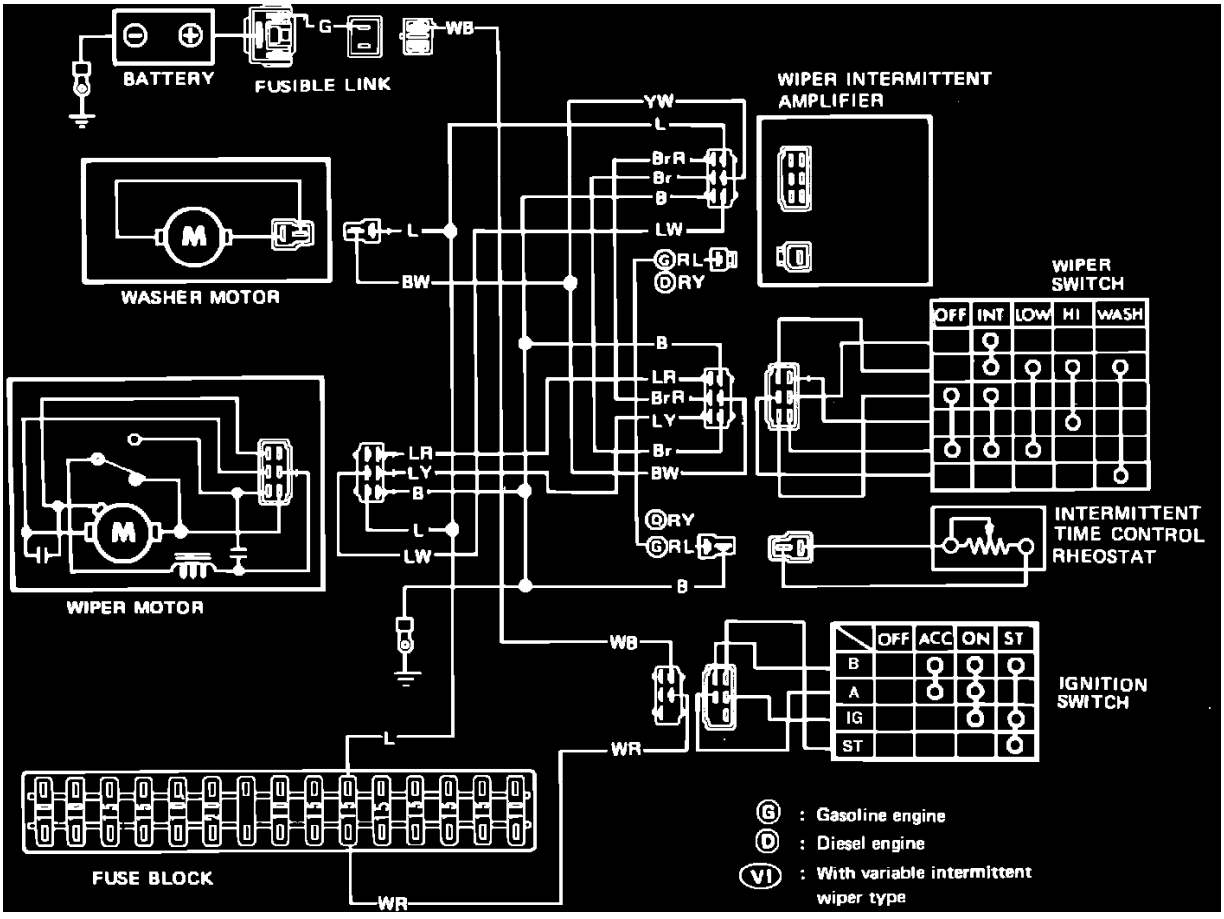


Fig. 345 Windshield Wiper & Washer Wiring Circuit. w/Intermittent Wipers

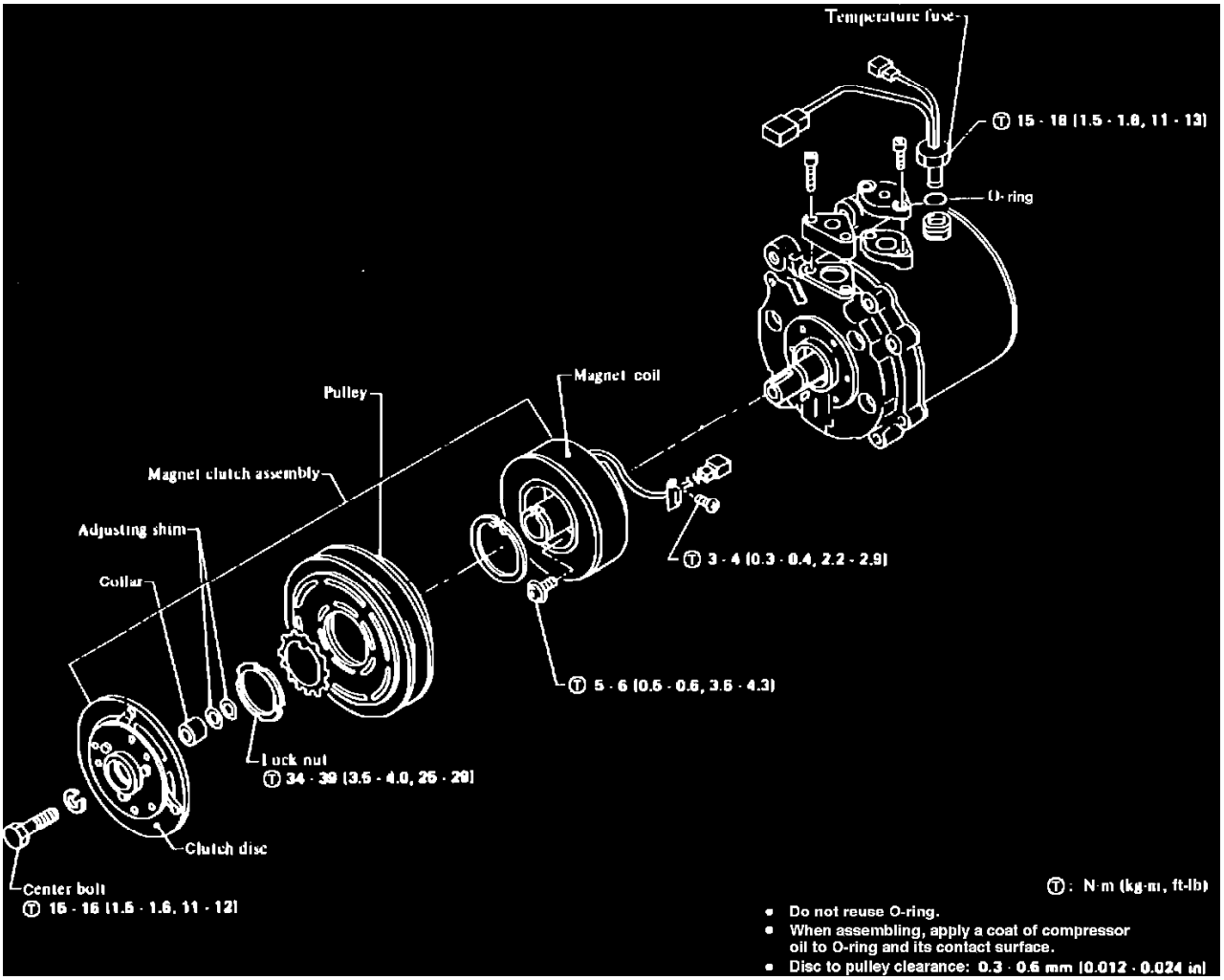


Fig. 22 Exploded view of Diesel Kiki DKV-14 series vane rotary compressor

Wiper Motor

1. Remove wiper arms.
2. Remove cowl top grille.
3. Remove stop ring connecting wiper motor arm to connecting rod.
4. Disconnect wiper motor electrical connector from beneath instrument panel.
5. Remove wiper motor retaining bolts and the wiper motor.
6. Remove flange nuts retaining pivot to cowl top.
7. Remove wiper motor linkage.
8. Reverse procedure to install.

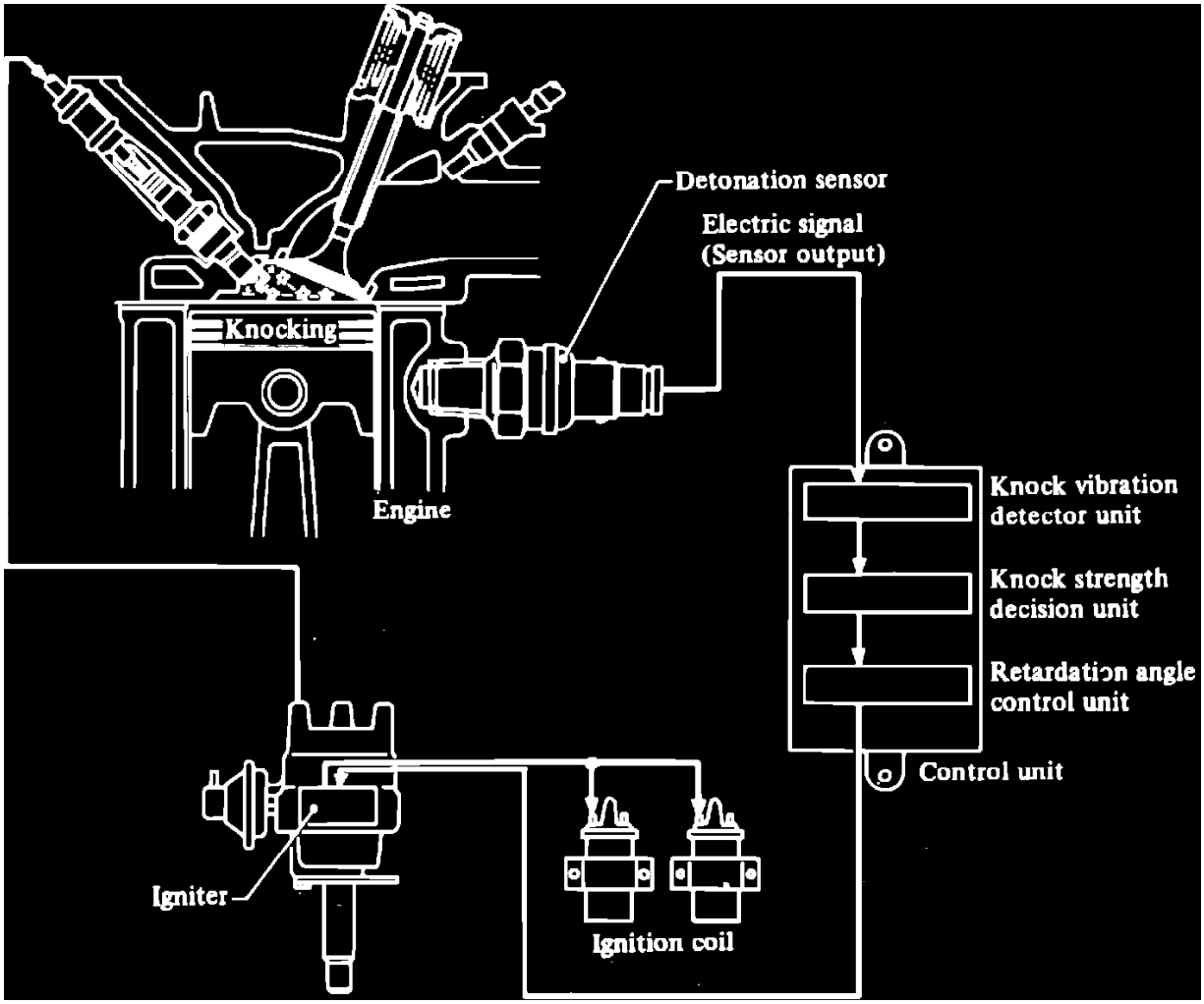


Fig. 13 Detonation Control System, MPG Model.

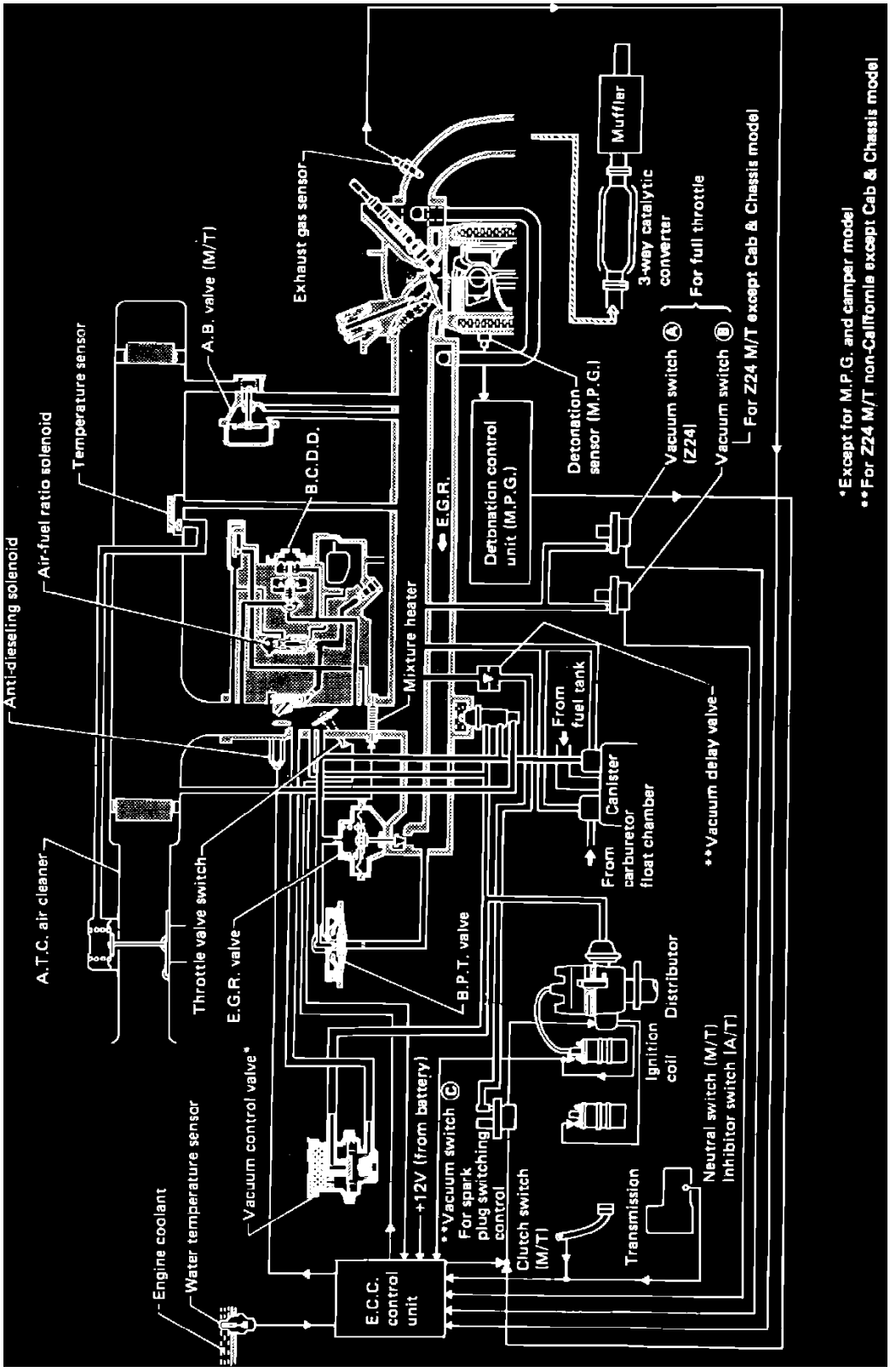
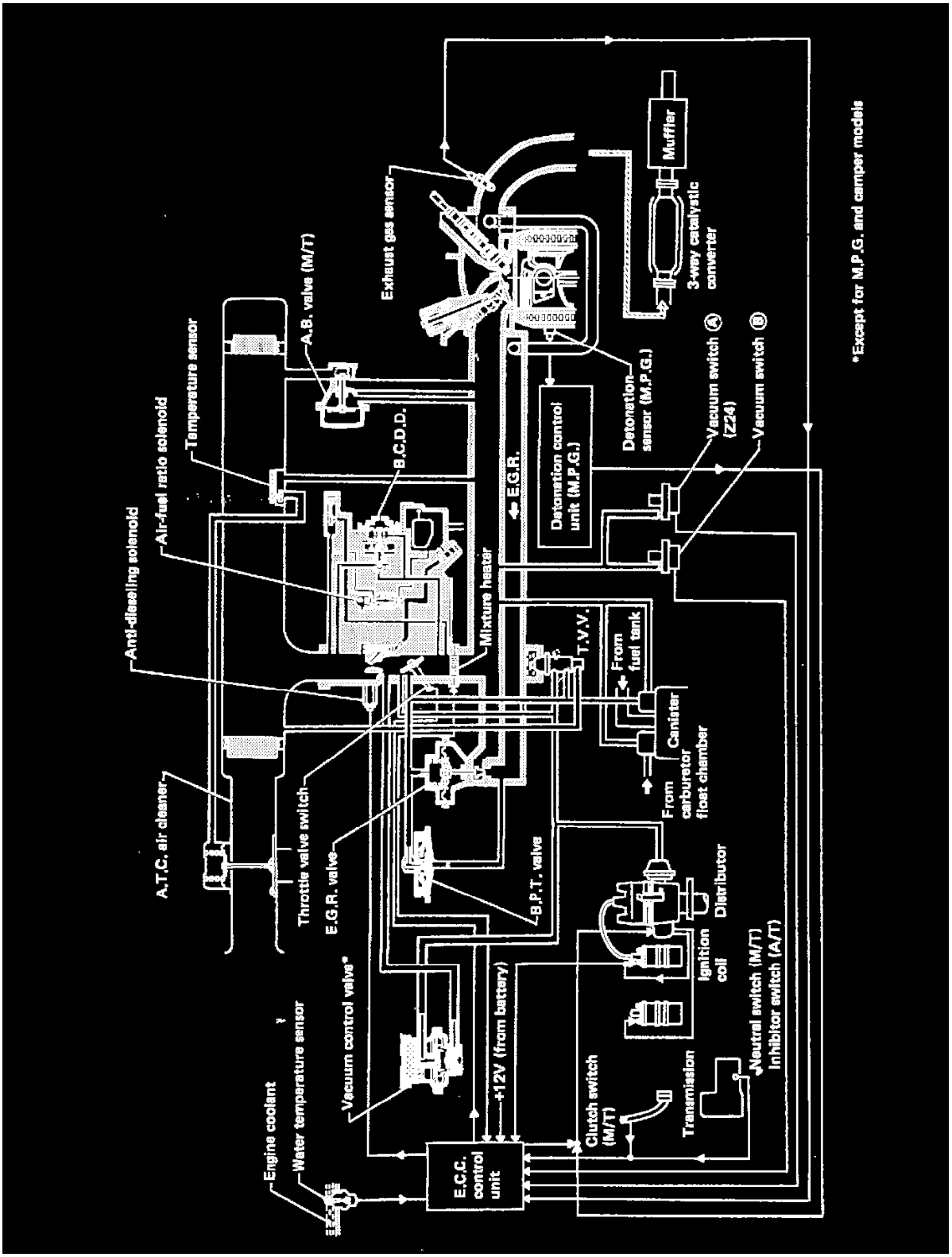


Fig. 63 Emission control system.



Engine And Emission Control Systems

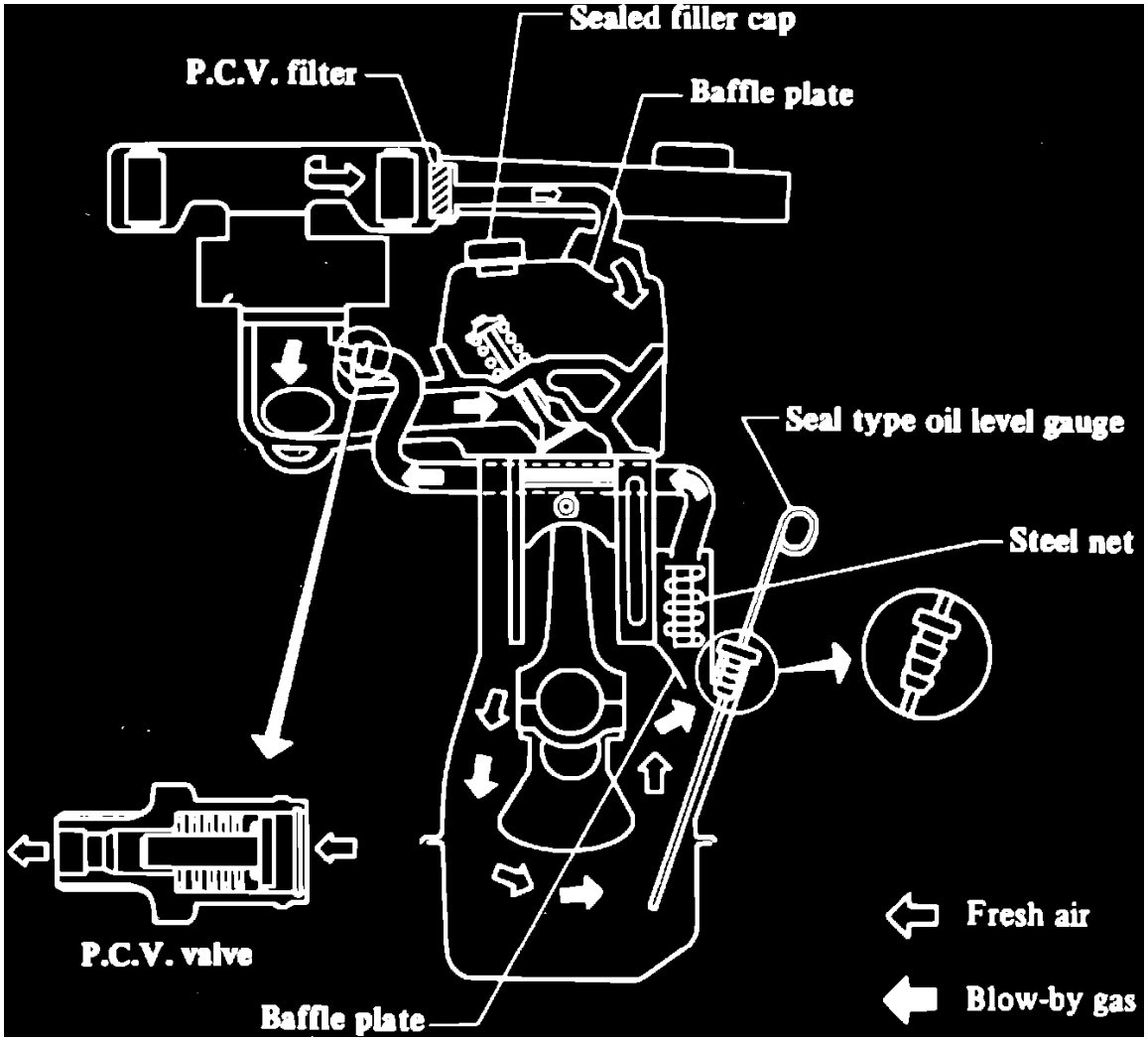


Fig. 28 Positive Crankcase Ventilation System.

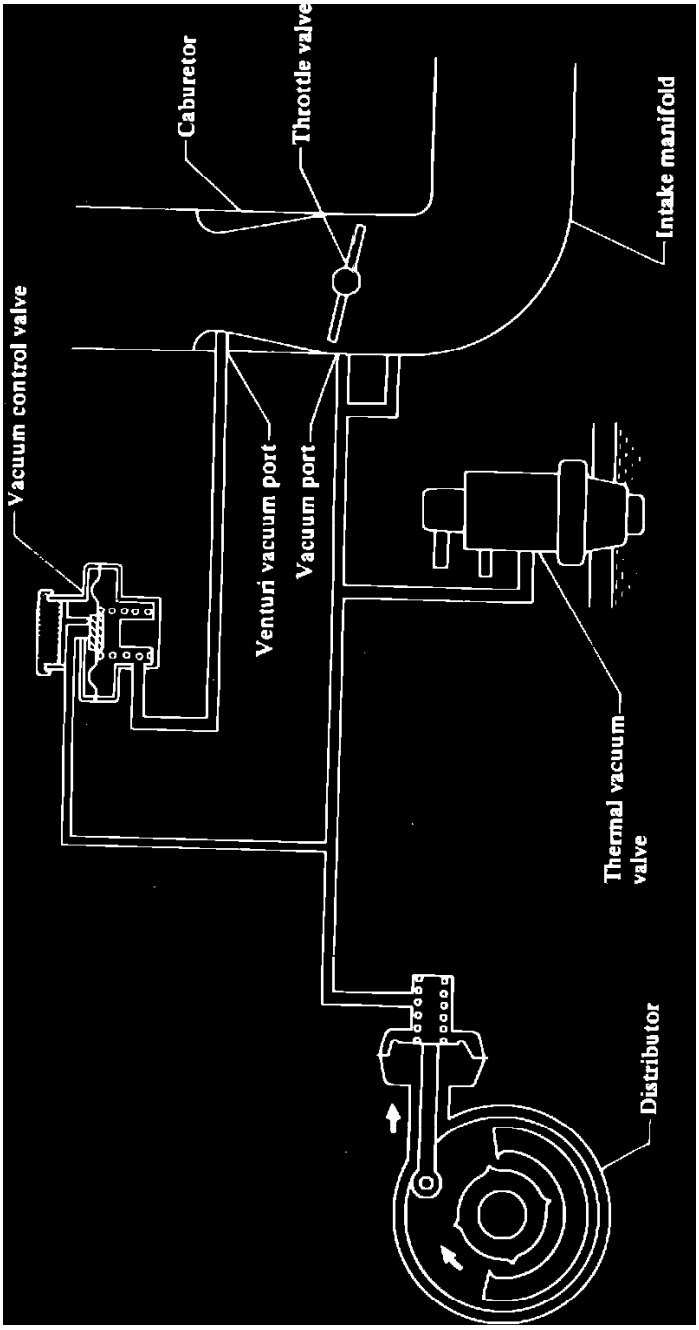


Fig. 34 Spark Timing Control System.

Computers and Control Systems: Component Tests and General Diagnostics

Power Supply Testing

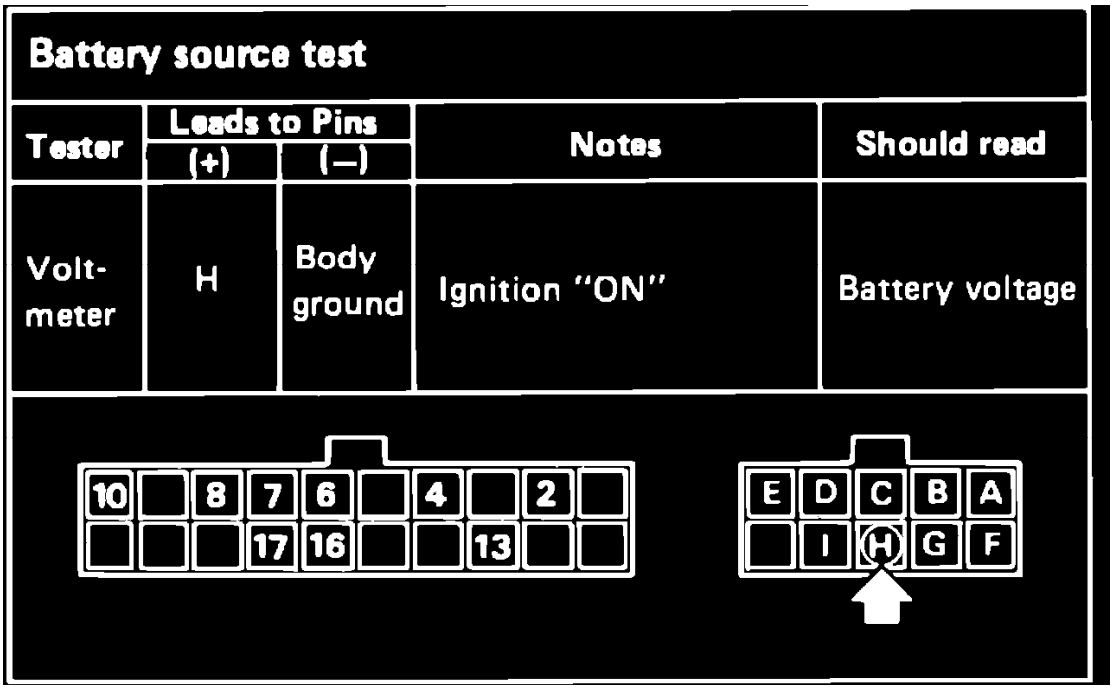


Fig. 25 Battery source test

Perform battery source test as illustrated in **Fig. 25.**

Diagnostic Notes

Note the following prior to performing any electrical tests of the ECC system:

1. Before performing any tests, disconnect battery ground cable and disconnect 10 and 20-pin electrical connectors from ECC control unit.
2. Use care to avoid damaging pins when disconnecting or connecting control unit connectors.
3. Following inspection or replacement, secure control unit connectors and recheck system operation.

Air/Fuel Ratio Control Solenoid Test

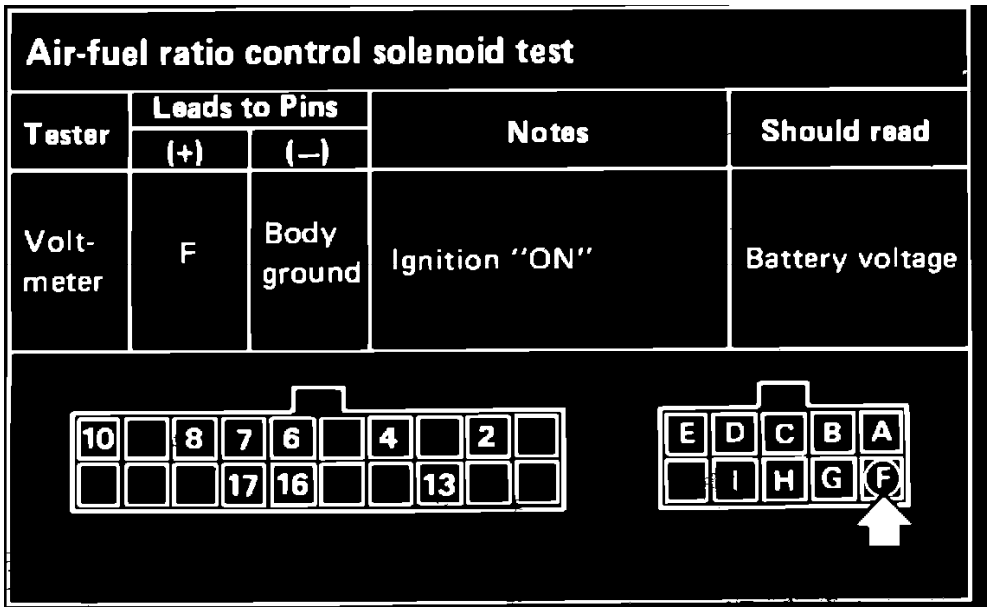


Fig. 23 Air/fuel ratio control solenoid test

Perform air/fuel control solenoid test as illustrated in **Fig. 23.**

Altitude Switch

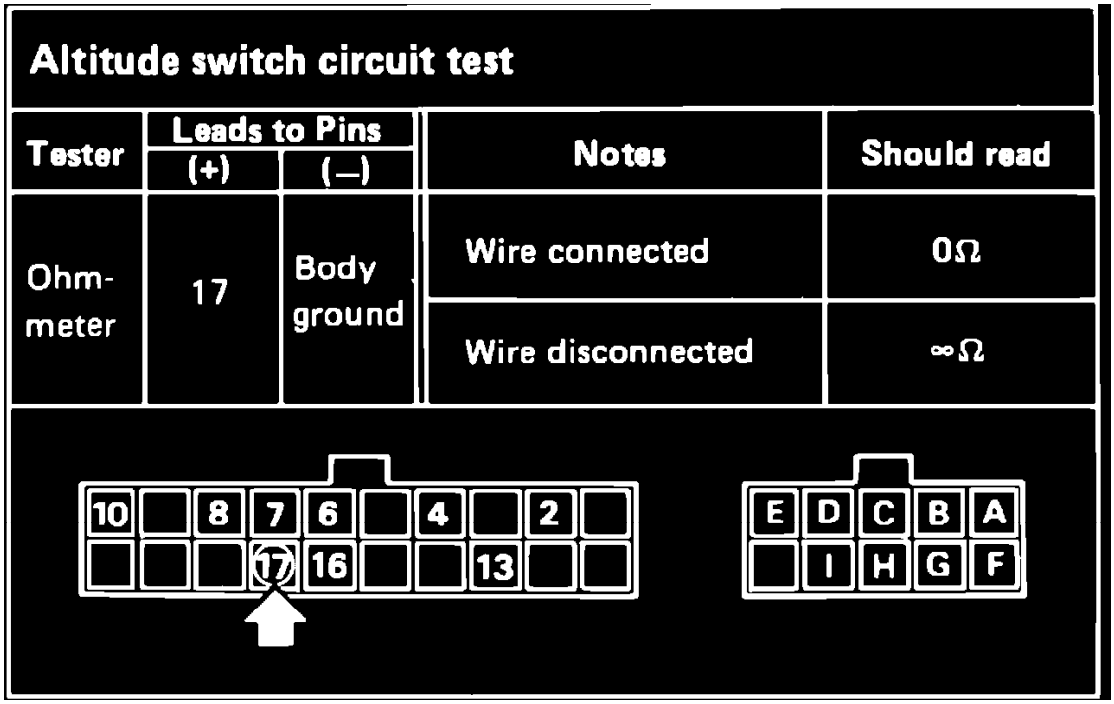


Fig. 26 Altitude switch circuit test

Perform altitude switch circuit test as illustrated in **Fig. 26.** Prior to testing, disconnect electrical connector from altitude switch, then connect jumper wire between harness connector terminals, connect battery ground cable and turn ignition on.

Anti-Dieseling Solenoid Circuit Test

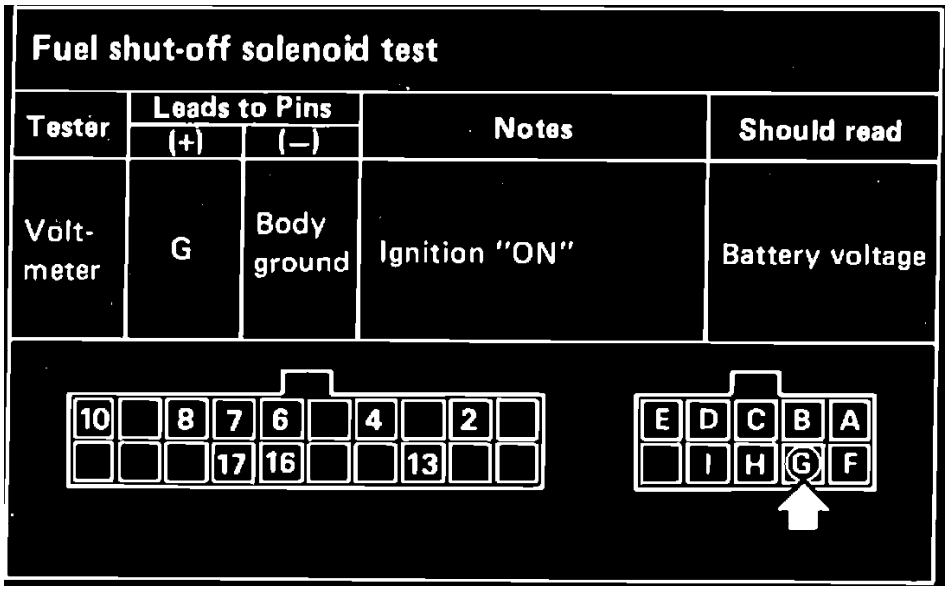


Fig. 24 Anti-dieseling solenoid circuit test

Perform anti-dieseling solenoid circuit test as illustrated in **Fig. 24.**

Clutch Switch Circuit (M/T Only)

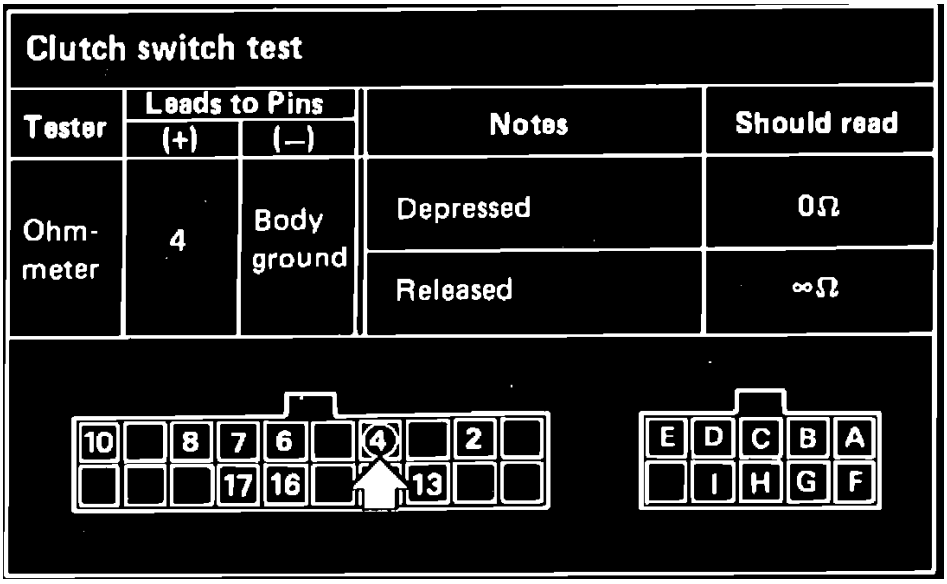


Fig. 11 Clutch switch test

Perform clutch switch test as illustrated in **Fig. 11.** Prior to testing, shift transaxle to any position except Neutral.

Control Unit Ground Circuit Test

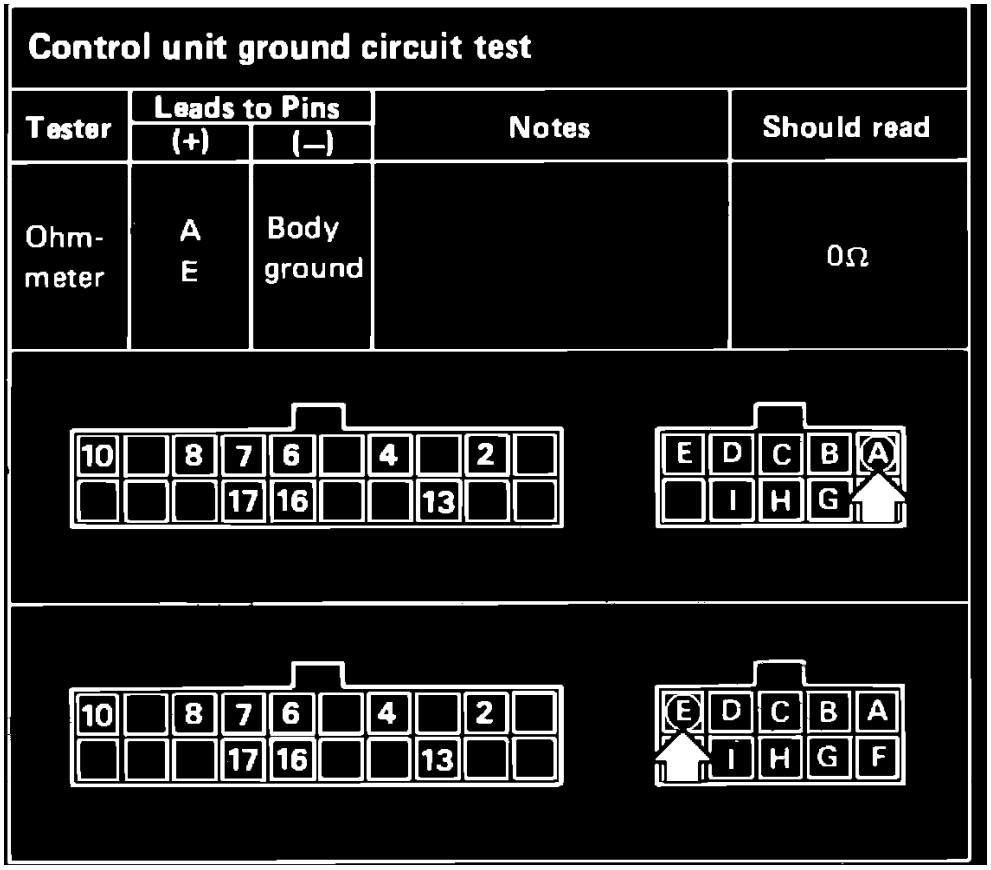


Fig. 21 Control unit ground circuit test

Perform control unit ground circuit test as illustrated in **Fig. 21.** if resistance is not as specified, check harness and repair as necessary.

Exhaust Gas Sensor

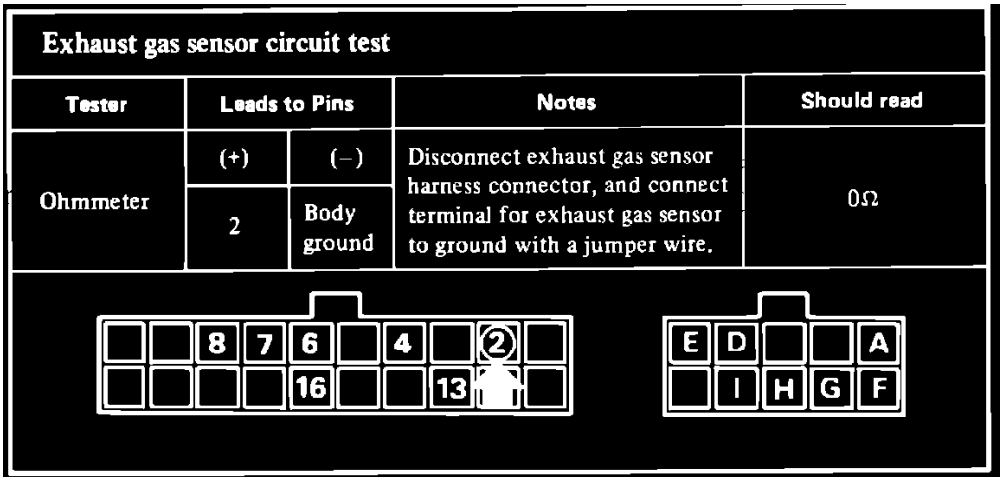


Fig. 20 Exhaust gas sensor circuit test

Perform exhaust gas sensor circuit test as illustrated in **Fig. 20.** Prior to testing, disconnect electrical connector from sensor and ground the sensor.

Fast Idle Control Device (FICD) Circuit

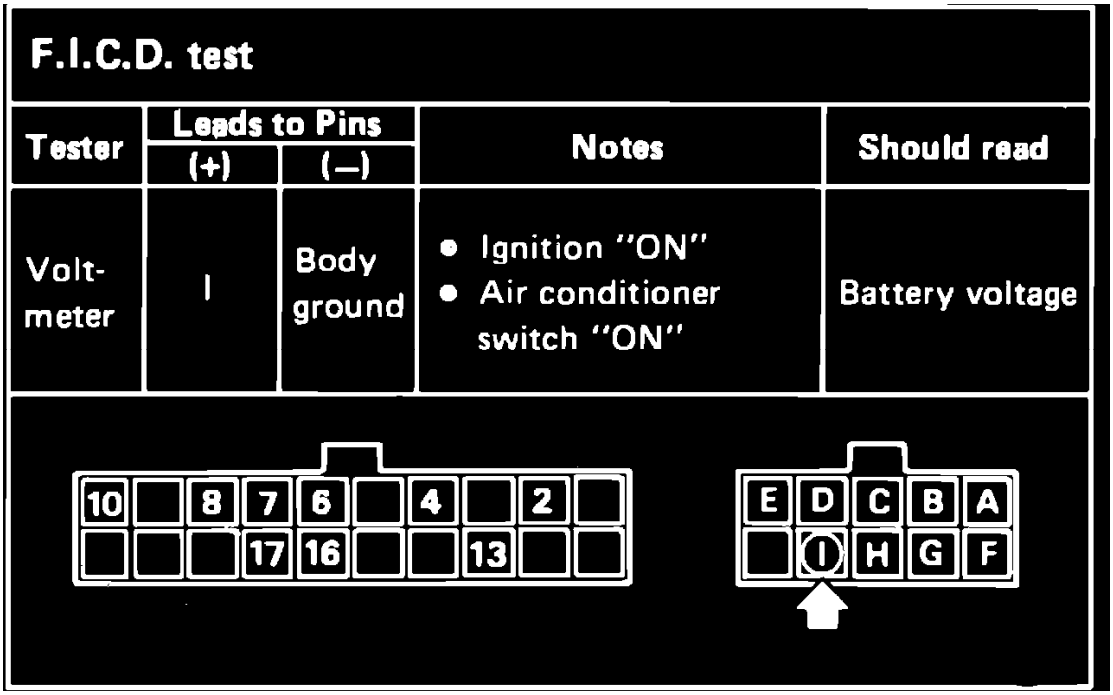


Fig. 30 FICD circuit test

Perform FICD circuit test as illustrated in **Fig. 30.**

Ignition Coil Trigger Input Test

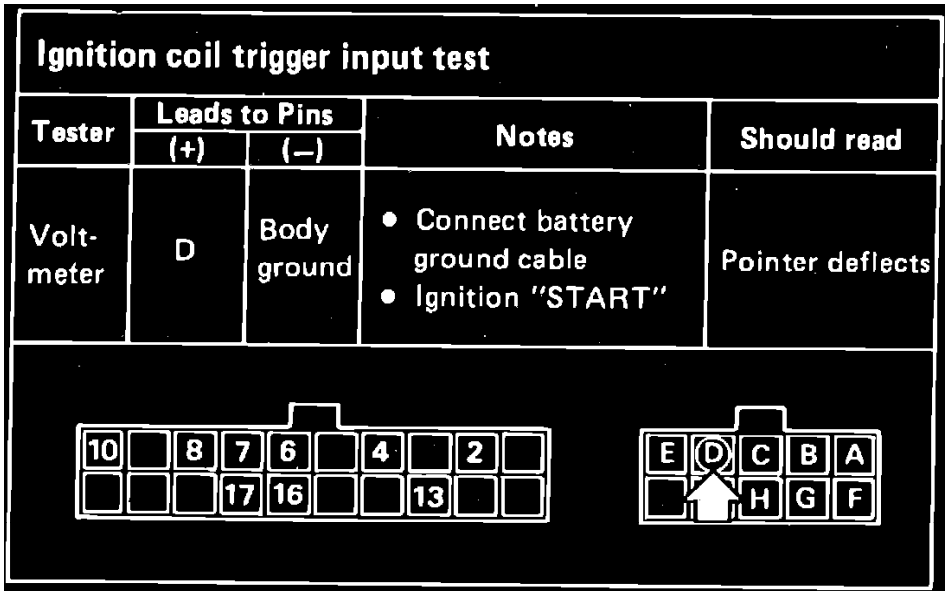


Fig. 22 Ignition coil trigger input test

Perform ignition coil trigger input test as illustrated in **Fig. 22.** If voltmeter does not respond as indicated, check ignition coil and wire harness and repair or replace as necessary.

Mixture Heater Control Circuit

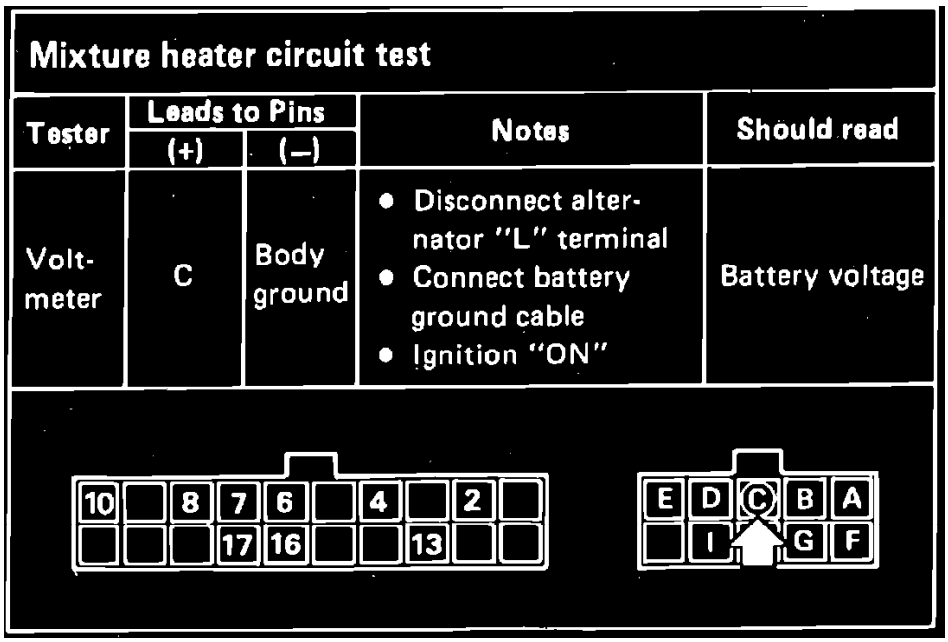


Fig. 29 Mixture heater circuit test

Perform mixture heater circuit test as illustrated in **Fig. 29.** If voltage is not as specified, check harness, automatic choke relay and mixture heater relay and repair or replace as necessary.

Neutral/Park Switch Test

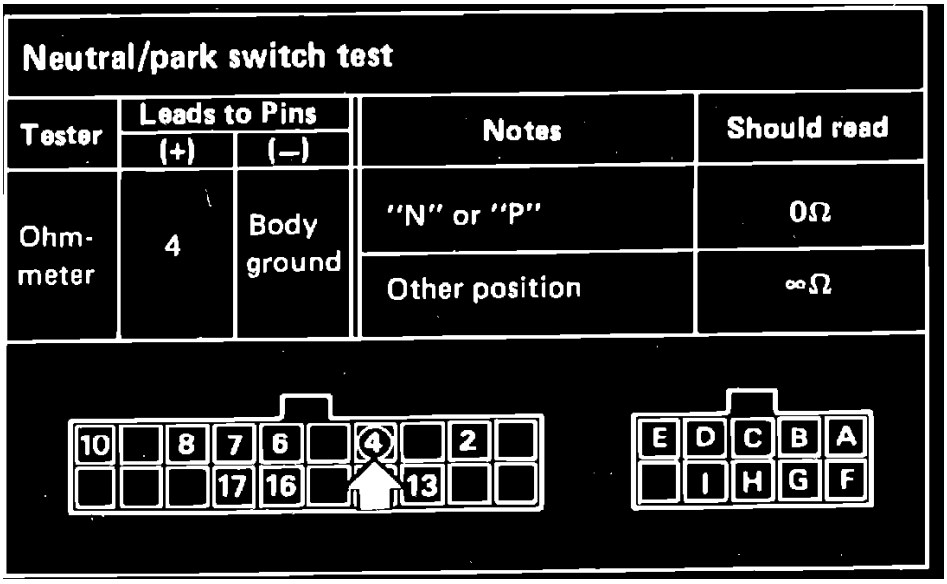


Fig. 10 Neutral/park switch test

Perform neutral/park switch test as illustrated in **Fig. 10.**

Spark Plug Switching Control

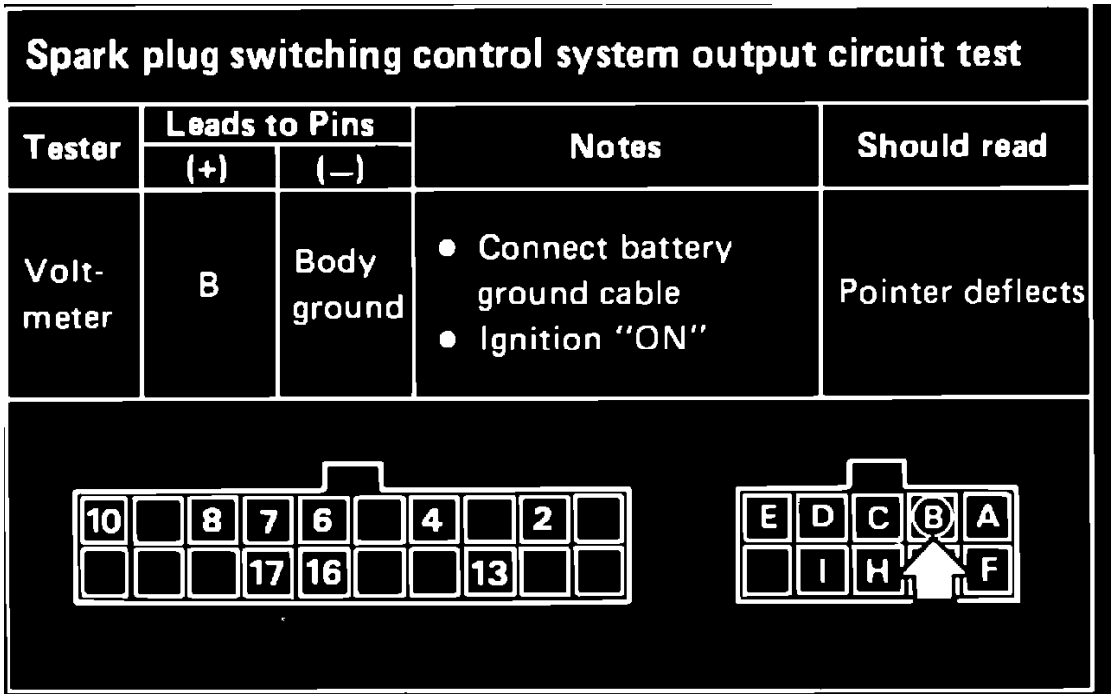


Fig. 27 Spark plug switching control system output test.

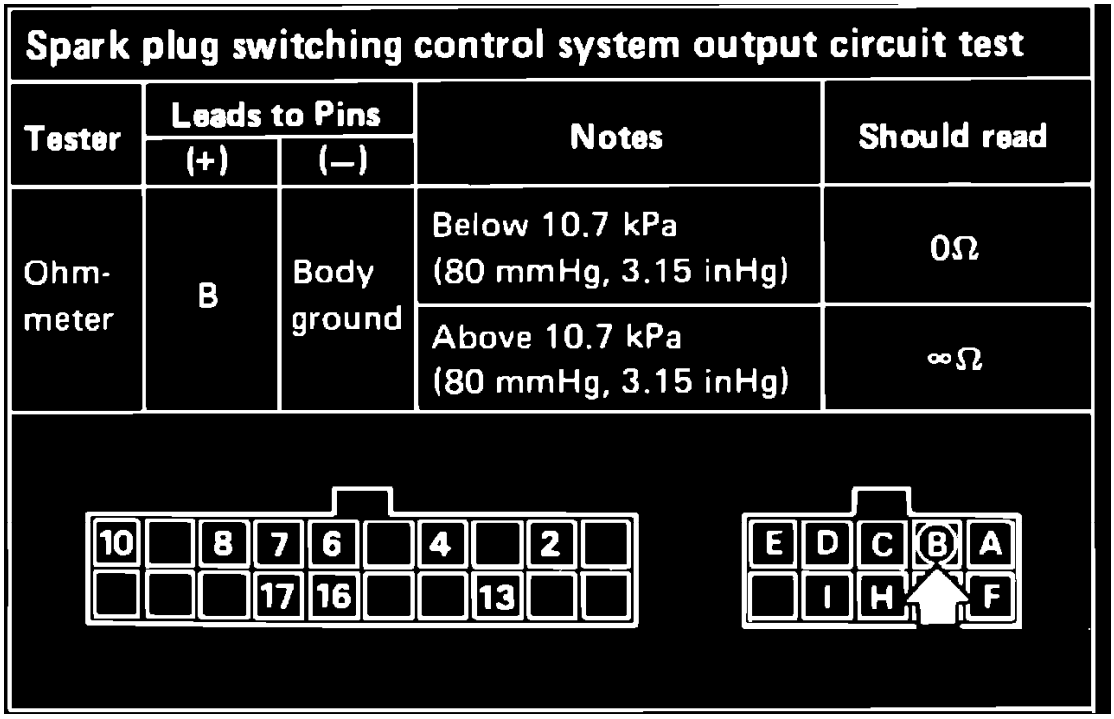


Fig. 28 Spark plug switching control system output test.

Perform spark plug switching control system output test as illustrated in **Figs. 27 and 28.** Prior to testing, on 1986 Federal models equipped with Z24 engine and manual transmission, except ``Cab & Chassis" models, disconnect vacuum hose from vacuum switch and connect a suitable hand vacuum pump to the switch. On all models, if tests results are not as specified, check harness, ignition control unit and vacuum switch and correct as necessary.

Throttle Valve Switch

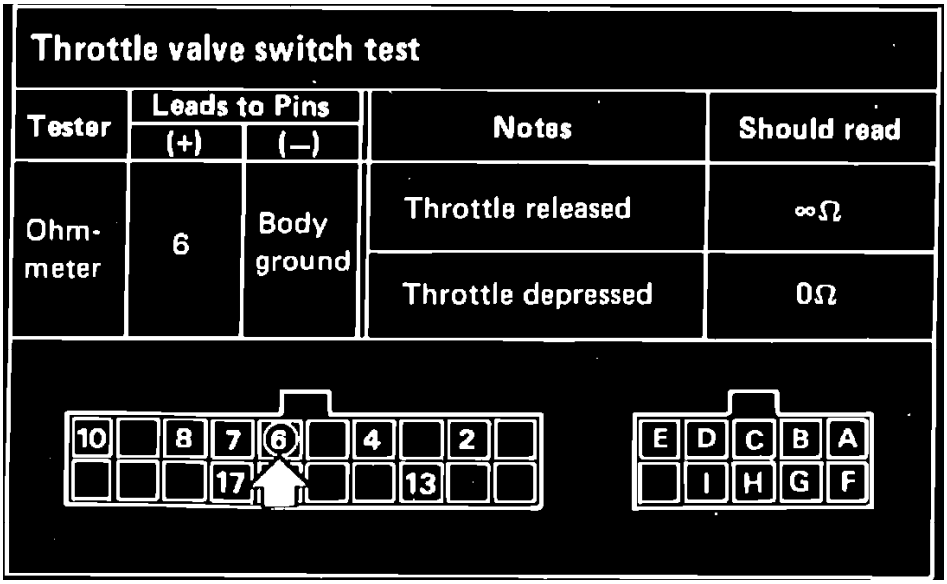


Fig. 12 Throttle valve switch test

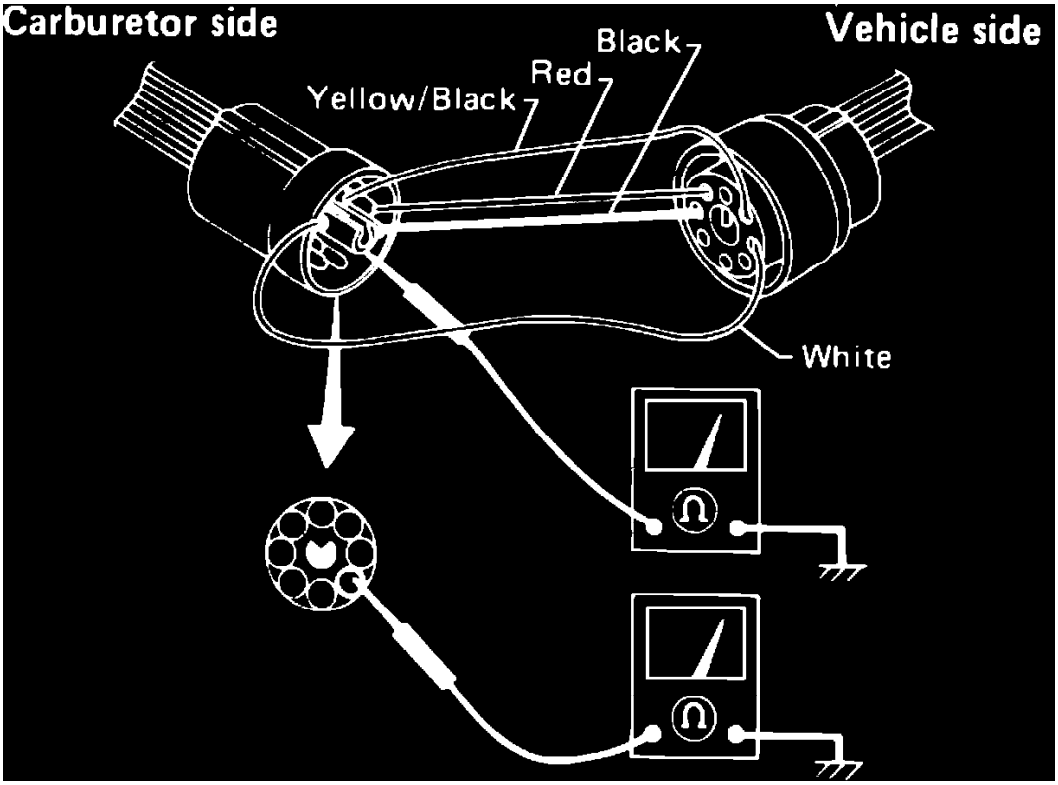


Fig. 13 Throttle valve switch check

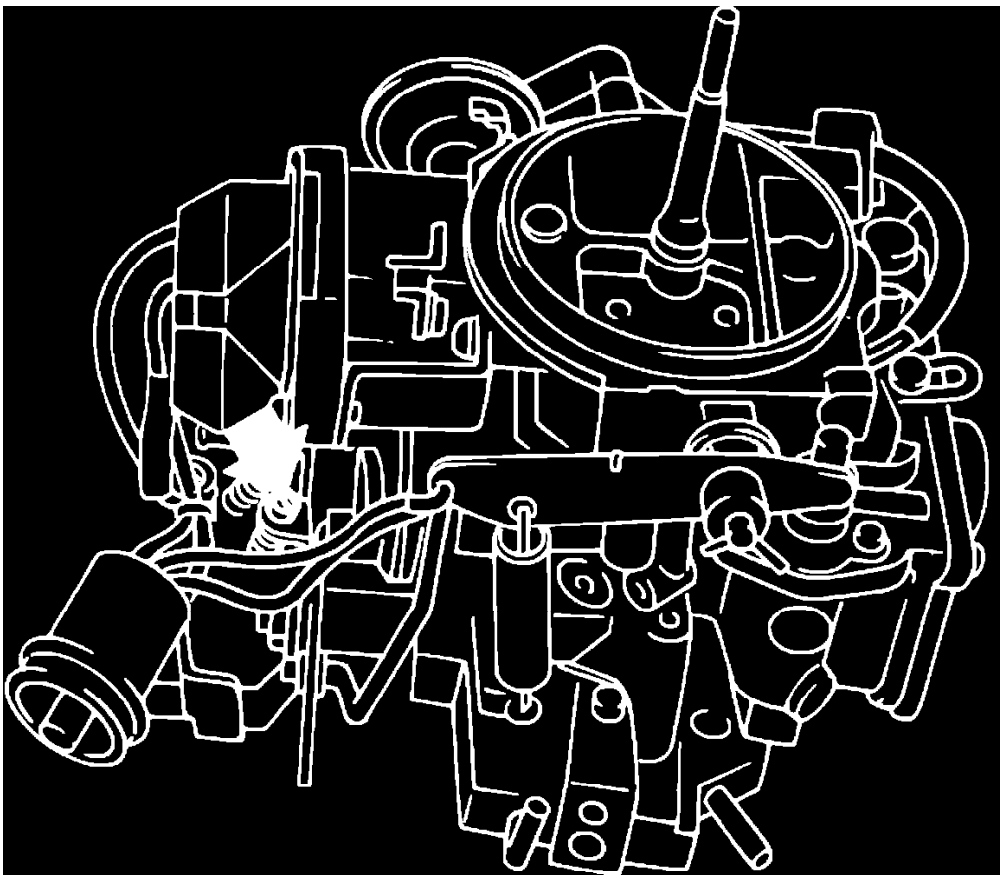


Fig. 14 Throttle valve switch adjustment

Perform throttle valve switch test as illustrated in **Fig. 12.**

Prior to testing, ensure choke valve is fully open. If resistances are not as specified, check and adjust throttle valve switch as follows:

1. Disconnect throttle valve switch electrical connector from carburetor.
2. Connect jumper wires between air/fuel ratio and anti-diesel solenoid terminals, **Fig. 13.**
3. Ensure continuity does not exist between throttle valve switch electrical connector and ground, **Fig. 13.**
4. Run engine at approximately 2000 RPM and ensure continuity exists between throttle valve switch electrical connector and ground.
5. Gradually decrease engine speed to 1300-1400 RPM on 1985 models, or 1150-1450 RPM on 1986 models and ensure circuit continuity breaks.

6. If circuit continuity is not broken at specified engine speed, adjust throttle valve switch as follows:
   a. Manually open the throttle to hold engine speed at approximately 1350 RPM on 1985 models, or 1250-1350 RPM on 1986 models. **Do not use idle speed screw.**
   b. Slowly turn adjusting screw, **Fig. 14,** in either direction until ohmmeter indicates an open circuit.
   c. Recheck adjustment, then adjust idle speed if necessary.

Vacuum Switch

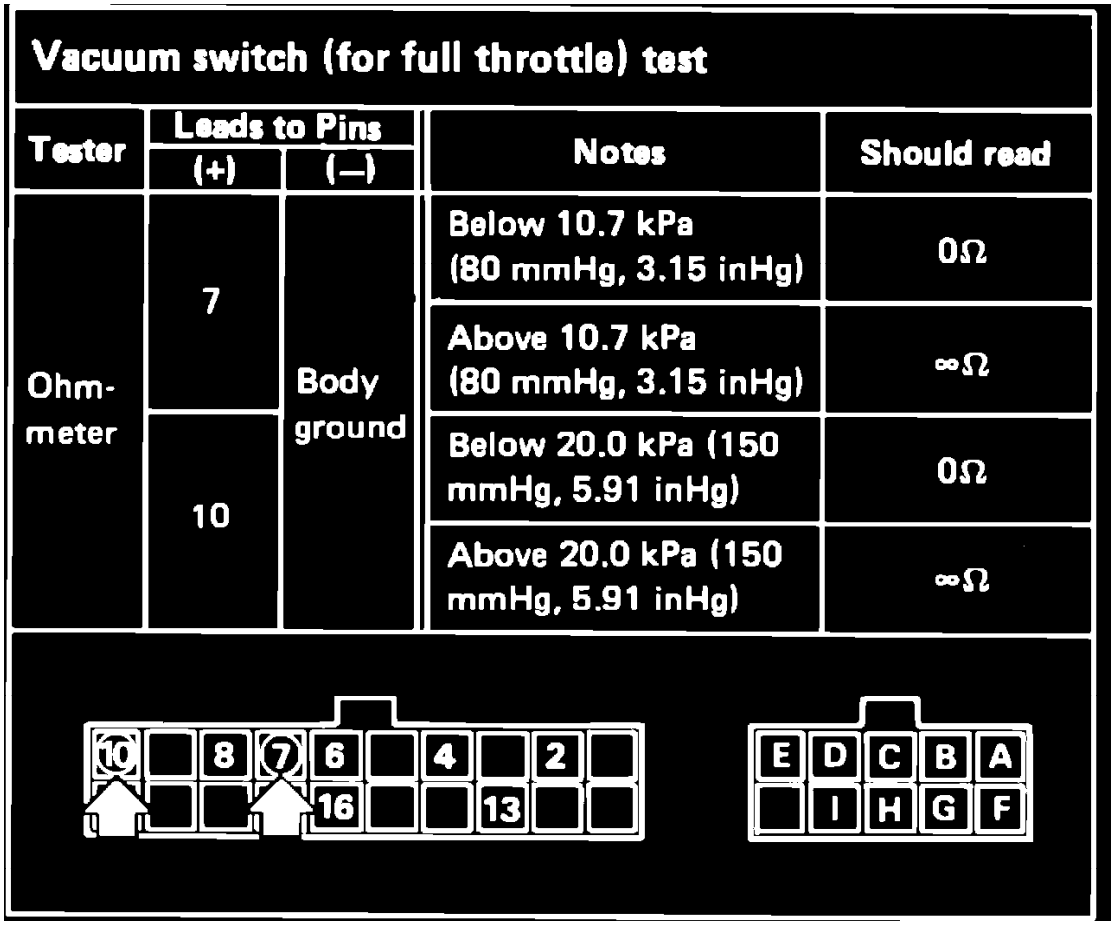


Fig. 15 Vacuum switch test.

Vacuum switch (for full throttle) test I

Tester	Leads to Pins (+)	Leads to Pins (–)	Notes	Should read
Ohm-meter	7	Body ground	Below 16.0 kPa (120 mmHg, 4.72 inHg)	0Ω
			Above 16.0 kPa (120 mmHg, 4.72 inHg)	∞Ω
	10		*Below 20.0 kPa (150 mmHg, 5.91 inHg)	0Ω
			*Above 20.0 kPa (150 mmHg, 5.91 inHg)	∞Ω

*For Z24 A/T, there is only one vacuum switch which operates at 16.0 kPa (120 mmHg, 4.72 inHg).

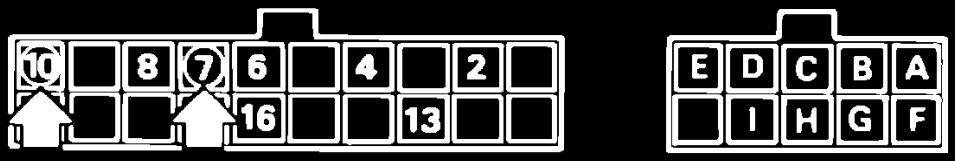


Fig. 16 Vacuum switch test No. 1.

Vacuum switch (for full throttle) test II

Tester	Leads to Pins (+)	Leads to Pins (–)	Notes	Should read
Ohm-meter	7	Body ground	Below 10.7 kPa (80 mmHg, 3.15 inHg)	0Ω
			Above 10.7 kPa (80 mmHg, 3.15 inHg)	∞Ω
	10		*Below 20.0 kPa (150 mmHg, 5.91 inHg)	0Ω
			*Above 20.0 kPa (150 mmHg, 5.91 inHg)	∞Ω

For Z24 Cab & Chassis model, there is only one vacuum switch which operates at 10.7 kPa (80 mmHg, 3.15 inHg).

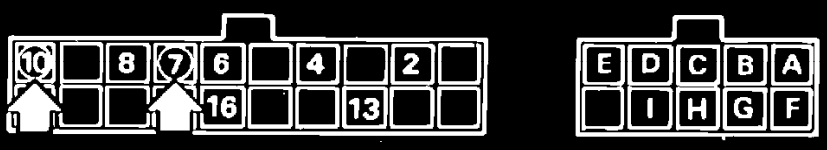


Fig. 17 Vacuum switch test No. 2.

Perform vacuum switch test as illustrated in **Figs. 15 through 17.** Prior to testing, disconnect vacuum hose from switch and connect a suitable hand vacuum pump to the switch.

Water Temperature Sensor

Water temperature sensor test

Tester	Leads to Pins (+)	Leads to Pins (–)	Notes	Should read
Ohm-meter	8	16	20° C (68° F) or above	Below 2.9 kΩ
			Below 20° C (68° F)	2.1 kΩ or above

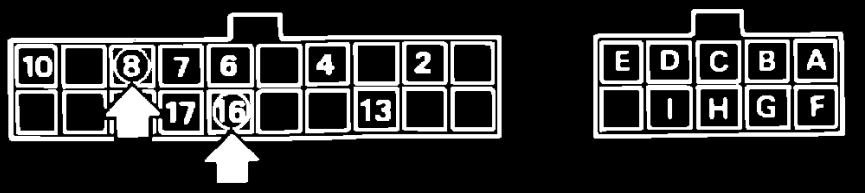


Fig. 18 Water temperature switch test

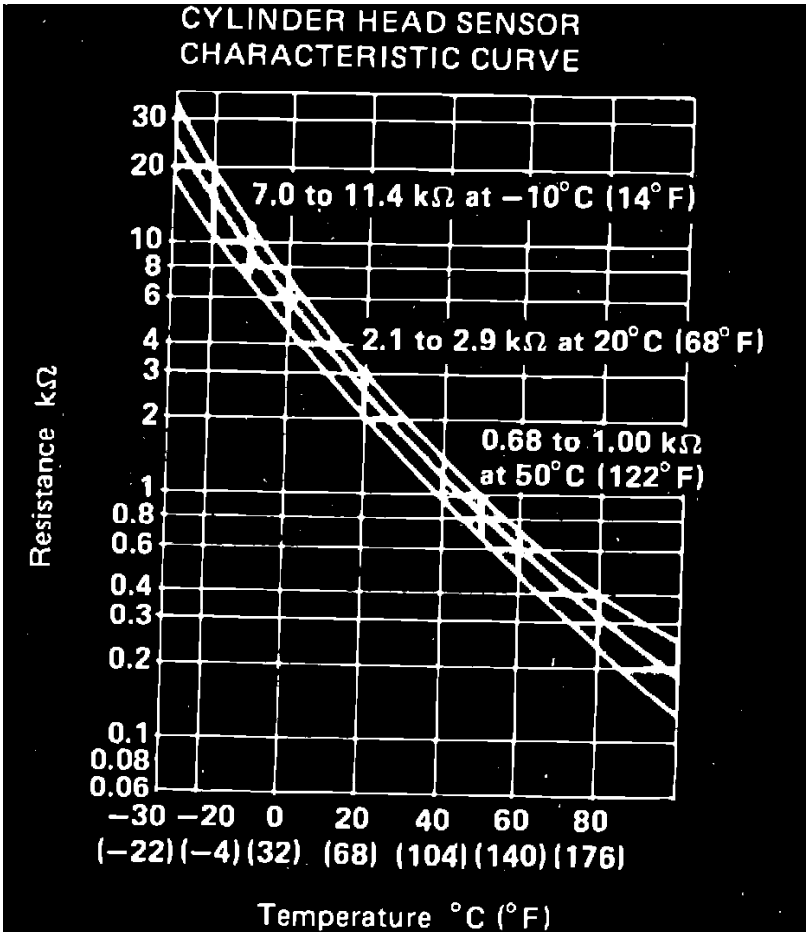


Fig. 19 Water temperature sensor resistance specifications

Perform water temperature sensor test as illustrated in **Fig. 18.** If resistances are not as specified, check sensor as follows:

1. Position water temperature sensor in a container of water and measure resistance when heated to various temperatures, **Fig. 19.**
2. If resistance readings are within specifications, check sensor harness and correct as necessary. If readings are not within specifications, replace sensor.

Computers and Control Systems: Symptom Related Diagnostic Procedures

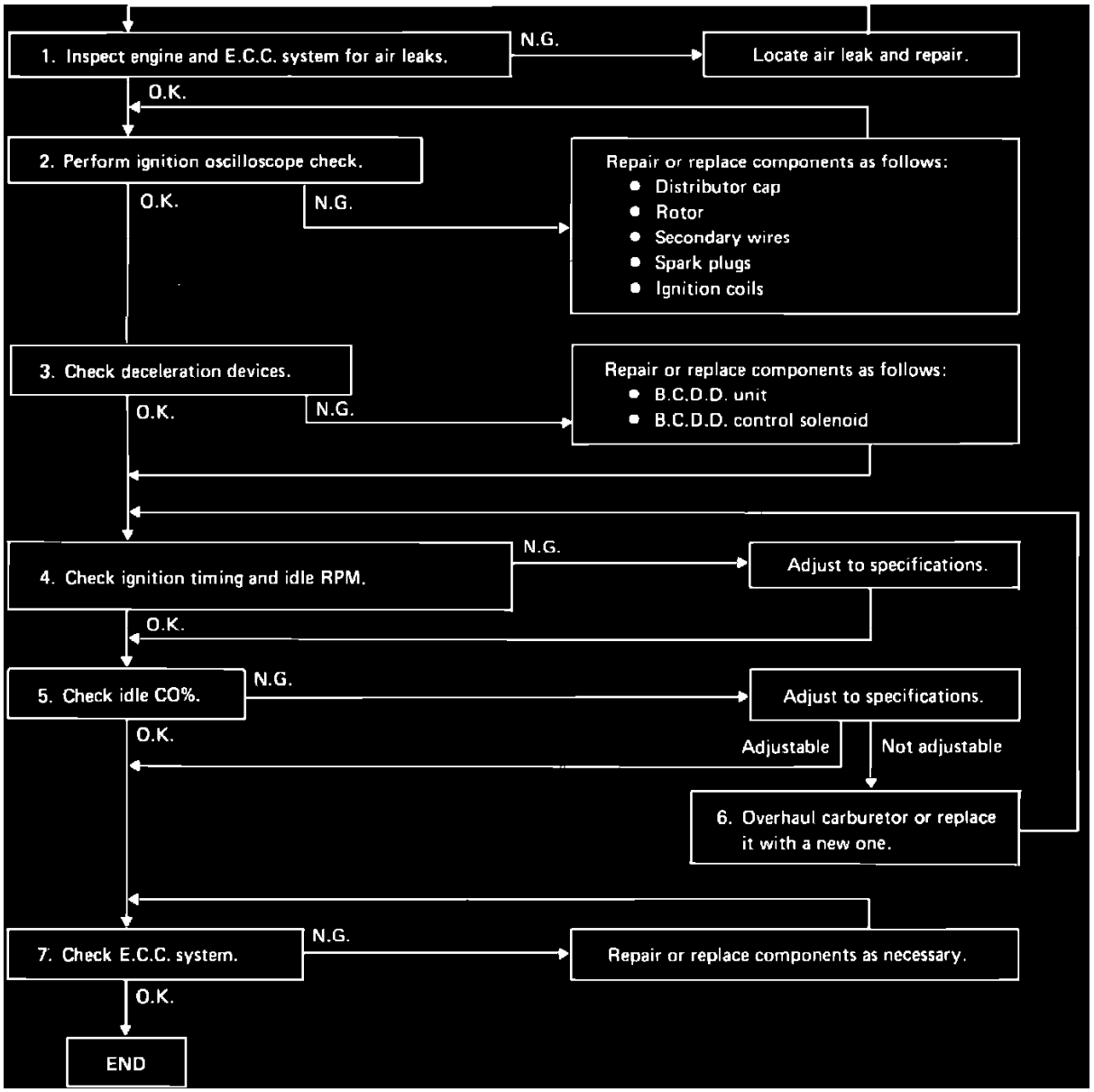


Fig. 7 Improper idling troubleshooting chart

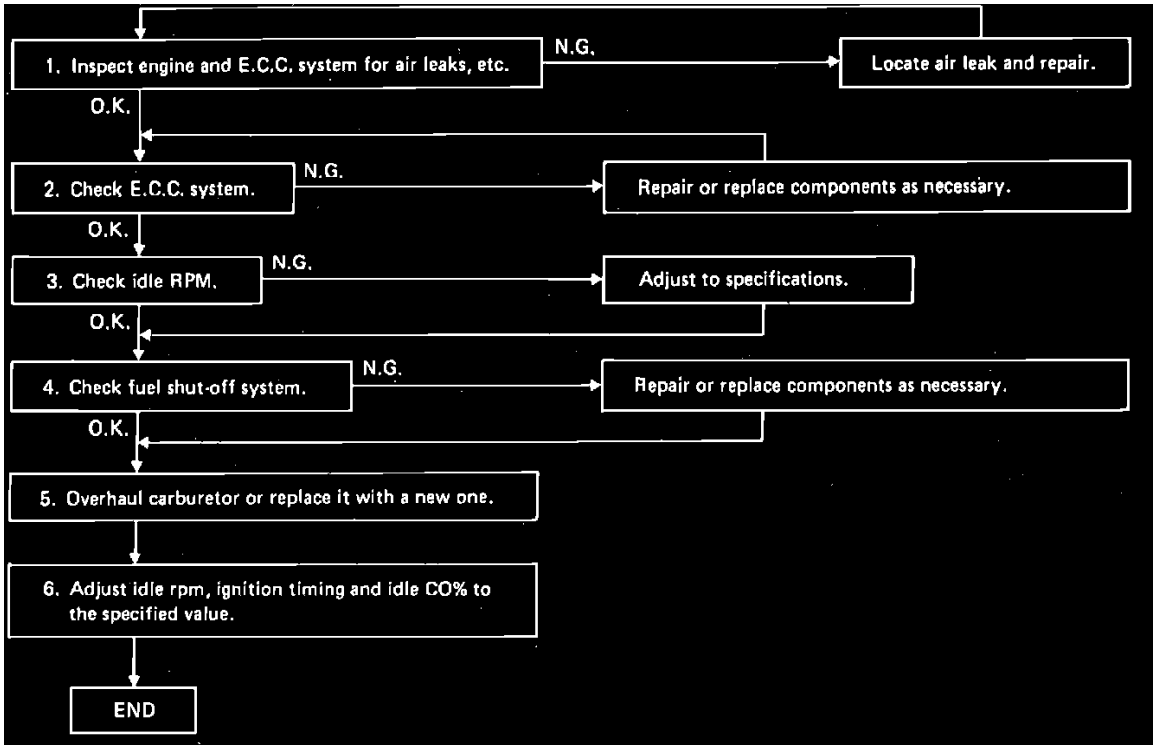


Fig. 9 Engine stall troubleshooting chart

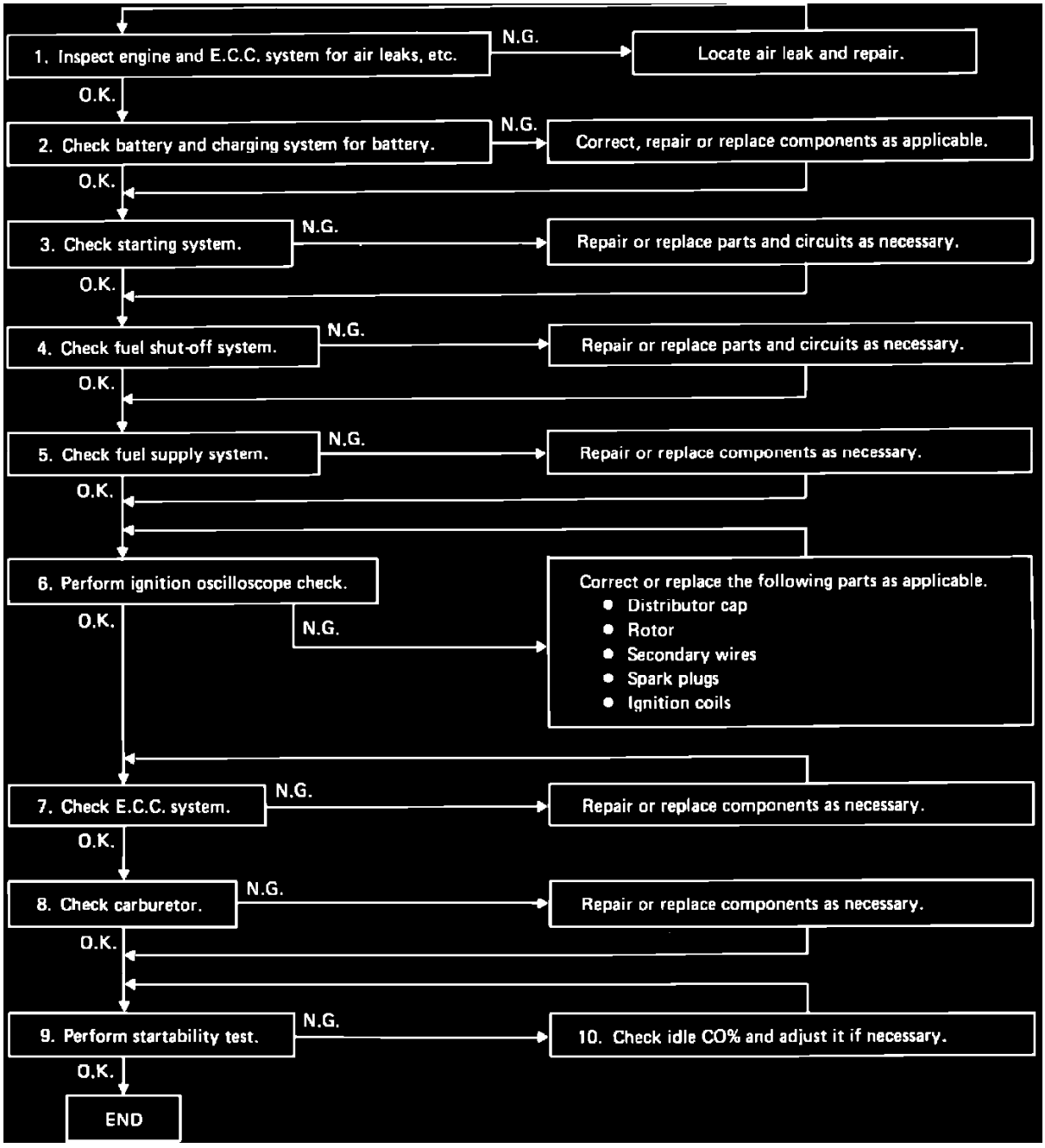


Fig. 8 Engine startability troubleshooting chart

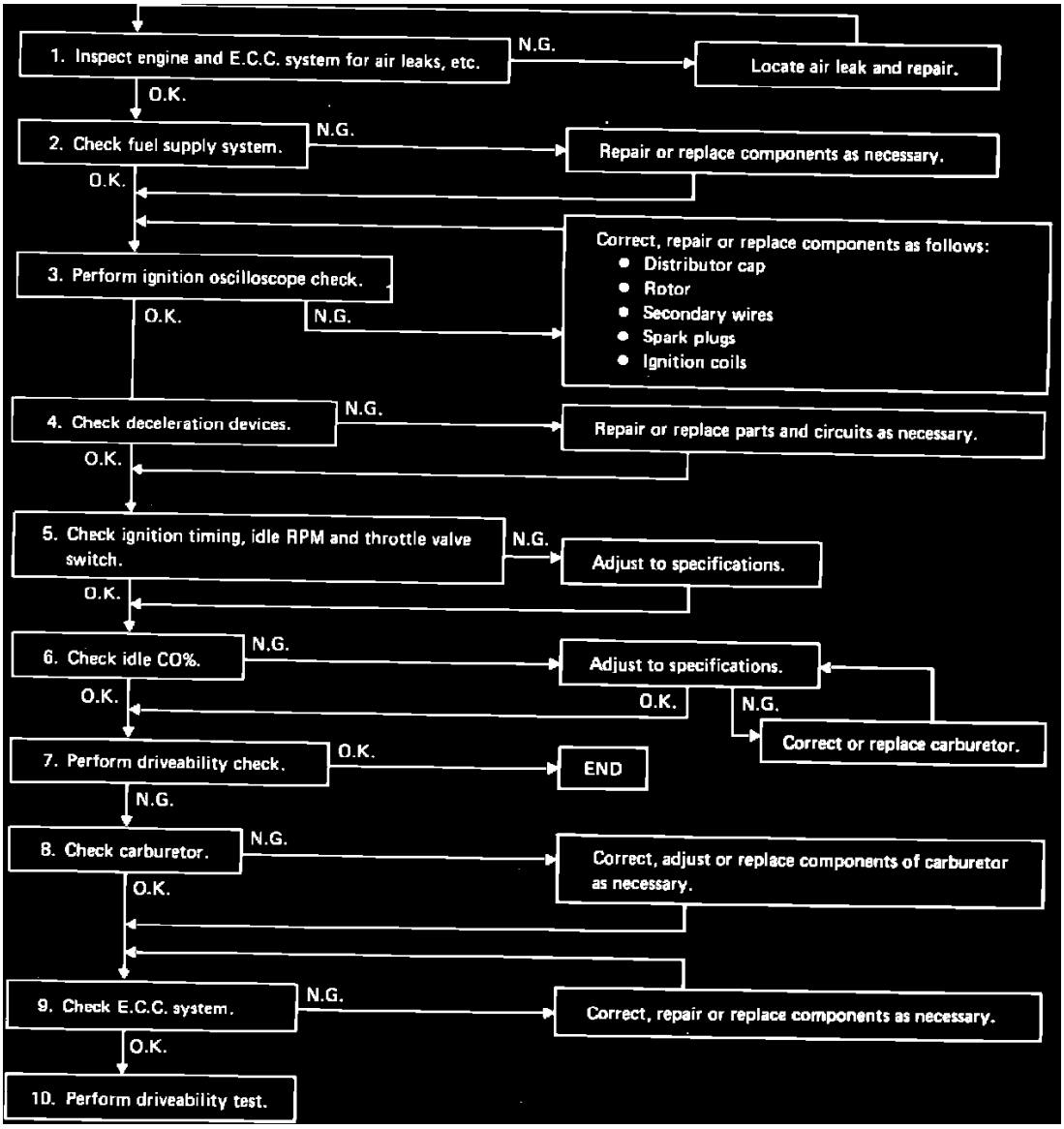


Fig. 6 Driveability troubleshooting chart

Technical Service Bulletins

All Technical Service Bulletins:

Number	Date	Name
00-013	Feb 00	Steering - Vibration/Brake Pedal Pulsation
00-027	Mar 00	Tools - Nissan Essential Tool Shipment Summary
00-033D	Aug 07	Brakes - Judder/Pedal Feel/Noise Diagnosis/Repair
01-005A	Oct 04	Restraint System - Seatbelts Slow to Retract
03-093A	Mar 04	Engine/Transmission - Precautions During R&R Procedure
04-094	Aug 04	Brakes - On-Car Rotor Refinishing
06-076	Nov 06	Wheels - Chrome Wheel Handling When Mounting Tires
87-064	Apr 87	Lights - Plastic Lens Isopropyl Alcohol Caution
87-103	Jun 87	Brakes - Explanation of Common Noises
87-135	Aug 87	Engine Controls - Intermittent Engine Surge/Hesitation
87-145	Sep 87	Paint - Spotting Prevention & Repair
87-172	Nov 87	A/T - Cleaning Components/Overhaul
88-015	Feb 88	Body - Warnings for Aftermarket Rust Proofing
88-152	Nov 98	Tires - Vibration, Diagnosis & Out of Round Measurement
88006	Jan 88	Engine - Replacement Pistons
88013	Feb 88	Paint - 2 and 3 Coat Pearlescent Finishes
88015	Feb 88	Chassis - Warnings for Aftermarket Rust Proofing
89-131	Aug 89	Brakes - Silicone and PBC Greases
89015	Feb 89	A/T - Slow Shift, Replacing ATF
89131	Aug 89	Brakes - Silicone & PBC Greases
89132	Aug 89	Tools - Rivnut Installation
90-044	May 90	Audio - Cassette Tape Player Maintenance
90-090	Oct 90	Tools - Angular Tightening Recommendation & Tools
90V072	Jun 90	Recall - Label Tire Pressure Max Load Incorrect
91049	May 91	Alignment - Toe Specification Clarification
91051	May 91	Seats - Care of Leather Trim
91052	May 91	A/C - Refrigerant Oil Availability/Recommendation
91060	Jun 91	A/C - ACR-3 Refrigerant Recovery and Recycling Machine
91067	Jul 91	Lights - Water Condensation In Lamp Lens
92-001	Jan 92	A/C - System Changes As Result of R-134A Refrigerant
92-062A	Jun 99	Brakes - AMMCO On Car Lathe Operating Guidlines
92003	Jan 92	Audio - Aftermarket Phone/Audio Installation Precautions
92062	Aug 92	Brakes - Ammco On Car Brake Lathe Operating Guidelines
92083	Oct 92	Maintenance - Cleaning Power Antenna & Wiper Blades
92086	Oct 92	Fuel - Injector Replacement Guidelines
92123	Dec 92	Wheels - Aftermarket Chroming of Nissan Alloys
93-017	Jan 93	Cassette - Poor Sound Quality/Loss of Channel/Jamming
93-176	Nov 93	ECM - Relay (Type 1M) Green or Blue Precautions
93071	Apr 93	Oil - Recommended Fluids, Lubricants and Chemicals
93075	May 93	Interior - Aid to Diagnosing Water Leaks
93148	Oct 93	Electrical - General System Diagnosis
93181	Dec 93	Emissions System - Troubleshooting Tips
94-004	Jan 94	Differentials - Recommended Lubricants
94-009	Mar 94	Battery - Charging/Replacement Procedure
94-011	Feb 94	Starting & Charging - Systems Description/Diagnostics
94-015	Feb 94	Paint - Contamination Identification and Repair
94-077	Aug 94	Emission - Inspection/Maintenance Program Overview
94-100	Nov 94	Fluids - Recommended Fluids, Lubricants & Chemicals
94004	Jan 94	Drivetrain - Differential Oil Recommendations
94005	Sep 94	A/C - Service Procedures For Retrofitted A/C Systems
94012	Feb 94	Brakes - Judder/Steering Wheel Vibration Correction
94088	Sep 94	Body - Components Material Safety Data Sheets (MSDS)
94091	Nov 94	A/C - Retrofit Service Procedures
95-015	Mar 95	A/C - Precautions for Repair/Installation
95-114	Dec 95	M/T - Clutch Operating Cylinder Service Information
95-120A	Jan 03	Fuel System - Cold Weather Engine Starting Tips
95017	Feb 95	Engine - Oil Level and Grade, Driveability
95030	Mar 95	Tools - Essential Tool Release, Engine, A/C
95057	Jun 95	A/C - Compressor Leak/Noise, Poor Performance
95062	Jun 95	Tools - Essential Release, Connector/Terminal Kit
95070	Jul 95	ECM - Green or Blue Relay Caution
95074	Aug 95	Antenna - Inoperative, Rod Maintenance & Replacement
95106	Oct 95	A/C - Refrigerant Oil Identification
96-023A	Dec 97	A/C - System Retrofit Information

Technical Service Bulletins

All Technical Service Bulletins:

Number	Date	Name
96-087	Sep 96	A/C - Revised Procedure For Detection Refrigerant Leaks
96-100	Oct 96	Cooling System - Fan Installation On Water Pump Flange
96-104	Nov 96	Engine Controls - Precautions Electronic System Testing
98-005	Feb 98	A/C - New Connections & O-Rings
98-042	May 98	A/T - Fluid Application
98-060	Jul 98	Body - Repair Guidlines for Rust & Corrosion
98-063	Jul 98	A/C - New Leak Detector
98-089	Nov 98	Oxygen Sensor - Thread Cleaning and Other Precautions
98-110	Jan 99	Interior - Squeak and Rattle Repair Supplies
99-017	Apr 99	Audio - Speaker Noise, Cellular Phone Interference
99-044B	Oct 99	Tools - Starting & Charging System Tester
99-048U	Aug 08	Battery/Starting/Charging System - Testing
AC86011	Jul 86	A/C - Component Service Kit
AT87003	Apr 87	A/T - Slow Shift In Cold Weather
AT87172	Nov 87	A/T - Cleaning Hydraulic System Components
ATRATB028	Oct 90	A/T - Engine Vacuum Testing
ATRATB053	Jun 91	A/T - Overdrive Planetary Burn Up
ATRATB062B	Jul 91	A/T - E4N71B, 4N71B & JM600 Overdrive Check Balls
ATRATB078	Nov 91	A/T - How To Use A Pressure Gauge
ATRATB113	May 92	A/T - E4N71B, L4N71B, 4N71B No 4th Gear
ATRATB8748	Aug 87	A/T - Slipping or No-Shift/Metal Sealing Rings
ATRATB8754	Sep 87	A/T - Front Bushing Wear
ATRATB8845	Oct 88	A/T - 4N71B Overdrive Case
ATRATB889	Feb 88	A/T - Identification
ATRATB8910	Apr 89	A/T - Shifts Into Overdrive with Switch Off
ATRATB8923	Aug 89	A/T - Math Formulas Part I
ATRATB8927	Sep 89	A/T - Twenty Steps To Successful Repairs
ATRATB8930	Oct 89	A/T - Math Part II
ATRATB9002006	Feb 90	A/T - Choosing the Right ATF
BE86020	Oct 86	Audio - Radio Installation Caution
BE86021	Dec 86	Antitheft - Optional Vehicle Security System Wiring
BF87013	Apr 87	Lights - Isopropyl Alcohol Caution
BF87017	May 87	Windshield - Repair Kit
BF87026	Jul 87	Seat Belts - Extender Availability
BF88012	Aug 88	Mirrors - Installation of Glass On Door Mirror
BF88015	Sep 88	PDI - Paint Guard Coating (PGC) Removal
BF89024	Sep 89	Exterior Trim - Cleaning Textured Plastic Surfaces
BF90003	Apr 90	Locks - Revised Torques For Door Lock & Striker Bolts
BR86001	Apr 86	Brakes - Automatic Parking Brake Adjustment
EC86010	Jul 86	Engine Controls - Oxygen Sensor Description & New Torque
EE86007	May 86	Battery - Designation Modification
EF87005	Mar 89	Ignition - Transistor Unit Application Chart
EL87020	Oct 87	Battery - Charging Precautions
EL88021	Nov 88	Audio - Cassette Tape Player Diagnosis & Maintenance
EL89013	Jul 89	Audio - Radio Installation Precautions
EL90002	May 90	Audio - Cassette Player Maintenance
EM90008	Oct 90	Engine - Angular Tightening Tools
EM90009	Oct 90	Coolant Tester - Calibration
EN86003	Apr 86	Extended Service Oil Filter - Application Chart
GI86001	Jan 86	Engine - Winter OIl Recommendations
GI86008	Mar 86	Wiring Diagram - How To Read Instructions
GI86024	Jul 86	Engine - Oil Refill Capacity Correction
GI86035	Oct 86	Powertrain Components - Rust Proofing
GI87012	May 87	Towing Information - Trucks With Manual Transmission
GI89015	Dec 89	Fuel - Recommendations
GI91004	May 91	CONSULT - Lithium Battery Replacement
HA87004	Feb 87	Defroster - Poor Performance Explanation
HA87023	Dec 87	A/C Blower Fan System - Inoperative
HA90006	Mar 90	R12 Refrigerant - Conservation/Recycling
HA91002	Feb 91	A/C - Refrigerant Oil Recommendations
NHTSA85V146000	Nov 85	Recall 85V146000: Steering Column Coupling Bolt Loose
PI95-006	Mar 95	Brakes - Noise Explanation
PI95-008	Apr 95	Enhanced Emission Inspection/Maintenance Program I/M240

Technical Service Bulletins

All Technical Service Bulletins:

Number	Date	Name
PI95006	Mar 95	Brake System - Noise Concern Explanation
PI95016	Sep 95	Remanufactured Starter/Alternator - Program
PI95017	Sep 95	Remanufactured Distributor - Program
ST86007	Oct 86	Power Steering Gear - Correct Oil Seal Installation
TS85096	Aug 85	Driveline - High/Low Speed Vibration
TS85138	Nov 85	Rear Leaf Spring - Squeaks On Rough Roads
TS86039	Mar 86	M/T - Shift Fork Installation Cautions
TS87122	Sep 87	M/T Shift Boot - Loose
WB90007	Jun 90	Hitachi Radio - Return Address Change
WB90010	Jun 90	A/C Refrigerant - Warranty Claim Reimbursement
WB90011	Jun 90	Seat Trim - Non-Warrantable Examples
WB91001	Feb 91	Warranty Information - Suspended Warranty Claims
WB91002	Feb 91	Warranty - Expansion of VOR Freight Reimbursement
WT86005	Jul 86	Tire Rotation and Pressure - Recommendations

Vehicle: Technical Service Bulletins

How to Find Technical Service Bulletins by Category/Symptom

Selecting TSB's "By Symptom"

If you have a vehicle which displays system-related symptoms, ALLDATA provides a way to quickly search for any relevant Technical Service Bulletins (TSB's). When you select TSB's "By Symptom," all relevant TSB's display at the top of the TSB title list. Viewing TSB's by Symptom is helpful when the vehicle displays a distinct, system related, malfunction. You may also wish to review the symptom list with your customer to uncover additional information that was not indicated on the Driveability Worksheet.

You can view TSB's by Symptom at any System or Sub-System level of the TurboView hierarchy. For example, a Symptom list will appear when selecting Powertrain Management or Computers and Control Systems. Symptoms will not appear when selecting a component (such as Mass Air Flow Sensor).

To view TSB's by Symptom:

1. Select the desired System or Sub-System and click the TSB icon.
2. Select "By Symptom" from the TSB list.
3. Select the symptom you wish to display.
4. Click on the desired TSB to display the article

Example:

Your customer complains of a noise in his 1989 Toyota Corolla (1.6L DOHC). The noise seems to be coming from the automatic transmission. To find TSB's related to transmission noise:

1. Select Transmission and Drivetrain, then Automatic Transmission.
2. Click the TSB icon and select "Noise" from the TSB symptom list.
3. Notice that TSB's related to transmission noise are now located at the top of the TSB title list while non-related TSB's for the transmission are listed below.

Technical Service Bulletin # **90V072** Date: **900607**

Recall - Label Tire Pressure Max Load Incorrect

Models: 1983.5-90 Truck

Section: Recall Campaign Bulletin

Classification

Bulletin No.: 90V-072

Date: June 7, 1990

VOLUNTARY RECALL CAMPAIGN FMVSS CERTIFICATION LABEL TIRE PRESSURE INFORMATION

AUTHORIZATION

Nissan Motor Co, Ltd., Tokyo, Japan, authorizes Nissan Motor Corporation in U.S.A. (NMC) to conduct a voluntary recall campaign on certain 1983.5 through 1990 trucks and multi-purpose vehicles.

INTRODUCTION

The tire pressure for the gross axle weight rating (GAWR) listed on the doorpost FMVSS certification label and on the tire placard in the glove box is incorrect for certain vehicle models and tire sizes. The affected years, models, and tire sizes are listed. All owners of the affected vehicles will receive a letter and correction labels, along with instructions for application. In the event assistance is needed, the owners will be instructed to contact their Nissan dealer for label application at no charge. A copy of the owner letter is enclosed in this bulletin.

IDENTIFICATION NUMBER

Nissan has assigned identification number 90V-072 to this campaign. This number must appear on all communications and documentation of any nature dealing with this campaign.

NOTE: The small number to the right of the bulletin date is the number sequence of the documents published for this campaign.

Dealer Responsibility and Parts Info.

DEALER RESPONSIBILITY

It is the dealer's responsibility to check each vehicle falling within the range of this campaign which for any reason enters the service department. This includes vehicles purchased from private parties or presented by transient (tourist) owners and vehicles on dealer used car sales lots. If a correction label is needed, and the owner does not have the notification letter and labels mailed by Nissan, labels should be obtained as listed below.

PARTS INFORMATION

These supplemental correction labels will not be available through the normal parts distribution system since the labels are being sent directly to the vehicle owner. In the event a label is lost or damaged, a replacement may be obtained through your regional service department.

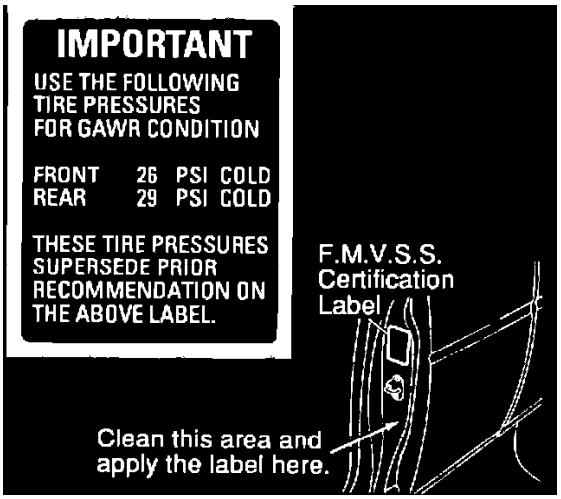
Affected Models

YEAR	MODEL/BODY STYLE	ORIGINALLY EQUIPPED WITH THESE TIRES	REPLACEMENT LABEL TYPE
1983.5-1986	720 2WD Truck	P195/75R14	A
1983.5-1986	720 Sport Truck	P205/75R14	Y
1986.5-1987	D21 2WD Truck (Std)	7.00-14	B
1988-1989	D21 2WD Truck (Std)	P185/75R14	D
1986.5-1990	D21 2WD Truck (E,XE)	P195/75R14	X
1988-1990	D21 4WD Truck (E,XE)	P215/75R15	C
1987-1990	WD21 Pathfinder (E,XE)	P215/75R15	C
1986-1988	M10 4WD Stanza Wgn.	P185/70R14	I

TABLE 1

The original equipment tire size is listed on the existing FMVSS certification label on the door pillar (the size is correct, only the pressure is in error).

Correction Procedure



1. Clean the surface of the door pillar below the door latch striker as shown below to remove dirt or grease.
2. Peel the new label from its backing, and place the label on the door pillar in the area just cleaned.
3. Press firmly to insure proper adhesion.
4. Install the new tire placard in the glove box over top of the existing placard. (1983.5-1986.5 trucks do not have a glove box placard)

Warranty Information

If you are requested by a vehicle owner to install the replacement labels, a recall campaign claim may be entered via DATANET. A peel-off label, imprinted with the owner's name, address, vehicle identification number, campaign description and PNC is included in the owner's notification package. Remove this label and apply it directly to the repair order to save the service writer's time and ensure accurate, readable information for claim submission. Dealers who are not yet on DATANET should submit a standard S-1-S warranty claim.

WARRANTY CLAIM INFORMATION Enter the DATANET claim or type the S-1-S claim using the following information:

CS	PNC	CT	OP CODE	FLAT RATE	OPERATION

Nissan-Datsun Truck PL720 2WD L4-1952cc 2.0L SOHC (Z20)

9Y	R0076	99	R00760	0.2	Apply FMVSS Label

1983-90 720, D21, WD21, M10 TIRE PRESSURE LABELS

Owner Letter

Dear Nissan Owner:

This notice is sent to you in accordance with the requirements of the National Traffic and Motor Vehicle Safety Act. Nissan Motor Co., Ltd. has determined that some 1983 to 1990 Non-passenger motor vehicles may fail to conform to Federal Motor Vehicle Safety Standard No. 120 - Tire Selection and Rims for Motor Vehicles other than Passenger Cars. Our records show that you are the owner of one of these vehicles. If you no longer own this vehicle, please fill out and return the enclosed Change of Information postcard.

Safety Standard No. 120 requires that information concerning tire size, rim size, and tire inflation pressures for carrying the maximum load be placed on a label on the vehicle. Additionally, except for 1983 to 1986 model trucks, Nissan provides information concerning tire pressures for moderate loads on a sticker inside the glove box. While the tire pressures specified for moderate loads are correct, the pressures specified for maximum load are incorrect. The tire pressure information for maximum loads is located on the manufacturer's label on the left doorpost and on the sticker inside the glove box. If the vehicle is driven with the maximum allowable passenger and cargo load and with the tires inflated to the incorrect pressure, the vehicle load may exceed the load carrying capacity of the tires.

Enclosed with this letter is a supplemental door post label showing the correct tire pressures for your vehicle. In some instances, a corrected glove box label will also be included. A corrected glove box label is not required for all vehicles. These additional labels should be placed on the door post near the original label and in the glove box (if necessary) as shown in the attached instructions. This letter should be kept in your vehicle Owner's Manual as a reminder that the tire pressure specifications have been changed. Please disregard any other tire pressure information which may have been provided with your vehicle.

It is important to replace tires with the same size and load carrying capacity as originally equipped. If you have replaced your tires with a size other than specified by Nissan in your Owner's Manual, which we do not recommend, then consult with your tire dealer to insure that the tire load capacity is sufficient to carry the vehicle load.

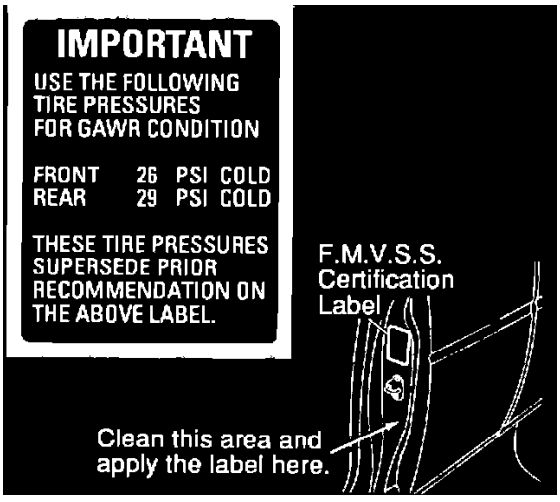
The following page of this notice explains the application areas. Before applying the new labels, please clean the surface of the door post to ensure that it is free of dirt and oil. If you wish, you may take your vehicle to any Nissan dealer for installation of the label at no charge. If you choose to do this, please bring this notice with you to the dealer who will assist you.

If the dealer fails to make this correction at no charge to you, you may contact the National Consumer Affairs Office, Nissan Motor Corporation in U.S.A. at P.O. Box 191, Gardena, California, 90248-0191. The toll-free telephone number is 1-800-NISSAN1.

You may also contact the Administrator of the National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C., 20590 or call the toll-free Auto Safety Hotline at 1-800-424-9393. (Washington D.C. area residents may call 426-0123).

Thank you for your cooperation. We are indeed sorry for any inconvenience this may have caused you.

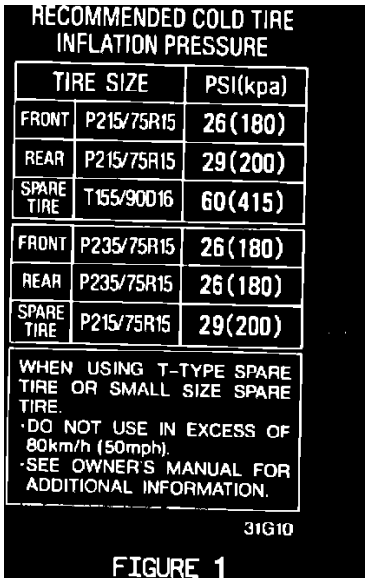
TIRE PRESSURE LABEL INSTALLATION PROCEDURE



1. Before installing the new Tire Pressure Label, the left door frame just below the door latch striker must be cleaned. Using clean water and a dishwashing detergent, remove all dirt, oil and/or grease from the frame surface.

2. Thoroughly dry the area with a clean cloth.

3. Apply the new Tire Pressure Label to the cleaned area. To ensure proper adhesion, firmly down on the center of the label, then wipe outward to the outer edges.


RECOMMENDED COLD TIRE INFLATION PRESSURE

TIRE SIZE		PSI(kpa)
FRONT	P215/75R15	26(180)
REAR	P215/75R15	29(200)
SPARE TIRE	T155/90D16	60(415)
FRONT	P235/75R15	26(180)
REAR	P235/75R15	26(180)
SPARE TIRE	P215/75R15	29(200)

WHEN USING T-TYPE SPARE TIRE OR SMALL SIZE SPARE TIRE.
·DO NOT USE IN EXCESS OF 80km/h (50mph).
·SEE OWNER'S MANUAL FOR ADDITIONAL INFORMATION.

31G10

FIGURE 1

4. If a tire placard similar to the one shown below [Figure 1] was included with this letter, place the placard in the glove box, over the top of the original placard. The new tire pressures should be used when inflating vehicle tires.

Technical Service Bulletin # **NHTSA85V146000** Date: **851112**

Recall 85V146000: Steering Column Coupling Bolt Loose

THE STEERING COLUMN IS CONNECTED TO THE STEERING GEAR BY MEANS OF SPLINED SHAFT COUPLINGS. THESE COUPLINGS ARE SECURED WITH A TRANSVERSE BOLT AND LOCKWASHER. IT WAS FOUND THAT THE BOLT WAS NOT TIGHTENED AND TORQUED TO SPECIFICATIONS. CONSEQUENCE OF DEFECT: ALTHOUGH THE SPLINES PROVIDE ADEQUATE COUPLING TO PERMIT OPERATION, EXTENDED USE MAY RESULT IN SPLINE DISENGAGEMENT AND LOSS OF VEHICLE CONTROL WHICH MAY CAUSE AN ACCIDENT. CORRECTIVE ACTION: INSPECT AND CORRECT AS NECESSARY TO PRECLUDE SPLINE DISENGAGEMENT.

SYSTEM: STEERING/SHAFT COUPLING.

VEHICLE DESCRIPTION: MODEL 720 LIGHT DUTY TRUCKS.

1986 NISSAN TRUCK 720

Technical Service Bulletin # **HA87004** Date: **870227**

Defroster - Poor Performance Explanation

Models All Models

Section Heater & Air Conditioner

Classification HA87-004

Bulletin No. TS87-036

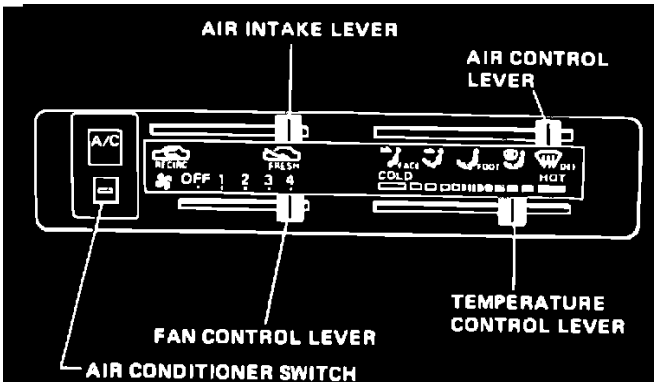
Date February 27, 1987

DEFROSTER PERFORMANCE

APPLIED MODELS: All Models

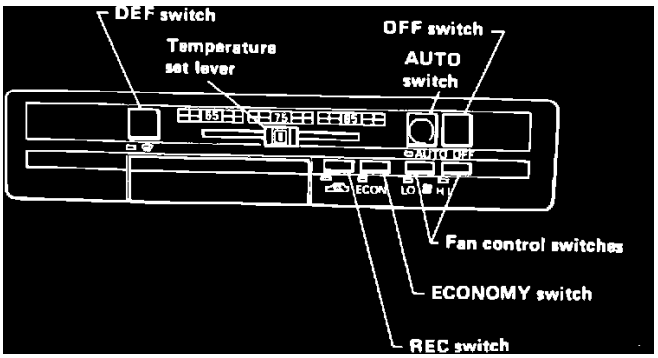
SERVICE INFORMATION

If a customer complains about poor defroster performance, use the following information to instruct the customer for optimum defroster performance.



Manual Systems

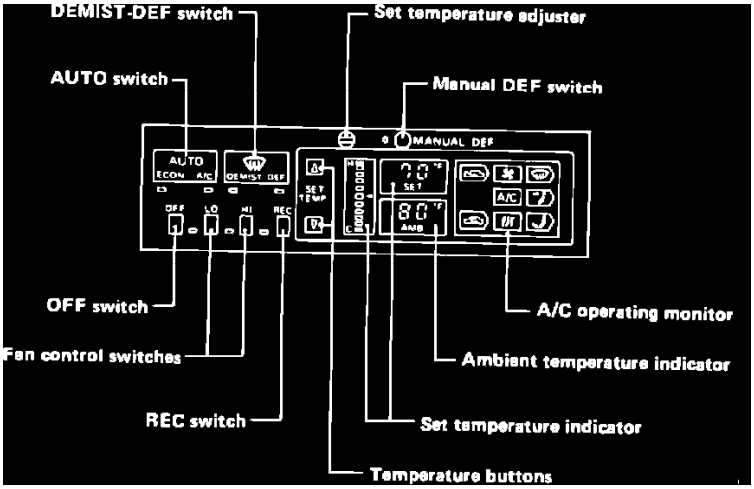
1. Set the air intake lever to the fresh position.
2. Set the air control lever to the defrost (DEF) position.
3. Turn on the fan control lever (# 4 position for quick defrost).
4. Set the temperature control lever to the middle through the "HOT" position.
5. If vehicle is equipped with air conditioning, push the A/C switch "ON".



Automatic Systems

A. Maxima:

1. Push the defrost (DEF) switch on.
2. Move the temperature set lever to the desired position.
3. Push the "HI" fan control switch for quick defrost.
4. Do not push the "REC" switch. The "REC" switch will not be activated when system is in the "DEF" mode.



B. 300ZX:

1. Push the "DEMIST-DEF" switch to the "DEF" mode. The temperature will automatically shift to full hot, the "SET" display will show 90~F and the fan speed will automatically switch to "HI". If less air flow is desired, push the "LOW" fan control switch.
2. Do not push the "REC" switch. The "REC" switch will not be activated when the system is in the "DEF" mode.

NOTE: Use the manual "DEF" switch only if the air conditioner is malfunctioning. When the manual "DEF" switch is pushed, the defroster operates in the full hot, high fan speed mode and all other controls are deactivated. Push the manual "DEF" switch again to activate the other controls.

Technical Service Bulletin # **00-013** Date: **000210**

Steering - Vibration/Brake Pedal Pulsation

Classification:
BR00-001

Reference:
NTB00-013

Date:
February 10, 2000

AMMCO ON-CAR BRAKE LATHE OPERATING PROCEDURE

APPLIED VEHICLES:
All Nissan vehicles with disc brakes

SERVICE INFORMATION

If a Nissan vehicle exhibits steering wheel vibration or brake pedal pulsation when braking, it may be brake judder. Brake judder is created by excessive thickness variation of the brake rotors. In most cases the thickness variation is a result of excessive brake rotor run-out. While brake judder is usually associated with the front brake rotors, the rear brake rotors may cause it too.

The most effective way to eliminate brake judder and excessive rotor run-out is to turn the brake rotors using the Ammco on-car brake lathe. This required special tool will minimize the assembled brake rotor run-out more than conventional off-car turning/installing on hub process. Please **note** the following points when using the on-car brake lathe:

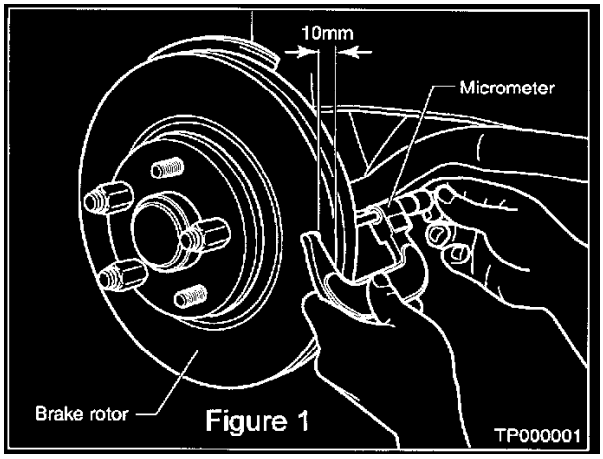
^ Prevent metal shavings from contacting or collecting on the ABS speed sensors. Remove any shavings that stick to the ABS speed sensor's magnet. It is best to clean the ABS sensor with the rotor removed.

^ Mark the exact location of the rotor (on the axle hub) before removing the rotor (see Figure 2).

^ Do not tighten the wheel lug nuts with an air impact driver. Uneven or high torque applied to the lugs may distort the brake rotor and hub, resulting in increased rotor run-out and excessive rotor thickness variation as the rotor wears.

^ If new rotors are required, install them on the hub in different positions (index) to achieve the lowest run-out reading (equal to or less than 0.0012", 0.03 mm), using a dial indicator. See Figure 11.

Service Procedure



1. Measure the rotor thickness at 10 mm in from the outside diameter of the rotor to ensure the rotors can be turned (see Figure 1).

   A. If the rotor thickness is below specification, the rotor cannot be turned, but must be replaced. When installing new rotors, install them on the hub in different positions (index) to achieve the lowest run-out reading (equal to or less than 0.0012", 0.03 mm).

   B. If the rotor thickness is within specification, the rotor can be turned. Proceed with step 2.

WARNING:
Do not cut below the minimum rotor thickness specification. Replace the rotor if the run-out cannot be eliminated without exceeding the

minimum rotor thickness specification.

2. Remove the brake caliper assembly.

CAUTION:
Do not allow the brake caliper assembly to hang from the brake hose. Use a piece of wire to hang the caliper from the front coil spring.

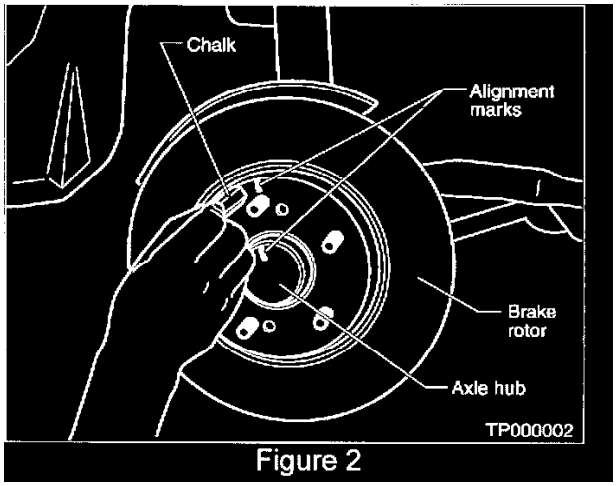


Figure 2

3. Put an alignment mark on the rotor and the axle to ensure the rotor remains in its original position (see Figure 2).

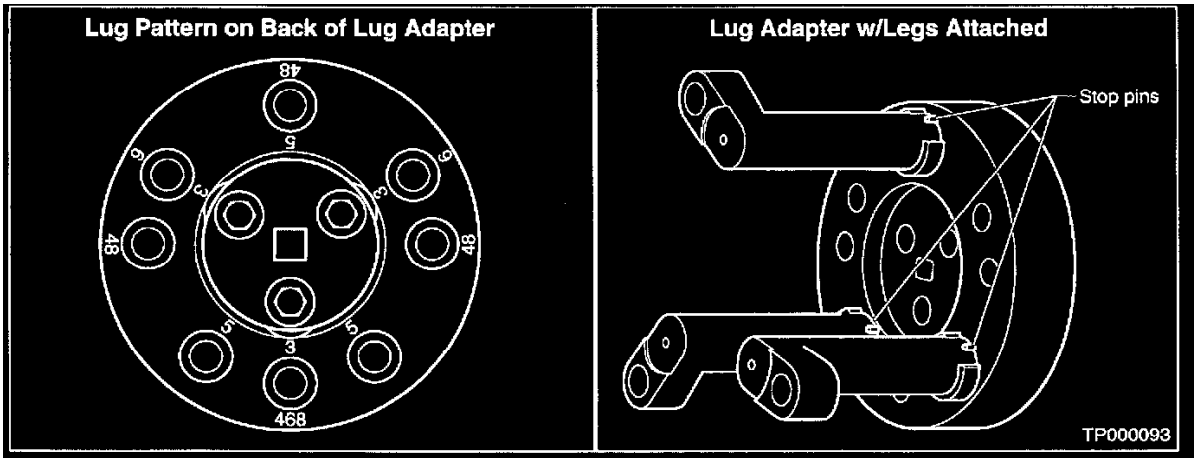


Figure 3

4. Assemble the legs on the lug adapter according to the lug pattern of the vehicle being worked on (see Figure 3). Then tighten the bolts that secure the legs to the adapter, making sure the legs are flat against the adapter and freely rotate.

5. Orient all legs to the full outside position, against the stop pin (see Figure 3).

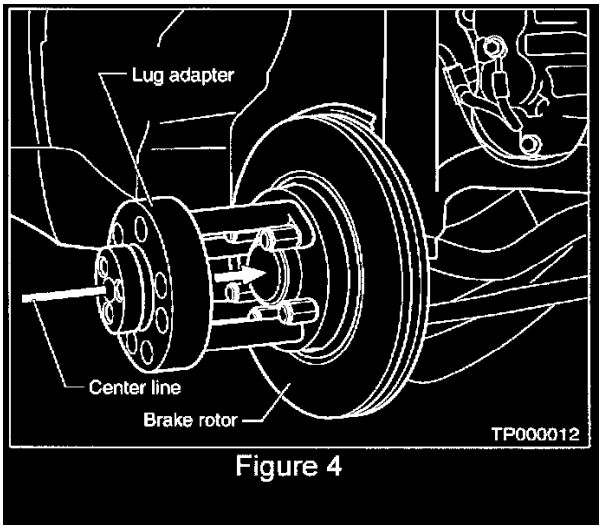


Figure 4

6. Install the lug adapter on the brake rotor (see Figure 4). Tighten all lug nuts to 40 ft/lb.

NOTE:
Ensure that all lug nuts are installed on the lug studs - including the lug studs not used for the lug adapter legs.

NOTE:
Make sure the lug adapter is centered on the brake rotor (see Figure 4).

7. Install the brake lathe on the vehicle as follows:

   A. Loosen the bolts holding the adjustable mounting brackets on the lathe and slide the brackets in or out to align with the holes in the caliper mounting bracket on the vehicle.

NOTE:
If the mounting brackets on the lathe do not adjust in or out far enough to reach the caliper mounting holes, the brackets may be switched end-to-end or switched end-to-end and turned 90 degrees to match the caliper mounting holes.

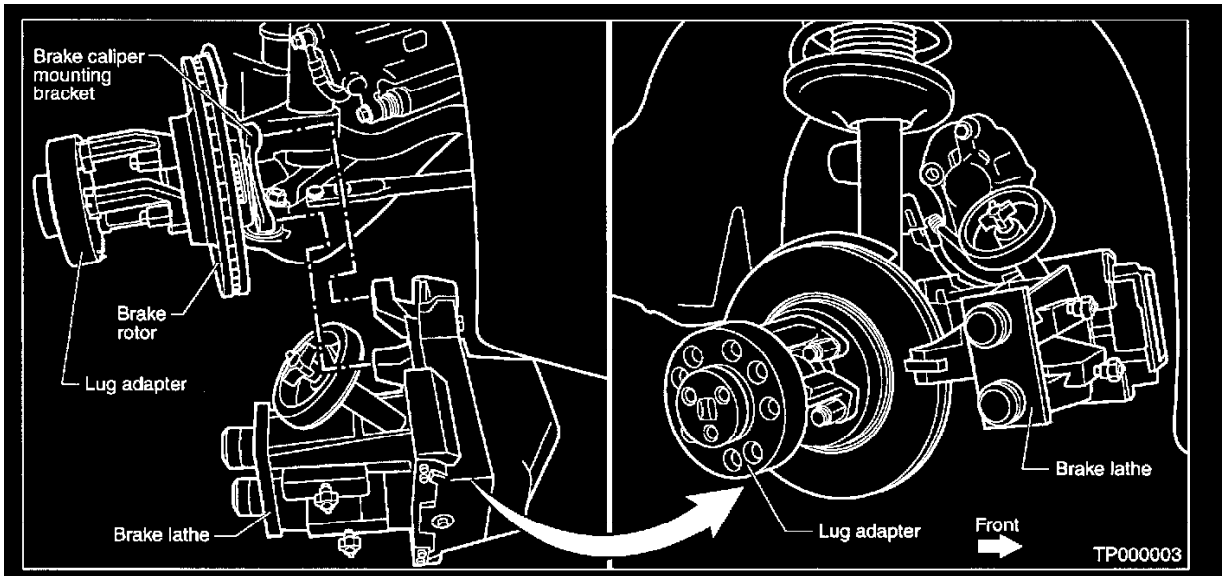


Figure 5

   B. Mount the lathe against the inboard side of the caliper mounting bracket using the appropriate adapter mounting bolts, sleeves and spacers to achieve adequate clearance between the lathe and the brake rotor (see Figure 5).

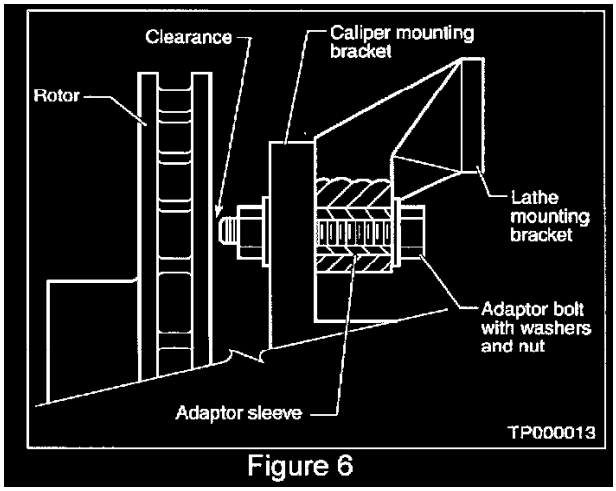


Figure 6

NOTE:
Use the appropriate adapter mounting bolts and sleeves to ensure the lathe is firmly mounted and that NO movement (play) exists between the caliper mounting bracket and the lathe. Also, make sure there is sufficient clearance between the adapter mounting bolts and the brake rotor (see Figure 6).

8. Install the silencer band on the outside diameter of the brake rotor to dampen vibrations during cutting.

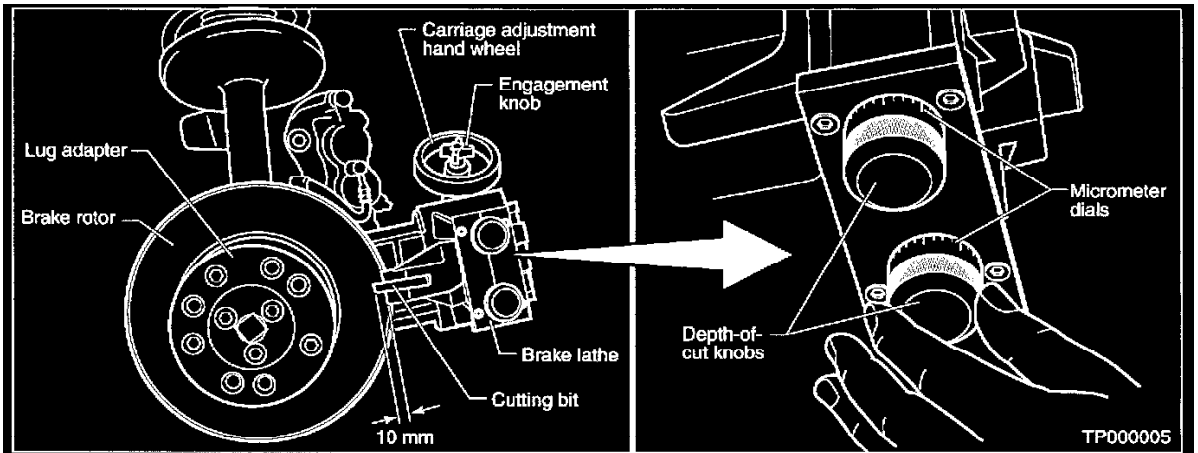


Figure 7

9. Position the cutting bits about 10 mm in from the outer edge of the rotor surface (see Figure 7).

NOTE:
Make sure the cutting bits are sharp and in good condition. Also, cutting bits should not be used more than ten times as they wear out.

10. Turn the (blue) depth-of-cut knob clockwise to advance the outboard cutter until it lightly contacts the rotor surface. Hold the knob still while rotating the micrometer dial to zero (see Figure 7). Then, turn the depth-of-cut knob 1 notch counterclockwise.

11. Turn the (red) depth-of-cut knob clockwise to advance the inboard cutter until it lightly contacts the rotor surface. Hold the knob still while rotating the micrometer dial to zero (see Figure 7). Then, turn the depth-of-cut knob 1 notch counterclockwise.

NOTE:
Once you have zeroed a micrometer dial, never use the dial to advance or withdraw a cutting bit; the dial may slip, losing the zero position. Only use the depth-of-cut knob to advance or withdraw the cutting bit.

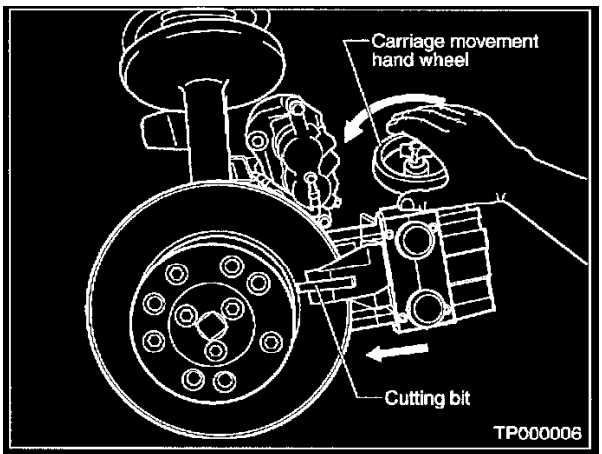


Figure 8

12. Advance the carriage with the hand wheel until the outboard cutting bit reaches the inside edge of the rotor surface (see Figure 8). Then, advance the carriage movement hand wheel an additional one-third turn.

13. Turn the depth-of-cut knobs individually to set each cutting bit to the desired depth of cut. Each cut may be between 0.002" and 0.004" (0.05 mm and 0.10 mm), but the final cut must be made at 0.001" (0.025 mm).

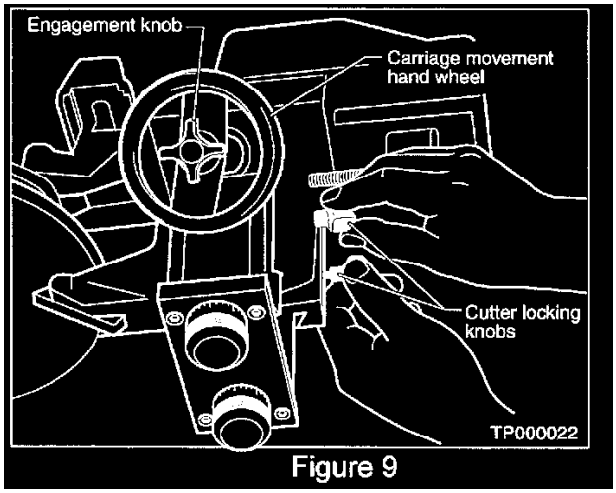


Figure 9

14. Tighten the cutter locking knobs (see Figure 9).

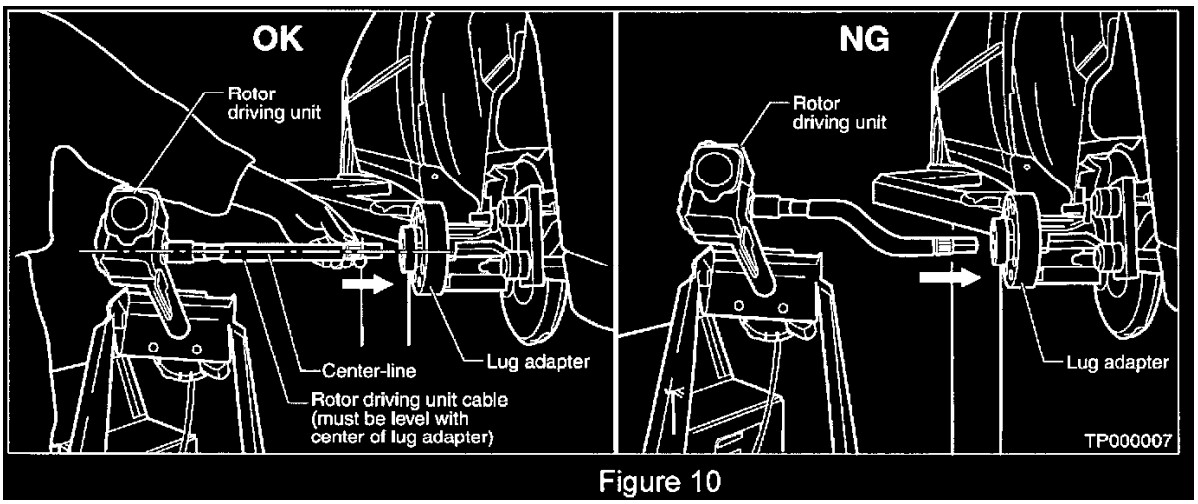


Figure 10

15. Connect the rotor driving unit to the lug adapter (see Figure 10).

NOTE:
Before using the rotor driving unit, ensure that all lug nuts are installed on the lug studs - including the lug studs not used for the lug adapter. Tighten the lug nuts to 40 ft-lb.

NOTE:
Make sure the rotor driving unit cable is exactly level with the center of the lug adapter (see Figure 10).

16. Activate the rotor driving unit.

17. Tighten the engagement knob in the center of the carriage movement hand wheel (see Figure 9) to start the cutting process. When the cutting bits clear the outer edge of the rotor, loosen the engagement knob to stop the carriage movement.

18. If part of the brake surface was not cut, leave the cutters in the locked position and move the carriage until the cutters are at the inside edge of the braking surface, then repeat steps 12, 13, 14, 16 and 17.

19. Turn the rotors with a finish-cut of 0.001" (0.025 mm).

NOTE:
The brake lathe cutting bits must be replaced after they have been used 10 times.

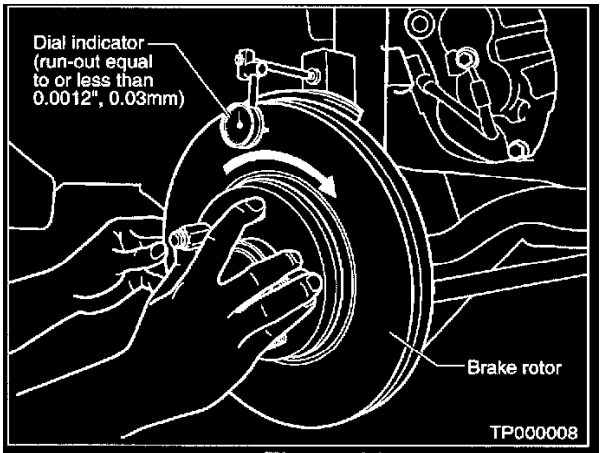


Figure 11

20. Use a dial indicator to ensure the rotor run-out is within specification (see Figure 11). Rotor run-out should not exceed 0.0012" (0.03 mm).

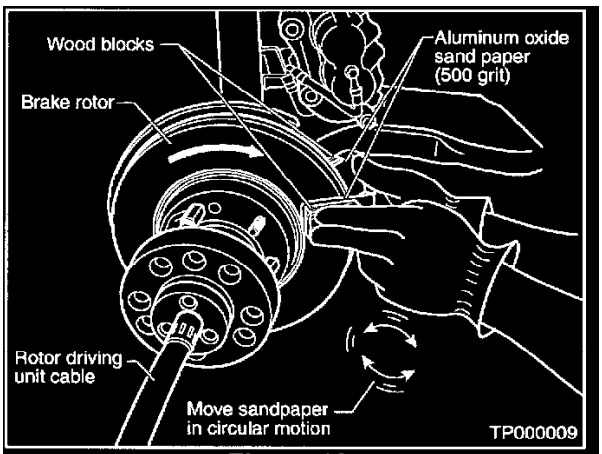


Figure 12

21. Turn the rotors and hand finish the newly turned rotor surface with a non-directional swirl pattern using #500 grit aluminum oxide sandpaper. This improves the rotor surface finish and helps to further reduce noise (see Figure 12).

NOTE:
Use a small, flat block of wood between the sandpaper and your fingers to ensure a flat, smooth surface finish (see Figure 12).

Technical Service Bulletin # **87-135** Date: **870824**

Engine Controls - Intermittent Engine Surge/Hesitation

Classification:
EC87-012

Reference:
TS87-135

Date:
August 24, 1987

INTERMITTENT ENGINE HESITATION/SURGING

APPLIED VEHICLE(S):
1986.5-1987 Truck, 1987 Pathfinder, 1987 Van, 1987 Sentra Coupe and 4WD Wagon, 1987 Pulsar NX (XE)

SERVICE INFORMATION

APPLIED VINs: MODEL	APPLIED VIN	APPLIED DATE
1987 Sentra Coupe	JN1PB24S( )HU055198	May 22, 1987
1987 Sentra Wagon 4WD	JN1PB25Y( )HU003516	June 1, 1987
1987 Van (A/T)	JN8SC26S( )H4004408	November 11, 1987
1987 Van (M/T)	JN8SC26S( )H4005184	November 20, 1986
1987 Pulsar NX (XE)	JN1PN34S ( )HM037700	May 29, 1987
U.S.A. Produced Trucks:		
• with Z24 engines	1N6ND11S( )HC321026	January 5, 1987
• with VG30 engines	1N6HD16Y( )HC321363	January 5, 1987
Japan Produced Trucks:		
• Z24/2WD/Reg. Bed / (M/T)	JN6ND11S( )HW013760	November 6, 1986
• Z24/2WD/Reg. Bed / (AT)	JN6ND11S( )HW016181	November 16, 1986
• Z24/2WD/Long Bed / (M/T)	JN6ND12S( )HW000775	November 6, 1986
• Z24/2WD/Reg. Bed / (A/T)	JN6ND12S( )HW000799	November 16, 1986
• Z24/2WD/King Cab / (M/T)	JN6ND16S( )HW007953	November 6, 1986
• Z24/2WD/Reg. Bed / (A/T)	JN6ND16S( )HW008481	November 16, 1986
• VG30/2WD/ Reg. Bed / (A/T)	JN6HD11S( )HW000276	December 25, 1986
• VG30/2WD/ Reg. Bed / (M/T)	JN6HD11S( )HW000286	January 10, 1987
• VG30/2WD/ King Cab / (A/T)	JN6HD16S( )HW003050	December 25, 1986
• VG30/2WD/ King Cab / (M/T)	JN6HD16S( )HW003064	January 10, 1987
• VG30/Long Bed/ H.D. / (A/T)	JN6HD12S( )HW000288	December 25, 1986
• VG30/Long Bed/ H.D. / (M/T)	JN6HD12S( )HW000322	January 10, 1987
• VG30/Cab & Chassis / (A/T)	JN6HD15S( )HW000248	December 25, 1986
• VG30/Cab & Chassis / (M/T)	JN6HD15S( )HW000269	January 10, 1987
• Z24/4WD/Reg. Bed	JN6ND11Y( )HW001972	November 16, 1986
• Z24/4WD/Long Bed	JN6ND12Y( )HW000227	November 16, 1986
• Z24/4WD/King Cab	JN6ND16Y( )HW001918	November 16, 1986
• VG30/4WD/ Reg. Bed / (A/T)	JN6HD11Y( )HW000491	December 25, 1986
• VG30/4WD/ Reg. Bed / (M/T)	JN6HD11Y( )HW000501	January 10, 1987
• VG30/4WD/ King Cab / (A/T)	JN6HD16Y( )HW004256	December 25, 1986
• VG30/4WD/ King Cab / (M/T)	JN6HD16Y( )HW004271	January 10, 1987
1987 Pathfinder:		
• Z24/ (M/T)	JN6ND14Y( )HW000615	November 6, 1986
• Z24/ (A/T)	JN6ND14Y( )HW001093	November 16, 1986
• VG30 / XE / (A/T)	JN8HD14Y( )HW001507	December 25, 1986
• VG30 / XE / (M/T)	JN8HD14Y( )HW001669	January 10, 1987
• VG30 / SE / (A/T)	JN8HD16Y( )HW012242	December 25, 1986
• VG30 / SE / (M/T)	JN8HD16Y( )HW012730	January 10, 1987

Some of the Applied Models built prior to the VINs shown may exhibit intermittent engine hesitation or surging under load. The condition "feels" as if the ignition is shut off for less than a second and then turned back on.

SERVICE PROCEDURE

For vehicles that exhibit this symptom, check the engine systems using the driveability diagnostic procedure in the EF & EC section of the appropriate Nissan Service Manual. This will include a complete self-diagnosis procedure at the vehicle ECU and a complete follow up with trouble-shooting on any trouble codes, until a code 44 or all clear code is achieved.

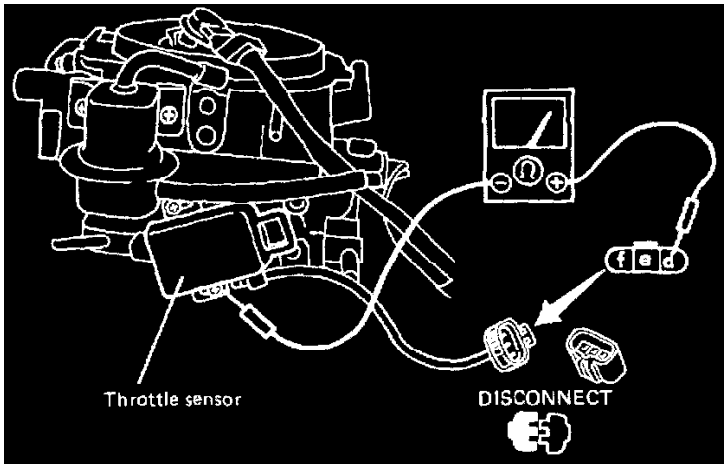
NOTE:

If a code 11 (crank angle sensor) occurs in a vehicle with manual transmission, clear the memory and repeat the self-diagnosis check. In some vehicles, the code 11 will appear in the self-diagnosis memory any time the ignition switch is turned to the "Start" position while the clutch pedal is not fully depressed.

If the intermittent condition persists after all engine systems are in proper working order according to the tests above, then perform the following test procedure.

Test Procedure

1. Depress and release the accelerator pedal several times prior to performing steps.



2. Connect an ohmmeter at the throttle sensor connector with the positive + side to pin 'd' (terminal side with connector disconnected) and the negative - side to the throttle sensor base plate as shown.

3. Resistance should be oo. Move the positive side to pins 'd' and 'f'. Resistance should remain at 00.

4. If the resistance is anything other than 00, repeat steps 2 and 3.

5. If the resistance is still anything other than 00, replace the throttle sensor with the appropriate part listed below. If the throttle sensor is replaced, be sure to adjust it using the procedures in the appropriate Service Manual.

NOTES:

E16i engines: the idle speed must be set with the throttle sensor disconnected before adjusting the throttle switch as described in the Service Manual under Throttle Valve Switch Adjustment.

VG30i engines: for slight off-idle hesitation on Truck/Pathfinder models, set the initial timing at exactly 14°.

DESCRIPTION	ENGINE	PART #
Throttle Sensor	Z24i	22620-41G00
	E16i	22620-61A00
	VG30i	22620-12G00

PARTS INFORMATION

The improved throttle sensor has been installed on production vehicles beginning with the VINs.

Technical Service Bulletin # **87-103** Date: **870629**

Brakes - Explanation of Common Noises

Classification:
BR87-005

Reference:
TS87-103

Date:
June 29, 1987

DISC BRAKE NOISE INFORMATION

APPLIED VEHICLE(S):
All Models with disc brakes (front or rear)

SERVICE INFORMATION

Some Nissan vehicles may exhibit brake noise under certain driving conditions. This Bulletin provides some information about normal and common noises and appropriate service procedures for each noise. Some of this information may be useful when explaining brake noises to the customer.

Refer to Technical Bulletin BR87-006, "Disc Brake Noise Countermeasure", for information about abnormal brake noises on Maxima, Stanza, and Stanza Wagon.

General Brake Information

Nissan-Datsun Truck PL720 2WD L4-1952cc 2.0L SOHC (Z20)

Nissan brake systems have been carefully designed to provide optimum braking performance under various driving conditions. One of the most important components in the brake system is the brake pad material. The following factors have been taken into consideration to select the best pad material.

^ technical and government regulations
^ stopping distance
^ vehicle control while braking
^ high operating temperatures
^ pedal force
^ pad and rotor wear rates
^ moisture resistance
^ friction coefficient stability
^ operating noise level

Unfortunately, there is no one brake pad material that provides perfect performance in all of these areas. Changing the material to improve some factors often causes a performance reduction in other areas. Higher brake operating noise levels in some instances occur as a result of factors which ensure proper brake performance and safety.

Common Brake Noises

The following brake noises occur most frequently on Nissan vehicles. These noises do not indicate any malfunction or improper operation.

1. GROANING NOISE AT LOW MILEAGE (0-300 MILES)
   ^ noise occurs with light to medium pedal force
   ^ noise occurs during medium speed stops (20-40 mph)
   ^ noise usually does not occur on the first or second stop
   ^ noise occurs with warm or hot brakes (not cold)
   ^ there may be a low frequency "judder" vibration

Nissan applies protective coatings to the brake rotors and pads to reduce corrosion during shipping and storage. These coatings may cause this groaning noise until they are worn off. Under normal driving conditions, this usually takes about 300 miles. If this noise occurs during the first 300 miles, it is not necessary to attempt any repairs.

Service Procedure:

There is no service procedure to eliminate this noise permanently. Replacing the brake pads or machining the rotors may cause the noise to disappear temporarily, but it will return and continue until the coatings are worn off the rotor and pads.

2. GROANING NOISE (AFTER 300 MILES)
   ^ while the vehicle is barely moving, with light brake pedal force
   ^ more noticeable during warm, dry weather
   ^ most common on vehicles with automatic transmission

This noise is common on most cars with front disc brakes. There are no repair procedures to eliminate this noise.

3. SQUEAKING/SQUEALING NOISE
   ^ noise occurs with light to medium pedal force
   ^ noise occurs during low speed stops (5-20 mph)
   ^ more noticeable during warm, dry weather

This noise is common on vehicles with high-performance potential that must be able to stop in short distances from high speeds. Other brands of brake pads may eliminate this noise, but Nissan does not recommend them because they may have reduced pad life or inadequate performance in high speed stops.

4. HIGH-PITCHED SQUEAKING/SCRAPING NOISE
   ^ whenever brakes are applied
   ^ may come from just one wheel

Nissan uses pad wear indicators on many of its disc brake pads to provide an audible warning when the brake pads need replacement. Spring steel tabs that are riveted to the brake pad scrape lightly on the rotor surface when the pad is worn down to its lowest limit. The customer should hear the noise at this time and bring the vehicle to the dealer for brake pad replacement. The pad wear indicator will not damage the rotor surface if the pad is replaced in a reasonable time.

Replace worn pads with new parts. Check the rotor surface for damage and machine if necessary.

Technical Service Bulletin # **95057** Date: **950621**

A/C - Compressor Leak/Noise, Poor Performance

CLASSIFICATION:

Nissan-Datsun Truck PL720 2WD L4-1952cc 2.0L SOHC (Z20)

HA95-011

REFERENCE:
NTB095-057

DATE:
June 21, 1995

AIR CONDITIONING COMPRESSOR LEAK/NOISE DIAGNOSIS

APPLIED VEHICLE: All

SERVICE INFORMATION

If a customer brings in a vehicle complaining of poor cooling performance and/or an air conditioning (A/C) compressor noise complaint and diagnosis shows that the refrigerant level is lower than specification, the A/C compressor may NOT be the cause.

SERVICE PROCEDURE

LEAK

When diagnosing compressors for a refrigerant leak, please use the following procedure:

1. Make sure the A/C system is charged with the specified amount of refrigerant.

2. Use the J39400 leak detector to identify the area of the leak. For detailed information on refrigerant leak detection, refer to technical bulletin NTB95-014, PROCEDURE FOR DETECTION OF REFRIGERANT LEAKS, dated February 22, 1995.

3. If a leak is detected, verify the exact location of the leak with a soap and water solution. Please note that if the compressor's joint connector has a leak, compressor oil may leak out on the compressor case. Therefore it should not be assumed that the compressor has a leak if compressor oil is detected on the compressor case.

4. If the leak is at the compressor's joint connector, do not replace the compressor. The leak should be repaired as follows:

   ^ Evacuate/Recover the refrigerant from the A/C system using the proper refrigerant recycling equipment.

   ^ Replace the "O" ring for the leaking joint connector.

   ^ Properly position the tube and compressor joint connector.

   ^ Tighten the connector's fastening bolt(s) by hand first. Confirm the tube and compressor joint connector are mated correctly. Then tighten to specification with a torque wrench and back up wrench.

5. Evacuate and recharge the system with the specified amount of refrigerant.

6. Conduct a leak test on the components which were repaired/replaced to confirm the leak is repaired.

7. Conduct performance test. If the incident is not resolved, refer to the service manual for further diagnosis.

NOISE

When diagnosing for suspected A/C compressor noise, please use the following procedure:

1. Note the engine RPM at which the noise occurs and listen to the noise with the A/C compressor turned ON, then OFF. If the noise can be heard when the compressor is OFF, the noise is not generated by the compressor. Look for other components which may be the source of the noise including the drive belts and the A/C compressor idler pulley.

2. If the noise is heard only when the compressor is ON, conduct further diagnosis on the A/C system. Please note that if the A/C system has a leak, refrigerant as well as compressor oil will leak out of the system. Low refrigerant and compressor oil quantity may cause the compressor to be noisy.

Technical Service Bulletin # **HA87023** Date: **871221**

A/C Blower Fan System - Inoperative

Models All Models

Section Heater & Air Conditioner

Classification HA87-023

Nissan-Datsun Truck PL720 2WD L4-1952cc 2.0L SOHC (Z20)

Bulletin No. TS87-190

Date December 21, 1987

HEATER-A/C BLOWER FAN SYSTEM TEST PROCEDURES

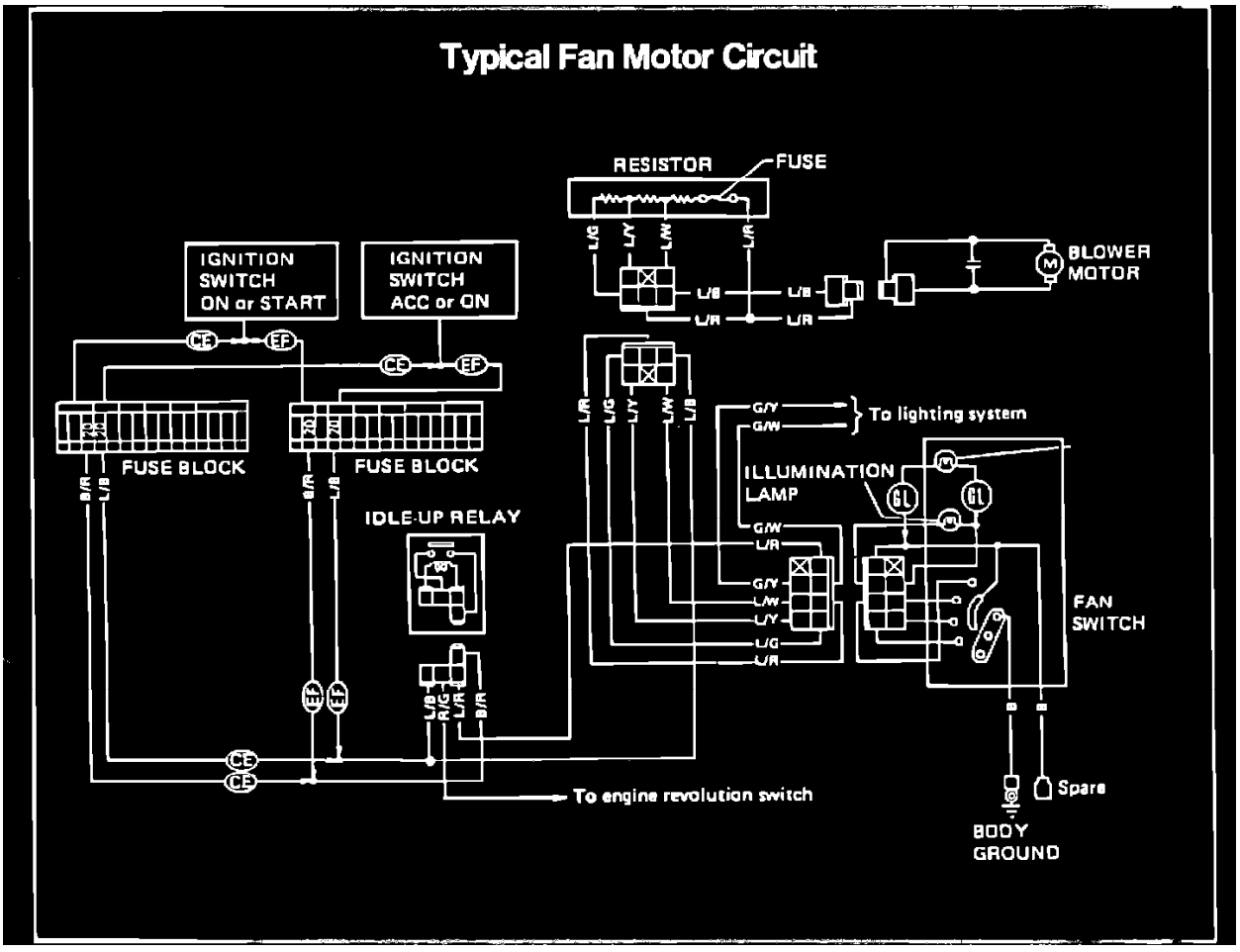
APPLIED MODELS: All Nissan models equipped with heater only or heater and manual air conditioning.

SERVICE INFORMATION

In some vehicles, the blower fan for the heater/AC system may become inoperative or it may not operate in all blower speeds. The following test procedures may be used to diagnose and repair malfunctions in blower fan operation.

SERVICE PROCEDURE

BLOWER FAN CONDITION	PERFORM TESTS
DOES NOT OPERATE ONLY OPERATES AT HIGHEST SPEED (# 4 POSITION)	1 and 2
DOES NOT OPERATE IN ONE OF THE LOWER SPEED POSITIONS (1, 2 or 3)	1 and 3



TEST PROCEDURE #1:

1. Place the fan switch in the "OFF" position. Turn the ignition switch to the "ACC" position. Check the available voltage to the fan motor fuse(s).

   ^ If the available voltage is 1.5 volts or more below battery voltage, check the power supply circuit to the fuse box for any source of high resistance.

2. Turn the ignition key to the "OFF" position. Check the fuse(s) and fuse holder for continuity and for any sign of corrosion. Clean or repair as necessary.

3. Place the fan switch in the "OFF" position. Check for continuity between the fuse box and body ground.

   ^ If there is continuity, check for a short in the blower fan circuit.

4. Place the fan switch in the highest (# 4) position. Check for continuity between the fuse box and body ground.

^ If there is no continuity, check for an open in the blower fan circuit.

TEST PROCEDURE # 2:

1. Place the ignition switch in the "OFF" position.

2. Visually inspect the thermal limiter (fuse) on the fan resistor assembly. If the fuse has burned open or has been overheated, replace the fan resistor assembly.

3. Remove the fan motor assembly from the intake air box and check for foreign material or water corrosion.

4. Check to make sure there is clearance between the fan cage and the motor mounting plate.

5. If the instrument connector was disconnected to remove the blower motor assembly, re-connect it.

6. Perform the following test:

   A. Place the fan switch in the "OFF" position.

   B. Turn the ignition key to the "ACC" position.

   C. Position the fan motor so that the fan operation can be safely observed.

   D. While observing the fan, turn the fan switch to the low speed (# 1) position for 10 seconds, then move it back to the "OFF" position.

      ^ If the blower fan does not operate during the 10 second test period, replace the fan motor.

      ^ If the individual fan blades can be visually identified during the 10 second test period, the fan is operating too slowly. Replace the fan motor.

TEST PROCEDURE # 3:

1. Place the ignition switch in the "OFF" position.

2. Place the fan switch in the "OFF" position.

3. For safety to your volt-ohmmeter, perform this test with the vehicle battery ground disconnected. Touch the positive (+) probe of an ohmmeter to the voltage supply wire at the blower fan resistor.

4. Connect the negative (-) probe to body ground.

5. Place the fan switch into the speed position in which the malfunction occurs.

^ If there is no continuity (open circuit to ground), check the circuit from the resistor to fan switch ground.

Technical Service Bulletin # **88-152** Date: **981121**

Tires - Vibration, Diagnosis & Out of Round Measurement

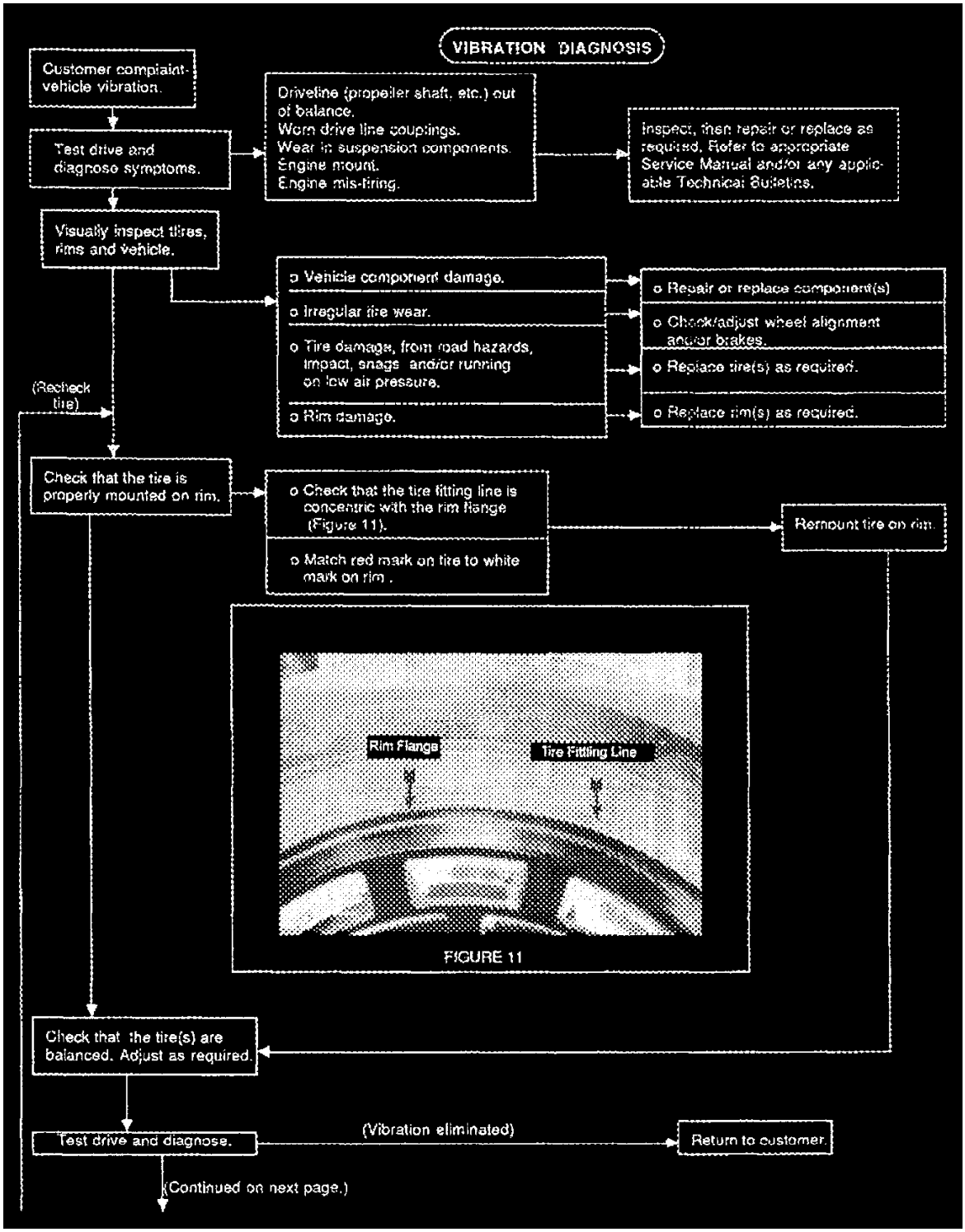
Classification:
WT88-003

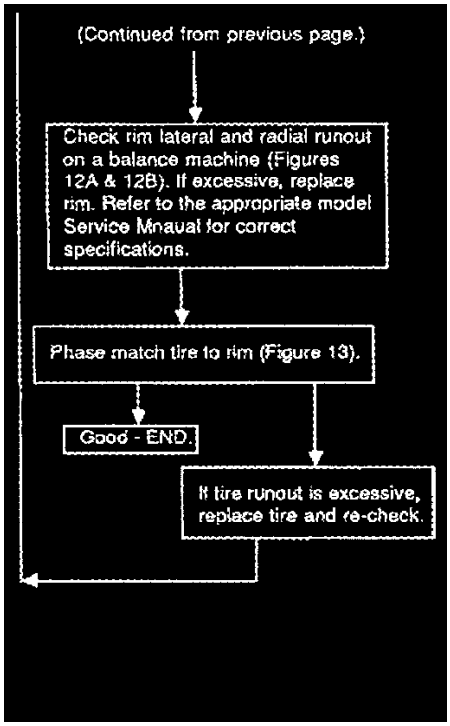
Reference:
TS88-152

Date:
November 21, 1988

TIRE DIAGNOSTIC PROCEDURES

APPLIED VEHICLE(S):
All Models


VIBRATION DIAGNOSIS
Customer compiaint-vehicle vibration.
Test drive and diagnose symptoms.
Driveline (propeller shaft, etc.) out of balance.
Worn drive line coupings.
Wear in suspension components.
Engine mount.
Engine mis-firing.
Inspect, then repair or replace as required. Refer to appropriate Service Manual and/or any applicable Technical Bulletins.
Visually inspect tires, rims and vehicle.
o Vehicle component damage.
o Irregular tire wear.
o Tire damage, from road hazards, impact, snags and/or running on low air pressure.
o Rim damage.
o Repair or replace component(s)
o Check/adjust wheel alignment and/or brakes.
o Replace tire(s) as required.
o Replace rim(s) as required.
(Recheck tire)
Check that the tire is properly mounted on rim.
o Check that the tire fitting line is concentric with the rim flange (Figure 11).
o Match red mark on tire to white mark on rim .
Remount tire on rim.
Rim Flange
Tire Fitting Line
FIGURE 11
Check that the tire(s) are balanced. Adjust as required.
Test drive and diagnose.
(Vibration eliminated)
Return to customer.
(Continued on next page.)



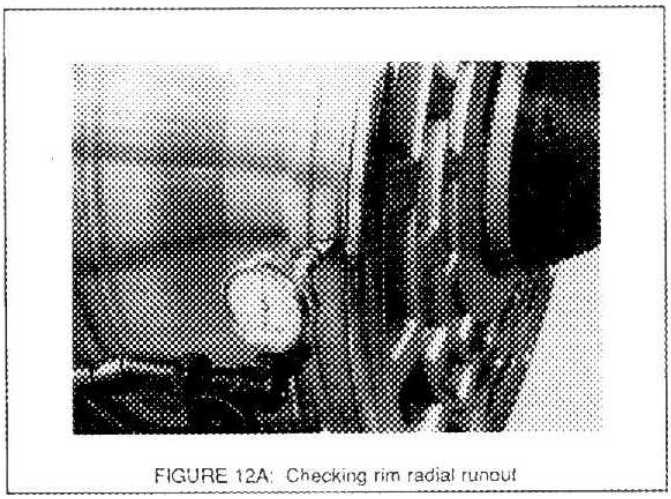


FIGURE 12A: Checking rim radial runout

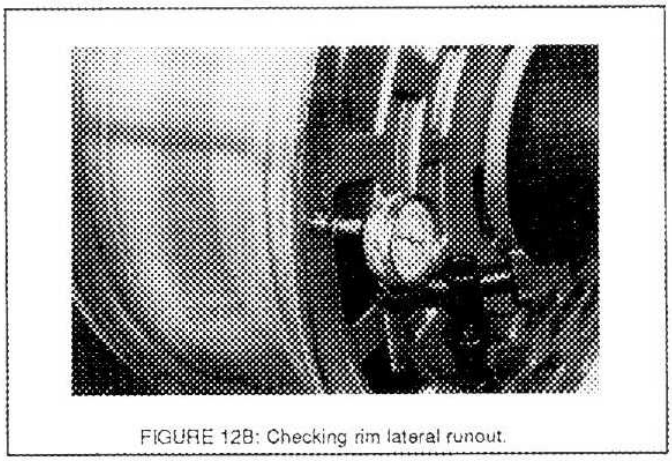


FIGURE 12B: Checking rim lateral runout.

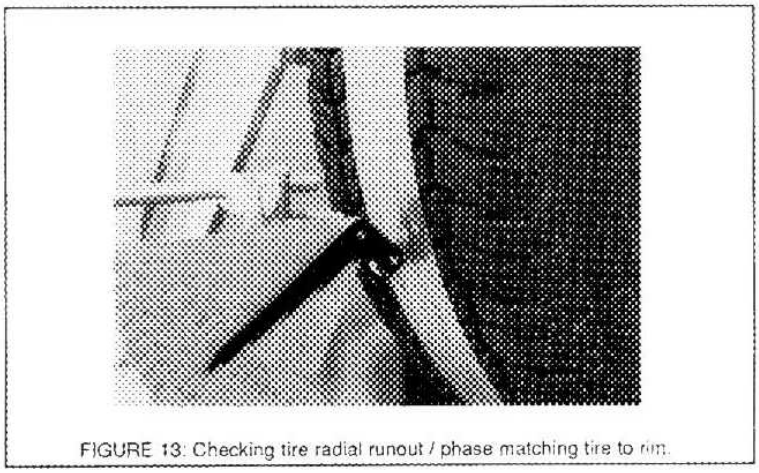


FIGURE 13: Checking tire radial runout / phase matching tire to rim.

Vibration Diagnosis

Please note that exact out-of-round specifications are hard to define. Because of this, when submitting a warranty claim for a gross out-of-round condition, the claim should be supported with actual measurement figures.

Service Information

This Technical Bulletin contains descriptions of the types of tire damage that are covered by the tire manufacturer's warranties (Limited to Bridgestone, Toyo, Yokohama and Dunlop). For tires not available through Nissan, please direct the customer to the manufacturer's nearest dealer. When a customer returns a tire for inspection and adjustment, refer to the information in this bulletin to help identify causes of tire failures and consequential damage to tires.

To determine warranty status, it is essential to ascertain if tire damage is caused by road hazards, mechanical problems, workmanship or materials. In determining the cause of tire failure, inspect both the exterior and interior of the tire.

Sometimes the cause of tire failure is immediately apparent. In other cases however, only a thorough inspection of the tire will show the cause of failure, and whether the damage should result in replacement under manufacturers warranty. Thorough inspection requires good lighting, a clean dismounted tire and close examination of the tire surface. Finding a point of penetration can sometimes be very difficult and should be done on a tire spreader.

NOTE:

For a full description of tire damage not covered by manufacturers warranty, please refer to the Passenger Car & Light Truck Tire Inspection & Adjustment booklet, sent to you with Technical Bulletin WT88-002 (TS88-084).

Sidewall Blister

Damage Description: Sidewall Blister
NISSAN CODE: 7N

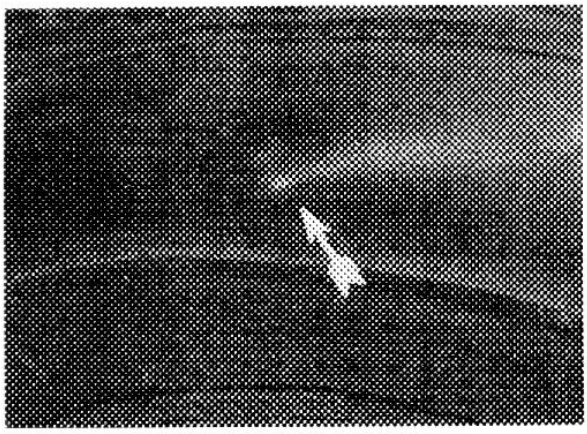


FIGURE 1

DEFINITION:
A lifting of the rubber layer (i.e., portions of sidewall stock or white sidewall rubber) from the tire's sidewall structure, caused by lack of adhesion between the rubber and structure. This lifting will often "pocket" air (see Figure 1).

MAJOR INSPECTION POINT(S):

1. Check for proper air pressure.
2. Localized separation, with or without an air pocket, between the sidewall rubber and tire casing.

3. There should be no evidence of chafing, shock, or abrasion on the tire sidewall.
4. There should be no tread penetrations or perforations in the tread area directly adjacent to the blister.

Open Splice In Sidewall

Damage Description: Open Splice in Sidewall

NISSAN CODE: 7M

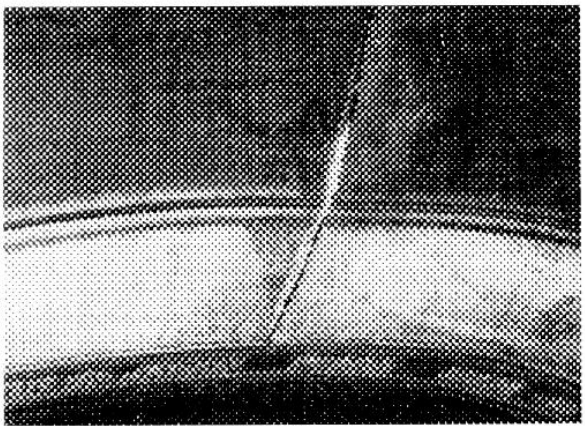


FIGURE 2

DEFINITION:
A localized detachment of the rubber stock between the block and/or white sidewall, caused by a lack/loss of adhesion where the rubber stock is joined (Figure 2). An open splice may be a partial opening, or a complete detachment and total perforation to the interior.

MAJOR INSPECTION POINT(S):

1. There should be no evidence of cuts or perforations in the failed area.
2. At the point of failure, interior rubber surfaces will be smooth and will appear joined at an angle.

Sidewall Ply Separation

Damage Description: Sidewall Ply Separation

NISSAN CODE: 7L

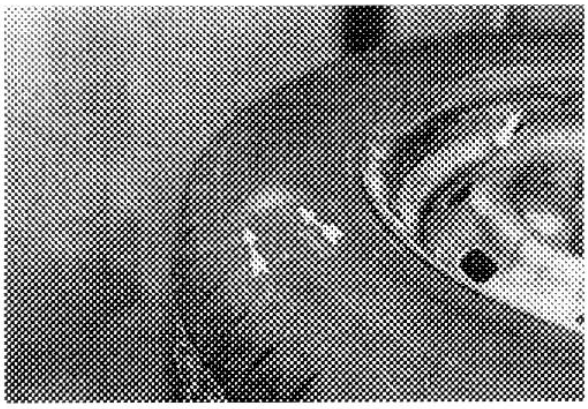


FIGURE 3

DEFINITION:
Localized separation of the sidewall ply cord (Figure 3)

MAJOR INSPECTION POINT(S):

1. Check for proper air pressure.
2. Check for an air bubble on the tire sidewall.
3. There should be no signs of scuff marks, abrasions, or chafing on the immediate area (i.e., on the bubble).

Sidewall Cracking

Damage Description: Sidewall Cracking

NISSAN CODE: 7K

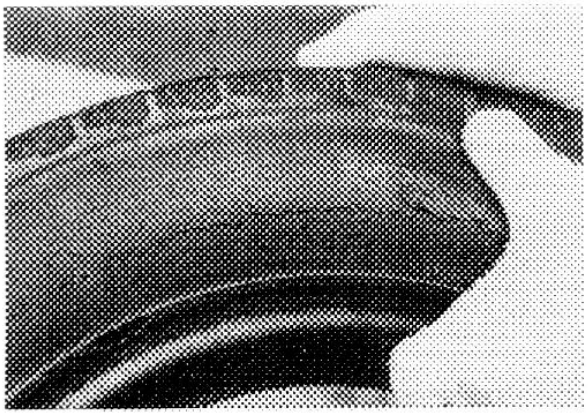


FIGURE 4

DEFINITION:
Several fine cracks on the tire sidewall, running in a radial or circumferential direction (Figure 4).

MAJOR INSPECTION POINTS:

1. Check for proper air pressure.
2. Check for several fine cracks on the sidewall, running in a lateral direction. These sidewall cracks are generally less than 1/10 of an inch in width, and do not penetrate to the interior of the tire.

Bead Separation

Damage Description: Bead Separation

NISSAN CODE: 7I

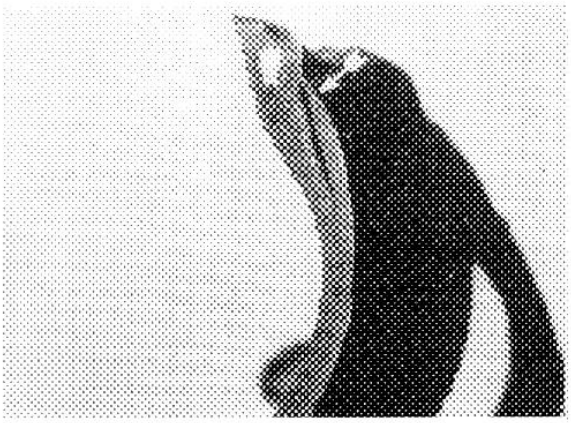


FIGURE 5A

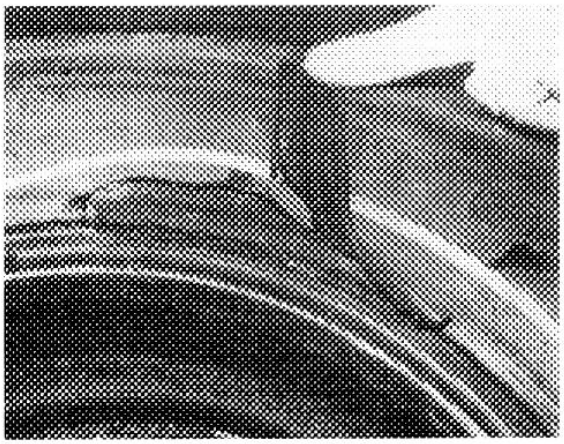


FIGURE 5B

DEFINITION:
Separation of the various tire materials (i.e., rubber, cord and wires) at the bead area near the rim line (Figures 5A, 5B).

MAJOR INSPECTION POINT(S):

Check for a bulge and/or jagged cracks visible near the tire rim fitting line.

Tread/Shoulder Separation

Damage Description: Tread/Shoulder Separation

NISSAN CODE: 7F

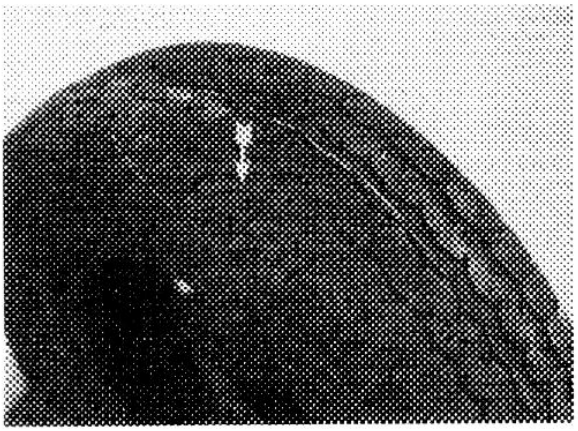


FIGURE 6A

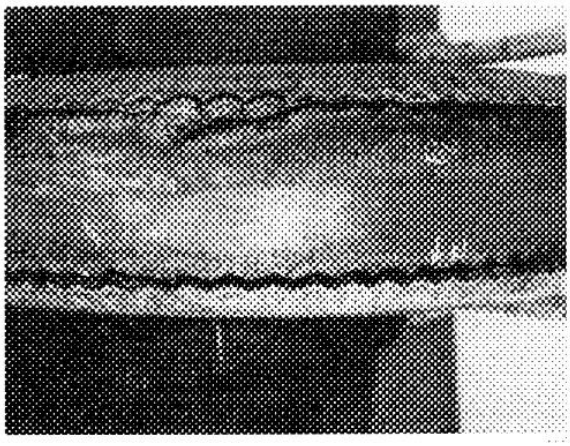


FIGURE 6B

DEFINITION:
Partial (Figure 6A) or complete (Figure 6B) separation between the rubber and the tire cord, or between the layers of the tire cord.

MAJOR INSPECTION POINT(S):

Check for a bulge on the tire shoulder, and a longitudinal crack on the bottom of the grooves, possibly accompanied by a break through the rubber surface. Both are usually accompanied by localized wear in the tread above the separation.

Chunks of Missing Tread

Damage Description: Chunks of missing tread

NISSAN CODE: 7D

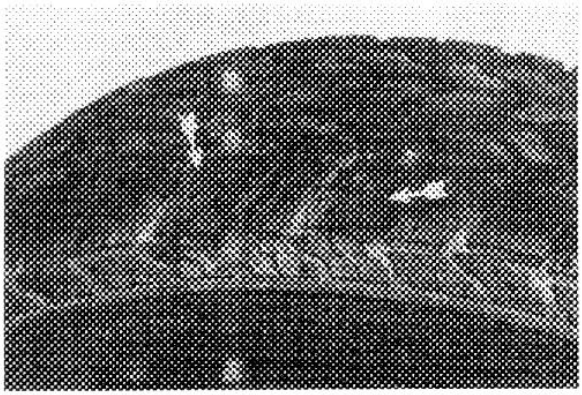


FIGURE 7

DEFINITION:
Partial peeling of new tread (Figure 7).

MAJOR INSPECTION POINT(S):

Check for tearing off, partial peeling or chipping of the tire tread. (**NOTE**: Tread rubber chipping caused by off-road driving is not warrantable.)

Tread Cracking

Damage Description: Tread Cracking

NISSAN CODE: 7A

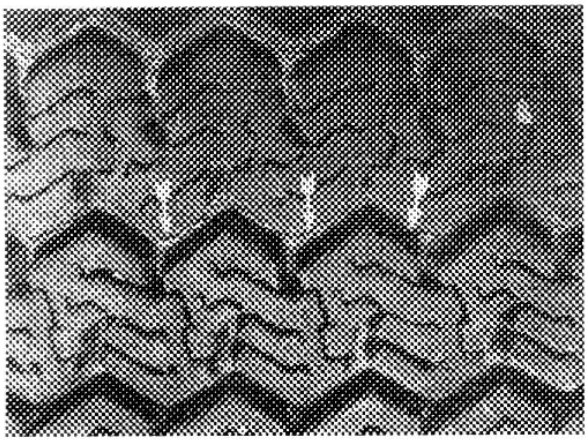


FIGURE 8

DEFINITION:
Fine longitudinal cracks appearing on the bottom of the tire grooves which do not penetrate into the cord material of the tire (Figure 8).

MAJOR INSPECTION POINT(S):

Check all the vehicle tires. If there are only one or two "cracks" in the tire groove, or if the "crack" continues up the side of the groove wall, the cause of the "crack" was a cut inflicted by a road hazard, and is not warrantable.

Ply Separation

Damage Description: Ply Separation

NISSAN CODE: 7B

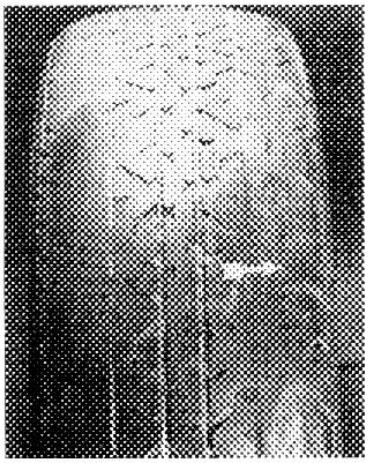


FIGURE 9A

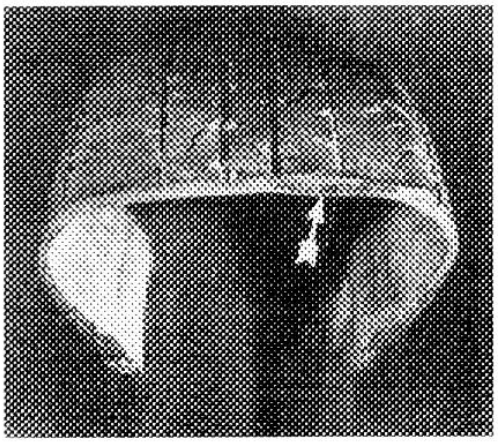


FIGURE 9B

DEFINITION:
Separation between the tread rubber and tire cord materials (Figure 9A), or between the tire cord ply layers (Figure 9B).

MAJOR INSPECTION POINT(S):

Check for tread separation at the tire shoulder area and the corresponding location inside the tire. There should be no evidence of accidental injury by sharp, perforating objects (e.g., screws, nails).

Open Splice

Damage Description: Open Splice

NISSAN CODE: 7C

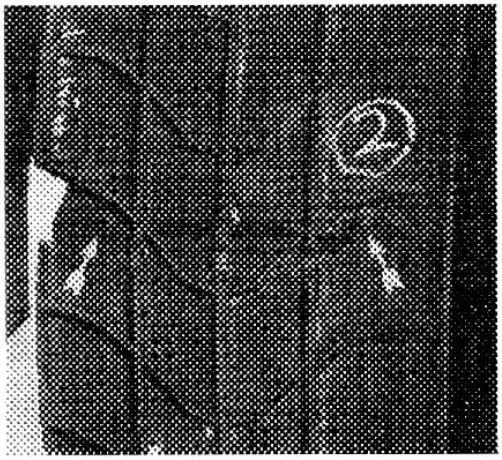


FIGURE 10

DEFINITION:
An open area of the tire tread where the tread rubbers overlap (Figure 10).

MAJOR INSPECTION POINT(S):

Check the edge of the splice opening; it will have a beveled appearance. The cracks do not penetrate through the tire cord, and the possibility of air leakage does not exist.

Out of Round

Damage Description: Out of Round

NISSAN CODE: 7P

DEFINITION:
Excessive vehicle vibration caused by an out-of-round condition of the tire with the rim.

General Information

Vehicle vibration caused by an out-of-round condition will generally appear within the first 100-200 miles of driving. If it appears later, the vibration is probably caused by some other condition. Please note that more than 90% of vehicle vibration Problems are caused by conditions other than out-of-round tires.

1989 MODELS	RIM LATERAL AND RADIAL RUNOUT* (inches [mm])			
	ALUMINUM WHEELS		STEEL WHEELS	
	Lateral runout	radial runout	Lateral runout	radial runout
Sentra	0.012(0.3)	0.012(0.3)	0.031(0.8)	0.020(0.5)
Pulsar	0.012(0.3)	0.012(0.3)	0.031(0.8)	0.020(0.5)
Truck/ Pathfinder	0.012(0.3)	0.012(0.3)	0.031(0.8)	0.020(0.5) [4WD] 0.031(0.8) [2WD]
Stanza	0.020(0.5)	0.020(0.5)	0.020(0.5)	0.020(0.5)
300ZX	0.020(0.5)	0.020(0.5)	0.039(1.0)	0.039(1.0)
Maxima	0.012(0.3)	0.012(0.3)	0.031(0.8)	0.020(0.5)
240SX	0.012(0.3)	0.012(0.3)	0.031(0.8)	0.020(0.5)

*Always refer to the appropriate model Service Manual when checking lateral/radial runout.

Out-of-roundness can only be measured as a radial force variation and most tire dealers do not have the equipment necessary to make this measurement. Because of this, the most effective way to inspect for this condition is to use a specific diagnostic procedure to rule out or confirm

other causes for the vibration. The following pages of this Technical Bulletin contain a procedure that can be used to confirm/eliminate tire out-of-round as a cause of vehicle vibration. Listed are the lateral and radial runout specifications for the 1989 Nissan models to assist you when performing the procedure.Technical Service Bulletin # **TS85138** Date: **851122**

Rear Leaf Spring - Squeaks On Rough Roads

TS85-138
November 22, 1985
Rear Axle & Suspension
REAR SPRING SQUEAK, 4X4 720 TRUCK
APPLIED MODEL:
1983.5 - 1986 4X4 720 Truck
SERVICE INFORMATION
The springs on some 1983.5 - 1986 4X4 Trucks may squeak when the truck is driven over rough roads. The noise is caused by the rear suspension number four leaf spring rubbing against the U-shaped bracket. A countermeasure number four leaf spring (with wider U-bracket and plastic liner) is available to correct this condition.
PARTS INFORMATION

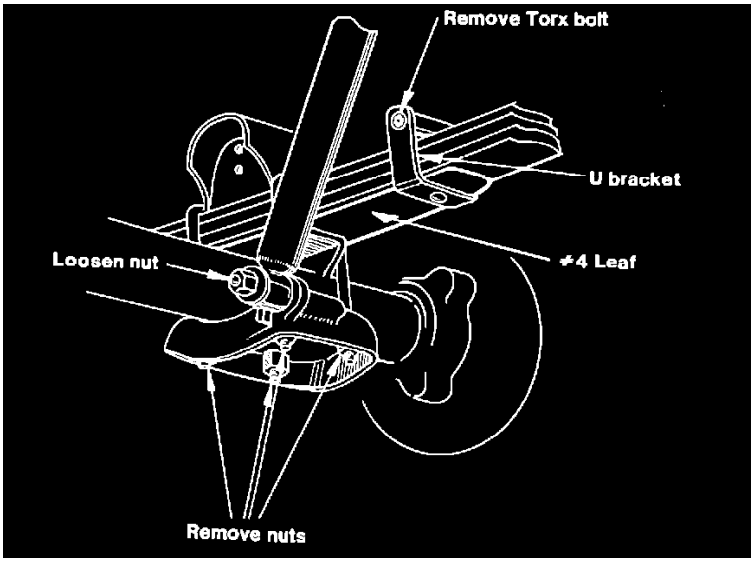
QUANTITY PART DESCRIPTION	REQUIRED	PART NUMBER
Countermeasure #4 Leaf (with U-bracket and liner)	2	55024-30W05

SERVICE PROCEDURE

1. Raise the truck on a frame type hoist to allow the rear axle to hang down.

2. Support the rear differential with a transmission jack.

3. Remove the left rear wheel to allow access to the U-bracket torx bolt.

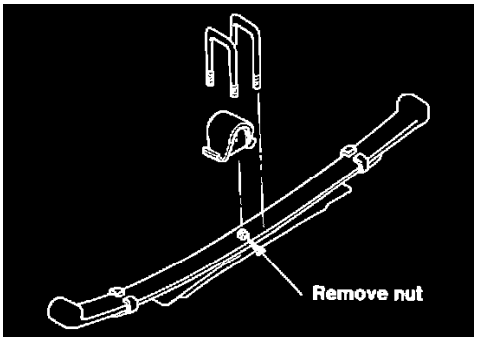


4. Remove the torx bolt of the U-bracket on the number four leaf of the left spring.
   NOTE: Illustration is of right spring.

5. Loosen (do not remove) the shock absorber lower end nut and remove the two U-bolts (4 nuts). Allow lower spring pad to hang from shock absorber.

6. Lower the differential (with transmission jack).

"CAUTION": Be careful not to stretch the brake hose.



7. Remove the nut that holds the leaves together.
8. Remove the #4 leaf and replace with the countermeasure leaf (with wider U-bracket).

9. Reassemble in reverse order of removal.
10. U-bolt nut torque: 65-72 ft-lbs. Shock absorber lower end nut torque: 22-30 ft-lbs.

11. Repeat Steps 4 through 10 for the right rear spring.

WARRANTY INFORMATION

CS	PNC	CT	OP CODE	FLAT RATE
4R	55020	35	LK99AA	0.5/hr.

NOTE: Flat rate time is for both springs.

Technical Service Bulletin # **99-017** Date: **990401**

Audio - Speaker Noise, Cellular Phone Interference

Classification:
EL99-005

Reference:
NTB99-017

Date:
April 1, 1999

NISSAN SPEAKER NOISE DUE TO CELLULAR PHONE INTERFERENCE

APPLIED VEHICLES:
All Nissan Vehicles

SERVICE INFORMATION

Cellular phone charging may cause a popping or crackling noise in the audio speakers of Nissan vehicles. If this condition exists, it is most likely to occur when the customer's cellular phone is turned off, plugged into the 12 volt cigarette lighter socket nearest the audio head unit, and placed within one foot of the audio head unit. The condition may occur more frequently in vehicles with audio systems with amplified speakers.

Refer to the appropriate owner's manual for cautions regarding the use of the cigarette lighter socket as a power source for other accessories.

Use the procedure below to verify that the condition exists as described above and provide instruction for the customer to reduce the possibility of future cellular phone interference.

SERVICE PROCEDURE

Perform the following test procedure to verify the condition exists as described:

1. Ask the customer for the cellular phone and charging adapter.

2. Confirm the cellular phone has been turned off for at least 30 minutes before proceeding.

NOTE:
Do not turn the cellular phone on at any time during the procedure. If the phone has to be turned from on to off, you will have to wait 30 minutes for the phone to reset to proceed with the test.

3. Plug the phone into the 12 volt cigarette lighter socket nearest the audio head unit.

4. Turn the ignition to the "ON" position (do not turn the cellular phone on).

5. Turn the audio unit on.

6. Place the cellular phone close to the front of the audio head unit.

7. Listen for a popping or crackling noise from the audio speakers.

8. If the noise is heard, move the cellular phone back from the audio unit. The noise should be reduced as the cellular phone is moved further away from the audio unit.

9. If the condition is confirmed through the above procedure, advise the customer to keep the cellular phone at least one foot away from the audio head unit to reduce the possibility of future cellular phone interference.

Technical Service Bulletin # **94012** Date: **940203**

Brakes - Judder/Steering Wheel Vibration Correction

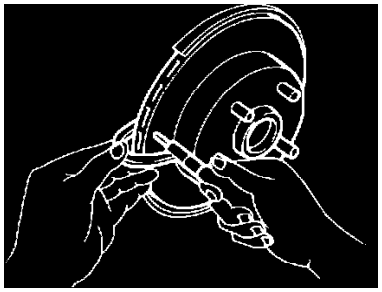
Classification: BR94-002
Section: Brake
Reference: TECHNICAL BULLETIN NTB94-012
Models: All models
Date: February 3, 1993

BRAKE JUDDER/STEERING WHEEL SHIMMY

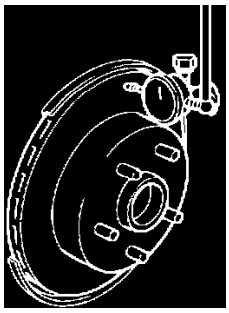
APPLIED MODELS:
All Models

GENERAL INFORMATION:

Brake judder/steering wheel shimmy is a condition which may occur in any vehicle when excessive rotor thickness variation is present on one (1) or more of the vehicle's brake rotors.



Rotor Thickness Variation (RTV) is the variation in thickness around the rotor. The RTV can be determined by measuring the rotor thickness with a micrometer at several locations around the circumference of the rotor. The RTV is the difference in thickness between the thickest and thinnest points on the rotor.

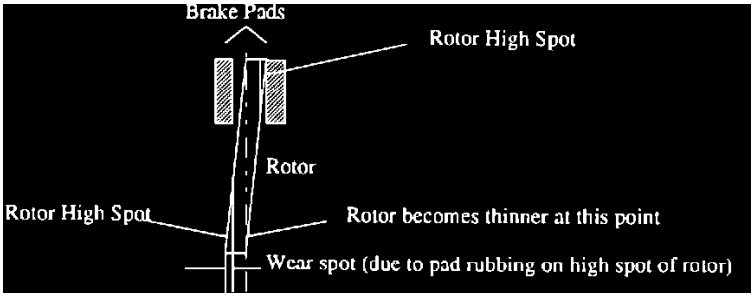


Rotor Run-Out is the distance that the rotor surface travels in and out, in relation to the vertical plane of the hub, as the rotor turns with the hub. The distance is measured with a dial indicator.

NOTE:
Rotor Run-Out does not cause brake judder or steering wheel shimmy.
However, excessive Rotor Run-Out does lead to rotor thickness variation as the rotor wears. It is the excessive rotor thickness variation that causes judder and/or steering wheel shimmy. This is described in more detail below.

POSSIBLE CAUSE OF BRAKE JUDDER/STEERING WHEEL SHIMMY

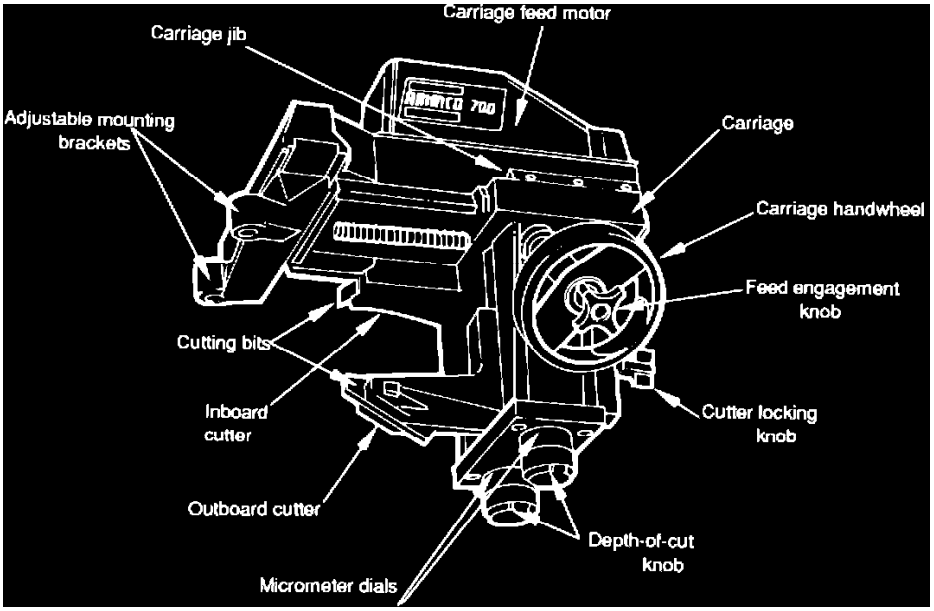
A brake judder/steering wheel shimmy incident may develop in any vehicle if the following series of events occur:



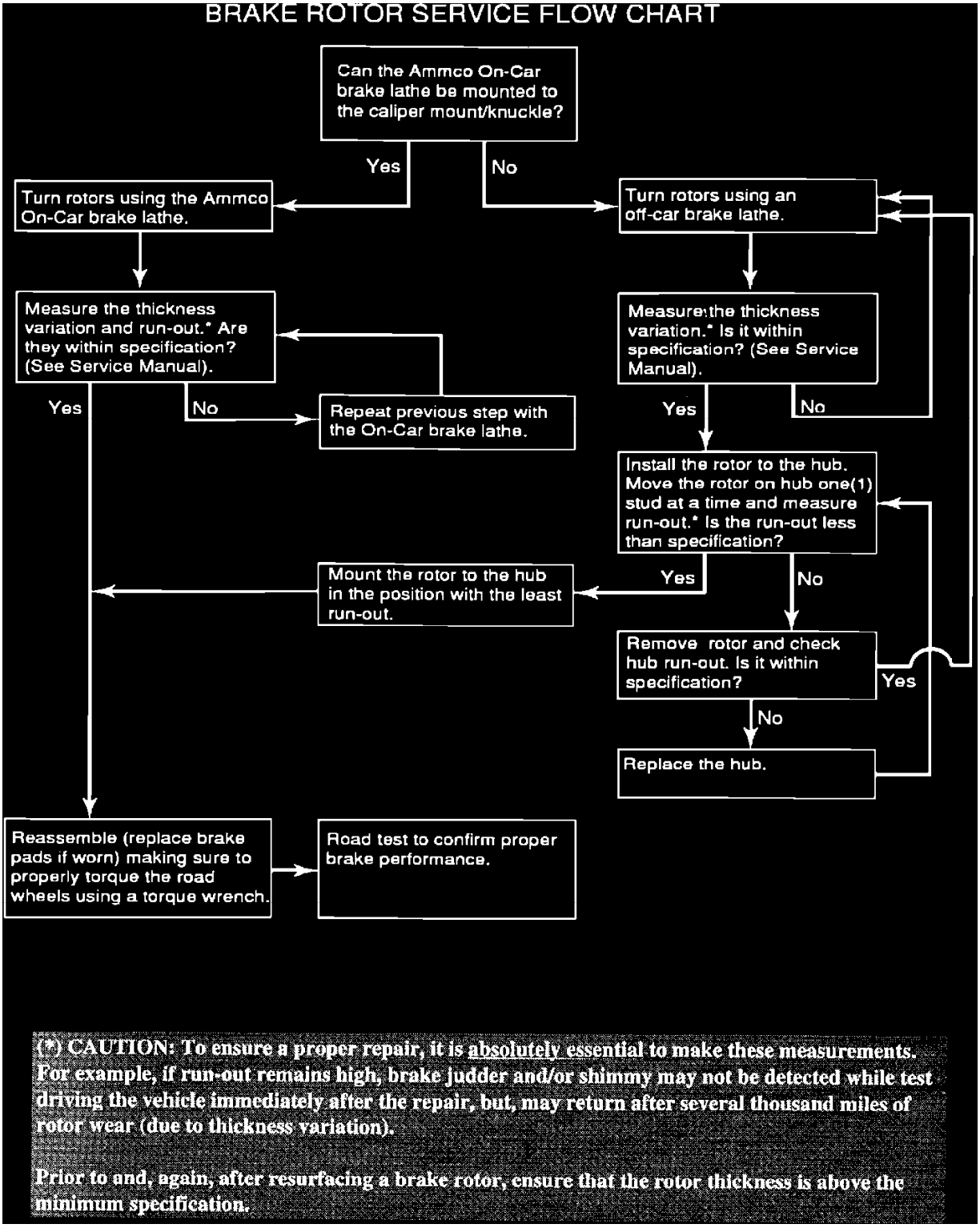
* The brake rotor run-out exceeds specification limits.
* As the brake pad rubs against the rotor while driving, the high spots on the brake rotor wear slightly.

* Rotor thickness variation may develop as the high spots on the brake rotor wear. If this thickness variation becomes large enough, brake judder/shimmy may occur.

NISSAN SERVICE PROCEDURE:



Resurfacing the brake rotor using the Ammco On-Car Brake Lathe is the preferred method of correcting excessive rotor run-out and thickness variation. Refer to Nissan Technical Bulletin NTB92-062 (BR92-004) "Ammco On-Car Brake Lathe Operating Guidelines."



Due to limited clearance, this machine cannot be used on the rear rotors of some vehicles. To resolve this issue, two (2) methods of repair are identified in the flow chart. Use this chart, as appropriate, when performing brake pad or rotor service.

GENERAL BRAKE REPAIR GUIDELINES

To properly perform brake repairs, it is important to observe the following.

1. Do not tighten wheel lug nuts with an impact wrench. Uneven or high torque applied to the lug bolts may distort the brake rotor and hub, resulting in increased rotor run-out.

2. Prevent contamination, such as rust, dirt, or metal chips between the hub and rotor mating surface. An uneven mating surface between the hub and rotor results in increased rotor run-out. Always check and clean the mating surfaces prior to resurfacing.

3. Use a sharp tip on the brake lathe when resurfacing a brake rotor. A dull or damaged cutting tip on the brake lathe causes a rough surface cut with large ridges, which wear very rapidly. This rapid wear results in rotor thickness variation.

4. Use the largest silencer band possible when resurfacing the rotor. The silencer band reduces chatter during resurfacing. Chatter causes a rough surface cut with large ridges, which wear very rapidly. This rapid wear results in rotor thickness variation.

5. Ensure that the brake lathe cutting head operates properly and is calibrated by the manufacturer or servicing agent. A damaged or uncalibrated brake lathe cutting head can result in increased rotor run-out and/or thickness variation.

6. Prior to installation, lubricate the brake caliper slide pins and/or clips. Corrosion from lack of lubrication results in sticking caliper slide pins and reduced pad movement. The sticking of the caliper slide pins and reduced brake pad movement, increases the rotor wear rate. This increased brake rotor wear results in increased brake rotor thickness variation.

7. Inspect the caliper pin boots or plugs and replace, if necessary. Corrosion may develop on the caliper slide pins. This corrosion reduces caliper movement which increases the brake rotor wear rate. This increased brake rotor wear rate results in brake rotor thickness variation.

8. Measure the brake rotor run-out after performing brake service. There are many reasons why brake rotor run-out may be above specification. To ensure that the brake rotor run-out is within specification, it is important to measure brake rotor run-out after every brake service.

NOTE:
The Warranty Flat Rate Time includes time to perform run-out measurement.

9. The On-Car brake lathe cutting head must be mounted properly. Do not mount the cutting head on one (1) knuckle and attempt to resurface both sides of the rotor from this one location. The On-Car Brake Lathe matches the rotor to the hub to achieve the least possible run-out. When the brake rotor is moved from the position in which it was resurfaced, this matching is lost.

10. Do not use harsh or corrosive chemicals to clean the wheels. Strong alkalis or acid-based cleaners degrade the surface finish on the caliper components and may, additionally attack the rotor surface, resulting in increased thickness variation.

Technical Service Bulletin # **TS85096** Date: **850827**

Driveline - High/Low Speed Vibration

TS85-096
August 27, 1985
Propeller Shaft & Differential

DRIVELINE VIBRATION, 4X4 TRUCK
APPLIED MODEL
1983.5 - 1986 4x4 720 Truck
SERVICE INFORMATION
Some 4X4 Trucks may exhibit a vibration at two different speed ranges.

A. HIGH SPEED VIBRATION

The high speed vibration, which may be accompanied by booming noise, occurs at 50-60 MPH. This vibration can be described as a continuous buzz in the seat, steering wheel and floor. A rapidly vibrating transfer case lever may also indicate driveline imbalance.

B. LOW SPEED VIBRATION

The low speed vibration occurs at 20-40 MPH. The low speed vibration is similar to the high speed, but with less intensity. Vibration caused by tire imbalance resembles a shaking sensation and should not be confused with driveline vibration. Additional vibration may be caused by having the transfer case in the 4H position or the 2H position with the hubs locked.

Use the following Service Procedure to reduce driveline vibration in incident vehicles. This procedure incorporates portions of, and replaces, the previous driveline vibration bulletin PD84-001 (TS84-001).

NOTE: Any testing or high speed evaluation should be done with the transfer case lever in the 2H position and the hubs unlocked.

Service Procedure

A. HIGH SPEED VIBRATION (50 - 60 MPH)

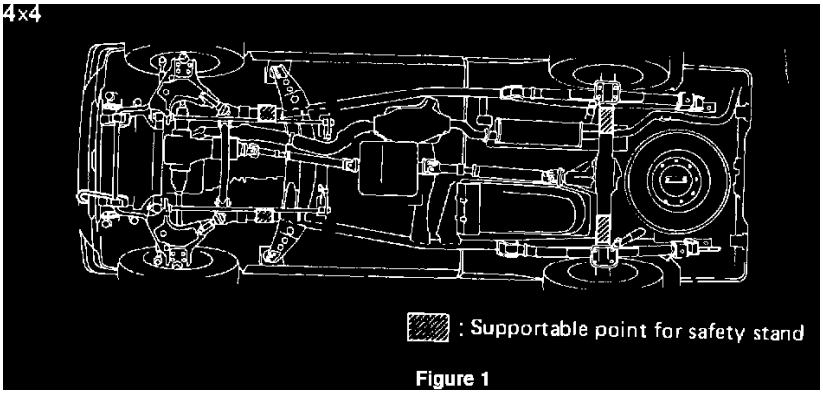


Figure 1

1. Road test the vehicle between 50 and 60 MPH to determine the speed at which the vibration is most noticeable. Record this speed.

2. Support vehicle on an axle hoist at points suitable for a safety stand (Figure 1).

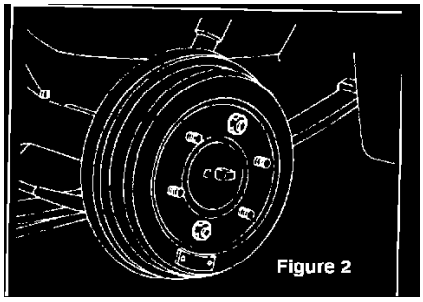


Figure 2

3. Remove both rear tire/wheel assemblies and securely install two (2) nuts to each brake drum (opposite studs) to hold brake drums on axle (Figure 2).
4. With the engine running, place the gear shift lever into fifth gear and have one person slowly bring the indicated speed to that speed noted in Step 1 (or the worst condition speed in the 50-60 MPH range). EXTREME CAUTION should be exercised at this point due to all the rotating surfaces. Stand clear of the rotating brake drums and driveshafts.

WARNING: To prevent injury, any loose articles of clothing (ties, shop rags, coats, etc.) should be safely secured, as should drop light cords, air hoses, electrical extensions, or anything that could contact the rotating surfaces.

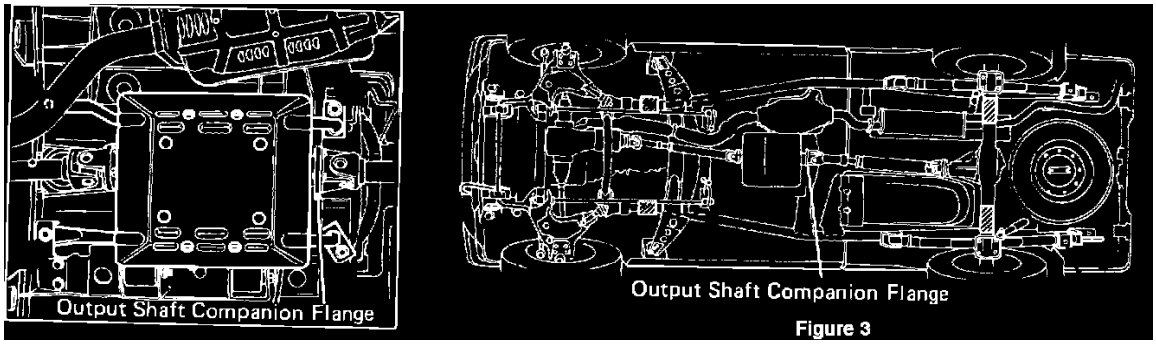


Figure 3

5. Have another person hold a piece of chalk or brightly colored crayon close to, but not touching the machined outer edge of the output shaft companion flange of the transfer case (Figure 3).

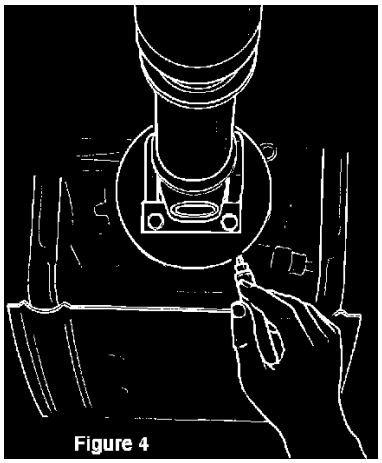


Figure 4

6. With the heel of his hand resting on the skid plate below the transfer case (see Figure 4), carefully bring the chalk or crayon closer and

closer to the companion flange until it lightly makes contact. Remove the chalk or crayon and bring the brake drums and driveshaft to a stop. There should now be a mark on the companion flange which would indicate the high point when the shaft is rotating. If there is a solid continuous ring around the companion flange, too much pressure was used on the chalk or crayon. Start over and use sufficient pressure so that only a small portion of the companion flange edge is marked. The marking must be done only at the speed at which the vibration is most noticeable.

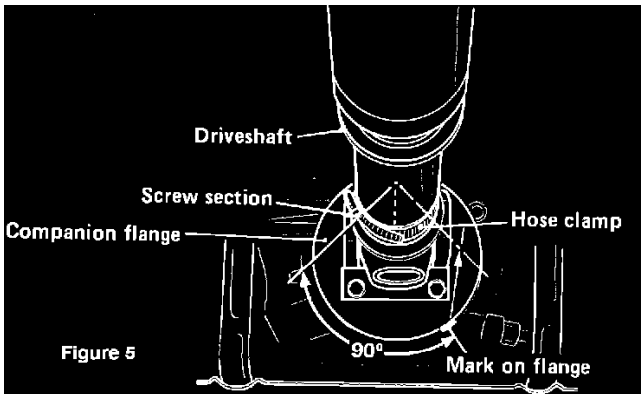


Figure 5

7. Using the mark as a reference point, and place the screw section of a large hose clamp 1/4 clockwise turn (90~ clockwise looking towards front of vehicle) past the mark and properly secure to the driveshaft (see Figure 5).
8. Road test the vehicle.

B. LOW SPEED VIBRATION (20 - 40 MPH)

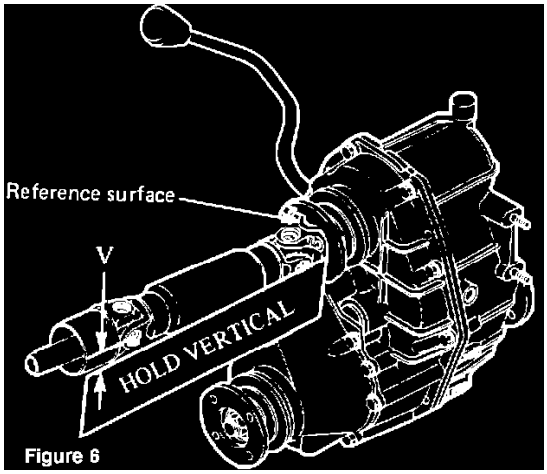


Figure 6

1. Remove transfer case underguard.

2. Measure the distance V (see Figure 6) with a straightedge, using the transfer case as a reference surface. Distance V is the vertical offset of two corresponding U-joints, one on each end of the propeller shaft.

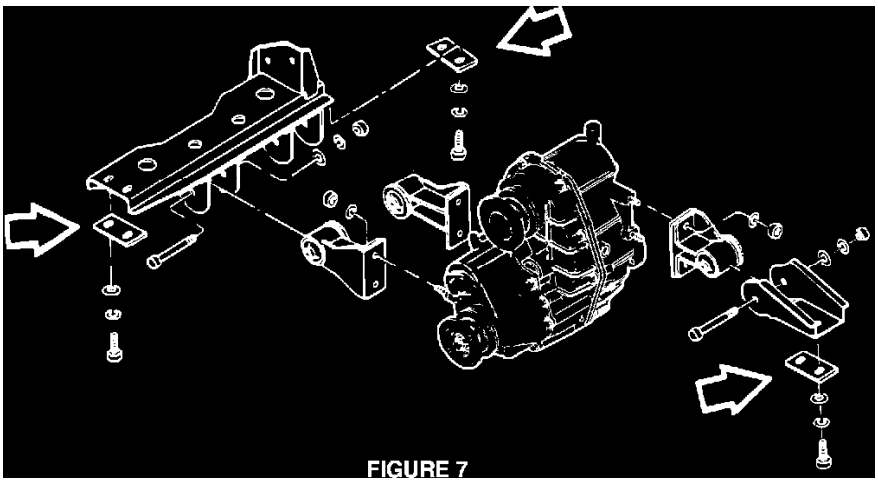


FIGURE 7

3. Install shims of a thickness equal to distance V between transfer case mounting bracket-to-frame (both ends of longitudinal member), for right side transfer mount, and between single bracket and frame for left side transfer mount. The dealer should make the shims from stock, not to exceed 10mm thickness (see Figure 7).

Warranty Information

CS	PNC	CT	OP CODE	FLAT RATE

A. High Speed 4S 37000 37 JA99AA 1.0/hr. Vibration

B. Low Speed 4S 33920 34 HP99AA 1.0/hr. Vibration

Technical Service Bulletin # **01-005A** Date: **041007**

Restraint System - Seatbelts Slow to Retract

Classification:
RS01-001A

Reference
NTB01-005A

Date:
October 7, 2004

ALL NISSAN VEHICLES; "D" RING RESIDUE CAN CAUSE SLOW SEAT BELT RETRACTION

This bulletin amends NTB01-005. Please discard all paper copies of the earlier version.

APPLIED VEHICLES:
All Nissan Vehicles with front seat belt "D" rings

IF YOU CONFIRM:

Seat belt retraction of front seat belt(s) is slow, caused by "residue" build-up on the "D" ring(s),

NOTE:
Slow seat belt retraction, if it occurs, may result in the following incidents after the seat belt is unbuckled:

^ Seat belt latch plate hanging up on clothing,

^ Seat belt latch plate becoming caught in the door,

ACTION

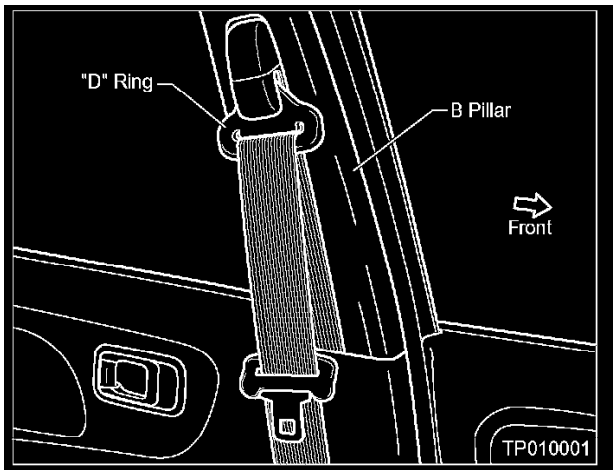


Figure 1

Use the "D" ring cleaning and refurbishing kit to:

^ Clean the residue off of the "D" rings.

^ Apply fluorine resin tape to the "D" rings.

IMPORTANT:
The purpose of "ACTIONS" (above) is to give you a quick idea of the work you will be performing. You MUST closely follow the entire Service Procedure as it contains information that is essential to successfully completing this repair.

DESCRIPTION	PART #	QUANTITY
Seat Belt, Tape Set	87880-79900	1

PARTS INFORMATION

NOTE: This is the ONLY approved repair procedure for this incident. A claim to Nissan for the repair of this incident may be denied if the repair is not performed exactly as outlined in this bulletin.

Submit a Primary Failed Part (PP) line using the following claims coding:

DESCRIPTION	PFP	OP CODE	SYM	DIA	FRT
Clean "D"-ring and apply tape, both sides	87880-79900	VX04AA	ZH	21	0.4

CLAIMS INFORMATION

NOTES:

- This is the only authorized repair for this incident. DO NOT REPLACE the front driver or passenger seat belt assemblies before first using the Service Procedure in this bulletin to clean the "D" rings.
- When this incident occurs, both front driver and passenger seat belt "D" rings must be serviced by using the Service Procedure provided in this bulletin.
- For 1996-99 Pathfinders built before December, 1998, see bulletin NTB00-003 for additional front seat belt retractor assembly information.

SERVICE PROCEDURE

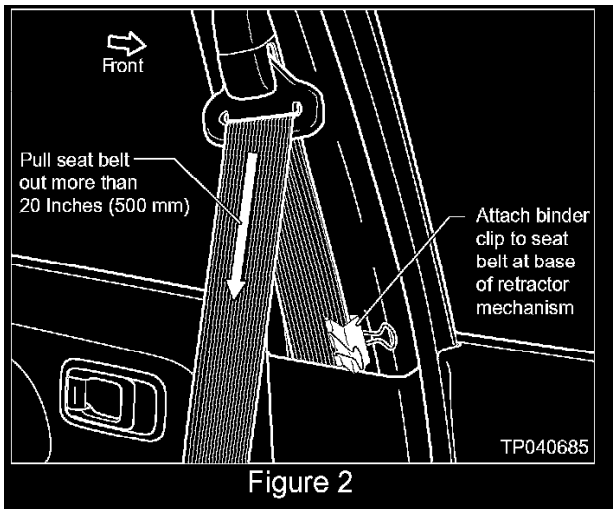


Figure 2

1. Pull the affected seat belt more than 20 inches (500 mm) out of the B pillar seat belt retractor mechanism (see Figure 2).
2. Attach a binder clip (or similar clamping device) to the seat belt at the base of the retractor mechanism to allow for slack in the seat belt (see Figure 2).

CAUTION:
Be careful not to damage the seat belt fabric when attaching or removing the clip.

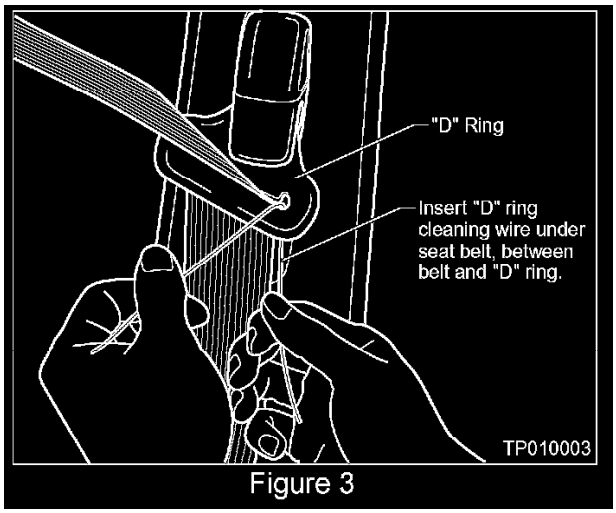


Figure 3

3. Insert the "D" ring cleaning wire under the seat belt; between the belt and the "D" ring (see Figure 3).

^ The "D" ring cleaning wire is provided in the kit that's listed in the Parts Information.

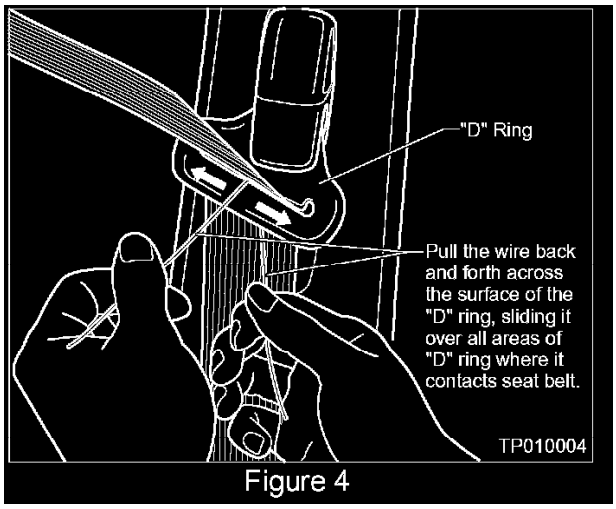


Figure 4

4. Pull the wire back and forth across the surface of the "D" ring.

^ Make sure all residue is removed from the "D" ring in all areas where it contacts the seat belt.

NOTE:

^ It is very important to remove all residue build-up from the "D" ring.

^ If you don't remove all residue buildup, the fluorine resin tape won't stick properly.

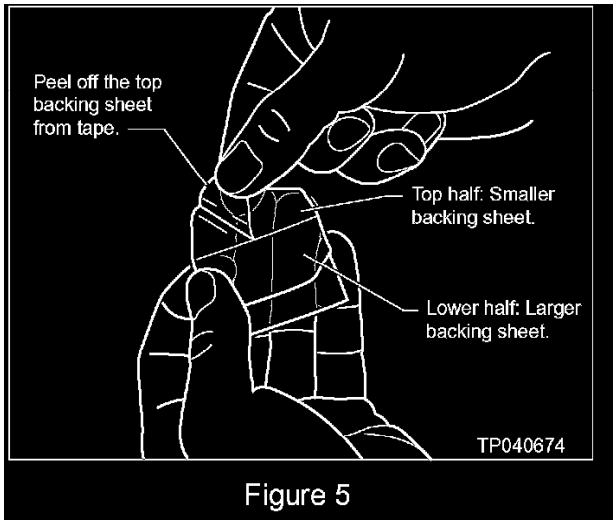


Figure 5

5. Peel off the top (smaller) backing sheet from one of the fluorine resin tapes (see Figure 5).

^ Two fluorine resin tape pieces are provided in the kit.

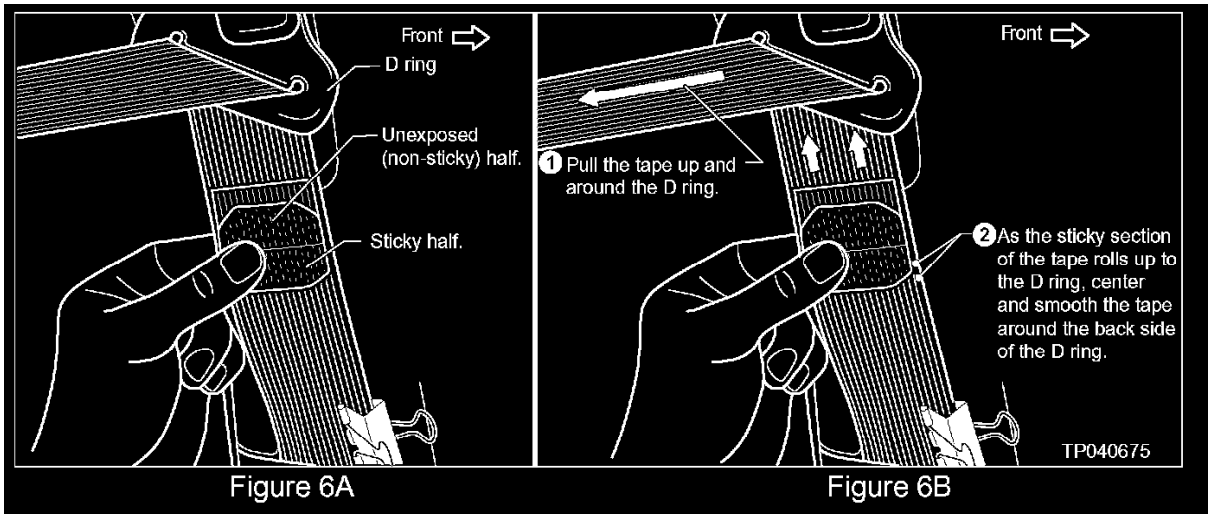


Figure 6A Figure 6B

6. Place the fluorine resin tape (adhesive side toward you) against the seat belt as shown in Figure 6A.

NOTE:

^ The sticky half should be down, toward the floor of the vehicle.

^ The unexposed (not sticky yet) half should be up, toward the ceiling of the vehicle.

7. Pull on the top of the seat belt to roll the tape up and around the "D" ring (see Figure 6B).

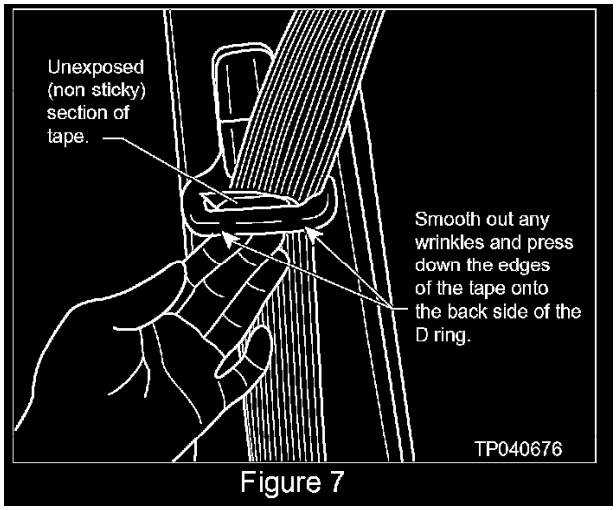


Figure 7

8. As the tape rolls up to the "D" ring, center and smooth the tape around the back side of the "D" ring. Press the bubbles and wrinkles out with your fingers (see Figure 7).

NOTE:

^ Once the fluorine resin tape is applied to the "D" ring, it cannot be repositioned.

^ Take care to properly attach the tape to the "D" ring.

^ Center the tape correctly on the "D" ring and smoothly apply it to the "D" ring surface so that no wrinkles or ridges are present.

^ Wrinkles or ridges in the tape may prevent the seat belt from moving smoothly through the "D" ring. If this should occur, replace the tape with a new piece.

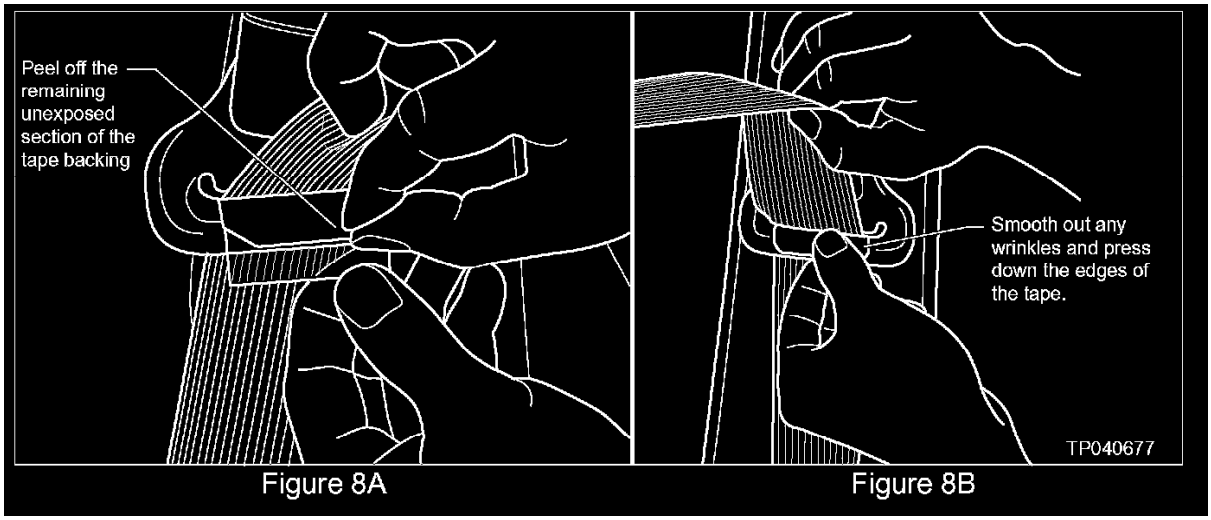


Figure 8A Figure 8B

9. Peel off the remaining tape backing (see Figure 8A).

10. Carefully apply the tape around the remainder of the "D" ring. Press down the edges and make sure there are no wrinkles (see Figure 8B).

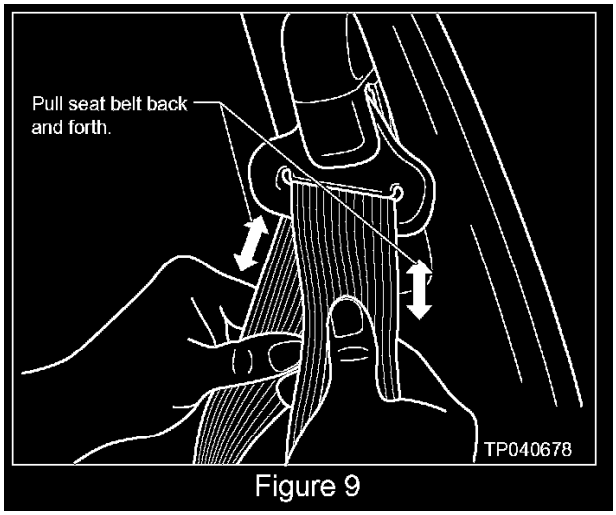


Figure 9

11. Pull the seat belt back and forth against the tape-covered "D" ring to ensure that the tape is firmly applied (see Figure 9).

12. Remove the binder clip from the seat belt.

13. Confirm the seat belt moves smoothly and quickly through the "D" ring.

    ^ Latch and unlatch it. Allow it to retract back into the retractor mechanism several times.

14. Repeat steps 1 through 13 on the remaining front seat belt.

Technical Service Bulletin # **95017** Date: **950208**

Engine - Oil Level and Grade, Driveability

Classification:
EM95-01

Section:
Engine Mechanical

Reference:
Technical Bulletin NTB95-017

Date:
February 8, 1995

ENGINE OIL LEVEL AND GRADE

APPLIED VEHICLES:
All

SERVICE INFORMATION

The cause of some driveability incidents is incorrect oil level or viscosity. Whenever you evaluate a vehicle for a driveability problem, check the oil level first. (It is a good practice to check oil level on
every vehicle that you work on.)

Overfilling may cause engine vibration or valve train clatter on vehicles with hydraulic lash adjusters due to oil aeration when the crankshaft hits the oil. Using the wrong viscosity oil can cause rough or low idle resulting from improper operation of the hydraulic lash adjusters.

When you add or change the engine oil, follow the service manual recommendations regarding proper oil fill level. Do not overfill the crankcase. If you find a vehicle to be overfilled with oil, drain the excess oil and dispose of properly. Remember to wait ten (10) minutes after refilling before checking. This allows time for the oil to drain back to the pan.

Always use the proper viscosity oil specified by the service manual for the temperature range in your geographic area. The viscosity specifications ensure proper engine operation and best engine efficiency.

Technical Service Bulletin # **89015** Date: **890209**

A/T - Slow Shift, Replacing ATF

Models All Models

Section Automatic Transmission

Classification AT89-002

Bulletin No. TS89-015

Date February 9, 1989

A/T SLOW SHIFT

APPLIED MODELS:
All Nissan Models equipped with automatic transmission or transaxle

SERVICE INFORMATION

During cold weather, the automatic transmission or transaxle may shift slowly until the vehicle warms up to normal operating temperature.

This condition can be improved by replacing the Factory fill transmission fluid with NISSANMATIC "C" automatic transmission fluid, available by ordering Part Number 999MP-A7013QT through the Genuine Nissan Motor Oil/ATF Program.

NOTE: This product is not recommended for use in Power Steering application.

Technical Service Bulletin # **AT87003** Date: **870420**

A/T - Slow Shift In Cold Weather

Models All Models

Section Automatic Transmission

Classification AT87-003

Bulletin No. TS87-072

Date April 20, 1987

AMENDMENT TO TECHNICAL BULLETIN ON A/T SLOW SHIFT

This amendment refers to Technical Bulletin TS87-010, issued on January 30, 1987, which recommended DEXRON type automatic transmission fluid as a remedy for slow shift symptoms during warm-up in cold weather operation.

The information published in that Bulletin has been superseded. Either genuine Nissan fluid or DEXRON are acceptable for use in Nissan automatic transaxles and transmissions under all conditions. However, neither will completely relieve the slow shift symptom under extreme cold conditions. A fluid that will meet the need is under development.

NOTE: Dexron II should not be used in Nissan vehicles.

Please disregard the earlier Bulletin, number TS87-010, on A/T Slow Shift.

Technical Service Bulletin # **95074** Date: **950802**

Antenna - Inoperative, Rod Maintenance & Replacement

CLASSIFICATION: EL95-008

REFERENCE: NTB95-074

DATE: August 2, 1995

POWER ANTENNA ROD MAINTENANCE AND REPLACEMENT

This Bulletin contains revised Warranty information. Please discard NTB94-019 dated February 17, 1994.

APPLIED VEHICLE: All models equipped with power antennas

SERVICE INFORMATION

Power antenna incidents for no operation or improper retraction are almost always caused by the following:

^ The antenna rod is broken or bent due to misuse. Common examples of this include the antenna contacts the top of a garage door opening or a tree branch. Also, a customer may forget to lower the antenna before entering an automated car wash.

^ Dirt, road grime, and other foreign matter collects on the rod interrupting proper operational movement. This occurs most frequently during

winter months in areas where road salt and other chemicals are splashed onto the antenna rod.

REPAIRS COMPLETED FOR THE TWO CAUSES DESCRIBED ABOVE ARE NOT COVERED UNDER WARRANTY. ONLY REPAIRS UNDERTAKEN DUE TO DEFECTS IN MATERIAL OR WORKMANSHIP WILL BE COVERED UNDER WARRANTY.

In a large majority of cases, the antenna motor is fully operational and receiving proper power. Therefore, replacement of the entire power antenna assembly is not usually necessary to restore power antenna operation. Prior to removing any power antenna assembly, an attempt should be made to repair the power antenna by removing dirt, road grime, and other foreign matter, and then lubricating the antenna rod sections as appropriate. if still inoperative, replacement of the rod only should be made. A sample replacement procedure is provided on the following page. Check the EL section under Audio and Power Antenna in the Service Manual for specifics on your respective vehicle.

SERVICE PROCEDURE

REPLACING THE ANTENNA ROD

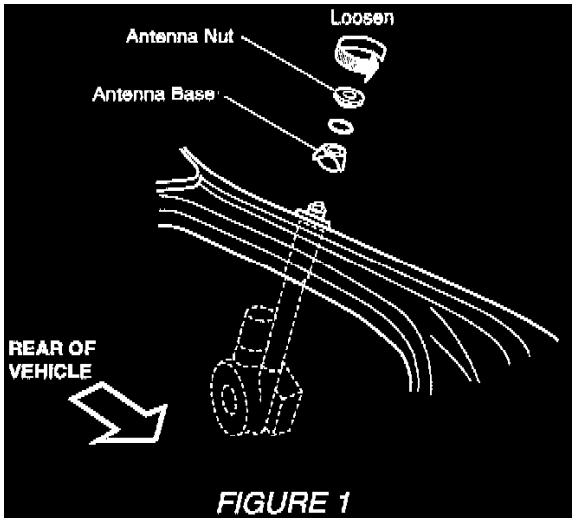


FIGURE 1

1. Remove antenna nut and base. (Figure 1)

2. Turn the radio to "ON" and the antenna rod will extend*. Assist the antenna rod to fully separate from the antenna base. Note the direction of the gear section on the antenna rope. [The new antenna rod must be installed in the same direction].

* If the antenna rod does not extend, always check the power supply to the power antenna before replacing the power antenna assembly.

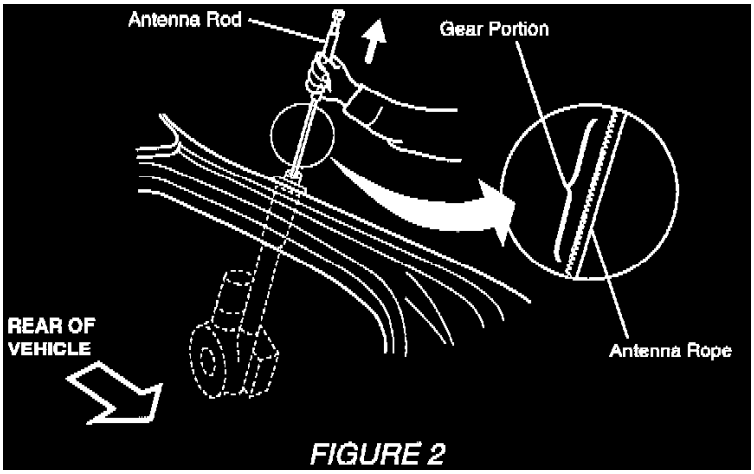


FIGURE 2

3. Insert the replacement antenna rod with the radio in the "ON" position. Insert antenna rope with gear section facing the motor assembly [Figure 2].

4. Turn the radio "OFF" to retract the antenna rod. If the antenna motor stops before the antenna has fully retracted, turn the radio switch "ON" and immediately turn it "OFF" again. Guide the antenna rope and rod into the antenna assembly.

5. Reinstall the antenna nut and base. Check antenna operation by cycling the radio "ON" and "OFF".

Power Antenna Maintenance

Clean power antenna rods at every service opportunity by wiping with a damp cloth.

PRECAUTIONS

Please remind the customer to:

1. Always turn the radio "OFF" to prevent bending the antenna rod, whenever going through car washes or entering parking garages with low ceilings or low hanging garage doors.

2. The antenna rod should be cleaned regularly by wiping off any dirt build up which may cause the antenna to bind. Customers should verify that their car wash attendants do this regularly.

CLAIMS INFORMATION

NOTE:
The following Claims Information applies to antenna rod replacement for defects in materials and workmanship. Damaged (bent) rods are not included.

OPERATION	OP CODE	PNC	SYMPTOM	DIAGNOSIS	FRT
Rpl. power antenna rod/ mast only.	RN29AA	28215	ZE	32	0.2 hrs

Note: New Claims System dealers should submit a Primary Part claim using the applicable antenna rod part numbers found in the Parts Information portion of this bulletin.

Claim Information

MODEL	PROD. DATES	PART #	ALT. PART #	QTY
Quest	ALL	28215-0B300		1
240SX	7/88-7/89	28215-61A00		1
	7/89-3/92	28215-35F05		1
	3/92-2/94	28215-50J00		1
	2/94-	28215-0E006	28215-0E000	1
Pathfinder*	8/87-*	28215-61A00*		1
	7/92-6/94*	28215-51E10*		1
300ZX	2/89-7/90	28215-89902		1
	7/90-	28215-F6506		1
Maxima	8/88-10/90	28215-89902		1
	10/90-2/94	28215-50J00		1
	2/94-	28215-0E000		1
Altima*	6/92-7/94	28215-0E000		1
	7/94-*	28215	-0E006*	1
	7/94-*	28215-61A00*	28215-0E000	1

*Check the parts catalog or fiche for the appropriate part number. This may vary depending upon the equipment installed on the vehicle.

Parts Information: Antenna Rod

Technical Service Bulletin # **87-145** Date: **870928**

Paint - Spotting Prevention & Repair

Classification:
BF87-030

Reference:
TS87-145

Date:
September 28, 1987

PAINT SPOTTING REPAIR PROCEDURE

APPLIED VEHICLE(S):
All Models

SERVICE INFORMATION

Paint spotting incidents occurring in the U.S. market are not unique to Nissan, but are being experienced by all manufacturers. To date, two separate types of paint spotting incidents have been identified as follows:

1. Particulate Fallout - Tiny solid particles which collect on horizontal panels, causing a dark stain which will penetrate into the paint if not cleaned.

2. Water Spotting - A ringlet or multiple water-drop-shaped light discoloration on dark painted horizontal panels.

THESE TYPES OF SPOTTING ARE NOT DUE TO PAINT DEFICIENCY, AND CAN BE PREVENTED THROUGH PROPER CARE.

SERVICE PROCEDURE

Particulate Fallout

Ash, dust, soot and other tiny solid particulate matter from industrial and other sources can be carried many miles. Particulate fallout is most noticeable on the horizontal surfaces (hood, luggage compartment lid, and roof) of the vehicle.

If left on a moist, painted surface, the particles will slowly dissolve and bond to the paint, frequently leaving a red stain. This stain can be present even on plastic surfaces such as bumpers if the fallout has an iron content. These spots may be visible on both solid and metallic paints (especially light colors). The particulate can be felt as a sharp point on the paint surface. When viewed through a magnifying lens, the staining may be evident.

VEHICLE CARE

Every 10 days, or more frequently depending upon local conditions, particulate fallout must be washed off with mild detergent and water to prevent its bonding and staining action. A good carnuba wax coating can help protect against damage from particulate fallout.

PARTICULATE FALLOUT REPAIR PROCEDURE

In most cases, thoroughly washing the affected area with a water and mild detergent solution (to avoid scratching the finish with dislodged particles) will remove the particulates.

After washing the vehicle, a stain, generally orange or red, may still be visible on white or other light colored vehicles. This stain can be removed with a fine compound material. DO NOT APPLY THE COMPOUNDING MATERIAL BEFORE ALL PARTICLES IN THE AFFECTED AREA ARE REMOVED BY THOROUGH WASHING.

Water Spotting

A photograph of typical water spotting is shown on page 26 of the Nissan **Paint Refinishing Guide*** (PIN 5REFGD). The spots are most visible when viewed at an angle, usually under fluorescent light. The paint surface is usually smooth to the touch because the spotting is a change in the top surface itself. This is not hard-water residue which will wash off with soap and water. These spots are visible on both solid and metallic paints with dark colors.

VEHICLE CARE

When a vehicle is stored outside and unprotected, dust patterns develop on the painted surfaces. These patterns guide moisture droplets from a light rain or morning dew to the same location each time. The strong sunlight, repeatedly concentrated on these water droplets, greatly contributes to the spotting. When storing a vehicle unprotected, where the painted surface is repeatedly exposed to a combination of sunlight and light rain (or morning dew), the vehicle MUST be washed AND thoroughly dried at least every two weeks, or more frequently if there is light rain or dew followed by strong sunlight.

When washing any vehicle, it must be out of direct sunlight and the painted surfaces should be cool to the touch.

WATER SPOTTING REPAIR PROCEDURE

The method of repairing a water spotted finish varies with the severity (depth of spot in finish) of the spotting. After a thorough washing, perform the following:

1. Water spots on light colored vehicles and some vehicles which have had minimal exposure to the elements can be repaired by buffing. First, apply a fine cutting compound using an orbital buffer to remove a thin layer of the top coat or clear coat. After removal of the spots, buff with glazing compound to remove the fine scratches.

2. More severe spotting can be removed with a coarser cutting compound followed by finer compound and glazing compound to remove the scratches.

3. The most severe water spots on clear coated, dark vehicles can be repaired by wet sanding the affected areas with 1200 grit sandpaper to prepare the surface then spraying a fresh clear coat on those areas. Non-clear coated vehicles should be repairable with either step 1 or 2.

* Available through Dyment Distribution Services.

M/T Shift Boot - Loose

Reference:		Date:
TECHNICAL BULLETIN TS87-122		September 7, 1987
Classification:	Section:	Models:
MT87-006	Manual Transmission	1980-1986 720 Trucks

TRANSMISSION SHIFT BOOT

APPLIED MODEL: 1980-1986 720 Trucks with 71B Manual Transmission

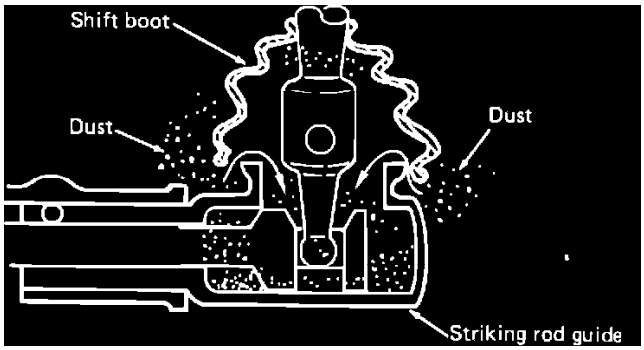


FIGURE 1

SERVICE INFORMATION

The shift boot on some 720 trucks with the 71B manual transmission may become loose due to oil and/or ozone contamination. When this condition occurs, dust and water may enter the transmission through the striking rod guide (see Figure 1).

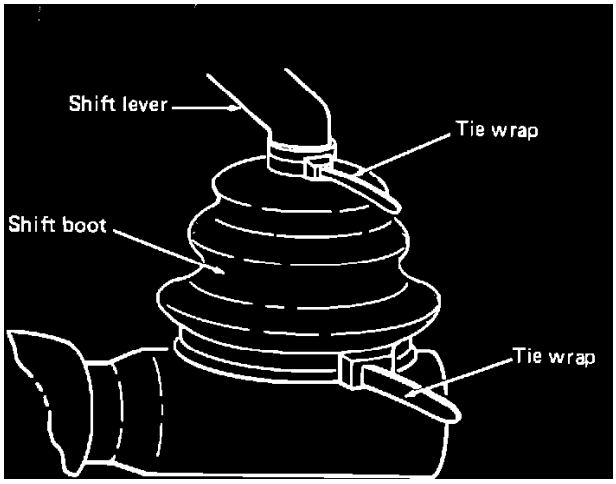


FIGURE 2

To correct this condition, tighten the shift boot with two plastic tie wraps (see Figure 2). If the shift boot is cracked or damaged, replace it with a new boot, and tighten it with two plastic tie wraps.

PARTS INFORMATION

NEW

PART DESCRIPTION	PART NUMBER	PART NUMBER
Plastic tie wrap (2.5 mm x 90 mm)	24216-V5000	-
Plastic tie wrap (2.5 mm x 200 mm)	24216-33G00	-

Shift boot -

^ Vehicles produced from 11/82 - ^ 32862-E9801 32862-E9800

^ Vehicles produced from 6/79 - 10/82 ^ Use same boot as original P/N 32862-E9300

WARRANTY INFORMATION

Refer to 1st Revision 1987 Warranty Flat Rate Manual, Section HF, Key 2.

Lights - Plastic Lens Isopropyl Alcohol Caution

Classification:
BF87-013

Reference:
TS87-064

Date:
April 20, 1987

ISOPROPYL ALCOHOL CAUTION ALL MODELS

APPLIED VEHICLES(S):
All Models

SERVICE INFORMATION

Isopropyl alcohol solution used for general cleaning and for preparing the vehicle surface for graphics installation will cause the plastic lenses on turn signal lights, side marker lights, corning lights, tail lights, etc., to crack.

Extreme care must be used to avoid all contact of isopropyl alcohol with any plastic lens (surface).

^ The isopropyl alcohol solution must not drip onto any plastic lens.

^ During cleaning of the vehicle, a wiping cloth soaked with alcohol solution must not contact any plastic lens.

^ During application of the urethane XE/SE Truck graphics, alcohol solution spray mist (used as the wetting solution) must not contact any plastic lens.Technical Service Bulletin # **99-017** Date: **990401**

Audio - Speaker Noise, Cellular Phone Interference

Classification:
EL99-005

Reference:
NTB99-017

Date:
April 1, 1999

NISSAN SPEAKER NOISE DUE TO CELLULAR PHONE INTERFERENCE

APPLIED VEHICLES:
All Nissan Vehicles

SERVICE INFORMATION

Cellular phone charging may cause a popping or crackling noise in the audio speakers of Nissan vehicles. If this condition exists, it is most likely to occur when the customer's cellular phone is turned off, plugged into the 12 volt cigarette lighter socket nearest the audio head unit, and placed within one foot of the audio head unit. The condition may occur more frequently in vehicles with audio systems with amplified speakers.

Refer to the appropriate owner's manual for cautions regarding the use of the cigarette lighter socket as a power source for other accessories.

Use the procedure below to verify that the condition exists as described above and provide instruction for the customer to reduce the possibility of future cellular phone interference.

SERVICE PROCEDURE

Perform the following test procedure to verify the condition exists as described:

1. Ask the customer for the cellular phone and charging adapter.

2. Confirm the cellular phone has been turned off for at least 30 minutes before proceeding.

NOTE:
Do not turn the cellular phone on at any time during the procedure. If the phone has to be turned from on to off, you will have to wait 30 minutes for the phone to reset to proceed with the test.

3. Plug the phone into the 12 volt cigarette lighter socket nearest the audio head unit.

4. Turn the ignition to the "ON" position (do not turn the cellular phone on).

5. Turn the audio unit on.

6. Place the cellular phone close to the front of the audio head unit.

7. Listen for a popping or crackling noise from the audio speakers.

8. If the noise is heard, move the cellular phone back from the audio unit. The noise should be reduced as the cellular phone is moved further away from the audio unit.

9. If the condition is confirmed through the above procedure, advise the customer to keep the cellular phone at least one foot away from the audio head unit to reduce the possibility of future cellular phone interference.

Technical Service Bulletin # **99-048S** Date: **080701**

99-048S - 07/01/08

This TSB number 99-048S, dated 07/01/08 has been superceded by TSB number 99-048U , dated 08/08/08

Technical Service Bulletin # **99-048N** Date: **060201**

99-048N - 02/01/06

This TSB number 99-048N, dated 02/01/06 has been superceded by TSB number 99-048U , dated 08/08/08

Technical Service Bulletin # **99-048M** Date: **060101**

99-048M - 01/01/06

This TSB number 99-048M, dated 01/01/06 has been superceded by TSB number 99-048U , dated 08/08/08

Technical Service Bulletin # **99-048C** Date: **000728**

99-048C - 07/28/00

This TSB number 99-048C, dated 07/28/00 has been superceded by TSB number 99-048U , dated 08/08/08

Technical Service Bulletin # **99-048B** Date: **000728**

99-048B - 07/28/00

This TSB number 99-048B, dated 07/28/00 has been superceded by TSB number 99-048U , dated 08/08/08

Technical Service Bulletin # **99-048** Date: **991028**

99-048 - 10/28/99

This TSB number 99-048, dated 10/28/99 has been superceded by TSB number 99-048U , dated 08/08/08

Technical Service Bulletin # **99-044A** Date: **991027**

99-044A - 10/27/99

This TSB number 99-044A, dated 10/27/99 has been superceded by TSB number 99-044B , dated 10/27/99

Technical Service Bulletin # **99-044** Date: **991027**

99-044 - 10/27/99

This TSB number 99-044, dated 10/27/99 has been superceded by TSB number 99-044B , dated 10/27/99

Technical Service Bulletin # **99-034** Date: **990602**

99-034 - 06/02/99

This TSB number 99-034, dated 06/02/99 has been superceded by TSB number 99-034A , dated 06/02/99

Technical Service Bulletin # **95-014** Date: **960911**

95-014 - 09/11/96

This TSB number 95-014, dated 09/11/96 has been superceded by TSB number 96-087 , dated 09/11/96

Technical Service Bulletin # **94-012** Date: **990617**

94-012 - 06/17/99

This TSB number 94-012, dated 06/17/99 has been superceded by TSB number 94-012A , dated 06/17/99

Technical Service Bulletin # **92-062** Date: **990617**

92-062 - 06/17/99

This TSB number 92-062, dated 06/17/99 has been superceded by TSB number 92-062A , dated 06/17/99

Technical Service Bulletin # **99-048I** Date: **030520**

99-048I - 05/20/03
This TSB number 99-048I, dated 05/20/03 has been superceded by TSB number 99-048U , dated 08/08/08
Technical Service Bulletin # **99-048G** Date: **030520**

99-048G - 05/20/03
This TSB number 99-048G, dated 05/20/03 has been superceded by TSB number 99-048U , dated 08/08/08
Technical Service Bulletin # **99-048F** Date: **030520**

99-048F - 05/20/03
This TSB number 99-048F, dated 05/20/03 has been superceded by TSB number 99-048U , dated 08/08/08
Technical Service Bulletin # **99-048E** Date: **030520**

99-048E - 05/20/03
This TSB number 99-048E, dated 05/20/03 has been superceded by TSB number 99-048U , dated 08/08/08
Technical Service Bulletin # **93058** Date: **930316**

Paint - Contamination, Identification and Repair
This TSB number 93058, dated 03/16/93 has been superceded by TSB number 94-015 , dated 02/08/94
Technical Service Bulletin # **94015** Date: **940208**

Paint - Contamination Identification & Repair
This TSB number 94015, dated 02/08/94 has been superceded by TSB number 94-015 , dated 02/08/94
Technical Service Bulletin # **99-028** Date: **990415**

Seat Belts - Slow Retraction, Cleaning D Ring
This TSB number 99-028, dated 04/15/99 has been superceded by TSB number 01-005A , dated 10/07/04
Technical Service Bulletin # **95014** Date: **950222**

A/C - Procedure For Detection of Refrigerant Leaks
This TSB number 95014, dated 02/22/95 has been superceded by TSB number 96-087 , dated 09/11/96
Technical Service Bulletin # **95015** Date: **950310**

A/C - Parts Proper Installation Procedure
This TSB number 95015, dated 03/10/95 has been superceded by TSB number 95-015 , dated 03/10/95
Technical Service Bulletin # **99-048T** Date: **080722**

99-048T - 07/22/08
This TSB number 99-048T, dated 07/22/08 has been superceded by TSB number 99-048U , dated 08/08/08
Technical Service Bulletin # **99-048R** Date: **080213**

99-048R - 02/13/08
This TSB number 99-048R, dated 02/13/08 has been superceded by TSB number 99-048U , dated 08/08/08
Technical Service Bulletin # **99-048O** Date: **060328**

Battery - Testing Procedures & Equipment
This TSB number 99-048O, dated 03/28/06 has been superceded by TSB number 99-048U , dated 08/08/08
Technical Service Bulletin # **99-048L** Date: **051006**

Battery - Testing Equipment/Procedures
This TSB number 99-048L, dated 10/06/05 has been superceded by TSB number 99-048U , dated 08/08/08
Technical Service Bulletin # **99-048K** Date: **041007**

Battery - Testing Procedures/Replacement
This TSB number 99-048K, dated 10/07/04 has been superceded by TSB number 99-048U , dated 08/08/08
Technical Service Bulletin # **99-048J** Date: **040621**

Battery - Testing/Replacement
This TSB number 99-048J, dated 06/21/04 has been superceded by TSB number 99-048U , dated 08/08/08
Technical Service Bulletin # **99-048H** Date: **030520**

Battery - Testing/Equipment/Replacement Applications

This TSB number 99-048H, dated 05/20/03 has been superceded by TSB number 99-048U , dated 08/08/08
Technical Service Bulletin # **99-048D** Date: **000728**

Battery - OE And Replacement Ratings

This TSB number 99-048D, dated 07/28/00 has been superceded by TSB number 99-048U , dated 08/08/08
Technical Service Bulletin # **99-048A** Date: **991028**

Battery - Original and Replacement Ratings

This TSB number 99-048A, dated 10/28/99 has been superceded by TSB number 99-048U , dated 08/08/08
Technical Service Bulletin # **94009** Date: **940304**

Battery - Charging/Testing Procedures

This TSB number 94009, dated 03/04/94 has been superceded by TSB number 99-044B , dated 10/27/99
Technical Service Bulletin # **00-033C** Date: **061023**

Brakes - Judder/Noise/Pedal Feel Diagnosis & Repair

This TSB number 00-033C, dated 10/23/06 has been superceded by TSB number 00-033D , dated 08/08/07
Technical Service Bulletin # **95055** Date: **950517**

A/T - Recommended Fluid

This TSB number 95055, dated 05/17/95 has been superceded by TSB number 98-042 , dated 05/15/98
Technical Service Bulletin # **95005** Date: **950322**

Fuel - Cold Weather Starting Tips

This TSB number 95005, dated 03/22/95 has been superceded by TSB number 95-120A , dated 01/10/03
Technical Service Bulletin # **89-051** Date: **890413**

A/T - Erratic Operations

This TSB number 89-051, dated 04/13/89 has been superceded by TSB number 89051 , dated 04/13/89
Technical Service Bulletin # **93016** Date: **931129**

ECM - Relay (Type 1M) Green or Blue Cautions

This TSB number 93016, dated 11/29/93 has been superceded by TSB number 93-176 , dated 11/29/93
Technical Service Bulletin # **93065** Date: **930316**

A/T - Fluid Type Application

This TSB number 93065, dated 03/16/93 has been superceded by TSB number 98-042 , dated 05/15/98
Technical Service Bulletin # **87010** Date: **870101**

A/T - Slow Shift

This TSB number 87010, dated 01/01/87 has been superceded by TSB number AT87003 , dated 04/20/87
Technical Service Bulletin # **00-027** Date: **000315**

Tools - Nissan Essential Tool Shipment Summary

Classification:
TE00-005

Reference:
NTB00-027

Date:
March 15, 2000

APPLIED VEHICLES:
All Nissan Vehicles

NISSAN 1999 ESSENTIAL TOOL SHIPMENT SUMMARY

This bulletin provides a list of essential tools that were released during 1999. Please verify availability of the following tools at your dealership and ensure they are used appropriately for related diagnostic and repair procedures:

SERVICE INFORMATION

TECH·MATE

TP000137

LIFETIME WARRANTY GUARANTEE SAME-DAY SHIPMENT

ESSENTIAL TOOL SHIPMENT

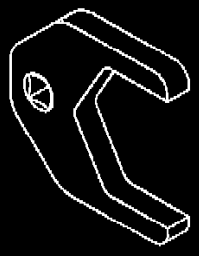
TO: Dealer Principal and Dealer Service Manager

1999 NISSAN
EG-130-99-01

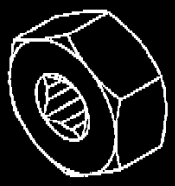
The following service tools have been classified essential by Nissan Motor Corporation U.S.A.

Refer to Nissan Service Bulletin NTB98-102 for instructions on the proper use of these tools.

J 43995
Steering Locknut Wrench
Application: Pathfinder 96~



J 43996
Steering Rack Adjustment Wrench
Application: Pathfinder 96~



In accordance with your dealer agreement with Nissan, your dealership will be invoiced via your non-vehicle open account $39.85 plus appropriate taxes.

NI99-77

All Tools May Not Be Included In this Shipment. Check Packing Slip for Tools Actually Shipped.

Phone 1-800-662-2001 • FAX 1-800-578-7375

J-43926 A/C Leak Detection Kit:

^ J-43995 and J-43996 Steering Rack Adjustment Wrenches

TECH·MATE

TP000140

LIFETIME WARRANTY GUARANTEE SAME-DAY SHIPMENT

ESSENTIAL TOOL SHIPMENT

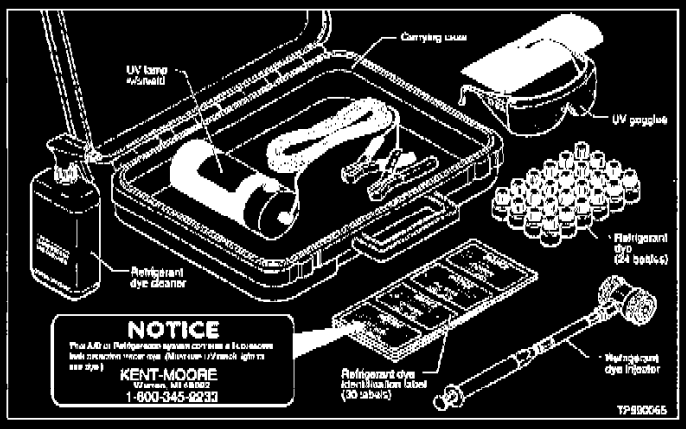
TO: Dealer Principal and Dealer Service Manager

1999 NISSAN
EG-130-99-02

The following service tool has been classified essential by Nissan Motor Corporation U.S.A.

Refer to NTB 99-011 for operating and precautionary procedures before using.

J-43926
A/C Dye Leak Detection Kit
Application: All R134a A/C systems



In accordance with your dealer agreement with Nissan, your dealership will be invoiced via your non-vehicle open account $320.35 plus appropriate taxes.

SPX KENT-MOORE

SPX Corporation
655 Eisenhower Drive
Owatonna, MN 55060-0995
Phone 800-345-2233
Fax 800-578-7375

NI99-117

All Tools May Not Be Included In this Shipment. Check Packing Slip for Tools Actually Shipped.

Phone 1-800-662-2001 • FAX 1-800-578-7375

J-43980 Squeak & Rattle Repair Kit:

^ J-43926 A/C Leak Detection Kit

TECH·MATE

TP000141

LIFETIME WARRANTY GUARANTEE SAME-DAY SHIPMENT

ESSENTIAL TOOL SHIPMENT

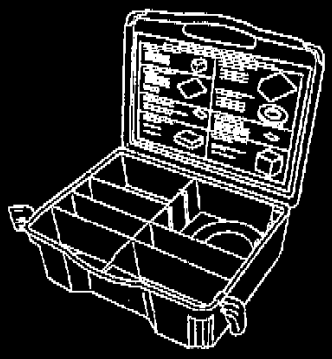
TO: Dealer Principal and Dealer Service Manager

1999 NISSAN
EG-130-99-03

The following service tool has been classified essential by Nissan Motor Corporation U.S.A. This tool, in conjunction with the Squeak and Rattle Seminar recently held, will help improve your dealership F-1 performance and customer satisfaction.

Refer to NTB98-110 for further details on usage and warranty details.

J-43980
Squeak & Rattle Repair Kit
Application: Universal



In accordance with your dealer agreement with Nissan, your dealership will be invoiced via your non-vehicle open account $58.60 plus appropriate taxes.

SPX KENT-MOORE

SPX Corporation • 655 Eisenhower Drive • Owatonna, MN 55060-0995 • Phone 800-662-2001 • Fax 800-578-7375

NI99-92

All Tools May Not Be Included In this Shipment. Check Packing Slip for Tools Actually Shipped.

Phone 1-800-662-2001 • FAX 1-800-578-7375

J-44200 CONSULT-II:

^ J-43980 Squeak & Rattle Repair Kit

TECH·MATE

TP000142

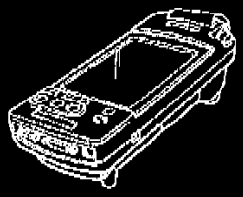
LIFETIME WARRANTY GUARANTEE SAME-DAY SHIPMENT

ESSENTIAL TOOL SHIPMENT

To: Dealer Principal and Dealer Service Manager
1999 NISSAN
EG-130-99-04

The following service tool has been classified essential by Nissan Motor Corporation U.S.A.
Refer to NPSB/98-79 for further details.

J-44200
CONSULT II Scan Tool
Application: Model year 2000 and beyond. Partial systems support for prior model years. Software updates to follow from NNA via ASIST.



The initial essential shipment to each dealer will be invoiced to your Nissan non-vehicle open account at $3495.00 (plus appropriate taxes) in accordance with your dealer agreement with Nissan.

SPECIAL MULTIPLE PURCHASE OFFER: If your dealership decides to purchase additional CONSULT II units between now and October 31, 1999, the price for each unit will be $3150.00 each including the initial essential unit you just received. Special pricing will be applied to additional purchases during this period. Here's how it works:

- 1st essential shipped unit priced at $3495.00 to your Nissan non-vehicle open account.
- 2nd additional purchase purchased through TechMate and priced at $2805.00.
- The total of the two purchases equals $6300.00, which averages $3150.00 each for the first two units.
- 3rd (and additional units) purchased through TechMate will be price at $3150.00 each.

After October 31, 1999, the list price will be $3495.00.

Call TechMate at 1-800-662-2001 to place additional orders.

SPX KENT-MOORE

SPX Corporation • 655 Eisenhower Drive • Owatonna, MN 55060-0995 • Phone 800-662-2001 • Fax 800-578-7375

NI99-215

All Tools May Not Be Included In this Shipment. Check Packing Slip for Tools Actually Shipped.

Phone 1-800-662-2001 • FAX 1-800-578-7375

J-44432 Ethernet Card For ASIST PC:

^ J-44200 CONSULT-II

^ J-44432 Ethernet Card For ASIST PC

TECH·MATE

TP000144

LIFETIME WARRANTY GUARANTEE SAME-DAY SHIPMENT

ESSENTIAL TOOL SHIPMENT

TO: Dealer Principal and Dealer Service Manager

1999 NISSAN
EG-130-99-05

The following service tool has been classified essential by Nissan North America, Inc. Refer to NTB99-044 for further details.

J-44373
Nissan Battery/Starting/Charging System Tester
Application: Universal.
Effective August 16, the tester must be used for all warranty-related claims for the battery, starting system and charging system. Refer to Claims Bulletin WB/99-014, dated July 29, 1999, for claims procedure information.

An optional Infrared Printer is available for outputting a paper copy of individual test results and warranty code. The price is $218.75 each under Kent-Moore part number J-44373-PRT. Call TechMate at 1-800-662-2001 to order one.

The initial essential shipment for the J-44373 Tester will be invoiced to your Nissan non-vehicle open account at $844.25 (plus appropriate taxes) in accordance with your dealer agreement with Nissan.

SPX KENT-MOORE

SPX Corporation • 655 Eisenhower Drive • Owatonna, MN 55060-0995 • Phone 800-662-2001 • Fax 800-578-7375

NI99-290

All Tools May Not Be Included In this Shipment. Check Packing Slip for Tools Actually Shipped.

Phone 1-800-662-2001 • FAX 1-800-578-7375

J-44183-A and J-44372 Pull Gauges For Steering Rack:

^ J-44373 MCR-620 Battery Tester

TECH·MATE

TP000145

LIFETIME WARRANTY GUARANTEE SAME-DAY SHIPMENT

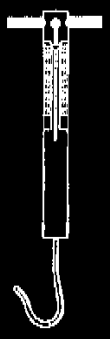
ESSENTIAL TOOL SHIPMENT

TO: Dealer Principal and Dealer Service Manager

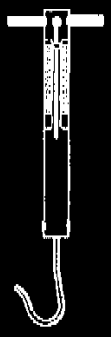
1999 NISSAN
EG-130-99-11

The following service tools have been classified essential by Nissan North America, Inc.
Refer to NPSB/99-101 for further details.

J 44183-A
20-100 Pound Pull Gauge
Application: Universal



J 44372
5-60 Pound Pull Gauge
Application: Universal



These initial essential tools will be invoiced to your Nissan non-vehicle open account at $27.00 for the J 44183-A and $25.35 for the J 44372 (plus appropriate taxes) in accordance with your dealer agreement with Nissan.

NI99-291

All Tools May Not Be Included In this Shipment. Check Packing Slip for Tools Actually Shipped.

Phone 1-800-662-2001 • FAX 1-800-578-7375

J-44615 Air Bag Lock Master Key Set:

^ J-44183-A and J-44372 Pull Gauges For Steering Rack

TECH·MATE

TP000146

LIFETIME WARRANTY GUARANTEE SAME-DAY SHIPMENT

ESSENTIAL TOOL SHIPMENT

TO: Dealer Principal and Dealer Service Manager

1999 NISSAN
EG-130-99-12

The following service tool has been classified essential by Nissan North America, Inc. Refer to NPSB/99-119, dated 12/23/99 for further details.

J-44615
Air Bag Master Key Set
Application: 2000 Maxima, Sentra

This air bag master key set is required to remove the accessory air bag locking bolt (p/n 999L2-AL000) on the models listed above.
Note: This master key set is a security item for Nissan dealership use only.

This essential tool will be invoiced to your Nissan non-vehicle open account at $65.30 (plus appropriate taxes) in accordance with your dealer agreement with Nissan.

NI99-483

All Tools May Not Be Included In this Shipment. Check Packing Slip for Tools Actually Shipped.

Phone 1-800-662-2001 • FAX 1-800-578-7375

^ J-44615 Air Bag Lock Master Key Set

These pages include copies of the flyers that were included with the special tools shipments.

Technical Service Bulletin # **90-090** Date: **901011**

Tools - Angular Tightening Recommendation & Tools

Classification:
EM90-008

Reference:
NTB90-090

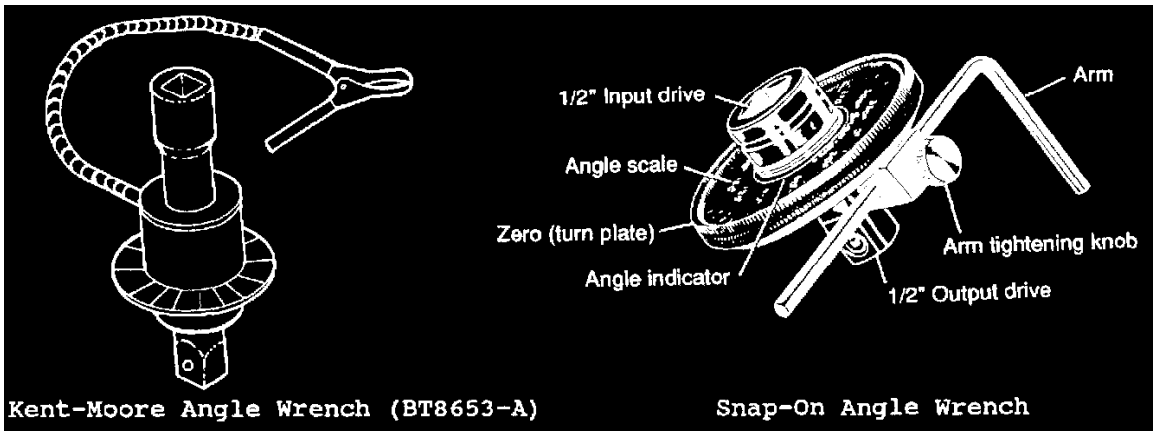
Date:
October 11, 1990

ANGULAR TIGHTENING

APPLIED VEHICLE(S)
All Models

SERVICE INFORMATION

It is important that some engine parts are tightened using an angular-tightening method rather than the exclusive use of the torque setting method because the tightening force (axial bolt force) which occurs using the torque setting method can result in "bolt stretch" or breakage. To assure satisfactory maintenance of the engine and to reduce the possibility of "bolt stretch" or breakage, Nissan recommends that the angular-tightening method be used rather than the torque setting method whenever the appropriate Service Manual indicates application of this method.



A suitable angle wrench can be obtained from the Kent-Moore and the Snap-On Companies.

Technical Service Bulletin # **95062** Date: **950621**

Tools - Essential Release, Connector/Terminal Kit

Classification: T&E95-005

Reference: NTB95-062

Date: June 21, 1995

ESSENTIAL TOOL RELEASE

SERVICE INFORMATION

Connector and Terminal Pin Kit

The week of June 26, 1995, all Nissan dealers will receive the J38751-95NI Connector and Terminal Pin Kit and the J38465-19ADP CONSULT Kit Update: Power Pack Adapter.

In response to dealership requests, the Nissan Connector and Terminal Pin Kit has been updated (the original kit was distributed in 1989). This new kit is designed to provide a cost effective method of performing wiring harness repairs and will save dealerships and customers time and money because a harness can be repaired rather than replaced. Additionally, the kit offers dealers an opportunity to increase service department sales profits.

Each kit contains 231 connectors (51 unique), 525 terminal pins (21 unique) and 200 seals (8 unique). A comprehensive application and component price list is also included with each kit. The J38751-3 terminal installation and removal tools included in the original J3875l Terminal Pin Kit are also required when using this new kit. Additional tool kits can be ordered through Tech-Mate.

CONSULT Kit Update: Power Pack Adapter

In the event of a NICAD battery failure when using CONSULT, the Power Pack Adapter can be used in place of the NICAD battery allowing continued operation. Refer to the instructions sheet enclosed with the tool for proper operation.

All orders for replacement components for the Connector and Terminal Pin Kit Update and any questions regarding repair or replacement of the Power Pack Adapter should be directed to your Tech-Mate Service Equipment and Special Tools representative at 800-NMC-2001.

Technical Service Bulletin # **WB91001** Date: **910220**

Warranty Information - Suspended Warranty Claims

Reference: WARRANTY BULLETIN WB/91-001

Date: February 20, 1991

TO: ALL NISSAN DEALERS

SUBJECT: SUSPENDED WARRANTY CLAIMS

Currently, warranty claims containing errors such as lack of required DSM approvals and/or missing or invalid information are suspended and manually examined at the National Warranty Department before being returned to the submitting dealership for correction.

In an effort to reduce turnaround time for correction and approval and try to thereby reduce the delay in Warranty payment to dealers, the Warranty Department has made certain system enhancements. These changes (effective February 20, 1991) will result in the immediate, automatic return to the submitting dealership of those claims requiring dealer correction.

Returned claims suspended for dealer correction will appear on Datanet report No. VMN0945-R2 "Warranty Claims Suspended Report " on the next business day or, in the case of non-Datanet dealers on month-end Dealer Credit Status Report. Codes describing the specific area(s) of the claim which require correction or approval will be listed under the heading "Validation Messages Open" below the suspended claim header information.

As a reminder, when the suspended warranty claim is returned for correction, it is important to make the necessary corrections and resubmit the claim to Nissan as soon as possible, thereby minimizing unnecessary delay in the payment of the claim.

NATIONAL WARRANTY DEPARTMENT

Technical Service Bulletin # **WB91002** Date: **910201**

Warranty - Expansion of VOR Freight Reimbursement

Reference: WARRANTY BULLETIN HB/91-002

Date: February 1, 1991

TO: ALL NISSAN DEALERS

SUBJECT: EXPANSION OF VOR FREIGHT REIMBURSEMENT

Nissan Motor Corporation in U.S.A. is pleased to announce that as a result of dealer comment and input, commencing January 2, 1991, warranty repairs are eligible for reimbursement for additional freight charges which are applied to VOR parts orders.

Parts which are not in stock at the dealership may now be ordered "Air Freight Collect". (Selection 1 on the Datanet Order Entry Screen.) Reimbursement will take place when the warranty claim which requests the VOR Freight Charge is processed by NMC.

In-dealership communications, concerning the availability and use of this policy change, will be an additional aid in your reaching higher levels of customer satisfaction due to the increased service levels which your dealership is now able to provide. Failure to notify the customer of the additional benefit of the overnight part service being provided is a missed opportunity to verbally demonstrate your commitment to customer satisfaction. Overnight service allows you to schedule, in advance, the part replacement. This allows you to notify your customer of the exact timing of vehicle repair.

This policy enhancement is applicable to all transactions which are not related to the following items: dealer "come backs", customer paid repairs, insurance repairs, wholesale accounts, tire claims, dealer owned/operated vehicles, and supplementing of stock orders.

A separate communication will be issued concerning Security+Plus repairs.

Part ordering procedures remain the same as outlined in the Parts & Accessories Policies & Procedures Manual.

Reimbursement calculations and procedures remain the same as outlined in Service Bulletin WB/90-002 dated March 21, 1990. That is, the reimbursement per part is calculated by dividing the total freight charges by the Total Number of Parts on the invoice. Request for reimbursement is accomplished by inserting the part number VORFXXXXXX in the parts section of the appropriate warranty claim. (The "XXXXXX: following VORF in the part number represents the invoice number.)

Documentation requirements remain unchanged from those announced previously.

Technical Service Bulletin # **93148** Date: **931015**

Electrical - General System Diagnosis

Nissan-Datsun Truck PL720 2WD L4-1952cc 2.0L SOHC (Z20)

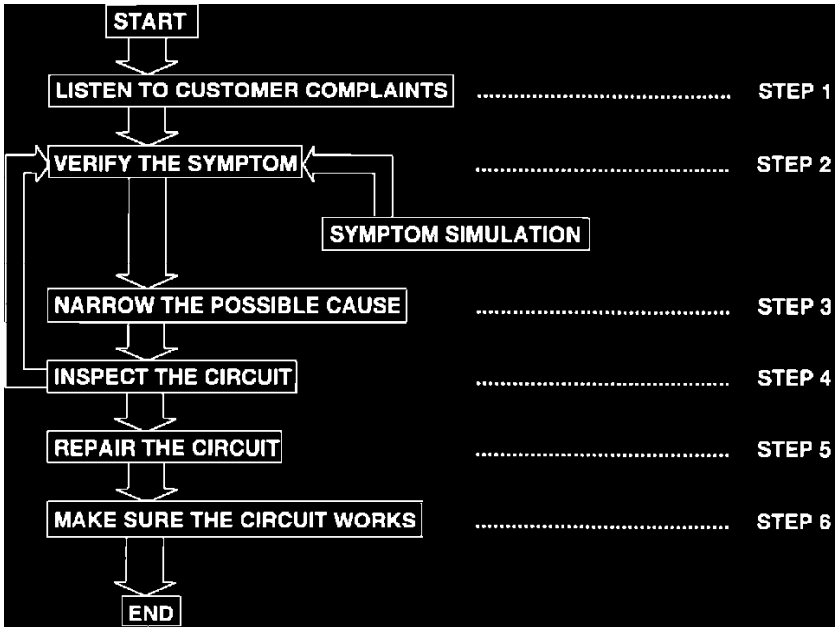
Classification: EL93-027
Section: Electrical System
Reference: TECHNICAL BULLETIN NTB93-148
Models: All Models
Date: October 15, 1993

ELECTRICAL SYSTEM DIAGNOSIS

General Inspection Procedure

In general, electrical systems are considered to be complex systems requiring a high level of technical knowledge. However, if you have a basic understanding of electrical systems and you understand their operation, you can approach a proper diagnosis and repair.

This is the first in a series of technical bulletins geared toward the diagnosis and repair of vehicle electrical systems.



How to Perform Trouble Diagnoses for Quick and Accurate Repair

Trouble Diagnosis Steps

The following chart shows the steps required to properly identify an electrical incident. It is important to follow each step thoroughly.

STEP 1 Listening To The Customer.

Listening to the customer and documenting the conditions which exist when the problem occurs is critical to properly diagnosing an electrical incident. You will need to understand the symptoms which caused the incident, to properly diagnose and/or to try to simulate the condition in the dealership. It may also be important to determine if the car has had any accessories recently installed or if any service work (collision repair, etc.) has been recently performed.

STEP 2 Verify the parameters of the incident.

Whenever possible, you should operate the complete system to verify the customers comments. Try to confirm the symptom(s) and under what conditions the incident occurs.

STEP 3 Get the proper diagnosis materials together.

Before beginning the diagnosis, make sure you have all of the necessary information. Along with these Fix Tips you should have the Power Supply Routing information in the EL section of the appropriate service manual. You should make sure you have a thorough understanding of how the system operates. Based upon the customers comments and your knowledge of the circuit operation, you should be able to identify which component(s) could cause the incident.

STEP 4 Inspect the system.

Inspect the system to find the cause of the symptom. Start the diagnosis by determining the location of the electrical units involved. Inspect each component to verify that it is mechanically free to operate and that all connectors and harnesses are securely connected and properly routed. Systematically check the circuits involved, using the Harness Layouts and Power Supply Routing in the service manual. Determine which circuit is the cause of the incident and whether it is a wiring problem or a component problem.

STEP 5 Repair or replace.

Repair or replace the incident component or electrical circuit.

STEP 6 Verify the system works properly under all conditions.

Once you have repaired the circuit or replaced a component you need to operate the system in all modes and particularly under the circumstances which resulted in the customers initial complaint.

Incident Simulation Tests

If the symptom is not present when the vehicle is brought in for service, it may be necessary for you to simulate the conditions and environment under which the incident occurred. Proceeding with a diagnosis when the vehicle is not displaying the symptom may lead the technician to a No Trouble Found Diagnosis. The following section illustrates ways to simulate the conditions/environments under which the owner experiences an electrical incident.

The section is broken into one of the six following topics:

1. Vehicle Vibration
2. Heat Sensitive
3. Freezing
4. Water Intrusion
5. Electrical Load
6. Cold or Hot Start Up

To properly simulate the condition under which the owner experiences the problem, it is important that you get a thorough description of the incident from the customer.

1. Vehicle Vibration

If the owner indicates the problem occurs or becomes worse while driving on a rough road or during periods when the engine is vibrating (idle with A/C on), you will want to check for a vibration related condition. Refer to the illustration below.

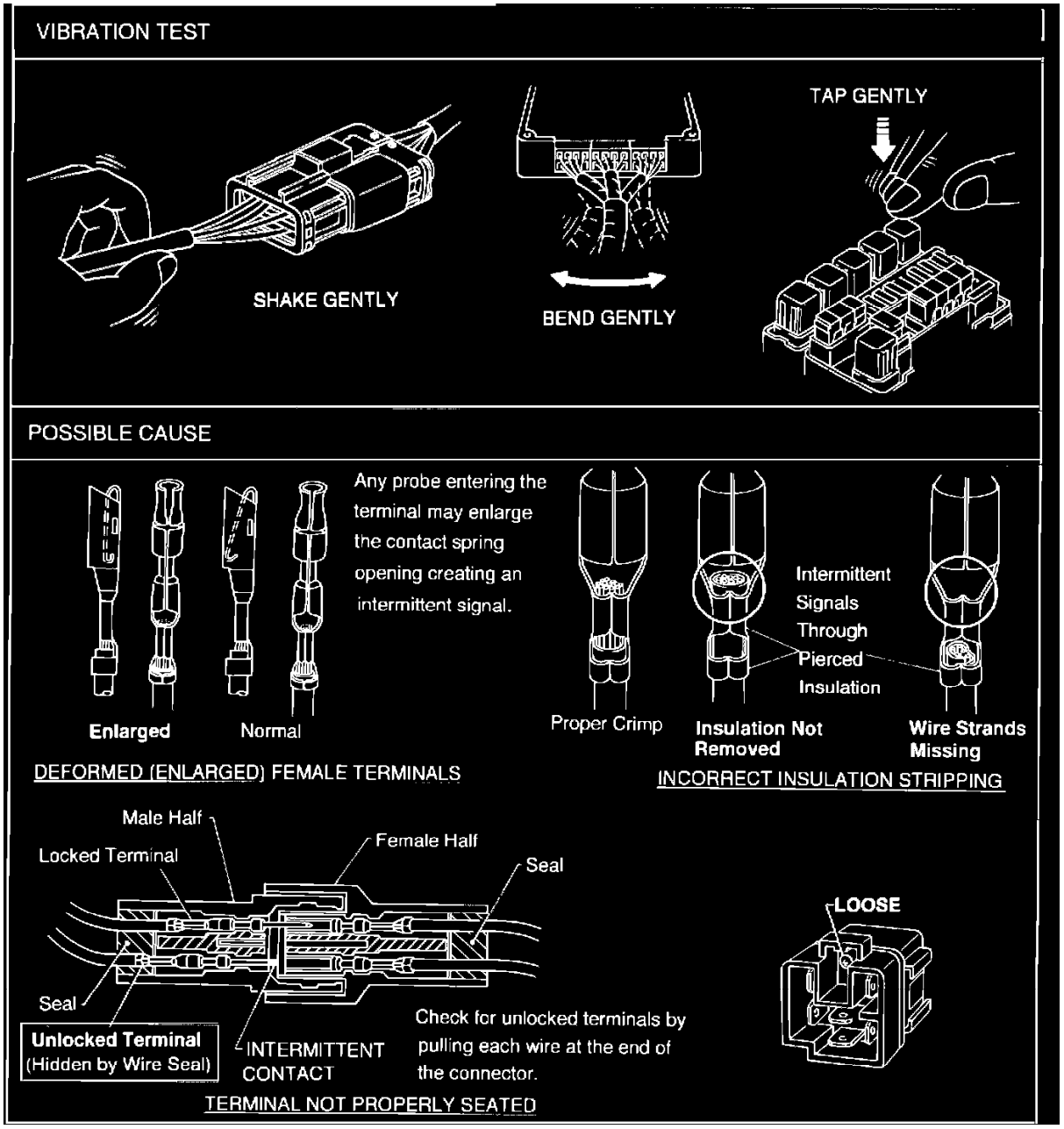
Connectors & Harness

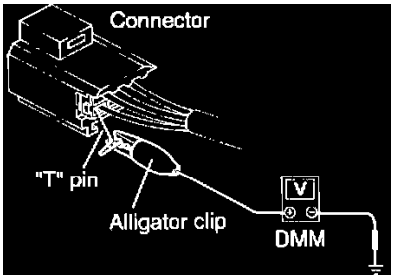
Determine which connectors and wiring harness would affect the electrical system you are inspecting. Gently shake each connector and harness while monitoring the system for the incident you are trying to duplicate. This test may indicate a loose or poor electrical connection.

HINT Connectors can be exposed to moisture. It is possible to get a thin film of corrosion on the connector terminals. A visual inspection may not reveal this without disconnecting the connector. On intermittent incidents it is a good idea to disconnect, inspect and clean the terminals on related connectors in the system.

Sensors & Relays

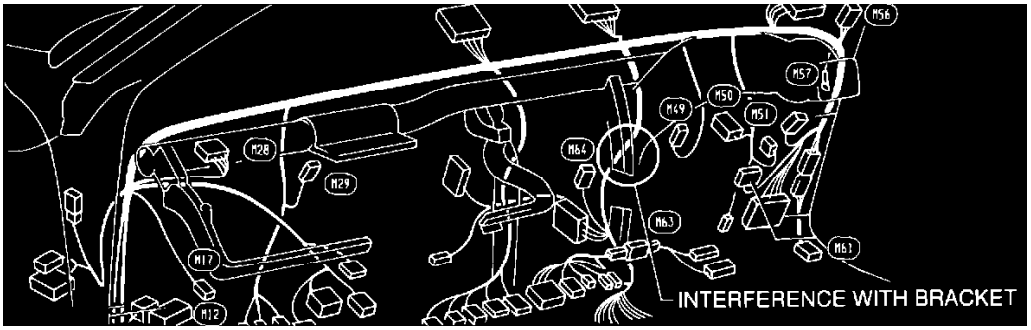
Gently apply a slight vibration to sensors and relays in the system your inspecting. This test may indicate a loose or poorly mounted sensor or relay.





When probing a connector it is possible to enlarge the contact spring opening. Refer to figure. If this occurs it may create an intermittent signal in the circuit. When probing a connector, use care not to enlarge the opening. If the probe of the Digital Multimeter (DMM) you are using will not fit into the connector cavity, you can back probe the connector with a "T" pin to create an extension. Most DMM's have accessory alligator clips which slide over the probe to allow clipping the "T" pin for a better contact. Refer to figure. If you have any difficulty probing a terminal, inspect the terminal to ensure you have not accidentally opened the contact spring or pulled a wire loose.

Behind The Instrument Panel

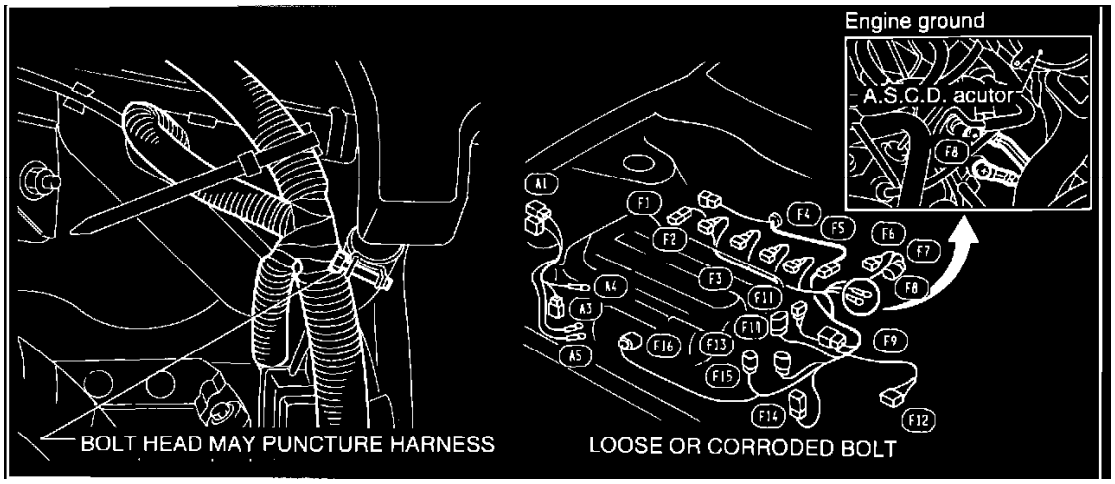


Improperly routed or improperly clamped harness can become pinched during accessory installation. Vehicle vibration can aggravate a harness which is routed along a bracket or near a screw behind or below the dash.

Engine Compartment

There are several reasons a vehicle or engine vibration could cause an electrical complaint. Some of the things to check for are:

A. Connectors which are inaccessible for diagnosis probing.
B. Connectors which may not fully be seated.
C. Wiring harness which are not long enough and are being stressed during engine vibrations or rocking.
D. Wires laying across brackets or moving components.
E. Loose dirty or corroded ground wires.
F. Wires routed too close to hot components.

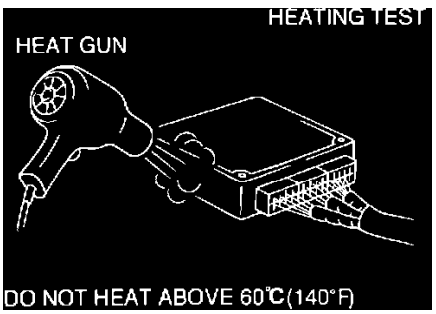


To inspect components underhood, start by verifying the integrity of ground connections. (Refer to the GROUND INSPECTION described later.) Once you have assured the system is properly grounded check for loose connections by gently shaking the wiring or component as previously explained. Using the wiring diagrams in the service manual, inspect the wiring for continuity.

Under Seating Area's

If a harness is not clamped properly or has too much slack, vehicle vibration could cause the wiring to become pinched by seat components such as slide guides. If the wiring runs under seating areas inspect wiring routing for possible damage or pinching.

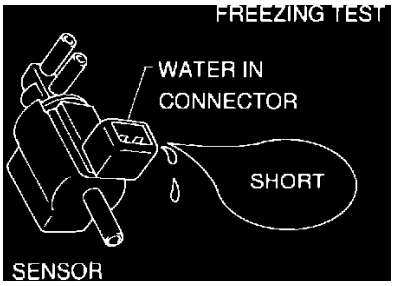
2. Heat Sensitive



If owner indicates the problem occurs during hot weather or after the car has sat for a short period of time, you will want to check for a heat sensitive condition.

To determine if an electrical component is heat sensitive, heat the component with a heat gun or equivalent. Do not heat components above 60 degrees Celsius (140 Fahrenheit). If the incident occurs while heating the unit you will need to replace the component or make sure it is properly insulated from the heat source.

3. Freezing

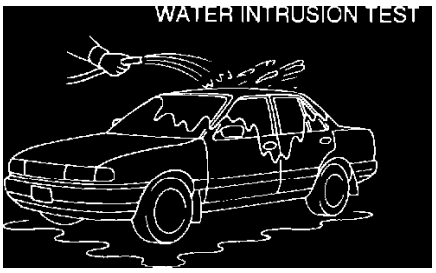


If the customer indicates the incident goes away after the car warms up (wintertime) the cause could be related to water freezing somewhere in the wiring/electrical system.

There are two methods to check for this. The first is to arrange for the owner to leave his car over night. Make sure it will get cold enough to demonstrate his complaint. Leave the car parked outside overnight. In the morning, be prepared to do a quick and thorough diagnosis of those electrical components which could be affected.

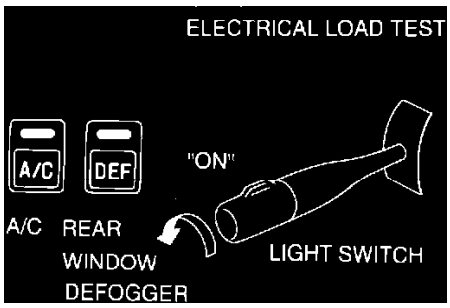
The second method to diagnose for a freezing component is to put the suspect component into a freezer long enough for any water to freeze. If reinstalling the part into the car results in the incident reoccurring you will need to repair or replace that component.

4. Water Intrusion



If the incident only occurs during high humidity or rainy/snowy periods, it could be caused by water intrusion on an electrical part. This can be simulated by soaking the car or running it through a car wash. Do not spray water directly on any electrical components.

5. Electrical Load



If the incident appears to be electrical load sensitive, perform diagnosis while all accessories are turned on including, A/C, rear defog, radio, fog lamps, etc.

6. Cold or Hot Start Up

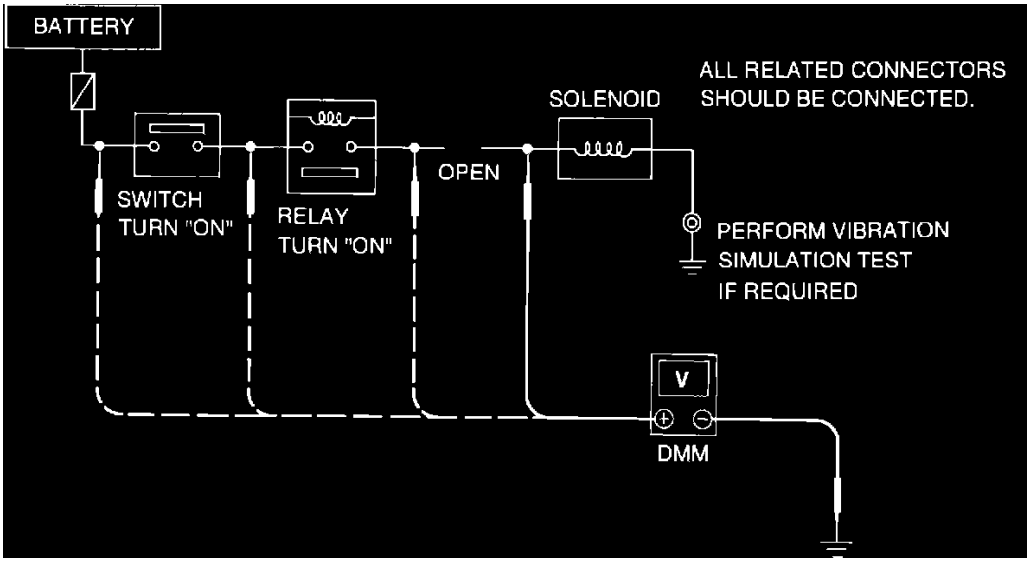
On some occasions an electrical incident may only occur when the car is started cold or when the car is restarted (hot) shortly after being turned off. In these cases you may have to keep the car overnight to make a proper diagnosis.

Testing Circuits

In general testing electrical circuits is an easy task if it is approached in a logical and organized method. Before beginning it is important that you have all available information related to the system you are going to test. You should also have a thorough understanding of how the system operates so that you use the appropriate test procedure and equipment.

While testing electrical components, if the incident is reported as intermittent, it may be necessary to gently shake the wiring harness or electrical component to simulate vehicle vibrations.

DIAGNOSTIC TOOLS AND EQUIPMENT



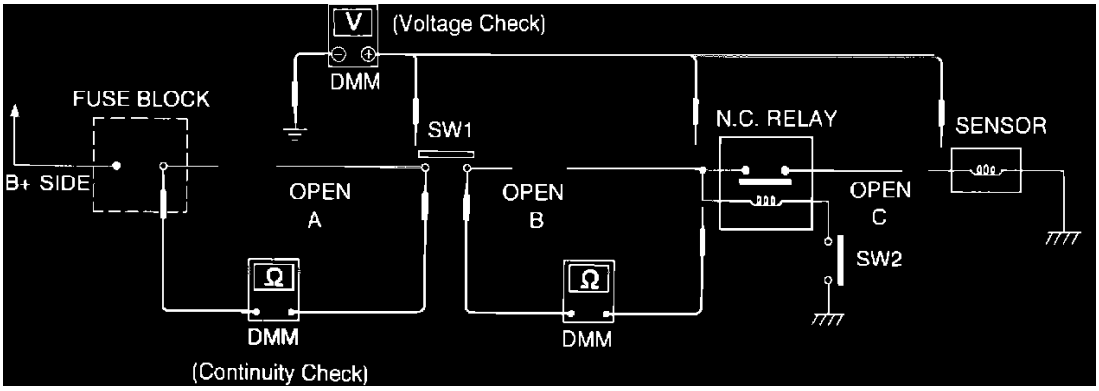
A Digital Multimeter DMM (10 megaohm input impedance) can safely be used to diagnose and test most vehicle systems.

Test lights are not recommended due to the possibility of inadvertently tapping into a computer or air bag circuit and causing damage.

Before attempting to diagnose a circuit for an open or a short, it is important that you:

1. Have the proper reference material available. Power Supply Routings Applicable Service Manual sections Fix Tips
2. Understand how the system works.
3. Have a good understanding of what condition you are diagnosing Situation when the problem occurs (weather, loads, etc.) What systems interact with the one you are diagnosing Is it intermittent or a consistent problem
4. Have proper equipment to perform the diagnosis such as a digital voltmeter, alligator clips, and probe leads.

TESTING FOR OPENS IN THE CIRCUIT



Before you begin to diagnose and test the system, you should rough sketch a schematic of the system. This will help you to logically walk through the diagnosis process. Drawing the sketch will also reinforce your working knowledge of the system. Refer to the attached drawing for sample schematics.

Continuity Check Method

The continuity check is used to find an open in the circuit. The Digital Multimeter (DMM) set on the resistance function will indicate an open circuit as over limit (OL, no beep tone or no ohms symbol). Make sure to always start with the DMM at the highest resistance level.

To help in understanding the diagnosis of open circuits please refer to the attached diagram.

1. Disconnect the battery negative cable.
2. Start at one end of the circuit and work your way to the other end. (At the fuse block in this example)
3. Connect 1 probe of the DMM to the fuse block terminal on the load side.
4. Connect the other probe to the fuse block (power) side of swl. Little or no resistance will indicate that portion of the circuit has good continuity. If there were an open in the circuit, the DMM would indicate an over limit or infinite resistance condition. (point A)
5. Connect the probes between swl and the relay. Little or no resistance will indicate that portion of the circuit has good continuity. If there were an open in the circuit, the DMM would indicate an over limit or infinite resistance condition. (point B)
6. Connect the probes between the relay and the sensor. Little or no resistance will indicate that portion of the circuit has good continuity. If there were an open in the circuit, the DMM would indicate an over limit or infinite resistance condition. (point C)

Any circuit can be diagnosed using the approach in the above example.

Voltage Check Method

To help in understanding the diagnosis of open circuits please refer to the previous diagram. In any powered circuit, an open can be found by methodically checking the system for the presence of voltage. This is done by switching the DMM to the voltage function.

1. Connect one probe of the DMM to a known good ground.
2. Begin probing at one end of the circuit and work your way to the other end.

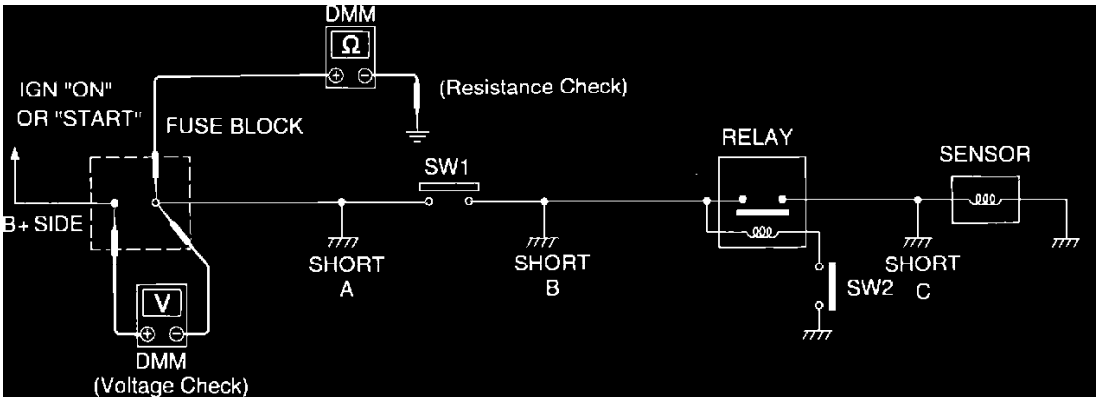
3. With swl open, probe at swl to check for voltage.
   voltage; open is further down the circuit than sw1.
   no voltage; open is between fuse block and swl (point A).

4. Close sw1 and probe at relay.
   voltage; open is further down the circuit than the relay.
   no voltage; open is between sw1 and relay (point B).

5. Close the relay and probe at the sensor.
   voltage; open is further down the circuit than the sensor.
   no voltage; open is between relay and sensor (point C).

Any powered circuit can be diagnosed using the approach in the above example.

TESTING FOR SHORTS IN THE CIRCUIT



To simplify the discussion of shorts in the system please refer to the schematic.

Resistance Check method

1. Disconnect the battery negative cable and remove the blown fuse.

2. Disconnect all loads (sw1 open, relay disconnected and sensor disconnected) powered through the fuse.

3. Connect one probe of the ohmmeter to the load side of the fuse terminal and the other probe to a known good ground.

4. With sw1 open, check for continuity.
   continuity; short is between fuse terminal and sw1 (point A).
   no continuity; short is further down the circuit than sw1.

5. With swl closed, relay disconnected and probes at the load side of fuse terminal and ground check for continuity.
   continuity; short is between sw1 and the relay (point B).
   no continuity; short is further down the circuit than the relay.

6. With sw1 closed, relay contacts jumped with jumper wire and probes at the load side of fuse terminal and ground check for continuity.
   continuity; short is between relay and sensor (point C).
   no continuity; check sensor, retrace steps.

Voltage Check Method

1. Remove the blown fuse and disconnect all loads (i.e. swl open, relay disconnected and sensor disconnected) powered through the fuse.

2. Turn the ignition key to the ON or START position and verify battery voltage at the B+side of the fuse terminal (one lead on the B+terminal side of the fuse block and one lead on a known good ground).

3. With swl open and the DMM leads across both fuse terminals, check for voltage.
   voltage; short is between fuse block and swl (point A).
   no voltage; short is further down the circuit than sw1.

4. With sw1 closed, relay and sensor disconnected and the DMM leads across both fuse terminals, check for voltage.
   voltage; short is between sw1 and the relay (point B).
   no voltage; short is further down the circuit than the relay.

5. With swl closed, relay contacts jumped with fused jumper wire check for voltage.
   voltage; short is down the circuit of the relay or between the relay and the disconnected sensor (point C).
   no voltage; retrace steps and check power to fuse block.

GROUND INSPECTION

Ground connections are very important to the proper operation of electrical and electronic circuits. Ground connections are often exposed to moisture, dirt and other corrosive elements. The corrosion (rust) can become an unwanted resistance. This resistance can change the way a circuit operates.

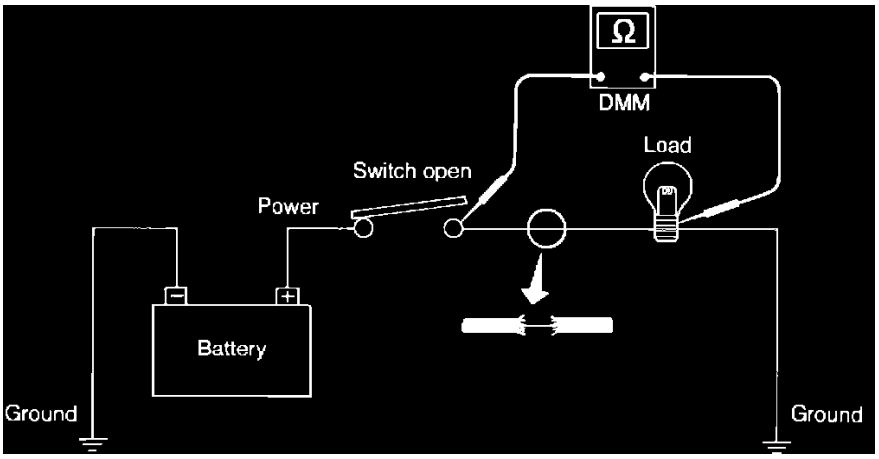
Electronically controlled circuits are very sensitive to proper grounding. A loose or corroded ground can drastically alter an electronically controlled circuit. These circuits generally operate in the 5 volt range. The components in these circuits can be seriously affected by a voltage change as low as one tenth (0.1V) of a volt. A poor or corroded ground can easily affect the circuit by that amount. Even when the ground connection looks clean, there can be a thin film of rust on the surface. When inspecting a ground connection follow these rules:

1. Remove the ground bolt screw or clip.
2. Inspect all mating surfaces for tarnish, dirt, rust, etc.
3. Clean as required to assure good contact.
4. Reinstall bolt or screw securely.
5. Inspect for "add-on" accessories which may be interfering with the ground circuit.
6. If several wires are crimped into one ground eyelet terminal, check for proper crimps. Make sure all of the wires are clean, securely fastened and providing a good ground path. If multiple wires are cased in one eyelet make sure one or more of the ground wires does not have excess wire insulation.

VOLTAGE DROP TESTS

Voltage Drop Tests are often used to find components or circuits which have excessive resistance. A voltage drop in a circuit is caused by a resistance when the circuit is in operation. Part of the available voltage is used by the resistance. When there is excessive resistance less voltage is available for other loads (lights, motors, etc.) in the circuit. Since each resistance in a circuit uses voltage, a voltmeter can be used to isolate problems.

A voltage drop across closed contacts can indicate excessive resistance. This can cause the circuit to operate incorrectly. Remember a switch is not a load. During diagnosis, use a voltmeter to measure the voltage drop across each switch contact while the circuit is in operation.



Check the wire in the illustration. If an ohmmeter is used to measure resistance (circuit off), the single strand of wire still making contact would give a reading of 0 ohms. This would indicate a good circuit. When the circuit operates, this single strand of wire is not able to carry the current. The single strand will have a high resistance to the current. Using the voltmeter this will be picked up as a slight voltage drop.

Unwanted high resistance can be caused by many factors as illustrated below:
Undersized Wiring (single strand example) Corrosion On Switch Contacts Loose Wire Connections Or Splices.

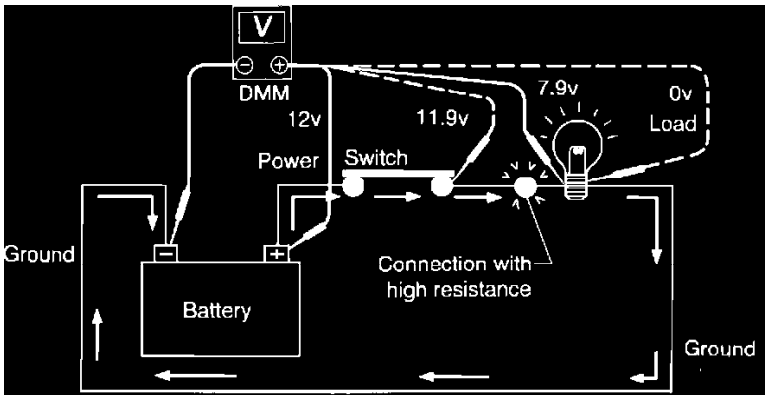
If repairs are needed always use wire that is of the same or larger gauge.

Measuring Voltage Drop-Accumulated Method

1. Connect the voltmeter across the connector or part of the circuit you want to check. The positive lead of the voltmeter should be closer to power and the negative lead closer to ground.

2. Operate the circuit

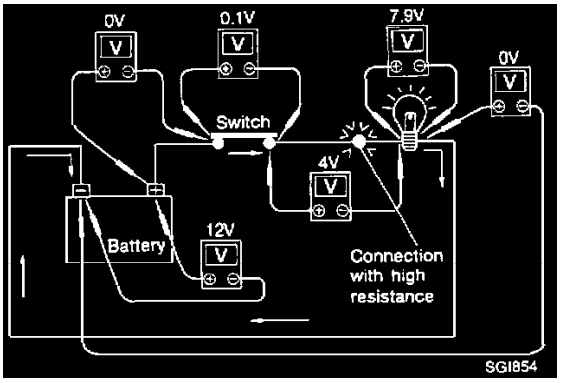
3. The voltmeter will indicate how many volts are being used to "push" current through that part of the circuit.



Note
in the illustration that there is an excessive 4.1 volt drop between the battery and the bulb.

Measuring Voltage Drop - Step By Step)

The Step by Step method is most useful in isolating excessive drops in low voltage systems, such as those in "Computer Controlled Systems". Circuits in the "Computer Controlled Systems" operate on very low amperage. Any variation in resistance in the system due to poor connections, improper installation, improper wire gauge or corrosion can adversely affect the systems operation. A step by step voltage drop test can be used to identify a component or wire which is operating under too much resistance.



Circuit Inspection

1. Connect the voltmeter as described in illustration, starting at the battery and working your way around the circuit.

2. An unusually large voltage drop will indicate a component or wire that needs to be repaired. As you can see in the illustration above, the poor connection causes a 4 volt drop.

The chart that follows illustrates some maximum allowable voltage drops. These values are given as a guideline, the exact value for each component may vary.

COMPONENT	VOLTAGE DROP
Wire	negligible <.001 volts
Ground Connections	Approx. 0.1 volts
Switch Contacts	Approx. 0.3 volts
Starter Solenoids	Approx. 0.5 volts

Proper Diagnostic Procedures to Avoid Damaging Other Components

In the process of diagnosing electrical incidents you may be required to remove components, disconnect connectors and inspect parts.

Test equipment

When working with any test equipment, be careful to follow all manufacturers directions and warnings. Improper use of test equipment can result in damage to either your test equipment or vehicle electrical components.

SERVICE PRECAUTIONS

When working on a vehicle's electrical system you need to use care. The following guidelines will help you prevent new problems while diagnosing an electrical incident.

Removing Components

When removing components (such as an engine) which have electrical connectors, disconnect all of the connectors prior to attempting to take the component out of the car. Stretching the connector harness can cause wiring to pull loose and may create a short or open circuit as well as a possible intermittent condition.

Installing Components

When reinstalling components, wait until the component is back in the vehicle before reattaching connectors. Once the component is back in the car, check to verify that the wires and harness are properly positioned in the vehicle. Check the male and female connectors to verify there is no water, grease, dirt, etc. in the connector. Assure that the harness will not be damaged by any brackets or finishing screws. Reconnect the connector. Make sure the connector has an appropriate amount of slack to accommodate any component motion without having unnecessary slack. Secure the harness as required to prevent possible damage to the harness itself.

Disconnecting Connectors

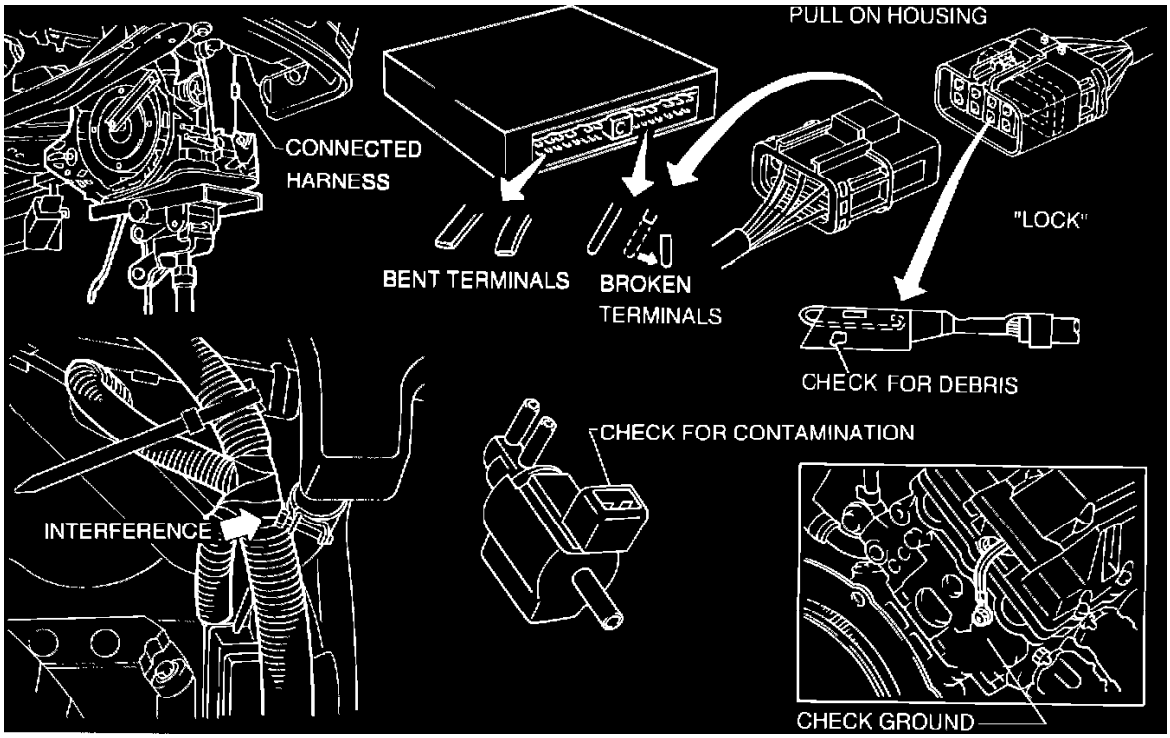
Disconnect the connectors by releasing any locking tabs and pulling on the connector housings. Never disconnect a connector by pulling on the harness or wires.

Connecting Harnesses

Before connecting the harness connectors, inspect the housings to make sure there is no water, grease, dirt, etc. in the housing which may interfere with the proper operation of the connector or component.

Align the male and female halves to prevent bending or breaking terminals.

Make sure the connectors are fully seated when connected. Visually verify that the connector has seated and is locked into place.



Technical Service Bulletin # **94005** Date: **940926**

A/C - Service Procedures For Retrofitted A/C Systems

Classification:
HA94-005

Section:
Air Conditioning

Reference:
TECHNICAL BULLETIN NTB94-091

Models:
See General Information

Date:

Nissan-Datsun Truck PL720 2WD L4-1952cc 2.0L SOHC (Z20)

September 26, 1994

SERVICE PROCEDURE FOR RETROFITTED A/C SYSTEMS

General Information

APPLIED MODEL:
All models except Quest equipped with a retrofitted A/C system

SERVICE INFORMATION

This technical Bulletin details the general service information for all models retrofitted to HFC-134a (R-134a) A/C systems, using a Nissan approved kit.

This Bulletin also describes the specific details of the J30 and B13 models retrofitted to HFC-134a (R-134a) A/C systems.

Refer to NTB93-001 for information not included in this Technical Bulletin.

The technical bulletin NTB93-001 describes general differences between the R-12 system and the R-134a system.

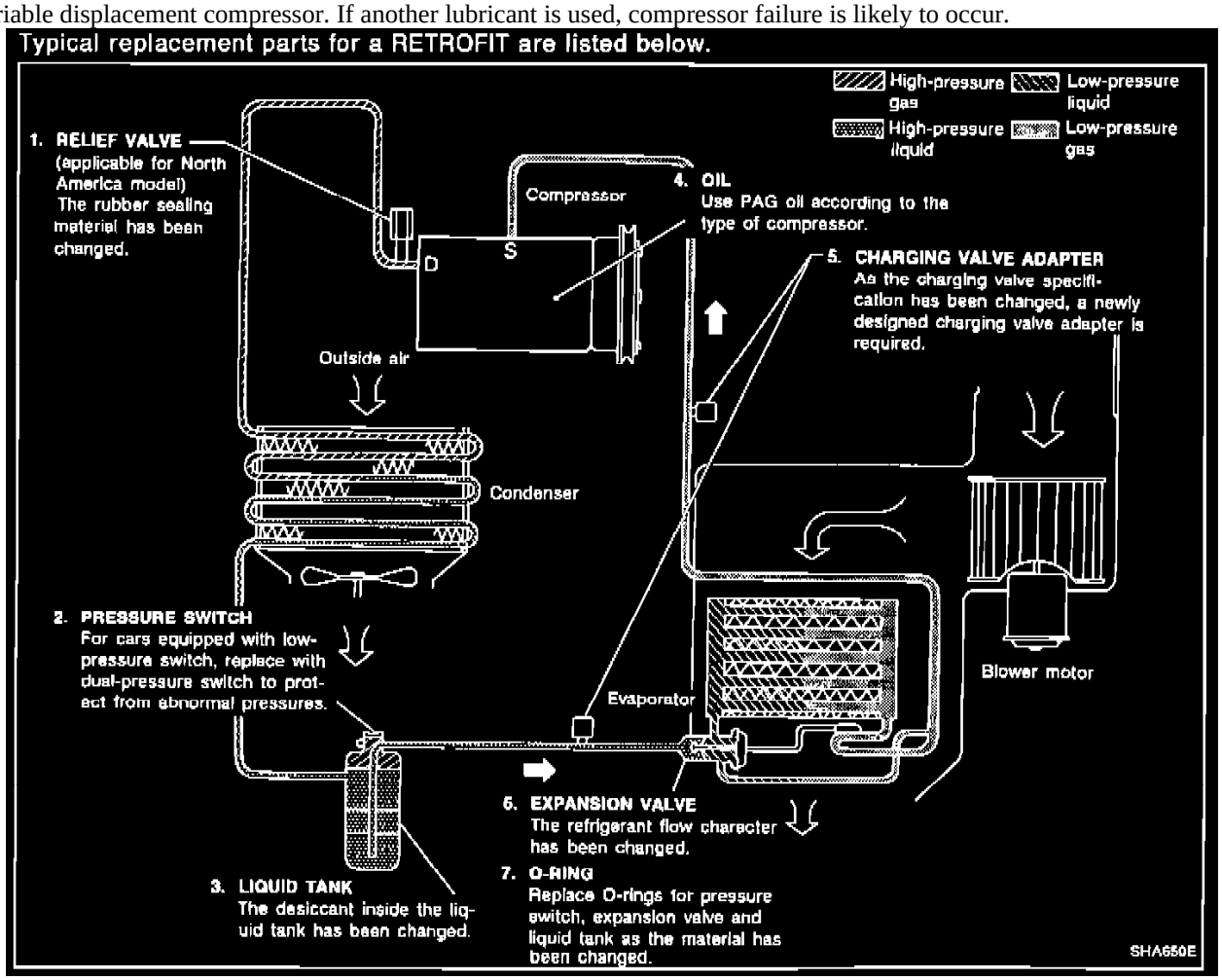
IMPORTANT POINTS

^ If the vehicle equipped with retrofit A/C system has a sight glass, do not use the sight glass to check refrigerant level because R-134a and the PAG lubricants do not exhibit" clear sight glass "characteristics, even when properly charged.

^ When charging R-134a systems, use the ACR4 Recovery/Recycling/Recharging equipment (J-39500) to insure accurate charging (to .01 lb).

^ If an R-134a system is suspected to be low on refrigerant charge, first perform a system leak check using the R-134 a leak detector. After repairing any leaks found, charge the system using the ACR4 Recovery/ Recycling/Recharging equipment (J-39500).

^ Use only Nissan A/C system oil type R for vane rotary compressor, and use only Nissan A/C System Oil Type S for swash plate compressor and V-6 variable displacement compressor. If another lubricant is used, compressor failure is likely to occur.



A/C specification label

NOTICE: RETROFITTED TO R-134a
RETROFIT PROCEDURE PERFORMED TO SAE J1661

	REFRIGERANT	COMPRESSOR LUBRICANT
TYPE	R-134a	
AMOUNT		

DATE: _____

RETROFITTER NAME: _____

ADDRESS: _____

CITY/STATE: _____

CAUTION PRECAUTION
- REFRIGERANT UNDER HIGH PRESSURE.
- SYSTEM TO BE SERVICED BY QUALIFIED PERSONNEL.
- IMPROPER SERVICE METHODS MAY CAUSE PERSONAL INJURY.
- CONSULT SERVICE MANUAL.

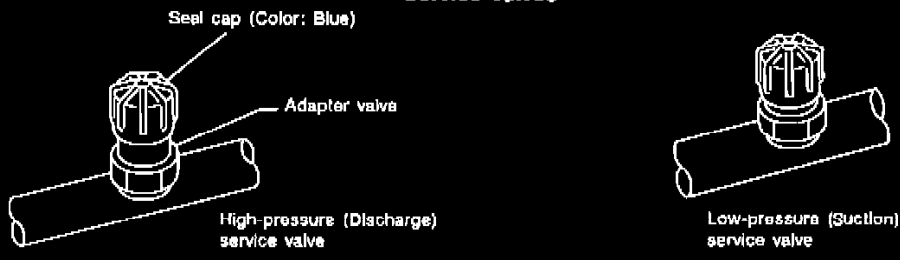
This label is located near the service charge ports, on a permanent metal structure, usually the bulkhead or strut tower.
(The blanks are filled by retrofitter.)
Color: Light blue

Compressor label and cooling unit label

RETROFITTED
TO R-134a

This label is located on the compressor and the cooling unit.
Color: Light blue

Service valves



The service valves are specially designed for the HFC-134a (R-134a) system. Those for the CFC-12 (R-12) system are different in size and configuration.
The seal cap color for the HFC-134a (R-134a) system is blue.

Precautions For Working With HFC0134A (R-134A)

WARNING:

- ^ CFC-12 (R-12) refrigerant and HFC-134a (R-134a) refrigerant are not compatible. These refrigerants must never be mixed, even in the smallest amounts. If the refrigerants are mixed, compressor failure is likely to occur.
- ^ Use only specified lubricant for the HFC-134a (R-134a) A/C system and HFC-134a (R-134a) components. If lubricant other than that specified is used, compressor failure is likely to occur.
- ^ The specified HFC-134a (R-134a) lubricant rapidly absorbs moisture from the atmosphere. The following handling precautions must be observed:
  - a: When removing refrigerant components from a vehicle, immediately cap (seal) the component to minimize the entry of moisture from the atmosphere.
  - b: When installing refrigerant components to a vehicle, do not remove the caps (unseal) until just before connecting the components. Connect all refrigerant loop components as quickly as possible to minimize the entry of moisture into system.
  - c: Only use the specified lubricant from a sealed container. Immediately reseal containers of lubricant. Without proper sealing, lubricant will become moisture saturated and should not be used.
  - d: Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Remove HFC-134a (R-134a) from A/C system, using certified service equipment meeting requirements of SAE J2210 (R-134a recycling equipment), or J2209 (R-134a recovery equipment). If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety Information may be obtained from refrigerant and lubricant manufacturers.
  - e: Do not allow lubricant (Nissan A/C System Oil Type S) to come in contact with styrofoam parts. Damage may result.

General Refrigerant Precautions

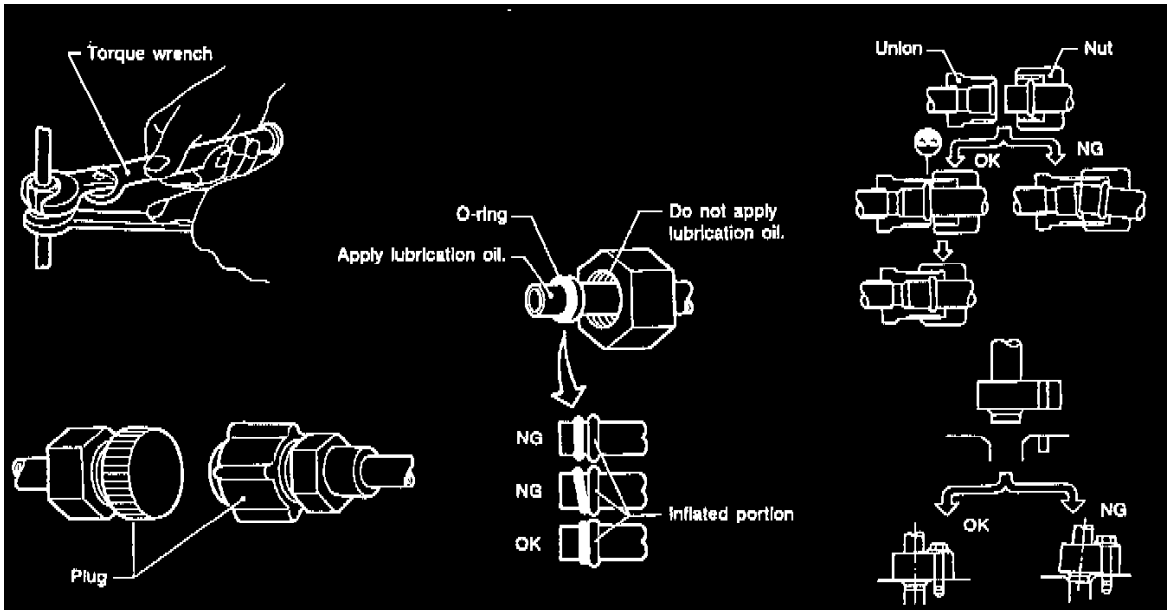
WARNING:

- ^ Do not release refrigerant into the air. Use approved recovery/recycling equipment to capture the refrigerant every time an air conditioning system is discharged.
- ^ Always wear eye and hand protection (goggles and gloves) when working with any refrigerant or air conditioning system.
- ^ Do not store or heat refrigerant containers above 52~C (125~F).
- ^ Do not heat a refrigerant container with an open flame; if container warming is required, place the bottom of the container in a warm pail of

water.

^ Do not intentionally drop, puncture, or incinerate refrigerant containers.
^ Keep refrigerant away from open flames: poisonous gas will be produced If refrigerant burns.
^ Refrigerant will displace oxygen, therefore be certain to work in well ventilated areas to prevent suffocation.
^ Do not introduce compressed air to any refrigerant container or refrigerant component.

Precautions For Refrigerant Service



WARNING:

Make sure all refrigerant is discharged into the recycling equipment and the pressure in the system is less than atmospheric pressure. Then gradually loosen the discharge side hose fitting and remove it.

CAUTION:

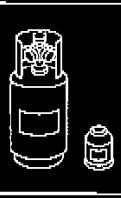
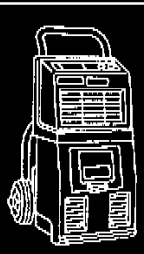
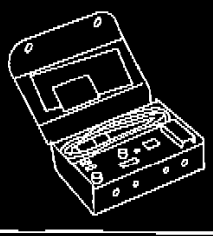
When replacing or cleaning refrigerant cycle components, observe the following.

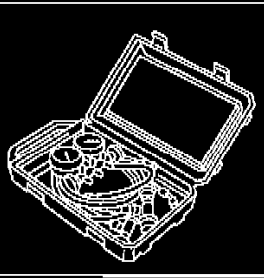
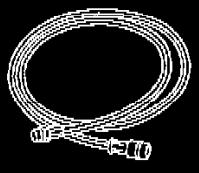
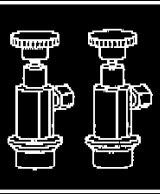
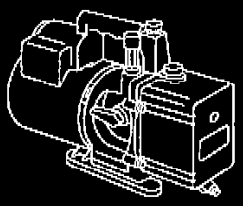
^ When the compressor is removed, store it in the same position as it is when mounted on the car. Failure to do so will cause lubricant to enter the low pressure chamber.
^ When connecting tubes, always use a torque wrench and a back-up wrench.
^ After disconnecting tubes, immediately plug all openings to prevent entry of dirt and moisture.
^ When installing an air conditioner in the vehicle, connect the pipes as the final stage of the operation. Do not remove the seal caps of pipes and other components until just before required for connection.
^ Allow components stored in cool areas to warm to working area temperature before removing seal caps. This prevents condensation from forming inside A/C components.
^ Thoroughly remove moisture from the refrigeration system before charging the refrigerant.
^ Always replace used 0-rings.
^ When connecting tube, apply lubricant to portions shown in illustration. Be careful not to apply lubricant to threaded portion.
Lubricant name: Nissan A/C System Oil Type S (For swash plate type compressor and V-6 compressor) Nissan A/C System Oil Type R (For vane rotary type compressor)
Part number: KLH00-PAGS1 (For swash plate type compressor and V-6 compressor) KLH00-PAGR1 (For vane rotary type compressor)
^ O-ring must be closely attached to inflated portion of tube.
^ After inserting tube into union until O-ring is no longer visible, tighten nut to specified torque.
^ After connecting line, conduct leak test and make sure that there is no leakage from connections. When the gas leaking point is found, disconnect that line and replace the O-ring. Then tighten connections of seal seat to the specified torque.

Precautions For Servicing Compressor

^ Plug all openings to prevent moisture and foreign matter from entering.
^ When the compressor is removed, store it in the same position as it is when mounted on the car.
^ When replacing or repairing compressor, follow "Maintenance of Lubricant Quantity in Compressor" exactly.
^ Keep friction surfaces between clutch and pulley clean. If the surface is contaminated, with lubricant, wipe it off by using a clean waste cloth moistened with thinner.
^ After compressor service operation, turn the compressor shaft by hand more than five turns in both directions. This will equally distribute lubricant inside the compressor. After the compressor is installed, let the engine idle and operate the compressor for one hour.
^ After replacing the compressor magnet clutch, apply voltage to the new one and check for normal operation.

HFC-134a (R-134a) Service Tools and Equipment

Tool number (Kent-Moore No.) Tool name	Description	Note
HFC-134a (R-134a) refrigerant	 NT196	Container color: Light blue Container marking: HFC-134a (R-134a) Fitting size: Thread size • 14 kg (30 lb) container 1/2"-16 ACME
KLH00-PAGS1 (—) Nissan A/C System Oil Type S	 NT197	Type: Poly alkylene glycol oil (PAG), type S Application: HFC-134a (R-134a) swash plate (piston) compressors (Nissan only) Lubricity: 40 mℓ (1.4 US fl oz, 1.4 Imp fl oz)
KLH00-PAGR1 (—) Nissan A/C System Oil Type R		Type: Poly alkylene glycol oil (PAG), type R Application: HFC-134a (R-134a) vane rotary compressors (Nissan only) Lubricity: 40 mℓ (1.4 US fl oz, 1.4 Imp fl oz)
(J-39500-NI) Recovery/Recycling/ Recharging equipment (ACR4)	 NT195	Function: Refrigerant Recovery and Recycling and Recharging
(J-39400) Electrical leak detector	 NT198	Power supply: • DC 12 V (Cigarette lighter or battery terminals)

Tool number (Kent-Moore No.) Tool name	Description	Note
(J-39183) Manifold gauge set (with hoses and couplers)	 NT199	Identification: • The gauge face indicates R-134a. Fitting size: Thread size • 1/2"-16 ACME • Couplers
Service hoses • High side hose (J-39501-72) • Low side hose (J-39502-72) • Utility hose (J-39476-72)	 NT201	Hose color: • Low hose: Blue with black stripe • High hose: Red with black stripe • Utility hose: Yellow with black stripe or green with black stripe Hose fitting to gauge: • 1/2"-16 ACME
Service couplers • High side coupler (J-39500-20) • Low side coupler (J-39500-24)	 NT202	Hose fitting to service hose: • M14 x 1.5 fitting is optional or permanently attached.
(J-39650) Refrigerant weight scale	 NT200	For measuring of refrigerant Fitting size: Thread size • 1/2"-16 ACME
(J-39649) Vacuum pump (Including the isolator valve)	 NT203	Capacity: • Air displacement: 4 CFM • Micron rating: 20 microns • Oil capacity: 482 g (17 oz) Fitting size: Thread size • 1/2"-16 ACME

Refrigerant container fittings, service hose fittings and service equipment fittings (equipment which handies refrigerant and/or lubricant) are different between CFC-12 (R-12) and HFC-134a (R-134a). This is to avoid mixed use of the refrigerants/lubricant.

Precautions For Service Equipment

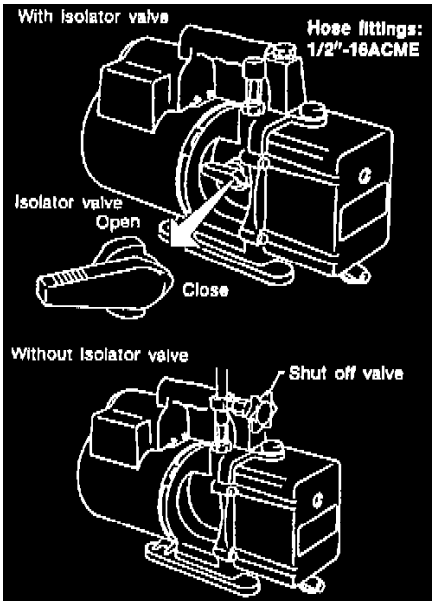
RECOVERY/RECYCLING/RECHARGING EQUIPMENT

Be certain to follow the manufacturers instructions for machine operation and machine maintenance. Never introduce any refrigerant other than that specified into the machine.

ELECTRONIC LEAK DETECTOR

Be certain to follow the manufactures instructions for tester operation and tester maintenance.

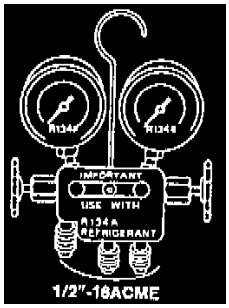
VACUUM PUMP



The lubricant contained inside the vacuum pump is not compatible with the specified lubricant for HFC-134a (R-134a) A/C systems. The vent side of the vacuum pump is exposed to atmospheric pressure. So the vacuum pump lubricant may migrate out of the pump into the service hose. This is possible when the pump is switched off after evacuation (vacuuming) and hose is connected to it. To prevent this migration, use a manual valve placed near the hose-to-pump connection, as follows.

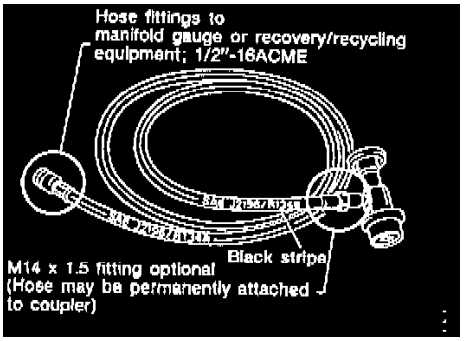
^ Usually vacuum pumps have a manual isolator valve as part of the pump. Close this valve to isolate the service hose from the pump.
^ For pumps without an isolator, use a hose equipped with a manual shut-off valve near the pump end. Close the valve to isolate the hose from the pump.
^ If the hose has an automatic shut off valve, disconnect the hose from the pump. As long as the hose is connected, the valve is open and lubricating oil may migrate. Some one-way valves open when vacuum is applied and close under a no vacuum condition. Such valves may restrict the pump's ability to pull a deep vacuum and are not recommended.

MANIFOLD GAUGE SET



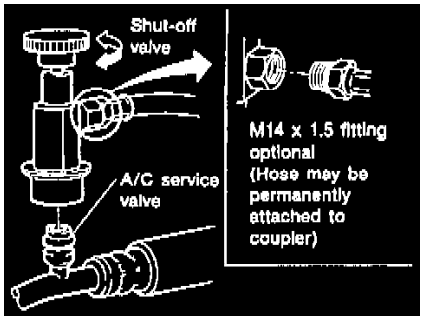
Be certain that the gauge face indicates R-134a or 134a. Be sure the gauge set has 1/2"-16 ACME threaded connections for service hoses. Confirm the set has been used only with refrigerant HFC-134a (R-134a) and specified lubricants.

SERVICE HOSES



Be certain that the service hoses display the markings described (colored hose with black stripe). All hoses must include positive shut off devices (either manual or automatic) near the end of the hoses opposite the manifold gauge.

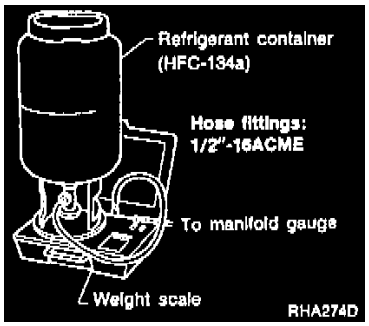
SERVICE COUPLERS



Never attempt to connect HFC-134a (R-134a) service couplers to an CFC-12 (R-12) A/C system. The HFC-134a (R-134a) couplers will not properly connect to the CFC-12 (R-12) system. However, if an improper connection is attempted, discharging and contamination may occur.

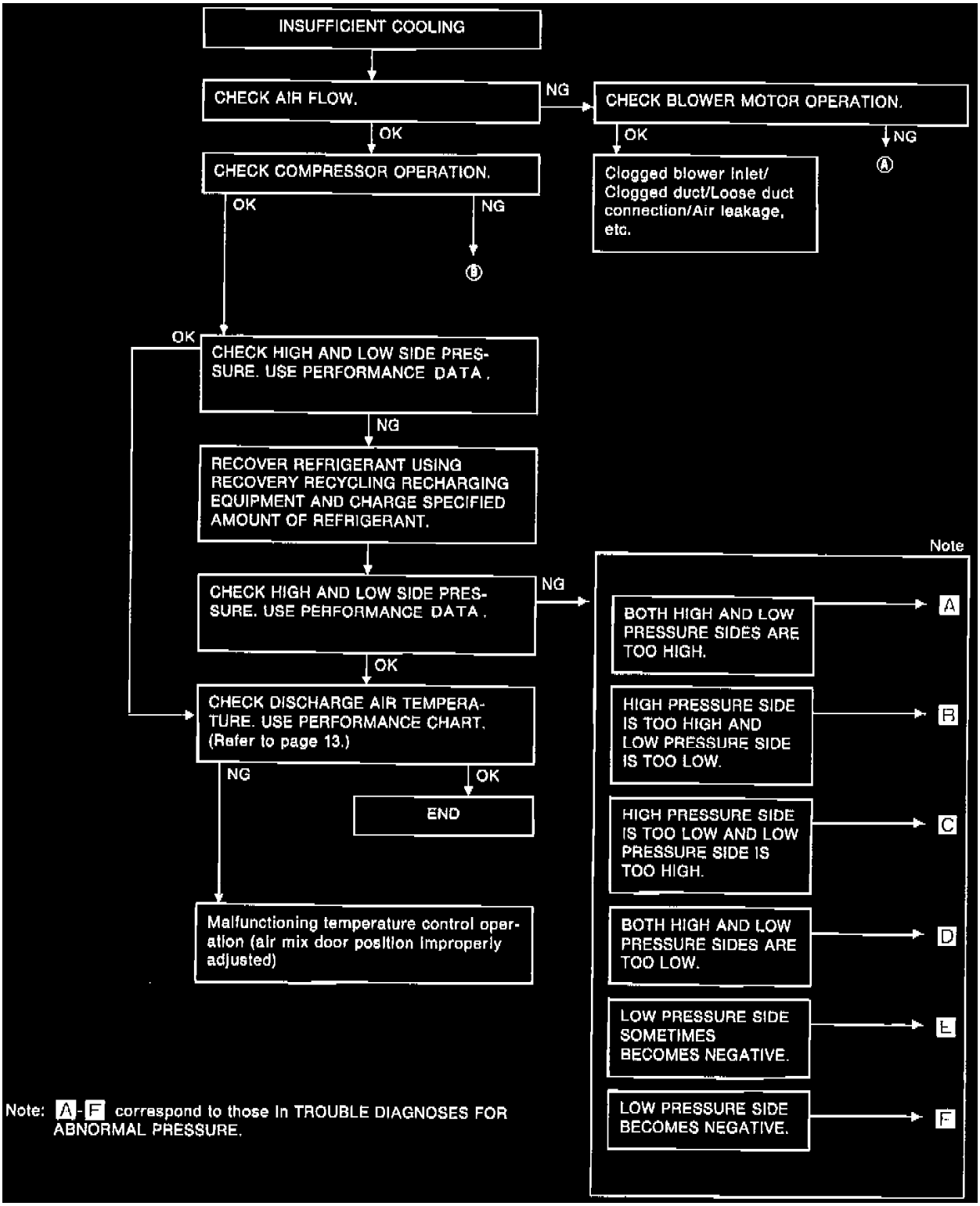
Shut off valve rotation	A/C service valve
Clockwise	Open
Counterclockwise	Close

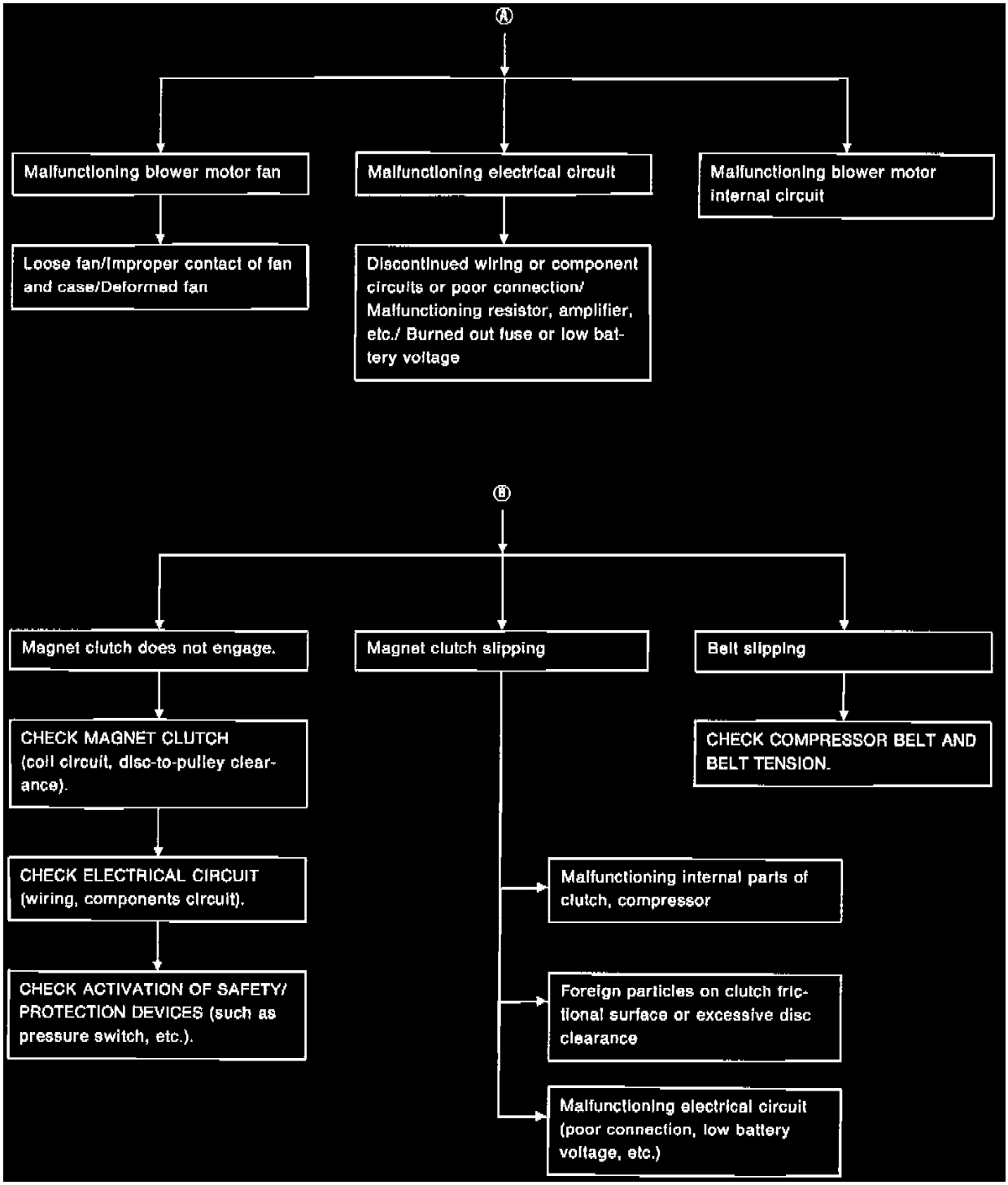
REFRIGERANT WEIGHT SCALE



Verify that no refrigerant other than HFC-134a (R-134a) and specified lubricants have been used with the scale. If the scale controls refrigerant flow electronically, the hose fitting must be 1/2"-16 ACME.

Insufficient Cooling


INSUFFICIENT COOLING
CHECK AIR FLOW.
NG
CHECK BLOWER MOTOR OPERATION.
OK
NG
Ⓐ
Clogged blower inlet/ Clogged duct/Loose duct connection/Air leakage, etc.
OK
CHECK COMPRESSOR OPERATION.
OK
NG
Ⓑ
OK
CHECK HIGH AND LOW SIDE PRESSURE. USE PERFORMANCE DATA.
NG
RECOVER REFRIGERANT USING RECOVERY RECYCLING RECHARGING EQUIPMENT AND CHARGE SPECIFIED AMOUNT OF REFRIGERANT.
CHECK HIGH AND LOW SIDE PRESSURE. USE PERFORMANCE DATA.
NG
OK
CHECK DISCHARGE AIR TEMPERATURE. USE PERFORMANCE CHART. (Refer to page 13.)
NG
OK
END
Malfunctioning temperature control operation (air mix door position improperly adjusted)
Note
BOTH HIGH AND LOW PRESSURE SIDES ARE TOO HIGH.
A
HIGH PRESSURE SIDE IS TOO HIGH AND LOW PRESSURE SIDE IS TOO LOW.
B
HIGH PRESSURE SIDE IS TOO LOW AND LOW PRESSURE SIDE IS TOO HIGH.
C
BOTH HIGH AND LOW PRESSURE SIDES ARE TOO LOW.
D
LOW PRESSURE SIDE SOMETIMES BECOMES NEGATIVE.
E
LOW PRESSURE SIDE BECOMES NEGATIVE.
F
Note: A-F correspond to those in TROUBLE DIAGNOSES FOR ABNORMAL PRESSURE.



Performance Data

General performance characteristics for the CFC-12 (R-12) A/C system and the retrofit A/C system differ. These differences are outlined below.

Recirculating-to-discharge air temperature

^ The retrofitted A/C system retains the original CFC-12 (R-12) heat exchanger (evaporator and condenser).
^ Some CFC-12 (R-12) lubrication oil remains in the A/C system.
^ Because of these two stated reasons, the retrofit A/C system has a slightly lower cooling capacity than the CFC-12 (R-12) A/C system. [Maximum discharge air temperature is increased by approximately 2~C (3.6~F).]

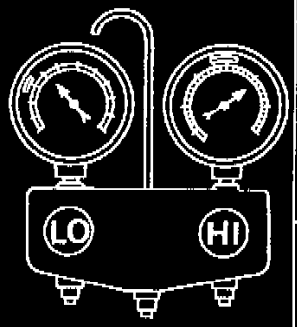
Ambient air temperature-to-operating pressure

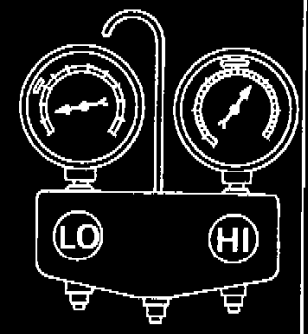
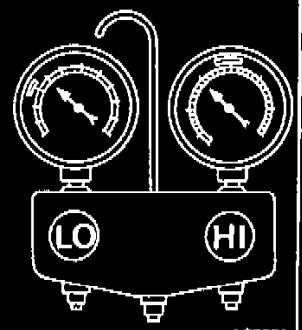
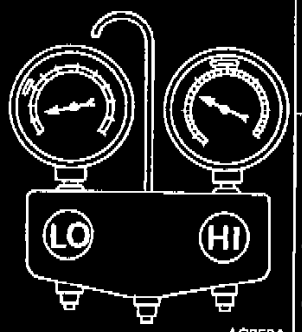
The retrofit A/C system has a higher operating pressure than the CFC-12 (R-12) A/C system when the outside air temperature exceeds 15~C (59~F).

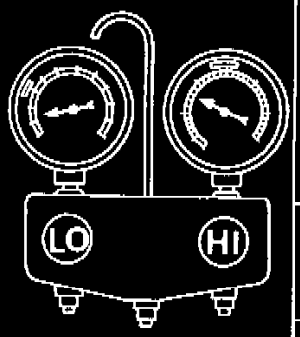
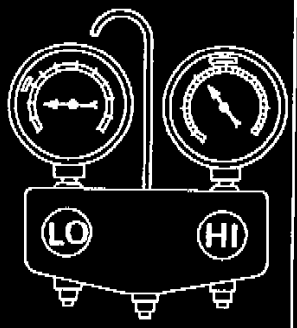
^ High-pressure side (Discharge side): Maximum pressure increase of approximately 294 kPa (3 kg/sq.cm, 43 psi)
^ Low-pressure side (Suction side): Same as CFC-12 (R-12) A/C system Refer to Service Manuals for discharge air temperature and operating pressure values for individual vehicle models. Refer to these Manuals for CFC-12 (R-12) A/C system values.

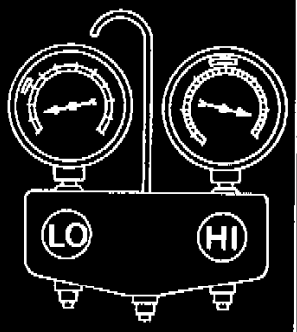
Diagnosis For Abnormal Pressure

Diagnosis for Abnormal Pressure

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Both high and low-pressure sides are too high. A  AC359A	• Pressure is reduced soon after water is splashed on condenser.	Excessive refrigerant charge in refrigeration cycle	Reduce refrigerant until specified pressure is obtained.
	Air suction by cooling fan is insufficient.	Insufficient condenser cooling performance ↓ ① Condenser fins are clogged. ② Improper fan rotation of cooling fan	• Clean condenser. • Check and repair cooling fan as necessary.
	• Low-pressure pipe is not cold. • When compressor is stopped high-pressure value quickly drops by approximately 196 kPa (2 kg/cm^2, 28 psi). It then decreases gradually thereafter.	Poor heat exchange in condenser (After compressor operation stops, high pressure decreases too slowly.) ↓ Air in refrigeration cycle	Evacuate repeatedly and recharge system.
	Engine tends to overheat.	Engine cooling systems malfunction.	Check and repair each engine cooling system.
	• An area of the low-pressure pipe is colder than areas near the evaporator outlet. • Plates are sometimes covered with frost.	• Excessive liquid refrigerant on low-pressure side • Excessive refrigerant discharge flow • Expansion valve is open a little compared with the specification. ↓ ① Improper thermal valve installation ② Improper expansion valve adjustment	Replace expansion valve.

Gauge Indication	Refrigerant cycle	Probable cause	Corrective action
High-pressure side is too high and low-pressure side is too low. B  AC360A	Upper side of condenser and high-pressure side are hot, however, liquid tank is not so hot.	High-pressure tube or parts located between compressor and condenser are clogged or crushed.	• Check and repair or replace malfunctioning parts. • Check lubricant for contamination.
High-pressure side is too low and low-pressure side is too high. C  AC356A	High and low-pressure sides become equal soon after compressor operation stops.	Compressor pressure operation is improper. ↓ Damaged inside compressor packings	Replace compressor.
	No temperature difference between high and low-pressure sides	Compressor discharge capacity does not change. (Compressor stroke is set at maximum.)	Replace compressor.
Both high- and low-pressure sides are too low. D  AC353A	• There is a big temperature difference between liquid tank outlet and inlet. Outlet temperature is extremely low. • Liquid tank inlet and expansion valve are frosted.	Liquid tank may be clogged.	• Replace liquid tank. • Check lubricant for contamination.
	• Temperature of expansion valve inlet is extremely low as compared with areas near liquid tank. • Expansion valve inlet may be frosted. • Temperature difference occurs somewhere in high-pressure side	High-pressure pipe located between liquid tank and expansion valve is clogged.	• Check and repair malfunctioning parts. • Check lubricant for contamination.

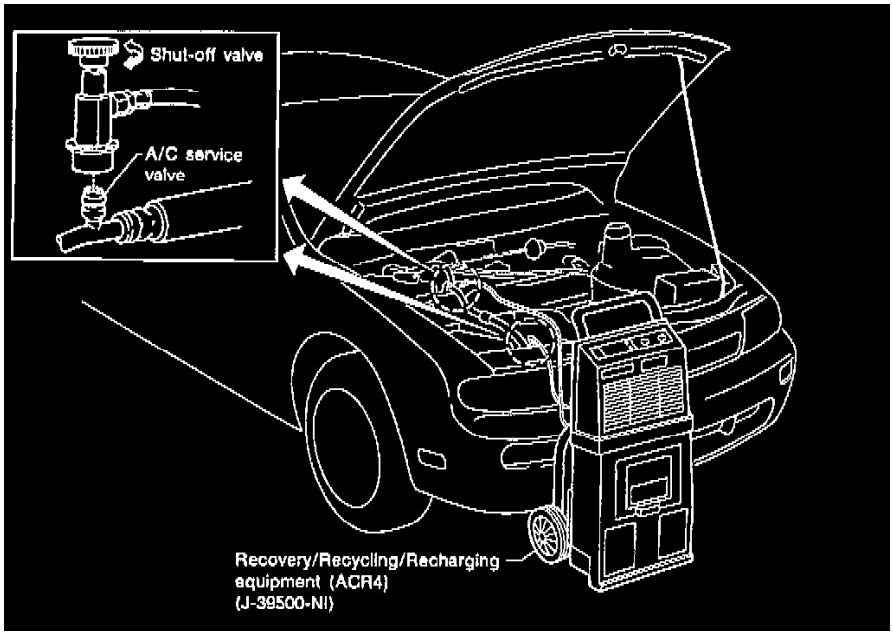
Gauge Indication	Refrigerant cycle	Probable cause	Corrective action
Both high- and low-pressure sides are too low. D  AC353A	There is a big temperature difference between expansion valve inlet and outlet while the valve itself is frosted.	Expansion valve closes a little compared with the specification. ↓ ① Improper expansion valve adjustment ② Malfunctioning thermal valve ③ Outlet and inlet may be clogged.	• Remove foreign particles by using compressed air. • Check lubricant for contamination.
	An area of the low-pressure pipe is colder than areas near the evaporator outlet.	Low-pressure pipe is clogged or crushed.	• Check and repair malfunctioning parts. • Check lubricant for contamination.
	Air flow volume is not enough or is too low.	Evaporator is frozen. ↓ Compressor discharge capacity does not change. (Compressor stroke is set at maximum length.)	Replace compressor.
Low-pressure side sometimes becomes negative. E  AC354A	• Air conditioning system does not function and does not cyclically cool the compartment air. • The system constantly functions for a certain period of time after compressor is stopped and restarted.	Refrigerant does not discharge cyclically. ↓ Moisture is frozen at expansion valve outlet and inlet. ↓ Water is mixed with refrigerant.	• Drain water from refrigerant or replace refrigerant. • Replace liquid tank.

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Low-pressure side becomes negative. F  AC362A	Liquid tank or front/rear side of expansion valve's pipe is frosted or dewed.	High-pressure side is closed and refrigerant does not flow. ↓ Expansion valve or liquid tank is frosted.	Leave the system at rest until no frost is present. Start it again to check whether or not the problem is caused by water or foreign particles. • If water is the cause, initially cooling is okay. Then the water freezes, causing a blockage. Drain water from refrigerant or replace refrigerant. • If due to foreign particles, remove expansion valve and remove the particles with dry and compressed air (not shop air). • If either of the above methods cannot correct the problem, replace expansion valve. • Replace liquid tank. • Check lubricant for contamination.

Whenever the high and/or low side pressure is abnormal, diagnose using a manifold gauge. The marker above the gauge scale in the tables indicates the standard (normal) pressure range. Since the standard (normal) pressure, however, differs from vehicle to vehicle, refer to ("Ambient air temperature-to-operating pressure").

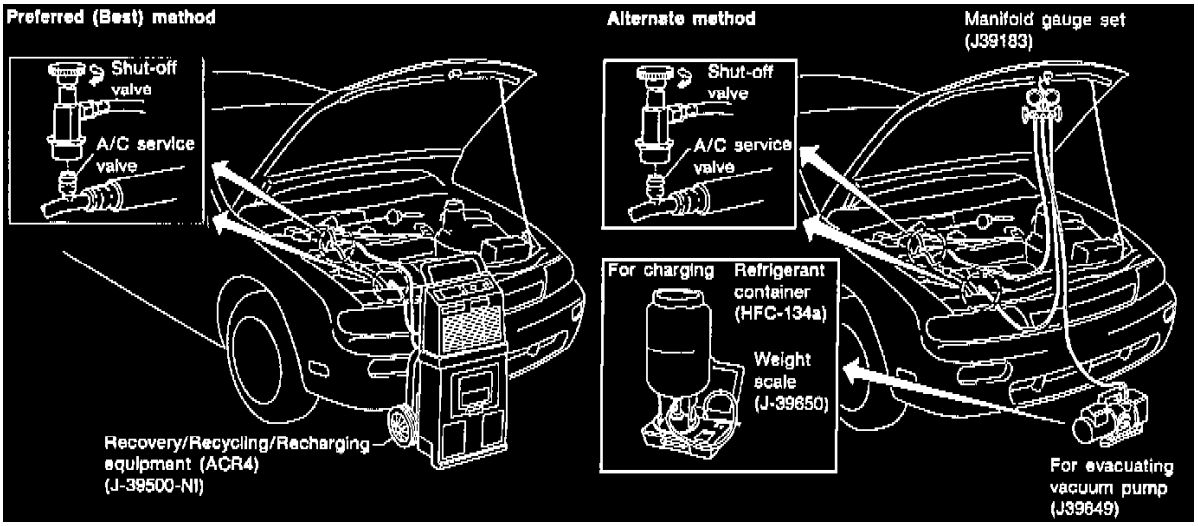
Service Procedures

DISCHARGING REFRIGERANT



WARNING:

Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Remove HFC-134a (R-134a) from A/C system using certified service equipment meeting requirements of SAE J2210 [HFC-134a (R-134a) recycling equipment] or J2209 [HFC-134a (R-134a) recovery equipment]. If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety Information may be obtained from refrigerant and lubricant manufacturers.



EVACUATING SYSTEM AND CHARGING REFRIGERANT

Maintenance of Lubricant Quantity in

Compressor

The lubricant used to lubricate the compressor circulates through the system with the refrigerant. Add lubricant to compressor when replacing any component or after repairing a large gas leak. It is important to maintain the specified amount. If lubricant quantity is not maintained properly, the following malfunctions may result:

^ Lack of lubricant: May lead to a seized compressor
^ Excessive lubricant: Inadequate cooling (thermal exchange interference)

LUBRICANT

Swash plate compressor and V-6 compressor

Name: Nissan A/C System Oil Type S
Part number: KLH00-PAGS1

Vane rotary compressor

Name: Nissan A/C System Oil Type R
Part number: KLH00-PAGR1

CHECKING AND ADJUSTING

CHECKING AND ADJUSTING

Adjust the lubricant quantity according to the flowchart shown below.

START

Can oil return operation be performed?
- A/C system works properly.
- There is no evidence of a large amount of oil leakage.

Yes → Perform oil return operation, proceeding as follows:

1. Start engine, and set the following conditions:
   - **Test condition**
     Engine speed: Idling to 1,200 rpm
     A/C or AUTO switch: ON
     Blower speed: Max. position
     Temp. control: Optional [Set so that intake air temperature is 25 to 30°C (77 to 86°F).]
2. **Next item is for V-6 compressor. Connect the manifold gauge, and check that the high pressure side pressure is 588 kPa (6 kg/cm², 85 psi) or higher.**
   If less than the reference level, attach a cover to the front face of the condenser to raise the pressure.
3. Perform lubricant return operation for about 10 minutes.
4. Stop engine.

CAUTION:
If excessive oil leakage is noted, do not perform the oil return operation.

No

Should the compressor be replaced?

No → Yes → Ⓐ

Is there any part to be replaced? (Evaporator, condenser, liquid tank or in case there is evidence of a large amount of lubricant leakage.)

Yes → After replacing any of the following major components, add the correct amount of lubricant to the system.

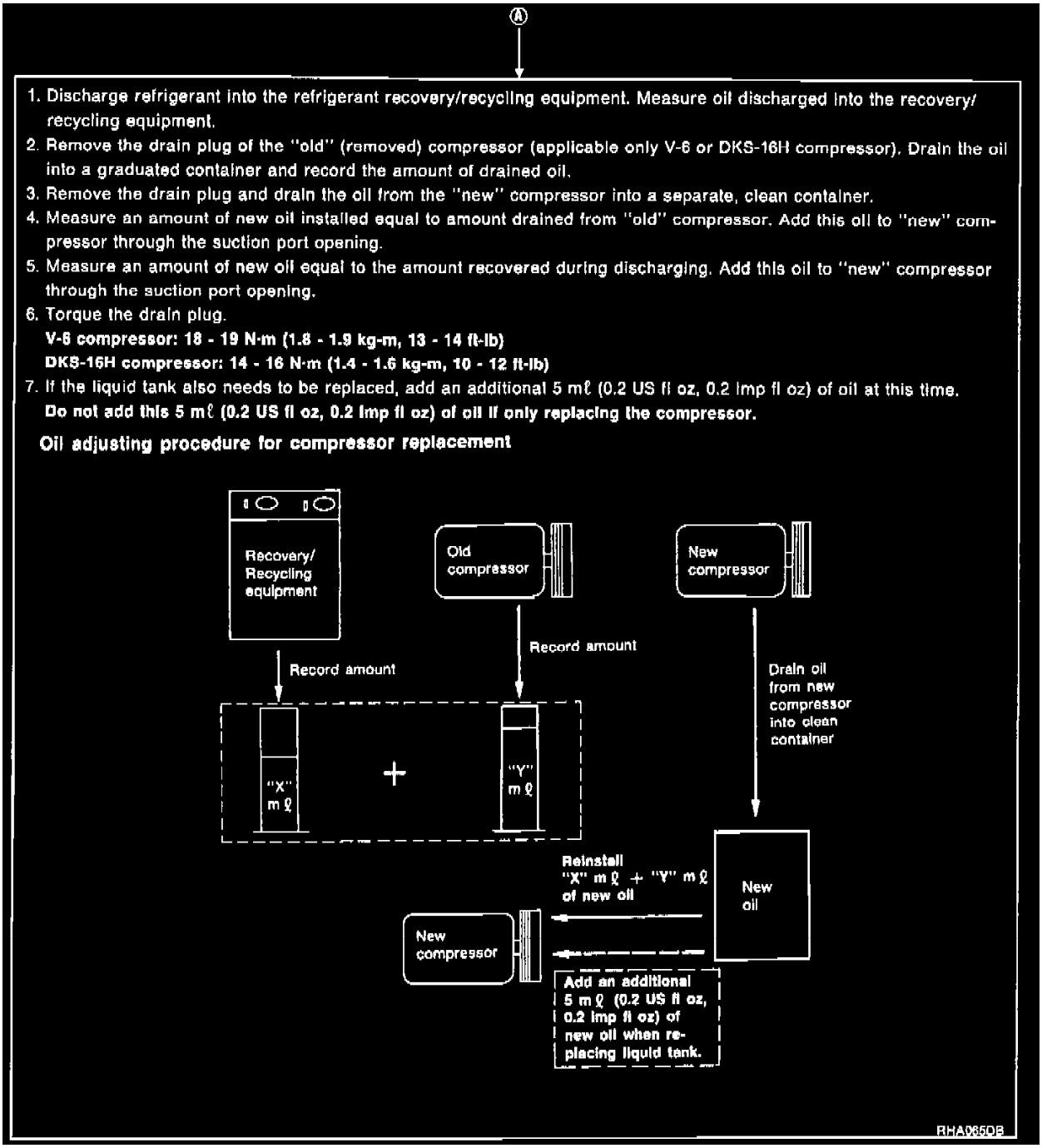
Amount of lubricant to be added

Part replaced	Lubricant to be added to system Amount of lubricant mℓ (US fl oz, Imp fl oz)	Remarks
Evaporator	75 (2.5, 2.6)	—
Condenser	75 (2.5, 2.6)	—
Liquid tank	5 (0.2, 0.2)	Add if compressor is not replaced. *1
In case of refrigerant leak	30 (1.0, 1.1)	Large leak
	—	Small leak*2

No

Carry out the A/C performance test.

*1: If compressor is replaced, addition of lubricant is included in the flow chart.
*2: If refrigerant leak is small, no addition of lubricant is needed.



Adjust the lubricant quantity according to the flowchart shown.

LUBRICANT AND REFRIGERANT

Model	J30	B13
Compressor Type	ZEXEL DKS-16H	ZEXEL DKV-14C
Lubricant Name	Nissan A/C System Oil Type S	Nissan A/C System Oil Type R
Part Number	KLH00-PAGS1	KLH00-PAGR1
Capacity ml (US fl oz, Imp fl oz)	200 (6.8, 7.0)	
Refrigerant Type	HFC-134a (R-134a)	
Capacity Kg (lb)	750 - 850 (1,654 - 1,874)	550 - 650 (1,213 - 1,433)

Technical Service Bulletin # **91060** Date: **910613**

A/C - ACR-3 Refrigerant Recovery and Recycling Machine

Nissan-Datsun Truck PL720 2WD L4-1952cc 2.0L SOHC (Z20)

Models: All models

Section: Heater & Air Conditioner

Classification: HA91-011

Bulletin No.: NTB91-060

Date: June 13, 1991

ACR-3 REFRIGERANT RECOVERY AND RECYCLING MACHINE

APPLIED MODELS: All

SERVICE INFORMATION:
When performing any A/C service, use the Kent-Moore ACR-3, or equivalent, refrigerant recovery and recycling equipment. The equipment is easy to use and benefits you by:

1. Saving Money: Using recycled R-12 saves the cost of buying new R-12, which is becoming more expensive as its production is limited.

2. Health Benefits: Recovering R-12, instead of venting it to the atmosphere, reduces skin cancer risk for humans. When the fluorocarbons in R-12 combine with other chemicals in the atmosphere, the ozone layer is progressively destroyed. The ozone layer helps protect us from the harmful ultraviolet rays of the sun (see NTB90-028; HA90-006 for further details).

3. Complying with EPA regulations: The Clean Air Act Amendments have now passed; you will be required by Federal Law to recover A/C refrigerant. Some areas are already enforcing refrigerant recovery laws and fining dealers who do not recover R-12 when they service an A/C system.

To help you recover and recycle R-12, this Bulletin outlines the use and simple maintenance of the Kent-Moore ACR-3. For detailed information, refer to the manufacturer's instructions. This Bulletin is intended only as a brief summary.

I.General Use and Cautions

- ^ The ACR-3 is a recovery and recycling station, only. The ACR-3 is not a recharging station.
- ^ The recovery pump is not a vacuum pump. A separate vacuum pump must be used to evacuate before recharging.
- ^ Recover the refrigerant from several vehicles before you recycle. There must be a minimum of a 8 lbs. of refrigerant in the tank to recycle.
- ^ Use the 30 lb. containers which come with the ACR-3 and are labeled, "Refillable Refrigerant Tank."
- ^ After every R-12 recovery, purge the oil from the ACR-3 to relieve head pressure in the oil separator and to determine how much oil to add back to the A/C system.
- ^ Before you recover R-12, check the tank and see how full it is. If the tank is almost full, recycle and, prior to recovery, replace the tank with the back-up tank initially supplied with the unit. If the tank fills during a job, it will shut off.
- ^ Do not remove the tank with recovered refrigerant that has not been "recycled." In this context, "recycled" means to remove moisture from the recovered refrigerant. Recovered refrigerant is not ready to reuse until it has been "recycled." Once the refrigerant is recycled, it is ready to be used to charge vehicle A/C systems.
- ^ Recycled refrigerant is as good as new. Recycled R-12 is approved for use by all major compressor manufacturers.
- ^ If the recycling feature is not functioning properly, contact Kent-Moore at (800) 345-2233.

NOTE: Before calling, locate and record your unit's serial number.

II. Initial Set-Up, Tank Installation

There are basically two (2) steps to prepare the machine for use the first time: ^1. Tank Installation & ^2. Filter/Dryer Core Installation.

1. Tank Installation

NOTE: For safety reasons, use only authorized reuseable refrigerant tanks, which are labeled "Refillable Refrigerant Tank." Part number information is located on page 7 of the Kent-Moore Instruction Manual.

- ^ Open either valve on the tank to purge the shipping charge of nitrogen.
- ^ Place the tank on the scale and attach the strap loosely around the tank.

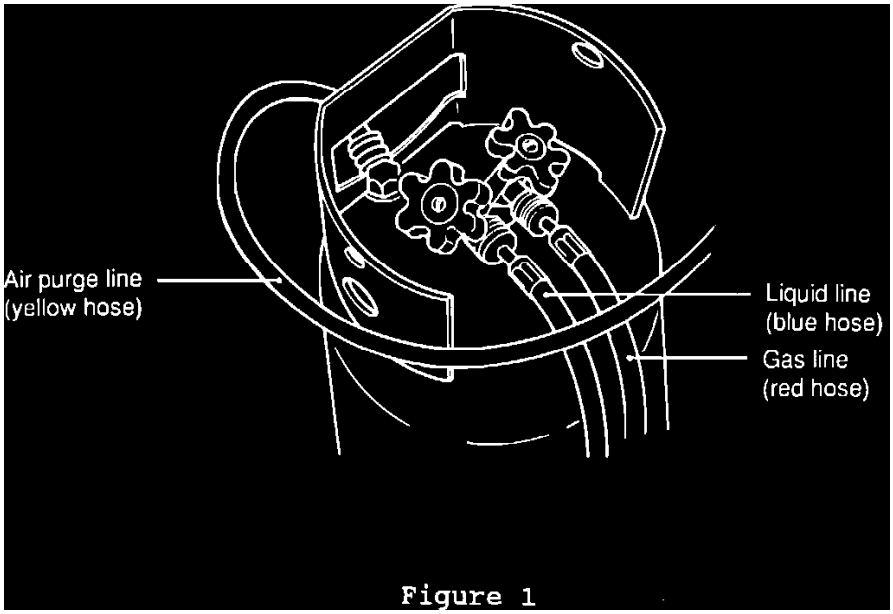


Figure 1

^ Attach the red hose from the back of the ACR-3 (Figure 1) to a vacuum pump.

^ Attach the blue hose from the back of the ACR-3 to the liquid port of the tank.
^ Attach the yellow hose from the back of the ACR-3 to the elbow on the tank.
^ Open the liquid valve on the tank (gas valve closed) and turn on the vacuum pump. Evacuate the tank and the ACR-3 for 10 minutes.
^ Disconnect the vacuum pump while it is running. Disconnect the red hose from the pump and attach it to the gas port on the tank.

2.Filter Installation

NOTE: Do not remove the filter from the can until just before installation, so the new filter does not absorb moisture from the air.

^ Close the liquid valve on the tank and disconnect the blue hose from the tank.
^ Attach the blue hose to the inlet connection on the side of the ACR-3.
^ Press the recovery start button and allow the machine to operate until it shuts off.
^ Loosen the eight (8) bolts and remove the endplate.
^ Remove the cardboard filler from the filter area.
^ Remove the filter and the gasket from the can. Install the new filter. Install the new gasket.

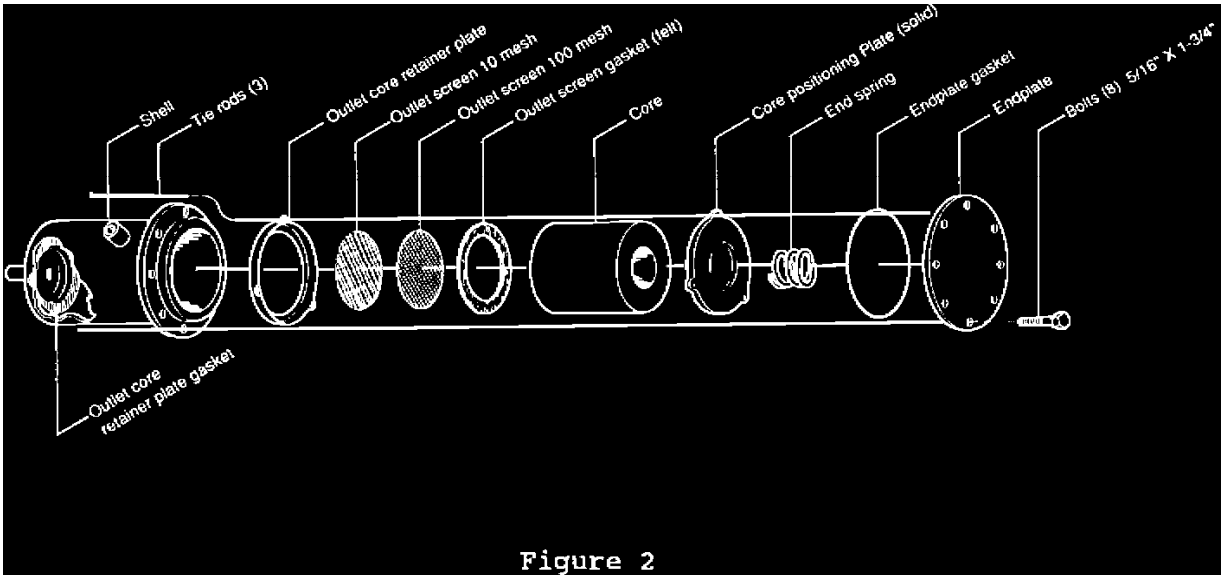


Figure 2

^ Reassemble the filter as shown (Figure 2).

^ Tighten the eight (8) bolts in a star pattern. Torque to 15 ft.lbs.
^ Remove the blue hose from the tank and attach it to a vacuum pump.
^ Evacuate for approximately 10 minutes to remove air that entered the ACR-3 during the filter installation.
^ Reattach the blue hose.

NOTE: Order additional filters to have available during servicing. Part number information can be found on page 7 of the Kent-Moore Instruction Manual.

3.Recovery Use

NOTE: When handling refrigerant, always wear gloves and eye protection. Refrigerant is very cold and can cause injury if contacted.

a. Recovery means pulling the refrigerant out of the system and storing it. Recovered refrigerant is not ready to reuse. It is stored in the machine, but it must be recycled before it is ready for reuse. Recover the refrigerant from several vehicles before recycling.
b. Connect a manifold gauge set to the A/C system and connect the center hose to the inlet connection on the side of the ACR-3.
c. Open the valves on the manifold gauge set and the tank. Be sure that the accumulator and oil drain valves are closed.

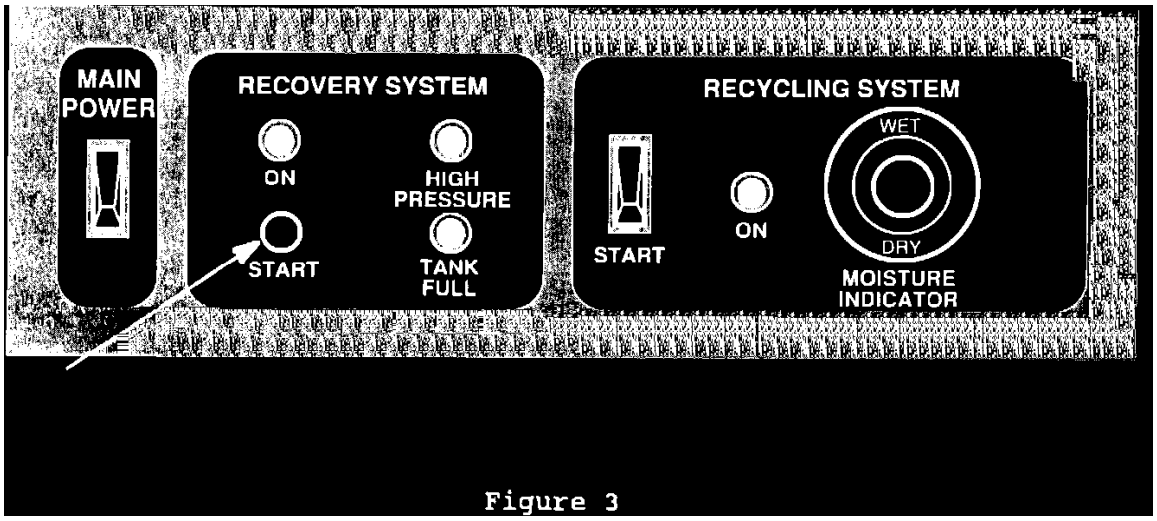


Figure 3

d. Plug in the ACR-3 and turn on the power switch on top of the unit (Figure 3).

e. Be sure the recycling switch is off; press the recovery start button. The amber light should come on.
f. Wait for the refrigerant to be recovered. The system will shut off when the refrigerant is recovered. This should take approximately five minutes.
g. To drain the oil separator, open the accumulator pressurizing valve for approximately 30 seconds. Close this valve and open the oil drain valve slowly.
h. Measure the amount of oil drained. This amount of new oil must be added back into the A/C system.

4.Recycling Use

a. Recycling means making the recovered refrigerant ready to reuse by removing the moisture and air.

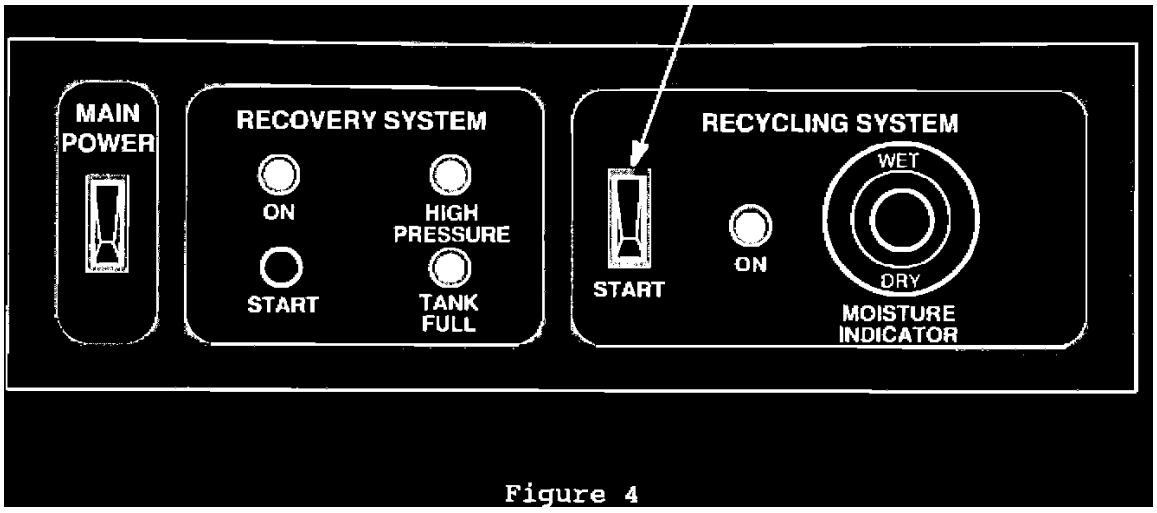


Figure 4

b. When the tank is full of recovered refrigerant, the limit switch will cause the "TANK FULL" light to come on. When this light is on, no more refrigerant can be recovered until the refrigerant in the tank is recycled (Figure 4).

c. Place the machine out of the way; turn it on and start the recycling operation. If bubbles appear in the moisture indicator and do not disappear after a few seconds, there is not enough refrigerant to recycle yet.
d. If the bubbles clear, allow the ACR-3 to recycle for 30 minutes. After 30 minutes, check the moisture indicator. If the indicator is yellow, there is still moisture in the refrigerant.
e. Keep recycling until the moisture indicator turns deep green. If the indicator does not turn green after two hours, the filter must be replaced. Follow the previously-stated filter replacement instructions to replace the filter.
f. If the moisture indicator is still not green - after a new filter has been installed and the recycler was run for two (2) hours - contact Kent-Moore at (800) 345-2233.

g. When the moisture indicator is green, turn off the unit. Close the valves on the tank and remove the tank from the unit. This tank is now ready to charge back into vehicles.
h. Install a new tank onto the ACR-3.

Technical Service Bulletin # **AC86011** Date: **860710**

A/C - Component Service Kit

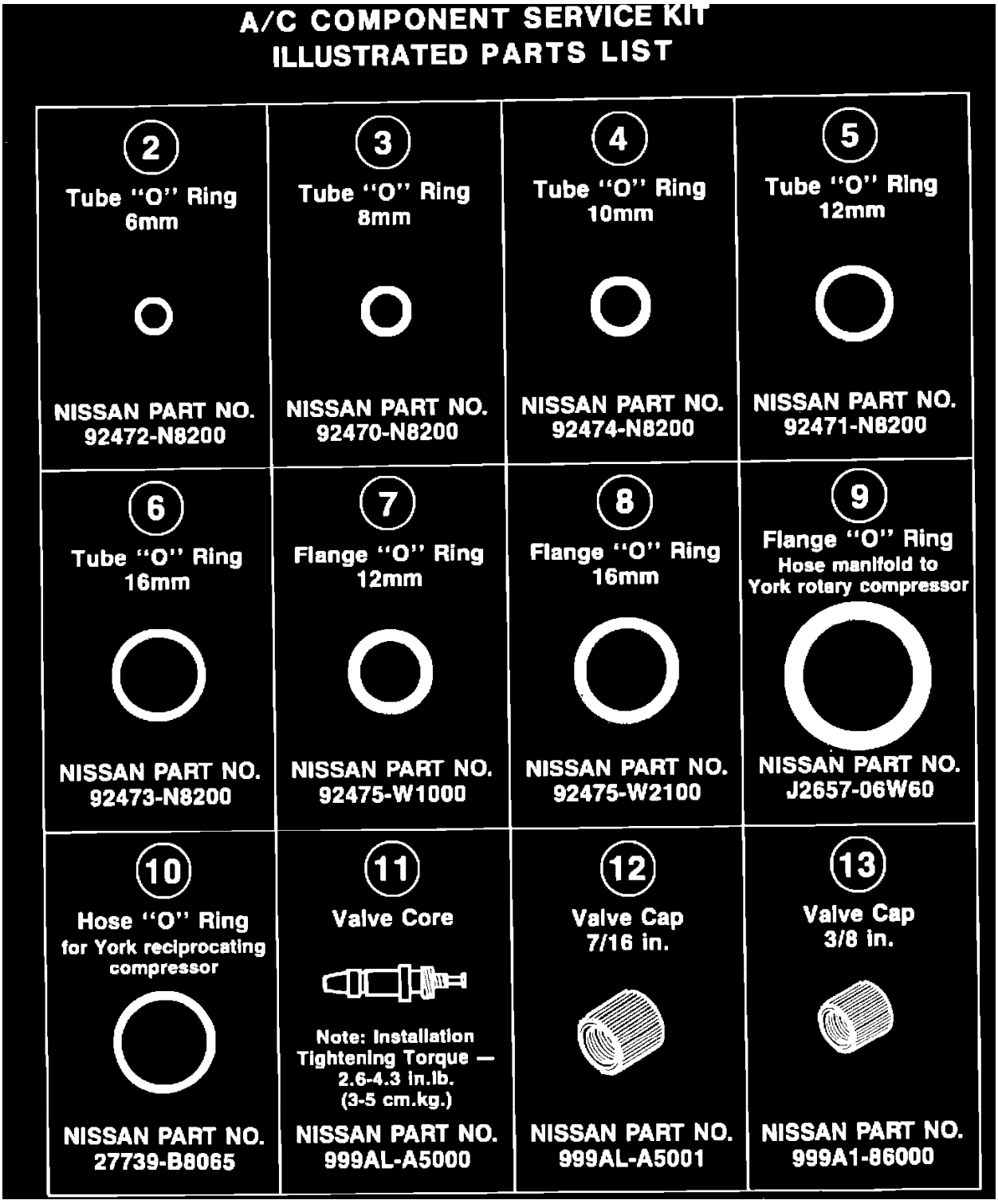
Models All Models

Section Air Conditioning

Classification AC86-011

Bulletin No. TS86-126

Date July 10, 1986



AIR CONDITIONER COMPONENT SERVICE KIT

Nissan Air Conditioner Component Service Kit, P/N 999A1-A6000, is now available for use on 1981-1987 Nissan model air conditioning systems. This compact kit contains many of the routine air conditioner replacement parts (i.e. O-rings, valve cores, valve caps) regularly used to repair or rebuild various A/C components.

The various kit parts are contained in re-sealable packages of 10, and are organized within a 7" x 11" plastic box. The re-sealable packages will extend kit component life, particularly the O-rings.

An illustrated parts listing attached to the inside cover of the kit details the part name and number for each kit component, along with an actual size illustration for easy technician identification. For your reference, a sample listing of the kit components can be found on next page.

In addition, the kit also contains a detailed component application chart for most current model Nissan vehicles. This chart shows where the various kit components are located in each model A/C system. Three copies of this chart are attached to this bulletin for your reference. Please note that as each new Nissan model is introduced, the application chart will be updated with the new information, and then be distributed to you.

Technical Service Bulletin # **HA87004** Date: **870227**

Defroster - Poor Performance Explanation

Models All Models

Section Heater & Air Conditioner

Classification HA87-004

Bulletin No. TS87-036

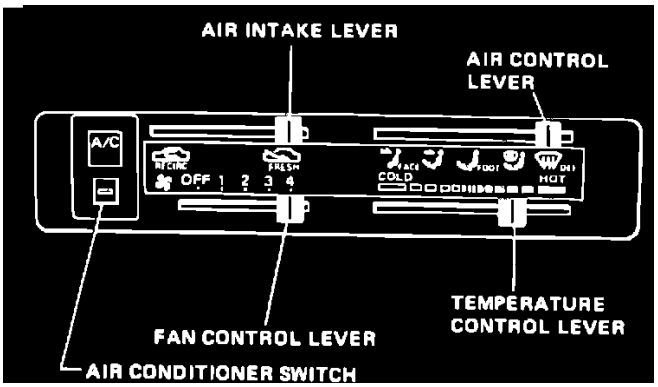
Date February 27, 1987

DEFROSTER PERFORMANCE

APPLIED MODELS: All Models

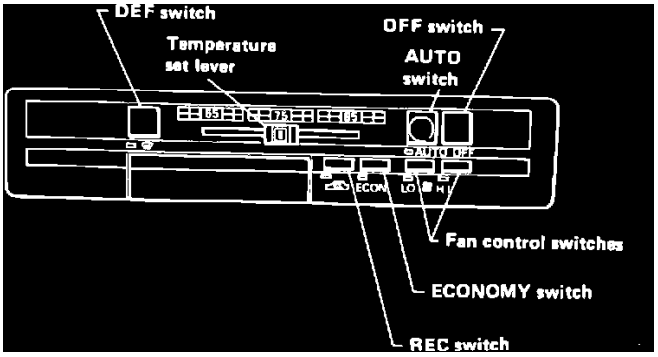
SERVICE INFORMATION

If a customer complains about poor defroster performance, use the following information to instruct the customer for optimum defroster performance.



Manual Systems

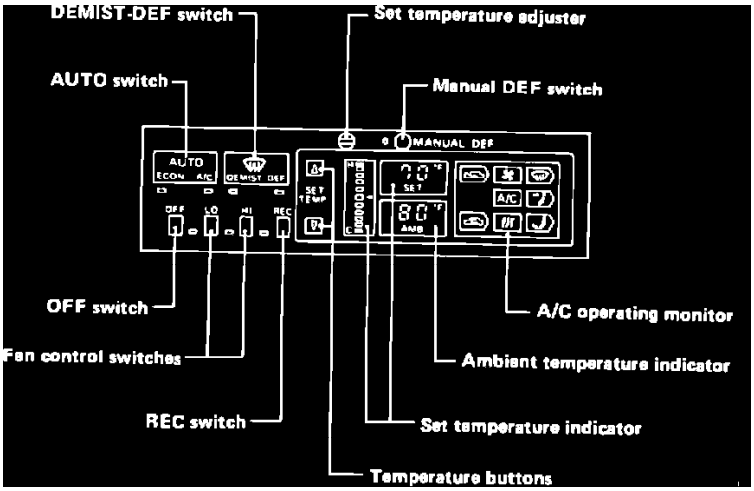
1. Set the air intake lever to the fresh position.
2. Set the air control lever to the defrost (DEF) position.
3. Turn on the fan control lever (# 4 position for quick defrost).
4. Set the temperature control lever to the middle through the "HOT" position.
5. If vehicle is equipped with air conditioning, push the A/C switch "ON".



Automatic Systems

A. Maxima:

1. Push the defrost (DEF) switch on.
2. Move the temperature set lever to the desired position.
3. Push the "HI" fan control switch for quick defrost.
4. Do not push the "REC" switch. The "REC" switch will not be activated when system is in the "DEF" mode.



B. 300ZX:

1. Push the "DEMIST-DEF" switch to the "DEF" mode. The temperature will automatically shift to full hot, the "SET" display will show 90~F and the fan speed will automatically switch to "HI". If less air flow is desired, push the "LOW" fan control switch.
2. Do not push the "REC" switch. The "REC" switch will not be activated when the system is in the "DEF" mode.

NOTE: Use the manual "DEF" switch only if the air conditioner is malfunctioning. When the manual "DEF" switch is pushed, the defroster operates in the full hot, high fan speed mode and all other controls are deactivated. Push the manual "DEF" switch again to activate the other controls.

Technical Service Bulletin # **94091** Date: **941126**

A/C - Retrofit Service Procedures

Classification: HA94-005

Section: Air Conditioning

Reference: TECHNICAL BULLETIN NTB94-091

Models: See below

Date: September 26, 1994

SERVICE PROCEDURE FOR RETROFITTED A/C SYSTEMS

APPLIED MODEL:
All models except Quest equipped with a retrofitted A/C system

Service Information

This technical Bulletin details the general service information for all models retrofitted to HFC-134a (R-134a) A/C systems, using a Nissan

approved kit.

This Bulletin also describes the specific details of the J3O and B13 models retrofitted to HFC-134a (R-134a) A/C systems.

Refer to the appropriate service Manual, the Retrofit Kit Installation Manual for each model, and NTB93-001 for information not included in this Technical Bulletin.

The technical bulletin NTB93-001 (Classification number HA93-OO1), entitled "A/C SYSTEM CHANGES FOR R-134a REFRIGERANT (All Models)" describes general differences between the R-12 system and the R-134a system.

IMPORTANT POINTS

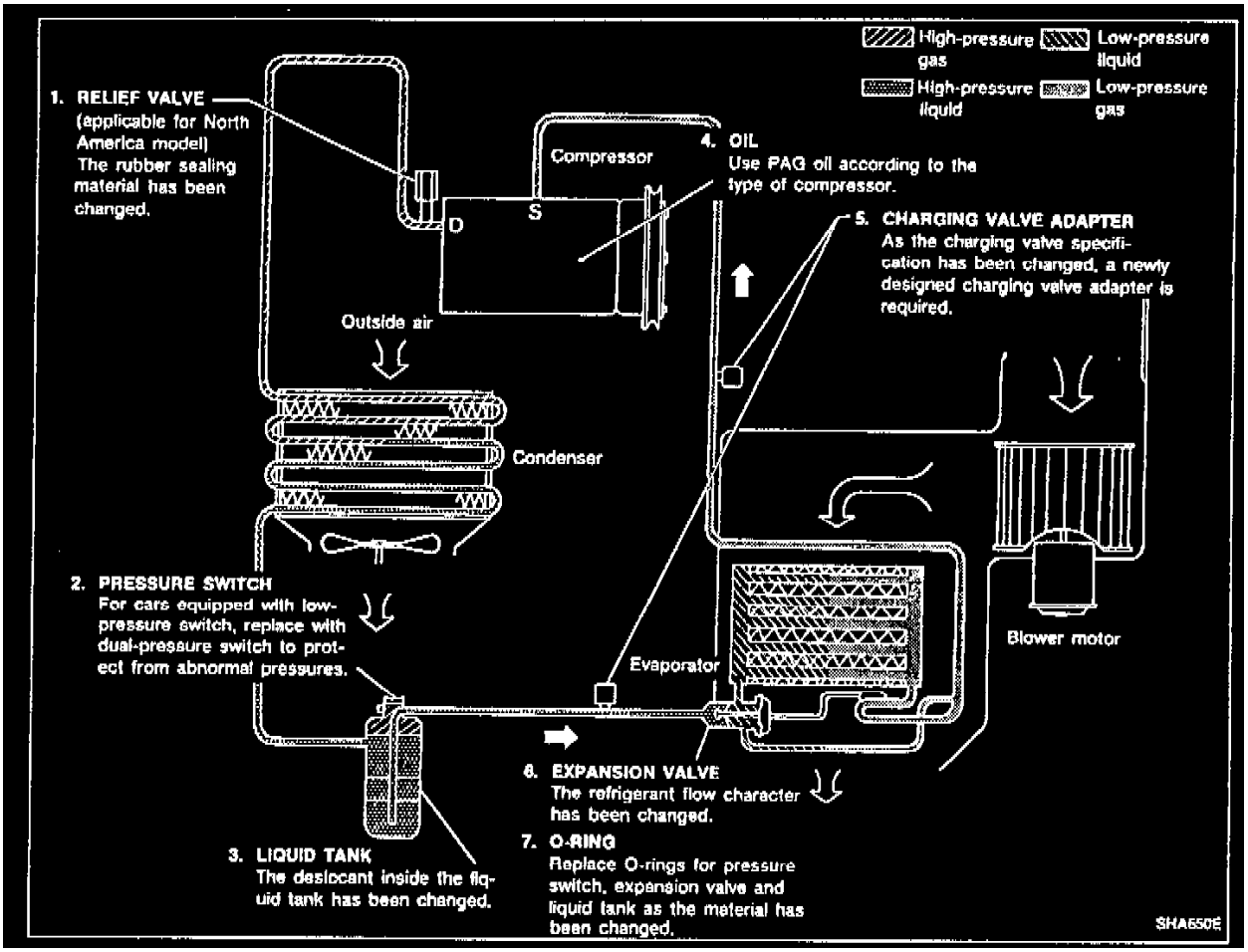
^ If the vehicle equipped with retrofit A/C system has a sight glass, do not use the sight glass to check refrigerant level because R-134a and the PAG lubricants do not exhibit "clear sight glass" characteristics, even when properly charged.

^ When charging R-134a systems, use the ACR4 Recovery/Recycling/Recharging equipment (J-39500) to insure accurate charging (to .01 lb).

^ If an R-134a system is suspected to be low on refrigerant charge, first perform a system leak check using the R-134a leak detector. After repairing any leaks found, charge the system using the ACR4 Recovery/ Recycling/Recharging equipment (J-39500).

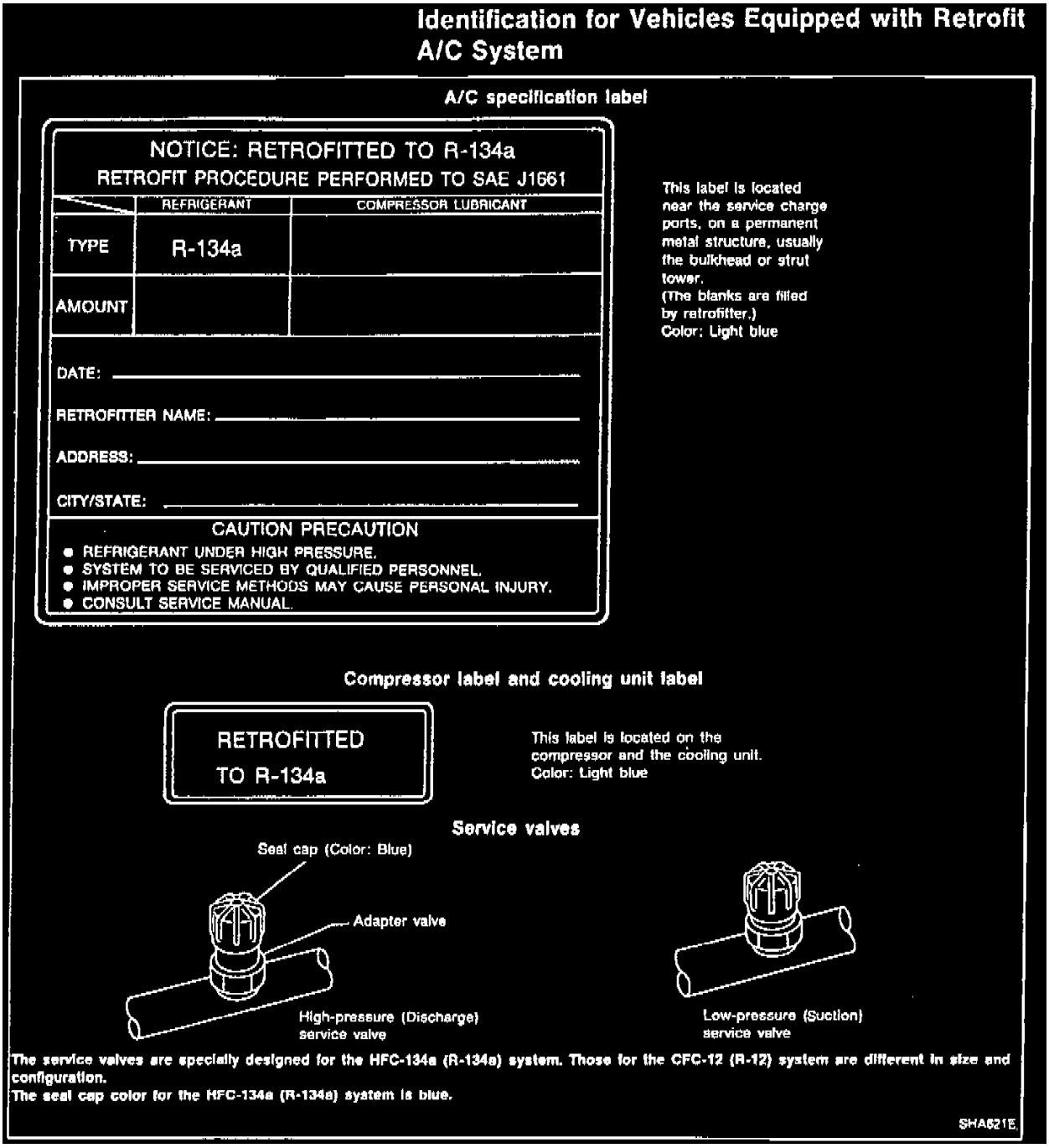
^ Use only Nissan A/C system oil type R for vane rotary compressor, and use only Nissan A/C System Oil Type S for swash plate compressor and V-6 variable displacement compressor. If another lubricant is used, compressor failure is likely to occur.

Typical Replacement Parts For Retrofit A/C System



Typical replacement parts for a RETROFIT are listed. See illustration.

Precautions and Preparation



Identification for Vehicles Equipped with Retrofit A/C System

PRECAUTIONS FOR WORKING WITH HFC-134a (R-134a)

WARNING:

- CFC-12 (R-12) refrigerant and HFC-134a (R-134a) refrigerant are not compatible. These refrigerants must never be mixed, even in the smallest amounts. If the refrigerants are mixed, compressor failure is likely to occur.
- Use only specified lubricant for the HFC-134a (R-134a) A/C system and HFC-134a (R-134a) components. If lubricant other than that specified is used, compressor failure is likely to occur.
- The specified HFC-134a (R-134a) lubricant rapidly absorbs moisture from the atmosphere. The following handling precautions must be observed:

  a: When removing refrigerant components from a vehicle, immediately cap (seal) the component to minimize the entry of moisture from the atmosphere.

  b: When installing refrigerant components to a vehicle, do not remove the caps (unseal) until just before connecting the components. Connect all refrigerant loop components as quickly as possible to minimize the entry of moisture into system.

  c: Only use the specified lubricant from a sealed container. immediately reseal containers of lubricant. Without proper sealing, lubricant will become moisture saturated and should not be used.

  d: Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Remove HFC-134a

(R-134a) from A/C system, using certified service equipment meeting requirements of SAE J221O (R-134a recycling equipment), or J2209 (R-134a recovery equipment). If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.

e: Do not allow lubricant (Nissan A/C System Oil Type S) to come in contact with styrofoam parts. Damage may result.

GENERAL REFRIGERANT PRECAUTIONS

WARNING:

^ Do not release refrigerant into the air. Use approved recovery/recycling equipment to capture the refrigerant every time an air conditioning system is discharged.

^ Always wear eye and hand protection (goggles and gloves) when working with any refrigerant or air conditioning system.

^ Do not store or heat refrigerant containers above 52° (125°F).

^ Do not heat a refrigerant container with an open flame; if container warming is required, place the bottom of the container in a warm pail of water.

^ Do not intentionally drop, puncture, or incinerate refrigerant containers.

^ Keep refrigerant away from open flames: poisonous gas will be produced if refrigerant burns.

^ Refrigerant will displace oxygen, therefore be certain to work in well ventilated areas to prevent suffocation.

^ Do not introduce compressed air to any refrigerant container or refrigerant component.

PRECAUTIONS FOR REFRIGERANT SERVICE

WARNING:

Make sure all refrigerant is discharged into the recycling equipment and the pressure in the system is less than atmospheric pressure. Then gradually loosen the discharge side hose fitting and remove it.

CAUTION:

When replacing or cleaning refrigerant cycle components, observe the following.

^ When the compressor is removed, store it in the same position as it is when mounted on the car. Failure to do so will cause lubricant to enter the low pressure chamber.

^ When connecting tubes, always use a torque wrench and a back-up wrench.

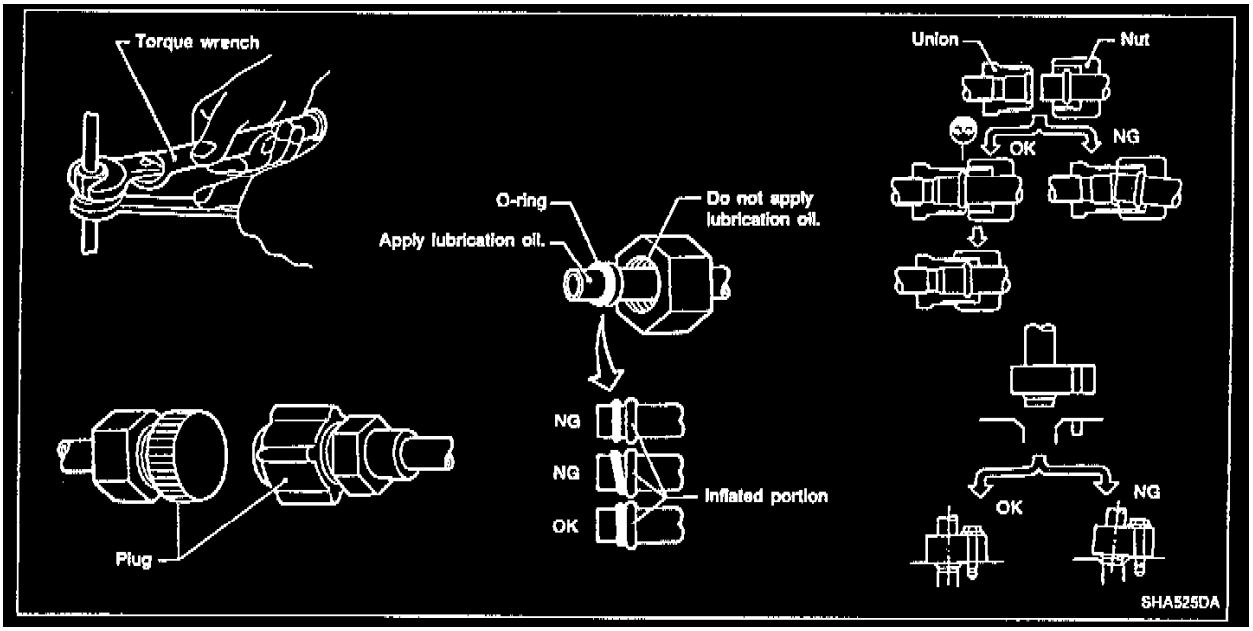
^ After disconnecting tubes, immediately plug all openings to prevent entry of dirt and moisture.

^ When installing an air conditioner in the vehicle, connect the pipes as the final stage of the operation. Do not remove the seal caps of pipes and other components until just before required for connection.

^ Allow components stored in cool areas to warm to working area temperature before removing seal caps. This prevents condensation from forming inside A/C components.

^ Thoroughly remove moisture from the refrigeration system before charging the refrigerant.

^ Always replace used 0-rings.



^ When connecting tube, apply lubricant to portions shown in illustration. Be careful not to apply lubricant to threaded portion.

Lubricant name:
Nissan A/C System Oil Type S (For swash plate type compressor and V-6 compressor)

Nissan A/C System Oil Type R (For vane rotary type compressor)

Part number:
KLHO0-PAGS1 (For swash plate type compressor and V-6 compressor)
KLH0O-PAGR1 (For vane rotary type compressor)

^ O-ring must be closely attached to inflated portion of tube.

^ After inserting tube into union until O-ring is no longer visible, tighten nut to specified torque.

^ After connecting line, conduct leak test and make sure that there is no leakage from connections. When the gas leaking point is found, disconnect that line and replace the O-ring. Then tighten connections of seal seat to the specified torque.

PRECAUTIONS FOR SERVICING COMPRESSOR

^ Plug all openings to prevent moisture and foreign matter from entering.

^ When the compressor is removed, store it in the same position as it is when mounted on the car.

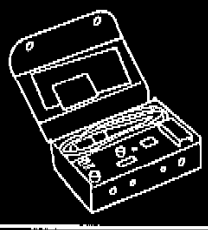
^ When replacing or repairing compressor, follow "Maintenance of Lubricant Quantity in Compressor" exactly.

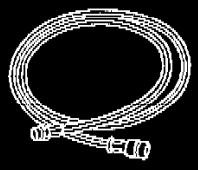
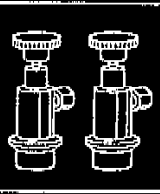
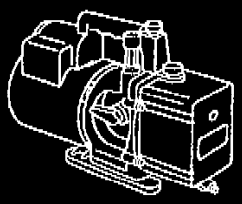
^ Keep friction surfaces between clutch and pulley clean. If the surface is contaminated, with lubricant, wipe it off by using a clean waste cloth moistened with thinner.

^ After compressor service operation, turn the compressor shaft by hand more than five turns in both directions. This will equally distribute lubricant inside the compressor. After the compressor is installed, let the engine idle and operate the compressor for one hour.

^ After replacing the compressor magnet clutch, apply voltage to the new one and check for normal operation.

HFC-134a (R-134a) Service Tools and Equipment

Tool number (Kent-Moore No.) Tool name	Description	Note
HFC-134a (R-134a) refrigerant	 NT196	Container color: Light blue Container marking: HFC-134a (R-134a) Fitting size: Thread size • 14 kg (30 lb) container 1/2"-16 ACME
KLH00-PAGS1 (—) Nissan A/C System Oil Type S	 NT197	Type: Poly alkylene glycol oil (PAG), type S Application: HFC-134a (R-134a) swash plate (piston) compressors (Nissan only) Lubricity: 40 mℓ (1.4 US fl oz, 1.4 Imp fl oz)
KLH00-PAGR1 (—) Nissan A/C System Oil Type R		Type: Poly alkylene glycol oil (PAG), type R Application: HFC-134a (R-134a) vane rotary compressors (Nissan only) Lubricity: 40 mℓ (1.4 US fl oz, 1.4 Imp fl oz)
(J-39500-NI) Recovery/Recycling/ Recharging equipment (ACR4)	 NT195	Function: Refrigerant Recovery and Recycling and Recharging
(J-39400) Electrical leak detector	 NT198	Power supply: • DC 12 V (Cigarette lighter or battery terminals)

Tool number (Kent-Moore No.) Tool name	Description	Note
(J-39183) Manifold gauge set (with hoses and couplers)	 NT199	Identification: • The gauge face indicates R-134a. Fitting size: Thread size • 1/2"-16 ACME • Couplers
Service hoses • High side hose (J-39501-72) • Low side hose (J-39502-72) • Utility hose (J-39476-72)	 NT201	Hose color: • Low hose: Blue with black stripe • High hose: Red with black stripe • Utility hose: Yellow with black stripe or green with black stripe Hose fitting to gauge: • 1/2"-16 ACME
Service couplers • High side coupler (J-39500-20) • Low side coupler (J-39500-24)	 NT202	Hose fitting to service hose: • M14 x 1.5 fitting is optional or permanently attached.
(J-39650) Refrigerant weight scale	 NT200	For measuring of refrigerant Fitting size: Thread size • 1/2"-16 ACME
(J-39649) Vacuum pump (Including the isolator valve)	 NT203	Capacity: • Air displacement: 4 CFM • Micron rating: 20 microns • Oil capacity: 482 g (17 oz) Fitting size: Thread size • 1/2"-16 ACME

Refrigerant container fittings, service hose fittings and service equipment fittings (equipment which handles refrigerant and/or lubricant) are different between CFC-12 (R-12) and HFC-134a (R-134a). This is to avoid mixed use of the refrigerants/lubricant.

PRECAUTIONS FOR SERVICE EQUIPMENT

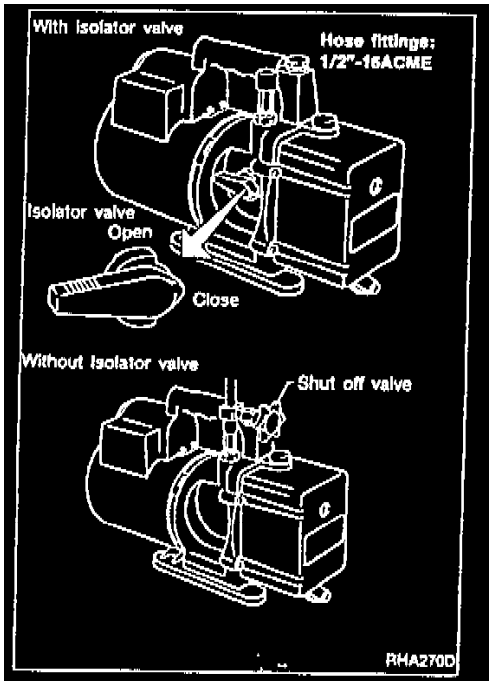
RECOVERY/RECYCLING/RECHARGING EQUIPMENT

Be certain to follow the manufacturers instructions for machine operation and machine maintenance. Never introduce any refrigerant other than that specified into the machine.

ELECTRONIC LEAK DETECTOR

Be certain to follow the manufactures instructions for tester operation and tester maintenance.

VACUUM PUMP



The lubricant contained inside the vacuum pump is not compatible with the specified lubricant for HFC-134a (R-134a) A/C systems. The vent side of the vacuum pump is exposed to atmospheric pressure. So the vacuum pump lubricant may migrate out of the pump into the service hose. This is possible when the pump is switched off after evacuation (vacuuming) and hose is connected to it.

To prevent this migration, use a manual valve placed near the hose-to-pump connection, as follows.

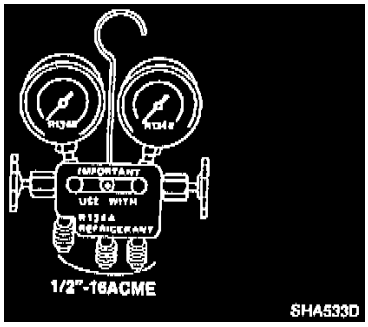
^ Usually vacuum pumps have a manual isolator valve as part of the pump. Close this valve to isolate the service hose from the pump.

^ For pumps without an isolator, use a hose equipped with a manual shut-off valve near the pump end. Close the valve to isolate the hose from the pump.

^ If the hose has an automatic shut off valve, disconnect the hose from the pump. As long as the hose is connected, the valve is open and lubricating oil may migrate.

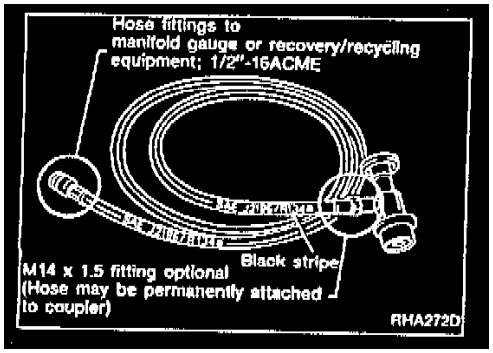
Some one-way valves open when vacuum is applied and close under a no vacuum condition. Such valves may restrict the pump's ability to pull a deep vacuum and are not recommended.

MANIFOLD GAUGE SET



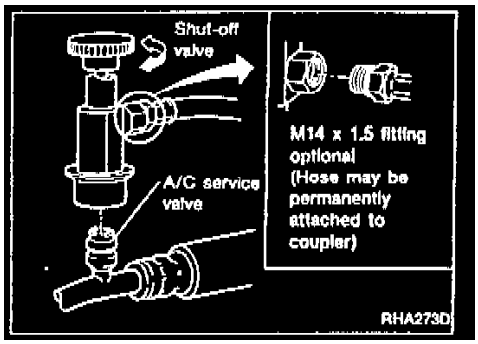
Be certain that the gauge face indicates R-134a or 134a. Be sure the gauge set has 1/2"-16 ACME threaded connections for service hoses. Confirm the set has been used only with refrigerant HFC-134a (R-134a) and specified lubricants.

SERVICE HOSES



Be certain that the service hoses display the markings described (colored hose with black stripe). All hoses must include positive shut off devices (either manual or automatic) near the end of the hoses opposite the manifold gauge.

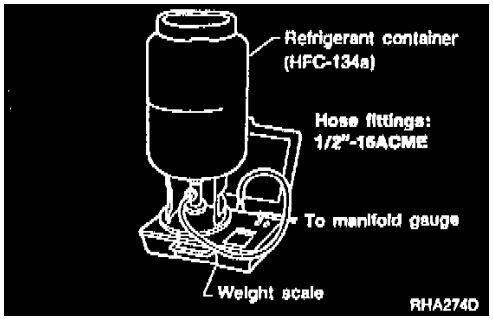
SERVICE COUPLERS



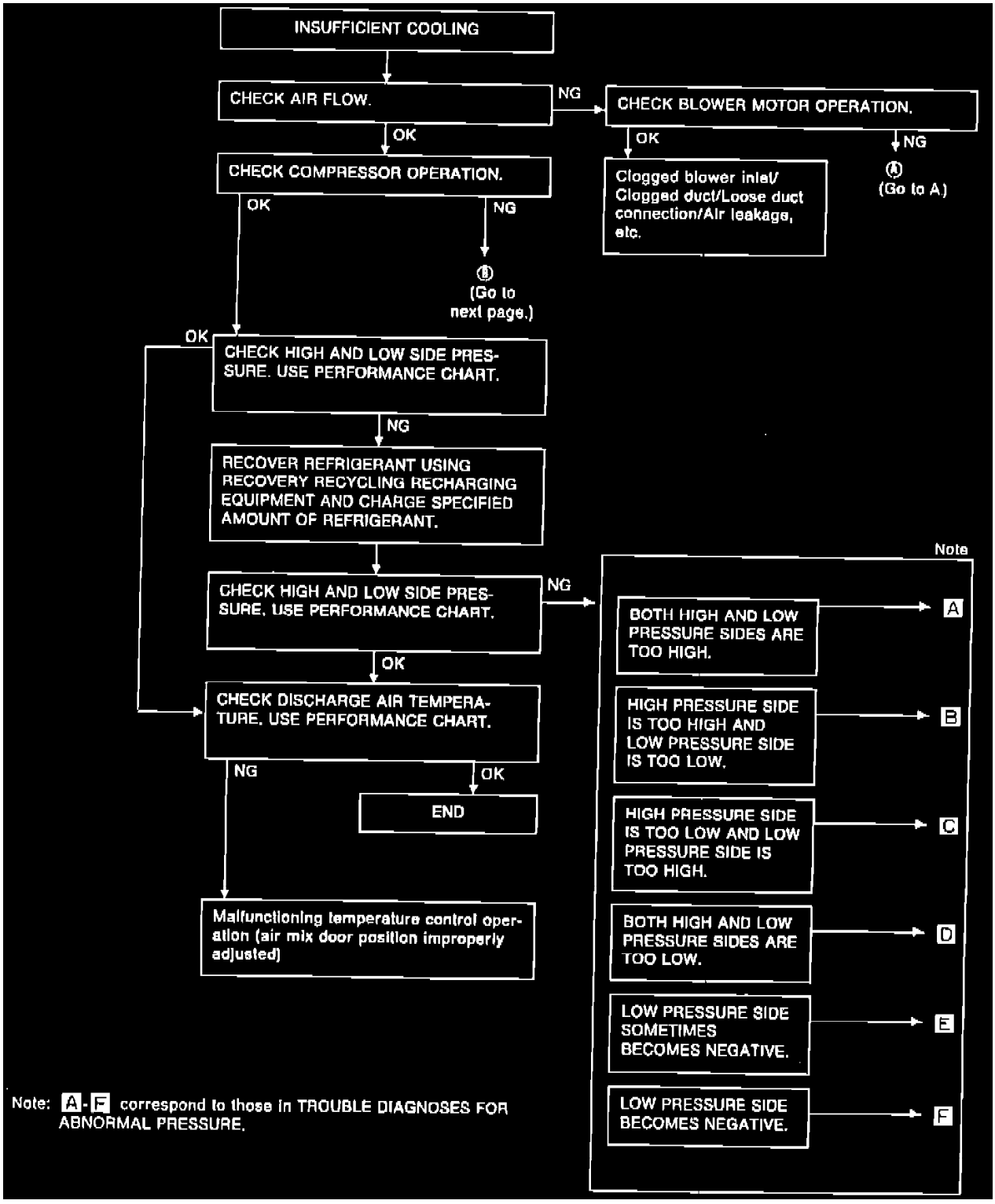
Never attempt to connect HFC-134a (R-134a) service couplers to an CFC-12 (R-12) A/C system. The HFC-134a (R-134a) couplers will not properly connect to the CFC-12 (R-12) system. However, if an improper connection is attempted. discharging and contamination may occur.

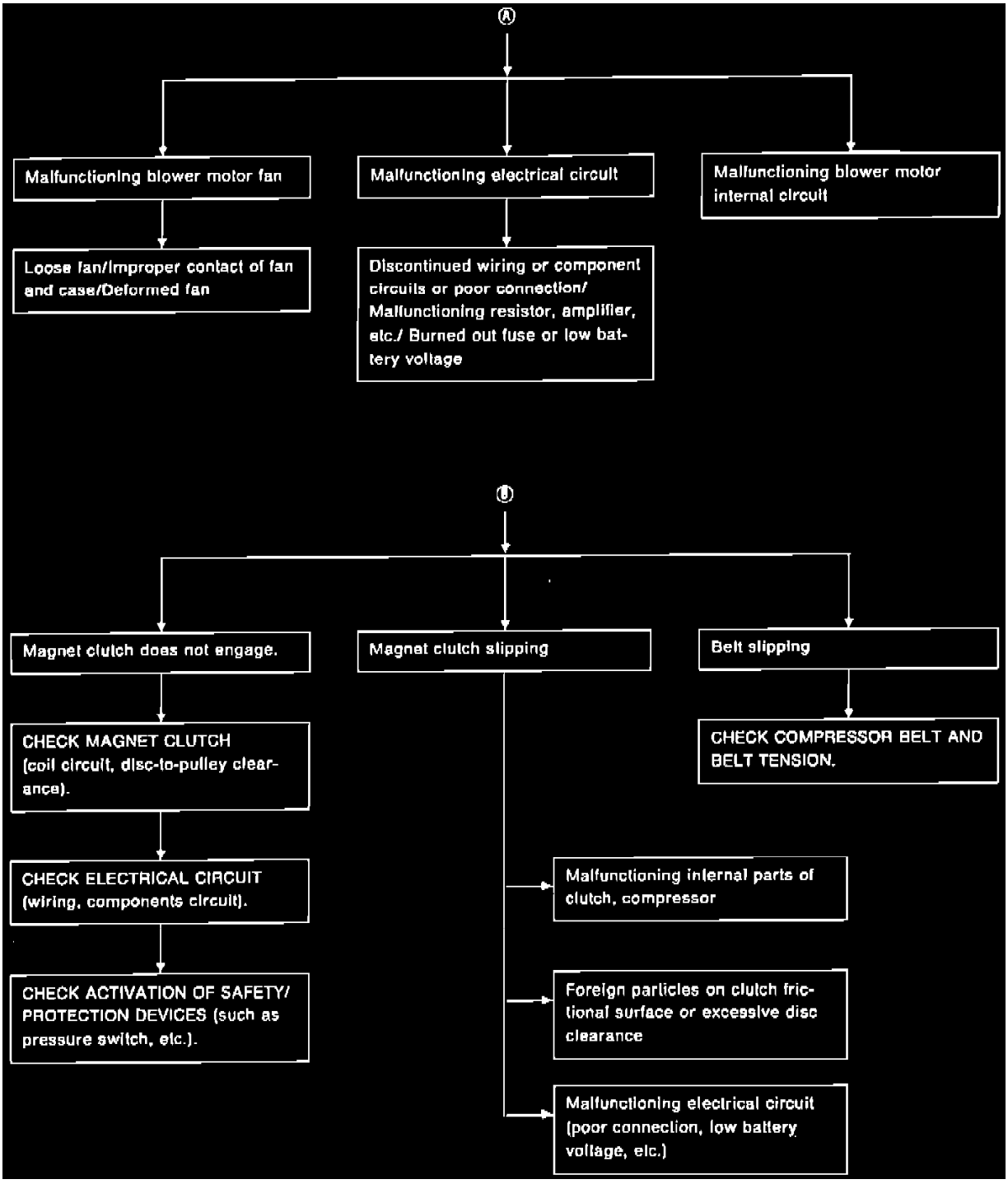
Shut off valve rotation	A/C service valve
Clockwise	Open
Counterclockwise	Close

REFRIGERANT WEIGHT SCALE



Verify that no refrigerant other than HFC-134a (R-134a) and specified lubricants have been used with the scale. If the scale controls refrigerant flow electronically, the hose fitting must be 1/2"-16 ACME.


INSUFFICIENT COOLING
CHECK AIR FLOW.
NG
CHECK BLOWER MOTOR OPERATION.
OK
NG
OK
Clogged blower inlet/ Clogged duct/Loose duct connection/Air leakage, etc.
Ⓐ (Go to A)
CHECK COMPRESSOR OPERATION.
OK
NG
Ⓑ (Go to next page.)
OK
CHECK HIGH AND LOW SIDE PRESSURE. USE PERFORMANCE CHART.
NG
RECOVER REFRIGERANT USING RECOVERY RECYCLING RECHARGING EQUIPMENT AND CHARGE SPECIFIED AMOUNT OF REFRIGERANT.
CHECK HIGH AND LOW SIDE PRESSURE. USE PERFORMANCE CHART.
NG
OK
CHECK DISCHARGE AIR TEMPERATURE. USE PERFORMANCE CHART.
NG
OK
END
Malfunctioning temperature control operation (air mix door position improperly adjusted)
Note
BOTH HIGH AND LOW PRESSURE SIDES ARE TOO HIGH.
A
HIGH PRESSURE SIDE IS TOO HIGH AND LOW PRESSURE SIDE IS TOO LOW.
B
HIGH PRESSURE SIDE IS TOO LOW AND LOW PRESSURE SIDE IS TOO HIGH.
C
BOTH HIGH AND LOW PRESSURE SIDES ARE TOO LOW.
D
LOW PRESSURE SIDE SOMETIMES BECOMES NEGATIVE.
E
LOW PRESSURE SIDE BECOMES NEGATIVE.
F
Note: A-F correspond to those in TROUBLE DIAGNOSES FOR ABNORMAL PRESSURE.



Performance Data

General performance characteristics for the CFC-12 (R-12) A/C system and the retrofit A/C system differ. These differences are outlined below.

Recirculating-to-discharge air temperature

^ The retrofitted A/C system retains the original CFC-12 (R-12) heat exchanger (evaporator and condenser).

^ Some CFC-12 (R-12) lubrication oil remains in the A/C system.

^ Because of these two stated reasons, the retrofit A/C system has a slightly lower cooling capacity than the CFC-12 R-12) A/C system. [Maximum discharge air temperature is increased by approximately 2° C (3.6° F).]

Ambient air temperature-to-operating pressure

The retrofit A/C system has a higher operating pressure than the CFC-12 (R-12) A/C system when the outside air temperature exceeds 15° C (59° F).

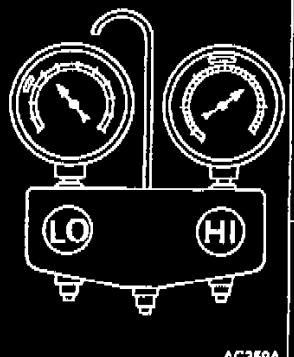
^ High-pressure side (Discharge side): Maximum pressure increase of approximately 294 kPa (3 kg/sq.cm, 43 psi)

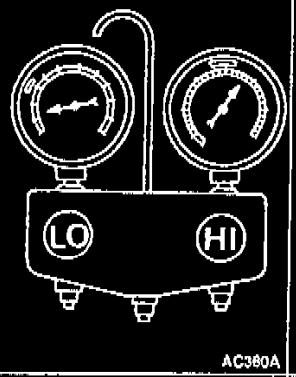
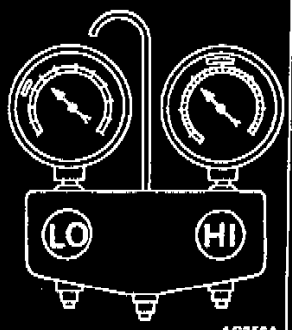
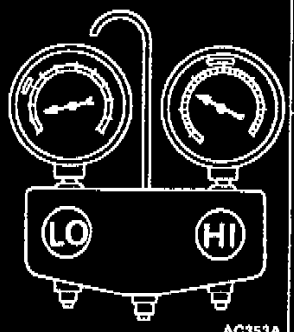
^ Low-pressure side (Suction side): Same as CFC-12 (R-12) A/C system

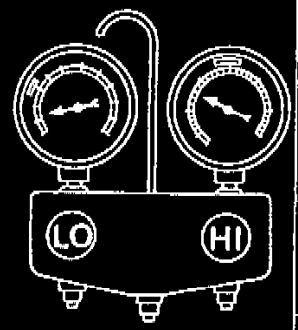
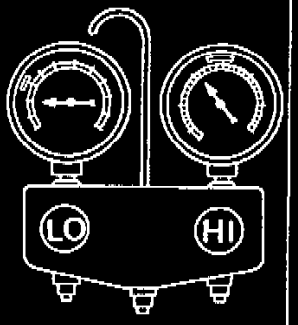
Refer to Service Manuals for discharge air temperature and operating pressure values for Individual vehicle models. Refer to these Manuals for

CFC-12 (R-12) A/C system values.

Diagnosis For Abnormal Pressure

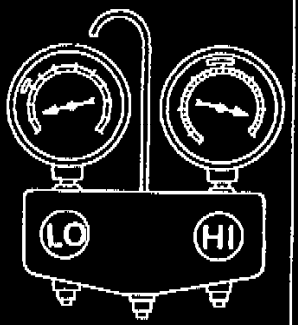
Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Both high and low-pressure sides are too high. A  AC359A	• Pressure is reduced soon after water is splashed on condenser.	Excessive refrigerant charge in refrigeration cycle	Reduce refrigerant until specified pressure is obtained.
	Air suction by cooling fan is insufficient.	Insufficient condenser cooling performance ↓ ① Condenser fins are clogged. ② Improper fan rotation of cooling fan	• Clean condenser. • Check and repair cooling fan as necessary.
	• Low-pressure pipe is not cold. • When compressor is stopped high-pressure value quickly drops by approximately 196 kPa (2 kg/cm², 28 psi). It then decreases gradually thereafter.	Poor heat exchange in condenser (After compressor operation stops, high pressure decreases too slowly.) ↓ Air in refrigeration cycle	Evacuate repeatedly and recharge system.
	Engine tends to overheat.	Engine cooling systems malfunction.	Check and repair each engine cooling system.
	• An area of the low-pressure pipe is colder than areas near the evaporator outlet. • Plates are sometimes covered with frost.	• Excessive liquid refrigerant on low-pressure side • Excessive refrigerant discharge flow • Expansion valve is open a little compared with the specification. ↓ ① Improper thermal valve installation ② Improper expansion valve adjustment	Replace expansion valve.

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
High-pressure side is too high and low-pressure side is too low. B  AC360A	Upper side of condenser and high-pressure side are hot, however, liquid tank is not so hot.	High-pressure tube or parts located between compressor and condenser are clogged or crushed.	• Check and repair or replace malfunctioning parts. • Check lubricant for contamination.
High-pressure side is too low and low-pressure side is too high. C  AC356A	High and low-pressure sides become equal soon after compressor operation stops.	Compressor pressure operation is improper. ↓ Damaged inside compressor packings	Replace compressor.
	No temperature difference between high and low-pressure sides	Compressor discharge capacity does not change. (Compressor stroke is set at maximum.)	Replace compressor.
Both high- and low-pressure sides are too low. D  AC353A	• There is a big temperature difference between liquid tank outlet and inlet. Outlet temperature is extremely low. • Liquid tank inlet and expansion valve are frosted.	Liquid tank may be clogged.	• Replace liquid tank. • Check lubricant for contamination.
	• Temperature of expansion valve inlet is extremely low as compared with areas near liquid tank. • Expansion valve inlet may be frosted. • Temperature difference occurs somewhere in high-pressure side	High-pressure pipe located between liquid tank and expansion valve is clogged.	• Check and repair malfunctioning parts. • Check lubricant for contamination.

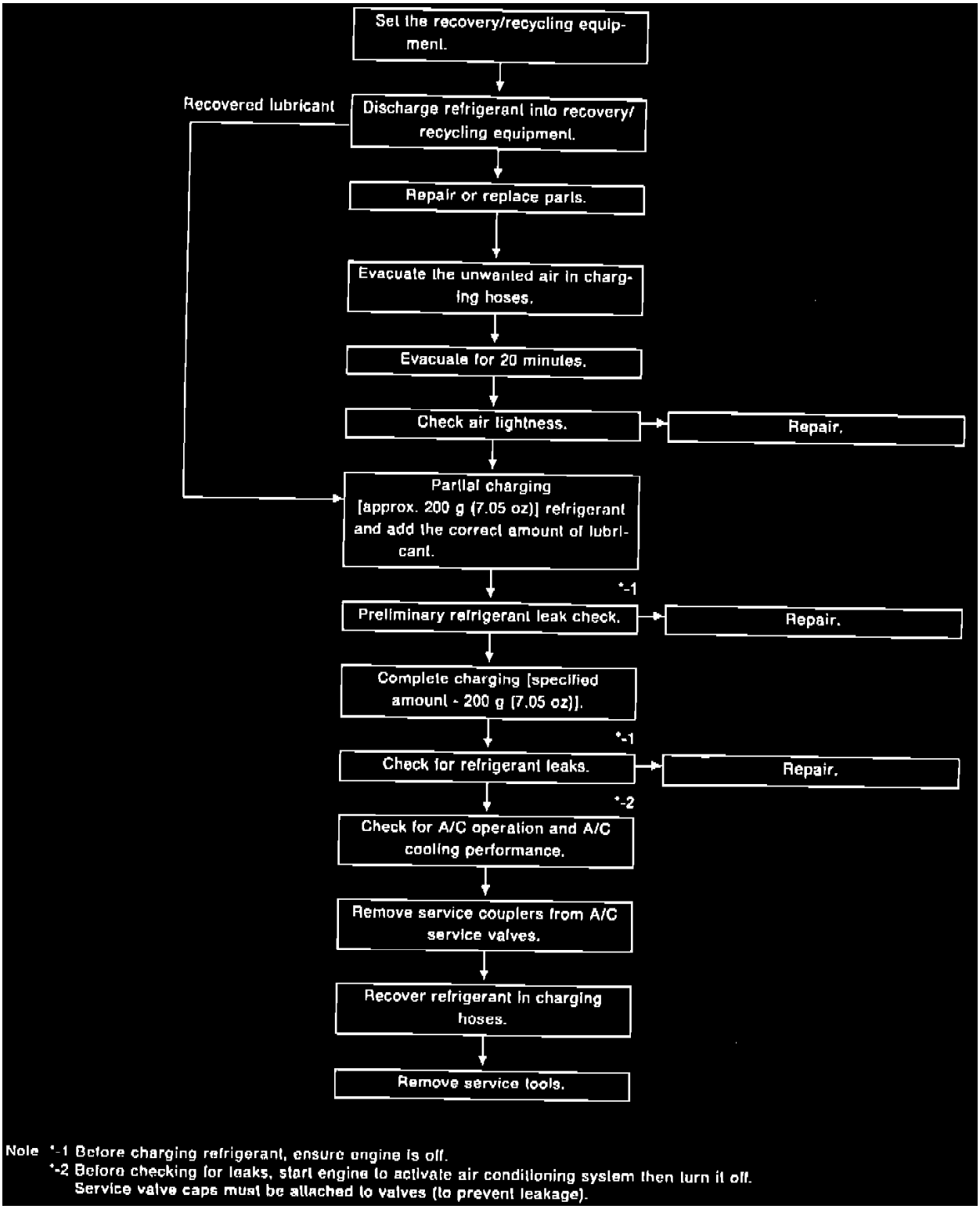
Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Both high- and low-pressure sides are too low. D  AC353A	There is a big temperature difference between expansion valve inlet and outlet while the valve itself is frosted.	Expansion valve closes a little compared with the specification. ↓ ① Improper expansion valve adjustment ② Malfunctioning thermal valve ③ Outlet and inlet may be clogged.	• Remove foreign particles by using compressed air. • Check lubricant for contamination.
	An area of the low-pressure pipe is colder than areas near the evaporator outlet.	Low-pressure pipe is clogged or crushed.	• Check and repair malfunctioning parts. • Check lubricant for contamination.
	Air flow volume is not enough or is too low.	Evaporator is frozen. ↓ Compressor discharge capacity does not change. (Compressor stroke is set at maximum length.)	Replace compressor.
Low-pressure side sometimes becomes negative. E  AC354A	• Air conditioning system does not function and does not cyclically cool the compartment air. • The system constantly functions for a certain period of time after compressor is stopped and restarted.	Refrigerant does not discharge cyclically. ↓ Moisture is frozen at expansion valve outlet and inlet. ↓ Water is mixed with refrigerant.	• Drain water from refrigerant or replace refrigerant. • Replace liquid tank.

TROUBLE DIAGNOSES

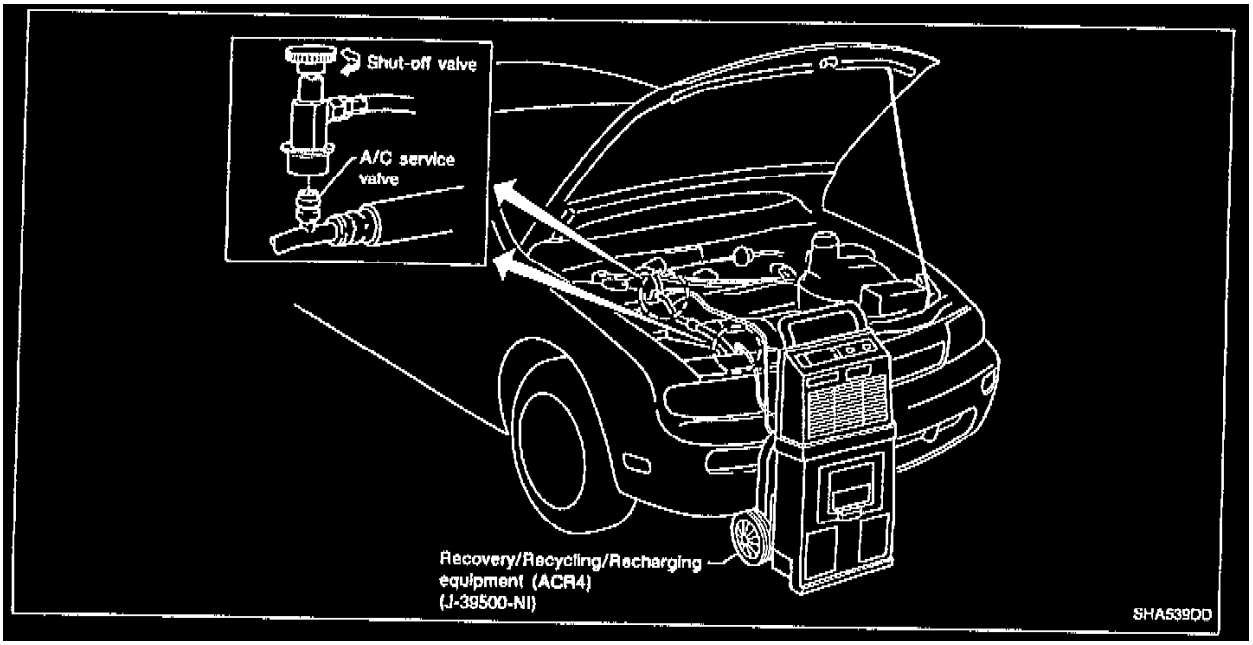
Diagnosis for Abnormal Pressure (Cont'd)

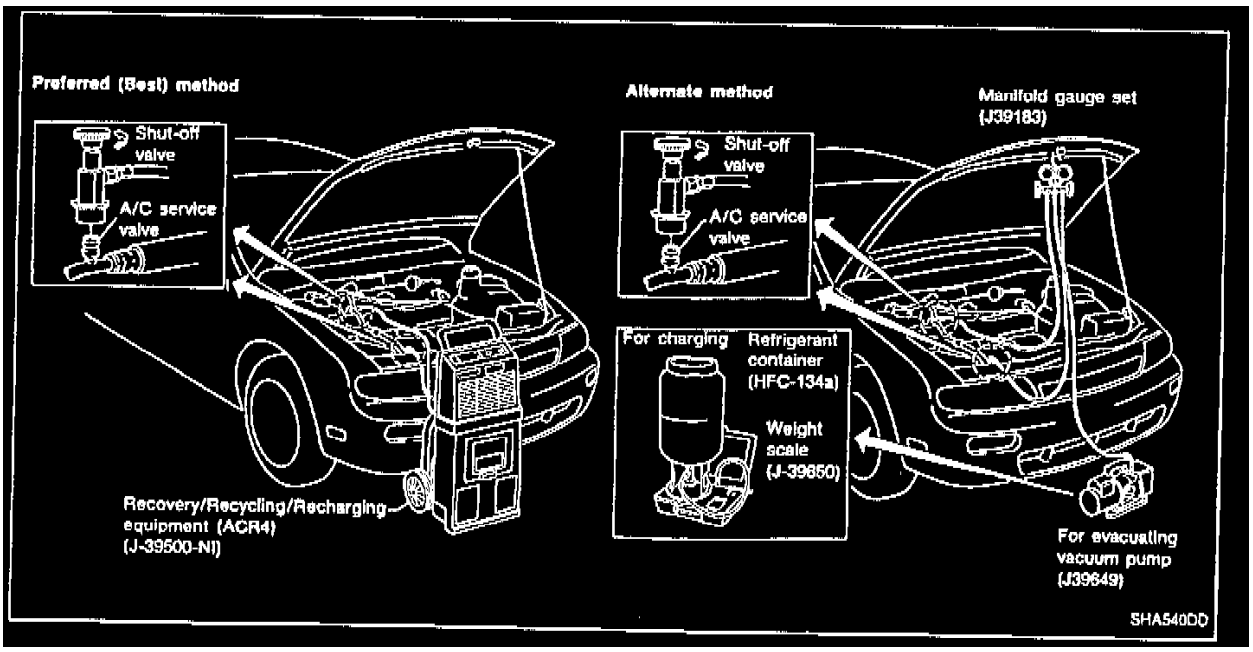
Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Low-pressure side becomes negative. F  AC352A	Liquid tank or front/rear side of expansion valve's pipe is frosted or dewed.	High-pressure side is closed and refrigerant does not flow. ↓ Expansion valve or liquid tank is frosted.	Leave the system at rest until no frost is present. Start it again to check whether or not the problem is caused by water or foreign particles. • If water is the cause, initially cooling is okay. Then the water freezes, causing a blockage. Drain water from refrigerant or replace refrigerant. • If due to foreign particles, remove expansion valve and remove the particles with dry and compressed air (not shop air). • If either of the above methods cannot correct the problem, replace expansion valve. • Replace liquid tank. • Check lubricant for contamination.

Whenever the high and/or low side pressure is abnormal, diagnose using a manifold gauge. The marker above the gauge scale in the tables indicates the standard (normal) pressure range. Since the standard (normal) pressure, however, differs from vehicle to vehicle, refer to ("Ambient air temperature-to-operating pressure").



Setting of Service Tools and Equipment





DISCHARGING REFRIGERANT

WARNING:

Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Remove HFC-134a (R-134a) from A/C system using certified service equipment meeting requirements of SAE J221O [HFC-134a (R-134a) recycling equipment or J22O9 [HFC-134a (R-134a) recovery equipment]. If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.

Maintenance of Lubricant Quantity In Compressor

The lubricant used to lubricate the compressor circulates through the system with the refrigerant. Add lubricant to compressor when replacing any component or after repairing a large gas leak. It is important to maintain the specified amount. If lubricant quantity is not maintained properly, the following malfunctions may result:

^ Lack of lubricant: May lead to a seized compressor

^ Excessive lubricant: Inadequate cooling (thermal exchange interference)

LUBRICANT

Swash plate compressor and V-6 compressor

The lubricant used to lubricate the compressor circulates through the system with the refrigerant Add lubricant to compressor when replacing any component or after repairing a large gas leak. It is important to maintain the specified amount. If lubricant quantity is not maintained properly, the following malfunctions may result:

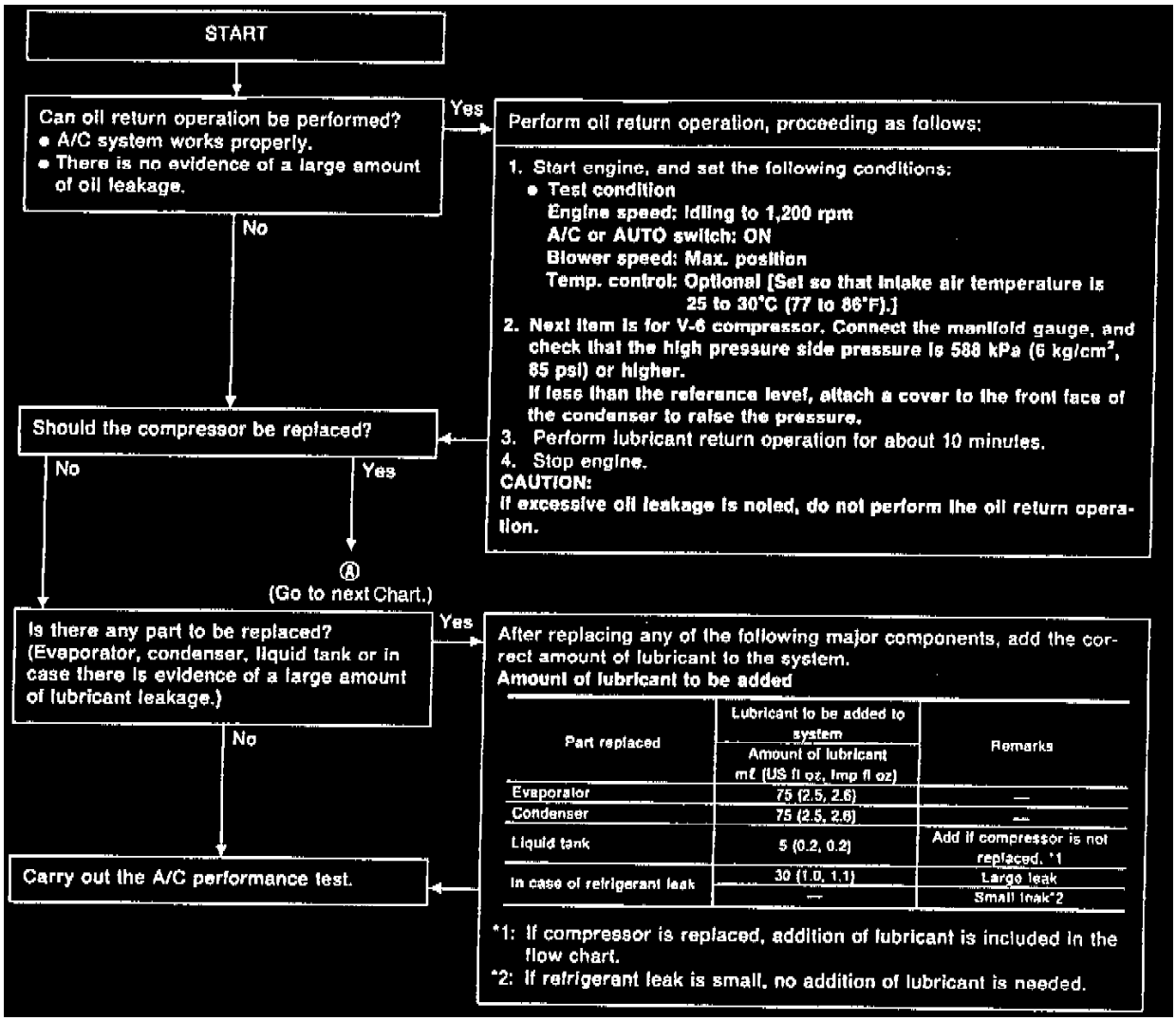
^ Lack of lubricant: May lead to a seized compressor

^ Excessive lubricant: Inadequate cooling (thermal exchange interference)

LUBRICANT

Swash plate compressor and V-6 compressor

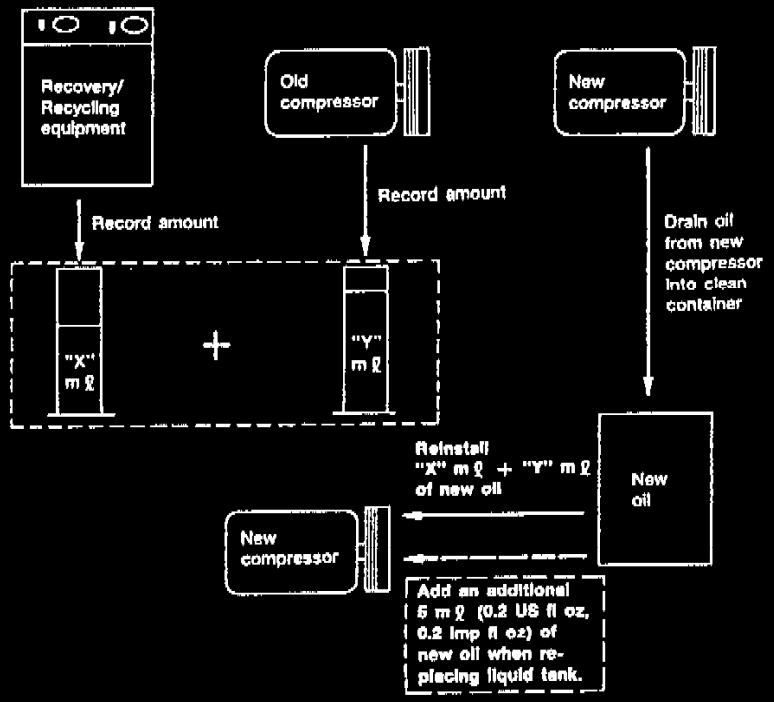
Checking and Adjusting



Ⓐ

1. Discharge refrigerant into the refrigerant recovery/recycling equipment. Measure oil discharged into the recovery/recycling equipment.
2. Remove the drain plug of the "old" (removed) compressor (applicable only V-6 or DKS-16H compressor). Drain the oil into a graduated container and record the amount of drained oil.
3. Remove the drain plug and drain the oil from the "new" compressor into a separate, clean container.
4. Measure an amount of new oil installed equal to amount drained from "old" compressor. Add this oil to "new" compressor through the suction port opening.
5. Measure an amount of new oil equal to the amount recovered during discharging. Add this oil to "new" compressor through the suction port opening.
6. Torque the drain plug.
   V-6 compressor: 18 - 19 N·m (1.8 - 1.9 kg-m, 13 - 14 ft-lb)
   DKS-16H compressor: 14 - 16 N·m (1.4 - 1.6 kg-m, 10 - 12 ft-lb)
7. If the liquid tank also needs to be replaced, add an additional 5 mℓ (0.2 US fl oz, 0.2 Imp fl oz) of oil at this time.
   Do not add this 5 mℓ (0.2 US fl oz, 0.2 Imp fl oz) of oil if only replacing the compressor.

Oil adjusting procedure for compressor replacement



RHA065DB

Adjusting the lubricant quantity to the flowchart shown.

General Specifications

LUBRICANT AND REFRIGERANT

Model	J30	B13
Compressor Type	ZEXEL DKS-16H	ZEXEL DKV-14C
Lubricant Name	Nissan A/C System Oil Type S	Nissan A/C System Oil Type R
Part Number	KLH00-PAGS1	KLH00-PAGR1
Capacity ml (US fl oz, Imp fl oz)	200 (6.8, 7.0)	
Refrigerant Type	HFC-134a (R-134a)	
Capacity Kg (lb)	750 - 850 (1,654 - 1,874)	550 - 650 (1,213 - 1,433)

ECM - Green or Blue Relay Caution

Classification: EC95-014

Reference: NTB95-070

Date: July 5, 1995

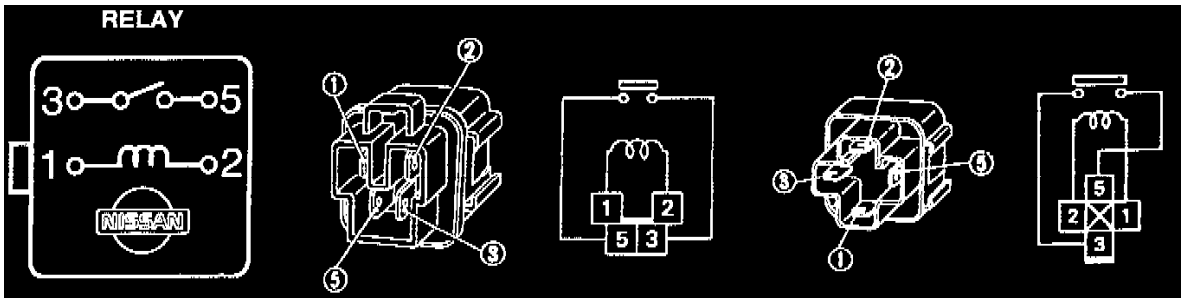
GREEN OR BLUE (FUEL PUMP & A/C) RELAY CAUTION

SERVICE INFORMATION

When servicing a customer's vehicle, exercise caution when diagnosing / checking the harness at any green or blue colored relay (Fuel pump & A/C) connector.

SERVICE PROCEDURE

When diagnosing the harness at any green or blue colored relay (Fuel pump & A/C) connector, observe the following pre-cautions to prevent damage to the Engine Control Module (ECM):



1. **Note** that the schematic on the relay is different than the orientation of the relay terminals in the harness connectors (see diagram):

2. Exercise caution to ensure that the correct terminals are being probed at the relay connector during diagnosing / checking.

NOTE:
Use a circuit tester first to verify the terminals that are supplied with battery voltage. If battery voltage is connected to terminal 2, the ECM will be damaged if the circuit being tested has terminal 2 connected to the ECM.

Technical Service Bulletin # **96-087** Date: **960911**

A/C - Revised Procedure For Detection Refrigerant Leaks

Classification:
HA96-008

Reference:
NTB96-087

Date:
September 11, 1996

REVISED PROCEDURE FOR DETECTION OF REFRIGERANT LEAKS

This bulletin supersedes NTB95-014/HA95-003, dated February 22, 1995.
Please discard bulletin NTB95-014.

APPLIED VEHICLES:
All

SERVICE INFORMATION

An updated refrigerant leak detection procedure is now included in all service manuals beginning with the 1997 model year.

The revised procedure is applicable to all models and includes the following changes or additions:

^ A minimum charge specification prior to conducting the leak check.

^ The recommended minimum ambient temperature for effective leak detection.

^ Recommended probe tip moving speed and position away from the point to be checked.

^ Proper cleaning of A/C components and fittings prior to leak checking.

^ Rechecking a suspected leak.

^ Checking procedures for specific A/C components such as the compressor, liquid tank, service valves and cooling unit.

^ Elimination of soap and water as a secondary check method.

In some cases you may not detect a leak readily if both the high and low side pressures are equalized. The revised procedure introduces a second test condition that can possibly detect a leak (or leaks) that the first test condition could not.

The service manuals listed below will contain the updated leak detection procedures:

^ 1997 Maxima
^ 1997 Sentra/200SX
^ 1997 Truck
^ 1997 Pathfinder
^ 1997 Quest
^ 1998 Altima
^ 1998 24OSX

Please reference Service Procedures under Contents at the beginning of the HA section. Within this section refer to "Checking Refrigerant Leaks" to find the leak detection procedures.

NOTE:
For models with service manuals not yet published or received, please refer to another model that is released because the procedure is the same for all models.

Technical Service Bulletin # **98-063** Date: **980715**

A/C - New Leak Detector

Classification:
T&E98-001

Reference:
NTB98-063

Date:
July 15, 1998

NEW A/C LEAK DETECTOR

APPLIED VEHICLES:
All with air conditioning

SERVICE INFORMATION

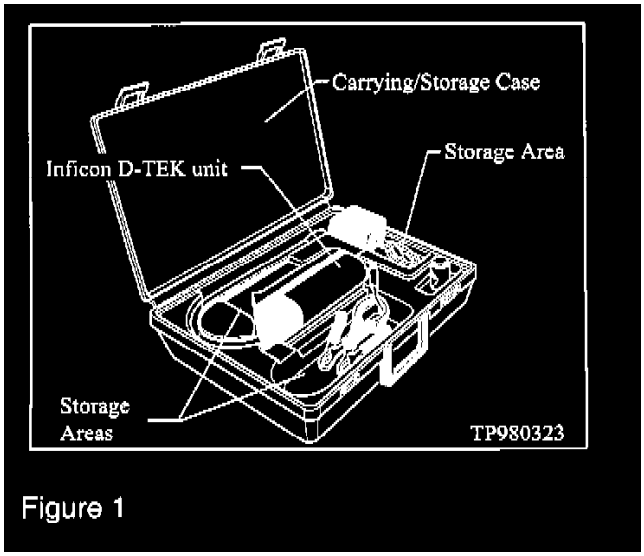


Figure 1

A new A/C leak detector (Leybold Inficon D-TEK, tool number J41995) for R12 and R134a has been released as a dealer replacement for the

Yokogawa J39400 leak detector (see Figure 1). While both units are approved by Nissan Motor Corporation for use, the operation, portability and response /recovery time of the D-TEK is improved over the Yokagawa unit. Use of the Yokogawa J39400 is still approved, however all replacements should be the D-TEK unit.

The simple calibration of the D-TEK combined with the following service procedure should reduce diagnostic time.

SERVICE PROCEDURE

1. Read all manufacture's operating and maintenance instructions before using the Inficon D-TEK for the first time.

2. Make sure the vehicle's A/C system has a minimum pressure of 50 psi.

3. Visually inspect the D-TEK's probe tip filter for contamination before use. Clean or replace the probe tip filter as needed.

4. Place the sensitivity selector in the HI position and move the power switch to the ON position. Check the unit for the following conditions:

   ^ The green lamp should be steady (not flashing) indicating the power cells are fully charged. If the green lamp is dim, out, or flashing, connect the power supply cord and charge the power cells.

   NOTE:
   The D-TEK can be operated while the power cells are re-charging, however this will lengthen the time required for a complete charge.

   ^ The alarm should sound and the seven yellow lamps will light for 15 to 20 seconds during warm-up. When the warm up is complete, the alarm and yellow lamps will go off. The D-TEK is now ready to be calibrated.

   NOTE:
   If the green lamp is not steady, or if there are any improper warm up conditions, refer to the operator's manual for trouble shooting procedures.

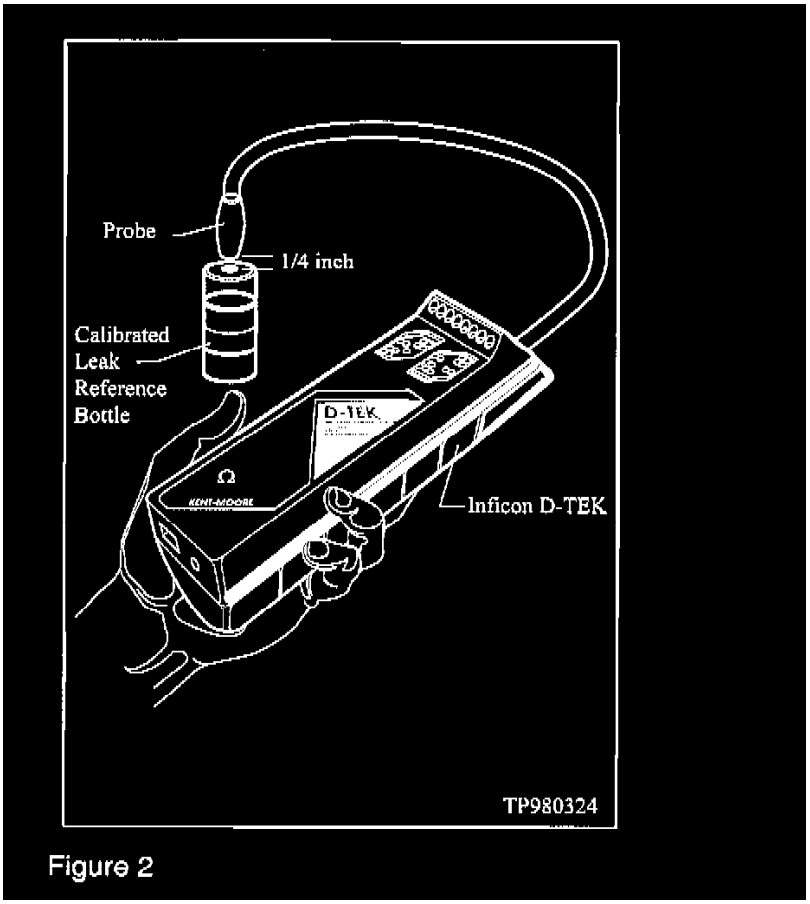


Figure 2

5. To calibrate the D-TEK, slowly pass the probe tip about... of an inch over the leak reference bottle, moving the probe about 1 - 2 inches per second to detect a leak rate of 0.5 ounces per year (see Figure 2). The alarm will sound and several yellow lamps will illuminate. Once the yellow lamps go out, the unit will have an audible click (about 2 clicks per second) which indicates the D-TEK is ready to use.

6. Visually inspect the entire A/C system for any signs of leakage or damage. If any are found, clean those areas thoroughly with a clean shop rag to prevent contamination to the D-TEK's probe.

7. Start the leak inspection at the compressor and move the probe (1 to 2 inches per second and no further than . .. inch from the components) in a continuous path along the high side line though the condenser core, receiver drier, evaporator, and back to the compressor on the low side

line.

8. To inspect the evaporator core, first place the blower fan on high with the A/C compressor off for 15 seconds. Then turn the fan off and allow the system to set for 13 minutes. Inspect the evaporator drain hose and passenger side foot duct.

CAUTION:
Do not allow the probe tip to contact water.

NOTE:
When a leak is detected, the D-TEK will emit a different audible tone, and the yellow lamps will illuminate. It is **important** to move the probe past the suspected leak to get a proper reading as the D-TEK responds to changes in the concentration of refrigerant.

9. When the D-TEK signals a leak, pull the probe away for a moment, blow area with shop air, and then return it to the same location to isolate the leak. If the leak is large, move the sensitivity switch to LOW.

10. Return the sensitivity setting to HI and continue looking for other possible leaks until the entire A/C system is inspected.

NOTE:
When you reset the instrument to the HI sensitivity setting, as when you turned the unit ON initially, the yellow lights will illuminate and the tone will sound again momentarily.

Technical Service Bulletin # **96-023A** Date: **971201**

A/C - System Retrofit Information

Classification:
HA96-001A

Reference:
NTB96-023A

Date:
December 1, 1997

AIR CONDITIONING (A/C) SYSTEM RETROFIT INFORMATION AND PROCEDURES

APPLIED VEHICLES:
Various 1984-1994 model vehicles equipped with R12 A/C systems.

This amended version of NTB96-023/HA96-001 updates the retrofit matrix of original bulletin.

SERVICE INFORMATION

This service bulletin identifies the necessary vehicle specific components required to install a Nissan approved retrofit A/C system. On some vehicles a "complete kit" is required and on others a common "main kit" with the additional listed components will be required. Complete kits contain vehicle specific installation instructions.

This bulletin also describes the generic retrofit procedure and necessary specifications (lubricant and refrigerant) to accompany this procedure. Where a "complete kit" is indicated, refer to the specific instructions supplied with that kit.

Refer to the appropriate service manual, NTB93-001, NTB94-091, and SIR video, Vol. 14 for information not included in this service bulletin:

^ Technical Service Bulletin NTB93-001 (Classification number HA93-001), entitled "A/C System Changes for R-134a Refrigerant (All Models)" describes general differences between the R-12 system and the R-134a system.

^ Technical Service Bulletin NTB94-091 (Classification number HA94-005), entitled "Service Procedure for Retrofitted A/C Systems" details general service information for all models retrofitted to R-134a A/C systems, using a Nissan approved retrofit kit.

^ SIR video "R-134a Air Conditioning System Retrofits, Vol. 14" gives the information needed to properly convert a R-12 refrigerant based A/C system to R-134a refrigerant.

Service Procedure

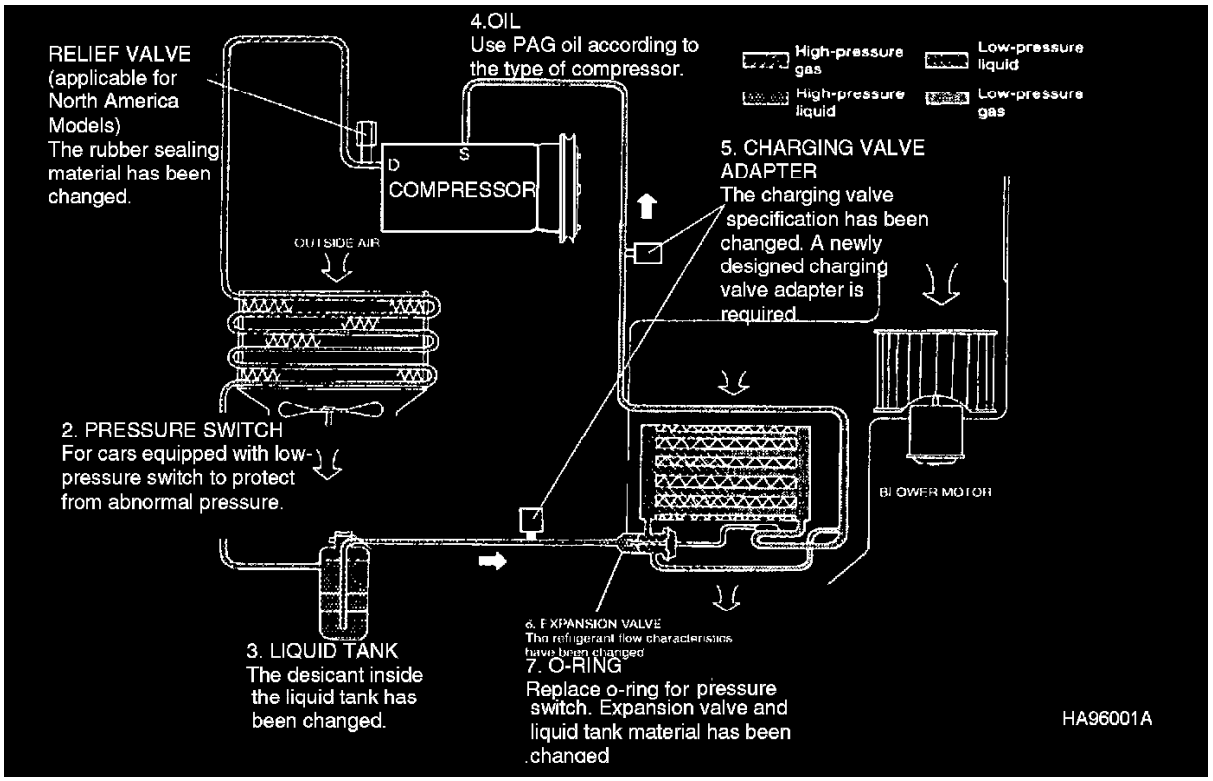
Important Points

^ When recharging the system with R134a, use the J39500 ACR4 Recovery / Recycling / Recharging equipment to ensure accurate charging (to .01 lb.)

^ Use only Nissan A/C System PAG Lubricant Type "R" for vane rotary compressors, or Nissan A/C System Lubricant type "S" for swash plate and V-6 variable displacement compressors. Use only Nissan A/C System PAG Lubricant Type "F" for the Quest. If another type lubricant is used, compressor failure is likely to occur.

This bulletin contains:

^ Typical replacement parts used to retrofit an A/C system
^ Retrofit kit / parts matrix
^ Retrofit main kit, J2270-10Y25 (parts listing)
^ R-134a system information
^ General specifications for retrofitted systems
^ Unique 300ZX (Z31 and Z32) data and 240SX (S13) V6 compressor information
^ How to perform an A/C retrofit (procedure manual).



MODEL	MY	Main/Comp.#	Exp.Valve	Liquid Tank	Misc. Parts	Comments
KN13 PULSAR	87-90	J2270-10Y25	92200-89905	92132-89907	N/A	3 Part #s req.
B12 SENTRA	87-90	J2270-10Y25	92200-01R05	92132-89902	N/A	3 Part #s req.
B13 SENTRA/NX	91-93/1.6L	27030-65Y05	Inc. in the kit	Inc. in the kit	N/A	Complete Kit
B13 SENTRA/NX	91-93/2.0L	27030-65Y05	Inc. in the kit	Inc. in the kit	92442-64C03	B13&Hi Pipe
T12 STANZA	87-89	J2270-10Y25	92200-89905	92132-89904	N/A	3 Part #s req.
U12 STANZA	90	J2270-10Y25	92200-89905	92132-89901	N/A	3 Part #s req.
U12 STANZA	91-92	J2270-10Y25	92200-7E100	92132-89900	N/A	3 Part #s req.
U11 MAXIMA	>88 NCI	J2270-10Y25	92200-89905	92132-89904	N/A	3 Part #s req.
U11 MAXIMA	85-88 USA	J2270-10Y25	92200-89905	92132-89904	N/A	3 Part #s req.
J30 MAXIMA	89-90	27030-85E20	Inc. In the kit	Inc. In the kit	N/A	Complete Kit
J30 MAXIMA	91-92	27030-85E21	Inc. in the kit	Inc. in the kit	N/A	Complete Kit
S12 200SX	85-88	J2270-10Y25	92200-01R05	92132-89908	N/A	3 Part #s req.
S13 240SX	89-90	J2270-10Y25	92200-01R05	92132-89901	N/A	3 Part #s req.
S13 240SX	91-MID93	27030-53F10	Inc. in the kit	Inc. in the kit	N/A	Complete Kit
Z31 300ZX	84-89	B7030-40P22	N/A	Inc. in the kit	N/A	Complete Kit
300ZX ATC-Turbo	90-93	B7030-33P00	N/A	Inc. in the kit	N/A	Complete Kit
300ZX ATC-Atmo	90-93	B7030-30P00	N/A	Inc. in the kit	N/A	Complete Kit
300ZX Man. A/C-Turbo	90-93	B7030-33P05	Inc. in the kit	Inc. in the kit	N/A	Complete Kit
300ZX Man. A/C-Atmo	90-93	B7030-30P05	Inc. in the kit	Inc. in the kit	N/A	Complete Kit
M10 STANZA WAGON	86-88	J2270-10Y25	92200-01R05	92132-01R05	N/A	3 Part #s req.
M11 AXXESS	90/91-3NCI	J2270-10Y25	92200-89905	92132-89901	N/A	3 Part #s req.
QUEST-FRONT	93-Mid 94	27030-0B025	N/A	Inc. in the kit	N/A	Complete Kit
QUEST-FR/REAR	93-Mid 94	27030-0B026	N/A	Inc. in the kit	N/A	Complete Kit
TRUCK/PATHFINDER	86.5-89	J2270-10Y25	92200-01R05	92132-89910	N/A	3 Part #s req.
TRUCK/PATHFINDER	90-92	J2270-10Y25	92200-59G00	92132-89910	N/A	3 Part #s req.
M30 INFINITI	90	J2270-10Y25	92200-89905	92132-89901	N/A	3 Part #s req.
M30 INFINITI	91-92	J2270-10Y25	92200-89905	92132-89900	N/A	3 Part #s req.
G20 INFINITI	91-93	J2270-10Y25	92200-7E100	92132-89900	N/A	3 Part #s req.
Q45 INFINITI	90-93	27030-60U10	Inc. in the kit	Inc. in the kit	N/A	Complete Kit

3 Part #s req. = expansion valve and liquid tank are required in addition to the main kit.
Complete Kit = only main kit is required.

Part Description	Part #	Quantity
8 mm O - Ring	92470 -N8200	4
12 mm O - Ring	92471 - N8200	2
16 mm O - Ring	92473 - N8200	1
19 mm O - Ring	92477 - N8200	1
11 mm O - Ring	J2476 - 89956	1
Insulation - TXV wrap	B7755 - 02A65	1
Insulation - Pipe / sensing bulb	27288 - 4E100	1
Cover - Valve, low	J2275 - 89900	1
Cover - Valve, high (7/16 - 20 UNF)	J2275 - 89910	1
Cover - Valve, high (3/8 - 24 UNF)	J2275 - 89915	1
Label - Caution, A/C	27090 - 89960	1
Label - Caution	92605 - 89910	2
Pressure relief valve, with O - Ring	92270 - 10Y00	1

3 Part # s req. = expansion valve and liquid tank are required in addition to the main kit.
complete kit= only main kit is required.

Model	PAG Type	PAG Part#	Total PAG Charge amt.	Refrigerant Charge Amount
Quest (V40) Front System Only	F	KLHOO-PAGQF - 10 oz.	**7.0 oz.** (0.21 L)	**1.75 lbs.** (0.8 Kg.)
Quest (V40) Front & Rear System	F	KLHOO-PAGQF - 10 oz.	**10.0 oz.** (0.30 L)	**2.75 lbs.** (1.25 Kg.)

NOTE: PAG S1 and R1 are packaged in a 6 pack of 40 ml. cans. S2 and R2 are packaged in single 236 ml. cans.

Model	B12	B13	N13	U12	
				'90 year model	'91 - '92 year models
Compressor type	ZEXEL DKV-14C			ATSUGI NVR140S	
Lubricant Name	Nissan A/C System Oil Type R				
Part number	KLH00-PAGR1				
Capacity mℓ (US fl oz, Imp fl oz)	200 (6.8, 7.0)				
Refrigerant Type	HFC-134a (R-134a)				
Capacity kg (lb)	0.75 - 0.85 (1.65 - 1.87)	0.55 - 0.65 (1.21 - 1.43)	0.75 - 0.85 (1.65 - 1.87)	0.70 - 0.80 (1.54 - 1.76)	0.65 - 0.75 (1.43 - 1.65)

Model	T12	S12	S13		M10
			'89 - '90 year models	'91 - '93 year models	
Compressor type	ATSUGI NVR140S	HITACHI MJS170	ATSUGI NVR140S	CALSONIC V-6 *	HITACHI MJS170
Lubricant Name	Nissan A/C System Oil Type R	Nissan A/C System Oil Type S	Nissan A/C System Oil Type R	Nissan A/C System Oil Type S	
Part number	KLH00-PAGR1	KLH00-PAGS1	KLH00-PAGR1	KLH00-PAGS1	
Capacity mℓ (US fl oz, Imp fl oz)	200 (6.8, 7.0)	150 (5.1, 5.3)	200 (6.8, 7.0)	300 (10.1, 10.6)	150 (5.1, 5.3)
Refrigerant Type	HFC-134a (R-134a)				
Capacity kg (lb)	0.85 - 0.95 (1.87 - 2.09)		0.80 - 0.90 (1.76 - 1.98)	0.70 - 0.80 (1.54 - 1.76)	0.85 - 0.95 (1.87 - 2.09)

Model	M11	U11	J30
Compressor type	ZEXEL DKS-16H	HITACHI MJS170	ZEXEL DKS-16H
Lubricant Name	Nissan A/C System Oil Type S		
Part number	KLH00-PAGS1		
Capacity mℓ (US fl oz, Imp fl oz)	200 (6.8, 7.0)	150 (5.1, 5.3)	200 (6.8, 7.0)
Refrigerant Type	HFC-134a (R-134a)		
Capacity kg (lb)	0.75 - 0.85 (1.65 - 1.87)	0.80 - 0.90 (1.76 - 1.98)	Kit number : 27030-16E10 0.85 - 0.95 (1.87 - 2.09) Kit number : 27030-16E05 27030-16E06 0.80 - 0.90 (1.76 - 1.98)	0.75 - 0.85 (1.65 - 1.87)

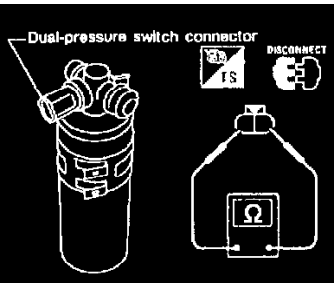
HA96001B

* A V6 compressor and the appropriate amount of PAG lubricant is included in the retrofit kit. Additional PAG lubricant is not required for retrofitting.

Model	D21		Z31	
	'86 - '89 year models	'90 - '92 year models	'86 - '88 year models	'89 year model
Compressor type	ZEXEL DKV-14C		HITACHI MJS170	ZEXEL DKS-16H
Lubricant				
Name	Nissan A/C System Oil Type R		Nissan A/C System Oil Type S	
Part number	KLH00-PAGR1		KLH00-PAGS1	
Capacity mℓ (US fl oz, Imp fl oz)	200 (6.8, 7.0)		150 (5.1, 5.3)	200 (6.8, 7.0)
Refrigerant				
Type	HFC-134a (R-134a)			
Capacity kg (lb)	0.75 - 0.85 (1.65 - 1.87)	0.70 - 0.80 (1.54 - 1.76)	0.75 - 0.85 (1.65 - 1.87)	

Model	Z32
Compressor type	ZEXEL DKS-16H
Lubricant	
Name	Nissan A/C System Oil Type S
Part number	KLH00-PAGS1
Capacity mℓ (US fl oz, Imp fl oz)	200 (6.8, 7.0)
Refrigerant	
Type	HFC-134a (R-134a)
Capacity kg (lb)	0.50 - 0.60 (1.10 - 1.32)

HA96001C



Electrical Components Inspection

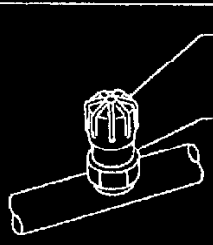
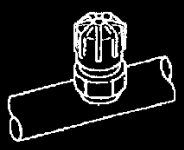
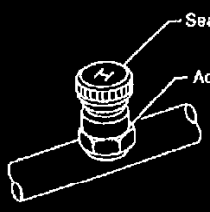
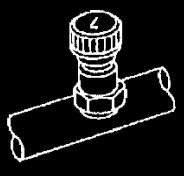
For Z31 and Z32 models, the low-pressure switch has been replaced by the dual-pressure switch.

DUAL-PRESSURE SWITCH

High-pressure side line pressure kPa (kg/cm², psi)	Operation	Continuity
Decreasing to 152.0 - 201.0 (1.55 - 2.05, 22.0 - 29.2) Increasing to 2,452 - 2,844 (25 - 29, 356 - 412)	Turn OFF.	Does not exist.
Increasing to 157 - 216 (1.6 - 2.2, 23 - 31) Decreasing to 1,275 - 1,667 (13 - 17, 185 - 242)	Turn ON.	Exists.

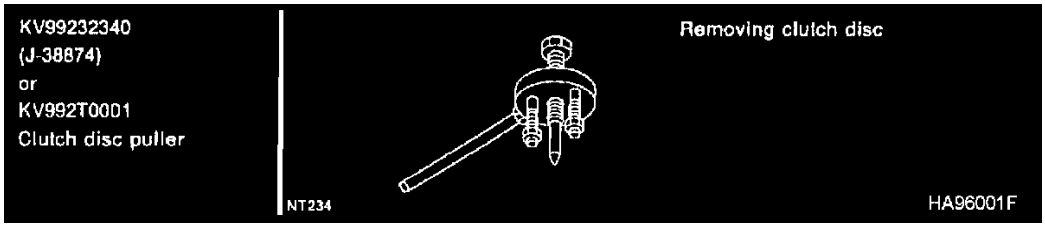
HA96001D

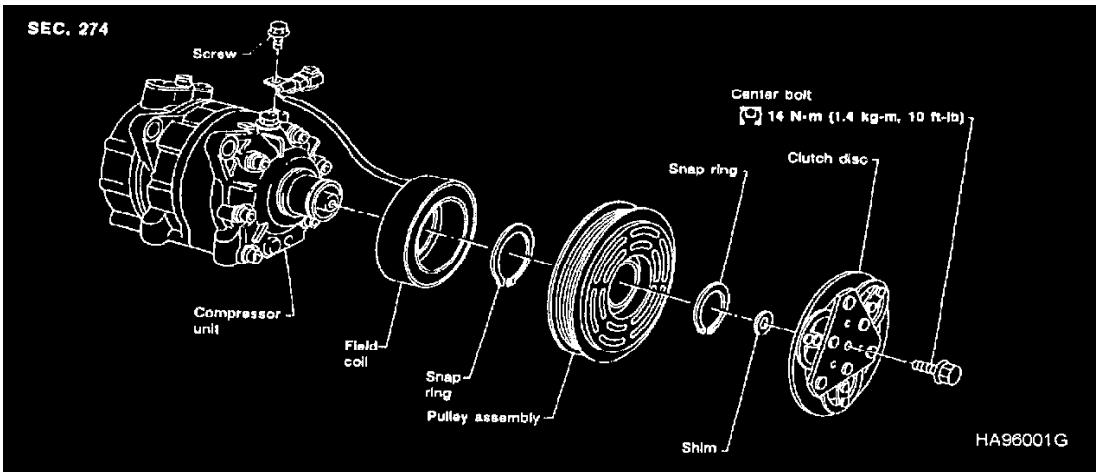
Service valves

	High-pressure (Discharge) service valve	Low-pressure (Suction) service valve
Except Z31 and Z32 models		
Z31 and Z32 models		

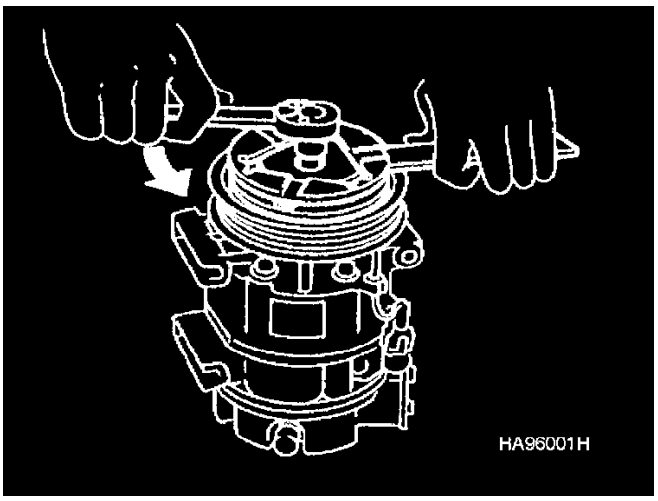
The service valves are specially designed for the HFC-134a (R-134a) system. Those for the CFC-12 (R-12) system are different in size and configuration.
The seal cap color for the HFC-134a (R-134a) system is blue or light blue.

HA96001E

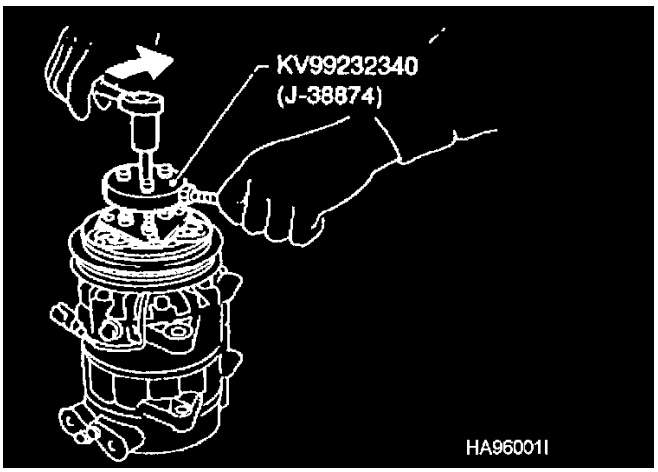




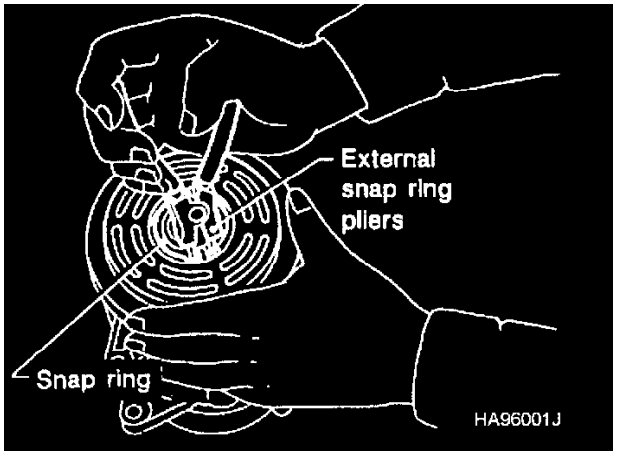
Removal



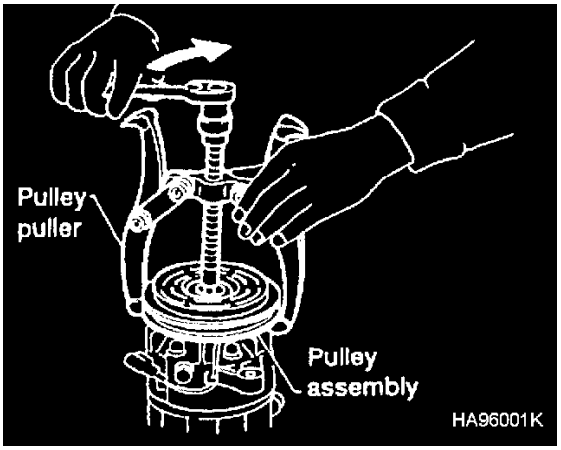
When removing center bolt, hold clutch disc with clutch disc wrench.



^ Remove the clutch disc using the clutch disc puller. Insert the holder's three pins into the holes in the clutch disc. Rotate the holder clockwise to hook it onto the plate. Then, tighten the center bolt to remove the clutch disc. After removing the clutch disc, remove the shims from either the drive side or the clutch disc.

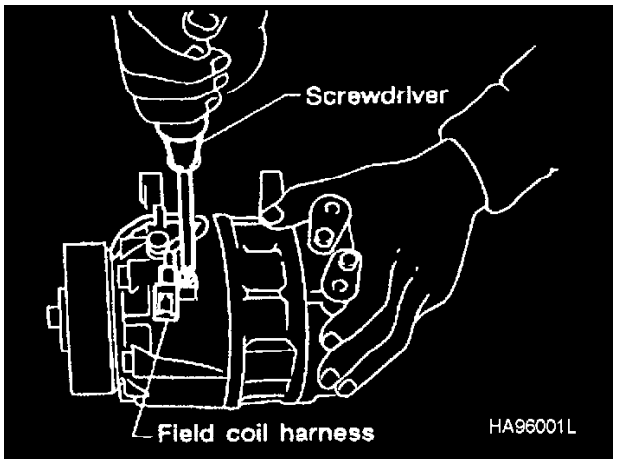


^ Remove the snap ring using external snap ring pliers.

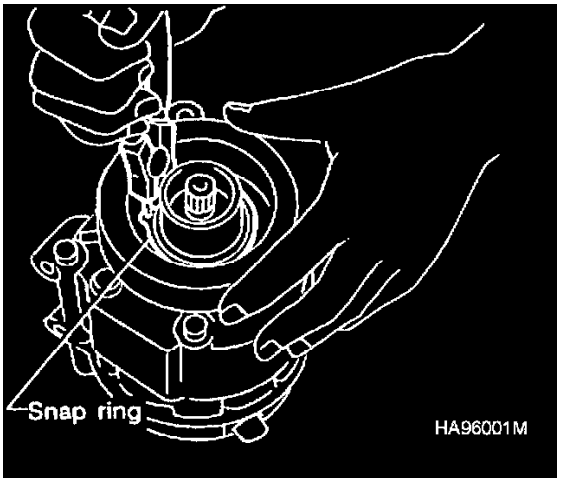


^ Pulley removal

Use any commercially available pulley puller. Position the center of the puller on the end of the drive shaft, and remove the pulley assembly. To prevent the pulley grove from being deformed, the puller claws should be positioned onto the edges of the pulley assembly.



^ Remove the field coil harness clip using a screwdriver.

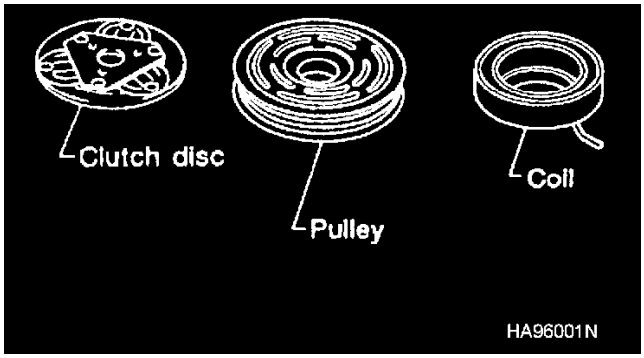


^ Remove the snap ring using external snap ring pliers.

Inspection

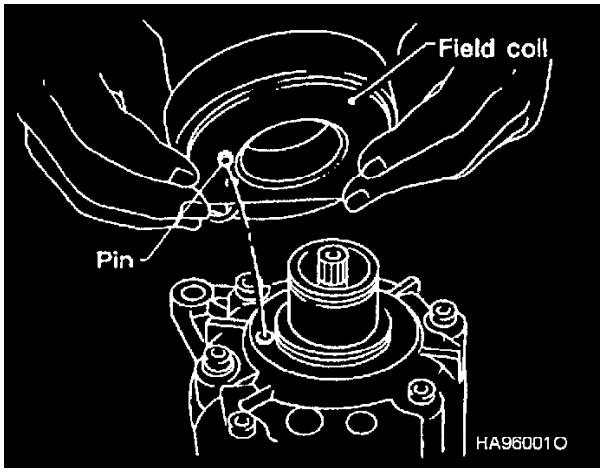
Clutch disc

If the contact surface shows signs of damage due to excessive heat, replace clutch disc and pulley.



Pulley

Check the appearance of the pulley assembly. Check the contact surface for any sign of excessive grooving due to slippage. If any sign is found, replace both the pulley and clutch disc. The contact surfaces of the pulley assembly should be cleaned with a suitable solvent before reinstallation.



Coil

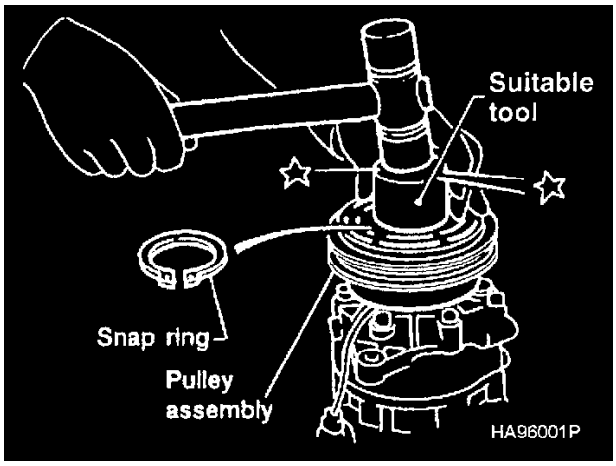
Check coil for loose connections or cracked insulation.

Installation

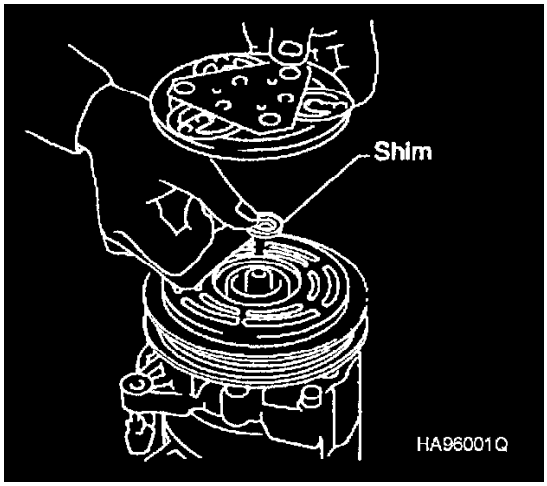
^ Install the field coil.

Be sure to align the coil's pin with the hole in the compressor's front head.

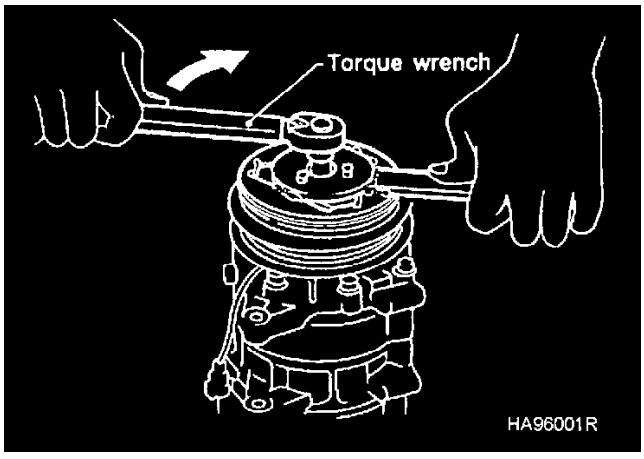
^ Install the field coil harness clip using a screwdriver.



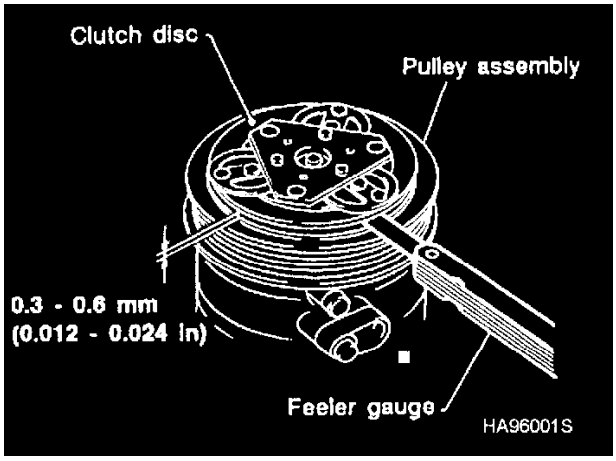
^ Install the pulley assembly using a suitable tool, then install the snap ring using snap ring pliers.



^ Install the clutch disc on the drive shaft with the original shim(s). Press the clutch disc down by hand.



^ Using the holder to prevent clutch disc rotation, tighten the bolt to 10 ft. lb (14 N.m, 1.4 kg-m) torque.



^ Check clearance around the entire periphery of the clutch disc.

Disc-to-pulley clearance

0.12 - 0.024 in. (0.3 - 0.6 mm)

If the specified clearance is not obtained, replace the adjusting spacer and readjust.

Break-in operation

When replacing the compressor clutch assembly, always conduct the break-in operation. This is done by engaging and disengaging the clutch about thirty times. Break-in operation raises the level of transmitted torque.

How to Perform an A/C Retrofit (Procedure Manual)

How to Perform an A/C Retrofit - Generic Instructions Except Quest

This procedure is used to replace R-12 refrigerant with R-134a refrigerant for Nissan vehicle A/C systems. For specific component removal and installation procedures, refer to the appropriate vehicle service manual.

Required Equipment

^ A set of R-12 service equipment certified to meet the requirements of SAE J1991. The J38750-A, ACR3 Recovery / Recycling / Recharging station meets these specifications.

^ A set of R-134a service equipment certified to meet the requirements of SAE J2210. The J39500-A, ACR4 Recovery / Recycling / Recharging System meets these specifications.

^ An adequate supply of R-134a refrigerant.

^ An adequate supply of PAG type "S", "R", and "F" A/C lubricant. Use only the lubricant specified for a particular system. Refer to the application table shown on page 3 of this bulletin.

Preliminary Checks

1. Before servicing any A/C system, determine which type of refrigerant and lubrication oil is currently in the system. This is important in order to avoid contamination of your existing refrigerant supplies or potential damage to your refrigerant equipment.

2. Ask the customer about the A/C service history. Have any alternative refrigerants been installed in the system? Has an A/C retrofit already been performed?

3. Check the engine compartment for A/C labels which may indicate previous retrofit work, oil additives, etc..

4. Verify the system you are working on, R-12 or R-134a.

Caution:

^ Always wear eye and hand protection (goggles and gloves) when working with any refrigerant or A/C system.

^ Avoid breathing A/C refrigerant and lubricant vapors or mist. Exposure may irritate eyes, nose, and throat. To remove R-134a from the A/C system, always use service equipment certified to meet the requirements of SAE J2210 (R-134a recycling equipment). Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.

^ Do not release refrigerant into the atmosphere. Use approved recovery / recycling equipment to capture the refrigerant every time an air conditioning system is discharged. If accidental discharge occurs, ventilate work area before resuming service.

^ R-134a service equipment or vehicle A/C systems should not be pressure tested or leak tested with compressed air. Some mixtures of air / R-134a have been shown to be combustible at elevated pressures. These mixtures are potentially dangerous and may result in fire or explosion causing injury or property damage. Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.

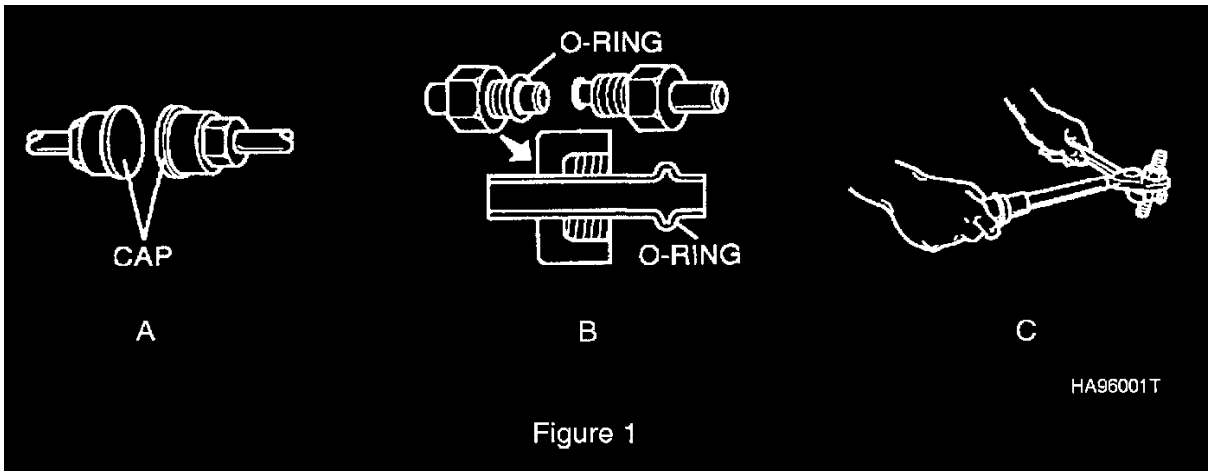


Figure 1

When installing refrigerant components, observe the following:

^ Do not remove the seal caps until just before connecting components (refer to "A" in Figure 1).

^ Be sure the O-ring is on the tube end and apply a small amount of refrigerant lubricant to the O-ring before assembling (refer to "B" in Figure 1).

^ Install tubes into mating parts and finger tighten nuts.

^ When tightening fittings, be sure to use a torque wrench and back up wrench (refer to "C" in Figure 1).

Retrofit Preparation

5. Determine the parts required for the vehicle system being retrofitted.

6. Conduct a "pre-retrofit performance test":

   ^ If the system is functioning properly, proceed to step 7
   ^ If the system is not functioning properly, determine the cause
   ^ If the system does not contain the proper amount of refrigerant, charge the system to 50 PSI with R-12 refrigerant and identify any leaks and/or failed components
   ^ If the system is still not functioning, proceed to step 7.

7. Recover the refrigerant using approved R-12 recovery / recycling equipment.

8. Repair or replace any failed components with the appropriate replacement.

NOTE:
When replacing a failed compressor, prior to retrofit, determine the type of lubricant the replacement contains. If the replacement compressor contains a lubricant other than the specified PAG lubricant, drain that lubricant before installation.

9. Disconnect the negative battery cable.

Passenger Compartment

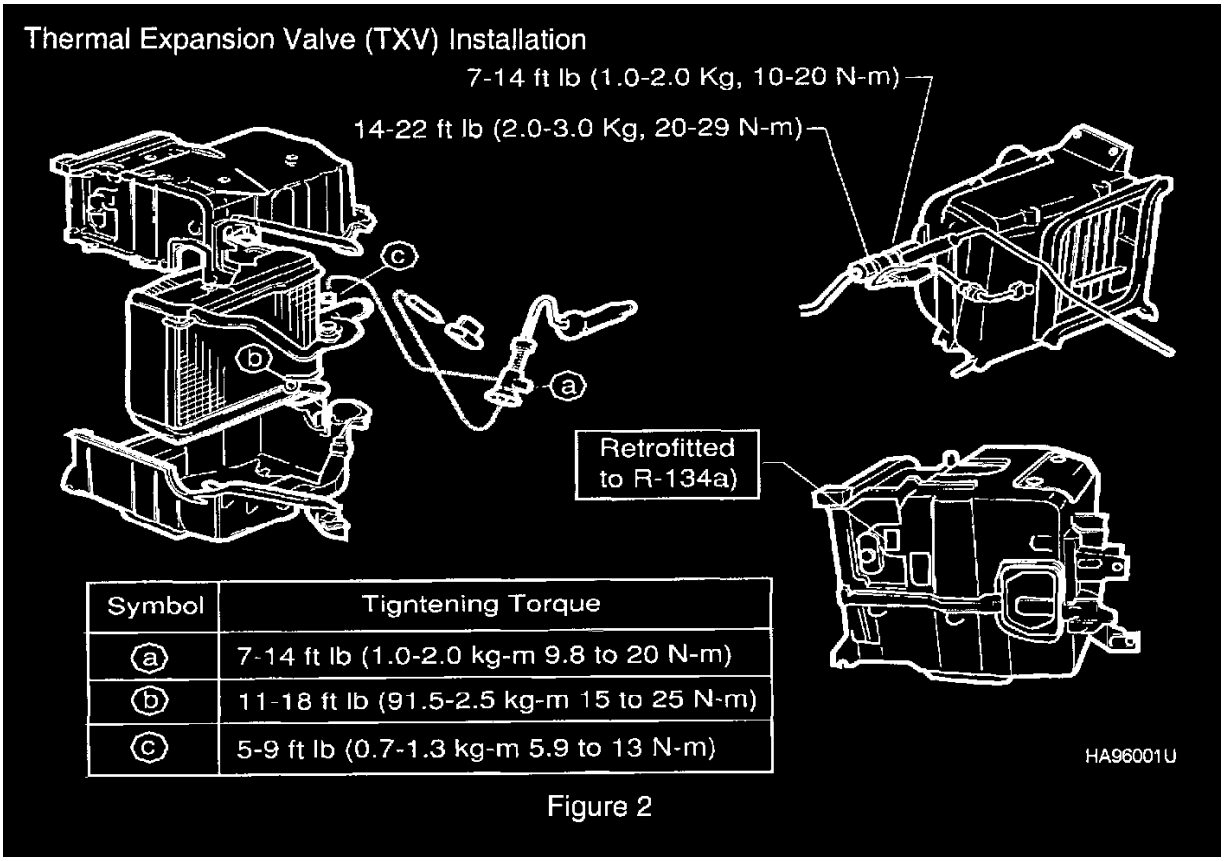
10. Remove the evaporator assembly as follows:

    A. Disconnect the high and low pressure tubes from the evaporator assembly.

    B. Disconnect the harness connector from the blower motor resistor (as necessary).

    C. Remove and save all mounting hardware.

    D. Remove the evaporator assembly.



Symbol	Tigntening Torque
ⓐ	7-14 ft lb (1.0-2.0 kg-m 9.8 to 20 N-m)
ⓑ	11-18 ft lb (91.5-2.5 kg-m 15 to 25 N-m)
ⓒ	5-9 ft lb (0.7-1.3 kg-m 5.9 to 13 N-m)

Figure 2

Thermal Expansion Valve (TXV) Installation

11. Remove and save the resistor bucket (2 screws) from the evaporator case assembly (if equipped).
12. Remove the thermistor from the evaporator core (if equipped). Note the thermistor location so it can be re-installed to its original location.
13. Remove and save the case halves from the evaporator core. (Carefully cut the air seals where the case halves meet).
14. Remove and discard the TXV bulb insulating wraps.
15. Disconnect the TXV equalizer tube from the evaporator outlet tube (use a backup wrench).
16. Remove the TXV sensing bulb from the evaporator outlet tube (1 clip).
17. Remove and discard the TXV (2 fittings).
18. Remove and discard O-rings on the TXV inlet and outlet tubes. Clean the tube ends.
19. Using new O-rings, install the new TXV onto the evaporator core.
20. Connect the TXV equalizer tube to evaporator outlet tube (lubricate the O-ring with the appropriate PAG lubricant as required) and torque fittings to specification (use a backup wrench).
21. Secure the TXV sensing bulb to the evaporator core.
22. Install new insulator foam wrap around the TXV sensing bulb.
23. Install new insulator butyl tape around the TXV.
24. Reassemble the case halves to the evaporator core.
25. Reinstall the thermistor to its original position (if equipped).
26. Reinstall the resistor bucket to the evaporator case (if equipped).
27. Repair air seals. If seals are not suitable for reuse, replace with new ones (available separately through NMC parts supply).
28. Reinstall the complete evaporator assembly into the vehicle in the reverse order of removal. Install new O-rings on the evaporator inlet and outlet tubes.Lubricate the O-rings with the appropriate PAG lubricant.
29. Reconnect the low and high pressure tubes to the evaporator. Torque fittings to specification.

30. Affix the "Retrofitted to R-134a" label to the evaporator case in a visible location. (Refer to Figure 2).

31. Remove and discard the existing pressure relief valve from the high pressure side (compressor side) flange.

32. Install the new pressure relief valve onto the high pressure hose flange. Lubricate O-ring with the appropriate PAG lubricant.

Torque the pressure relief valve to specification.

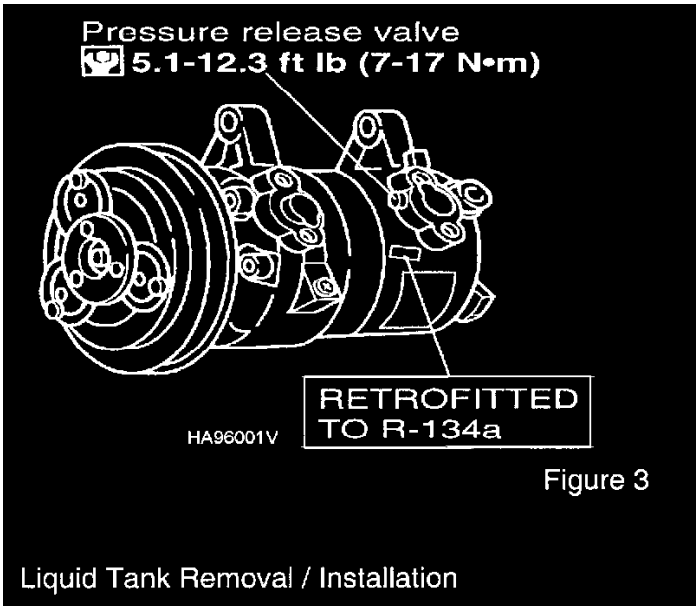


Figure 3

Liquid Tank Removal / Installation

33. Affix the "Retrofitted to R-134a" label to the compressor in a visible location as shown in Figure 3.

Liquid Tank Removal / Installation

34. Disconnect the liquid tank (LT) switch harness from the vehicle harness.

35. Remove and save the pressure switch from the old LT.

36. Disconnect the tubes from the LT. Remove the LT.

37. Remove and discard the blind plug from the new LT. Make sure the fusible plug remains in the new LT.

38. Install the old pressure switch into the new LT blind plug port, use a new O-ring. Lubricate with appropriate PAG lubricant.

39. Loosely install the new LT into the LT bracket.

40. Reconnect the pressure switch harness connector to the vehicle harness.

41. Install new O-rings on the LT inlet and outlet tubes. Lubricate O-rings with the appropriate PAG lubricant.

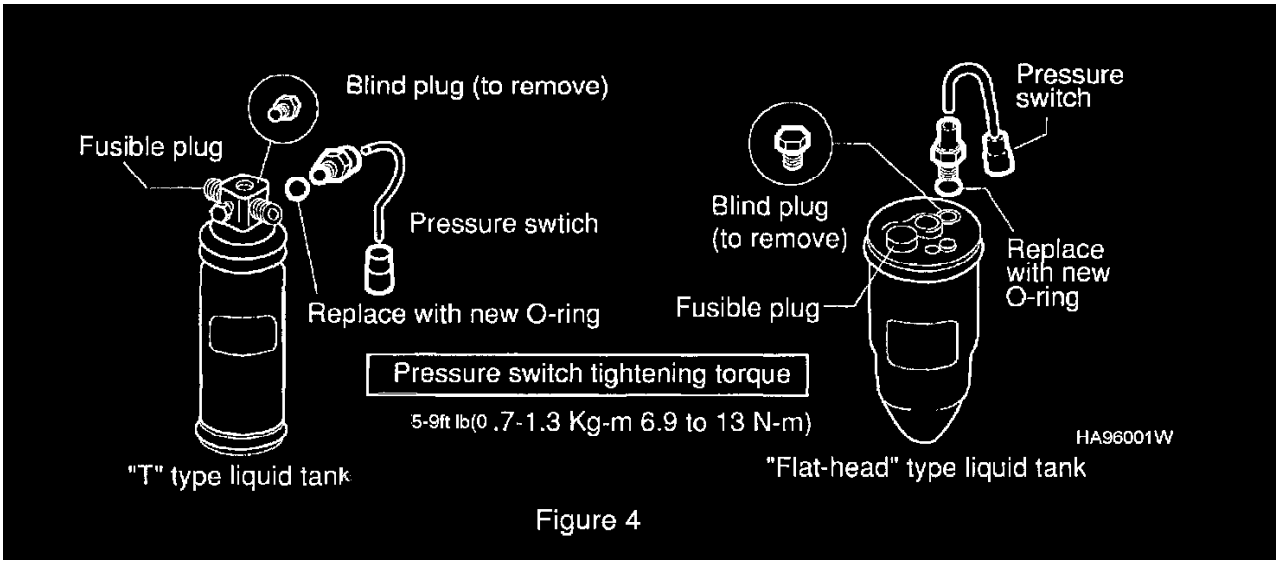


Figure 4

42. Reconnect the tubes to the LT. Torque to specification.

43. Tighten the LT bracket pinch bolt to secure the LT in the LT bracket.

Final Assembly

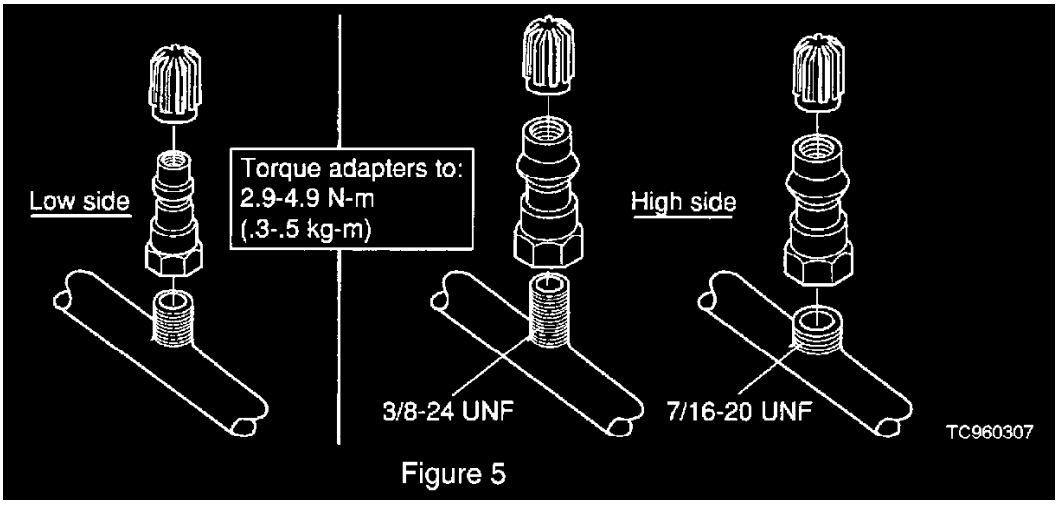


Figure 5

44. Install the charge adapters to the high and low pressure service valves. Torque adapters to specification (use a backup wrench).

NOTE:
THERE ARE TWO TYPES OF HIGH PRESSURE SERVICE VALVES 7/16-20 UNF AND 3/8-24 UNF. BOTH SIZES OF ADAPTERS ARE INCLUDED IN THE RETROFIT KIT. INSTALL THE CORRECT ADAPTER AFTER CONFIRMING THE SERVICE VALVE CONFIGURATION.

45. Using an ink pen, completely fill out the retrofit label. After filling out the label, peel the backing from the label's adhesive clear cover shield and firmly press the cover shield against the label face to permanently seal the label.

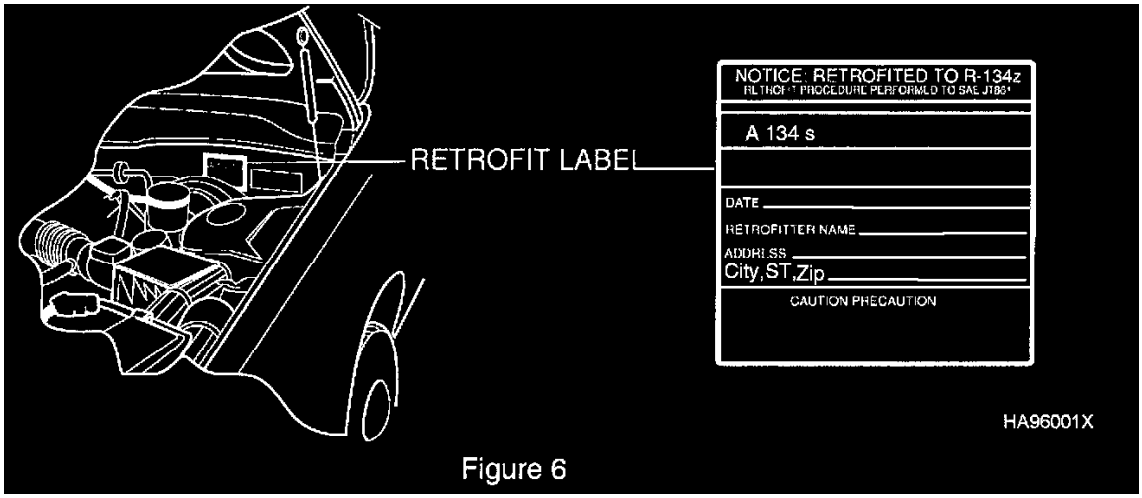


Figure 6

46. Affix the caution label to the engine room wall or suitable (permanent under-hood body panel) visible location as shown in Figure 6. Make sure the surface is clean before installing the label.

47. With a permanent marker, delete references to R-12 from the original caution label.

48. Reconnect the negative battery cable.

After Installation

49. Evacuate the A/C system for a minimum of 30 minutes.

50. Add the appropriate PAG oil as specified in the "Lubricant / Refrigerant Specification Chart" shown in this bulletin.

NOTE:
Do not compensate for lubricant change. Add the full amount indicated in the "Lubricant / Refrigerant Specification chart.

51. Charge the A/C system with the specified amount of R-134a refrigerant. (Refer to the "Retrofit Lubricant / Refrigerant Specification" chart in this bulletin).

52. Perform a refrigerant leak test using Kent-Moore tool J39400 to insure there are no refrigerant leaks.

53. Conduct an A/C performance test. (Refer to the "Performance Characteristics" information listed below).

Performance Characteristics for Retrofitted A/C Systems

General performance characteristics for R-12 A/C systems and the retrofit R-134a systems differ. These differences are outlined below:

Recirculating-to-discharge Air Temperature

^ The retrofitted system retains the original R-12 heat exchanger (evaporator and condenser)

^ Some R-12 lubricant oil remains in the A/C system

^ Because of these two reasons, the retrofit A/C system has a slightly lower cooling capacity than the R-12 A/C system. The maximum discharge temperature is increased by approximately 3.6 deg. F (2 deg. C).

Ambient Air Temperature-to-Operating Pressure

The retrofit A/C system has a higher operating pressure than the R-12 A/C system when the outside temperature exceeds 59 deg. F (15 deg. C).

^ High pressure side (discharge side): Maximum pressure increase of approximately 43 PSI (294 kPa, 3 kg/cm.).

^ Low pressure side (suction side): Same as R-12 A/C system.

Refer to the appropriate service manual for discharge air temperatures and operating pressure values for individual models. After verifying the discharge air temperature is within specifications, the retrofit is complete.

Technical Service Bulletin # **95-015** Date: **950310**

A/C - Precautions for Repair/Installation

Classification:
HA95-004

Reference:
NTB95-015

Date:
March 10, 1995

AIR CONDITIONING (A/C) PARTS PROPER INSTALLATION PROCEDURE

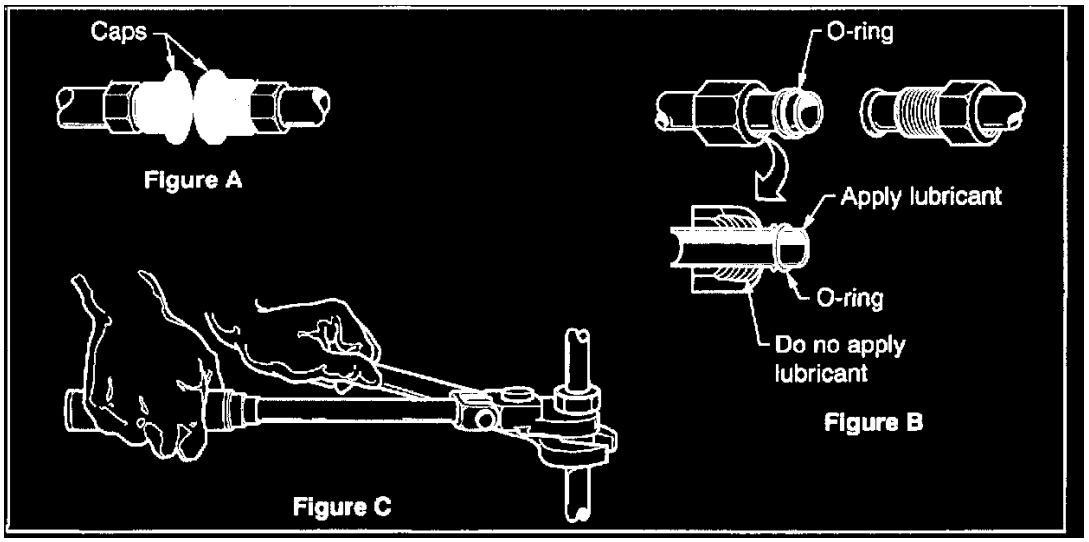
SERVICE INFORMATION

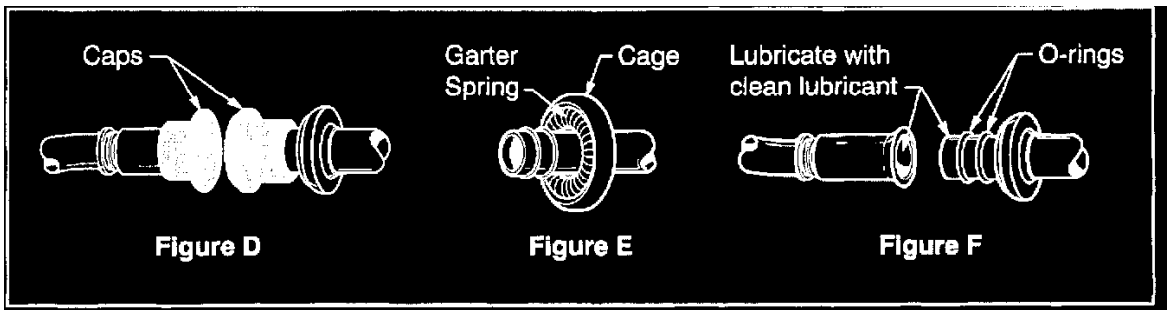
The information outlined below shows how to properly handle and install A/C system components during an A/C repair or kit installation.

1. Clean Working Area Surface

Clean all working area surfaces which may come in contact with A/C components. Dirt particles, metal chips, dirty oil, moisture, etc. can contaminate and damage the "O" rings and joint connectors. In addition, ensure that your hands are clean when handling A/C components.

2. Seal Caps





After disconnecting tubes, immediately plug all connector openings with seal caps to prevent entry of dirt and moisture. Do not remove the seal caps of pipes and other components until just before connecting the components. The caps prevent contaminants and moisture from entering and damaging the system (refer to figures A and D).

3A. "O" Rings and Joint Connectors (all vehicles except Quest)

A. Always replace used "O" rings with new ones. Always install the same size "O" ring.

B. Inspect new "O" rings and joint connectors before installation.

C. Make sure the "O" ring(s) are not scratched or cut. If the "O" ring has a cut or scratch, do not use it.

D. Be sure the "O" ring is on the tube end. Apply a small amount of refrigerant oil to the "O" ring. Be careful not to apply lubricant to the threaded portion (see figure B).

E. Inspect mating surfaces of components. Make sure there are no contaminants, burrs, scratches or damage especially at sealing surfaces.

3B. "O" Rings and Joint Connectors (Quest only)

A. Always replace used "O" rings with new ones. Always install the same size and same material "O" ring.

NOTE:
"O" rings used with the spring lock couplings on the Quest are a special material. The "O" rings normally used in refrigerant system connections are not the same material and should not be used with the spring lock coupling.

B. Inspect joint connectors before installation. Check that the garter spring is in the cage of the male fitting (see Figure E). If the garter spring is damaged, replace it with a new spring.

C. Make sure the "O" ring(s) are not scratched or cut. If the "O" ring has a cut or scratch, do not use it.

D. Be sure the "O" rings are on the male fitting. Lubricate the male fitting, "O" rings and inside the female fitting with clean lubricant (see Figure F).

E. Inspect mating surfaces of components. Make sure there are no contaminants, burrs, scratches or damage especially at sealing surfaces.

F. If you use a plastic indicator ring, install the ring into the cage opening.

G. Fit the female fitting to the male fitting and push until the garter spring snaps over the flared end of the female fitting. To indicate engagement, the plastic indicator ring will snap out of the cage opening when the coupling is connected.

H. If you do not use the indicator ring, visually verify the garter spring is over the flared end of the female fitting.

4. Making the Connections (all vehicles except Quest)

Tighten joint connections by hand first. Confirm the tubes are mated correctly. Then tighten the fittings using a torque wrench and a backup wrench to prevent twisting. Twisting can damage tubes and result in a leak later in the life of the vehicle (see figure C).

5. Torquing (all vehicles except Quest)

Torque the fittings to specification. Do not over torque. Over torque will damage the sealing surfaces and result in a leak. Be especially careful when installing plastic components such as switches and sensors. These components can be easily damaged due to mishandling or over torquing.

6. Leak Check

After completing all connections, evacuate and charge the system with the specified amount of refrigerant. Conduct a leak check to confirm there are no leaks from the connections. For more information on the detection of refrigerant leaks refer to NTB95-014.

Technical Service Bulletin # **95030** Date: **950322**

Tools - Essential Tool Release, Engine, A/C

Classification:
T&E95-03

Reference:
NTB95-030

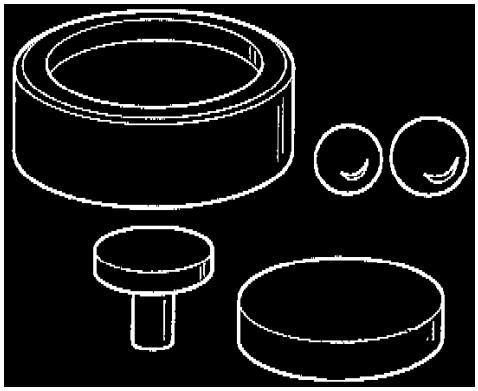
Date:
March 22, 1995

ESSENTIAL TOOL RELEASE

SERVICE INFORMATION

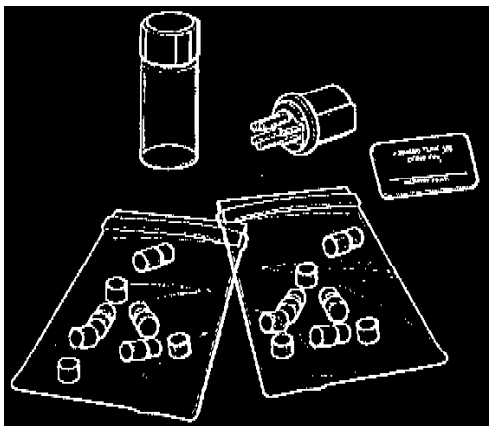
During the week of February 6, 1995, all Nissan dealers were sent the following special tools as part of the Essential Service Tool Program.

SERVICE PROCEDURE



1. J41471 Variable Timing Control (VTC) Sprocket Rebuild Kit. This kit provides the necessary tools to rebuild the VTC intake camshaft sprockets on the VE30DE engine. The initial shipment of this tool has been provided to all Nissan dealers at no charge. Additional kits can be purchased through the Tech-Mate Service Equipment and Special Tools program by calling 800-NMC-2001.

Refer to Technical Bulletin NTB95-022 for proper usage of these tools.



2. J39400-A/C Leak Detector Tune-up Kit. This kit provides all the items necessary to perform preventive maintenance on the J39400 A/C Leak Detector.

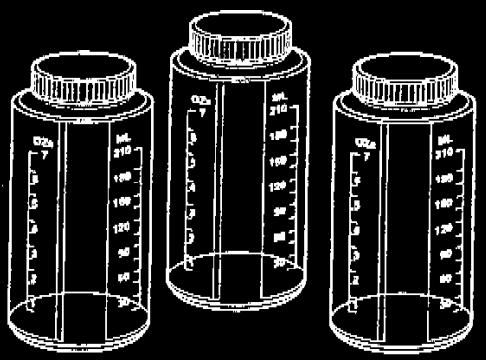
J 39400-TUNEUP
Leak Detector Kit

Included in the kit are:

DESCRIPTION	QUANTITY
New heated diode sensor	1
calibration bottle	1
filters	12
cotton swab cleaning sticks	10
air flow balls	4
safety pin	1
tune up date label	1
tune up kit instruction sheet	1

3. **J39500-71N, ACR4 Lubricant Injection Bottle Conversion Kit**

J 39500-71
ACR⁴ Lubricant Injection Conversion Kit



Tune-Up Kit Contents

This kit provides three, 12 ounce plastic bottles and related fittings to replace the existing 7 ounce bottles. These bottles will accommodate the proper lubricant charge when retrofitting from R-12 to R-134a refrigerant systems.

PARTS INFORMATION

DESCRIPTION	KENT-MOORE PART #
Variable Timing Control (VTC) Sprocket Rebuild Kit	J41471
A/C Leak Detector Tune-up Kit	J39400-Tune up
ACR4 Lubricant Injection Bottle Conversion Kit	J39500-71N

Technical Service Bulletin # **00-013** Date: **000210**

Steering - Vibration/Brake Pedal Pulsation

Classification:
BR00-001

Reference:
NTB00-013

Date:
February 10, 2000

AMMCO ON-CAR BRAKE LATHE OPERATING PROCEDURE

APPLIED VEHICLES:
All Nissan vehicles with disc brakes

SERVICE INFORMATION

If a Nissan vehicle exhibits steering wheel vibration or brake pedal pulsation when braking, it may be brake judder. Brake judder is created by excessive thickness variation of the brake rotors. In most cases the thickness variation is a result of excessive brake rotor run-out. While brake judder is usually associated with the front brake rotors, the rear brake rotors may cause it too.

The most effective way to eliminate brake judder and excessive rotor run-out is to turn the brake rotors using the Ammco on-car brake lathe. This required special tool will minimize the assembled brake rotor run-out more than conventional off-car turning/installing on hub process. Please **note** the following points when using the on-car brake lathe:

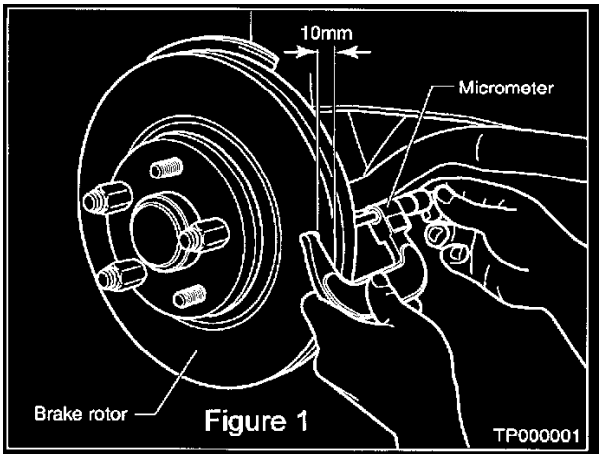
^ Prevent metal shavings from contacting or collecting on the ABS speed sensors. Remove any shavings that stick to the ABS speed sensor's magnet. It is best to clean the ABS sensor with the rotor removed.

^ Mark the exact location of the rotor (on the axle hub) before removing the rotor (see Figure 2).

^ Do not tighten the wheel lug nuts with an air impact driver. Uneven or high torque applied to the lugs may distort the brake rotor and hub, resulting in increased rotor run-out and excessive rotor thickness variation as the rotor wears.

^ If new rotors are required, install them on the hub in different positions (index) to achieve the lowest run-out reading (equal to or less than 0.0012", 0.03 mm), using a dial indicator. See Figure 11.

Service Procedure



1. Measure the rotor thickness at 10 mm in from the outside diameter of the rotor to ensure the rotors can be turned (see Figure 1).

   A. If the rotor thickness is below specification, the rotor cannot be turned, but must be replaced. When installing new rotors, install them on the hub in different positions (index) to achieve the lowest run-out reading (equal to or less than 0.0012", 0.03 mm).

   B. If the rotor thickness is within specification, the rotor can be turned. Proceed with step 2.

WARNING:
Do not cut below the minimum rotor thickness specification. Replace the rotor if the run-out cannot be eliminated without exceeding the minimum rotor thickness specification.

2. Remove the brake caliper assembly.

CAUTION:
Do not allow the brake caliper assembly to hang from the brake hose. Use a piece of wire to hang the caliper from the front coil spring.

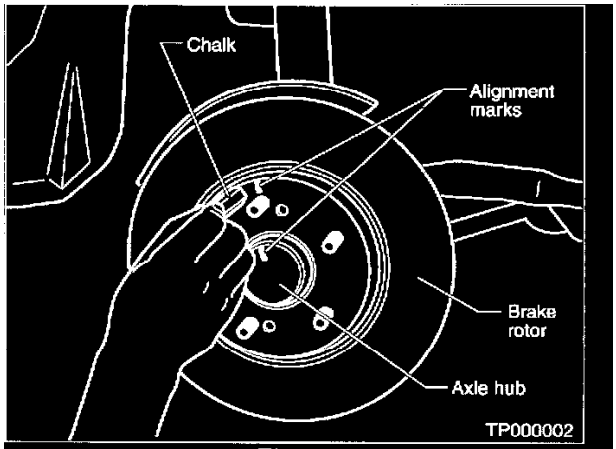


Figure 2

3. Put an alignment mark on the rotor and the axle to ensure the rotor remains in its original position (see Figure 2).

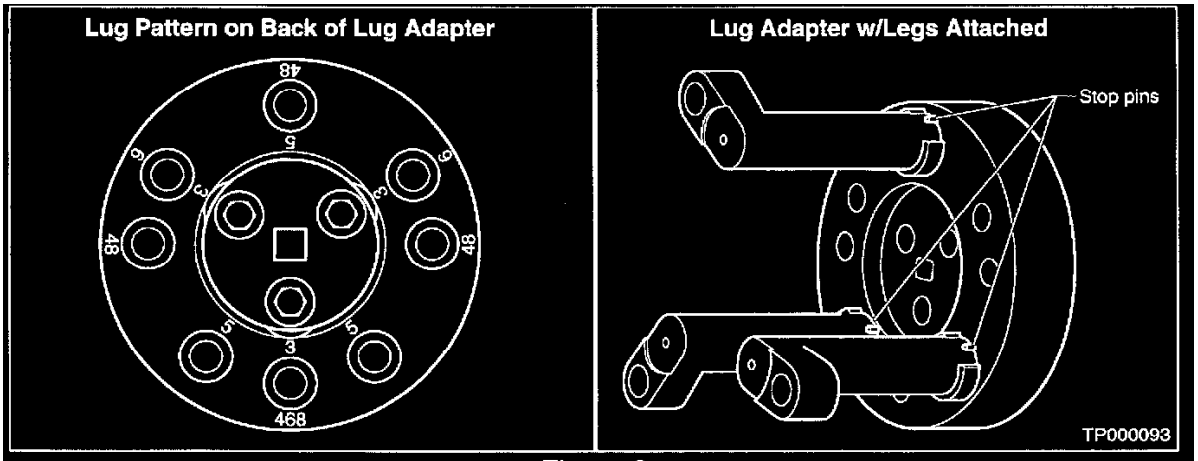


Figure 3

4. Assemble the legs on the lug adapter according to the lug pattern of the vehicle being worked on (see Figure 3). Then tighten the bolts that secure the legs to the adapter, making sure the legs are flat against the adapter and freely rotate.

5. Orient all legs to the full outside position, against the stop pin (see Figure 3).

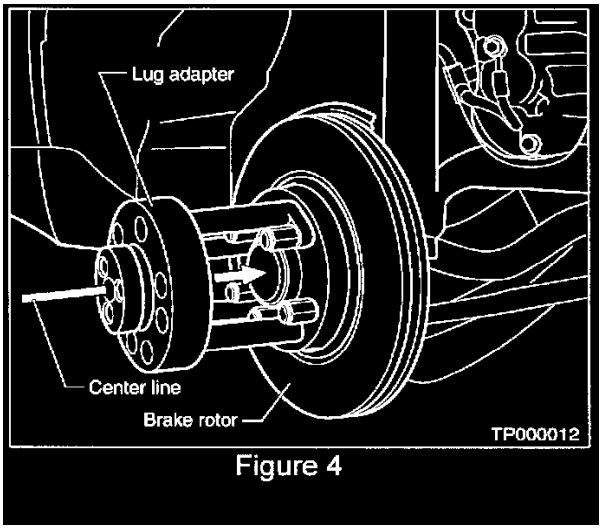


Figure 4

6. Install the lug adapter on the brake rotor (see Figure 4). Tighten all lug nuts to 40 ft/lb.

NOTE:
Ensure that all lug nuts are installed on the lug studs - including the lug studs not used for the lug adapter legs.

NOTE:
Make sure the lug adapter is centered on the brake rotor (see Figure 4).

7. Install the brake lathe on the vehicle as follows:

A. Loosen the bolts holding the adjustable mounting brackets on the lathe and slide the brackets in or out to align with the holes in the caliper mounting bracket on the vehicle.

NOTE:
If the mounting brackets on the lathe do not adjust in or out far enough to reach the caliper mounting holes, the brackets may be switched end-to-end or switched end-to-end and turned 90 degrees to match the caliper mounting holes.

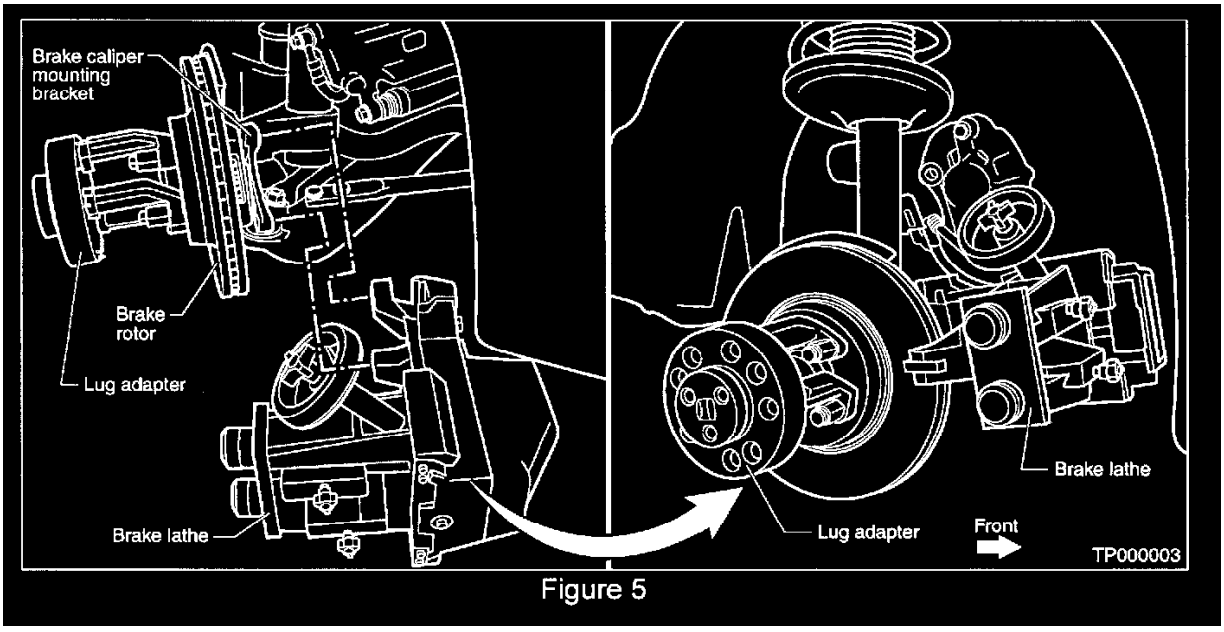


Figure 5

B. Mount the lathe against the inboard side of the caliper mounting bracket using the appropriate adapter mounting bolts, sleeves and spacers to achieve adequate clearance between the lathe and the brake rotor (see Figure 5).

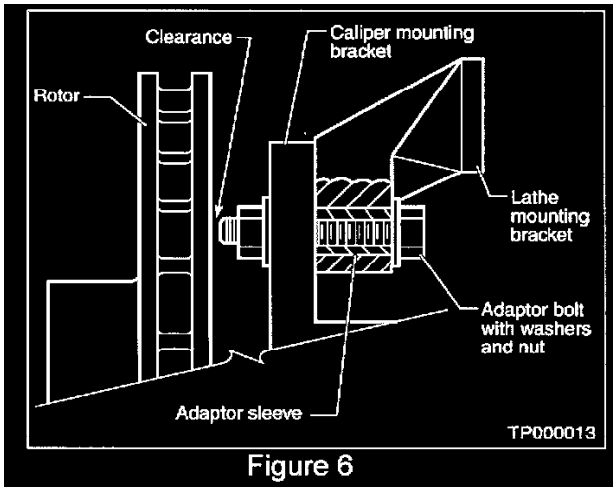


Figure 6

NOTE:
Use the appropriate adapter mounting bolts and sleeves to ensure the lathe is firmly mounted and that NO movement (play) exists between the caliper mounting bracket and the lathe. Also, make sure there is sufficient clearance between the adapter mounting bolts and the brake rotor (see Figure 6).

8. Install the silencer band on the outside diameter of the brake rotor to dampen vibrations during cutting.

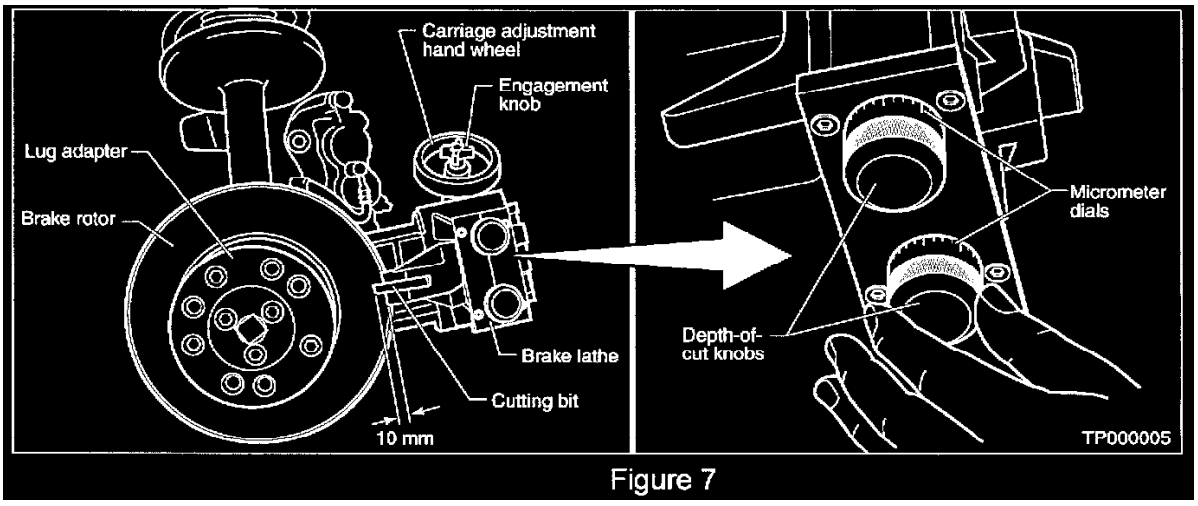


Figure 7

9. Position the cutting bits about 10 mm in from the outer edge of the rotor surface (see Figure 7).

NOTE:
Make sure the cutting bits are sharp and in good condition. Also, cutting bits should not be used more than ten times as they wear out.

10. Turn the (blue) depth-of-cut knob clockwise to advance the outboard cutter until it lightly contacts the rotor surface. Hold the knob still while rotating the micrometer dial to zero (see Figure 7). Then, turn the depth-of-cut knob 1 notch counterclockwise.

11. Turn the (red) depth-of-cut knob clockwise to advance the inboard cutter until it lightly contacts the rotor surface. Hold the knob still while rotating the micrometer dial to zero (see Figure 7). Then, turn the depth-of-cut knob 1 notch counterclockwise.

NOTE:
Once you have zeroed a micrometer dial, never use the dial to advance or withdraw a cutting bit; the dial may slip, losing the zero position. Only use the depth-of-cut knob to advance or withdraw the cutting bit.

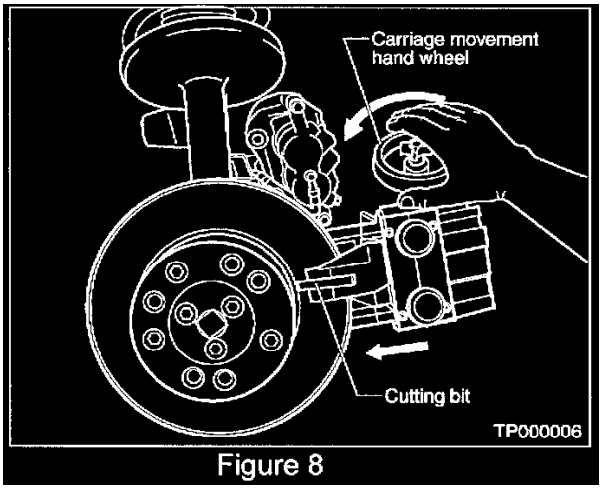


Figure 8

12. Advance the carriage with the hand wheel until the outboard cutting bit reaches the inside edge of the rotor surface (see Figure 8). Then, advance the carriage movement hand wheel an additional one-third turn.

13. Turn the depth-of-cut knobs individually to set each cutting bit to the desired depth of cut. Each cut may be between 0.002" and 0.004" (0.05 mm and 0.10 mm), but the final cut must be made at 0.001" (0.025 mm).

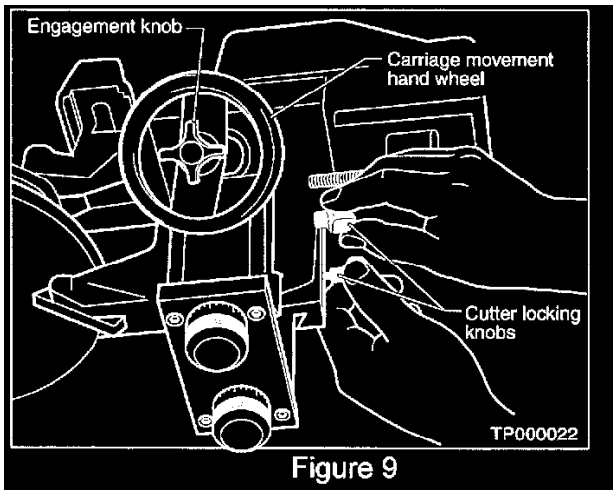


Figure 9

14. Tighten the cutter locking knobs (see Figure 9).

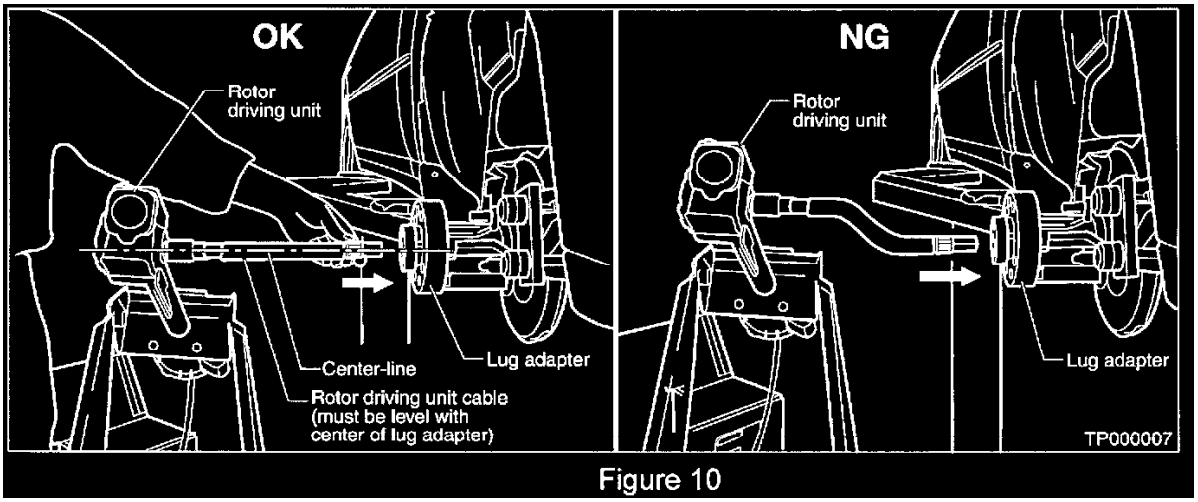


Figure 10

15. Connect the rotor driving unit to the lug adapter (see Figure 10).

NOTE:
Before using the rotor driving unit, ensure that all lug nuts are installed on the lug studs - including the lug studs not used for the lug adapter. Tighten the lug nuts to 40 ft-lb.

NOTE:
Make sure the rotor driving unit cable is exactly level with the center of the lug adapter (see Figure 10).

16. Activate the rotor driving unit.

17. Tighten the engagement knob in the center of the carriage movement hand wheel (see Figure 9) to start the cutting process. When the cutting bits clear the outer edge of the rotor, loosen the engagement knob to stop the carriage movement.

18. If part of the brake surface was not cut, leave the cutters in the locked position and move the carriage until the cutters are at the inside edge of the braking surface, then repeat steps 12, 13, 14, 16 and 17.

19. Turn the rotors with a finish-cut of 0.001" (0.025 mm).

NOTE:
The brake lathe cutting bits must be replaced after they have been used 10 times.

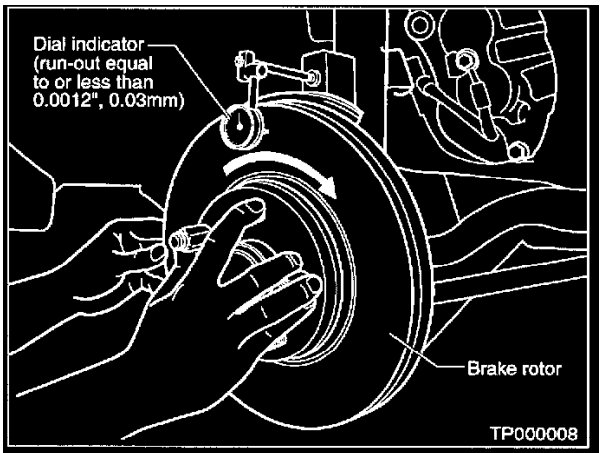


Figure 11

20. Use a dial indicator to ensure the rotor run-out is within specification (see Figure 11). Rotor run-out should not exceed 0.0012" (0.03 mm).

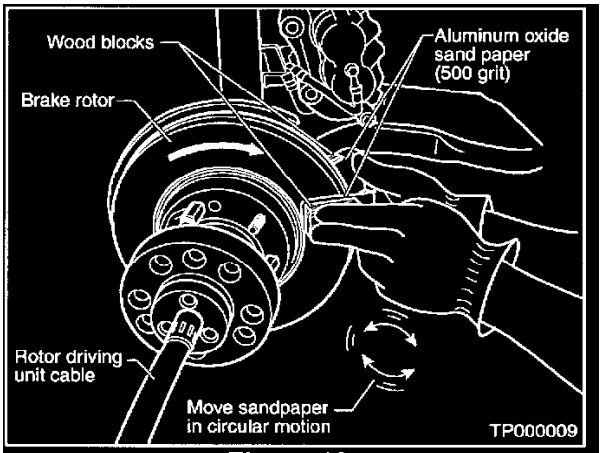


Figure 12

21. Turn the rotors and hand finish the newly turned rotor surface with a non-directional swirl pattern using #500 grit aluminum oxide sandpaper. This improves the rotor surface finish and helps to further reduce noise (see Figure 12).

NOTE:
Use a small, flat block of wood between the sandpaper and your fingers to ensure a flat, smooth surface finish (see Figure 12).

Technical Service Bulletin # **GI86035** Date: **861017**

Powertrain Components - Rust Proofing

Models All Models

Section General Information

Classification GI86-035

Bulletin No. TS86-182

Date October 17, 1986

RUST PROOFING OF SERVICE PARTS

TABLE 1

LARGE SIZED PARTS	NEW TYPE	OLD TYPE
Bare engine	Coated with rust-proofing oil and packed in PP* film	Covered with PP film with occasional use of anti-moisture paper
Short engine, Cylinder-block	Coated with rust-proofing oil and packed in PP film	Coated with rust-proofing oil and wrapped in PP film and anti-moisture paper
Transmission, including A/T	Coated with rust-proofing oil and packed in PP film	Covered with PP film with occasional use of anti-moisture paper
Final drive assy, including gear set	Coated with rust-proofing oil and packed in PP film	Wrapped in anti-moisture paper and PP film
MEDIUM SIZED PARTS	**NEW TYPE**	**OLD TYPE**
Such as flywheel	Coated with rust-proofing oil and packed in PP film	Wrapped in anti-moisture paper and packed in carton box

*PP = Polypropylene

SERVICE INFORMATION

The factory has begun to apply a new rust-proofing material to large and medium sized service parts. This new type of rust-proofing oil must be removed (see below) before installing the parts to a vehicle. Table 1 lists the applied parts with the new and old type of rust-proofing material used.

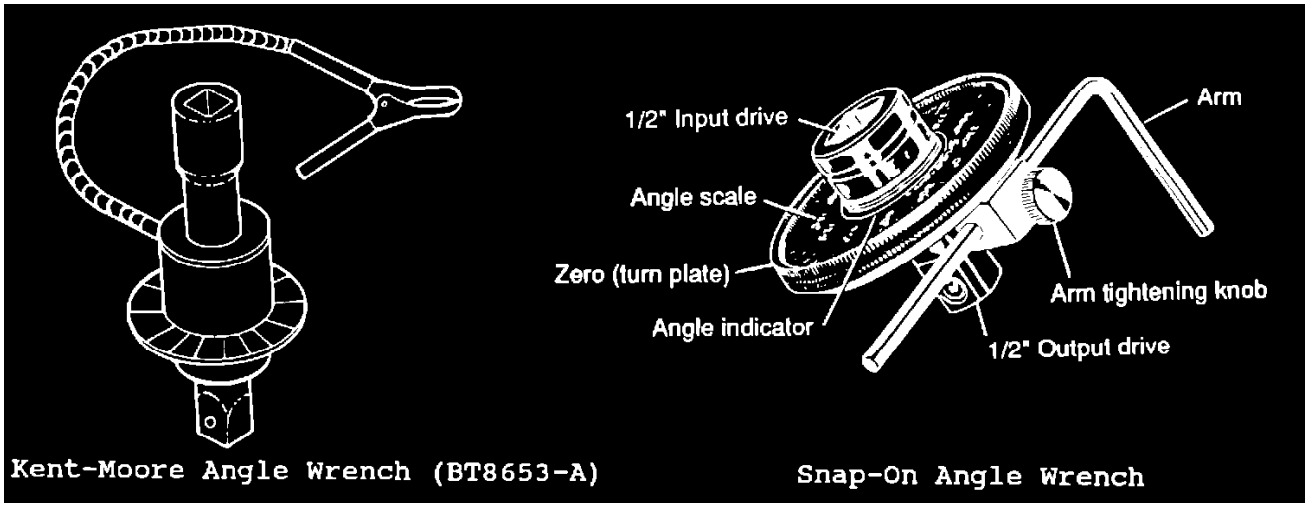
RUST-PROOFING OIL REMOVAL

Rust-proofing oil should be washed or wiped off the parts using kerosene or equivalent. This new oil is easier to remove than the current oil applied to short engine and cylinder blocks.

Technical Service Bulletin # **EM90008** Date: **901011**

Engine - Angular Tightening Tools

Classification: Section:
EM90-008 ENGINE MECHANICAL
Reference:
TECHNICAL BULLETIN NTB90-090
Models:
ALL MODELS Date:
OCTOBER 11, 1990



ANGULAR TIGHTENING

APPLIED MODELS: All Models

SERVICE INFORMATION:

It is important that some engine parts are tightened using an angulartightening method rather than the exclusive use of the torque setting method because the tightening force (axial bolt force) which occurs using the torque setting method can result in "bolt stretch" or breakage. To assure satisfactory maintenance of the engine and to reduce the possibility of "bolt stretch" or breakage, Nissan recommends that the angular-tightening method be used rather than the torque setting method whenever the appropriate Service Manual indicates application of this method.

A suitable angle wrench can be obtained from the Kent-Moore and the Snap-On Companies.

Technical Service Bulletin # **03-093A** Date: **040319**

Engine/Transmission - Precautions During R&R Procedure

Classification:
EM03-001a

Reference:
NTB03-093a

Date:
March 19, 2004

CAUTION DURING ENGINE OR TRANSMISSION REPLACEMENT

This bulletin amends NTB03-093. This version amends the Service Information. Please discard all paper copies of the earlier version.

APPLIED VEHICLES:
All Nissan

SERVICE INFORMATION

Improper or incorrect service and repair procedures may cause damage to new or repaired parts and components.

^ Damage to repaired or replaced engine, transmission, or other components caused by improper procedures during repair or replacement is not covered by warranty.

This TSB contains information to help you avoid damaging these parts and components.

Cylinder Block - Transmission Dowel Pins

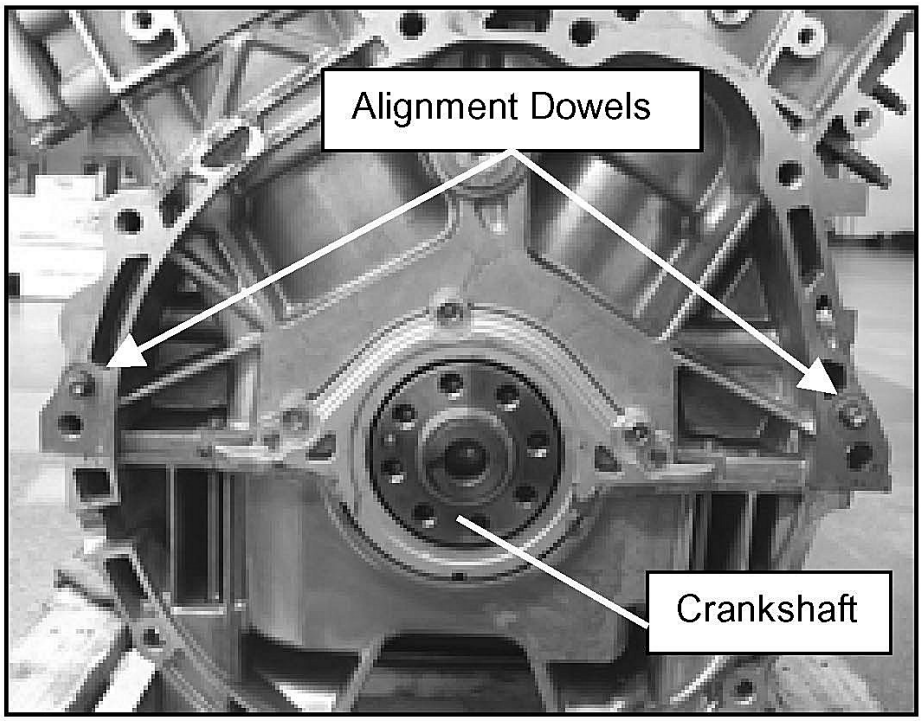


Figure 1

1. Alignment dowels are installed between the cylinder block and transmission.
   - ^ They ensure accurate alignment of the crankshaft to the transmission input shaft.
2. If you replace an engine or transmission you must make sure the dowels are installed correctly during re-assembly.
   - ^ Improper alignment caused by missing dowels may cause vibration, oil leaks or breakage of drive-train components.

Crankshaft - Drive Plate/Flywheel Alignment Dowel Pin

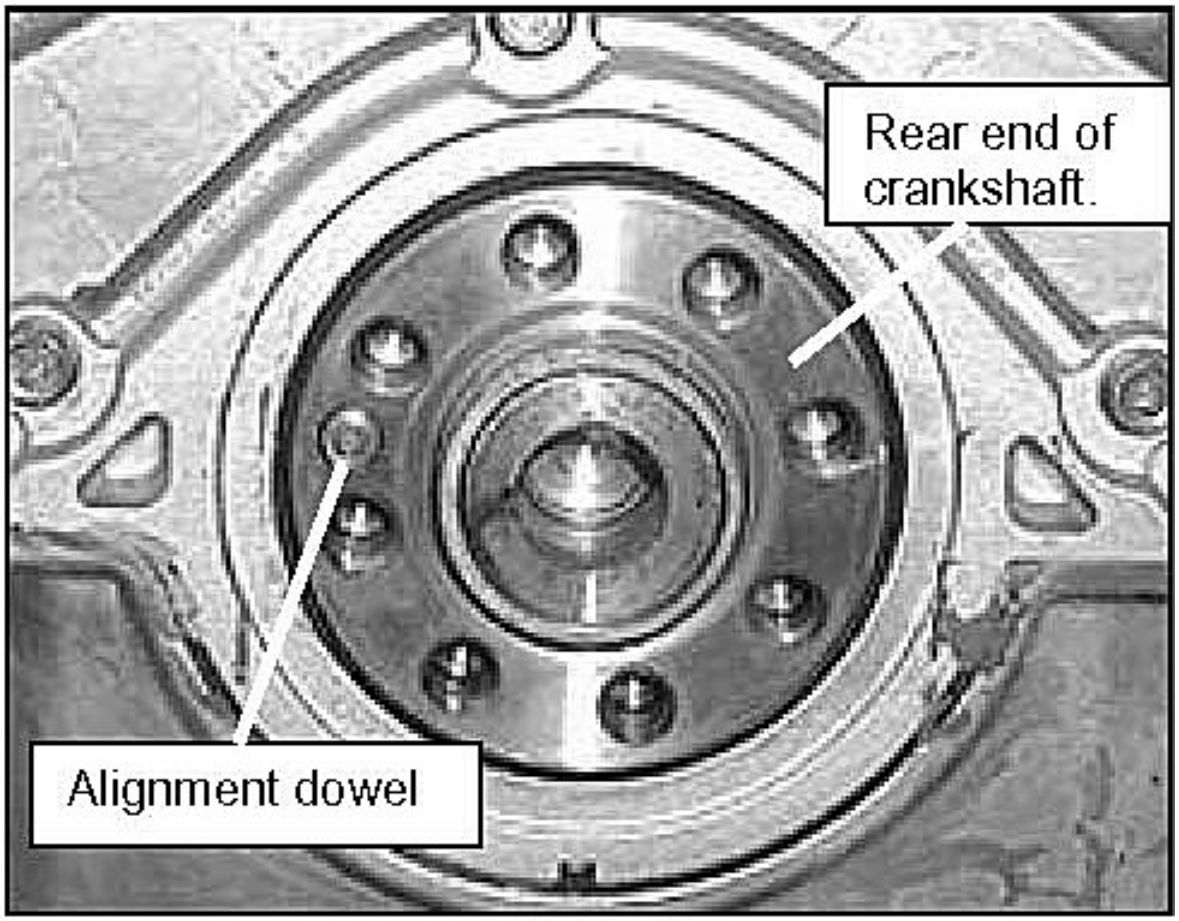


Figure 2

1. Most late model engines have an alignment dowel installed in the rear of the crankshaft.
   - ^ This dowel is used to properly align (locate) the drive plate or flywheel with the crankshaft.
2. If you replace an engine that uses this dowel, make sure it is installed during re-assembly.
3. On engines that use this dowel:
   - ^ During re-assembly, the drive plate or flywheel locating hole must be aligned with this dowel for proper operation of the engine control system.
   - ^ If not aligned (clocked) correctly, rough running and MIL "ON" will occur.

Torque Converter Pilot (A/T) Pilot Bushing (M/T)

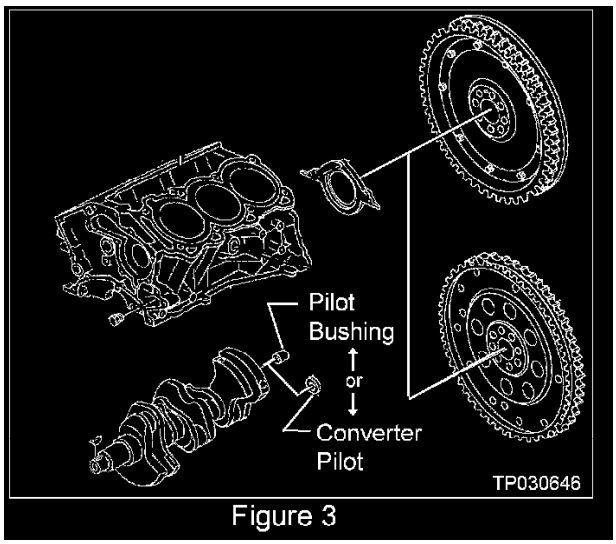


Figure 3

1. Either bushing above is "pressed" into the rear of the crankshaft.

^ This ensures proper alignment at re-assembly.

2. Some automatic transmission equipped vehicles use a torque converter pilot.

^ It supports the torque converter.

3. Some manual transmission equipped vehicles use a pilot bushing.

^ This bushing supports the end of the transmission input shaft.

4. If you replace an engine (or an engine crankshaft) on a vehicle that uses a Pilot Bushing or Converter Pilot, you must make sure that the correct pilot is installed: Automatic Transmission pilot Vs Manual Transmission pilot.

^ Vibration and/or hard shifting may result if the correct pilot is not installed.

Debris in the Intake and Exhaust System

1. Whenever an engine (short or long block) is replaced or repaired, note the following:

^ You must make sure that the intake and exhaust system components are cleaned out.

^ They must be completely free of debris, water, or other "foreign material."

^ Anything like that left in the intake or exhaust system will probably cause engine damage.

^ If a piston or valve was broken on the old engine, it is likely that metal debris will be found in both the intake and exhaust systems.

2. Review the following cleaning recommendation for the intake and exhaust systems when you replace or repair an engine:

^ Visually inspect for debris, water, or other foreign material inside the entire intake system, from the air filter intake through the intake manifold; clean as needed.

^ Inspect the intake manifold "runners" from the cylinder head side. Make sure that no particles of metal (broken pieces of piston, valve, etc) have stuck to the walls of the runners.

^ Visually inspect the "flange" portion of the manifold, where it attaches to the head. Make sure there are no scratches or burrs that might cause a bad seal seal.

^ Visually inspect the "power valves" inside the intake manifold (if applicable). Make sure all retaining screws that attach the "butterflies" to the shaft are in place and tight.

^ Make sure the exhaust ports are clean and free of debris.

^ Inspect the entire exhaust system for debris or other foreign material. Clean or replace as needed.

Oil Pressure at "New or Repaired" Engine Start-Up

Before a new service engine is started for the first time, "prime" the oil system as follows:

1. After filling, allow a few minutes for the oil to drain down to the oil pan before measuring.

^ Be sure the vehicle is level.

^ Confirm the oil is filled to the "H" (full) mark on the dipstick.

NOTE:
Some models require as much as 10 minutes wait time for oil to drain to the pan. See the LU or MA section of the appropriate Service Manual (ESM).

2. Remove the fuse for the fuel pump.

3. Crank the engine for about 10 seconds or until the oil pressure warning light goes out.

(Do not crank the engine for more then 10 seconds at a time.)

4. Reinstall the fuel pump fuse and start the engine.

5. Inspect for oil, fuel, or water leaks.

6. Confirm normal engine and transmission operation.

Final Quality Check:

Inspect your work to confirm that all wires, hoses, trim, etc. are properly located and secure. This helps to prevent comebacks and unhappy customers.

Technical Service Bulletin # **96-100** Date: **961023**

Cooling System - Fan Installation On Water Pump Flange

Classification:
EM96-008

Reference:
NTB96-100

Date:
October 23, 1996

FAN INSTALLATION TO WATER PUMP FLANGE

APPLIED VEHICLE:
All with water pump mounted fan

SERVICE INFORMATION

The fan mounting flange of the water pump may become loose on the shaft if the fan, fan coupling, or fan pulley (water pump pulley) are not properly installed during a repair. The incident may be exhibited as a screeching noise from the engine when starting cold. When removing or installing the fan, fan coupling or fan pulley, always perform the procedure listed below.

SERVICE PROCEDURE

1. Turn the ignition switch to off.

2. Loosen the alternator then remove the drive belt. Do not leave the drive belt in place and release the drive belt tension by removing the fan pulley. (Releasing the drive belt tension by removing, the fan pulley may complicate component re-installation).

3. Remove the fan, fan coupling, fan pulley and any other components required for the service you are performing.

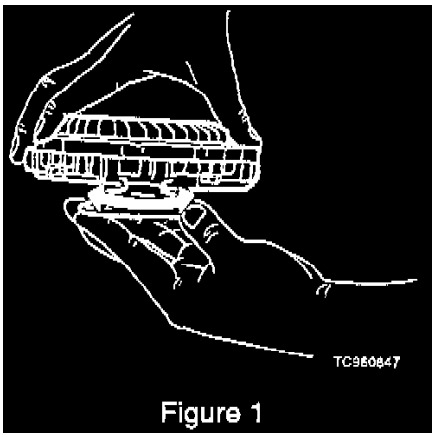


Figure 1

4. Inspect the fan coupling for wobbling (Figure 1), oil leakage or bent/broken bimetal before assembly.

5. Carefully Install the fan, fan coupling and fan pulley. Torque the M6 x 0.8 nuts and screws securing the fan to the fan coupling and the fan coupling to the water pump flange to 4.3-7.2 ft. lb. Install the drive belt only after the fan and fan coupling to water pump flange bolts/nuts have been properly torqued.

NOTE:
Proper alignment of these components is essential. Improper alignment will cause them to wobble and may eventually cause the fan to separate from the water pump causing extensive damage.

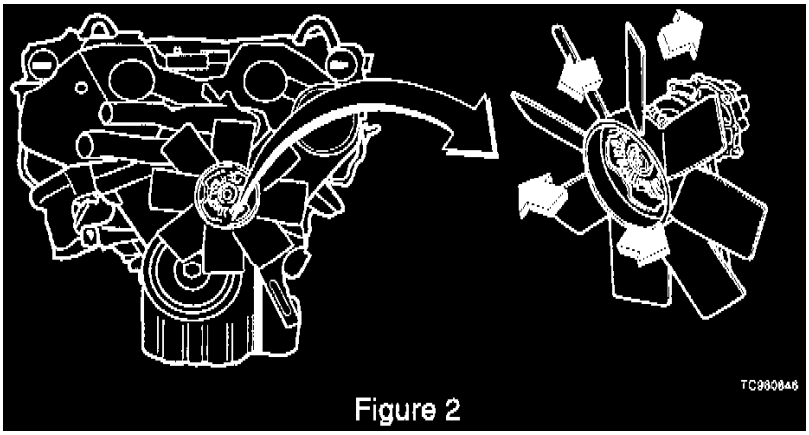


Figure 2

6. After assembly, verify the fan does not exhibit any wobble or flapping while the engine is running. If any wobble or flapping is observed, it must be corrected before the vehicle is released to the customer.

CAUTION:
When the engine is running, keep hands, clothing and jewelry away from moving parts such as drive belts and fan.

Technical Service Bulletin # **99-044B** Date: **991027**

Tools - Starting & Charging System Tester

Classification:
EL99-014B

Reference:
NTB99-044B

Date:
October 27, 1999

APPLIED VEHICLE(S)
All Nissan

APPLIED DATE(S)
All years

NISSAN BATTERY/STARTING/CHARGING SYSTEM TESTER

This bulletin supersedes NTB94-009 and amends NTB99-044 & NTB99-044a. This version contains updated Service and Warranty information including alternator and starter diagnostics. Please discard all paper copied of the earlier bulletins.

SERVICE INFORMATION

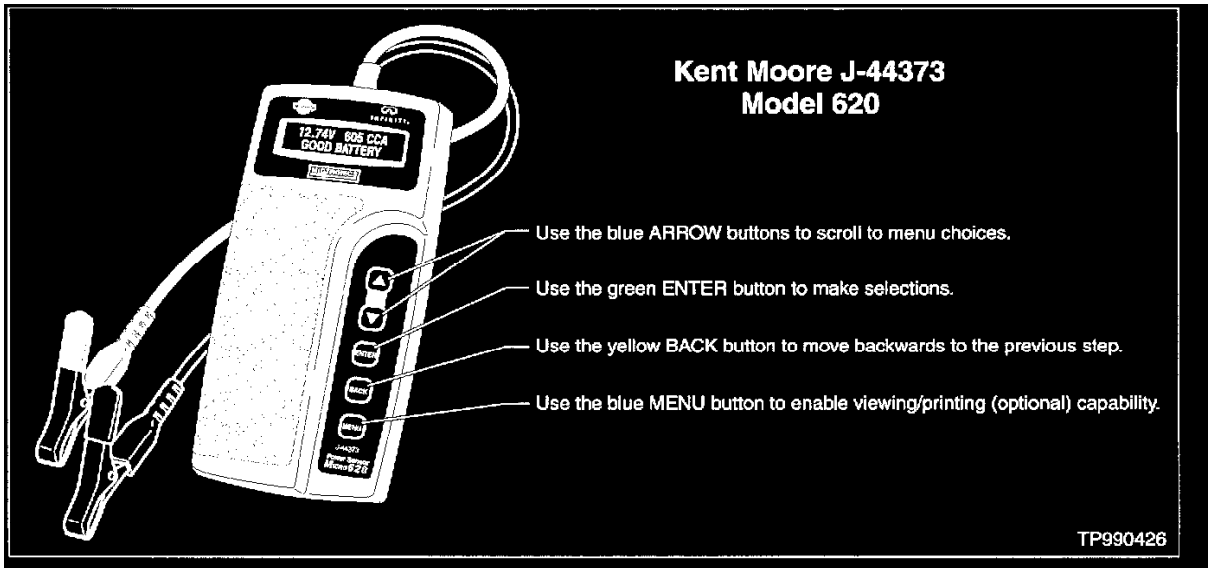


Figure 1

A new Special Tool has been issued to aid in diagnosis of battery, starting system, and charging system incidents. Using Kent-Moore tool # J-44373 Model 620 (see Figure 1), several comprehensive diagnostic tests can be performed on these systems in a matter of minutes. This will help isolate and identify the incident faster, improving Customer Satisfaction and Fixed Right First Time performance.

The Model 620 tool is specifically calibrated for use with Nissan vehicles. It uses two phases of testing and will provide diagnosis and a 12 character test output code. This method of testing can save time as the entire battery/starting/charging system can be quickly scanned to identify the particular area of concern.

Claims Bulletin WB/99-022, dated September 2, 1999, announced that technicians must use this essential tool for all battery replacement claims for warranty, service contract, goodwill or service campaign (except when specific instructions for component replacement without testing apply) effective with repair order open dates of September 15, 1999, and greater.

Claims Bulletin WB/99-028, dated October 28, 1999, announces that this essential tool must now also be used for all alternator replacement claims for warranty, service contract, goodwill or service campaign (except when specific instructions for component replacement without testing apply) effective with repair order open dates of November 8, 1999, and greater.

Claims Bulletin WB/99-030, to be dated November 11, 1999, will announce that this essential tool must also be used for all starter replacement claims for warranty, service contract, goodwill or service campaign (except when specific instructions for component replacement without testing apply) effective with repair order open dates of November 22, 1999, and greater.

The 12 character test output code for each of the two phases of testing must be recorded in the Technician Remarks field on the hard copy of the repair order for all battery, alternator or starter replacement claims. Refer to the respective Claims Bulletin for claims procedure information.

CLAIMS INFORMATION

Claims Bulletin WB/99-022, dated September 2, 1999, announced that technicians must use this essential tool for all battery replacement claims for warranty, service contract, goodwill or service campaign (except when specific instructions for component replacement without testing apply) effective with repair order open dates of September 15, 1999, and greater.

Claims Bulletin WB/99-028, dated October 28, 1999, announces that this essential tool must now also be used for all alternator replacement claims for warranty, service contract, goodwill or service campaign (except when specific instructions for component replacement without testing apply) effective with repair order open dates of November 8, 1999, and greater.

Claims Bulletin WB/99-030, to be dated November 11, 1999, will announce that this essential tool must also be used for all starter replacement claims for warranty, service contract, goodwill or service campaign (except when specific instructions for component replacement without testing apply) effective with repair order open dates of November 22, 1999, and greater.

The 12 character test output code for each of the two phases of testing must be recorded in the Technician Remarks field on the hard copy of the repair order for all battery, alternator or starter replacement claims. Refer to the respective Claims Bulletin for claims procedure information.

Tester Preparation

NOTE:

The date and time MUST BE accurately set on the tester. If the date and time are incorrect, the suspension or denial of repairs claimed as warranty, service contract, goodwill or service campaign will result.

Verifying date and time.

A. With the tester clamps disconnected, press and hold the "MENU" button until the "OPTION SELECT-PRINT RESULTS" display appears.

B. Use either of the blue up/down arrows to scroll until the "SET DATE & TIME" display appears.

C. Press "ENTER." The day of the week, calendar date, "STD" (standard) or "MIL" (military) time, the hour/minute and "AM/PM" (if "STD" is displayed) will appear.

D. If the date and time displayed are correct, continue to press "ENTER" repeatedly until the "OPTION SELECT-PRINT RESULT" display appears. Proceed to Tester Usage on next page. If the date and time are not correct, proceed to Adjusting the date and time, step A.

Adjusting the date and time.

A. The underscore (_) symbol will be present under the day of the week.

^ If this is correct, press "ENTER" to move the underscore symbol to the month.

^ If the day of the week display is incorrect, use the blue up/down arrows to select the correct day of the week, then press "ENTER."

^ Continue to set the month/day/year in this fashion.

B. The underscore symbol should now be under the "STD" display. If "MIL" is displayed use the blue arrow keys to select "STD", then press "ENTER" to move the underscore symbol to the hour adjustment.

C. Using the "ENTER" button and the blue arrow keys, continue to adjust the hour, minute and "AM/PM" display.

D. After you have adjusted the "AM/PM" display and pushed "ENTER", the "OPTION SELECT-PRINT RESULT" display will appear. The date and time are now set.

Tester Usage

To ensure a complete and thorough diagnosis, the battery, starter and alternator test segments must be done as a set from start to finish (unless the bulletin instructs otherwise). In most cases it will take less than five minutes.

WARNING:
When working with batteries always wear appropriate eye protection.

NOTES:

^ If battery surface charge is detected while testing, the tester will prompt you to turn on the headlights to remove the surface charge. Follow the instructions on the display. After detecting the removal of the surface charge, the tester will automatically resume testing.

^ If necessary, the tester will prompt you to determine if the battery temperature is above or below 32 degrees F. Choose the appropriate selection by pressing the up or down arrow button, then press ENTER to make the selection.

^ When testing older model diesel engines in cold weather, operation of the glow plugs may cause incorrect test results. Warm the engine to operating temperature first, then proceed with testing.

1. Record the radio presets for reprogramming after the test (if needed).

2. Using CONSULT or CONSULT II (where applicable) ENGINE DATA MONITOR mode, check the engine coolant temperature. Write this value onto the repair order.

3. Confirm the engine oil level is correct and that the Nissan recommended weight of engine oil (such as 5W30) is being used.

NOTE:
Steps # 2 and # 3 need to be checked as support data for the starter test.

4. Turn off all loads on the vehicle electrical system. They must remain off until step 15. Make sure the ignition is in the "off" position.

Battery Test Segment

5. Visually inspect the battery, battery terminals and cable ends. Clean as necessary. If the battery case is cracked or the terminals damaged, replace the battery.

NOTE:
The contact surface between the battery terminals, cable ends and tester leads must be clean for a valid test. A poor connection will prevent testing and a CHECK CONNECTION message will appear during the test procedures. If this occurs, clean the battery post and terminals, reconnect them and restart the test.

6. Connect the red tester lead clamp to the positive battery terminal, and the black to the negative. Wiggle the lead clamps so the clamp teeth

bite into the cable ends.

7. The tester will turn on automatically. Using the arrow keys select "In Vehicle" on the tester then press the ENTER key.

8. Locate the battery type and rating stamped or written on the top case of the battery to be tested. It will have either of the following ratings:

   ^ CCA: Cold Cranking Amps (490 CCA, 550 CCA, etc.)

   ^ JIS: Japanese Industrial Standard. Battery is stamped with a number such as: 80D26L = 80 (rank of output), D (physical size - depth), 26 (width in cm). The last character L (post configuration) is not input into the tester

NOTE:
The tester requires the rating for the battery be entered exactly as it is written or stamped on the battery. Do not attempt a CCA conversion for JIS stamped batteries. JIS must be input directly.

9. Using the arrow and ENTER keys alternately, select the battery type and rating determined above.

   NOTE:
   The tester lists five choices here; CCA, JIS, IEC, DIN, and EN. Only use CCA or JIS.

10. Press ENTER to begin the test. Write the diagnosis and the test values displayed on the tester onto the repair order.

NOTES:

^ If necessary, the tester will ask the user to determine if the battery has just been charged. Choose the appropriate selection by pressing the up or down arrow button then press the ENTER button to make the selection.

^ When testing a battery installed in a vehicle that has recently been driven, select BEFORE CHARGE.

^ If the battery has just been slow charged due to a "CHARGE & RETEST" decision by the tester, and the tester asks the user BEFORE CHARGE/AFTER CHARGE, select AFTER CHARGE.

11. Once the battery test result is viewed, follow the tester prompt and press ENTER to obtain the 12 character test output code (this coding does not use the letters I or O). Write the 12 character test output code (for example BATCC-L9CPGGG) on the repair order, then toggle back to the diagnostic screen. One of five diagnostic results will be displayed on the tester screen:

    ^ GOOD BATTERY: Go to step 12.

    ^ REPLACE BATTERY: Clean the battery cable clamps and battery posts if it has not already been done earlier. Return to step 6 and recheck the results. If the second test shows REPLACE BATTERY, do so and return to step 6.

    ^ BAD CELL-REPLACE: Replace the battery and return to step 6 above.

    ^ GOOD-RECHARGE: Perform the Slow Battery Charging Procedure in this bulletin. Once the charging is done, return to step 6, above.

    ^ CHARGE & RETEST: Perform the Slow Battery Charging Procedure in this bulletin. Once the charging is done, return to step 6, above. If the tester asks the user BEFORE CHARGE/AFTER CHARGE, select AFTER CHARGE.

    CAUTION:
    Never fast charge batteries. See Slow Battery Charging procedures and cautions on next page of this bulletin.

Starting System and Charging System Test Segment

12. Follow the tester prompt and press ENTER to begin the starting system test. Then start the engine. Write the diagnostic results and the test values displayed on the tester onto the repair order. One of the following diagnostic results will be displayed:

    ^ CRANKING VOLTAGE NORMAL: Click here or refer to "CRANKING VOLTAGE NORMAL" in Attachment I of this bulletin

    ^ CRANKING VOLTAGE LOW or if the starter does not run: Click here or refer to "CRANKING VOLTAGE LOW" in Attachment I of this bulletin.

    ^ CHARGE BATTERY: Return to step 11, GOOD-RECHARGE/CHARGE & RETEST.

    ^ REPLACE BATTERY: Return to step 11, REPLACE BATTERY.

    NOTE:
    If the starter performs normally but the engine does not start, perform engine diagnosis. Once resolved, return to step 6.

    NOTE:
    For intermittent NO CRANK / NO STARTER OPERATION incidents, click here or refer to "NO CRANK / NO STARTER

OPERATION" in Attachment I of this bulletin.

13. Press ENTER to begin the charging system test. When complete, the tester will prompt you to press ENTER again.

14. Raise and hold the engine speed to 1500 - 2000 RPM for about 5 seconds, then return the engine to idle. Press ENTER to continue once the rev is detected.

NOTE:
If after 30 seconds an increase in engine idle speed is not detected, RPM NOT DETECTED will display. Press ENTER and redo step 13.

NOTE:
Some engines may have a higher idle initially after starting, particularly when the engine is cold. The tester may detect this without any other action being taken. If this occurs, continue on with the testing process. The final results will not be affected.

15. The tester will now check the engine at idle and perform the Diode/Ripple check. When complete, the tester will prompt you to turn on electrical loads. Turn on the following:

^ Heater fan on Manual systems to High. On Auto A/C systems set to highest heat, floor duct. Do not run the A/C or windshield defroster.

^ Headlights on high beam.

^ Rear window defogger (if equipped).

^ Do not run the windshield wipers or any other cyclical loads.

16. Press ENTER to continue. Raise and hold the engine speed to 1500 - 2000 RPM for about 5 seconds, then return the engine to idle. The tester will show that it detected the increased engine speed. Press ENTER to continue.

NOTE:
If after 30 seconds an increase in engine idle speed is not detected, RPM NOT DETECTED will display. Repeat step 16.

17. The tester will analyze all the readings and provide the results of the charging system test.

NOTE:
The option PRESS ENTER FOR CHARGING CODE will toggle with the charging system test results. First press ENTER and write the 12 character test output code (for example ALTST-2UQ3Q28) on the repair order (this coding does not use the letters I or O). Then toggle back to the diagnostic screen. It will display some of the following possible test results:

^ CHARGING SYSTEM NORMAL, DIODE RIPPLE NORMAL: Go to step 18.

^ IDLE VOLT/LOAD VOLT: Write these values on the repair order, then continue reading results of testing.

^ CHARGING SYSTEM INCIDENT: If this is displayed, one of the four following results will also be displayed: NO CHARGING VOLTAGE, LOW CHARGING VOLTAGE, HIGH CHARGING VOLTAGE or EXCESS RIPPLE DETECTED. For these results click here or refer to Attachment II of this bulletin. Once resolved, return to step 6.

18. Turn off the engine and disconnect the tester.

19. Reprogram radio presets if necessary.

Slow Battery Charging Procedure

1. Appearance check:

^ If the battery case is cracked or the terminals damaged, replace the battery.

2. Electrolyte Level check (if applicable):

^ Remove the vent caps with a suitable tool. Add distilled water to the "MAX" level.

3. Requirement: Initial rate of charge is 10 Amps for twelve (12) hours.

CAUTIONS:

^ Continue charging for twelve (12) hours, even though the current will decrease as the battery charges.

^ Charge battery one at a time. Do not charge batteries in a parallel circuit.

^ During charging, keep open flames away from the battery.

^ When connecting the charger, connect the leads first; then turn on the charger.

^ Stop charging if the battery electrolyte temperature exceeds 140 degrees F (60 degrees C).

Technical Service Bulletin # **87-135** Date: **870824**

Engine Controls - Intermittent Engine Surge/Hesitation

Classification:
EC87-012

Reference:
TS87-135

Date:
August 24, 1987

INTERMITTENT ENGINE HESITATION/SURGING

APPLIED VEHICLE(S):
1986.5-1987 Truck, 1987 Pathfinder, 1987 Van, 1987 Sentra Coupe and 4WD Wagon, 1987 Pulsar NX (XE)

SERVICE INFORMATION

APPLIED VINs: MODEL	APPLIED VIN	APPLIED DATE
1987 Sentra Coupe	JN1PB24S( )HU055198	May 22, 1987
1987 Sentra Wagon 4WD	JN1PB25Y( )HU003516	June 1, 1987
1987 Van (A/T)	JN8SC26S( )H4004408	November 11, 1987
1987 Van (M/T)	JN8SC26S( )H4005184	November 20, 1986
1987 Pulsar NX (XE)	JN1PN34S ( )HM037700	May 29, 1987
U.S.A. Produced Trucks:		
• with Z24 engines	1N6ND11S( )HC321026	January 5, 1987
• with VG30 engines	1N6HD16Y( )HC321363	January 5, 1987
Japan Produced Trucks:		
• Z24/2WD/Reg. Bed / (M/T)	JN6ND11S( )HW013760	November 6, 1986
• Z24/2WD/Reg. Bed / (AT)	JN6ND11S( )HW016181	November 16, 1986
• Z24/2WD/Long Bed / (M/T)	JN6ND12S( )HW000775	November 6, 1986
• Z24/2WD/Reg. Bed / (A/T)	JN6ND12S( )HW000799	November 16, 1986
• Z24/2WD/King Cab / (M/T)	JN6ND16S( )HW007953	November 6, 1986
• Z24/2WD/Reg. Bed / (A/T)	JN6ND16S( )HW008481	November 16, 1986
• VG30/2WD/ Reg. Bed / (A/T)	JN6HD11S( )HW000276	December 25, 1986
• VG30/2WD/ Reg. Bed / (M/T)	JN6HD11S( )HW000286	January 10, 1987
• VG30/2WD/ King Cab / (A/T)	JN6HD16S( )HW003050	December 25, 1986
• VG30/2WD/ King Cab / (M/T)	JN6HD16S( )HW003064	January 10, 1987
• VG30/Long Bed/ H.D. / (A/T)	JN6HD12S( )HW000288	December 25, 1986
• VG30/Long Bed/ H.D. / (M/T)	JN6HD12S( )HW000322	January 10, 1987
• VG30/Cab & Chassis / (A/T)	JN6HD15S( )HW000248	December 25, 1986
• VG30/Cab & Chassis / (M/T)	JN6HD15S( )HW000269	January 10, 1987
• Z24/4WD/Reg. Bed	JN6ND11Y( )HW001972	November 16, 1986
• Z24/4WD/Long Bed	JN6ND12Y( )HW000227	November 16, 1986
• Z24/4WD/King Cab	JN6ND16Y( )HW001918	November 16, 1986
• VG30/4WD/ Reg. Bed / (A/T)	JN6HD11Y( )HW000491	December 25, 1986
• VG30/4WD/ Reg. Bed / (M/T)	JN6HD11Y( )HW000501	January 10, 1987
• VG30/4WD/ King Cab / (A/T)	JN6HD16Y( )HW004256	December 25, 1986
• VG30/4WD/ King Cab / (M/T)	JN6HD16Y( )HW004271	January 10, 1987
1987 Pathfinder:		
• Z24/ (M/T)	JN6ND14Y( )HW000615	November 6, 1986
• Z24/ (A/T)	JN6ND14Y( )HW001093	November 16, 1986
• VG30 / XE / (A/T)	JN8HD14Y( )HW001507	December 25, 1986
• VG30 / XE / (M/T)	JN8HD14Y( )HW001669	January 10, 1987
• VG30 / SE / (A/T)	JN8HD16Y( )HW012242	December 25, 1986
• VG30 / SE / (M/T)	JN8HD16Y( )HW012730	January 10, 1987

Nissan-Datsun Truck PL720 2WD L4-1952cc 2.0L SOHC (Z20)

Some of the Applied Models built prior to the VINs shown may exhibit intermittent engine hesitation or surging under load. The condition "feels" as if the ignition is shut off for less than a second and then turned back on.

SERVICE PROCEDURE

For vehicles that exhibit this symptom, check the engine systems using the driveability diagnostic procedure in the EF & EC section of the appropriate Nissan Service Manual. This will include a complete self-diagnosis procedure at the vehicle ECU and a complete follow up with trouble-shooting on any trouble codes, until a code 44 or all clear code is achieved.

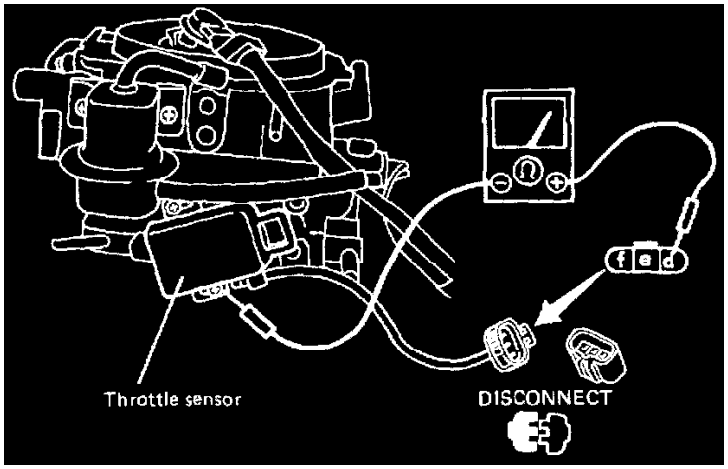
NOTE:

If a code 11 (crank angle sensor) occurs in a vehicle with manual transmission, clear the memory and repeat the self-diagnosis check. In some vehicles, the code 11 will appear in the self-diagnosis memory any time the ignition switch is turned to the "Start" position while the clutch pedal is not fully depressed.

If the intermittent condition persists after all engine systems are in proper working order according to the tests above, then perform the following test procedure.

Test Procedure

1. Depress and release the accelerator pedal several times prior to performing steps.



2. Connect an ohmmeter at the throttle sensor connector with the positive + side to pin 'd' (terminal side with connector disconnected) and the negative - side to the throttle sensor base plate as shown.

3. Resistance should be oo. Move the positive side to pins 'd' and 'f'. Resistance should remain at 00.

4. If the resistance is anything other than 00, repeat steps 2 and 3.

5. If the resistance is still anything other than 00, replace the throttle sensor with the appropriate part listed below. If the throttle sensor is replaced, be sure to adjust it using the procedures in the appropriate Service Manual.

NOTES:

E16i engines: the idle speed must be set with the throttle sensor disconnected before adjusting the throttle switch as described in the Service Manual under Throttle Valve Switch Adjustment.

VG30i engines: for slight off-idle hesitation on Truck/Pathfinder models, set the initial timing at exactly 14°.

DESCRIPTION	ENGINE	PART #
Throttle Sensor	Z24i	22620-41G00
	E16i	22620-61A00
	VG30i	22620-12G00

PARTS INFORMATION

The improved throttle sensor has been installed on production vehicles beginning with the VINs.

Technical Service Bulletin # **87-103** Date: **870629**

Brakes - Explanation of Common Noises

Classification:
BR87-005

Nissan-Datsun Truck PL720 2WD L4-1952cc 2.0L SOHC (Z20)

Reference:
TS87-103

Date:
June 29, 1987

DISC BRAKE NOISE INFORMATION

APPLIED VEHICLE(S):
All Models with disc brakes (front or rear)

SERVICE INFORMATION

Some Nissan vehicles may exhibit brake noise under certain driving conditions. This Bulletin provides some information about normal and common noises and appropriate service procedures for each noise. Some of this information may be useful when explaining brake noises to the customer.

Refer to Technical Bulletin BR87-006, "Disc Brake Noise Countermeasure", for information about abnormal brake noises on Maxima, Stanza, and Stanza Wagon.

General Brake Information

Nissan brake systems have been carefully designed to provide optimum braking performance under various driving conditions. One of the most important components in the brake system is the brake pad material. The following factors have been taken into consideration to select the best pad material.

^ technical and government regulations
^ stopping distance
^ vehicle control while braking
^ high operating temperatures
^ pedal force
^ pad and rotor wear rates
^ moisture resistance
^ friction coefficient stability
^ operating noise level

Unfortunately, there is no one brake pad material that provides perfect performance in all of these areas. Changing the material to improve some factors often causes a performance reduction in other areas. Higher brake operating noise levels in some instances occur as a result of factors which ensure proper brake performance and safety.

Common Brake Noises

The following brake noises occur most frequently on Nissan vehicles. These noises do not indicate any malfunction or improper operation.

1. GROANING NOISE AT LOW MILEAGE (0-300 MILES)
   ^ noise occurs with light to medium pedal force
   ^ noise occurs during medium speed stops (20-40 mph)
   ^ noise usually does not occur on the first or second stop
   ^ noise occurs with warm or hot brakes (not cold)
   ^ there may be a low frequency "judder" vibration

Nissan applies protective coatings to the brake rotors and pads to reduce corrosion during shipping and storage. These coatings may cause this groaning noise until they are worn off. Under normal driving conditions, this usually takes about 300 miles. If this noise occurs during the first 300 miles, it is not necessary to attempt any repairs.

Service Procedure:

There is no service procedure to eliminate this noise permanently. Replacing the brake pads or machining the rotors may cause the noise to disappear temporarily, but it will return and continue until the coatings are worn off the rotor and pads.

2. GROANING NOISE (AFTER 300 MILES)
   ^ while the vehicle is barely moving, with light brake pedal force
   ^ more noticeable during warm, dry weather
   ^ most common on vehicles with automatic transmission

This noise is common on most cars with front disc brakes. There are no repair procedures to eliminate this noise.

3. SQUEAKING/SQUEALING NOISE
   ^ noise occurs with light to medium pedal force

- ^ noise occurs during low speed stops (5-20 mph)
- ^ more noticeable during warm, dry weather

This noise is common on vehicles with high-performance potential that must be able to stop in short distances from high speeds. Other brands of brake pads may eliminate this noise, but Nissan does not recommend them because they may have reduced pad life or inadequate performance in high speed stops.

4. HIGH-PITCHED SQUEAKING/SCRAPING NOISE
   - ^ whenever brakes are applied
   - ^ may come from just one wheel

Nissan uses pad wear indicators on many of its disc brake pads to provide an audible warning when the brake pads need replacement. Spring steel tabs that are riveted to the brake pad scrape lightly on the rotor surface when the pad is worn down to its lowest limit. The customer should hear the noise at this time and bring the vehicle to the dealer for brake pad replacement. The pad wear indicator will not damage the rotor surface if the pad is replaced in a reasonable time.

Replace worn pads with new parts. Check the rotor surface for damage and machine if necessary.

Technical Service Bulletin # **95057** Date: **950621**

A/C - Compressor Leak/Noise, Poor Performance

CLASSIFICATION:
HA95-011

REFERENCE:
NTB095-057

DATE:
June 21, 1995

AIR CONDITIONING COMPRESSOR LEAK/NOISE DIAGNOSIS

APPLIED VEHICLE: All

SERVICE INFORMATION

If a customer brings in a vehicle complaining of poor cooling performance and/or an air conditioning (A/C) compressor noise complaint and diagnosis shows that the refrigerant level is lower than specification, the A/C compressor may NOT be the cause.

SERVICE PROCEDURE

LEAK

When diagnosing compressors for a refrigerant leak, please use the following procedure:

1. Make sure the A/C system is charged with the specified amount of refrigerant.

2. Use the J39400 leak detector to identify the area of the leak. For detailed information on refrigerant leak detection, refer to technical bulletin NTB95-014, PROCEDURE FOR DETECTION OF REFRIGERANT LEAKS, dated February 22, 1995.

3. If a leak is detected, verify the exact location of the leak with a soap and water solution. Please note that if the compressor's joint connector has a leak, compressor oil may leak out on the compressor case. Therefore it should not be assumed that the compressor has a leak if compressor oil is detected on the compressor case.

4. If the leak is at the compressor's joint connector, do not replace the compressor. The leak should be repaired as follows:

   - ^ Evacuate/Recover the refrigerant from the A/C system using the proper refrigerant recycling equipment.

   - ^ Replace the "O" ring for the leaking joint connector.

   - ^ Properly position the tube and compressor joint connector.

   - ^ Tighten the connector's fastening bolt(s) by hand first. Confirm the tube and compressor joint connector are mated correctly. Then tighten to specification with a torque wrench and back up wrench.

5. Evacuate and recharge the system with the specified amount of refrigerant.

6. Conduct a leak test on the components which were repaired/replaced to confirm the leak is repaired.

7. Conduct performance test. If the incident is not resolved, refer to the service manual for further diagnosis.

NOISE

When diagnosing for suspected A/C compressor noise, please use the following procedure:

1. Note the engine RPM at which the noise occurs and listen to the noise with the A/C compressor turned ON, then OFF. If the noise can be heard when the compressor is OFF, the noise is not generated by the compressor. Look for other components which may be the source of the noise including the drive belts and the A/C compressor idler pulley.

2. If the noise is heard only when the compressor is ON, conduct further diagnosis on the A/C system. Please note that if the A/C system has a leak, refrigerant as well as compressor oil will leak out of the system. Low refrigerant and compressor oil quantity may cause the compressor to be noisy.

Technical Service Bulletin # **HA87023** Date: **871221**

A/C Blower Fan System - Inoperative

Models All Models

Section Heater & Air Conditioner

Classification HA87-023

Bulletin No. TS87-190

Date December 21, 1987

HEATER-A/C BLOWER FAN SYSTEM TEST PROCEDURES

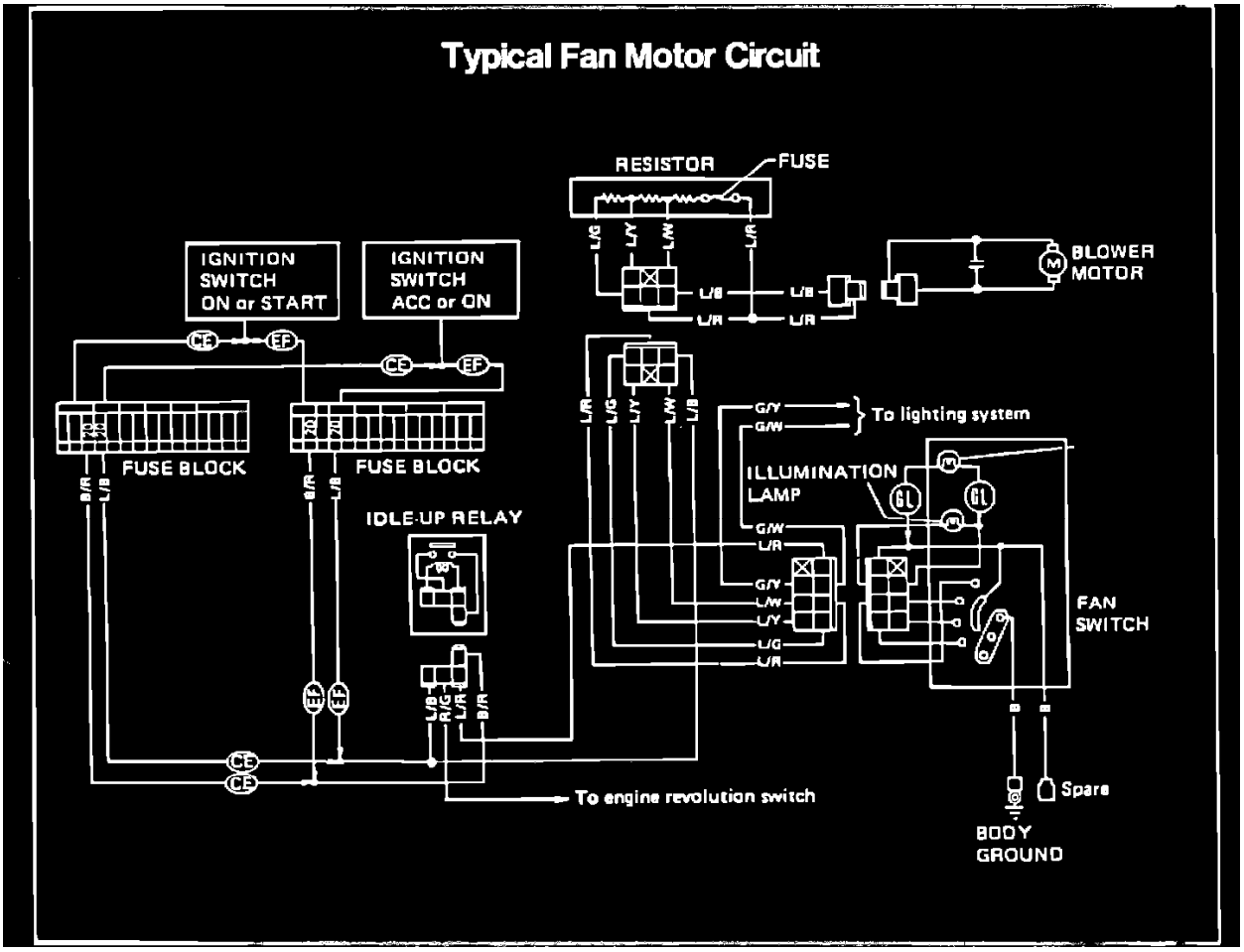
APPLIED MODELS: All Nissan models equipped with heater only or heater and manual air conditioning.

SERVICE INFORMATION

In some vehicles, the blower fan for the heater/AC system may become inoperative or it may not operate in all blower speeds. The following test procedures may be used to diagnose and repair malfunctions in blower fan operation.

SERVICE PROCEDURE

BLOWER FAN CONDITION	PERFORM TESTS
DOES NOT OPERATE ONLY OPERATES AT HIGHEST SPEED (# 4 POSITION)	1 and 2
DOES NOT OPERATE IN ONE OF THE LOWER SPEED POSITIONS (1, 2 or 3)	1 and 3



TEST PROCEDURE #1:

1. Place the fan switch in the "OFF" position. Turn the ignition switch to the "ACC" position. Check the available voltage to the fan motor fuse(s).

   ^ If the available voltage is 1.5 volts or more below battery voltage, check the power supply circuit to the fuse box for any source of high resistance.
2. Turn the ignition key to the "OFF" position. Check the fuse(s) and fuse holder for continuity and for any sign of corrosion. Clean or repair as necessary.

3. Place the fan switch in the "OFF" position. Check for continuity between the fuse box and body ground.

   ^ If there is continuity, check for a short in the blower fan circuit.

4. Place the fan switch in the highest (# 4) position. Check for continuity between the fuse box and body ground.

   ^ If there is no continuity, check for an open in the blower fan circuit.

TEST PROCEDURE # 2:

1. Place the ignition switch in the "OFF" position.

2. Visually inspect the thermal limiter (fuse) on the fan resistor assembly. If the fuse has burned open or has been overheated, replace the fan resistor assembly.

3. Remove the fan motor assembly from the intake air box and check for foreign material or water corrosion.

4. Check to make sure there is clearance between the fan cage and the motor mounting plate.

5. If the instrument connector was disconnected to remove the blower motor assembly, re-connect it.

6. Perform the following test:

   A. Place the fan switch in the "OFF" position.

   B. Turn the ignition key to the "ACC" position.

C. Position the fan motor so that the fan operation can be safely observed.

D. While observing the fan, turn the fan switch to the low speed (# 1) position for 10 seconds, then move it back to the "OFF" position.

^ If the blower fan does not operate during the 10 second test period, replace the fan motor.

^ If the individual fan blades can be visually identified during the 10 second test period, the fan is operating too slowly. Replace the fan motor.

TEST PROCEDURE # 3:

1. Place the ignition switch in the "OFF" position.

2. Place the fan switch in the "OFF" position.

3. For safety to your volt-ohmmeter, perform this test with the vehicle battery ground disconnected. Touch the positive (+) probe of an ohmmeter to the voltage supply wire at the blower fan resistor.

4. Connect the negative (-) probe to body ground.

5. Place the fan switch into the speed position in which the malfunction occurs.

^ If there is no continuity (open circuit to ground), check the circuit from the resistor to fan switch ground.

Technical Service Bulletin # **ST86007** Date: **861003**

Power Steering Gear - Correct Oil Seal Installation

Models All Models

Section Steering

Classification ST86-007

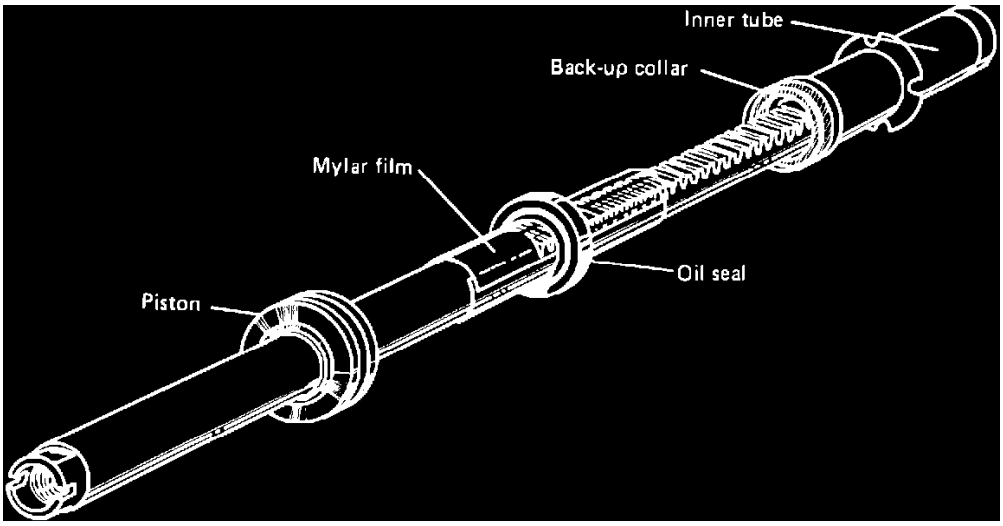
Bulletin No. TS86-173

Date October 3, 1986

POWER STEERING GEAR OIL SEAL INSTALLATION

APPLIED MODEL: All models with power rack and pinion steering gears.

This bulletin supplements all Nissan power steering gear rebuild procedures. It describes correct and incorrect methods to install the oil seal on the pinion side of the rack.

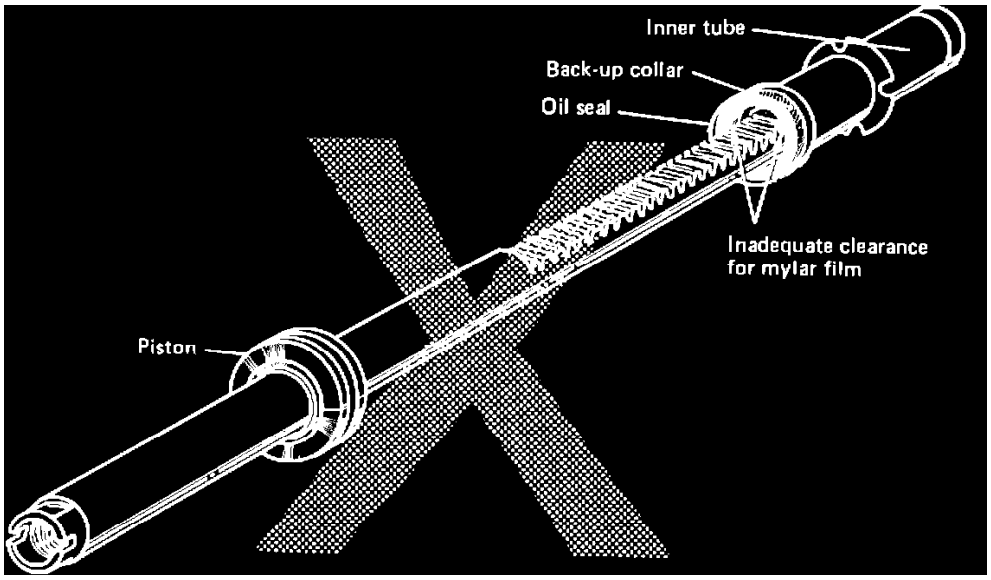


CORRECT METHOD

Step 1: Install the oil seal by itself using the mylar film in the seal kit. Slide the film and seal over the rack teeth and onto the smooth area of the shaft. Then slide the seal off the film.

Step 2: Slide the inner tube and back-up collar over the rack teeth.

Step 3: Press the seal into the inner tube as described in the Rebuild Procedure. Be sure to use the appropriate special tool.



INCORRECT METHOD

^ Do not install the oil seal in the inner tube first.

^ There is not enough clearance between the back-up collar and the rack for the mylar film. The lip of the seal will not be protected by the mylar film and will be cut on the rack teeth. The steering gear will leak after rebuild.

NOTE: GEAR AND LINKAGE ASSEMBLY REPLACEMENT REQUIRES PRIOR APPROVAL OF DISTRICT SERVICE MANAGER.

Technical Service Bulletin # **88006** Date: **880125**

Engine - Replacement Pistons

Models: 1985 Truck, 1987 Pathfinder

Section: Engine Mechanical

Classification: EM88-001

Bulletin No.: TS88-006

Date: January 25, 1988

Z24i REPLACEMENT PISTONS

APPLIED MODELS:
1985-86 Truck (720) 1986.5-87 Truck (D21) with Z24i engine 1987 Pathfinder with Z24i engine 1987-88 Van (C22)

SERVICE INFORMATION

Service Manuals for the subject vehicles refer to piston grades 1-5 in their respective Service Data and Specifications sections. The use of graded pistons is also indicated in the Engine Overhaul-Inspection text of the Service Manuals for the 1986.5 Truck, 1987 Truck/Pathfinder, and 1987-88 Van. However, these graded pistons are used for factory assembly of engines only and are not available as service parts.

Replacement pistons are only available in the following sizes:

1. Standard [0.02 mm (0.0008 in.) oversize]
2. .50 mm (0.0197 in.) oversize
3. 1.00 mm (0.0394 in.) oversize

Please refer to applicable Parts Microfiche for part number information.

Technical Service Bulletin # **98-089** Date: **981115**

Oxygen Sensor - Thread Cleaning and Other Precautions

Classification:
TE98-005

Reference:
NTB98-089

Date:
November 15, 1998

02 SENSOR THREAD REPAIR FOR EXHAUST TUBE,
EXHAUST MANIFOLD AND CATALYTIC CONVERTER

APPLIED VEHICLE:
All models with 02 sensors

SERVICE INFORMATION

When removing a front or rear 02 sensor, material may remain on the internal threads of the exhaust tube, catalytic converter, or exhaust manifold. Special service tools (see Figure 1) are available to clean the internal threads in such cases. This will minimize the need to replace these components. These required special tools will be mailed separately.

Use this bulletin when replacing 02 sensors as part of the 1996 Maxima OBDII Campaign (NTB98-073) or whenever there is a need to clean 02 sensor threads.

NOTE:
This tool is not to be used for tapping threads.

SERVICE PROCEDURE

CAUTION:
Always follow these general guidelines when servicing 02 sensors.

Do not apply severe shock to the sensor when installing it. Do not use an impact wrench for installing it.

Discard any sensor that has been dropped.

Never attempt to clean an 02 sensor by applying solvent to it.

Anti-seize must only be applied to the threads, not the sensing element.

1. Remove the 02 sensor from the exhaust tube, exhaust manifold, or catalytic converter.

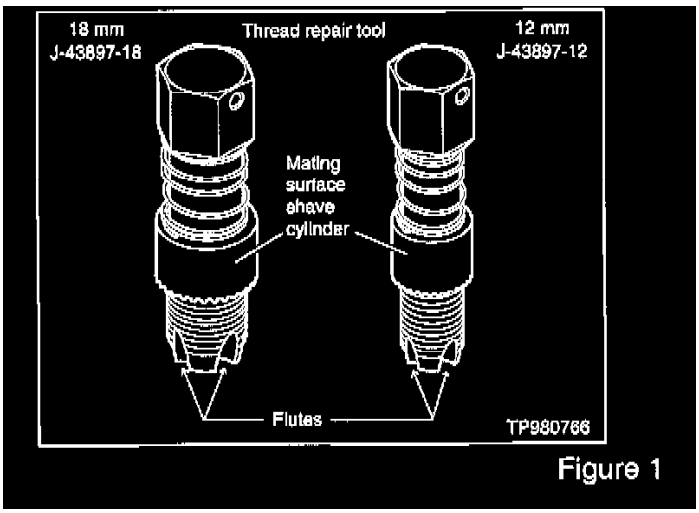


Figure 1

2. Select the correct thread repair tool based on the thread diameter of the removed 02 sensor (see Figure 1).

   ^ Zirconia 02 sensors use the 18 mm diameter tool: J-43897-18.

   ^ Titania 02 sensors use the smaller 12 mm diameter tool: J-43897-12.

3. Make sure that the tool is clean of all debris from prior usage.

4. Liberally apply the anti-seize compound, specified in the Parts Information section of this bulletin, into the flutes (see Figure 1) of the thread repair tool.

   CAUTION:
   Only use the anti-seize material specified. Other materials may chemically damage the 02 sensor.

5. Carefully screw the thread repair tool into the exhaust tube, exhaust manifold, or catalytic converter by hand. It needs to be installed until the

tool's taper is fully inserted within the internal thread of the exhaust tube, exhaust manifold, or catalytic converter.

CAUTION:
Ensure the tool goes in straight.

6. After the thread has been adequately started by hand, a tool such as a socket or wrench can be used to continue the removal of the material.

^ When only light removal of material is needed, screw the thread repair tool in until the cutting surface of the mating surface shave cylinder (see Figure 1) touches the sealing surface for the 02 sensor. Then turn it one full turn further.

^ When there is a lot of material to be removed, occasionally back off the tool to remove accumulated material from around the tool before continuing.

CAUTION:
Do not expect the tool to screw in to an absolute stop. The tool's spring and mating surface shave cylinder will rotate until the spring is completely compressed.

7. Wipe the threads of the exhaust tube, exhaust manifold, or catalytic converter to remove any debris or anti-seize before replacing the 02 sensor.

NOTE:
If the 02 sensor could not be removed or there is permanent damage to the internal threads, it will be necessary to replace the exhaust tube, exhaust manifold, or catalytic converter.

8. Install the 02 sensor and confirm that there is no exhaust leak from the mating surface of the 02 sensor to the exhaust tube, exhaust manifold, or catalytic converter. If there is leakage, then there may have been permanent damage to internal threads. This would require replacement of the exhaust tube, exhaust manifold, or catalytic converter.

9. Completely clean the anti-seize compound and metal debris from the tool to ready it for its next use.

DESCRIPTION	PART NUMBER	SOURCE	QUANTITY
Anti-seize lubricant	Permatex™ 133AR or similar meeting MIL specification MIL-A-907	Local	As required

PARTS INFORMATION

Technical Service Bulletin # **92123** Date: **921222**

Wheels - Aftermarket Chroming of Nissan Alloys

Classification:
WT92-003

Section:
Wheel & Tire

Reference:
TECHNICAL BULLETIN NTB92-123

Models:
All

Date:
December 22, 1992

AFTERMARKET CHROMING OF NISSAN ALLOY WHEELS

SERVICE INFORMATION

The Original Equipment Alloy Wheels on Nissan vehicles are specifically developed in order to achieve the Nissan design and performance standards. These Original Equipment wheels are also subject to rigorous testing procedure's to ensure they meet Nissan's standards.

Nissan cannot ensure that Original Equipment Alloy Wheels which are subjected to aftermarket chroming meet these same standards, and therefore Nissan does not recommend the use of such wheels, nor does Nissan make any representations concerning their performance.

Indeed, if these Original Equipment Alloy Wheels are subjected to aftermarket chroming, there are serious potential problems which may occur as a result of the chroming process:

1. The chroming process removes the original paint coating by "burning" or "chemical" methods, both of which cause the alloy surface to be changed. The application of chrome plating has to be controlled correctly, as the alloy can be harmed by a poorly controlled process.

2. Overall aftermarket chroming may degrade the durability, long term appearance, and may affect safety and performance of the wheels.

Accordingly, Nissan recommends that Original Equipment Wheels NOT be chrome plated.

Please consult the Nissan Warranty Policies and Procedures Manual pertaining to the Dealer's responsibility when altering or modifying vehicles.

WARRANTY INFORMATION

Note that damage to Nissan Alloy road wheels due to any non-factory-authorized process, such as chroming, is the responsibility of the customer, and is not covered by the Nissan Warranty, please consult the "Nissan Warranty Information Booklet" for specific details.

Technical Service Bulletin # **88-152** Date: **981121**

Tires - Vibration, Diagnosis & Out of Round Measurement

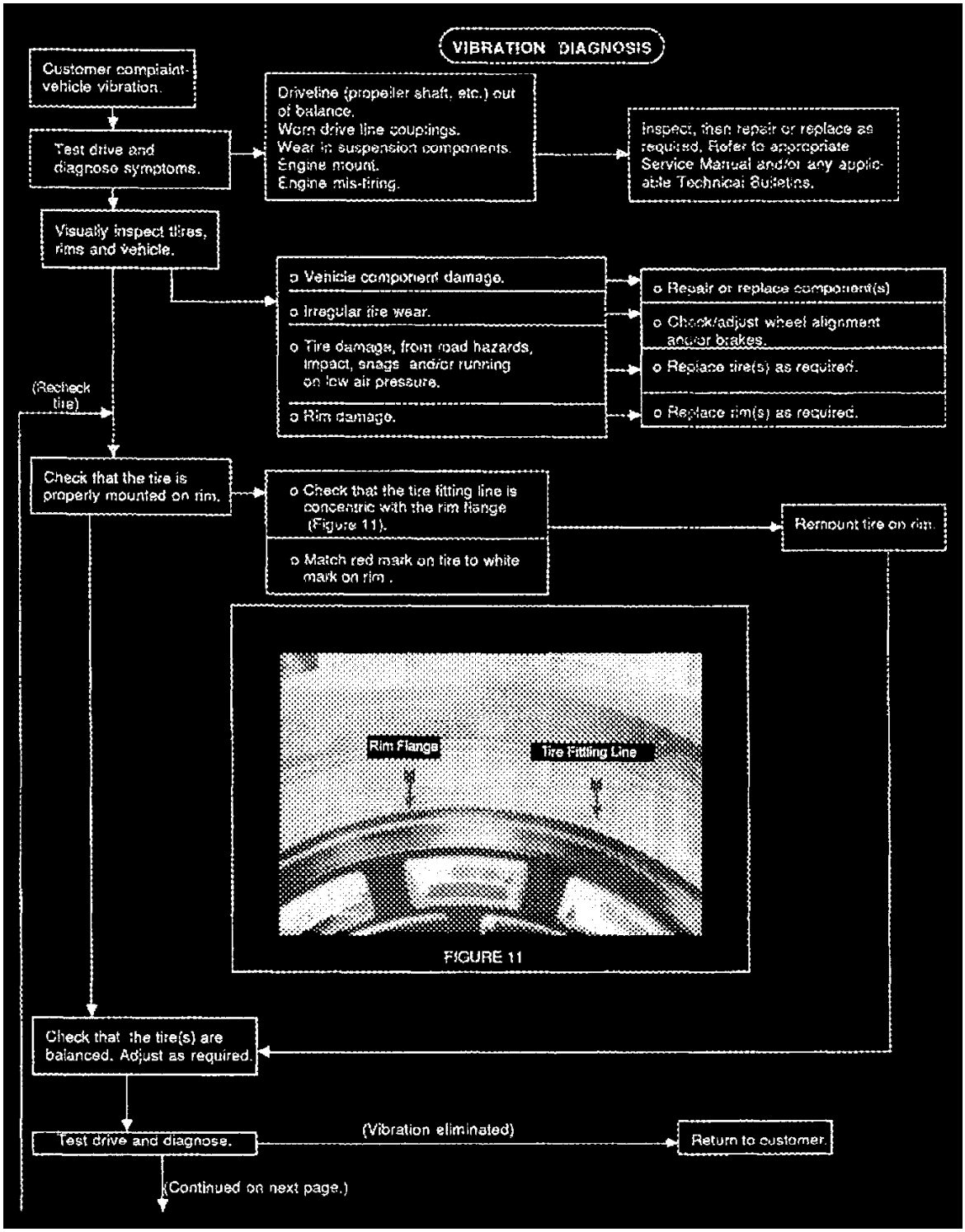
Classification:
WT88-003

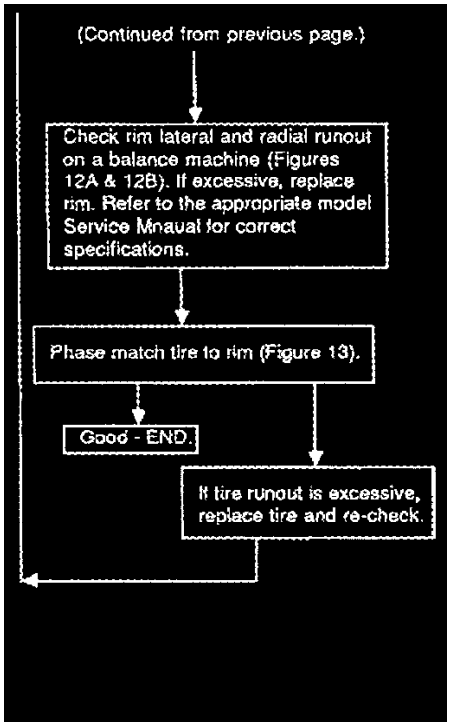
Reference:
TS88-152

Date:
November 21, 1988

TIRE DIAGNOSTIC PROCEDURES

APPLIED VEHICLE(S):
All Models


VIBRATION DIAGNOSIS
Customer compiaint-vehicle vibration.
Test drive and diagnose symptoms.
Driveline (propeller shaft, etc.) out of balance.
Worn drive line coupings.
Wear in suspension components.
Engine mount.
Engine mis-firing.
Inspect, then repair or replace as required. Refer to appropriate Service Manual and/or any applicable Technical Bulletins.
Visually inspect tires, rims and vehicle.
o Vehicle component damage.
o Irregular tire wear.
o Tire damage, from road hazards, impact, snags and/or running on low air pressure.
o Rim damage.
o Repair or replace component(s)
o Check/adjust wheel alignment and/or brakes.
o Replace tire(s) as required.
o Replace rim(s) as required.
(Recheck tire)
Check that the tire is properly mounted on rim.
o Check that the tire fitting line is concentric with the rim flange (Figure 11).
o Match red mark on tire to white mark on rim .
Remount tire on rim.
Rim Flange
Tire Fitting Line
FIGURE 11
Check that the tire(s) are balanced. Adjust as required.
Test drive and diagnose.
(Vibration eliminated)
Return to customer.
(Continued on next page.)



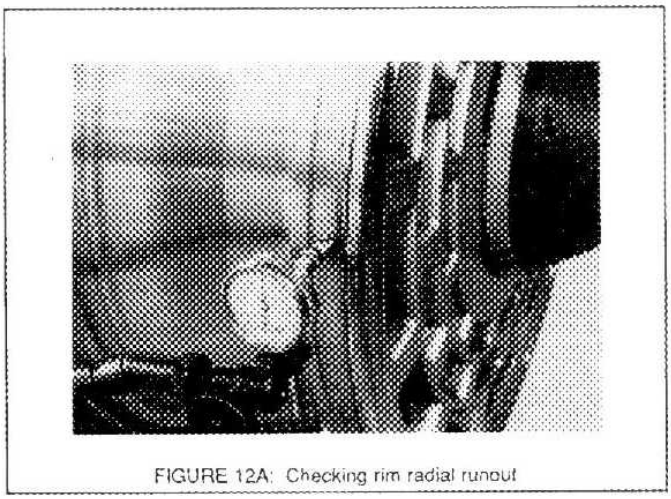


FIGURE 12A: Checking rim radial runout

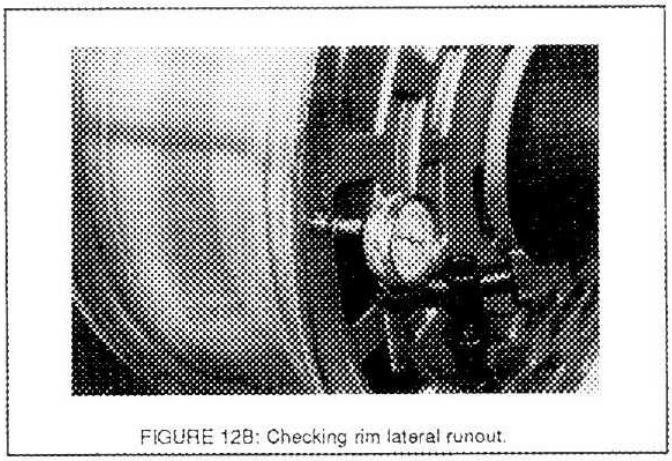


FIGURE 12B: Checking rim lateral runout.

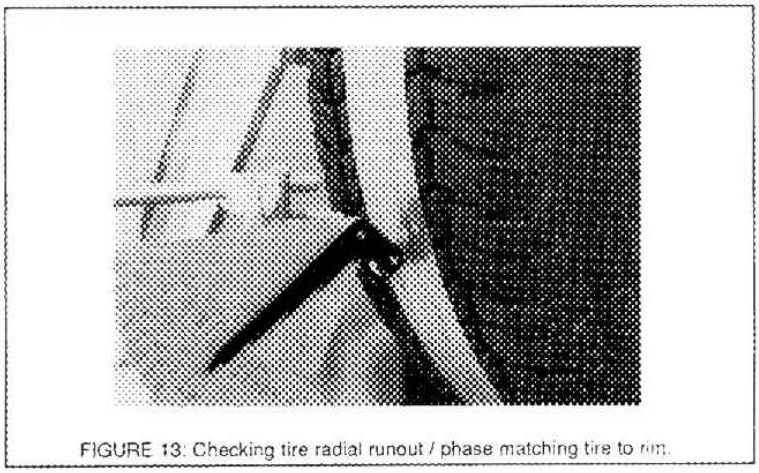


FIGURE 13: Checking tire radial runout / phase matching tire to rim.

Vibration Diagnosis

Please note that exact out-of-round specifications are hard to define. Because of this, when submitting a warranty claim for a gross out-of-round condition, the claim should be supported with actual measurement figures.

Service Information

This Technical Bulletin contains descriptions of the types of tire damage that are covered by the tire manufacturer's warranties (Limited to Bridgestone, Toyo, Yokohama and Dunlop). For tires not available through Nissan, please direct the customer to the manufacturer's nearest dealer. When a customer returns a tire for inspection and adjustment, refer to the information in this bulletin to help identify causes of tire failures and consequential damage to tires.

To determine warranty status, it is essential to ascertain if tire damage is caused by road hazards, mechanical problems, workmanship or materials. In determining the cause of tire failure, inspect both the exterior and interior of the tire.

Sometimes the cause of tire failure is immediately apparent. In other cases however, only a thorough inspection of the tire will show the cause of failure, and whether the damage should result in replacement under manufacturers warranty. Thorough inspection requires good lighting, a clean dismounted tire and close examination of the tire surface. Finding a point of penetration can sometimes be very difficult and should be done on a tire spreader.

NOTE:

For a full description of tire damage not covered by manufacturers warranty, please refer to the Passenger Car & Light Truck Tire Inspection & Adjustment booklet, sent to you with Technical Bulletin WT88-002 (TS88-084).

Sidewall Blister

Damage Description: Sidewall Blister
NISSAN CODE: 7N

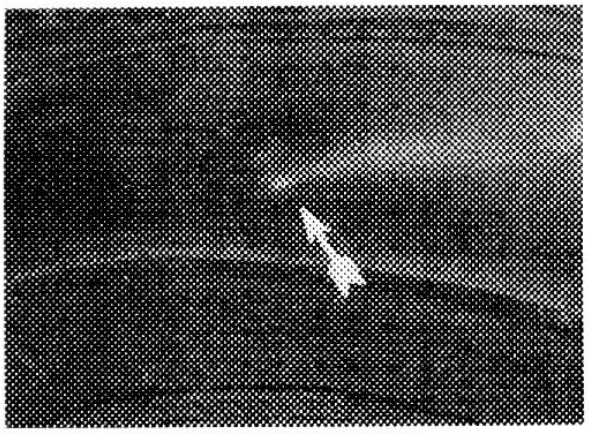


FIGURE 1

DEFINITION:
A lifting of the rubber layer (i.e., portions of sidewall stock or white sidewall rubber) from the tire's sidewall structure, caused by lack of adhesion between the rubber and structure. This lifting will often "pocket" air (see Figure 1).

MAJOR INSPECTION POINT(S):

1. Check for proper air pressure.
2. Localized separation, with or without an air pocket, between the sidewall rubber and tire casing.

3. There should be no evidence of chafing, shock, or abrasion on the tire sidewall.
4. There should be no tread penetrations or perforations in the tread area directly adjacent to the blister.

Open Splice In Sidewall

Damage Description: Open Splice in Sidewall

NISSAN CODE: 7M

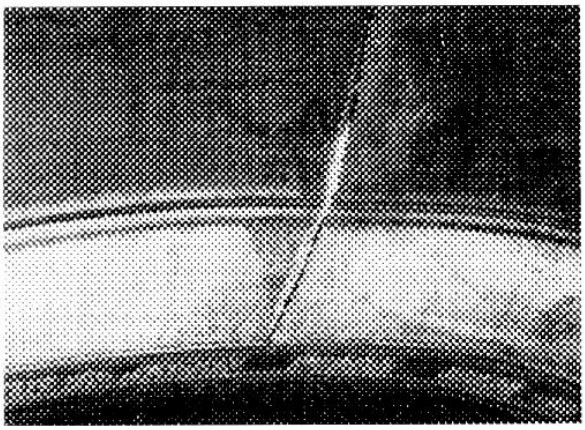


FIGURE 2

DEFINITION:
A localized detachment of the rubber stock between the block and/or white sidewall, caused by a lack/loss of adhesion where the rubber stock is joined (Figure 2). An open splice may be a partial opening, or a complete detachment and total perforation to the interior.

MAJOR INSPECTION POINT(S):

1. There should be no evidence of cuts or perforations in the failed area.
2. At the point of failure, interior rubber surfaces will be smooth and will appear joined at an angle.

Sidewall Ply Separation

Damage Description: Sidewall Ply Separation

NISSAN CODE: 7L

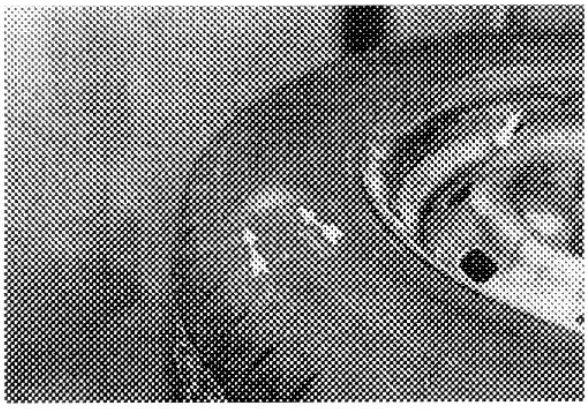


FIGURE 3

DEFINITION:
Localized separation of the sidewall ply cord (Figure 3)

MAJOR INSPECTION POINT(S):

1. Check for proper air pressure.
2. Check for an air bubble on the tire sidewall.
3. There should be no signs of scuff marks, abrasions, or chafing on the immediate area (i.e., on the bubble).

Sidewall Cracking

Damage Description: Sidewall Cracking

NISSAN CODE: 7K

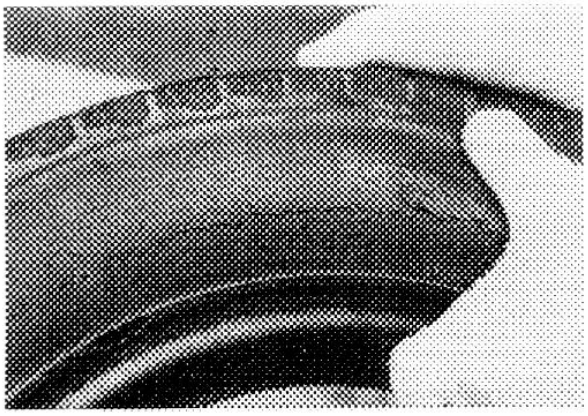


FIGURE 4

DEFINITION:
Several fine cracks on the tire sidewall, running in a radial or circumferential direction (Figure 4).

MAJOR INSPECTION POINTS:

1. Check for proper air pressure.
2. Check for several fine cracks on the sidewall, running in a lateral direction. These sidewall cracks are generally less than 1/10 of an inch in width, and do not penetrate to the interior of the tire.

Bead Separation

Damage Description: Bead Separation

NISSAN CODE: 7I

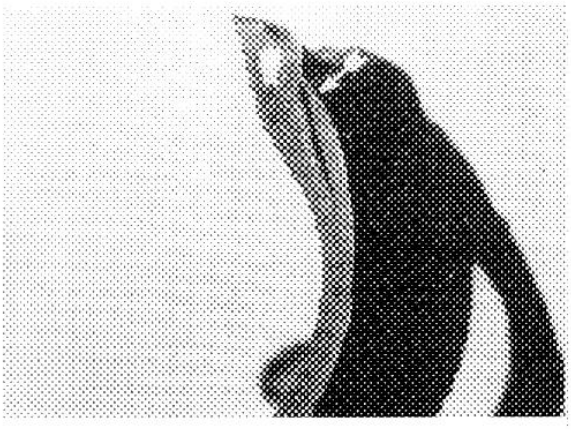


FIGURE 5A

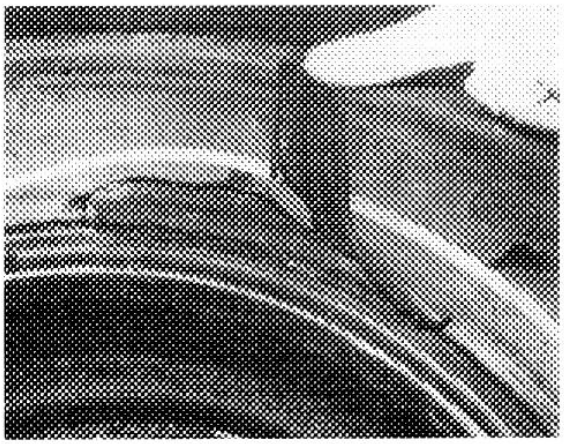


FIGURE 5B

DEFINITION:
Separation of the various tire materials (i.e., rubber, cord and wires) at the bead area near the rim line (Figures 5A, 5B).

MAJOR INSPECTION POINT(S):

Check for a bulge and/or jagged cracks visible near the tire rim fitting line.

Tread/Shoulder Separation

Damage Description: Tread/Shoulder Separation

NISSAN CODE: 7F

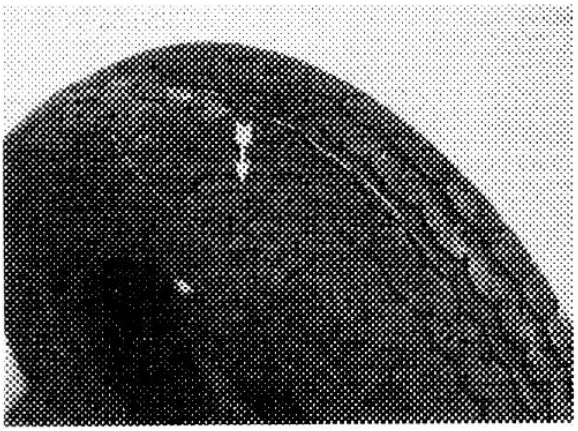


FIGURE 6A

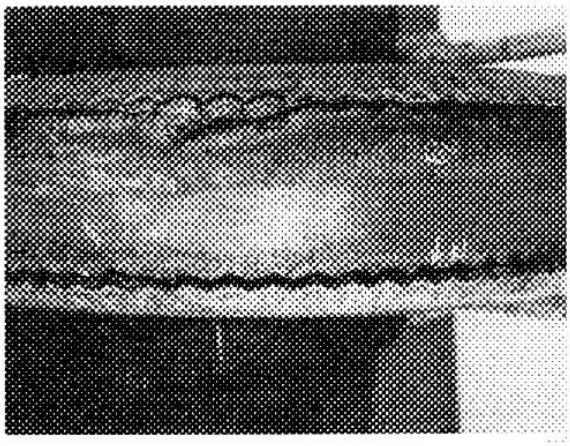


FIGURE 6B

DEFINITION:
Partial (Figure 6A) or complete (Figure 6B) separation between the rubber and the tire cord, or between the layers of the tire cord.

MAJOR INSPECTION POINT(S):

Check for a bulge on the tire shoulder, and a longitudinal crack on the bottom of the grooves, possibly accompanied by a break through the rubber surface. Both are usually accompanied by localized wear in the tread above the separation.

Chunks of Missing Tread

Damage Description: Chunks of missing tread

NISSAN CODE: 7D

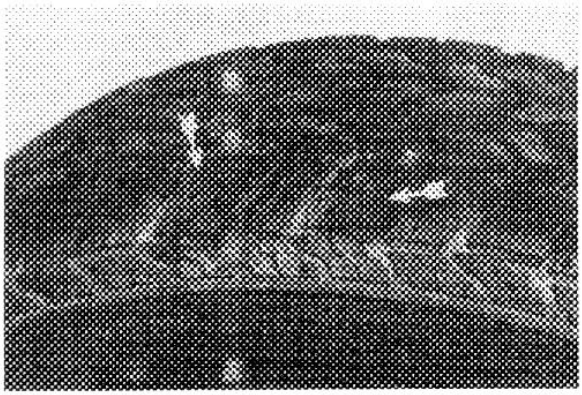


FIGURE 7

DEFINITION:
Partial peeling of new tread (Figure 7).

MAJOR INSPECTION POINT(S):

Check for tearing off, partial peeling or chipping of the tire tread. (**NOTE**: Tread rubber chipping caused by off-road driving is not warrantable.)

Tread Cracking

Damage Description: Tread Cracking

NISSAN CODE: 7A

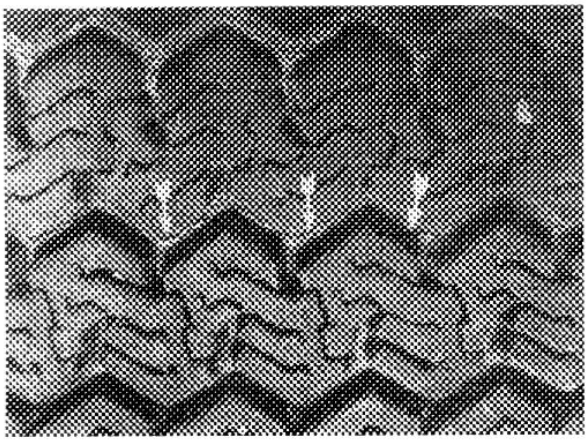


FIGURE 8

DEFINITION:
Fine longitudinal cracks appearing on the bottom of the tire grooves which do not penetrate into the cord material of the tire (Figure 8).

MAJOR INSPECTION POINT(S):

Check all the vehicle tires. If there are only one or two "cracks" in the tire groove, or if the "crack" continues up the side of the groove wall, the cause of the "crack" was a cut inflicted by a road hazard, and is not warrantable.

Ply Separation

Damage Description: Ply Separation

NISSAN CODE: 7B

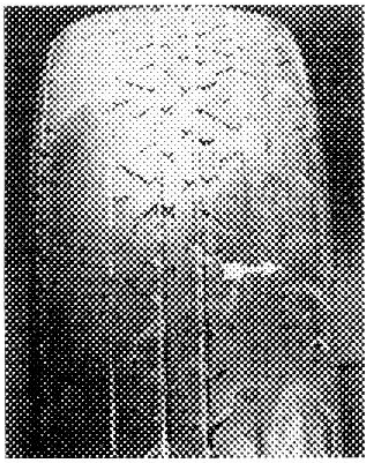


FIGURE 9A

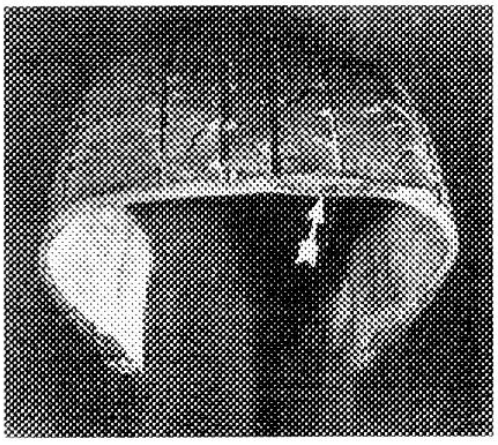


FIGURE 9B

DEFINITION:
Separation between the tread rubber and tire cord materials (Figure 9A), or between the tire cord ply layers (Figure 9B).

MAJOR INSPECTION POINT(S):

Check for tread separation at the tire shoulder area and the corresponding location inside the tire. There should be no evidence of accidental injury by sharp, perforating objects (e.g., screws, nails).

Open Splice

Damage Description: Open Splice

NISSAN CODE: 7C

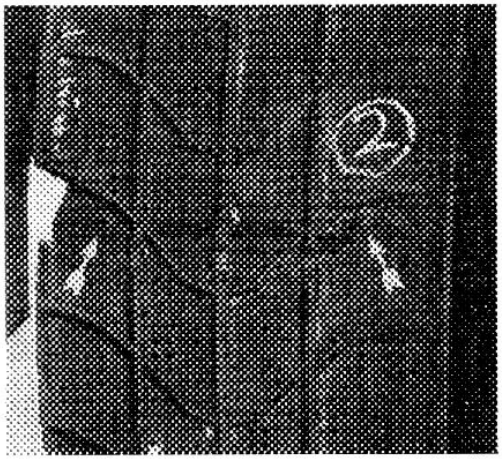


FIGURE 10

DEFINITION:
An open area of the tire tread where the tread rubbers overlap (Figure 10).

MAJOR INSPECTION POINT(S):

Check the edge of the splice opening; it will have a beveled appearance. The cracks do not penetrate through the tire cord, and the possibility of air leakage does not exist.

Out of Round

Damage Description: Out of Round

NISSAN CODE: 7P

DEFINITION:
Excessive vehicle vibration caused by an out-of-round condition of the tire with the rim.

General Information

Vehicle vibration caused by an out-of-round condition will generally appear within the first 100-200 miles of driving. If it appears later, the vibration is probably caused by some other condition. Please note that more than 90% of vehicle vibration Problems are caused by conditions other than out-of-round tires.

1989 MODELS	RIM LATERAL AND RADIAL RUNOUT* (inches [mm])			
	ALUMINUM WHEELS		STEEL WHEELS	
	Lateral runout	radial runout	Lateral runout	radial runout
Sentra	0.012(0.3)	0.012(0.3)	0.031(0.8)	0.020(0.5)
Pulsar	0.012(0.3)	0.012(0.3)	0.031(0.8)	0.020(0.5)
Truck/ Pathfinder	0.012(0.3)	0.012(0.3)	0.031(0.8)	0.020(0.5) [4WD] 0.031(0.8) [2WD]
Stanza	0.020(0.5)	0.020(0.5)	0.020(0.5)	0.020(0.5)
300ZX	0.020(0.5)	0.020(0.5)	0.039(1.0)	0.039(1.0)
Maxima	0.012(0.3)	0.012(0.3)	0.031(0.8)	0.020(0.5)
240SX	0.012(0.3)	0.012(0.3)	0.031(0.8)	0.020(0.5)

*Always refer to the appropriate model Service Manual when checking lateral/radial runout.

Out-of-roundness can only be measured as a radial force variation and most tire dealers do not have the equipment necessary to make this measurement. Because of this, the most effective way to inspect for this condition is to use a specific diagnostic procedure to rule out or confirm

other causes for the vibration. The following pages of this Technical Bulletin contain a procedure that can be used to confirm/eliminate tire out-of-round as a cause of vehicle vibration. Listed are the lateral and radial runout specifications for the 1989 Nissan models to assist you when performing the procedure.Technical Service Bulletin # **WT86005** Date: **860710**

Tire Rotation and Pressure - Recommendations

Models All Models

Section Wheel & Tire

Classification WT86-005

Bulletin No. TS86-125

Date July 10, 1986

NISSAN TIRE ROTATION AND PRESSURE RECOMMENDATIONS, ALL MODELS

TIRE ROTATION

Front and rear tires perform different jobs and can wear differently. For longer tire life, tires should be inspected and rotated at 6,000 to 8,000 mile intervals. However, it is important to point out that rotation should be performed more frequently if there are signs of irregular or uneven wear.

If premature, irregular or uneven tire wear exist, the following items should be checked:

- Tire pressure
- Bumper/suspension height
- Front and rear suspension alignment

NOTE: For optimum tire wear, toe-in should be set to near zero as allowed by the specification.

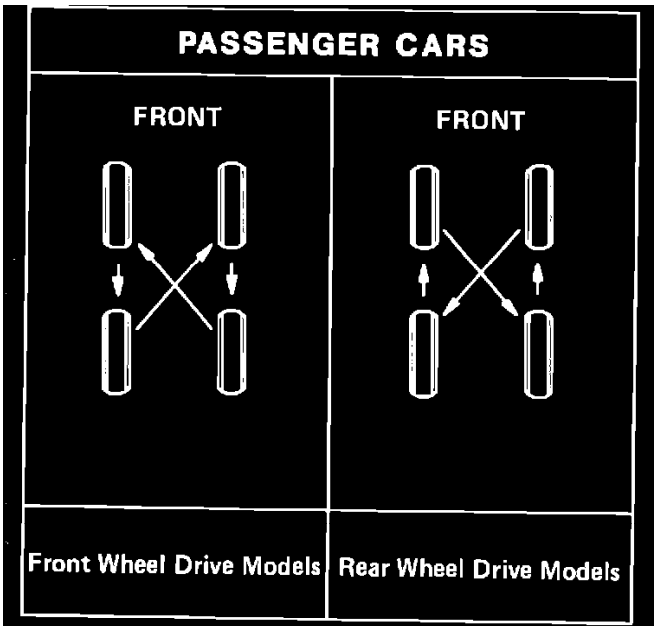
Also see Technical Bulletins:

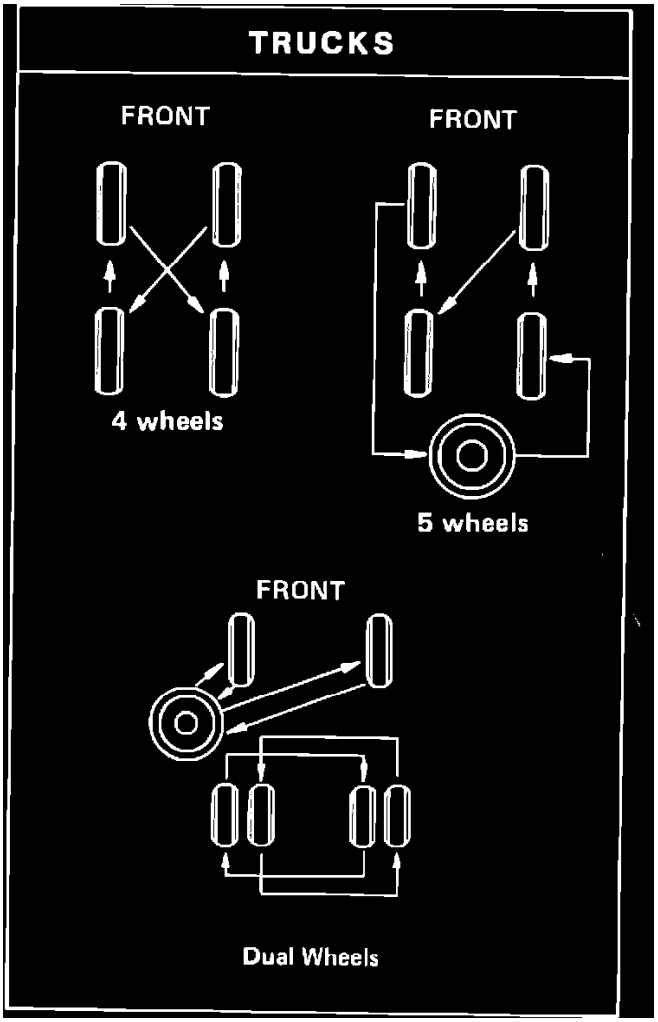
- WT85-006, Rear Tire Wear, Sentra/Pulsar
- RA86-003, Uneven Tire Wear, 200SX

The recommended tire rotation patterns for 1987 and later models is shown on page WT-10. Refer to the appropriate Service or Owner's Manual for 1986 and earlier models.

TIRE PRESSURE

A tire will normally lose between 1/2 and 2 psi per month. For optimum tread wear, tire performance and fuel economy, tire pressure should be checked at least once every month. A tire size and pressure application chart for 1985, 1986 and some 1987 Nissan models is included on pages WT-10 and -11.





RECOMMENDED TIRE ROTATION PATTERNS - 1987 MODELS

VEHICLE MODEL	YEAR	TIRE SIZE	COLD TIRE INFLATION PRESSURE, PSI FRONT	REAR	SPARE	COMMENTS
MAXIMA	1985-1987	195/60R15 T135/70D15	33	29	60	
300ZX	1985	P215/60R15	28	28		
			30	30		High speed driving
		155/90D15			28	Space Saver/Foldable spare tire - 28 psi only when inflated.
	1986	P215/60R15	28	28		
		P225/50VR16	28	28		
		155/90D15			28	Space Saver/Foldable spare tire - 28 psi only when inflated.

VEHICLE MODEL	YEAR	TIRE SIZE	COLD TIRE INFLATION PRESSURE, PSI FRONT	REAR	SPARE	COMMENTS
200SX	1985	195/60R15	28	28		
		T135/70D15			60	
	1986	195/60R15	28	28		
		205/60R15	28	28		
		T135/70D15			60	
SENTRA	1985-1986	155SR13	26	26		Diesel uses 28 psi for front tires
		175/70SR13	26	26		
		P155/80D13			35	
	1987	P155/80R13	29	26		
		P175/70R13	29	29		
		185/60R14	29	26		
		T115/70D14			60	
STANZA	1985-1986	185/70SR13	26	26		
		P155/80D13			35	
	1987	P185/70R14	29	29		
		T135/70D15			60	
STANZA WAGON	1986 (2WD)	185/70SR14	29	29		
		T135/70D15			60	
	1986 (4WD)	P185/70R14	33	29		
		T135/90D15			60	
PULSAR NX	1985-1986	175/70SR13	26	26		
		P155/80D13			35	
TRUCK (2WD)	1985-1986	P195/75R14	24	24		Heavy load - 32 psi
		P205/75R14	24	24		Heavy load - 28 psi
		LT195/75R14	36	36		Dual rear tires
				65		Single rear tires
		P185/80R14	27	27		
	1986.5	7.00-14-4PR	21	21		
		P195/75R14	26	26		Hvy load - 34 psi in rear tires
		P215/75R14	26	26		Hvy load - 34 psi in rear tires
		LT195/75R14	36	36		Dual rear tires
				64		Single rear tires
		T135/70D16			60	
TRUCK (4WD)	1985-1986	P215/75R15	28	28		
		P225/75R15	28	28		
	1986.5	P215/75R15	26	26		
		P235/75R15	26	26		
		31x10.5 R15	26	26		

TIRE PRESSURE APPLICATION CHART

Technical Service Bulletin # **90V072** Date: **900607**

Recall - Label Tire Pressure Max Load Incorrect

Models: 1983.5-90 Truck

Section: Recall Campaign Bulletin

Classification

Bulletin No.: 90V-072

Date: June 7, 1990

Nissan-Datsun Truck PL720 2WD L4-1952cc 2.0L SOHC (Z20)

VOLUNTARY RECALL CAMPAIGN FMVSS CERTIFICATION LABEL TIRE PRESSURE INFORMATION

AUTHORIZATION

Nissan Motor Co, Ltd., Tokyo, Japan, authorizes Nissan Motor Corporation in U.S.A. (NMC) to conduct a voluntary recall campaign on certain 1983.5 through 1990 trucks and multi-purpose vehicles.

INTRODUCTION

The tire pressure for the gross axle weight rating (GAWR) listed on the doorpost FMVSS certification label and on the tire placard in the glove box is incorrect for certain vehicle models and tire sizes. The affected years, models, and tire sizes are listed. All owners of the affected vehicles will receive a letter and correction labels, along with instructions for application. In the event assistance is needed, the owners will be instructed to contact their Nissan dealer for label application at no charge. A copy of the owner letter is enclosed in this bulletin.

IDENTIFICATION NUMBER

Nissan has assigned identification number 90V-072 to this campaign. This number must appear on all communications and documentation of any nature dealing with this campaign.

NOTE: The small number to the right of the bulletin date is the number sequence of the documents published for this campaign.

Dealer Responsibility and Parts Info.

DEALER RESPONSIBILITY

It is the dealer's responsibility to check each vehicle falling within the range of this campaign which for any reason enters the service department. This includes vehicles purchased from private parties or presented by transient (tourist) owners and vehicles on dealer used car sales lots. If a correction label is needed, and the owner does not have the notification letter and labels mailed by Nissan, labels should be obtained as listed below.

PARTS INFORMATION

These supplemental correction labels will not be available through the normal parts distribution system since the labels are being sent directly to the vehicle owner. In the event a label is lost or damaged, a replacement may be obtained through your regional service department.

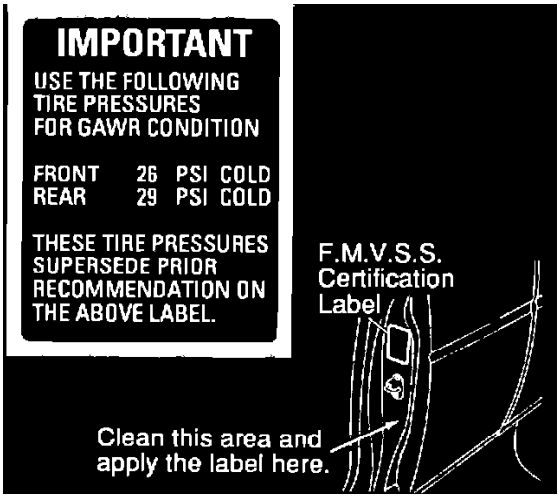
Affected Models

YEAR	MODEL/BODY STYLE	ORIGINALLY EQUIPPED WITH THESE TIRES	REPLACEMENT LABEL TYPE
1983.5-1986	720 2WD Truck	P195/75R14	A
1983.5-1986	720 Sport Truck	P205/75R14	Y
1986.5-1987	D21 2WD Truck (Std)	7.00-14	B
1988-1989	D21 2WD Truck (Std)	P185/75R14	D
1986.5-1990	D21 2WD Truck (E,XE)	P195/75R14	X
1988-1990	D21 4WD Truck (E,XE)	P215/75R15	C
1987-1990	WD21 Pathfinder (E,XE)	P215/75R15	C
1986-1988	M10 4WD Stanza Wgn.	P185/70R14	I

TABLE 1

The original equipment tire size is listed on the existing FMVSS certification label on the door pillar (the size is correct, only the pressure is in error).

Correction Procedure



1. Clean the surface of the door pillar below the door latch striker as shown below to remove dirt or grease.
2. Peel the new label from its backing, and place the label on the door pillar in the area just cleaned.
3. Press firmly to insure proper adhesion.
4. Install the new tire placard in the glove box over top of the existing placard. (1983.5-1986.5 trucks do not have a glove box placard)

Warranty Information

If you are requested by a vehicle owner to install the replacement labels, a recall campaign claim may be entered via DATANET. A peel-off label, imprinted with the owner's name, address, vehicle identification number, campaign description and PNC is included in the owner's notification package. Remove this label and apply it directly to the repair order to save the service writer's time and ensure accurate, readable information for claim submission. Dealers who are not yet on DATANET should submit a standard S-1-S warranty claim.

WARRANTY CLAIM INFORMATION Enter the DATANET claim or type the S-1-S claim using the following information:

CS	PNC	CT	OP CODE	FLAT RATE	OPERATION
9Y	R0076	99	R00760	0.2	Apply FMVSS Label

1983-90 720, D21, WD21, M10 TIRE PRESSURE LABELS

Owner Letter

Dear Nissan Owner:

This notice is sent to you in accordance with the requirements of the National Traffic and Motor Vehicle Safety Act. Nissan Motor Co., Ltd. has determined that some 1983 to 1990 Non-passenger motor vehicles may fail to conform to Federal Motor Vehicle Safety Standard No. 120 - Tire Selection and Rims for Motor Vehicles other than Passenger Cars. Our records show that you are the owner of one of these vehicles. If you no longer own this vehicle, please fill out and return the enclosed Change of Information postcard.

Safety Standard No. 120 requires that information concerning tire size, rim size, and tire inflation pressures for carrying the maximum load be placed on a label on the vehicle. Additionally, except for 1983 to 1986 model trucks, Nissan provides information concerning tire pressures for moderate loads on a sticker inside the glove box. While the tire pressures specified for moderate loads are correct, the pressures specified for maximum load are incorrect. The tire pressure information for maximum loads is located on the manufacturer's label on the left doorpost and on the sticker inside the glove box. If the vehicle is driven with the maximum allowable passenger and cargo load and with the tires inflated to the incorrect pressure, the vehicle load may exceed the load carrying capacity of the tires.

Enclosed with this letter is a supplemental door post label showing the correct tire pressures for your vehicle. In some instances, a corrected glove box label will also be included. A corrected glove box label is not required for all vehicles. These additional labels should be placed on the door post near the original label and in the glove box (if necessary) as shown in the attached instructions. This letter should be kept in your vehicle Owner's Manual as a reminder that the tire pressure specifications have been changed. Please disregard any other tire pressure information which may have been provided with your vehicle.

It is important to replace tires with the same size and load carrying capacity as originally equipped. If you have replaced your tires with a size other than specified by Nissan in your Owner's Manual, which we do not recommend, then consult with your tire dealer to insure that the tire load capacity is sufficient to carry the vehicle load.

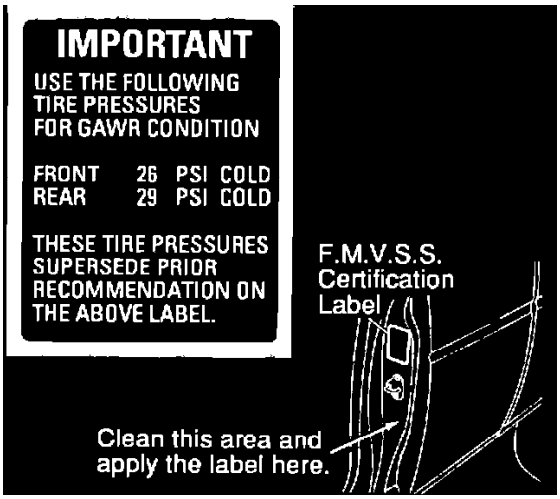
The following page of this notice explains the application areas. Before applying the new labels, please clean the surface of the door post to ensure that it is free of dirt and oil. If you wish, you may take your vehicle to any Nissan dealer for installation of the label at no charge. If you choose to do this, please bring this notice with you to the dealer who will assist you.

If the dealer fails to make this correction at no charge to you, you may contact the National Consumer Affairs Office, Nissan Motor Corporation in U.S.A. at P.O. Box 191, Gardena, California, 90248-0191. The toll-free telephone number is 1-800-NISSAN1.

You may also contact the Administrator of the National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C., 20590 or call the toll-free Auto Safety Hotline at 1-800-424-9393. (Washington D.C. area residents may call 426-0123).

Thank you for your cooperation. We are indeed sorry for any inconvenience this may have caused you.

TIRE PRESSURE LABEL INSTALLATION PROCEDURE



1. Before installing the new Tire Pressure Label, the left door frame just below the door latch striker must be cleaned. Using clean water and a dishwashing detergent, remove all dirt, oil and/or grease from the frame surface.

2. Thoroughly dry the area with a clean cloth.

3. Apply the new Tire Pressure Label to the cleaned area. To ensure proper adhesion, firmly down on the center of the label, then wipe outward to the outer edges.

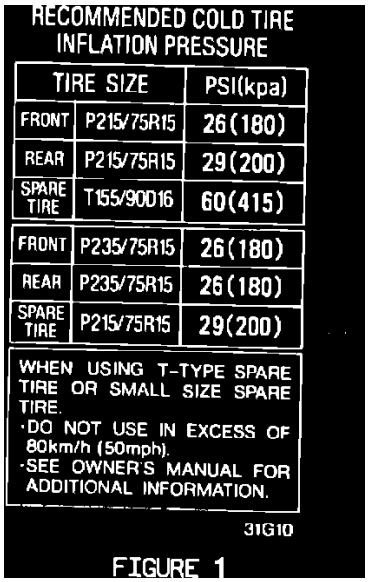


FIGURE 1

4. If a tire placard similar to the one shown below [Figure 1] was included with this letter, place the placard in the glove box, over the top of the original placard. The new tire pressures should be used when inflating vehicle tires.

Technical Service Bulletin # **TS85138** Date: **851122**

Rear Leaf Spring - Squeaks On Rough Roads

TS85-138
November 22, 1985
Rear Axle & Suspension
REAR SPRING SQUEAK, 4X4 720 TRUCK
APPLIED MODEL:
1983.5 - 1986 4X4 720 Truck
SERVICE INFORMATION
The springs on some 1983.5 - 1986 4X4 Trucks may squeak when the truck is driven over rough roads. The noise is caused by the rear suspension number four leaf spring rubbing against the U-shaped bracket. A countermeasure number four leaf spring (with wider U-bracket and plastic liner) is available to correct this condition.

Nissan-Datsun Truck PL720 2WD L4-1952cc 2.0L SOHC (Z20)

PARTS INFORMATION

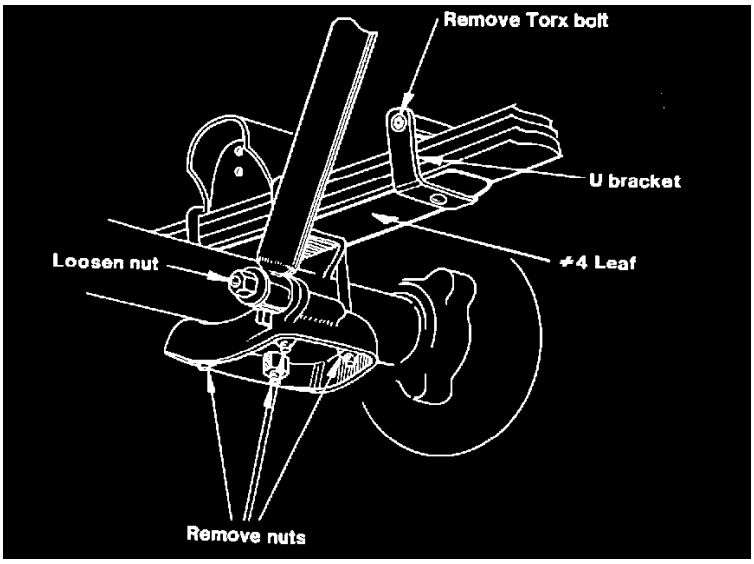
PART DESCRIPTION	QUANTITY REQUIRED	PART NUMBER
Countermeasure #4 Leaf (with U-bracket and liner)	2	55024-30W05

SERVICE PROCEDURE

1. Raise the truck on a frame type hoist to allow the rear axle to hang down.

2. Support the rear differential with a transmission jack.

3. Remove the left rear wheel to allow access to the U-bracket torx bolt.

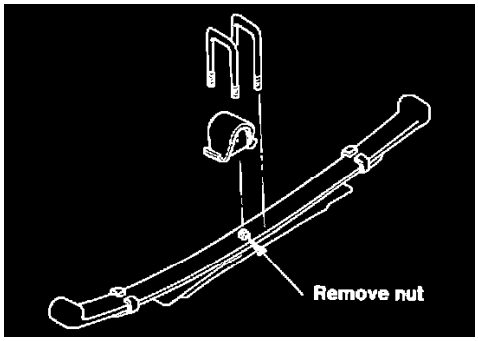


4. Remove the torx bolt of the U-bracket on the number four leaf of the left spring.
   NOTE: Illustration is of right spring.

5. Loosen (do not remove) the shock absorber lower end nut and remove the two U-bolts (4 nuts). Allow lower spring pad to hang from shock absorber.

6. Lower the differential (with transmission jack).

"CAUTION": Be careful not to stretch the brake hose.



7. Remove the nut that holds the leaves together.
8. Remove the #4 leaf and replace with the countermeasure leaf (with wider U-bracket).

9. Reassemble in reverse order of removal.
10. U-bolt nut torque: 65-72 ft-lbs. Shock absorber lower end nut torque: 22-30 ft-lbs.

11. Repeat Steps 4 through 10 for the right rear spring.

WARRANTY INFORMATION

CS	PNC	CT	OP CODE	FLAT RATE
4R	55020	35	LK99AA	0.5/hr.

NOTE: Flat rate time is for both springs.

Locks - Revised Torques For Door Lock & Striker Bolts

Section:

Classification:

BF90-003 Body & Frame

Reference:

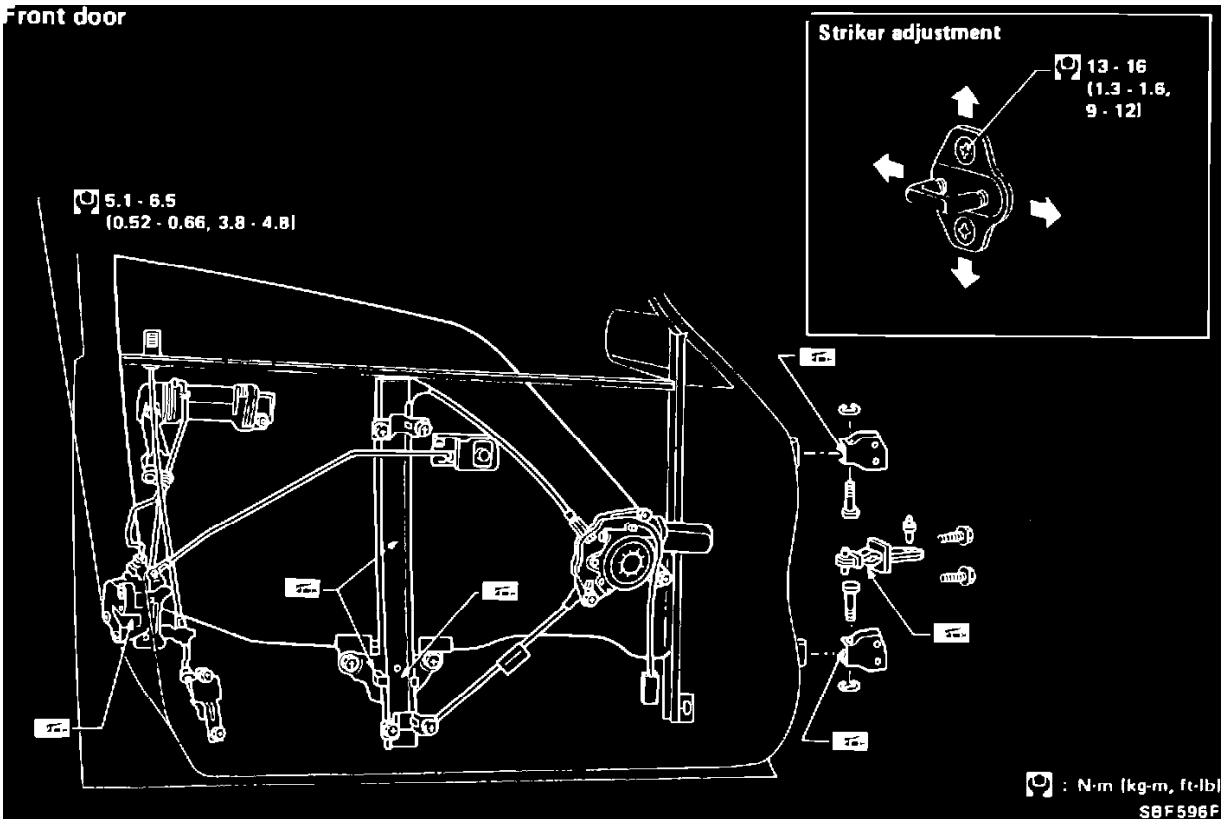
TECHNICAL BULLETIN NTB90-036

Models:

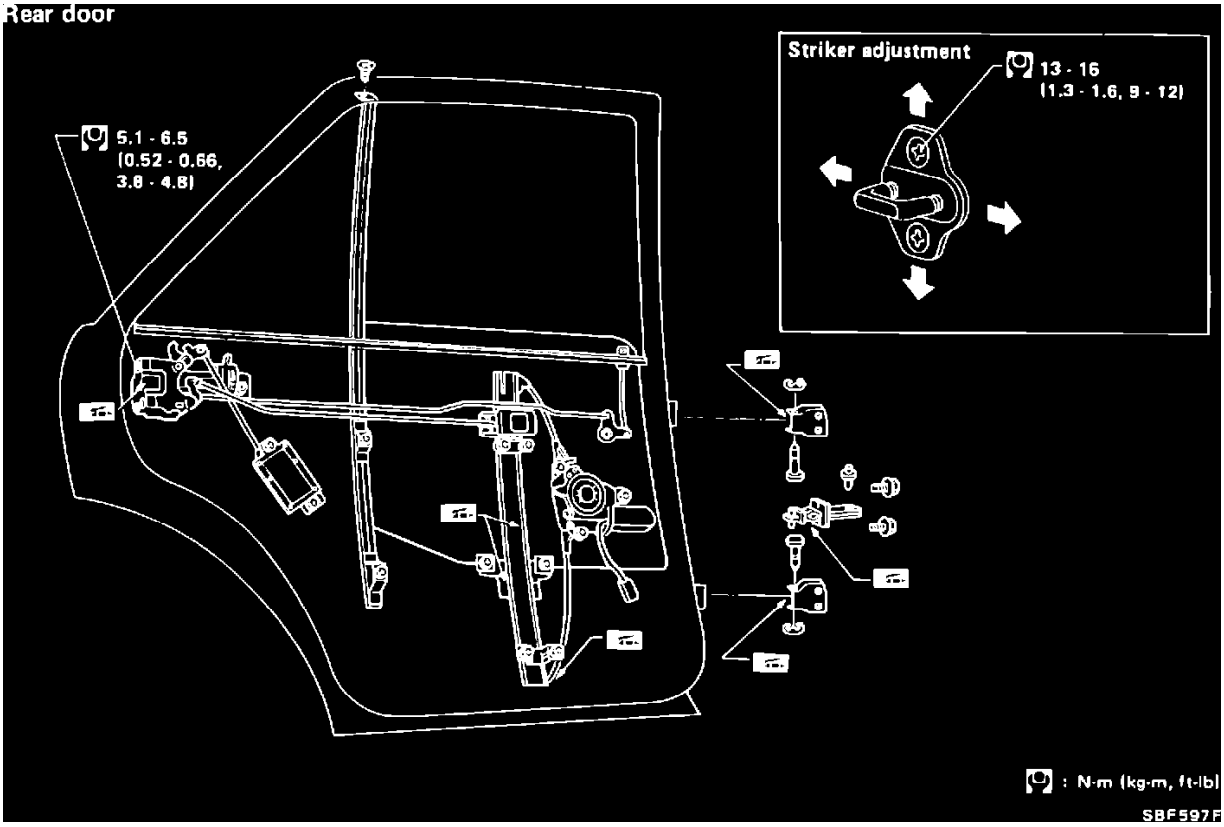
All models Date:

April 12, 1990

	New	Former
Door lock bolts	5.1-6.5 (0.52-0.66, 3.8-4.8)	3.7-5.0 (0.38-0.51, 2.7-3.7)
Striker bolts	13-16 (1.3-1.6, 9-12)	11.3-15.2 (1.15-1.55, 8.3-11.2)



Front door



Rear door

DOOR LOCK & STRIKER BOLTS

This Bulletin gives revised torque specifications for door lock and door striker bolts (see illustration on next page).

Technical Service Bulletin # **91051** Date: **910523**

Seats - Care of Leather Trim

Models All Models

Section Body & Frame

Classification BF91-014

Bulletin No. NTB91-051

Date May 23, 1991

CARE OF LEATHER TRIM

APPLIED MODELS: All Models Equipped With Leather Trim

SERVICE INFORMATION:

Nissan currently uses Cow Hide on all vehicles equipped with Leather Interior Trim (excluding certain 1988 Maximas which were equipped with Suede Seats). This bulletin refers only to those vehicles equipped with Cow Hide Leather Interior Trim. Suede seat covers are made of Pig Skin and should be cared for according to the instructions provided in the U11 Maxima Seat Care Kit (P/N 999M1-U8000). Leather is typically used on seat surfaces, trim pieces, steering wheels, and shift knobs in Nissan Vehicles. Maintaining a high quality appearance is best achieved by using the procedures indicated below.

1. Occasionally, loose dust should be removed from the interior trim and seat surfaces using a vacuum cleaner or a soft brush. The leather surfaces should be wiped clean with a soft dry cloth.

2. Some leather trim, such as the leather wrapped steering wheel, may become grayish in color with use. The original condition may be restored by rubbing the affected area with a clean soft cloth dampened in a mild soap solution, and then wiped clean with a soft dry cloth.

3. Leather seat surfaces may be regularly coated with a leather conditioner such as saddle soap.

Cautions:

Never use benzene, thinner, or any similar product on leather trim.

Never use car wax on leather trim.

Never use fabric protectors on leather trim unless recommended by the manufacturer. Some fabric protectors contain chemicals that may stain or bleach the leather trim.

Technical Service Bulletin # **WB90011** Date: **900615**

Seat Trim - Non-Warrantable Examples

Reference: WARRANTY BULLETIN WB/90-011
Date: June 15, 1990
TO: ALL NISSAN DEALERS

SUBJECT: SEAT TRIM WARRANTY CLAIMS

An ongoing analysis of Seat Trim returned through the Part Return Program has shown an increasing volume of non-warrantable seat trim replacements being claimed as a warrantable repair. Non-warrantable seat trim examples are cigarette burns, cuts and punctures.

Please instruct your Warranty Administration team that seat trim damage as indicated above is not covered by the Nissan New Vehicle Limited Warranty and should not be submitted for reimbursement via the Warranty Claim Processing System.

Thank you for your assistance.

Technical Service Bulletin # **NHTSA85V146000** Date: **851112**

Recall 85V146000: Steering Column Coupling Bolt Loose

THE STEERING COLUMN IS CONNECTED TO THE STEERING GEAR BY MEANS OF SPLINED SHAFT COUPLINGS. THESE COUPLINGS ARE SECURED WITH A TRANSVERSE BOLT AND LOCKWASHER. IT WAS FOUND THAT THE BOLT WAS NOT TIGHTENED AND TORQUED TO SPECIFICATIONS. CONSEQUENCE OF DEFECT: ALTHOUGH THE SPLINES PROVIDE ADEQUATE COUPLING TO PERMIT OPERATION, EXTENDED USE MAY RESULT IN SPLINE DISENGAGEMENT AND LOSS OF VEHICLE CONTROL WHICH MAY CAUSE AN ACCIDENT. CORRECTIVE ACTION: INSPECT AND CORRECT AS NECESSARY TO PRECLUDE SPLINE DISENGAGEMENT.

SYSTEM: STEERING/SHAFT COUPLING.

VEHICLE DESCRIPTION: MODEL 720 LIGHT DUTY TRUCKS.

1986 NISSAN TRUCK 720

Technical Service Bulletin # **94004** Date: **940113**

Drivetrain - Differential Oil Recommendations

Classification:
GI94-001

Section:
General Information

Reference:
TECHNICAL BULLETIN NTB94-004

Models:
See Below

Date:
January 13, 1994

RECOMMENDED OIL FOR DIFFERENTIALS
[Conventional or Viscous Limited Slip Types]

APPLIED MODELS:
All Rear Wheel Drive (RWD) Nissan Vehicles with Conventional or Viscous Limited Slip Differentials

NOTE:
For Nissan vehicles equipped with most types of Limited Slip Differentials, refer to Nissan Technical Bulletin NTB93-140 (GI93-011), "Oil for

Limited Slip Differential."

SERVICE INFORMATION:

To refill the oil for RWD conventional or viscous limited slip differentials applied to Nissan vehicles, the following criteria should be applied:

Lubrication Purpose: Conventional Differential Gear Oil

Differential Gear Oil Capacity: Refer to the Maintenance Section.

Type: Sulfur-Phosphorus with Extreme Pressure Additives

American Petroleum Institute (API) Rating: GL-5

NOTE:
Oil meeting the "GL-5" Rating is defined as a "lubricant for hypoid gears in severe service, including "shock loading".

Viscosity: Refer to the chart for differential gear oil viscosity selection with respect to ambient temperature.

Technical Service Bulletin # **94-004** Date: **940113**

Differentials - Recommended Lubricants

Classification:
GI94-001

Reference:
NTB94-004

Date:
January 13, 1994

RECOMMENDED OIL FOR DIFFERENTIALS [CONVENTIONAL OR VISCOUS LIMITED SLIP TYPES]

APPLIED VEHICLE(S):
All Rear Wheel Drive (RWD) Nissan Vehicles with Conventional or Viscous Limited Slip Differentials

SERVICE INFORMATION

NOTE:
For Nissan vehicles equipped with most types of Limited Slip Differentials, refer to Nissan Technical Bulletin NTB93-140 (GI93-011), "Oil for Limited Slip Differential."

To refill the oil for RWD conventional or viscous limited slip differentials applied to Nissan vehicles, the following criteria should be applied:

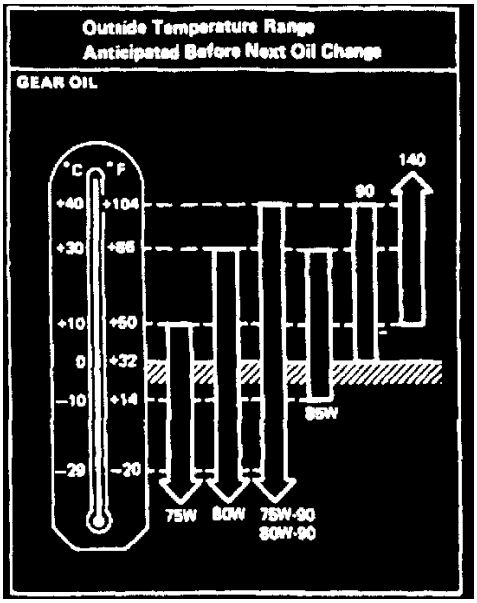
Lubrication Purpose:
Conventional Differential Gear Oil

Differential Gear Oil Capacity:
Refer to the "MA" Section in the appropriate Service Manual.

Type:
Sulfur-Phosphorus with Extreme Pressure Additives

American Petroleum Institute (API) Rating:
GL-5

NOTE:
Oil meeting the "GL-5" Rating is defined as a "lubricant for hypoid gears in severe service, including "shock loading" ".



80W-90 is preferable for ambient temperature below 40°C (104°F).

Viscosity:
Refer to the following chart for differential gear oil viscosity selection with respect to ambient temperature.

Technical Service Bulletin # **AT87172** Date: **871123**

A/T - Cleaning Hydraulic System Components

Models All Models

Section Automatic Transmission

Classification AT87-008

Bulletin No. TS87-172

Date November 23, 1987

CLEANING AUTOMATIC TRANSMISSION COMPONENTS

APPLIED MODELS: All Nissan models equipped with automatic transmission or transaxle

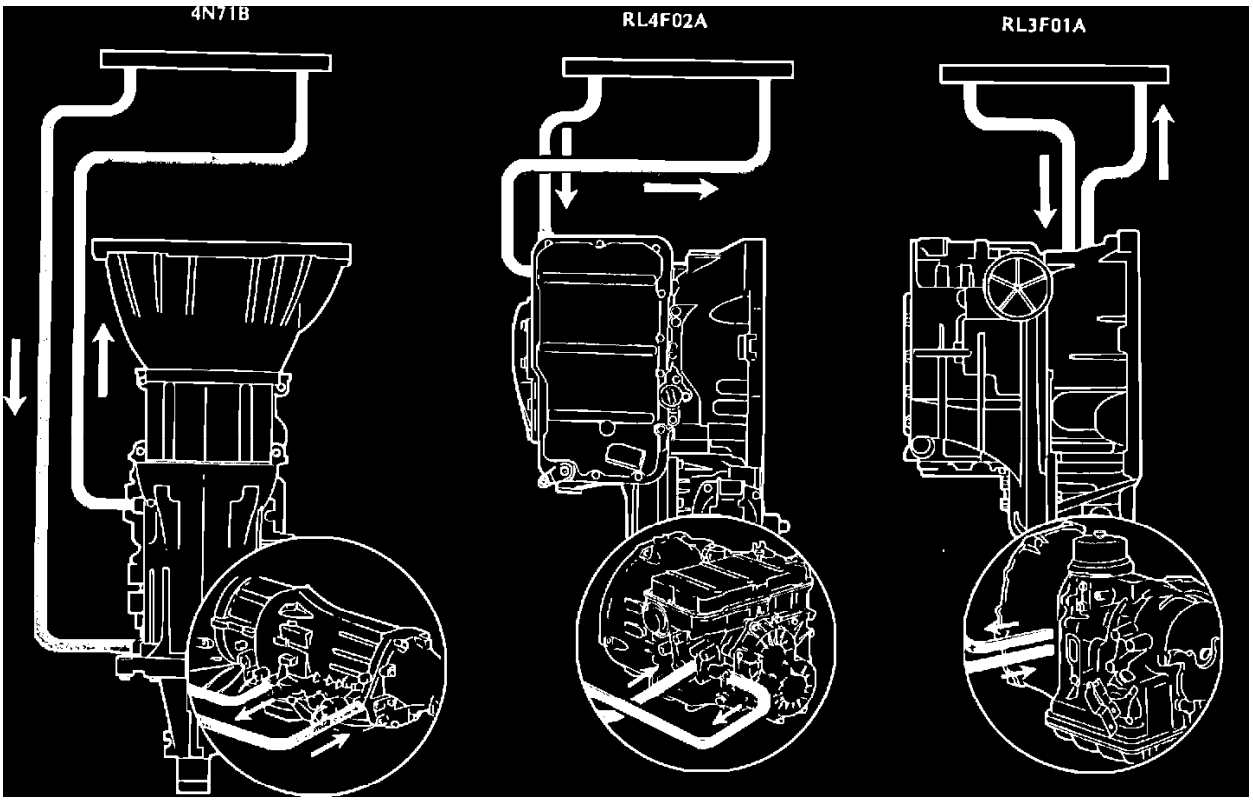
CONDITION	A/T COMPONENTS INCLUDING CONTROL VALVE BODY	TORQUE CONVERTER	OIL COOLER AND PIPING
Burned oil.	1. In-vehicle fluid change/flush* OR 2. Disassemble component parts, flush with clean solvent. Air dry. (Do not use compressed air).	1. In-vehicle fluid change/flush OR 2. Solvent clean using torque converter cleaning machine. (May be done by an AT rebuilder.)	Flush with solvent and compressed air* CAUTION: Use only filtered air at a pressure of 25 p.s.i. or less.
Clutch and brake material in oil.	Disassemble component parts. Flush with solvent. Air dry. (Do not use compressed air).	Solvent clean using torque converter cleaning machine. (May be done by an AT rebuilder.)	Flush with solvent and compressed air* CAUTION: Use only filtered air at a pressure of 25 p.s.i. or less.
Metal particles in oil.	1. Disassemble component parts. Flush with solvent. Air dry. (Do not use compressed air). 2. If a lot of metal particles are found, replace control valve body.	Replace torque converter.	Flush with solvent and compressed air* CAUTION: Use only filtered air at a pressure of 25 p.s.i. or less.

*See attached pages.

- In-vehicle fluid change/flush
- Heat exchanger cleaning procedure

SERVICE INFORMATION

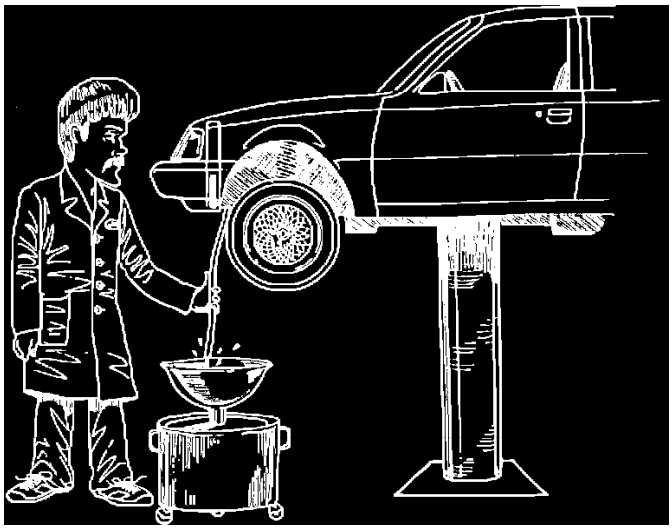
Under severe service, some automatic transmissions or transaxles may become contaminated with burned fluid, clutch and brake material, or metal particles, all of which can cause reduced efficiency or damage. If the damage is not so extensive as to warrant transmission overhaul, use the following procedures to clean the contaminants out of the hydraulic system components before replacing the fluid.



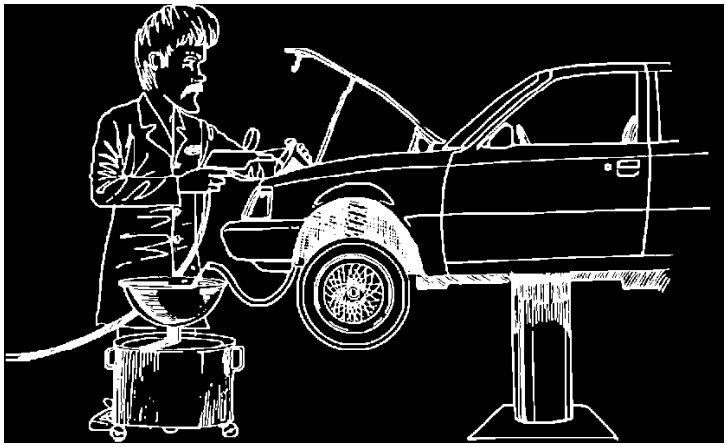
IN-VEHICLE FLUID CHANGE/FLUSH

If the transmission or transaxle is contaminated with burned oil or clutch and band material, all fluid, including the fluid in the torque converter, must be changed and the transmission flushed out. Drain and replace the the old fluid and use the following procedure to flush the assembly.

1. Disconnect the transmission oil cooling lines at the radiator heat exchanger.



2. Block the transmission oil return line. Connect a rubber line to the disconnected transmission oil "out" line and place the rubber line into a suitable oil drain pan.
3. Start the engine and allow the vehicle to run at idle in "PARK." Oil will now be discharged out of the transmission oil cooler line.



4. Place a filler funnel into the transmission filler tube and slowly fill the transmission with new automatic transmission fluid. Replace the fluid at approximately the same rate that it is discharged out of the oil cooler line. This will be about 3 or 4 quarts per minute.

CAUTION: DO NOT ALLOW THE TRANSMISSION TO RUN OUT OF FLUID. DAMAGE TO INTERNAL COMPONENTS COULD RESULT.

5. Run the engine and allow the flushing process to continue until the fluid discharged out of the oil cooler line is clear. This will require a total of about 7 quarts of fluid flushed through the system.

6. Stop the engine and perform the Oil Cooler/Heat Exchanger Cleaning Procedure described below.

7. After the flushing is completed, re-connect the oil cooler lines. Re-start the engine and check for transmission fluid level. Refill as necessary.

OIL COOLER/HEAT EXCHANGER CLEANING PROCEDURE

If contaminants are found in the automatic transmission, there will also be contaminants in the oil cooler. Therefore, the cooler must be flushed or the materials that are present will find their way into the clean transmission. To flush the heat exchanger, use clean solvent in the following procedure.

1. Connect two long hoses (approximately 4 ') onto the radiator heat exchanger fittings.

2. Place one end of the hose onto the solvent discharge line of your shop solvent tank.

3. Run the second line back into the solvent tank.

4. Start the pump on the solvent tank and allow the solvent to flow for a minimum of ten minutes.

5. Disconnect the hoses at the radiator heat exchanger. Blow the heat exchanger out with compressed air at low pressure (10 psi maximum). Then reinstall the automatic transmission cooler lines.

Technical Service Bulletin # **95-114** Date: **951206**

M/T - Clutch Operating Cylinder Service Information

Classification:
MT95-003

Reference:
NTB95-114

Date:
December 6, 1995

CLUTCH OPERATING CYLINDER - DUAL CUP PISTON SEAL ARRANGEMENT

SERVICE INFORMATION

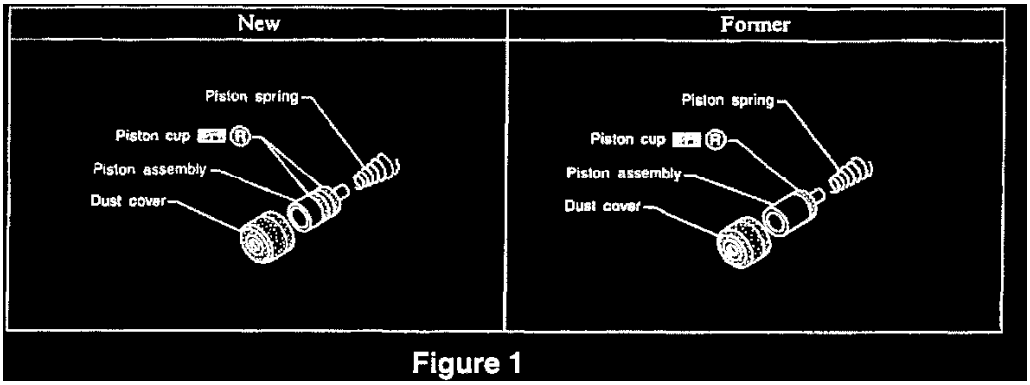


Figure 1

The piston cup for the clutch operating cylinder has been changed from a single cup to a dual cup. The parts are interchangeable with a piston kit (piston assembly, piston spring and dust cover), see Figure 1.

Please update the CL section of your service manuals to show the dual cup piston seal arrangement.

Please refer to your microfiche parts catalog for the appropriate vehicle and part number.

Technical Service Bulletin # **92086** Date: **921013**

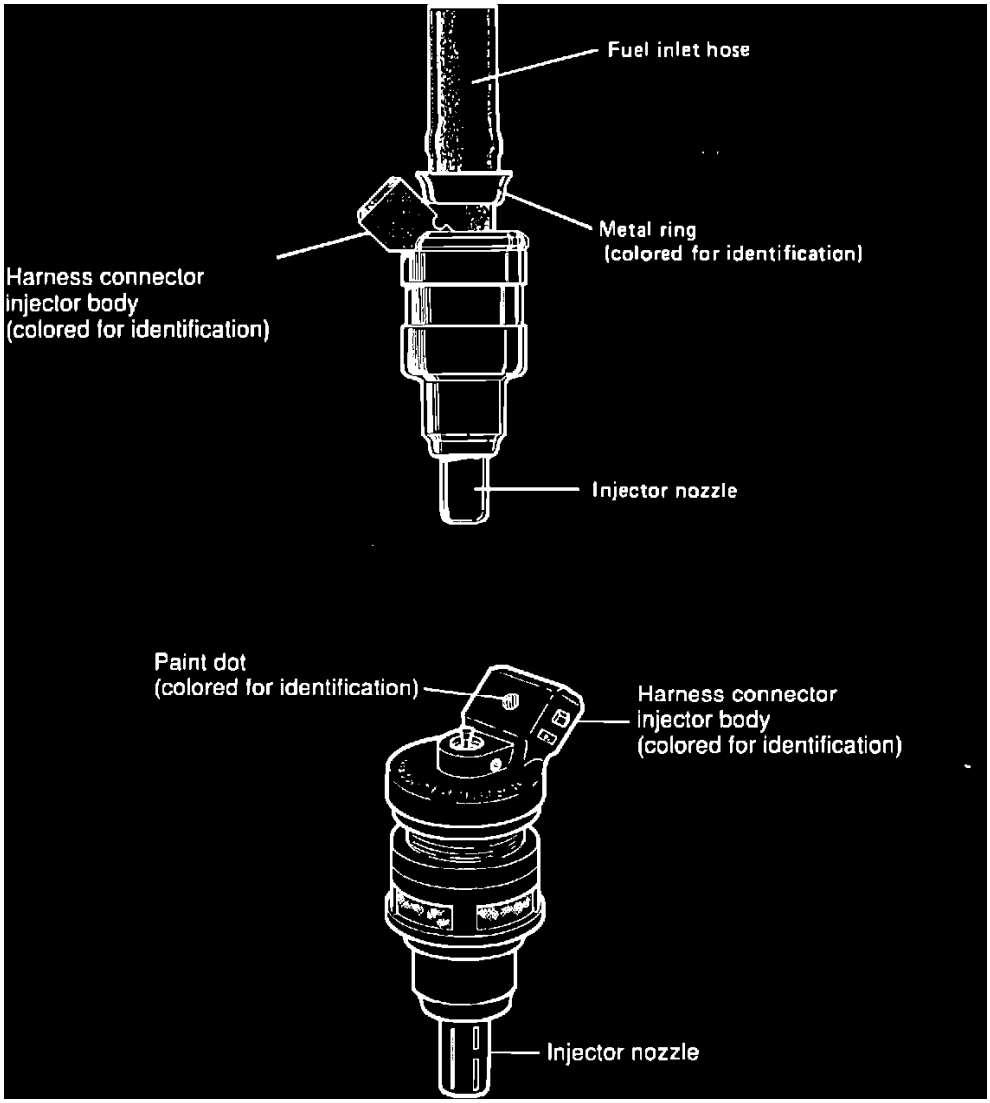
Fuel - Injector Replacement Guidelines

Models: All models
Section: Engine Fuel & Emission Control
Classification: EF&EC92-003
Bulletin No.: NTB92-086
Date: October 13, 1992

FUEL INJECTOR REPLACEMENT

APPLIED MODELS:
All multi point fuel injected engines.

SERVICE INFORMATION:



When fuel injector replacement is required, the following guidelines should be followed:

1. Injector body/harness connector color must always be the same. Injector body colors are beige, blue, brown, green, pink, purple, and red. Therefore red should always be replaced with red and green should always be replaced with green.

2. Paint dot or metal ring color must be the same when replacing one injector out of a set. Paint dot or ring colors are black, blue, gray, green, orange, red, white, and yellow. Therefore a red with blue paint dot should always be replaced with a red with blue paint dot and pink with black paint dot should always be replaced with pink with black paint dot.

3. When replacing a complete set of injectors any paint dot or ring color is acceptable, however the injector body/harness connector color must remain the same.

4. There is no difference between injectors made by different manufacturers.

The following table shows correct injector replacement

CORRECT REPLACEMENT

ORIGINAL INJECTOR	REPLACEMENT INJECTOR
connector color/paint dot	connector color/paint dot
Red/Blue	Red/Blue
Pink/Black	Pink/Black

The following table shows incorrect injector replacement

INCORRECT REPLACEMENT

ORIGINAL INJECTOR	REPLACEMENT INJECTOR
connector color/paint dot	connector color/paint dot
Red/Blue	Red/Black
Purple/Black	Red/Black
Beige/Blue	Brown/Blue

MODEL CODE	ENGINE TYPE	HARNESS CONNECTOR COLOR	PAINT DOT OR RING COLOR
ALTIMA U13	KA24DE	RED	
AXXESS M11	KA24E	RED	
AXXESS M11	KA24E	RED	BLACK
AXXESS M11	KA24E	RED	BLUE
AXXESS M11	KA24E	RED	YELLOW
AXXESS M11	KA24E	RED	RED
AXXESS M11	KA24E	RED	WHITE
AXXESS M11	KA24E	RED	GREEN
MAXIMA 910	L24E	GREEN	BLUE
MAXIMA J30	VG30E	PINK	BLUE
MAXIMA J30	VG30E	PINK	BLACK
MAXIMA J30	VE30DE	RED	
MAXIMA U11	VG30E	BEIGE	BLUE
MAXIMA U11	VG30E	PINK	GRAY
MAXIMA U11	VG30E	BEIGE	BLACK
MAXIMA U11	VG30E	PINK	GRAY
NX 1600 KB13	GA16DE	PINK	
NX 2000 KB13	SR20DE	RED	
PATHFINDER WD21	VG30E	PINK	BLUE
PATHFINDER WD21	VG30E	PINK	BLACK
PULSAR N12	E15ET	BLUE	GREY
PULSAR KN13	CA16DE	BLUE	BLUE
PULSAR KN13	CA16DE	BLUE	BLACK
PULSAR KN13	CA18DE	RED	BROWN
PULSAR KN13	CA18DE	RED	
QUEST V40	VG30E	PINK	BLUE
QUEST V40	VG30E	PINK	BLACK
SENTRA B13	GA16DE	PINK	
SENTRA B13	SR20DE	RED	
STANZA T11	CA20E	GREEN	BLUE
STANZA T11	CA20E	GREEN	BLACK
STANZA T12	CA20E	GREEN	BLUE
STANZA T12	CA20E	GREEN	BLACK
STANZA T12	CA20E	BEIGE	BLUE
STANZA T12	CA20E	BEIGE	BLACK

MODEL CODE	ENGINE TYPE	HARNESS CONNECTOR COLOR	PAINT DOT OR RING COLOR
STANZA U12	KA24E	RED	BLACK
STANZA U12	KA24E	RED	BLUE
STANZA U12	KA24E	RED	YELLOW
STANZA U12	KA24E	RED	RED
STANZA U12	KA24E	RED	WHITE
STANZA U12	KA24E	RED	GREEN
STANZA WGN.M10	CA20E	GREEN	BLUE
STANZA WGN.M10	CA20E	BEIGE	BLUE
STANZA WGN.M10	CA20E	GREEN	BLACK
STANZA WGN.M10	CA20E	BEIGE	BLACK
TRUCK D21	VG30E	PINK	BLUE
TRUCK D21	VG30E	PINK	BLACK
TRUCK D21	KA24E	RED	
200 SX S110	Z20E	GREEN	BLACK
200 SX S110	Z22E	GREEN	BLACK
200 SX S12	CA18ET	BLUE	BLUE
200 SX S12	CA18ET	BLUE	BLACK
200 SX S12	CA20E	GREEN	BLUE
200 SX S12	CA20E	GREEN	BLUE
200 SX S12	VG30E	BEIGE	BLUE
200 SX S12	VG30E	BEIGE	BLACK
240 SX S13	KA24E	RED	
240 SX S13	KA24E	RED	BLACK
240 SX S13	KA24E	RED	BLUE
240 SX S13	KA24E	RED	ORANGE
280 ZX S130	L28E	GREEN	
280 ZX S130	L28E	GREEN	YELLOW
280 ZX S130	L28E	GREEN	BLUE
280 ZX S130	L28E	GREEN	BLACK
280 ZX S130	L28ET	BROWN	
300 ZX Z31	VG30E	BEIGE	BLUE
300 ZX Z31	VG30E	BEIGE	BLACK
300 ZX Z31	VG30E	PINK	GRAY
300 ZX Z31	VG30E	PINK	GRAY
300 ZX Z31	VG30ET	BROWN	BLUE
300 ZX Z31	VG30ET	BROWN	BLACK
300 ZX Z31	VG30ET	BROWN	
300 ZX Z31	VG30ET	RED	GREY
300 ZX Z31	VG30ET	RED	
300 ZX Z32	VG30DE	RED	BLUE
300 ZX Z32	VG30DE	RED	BLACK
300 ZX Z32	VG30DETT	PURPLE	BLUE
300 ZX Z32	VG30DETT	PURPLE	BLACK

The table shows the injector colors for various models. This is intended as a quick reference guide to verify that the correct injectors are reinstalled. Please refer to the parts catalog for correct part numbers.

Technical Service Bulletin # **93-176** Date: **931129**

ECM - Relay (Type 1M) Green or Blue Precautions

Classification:
EC93-016

Reference:
NTB93-176

Date:
November 29, 1993

GREEN OR BLUE (TYPE 1M) RELAY CAUTION

APPLIED VEHICLE(S):
All Models

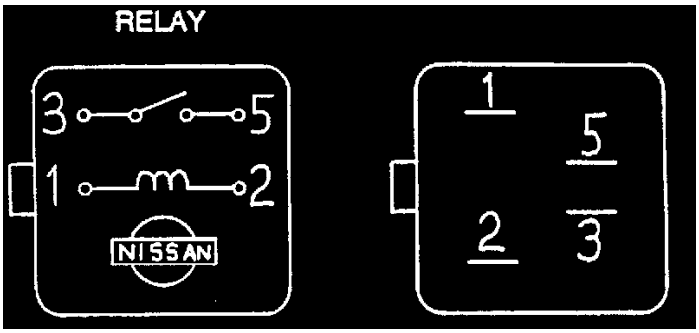
SERVICE INFORMATION

When servicing a customer's vehicle, exercise caution when diagnosing / checking at any green or blue colored relay (type 1M, 1 make-normally

open relay).

SERVICE PROCEDURE

When diagnosing at any green or blue colored relay (type 1M, 1 make-normally open relay), observe the following cautions to prevent damage to the Engine Control Module (ECM):



1. **Note** that the schematic on the fuel pump relay is rotated 90 degrees from the orientation of the relay terminals in the relay connector (see diagram):

2. Exercise caution to ensure that the correct terminals are being probed at the relay connector during diagnosing / checking.

Note:
If terminals 2 or 3 (battery voltage) are connected to terminal 1, the ECM will become damaged if the circuit being tested has terminal 1 connected to the ECM.

Technical Service Bulletin # **EC86010** Date: **860711**

Engine Controls - Oxygen Sensor Description & New Torque

Models All Models (1982-1987)

Section Emission Control

Classification EC86-010

Bulletin No. TS86-128

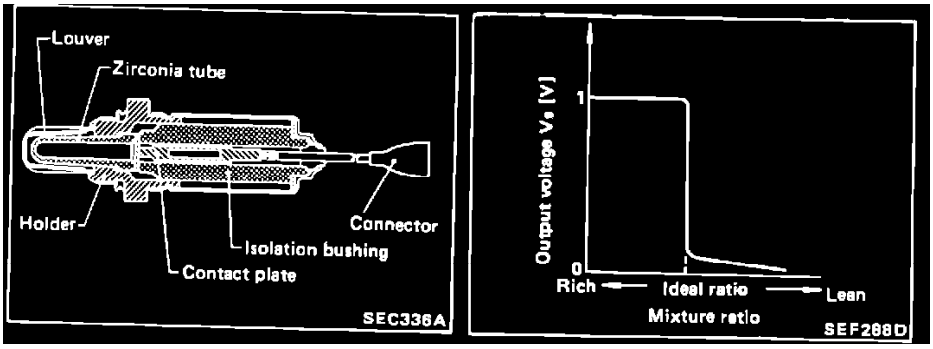
Date July 11, 1986

EXHAUST GAS SENSORS, ALL MODELS

SERVICE INFORMATION

Starting with the 1986 Model Year, two types of exhaust gas sensors have been used on Nissan vehicles. In addition to the previously used Zirconia type sensor, some 1986 and 1987 vehicles are now being manufactured with Titania type sensors. This bulletin contains a description of these sensors and a model application chart for your reference.

In addition, the tightening torque for exhaust gas sensors has been standardized. This revised torque information follows the appropriate model application chart. Please make note of the new torque by hand in the Tightening Torque Table of the EF&EC S.D.S. Section of the appropriate model Service Manual, if necessary.

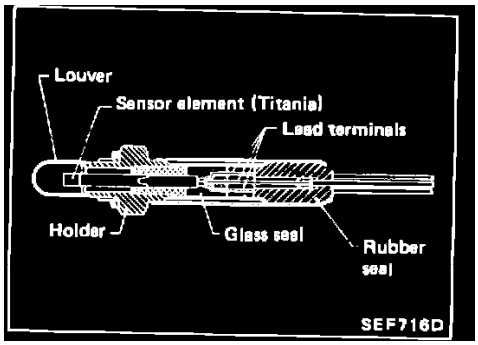


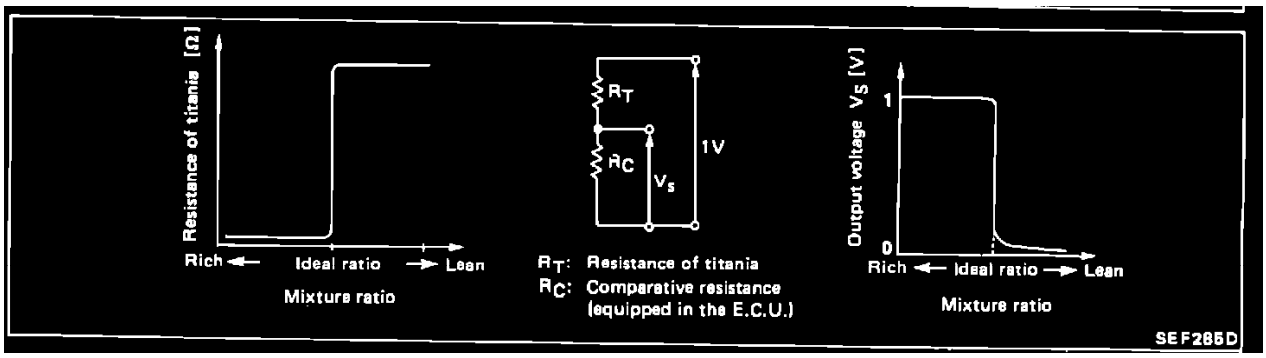
I. ZIRCONIA TYPE EXHAUST GAS SENSOR The exhaust gas sensor, which is placed into the exhaust manifold, monitors the mount of oxygen in the exhaust gas. The sensor has a closed-end tube made of ceramic zirconia. The outer surface of the tube is exposed to exhaust gas, and the inner surface to atmosphere. The zirconia of the tube compares the oxygen density of exhaust gas with that of atmosphere, and generates electricity. In order to improve generating power of the zirconia, its tube is coated with platinum. The voltage is approximately 1V

when the mixture ratio is richer than the ideal air-fuel ratio, and approximately OV when leaner. The radical change from 1V to OV occurs near the ideal mixture ratio. In this way, the exhaust gas sensor detects the amount of oxygen in the exhaust gas and sends the signal of approximately 1V or OV to the E.C.U. On 1984-1985 300ZX and 1985-1986 Maxima models, with VG30 engines a ceramic heater was employed to ensure the stable performance of the sensor.

APPLIED MODELS	1982-1986 Sentra (B11) 1983-1986 Pulsar NX 1983.5-1986 720 Trucks 1986.5 D21 Truck (Z24i) 1979-1983 280ZX 1984-1985 300ZX	1984-1987 Stanza (T11) 1986 Stanza Wagon (M10) 2WD 1981-1984 Maxima (910) 1985-1986 Maxima (U11) 1980-1983 200SX (S110) 1984-1986.5 200SX (S12)
REVISED TORQUE (ft-lb/N•m/kg-m)	30 - 37/ 40 - 50/ 4.1 - 5.1	

Make note of this new torque information in the Tightening Torque Table, EF&EC Section of these model Service Manuals.





II. TITANIA TYPE EXHAUST GAS SENSOR The exhaust gas sensor, located in the exhaust tube, monitors the amount of oxygen in the exhaust gas. This sensor is made of ceramic titania that is drastically changed by electrical resistance at the ideal air-fuel ratio. The E.C.U. supplies the sensor with approximately 1V and reads the sensor output voltage, depending on its resistance. In order to activate the sensor element, it is equipped with a heater.

APPLIED MODELS	1986 300ZX 1987 Maxima 1987 Sentra (B12)	1986 Stanza Wagon (M10) 4WD 1986.5 D21 Truck (VG30i)
REVISED TORQUE (ft-lb/N m/kg-m)	13 - 17/ 18 - 24/ 1.8 - 2.4	

Make note of new torque information in the Tightening Torque Table, EF&EC Section of these model Service Manuals.

REMOVAL CAUTION: If the exhaust gas sensor is difficult to remove, use Nissan Rust Penetrant, P/N 999MP-A3020, or equivalent to avoid possible engine damage.

Technical Service Bulletin # **EE86007** Date: **860515**

Battery - Designation Modification

Models All Models

Section Engine Electrical

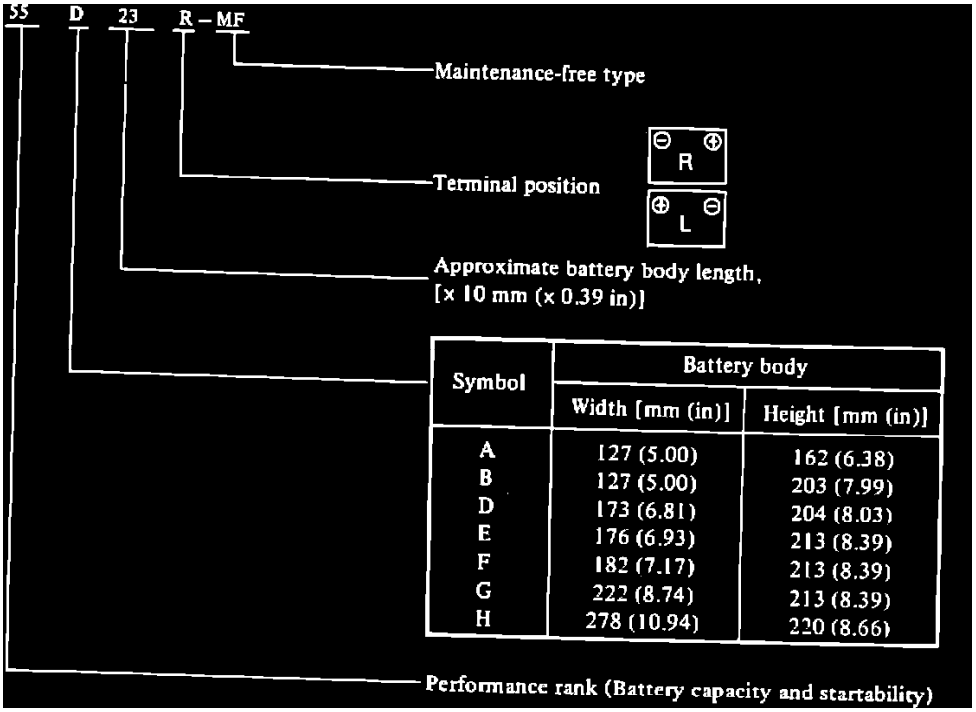
Classification EE86-007

Bulletin No. TS86-084

Date May 15, 1986
BATTERY DESIGNATION

Battery designations for Nissan models have been changed. However, the performance and size of the batteries remain the same. For your reference, an explanation of battery designations is shown below, and a cross reference chart of old and new designations is found on page EE-20.

The recently distributed 1986.5 200SX, 1987 Maxima and Sentra Service Manuals contain the new designations (Section EL, Battery procedures). In addition, all future printings of Nissan Service Manuals will reference the new designations.



Symbol	Battery body	
	Width [mm (in)]	Height [mm (in)]
A	127 (5.00)	162 (6.38)
B	127 (5.00)	203 (7.99)
D	173 (6.81)	204 (8.03)
E	176 (6.93)	213 (8.39)
F	182 (7.17)	213 (8.39)
G	222 (8.74)	213 (8.39)
H	278 (10.94)	220 (8.66)

I. IDENTIFICATION OF BATTERY DESIGNATIONS

New battery designation	Former battery designation	Capacity [V-Ah]	Note
26A19R (L)	12N24-4 (L)	12-26	
28A19R (L)	NT50-N24 (L)		
32A19R (L)	NX60-N24 (L)	12-30	
28B17L	28B17L		
28B19R (L) (-MF)	NS40S (L) (-MF)		
–	NS40 (L)	12-32	Eliminated
34B19R (L) (-MF)	NS40ZA (L) (-MF)	12-33	
36B20R (L)	NS40Z (L)	12-35	
38B20R (L)	NT60-S4 (L)		
–	N40 (L)	12-40	Eliminated
46B24R (L) (-MF)	NS60 (L) (-MF)	12-45	
50B24R (L)	NT80-S6 (L)		
55B24R (L) (-MF)	NX100-S6 (L) (-MF)		
50D23R (L) (-MF)	N50S (L) (-MF)	12-50	
55D23R (L) (-MF)	55D23R (L) (-MF)	12-60	
48D26R (L)	N50 (L)	12-50	
55D26R (L)	N50Z (L)	12-60	
65D26R (L) (-MF)	NS70 (L) (-MF)	12-65	
80D26R (L) (-MF)	NX110-5 (L) (-MF)		
65D31R (L)	N70 (L)	12-70	
75D31R (L) (-MF)	N70Z (L) (-MF)		
95D31R (L) (-MF)	NX120-7 (L) (-MF)	12-80	
95E41R (L)	N100 (L)	12-100	
105E41R (L)	N100Z (L)		
130E41R (L)	NX200-10 (L)	12-110	
115F51	N120	12-120	
145F51	NS150	12-140	
145G51	N150	12-150	
190H52	N200	12-200	

II. CROSS REFERENCE FOR BATTERY DESIGNATIONS

Technical Service Bulletin # **EL87020** Date: **871026**

Battery - Charging Precautions

Models All Models

Section Electrical System

Classification EL87-020

Bulletin No. TS87-158

Date October 26, 1987

CHARGING NISSAN BATTERIES

APPLIED MODELS: All Nissan models built after February, 1985

SERVICE INFORMATION:

A "hybrid" type battery, with calcium and antimony plates, has been installed in all Nissan models starting with 1986 production. This type of battery has improved recharging capabilities and may be recharged with a standard shop battery charger, even after deep discharge. Follow the procedures given in the current Nissan service manuals.

These batteries also have a slightly higher self discharge rate. To eliminate the effects of vehicle storage and to improve customer satisfaction, each battery should be checked before the new vehicle is delivered to a customer. This will insure that the battery is fully charged and provide the customer with the proper battery service life.

BATTERY CHARGING CAUTIONS:

1. Do not attempt to recharge batteries that have low electrolyte (water) levels. Add only distilled water to bring the levels to between the lines on the battery.

2. Use of any substance other than distilled water will damage the battery and cause reduced service life.

3. Hybrid batteries do require periodic water level inspection. Water usage varies with driving conditions and weather.

(Also, see the CAUTIONS listed in the service manual.)

Technical Service Bulletin # **94-009** Date: **940304**

Battery - Charging/Replacement Procedure

CLASSIFICATION:
EL94-001

REFERENCE:
NTB94-009

DATE:
MARCH 4, 1994

BATTERY CHARGING/REPLACEMENT PROCEDURE

APPLIED VEHICLE(S)
All

SERVICE INFORMATION

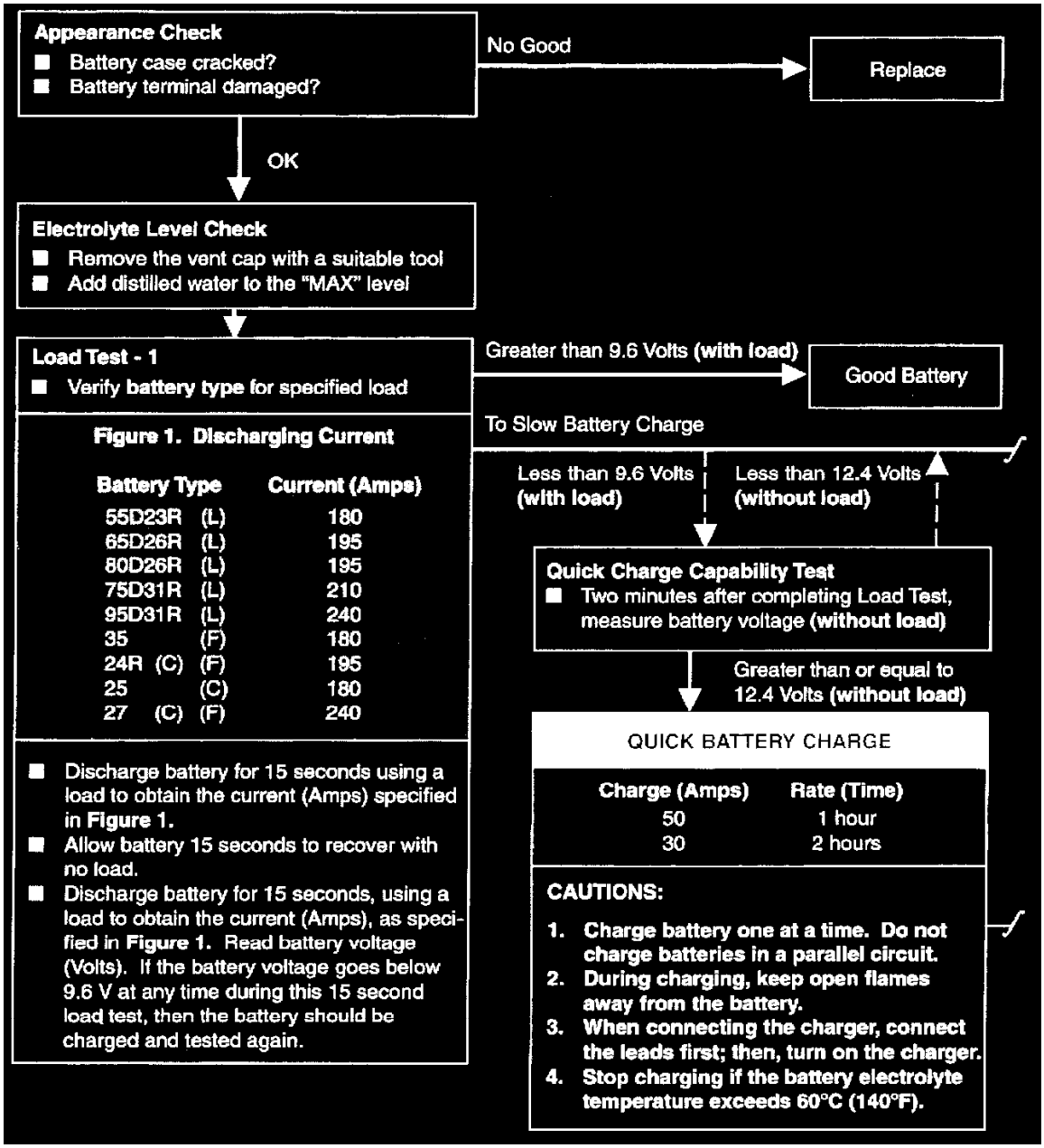
As the demands on the vehicle battery increase with the complexity of electrical systems, there is a need for a usable, consistent and repeatable procedure for determining the need for charging or replacement of vehicle batteries.

It is the Dealer's responsibility to determine the condition/chargeability of a battery, prior to replacement of the battery.

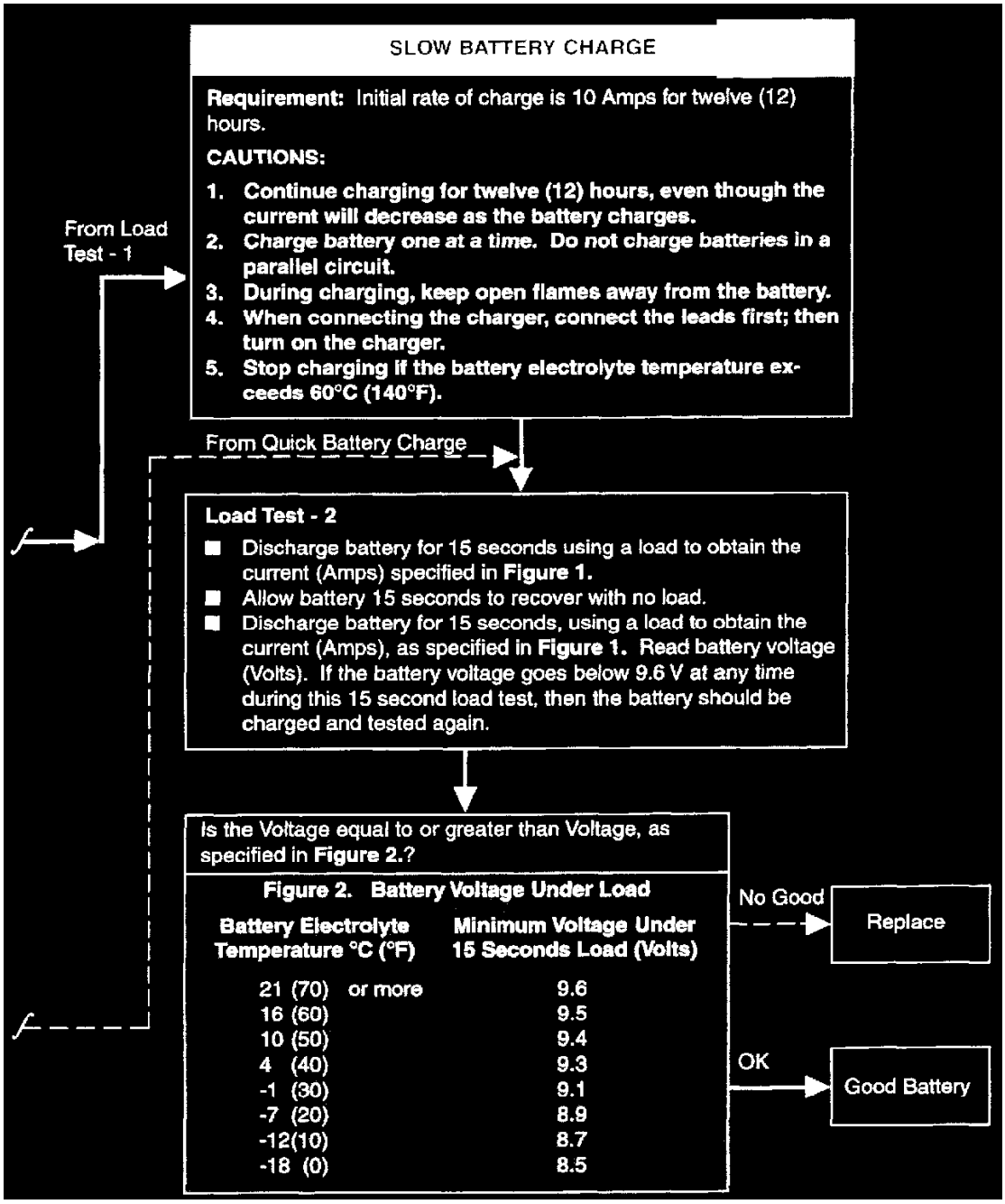
SERVICE PROCEDURE

See the following illustrations for BATTERY CHARGING/REPLACEMENT PROCEDURE.

Battery Charging/Replacement Procedure



Quick Battery Charge



Slow Battery Charge

CLAIMS INFORMATION

Please reference the Nissan "Assurance Products Resource Manual" for battery claim procedures.

Technical Service Bulletin # **PI95016** Date: **950928**

Remanufactured Starter/Alternator - Program

Reference: PI95-016

Date: September 28, 1995

GENUINE NISSAN REMANUFACTURED STARTER/ALTERNATOR PROGRAM

APPLIED VEHICLES:
Selected models

SERVICE INFORMATION

Beginning October 2, 1995, Nissan will offer remanufactured starters and alternators for selected Nissan models. Consult the Genuine Nissan Remanufactured Parts Sourcebook for part numbers and affected models. Refer to the Nissan Parts Bulletin NTB/95-023 for complete program procedures.

SERVICE PROCEDURE

The diagnostic procedure for troubleshooting starter and alternator incidents has not changed. Refer to the appropriate service manual for specific diagnostic procedures.

Technical Service Bulletin # **EF87005** Date: **890323**

Ignition - Transistor Unit Application Chart

Models All Models

Section Engine Fuel & Emission Control

Classification EF&EC87-005

Bulletin No. TS87-052

Date March 23, 1987

TRANSISTOR IGNITION UNIT APPLICATION CHART

The chart on page 2/2 of this bulletin is a summary of the transistor ignition unit applications for some Nissan models. When replacing an ignition unit, refer to the chart to obtain and/or verify part numbers.

MODEL/APPLICATION		VEHICLE PRODUCTION DATES	TYPE	PART NUMBER
280ZX (S130)	All (Non-Turbo) All	To 8/81 From 7/81 to 7/82 From 7/82 to 7/83	E12-80 E12-80A E12-92 E12-92A E12-93 E12-93A	22020-S6701 22020-S6702 22020-W3100 22020-P9101 22020-P9700 22020-P9701
Maxima/810 (910)	All	To 6/81 From 7/81 to 7/82 From 7/82 to 7/84	E12-80 E12-80A E12-92 E12-92A E12-93 E12-93A	22020-S6701 22020-S6702 22020-W3100 22020-P9101 22020-P9700 22020-P9701
200SX (S110)	All	From 6/79 to 6/83	E12-83 E12-83A	22020-D0200 22020-V5400
200SX (S12)	All M/T A/T	To 8/85 From 8/85 From 8/85	E12-84 E12-84A E12-84B E12-83A E12-84B	22020-D1701 22020-D1702 22020-D3300 22020-V5400 22020-D3300
Sentra (B11)	All	From 2/82 to 5/86	E12-61 E12-61AS	22020-15M00 22020-15M20
Pulsar (N12)	All	From 8/82 to 10/86	E12-61 E12-61AS	22020-15M00 22020-15M20
Stanza (T11)	CA20S CA20E CA20E A/T CA20E M/T CA20E M/T (Hitachi) CA20E M/T (Mitsubishi)	From 8/81 to 11/83 To 11/83 From 11/83 to 12/85 From 11/83 to 9/84 From 9/84 to 5/86 From 10/84 to 5/86	E12-84 E12-84A E12-84B E12-84 E12-84A E12-84B E12-84A E12-84B E12-84A E12-84B E12-83A J007X-03471	22020-D1701 22020-D1702 22020-D3300 22020-D1701 22020-D1702 22020-D3300 22020-D1702 22020-D3300 22020-D1702 22020-D3300 22020-V5400 22020-D0210
Stanza Wagon (M10)	M/T A/T	All All	E12-83A E12-84B	22020-V5400 22020-D3300
Truck (720)	Z22 Engine Z24 Engine Z24 Engine Z20 Engine Z20 Engine	To 12/82 To 6/84 From 7/84 to 12/85 To 6/84 From 7/84 to 12/85	E12-81 E12-83 E12-83A E12-83A E12-94 E12-94A E12-94A	22020-W0560 22020-D0200 22020-V5400 22020-V5400 22020-61W00 22020-61W02 22020-61W02

TRANSISTOR IGNITION UNIT (HIC) APPLICATION
Technical Service Bulletin # **PI95017** Date: **950928**

Remanufactured Distributor - Program

Reference: PI95-017

Date: September 28, 1995

GENUINE NISSAN REMANUFACTURED DISTRIBUTOR PROGRAM

APPLIED VEHICLES:
Selected models

SERVICE INFORMATION

Beginning October 2, 1995, Nissan will offer remanufactured distributors for selected Nissan models. Consult the Genuine Nissan Remanufactured Pans Sourcebook for part numbers and affected models. Refer to Parts Bulletin NPB/95-023 for complete program procedures.

SERVICE PROCEDURE

The diagnostic procedure for troubleshooting distributor incidents has not changed. Refer to the appropriate service manual for specific diagnostic procedures.

Technical Service Bulletin # **BE86020** Date: **861023**

Audio - Radio Installation Caution

Models All Models

Section Body Electrical

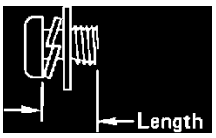
Classification BE86-020

Bulletin No. TS86-185

Date October 23, 1986

RADIO INSTALLATION CAUTION

APPLIED MODELS: All Models



SERVICE CAUTION

When installing a radio, it is extremly important to use the correct size mounting screws. A screw that is too long will cause internal damage to the radio.

All Nissan radio chassis are marked with a reference code (located near the screw holes) where the last digit indicates the maximum screw length as shown in the example below:

EXAMPLE: M5 X 8 - 8 indicates a maximum screw length of 8 mm.
DO NOT substitute screws without first checking the code to make sure that they do not exceed the maximum length allowed.

Technical Service Bulletin # **92003** Date: **920116**

Audio - Aftermarket Phone/Audio Installation Precautions

Classification:
GI92-001

Section:
General Information

Reference:
TECHNICAL BULLETIN NTB92-003

Models:
All Models

Date:
January 16, 1992

AFTERMARKET CELLULAR PHONE AND AUDIO

EQUIPMENT INSTALLATION

APPLIED MODELS: All Models

SERVICE INFORMATION

Many customers request installation of aftermarket cellular phones and audio equipment at the time of new vehicle purchase. Nissan does not authorize or warrant non-Nissan approved parts or accessories installed in Nissan vehicles. If these installations are made, they should be checked routinely after sublet work has been performed to help eliminate customer complaints. The following guidelines should be followed:

1. Route wires at least 18" away from ECU and air bag controller. Use high quality shielded cables for all signal cables (98% shielded).

2. Do not tap into wires that are part of any safety or ECCS equipment, such as airbag, brake lights, turn indicators, warning lights, ABS, fuel injection, etc. Power should come from the battery or the accessory circuit. Ground leads should terminate at the battery. Always use inline fuses as close to the power source as possible.

3. Use wire ties to securely fasten new harness in vehicle.

4. Before any panels or finishers are replaced, ensure that all fasteners are in good condition and are properly located.

5. When it is necessary for additional harnesses or cables to pass under the edge of a finisher, such as a cellular phone antenna coaxial cables, notch the finisher at that point so that it will fit back into place correctly.

6. Glass-mounted cellular phone antennas are affected by defroster wires in the window. Mount the antenna as high on the glass as possible and at least 1/2" away from defroster wires.

7 Test drive all vehicles to listen for squeaks or rattles.

NOTE: Please supply a copy of these guidelines to accessory installation shops that your dealership or customers use regularly.

Technical Service Bulletin # **99-017** Date: **990401**

Audio - Speaker Noise, Cellular Phone Interference

Classification:
EL99-005

Reference:
NTB99-017

Date:
April 1, 1999

NISSAN SPEAKER NOISE DUE TO CELLULAR PHONE INTERFERENCE

APPLIED VEHICLES:
All Nissan Vehicles

SERVICE INFORMATION

Cellular phone charging may cause a popping or crackling noise in the audio speakers of Nissan vehicles. If this condition exists, it is most likely to occur when the customer's cellular phone is turned off, plugged into the 12 volt cigarette lighter socket nearest the audio head unit, and placed within one foot of the audio head unit. The condition may occur more frequently in vehicles with audio systems with amplified speakers.

Refer to the appropriate owner's manual for cautions regarding the use of the cigarette lighter socket as a power source for other accessories.

Use the procedure below to verify that the condition exists as described above and provide instruction for the customer to reduce the possibility of future cellular phone interference.

SERVICE PROCEDURE

Perform the following test procedure to verify the condition exists as described:

1. Ask the customer for the cellular phone and charging adapter.

2. Confirm the cellular phone has been turned off for at least 30 minutes before proceeding.

NOTE:
Do not turn the cellular phone on at any time during the procedure. If the phone has to be turned from on to off, you will have to wait 30 minutes for the phone to reset to proceed with the test.

3. Plug the phone into the 12 volt cigarette lighter socket nearest the audio head unit.

4. Turn the ignition to the "ON" position (do not turn the cellular phone on).

5. Turn the audio unit on.

6. Place the cellular phone close to the front of the audio head unit.

7. Listen for a popping or crackling noise from the audio speakers.

8. If the noise is heard, move the cellular phone back from the audio unit. The noise should be reduced as the cellular phone is moved further away from the audio unit.

9. If the condition is confirmed through the above procedure, advise the customer to keep the cellular phone at least one foot away from the audio head unit to reduce the possibility of future cellular phone interference.

Technical Service Bulletin # **EN86003** Date: **860411**

Extended Service Oil Filter - Application Chart

Models All Models

Section Engine

Classification EN86-003

Bulletin No. TS86-044

Date April 11, 1986

EXTENDED SERVICE
OIL FILTER APPLICATION CHART

TYPE	PART NUMBER	APPLIED ENGINE SERIES
Standard	15208-H8911	A (From 8/73), E, CA and VG
Extended Service	15208-H8903	
Standard	15208-H8920	A (Thru 7/73), R and J13
Extended Service	-----	
Standard	15208-W1111	L (6 CYL), Z and L20B (From 2/80)
Extended Service	15208-W1103	
Standard	15208-W1120	L20B (Thru 1/80)
Extended Service	15208-W3401	
Standard	15208-17A10	CD17
Extended Service	15208-17A02	

The following charts provide part number application information for extended service (15,000 miles) oil filters*, and standard service (7,500 miles) oil filters as well as the oil and filter change intervals for all 1986 Nissan cars and trucks. For oil and filter change intervals for 1985 and older Nissan vehicles, consult the appropriate service or owner's manual.

* It is important to note that the 15,000 mile service interval applies to normal driving conditions and is applicable only to the engine series designated on the chart above. Consult the appropriate Owner's Manual or Service Manual for the correct oil and filter change intervals of each model Nissan/Datsun car and truck.

1986 VEHICLES

MODEL	7,500		15,000		22,500		30,000	
	OIL	FILTER	OIL	FILTER	OIL	FILTER	OIL	FILTER
• Pulsar NX (except California) • Sentra Gas (except California) • Stanza (including Wagon) • Maxima • 200SX Non-Turbo • 300ZX Non-Turbo • 720 Truck (except California) • D21 Truck	X	X	X		X	X	X	

1986 CALIFORNIA SENTRA, PULSAR & 720 TRUCK VEHICLES

MODEL	7,500		15,000		22,500		30,000	
	OIL	FILTER	OIL	FILTER	OIL	FILTER	OIL	FILTER
• Sentra • Pulsar NX • 720 Truck	X	X	X	X	X	X	X	X

1986 TURBOCHARGED AND DIESEL VEHICLES

MODEL	5,000		10,000		15,000		20,000		25,000		30,000	
	OIL	FILTER	OIL	FILTER	OIL	FILTER	OIL	FILTER	OIL	FILTER	OIL	FILTER
• 200SX Turbo • 300ZX Turbo • Sentra Diesel	X	X	X		X	X	X		X	X	X	

SEVERE DRIVING CONDITIONS FOR GASOLINE ENGINE MODELS

SEVERE CONDITION	3,000		6,000		9,000		12,000		15,000		18,000	
	OIL	FILTER	OIL	FILTER	OIL	FILTER	OIL	FILTER	OIL	FILTER	OIL	FILTER
• Repeated Short Distance Driving • Extensive Idling • Driving In Dusty Conditions • Towing A Trailer	X	X	X	X	X	X	X	X	X	X	X	X

SEVERE DRIVING CONDITIONS FOR DIESEL ENGINE MODELS

SEVERE CONDITION	2,500		5,000		7,500		10,000		12,500		15,000	
	OIL	FILTER	OIL	FILTER	OIL	FILTER	OIL	FILTER	OIL	FILTER	OIL	FILTER
• Repeated Short Distance Driving • Extensive Idling • Driving In Dusty Conditions • Towing A Trailer	X		X	X	X		X	X	X		X	X

ENGINE OIL AND OIL FILTER CHANGE MILEAGE INTERVALS
Technical Service Bulletin # **92-062A** Date: **990617**

Brakes - AMMCO On Car Lathe Operating Guidlines

REFERENCE:
NTB92-062A

CLASSIFICATION:
BR92-004A

DATE:
June 17,1999

TITLE:
AMMCO ON-CAR BRAKE LATHE OPERATING GUIDELINES

Nissan-Datsun Truck PL720 2WD L4-1952cc 2.0L SOHC (Z20)

APPLIED VEHICLE(S):
All models

This amended version of NTB92-062 adds a CAUTION and a NOTE to the Service Procedure. Please discard all paper copies of NTB92-062.

SERVICE INFORMATION

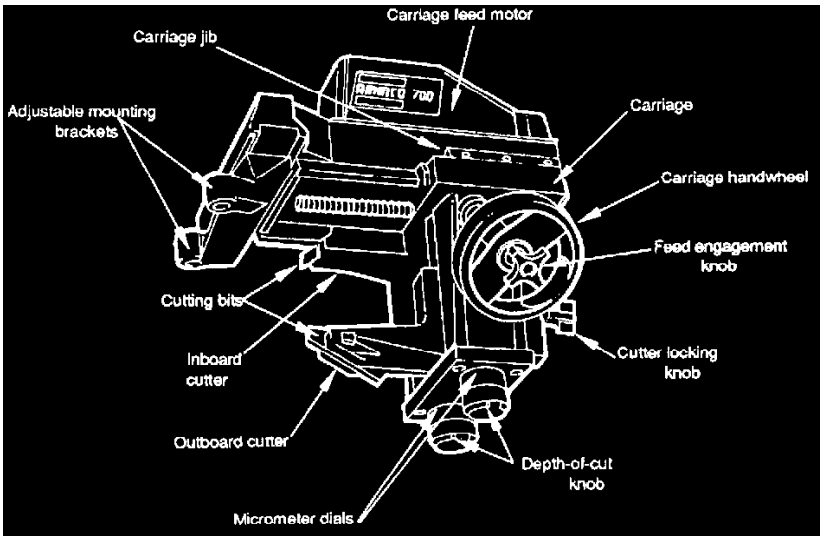
To ensure the best possible surface finish and least amount of run-out and rotor thickness variation when using the Ammco on-car brake lathe, the following guidelines should be observed.

Service Procedure

SERVICE PROCEDURE

Before mounting the brake lathe on the vehicle ensure the following:

1. The V-way between the carriage and carriage gib must be clean and adjusted properly (see Operation Manual for adjustment procedure). Wipe off sliding surfaces with a soft cloth after each use.



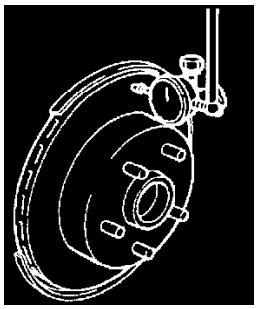
2. The cutters and cutting bits must be tight in their mounts and positioned properly. Change cutting bits when they become dull.

3. When securing the adjustable mounting brackets to the caliper mount/knuckle the mounting surfaces must be smooth and free of burrs.

4. Make sure the adjustable mounting brackets are securely mounted to caliper mount/knuckle. There should be no movement between the cutting tool and the caliper mount/knuckle.

ROTOR DRIVING UNIT

Before using the drive unit ensure the following:



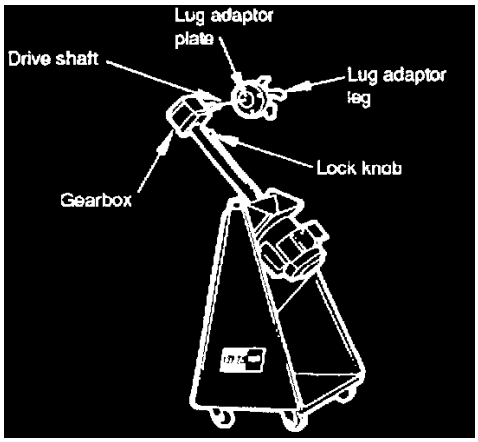
1. Before using the rotor driving unit ensure that all lug nuts are installed on the lugs (including the lugs not used for the lug adaptor). All lug nuts should be evenly torqued, to at least 40 ft/lbs. Do not over-tighten the lug nuts as damage may occur to the lug adaptor legs.

2. To prevent chatter and ensure a smooth rotor finish, install the largest and heaviest silencer band possible around the outside diameter of the rotor.

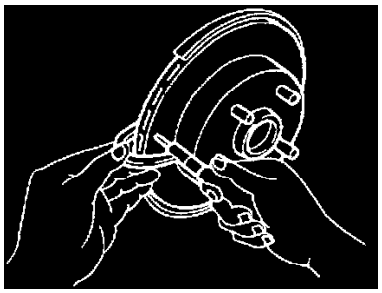
ROTOR CUTTING

Nissan-Datsun Truck PL720 2WD L4-1952cc 2.0L SOHC (Z20)

Before engaging the cutting tool, ensure the following:



1. Using the dial indicator, measure rotor/hub run-out prior to resurfacing rotor and adjust cutting depth to eliminate this run-out. Each cut may be between 0.05 mm and 0.25 mm (0.002" and 0.010"). Additional cuts may be necessary to eliminate all the run-out.



2. Using a micrometer, measure rotor thickness in at least 8 even locations around the rotor. Do not cut below the minimum rotor thickness specification. Replace rotor if the run-out cannot be eliminated without exceeding the minimum rotor thickness specification.

3. After rotor resurfacing is completed, measure the rotor/hub run-out using a dial indicator. Ensure that the run-out is below the specification for the vehicle. If run-out is not within specifications, turn the rotors again. Properly machined rotors will have almost zero run-out (.001" or less) with no measurable thickness variation.

CAUTION: When using an on the car brake lathe, be sure to prevent metal shavings from contacting or collecting on the ABS wheel speed sensor. Remove any shavings that stick to the ABS wheel speed sensor's magnet.

NOTE: If the rotor must be removed for cleaning and/or other purposes after resurfacing with an on the car brake lathe is complete, mark its exact location on the axle prior to removal. Incorrect alignment during reinstallation will cause the run-out to change, possibly exceeding specifications. This could require the rotor to be turned again.

4. Do not smooth the rotor surface with sand paper or other abrasive material.

Technical Service Bulletin # **94012** Date: **940203**

Brakes - Judder/Steering Wheel Vibration Correction

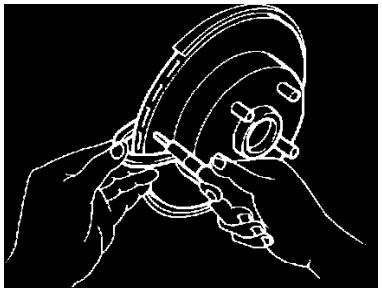
Classification: BR94-002
Section: Brake
Reference: TECHNICAL BULLETIN NTB94-012
Models: All models
Date: February 3, 1993

BRAKE JUDDER/STEERING WHEEL SHIMMY

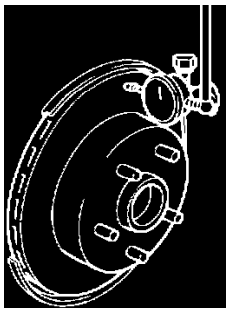
APPLIED MODELS:
All Models

GENERAL INFORMATION:

Brake judder/steering wheel shimmy is a condition which may occur in any vehicle when excessive rotor thickness variation is present on one (1) or more of the vehicle's brake rotors.



Rotor Thickness Variation (RTV) is the variation in thickness around the rotor. The RTV can be determined by measuring the rotor thickness with a micrometer at several locations around the circumference of the rotor. The RTV is the difference in thickness between the thickest and thinnest points on the rotor.

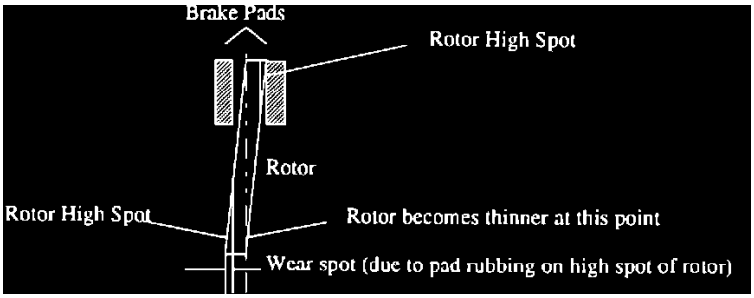


Rotor Run-Out is the distance that the rotor surface travels in and out, in relation to the vertical plane of the hub, as the rotor turns with the hub. The distance is measured with a dial indicator.

NOTE:
Rotor Run-Out does not cause brake judder or steering wheel shimmy.
However, excessive Rotor Run-Out does lead to rotor thickness variation as the rotor wears. It is the excessive rotor thickness variation that causes judder and/or steering wheel shimmy. This is described in more detail below.

POSSIBLE CAUSE OF BRAKE JUDDER/STEERING WHEEL SHIMMY

A brake judder/steering wheel shimmy incident may develop in any vehicle if the following series of events occur:

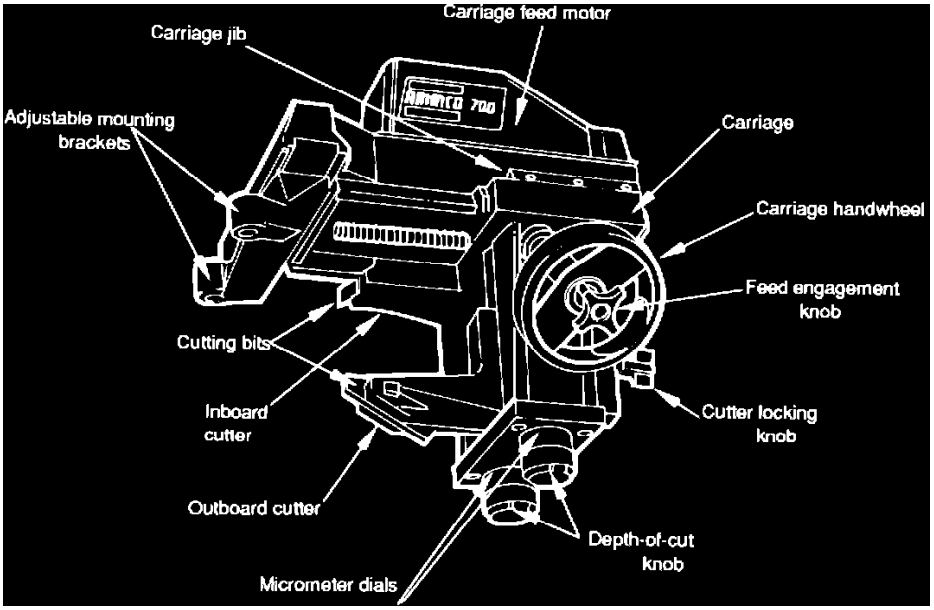


* The brake rotor run-out exceeds specification limits.
* As the brake pad rubs against the rotor while driving, the high spots on the brake rotor wear slightly.

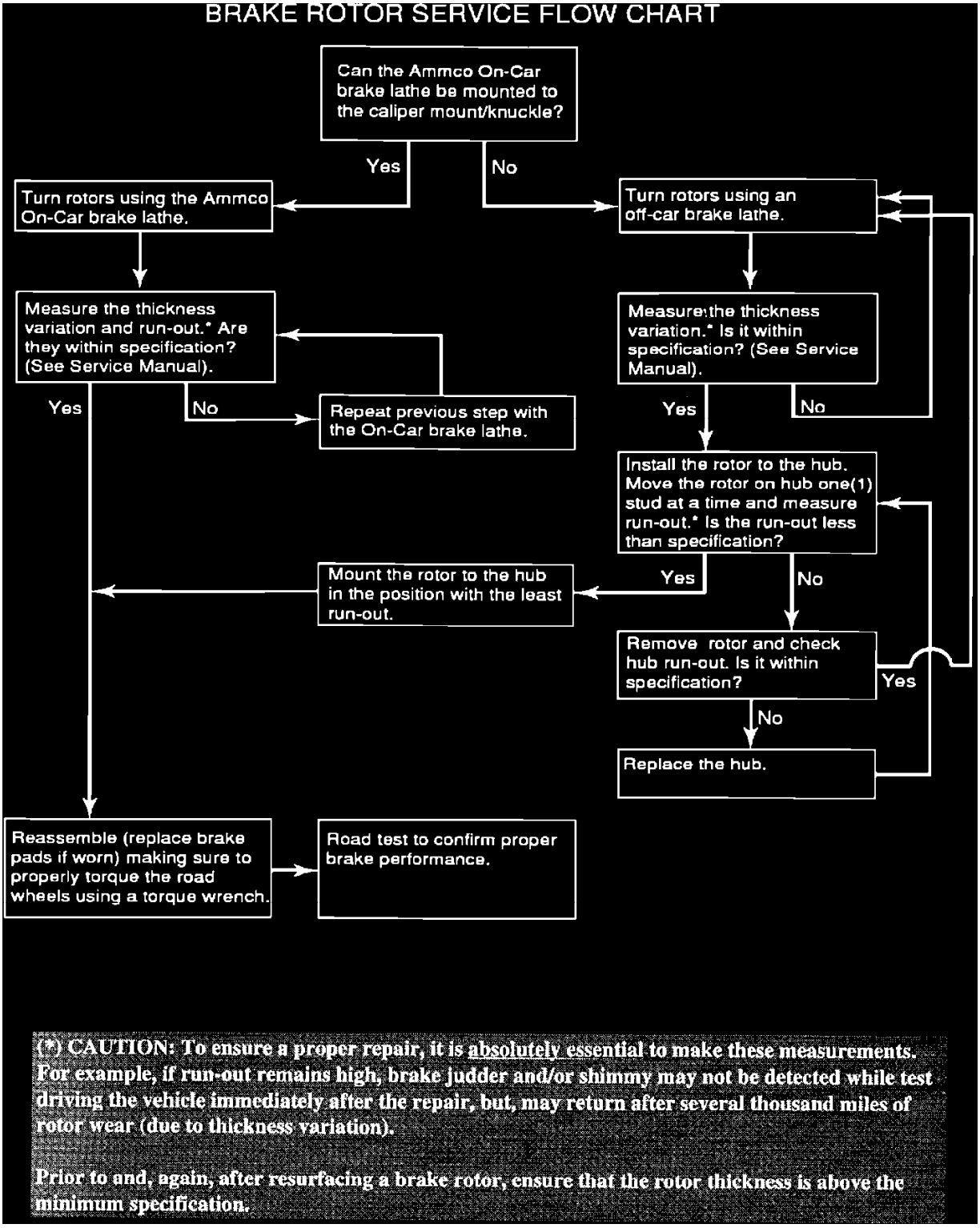
* Rotor thickness variation may develop as the high spots on the brake rotor wear. If this thickness variation becomes large enough, brake judder/shimmy may occur.

NISSAN SERVICE PROCEDURE:

Nissan-Datsun Truck PL720 2WD L4-1952cc 2.0L SOHC (Z20)



Resurfacing the brake rotor using the Ammco On-Car Brake Lathe is the preferred method of correcting excessive rotor run-out and thickness variation. Refer to Nissan Technical Bulletin NTB92-062 (BR92-004) "Ammco On-Car Brake Lathe Operating Guidelines."



Due to limited clearance, this machine cannot be used on the rear rotors of some vehicles. To resolve this issue, two (2) methods of repair are identified in the flow chart. Use this chart, as appropriate, when performing brake pad or rotor service.

GENERAL BRAKE REPAIR GUIDELINES

To properly perform brake repairs, it is important to observe the following.

1. Do not tighten wheel lug nuts with an impact wrench. Uneven or high torque applied to the lug bolts may distort the brake rotor and hub, resulting in increased rotor run-out.

2. Prevent contamination, such as rust, dirt, or metal chips between the hub and rotor mating surface. An uneven mating surface between the hub and rotor results in increased rotor run-out. Always check and clean the mating surfaces prior to resurfacing.

3. Use a sharp tip on the brake lathe when resurfacing a brake rotor. A dull or damaged cutting tip on the brake lathe causes a rough surface cut with large ridges, which wear very rapidly. This rapid wear results in rotor thickness variation.

4. Use the largest silencer band possible when resurfacing the rotor. The silencer band reduces chatter during resurfacing. Chatter causes a rough surface cut with large ridges, which wear very rapidly. This rapid wear results in rotor thickness variation.

5. Ensure that the brake lathe cutting head operates properly and is calibrated by the manufacturer or servicing agent. A damaged or uncalibrated brake lathe cutting head can result in increased rotor run-out and/or thickness variation.

6. Prior to installation, lubricate the brake caliper slide pins and/or clips. Corrosion from lack of lubrication results in sticking caliper slide pins and reduced pad movement. The sticking of the caliper slide pins and reduced brake pad movement, increases the rotor wear rate. This increased brake rotor wear results in increased brake rotor thickness variation.

7. Inspect the caliper pin boots or plugs and replace, if necessary. Corrosion may develop on the caliper slide pins. This corrosion reduces caliper movement which increases the brake rotor wear rate. This increased brake rotor wear rate results in brake rotor thickness variation.

8. Measure the brake rotor run-out after performing brake service. There are many reasons why brake rotor run-out may be above specification. To ensure that the brake rotor run-out is within specification, it is important to measure brake rotor run-out after every brake service.

NOTE:
The Warranty Flat Rate Time includes time to perform run-out measurement.

9. The On-Car brake lathe cutting head must be mounted properly. Do not mount the cutting head on one (1) knuckle and attempt to resurface both sides of the rotor from this one location. The On-Car Brake Lathe matches the rotor to the hub to achieve the least possible run-out. When the brake rotor is moved from the position in which it was resurfaced, this matching is lost.

10. Do not use harsh or corrosive chemicals to clean the wheels. Strong alkalis or acid-based cleaners degrade the surface finish on the caliper components and may, additionally attack the rotor surface, resulting in increased thickness variation.

Technical Service Bulletin # **92062** Date: **920818**

Brakes - Ammco On Car Brake Lathe Operating Guidelines

Classification:
BR92-004

Section:
Brake

Reference:
TECHNICAL BULLETIN NTB92-062

Models:
All models

Date:
August 18, 1992

AMMCO ON-CAR BRAKE LATHE OPERATING GUIDELINES

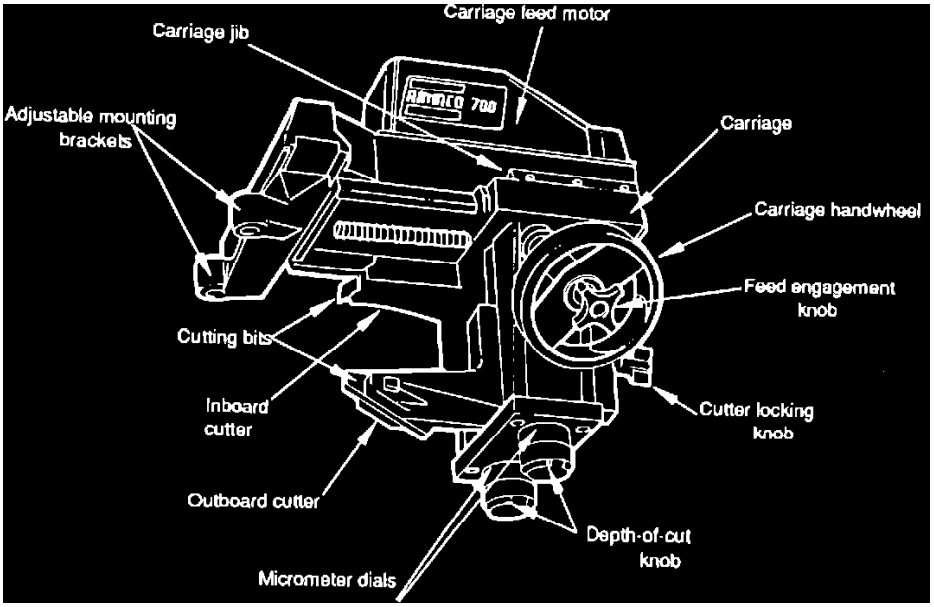
APPLIED MODEL:
All models

SERVICE INFORMATION

To ensure the best possible surface finish and least amount of run-out and rotor thickness variation when using the Ammco on-car brake lathe, the following guidelines should be observed.

SERVICE PROCEDURE

Before mounting the brake lathe on the vehicle ensure the following:



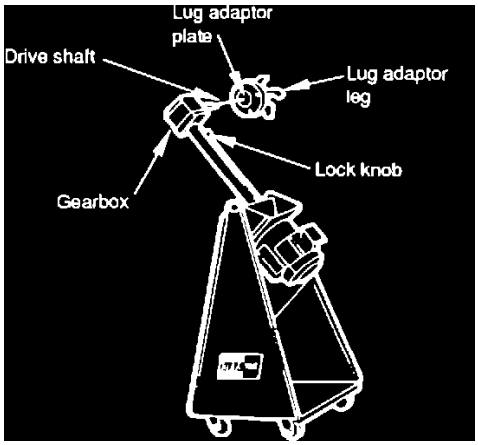
1. The V-way between the carriage and carriage jib must be clean and adjusted properly (see Operation Manual for adjustment procedure). Wipe off sliding surfaces with a soft cloth after each use.

2. The cutters and cutting bits must be tight in their mounts and positioned properly. Change cutting bits when they become dull.

3. When securing the adjustable mounting brackets to the caliper mount/knuckle the mounting surfaces must be smooth and free of burrs.

4. Make sure the adjustable mounting brackets are securely mounted to caliper mount/knuckle. There should be no movement between the cutting tool and the caliper mount/knuckle.

Rotor Driving Unit Before using the drive unit ensure the following:



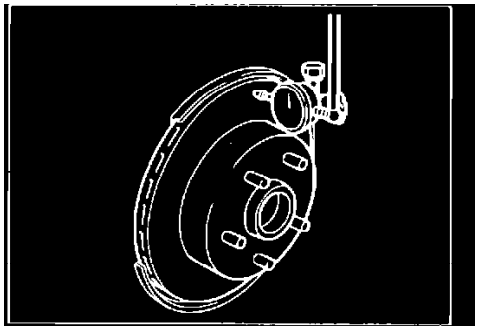
1. Before using the rotor driving unit ensure that all lug nuts are installed on the lugs (including the lugs not used for the lug adaptor). All lug nuts should be evenly torqued, to at least 40 ft.lbs. Do not over-tighten the lug nuts as damage may occur to the lug adaptor legs.

2. To prevent chatter and ensure a smooth rotor finish, install the largest and heaviest silencer band possible around the outside diameter of the rotor.

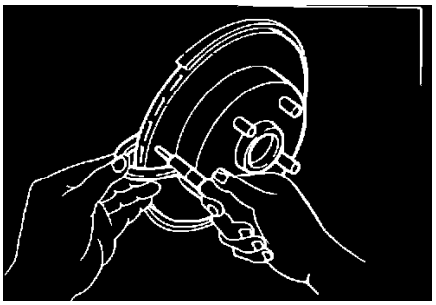
Rotor Cutting

Before engaging the cutting tool, ensure the following:

1. Using the dial indicator, measure rotor/hub run-out prior to resurfacing rotor and adjust cutting depth to eliminate this run-out. Each cut may be between 0.05 mm and 0.25 mm (0.002" and 0.010"). Additional cuts may be necessary to eliminate all the run-out.



2. Using a micrometer, measure rotor thickness in at least 8 even locations around the rotor.
   Do not cut below the minimum rotor thickness specification. Replace rotor if the run-out cannot be eliminated without exceeding the minimum rotor thickness specification.



3. After rotor resurfacing is completed, measure the rotor/hub run-out using a dial indicator.
   Ensure that the run-out is below the specification for the vehicle. If runout is not within specifications, turn the rotors again. Properly machined rotors will have almost zero runout (.001" or less) with no measurable thickness variation.

4. Do not smooth the rotor surface with sand paper or other abrasive material.

Technical Service Bulletin # **04-094** Date: **040820**

Brakes - On-Car Rotor Refinishing

Classification:
BR04-007

Reference:
NTB04-094

Date:
August 20, 2004

NISSAN: ON-CAR BRAKE ROTOR RESURFACING

APPLIED VEHICLES:
All Nissan

If YOU CONFIRM:

A vehicle needs to have the brake rotors resurfaced (front or rear),

ACTION:

Use the ProCut(TM) PFM Series on-car brake lathe to perform brake rotor resurfacing and follow the tips listed in this bulletin.

^ The ProCut(TM) PFM Series brake lathe has been chosen as the approved tool for rotor resurfacing.

^ The ProCut(TM) PFM Series brake lathe can be ordered from TECH-MATE at 1-800-662-2001.

^ ProCut(TM) technical support or service can be obtained by calling 1-800-543-6618.

NOTE:
Brake rotors may need to be resurfaced during routine brake repair or for brake "Judder" incidents.

^ Brake judder: A brake pedal pulsation and/or steering wheel shimmy when braking that occurs when there is too much thickness variation of the brake rotors (see NTB00-033).

TIPS FOR USING THE PROCUT(TM) PFM SERIES ON-CAR BRAKE LATHE

^ Read and follow all instructions contained in the Technical Manual provided with your ProCut(TM) equipment.

^ The ProCut(TM) brake lathe also comes with an instructional video that can be used as a training aid.

^ Additional training is available from your local ProCut(TM) representative by calling 1-800-543-6618.

A. Make sure the cutting tips are sharp, in good condition and installed "right-side" up.

^ Make sure to use ProCut(TM) brand tips.

^ The cutting tip "UP" side has a groove or letters.

NOTE:
A tip mounted upside-down will produce a surface finish that looks like an old LP record.

^ Each cutting tip has three cutting corners. Rotate or replace the tip as needed.

NOTE:
You should get at least 7 cuts per corner. However, tip life is affected by variables such as rust or ridges. In order to determine when to rotate tips, monitor the rotor finish. If the rotor finish begins to look inconsistent or feels rough to the touch, tips should be rotated or replaced. Tips that are chipped or cracked should never be used.

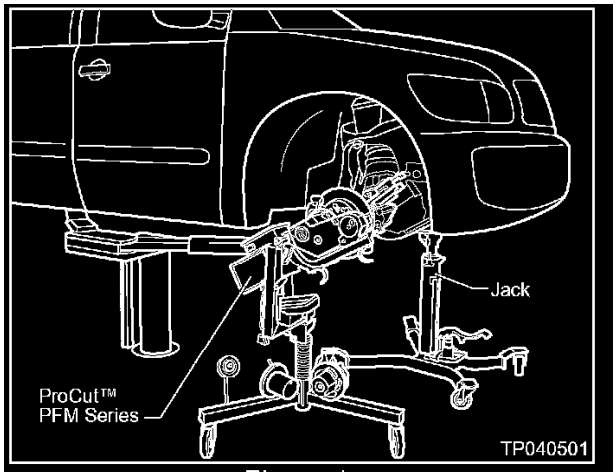


Figure 1

B. For best accuracy, "stabilize" (firmly support) the vehicle with a jack or jack stand as shown in Figure 1.

^ On some hoists, the vehicle may "wobble" a little while using the on-car brake lathe. Not good.

CAUTION:
Any rocking motion (wobble) of the vehicle during the ProCut(TM) "Automatic compensation" procedure will reduce the accuracy of the resurfacing.

^ If wobble occurs during the rotor resurfacing process/procedure, the finished rotor runout may be more than factory specification and should be checked before using the rotor.

C. Prevent metal shavings from contacting or collecting on the ABS speed sensors.

^ Remove any shavings that stick to the ABS speed sensor's magnet. It is best to clean the ABS sensor with the rotor removed.

D. After a rotor has been resurfaced with the ProCut(TM) brake lathe:

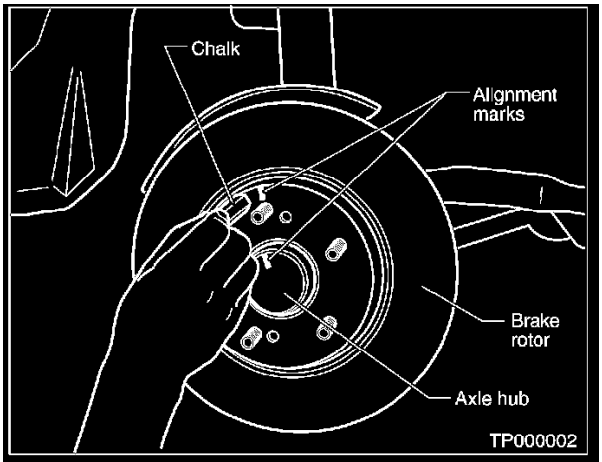


Figure 2

^ If the rotor must be removed for any reason, mark the exact location (rotor to axle hub) before removing the rotor (see Figure 2).

^ The rotor must be reinstalled back to the same location.

E. Do not tighten the wheel lug nuts with an air impact driver.

^ Use a torque wrench to tighten the lug nuts to the proper torque specification.

^ Uneven or high torque applied to the lug nuts may "distort" (warp) the brake rotor and hub. This may increase rotor runout and cause excessive rotor thickness variation as the rotor wears.

CLAIMS INFORMATION

Please reference the current Nissan "Warranty Flat Rate Manual" and submit your claim(s) using the Operation Code (Op Code) or combination of Op Codes that best describes the operations performed.

Technical Service Bulletin # **94088** Date: **940913**

Body - Components Material Safety Data Sheets (MSDS)

Classification: GI94-005

Section: General Information

Reference: TECHNICAL BULLETIN NTB94-088

Model: All

Date: September 13, 1994

MSDS INFORMATION FOR GENUINE NISSAN BODY PARTS

SERVICE INFORMATION

The Material Safety Data Sheets (MSDS) have been issued and revised as of July 1, 1994.

The three MSDS sheets are applicable to the following materials:

1. Steel parts with Primers and Coatings

2. Plastic parts with Primers and Coatings

3. Chrome Plated Steel parts

These Material Safety Data sheets should be kept on file and made available upon request within a reasonable time frame to consumers, purchasers or concerned persons or parties. Nissan Motor Corporation appreciates your efforts in retaining this information and providing it upon request.

The information in this MSDS is believed to be correct and is given in good faith, but no warranty, expressed or implied, is intended.

DISTRIBUTED BY: **NISSAN MOTOR CORP. IN U.S.A.** **18501 S. FIGUEROA STREET** **GARDENA, CA 90248-0191**	**ISSUED DATE:**	July 1, 1994
	REVISION DATE:	July 1, 1994
	FIRE 0 **HEALTH** 0 **REACTIVITY** 0 **SPECIAL**	

I. MATERIAL IDENTIFICATION

DISTRIBUTOR:	**INFORMATION/EMERGENCY TELEPHONE:**
Nissan Motor Corp. in U.S.A.	Chemtrec: 1-800-424-9300
ADDRESS:	
18501 S. Figueroa St. Gardena, CA 90248-0191	
PRODUCT TRADE NAME:	
Steel Parts with Primers & Coatings	

II. HAZARDOUS INGREDIENTS

MATERIAL OR COMPONENTS	CAS Reg. NO	ACGIH TLV (mg/m^3)	OSHA PEL (mg/m^3)	%
Carbon Steel:				
Iron	7439-89-6	10[1]-dust 5-fumes	15[1]-dust 10-fumes	93-99
Carbon	7440-44-0	10[1]	15[1]	.001-1.5
Manganese*	7439-96-5	5-dust 1-fumes	5-dust 1-fumes	.01-2.2
Phosphorus*	7723-14-0	0.1	0.1	.001-.4
Sulfur	7704-34-9	10[1]	15[1]	.001-.35
Silicon	7440-21-3	10	15[1]-dust 10-fumes	.01-.4
Aluminum*	7429-90-5	10[1]-dust 5-fumes	15	.01-.3
Copper*	7440-50-8	1-dust 0.2-fumes	0.1	.01-.99
Calcium	7440-70-2	10[1]-dust 2-fumes	15[1]-dust 5-fumes	.01-.2
Zirconium	7440-67-7	5	5	0-.2
Nickel*	7440-02-0	1	1	.01-.65
Titanium	7440-32-6	10	15[1]-dust 10-fumes	0-.15
Zinc*	7440-66-6	10[1]-dust 5-fumes	15[1]-dust 5-fumes	.01-4.99

II. HAZARDOUS INGREDIENTS

MATERIAL OR COMPONENTS	CAS Reg. NO	ACGIH TLV (mg/m^3)	OSHA PEL (mg/m^3)	%
Boron	7440-42-8	10	15[1]-dust 10-fumes	0-.1
Antimony*	7440-36-0	0.5	0.5	0-.08
Vanadium*	7440-62-2	10[1]	15[1]	0-.25
Columbium	7440-03-1	10[1]	15[1]	0-.2
Chromium*	7440-47-3	0.5	0.5	0-.04
Molybdenum	7439-98-7	10	10	0-.35
Lead*	7439-92-1	0.15	0.05	0-.35
Arsenic*	7440-38-2	0.01	0.5	0-.01
Tin	7440-31-5	2	0.1	0-.04
Coatings: (may contain the following ingredients)				
Carbon black	1333-86-4	3.5	3.5	N/A
Titanium dioxide	13463-67-7	10	10	N/A
Lead*	7439-92-1	0.15	0.05	N/A
Talc	14807-96-6	2	2	N/A
Iron oxide	1309-37-1	5	10	N/A
Silica, fumed	7631-86-9	10	6	N/A
Mica, silicates	12001-26-2	3	3	N/A
Magnesium silicate	53320-86-8	N/A	N/A	N/A
Aluminum*	7429-90-5	5	15	N/A
Nickel antimony titanium yellow*	8007-18-9	N/A	N/A	N/A
Yellow iron oxide	51274-00-1	5	10	N/A
Monoazo red pigment	5280-66-0	N/A	N/A	N/A
Copper phthalocyanine green-1*	1328-53-6	N/A	N/A	N/A
Copper phthalocyanine blue-1*	147-14-8	1	N/A	N/A
Copper phthalocyanine green-2*	14302-13-7	N/A	N/A	N/A
Resins	N/A	N/A	N/A	N/A

[1]As particulates not otherwise regulated.
* Subject to SARA 313 reporting requirements.

III. PHYSICAL PROPERTIES

APPEARANCE:	Solid/no odor	**SOLUBILITY IN H_2O:**	Negligible
SPECIFIC GRAVITY (H_2O = 1):	Approx. 8	**VAPOR PRESSURE:**	Not applicable
BOILING POINT °F:	Not applicable	**% VOLATILES:**	0
MELTING POINT °F:	2800°F		
EVAPORATION RATE:	Not applicable		
pH AS IS:	Not applicable		
VAPOR DENSITY (Air = 1):	Not applicable		

IV. FIRE AND EXPLOSIVE HAZARDS

FLASHPOINT	(METHOD USED)	FLAMMABLE LIMITS	AUTOIGNITION TEMP
N/A	N/A	LEL N/A UEL N/A	N/A
EXTINGUISHING MEDIA:		Use CO_2, dry chemical or foam for coating fires.	

IV. FIRE AND EXPLOSIVE HAZARDS	
SPECIAL FIRE FIGHTING PROCEDURES:	Wear self-contained breathing apparatus.
UNUSUAL FIRE & EXPLOSION HAZARDS:	Steel products in the solid state present no fire or explosion hazard; however, the particulates generated from grinding or cutting may present a dust explosion hazard. At temperatures above the melting point, may liberate fumes containing oxides of iron and alloying elements.

V. REACTIVITY DATA

STABILITY:

Stable under normal conditions.

CONDITIONS TO AVOID:

Metal will react with strong acids to liberate hydrogen.

INCOMPATIBILITIES:

Strong acids.

HAZARDOUS DECOMPOSITION:

Metal oxides

HAZARDOUS POLYMERIZATION:

Will not occur.

VI. HEALTH HAZARD SUMMARY

Steel products in their usual physical form do not pose a health hazard. However, operations such as sawing, grinding, and machining, result in the generation of airborne particulates which may present health hazards. Metal fumes may be formed during welding, brazing, or burning operations in which the temperature of the product is elevated to or above its melting point.
Inhalation of metal dust and fumes may result from further processing of the material by the user, particularly during welding, burning, grinding, and machining activities and should be evaluated by an industrialized hygienist. The possible presence of nonmetallic surface coatings should also be considered when evaluating potential employee exposures.

The inhalation of high concentrations of freshly formed oxide fumes and dusts of manganese, copper, lead and/or zinc in the respirable particle ranges can cause an influenza-like illness termed metal fume fever. Metal fume fever symptoms include cough, headache, metallic taste in mouth, nausea, fever, chilling, pain in muscles and joints, usually lasting <1 day. Typical symptoms last 12 to 48 hours are characterized by metallic taste in the mouth, dryness and irritation of the throat, followed by weakness, muscle pain, fever and chills.

Iron: Chronic inhalation of high concentrations of ferric oxide fumes or dusts may lead to a pneumoconiosis called siderosis, a benign pneumoconiosis (siderosis). Inhalation of iron oxide may cause irritation of eyes, nose, and throat, and metal fume fever. Inhalation of high concentrations of ferric oxide possibly enhance the risk of lung cancer development in workers exposed to pulmonary carcinogens.

Lead: Exposure to lead can lead to irritability, headaches, tremor, memory loss, kidney damage, anorexia, dark line on gums, pale skin, abdominal pain, severe constipation, paralysis of wrist joint, decreased hand-grip strength, and loss of teeth. May also effect human reproductive functions and the fetus. Ingestion of lead dust may cause irritation of the mouth and throat.

Chromium: Repeated or prolonged exposure to hexavalent chromium compounds may cause respiratory irritation, nosebleed, ulceration and perforation of the nasal septum, industrial exposure to certain forms of hexavalent chromium has been related to an increased incidence of cancer.

VI. HEALTH HAZARD SUMMARY

Manganese: Exposure may cause irritation of eyes, nose, and throat, metallic taste in mouth and metal fume fever. Advanced symptoms may include weakness, sleepiness, nervousness, lack of coordination, uncontrollable laughter, mental confusion, speech disturbances, and aggressiveness. Manganese may cause bronchitis, pneumonitis and central nervous system disturbances including irritability, impairment in walking, speech disorders, compulsive behavior, mask-like face and a Parkinson-like syndrome.

Nickel: Respiratory irritation and pneumonitis; several nickel compounds, including nickel oxide, are suspect lung and nasal carcinogens. May cause irritation of the mouth and throat. Dermatitis due to sensitization may occur in some individuals from exposure to nickel fumes. Persons with pre-existing skin disorders may be more susceptible. May cause eye irritation.

Aluminum: Generally considered to be a nuisance particulate. May cause irritation of the upper respiratory tract, skin, and eyes. Inhalation of fine particles may cause a pulmonary fibrosis known as Shaver's disease. Symptoms may include dyspnea, cough and fatigue. May be implicated in Alzheimer's disease.

Vanadium: Irritation of respiratory tract and conjunctivae. Excessive exposure may result in skin pallor, greenish discoloration of tongue, eczematous skin lesions, cough, bronchitis and chest pains. Long term exposure may cause pulmonary edema, pneumonia, chronic bronchitis, anemia, albuminuria and nervous complaints.

Copper: Inhalation may cause metal fume fever, a flu like illness. Signs and symptoms may include fever, chills, muscle aches, nausea, sweet metallic taste in mouth, and a dry throat. Exposure has been associated with discoloration of the skin and hair. Chronic exposure may damage liver, kidney, and spleen. Copper oxide is an irritant to eyes and upper respiratory tract.

Silica, fumed or gel: Overexposure may result in silicosis, a lung disease characterized by scarring of the lungs, cough, and shortness of breath. Amorphous silica, such as fumed silica, have not shown carcinogenicity in humans.

Mica: Inhalation of mica powders may cause irritation of the respiratory tract. Chronic inhalation may result in pnuemonicosis. Moderately toxic by ingestion.

Silicates: Overexposure may result in silicosis, a lung disease characterized by scarring of the lungs, cough, and shortness of breath. Crystilline silicas have shown limited evidence of carcinogenicity in humans.

KNOWN OR SUSPECTED CARCINOGEN:

According to OSHA, the National Toxicology Program (NTP), and the International Agency for Research on Cancer (IARC), known and suspected carcinogens that may be contained in this product include: nickel and certain nickel compounds, arsenic, and cadmium.

VII. RECOMMENDED FIRST AID TREATMENT

EYES:

Flush with large amounts of water to remove particles. Seek medical attention.

SKIN:

If thermal burn has occurred, flush area with cold water. Cover with clean cotton sheeting or gauze. Seek medical attention. If irritation develops, wash with soap and water. Consult medical attention if irritation persists.

INHALATION:

For overexposure to fumes and particles, immediately move person to fresh air. Give artificial respiration if breathing has stopped or oxygen, if necessary. Seek medical attention promptly. Metal fume fever may be treated by bed rest and administering a pain and fever reducing medication. Seek medical attention.

INGESTION:

Seek medical attention immediately.

VIII. SPECIAL PROTECTION INFORMATION	
GENERAL VENTILATION:	If your operation generates particulate when processing this product, general ventilation may be necessary to control employee exposures to within applicable limits. General ventilation[a] shall be provided in areas where PELs are exceeded.
LOCAL EXHAUST:	Local exhaust ventilation should be provided when welding, burning, sawing or brazing to prevent excessive dust or fume exposure. Local ventilation[a] shall be provided in areas where PELs are exceeded.
RESPIRATORY PROTECTION:	When engineering controls are not feasible or sufficient to lower exposure levels below applicable limits, a properly fitted, NIOSH-approved, dust-fume respirator should be worn during welding or burning whenever welding fumes exceed recommended limits.
TYPE:	NIOSH-approved dust and fume respirators should be used to avoid excessive inhalation of particulate or fumes, especially during grinding and welding operations. Appropriate respirator selection depends on the magnitude of exposure, in accordance with the OSHA Respiratory Protection Standard (29 CFR 1910.134) .
MECHANICAL:	Use lifting and work devices (e.g., hoist) within rated capacities when handling these materials.
GLOVES:	Protective gloves and welder's apron should be worn as required for welding or burning operations. Impermeable gloves may be appropriate when contact with oil produces skin irritation.
EYE PROTECTION:	Use safety glasses, goggles or other protective eyewear when exposure to eye or face hazards exists, such as flying objects, molten metal, and injurious light radiation during welding, burning, sawing, brazing, grinding or machining operations. Use face shield (8" minimum) and/or goggles when welding.

[a] Ventilation, as described in the Industrial Ventilation Manual produced by the American Conference of Governmental Industrial Hygienists, shall be provided in areas where exposures are above permissible exposure limits or threshold limit values specified by OSHA or other local, state, and federal regulations. Such situations include welding, burning, grinding or other similar operations.

IX. SPILL OR LEAK PROCEDURES
CONTAINMENT PROCEDURES:
Promptly sweep up and contain all dust generated by grinding and cutting.
WASTE DISPOSAL PROCEDURES:
Steel scrap can be recycled. Recycle or dispose of waste according to federal, state, and local regulations.

X. STORAGE AND HANDLING REQUIREMENTS
HANDLING PROCEDURES:
None
SARA REPORTING REQUIREMENTS:
This material contains chemicals subject to SARA 313 reporting requirements, as indicated in Section II.
TSCA (PCBs, ASBESTOS, NEW CHEMICALS) STATUS:
None.

X. STORAGE AND HANDLING REQUIREMENTS	
NOTE ANY SPECIAL STATE REQUIREMENTS:	
CALIFORNIA PROPOSITION 65:	Warning: Steel products and coatings may contain arsenic, cadmium, lead, nickel, carbon black and nickel compounds in trace amounts, known to the State of California to cause cancer or birth defects or other reproductive harm.
NJ COMMUNITY RIGHT TO KNOW LAW SPECIAL LABELING:	Not required

XI. DOT SHIPPING INFORMATION	
DOMESTIC HAZARD CLASS:	Nonhazardous

N/A = Data not available.

The information in this MSDS is believed to be correct and is given in good faith, but no warranty, expressed or implied, is intended.

DISTRIBUTED BY:	ISSUED DATE:	July 1, 1994
	REVISION DATE:	July 1, 1994
NISSAN MOTOR CORP. IN U.S.A. 18501 S. FIGUEROA STREET GARDENA, CA 90248-0191	FIRE 0 HEALTH 0 0 REACTIVITY SPECIAL	

I. MATERIAL IDENTIFICATION

DISTRIBUTOR:	INFORMATION/EMERGENCY TELEPHONE:
Nissan Motor Corp. in U.S.A.	Chemtrec: 1-800-424-9300
ADDRESS:	
18501 S. Figueroa St. Gardena, CA 90248-0191	
PRODUCT TRADE NAME:	
Plastic Parts with Primers and Coatings	

II. HAZARDOUS INGREDIENTS

MATERIAL OR COMPONENTS	CAS Reg. NO	ACGIH TLV (mg/m^3)	OSHA PEL (mg/m^3)	%
Plastic: (may contain one of the following materials)				
Rubber modified polypropylene	N/A	10[1]	15[1]	100
Talc filled polypropylene	N/A	10[1]	15[1]	100
Polyolefin compounds	N/A	10[1]	15[1]	100
Coatings: (may contain the following materials)				
Silica-fumed	7631-86-9	10	6	N/A
Silica-gel	63231-67-4	10	6	N/A
Aluminum	7429-90-5	10-dust 5-fumes	15	N/A
Lead silicate*	7439-92-1	0.15	0.05	N/A
Aluminum silicate	1332-58-7	2	N/A	N/A
Aluminum silicate*	1327-36-2	2	N/A	N/A
Carbon black	1333-86-4	3.5	3.5	N/A
Lead*	7439-92-1	0.15	0.05	N/A
Resins	N/A	N/A	N/A	N/A

[1]As particulates not otherwise regulated.
* Subject to SARA 313 reporting requirements.

III. PHYSICAL PROPERTIES

APPEARANCE:	Solid/no odor	SOLUBILITY IN H_2O:	Negligible
SPECIFIC GRAVITY (H_2O = 1):	0.9-1.2	VAPOR PRESSURE:	Not applicable

III. PHYSICAL PROPERTIES			
BOILING POINT °F	Not applicable	% VOLATILES:	0
MELTING POINT °F	N/A		
EVAPORATION RATE:	Not applicable		
pH AS IS:	Not applicable		
VAPOR DENSITY (Air = 1):	Not applicable		

IV. FIRE AND EXPLOSIVE HAZARDS			
FLASHPOINT	(METHOD USED)	FLAMMABLE LIMITS	AUTOIGNITION TEMP
480°F to 600°F	N/A	LEL N/A UEL N/A	> 575°F
EXTINGUISHING MEDIA:		Extinguish fire by cooling with water spray.	
SPECIAL FIRE FIGHTING PROCEDURES:		Use water to cool fire exposed surfaces and to protect personnel. Isolate "fuel" supply from fire. Respiratory and eye protection required for fire fighting personnel.	
UNUSUAL FIRE & EXPLOSION HAZARDS:		Solid material may burn at or above the flashpoint. Toxic gases will form upon combustion. Material can accumulate a static charge which can cause an incendiary electrical discharge. Fire is accompanied by evolution of dark smoke with an acrid odor and may cause watery eyes.	

V. REACTIVITY DATA
STABILITY:
Stable under normal conditions.
CONDITIONS TO AVOID:
None
INCOMPATIBILITIES:
None
HAZARDOUS DECOMPOSITION:
Flammable hydrocarbons, organic acids, carbon monoxide.
HAZARDOUS POLYMERIZATION:
Will not occur.

VI. HEALTH HAZARD SUMMARY

Plastic and rubber products in their usual physical form do not pose a health hazard. However, operations such as sawing, grinding, and machining, result in the generation of airborne particulates which may present health hazards. Airborne particulates may also be formed during operations in which the temperature of the product is elevated to or above its melting point.

Silica, fumed or gel: Overexposure may result in silicosis, a lung disease characterized by scarring of the lungs, cough, and shortness of breath. Amorphous silica, such as fumed silica, have not shown carcinogenicity in humans.

Silicates: Overexposure may result in silicosis, a lung disease characterized by scarring of the lungs, cough, and shortness of breath. Crystilline silicas have shown limited evidence of carcinogenicity in humans.

Aluminum: Generally considered to be a nuisance particulate. May cause irritation of the upper respiratory tract, skin, and eyes. Inhalation of fine particles may cause a pulmonary fibrosis known as Shaver's disease. Symptoms may include dyspnea, cough and fatigue. May be implicated in Alzheimer's disease.

Lead: Exposure to lead can lead to irritability, headaches, tremor, memory loss, kidney damage, anorexia, dark line on gums, pale skin, abdominal pain, severe constipation, paralysis of wrist joint, decreased hand-grip strength, and loss of teeth. May also effect human reproductive functions and the fetus. Ingestion of lead dust may cause irritation of the mouth and throat.

Resins: CO, CO_2, and organic breakdown products may be produced during burning. May cause irritation of the mouth and throat.

KNOWN OR SUSPECTED CARCINOGEN:

According to OSHA, the National Toxicology Program (NTP), and the International Agency for Research on Cancer (IARC), known and suspected carcinogens that may be contained in this product include: carbon black.

VII. RECOMMENDED FIRST AID TREATMENT

EYES:

Flush with large amounts of water to remove particles. Seek medical attention.

SKIN:

For thermal burns resulting from contact with hot plastic, immerse in or flush the affected area with large amounts of cold water. Cover with clean cotton sheeting or gauze. Seek medical attention. Do not attempt to remove the plastic material or contaminated clothing from skin.

INHALATION:

For overexposure to vapors and/or aerosols formed at elevated temperatures, immediately remove person to fresh air. Give artificial respiration if breathing has stopped or oxygen if necessary. Seek medical attention promptly.

INGESTION:

Seek medical attention immediately.

VIII. SPECIAL PROTECTION INFORMATION

GENERAL VENTILATION:	If your operation generates particulate when processing this product, general ventilation may be necessary to control employee exposures to within applicable limits. General ventilation[a] shall be provided in areas where PELs are exceeded.
LOCAL EXHAUST:	Local exhaust ventilation should be provided when heating material or sawing to prevent excessive dust or fume exposure. Local ventilation[a] of process equipment shall be provided in areas where PELs are exceeded.

VIII. SPECIAL PROTECTION INFORMATION	
RESPIRATORY PROTECTION:	When engineering controls are not feasible or sufficient to lower exposure levels below applicable limits, a properly fitted, NIOSH-approved, dust-fume respirator should be worn whenever fumes exceed recommended limits.
TYPE:	NIOSH-approved dust and fume respirators should be used to avoid excessive inhalation of particulate. Appropriate respirator selection depends on the magnitude of exposure.
MECHANICAL:	Use lifting and work devices (e.g., hoist) within rated capacities when handling these materials.
GLOVES:	Gloves should be considered when handling material to prevent cuts and skin irritation. Where contact may occur with hot material, wear thermal resistant gloves and arm protection.
EYE PROTECTION:	Particulate may scratch eye surfaces and/or cause mechanical irritation. Safety glasses or goggles as required for sawing, grinding or machining operations. Where contact may occur with hot material, wear face shield.

[a] Ventilation, as described in the Industrial Ventilation Manual produced by the American Conference of Governmental Industrial Hygienists, shall be provided in areas where exposures are above permissible exposure limits or threshold limit values specified by OSHA or other local, state, and federal regulations. Such situations include welding, burning, grinding or other similar operations.

IX. SPILL OR LEAK PROCEDURES
CONTAINMENT PROCEDURES:
Promptly sweep up and contain all dust generated by grinding and cutting.
WASTE DISPOSAL PROCEDURES:
Recycle or dispose of waste according to federal, state, and local regulations.

X. STORAGE AND HANDLING REQUIREMENTS	
HANDLING PROCEDURES:	
None	
SARA REPORTING REQUIREMENTS:	
This material contains chemicals subject to SARA 313 reporting requirements, as indicated in Section II.	
TSCA (PCBs, ASBESTOS, NEW CHEMICALS) STATUS:	
None	
NOTE ANY SPECIAL STATE REQUIREMENTS:	
CALIFORNIA PROPOSITION 65:	Warning: Coatings may contain lead and carbon black in trace amounts, which are known to the State of California to cause cancer or birth defects or other reproductive harm.
NJ COMMUNITY RIGHT TO KNOW LAW SPECIAL LABELING REQUIRED:	Not required.

XI. DOT SHIPPING INFORMATION	
DOMESTIC HAZARD CLASS:	Nonhazardous

N/A = Data not available.

DISTRIBUTED BY:	ISSUED DATE: July 1, 1994
NISSAN MOTOR CORP. IN U.S.A. 18501 S. FIGUEROA STREET GARDENA, CA 90248-0191	REVISION DATE: July 1, 1994
	FIRE 0 HEALTH 0 — 0 REACTIVITY SPECIAL

I. MATERIAL IDENTIFICATION

DISTRIBUTOR:	INFORMATION/EMERGENCY TELEPHONE:
Nissan Motor Corp. In U.S.A.	Chemtrec: 1-800-424-9300
ADDRESS:	
18501 S. Figueroa St. Gardena, CA 90248-0191	
PRODUCT TRADE NAME:	
Chrome Plated Steel Parts	

II. HAZARDOUS INGREDIENTS

MATERIAL OR COMPONENTS	CAS Reg. NO	ACGIH TLV (mg/m^3)	OSHA PEL (mg/m^3)	%
Carbon Steel:				
Iron	7439-89-6	$10^{(1)}$-dust 5-fumes	$15^{(1)}$-dust 10-fumes	93-99
Carbon	7440-44-0	$10^{(1)}$	$15^{(1)}$	.001-1.5
Manganese*	7439-96-5	5-dust 1-fumes	5-dust 1-fumes	.01-2.2
Phosphorus*	7723-14-0	0.1	0.1	.001-.4
Sulfur	7704-34-9	$10^{(1)}$	$15^{(1)}$	.001-.35
Silicon	7440-21-3	10	$15^{(1)}$-dust 10-fumes	.01-.4
Aluminum*	7429-90-5	$10^{(1)}$-dust 5-fumes	15	.01-.3
Copper*	7440-50-8	1-dust 0.2-fumes	0.1	.01-.99
Calcium	7440-70-2	$10^{(1)}$-dust 2-fumes	$15^{(1)}$-dust 5-fumes	.01-.2
Zirconium	7440-67-7	5	5	0-.2
Nickel*	7440-02-0	1	1	.01-.65
Titanium	7440-32-6	10	$15^{(1)}$-dust 10-fumes	0-.15
Zinc*	7440-66-6	$10^{(1)}$-dust 5-fumes	$15^{(1)}$-dust 5-fumes	.01-4.99

II. HAZARDOUS INGREDIENTS

MATERIAL OR COMPONENTS	CAS Reg. NO	ACGIH TLV (mg/m^3)	OSHA PEL (mg/m^3)	%
Boron	7440-42-8	10	15[1]-dust 10-fumes	0-.1
Antimony*	7440-36-0	0.5	0.5	0-.08
Vanadium*	7440-62-2	10[1]	15[1]	0-.25
Columbium	7440-03-1	10[1]	15[1]	0-.2
Chromium*	7440-47-3	0.5	0.5	0-.04
Molybdenum	7439-98-7	10	10	0-.35
Lead*	7439-92-1	0.15	0.05	0-.35
Arsenic*	7440-38-2	0.01	0.5	0-.01
Tin	7440-31-5	2	0.1	0-.04
Chrome Metal Plate: (may contain the following ingredients)				
Chromium*	7440-47-3	0.5	0.5	N/A
Nickel*	7440-02-0	1	1	N/A

[1]As particulates not otherwise regulated.
* Subject to SARA 313 reporting requirements.

III. PHYSICAL PROPERTIES

APPEARANCE:	Solid/no odor	**SOLUBILITY IN H_2O:**	Negligible
SPECIFIC GRAVITY (H_2O = 1):	Approx. 8	**VAPOR PRESSURE:**	Not applicable
BOILING POINT °F	Not applicable	**% VOLATILES:**	0
MELTING POINT °F	2800°F		
EVAPORATION RATE:	Not applicable		
pH AS IS:	Not applicable		
VAPOR DENSITY (Air = 1):	Not applicable		

IV. FIRE AND EXPLOSIVE HAZARDS

FLASHPOINT	(METHOD USED)	FLAMMABLE LIMITS	AUTOIGNITION TEMP
N/A	N/A	LEL N/A UEL N/A	N/A

EXTINGUISHING MEDIA:	Not applicable
SPECIAL FIRE FIGHTING PROCEDURES:	None
UNUSUAL FIRE & EXPLOSION HAZARDS:	Steel products in the solid state present no fire or explosion hazard; however, the particulates generated from grinding or cutting may present a dust explosion hazard. At temperatures above the melting point, may liberate fumes containing oxides of iron and alloying elements.

V. REACTIVITY DATA

STABILITY:

Stable under normal conditions.

V. REACTIVITY DATA

CONDITIONS TO AVOID:

Metal will react with strong acids to liberate hydrogen.

INCOMPATIBILITIES:

Strong acids.

HAZARDOUS DECOMPOSITION:

Metal oxides

HAZARDOUS POLYMERIZATION:

Will not occur

VI. HEALTH HAZARD SUMMARY

Steel products in their usual physical form do not pose a health hazard. However, operations such as sawing, grinding, and machining, result in the generation of airborne particulates which may present health hazards. Metal fumes may be formed during welding, brazing, or burning operations in which the temperature of the product is elevated to or above its melting point.

Inhalation of metal dust and fumes may result from further processing of the material by the user, particularly during welding, burning, grinding, and machining activities and should be evaluated by an industrialized hygienist. The possible presence of nonmetallic surface coatings should also be considered when evaluating potential employee exposures.

The inhalation of high concentrations of freshly formed oxide fumes and dusts of manganese, copper, lead and/or zinc in the respirable particle ranges can cause an influenza-like illness termed metal fume fever. Metal fume fever symptoms include cough, headache, metallic taste in mouth, nausea, fever, chilling, pain in muscles and joints, usually lasting <1 day. Typical symptoms last 12 to 48 hours are characterized by metallic taste in the mouth, dryness and irritation of the throat, followed by weakness, muscle pain, fever and chills.

Iron: Chronic inhalation of high concentrations of ferric oxide fumes or dusts may lead to a pneumoconiosis called siderosis, a benign pneumoconiosis (siderosis). Inhalation of iron oxide may cause irritation of eyes, nose, and throat, and metal fume fever. Inhalation of high concentrations of ferric oxide possibly enhance the risk of lung cancer development in workers exposed to pulmonary carcinogens.

Lead: Exposure to lead can lead to irritability, headaches, tremor, memory loss, kidney damage, anorexia, dark line on gums, pale skin, abdominal pain, severe constipation, paralysis of wrist joint, decreased hand-grip strength, and loss of teeth. May also effect human reproductive functions and the fetus. Ingestion of lead dust may cause irritation of the mouth and throat.

Chromium: Repeated or prolonged exposure to hexavalent chromium compounds may cause respiratory irritation, nosebleed, ulceration and perforation of the nasal septum, industrial exposure to certain forms of hexavalent chromium has been related to an increased incidence of cancer.

Manganese: Exposure may cause irritation of eyes, nose, and throat, metallic taste in mouth and metal fume fever. Advanced symptoms may include weakness, sleepiness, nervousness, lack of coordination, uncontrollable laughter, mental confusion, speech disturbances, and aggressiveness. Manganese may cause bronchitis, pneumonitis and central nervous system disturbances including irritability, impairment in walking, speech disorders, compulsive behavior, mask-like face and a Parkinson-like syndrome.

Nickel: Respiratory irritation and pneumonitis; several nickel compounds, including nickel oxide, are suspect lung and nasal carcinogens. May cause irritation of the mouth and throat. Dermatitis due to sensitization may occur in some individuals from exposure to nickel fumes. Persons with pre-existing skin disorders may be more susceptible. May cause eye irritation.

VI. HEALTH HAZARD SUMMARY

Aluminum: Generally considered to be a nuisance particulate. May cause irritation of the upper respiratory tract, skin, and eyes. Inhalation of fine particles may cause a pulmonary fibrosis known as Shaver's disease. Symptoms may include dyspnea, cough and fatigue. May be implicated in Alzheimer's disease.

Vanadium: Irritation of respiratory tract and conjunctivae. Excessive exposure may result in skin pallor, greenish discoloration of tongue, eczematous skin lesions, cough, bronchitis and chest pains. Long term exposure may cause pulmonary edema, pneumonia, chronic bronchitis, anemia, albuminuria and nervous compliants.Copper: Inhalation may cause metal fume fever, a flu like illness. Signs and symptoms may include fever, chills, muscle aches, nausea, sweet metallic taste in mouth, and a dry throat. Exposure has been associated with discoloration of the skin and hair. Chronic exposure may damage liver, kidney, and spleen. Copper oxide is an irritant to eyes and upper respiratory tract.

Silicates: Overexposure may result in silicosis, a lung disease characterized by scarring of the lungs, cough, and shortness of breath. Crystilline silicas have shown limited evidence of carcinogenicity in humans.

KNOWN OR SUSPECTED CARCINOGEN:

According to OSHA, the National Toxicology Program (NTP), and the International Agency for Research on Cancer (IARC), known and suspected carcinogens that may be contained in this product include: nickel and certain nickel compounds, arsenic, and cadmium.

VII. RECOMMENDED FIRST AID TREATMENT

EYES:

Flush with large amounts of water to remove particles. Seek medical attention.

SKIN:

If thermal burn has occurred, flush area with cold water. Cover with clean cotton sheeting or gauge. Seek medical attention. If irritation develops, wash with soap and water. Consult medical attention if irritation persists.

INHALATION:

For overexposure to fumes and particles, immediately move person to fresh air. Give artificial respiration if breathing has stopped or oxygen, if necessary. Seek medical attention promptly. Metal fume fever may be treated by bed rest and administering a pain and fever reducing medication. Seek medical attention.

INGESTION:

Seek medical attention immediately.

VIII. SPECIAL PROTECTION INFORMATION

GENERAL VENTILATION:	If your operation generates particulate when processing this product, general ventilation may be necessary to control employee exposures to within applicable limits. General ventilation[a] shall be provided in areas where PELs are exceeded.
LOCAL EXHAUST:	Local exhaust ventilation should be provided when welding, burning, sawing or brazing to prevent excessive dust or fume exposure. Local ventilation[a] shall be provided in areas where PELs are exceeded.
RESPIRATORY PROTECTION:	A properly fitted, NIOSH-approved, dust-fume respirator should be worn during welding or burning whenever welding fumes exceed recommended limits.
TYPE:	When engineering controls are not feasible or sufficient to lower exposure levels below applicable limits, NIOSH-approved dust and fume respirators should be used to avoid excessive inhalation of particulate. Appropriate respirator selection depends on the magnitude of exposure.

VIII. SPECIAL PROTECTION INFORMATION	
MECHANICAL:	Use lifting and work devices (e.g., hoist) within rated capacities when handling these materials.
GLOVES:	Protective gloves should be worn as required for welding, burning or handling operations.
EYE PROTECTION:	Use safety glasses, goggles or other protective eyewear when exposure to eye or face hazards exists, such as flying objects, molten metal, and injurious light radiation during welding, burning, sawing, brazing, grinding or machining operations. Use face shield (8" minimum) and/or goggles when welding.

[a] Ventilation, as described in the Industrial Ventilation Manual produced by the American Conference of Governmental Industrial Hygienists, shall be provided in areas where exposures are above permissible exposure limits or threshold limit values specified by OSHA or other local, state, and federal regulations. Such situations include welding, burning, grinding or other similar operations.

IX. SPILL OR LEAK PROCEDURES
CONTAINMENT PROCEDURES:
Promptly sweep up and contain all dust generated by grinding and cutting.
PROTECTIVE CLOTHING:
Avoid contact with dust. Use appropriate protective measures specified in Section VIII.
WASTE DISPOSAL PROCEDURES:
Steel scrap can be recycled. Recycle or dispose of waste according to federal, state, and local regulations.

X. STORAGE AND HANDLING REQUIREMENTS	
HANDLING PROCEDURES:	
None	
SARA REPORTING REQUIREMENTS:	
This material contains chemicals subject to SARA 313 reporting requirements, as indicated in Section II.	
TSCA (PCBs, ASBESTOS, NEW CHEMICALS) STATUS:	
None	
NOTE ANY SPECIAL STATE REQUIREMENTS:	
CALIFORNIA PROPOSITION 65:	Warning: Steel products and chrome metal plate may contain arsenic, cadmium, lead and nickel in trace amounts, known to the State of California to cause cancer or birth defects or other reproductive harm.
NJ COMMUNITY RIGHT TO KNOW LAW SPECIAL LABELING REQUIRED:	Not required.

XI. DOT SHIPPING INFORMATION	
DOMESTIC HAZARD CLASS:	Nonhazardous

N/A = Data not available.

The information in this MSDS is believed to be correct and is given in good faith, but no warranty, expressed or implied, is intended.

Technical Service Bulletin # **88015** Date: **880215**

Chassis - Warnings for Aftermarket Rust Proofing

Models:
All Models

Section:
Body & Frame

Classification:
BF88-005

Bulletin No.:
TS88-015

Date:
February 15, 1988

CAUTIONS FOR AFTERMARKET
RUST PROOFING APPLICATION

APPLIED MODELS:
All Nissan Models

SERVICE INFORMATION

The National Highway Traffic Safety Administration has conducted an investigation into potential failure of the front safety belt systems of certain vehicles due to the unintentional application of rust-proofing material to the belt retractors in the "B" pillar area. Their information suggests that the movement of the pendulum inside the belt retractor mechanism can be restricted if rust-proofing material is inadvertently applied in the pendulum area. Restricting the pendulum movement can result in the belts failing to protect occupants in an accident.

Nissan's current models have extensive anti-corrosion treatment applied at the factories and we do not endorse "rust-proofing" at the dealer or aftermarket level. The only instance in which Nissan recommends rust-proofing be applied is in the case of body panel replacement (Please refer to Service Bulletin TS82-066, BF82-007 for instructions about rust-proofing replacement body panels).

If additional rust-proofing is applied to Nissan vehicles, DO NOT apply rust-proofing to the "B" pillar area near the seat belt retractor, or any other location near the seat belt retractors of any vehicle. Of course, the usual precautions in applying rust-proofing material still apply. For example, it is important that rust-proofing material not be inadvertently applied to door lock assemblies, drain holes, the exhaust system or driveshaft.

IMPROPER RETRACTOR OPERATION CAUSED BY THE INSTALLATION OF RUST-PROOFING MATERIAL WILL BE THE RESPONSIBILITY OF THE INSTALLING AGENCY.

Technical Service Bulletin # **89132** Date: **890831**

Tools - Rivnut Installation

Models: All Models

Section: Body & Frame

Classification: BF89-026

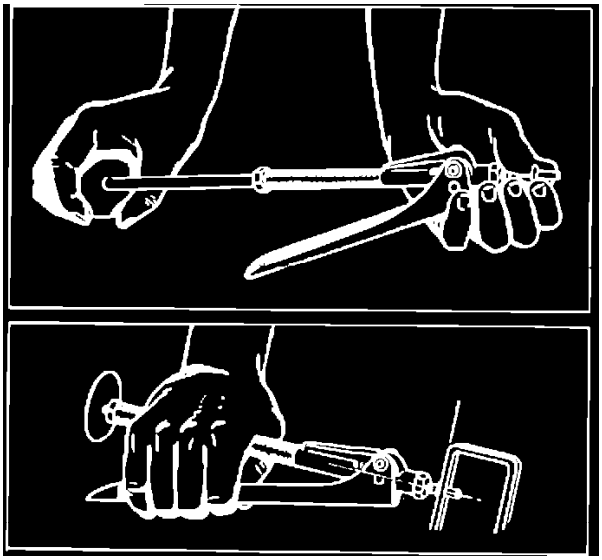
Bulletin No.: TS89-132

Date: August 31, 1989

RIVNUT INSTALLATION

SERVICE INFORMATION

The Rivnuts used for installation of a roof rack and deck rack require a substantial amount of time to install by hand. A Rivnut installation tool which will reduce the installation time is available from most automotive supply stores.



EXAMPLE: B.F. Goodrich C-6000 Speed Header

Technical Service Bulletin # **93075** Date: **930525**

Interior - Aid to Diagnosing Water Leaks

Classification:
BF93-023

Section:
Body & Frame

Reference:
TECHNICAL BULLETIN NB93-075

Models:
All Nissan Models

Date:
May 25, 1993

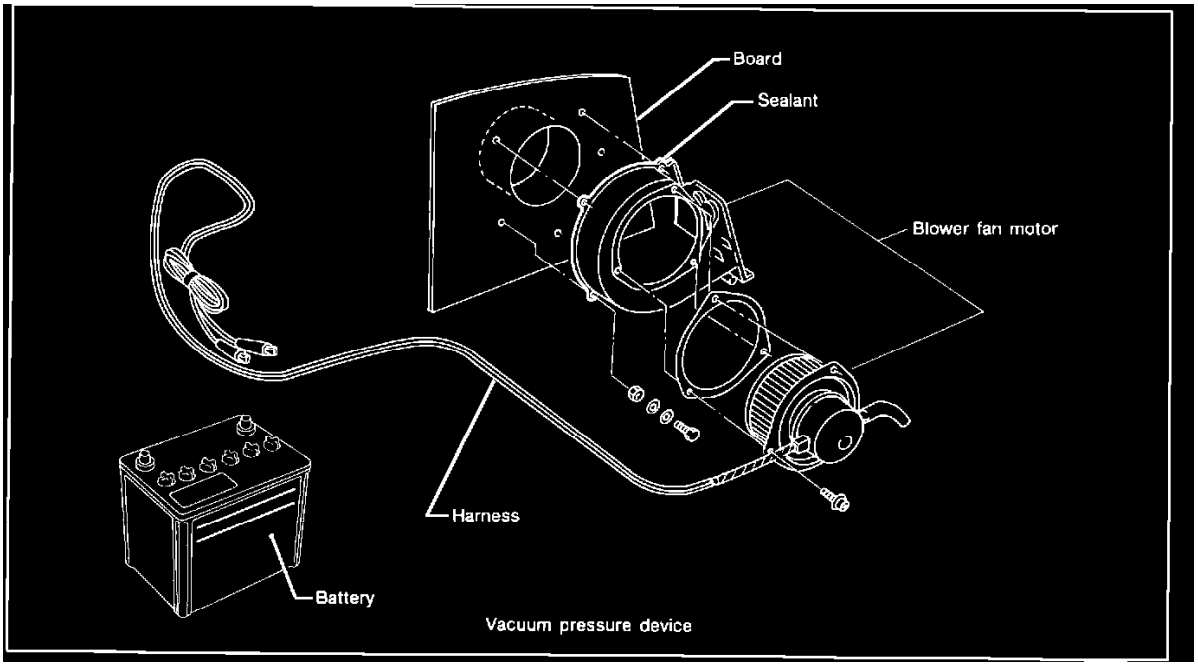
DIAGNOSING WATER LEAKS

Water Leaks

Water leaks refer to the seepage of water into the passenger compartment from outside. Basic procedures for detecting water leaks are explained below.

Detection

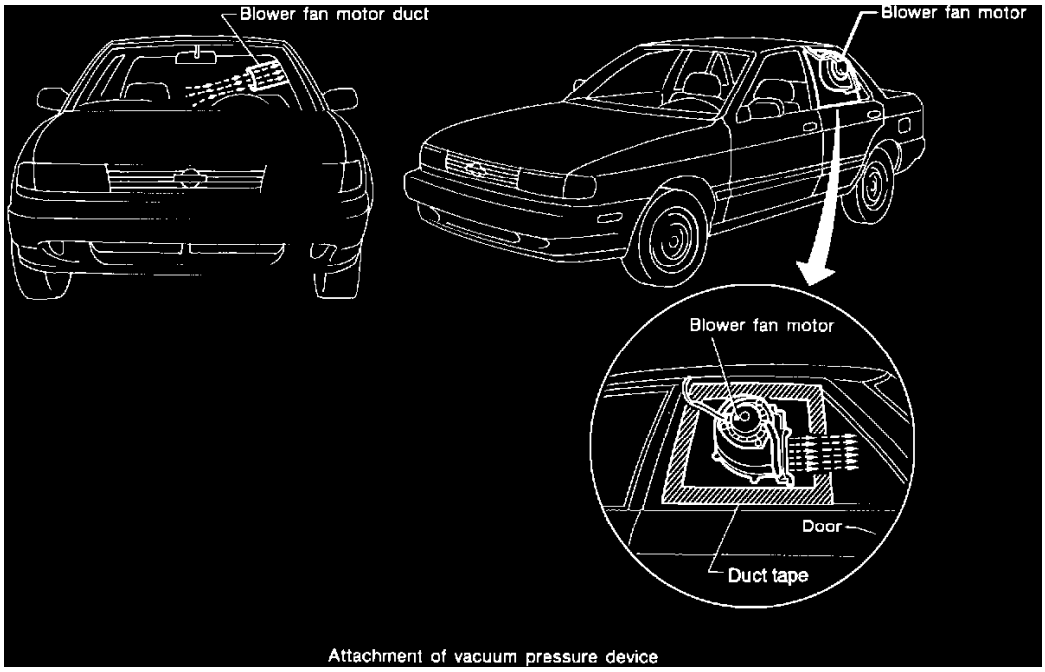
Accurate detection of leakage requires the application of a vacuum pressure of -1.10 mHg, -147 Pa, within the passenger compartment.



Vacuum pressure device

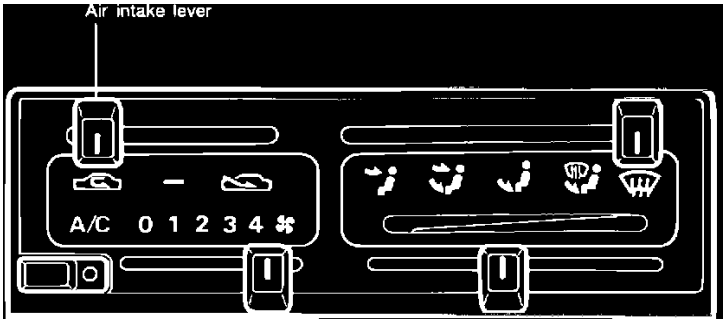
Equipment required
Test vehicle
Vacuum pressure device (set up the device as shown.)

Steps
(1) Remove trim parts from the suspected area in order to make leakage plainly visible.

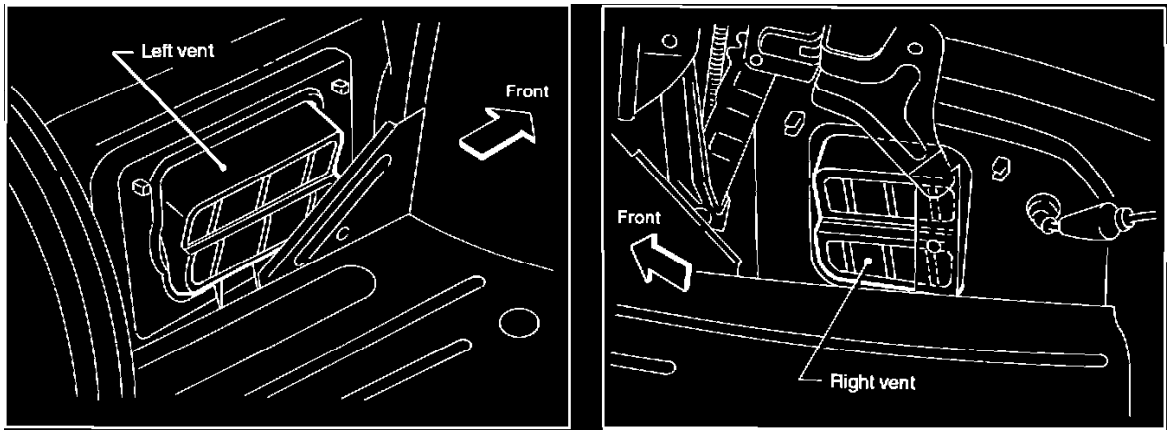


Attachment of vacuum pressure device

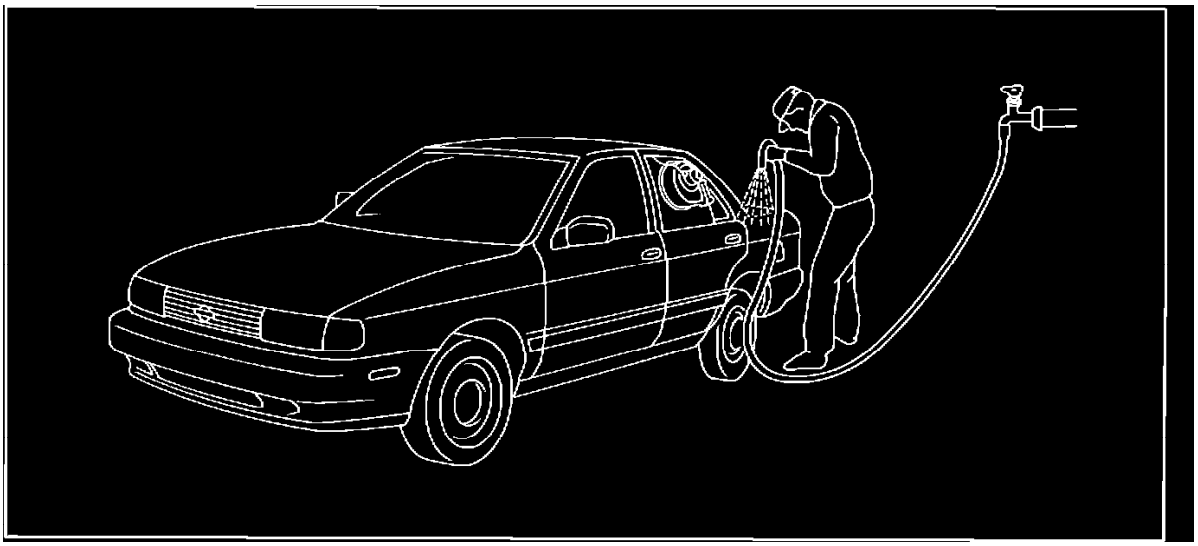
(2) Install the vacuum pressure device in the vehicle as shown in the figure. Securely fasten with duct tape.



(3) Set the heater air intake lever to the recirculate position.



(4) Remove the floor carpet from the trunk and close both the left and right vents from the inside as shown.



(5) Apply water to the suspected leaking areas from lower to higher areas at a volume of 5 to 10 liters per minute. One person should be inside the vehicle to locate any leaks.

(6) Activate the vacuum pressure device to create a vacuum within the passenger compartment.

CAUTION:

If a vacuum pressure of -2.20 mmhg, -294 Pa is created within the passenger compartment, only apply water to where the leak is believed to be. At higher vacuum pressure, leakage may occur around weather-stripping or other areas which are comparatively less watertight.

(7) Recheck watertightness after repairing leaking areas.

Technical Service Bulletin # **BF87013** Date: **870420**

Lights - Isopropyl Alcohol Caution

Models All Models

Section Body & Frame

Classification BF87-013

Bulletin No. TS87-064

Date April 20, 1987

ISOPROPYL ALCOHOL CAUTION

ALL MODELS

Isopropyl alcohol solution used for general cleaning and for preparing the vehicle surface for graphics installation will cause the plastic lenses on turn signal lights, side marker lights, cornering lights, tail lights, etc., to crack.

Extreme care must be used to avoid all contact of isopropyl alcohol with any plastic lens (surface).

- The isopropyl alcohol solution must not drip onto any plastic lens.
- During cleaning of the vehicle, a wiping cloth soaked with alcohol solution must not contact any plastic lens.
- During application of the urethane XE/SE Truck graphics, alcohol solution spray mist (used as the wetting solution) must not contact any plastic lens.

Technical Service Bulletin # **98-060** Date: **980715**

Body - Repair Guidlines for Rust & Corrosion

Classification:
BT98-016

Reference:
NTB98-060

Date:
Julyl5, 1998

GENERAL BODY REPAIR GUIDELINES FOR PROPER SEALANT APPLICATION ON RUST AND CORROSION RELATED REPAIRS

APPLIED VEHICLES:
All Nissan

SERVICE INFORMATION

While performing corrosion-related or collision-related repairs, proper preparation and treatment of the metal is required to help prevent future corrosion related incidents. This bulletin describes the OEM material used and the metal treatments available.

For specific body panel composition (e.g. cold-rolled, DURASTEEL(R), ETC.) AND PROPER DETAIL REPAIR PROCEDURES, PLEASE REFERENCE THE SPECIFIC NISSAN BODY REPAIR MANUAL (AVAILABLE THROUGH DYMENT DISTRIBUTION SERVICES AT 1-216-572-0725).

Following are the types of metal being used and the anti-corrosive treatments available.

Types of OEM Steel Materials and Coatings Used

DURASTEEL(R)

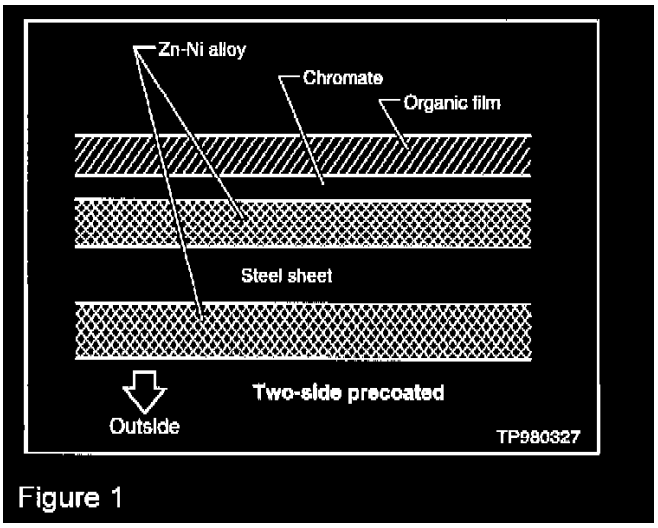


Figure 1

DURASTEEL(R) IS AN ELECTROPLATED, ZINC-NICKEL ALLOY UNDER AN ORGANIC FILM WHICH PROVIDES EXCELLENT CORROSION RESISTANCE (SEE FIGURE 1). THIS COATING INSULATES THE METAL AGAINST AIR AND MOISTURE TO HELP PREVENT RUST FORMATION.

NOTE: Nissan genuine Service Parts are fabricated from DURASTEEL(R) SHEETS. THEREFORE, WE RECOMMEND YOU USE GENUINE NISSAN PARTS FOR PANEL REPLACEMENT TO MAINTAIN THE ANTI-CORROSIVE PERFORMANCE BUILT INTO THE VEHICLE AT THE FACTORY.

Phosphate Coating Treatment and E-coat

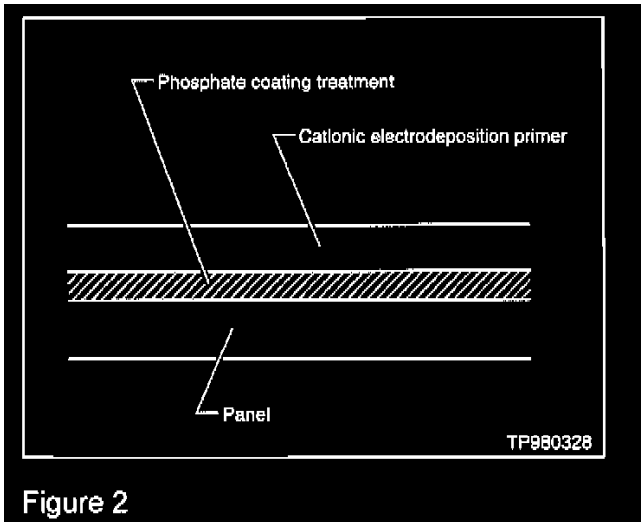


Figure 2

In addition, a phosphate coating treatment and a cationic electro-deposition primer (E-coat), which provide an excellent anti-corrosion effect, is used on all body components (see Figure 2).

NOTE: Nissan genuine Service Parts are also treated in the same manner. Therefore, we recommend you use GENUINE NISSAN PARTS for panel replacement to maintain the anti-corrosive performance built into the vehicle at the factory.

Anti-Corrosive Treatments

Anti-corrosive treatments can be performed:

^ Before welding (e.g.: weld-through primers and spot sealers),

^ Before painting (e.g.: metal conditioners),

^ During painting (e.g.: epoxy primers and seam sealers), and

^ After painting (e.g.: anti-corrosive wax).

Following are general steps involved for a corrosion resistant panel repair and a general overview of each type of treatment:

1. Proper cleaning of all surfaces.

2. Use of a metal conditioner on bare steel to produce a rust preventative coating.

3. Use of weld through primer to eliminate the possibility of bare metal exposure.

4. Use of epoxy primer on all bare metal areas.

5. Proper application of seam sealer to all required panel joints.

6. Use of undercoating on wheelhouse and underbody areas.

7. Use of anti-corrosive wax to non-exposed welded parts (e.g. inside of pillar area).

1. Surface Cleaning

Use a general cleaning solvent on painted surfaces (such as PPG DX330 or equivalent - check with local VOC regulations).

2. Metal Conditioner

For panels that do not require welding, treat the bare metal in and around the area with metal conditioner (such as PPG DX 520SG or equivalent - check with local VOC regulations). For proper application, do not allow the metal conditioner to dry. You also need to wipe it oft immediately with a clean cloth. This is very important if any rust-out repair is to last more than a few months.

3. Weld-Through Primers

For panels that require welding, different types of anti-corrosive treatments (primers) are available depending on the type of repair. For example:

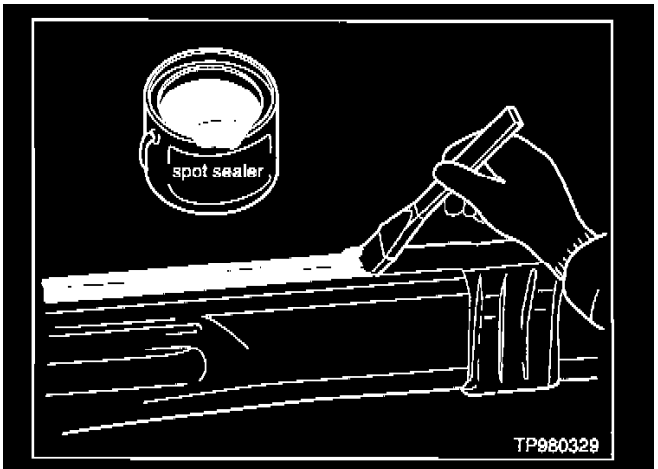


Figure 3

^ Spot sealer is required for spot welding (see Figure 3)

^ A weld-through primer (such as 3M Weld-Thru Coating # 05913 or equivalent - check with local VOC regulations) is required for MIG-welded panels.

You must apply these primers to the mating surfaces to prevent rust formation. Elimination of this step will result in future rust/perforation incidents.

4. Corrosion-Resistant Primers

After all repair work has been performed, you need to apply a corrosion resistant primer for proper corrosion protection. For example, you should apply PPG DP Epoxy primer (or equivalent - check with local VOC regulations) prior to seam sealer application.

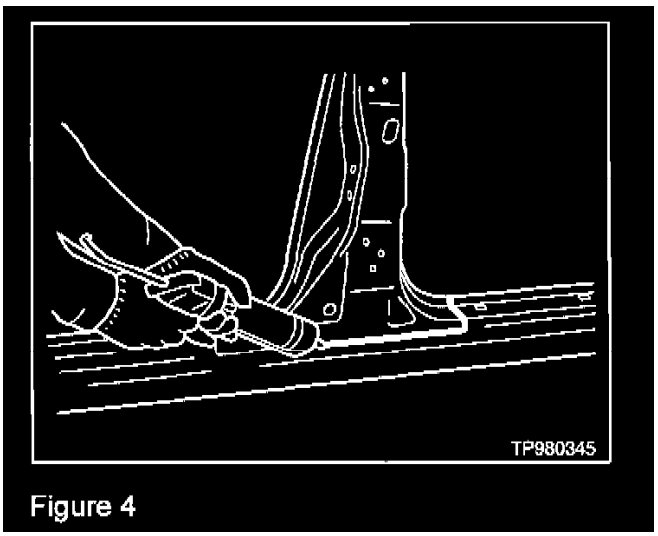


Figure 4

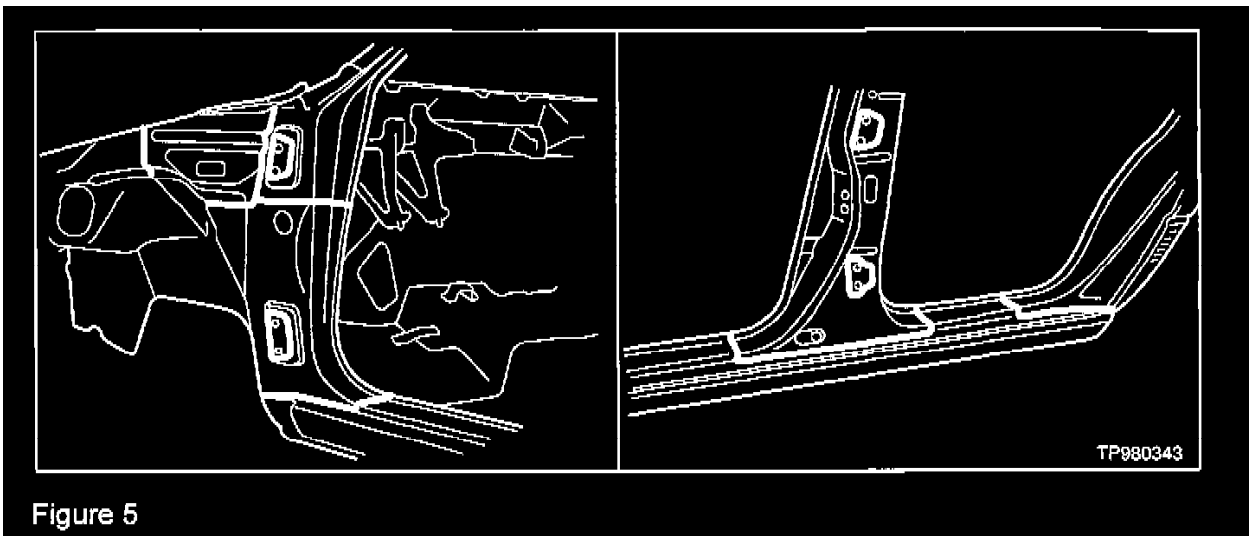


Figure 5

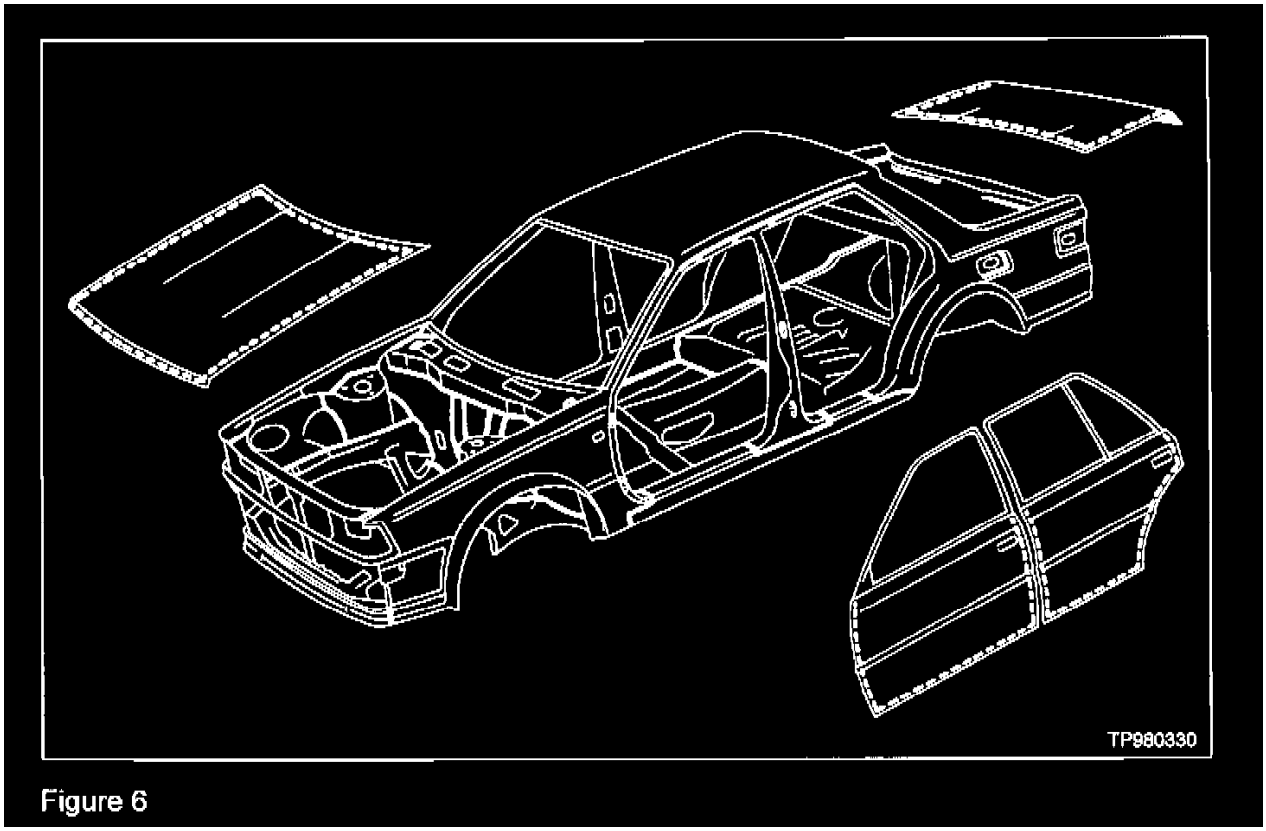


Figure 6

5. Seam Sealer

Use of body (seam) sealer (such as Fusor # 800 Seam Sealer or equivalent - check with local VOC regulations) prior to base coat application aids in the appearance of the repair. It is also important for proper corrosion protection (see Figures 4, 5 & 6). Seam sealer helps prevent water or mud from entering between panel joints and it also helps prevent the formation of corrosion. Please refer to the proper Nissan Body Repair Manual for seam sealer application points.

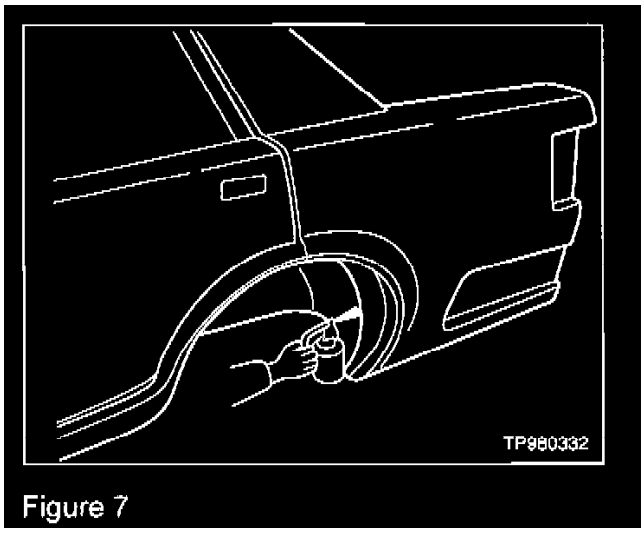


Figure 7

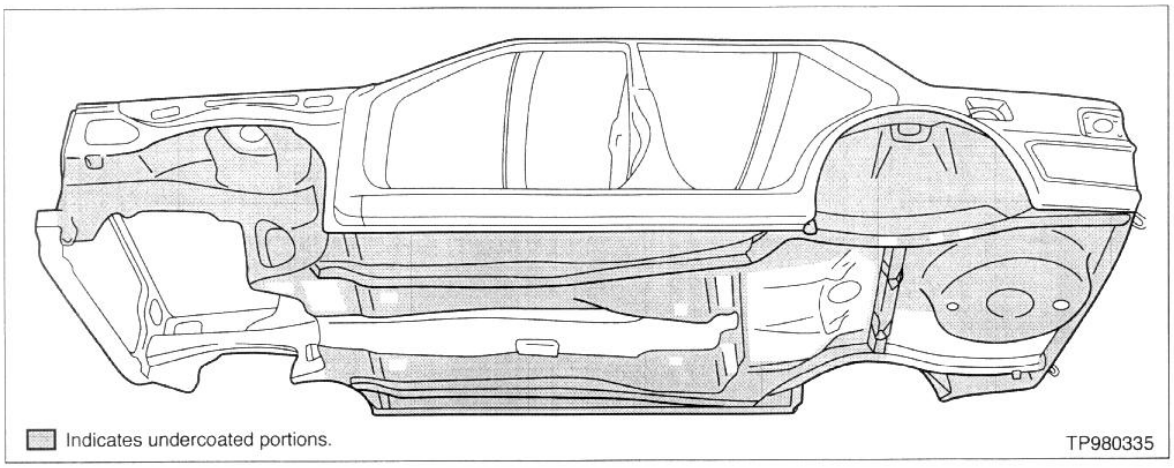


Figure 8

6. Undercoating

Undercoating (such as 3M Rubberized Undercoating # 08883 or equivalent - check with local VOC regulations) is an elastic coating applied to the underbody (see Figures 7 & 8). This undercoating helps prevent rust, and it also reduces body vibration and noise. If the undercoating is removed during body repair, it must be reapplied to the same areas. Pay attention to critical areas such as body seams and panel joints.

7. Anti-Corrosive Wax

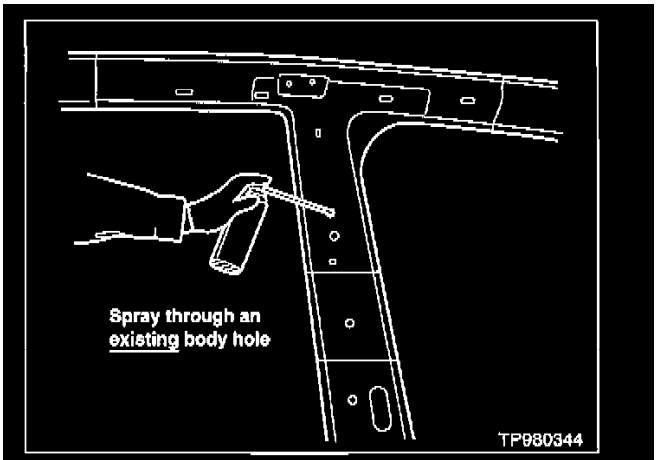


Figure 9

The recessed portions of the body which cannot be painted easily must be coated with anti-corrosive wax (such as Tectyl 517 Bitumen Wax or equivalent - check with local VOC regulations). This is to ensure that there will not be any bare metal exposed (see Figure 9).

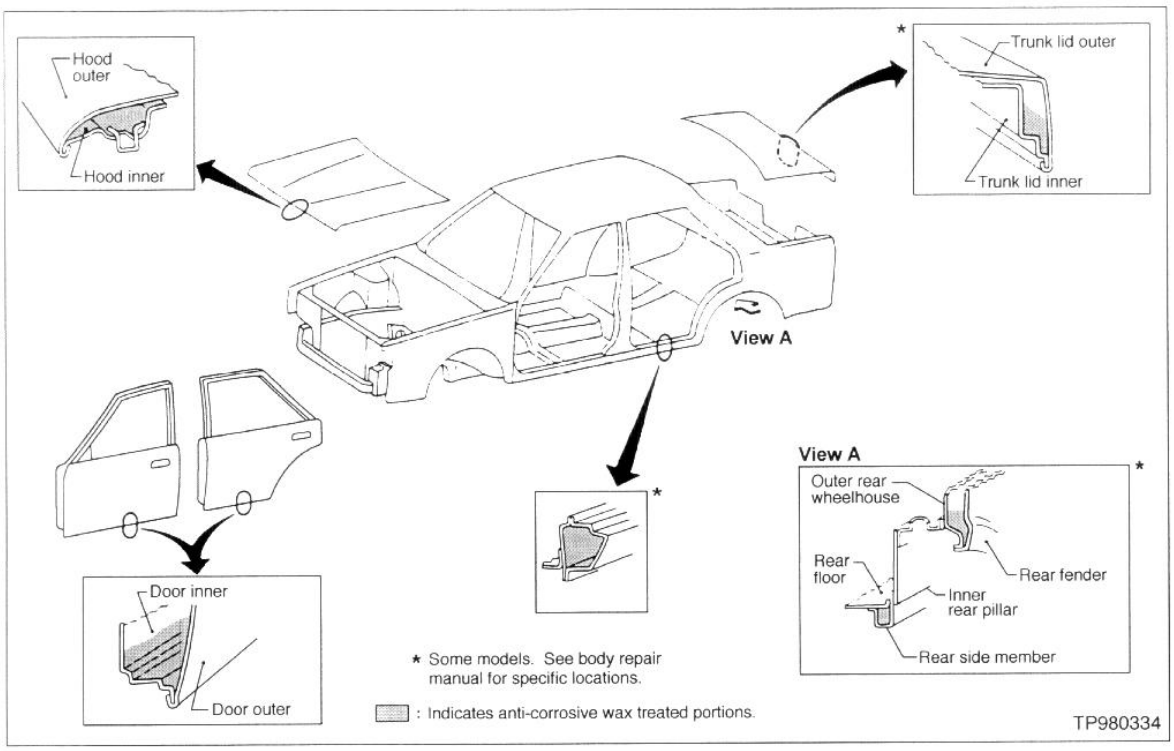


Figure 10

The factory applies wax to various areas of the vehicle to prevent corrosion/perforation. Below is an example of the different body locations where wax is applied (see Figure 10).

Technical Service Bulletin # **88-015** Date: **880215**

Body - Warnings for Aftermarket Rust Proofing

Classification:
BF88-005

Reference:
TS88-015

Date:
February 15, 1988

CAUTIONS FOR AFTERMARKET RUST PROOFING APPLICATION

APPLIED VEHICLE(S):
All Nissan Models

SERVICE INFORMATION

The National Highway Traffic Safety Administration has conducted an investigation into potential failure of the front safety belt systems of certain vehicles due to the unintentional application of rust-proofing material to the belt retractors in the "B" pillar area. Their information suggests that the movement of the pendulum inside the belt retractor mechanism can be restricted if rust-proofing material is inadvertently applied in the pendulum area. Restricting the pendulum movement can result in the belts failing to protect occupants in an accident.

Nissan's current models have extensive anti-corrosion treatment applied at the factories and we do not endorse "rust-proofing" at the dealer or aftermarket level. The only instance in which Nissan recommends rust-proofing be applied is in the case of body panel replacement (Please refer to Service Bulletin TS82-066, BF82-007 for instructions about rust-proofing replacement body panels).

If additional rust-proofing is applied to Nissan vehicles, DO NOT apply rust-proofing to the "B" pillar area near the seat belt retractor, or any other location near the seat belt retractors of any vehicle. Of course, the usual precautions in applying rust-proofing material still apply. For example, it is important that rust-proofing material not be inadvertently applied to door lock assemblies, drain holes, the exhaust system or driveshaft.

IMPROPER RETRACTOR OPERATION CAUSED BY THE INSTALLATION OF RUST-PROOFING MATERIAL WILL BE THE RESPONSIBILITY OF THE INSTALLING AGENCY.Technical Service Bulletin # **91067** Date: **910711**

Lights - Water Condensation In Lamp Lens

Models All Models

Section Body & Frame

Classification BF91-017

Bulletin No. NTB91-067

Date July 11, 1991

WATER CONDENSATION IN LAMPS

APPLIED MODELS: ALL MODELS

MODEL YEARS: ALL

SERVICE INFORMATION

A small amount of water condensation on the inside lens surfaces of exterior lamps is normal on Nissan vehicles. Most Nissan exterior lamps (head lamp assembly, turn signal lamp assembly, side combination lamp assembly, fog lamp assembly, rear combination lamp assembly, stop lamp assembly, trunk lid finisher, etc.) have a breather on the back side of the lamp assembly which allows air to enter and exit the lamp assembly. Air will flow in and out of the lamp assembly depending on the temperature difference between the outside and inside of the lamp assembly.

Water condensation forms on the inside lens surface of exterior lamps and can be seen as small water droplets. This usually occurs when the inside of the lamp surfaces are heated by having the lamps ON or by the sun shining into the lamp assembly. As the lamp assembly cools down, it draws in outside air. The moisture in the outside air condenses on the inside lens surface. This is much like water condensation on the outside of a glass of cold water on a warm day or the frosting up of a vehicle's inside glass surfaces on a cold winter day.

Replacing the lamp assembly will not resolve the customer's complaint because this condition is normal. Even if the lamp assembly is replaced, the incident will re-occur when the conditions that originally caused the incident are present.

To resolve this condition, dry out the incident area of the lamp assembly with a hair dryer. Be extremely careful not to overheat the lamp assembly causing it to deform. Explain to the customer that condensation is normal and will not affect lamp performance.

If there is a large puddle of water at the bottom of the lamp assembly this condition is not normal. This indicates that there is a leak somewhere on the lamp assembly seal. Replace the lamp assembly to resolve this condition.

Technical Service Bulletin # **87-064** Date: **870420**

Lights - Plastic Lens Isopropyl Alcohol Caution

Classification:
BF87-013

Reference:
TS87-064

Date:
April 20, 1987

ISOPROPYL ALCOHOL CAUTION ALL MODELS

APPLIED VEHICLES(S):
All Models

SERVICE INFORMATION

Isopropyl alcohol solution used for general cleaning and for preparing the vehicle surface for graphics installation will cause the plastic lenses on turn signal lights, side marker lights, corning lights, tail lights, etc., to crack.

Extreme care must be used to avoid all contact of isopropyl alcohol with any plastic lens (surface).

^ The isopropyl alcohol solution must not drip onto any plastic lens.

^ During cleaning of the vehicle, a wiping cloth soaked with alcohol solution must not contact any plastic lens.

^ During application of the urethane XE/SE Truck graphics, alcohol solution spray mist (used as the wetting solution) must not contact any plastic lens.Technical Service Bulletin # **BE86021** Date: **861208**

Antitheft - Optional Vehicle Security System Wiring

Nissan-Datsun Truck PL720 2WD L4-1952cc 2.0L SOHC (Z20)

Models All Models

Section Body Electrical

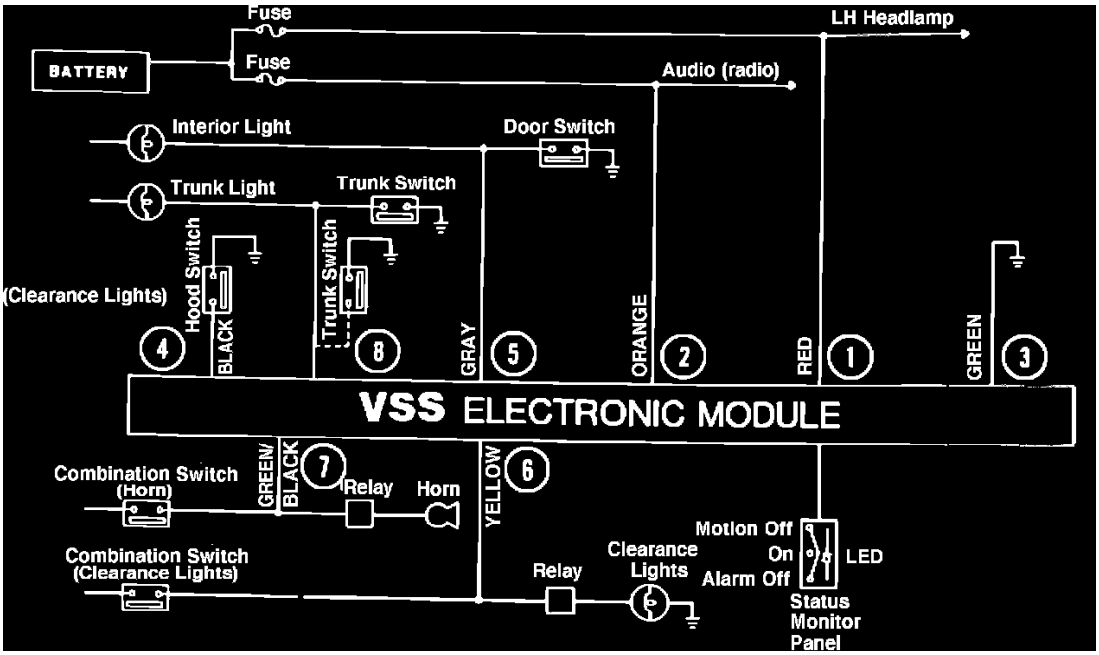
Classification BE86-021

Bulletin No. TS86-206

Date December 8, 1986

VEHICLE SECURITY SYSTEM WIRING INFORMATION

APPLIED MODELS: All models with the port or dealer installed accessory Vehicle Security System (VSS)



GENERAL WIRING SCHEMATIC

SERVICE INFORMATION

This bulletin contains a general wiring schematic and a vehicle wiring harness matrix to use when troubleshooting the VSS. The circled numbers in the general wiring schematic below correspond to the circled numbers in the harness matrix and wire functions on next page.

	VSS INPUT/OUTPUT WIRE	VEHICLE CONNECTING WIRE					
		1987 SENTRA	1987 STANZA	1986 STANZA WAGON	1986 PULSAR	1986, 1986-5 200SX	1986-5 TRUCK
(1)	RED Fusebox (Headlamp)	RED/WHITE Bottom row, 3rd position from left	RED Bottom row, 4th position from right	RED/WHITE Bottom row, 1st position on left	RED/WHITE Left column, 1st position at top	RED/WHITE Right column, 3rd position from top	RED/WHITE Bottom row, 2nd position from right
(2)	ORANGE Fusebox (Audio/Radio)	BROWN Top row, 6th position from left	PINK Bottom row, 3rd position from left	BLUE/BLACK Top row, 4th position from left	BLUE/BLACK Right column, 5th position, from top	PINK Left column, 3rd position, from bottom	GREEN/WHITE Top row, 6th position, from left
(3)	GREEN Ground	Use suitable ground.					
(4)	BLACK Hoodswitch	Attach to hood pinswitch. Refer to Installation Instructions.					
(5)	GRAY Doorswitch	YELLOW/PURPLE	ORANGE/BLUE	RED/BLACK	RED/BLACK	E Trim Level BLACK WITH BROWN RINGS XE Trim Level ORANGE/BLUE Foot lamp wire	RED/BLACK
(6)	YELLOW Steering Column (Clearance Lamp)	GREEN/BLACK (130M)	RED/WHITE (138M)	GREEN/WHITE (124M)	BLUE/WHITE (138M)	Hatchback with Digital Package RED/WHITE All Other Vehicles RED (100M)	PINK/BLUE (242M)
(7)	DARK GREEN/BLACK Steering Column (Horn)	GREEN/BLACK (131M)	GREEN/WHITE (134M)	GREEN/BLACK (125M)	GREEN/BLACK (125M)	GREEN/WHITE (99M)	LT. GREEN/BLACK (241M)
(8)	BLACK Trunkswitch Wire (Vehicles with trunk or cargo light installed.)	Wagon RED/YELLOW (2D) 3 Dr. Hatch RED/YELLOW (12D) Sedan/Coupe RED/BLACK (22B)	Sedan RED/WHITE (34B) Hatch RED/WHITE (34B)	BLACK/YELLOW (Refer to Instalation Instructions.)	BLACK/WHITE (135M)	Notchback RED/WHITE (154M) Hatchback RED/WHITE (171M)	—

Note: Numbers in parenthesis following vehicle connecting wires refer to the wiring harness connector as depicted in the Vehicle Service Manual.

VEHICLE HARNESS MATRIX
FUNCTION OF WIRES

(1) (Red) Provides constant power for VSS operation.

(2) (Orange) Provides the signal to shut the VSS down when the ignition key is turned to the "ACCESSORY" position.

(3) (Green) Provides ground for VSS system.

(4) (Black) Provides instant alarm for hood.

(5) (Gray) Provides the signal for the 20 second entry delay when a door is opened.

(6) (Yellow) Flashes the clearance lamps when alarm is triggered.

(7) (Dark Green/Black) Operates the horn when alarm is triggered.

(8) (Black) Provides instant alarm for trunk.

Technical Service Bulletin # **93181** Date: **931214**

Emissions System - Troubleshooting Tips

Classification: EF&EC93-019
Section: Engine Fuel & Emission
Reference: SERVICE ADVISORY NTB93-181
Models: All
Date: December 14, 1993

EMISSIONS SYSTEMS DIAGNOSTICS

SERVICE INFORMATION

This service advisory is intended to help diagnose some possible reasons why a vehicle may not pass a vehicle emissions inspection for State vehicle registration.

1. Check all basic engine settings such as; Ignition Timing, Throttle Position Sensor etc, to verify that they are in specification. Refer to vehicle Service Manual for the exact year and model to determine the correct specifications.

2. Check engine oil for fuel contamination. A vehicle with 5-7,000 miles on the engine oil may have accumulated some fuel in the oil, especially on a vehicle that is used primarily for city short distance driving. In addition, severe driving conditions (as defined in the owners

and service manual) warrant engine oil changes every 3,000 miles.

3. Inspect air filter condition for excessive dirt or foreign material (leaves, large insects, or paper). If there is a large amount of foreign material on the filter element it may disturb the air flow through the mass air flow sensor causing the mixture to go excessively rich or lean.

4. Check AIV system (if the vehicle is so equipped) for a contaminated air filter. Check for proper seating and operation of the reed valves. A properly operating system will make a pulsating sound when the AIV is activated. If the AIV is not operating, the high RPM test may pass but the idle test will not. Also, make sure that the vacuum lines to the AIV control solenoid are routed correctly.

	LED Flashes "On" & "Off"		
Engine condition	Normal	Limit	CONSULT
2000 RPM under no load	About 10 times in 10 seconds*1	At least 5 or 7 times in 10 seconds*2	"Mixture Ratio Test" in Function Test

*1 Reference Value.
*2 Refer to Service Manual for detailed information (All CONSULT equipped vehicles flash 5 times only).

5. Perform a mixture ratio test to ensure that the oxygen sensor is working correctly. On a CONSULT equipped vehicle perform a mixture ratio test in Function Test.

6. Check the fuel pressure to ensure it meets factory specification at idle and during snap acceleration. A few psi too high and the ECM will not be able to compensate. The higher the fuel pressure the richer the mixture.

7. If any service was performed to the emissions system to correct an out of specification condition, then the ECM's self learning needs to be cleared. This can be easily done on a CONSULT compatible vehicle by clearing self learning in active tests. This will allow the ECM to reset itself to the new conditions.

   For a non-CONSULT compatible vehicle produced after 1988 model year the self learning can be cleared by the following three methods:

   1. Disconnect the air flow meter connector while the engine is running.

   2. Disconnect the 02 sensor connector while the engine is running.

   3. Disconnect the battery cable.

      Refer to "Injector Leak Diagnosis" (Code 45) in the Service Manual for detailed information for the three methods.

   It is necessary to drive the vehicle with constant speeds under the following conditions for at least fifteen minutes without acceleration and deceleration before attempting to measure the emissions again.

   A. No load 2500 +/- 300 RPM (in Neutral)
      AND/OR
   B. Loaded test condition only for the state of Arizona.

8. Check for leaking injectors. Install a fuel pressure gauge near the fuel injector rail and turn the ignition on to cycle the fuel pump and build fuel pressure. The fuel pressure should stay the same for a while on a cool engine. If there is a sudden loss of pressure after the fuel pump stops then try clamping the fuel rail inlet and outlet hoses to insure that it is the injectors and not a check valve in the fuel pump or a leaking fuel pressure regulator.

Technical Service Bulletin # **94-077** Date: **940804**

Emission - Inspection/Maintenance Program Overview

Models: All
Section: General Information
Classification: GI94-004
Bulletin No.: NTB94-077
Date: August 4, 1994

ENHANCED EMISSION INSPECTION/MAINTENANCE PROGRAM

SERVICE INFORMATION

You may have already heard about the forthcoming enhanced inspection/maintenance (I/M) program which is being implemented in targeted locations of the country beginning in January 1995 (July 1994 in Maine). The purpose of this advisory is to provide a general overview of the I/M requirements, and the potential impact upon dealers.

ENHANCED I/M AREAS*

Currently Operating**

Allentown-Bethlehem, PA-NJ MSA
Atlanta, GA
Atlantic City, NJ MSA
Bakersfield, CA
Baltimore, MD MSA
Baton Rouge, LA
Bergen-Passaic, NJ PMSA
Boston, MA PMSA
Bridgeport-Milford, CT PMSA
Brockton, MA PMSA
Chicago, IL-NW Indiana
Danbury, CT PMSA
Denver, CO
El Paso, TX-NM
Fall River, MA-RI PMSA
Fitchburg-Leominster, MA MSA
Fresno, CA
Hartford, CT PMSA
Houston, TX
Jersey City, NJ PMSA
Las Vegas, NV
Lawrence-Haverhill, MA-NH PMSA
Los Angeles, CA
Lowell, MA-NH PMSA
Middlesex-Somerset Hunterdon, NJ PMSA
Milwaukee, WI
Monmouth-Ocean, NJ PMSA
Nashua, NH PMSA
Nassau-Suffolk, NY PMSA
Newark, NJ PMSA
New Bedford, MA MSA
New Britain, CT PMSA
New Haven-Meriden, CT MSA
New London-Norwich, CT-RI MSA
New York, NY PMSA
Norwalk, CT PMSA
Oxnard-Ventura, CA
Portland, MW MSA
Philadelphia, PA-NJ PMSA
Pittsburgh PA, PMSA
Pawtucket-Woonsocket-Attleboro,RL-MA PMSA
Riverside-San Bernardino, CA
Sacramento, CA
Salem-Gloucester, MA MSA
San Diego, CA
Seattle, WA
Spokane, WA
Springfield, MA MSA
Stanford, CT PMSA
Trenton, NJ PMSA
Vineland-Millville-Bridgeton, NJ PMSA
Washington, DC-MD-VA MSA
Waterbury, CT MSA
Wilmington, DE-NJ-MD PMSA
Worcester, MA MSA

Not Operating

Albany-Schenectady-Troy, NY MSA
Altoona, PA MSA
Binghamton, NY MSA
Buffalo, NY PMSA
Burlington, VT MSA
Erie, PA MSA
Glen Falls, NY MSA
Hagerstown, MD MSA
Harrisburg-Lebanon-Carlisle, PA MSA
Jamestown-Dunkirk, NY MSA
Johnstown, PA MSA
Lancaster, PA MSA
Manchester, NH MSA
Niagara Falls, NY PMSA
Orange County, NY PMSA
Portsmouth-Dover Rochester, NH-ME MSA
Poughkeepsie, NY MSA
Providence, RI PMSA
Reading, PA MSA
Rochester, NY MSA
Scranton-Wilkes Barre, PA MSA
Sharon, PA MSA
State College, PA MSA
Syracuse, NY MSA
Tacoma, WA
Utica-Rome, NY MSA
Williamsport, PA MSA
Yokr, PA MSA

BASIC I/M AREAS

Currently Operating

Albuquerque, NM	Hemet-San Jacinto, CA	Provo-Orem, UT
Alton, IL	Hesperia-Apple Valley Victorville, CA	Racine, WI
Anchorage, AK	High Point, NC	Raleigh, NC
Antioch-Pittsburg, CA	Indio-Coachella, CA	Reno, NV
Aurora, IL	Jacksonville, FL	Round Lake Beach-McHenry, IL-WI
Boise, ID	Joliet, IL	Salinas, CA
Boulder, CO	Kenosha, WI	Salt Lake City, UT
Bristol, CT	Lancaster-Palmdale, CA	San Francisco-Oakland, CA
Charlotte, NC	Lewiston-Auburn, ME	San Jose, CA
Cincinnati, OH-KY	Lodi, CA	San Luis Obispo, CA
Chico, CA	Lompoc, CA	Santa Barabara, CA
Cleveland, OH	Lorain-Elyria, OH	Santa Cruz, CA
Colorado Springs, CO	Louisville, KY-IN	Santa Maria, CA
Dallas-Ft. Worth, TX	Medford, OR	Santa Rosa, CA
Davis, CA	Memphis, TN-AR-MS	Seaside-Monterey, CA
Detroit, MI	Merced, CA	Simi Valley, CA
Durham, NC	Miami-Hialeah, FL	St. Louis, MO-IL
Elgin, IL	Middletown, OH	Stockton, CA
Fairbanks, AK	Mineapolis-St. Paul, MN	Tampa-St. Petersburg-Clearwater, FL
Fairfield, CA	Modesto, CA	Tucson, AZ
Fort Collins, CO	Napa, CA	Vacaville, CA
Fort Lauderdale-Hollywood-Pompano Beach, FL	Nashville, TN	Visalia, CA
Gastonia, NC	Ogden, UT	West Palm Beach-Boca Raton-Delray Beach, FL
Greeley, CO	Palm Springs, CA	Winston Salem, NC
Greensboro, NC	Phoenix, AZ	
Hamilton, OH	Portland-Vancouver, OR-WA	

Not Operating

Akron, OH	Grand Rapids, MI	Port-Arthur, TX
Ann-Arbor, MI	Holland, MI	Port Huron, MI
Beaumont, TX	Huntington-Ashland, WV-KY-OH	Richmond, VA
Charleston, WV	Lewisville, TX	Sheboygan, WI
Crystal Lake, IL	Muskegon, MI	Springfield, OH
Dayton, OH	Newport, RI	Texas City, TX
Denton, TX	Parkersburg, WV-OH	Toledo, OH-MI
Galveston, TX	Petersburg-Colonial Heights, VA	

* This list shows Metropolitan Statistical Areas (MSA's) and Primary Metropolitan Areas PMSA's) in the North Eastern Ozone Transport Region and urbanized areas in the rest of the country.

** These areas are currently operating I/M programs but are not necessarily meeting enhanced I/M

In response to the 1990 Clean Air Act amendments, the Environmental Protection Agency (EPA) has mandated additional reductions in air pollution. To accomplish these reductions, the EPA has expanded their list of geographical areas that require a basic I/M test. and have added a new "enhanced" test in approximately 30 states. The EPA's list of areas affected by both the basic and enhanced testing is attached, however, dealers should check with their local environmental agency to determine if your area is affected by the enhanced I/M program.

The enhanced I/M program, also known as I/M 240, utilizes a computer driven dynamometer to test exhaust and evaporative emissions during a 240 second dynamic driving cycle. The EPA has suggested the use of centralized, state-owned/authorized, inspection-only centers. if the vehicle fails the test, the customer will be provided with data that indicates second-by-second emission levels and purge system operations. The customer may then take the vehicle to a repair facility of their choice to correct the out-of-line condition(s) identified by the test.

The EPA has established a $450 guideline limit for customer pay corrective repairs, although dealers are again encouraged to contact their local environmental agency for specific details and guidelines (this limit does not apply to any repairs covered under warranty). Additionally, it is important to note that the EPA intends to monitor program performance (i.e. - repair quality) in the enhanced I/M areas. This information, which will be readily available to the general public, is expected to list such things as repair facility pass/fail scores, repair expense, and repeat repairs.

Nissan is currently evaluating specialized diagnostic procedures and diagnostic equipment to support the accurate repair of failures identified through the enhanced I/M tests.

Until further notice, Nissan strongly advises dealers against purchasing any emissions-related equipment for the purposes of diagnosing enhanced

I/M test failures, unless they are fully familiar with the program in their area.

Technical information regarding Nissan's diagnostic procedures and/or recommended equipment will be provided to you in the near future.

Technical Service Bulletin # **PI95-008** Date: **950405**

Enhanced Emission Inspection/Maintenance Program I/M240

Classification:

Reference:
PI95-008

Date:
April 5, 1995

APPLIED VEHICLE(S):
ALL MODELS

ENHANCED EMISSION INSPECTION/MAINTENANCE PROGRAM-I/M240

SERVICE INFORMATION

As a result of the 1990 Clean Air Act Amendments, the Environmental Protection Agency (EPA) has mandated a more stringent vehicle emission testing program, known as I/M240. Most major metropolitan areas within the United States are designated as I/M240 areas, and the EPA's expectation is that these areas will establish a centralized test-only facility.

While several states are operating an I/M program, other states have postponed, modified, or canceled their start-up dates (To confirm the requirements in your local area and obtain additional information, please contact your local environmental agency).

As envisioned by the EPA, an independent contractor would perform the test utilizing a computer driven dynamometer to test both the exhaust gases and the performance of the evaporative emission system. If a vehicle were to fail any portion of the test, the consumer would then take the vehicle to a separate repair facility of his or her choice for repair, and then return to the centralized test facility to retest the vehicle.

Based upon actual I/M240 testing, known good vehicles have failed the test under certain circumstances, primarily due to the operating temperature (below the norm) of the catalytic converter. These erroneous test "failures" were found to be caused by extended idling of the vehicle while waiting in line for the test, or the engine/exhaust system not being at normal operating temperature. In such situations, the catalytic converter would not be at its normal operating temperature, and the vehicle may fail the test for a high NOx condition.

These erroneous "failures" create a difficult situation for the dealer to diagnose. Because such a vehicle would be operating as designed, there would be no failed parts. The consumer might be frustrated by the erroneous "failure" and the dealer's inability to discover the reason for it. In actual retesting of several vehicles that initially failed for high NOx, a high percentage of these vehicles passed with an adequate margin without any repairs being performed after an adequate warm-up cycle prior to the beginning of the test was allowed.

This warming-up (or "preconditioning") of the catalytic converter brings the vehicle's emissions systems into the normal operating range, rendering a more accurate I/M240 test result. Typically, driving at freeway speeds for 5-10 minutes will ensure that the system is at normal operating temperature. Nissan is investigating this issue, and developments in this area will be communicated to dealers as they become available.

Of particular importance to Nissan, is the EPA's recent advice to all automobile manufacturers of instances where dealers have refused to repair vehicles that have failed the I/M test. The EPA reports that these refusals to repair are based primarily upon the dealers perceived lack of required diagnostic equipment, specifically dynamometers and/or an exhaust gas analyzers that measure NOx. The EPA, however, recognizes that very few (if any) dealers currently own a dynamometer, particularly the type used in the I/M test, together with an analyzer that measures NOx.

As described in the EPA letter, current I/M 240 tests are using "very loose pass/fail standards... Vehicles that fail will almost certainly have a significant malfunction in one or more of the major emission control systems which can be diagnosed and fixed using tools and methods that repair shops currently have.... Repair providers can apply standard diagnostic procedures to the fuel delivery, ignition, EGR, and other emission control systems when presented with a...(test) failure". With the exception of the preconditioning matter described earlier, the EPA information concerning diagnosis and repair is generally reliable for vehicles that fail the current I/M 240 test.

Nissan Motor Corporation U.S.A. strongly advises dealers against purchasing any additional emission related equipment at this time for the purposes of diagnosing Nissan vehicles. As indicated in the initial I/M240 dealer letter mailed in August, 1994, Nissan's existing emission systems diagnostic procedures and tools are adequate for dealers to correct and repair vehicles failing an I/M 240 test.

As the vehicle repair industry gains knowledge and experience with the I/M tests, corresponding improvements in repair technology are expected. There are new and innovative technological approaches currently under test and review. Nissan continues to monitor and evaluate I/M 240 testing & diagnostic requirements and will continue to advise dealers of developments as they become available.

Technical Service Bulletin # **96-104** Date: **961113**

Engine Controls - Precautions Electronic System Testing

Classification:

Nissan-Datsun Truck PL720 2WD L4-1952cc 2.0L SOHC (Z20)

EC96-013

Reference:
NTB96-104

Date:
November 13, 1996

PRECAUTIONS FOR ELECTRONIC CONCENTRATED ENGINE CONTROL SYSTEM (ECCS) TESTING

APPLIED VEHICLES:
All

SERVICE INFORMATION

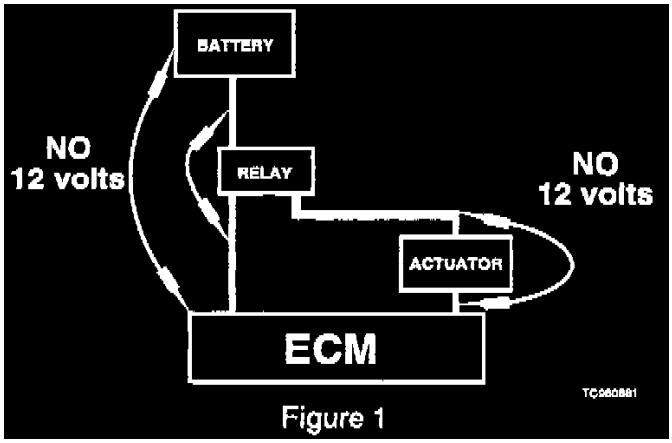


Figure 1

Always use caution when performing electrical checks on the electrical harness or engine control module (ECM) to avoid damaging the ECM. NEVER apply direct battery voltage to any terminal of the ECM by either connecting a 12 volt battery positive (+) terminal, or by jumping (short circuiting) any actuator that is connected to the ECM. Below is a partial list of typical actuators:

^ Relays (fuel pump, A/C, cooling fan, EFI)

^ Solenoid valves (EGR control, purge control, vent control, vacuum cut valve bypass or intake valve timing control)

^ Fuel injectors

^ IACV-AAC valve or IACV-FICD valve.

NOTE:
Applying battery voltage to the ECM without sufficient resistive load (normally supplied by an actuator) will cause an over-current condition to the ECM transistor resulting in instant, permanent damage to the ECM.

Technical Service Bulletin # **GI91004** Date: **910509**

CONSULT - Lithium Battery Replacement

Classification: GI91-004

Section: GENERAL INFORMATION

Reference: TECHNICAL BULLETIN NTB91-046

Models: ALL MODELS

Date: MAY 9, 1991

CONSULT LITHIUM BATTERY REPLACEMENT

APPLIED MODELS: ALL MODELS

SERVICE INFORMATION:

Your CONSULT unit incorporates two batteries:

^ One is a NiCad rechargeable battery which powers the display and the printer.

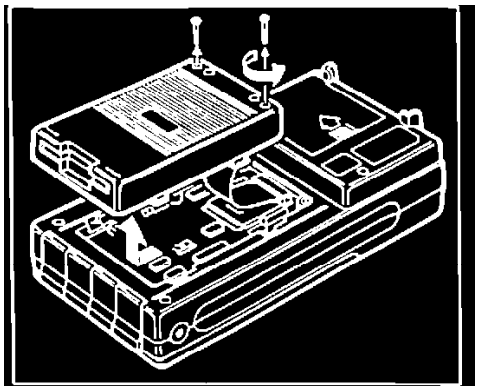
^ The other is a lithium battery to backup the memory, clock, and calendar functions when the NiCad battery has been removed or is completely discharged.

The lithium battery must be replaced once it is discharged. IT IS VERY IMPORTANT THAT THIS BATTERY BE REPLACED ONLY WITH A SANYO ELECTRIC CO. LTD., CR2032 BATTERY. Replacement batteries may be purchased locally. The replacement procedure is shown below.

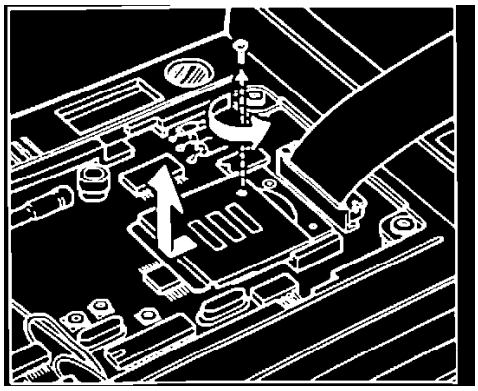
CAUTION: Use of another battery may create the risk of fire or explosion.

REPLACING THE LITHIUM BATTERY:

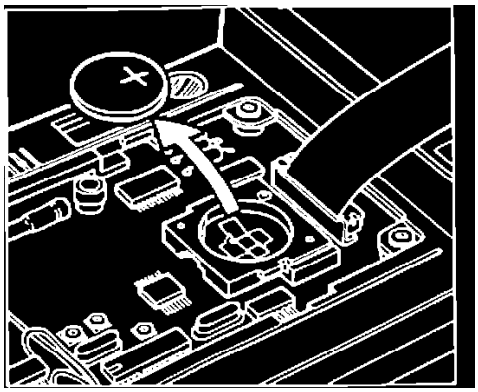
1. Press the power OFF switch.



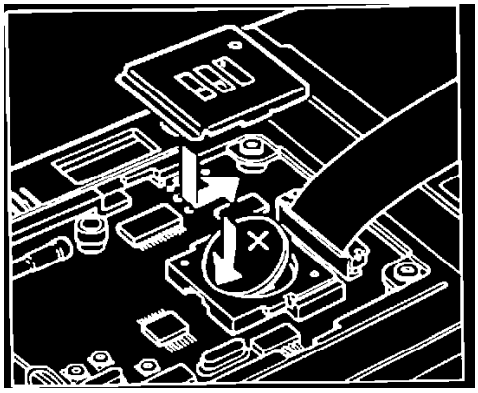
2. Remove the two card reader screws with a phillips screwdriver. Then remove the card reader as shown in the illustration. It is not necessary to disconnect the connector between the card reader and body.



3. Remove the screw on the lithium battery compartment cover with a phillips screwdriver. Then remove the cover by pushing it in the direction of the arrow.



4. Remove the lithium battery.



5. Insert the new lithium battery with the plus and minus terminals correctly positioned. Then press the lithium battery down and replace the battery compartment cover.

6. Press the power OFF switch and reinstall the program card reader.

Technical Service Bulletin # **TS85096** Date: **850827**

Driveline - High/Low Speed Vibration

TS85-096
August 27, 1985
Propeller Shaft & Differential

DRIVELINE VIBRATION, 4X4 TRUCK
APPLIED MODEL
1983.5 - 1986 4x4 720 Truck
SERVICE INFORMATION
Some 4X4 Trucks may exhibit a vibration at two different speed ranges.

A. HIGH SPEED VIBRATION

The high speed vibration, which may be accompanied by booming noise, occurs at 50-60 MPH. This vibration can be described as a continuous buzz in the seat, steering wheel and floor. A rapidly vibrating transfer case lever may also indicate driveline imbalance.

B. LOW SPEED VIBRATION

The low speed vibration occurs at 20-40 MPH. The low speed vibration is similar to the high speed, but with less intensity. Vibration caused by tire imbalance resembles a shaking sensation and should not be confused with driveline vibration. Additional vibration may be caused by having the transfer case in the 4H position or the 2H position with the hubs locked.

Use the following Service Procedure to reduce driveline vibration in incident vehicles. This procedure incorporates portions of, and replaces, the previous driveline vibration bulletin PD84-001 (TS84-001).

NOTE: Any testing or high speed evaluation should be done with the transfer case lever in the 2H position and the hubs unlocked.

Service Procedure

A. HIGH SPEED VIBRATION (50 - 60 MPH)

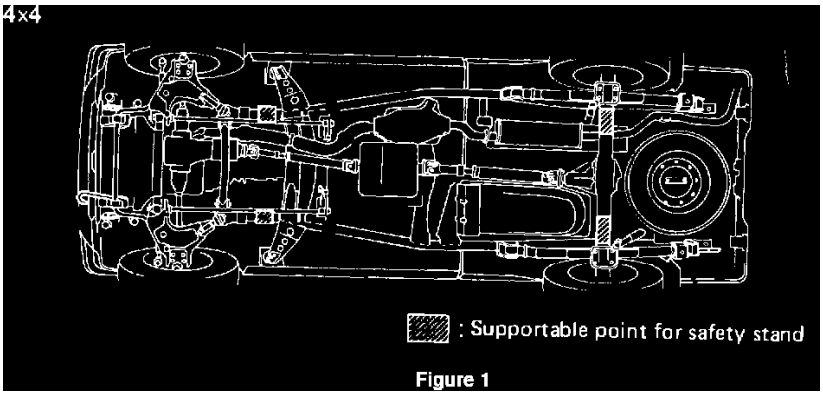


Figure 1

1. Road test the vehicle between 50 and 60 MPH to determine the speed at which the vibration is most noticeable. Record this speed.

2. Support vehicle on an axle hoist at points suitable for a safety stand (Figure 1).

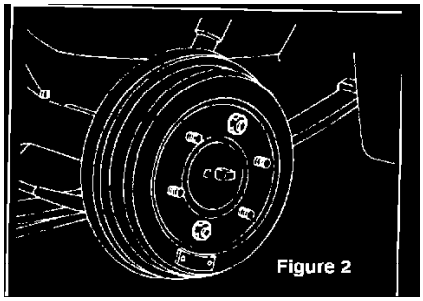


Figure 2

3. Remove both rear tire/wheel assemblies and securely install two (2) nuts to each brake drum (opposite studs) to hold brake drums on axle (Figure 2).
4. With the engine running, place the gear shift lever into fifth gear and have one person slowly bring the indicated speed to that speed noted in Step 1 (or the worst condition speed in the 50-60 MPH range). EXTREME CAUTION should be exercised at this point due to all the rotating surfaces. Stand clear of the rotating brake drums and driveshafts.

WARNING: To prevent injury, any loose articles of clothing (ties, shop rags, coats, etc.) should be safely secured, as should drop light cords, air hoses, electrical extensions, or anything that could contact the rotating surfaces.

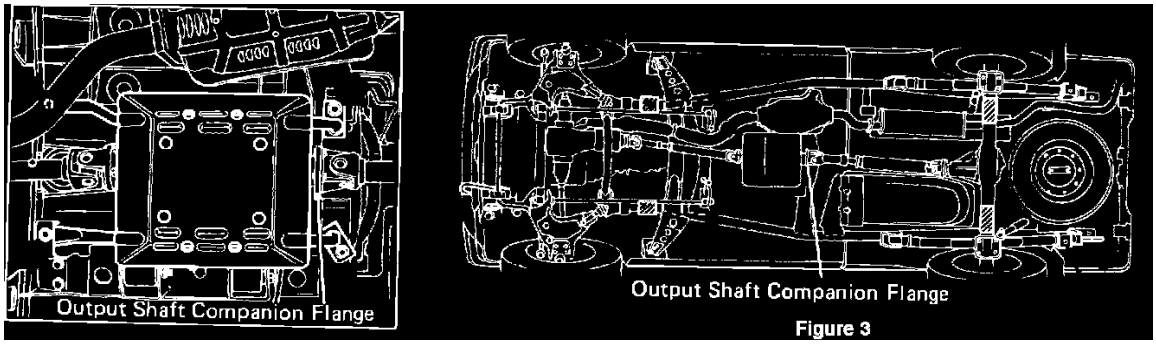


Figure 3

5. Have another person hold a piece of chalk or brightly colored crayon close to, but not touching the machined outer edge of the output shaft companion flange of the transfer case (Figure 3).

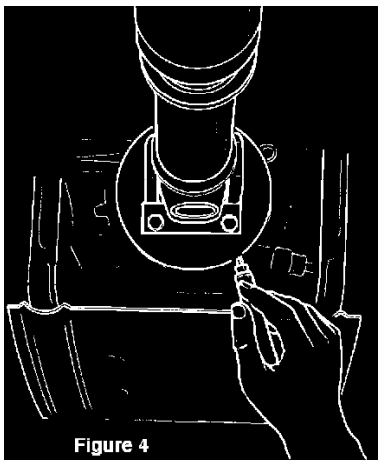


Figure 4

6. With the heel of his hand resting on the skid plate below the transfer case (see Figure 4), carefully bring the chalk or crayon closer and closer to the companion flange until it lightly makes contact. Remove the chalk or crayon and bring the brake drums and driveshaft to a stop. There should now be a mark on the companion flange which would indicate the high point when the shaft is rotating. If there is a solid continuous ring around the companion flange, too much pressure was used on the chalk or crayon. Start over and use sufficient pressure so that only a small portion of the companion flange edge is marked. The marking must be done only at the speed at which the vibration is most noticeable.

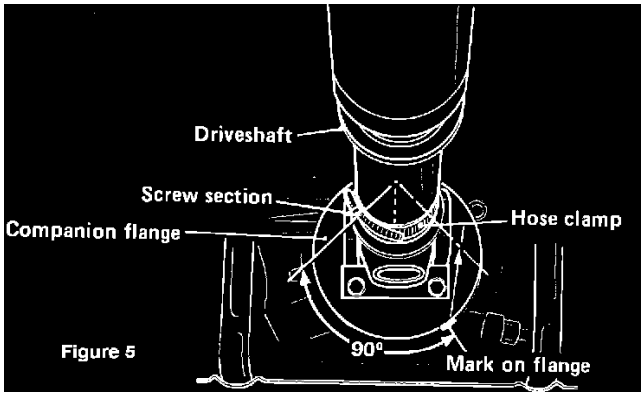


Figure 5

7. Using the mark as a reference point, and place the screw section of a large hose clamp 1/4 clockwise turn (90~ clockwise looking towards front of vehicle) past the mark and properly secure to the driveshaft (see Figure 5).
8. Road test the vehicle.

B. LOW SPEED VIBRATION (20 - 40 MPH)

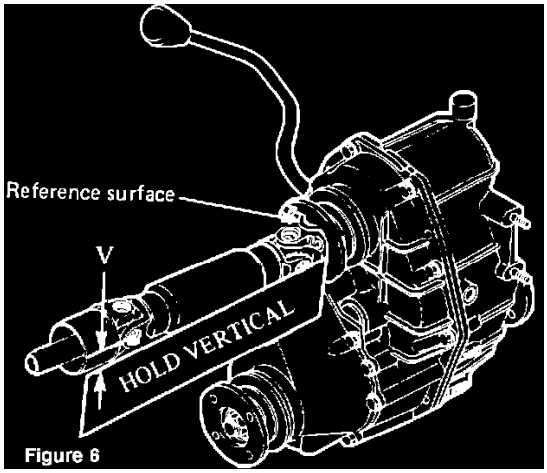


Figure 6

1. Remove transfer case underguard.

2. Measure the distance V (see Figure 6) with a straightedge, using the transfer case as a reference surface. Distance V is the vertical offset of two corresponding U-joints, one on each end of the propeller shaft.

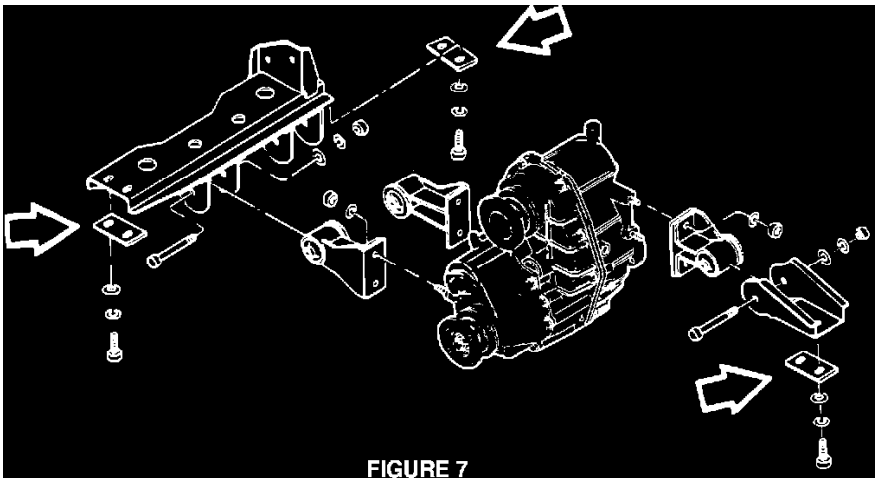


FIGURE 7

3. Install shims of a thickness equal to distance V between transfer case mounting bracket-to-frame (both ends of longitudinal member), for right side transfer mount, and between single bracket and frame for left side transfer mount. The dealer should make the shims from stock, not to exceed 10mm thickness (see Figure 7).

Warranty Information

		CS	PNC	CT	OP CODE	FLAT RATE
A.	High Speed	4S	37000	37	JA99AA	1.0/hr. Vibration
B.	Low Speed	4S	33920	34	HP99AA	1.0/hr. Vibration

Restraint System - Seatbelts Slow to Retract

Classification:
RS01-001A

Reference
NTB01-005A

Date:
October 7, 2004

ALL NISSAN VEHICLES; "D" RING RESIDUE CAN CAUSE SLOW SEAT BELT RETRACTION

This bulletin amends NTB01-005. Please discard all paper copies of the earlier version.

APPLIED VEHICLES:
All Nissan Vehicles with front seat belt "D" rings

IF YOU CONFIRM:

Seat belt retraction of front seat belt(s) is slow, caused by "residue" build-up on the "D" ring(s),

NOTE:
Slow seat belt retraction, if it occurs, may result in the following incidents after the seat belt is unbuckled:

^ Seat belt latch plate hanging up on clothing,

^ Seat belt latch plate becoming caught in the door,

ACTION

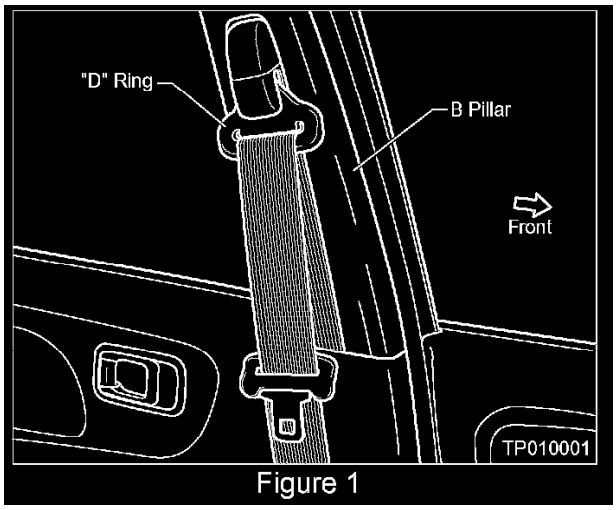


Figure 1

Use the "D" ring cleaning and refurbishing kit to:

^ Clean the residue off of the "D" rings.

^ Apply fluorine resin tape to the "D" rings.

IMPORTANT:
The purpose of "ACTIONS" (above) is to give you a quick idea of the work you will be performing. You MUST closely follow the entire Service Procedure as it contains information that is essential to successfully completing this repair.

DESCRIPTION	PART #	QUANTITY
Seat Belt, Tape Set	87880-79900	1

PARTS INFORMATION

NOTE: This is the ONLY approved repair procedure for this incident. A claim to Nissan for the repair of this incident may be denied if the repair is not performed exactly as outlined in this bulletin.

Submit a Primary Failed Part (PP) line using the following claims coding:

DESCRIPTION	PFP	OP CODE	SYM	DIA	FRT
Clean "D"-ring and apply tape, both sides	87880-79900	VX04AA	ZH	21	0.4

CLAIMS INFORMATION

NOTES:

^ This is the only authorized repair for this incident. DO NOT REPLACE the front driver or passenger seat belt assemblies before first using the Service Procedure in this bulletin to clean the "D" rings.

^ When this incident occurs, both front driver and passenger seat belt "D" rings must be serviced by using the Service Procedure provided in this bulletin.

^ For 1996-99 Pathfinders built before December, 1998, see bulletin NTB00-003 for additional front seat belt retractor assembly information.

SERVICE PROCEDURE

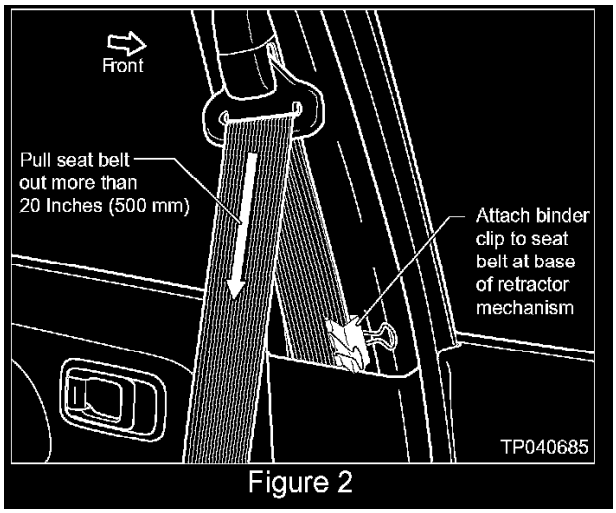


Figure 2

1. Pull the affected seat belt more than 20 inches (500 mm) out of the B pillar seat belt retractor mechanism (see Figure 2).

2. Attach a binder clip (or similar clamping device) to the seat belt at the base of the retractor mechanism to allow for slack in the seat belt (see Figure 2).

CAUTION:
Be careful not to damage the seat belt fabric when attaching or removing the clip.

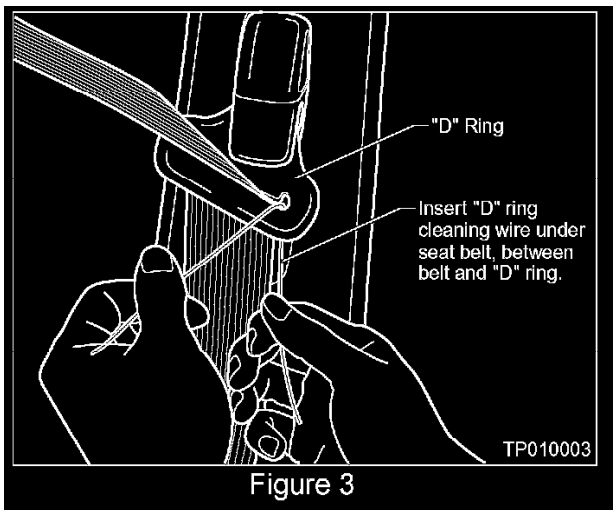


Figure 3

3. Insert the "D" ring cleaning wire under the seat belt; between the belt and the "D" ring (see Figure 3).

^ The "D" ring cleaning wire is provided in the kit that's listed in the Parts Information.

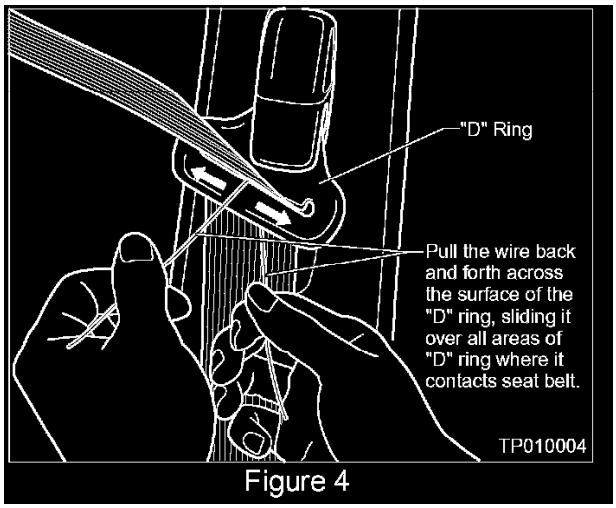


Figure 4

4. Pull the wire back and forth across the surface of the "D" ring.

^ Make sure all residue is removed from the "D" ring in all areas where it contacts the seat belt.

NOTE:

^ It is very important to remove all residue build-up from the "D" ring.

^ If you don't remove all residue buildup, the fluorine resin tape won't stick properly.

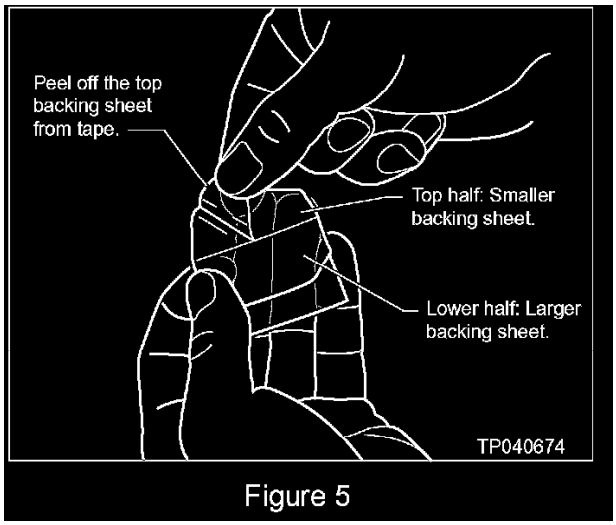


Figure 5

5. Peel off the top (smaller) backing sheet from one of the fluorine resin tapes (see Figure 5).

^ Two fluorine resin tape pieces are provided in the kit.

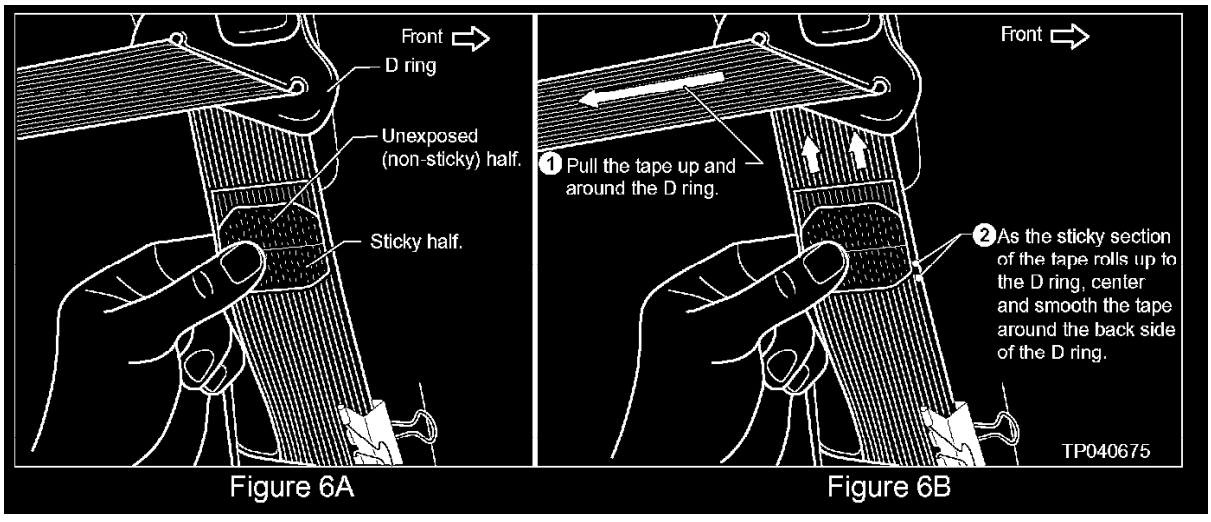


Figure 6A Figure 6B

6. Place the fluorine resin tape (adhesive side toward you) against the seat belt as shown in Figure 6A.

NOTE:

^ The sticky half should be down, toward the floor of the vehicle.

^ The unexposed (not sticky yet) half should be up, toward the ceiling of the vehicle.

7. Pull on the top of the seat belt to roll the tape up and around the "D" ring (see Figure 6B).

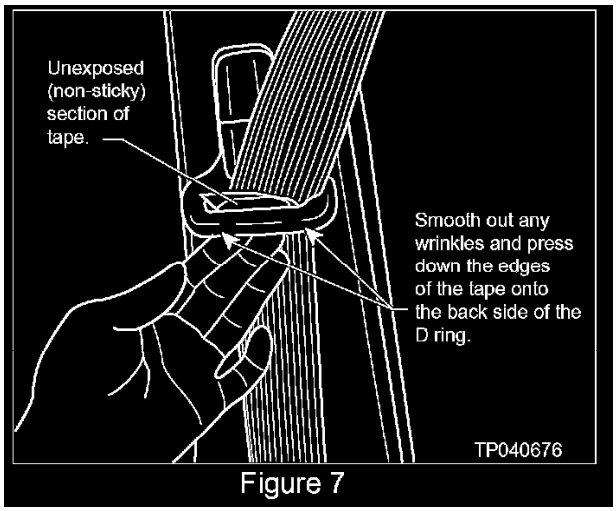


Figure 7

8. As the tape rolls up to the "D" ring, center and smooth the tape around the back side of the "D" ring. Press the bubbles and wrinkles out with your fingers (see Figure 7).

NOTE:

^ Once the fluorine resin tape is applied to the "D" ring, it cannot be repositioned.

^ Take care to properly attach the tape to the "D" ring.

^ Center the tape correctly on the "D" ring and smoothly apply it to the "D" ring surface so that no wrinkles or ridges are present.

^ Wrinkles or ridges in the tape may prevent the seat belt from moving smoothly through the "D" ring. If this should occur, replace the tape with a new piece.

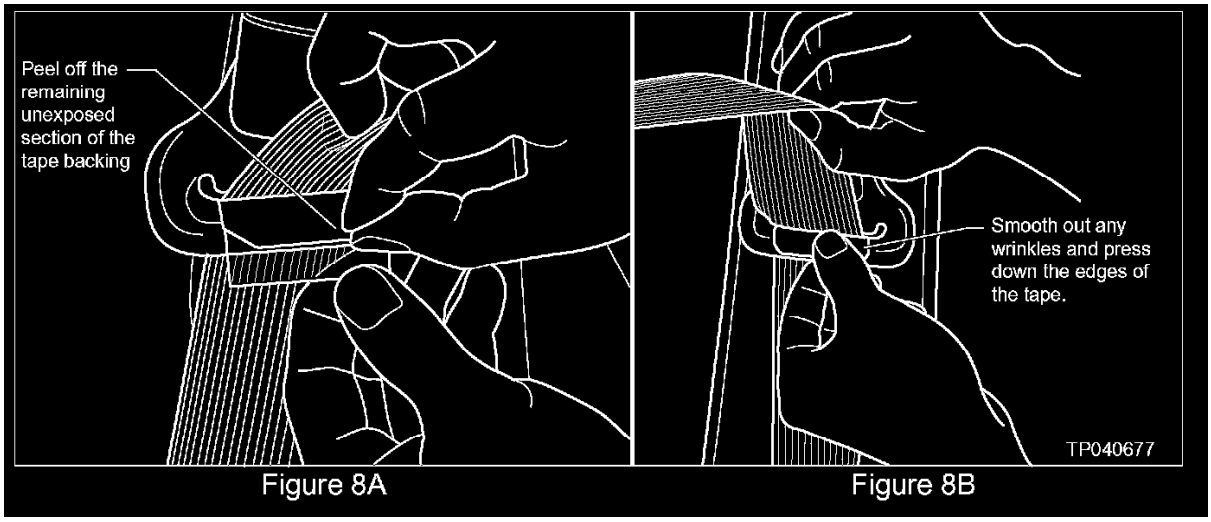


Figure 8A Figure 8B

9. Peel off the remaining tape backing (see Figure 8A).

10. Carefully apply the tape around the remainder of the "D" ring. Press down the edges and make sure there are no wrinkles (see Figure 8B).

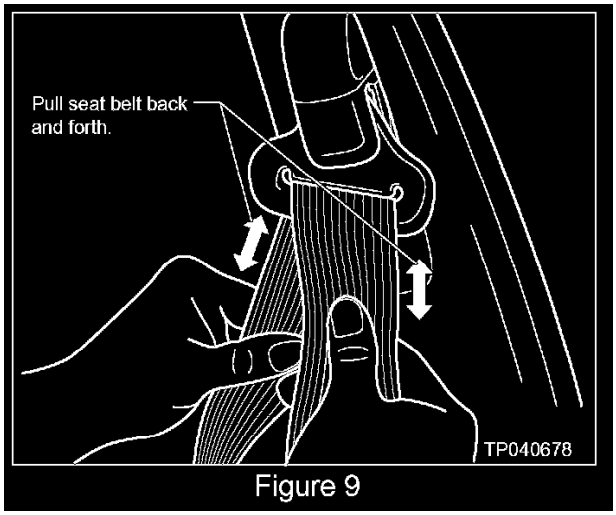


Figure 9

11. Pull the seat belt back and forth against the tape-covered "D" ring to ensure that the tape is firmly applied (see Figure 9).

12. Remove the binder clip from the seat belt.

13. Confirm the seat belt moves smoothly and quickly through the "D" ring.

    ^ Latch and unlatch it. Allow it to retract back into the retractor mechanism several times.

14. Repeat steps 1 through 13 on the remaining front seat belt.

Technical Service Bulletin # **BF87017** Date: **870518**

Windshield - Repair Kit

Models All Models

Section Body & Frame

Classification BF87-017

Bulletin No. TS87-085

Date May 18, 1987

WINDSHIELD REPAIR KIT, P/N 999V1-U5000

SERVICE INFORMATION

Windshield Sealant Kit, P/N 999V1-U5000, is available for use during windshield repair and/or replacement procedures on all Nissan models.

The following points should be noted regarding this kit:

1. Each kit will provide for complete installation of one windshield.

2. This kit uses 3 step primer preparation instead of 2 step primer method detailed in current Nissan Service Manuals.

3. All CAUTIONS and WARNINGS should be carefully observed, including those on shelf-life.

Starting on page 2/5 of this Technical Bulletin is a copy of the instruction sheet contained in this sealant kit. These instructions detail the kit components and their use. Procedures reflecting the use of the three primer method will be incorporated in future printings of Nissan Service Manuals. Make the following note in the WINDSHIELD AND WINDOWS Section of your copies of each model Service Manual:

"See Technical Bulletin BF87-017 (TS87-085) for revised Sealant Kit instructions"

REPAIR KIT COMPONENTS

ITEM	QUANTITY
Urethane Tube (558.02)	1
Primer Bottle # 1 (435.18)	1
Primer Bottle # 2 (435.20)	1
Primer Bottle # 3 (435.34)	1
Dabber	1
1/4" Brush	2
Nozzle	1
Chem Wipe	1

GENERAL CAUTIONS FOR KIT USE

^ Before opening the kit, read all instructions thoroughly, particularly the Warnings and Cautions.

^ In addition to the procedures described in this instruction sheet, refer to the appropriate model Service Manual for windshield removal, assembly and other pertinent instructions.

^ All primer containers must be shaken well before use.

^ Keep primers and sealants in a cool, dry place. When not in use, container and tube caps must be securely in place.

WARNINGS

^ The materials included in this kit are for commercial use only. Keep away from heat, sparks and flame.

^ The materials in this kit are harmful if swallowed, and may irritate skin and eyes. Avoid contact with the skin and eyes. If swallowed, CALL FOR A PHYSICIAN IMMEDIATELY. In case of skin contact, wipe off excess material, then wash with soap and water. If material gets in your eyes, flush with water for 15 minutes. Consult a physician, if necessary.

^ Use in an open, well ventilated location. Avoid breathing the vapors. They can be harmful if inhaled, causing possible lung irritation and/or allergic respiratory reactions. If affected by inhalation, move to an area with plenty of fresh air, then consult a physician if necessary.

SHELF-LIFE CAUTION

Shelf-life of this product is limited to six months after the date of manufacture. Carefully adhere to the expiration date printed on each container and do not store in high temperature or high humidity areas.

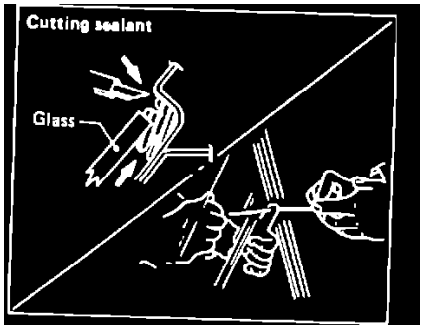


FIGURE 1

SERVICE PROCEDURE

1. Cover interior and exterior areas with protective covering to avoid damage and reduce cleanup.

2. Remove both windshield wiper arms, all interior and exterior moldings.

3. Remove the windshield (Figure 1). If necessary, use an electric hot knife (Kent Moore Hot Knife J-24709-1 or equivalent) to cut the adhesive material from the glass.

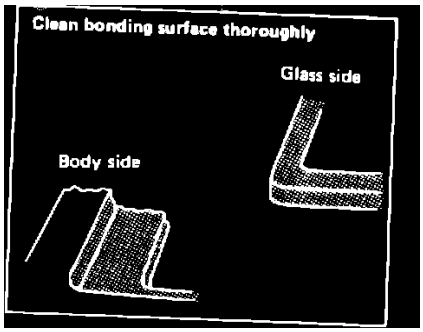


FIGURE 2

4. Thoroughly clean the bonding surfaces (Figure 2). If necessary, trim excess sealant from around the rubber spacers. This will allow for a good fix when the new sealant is applied.

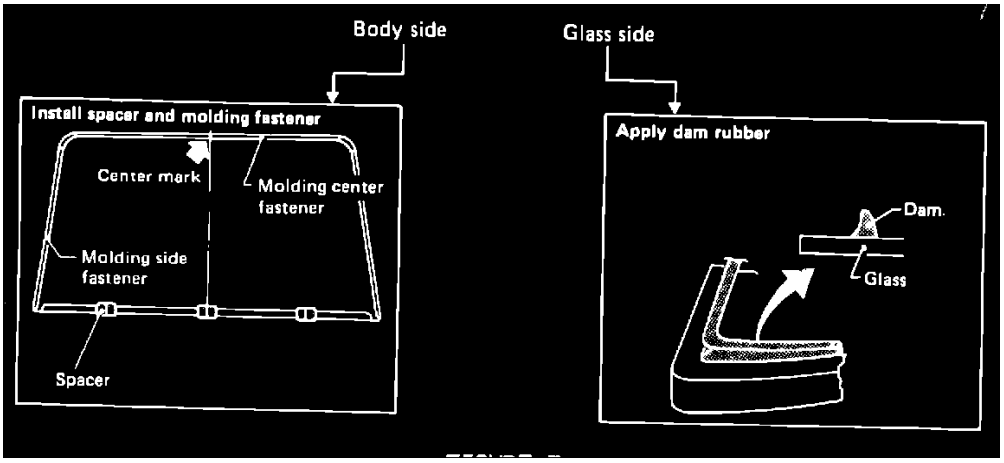


FIGURE 3

5. Install spacers, moldings and rubber dam as required (Figure 3).

NOTE: Kits containing Genuine Nissan window retainer components for various Nissan models are available from your Nissan dealer. Refer to the appropriate model Service Manual for installation specifications.

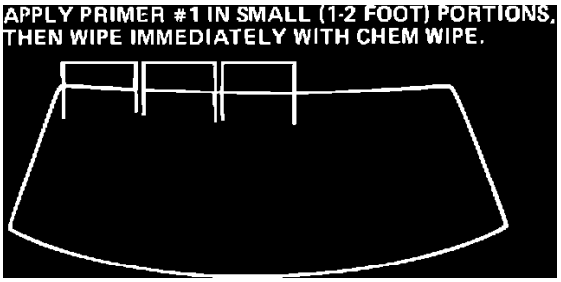


FIGURE 4

6. Using the wool dabber, apply Cleaner-primer bottle # 1 around the windshield edge Figure 4. The primer sets very quickly and must be wiped off while still wet (within seconds of application). Do only 1 or 2 feet of the windshield edge at a time, then quickly wipe clean with the chem wipe provided in the kit. DO NOT touch after cleaning.

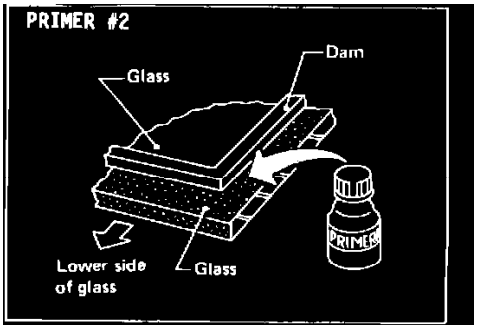


FIGURE 5A

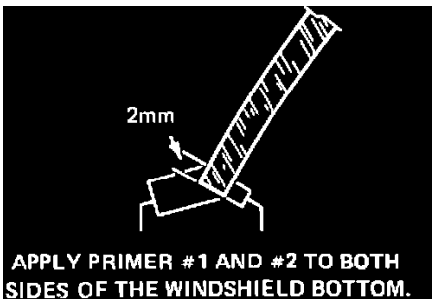


FIGURE 5B

7. Using the small brush in the kit, apply primer bottle # 2 to the top and side windshield edges and lower surfaces (Figure 5a),and to both sides of the lower edge as indicated (Figure 5b).

CAUTION: Let primer dry, DO NOT touch primed surfaces.

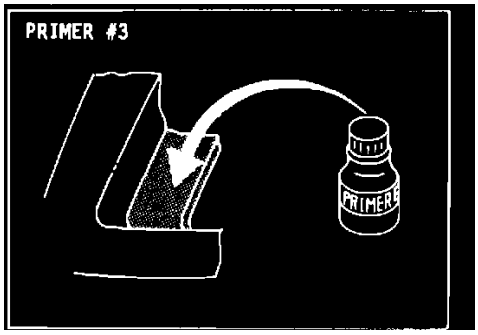


FIGURE 6

8. Using the second small brush in the kit, apply primer bottle # 3 to the body/paint surface at the areas indicated (Figure 6).
CAUTION: Let dry for 15 minutes. Do not touch primed surfaces.

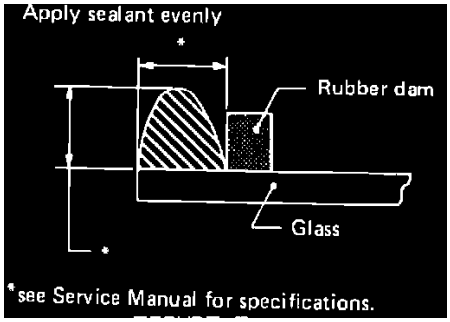


FIGURE 7

9. Cut the urethane applicator tip at an angle. Only about 1/3 of the tip head should be cut away to allow for proper sealant distribution. Apply a bead of adhesive around the perimeter of the windshield (Figure 7).

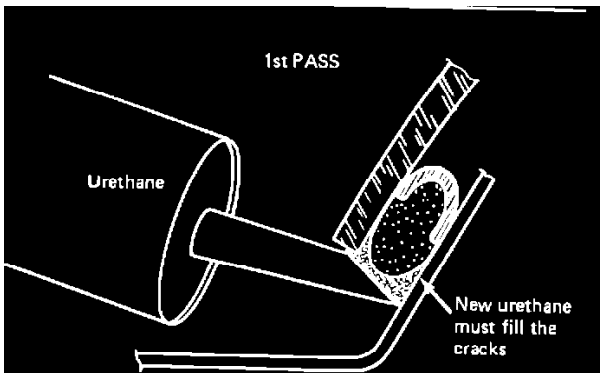


FIGURE 8

10. Set the glass in place, pressing lightly and evenly around the edges.

11. After the windshield is in place, apply additional urethane adhesive along the windshield bottom edge making sure that it fills the cracks around the original adhesive (Figure 8).

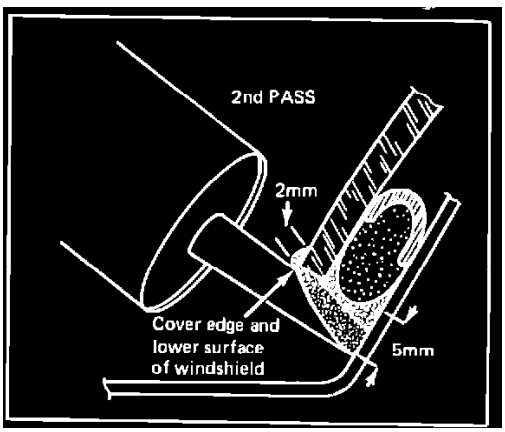


FIGURE 9

12. Make a 2nd pass to widen the base and cover the edge and surface (2 mm) of the windshield (Figure 9) Adhesive should extend at least 5 mm outside the edge of the windshield.
13. Water test the windshield using the procedure found in the appropriate model Service Manual.

14. Install the windshield moldings.

15. Install the windshield wipers. Be certain to follow all special cautions found in the appropriate model Service Manual when installing the wipers.

16. Test wiper operation to ensure that they function properly.

Technical Service Bulletin # **92083** Date: **921008**

Maintenance - Cleaning Power Antenna & Wiper Blades

Models: See below
Section: Electrical
Classification: EL92-011
Bulletin No.: NTB92-083
Date: October 8, 1992

MAINTENANCE OF POWER ANTENNA AND WIPER BLADES

APPLIED MODELS:
All with Power Antenna; All Vehicles [Wiper Blades].

SERVICE INFORMATION:

1. Maintenance of Power Antenna

It is recommended that the Power Antenna rod, in its extended position, be periodically wiped with a clean, soft, dry cloth. This is the most current information from the factory concerning proper periodic maintenance of the Power Antenna.

I. Maintenance of Wiper Blades

1. To clean the rubber wiper blades, it is recommended to use a clean, soft, wet cloth [the cloth should be moistened with washer liquid].

2. Before lowering the wiper blades onto the glass, it is advised to first clean the glass area swept by the wiper blade. Use an appropriate, commercially-available glass cleaner and either paper towels or a lint-free towel.

NOTE:
If the vehicles you service are subject to ice and snow formation on the front or rear windshields, you may recommend to your customers that wiper blade effectiveness, during these environmental conditions, may be optimized, if both snow and ice are removed prior to operating the wiper system(s).

Technical Service Bulletin # **BF88012** Date: **880815**

Mirrors - Installation of Glass On Door Mirror

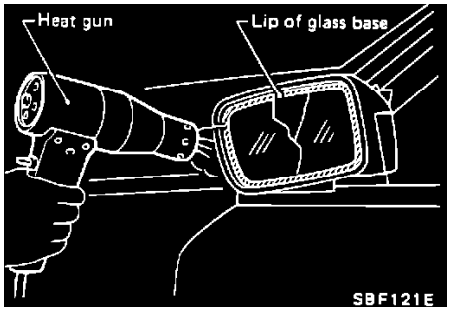
Classification: Section:
BF88-012 Body & Frame
Reference TECHNICAL BULLETIN TS88-101
Models:
All
Date:
August 15, 1988
INSTALLATION OF GLASS ON DOOR MIRROR

APPLIED MODELS: All, except D21

SERVICE INFORMATION

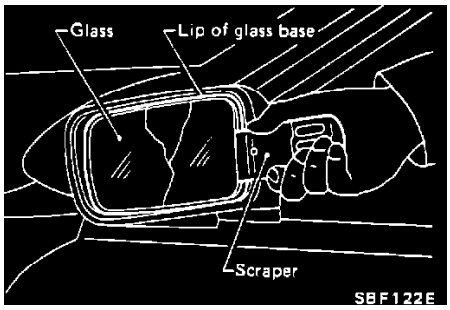
To improve serviceability, a glass replacement is now available when replacing broken glass on the door mirrors. Use the following installation procedure.

PRECAUTIONS:
^ Take care when removing the glass.
^ Do not use excessive force.
^ Because of the difference between left and right mirrors, ensure that the proper replacement is used.
^ Prepare 700 - 1,OOOW heat gun.

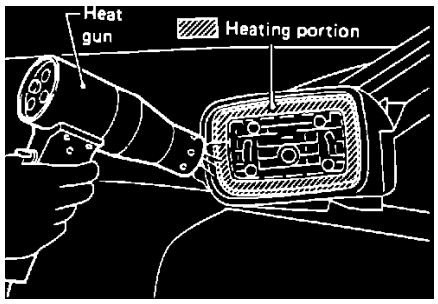


Removal

^ Warm up lip of glass base with heat gun.

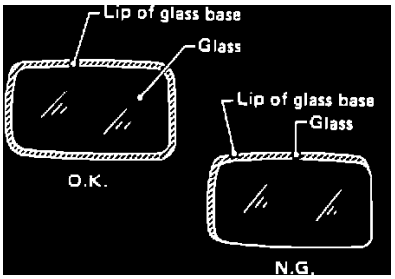


^ Remove glass from glass base with scraper.



Installation

^ Before installing new glass, remove adhesive tape from base.
^ Warm up lip of base and back of new glass.



^ Put new glass on warmed lip of glass base. CAUTION:

Put glass on lip evenly; if not done properly, it is possible to damage the glass and glass base.
PARTS INFORMATION

PART NAME	NEW PART NO.	FORMER PART NO.
Replacement glass (L)	See pages 3 and 4	N/A
(R)	N/A	N/A

PART NUMBER SPECIFICATION	APPLIED MODEL	APPLIED DATE
SENTRA (B11) 1982-1986		
96365-D1216 (RH)	OP: S (XE)	2/82-11/82
	OP: S(STD, DX)	9/83-
	OP: W(DX), C(DX)	9/83-
	W(XE), C(XE)	9/83-
96365-D1100 (RH)	OP: S(DX), W, C	2/82-11/82
96365-D1110 (RH)	OP: S(DX)	11/82-9/83
	OP: W	11/82-2/83
	OP: W(DX, XE), C(DX, XE)	2/83-9/83
	OP: C	2/82-2/83
96366-D1100 (LH)	S, W, C	2/82-11/82
96366-D1110 (LH)	S, W	11/82-9/83
	C	11/82-2/83
	C(DX, XE)	2/83-9/83
96366-D1216 (LH)	S, W(DX), C(DX, XE)	9/83-
SENTRA B12) 1987-		
96365-D4500 (RH)	4S(XE), 4S(GXE), W(XE), W(GXE), 2S(XE), C, HB	1/86-
96366-67M01 (LH)	4S(XE), 4S(GXE), W(XE), W(GXE), 2S(XE), HB(XE), C	1/86-
PULSAR (N12) 1983-1986		
96365-D1110 (RH)	HB	8/82-
96365-D1216 (RH)	C	8/82-
96366-D1110 (LH)	HB	8/82-
96366-D1216 (LH)	C	8/82
PULSAR (KN13) 1987-		
96365-D4500 (RH)	ALL	9/86-
96366-67M01 (LH)	All	9/86-
200SX (S12) 1984-		
96365-07F00 (RH)	CA20E (GL)	10/83-
96366-07F00 (LH)	CA20E (GL)	10/83-

PART NUMBER	SPECIFICATION	APPLIED MODEL	APPLIED DATE
STANZA (T11) 1982-			
96365-D1100 (RH)	T=1.9 Flat	OP: All	1/83-9/83
96365-D1110 (RH)	T=3.0 Flat	OP: All	9/83-
96365-D1216 (RH)	T=3.0, R=1000. w/Caution	OP: All	9/83-
96365-D1610 (RH)	T=3.0 Flat tinted	OP: All	1/83-7/83
96365-D1615 (RH)	T=3.0 Flat w/Caution tinted	OP: All	7/83-
96365-D1615 (RH)	T=3.0 R=100, w/Caution tinted	OP: All	7/83-9/83
96366-D1100 (LH)	T=1.9 Flat	All	1/83-9/83
96366-D1110 (LH)	T=3.0 Flat	All	9/83-
96366-D1216 (LH)	T=3.0 Flat Chrome Mirror	OP: All	9/83-
96365-D1615 (LH)	T=3.0 Flat Tinted	OP: All	1/83-7/83
96366-D1615 (LH)	T=3.0 Flat Tinted	OP: All	7/83-
STANZA (T12) 1987-			
96365-D4500 (RH)		All	1/86-
96366-67M01 (LH)		All	1/86-
STANZA WAGON (M10) 1986-			
96365-D1216 (RH)		All	3/85-
96366-D1216 (LH)		All	3/85-
300ZX (Z31) 1984-			
96365-07F00 (RH)		SF, SS, GL	7/83
96366-07F00 (LH)		SF, SS, GL	7/83-
PATHFINDER (WD21) 1987-			
96365-07G00 (RH)		OP: SE	7/86-
96366-07G00 (LH)		OP: SE	7/86-
VAN GC22) 1987-			
96365-17C10 (RH)		W	9/86-
96366-17C10 (LH)		W	9/86-
MAXIMA (U11) 1985-			
96365-15E00 (RH)		All	7/84-
96366-15E00 (LH)		All	7/84-

DOOR MIRROR REPLACEMENT GLASS

Technical Service Bulletin # **GI86001** Date: **860114**

Engine - Winter OIl Recommendations

Models All Models

Section General Information

Classification GI86-0001

Bulletin No. TS86-002

Date January 14, 1986

WINTER ENGINE OIL, ALL MODELS

This bulletin highlights engine oil specifications to be used during the winter months.

SAE VISCOSITY NUMBER

Gasoline Engine

- ^ 5W-30 oil is acceptable for use when the outside temperature is below 60~F (16~C). 5W-30 oil MUST be used if the outside temperature drops below 0~F(-18~C).
- ^ 10W-30 (preferred) or 10W-40 oil may be used if the outside temperature NEVER drops below 0~F(-18~C).
- ^ NEVER use a straight weight oil (e.g. 30) in a gasoline engine.

Diesel Engine

- ^ 5W-30 oil is acceptable for use when the outside temperature is below 60~F (16~C). 5W-30 oil MUST be used if the outside temperature drops below 0~F(-18~C).
- ^ 10W-30 oil may be used if the outside temperature NEVER drops below 0~F(-18~C).
- ^ 15W-40 oil may be used if the outside temperature NEVER drops below 20~F(-7~C).
- ^ 30 oil may be used if the outside temperature NEVER drops below 32~F(0~C).

ENGINE OIL SPECIFICATIONS

Non-Turbo Engine	API SF (Energy Conserving Oils)*
Turbo Engine	API SF/CC or SF/CD**
Diesel Engine	API SE/CC, SF/CC, SE/CD, SF/CD or CD

*Non-energy conserving oils or API SE grade oils can also be used in 1982 and before models.

**API SE grade oils can also be used in 1983 and before models.

Technical Service Bulletin # **GI86024** Date: **860730**

Engine - Oil Refill Capacity Correction

Models All Models

Section General Information

Classification GI86-024

Bulletin No. TS86-139

Date July 30, 1986

ENGINE OIL REFILL CAPACITY

This bulletin contains a listing of the approximate engine oil refill capacities of all Nissan models. The capacities indicated in the table represent the actual refill capacity with and without an oil filter change, taking into account the oil remaining in the oil pan at the time of refill.

As a precaution, since refill capacity changes slightly depending on oil temperature and drain time, use these values as a reference and be certain to check the oil level with the dip stick after refill.

NOTE: Page MA-36 of the 1986 720 Truck Service Manual gives an incorrect oil capacity for Federal and California SD-25 engines. Please correct this information by hand using the specifications found on page GI-20.

MODEL		ENGINE	UNIT: U.S. qt (liter) WITH OIL FILTER CHANGE	WITHOUT OIL FILTER CHANGE
Pulsar NX (N12)		E16	3 3/8 (3.2)	3 (2.8)
Sentra (B11)		E16	3 3/8 (3.2)	3 (2.8)
		CD17	4 1/4 (4.0)	3 3/8 (3.2)
Sentra (B12)		E16	3 3/8 (3.2)	3 (2.8)
		CD17	4 1/4 (4.0)	3 3/8 (3.2)
Stanza Sedan (T11)		CA20	3 3/4 (3.5)	3 1/4 (3.1)
Stanza Sedan (T12)		CA20	3 3/4 (3.5)	3 1/4 (3.1)
Stanza Wagon (M10)		CA20	3 3/4 (3.5)	3 1/4 (3.1)
200SX (S12)		CA20, CA18T	3 7/8 (3.6)	3 3/8 (3.2)
300ZX (Z31)		VG30	4 1/4 (4.0)	3 7/8 (3.6)
Maxima (U11)		VG30	4 1/2 (4.3)	4 1/8 (3.9)
720 Truck	2WD	Z20, Z24	3 7/8 (3.7)	3 3/8 (3.2)
		SD25	5 7/8 (5.5) 6 (5.7)*	5 1/8 (4.8)
	4WD	Z24	4 1/4 (4.0)	3 3/4 (3.5)
D21 Truck	2WD	VG30i	4 1/4 (4.0)	3 7/8 (3.6)
		Z24i	4 (3.8)	3 1/2 (3.3)
		SD25	7 3/8 (7.0)	7 1/2 (6.2)
	4WD	VG30i	3 5/8 (3.4)	3 1/8 (3.0)
		Z24i	5 1/8 (4.8)	4 3/4 (4.5)

*California models.

APPROXIMATE ENGINE OIL REFILL CAPACITY

Technical Service Bulletin # **95017** Date: **950208**

Engine - Oil Level and Grade, Driveability

Classification:
EM95-01

Section:
Engine Mechanical

Reference:
Technical Bulletin NTB95-017

Date:
February 8, 1995

ENGINE OIL LEVEL AND GRADE

APPLIED VEHICLES:
All

SERVICE INFORMATION

The cause of some driveability incidents is incorrect oil level or viscosity. Whenever you evaluate a vehicle for a driveability problem, check the oil level first. (It is a good practice to check oil level on

every vehicle that you work on.)

Overfilling may cause engine vibration or valve train clatter on vehicles with hydraulic lash adjusters due to oil aeration when the crankshaft hits the oil. Using the wrong viscosity oil can cause rough or low idle resulting from improper operation of the hydraulic lash adjusters.

When you add or change the engine oil, follow the service manual recommendations regarding proper oil fill level. Do not overfill the crankcase. If you find a vehicle to be overfilled with oil, drain the excess oil and dispose of properly. Remember to wait ten (10) minutes after refilling before checking. This allows time for the oil to drain back to the pan.

Always use the proper viscosity oil specified by the service manual for the temperature range in your geographic area. The viscosity specifications ensure proper engine operation and best engine efficiency.

Technical Service Bulletin # **EM90009** Date: **901018**

Coolant Tester - Calibration

Classification: Section:
EM90-009 Engine Mechanical
Reference:
Technical Bulletin NTB90-093
Models:
All
Date:
October 18, 1990
COOLANT TESTERS

BACKGROUND INFORMATION:
Evaluations have shown that some after-market coolant testers displayed inaccurate readings which were, in some cases, off by as much as 10~F.

SERVICE INFORMATION:
When coolant concentrations are in question, the following advice is recommended to dealers:

1. Select a name-brand tester, preferably from a specialty tool supplier.

2. Prior to usage, calibrate the coolant tester:
   - ^ Prepare a "known" mixture of exactly 50% fresh anti-freeze and exactly 50% fresh water. Keep this mixture in a clean, sealed container to use for calibration purposes.
   - ^ To calibrate a coolant tester, draw from the above "known" mixture when it is at room temperature (65-75~F). Use a "Magic Marker" to place a mark on the coolant tester for the "known" 50/50 mixture.
   - ^ Also, be sure that the coolant you wish to test is between 65-75~F. This means that you may have to wait for the temperature of the coolant to fall within this range.

     NOTE: During extremely hot weather, it may be impractical to wait for the coolant to fall within the 65-75~F range. However, the coolant tester can be re-calibrated for the new, "hot weather" temperature using the "known" 50/50 mixture - provided both this 50/50 mixture and the coolant are at ambient temperature.

3. Measure the vehicle's coolant concentration using the calibrated mark on the coolant tester as an indication of a proper 50/50 solution.

   NOTE: Technicians should be equally concerned if the coolant concentration is too high as well as too low. High coolant concentrations reduce the ability of the coolant to transfer heat, which, in some cases, may lead to over-heating. In extreme cases, the coolant can sludge and restrict flow in the radiator.
4. After use, clean the tester by flushing it with fresh water.

   NOTE: Testing has shown that, if not properly cleaned, a non-soluble residue remains on the bouyant devices of the tooters after drying. This residue can effect the density of the bouyant devices and, consequently, effect the tester's accuracy.

If there are any further questions regarding coolant concentrations, please contact your Technical service Manager (TSM). The TSM's have access to laboratory-grade hydrometers.

Technical Service Bulletin # **89015** Date: **890209**

A/T - Slow Shift, Replacing ATF

Models All Models

Section Automatic Transmission

Classification AT89-002

Bulletin No. TS89-015

Date February 9, 1989

A/T SLOW SHIFT

APPLIED MODELS:
All Nissan Models equipped with automatic transmission or transaxle

SERVICE INFORMATION

During cold weather, the automatic transmission or transaxle may shift slowly until the vehicle warms up to normal operating temperature.

This condition can be improved by replacing the Factory fill transmission fluid with NISSANMATIC "C" automatic transmission fluid, available by ordering Part Number 999MP-A7013QT through the Genuine Nissan Motor Oil/ATF Program.

NOTE: This product is not recommended for use in Power Steering application.

Technical Service Bulletin # **87-172** Date: **871123**

A/T - Cleaning Components/Overhaul

REFERENCE:
TS87-172

CLASSIFICATION:
AT87-008

DATE:
November 23, 1987

TITLE:
CLEANING AUTOMATIC TRANSMISSION COMPONENTS

APPLIED VEHICLE(S):
All Nissan models equipped with automatic transmission or transaxle

SERVICE INFORMATION

Under severe service, some automatic transmissions or transaxles may become contaminated with burned fluid, clutch and brake material, or metal particles, all of which can cause reduced efficiency or damage. If the damage is not so extensive as to warrant transmission overhaul, use the procedures to clean the contaminants out of the hydraulic system components before replacing the fluid.

CONDITION	A/T COMPONENTS INCLUDING CONTROL VALVE BODY	TORQUE CONVERTER	OIL COOLER AND PIPING
Burned oil.	1. In-vehicle fluid change/flush OR 2. Disassemble component parts, flush with clean solvent. Air dry. (Do not use compressed air).	1. In-vehicle fluid change/flush OR 2. Solvent clean using torque converter cleaning machine. (May be done by an AT rebuilder.)	Flush with solvent and compressed air CAUTION: Use only filtered air at a pressure of 25 p.s.i. or less.
Clutch and brake material in oil.	Disassemble component parts, flush with clean solvent. Air dry. (Do not use compressed air).	Solvent clean using torque converter cleaning machine. (May be done by an AT rebuilder.)	Flush with solvent and compressed air CAUTION: Use only filtered air at a pressure of 25 p.s.i. or less.
Metal particles in oil.	1. Disassemble component parts, flush with clean solvent. Air dry. (Do not use compressed air). 2. If a lot of metal particles are found, replace control valve body.	Replace torque converter.	Flush with solvent and compressed air CAUTION: Use only filtered air at a pressure of 25 p.s.i. or less.

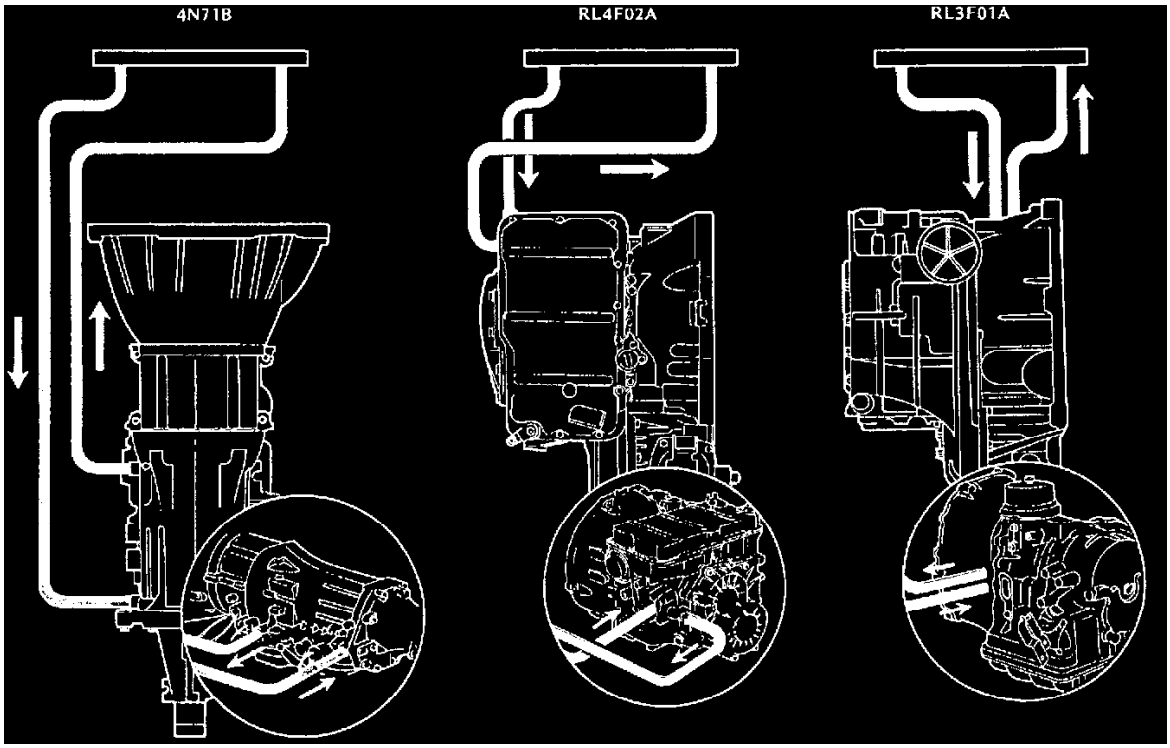
SERVICE PROCEDURE

- In-vehicle fluid change/flush
- Heat exchanger cleaning procedure

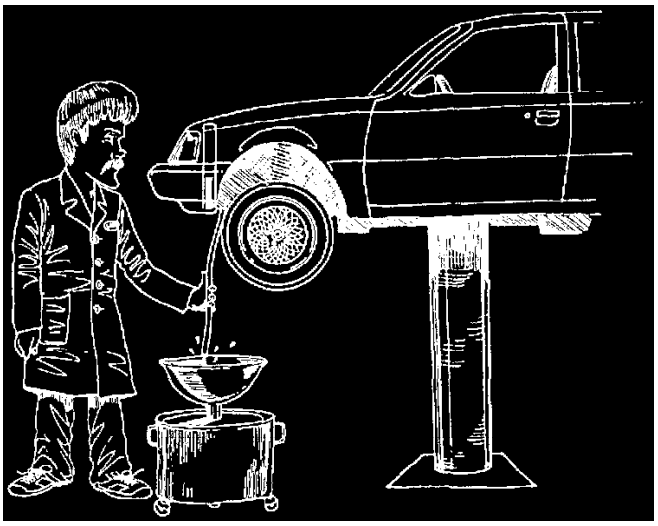
In-Vehicle Fluid Change/Flush

IN-VEHICLE FLUID CHANGE/FLUSH

If the transmission or transaxle is contaminated with burned oil or clutch and band material, all fluid, including the fluid in the torque converter, must be changed and the transmission flushed out. Drain and replace the old fluid and use the following procedure to flush the assembly.

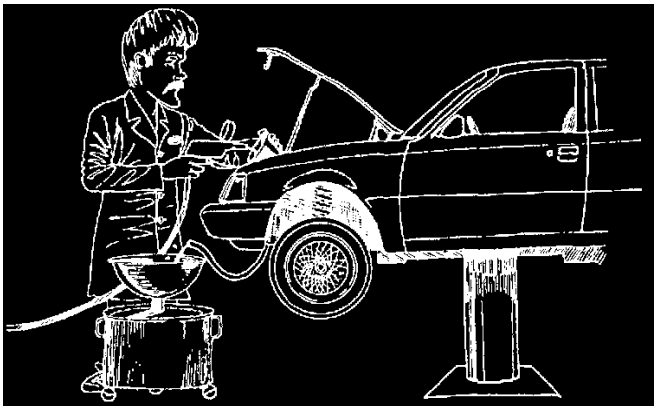


1. Disconnect the transmission oil cooling lines at the radiator heat exchanger.



2. Block the transmission oil return line. Connect a rubber line to the disconnected transmission oil "out" line and place the rubber line into a suitable oil drain pan.

3. Start the engine and allow the vehicle to run at idle in "PARK." Oil will now be discharged out of the transmission oil cooler line.



4. Place a filler funnel into the transmission filler tube and slowly fill the transmission with new automatic transmission fluid. Replace the fluid at approximately the same rate that it is discharged out of the oil cooler line. This will be about 3 or 4 quarts per minute.

   CAUTION: DO NOT ALLOW THE TRANSMISSION TO RUN OUT OF FLUID. DAMAGE TO INTERNAL COMPONENTS COULD RESULT.

5. Run the engine and allow the flushing process to continue until the fluid discharged out of the oil cooler line is clear. This will require a total of about 7 quarts of fluid flushed through the system.

6. Stop the engine and perform the Oil Cooler/Heat Exchanger Cleaning Procedure.

7. After the flushing is completed, re-connect the oil cooler lines. Restart the engine and check for transmission fluid level. Refill as necessary.

Heat Exchanger Cleaning Procedure

OIL COOLER/HEAT EXCHANGER CLEANING PROCEDURE

If contaminants are found in the automatic transmission, there will also be contaminants in the oil cooler. Therefore, the cooler must be flushed or the materials that are present will find their way into the clean transmission. To flush the heat exchanger, use clean solvent in the following procedure.

1. Connect two long hoses (approximately 4') onto the radiator heat exchanger fittings.

2. Place one end of the hose onto the solvent discharge line of your shop solvent tank.

3. Run the second line back into the solvent tank.

4. Start the pump on the solvent tank and allow the solvent to flow for a minimum of ten minutes.

5. Disconnect the hoses at the radiator heat exchanger. Blow the heat exchanger out with compressed air at low pressure (10 psi maximum). Then reinstall the automatic transmission cooler lines.

Technical Service Bulletin # **ATRATB028** Date: **901001**

A/T - Engine Vacuum Testing

BULLETIN: # 028

DATE: October 1990

SUBJECT: Engine Testing With A Vacuum Gauge

TRANSMISSION: All

Engine Testing With A Vacuum Gauge

ENGINE/TRANSMISSION RELATIONS

An important part of transmission diagnosis is to make certain the engine operates properly. If the engine performance is incorrect, the transmission will receive the wrong information.

The engine sends signals to the transmission through a vacuum line, throttle cable or both. These signals basically synchronize torque with transmission line pressure, shift feel and shift timing.

Malfunctions in items like the air filter, spark plugs, EGR valves and other parts of the fuel, electrical and emission systems could result in improper transmission performance.

VACUUM GAUGE ENGINE PERFORMANCE TESTING

A vacuum gauge shows the difference between outside atmospheric pressure and the amount of vacuum present in the intake manifold.

The pistons in the engine serve as suction pumps and the amount of vacuum they create is affected by the related actions of:

- Piston rings
- Valves
- Ignition system
- Fuel control system
- Other parts affecting the combustion process (emission devices, etc.).

Each has a characteristic effect on vacuum and you judge their performance by watching variations from normal.

It is important to judge engine performance by the general location and action of the needle on a vacuum gauge, rather than just by a vacuum reading. Gauge readings which may be found are as follows:

NORMAL ENGINE OPERATION

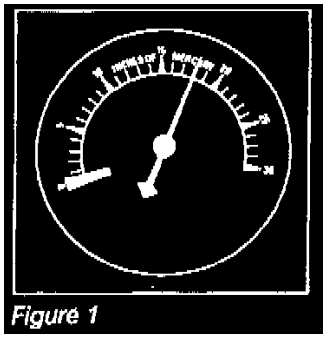


Figure 1

At idling speed, an engine at sea level should show a steady vacuum reading between 14" and 22" HG. A quick opening and closing of the throttle should cause vacuum to drop below 5" then rebound to 23" or more. See figure 1.

GENERAL IGNITION TROUBLES OR STICKING VALVES

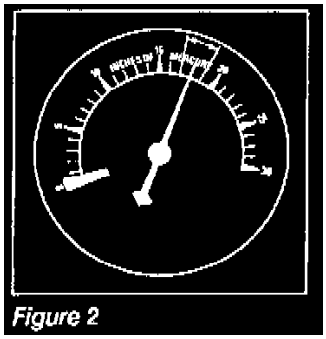


Figure 2

With the engine idling, continued fluctuation of 1 to 2 inches may indicate an ignition problem. Check the spark plugs, spark plug gap, primary ignition circuit, high tension cables, distributor cap or ignition coil. Fluctuations of 3 to 4 inches may be sticking valves. See figure 2.

INTAKE SYSTEM LEAKAGE, VALVE TIMING, OR LOW COMPRESSION

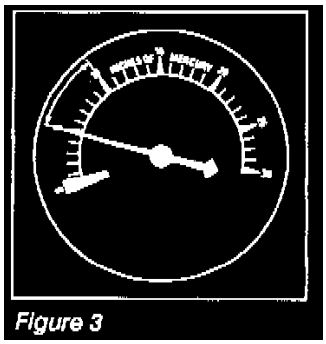


Figure 3

A vacuum reading at idle much lower than normal can indicate leakage through intake manifold gaskets, manifold-to-carburetor gaskets, vacuum brakes or the vacuum modulator. Low readings could also be very late valve timing or worn piston rings. See figure 3.

EXHAUST BACK PRESSURE

Starting with the engine at idle, slowly increase engine speed to 3000 RPM, engine vacuum should be equal to or higher than idle vacuum at 3000 RPM.

If vacuum decreases at higher engine RPM's, an excessive exhaust back pressure is probably present.

CYLINDER HEAD GASKET LEAKAGE

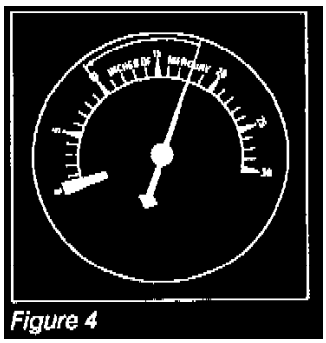


Figure 4

With the engine Idling, the vacuum gauge pointer will drop sharply, every time the leak occurs. The drop will be from the steady reading shown by the pointer to a reading of 10" to 12" Hg or less. If the leak Is between two cylinders, the drop will be much greater. You can determine the location of the leak by compression tests. See figure 4.

FUEL CONTROL SYSTEM TROUBLES

All other systems in an engine must be functioning properly before you check the fuel control system as a cause for poor engine performance. If the pointer has a slow floating motion of 4 to 5 inches - you should check the fuel control.

BULLETIN RECAP

- ^ Engine problems can affect transmission performance.
- ^ If you suspect an engine problem, connect a vacuum gauge to the intake manifold.
- ^ Note the location and action of the vacuum gauge needle.

^ Use the information in the bulletin to determine the engine problem.

^ Correct the engine problem before doing extensive calibration work on the transmission.

Technical Service Bulletin # **ATRATB053** Date: **910601**

A/T - Overdrive Planetary Burn Up

TRANSMISSION: L4N71B, E4N71B & JM600

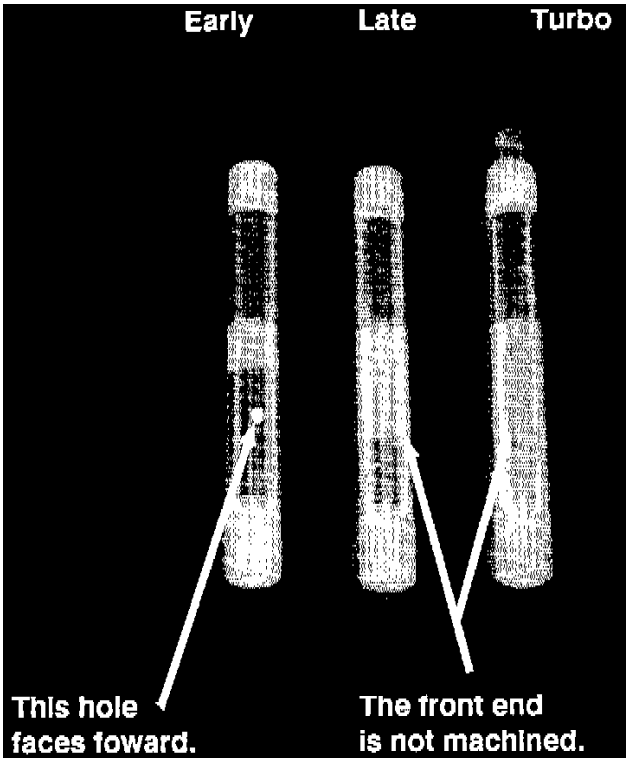
BULLETIN: # 053

SUBJECT: O.D. Planetary Burn up

APPLICATION: Nissan

DATE: June 1991

OVERDRIVE PLANETARY BURN UP



If you have an L4N71B, E4N71B or a JM600 with a burnt up planetary, make sure you don't have the intermediate shaft in backwards. Figure 1 shows all three types of intermediate shafts.

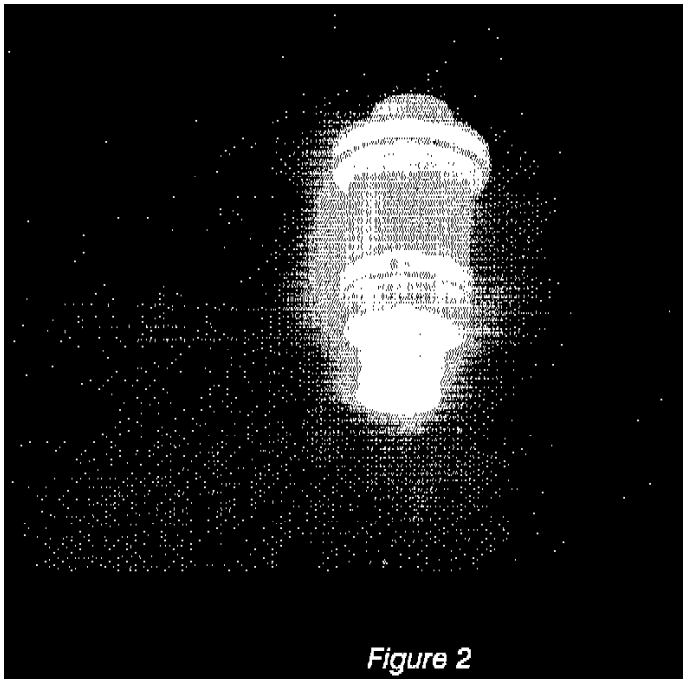


Figure 2

The next thing you'll want to do is make sure you have a .250" gap in the 3-4 accumulators' lower sealing ring. (Figure 2)

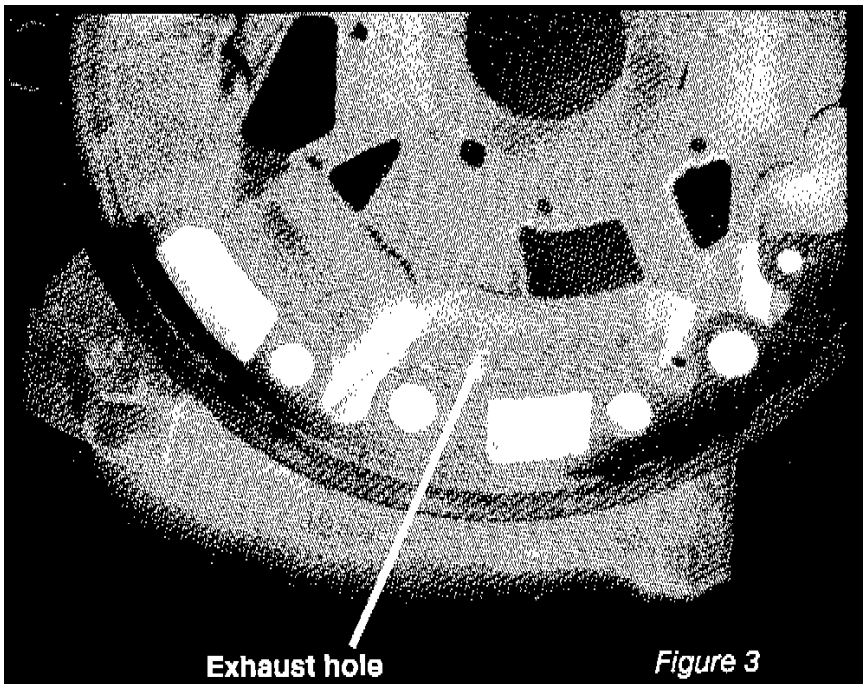


Figure 3

This was a factory modification that allows line pressure to bleed out an exhaust hole (figure 3) to add extra lube to the planet.

Note

Early accumulators do not have this gap, you'll have to cut the sealing ring yourself. When you do this you'll need to use a heavier spring. A pump slide from a 700-R4 will work just fine.

Technical Service Bulletin # **ATRATB062B** Date: **910701**

A/T - E4N71B, 4N71B & JM600 Overdrive Check Balls

TRANSMISSION: E4N71B, 4N71B & JM600

BULLETIN: # 062B

SUBJECT: Overdrive Check Balls

APPLICATION: Nissan/Dodge/Mitsubishi

DATE:July 1991

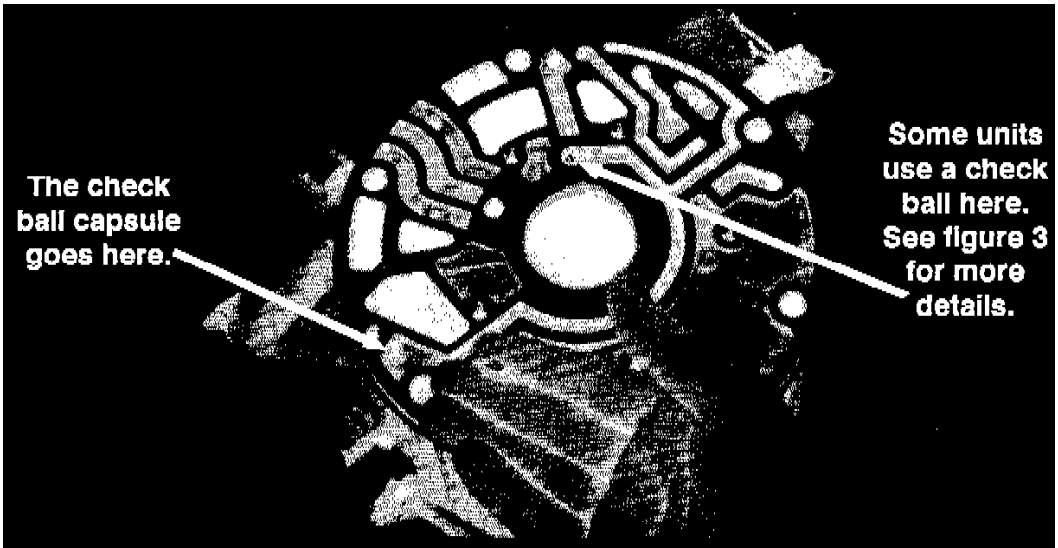


Figure 1

If the overdrive section has a sprag, put the capsule in with the pointed side out. If you don't have a sprag, the pointed side goes in. Putting the capsule in the wrong way can give you a flare-up or a bind-up on the 3-4 shift.

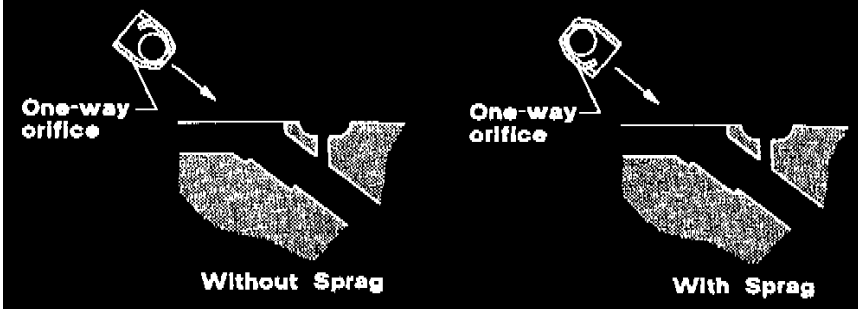


Figure 2

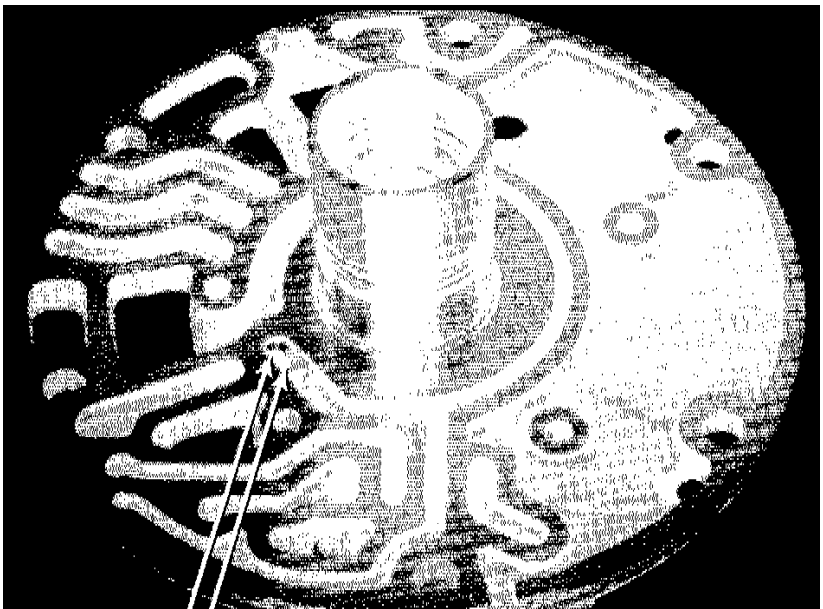


Figure 3

If your support has two holes here, put a check ball in the overdrive housing. See figure 1.

Check Ball Locations In The Overdrive Section

Technical Service Bulletin # **ATRATB078** Date: **911101**

A/T - How To Use A Pressure Gauge

BULLETIN : # 078

SUBJECT: Pressure Gauge

APPLICATION: Misc.

DATE: November 1991

HOW TO USE A PRESSURE GAUGE

A significant number of calls we receive involve improper pressures, so we need to use a pressure gauge when diagnosing problems.

Using a pressure gauge can seem like a formidable task. The reason most people do not use a pressure gauge is because they do not see the value in using one. Technicians do not see the value because the gauge readings do not tell them how to fix the problem. This article will attempt to show the technician how to interpret pressure gauge readings so the technician can find the fix to the problem.

	SLOW IDLE	FAST IDLE	WOT
P			X
R			
N			X
D			
3			
2			
1			

Figure 1

It is best to start pressure tests with mainline pressure. Mainline pressure should be checked in each range: P, R, N, D, 3, 2, 1. Each range, except Park and Neutral, should be checked under three conditions: Slow idle, fast idle, and wide open throttle. A form, as in figure 1 should be made to record the readings.

If all pressures are within specification at slow idle then the pump and pressure regulator are functioning properly.

If all pressures are low at slow idle, it indicates a potential problem in the pump, pressure regulator, filter, low fluid, or internal leakage. To help verify where the problem is, check pressures at fast idle. If all the pressures now read normally, it usually indicates a worn pump but the problem could still be internal leaks.

Internal leaks will usually show up in a particular range. For example a forward clutch leak would have normal pressure in Park, Reverse and Neutral but have low pressure in all forward ranges. A direct clutch leak will show a pressure drop when the transmission shifts to third and low pressure in reverse because in most cases, the direct clutch is on in third and reverse.

A restricted filter will usually show up as a gradual pressure drop at higher engine RPM because the filter cannot pass as much fluid as the pump is trying to draw.

A stuck pressure regulator valve will show up as fixed line pressure which means the same pressure all the time. The pressure may vary with engine RPM which means low pressure at slow RPM and higher pressure at higher RPM. There will be no boost in pressure from the TV or modulator system and no reverse boost.

If pressures are high at slow idle it indicates a pressure regulator or throttle pressure problem. On most cars, the modulator controls throttle pressure. If the transmission has a throttle pressure tap, it will tell you if the throttle pressure circuit is the problem. On GM units without a throttle pressure tap, remove the TV plunger. If line pressure is now normal then it's a TV problem, if not it's a pressure regulator problem.

Pressures also need to be checked at stall or wide open throttle (WOT). When doing a stall test, always observe safety precautions such as checking for broken mounts or bad brakes. Testing should always be done under operating conditions. To do a stall test, put the selector in the range to be tested and with one foot firmly on the brake, press the accelerator to the floor then note your pressure reading. Some technicians will pull the vacuum line off or pull the TV cable with the engine at fast idle. That is not operating conditions and will not detect a problem of trapped vacuum or a cable problem.

If all pressure at stall are low, then you should pull the TV cable to maximum or disconnect the vacuum line. If the pressures are now OK, the problem is in the cable or vacuum system. If the pressures are still low, then the problem is in the pump or control system.

If all pressures at stall are high, then look at the idle pressures. If the idle pressures are also high then this could be a pressure regulator or throttle

system problem. If idle pressures are normal then the problem is in just the throttle system.

The reverse stall test is also a maximum pump output test. If you suspect a weak pump then this test will help find it. Often this will show up as low pressure at reverse stall but all other pressures including idle will be normal. If a person wanted to become really proficient with a pressure gauge they should first put a pressure gauge on their own vehicle and leave it there for exactly one week. Every time they drive the car they should watch the gauge. After one week, they should then put the pressure gauge on every single car in the shop that DOES NOT have a problem. Don't use the gauge on cars WITH problems yet. After 30 days of using a gauge on units that work properly, they can then start using the gauge on units with problems. The technician is accustomed to normal readings, abnormal readings will stand out like a sore thumb.

To fix today's transmissions, every professional technician must be proficient in the use of a pressure gauge. The only way to gain this proficiency is to use the pressure gauge daily. Practice makes perfect.

Technical Service Bulletin # **ATRATB113** Date: **920501**

A/T - E4N71B, L4N71B, 4N71B No 4th Gear

TECHNICAL BULLETIN # 113

TRANSMISSION: E4N71B, L4N71B, 4N71B

SUBJECT: NO 4TH Gear

APPLICATION: Nissan, Mazda, Mitsubishi

DATE: May 92

A complaint of no 4th gear may be caused by several factors. Follow this step by step procedure to help isolate the problem.

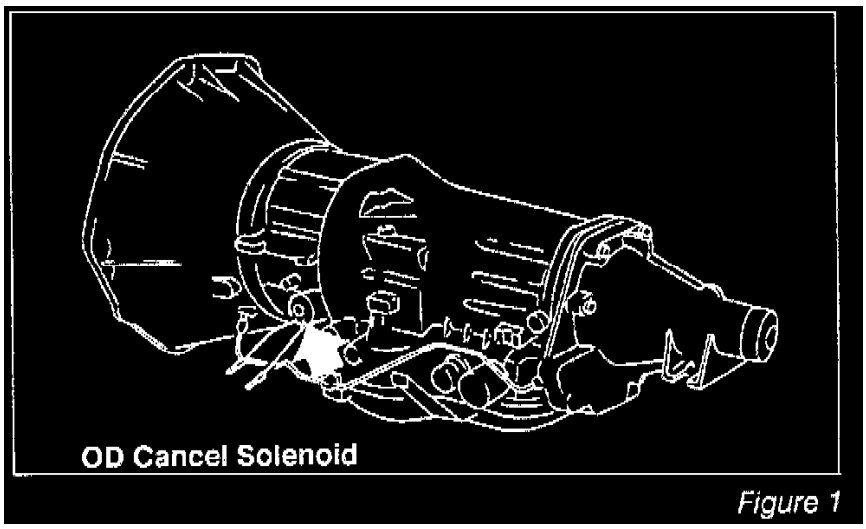


Figure 1

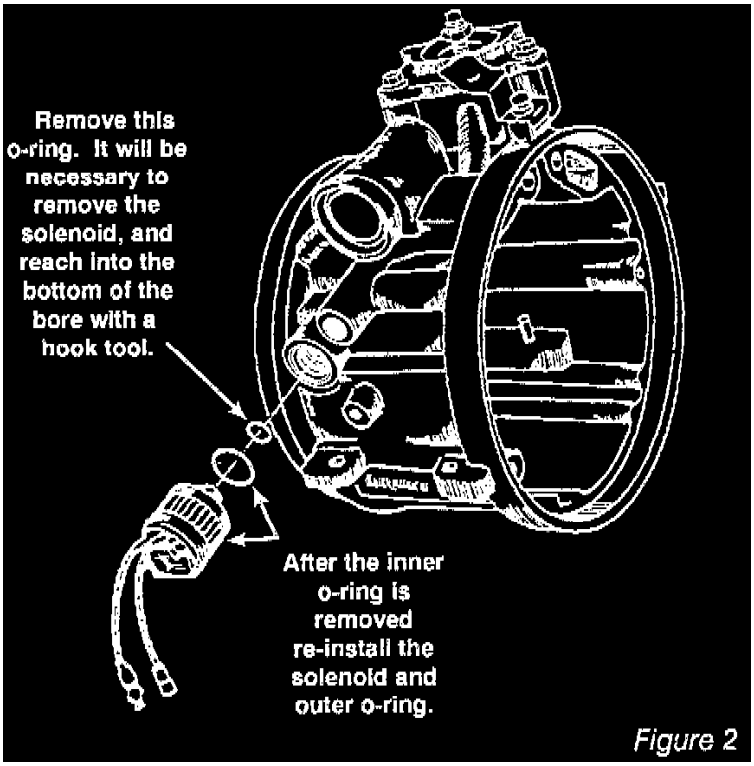
[STEP 1]
Disconnect the wire (or wires) to the overdrive cancel solenoid. If you have no 4th gear with the wires disconnected go to Step 2. If you have 4th gear with the wires disconnected, a vehicle electronics problem is indicated. Since the electronics involved are vastly different for each vehicle, refer to the proper year service manual for the electronics trouble-shooting procedure. The O/D cancel solenoid is located on the O/D housing.

SERVICE INFORMATION: UNIT IDENTIFICATION

The 4N71B is a 4 speed non-lock-up transmission. It has an O/D cancel solenoid and kickdown solenoid. There were relatively few of these units produced.

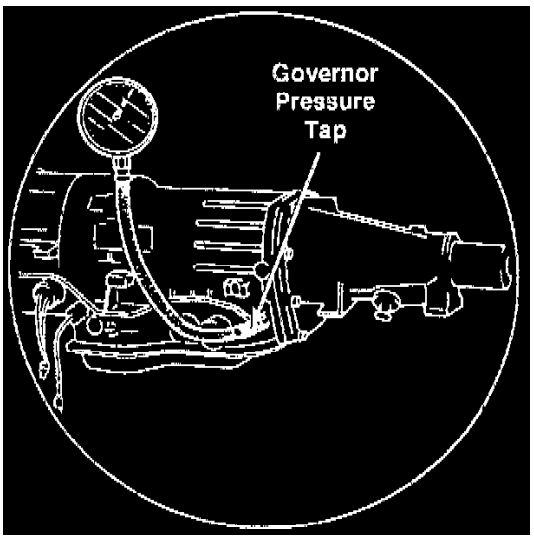
The L4N71B is a 4 speed lock-up transmission. It has an O/D cancel solenoid and kickdown solenoid. It also has a tube on the left side which feeds governor pressure from the rear of the case to the bell housing, to control the lock-up valve.

The E4N71B is a 4 speed lock-up transmission. This unit has an O/D cancel solenoid, kickdown solenoid, and a lock-up solenoid. The E4N71B is the only model of the series with a solenoid on the bell housing.



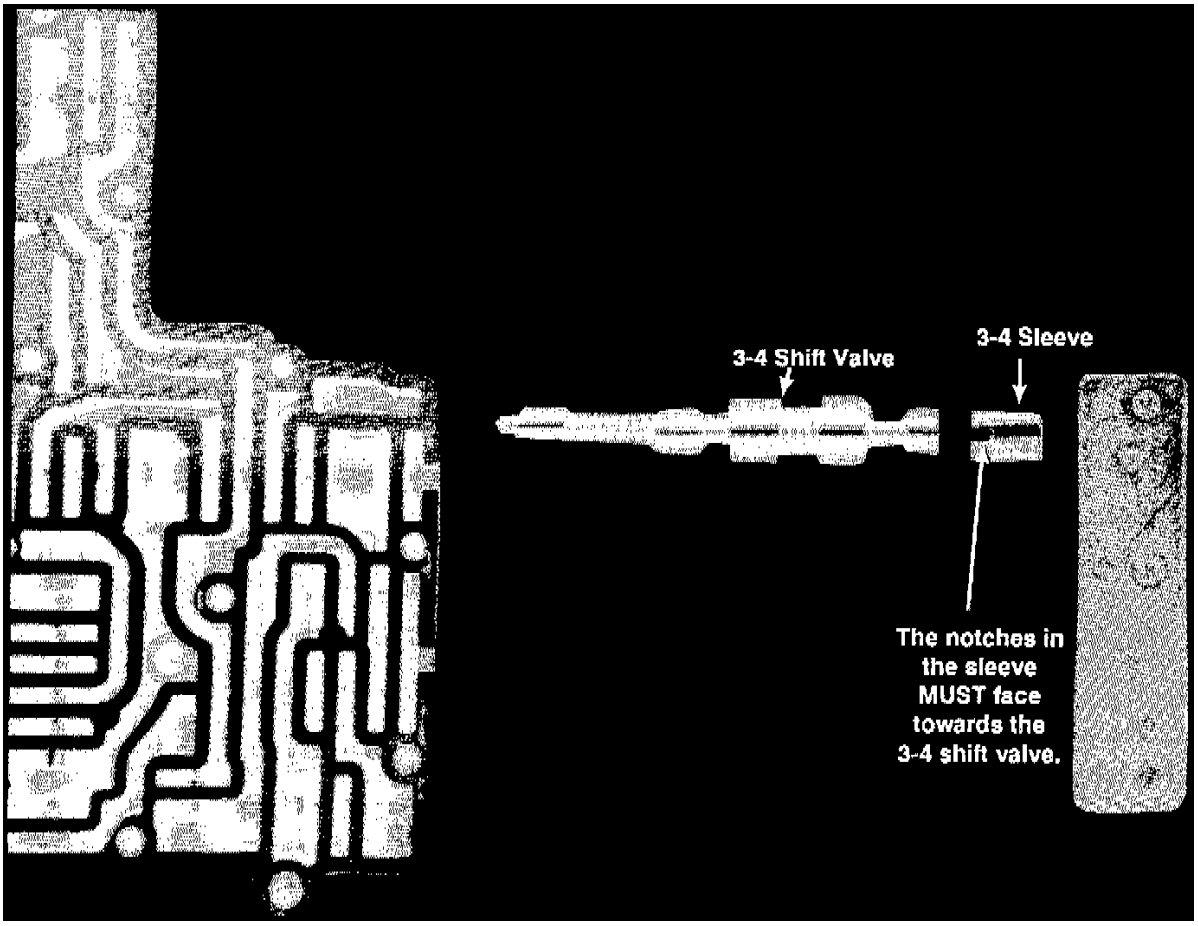
[STEP 2]
Remove the inner O-ring from the O/D cancel solenoid and road test the vehicle. (Figure 2) If you still have no 4th go to step 3.

If you do have 4th the O/D cancel solenoid is defective. You will also notice that when the transmission shifts to 4th, the O/D cancel switch will not cancel O/D. Don't be alarmed by this as the solenoid is disabled for this test.



[STEP 3]
Check governor pressure. Governor pressure should be APPROXIMATELY the same as miles per hour (15mph = 15 PSI, 30 mph = 30 PSI etc...) The governor pressure tap is on the left rear of the case.

If governor pressure is substantially lower than miles per hour, check the governor and governor circuit. If governor pressure rise is OK go to step 4.



[STEP 4]
Remove the valve body and locate the 3-4 shift valve train. Make sure the 3-4 shift valve isn't stuck and make sure that the sleeve isn't installed backwards.
If the valve is stuck or the sleeve is backwards repair as required.

Note
Many manuals (factory and aftermarket) show the sleeve to be installed incorrectly. When the sleeve is installed backwards, governor pressure is blocked from reaching the 3-4 shift valve.

The above procedure will locate the most common problems. Other possible problems are:

1. Stuck overdrive cancel valve (located in drum support)
2. Defective Servo
3. Defective Band

Technical Service Bulletin # **ATRATB8748** Date: **870801**

A/T - Slipping or No-Shift/Metal Sealing Rings

TSB 87-48 (Aug)

SUBJECT: Metal sealing rings

Various Units

PROBLEM: Slipping, or sometimes no-shift

POSSIBLE SOLUTION: Sealing rings could be under-size.

1. Always inspect rings as outlined in SIL 84-29

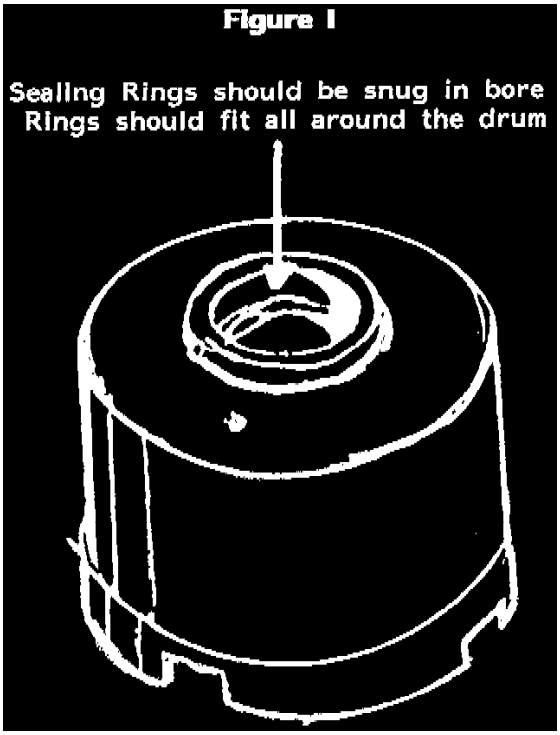
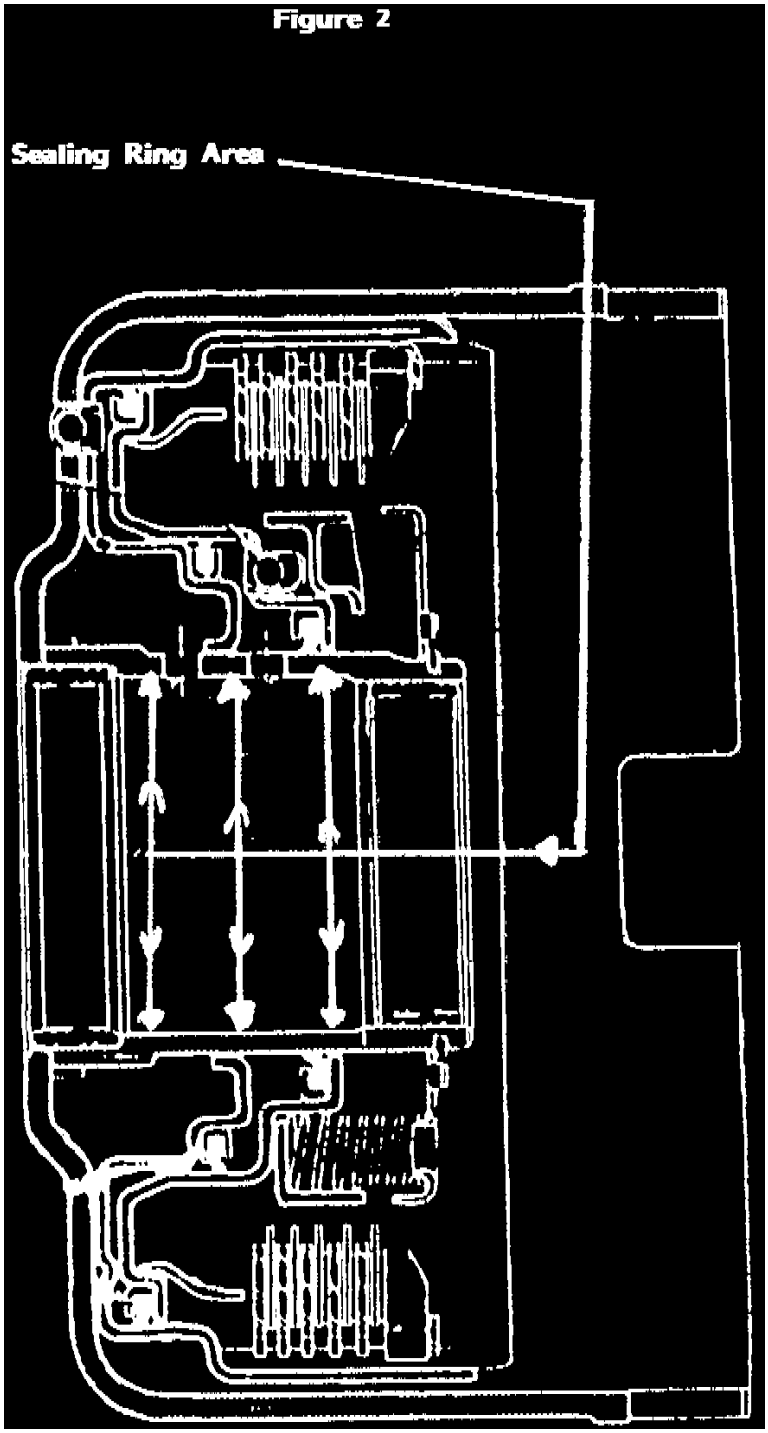


Figure 1
Sealing Rings should be snug in bore
Rings should fit all around the drum



2. Place ring in bore of drum where they will be running. (See Figures 1 & 2)

3. Sealing rings should be snug in bore; rings should fit all around the drum. (drum could be out-of-round)

4. Air check all drums. (Use 30 PSI air pressure only.) If air escapes you have leaks -- better find now, than later. This represents lost clutch pressure, and could result in soft application and burned friction material.

5. Following these steps will help you save money, plus help you build better units.

Technical Service Bulletin # **ATRATB8754** Date: **870901**

A/T - Front Bushing Wear

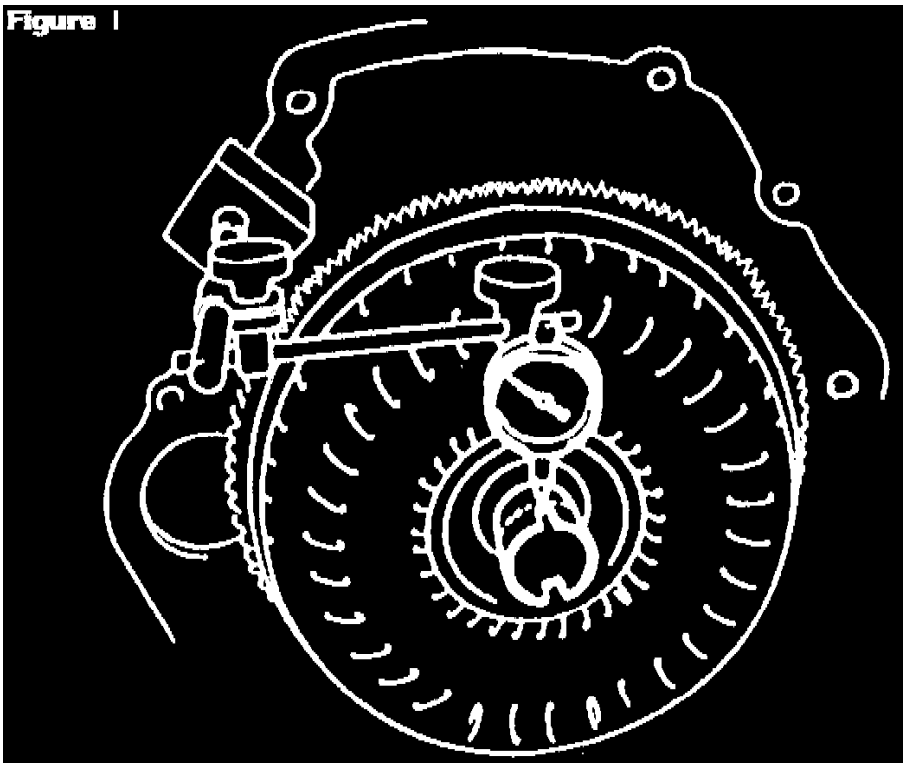
TSB 87-54 (Sept)

SUBJECT: ALL AUTOMATICS

PROBLEM: Front Bushing Wear

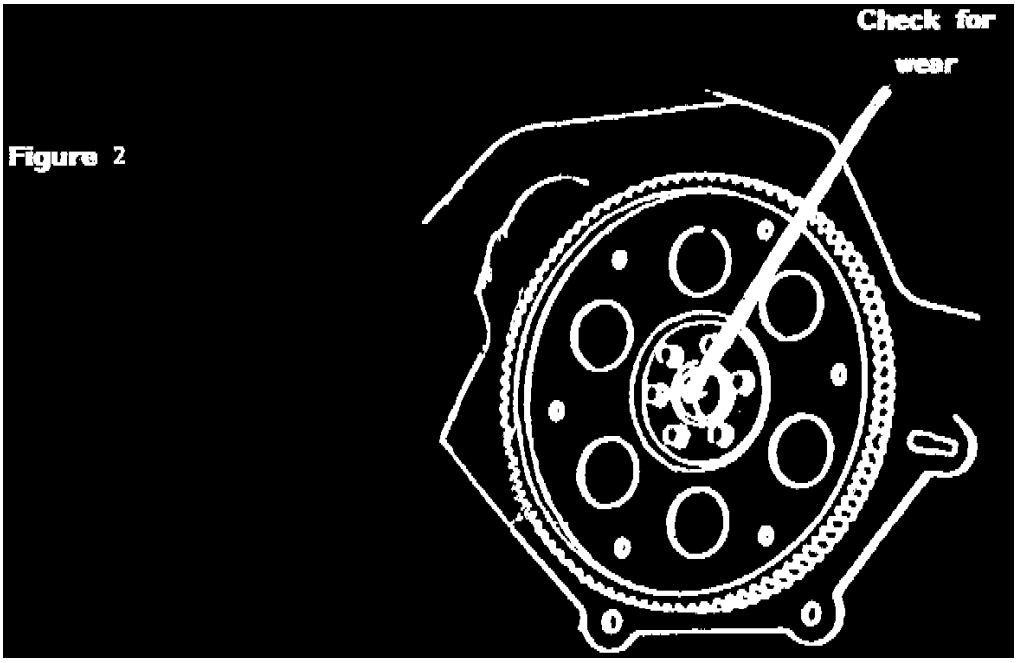
CAUSE:
When diagnosing front pump bushing wear, the cause may be:

1. Excessive CONVERTER HUB RUN-OUT. This may, or may not be due to a faulty torque converter.



The torque converter can be checked visually, and with a dial indicator. (See Figure 1) Hub run-out should not exceed .010".

2. BROKEN, BENT OR CRACKED FLYWHEELS can also cause run-out. If the torque-converter-to-flywheel bolts have been loose, the flywheel holes can become egg-shaped, or the torque converter pads may wear into the flywheel, causing run-out.



3. Another possibility is WEAR IN THE CRANKSHAFT, where it supports the torque converter pilot.(See Figure 2)

Often the crankshaft is only worn in a small area where the torque converter pilot has been against it.

If only a portion of the crankshaft is worn, rotate the crankshaft until the worn area is at 12:00 o'clock.

When the torque converter is pushed forward into the crankshaft, the torque converter pilot will bottom on a good portion, and should center properly.

Technical Service Bulletin # **ATRATB8845** Date: **881001**

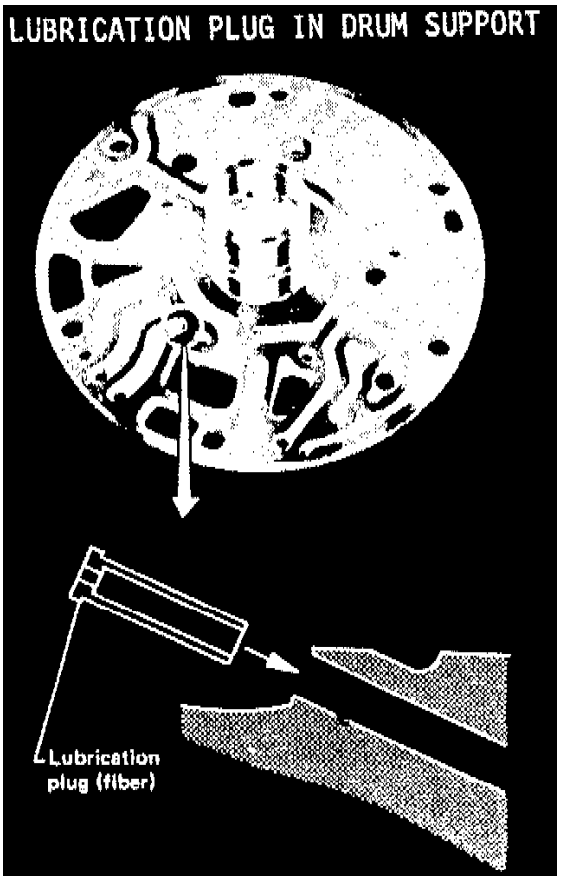
A/T - 4N71B Overdrive Case

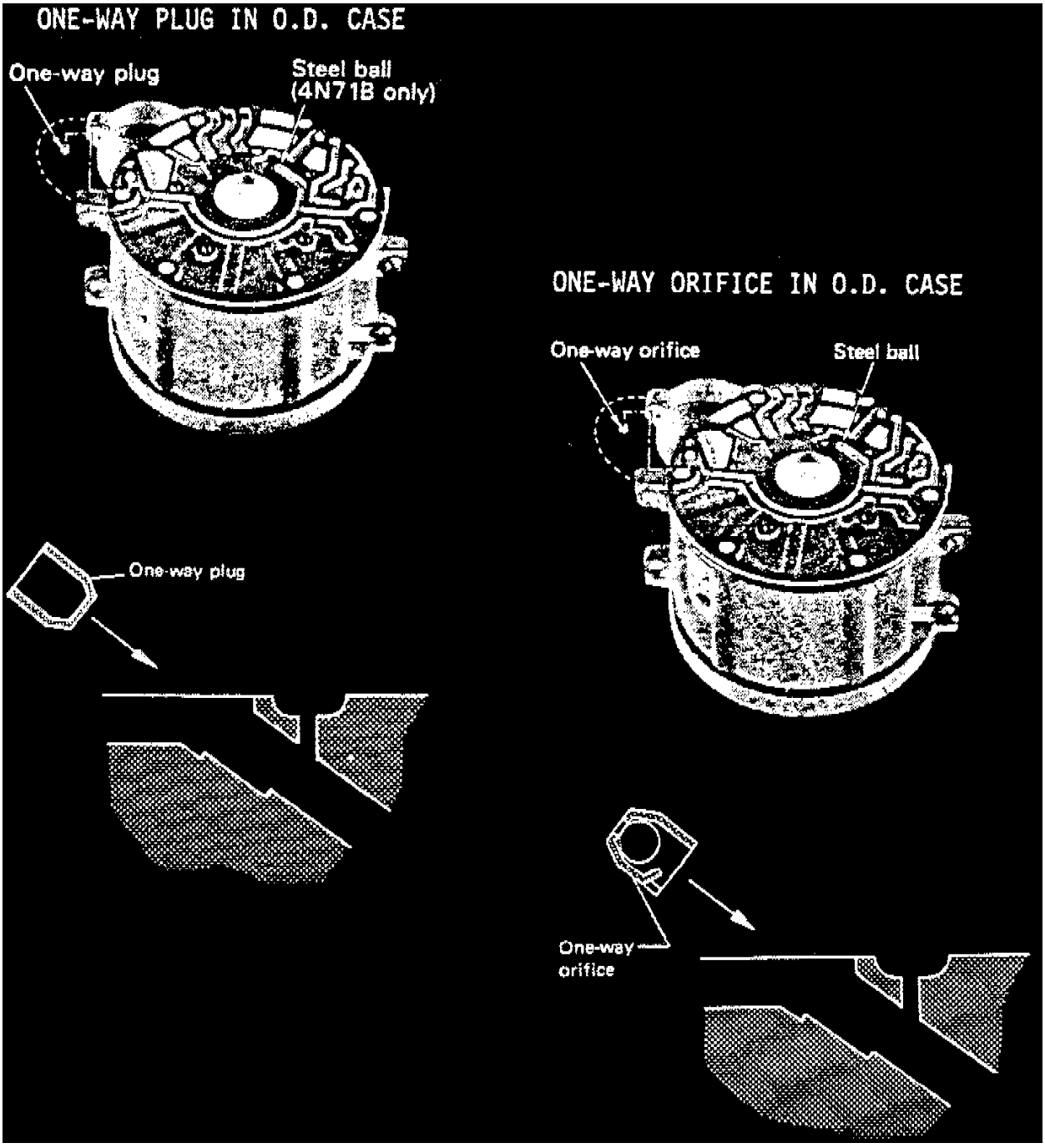
Nissan-Datsun Truck PL720 2WD L4-1952cc 2.0L SOHC (Z20)

TSB 88-45 (Oct)

SUBJECT: NISSAN 4N71B

Overdrive Case





The illustrations show the correct installation of small parts installed into the overdrive case, and the lubrication plug in the drum support.

Some models use a one-way plug in the overdrive case. Others use a one-way orifice checkball capsule. These parts may fall out during disassembly and can be easily misplaced.

Technical Service Bulletin # **ATRATB889** Date: **880201**

A/T - Identification

TSB: 88-9 (Feb)

SUBJECT: CORRECT TRANSMISSION IDENTIFICATION

The transmission/transaxle model is stamped on an identification plate located on the firewall in the engine compartment on Toyota, Nissan and Mitsubishi vehicles. This identification can be done quickly during the fluid check before road testing.

Accurate identification of transmission model can help in diagnosing and price estimating of a given transmission service.

For example: High gear starts on an A43DL is probably a stuck governor valve, while on an A43DE, it is the transmission computer operating in "failsafe mode" due to several possible causes -- fuse blown, vehicle speed sensor solenoid open or shorted, throttle position sensor or the computer itself, but certainly not a stuck governor, because the A43DE doesn't have a governor.

Pricing an A4l as an A40, or pricing an A43D as an A40D will be an unhappy surprise for anyone involved, if there is any hard part damage, because the cost and availability of good used hard parts is POOR for the A41 and the A43D, compared to the A40 and the A40D.

The following are examples of what is on the identification-plate of late model Japanese vehicles:

84 Toyota Camry

Automatic Transmission - A140E

83 Nissan Stanza

Transaxle - R13F01A

83 Mitsubishi Cordia

Transaxle - KM 171

Technical Service Bulletin # **ATRATB8910** Date: **890401**

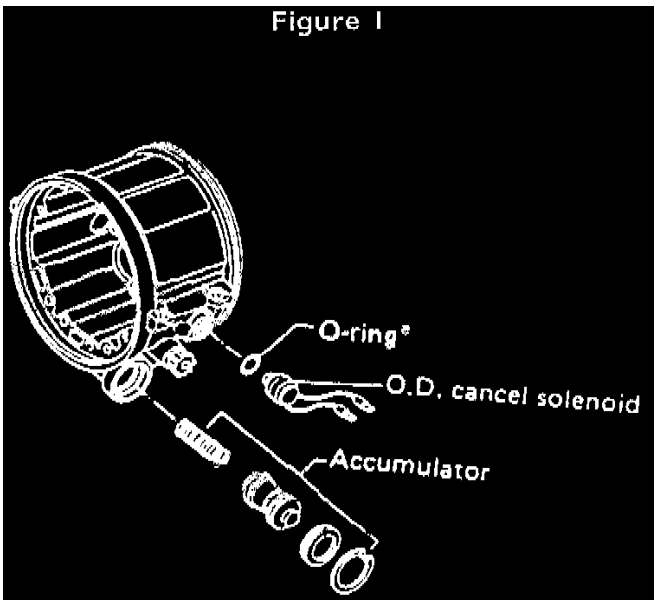
A/T - Shifts Into Overdrive with Switch Off

TSB 89-10 (Apr)

SUBJECT: NISSAN - L4N71B

OVERDRIVE SHIFTING

PROBLEM:
Transmission shifts into overdrive, even with the overdrive switch off.



CAUSE/SOLUTION:
Failure to install the small o-ring into the housing for the overdrive-cancel solenoid (See Figure 1)

Technical Service Bulletin # **ATRATB8923** Date: **890801**

A/T - Math Formulas Part I

TSB: 89-23 (Aug)

SUBJECT:
TRANSMISSION MATH FORMULAS (Your most valuable tool)

Transmission math formulas are not reserved exclusively for engineers. Understanding some basic mathematical formulas can be one of your most valuable tools.

The following information contained in this bulletin will discuss various basic formulas dealing with:

1. Shift Speed
2. Pressure
3. Speedometer ratios

Take the time, now, to understand these relatively simple concepts.

You will be saving yourself many problems, and considerable frustration, and also dollars, in the future.

Shift Speed and Pressure

SHIFT SPEED AND PRESSURE

To figure the area of a circle (valve or servo):

Radius (which is 1/2 the diameter) x Radius x 3.14159 = Area

EXAMPLE: A 1" diameter circle has a radius of 0.5"

0.5 x 0.5 x 3.14159 = 0.785

Therefore a 1" diameter circle has an Area of 0.785 sq. inches

Pressure x Area = Force

EXAMPLE: 100 psi line pressure, on a servo with an area of 2 square inches = force

So, 100 psi line pressure x 2 sq in = 200 pounds of force.

Force divided by Area = Pressure

EXAMPLE: 200 lbs divided by 2" = 100 psi

Force divided by Pressure = Area

EXAMPLE: 200 lbs divided by 100 psi = 2 inches

THINGS WE CAN DO WITH THESE FORMULAS:

EXAMPLE: A 700 R4 has 62 psi of line pressure at Idle.
The PR spring weighs 6.5 lbs

The tip (reaction end) of the PR valve has a diameter of 0.365" (0.365 divided by 2 = 0.1825 radius) 0.1825 x 0.1825 x 3.14159 = 0.1046" area

We want 75 psi of line pressure at Idle

First, let's see if those numbers add up, using: Pressure x Area = Force

62 psi x 0.1046 = 6.48, or 6 1/2 lb PR Spring

We want 75 psi:
Pressure x Area = Force (Spring) 75 psi x 0.1046 = 7.85 lb spring

What if we put in an 8 lb Spring? Force divided by Area = Pressure

8 lbs divided by 0.1046 = 76.48 or 76 1/2 line pressure

Now, let's look at RATIO.

Ratio is the relationship in quantity, amount or size, between two or more things.

In our example ratio is: How many psi each pound of spring will add.

Pressure divided by Force = Ratio

EXAMPLE: 62 psi divided by 6.5 lbs = 9.5 ratio Each pound of spring will increase pressure 9.5 psi

Force x Ratio = Pressure

EXAMPLE: 6.5 lbs x 9.5 = 61.75 or 62 psi

(Let's add 1 lb of spring, and see if we get 9.5 more psi.)

Force x Ratio = Pressure

EXAMPLE: 7.5 lbs x 9.5 = 71.25

New pressure Old pressure = Pressure difference

71.25 minus 61.75 = 9.5 psi change (by adding 1 lb of spring)

Once you know the ratio, a lot can be determined. Pressure divided by Ratio = Force

62 psi (actually 61.75) divided by 9.5 = 6.5 lb spring

The ratio never changes. This means that if I know that line pressure is 55 psi at idle, in a 700 R4, the the PR spring must be 5.78 lbs.

Pressure divided by Ratio = Force

So, 55 psi divided by 9.5 = 5.78 lbs.

Now, let's look at a math formula for shift speeds.

Suppose we had shift speeds of 15 mph and 20 mph, for the 1-2 & 2-3 shifts on a transmission. 20 mph may be too early for the 2-3 shift. If we adjust TV modulator, we will move both shifts. We don't want to do that because the 1-2 shift is fine, so let's work with just the 2-3 shift spring.

EXAMPLE: Original spring divided by Original MPH = Ratio

As, 4 lbs divided by 25mph = 0.2

Ratio x Desired MPH = New Spring

0.2 x 25 mph = 5 lb spring

A 5 lb spring will raise the shift on this transmission to 25 mph.

All you need to know is -- Where is it shifting now (at MINIMUM throttle) and what does the spring weigh.

This formula will get you very close, but may be a "tad" off, because we are not accounting for TV pressure helping the spring. This is why you want to check it at minimum throttle, so TV has the least effect.

Speedometer Ratios

Finally, let's look at speedometer ratios.

Suppose we put an exchange transmission in a car, and now the speedometer is off, because the speedometer drive gear has a different tooth count. What do we have to do to the driven gear to correct it?

Let's say the old drive gear had 7 teeth and the old driven gear had 21 teeth. The exchange unit had 8 teeth on the drive gear.

Old Drive Gear divided by the New Drive Gear = Ratio

7 teeth divided by 8 teeth = 0.875

Old Driven Gear divided by Ratio = New Driven Gear

21 teeth divided by 0.875 = 24 teeth

A 24 tooth driven gear will correct the speedometer error.

Let's do one more speedometer change. This time the old drive is 9, and the new drive is 10. The old driven gear is still 21.

Old Drive Gear divided by New Drive Gear = Ratio

9 tooth divided by 10 tooth = 0.9

Old Driven Gear divided by Ratio = New Driven Gear

21 tooth divided by 0.9 = 23.33 teeth

We can't get a 23.3 tooth count so we round it off to 23 teeth. Now the speedometer will be close, but not exact, because we had to round off the number.

Technical Service Bulletin # **ATRATB8927** Date: **890901**

A/T - Twenty Steps To Successful Repairs

Nissan-Datsun Truck PL720 2WD L4-1952cc 2.0L SOHC (Z20)

TSB 89-27 (Sept)

SUBJECT: TWENTY STEPS TO SUCCESSFUL TRANSMISSION REPAIR

1. As you start work on a transmission, read your ATRA bulletins pertaining to that transmission. (If you do this every time, before you know it you'll have the bulletins memorized.)
2. Clean the entire transmission, including the valve body.
3. Check pumps, valve bodies, and cases for warpage.
4. Flat file pumps, valve bodies, and cases. (Just a few strokes with the file to knock off high spots and handle burrs.)
5. Check all pump gear clearances.
6. Check planet pinion endplay and side to side motion.
7. Soak all planet assemblies.
8. Soak all friction material for 15-30 minutes.
9. Sand, tumble, or replace all steel plates.
10. Re-surface all drums on which a band rides.
11. Replace all rotating oi1 control rings.
12. Check all oil control rings, and rubber products in their bores for proper fit.
13. Replace all major support bushings and bushings that control lube oil.
14. Pre-lubricate all bushings and thrust washers.
15. Pre-lube pumps.
16. Pre-fill torque converters.
17. Use available manuals to find specifications.
18. Set correct clutch and band clearances
19. Take the time to set total unit endplay
20. Use a torque wrench on all pumps and valve bodies.

Technical Service Bulletin # **ATRATB8930** Date: **891001**

A/T - Math Part II

TSB: 89-30 (Oct)

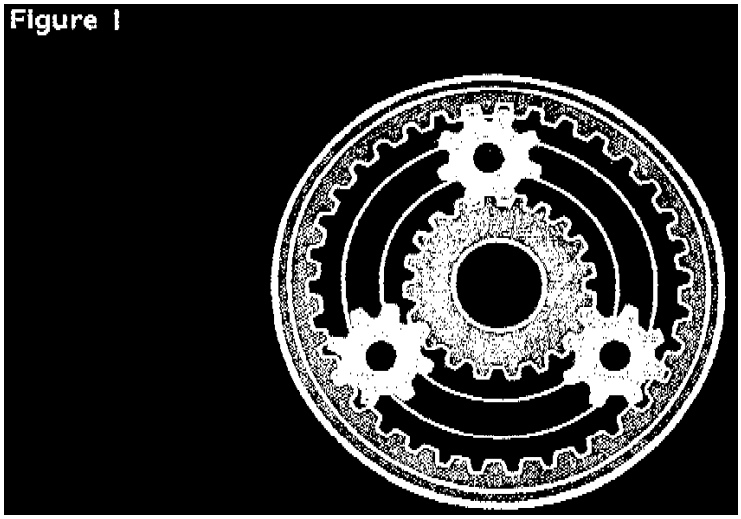
SUBJECT: TRANSMISSION MATH - Part II

Planetary Gear Sets:

Knowing the gear ratios of an automatic transmission can come in handy at times -- especially when you're swapping transmission types or differentials. The problem is in trying to find a manual with the ratios listed. What do you do?

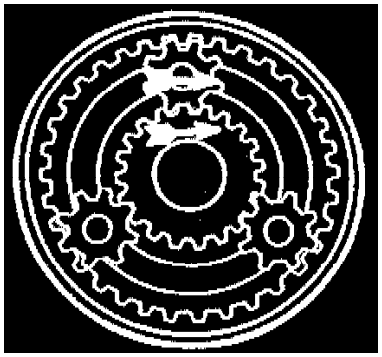
BREAK OUT THE CALCULATOR, AND FIGURE IT OUT.

When you figure the gear ratios for planetary gear sets, it is just like any other gear set. You divide the output gear by the input. Also, don't count the idler gear; planetaries are considered idler gears. Set them aside, their tooth count doesn't matter.



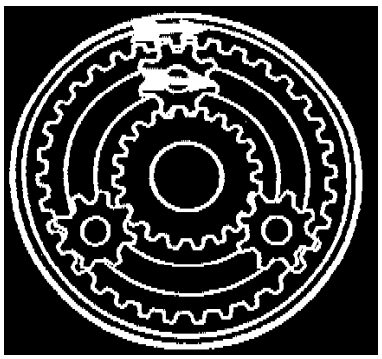
Now for the tricky part -- which gear do you consider the input, and which one the output? Figure 1 shows a planetary gear set with 34 teeth on the ring gear and 20 teeth on the Sun gear.

FOR GEAR REDUCTION, one of the gears is held stationary, and the other is used for the INPUT. THE TOOTH COUNT FOR THE OUTPUT GEAR IS THE SUM OF THE SUN GEAR AND THE RING GEAR, so if you are using the Sun gear for the input, then the ring gear + the Sun gear divided by the Sun gear = Ratio.



EXAMPLE: 34 + 20 divided by 20 = 2.7:1 This is how 1st gear on a THM 700 R4 is calculated. (See figure)

When the ring gear is used as the input, then the ring gear + the Sun gear divided by the ring gear = Ratio.

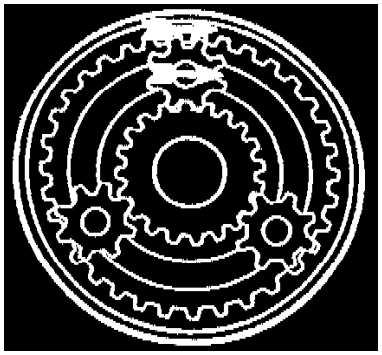


EXAMPLE: 34 + 20 divided by 34 = 1.58 This is now 2nd gear on a THM 350 is calculated. (See figure)

FOR OVERDRIVE, the sum of the ring gear + Sun gear is used for the input tooth count.

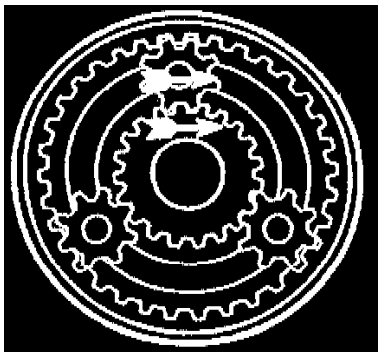
So, IF THE SUN GEAR IS HELD, then the ring gear divided by (ring gear + Sun gear) = Ratio

EXAMPLE: 34 divided by (34 + 20) = .63:1 Look familiar?



The A4LD, the THM 200-4R, the A-140E, the A-40D, the THM 325-4L are some of the units that use this method of getting overdrive. (See figure)

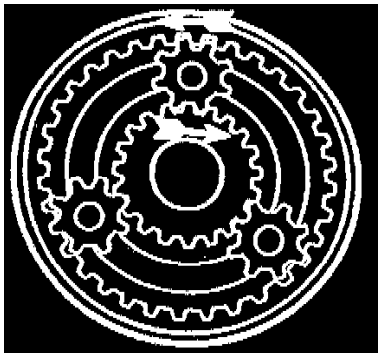
If the ring gear is held, then the Sun gear divided by (ring gear = Sun gear) = Ratio



EXAMPLE: 20 divided by (34 + 20) = .37:1 (See figure)

REVERSE IS THE EASIEST - THE PLANET IS HELD.

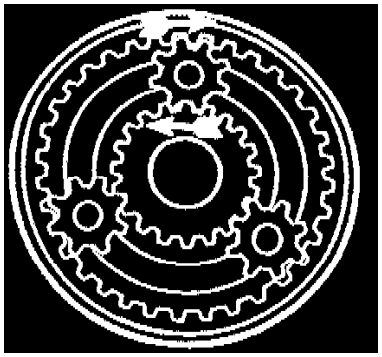
The Sun gear is the input, and the ring gear is the output. The formula for this is: The ring gear divided by the Sun gear = Ratio.



EXAMPLE: 34 divided by 20 = 1.7 (See figure)

Occasionally, the ring gear is used as the input, and the Sun gear as the output.

The formula for this is: The Sun gear divided by the ring gear = Ratio.



EXAMPLE: 20 divided by 34 = .59
(See figure)

Notice that the output is overdriven.

A transmission using this method must use another planetary gear set to reduce the output. The Mercedes W3A-040 is a good example of this

To get more than one gear forward and a reverse, requires multiple, or compound planetary gear sets.

Two of the most common of these are the SIMPSON GEAR SET, used in transmissions like the THM 350, the Ford C-4, and the TF 6 & 8, and the RAVIGNEAUX GEAR SET, found in transmissions such as the FMX, the AOD, and the T-35.

Figuring out all the ratios for these transmissions is a little tricky, so I'll give you the formulas, and let you figure out how these formulas were derived.

THE SIMPSON GEAR SET:

For this example I'll use a THM 200, which has 74 TEETH ON THE FRONT RING GEAR, 42 TEETH ON THE FRONT SUN GEAR, 30 TEETH ON THE REAR SUN GEAR, AND 62 TEETH ON THE REAR RING GEAR.

The formula for 1ST GEAR is: rear ring divided by rear Sun x front Sun plus front Sun + front ring divided by front ring.

EXAMPLE: On the THM 200, it would be:

62 divided by 30 x 42 + 42 + 74 divided by 74 = 2.74:1

SECOND GEAR is easy: Front Sun + front ring divided by front ring.

EXAMPLE: 42 + 74 divided by 74 = 1.57:1

THIRD GEAR is Direct Drive, or 1:1

REVERSE is rear ring divided by rear Sun

EXAMPLE: 62 divided by 30 = 2.06

THM 440-T4 (BACKWARDS SIMPSON):

The THM 440 T4 is sort of a backwards version of a Simpson gear set, and although it looks complicated, it really is very simple.

The front Sun gear has 26 teeth, while the rear Sun gear has 42. The front ring gear has 62 teeth, but keep in mind that it is part of the rear carrier, just as the rear ring gear is part of the front carrier, with a tooth count of 74.

As I said earlier, the THM 440 T4 is sort of a backwards version of a Simpson gear set, so in figuring the ratio for 1ST GEAR -- it is identical, except you substitute the words "front" and "rear" in the appropriate places. Front ring divided by front sun x rear Sun + rear Sun + rear ring divided by rear ring = Ratio

EXAMPLE: 62 divided by 26 x 42 + 42 + 74 divided by 74 = 2.92:1

2ND GEAR: Rear Sun + rear ring divided by rear ring

Example: 42 + 74 divided by 74 = 1.57:1

3RD GEAR: Direct Drive, or 1:1

4TH GEAR: Front ring divided by (front Sun + front ring = Ratio

EXAMPLE: 62 divided by (26 + 62) = .74:1

RAVIGNEAUX GEAR SET:

This is considered a compound gear set, and for this example I'll use an AOD, which has:

36 teeth on the front Sun gear

30 teeth on the rear Sun gear, and
72 teeth on the ring gear

The formula for first gear is: Ring gear divided by rear Sun gear = Ratio

EXAMPLE: 72 divided by 30 = 2.4:1

SECOND GEAR formula is: Rear Sun + front Sun divided by rear Sun x Ring divided by (Ring + front Sun)

EXAMPLE: (30 + 36) divided by 30 x 72 divided by (72 + 36) = Ratio 66 divided by 30 x 72 divided by 108 = 1.47

THIRD GEAR is Direct, or 1:1

FOURTH GEAR is: Ring gear divided by (ring gear + front Sun gear) = Ratio

EXAMPLE: 72 divided by (72 + 36) = .67:1

REVERSE on a Ford AOD is: Ring gear divided by front Sun gear.

EXAMPLE: 72 divided by 36 = 2:1

Technical Service Bulletin # **ATRATB9002006** Date: **900201**

A/T - Choosing the Right ATF

TRANSMISSION: ALL

BULLETIN: # 9002006

SUBJECT: Automatic Transmission Fluid

DATE: Feb 1990

AUTOMATIC TRANSMISSION FLUID

CHOOSING YOUR ATF

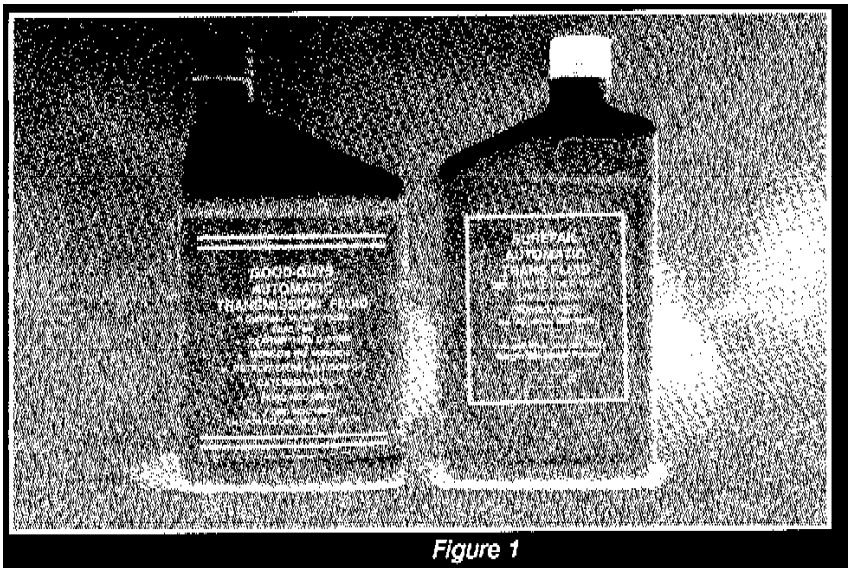


Figure 1

Different ATF's (Automatic Transmission Fluid) can have different frictional properties which can produce different shift characteristics. You may have already experienced problems like lock-up shudder, or squawks on shifts and have corrected them by changing the fluid. This alone tells, you that friction material and fluids are critical in today's cars.

MEETING THE O.E.M. SPECIFICATIONS

The first thing to consider when choosing an ATF is "Does it meet the O.E.M. specification?" ATF's wishing to be labeled as DEXRON II and/or MERCON must first meet the respective minimum requirements. It's important to note that even though the specification for DEXRON II and MERCON are currently very similar, THEY ARE NOT IDENTICAL. Also note, even fluids which meet the same specification may not be identical. One fluid may just meet a specification and, another may far surpass it. You should know what your fluids properties are! You can get that information from your fluid supplier.

EVALUATING YOUR FLUID

Ask your supplier to prove (certify) that the fluid meets O.E.M. specifications (MERCON OR DEXRON II). He will do that by supplying you with the license (certification) number issued to him by the O.E.M.

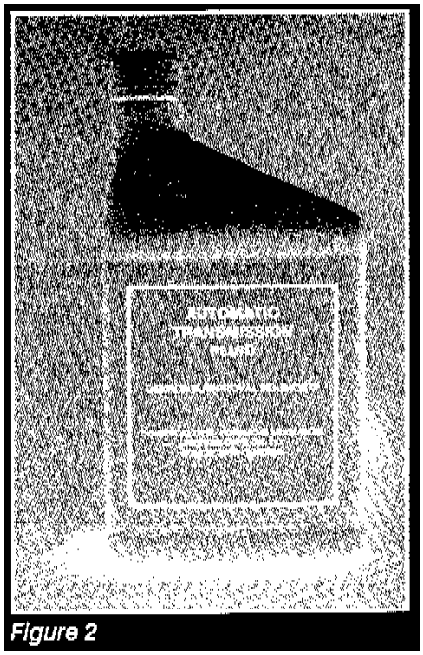


Figure 2

A DEXRON-II license number (sometimes referred to as a "D" number) will always start D-2. A typical DEXRON license number can be seen in Figure 2.

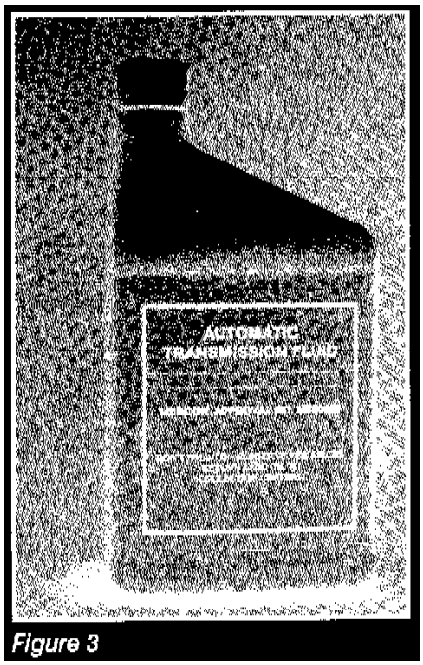


Figure 3

MERCON license numbers will be six digits starting with M as shown in Figure 3..

TRY TO MEET SEVERAL SPECIFICATIONS!

DEXRON II and MERCON have different minimum specifications, so a product that meets BOTH specifications may be better then those meeting only one spec. Meeting other specs, in addition to the first two can be an added benefit. If a fluid is licensed as DEXRON II AND MERCON as well as others like Allison C-4, or Caterpillar TO-2/TO-4, it means the fluid had to pass more tests and may be a better fluid.

Lastly, demand that the license numbers be placed on all your invoices especially if you buy in bulk. If your supplier is unwilling, it is very likely that they are supplying you an unlicensed fluid. Licensed suppliers are required to supply the license numbers to their customers as part of their agreement with the O.E.M.

OTHER THINGS TO CHECK

So now you've narrowed your choices down to a few suppliers that have O.E.M. license numbers. How do you compare two fluids that meet the same O.E.M. Spec.? Ask your supplier to give you the viscometrics on the fluid you buy.

An excellent "bench mark of the overall quality of a fluid is its viscosity at -40 degrees. This is measured in "centipoise" or "cPs". DEXRON II specification says viscosity will be no more then 50,000 cPs @ - 40 degrees. (Some poor fluids have tested at over 1,000,000 cPs) In general, the lower the number, the better the fluid.

Keep in mind that as the number goes down the price of the fluid usually goes up. (You get what you pay for) Most good fluids will average around

35,000 cPs. Hydrotreated (or Hydrocracked) fluids average around 20,000 cPs or less. (Hydrotreating is a refining process done to the base oil to clean out contaminants or impurities) Synthetic ATF's average 10,000 cPs or less, and some are as low as 5000 cPs. Viscosity at -40 degrees is a function of the base stock from which the ATF is made. A low number indicates a premium base oil OR an expensive refining process. (Hydrotreating)

FOR ADDITIONAL INFORMATION:

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BULLETIN RECAP

- ^ Only use fluids with O.E.M. approvals.
- ^ Try to get a fluid that meets more than one spec (e.g DEXRON II AND MERCON)
- ^ Check the viscosity at -40 degrees. The lower the number the better.
- ^ Avoid bargain basement fluids with no license numbers.

Technical Service Bulletin # **98-042** Date: **980515**

A/T - Fluid Application

Classification:
AT96-001

Reference:
NTB98-042

Date:
May 15, 1998

AUTOMATIC TRANSMISSION FLUID

This amended version of NTB95-055 updates information regarding the Recommendation ATF usage.

Please disregard previous NTB95-055 and NTB93-065.

SERVICE INFORMATION

IMPORTANT NOTE:
Nissan Matic "D" ATF must be used in performing repairs paid by Nissan, such as warranty, service contract, or goodwill repairs. Nissan will not reimburse dealers for repairs when non-genuine Nissan Matic "D" is used.

For current and prior production Nissan vehicles, front wheel and/or rear wheel drive, only Nissan Matic "D", or other ashless petroleum based ATF, is formulated to meet the requirements of Nissan automatic transmissions and automatic transaxles. Nissan Matic "D", or other ashless petroleum based ATF, assists in ensuring transmission durability, smooth driveability, low exhaust emissions and customer satisfaction.

Only an ashless type petroleum based ATF should be used to repair Nissan vehicles because other types of ATF may contain compounds which adversely affect transmission performance. Specifically, ash will impact friction response. In addition, ATF with ash is likely to have a higher Zinc (Zn) content. Zinc will adhere to clutch linings and cause slippage, resulting in transmission damage.

For ordering procedures, please refer to the "Dealer Confidential Parts Price List".Technical Service Bulletin # **AT87003** Date: **870420**

A/T - Slow Shift In Cold Weather

Models	All Models
Section	Automatic Transmission
Classification	AT87-003
Bulletin No.	TS87-072
Date	April 20, 1987

AMENDMENT TO TECHNICAL BULLETIN ON A/T SLOW SHIFT

This amendment refers to Technical Bulletin TS87-010, issued on January 30, 1987, which recommended DEXRON type automatic transmission fluid as a remedy for slow shift symptoms during warm-up in cold weather operation.

The information published in that Bulletin has been superseded. Either genuine Nissan fluid or DEXRON are acceptable for use in Nissan automatic transaxles and transmissions under all conditions. However, neither will completely relieve the slow shift symptom under extreme cold conditions. A fluid that will meet the need is under development.

NOTE: Dexron II should not be used in Nissan vehicles.

Please disregard the earlier Bulletin, number TS87-010, on A/T Slow Shift.

Technical Service Bulletin # **94-011** Date: **940201**

Starting & Charging - Systems Description/Diagnostics

Classification:
EL94-002

Reference:
NTB94-011

Date:
February 1, 1994

STARTING & CHARGING SYSTEMS
GENERAL ELECTRICAL DIAGNOSIS

APPLIED VEHICLE(S):
All Models

SERVICE INFORMATION

The following bulletin provides a general description of the Starting and Charging systems, along with some service procedures for diagnosing system failures

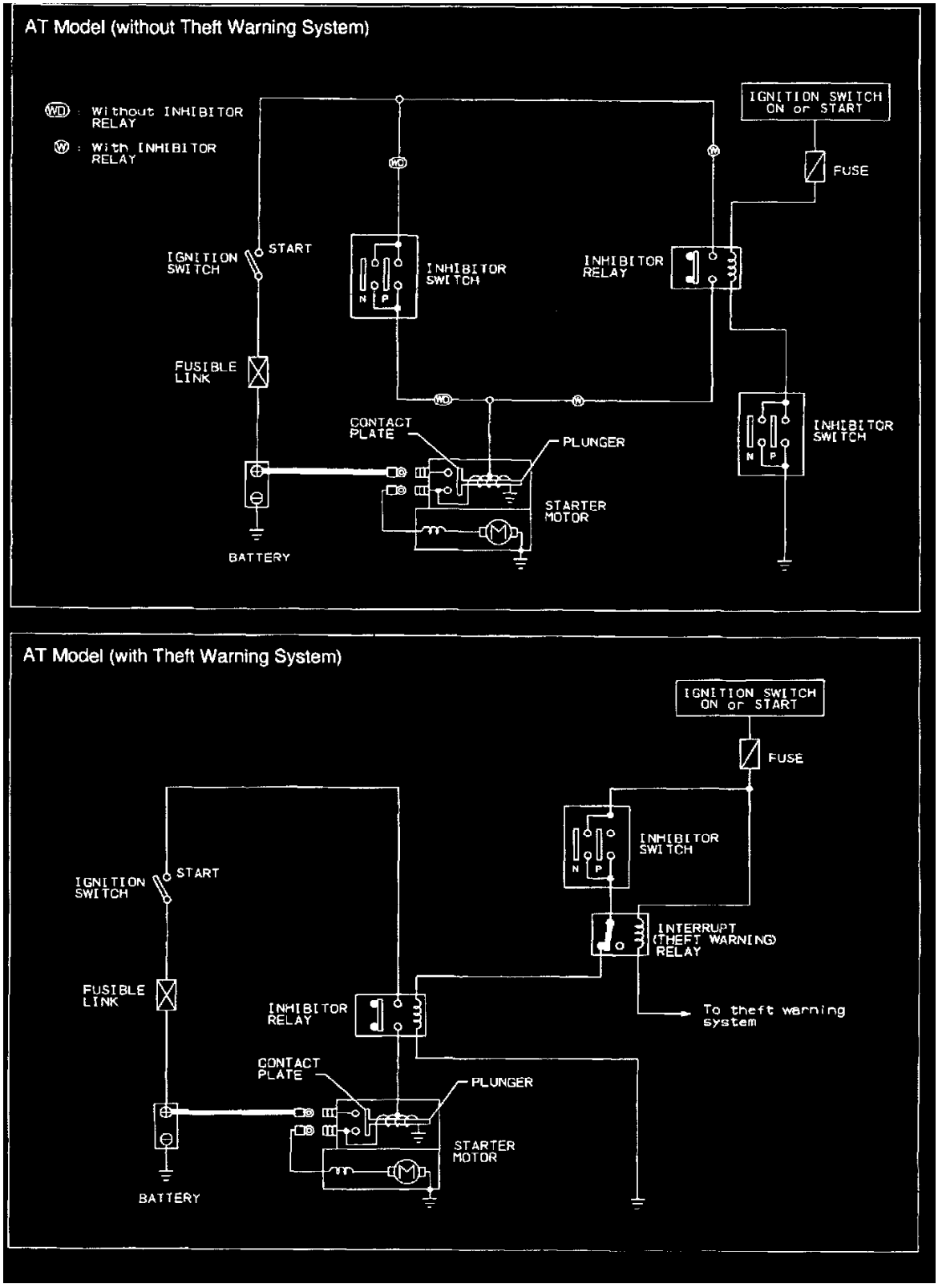
Starter Motor Operation

When the ignition switch is in the START position, battery voltage is supplied to the starter motor through the ignition switch. The plunger in the motor is pulled to the left by a magnetic force as indicated in the following diagrams, then the contact plate of the plunger allows battery voltage to be applied to the motor directly, and the starter motor rotates.

When the engine is running and the ignition switch is returned to the ON position, the magnetic force required to pull the plunger in is removed and the plunger is returned to its resting position by the return spring in the starter motor. Battery voltage is no longer applied to the starter motor and the motor stops.

Starting System Operation

AT MODEL



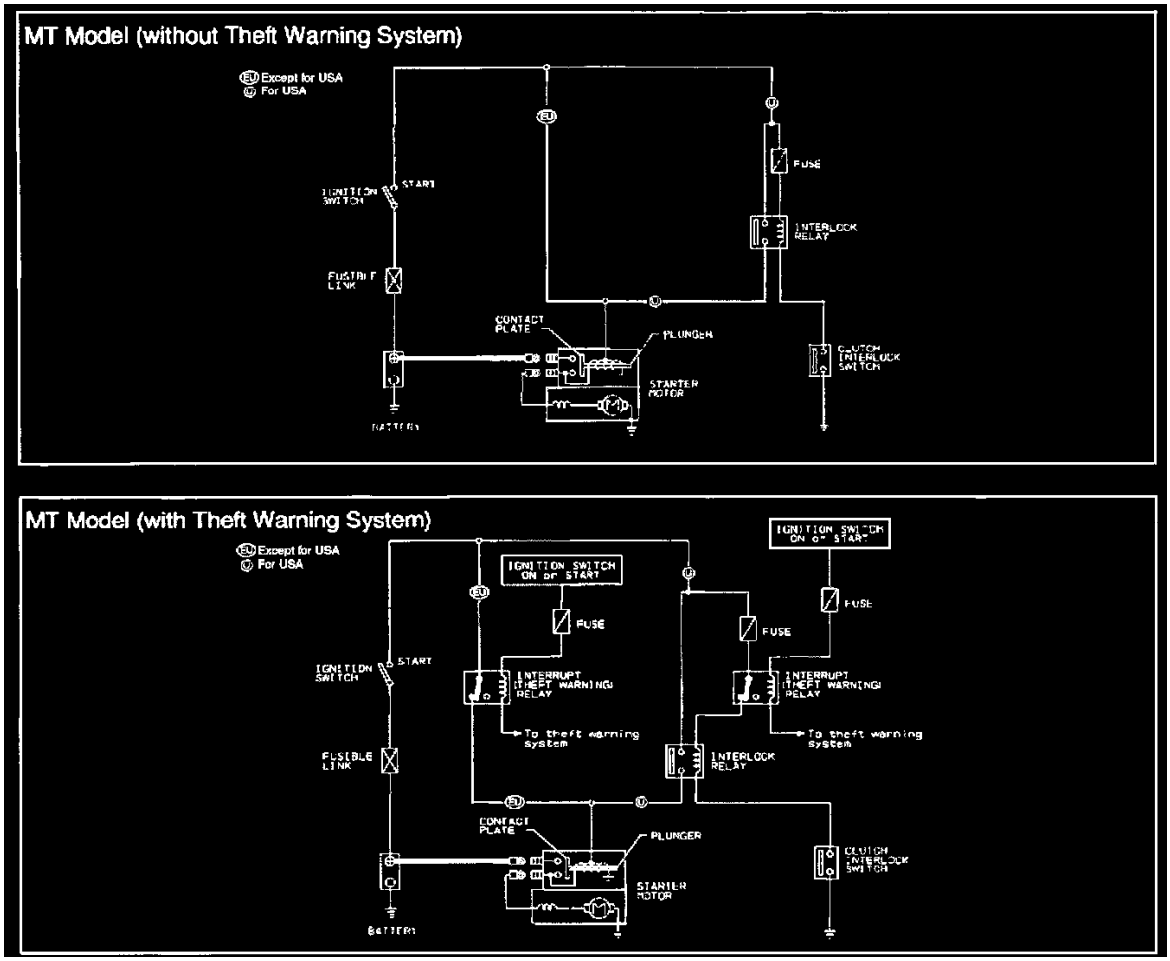
^ Without Theft Warning System

With the inhibitor switch in PARK or NEUTRAL and the ignition switch in ON or START, battery voltage is ready to be applied to the starter motor through the inhibitor relay.

^ With Theft Warning System

With the inhibitor switch in PARK or NEUTRAL and the ignition switch in ON or START, without the interrupt relay (theft warning relay) activated, battery voltage is ready to be applied to the starter motor through the inhibitor relay.

MT MODEL
For USA



^ Without Theft Warning System
With the clutch interlock switch in ON (clutch pedal depressed), battery voltage is ready to be applied to the starter motor through the interlock relay.
^ With Theft Warning System
With the clutch interlock switch in ON (clutch pedal depressed), without the interrupt relay (theft warning relay) activated, battery voltage is ready to be applied to the starter motor through the interlock relay.

Except for USA
^ Without Theft Warning System
With the ignition switch in START, battery voltage is directly applied to the starter motor.
^ With Theft Warning System
Without the interrupt relay (theft warning relay) activated, battery voltage is ready to be applied to the starter motor through the interrupt relay (theft warning relay).

Checking Terminal Voltage

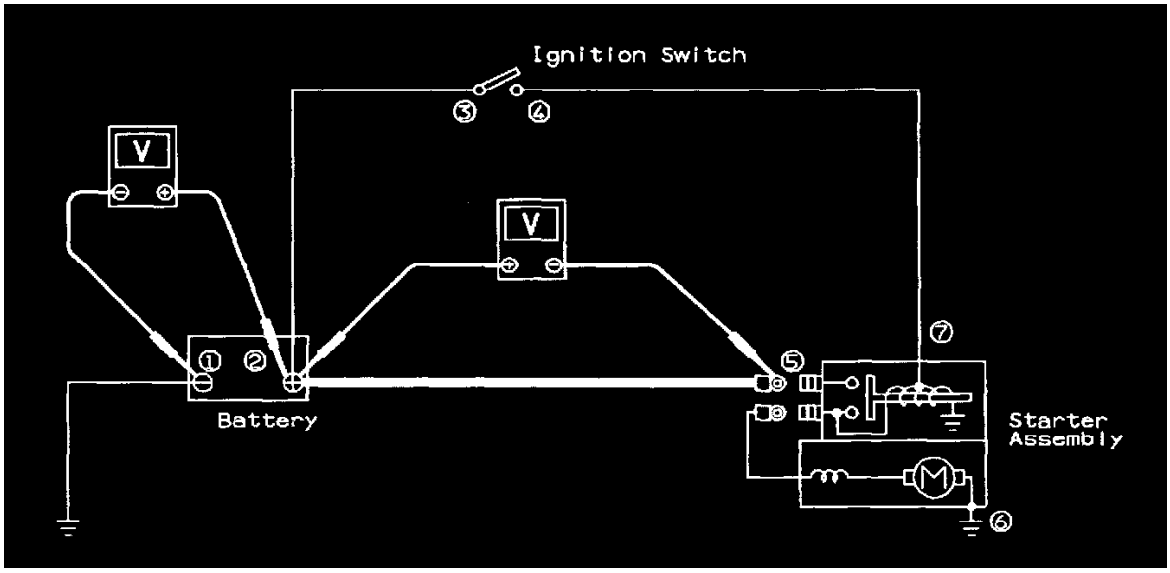
The following information contains techniques on how to perform a voltage drop test on a starter circuit. Performing a voltage drop test can aid the technician in locating and correcting starter circuit problems.

NOTE: To prevent the engine from starting during testing, remove the fuel pump fuse and bleed-off the fuel pressure from the fuel system.

Before performing the following test, visually inspect the starter, battery, cables and any other related components to ensure that the problem lies beyond a simple visual inspection.

Let the following chart serve as a diagnostic guide in troubleshooting a starting circuit.

NOTE: System voltage is 12.2 volts unless otherwise noted. Values may vary depending on ambient or engine temperature, engine condition, oil viscosity, etc.



TEST POINTS

TERMINALS	VOLTS	AMPS	CONDITION
1(-) & 2(+)	12.8	-	no load
1(-) & 2(+)	11.2	-	while cranking
Between 2 & 5	-	60.0	while cranking
2(+) & 5(-)	0.2	-	while cranking
6(+) & 1(-)	0.15	-	while cranking
2(+) & 7(-)	0.82	-	while cranking
Between 4 & 7	-	20.0	while cranking
2(+) & 3(-)	0.17	-	while cranking
3(+) & 4(-)	0.18	-	while cranking
4(+) & 7(-)	0.29	-	while cranking

(+), (-): Tester probe for voltmeter

Voltage Drop Test Chart (Example)

Charging System Operation

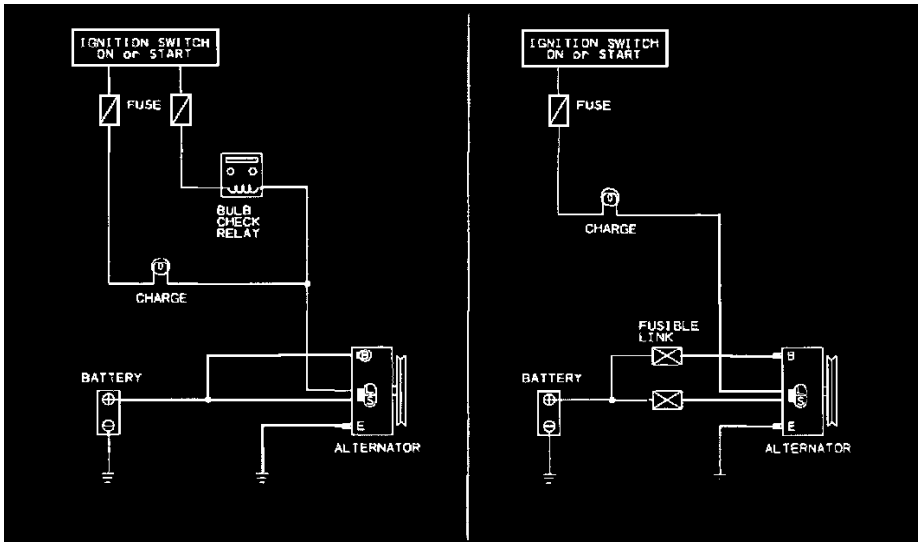
When the ignition switch is in ON or START, current from the battery flows from the L terminal to the E terminal of the alternator, causing the CHARGE lamp to light up.

Then when the engine is started, the voltage output increases as the alternator rpm increases. When the voltage output becomes greater than the battery voltage, current for recharging flows from the B terminal. Simultaneously, voltage at the L terminal disappears, causing the CHARGE lamp to go out.

Note: It is possible for the alternator to charge, with the "L" circuit in operation by accelerating the engine so the RPM's are above 3,600. The current will raise high enough to complete the field current. The alternator will continue to charge until the engine is turned off. Alternator will not charge below 3,600 RPM because the field current has not been turned on by current induced by residual magnetism.

Checking Terminal Voltage
When diagnosing the charging circuit the same precautions and test methods as used for the starting circuit should be followed. Visually checking for wires and connections that are loose, corroded, chaffed, etc. can aid in the diagnosis process.

Nissan-Datsun Truck PL720 2WD L4-1952cc 2.0L SOHC (Z20)



The voltage drop method can also be used to isolate poor connections and unwanted resistance just as in the starting circuit.

TERMINALS	VOLTS	CONDITION(S)
"B" terminal of alternator (+) positive terminal of battery (-)	0.2	charging 10 amps flowing in circuit
negative terminal of battery (+) alternator frame (-)	0.2	charging
positive terminal of battery (+) "L" terminal of alternator (-)	0.2	engine off and key on *

*System voltage 12.1 volts (+), (-): Tester probe for voltmeter

Voltage Drop Test Chart (Example)
For the chart charging voltage is 14.7 volts.

Battery, Starter, Alternator Incidents By Model

1991 Truck (D21) KA24E Engine

Customer Complaint: "The engine won't start. It doesn't turn over".

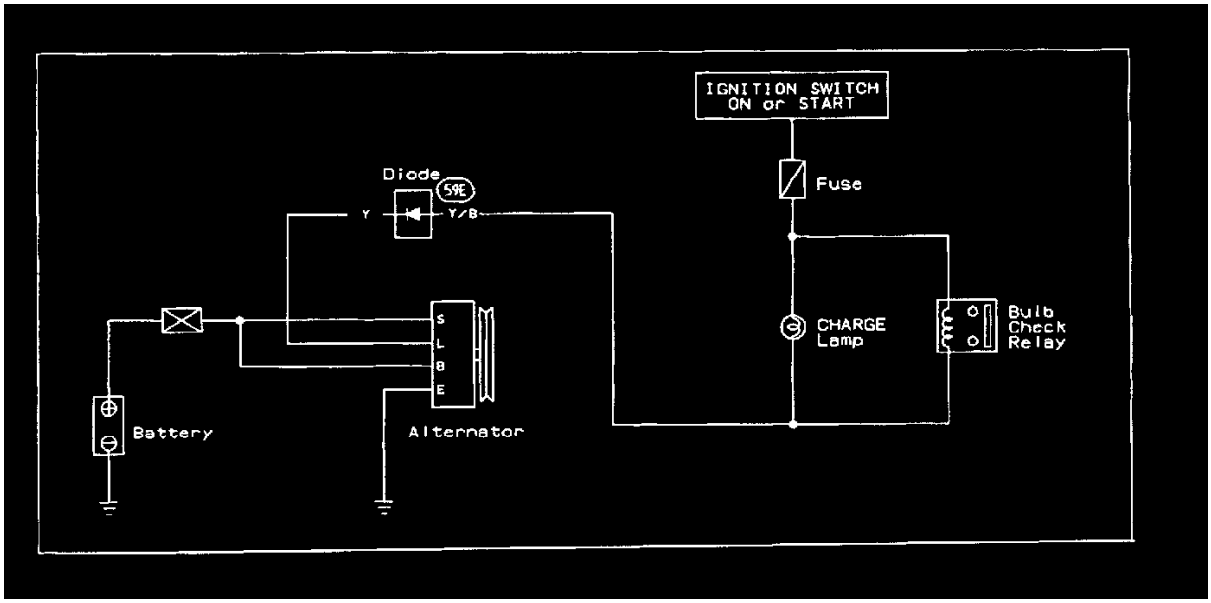
Dealer Verified Symptoms: Dealer verified battery was completely discharged.

Dealer Action: Dealer recharged battery. Battery failed load test. Dealer tested alternator output and found the alternator output 0.0V. Vehicle was running on battery voltage. Dealer installed a new alternator and battery.

ITEM	CONDITION	ACTION	RESULTS
Battery	Load test @ 150 amps for 15 seconds Minimum voltage 7.6 volts	Replace	No change
Alternator	Maximum output voltage at 2,000 RPM 12.1V	Replace	No change
Wire harness "Y" wire at diode 59E	Output voltage at alternator 'L' terminal was 14.1V@ 3,800 RPM. Voltage at "Y/B" wire at diode 59E was 0.0V.	Repair "Y" wire at diode 59E	Resolved

Dealer Test Procedure

Nissan-Datsun Truck PL720 2WD L4-1952cc 2.0L SOHC (Z20)



Field Correction: Dealer found the "Y" wire at diode 59E broken. The wire had been installed on harness and not on diode. Dealer repaired the "Y" wire and properly secured the diode to the engine harness. With damaged harness in "L" terminal circuit, the alternator will not charge below 3,600 RPM.

1992 Maxima (J30) VE30DE Engine

Customer Complaint: "My lights went dim. The car stalled".

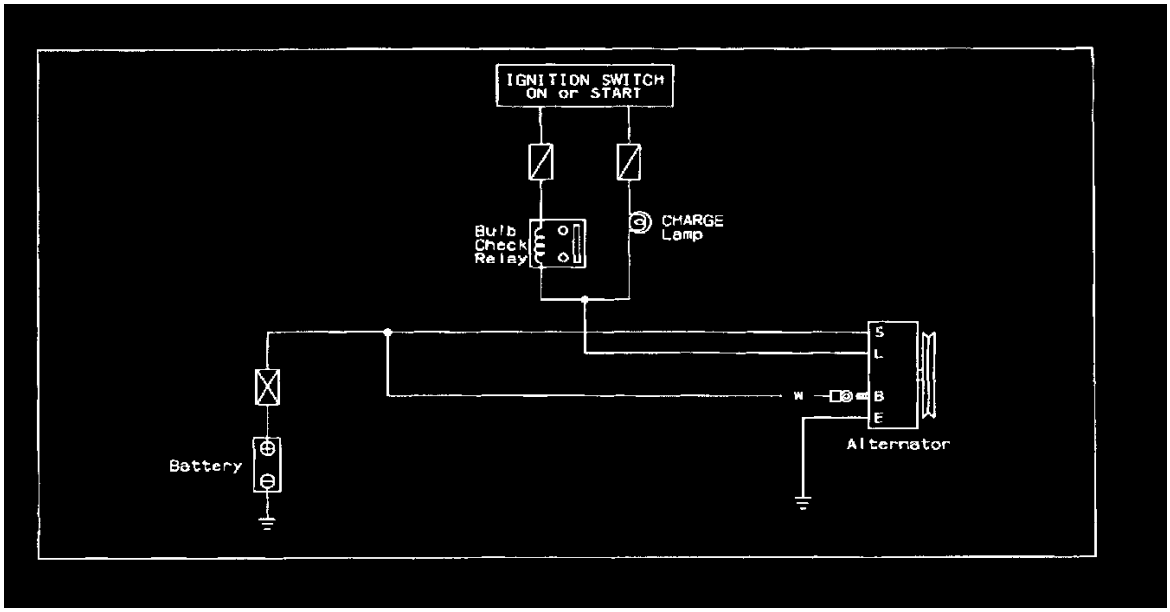
Dealer Verified Symptoms: Dealer verified battery voltage was low when vehicle was towed to Dealer.

Dealer Action: Dealer found battery specific gravity to be 1.150. Dealer recharged battery. Load tested battery after recharging. Alternator output test showed alternator failure.

ITEM	CONDITION	ACTION	RESULTS
Battery	Specific gravity hydrometer test 1.150	Recharge battery	No change
Battery	Load test @ 150 amps for 15 seconds Minimum voltage 10.2V	No further action	No change
Alternator Output	Maximum output voltage at 2,000 RPM 12.5V	Alternator harness inspection	No change
Wire harness inspection	Engine "Off"	Repair damaged "W" Battery Voltage wire	Resolved

Dealer Test Procedure

Nissan-Datsun Truck PL720 2WD L4-1952cc 2.0L SOHC (Z20)



Field Correction: Dealer found the "W" Battery Voltage wire connector loose and burnt. Dealer removed and replaced section of damaged wire, installed a new eyelet ring, and cleaned connection at alternator. Dealer reattached "W" wire to alternator to resolve incident.

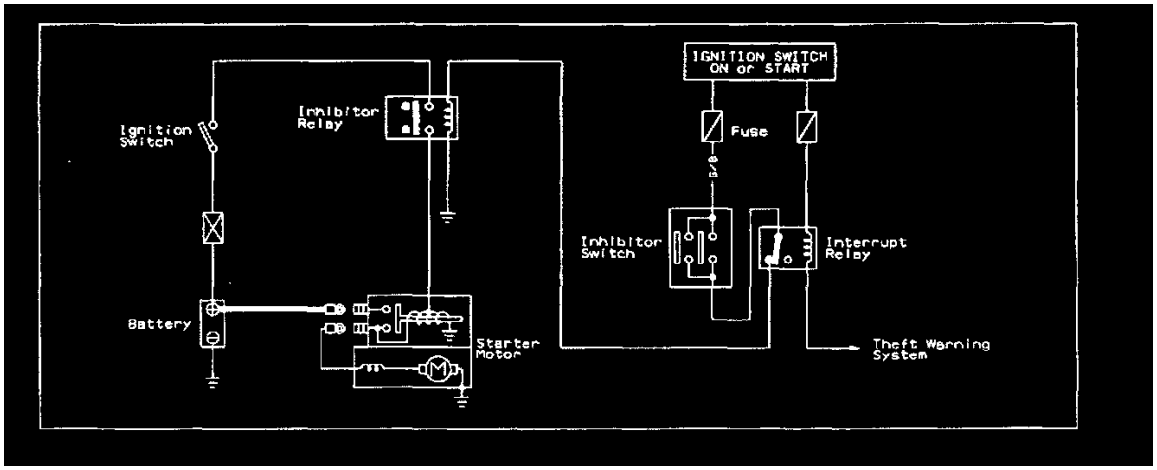
1992 Maxima (J30) VG30E Engine

Customer Complaint: "When I back up a hill, my car won't start".
Dealer Verified Symptoms: Dealer verified engine will not crank intermittently. Dealer could duplicate incident best when parking vehicle on a slight incline.

Dealer Action: Dealer tested battery alternator, and starter. Dealer tested inhibitor switch and inhibitor relay circuit.

ITEM	CONDITION	ACTION	RESULTS
Battery	Specific gravity hydrometer test 1.240	Pass test	No change
Battery	Load test @ 150 amps for 15 seconds Minimum voltage 10.2V	Pass test	No change
Alternator Output	Maximum output voltage at 2,000 RPM 14.1V	Pass test	No change
Starter Motor Amperage draw Incident occurring	Engine "No crank"	Starter Motor had 0.0 amperage draw during incident	No change
Starter Motor Amperage draw No incident	Engine "Cranking"	Starter Motor had 110 amperage draw when "Cranking"	No change
Inhibitor switch	Engine "No crank"	Battery Voltage not supplied to inhibitor switch	No change
Wire harness inspection	Engine "No crank"	Repair damaged inhibitor switch power supply "G/B wire	Resolved

Dealer Test Procedure



Field Correction: Dealer found the "G/B" power supply wire to the inhibitor switch damaged. The EFI/Engine harness wire tie was too tight and was cutting wire. Parking vehicle on a hill put additional strain on harness creating an open circuit.

1989 Maxima (J30) VG30E Engine

Customer Complaint: "Engine would not crank".

Dealer Verified Symptoms: Dealer verified customer complaint of "Engine will not turn over".

Dealer Action: Dealer tested battery and starter. Dealer performed battery test specific gravity and load test, starter draw test with ignition switch in "Crank/Start position".

ITEM	CONDITION	ACTION	RESULTS
Battery	Specific gravity hydrometer test 1.235	Pass test	No change
Battery	Load test @ 150 amps for 15 seconds Minimum voltage 9.8V	Pass test	No change
Starter Motor Amperage draw Incident occurring	Engine "No crank" Starter Motor had 410 Amperage draw ignition switch "Crank/Start".	Replace Starter	Resolved

Dealer Test Procedure

Field Correction: Dealer found Starter Motor armature burned. Brush holders bent over from heat. Dealer installed a rebuilt Starter Motor.

Technical Service Bulletin # **GI86008** Date: **860313**

Wiring Diagram - How To Read Instructions

Models All Models

Section General Information

Classification GI86-008

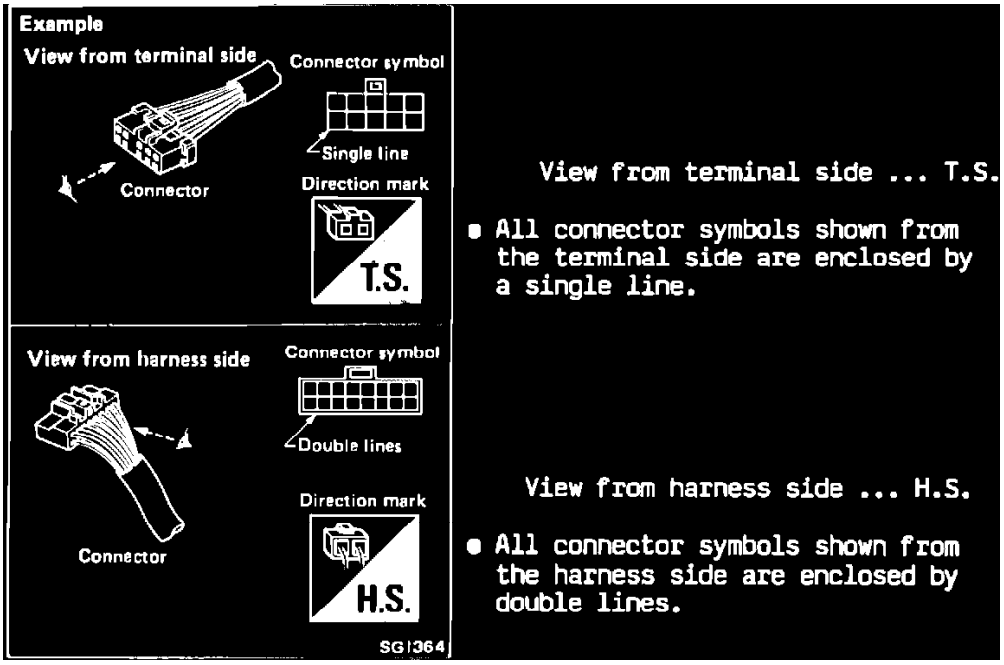
Bulletin No. TS86-027

Date March 13, 1986

HOW TO READ WIRING DIAGRAMS

Effective with the publication of the recently distributed 1986 D21 Truck Service Manual, two changes have been incorporated to assist technicians when servicing vehicle electronic components. In the future, these changes will be incorporated into all new model Service Manuals.

I. Because wiring diagrams are now found in more than just the EL Section, the "How to Read Wiring Diagrams" information has been moved to the GI Section for ease of reference.



II. As shown in the example below, direction marks are now being used in various electrical service procedures. These marks will clarify the connector side (terminal or harness) being serviced, and are used mainly in illustrations indicating terminal inspection.

Technical Service Bulletin # **GI89015** Date: **891214**

Fuel - Recommendations

Classification: Section: GI89-015 General Information
Reference:
TECHNICAL BULLETIN TS89-169
Models:
All 1975-90 (2/gasoline engines)
Date: December 14, 1989
REVISED FUEL RECOMMENDATION

SERVICE INFORMATION

Nissan Owner's Manuals contain, fuel recommendations for gasolines which are blended with Oxygenates. The purpose of this bulletin is to provide you, the Nissan dealer, with revised information to better respond to your customers' questions concerning these Oxygenate-blended gasolines. Certain types of Oxygenate-blended gasolines may contain Methyl Tertiary Butyl Ether (MTBE). Your customers may notice a posted MTBE level on the gasoline pump and ask about its safe usage in their Nissan vehicles.

Nissan has determined that MTBE may compose up to 15%, by volume, in each gallon of unleaded gasoline. Current editions of Nissan Owner's Manuals cite allowable levels of 11%, by volume, of MTBE.

Recommendations for Oxygenate blends of Ethanol or Methanol remain unchanged from the levels currently published in the respective Owner's Manuals:

^ Ethanol, up to 10%, by volume.

^ Methanol, up to 5%, by volume.

Technical Service Bulletin # **95074** Date: **950802**

Antenna - Inoperative, Rod Maintenance & Replacement

CLASSIFICATION: EL95-008

REFERENCE: NTB95-074

DATE: August 2, 1995

POWER ANTENNA ROD MAINTENANCE AND REPLACEMENT

This Bulletin contains revised Warranty information. Please discard NTB94-019 dated February 17, 1994.

APPLIED VEHICLE: All models equipped with power antennas

SERVICE INFORMATION

Power antenna incidents for no operation or improper retraction are almost always caused by the following:

^ The antenna rod is broken or bent due to misuse. Common examples of this include the antenna contacts the top of a garage door opening or a tree branch. Also, a customer may forget to lower the antenna before entering an automated car wash.

^ Dirt, road grime, and other foreign matter collects on the rod interrupting proper operational movement. This occurs most frequently during winter months in areas where road salt and other chemicals are splashed onto the antenna rod.

REPAIRS COMPLETED FOR THE TWO CAUSES DESCRIBED ABOVE ARE NOT COVERED UNDER WARRANTY. ONLY REPAIRS UNDERTAKEN DUE TO DEFECTS IN MATERIAL OR WORKMANSHIP WILL BE COVERED UNDER WARRANTY.

In a large majority of cases, the antenna motor is fully operational and receiving proper power. Therefore, replacement of the entire power antenna assembly is not usually necessary to restore power antenna operation. Prior to removing any power antenna assembly, an attempt should be made to repair the power antenna by removing dirt, road grime, and other foreign matter, and then lubricating the antenna rod sections as appropriate. if still inoperative, replacement of the rod only should be made. A sample replacement procedure is provided on the following page. Check the EL section under Audio and Power Antenna in the Service Manual for specifics on your respective vehicle.

SERVICE PROCEDURE

REPLACING THE ANTENNA ROD

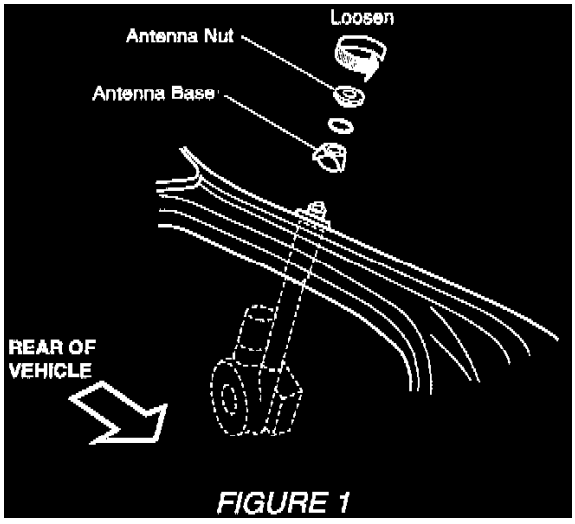


FIGURE 1

1. Remove antenna nut and base. (Figure 1)

2. Turn the radio to "ON" and the antenna rod will extend*. Assist the antenna rod to fully separate from the antenna base. Note the direction of the gear section on the antenna rope. [The new antenna rod must be installed in the same direction].

* If the antenna rod does not extend, always check the power supply to the power antenna before replacing the power antenna assembly.

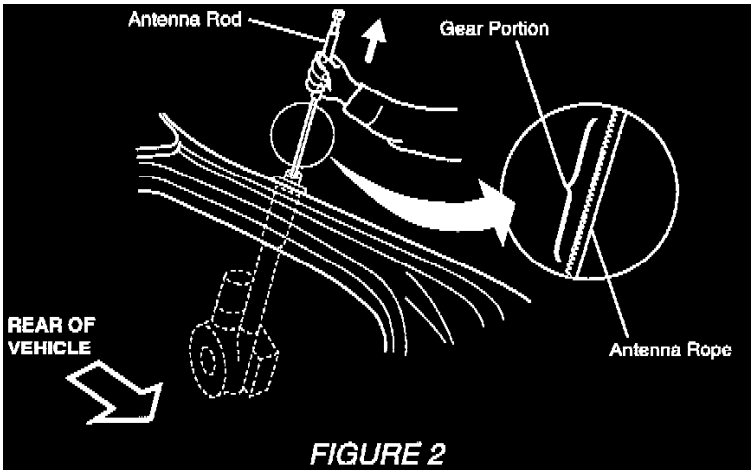


FIGURE 2

3. Insert the replacement antenna rod with the radio in the "ON" position. Insert antenna rope with gear section facing the motor assembly [Figure 2].

4. Turn the radio "OFF" to retract the antenna rod. If the antenna motor stops before the antenna has fully retracted, turn the radio switch "ON" and immediately turn it "OFF" again. Guide the antenna rope and rod into the antenna assembly.

5. Reinstall the antenna nut and base. Check antenna operation by cycling the radio "ON" and "OFF".

Power Antenna Maintenance

Clean power antenna rods at every service opportunity by wiping with a damp cloth.

PRECAUTIONS

Please remind the customer to:

1. Always turn the radio "OFF" to prevent bending the antenna rod, whenever going through car washes or entering parking garages with low ceilings or low hanging garage doors.

2. The antenna rod should be cleaned regularly by wiping off any dirt build up which may cause the antenna to bind. Customers should verify that their car wash attendants do this regularly.

CLAIMS INFORMATION

NOTE:
The following Claims Information applies to antenna rod replacement for defects in materials and workmanship. Damaged (bent) rods are not included.

OPERATION	OP CODE	PNC	SYMPTOM	DIAGNOSIS	FRT
Rpl. power antenna rod/ mast only.	RN29AA	28215	ZE	32	0.2 hrs

Note: New Claims System dealers should submit a Primary Part claim using the applicable antenna rod part numbers found in the Parts Information portion of this bulletin.

Claim Information

MODEL	PROD. DATES	PART #	ALT. PART #	QTY
Quest	ALL	28215-0B300		1
240SX	7/88-7/89	28215-61A00		1
	7/89-3/92	28215-35F05		1
	3/92-2/94	28215-50J00		1
	2/94-	28215-0E006	28215-0E000	1
Pathfinder*	8/87-*	28215-61A00*		1
	7/92-6/94*	28215-51E10*		1
300ZX	2/89-7/90	28215-89902		1
	7/90-	28215-F6506		1
Maxima	8/88-10/90	28215-89902		1
	10/90-2/94	28215-50J00		1
	2/94-	28215-0E000		1
Altima*	6/92-7/94	28215-0E000		1
	7/94-*	28215	-0E006*	1
	7/94-*	28215-61A00*	28215-0E000	1

***Check the parts catalog or fiche for the appropriate part number. This may vary depending upon the equipment installed on the vehicle.**

Parts Information: Antenna Rod

Technical Service Bulletin # **98-110** Date: **990115**

Interior - Squeak and Rattle Repair Supplies

Classification:
BT98-041

Reference:
NTB98-110

Date:
January 15, 1999

NISSAN VEHICLE SQUEAK AND RATTLE MATERIALS

APPLIED VEHICLES:
All

SERVICE INFORMATION

In support of the recent Squeak and Rattle Seminars, this bulletin provides part numbers, descriptions, dimensions and recommended uses for materials which can be used to help eliminate noises in vehicle interior components. Many of these part numbers have been referenced in recently released squeak and rattle bulletins.

These materials will also be included in a Squeak and Rattle Repair Kit that will be sent to every dealer in early 1999. The materials are currently available and can be ordered separately as necessary for squeak and rattle repairs.

Please see the Parts Information Section for detailed parts information.

#*	DESCRIPTION**	PART #/PFP	DIMENSIONS
1	Headliner Spacer, Foam	73982-9E000	45 mm thick, 50x50 mm
2	Headliner Spacer, Foam	73982-4L700	10 mm thick, 50x50 mm
3	Insulator, Foam Block, Vinyl Covered	80845-71L00	30 mm thick, 30x50 mm
4	Urethane, Adhesive Backed Pad	76884-71L01	1.5 mm thick, 60x85 mm
5	Urethane, Adhesive Backed Pad	76884-71L02	1.5 mm thick, 15x25 mm
6	Urethane, Adhesive Backed Pad	76268-9E005	1.5 mm thick, 100x135 mm
7	Felt Cloth Tape, 'Non-woven'	68370-4B000	15x25 mm
8	Felt Cloth Tape, 'Non-woven'	68239-13E00	5 mm wide roll

*Intended or Recommended Use:

1 & 2: Headliner Spacer to take up space between panels.
3: Insulator to eliminate movement between panels, ducting, etc. Can be used in areas where movement is necessary, such as door lock rods.
4, 5, & 6: Urethane to isolate harnesses, connectors, ducting, etc.
7: Felt cloth square can be installed over dash or door panel mounting pins to prevent contact (center is perforated).
8: Felt Cloth Tape to be applied between panels, trim and covers to prevent squeak or rattle during movements.

** All materials are adhesive backed.

PARTS INFORMATION

CLAIMS INFORMATION

Please reference Nissan Claims Bulletin WB/98-021a and Section "UX - Squeak & Rattle Repairs" of the current Nissan "Warranty Flat Rate Manual" for complete details regarding policy and claims coding applicable to the repair of squeaks and rattles.

Expense Details:

Pro-rate the bulk "Squeak & Rattle Repairs" material(s) and claim only the amount that is actually used in the repair. Claim this amount using Expense Code: 022. Do not claim the repair material(s) part number(s) on the claims.

Technical Service Bulletin # **EL89013** Date: **890720**

Audio - Radio Installation Precautions

Classification: Section:
EL89-013 Elect. System
Reference: TECHNICAL BULLETIN TS89-101
Models: All

Date: July 20, 1989

RADIO INSTALLATION: GENERAL INFORMATION

APPLIED MODELS: All Models

SERVICE INFORMATION:

It is important to follow 4 basic guidelines when installing a radio. In many cases where a newly-installed radio had been declared defective, subsequent examination of the vehicle and/or the radio chassis, disclosed certain installation shortcomings. This bulletin will remind dealership personnel that the following basic installation procedures should be followed.

1. RADIO CHASSIS MOUNTING SCREWS

   Do not use radio mounting screws other than the ones supplied in the installation package. A screw that is too long will damage the radio's circuit board(s).

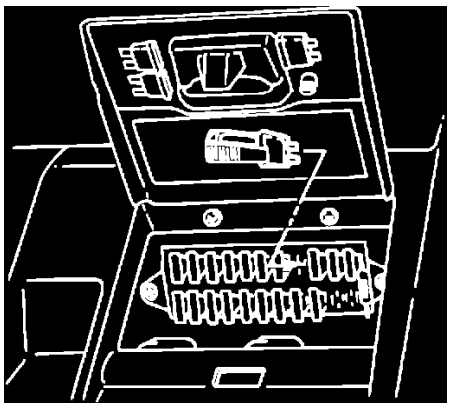


Figure 2

2. RADIO BACK-UP FUSE

   In many cases, complaints of "radio has no power...will not turn on" can be traced to a simple pre-delivery error of not installing the radio back-up fuse (Figure 2)

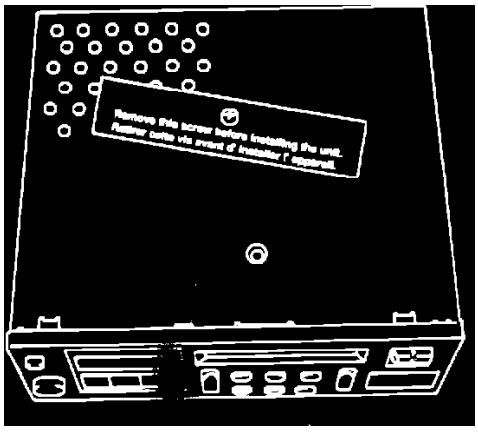


Figure 3

   Prior to testing the radio, verify that the Radio Back-up Fuse has been installed.

3. CASSETTE CAPSTAN LOCK SCREW

   It is necessary to remove the capstan lock screw prior to radio installation. This screw is utilized to lock the capstan (protecting it from vibration damage) during transport. An identification tag is attached to this fastener (Figure 3).

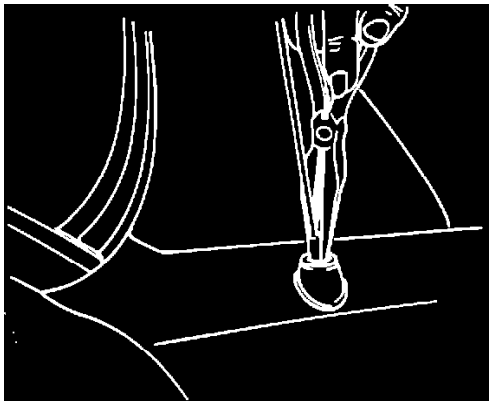


Figure 4

4. ANTENNA GROUND CIRCUIT

If the radio has poor reception or static noise, especially noticeable in the AM band, check the antenna for a secure fit against the fender. The antenna locking nut must be thoroughly tightened to ensure a proper ground (Figure 4).

Technical Service Bulletin # **WB90007** Date: **900613**

Hitachi Radio - Return Address Change

Reference:
WARRANTY BULLETIN WB/90-007
Date:
June 13, 1990
TO: ALL NISSAN DEALERS

SUBJECT: HITACHI AUDIO RETURNED ADDRESS CHANGE

We have recently been informed by Hitachi Sales Corporation of America that their office building located at 612 West Walnut Street, Compton, California has been closed.

Effective immediately, all defective Hitachi Audio chassis must be returned to the following address:

RADIO REMANUFACTURE DIVISION HITACHI SALES CORP OF AMERICA 401 WEST ARTESIA BLVD. COMPTON, CALIF. 90220

The toll-free telephone number for ordering audio chassis is (800) 523-7702. This toll-free number has not changed and can be found in the Warranty Policy and Procedures Manual.

It is vital to inform the appropriate personnel at your dealership about this change to avoid any further delay on returning defective audio chassis to Hitachi.

Should you have any further questions regarding the Radio Exchange Program, please contact your District Service Manager or your Regional Parts & Service Department.

Technical Service Bulletin # **88013** Date: **880208**

Paint - 2 and 3 Coat Pearlescent Finishes

Models:
All

Section:
Body & Frame

Classification:
BF88-004

Bulletin No.:
TS88-013

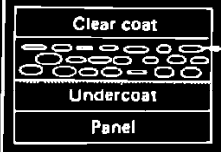
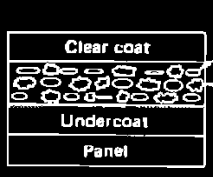
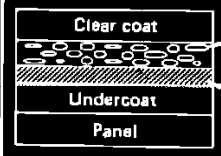
Date:
February 8, 1988

PEARLESCENT PAINT

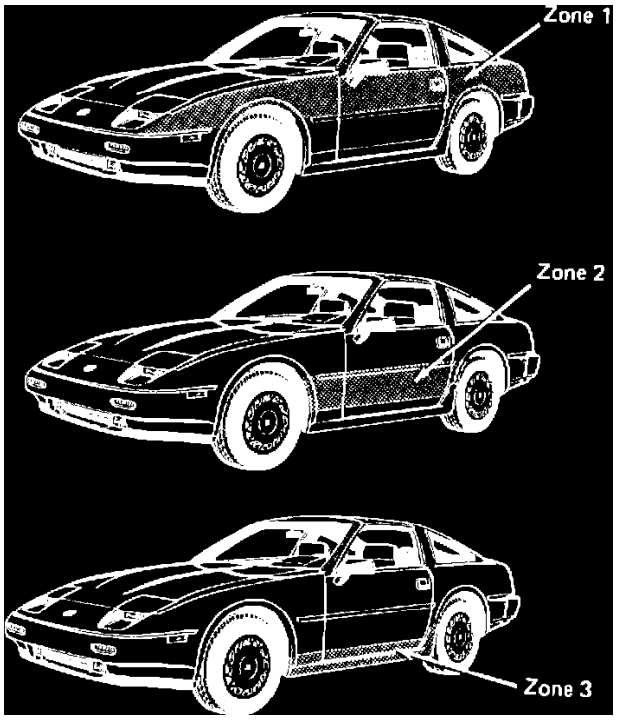
APPLIED MODELS:
All

SERVICE INFORMATION

APPLICATION CHART

PAINTING METHOD	COLOR CODE	MODEL
2-Coat Pearl (2P) 	624 (Cabernet Pearl) 726 (Flare Red Pearl)	Truck, Pathfinder, 300ZX Pathfinder, 300ZX
2-Coat Pearl Metallic (2PM) 	656 (Champagne Pearl) 728 (Crystal Blue Pearl)	Pulsar, Maxima, 300ZX Pathfinder
3-Coat Pearl (3P) 	234 (Moonglow Pearl)	300ZX SS-Turbo

Pearlescent paints containing mica are now being used on some 1988 Nissan models. These paints differ from solid or metallic paints. Three types of pearlescent paints are currently being used by Nissan; 2-coat pearl, 2-coat pearl metallic, and 3-coat pearl (see chart).



Application of 2-coat pearl and 2-coat pearl metallic is similar to that of other 2-coat metallic paints. However, repairs on 3-coat pearl require special technique and experience since color matching is much more critical. Also, when spot or partial repairing is required, the full panel or "Zone" must be repainted (see drawing).

If a Dealer requires assistance in 3-coat pearl paint procedure, the following paint manufacturers are willing to provide it.

^ Basf/Inmont/Glasurit
^ Dupont
^ P.P.G./Ditzler
^ Sherwin Williams
^ Sikkens

Or contact your local paint jobber.

^ Two types of mica are available, white and colored. They should be used properly to fit the base color.

^ Pearl mica has complex reflection characteristics without hiding power. This produces minute changes in color tone and luster as the painted surface is viewed at different angles or under different lighting conditions. When matching color during repair, you should carefully observe the paint color under direct sunlight (at a distance of 3 to 7 feet), from every direction.

This flowchart shows the main steps for refinishing.

O: Required practice
Δ: If necessary

No. Operative procedures	2P or 2PM	3P	Notes
① Washing	O	O	
② Degreasing	O	O	Remove any stain or grease on or around the portion to be repaired with solvent.
③ Sanding (I)	O	O	Use sandpaper #240 to #320 (dry).
④ Cleaning	O	O	Use a tack rag.
⑤ Priming surface	O	O	For proper mixing ratios and drying times, obtain instructions from the paint maker.
⑥ Drying	Δ	Δ	
⑦ Sanding (II)	Δ	Δ	Use sandpaper #320 to #600 (dry) with a sander or sandpaper #800 to #1000 (wet).
⑧ Sanding (III)	Δ	Δ	Use compound or sandpaper #1500 (wet). Clean with tack rag.
⑨ Color base coating	–	O	Apply 3 to 4 single coats. If fading out, apply 4 to 5 single coats.
⑩ Drying	–	O	For proper mixing ratios and drying times, obtain instructions from the paint maker.
⑪ Sanding (IV)	–	Δ	Use compound or sandpaper #1500 (wet). Clean with tack rag.
⑫ Pearl coating	O	O	[2P or 2PM] Apply 3 to 4 single coats of pearlescent base color. [3P] Apply 3 to 4 single coats of pearl base containing pearlescent mica. (Pearl base) After applying last coat, wait 20 minutes for flash-off time.
⑬ Clear coating	O	O	Apply 2 to 3 single coats. For proper mixing ratios and drying times, obtain instructions from the paint maker.
⑭ Drying	O	O	

2P = 2-coat pearl
2PM= 2-coat pearl metallic
3P = 3-coat pearl

REFINISHING GUIDE

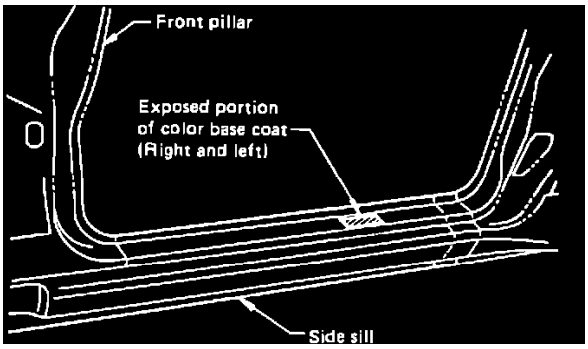
CAUTION:
Air line respirator with full hood or half mask, or vapor/particulate type respirator that is recommended as effective for isocyanate vapor and mist, must be worn during the entire painting process.

CAUTION:
When painting with pearlescent paint, be sure to keep the panel surface clean and free from dirt and dust as it will be very conspicuous and difficult to remove.

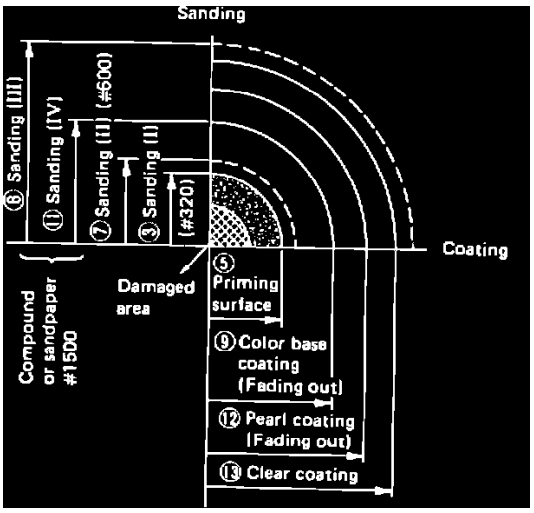
2-Coat Pearlescent Paint

1. In general, use the same painting method which is used for metallic painting.
2. Use the same mica base which was originally used on the vehicle, and match the color by referring to the data and instructions given by the paint manufacturer.
3. Apply paints to the vehicle body under the same conditions and using the same painting methods as those used to make the color comparison board.

3-Coat Pearlescent Paint



1. It is necessary to match the color of the refinishing base color paint and the original body paint. On all cars, an exposed portion of the color base coat will be found under the right and left hand sill plates.



2. The color tone of a pearl base coat varies with the number of overlapped spray strokes (film thickness). Use the same spraying conditions as those for color matching.
3 Areas to be sanded and coated for Zone repairs.

Technical Service Bulletin # **BF88015** Date: **880915**

PDI - Paint Guard Coating (PGC) Removal

Classification:
BF88-015
Section:
Body & Frame
Reference:
TECHNICAL BULLETIN TS88-120
Models:
All Models

Date:
September 15, 1988
PAINT GUARD COATING REMOVAL

This Bulletin supersedes the previously issued "Paint Guard Coating Removal", BF88-006/TS88-043, dated May 5, 1988. Due to duplicate numbering this Bulletin is being re-issued with new Classification/Reference numbers. There are NO changes to the contents of the Bulletin. Please discard the original Bulletin.
APPLIED MODELS: All Models

SERVICE INFORMATION

The following information should be used to help your wash and detail personnel in the clean-up of vehicles delivered with PGC (paint guard coating). The paint guard coating remover solution is supplied with each vehicle and can be found in the glove box. In order to make the removal

process easier, the Ports have improved the application process and are careful to avoid sags and thick coats of the material.

Please post these directions in your car wash area and review with clean-up personnel. A good understanding of the PGC and remover will greatly speed your clean-up and preserve the new car finish.

A Material Safety Data Sheet on PGC has been distributed as part of a National Parts Bulletin.

1. Park vehicle in shade and rinse thoroughly using a spray of water. If the vehicle is extremely dirty, wash it with soap and water. This will loosen dirt and cool the sheet metal. The surface must not be allowed to dry during the cleaning process.

When applying the remover solution in the next step, a pair of rubber gloves, eye protection, and boots should be worn for protection.

2. Mix a solution of water and remover into a bucket. The solution should be mixed at 1 part remover to 8 parts of water. Using a clean wash mit, gently spread the solution onto the vehicle with long sweeping strokes.

The remover works chemically, so there is no need for rubbing the surface at this point.

Caution: the use of any chemical other than the one supplied to remove the paint guard coating, (KATS UL 6000), may make the coating harder to remove and it could damage the paint.

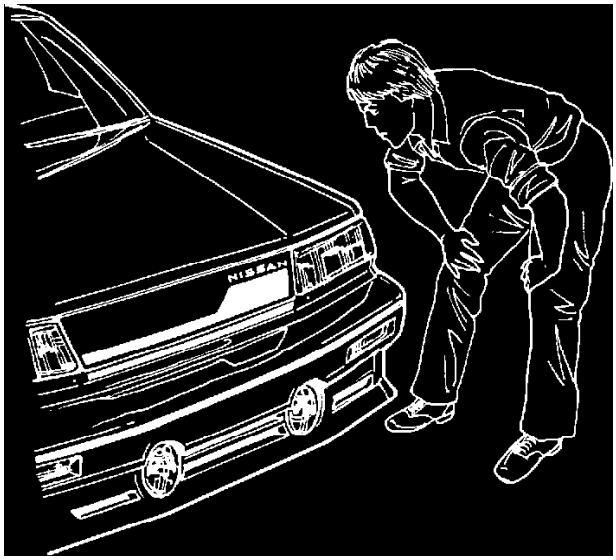
3. Keep the solution wet for 3 to 5 minutes. Don't let it dry.

   Apply additional solution to areas which begin to dry too quickly.

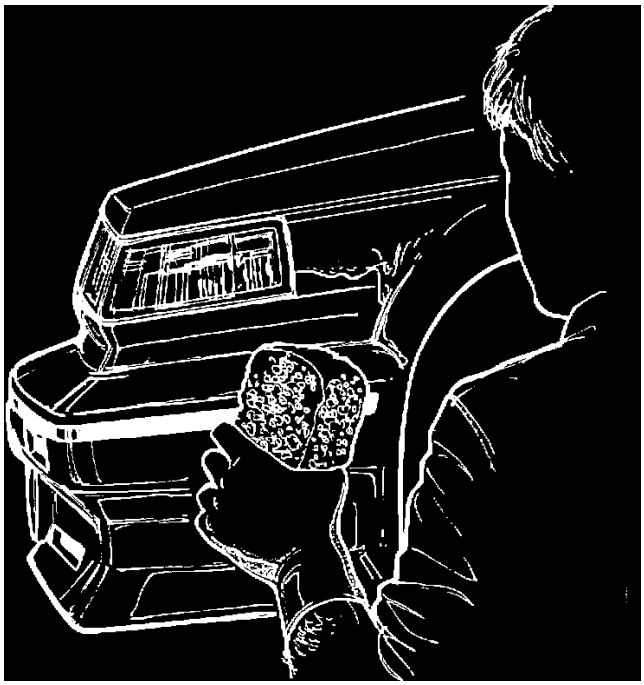
4. Rinse with water.

   This rinses off the coating and remover.

5. Dry vehicle with a chamois.



6. After rinsing - inspect the surface for drips, sags, runs and missed areas.



7. Mix one part remover solution to one part water into a bucket. Spread solution directly onto runs, sags and thick areas of paint guard coating.

   Rewash those areas repeatedly with remover and light sponging. Coatings that smear but do not wash off are not PGC. They're probably engine wax overspray or anti-corrosion wax drips. Use your normal solvent to remove these.

   Caution: Do not let the remover dry.

   Be especially careful to watch for drips onto the top surface of the bumpers when using the 1 to 1 mixture. If the solution is allowed to dry on these surfaces, it may cause recoating of the PGC.

Force can damage the paint and other chemicals can make the coating more resistant to removal.

The mixture of 1 part remover to

1 part water is used only on thick areas. Do not use the remover without mixing it with water.

8. Thoroughly rinse and dry vehicle.

9. Give the vehicle a final inspection.

Technical Service Bulletin # **94-015** Date: **940208**

Paint - Contamination Identification and Repair

Classification:
BF94-003

Reference:
NTB94-O15

Date:
February 8, 1994

PAINT CONTAMINATION IDENTIFICATION AND REPAIR

This bulletin supersedes NTB93-058 / BF93-014 & NTB91-090 / BF91-023

APPLIED VEHICLE(S):
ALL

SERVICE INFORMATION

The following procedures and materials have been found effective in removing iron particles, water or chemical spots, scratches and/or swirl marks which have not penetrated the clear coat/color coat of painted vehicle surfaces.

NOTE:
The updated repair procedures discussed in this Service Bulletin can be applied to all types of Nissan clear coat materials, including the new Cross Link clear coat (NCLC)/hard clear coat.

***NOTE:**
Measure the paint thickness before and after abrasive cleaning. If abrasive repair is not successful on the first panel tested, it must be tried on each affected panel (hood, roof, trunk etc.,) to determine which panel(s) must be re-clear coated or re-color/clear coated and which may be repaired by abrasive means.

Finish Kare Product Distributors:

1726 Floradale Ave., El Monte, CA 91733 (213) 686-0462

Alaska Auto Preservation 3200 Seward Highway Anchorage, Alaska 99503 (907) 272-1366 Herb Worthly	Teteak Distributing 4444 N. 47th Place Phoenix, AZ 85018 (602) 840-6164
S.C. Finish Kare 2639 N. Grand Ave. Suite 112 Santa Ana, CA 92701 (714) 771-0258 Nick	Bay Area Finish Kare 4024 W. Las Positas Ave. Pleasanton, CA 94588 (415) 417-1049 Ernie Zuccato
Deifel Paint & Supply 1030 Alta Vista Dr. Bakersfield, CA 93305 (805) 325-7201 Greg	R & S Sales 601 William Madera, CA 93637 (209) 674-7210 Ray
Central Coast Auto 1951 Santa Barbara Ave. San Luis Obispo, CA 93401 (805) 541-1214	Canadian Auto Preservation 351 N. Rivermede RD. Unit 4 Concord, Ontario, Canada L4K 3N2 (416) 798-7511 Randy or Sam
W.S.E. Inc. P.O. Box 9323 Denver, CO 80209 (303) 722-1817 Dean Stone	Auto Restoration of Florida Palm Harbor, FL (813) 785-3150 Gary Sounder
After-Market Services Jacksonville, FL (904) 731-3524 Kevin McCabe	Finish Kare Hawaii 3375 Koapaka #350 Honolulu, HI 96819 (808) 837-7770 Dave Fleming
Star Enterprises 1209 Paramount Parkway Batavia, IL 60510 (708) 406-0222	Finish Kare Auto Products 2422 South Seneca Suite A-B-C Wichita, KS 67217 (316) 263-5600 Dave McDavitt
Sam Brown Sales 615 Livernois Ferndale, MI 48220 (800) 336-2508 Hershel	Crest Industries 10888 Indian Head In. Blvd. St. Louis, MO 63132 (314) 423-4080 Mike Garlik

Finish Kare products are marketed by mobile distributors which will deliver the product directly to your dealership. If a Finish Kare distributor is not located in your area, Finish Kare can be contacted at the number above for direct shipment from their national office.

Auto Pak Route 7, Box 37 Jackson, MS 39209 (601) 924-0015 John Howard	Jim Drake Chemical Sales 3937 South 42nd St. Lincoln, NE 68506 (402) 489-8769 Jim Drake
Auto Service Supply 91 Birch Parkway Sparta, NJ 07871 (201) 729-7815 Doug Mann	Costal Chemical Supply 106 Pickard Dr. Mattydale, NY 13211 (315) 682-5942 Doug Profitt
BZ Distributing 4036 Montoya Ave. Las Vegas, NV 89120 (702) 435-0674	Northwest Auto Accessories 2424 E. Burnside Street Portland, OR 92714 (503) 234-2020
Auto Preservation Waxol Car Kare Products 6949 East Kemper Rd. Cincinnati, OH 45249 (800) 543-8324 local 489-7885 Trey Hallberg, Wayne Eko	Lester Sales 1543 E.11th Street Tulsa, OK 74120 (918) 599-8011
MG Reconditioning 756 Ashland Ave. Eddystone, PA 19013 (215) 876-6281 Norm Larson	Cashers Supply 1700 Bobali Drive Harrisburg, PA (717) 238-0815
South Carolina Finish Kare 1471 Center St. Extension Unit G4 Mt. Pleasant, SC 29464 (803) 849-9078	Pro-Chem of DFW 1820 Hickory Dr. Fort Worth, TX 76117 (817) 831-2868 Marty David, Brett Moreland
Auto Wizard 14303 J. Sullyfield Circle Chantilly, VA 22021 (703) 802-0000 Don Ballard	Finish Kare Northwest 2138 49th Ave. S.W. Seattle, WA 98116 (206) 938-5616 Russ Dow

CLAIMS INFORMATION

Repairs of environmental contamination discovered and reported at the time of vehicle delivery to the dealership can be claimed utilizing procedures outlined in Warranty Bulletin WB92-003 dated January 24, 1992.

Outline of Procedures

A. Wash with detergent such as (Nissan P/N 999MP-A3100), then dry.

B. Identify the type of contamination using fluorescent lights and magnification. If paint over-spray is found, a specialized repair process is needed.

If paint contamination other than paint over spray is suspected, test a 2' x 2' section on each affected panel as follows to determine the severity of damage and repair effort needed:

C. Re-wash several times to remove detergent and water soluble spots. If spots are removed, wash affected panels.

D. Clean with Nissan Bug and Tar remover for solvent soluble spots. If spots are removed, clean affected panels.

E. To remove iron particles and acid rain residue, use Finish Kare # 1119 followed by # 883 (apply # 883 several times if necessary) and always neutralize with # 118SC.

F. Inspect for damage using fluorescent light source and magnification. If spots are removed, clean affected panels.

G. Use abrasive cleaning on test section to remove up to 0.5 mil of damaged top/clear coat.* If damage is less than 0.5 mil deep, clean affected panels with abrasive method. After polishing, inspect for swirl marks using halogen lights. If damage is more than 0.5 mil deep, the affected

panels must be repaired either by re-clear, re-color/clear coat, or re-color coated (on vehicles with no final clear coat).

A. Wash Procedure

Wash Equipment and Materials:

Spray wash system (a mobile or stationary unit with hand held spray similar to a coin operated car wash that provides soap solution, rinse water and de-ionized final rinse).

Car wash detergent containing no phosphates, (Nissan P/N 999MP-A3100).

Clean 100% cotton terry cloth towels.

De-ionized water for the final rinse. De-ionized water is highly recommended as it reduces water spotting. De-ionizing cylinders can be purchased or rented from water purification companies

1. During the summer months, the early morning hours are the best time to wash a car unless you can wash and dry it in the shade. Never wash a car under the hot sun. All paint is subject to water spot damage when washed under the sun due to high surface temperature.

2. Thoroughly rinse oft the surface dirt and foreign materials with a spray of clean tap water.

3. Gently apply detergent and water solution (Nissan P/N 999MP-A3100), keeping it wet for 4-5 minutes. To avoid scratching the finish, do not rub, gently move the solution around with light pressure. Do not allow the solution to dry before rinsing. Use, clean warm water and a clean terry cloth towel. Frequently rinse off the terry cloth towel to avoid scratches from entrapped dirt. Replace the towel with a clean one once it becomes soiled.

Caution:
When washing a convertible rear window use gentle horizontal and vertical strokes, do not use a circular motion.Use a clean terry cloth towel. Also refer to NTB92-092 for additional information on convertible wash procedure.

4. Rinse with a spray of clean tap water. Make sure all detergent is flushed off the body. If soap dries on the convertible rear window or some moldings it may cause streaking. Use a spray of de-ionized water for the final rinse.

5. Use a clean damp terry cloth towel and gentle pressure to remove the majority of the rinse water allowing the remaining water film to air dry. Replace the towel frequently to avoid scratches from entrapped dirt.

6. Always wash, rinse, and dry a vehicle beginning with the roof and glass. Then the hood and trunk followed by the vertical surfaces. Wash, rinse, and dry one section at a time if low humidity causes fast drying. Do not allow soap solution or rinse water to dry on the finish.

B. Identifying Contamination

Examine the vehicle in both strong sunlight and indoor fluorescent lighting (inspection is easier with a hand held 500 watt halogen lamp or a hand held fluorescent lamp) to identify which type of contamination may be affecting the vehicle. Magnified viewing of spots is most easily done with a 8X and 30X illuminated magnifier from Radio Shack (catalog no. 63-851).

CONTAMINATION	INITIAL APPEARANCE	MAGNIFIED APPEARANCE
ACID RAIN	1/8" to 3/4" dia. U-shaped. Chalking appearance along edge	Chalking is composed of tiny cracks and chips
BEE POLLEN & INSECT JUICES	Small near circular yellow spots or small spots and streaks of various colors	Pollen, drop of paint. Insect juice may be hazy or translucent
BIRD DROPPINGS	Large irregular white, grey or black deposits	Chalking may be light haze or tiny cracks and chips
CHEMICAL SPOTS (incl. Fertilizer, Petroleum, etc.)	Various sizes and shapes. Chalky appearance throughout	Chalking may be light haze or tiny cracks and chips
IRON PARTICLES (incl. Copper, Lead, Mercury, Zinc, Tin)	Pin point spots which can be felt with a finger. Look black on white or light color paint, grey on dark color paint	Spots appear like a small cinder or rock. Sometimes surrounded by an orange stain if viewed on light color paint
PAINT OVER SPRAY	Pin point spots which can be felt with a finger. Many colors	Spots appear like a colored bead sitting on the surface
TREE SAP	1/8" to 1/4" dia. runs and circular spots, usually sticky	Chalky or glazed appearance
WATER SPOTS	1/8" to 3/4" dia. near circular in shape. Slight haze or chalking throughout	Spots tend to disappear under magnification
HARD WATER DEPOSITS	1/8" to 1/4" dia. U-shaped. Chalky appearance throughout	Chalking may be light haze, but tends to disappear
WAX DRIPS	Large 1/8" to 1/2" dia. Raised clear, circular or oval spots	Spots tend to disappear under magnification
CEMENT DUST	Appears like a white crust once moisture activated	

The table provides a brief description of some types of paint contamination you may encounter.

Select a 2' x 2' test section to perform the following Contamination Test Removal.

C. RE-Wash

C. Re-Wash with detergent and water solution, keeping it wet for 4-5 minutes. To avoid scratching the finish, do not rub, gently move the solution around with light pressure. Do not allow the solution to dry before rinsing. Use, clean warm water and a clean terry cloth towel. Frequently rinse off the terry cloth towel to avoid scratches from entrapped dirt. Replace the towel with a clean one once it becomes soiled. Rinse with a spray of clean water. Repeat up to four times.

D. Clean

D. Clean with Nissan Bug and Tar remover using a clean terry cloth towel and gentle pressure. Repeat up to four times.

E. Applying Finish Kare

E. Apply Finish Kare to remove iron particles and acids. See procedure below:

Caution:
Attempting to buff iron particles will cause severe scratching.

1. Apply Finish Kare # 1119, solution, keeping it wet for 4-5 minutes. To avoid scratching the finish, do not rub, gently move the solution around with light pressure. Do not allow the solution to dry before rinsing.

2. After the wash and rinse, gently dry the contaminated surfaces with the terry cloth towels to remove the majority of the water. Use gentle pressure on the towel to avoid scratching the paint with any loosened iron particles.

3. Apply Finish Kare # 883 directly from the bottle using the applicator provided. Keep the affected areas wet for 5 minutes and allow the solution to lift the particles. Agitate gently, but do not rub as this will scratch the color coat or clear coat of paint. Reapply # 883 to spots

which start to dry before rinsing

CAUTION:
Do not exceed the 5 minute soak time as this solution may damage the paint or trim.

4. Rinse thoroughly with tap water, dry and inspect the surface.

5. Reapply # 883 as often as needed to remove more difficult spots.

6. When all iron particles are removed, wash with Finish Kare # 118SC (Neutralizer and Shampoo) and rinse thoroughly. Gently dry with a fresh towel. Do not use towels used in the above steps, as they may have iron particles in the nap and could scratch the color coat or clear coat.

F. Inspect For Damage Severity

After washing and iron particle/chemical removal are performed on the test section, inspect the surface to determine the severity of damage. Levels 2 and 3 are determined using abrasive removal on test sections on each affected panel.

Examine the vehicle in both strong sunlight and/or indoor fluorescent lighting (inspection is easier with a hand held 500 watt halogen lamp and a hand held fluorescent lamp) to identify which type of contamination may be affecting the vehicle. Magnified viewing of spots is easily done with an 8X and 30X illuminated magnifier from Radio Shack (catalog no. 63-851).

Level 1
No damage, the contamination did not penetrate the paint surface and washed off using the detergent and water and the iron particle remover.

Level 2
Minor damage, the contamination did not penetrate more than 0.5 mil of the color coat or clear coat. Abrasive cleaning will resolve.

Level 3
Substantial damage, the contamination penetrated more than 0.5 mil of the color coat or clear coat. Re-color and clear coat is necessary

G. Abrasive Cleaning

IMPORTANT:
All iron particles and acids must be removed and the surface neutralized with the above procedure before proceeding. Iron particles and acids which remain will not be fully removed by abrasive cleaning. Small amounts of contamination will wick moisture into the clear coat or through a re-color/clear coat and cause blistering

The goal of abrasive cleaning is to remove the damaged layer of color coat or clear coat (up to 0.5 mil in thickness) using the least abrasive process. The steps below demonstrate the sequence of operations to use on the test section to identify the severity of damage and the repair needed.

1. Measure paint film thickness.

2. Polish and evaluate. If OK Polish all affected surfaces. If NG go to step 3.

   Also determine film thickness removed.

3. Buff and evaluate. If OK Buff and then polish all affected surfaces. If NG go to step 4.
   Also determine film thickness removed

4. Wet sand and evaluate. If OK wet sand then buff and polish affected surfaces If NG go to step 5.
   Also determine film thickness removed.

5. Re-clear/color coat after neutralizing surfaces.

6. Apply color coat and clear coat if damage is completely through clear coat

NOTE:

Polishing to remove buffing or swirl marks requires a foam finishing pad on a dual action sander.

Sanding Materials	Buffing Materials	Polishing Materials
#02044 2000 grit sandpaper	#05928 Finesse-it II (qrt.)	#05996 Perfect-it glaze (dark)*
#05526 Sanding sponge	#05929 Finesse-it II (gal.)	#05995 Perfect-it glaze (white)*
#05518 Squeegee	#05705 Wool Polishing pad	#05725 Foam pad
	#05710 Superbuff Adapter	#05718 Backup Pad

* # 5996 is dark in color to ease clean-up on dark cars, # 5995 is white for light colors.

3M materials:

Sanding Materials	Buffing Materials	Polishing Materials
#S2025 2000 grit Nikken Sandpaper	#M-0232 Fine Cleaner #2 (qrt.)	#M-0932 Swirl Remover #9 (qrt.)
#E-7200 Sanding sponge	#M-0132 Medium Cleaner #3 (qrt.)	#W9000 Meguiar's Foam polishing pad or #05705 3M
#M-0016 Sanding Lubricant (pint)	#M-0432 Heavy Cleaner #4 (qrt.)	Wool polishing pad for initial polishing
#E-2000 Tack sponge	#05705 3M Wool Polishing pad #05710 3M Superbuff	#W-5500 Foam Polishing Pad, 5.5" dia. or #W6000 Foam Polishing Pad, 6"

3M and Meguiar's materials are available at local automotive paint and body supply stores.

Meguiar's materials:

Misc:

8" buffer (1500-1750 RPM)
Dual action sander, variable speed
Terry cloth towels (100% cloth)

NOTE:
Always use separate pads for each liquid (mark the backside of each pad with the type of liquid used) and clean the pads frequently. Use of a wool pad on clear coat is limited to the polishing type of pad and is always followed by a foam Dad on a dual action sander to remove swirl marks.

Measuring Paint Film Thickness

Before any abrasive removal, measure the initial film thickness at several places to establish an average figure. After each abrasive step measure several places again to determine how much paint film was removed. Follow the instructions provided by the manufacturer of the mil gauge you are using for measurement and calibration. If you do not have a thickness gauge use the following rule of thumb during abrasive removal; When the "orange peel" surface is removed, 0.5 mil has been removed.

Polishing

Polishing is done in two steps: The first step is with an 8" buffer and the second step with a dual action sander to remove buffing and swirl marks. Low speed (1500-1750 RPM) is necessary to prevent overheating the surface.

CAUTION:
Do not polish or buff a surface dry. More than the usual quantity of liquid must be used to keep the paint surface cool. Wipe the excess material off with a clean soft towel after each operation

1. Clean the surface of all residue before polishing.

2. Use an 8" buffer (at 1500 - 1750 RPM) with either a 3M wool polishing pad or a Meguiar's foam pad, apply polishing compound over the work area (2' x 2' or less). Spread the liquid around with the pad before turning the buffer "ON". Use an overlapping pattern to assure even polishing effort on all areas.

3. Second use a dual action sander with either a 3M foam pad or a Meguiar's foam pad, apply polishing liquid over the work area (2' x 2' or

less). Polish with the same technique as above. Do not polish dry, wipe off excess material with a clean terry cloth towel.

If build up occurs, cool the surface with clean water and dry with a clean terry cloth towel and clean the foam pad. Use a slower speed to prevent heating the surface and ground the vehicle to a metal water pipe to reduce static electricity.

INSPECTION

Gently clean a small section with PPG DX330 Wax and Grease remover or similar wax remover, using a clean towel to remove any polish/filler. Wipe in one direction to aid in distinguishing between buffing scratches and towel scratches. Inspect the surface for swirl marks under full sunlight or with a 500 watt halogen work lamp held at an angle about an arms length away.

CAUTION:
If you clean with an alcohol and water cleaning solution it will cause damage to plastic lenses. The damage is not immediately visible, but develops later

Buffing

Buffing is done with a 8" buffer at 1500-1750 RPM to remove sanding scratches.

1. Clean the surface of all residue before buffing.

2. Apply a buffing liquid and spread it over the work area (2' x 2' or less) with the buffing pad before turning the buffer "ON". Keep the pad nearly flat and move it slowly but continuously over the area. Use an overlapping pattern to assure even buffing effort on all areas. Do not buff dry, wipe off excess material with a clean terry cloth towel.

INSPECTION

Inspect the surface for sanding marks under full sunlight or with a 500 watt halogen work lamp held at an angle about an arms length away. If necessary, gently clean a small section of the surface with PPG DX330 Wax and Grease remover or similar wax remover, using a clean towel to remove any polish/filler. Wipe in one direction to aid in distinguishing between buffing scratches and towel scratches.

Sanding

1. Soak the sand paper in water with lubricant such as Meguiar's # 0016, for at least 15 minutes before use. Mask the fenders and doors to reduce cleanup time. Wet sanding with a lubricant prevents buildup on the paper and consequent gouging of the finish.

2. Sand with 2000 grit sand paper using a sanding pad, never by hand alone. Apply plenty of water while sanding in one direction only, no more than 12-15 strokes. Do not sand in a circular pattern. Do not sand over body lines and panel edges. Rinse the paper frequently to prevent gouging.

NOTE:
Wet sanding vehicles with the New Cross Link Clear Coat (NCLC) hard clear coat requires a more aggressive sanding stroke. Vehicles with a conventional clear coat require a normal sanding stroke.

3. Rinse with water and squeegee gently. As the squeegee clears the water, inspect for damage.

INSPECTION

Inspect the surface for damage under both strong fluorescent lights and full sunlight (a 500 watt halogen work lamp held at an angle about an arms length away is necessary on cloudy days). A smooth dull sanded surface is expected at this time. Bright spots or other irregularities indicate the damage needs more sanding, up to the 0.5 mil standard.

4. After the damage is removed, measure the paint thickness in several places to determine if less than 0.5 mil has been removed.

5. If the damage was deeper than 0.5 mil, the surface must be re-clear coated, or re-color coated on vehicles with no clear coat. Refer to the Warranty Paint and Body Self-Study Course, or the Warranty Flat Rate Manual for assistance.

6. If the damage has been removed with less than 0.5 mil of the color/clear coat removed, buff and polish to remove the sanding marks.

Technical Service Bulletin # **87-145** Date: **870928**

Paint - Spotting Prevention & Repair

Classification:
BF87-030

Reference:
TS87-145

Date:
September 28, 1987

PAINT SPOTTING REPAIR PROCEDURE

Nissan-Datsun Truck PL720 2WD L4-1952cc 2.0L SOHC (Z20)

APPLIED VEHICLE(S):
All Models

SERVICE INFORMATION

Paint spotting incidents occurring in the U.S. market are not unique to Nissan, but are being experienced by all manufacturers. To date, two separate types of paint spotting incidents have been identified as follows:

1. Particulate Fallout - Tiny solid particles which collect on horizontal panels, causing a dark stain which will penetrate into the paint if not cleaned.

2. Water Spotting - A ringlet or multiple water-drop-shaped light discoloration on dark painted horizontal panels.

THESE TYPES OF SPOTTING ARE NOT DUE TO PAINT DEFICIENCY, AND CAN BE PREVENTED THROUGH PROPER CARE.

SERVICE PROCEDURE

Particulate Fallout

Ash, dust, soot and other tiny solid particulate matter from industrial and other sources can be carried many miles. Particulate fallout is most noticeable on the horizontal surfaces (hood, luggage compartment lid, and roof) of the vehicle.

If left on a moist, painted surface, the particles will slowly dissolve and bond to the paint, frequently leaving a red stain. This stain can be present even on plastic surfaces such as bumpers if the fallout has an iron content. These spots may be visible on both solid and metallic paints (especially light colors). The particulate can be felt as a sharp point on the paint surface. When viewed through a magnifying lens, the staining may be evident.

VEHICLE CARE

Every 10 days, or more frequently depending upon local conditions, particulate fallout must be washed off with mild detergent and water to prevent its bonding and staining action. A good carnuba wax coating can help protect against damage from particulate fallout.

PARTICULATE FALLOUT REPAIR PROCEDURE

In most cases, thoroughly washing the affected area with a water and mild detergent solution (to avoid scratching the finish with dislodged particles) will remove the particulates.

After washing the vehicle, a stain, generally orange or red, may still be visible on white or other light colored vehicles. This stain can be removed with a fine compound material. DO NOT APPLY THE COMPOUNDING MATERIAL BEFORE ALL PARTICLES IN THE AFFECTED AREA ARE REMOVED BY THOROUGH WASHING.

Water Spotting

A photograph of typical water spotting is shown on page 26 of the Nissan **Paint Refinishing Guide*** (PIN 5REFGD). The spots are most visible when viewed at an angle, usually under fluorescent light. The paint surface is usually smooth to the touch because the spotting is a change in the top surface itself. This is not hard-water residue which will wash off with soap and water. These spots are visible on both solid and metallic paints with dark colors.

VEHICLE CARE

When a vehicle is stored outside and unprotected, dust patterns develop on the painted surfaces. These patterns guide moisture droplets from a light rain or morning dew to the same location each time. The strong sunlight, repeatedly concentrated on these water droplets, greatly contributes to the spotting. When storing a vehicle unprotected, where the painted surface is repeatedly exposed to a combination of sunlight and light rain (or morning dew), the vehicle MUST be washed AND thoroughly dried at least every two weeks, or more frequently if there is light rain or dew followed by strong sunlight.

When washing any vehicle, it must be out of direct sunlight and the painted surfaces should be cool to the touch.

WATER SPOTTING REPAIR PROCEDURE

The method of repairing a water spotted finish varies with the severity (depth of spot in finish) of the spotting. After a thorough washing, perform the following:

1. Water spots on light colored vehicles and some vehicles which have had minimal exposure to the elements can be repaired by buffing. First, apply a fine cutting compound using an orbital buffer to remove a thin layer of the top coat or clear coat. After removal of the spots, buff with glazing compound to remove the fine scratches.

2. More severe spotting can be removed with a coarser cutting compound followed by finer compound and glazing compound to remove the scratches.

3. The most severe water spots on clear coated, dark vehicles can be repaired by wet sanding the affected areas with 1200 grit sandpaper to prepare the surface then spraying a fresh clear coat on those areas. Non-clear coated vehicles should be repairable with either step 1 or 2.

* Available through Dyment Distribution Services.

Technical Service Bulletin # **90-044** Date: **900524**

Audio - Cassette Tape Player Maintenance

Classification:
EL90-002

Reference:
NTB90-044

Date:
May 24, 1990

CASSETTE TAPE PLAYER MAINTENANCE

APPLIED VEHICLE(S)
All Nissan vehicles equipped with a cassette tape player

SERVICE INFORMATION

The playback head, capstan, and roller will attract dirt or residues from the tape material each time a cassette is played. This causes a deterioration of sound quality (i.e. distortion, reduced frequency response, and reduced clarity/fullness). If residues and dirt are not removed, loss of channel(s) or tape continuity (also referred to as: "tape eating") may occur.

SERVICE PROCEDURE

To ensure the optimum performance from a cassette tape player, the following Periodic Maintenance guidelines should be observed:

^ Clean the cassette tape player (specifically, the tape head and capstan rollers) after 10 hours of play or once a month (whichever occurs first).

^ Use a cassette cleaning kit (such as: Nissan Cassette Deck Cleaning System, P/N 999U2-A7000 or equivalent), being careful to follow the kit manufacturer's instructions.

Additionally, the following Cassette Tape Care guidelines should be observed:

^ Before turning off the radio, eject the cassette being played. Leaving the tape mechanism stopped while a tape is engaged can damage the tape, pinch roller, or capstan. Use tapes which are 90 minutes or less in play time.

^ Store cassette tapes properly, when not in use;

1. Use protective plastic case to prevent tape from unwinding and accumulating dust.

2. Protect tapes from extreme heat, direct sun light, and extreme cold. After turning off the radio, do not leave the tape in the cassette door pathway. Remove it to allow the tape slot door to close and keep out airborne dirt.

^ Do not use tapes that are more than 5 years old. Older tapes suffer from stretch and increased tape head residue.

The preceding information should be given to the customer at the time of vehicle purchase (Sales Department) and during vehicle servicing (Service Department).

Technical Service Bulletin # **93-017** Date: **930121**

Cassette - Poor Sound Quality/Loss of Channel/Jamming

REFERENCE:
NTB93-017

CLASSIFICATION:
EL93-004

DATE:
January 21, 1993

TITLE:
CASSETTE TAPE PLAYER MAINTENANCE

APPLIED VEHICLES(S):
All Nissan vehicles equipped with cassette tape players

SERVICE INFORMATION

In normal use, the playback head, capstan and rollers of any cassette tape player will attract dirt or residues from the tape material each time a cassette is played. This causes a deterioration of sound quality (i.e., distortion, reduced frequency response, and reduced clarity). If residues and dirt are not removed, loss of channel(s) or "tape eating" may occur. In order to help your customers to avoid these incidents and ensure optimum performance from their cassette tape players, please advise them of the need to perform the following maintenance procedures:

SERVICE PROCEDURE

Use a cassette cleaning kit to clean the cassette tape player (specifically the tape head and capstan rollers) after every 30 hours of play or once a month, whichever comes first. You may use the Nissan Cassette Deck Cleaning System, P/N 999U2-AD010 or equivalent. Be careful to follow the kit usage instructions.

CASSETTE TAPE CARE GUIDELINES:

- Before turning off the radio, eject the cassette being played. Allowing the tape mechanism to stop while a tape is engaged can damage the tape, pinch roller or capstan. After turning off the radio, do not leave the tape in the cassette door pathway.

- Use tapes which are 90 minutes or less in play time.

- Use protective plastic cases to store cassettes when not in use. This will prevent them from unwinding and collecting dust.

- Protect tapes from extreme heat, direct sunlight, extreme cold, and from foreign material such as liquids or sticky substances. Discard damaged or contaminated tapes.

- Do not use tapes that are more than 5 years old. Older tapes suffer from stretch and increased tape residue.

NOTE: If your customer complains of deterioration of sound quality, loss of channels(s) or "tape eating," please clean the cassette tape player using the Cassette Deck Cleaning System as described above. In most cases, this procedure will return the cassette deck to full efficiency.

Technical Service Bulletin # **EL88021** Date: **881110**

Audio - Cassette Tape Player Diagnosis & Maintenance

Classification: Section:

EL88-021 Electrical System
Reference:
TECHNICAL BULLETIN TS88-148
Models:
All
Date:
November 10, 1988
CASSETTE TAPE PLAYER DIAGNOSIS & MAINTENANCE

SERVICE INFORMATION

A recent survey has shown that a majority of customer complaints about cassette tape player performance can be resolved by cleaning the tape head. Some of the symptoms of a dirty tape head are:

^ One channel out
^ Low sound
^ Distortion
^ The cassette deck "eats" tapes
^ No high frequency

If a customer's cassette player exhibits any of these symptoms, please perform the following before removing the unit:

1. Clean the tape head using Nissan Cassette Deck Cleaning System, P/N 99902-A7000.
2. Test the unit to see if the problem is resolved.
3. If the problem is not resolved, conduct further diagnosis.

In addition, please coordinate with your Sales Department to provide the customer with the following recommendations for optimum sound quality

and system performance:

To prevent heavy accumulation of dirt, clean the tape head at least once every month or after 10 hours of play.
^ Use brand name quality cassette tapes that are 90 minutes or less in play time (120 minute cassette should not be used).
^ Store cassettes in their protective cases and away from direct sunlight and heat. Direct sunlight can cause the cassette to become deformed, and a deformed cassette may jam in the player.
^ Do not use extremely old tapes. The presence of a brownish powdery substance, or small pieces of magnetic tape on the front of the cassette tape indicates that the cassette tape is too old to use.
^ Refer to the Owner's Manual for more information on proper maintenance and operation of the sound system.

Technical Service Bulletin # **EL90002** Date: **900524**

Audio - Cassette Player Maintenance

Classification: Section:
EL90-002 Electrical
Reference:
TECHNICAL BULLETIN NTB90-044
Models:
All with cassette
Date:
May 24, 1990
CASSETTE TAPE PLAYER MAINTENANCE

APPLIED VEHICLES: All Nissan vehicles equipped with a cassette tape player

SERVICE INFORMATION:
The playback head, capstan, and roller will attract dirt or residues from the tape material each time a cassette is played. This causes a deterioration of sound quality (i.e. distortion, reduced frequency response, and reduced clarity/fullness). If residues and dirt are not removed, loss of channel(s) or tape continuity (also referred to as: "tape eating") may occur.

MAINTENANCE PROCEDURE:
To ensure the optimum performance from a cassette tape player, the following Periodic maintenance guidelines should be observed:
^ Clean the cassette tape player (specifically, the tape head and capstan rollers) after 10 hours of play or once a month (whichever occurs first).
^ Use a cassette cleaning kit (such as: Nissan Cassette Deck Cleaning System, P/N 999U2-A7000 or equivalent), being careful to follow the kit manufacturer's instructions.

Additionally, the following Cassette Tape Care guidelines should be observed:
^ Before turning off the radio, eject the cassette being played. Leaving the tape mechanism stopped while a tape is engaged can damage the tape, pinch roller, or capstan. Use tapes which are 90 minutes or less in play time.
^ Store cassette tapes properly, when not in use;
1. Use protective plastic case to prevent tape from unwinding and accumulating dust.
2. Protect tapes from extreme heat, direct sun light, and extreme cold. After turning off the radio, do not leave the tape in the cassette door pathway. Remove it to allow the tape slot door to close and keep out airborne dirt.
^ Do not use tapes that are more than 5 years old. Older tapes suffer from stretch and increased tape head residue.

The preceding information should be given to the customer at the time of vehicle purchase (Sales Department) and during vehicle servicing (Service Department).

Technical Service Bulletin # **92-001** Date: **920101**

A/C - System Changes As Result of R-134A Refrigerant

Classification:
HA92-OO1

Reference:
NTB92-OO1

Date:
January 1992

A/C SYSTEM CHANGES FOR R-134A REFRIGERANT

(ALL MODELS)

APPLIED VEHICLE(S):
All Models

Service Information

Introduction

Nissan-Datsun Truck PL720 2WD L4-1952cc 2.0L SOHC (Z20)

Due to its harmful effect on the ozone layer, R-12 is being phased out and replaced by R-134a, which does not harm the ozone layer. While the R-134a A/C system is very similar to an R-12 A/C system, the differences in the refrigerant, lubricants, and service equipment are important.

Nissan A/C systems will change from R-12 to R-134a at the time of new vehicle (full model change) introduction, or in some cases by model year update to an existing model line.

This bulletin describes all of the general differences between the R-12 and R-134a systems. For details of an R-134a system for a specific model, refer to that model's service manual or new product information.

Refrigerant Handling Precautions

^ R-12 refrigerant and R-134a refrigerant must never be mixed, even in the smallest amounts, as they are incompatible with each other. If the refrigerants are mixed, compressor failure is likely to occur.

^ Use only specified lubricant for the R-134a A/C system and R-134a components. If lubricants other than those specified are used, compressor failure is likely to occur.

^ The specified R-134a lubricant absorbs moisture from the atmosphere at a rapid rate, therefore the following handling precautions must be observed:

^ When removing refrigerant components from a vehicle, immediately cap (seal) the component to minimize the entry of moisture from the atmosphere.

^ When installing refrigerant components to a vehicle, do not remove the caps (unseal) until just before connecting the components. Also, complete the connection of all refrigerant tubes and hoses without delay to minimize the entry of moisture into the system.

^ Use the specified lubricant from a sealed container only. Containers must be re-sealed immediately after dispensing the lubricant. Lubricant in containers which are not properly sealed will become moisture saturated. Such lubricant is no longer suitable for use and should be properly disposed.

^ Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Use only approved service equipment meeting SAE standards to discharge R-134a Systems.

^ If accidental system discharge occurs, ventilate the work area before resuming service.

^ Always wear eye and hand protection (goggles and gloves) when working with any refrigerant or air conditioning system.

^ Do not store or heat refrigerant containers above 125° (52°C).

^ Do not heat a refrigerant container with an open flame; if container warming is required, place the bottom of the container in a pail of warm water.

^ Do not intentionally drop, puncture, or incinerate refrigerant containers.

^ Keep refrigerant away from open flames: hazardous gas will be produced if refrigerant burns.

^ Refrigerant will displace oxygen, therefore be certain to work in well ventilated areas to prevent suffocation.

^ Do not introduce compressed air to any refrigerant container or refrigerant component, because contamination will occur.

^ R-134a in the presence of oxygen and under pressure may form a combustible mixture. Therefore, never introduce compressed air into any R-134a container, cylinder, A/C component, recover/recycle equipment, or other service equipment. This includes "empty" containers.

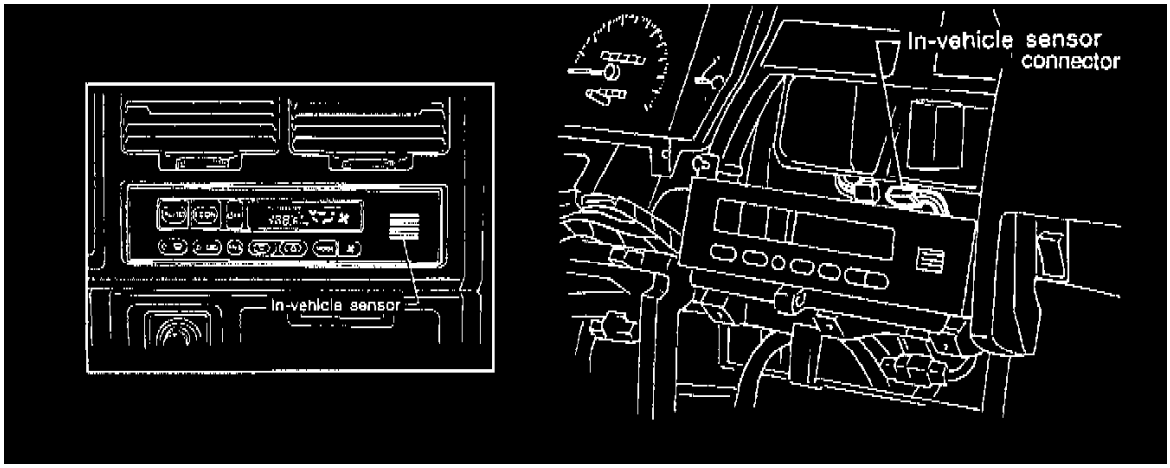
Refrigerant Terminology

Please use the correct name or names when specifying refrigerants. The guidelines are listed below:

^ Freon --> is a registered trademark of DuPont, and should only be used if referring to DuPont R-12.

^ DuPont's trade name for R-134a (automotive use) is Suva-->Trans A/C.

Nissan-Datsun Truck PL720 2WD L4-1952cc 2.0L SOHC (Z20)

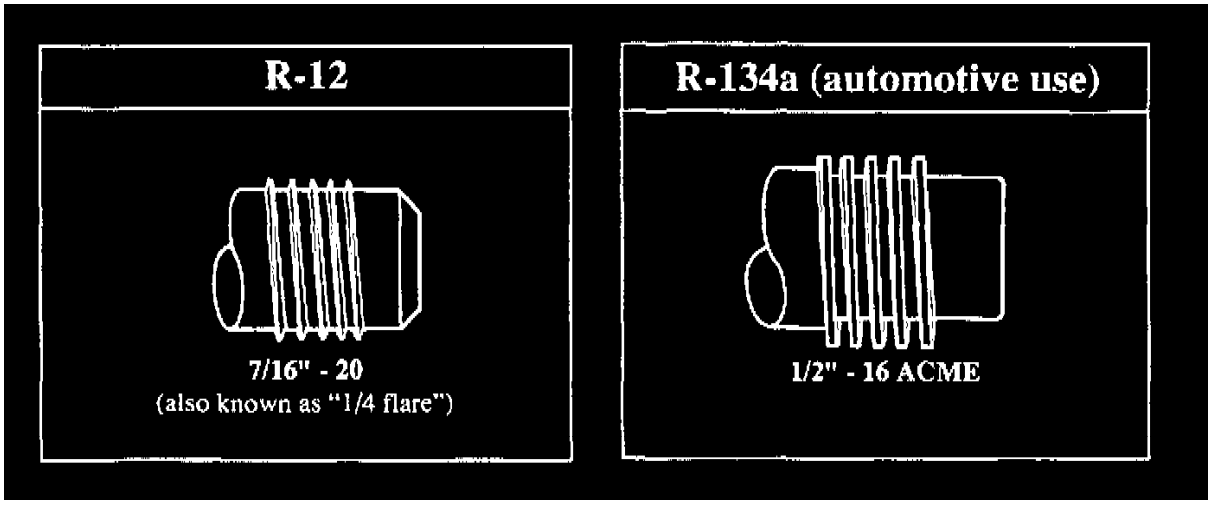


^ When referring to refrigerants, the terms Freon-->and Suva--> should not be used as a general reference. The proper terms are R-12 and R-134a

Comments regarding refrigerants:

^ R-12 and R-134a are not compatible with each other and should never be mixed, even in the smallest amounts.

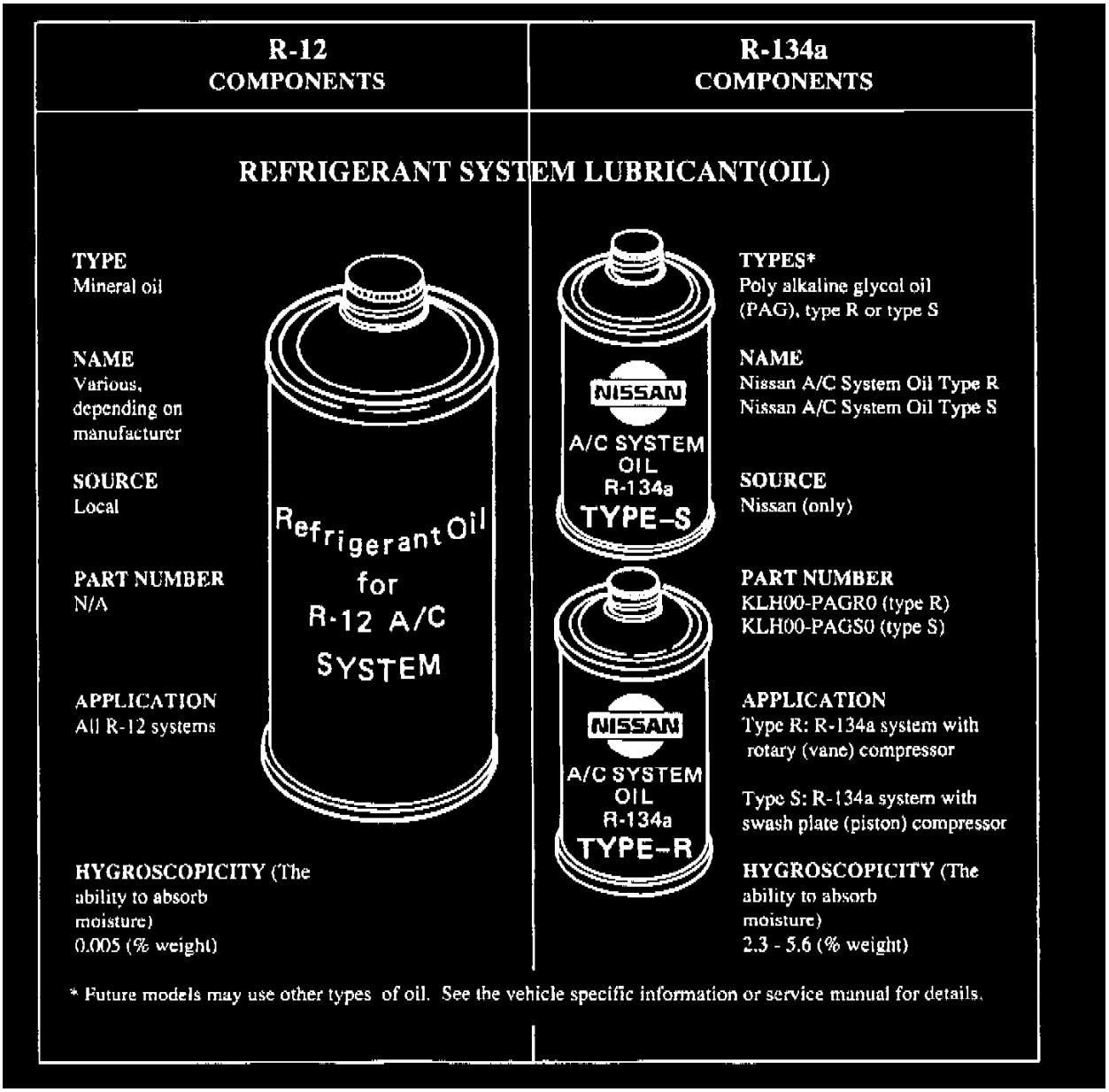
^ R-134a for automotive use has a special tank fitting size (1/2" - 16 ACME) which is compatible with automotive service equipment



^ When purchasing R-134a, be certain that the fitting size on the tank is 1/2" - 16 ACME. This thread size is easy to recognize by the square thread, as shown.

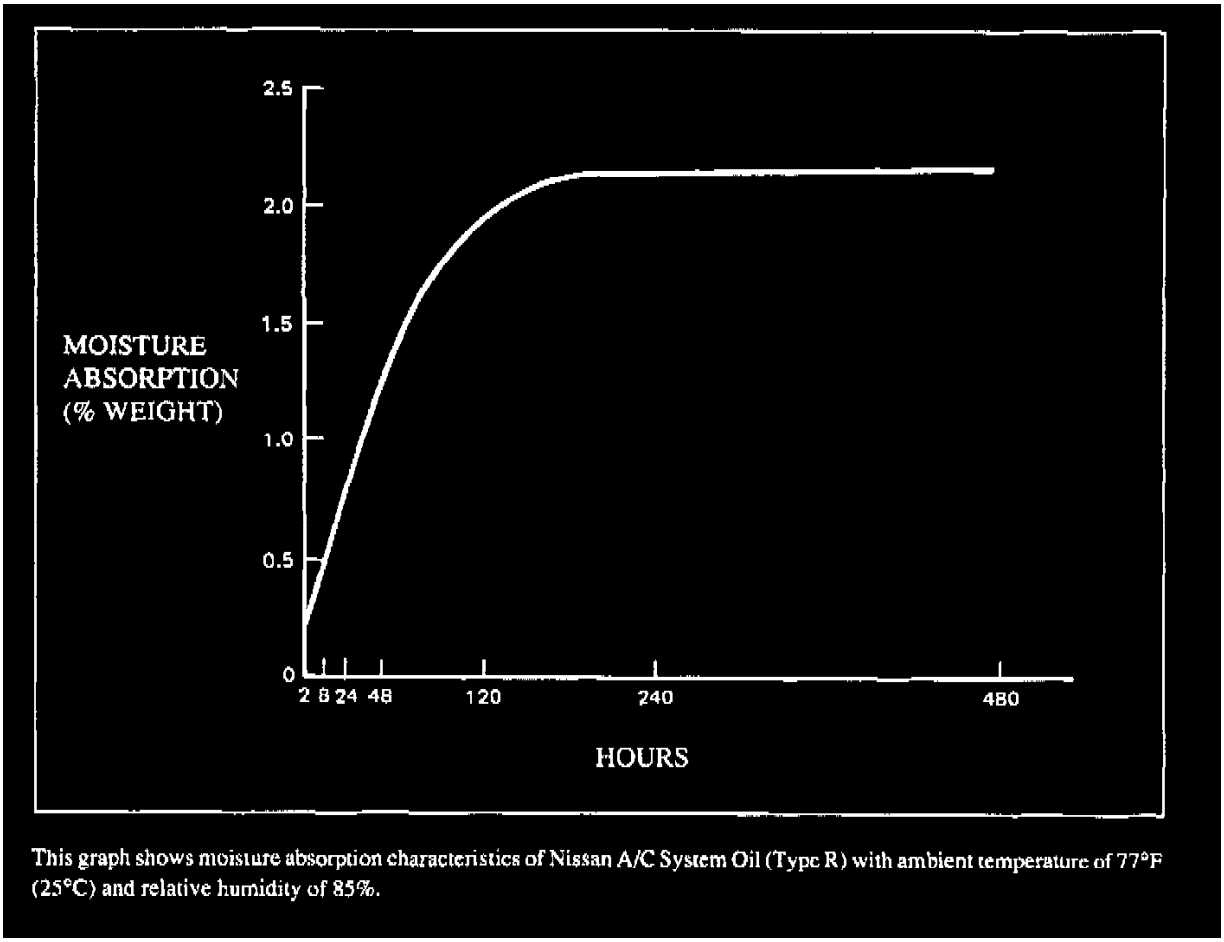
^ Although R-134a has no ozone depletion potential (ODP), it does have a slight global warming potential (GWP). Due to this slight GWP, as well as its high cost, venting of R-134a into the air is not recommended.

^ Recovery/recycling of R-134a will be required by U.S. Federal Law, Clean Air Act Amendments of 1990.



Comments regarding PAG refrigerant oils:

^ PAG oil absorbs moisture from the air at an exceptionally fast rate, and moisture can damage the A/C system.



This graph shows moisture absorption characteristics of Nissan A/C System Oil (Type R) with ambient temperature of 77°F (25°C) and relative humidity of 85%.

^ The graph on the following page shows that PAG oil left open to air (e.g. in an unsealed container) will absorb 2% moisture (by weight) in 120 hours (5 days).

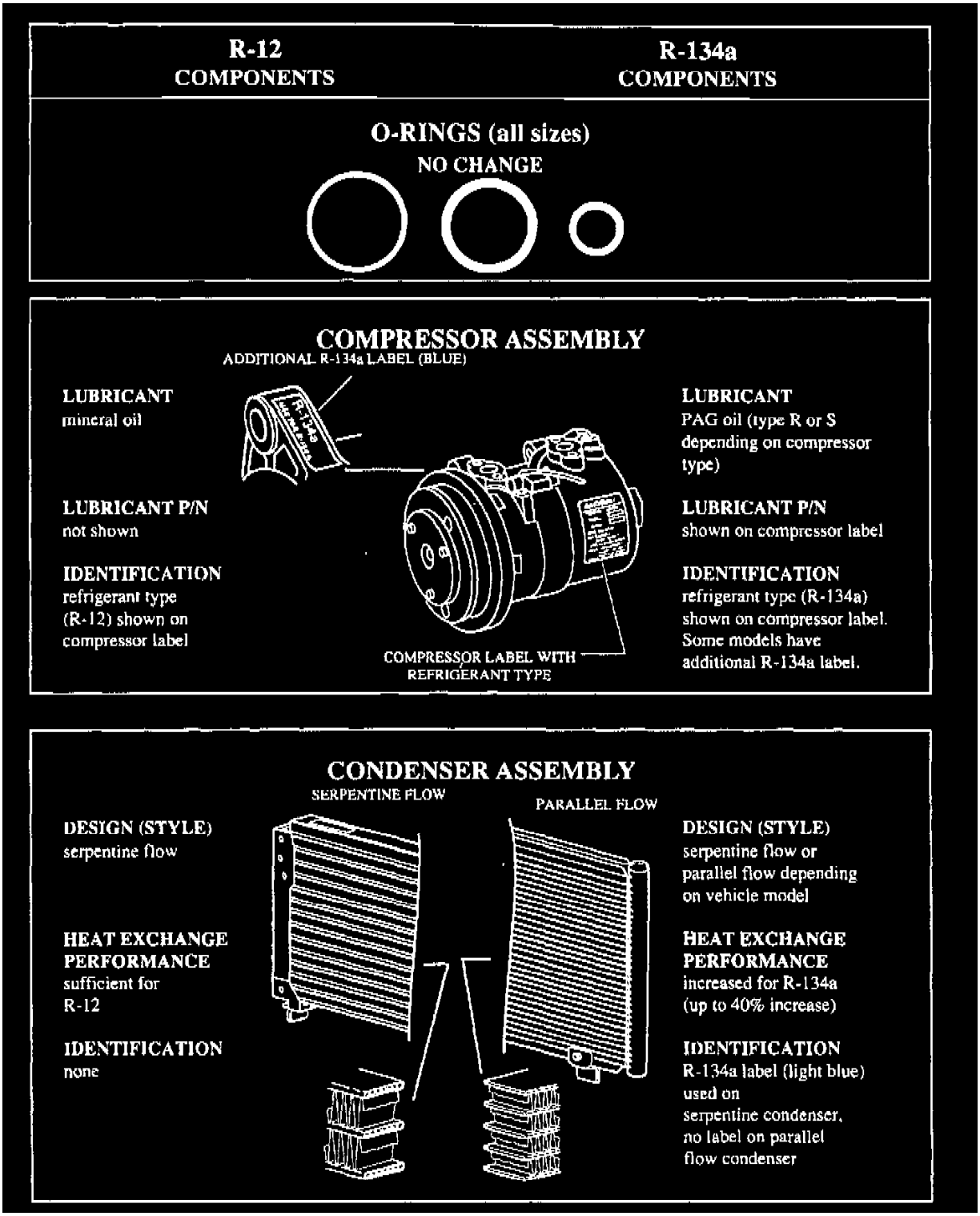
^ PAG containers, and any A/C component which contains PAG oil (such as the compressor) should remain tightly capped and sealed until ready for use.

^ If you believe that a container of PAG oil may not have been adequately re-sealed after opening, dispose of the oil properly and use oil from a new sealed container.

^ When installing or servicing an A/C system, the refrigerant tube and hose connections should be sealed (all connections made and tightened to specification) without delay.

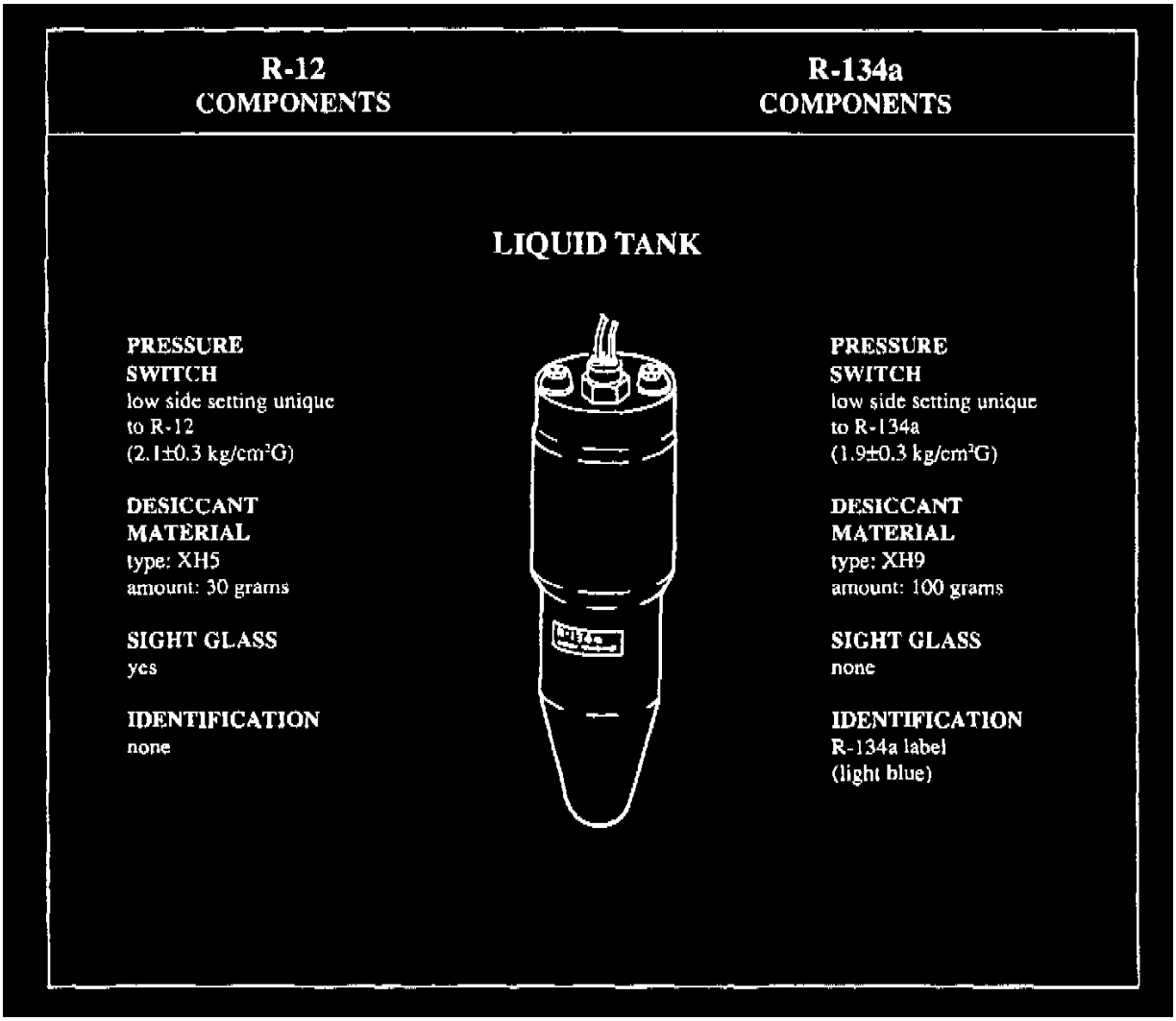
^ The above precautions will keep the absorption of moisture into the system to a minimum. Using moisture saturated PAG oil in R-134a systems may lead to the formation of acids and related system damage or failure.

^ Do not allow refrigerant oil (Nissan A/C System Oil Type S) to contact styrofoam, as the lubricant will damage this material.



Comments regarding condensers:

^ The parallel flow condenser can be identified by the refrigerant end tanks, and smaller, more closely spaced center section tubes.

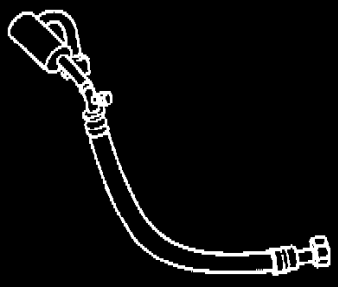


Comments regarding liquid tanks:

^ For R-134a, the sight glass has been deleted. Refer to the service procedures section of this bulletin for additional information regarding the refrigerant charge determination. Pressure switches are not interchangeable between R-12 and R-134a systems.

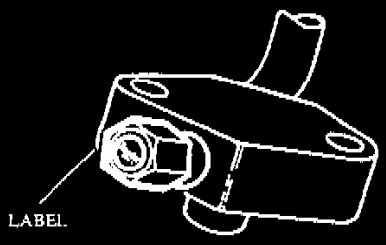
R-12 COMPONENTS	R-134a COMPONENTS

FLEXIBLE HOSE ASSEMBLY
(high and low pressure)



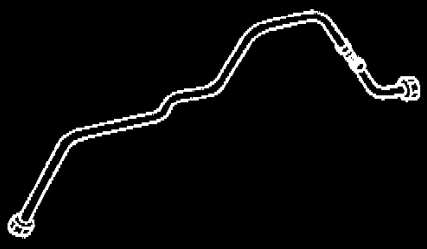
R-12 COMPONENTS	R-134a COMPONENTS
CONSTRUCTION nylon inner liner optional	**CONSTRUCTION** nylon inner liner required
SERVICE VALVE (if equipped) R-12 style	**SERVICE VALVE** (if equipped) R-134a style
IDENTIFICATION none	**IDENTIFICATION** R-134a label (light blue)

PRESSURE RELIEF VALVE
(high pressure hose only)



R-12 COMPONENTS	R-134a COMPONENTS
CONSTRUCTION NBR (nitrile butyl rubber) internal seal	**CONSTRUCTION** HNBR (hydrogenated nitrile butyl rubber) internal seal
IDENTIFICATION gold colored label	**IDENTIFICATION** light blue label

TUBE ASSEMBLY
(high and low pressure)



R-12 COMPONENTS	R-134a COMPONENTS
SERVICE VALVE (if equipped) R-12 style	**SERVICE VALVE** (if equipped) R-134a style
IDENTIFICATION none	**IDENTIFICATION** R-134a label (light blue)

R-12 COMPONENTS	R-134a COMPONENTS

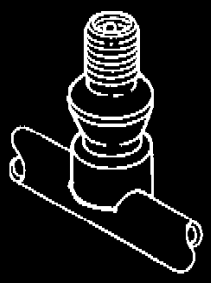
HIGH PRESSURE SERVICE VALVE

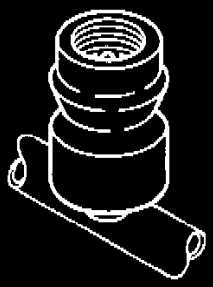
CAP
unique to R-12
high side

THREADS
3/8" - 24 for
screw-on coupler

EXTERNAL SHAPE
unique to R-12
high side
service connector

VALVE CORE
unique to R-12





CAP
unique to R-134a
high side

NO EXTERNAL THREADS*
(quick coupler)

EXTERNAL SHAPE
unique to R-134a
high side
service connector

VALVE CORE
unique to R-134a

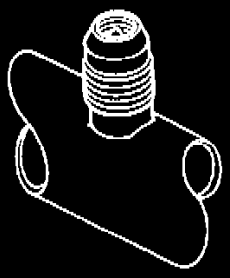
LOW PRESSURE SERVICE VALVE

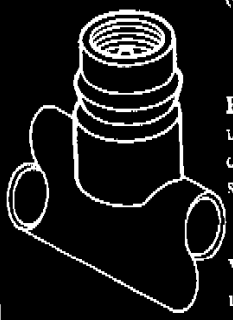
CAP
unique to R-12
low side

THREADS
7/16" - 20, also
known as
"1/4 flare"

EXTERNAL SHAPE
no provision for
low side quick
release service
coupler

VALVE CORE
unique to R-12





CAP
unique to R-134a
low side

NO EXTERNAL THREADS*
(quick coupler)

EXTERNAL SHAPE
unique to R-134a
quick release
service coupler

VALVE CORE
unique to R-134a

** Internal threads are for seal caps only.*

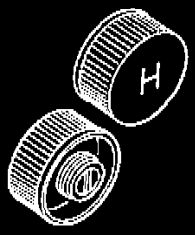
R-12 COMPONENTS	R-134a COMPONENTS

VALVE CORE
(high and low sides)

R-12 COMPONENTS		R-134a COMPONENTS
THREAD SIZE "TV5" (national special, not metric)		**THREAD SIZE** M6 metric
SEALING METHOD (valve to housing) Teflon		**SEALING METHOD** (valve to housing) O-ring
SPRING Internal		**SPRING** External

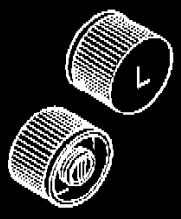
SEAL CAP - HIGH SIDE

R-12 COMPONENTS		R-134a COMPONENTS
COLOR Red		**COLOR** Light blue (with "H" mark)
THREADS Internal		**THREADS** External on center post
SIZE To fit R-12 high side valve		**SIZE** To fit R-134a high side valve



SEAL CAP - LOW SIDE

R-12 COMPONENTS		R-134a COMPONENTS
COLOR Black		**COLOR** Light blue (with "L" mark)
THREADS Internal		**THREADS** External on center post
SIZE To fit R-12 low side valve		**SIZE** To fit R-134a low side valve



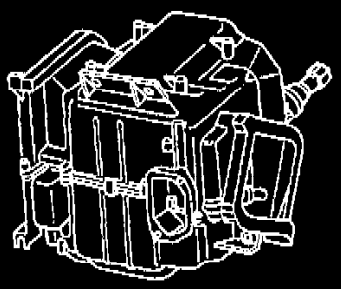
R-12 COMPONENTS	R-134a COMPONENTS

COOLING UNIT
(evaporator assembly)

EXPANSION VALVE
flow characteristics unique to R-12

SUCTION THROTTLING VALVE
(if equipped)
unique to R-12

IDENTIFICATION
none



EXPANSION VALVE
flow characteristics unique to R-134a

SUCTION THROTTLING VALVE
not currently available

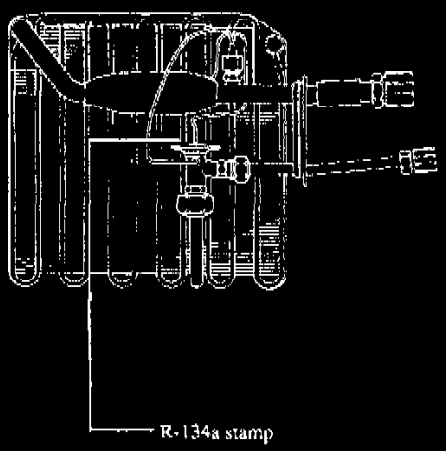
IDENTIFICATION
R-134a label (light blue) on case bottom (some models only)

EVAPORATOR CORE ASSEMBLY WITH THERMAL EXPANSION VALVE
(and Suction Throttling Valve if equipped)

EXPANSION VALVE
unique to R-12

SUCTION THROTTLING VALVE
(if equipped)
unique to R-12

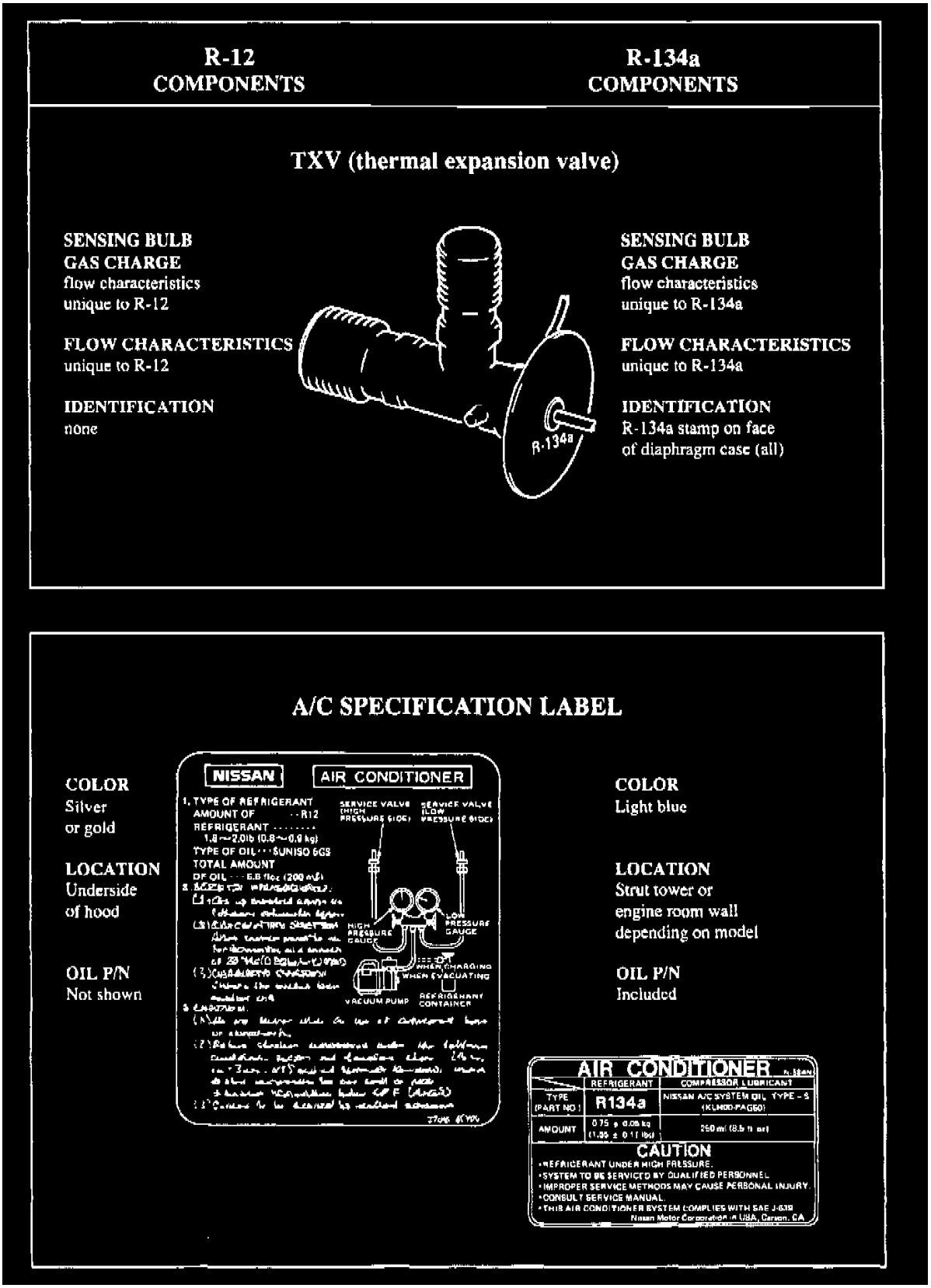
IDENTIFICATION
none



EXPANSION VALVE
unique to R-134a

SUCTION THROTTLING VALVE
not currently available

IDENTIFICATION
R-134a stamp on TXV
(thermal expansion valve)



Comments regarding tubes and hoses:

^ Some R-134a tubes and hoses have reversed male/female connections to prevent interchangeability with R-12 components.

R134A Service Tools & Equipment

^ R-12 and R-134a require separate and non-interchangeable sets of recovery, recycle, and recharge equipment, because the refrigerants and lubricants are not compatible and cannot be mixed even in the smallest amounts.

^ DO NOT attempt to use one set of equipment for both R-12 and R-134a, as all equipment contains residual amounts of refrigerant and/or lubricant, which will result in contamination, and damage to recovery/recycle equipment.

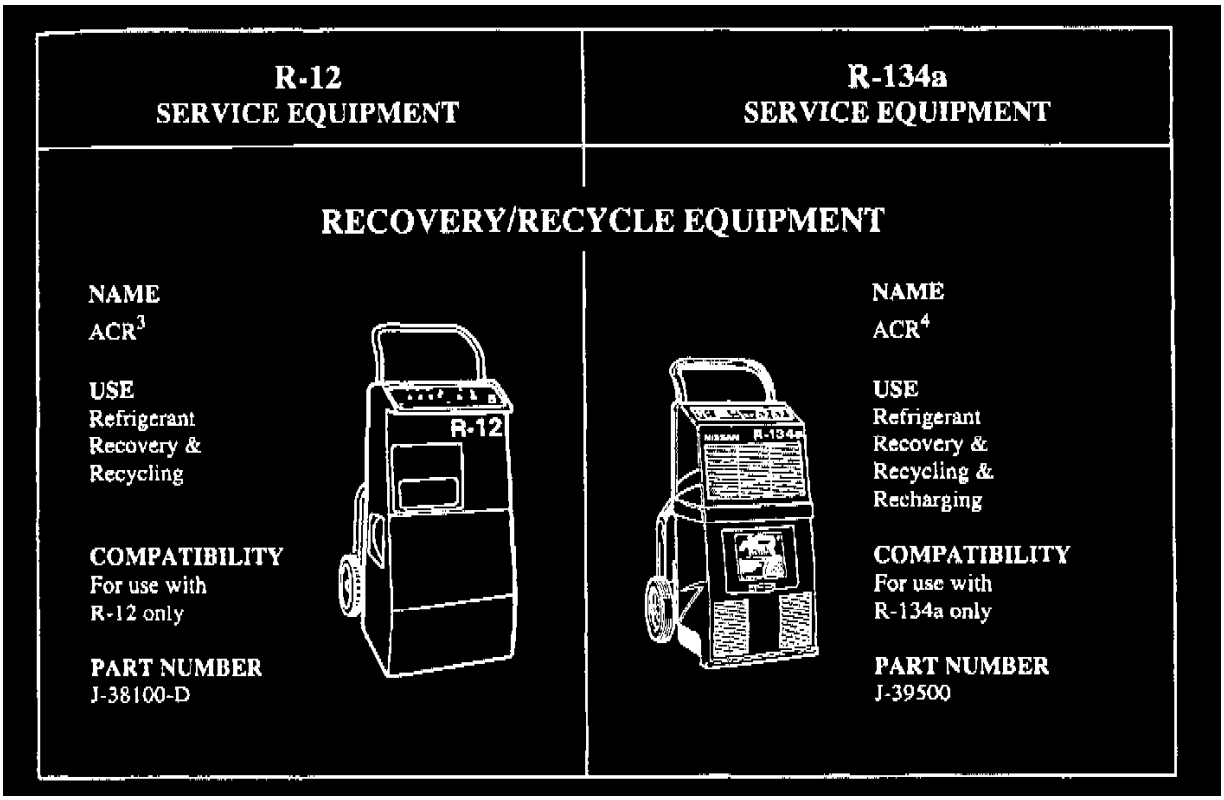
^ Use equipment designed to meet Society of Automotive engineers (SAE) standards, which specify R-134a service equipment fitting size (1/2" - 16 ACME), and service hose identification (black stripe on hose).

^ Adapters to convert from one size fitting to the other must never be used; refrigerant/lubricant contamination will occur and system failure may result.

^ The use of incorrect equipment will result in refrigerant and/or lubricant contamination, which may cause A/C system or equipment failure.

^ ACR(4) machine will perform all required service functions (recovery, evacuation, recycle, recharge).

^ High volume A/C service facilities may benefit from "component" A/C service equipment (vacuum pump, weight scale, manifold gauge set) to supplement the ACR(4).



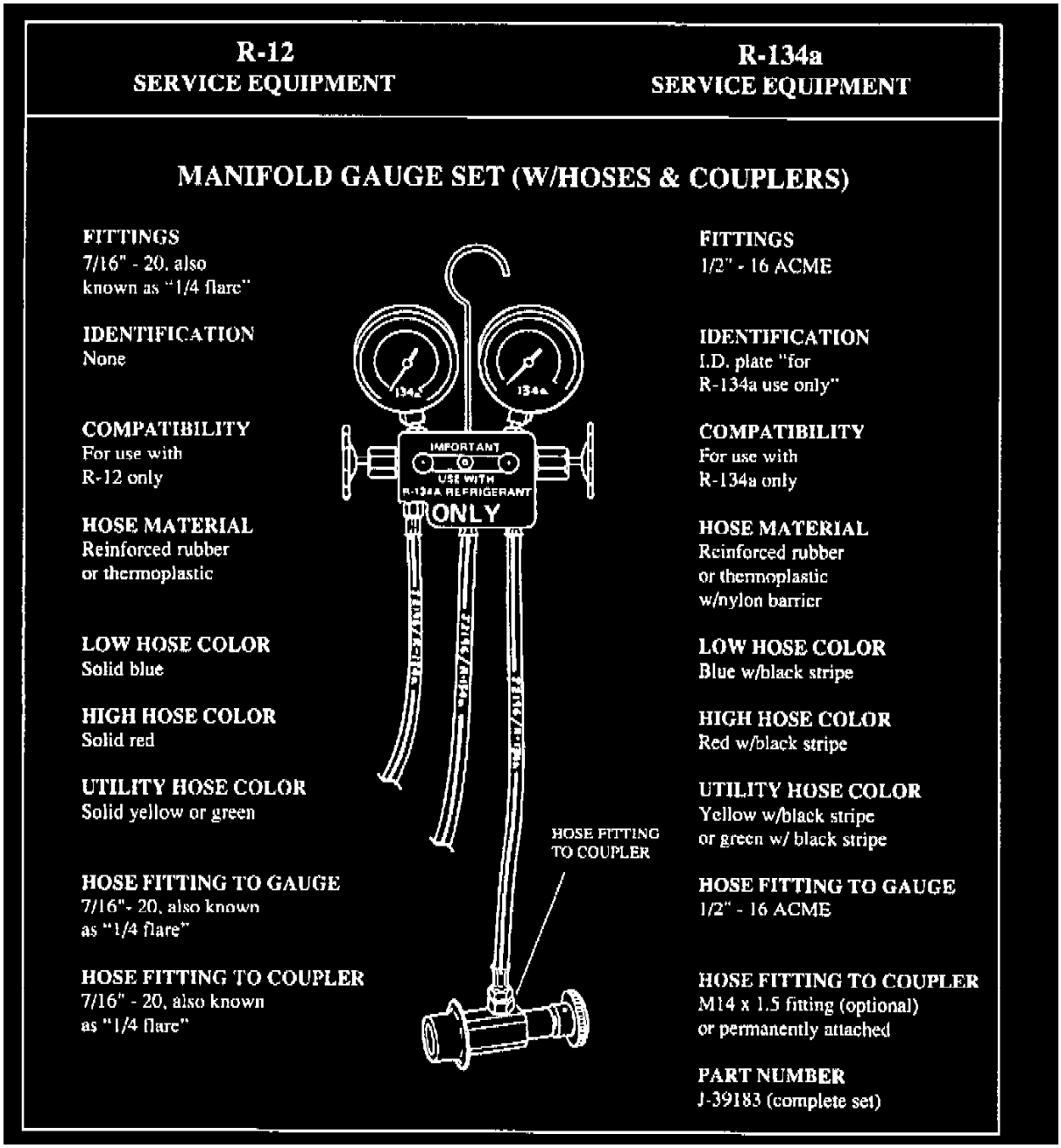
Comments regarding recovery/recycling equipment:

^ Be certain to follow the manufacturer's instructions for machine operation and machine maintenance.

^ Never introduce any refrigerant other than that specified into the machine.

^ Only R-134a containers with a 1/2"-16 ACME can be used to add R-134a to the ACR4 recovery/recycle machine.

^ Periodic maintenance of this equipment is required; follow the manufacturer's recommendations as described in the equipment instruction manual.

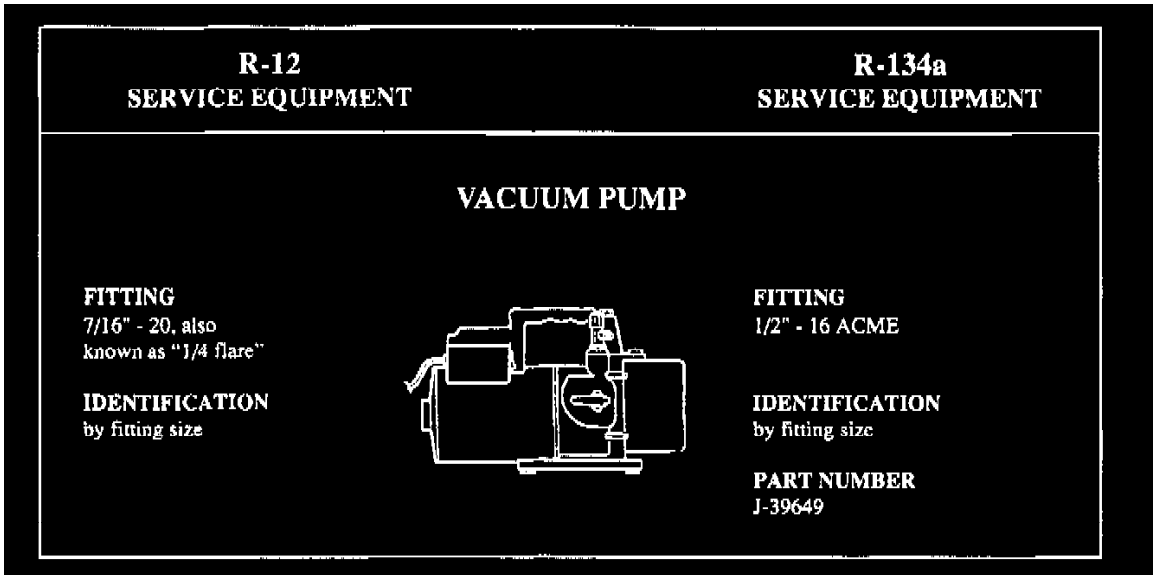


Comments regarding R-134a manifold gauge set:

^ Be certain that the gauge face indicates R134a or 134a.

^ Be certain that the manifold gauge set has the 1/2" - 16 ACME threaded connections for service hoses, ensuring that only R-134a service hoses are used.

^ Be certain that no refrigerants other than R-134a (along with only specified lubricants) are used with the manifold gauge set.



Comments regarding vacuum pump use:

^ The lubricant contained inside the vacuum pump is not compatible with the lubrication for R-134a A/C systems.

^ The vent side of the vacuum pump is exposed to atmospheric pressure, causing the vacuum pump lubricant to migrate out of the pump if the pump is switched oft after evacuation (vacuuming) and there is no shut off valve between the pump and the hose.

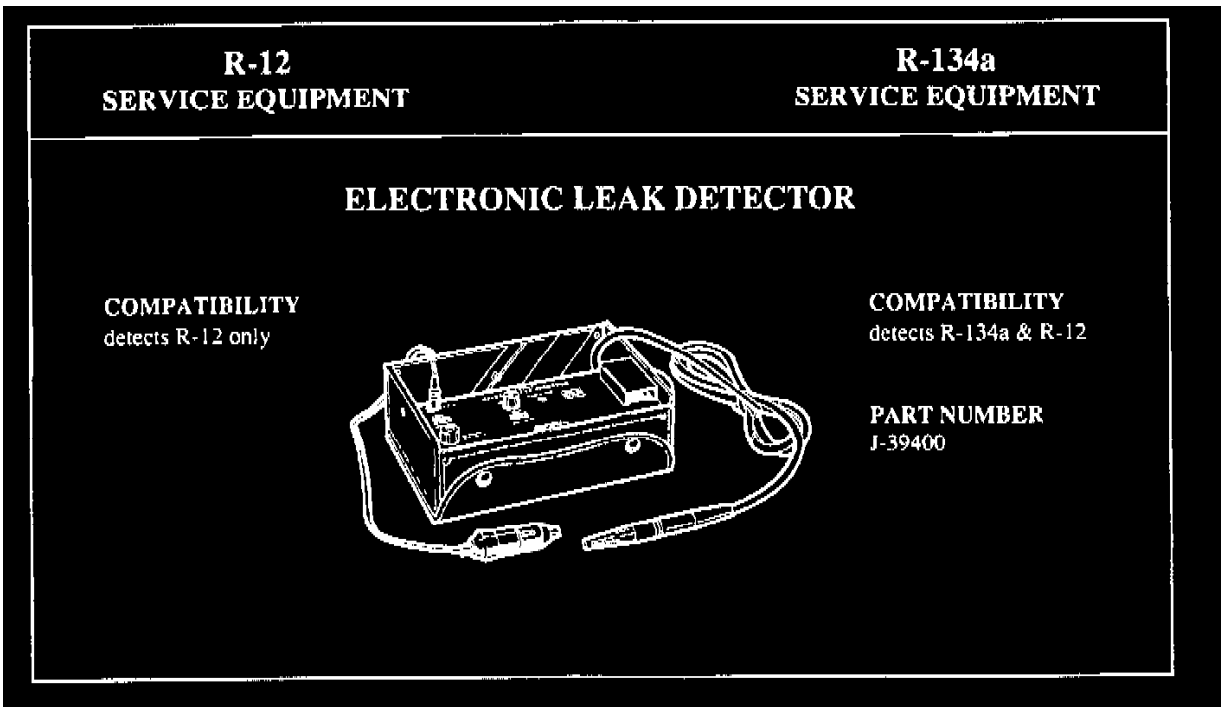
^ To prevent the migration of vacuum pump lubricant into service hoses, it is necessary to use a valve (which can be manually opened or closed) near the connection of the service hose to the pump.

^ On a vacuum pump which is equipped with an isolation valve (usually part of the vacuum pump), closing this valve will isolate the service hose from the pump.

^ For pumps without an isolation valve, be certain that the service hose is equipped with a manual shut off valve near the pump end of the hose.

^ Hoses which contain an automatic shut off valve at the end of the service hose must be disconnected from the vacuum pump to prevent the migration of lubricant; as long as the hose is connected, the valve is open and lubricant may migrate (with pump off).

^ One-way valves which open when vacuum is applied and close under a no vacuum condition are not recommended, because this valve may restrict the pump's ability to pull a deep vacuum.

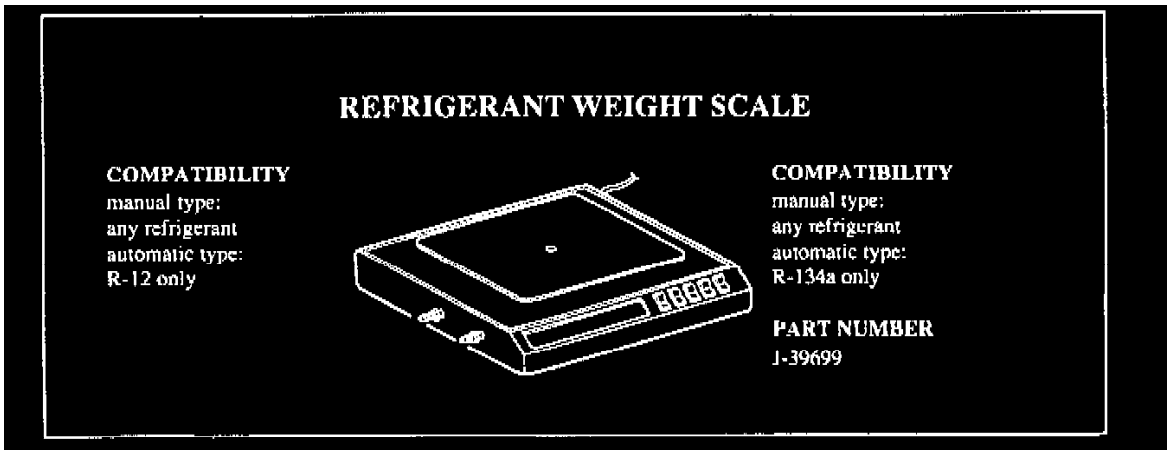


Comments regarding leak detector use:

^ Existing R-12 leak detectors currently will not detect R-134a.

^ Many R-134a leak detectors will detect R-12; check with the equipment manufacturer.

^ Always refer to and follow the equipment manufacturers recommendations when operating leak detectors.



Comments regarding weight scale use:

^ If the scale allows electronic control of the flow of refrigerant through the scale, (i.e. internal solenoid valves) be certain that the hose fitting size is 1/2"-16 ACME, and that no refrigerant other than R-134a (along with only specified lubricant) have been used with the scale.

Charging Cylinder

^ The use of a charging cylinder is not recommended because:

^ The refrigerant may be vented into the air from the top valve of cylinder when filling the cylinder with refrigerant.

^ The accuracy of a charging cylinder is generally less than that of an electronic scale or of quality recycle/recharge equipment.

Service Procedures

^ The service procedures for R-134a A/C systems are basically the same as for R-12 A/C systems, however, the following should always be kept in mind:

^ Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose, and throat. Use only approved recovery/recycling equipment to discharge R-134a systems.

^ If accidental system discharge occurs, ventilate the work area before resuming service work.

^ R-134a and R-12 A/C components are not interchangeable. Cleaning of used (in service) components for use with another type of refrigerant and/or lubricant is not an acceptable practice, and may result in A/C system failure.

^ Always use the proper PAG oil when servicing an R-134a A/C system. The Nissan part number for the appropriate PAG compressor oil can be found on the A/C specification label in the engine compartment, and also in the Factory Service Manual, and on the label on the compressor. These oils are only available from your Nissan Parts Department.

^ When leak checking an R-134a system, be certain that you are using a detector which will detect R-134a.

^ As mentioned previously in this bulletin, the R-134a PAG lubricants absorb moisture; PAG oil containers and A/C components containing PAG oil must remain tightly sealed until ready for use.

^ Unlike R-12 systems, R-134a systems do not exhibit a "clear sight glass", even when properly charged. For this reason, the R-134a A/C systems have no sight glass.

^ With R-134a systems it is important to properly control the amount of refrigerant charged into the system during system charging. A charging machine or weight scale must always be used during charging for proper charge determination.

^ Questions regarding R-12 or R-134a should be addressed to your Regional Service Staff or the FIXS Hotline. Technical Service Bulletin # **WB90010** Date: **900625**

A/C Refrigerant - Warranty Claim Reimbursement

Reference:
WARRANTY BULLETIN WB/90-010
Date:
June 25, 1990
TO: ALL NISSAN DEALERS

SUBJECT: REFRIGERANT REIMBURSEMENT WARRANTY POLICY

As a result of the implementation of the new refrigerant recycling equipment, the National Warranty Department has adopted the following policy pertaining to warranty claim refrigerant reimbursement.

1. When requesting reimbursement for newly added refrigerant, reimbursement use the special part number LOCALFREON.

2. When requesting reimbursement for use of recycled refrigerant, use the special part number LOCALRECYC.

3. In both cases, up to $4.00 may be claimed for each quantity of one (1).
   Note: Quantity 1 = 1 lb.

4. A quantity of two (2) is the maximum allowed per repair ($8.00 total).

This policy is effective immediately. Should you have questions pertaining to refrigerant reimbursement, please contact your District Service Manager or Regional Parts & Service Department.

Technical Service Bulletin # **HA90006** Date: **900315**

R12 Refrigerant - Conservation/Recycling

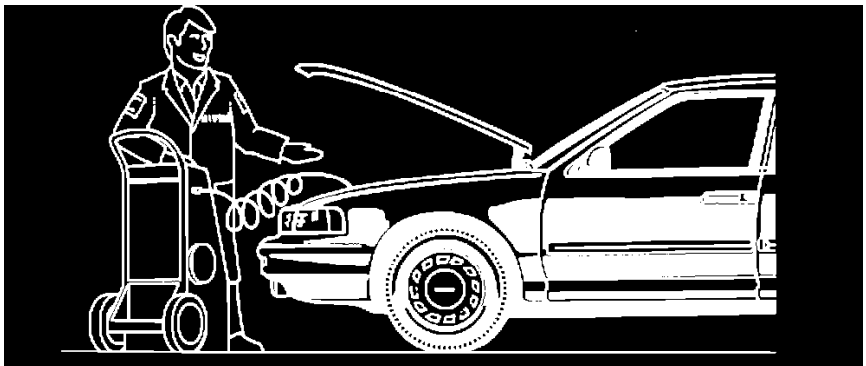
Classification: Section:
HA90-006 Air Conditioning
Reference:
TECHNICAL BULLETIN NTB90-028
Models:
All Models with A/C
Date:
March 15, 1990
CFC REFRIGERANT CONSERVATION AND RECYCLING

APPLIED MODELS: All models equipped with air conditioning.

SERVICE INFORMATION:

Because of environmental concerns, it is extremely important that we all take every precaution to reduce or eliminate the release of CFC refrigerant (R12) into the air.

Recycling Equipment In Your Dealership

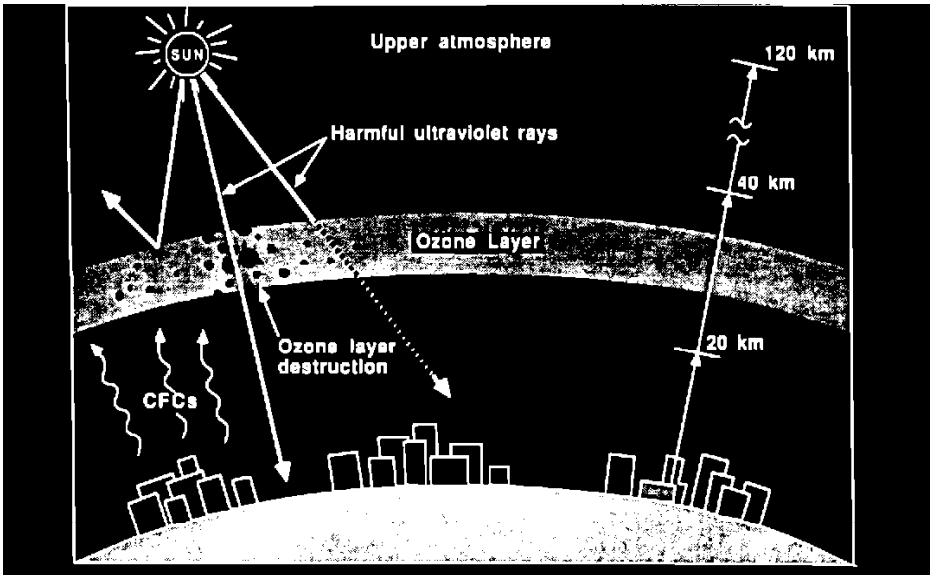


If your dealership has not already received one, you will receive a Kent-Moore ACR(3) J- 38100-NI Refrigerant Recovery and Recycling System within the next few days. This machine will recover the refrigerant from any vehicle you service, clean the refrigerant, remove all moisture and oil, and place the refrigerant into a 30 lb. container for re-use. To save our atmosphere, you must use the machine every time you perform A/C service that requires a purge of the refrigerant.

Maintenance Is Essential

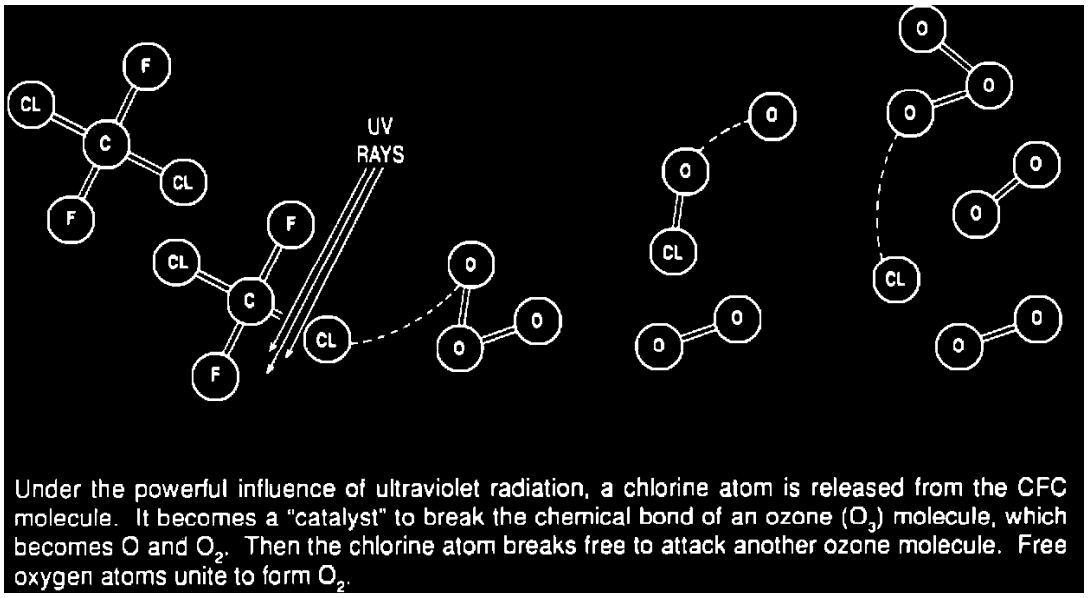
If the recycling equipment is maintained properly, it can clean and purify the removed refrigerant so that it will exceed the SAE standards for content of moisture, oil, air and noncondensibles. Like any equipment, however, this machine will operate at its best efficiency only if it is maintained properly. This means you must check the moisture indicator often and replace the filter drier core whenever necessary. You must make sure the correct manifold gauge and hoses are used in all cases, and that the valves in the hoses are working properly. Make sure the unit stays clean and that the hoses are always hung up away from contamination when the unit is not in use.

Destruction of the Earth's Ozone Layer



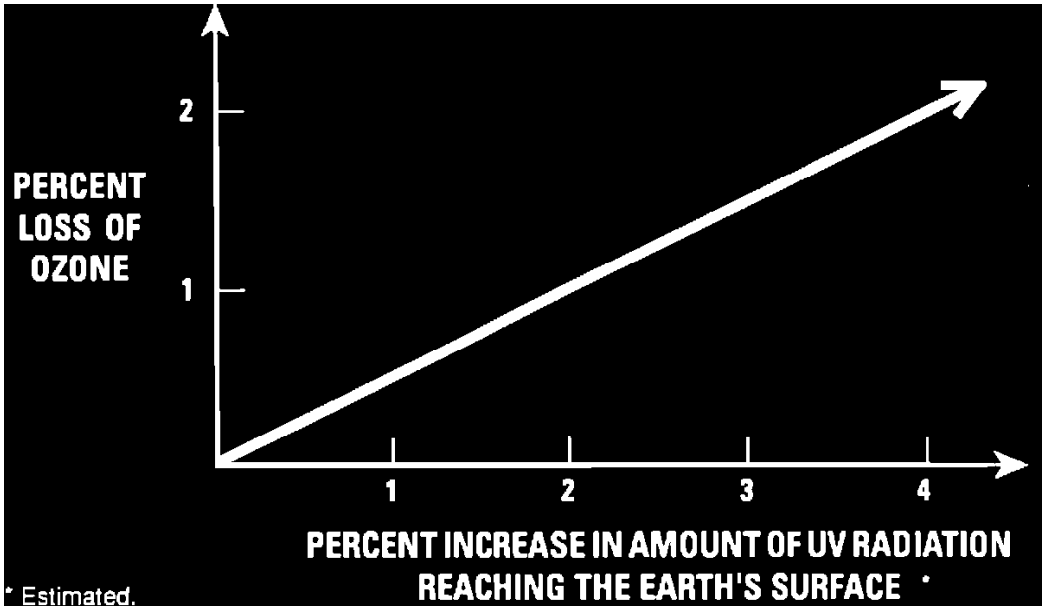
When the "ozone layer" is damaged, increased ultraviolet radiation reaches the earth.

Chlorofluorocarbons (CFCS) are chemical compounds made up of molecules that contain atoms of chlorine and fluorine bonded to carbon atoms. CFCs are used in a number of applications, the most common of which are in automotive air conditioners, in the blowing of plastic foam products, and as solvents in electronic component manufacturing. Ozone is a special form of oxygen which combines three oxygen atoms into O3. Ozone in the Earth's upper atmosphere serves as a shield from harmful ultra violet solar radiation by reflecting the rays back into space.



Under the powerful influence of ultraviolet radiation, a chlorine atom is released from the CFC molecule. It becomes a "catalyst" to break the chemical bond of an ozone (O_3) molecule, which becomes O and O_2. Then the chlorine atom breaks free to attack another ozone molecule. Free oxygen atoms unite to form O_2.

When CFCs are released into the air, here's what happens: the molecules work their way upward in the atmosphere slowly, taking as long as ten years to reach the middle stratosphere, 20 to 40 kilometers above the surface of the earth, where the "ozone layer" resides. The CFC molecules are bombarded by ultra violet light from the sun, which tends to break the chemical bonds that hold chlorine and fluorine to the carbon. The fluorine atoms can combine with moisture to form acids. When the chlorine breaks away, it becomes a chemical "catalyst," which means that it can cause chemical reactions to occur rapidly. Thus, a chlorine atom can break the chemical bonds that hold O3 together and O3 becomes O2 and O. It is now no longer "ozone" and it no longer has its reflective quality to turn ultra violet radiation away from the earth. Given the right conditions, the chlorine from one CFC molecule could destroy up to 100,000 ozone molecules.



A Dangerous Trend

By the most reliable estimates, the total ozone level in the Earth's upper atmosphere decreased about 2.5% between 1978 and 1985. A 1% loss of ozone results in an estimated 2% increase in the amount of ultraviolet radiation (UV) that reaches the surface of the earth. This has dangerous implications for life as we know it. A 2% increase in UV will increase the number of human deaths from skin cancer by approximately 5%. UV also increases
the number of eye cataracts, causes damage to the human immune system, damages crops and marine life.
The Montreal Protocol

An agreement, called the Montreal Protocol, signed in 1987 by representatives of 31 countries including the United States, limits world production of CFCs to 1986 levels and calls for further reductions of 50% by 1999. Another International Conference will be held in June, 1990, with the likelihood that the schedule for a complete phase-out of CFCs will occur even earlier. This means that the supply of R12 refrigerant will decrease dramatically over the next few years and the cost will increase.

Recycling Makes Good Sense

It's already established that making sure CFCs are not vented to the atmosphere is essential for the environment. With the supply of R12 decreasing and the cost increasing, recycling all of the refrigerant you remove from vehicles during repairs or before a vehicle is crushed will make more and more economic sense.

Technical Service Bulletin # **TS86039** Date: **860301**

M/T - Shift Fork Installation Cautions

Reference:		Date:
TECHNICAL BULLETIN TS86-039		March 21, 1986
Classification:	Section:	Models:
TM86-005	Transmission	1986.5 Truck

SPECIAL TRANSMISSION SERVICE CAUTIONS, 1986.5 TRUCK

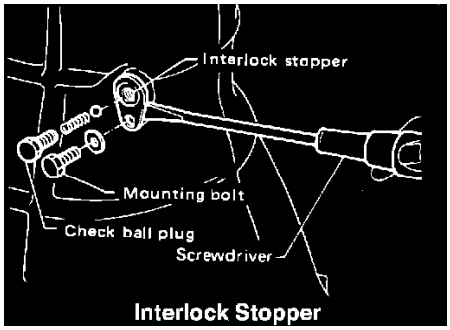
This bulletin supplements Technical Bulletins TM86-002 and TM86-003. DO NOT discard the original bulletins.

SERVICE INFORMATION

This bulletin contains more detail and additional cautions of the shift fork replacement procedures in Technical Bulletins TM86-002 and TM86-003. The procedures in this bulletin when replacing the 1st/2nd and reverse shift forks. Use the procedure in the original bulletins to remove and replace the transmission.

SHIFT FORK REPLACEMENT PROCEDURES

NOTE: Items that are double underlined are revisions or additions to the original procedure.

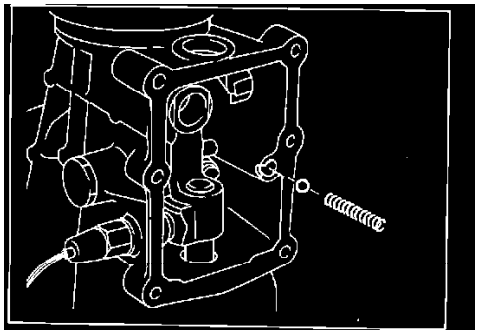


INTERLOCK STOPPER

1. Remove the check ball plug (14 mm), check spring and check ball. Then remove the 14 mm mounting bolt and interlock stopper from the transmission case (not in rear extension). Save the check ball plug and discard the mounting bolt.

CAUTION: If the interlock stopper is not removed, the striking interlock will be damaged during case removal.

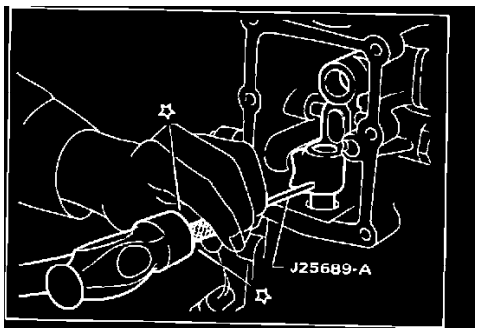
2. Remove the clutch release lever from the transmission case.



RETURN SPRING

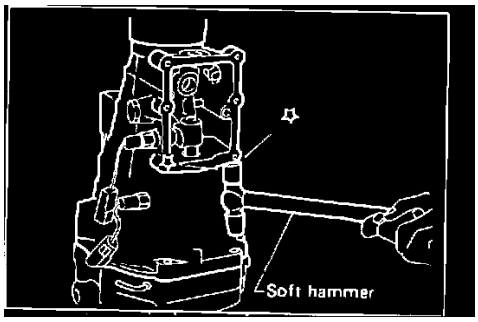
3. Remove the return spring and check ball from the control housing.
4. THIS STEP IS FOR 2WD VEHICLES ONLY.

Remove the speedometer pinion from the rear extension.



RETAINING PIN

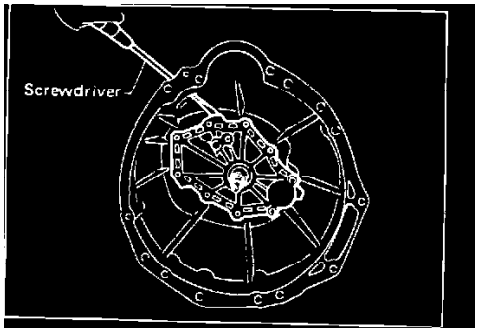
5. Drive out the retaining pin from the striking arm.
6. Remove the ten bolts (14 mm) between the rear extension and transmission case (on 4WD some bolts are 8 mm internal hex).



REAR EXTENSION

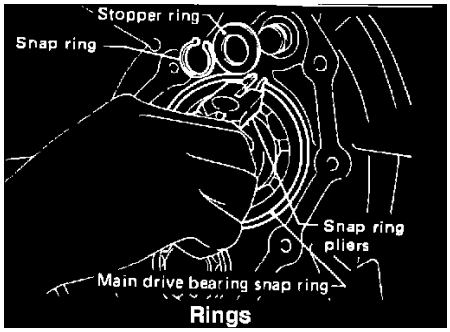
7. Remove the rear extension together with the striking arm by tapping with a soft hammer.

CAUTION: When removing the rear extension, make sure the neutral switch plunger does not fall out.



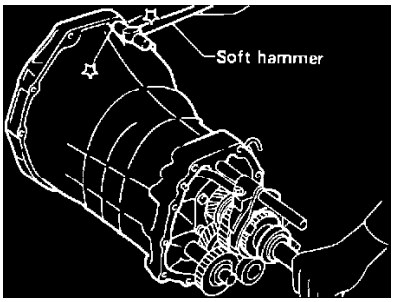
FRONT COVER

8. Remove the nine bolts (12 mm) on the front cover. Then remove the front cover.



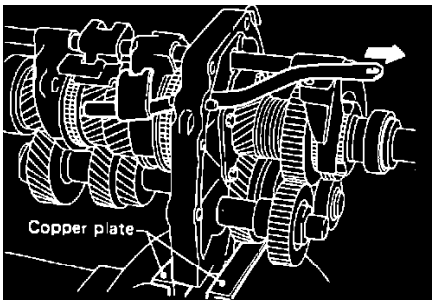
RINGS

9. Remove the snap ring stopper ring and the front main drive bearing snap ring.
CAUTION: If the snap ring and stopper ring are not removed, the striking lever will be damaged during case removal.



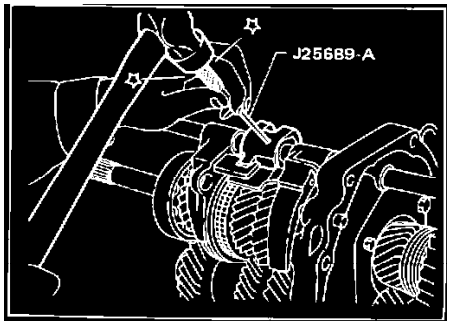
TRANSMISSION CASE

10. Remove transmission case by tapping with a soft hammer.
11. Mount the adapter plate in a vise using soft jaws to protect the adapter plate.



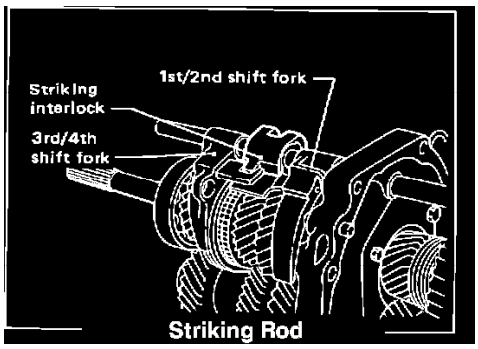
O.D./REVERSE ROD

12. Remove the bolt (12 mm) on O.D./REVERSE rod and then remove the rod.



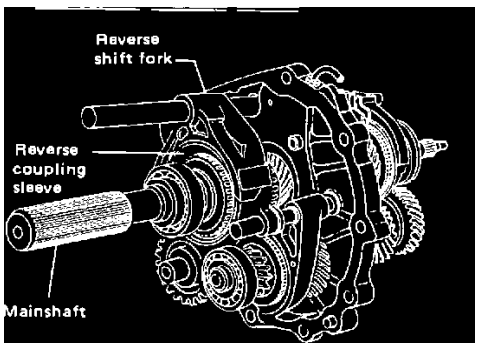
RETAINING PIN

13. Drive out the retaining pin from the striking lever.
    CAUTION: The retaining pin must be completely removed from striking lever and striking rod before moving striking rod, or damage to the striking lever may occur.



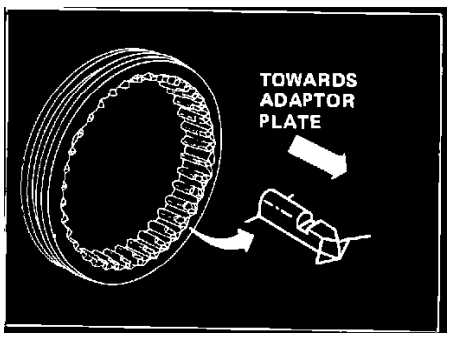
STRIKING ROD

14. Slide out the striking rod enough to free the 1st/2nd shift fork. Install the new 1st/2nd shift fork and slide the striking rod through it, the striking lever, striking interlock and 3rd/4th shift fork.
    NOTE DIRECTION of striking interlock. Make sure striking rod moves smoothly.
15. Slide the striking rod the other way to free the reverse shift fork.



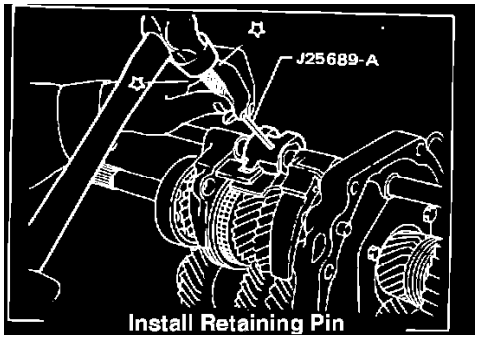
REVERSE COUPLING

16. Slide the reverse coupling sleeve off the mainshaft.



COUPLING SLEEVE

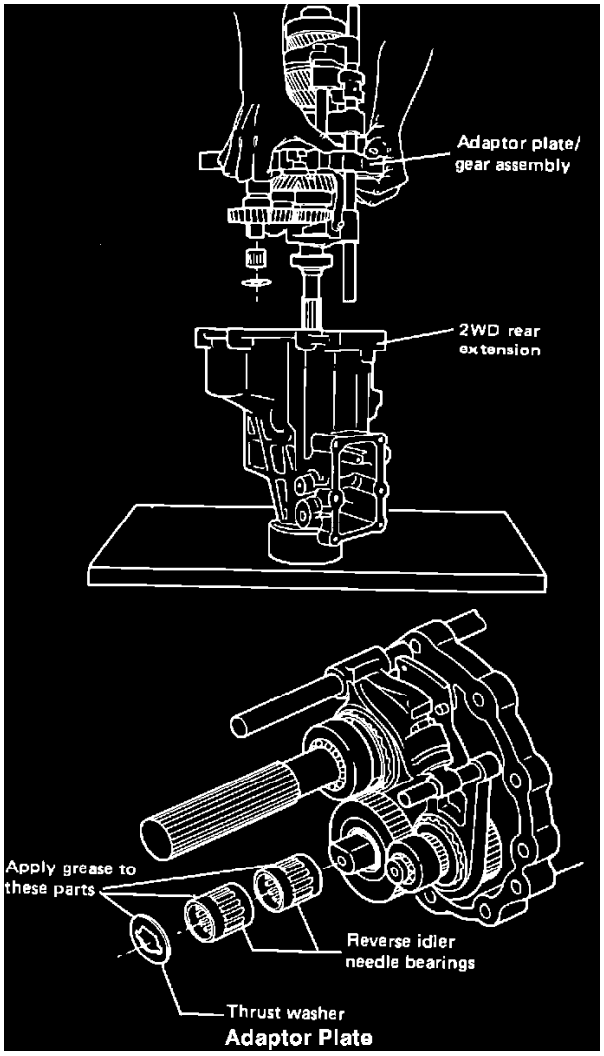
17. Install the new reverse coupling sleeve onto the mainshaft.
    CAUTION: Splines on coupling sleeve should point towards the adapter plate.



INSTALLING RETAINING PIN

18. Install the new reverse shift fork and slide the striking rod through the hole. Then install a new retaining pin into the striking lever. NOTE DIRECTION of striking interlock. Make sure striking rod moves smoothly.
    CAUTION: Use the correct factory retaining pin (2 pins, one inside the other).
19. Install the O.D./reverse fork rod and retaining bolt.

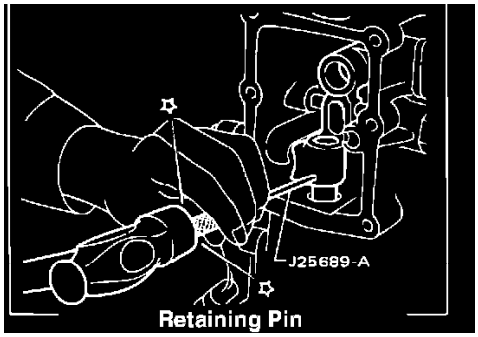
    Apply lock sealant to threads of bolt.



ADAPTER PLATE

20. Apply Three Bond sealant 1215 or equivalent formed-in-place type gasket/sealant to the rear extension/adapter plate mating surface.

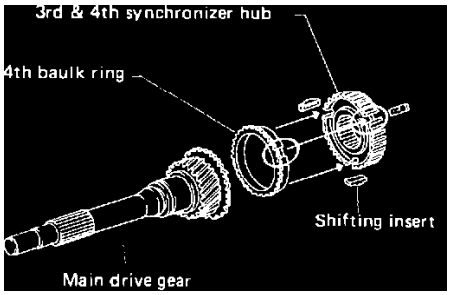
21. Install rear extension to adapter plate/gear assembly.
    CAUTION: If the rear extension is stood on end and the adapter plate/gear assembly is installed into it as shown below, apply oil soluble grease to the reverse idler needle bearings and reverse idler rear thrust washer before assembly. This will hold them in place when installing the adapter plate/gear assembly.



RETAINING PIN

22. Install the original retaining pin into striking arm.

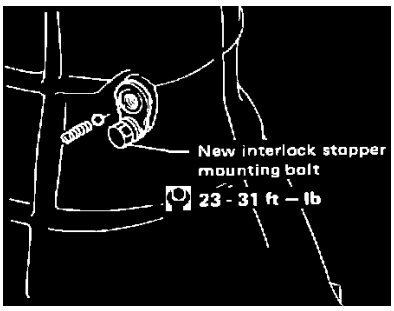
    Make sure roll pin head is even with striking lever surface.
23. Apply Three Bond sealant 1215 or equivalent formed-in-place type gasket/sealant to transmission case/adapter plate mating surface.



COUNTER GEAR THRUST BEARING

24. Make sure the counter gear thrust bearing is installed. Then make sure all gears are in "neutral".

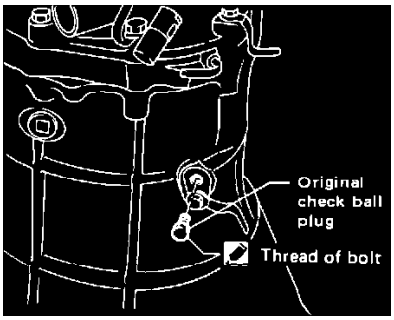
    NOTE: The 4th balk ring should be lined up with the shifting inserts in the 3rd and 4th synchronizer hub.
25. Install transmission case onto adapter plate/gear assembly. Then install the ten attachment bolts.



NEW MOUNTING BOLT

26. Install the interlock stopper with a new mounting bolt included in repair kit. The mounting bolt and check ball plug have a diifferent pitch size and are not interchangeable.
27. Install check ball and check spring into interlock stopper. Use the original short spring (free length: 1.291 in.).

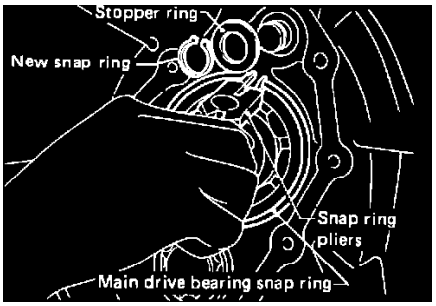
    Apply multi-purpose grease to check ball.



ORIGINAL INTERLOCK CHECK BALL PLUG

28. Install the original interlock check ball plug.

Apply Three Bond sealant 1215 or equivalent formed-in-place type gasket/sealant to the threads of check ball plug.

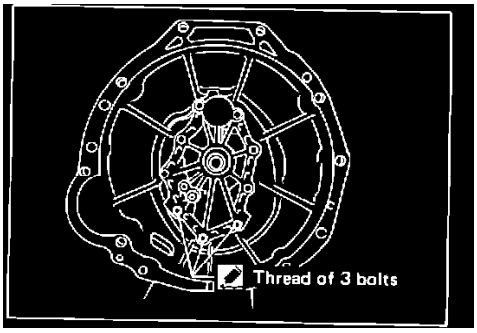


SNAP RINGS

29. THIS STEP IS FOR 2WD VEHICLES ONLY.

    Install the speedometer pinion into the rear extension.

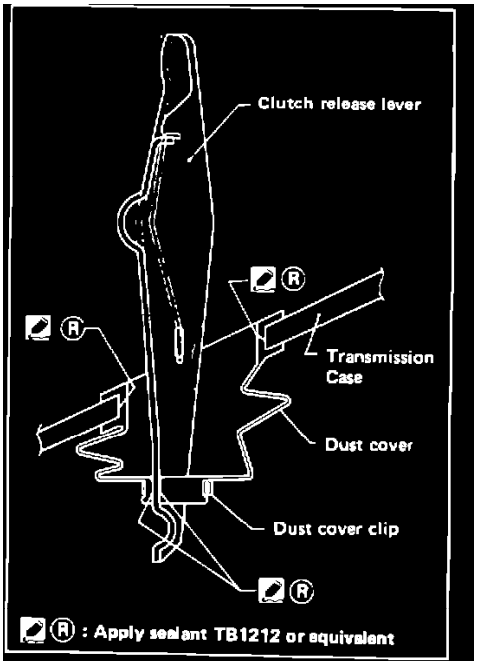
30. Install stopper ring with the new snap ring included in repair kit. Install main drive bearing snap ring.
    CAUTION: Make sure snap rings are secure in grooves.



FRONT COVER WITH A NEW GASKET

31. Install front cover with a new gasket.

    Apply Three Bond sealant 1215 or equivalent formed-in-place type gasket/sealant to the threads of the three bolts indicated below.

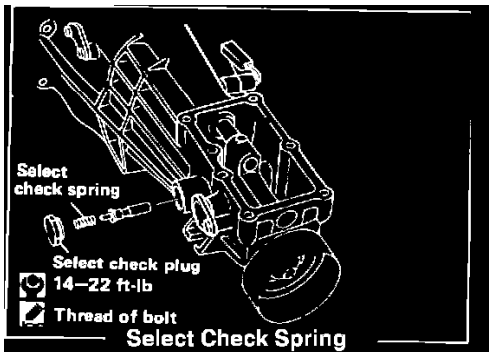


CLUTCH RELEASE LEVER

32. Install the clutch release lever.

33. THIS STEP IS FOR 4WD VEHICLES ONLY.

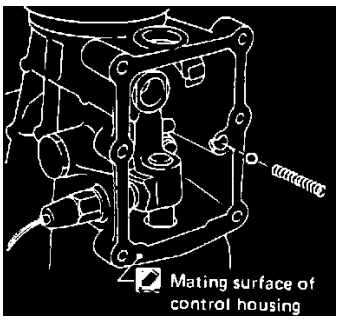
    Install the new clutch release lever rubber dust cover using Three Bond sealant 1212 or equivalent RTV silicone type sealant.



SELECT CHECK SPRING

34. Remove the select check plug and select check spring from the left side of the rear extension. Replace the one original check spring with the two new springs (one inside the other) in the kit. Install the check plug.

    Apply lock sealant to the threads of select check plug.



RETURN SPRING AND CHECK BALL

NOTE: Illustration is of 2WD transmission

35. Install the original long return spring and check ball.

    Spring Free Length:

    2WD Model: 1.866 in. 4WD Model: 1.984 in.

Technical Service Bulletin # **98-005** Date: **980201**

A/C - New Connections & O-Rings

Classification:
HA97-O12

Reference:
NTB98-005

Date:
February 1, 1998

NEW A/C CONNECTION 0-RINGS

APPLIED VEHICLES:
All Nissan (except Quest)

SERVICE INFORMATION

This service bulletin identifies differences in A/C 0-rings as they apply to the NEW and FORMER type A/C connections.

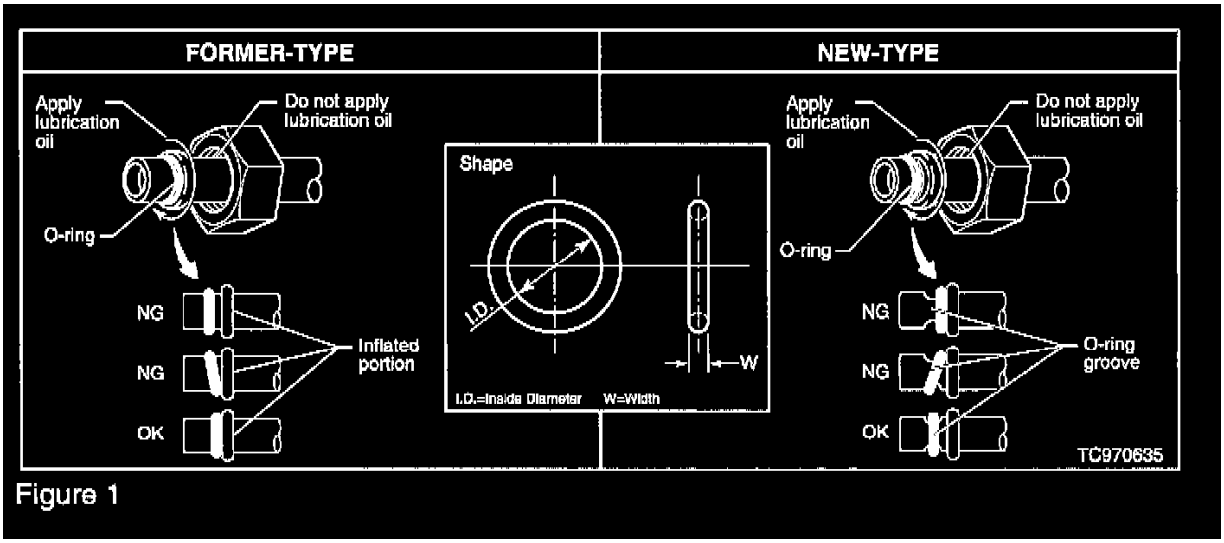


Figure 1

The NEW type connection has a groove in the tube end in which the 0-ring is seated. The FORMER type connection does not have a groove but instead has an inflated portion on the tube end to support the 0-ring. Refer to Figure 1 for illustrations identifying each connection type.

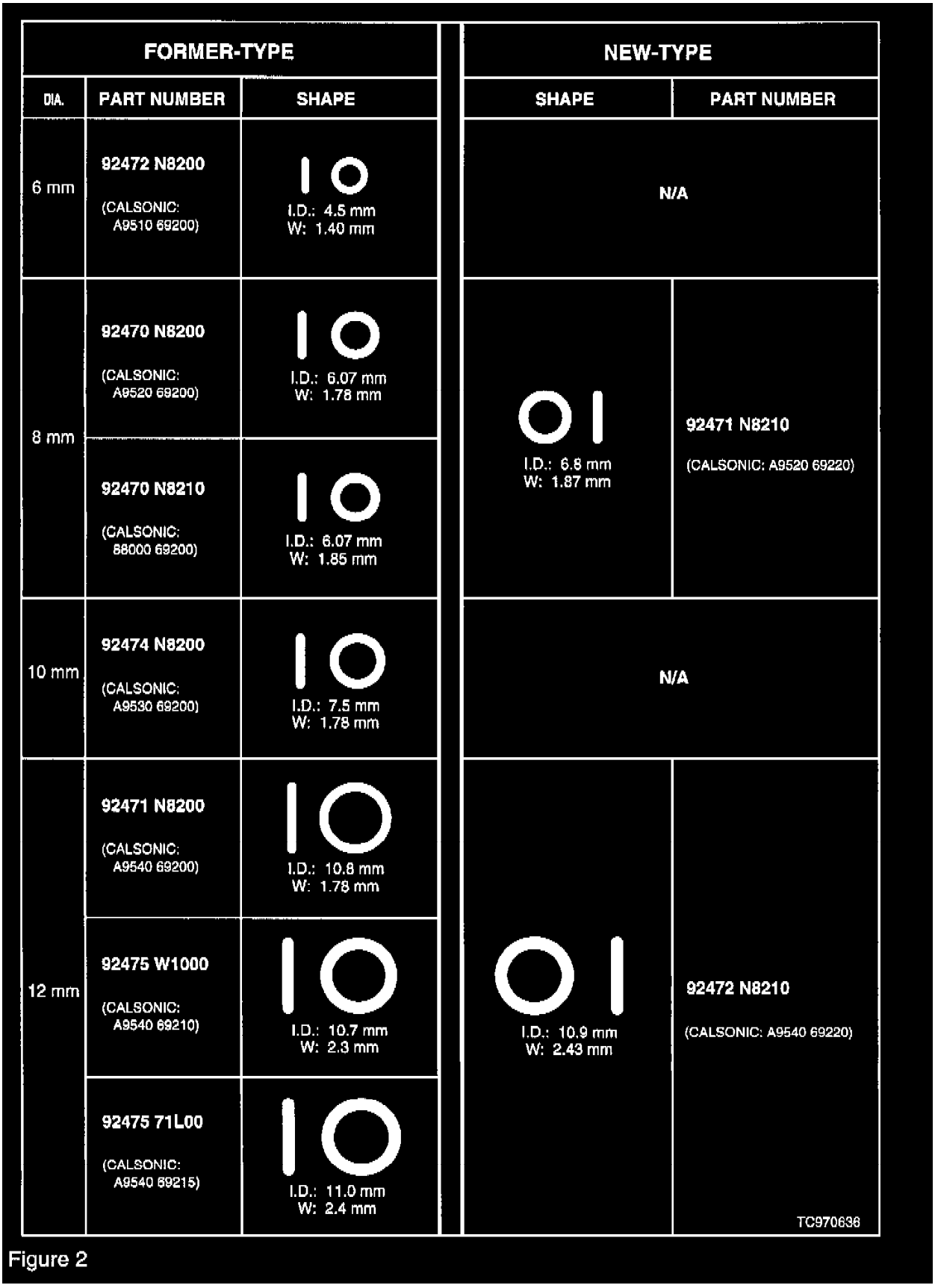

FORMER-TYPE
DIA.
PART NUMBER
SHAPE
NEW-TYPE
SHAPE
PART NUMBER
6 mm
92472 N8200
(CALSONIC: A9510 69200)
I.D.: 4.5 mm
W: 1.40 mm
N/A
8 mm
92470 N8200
(CALSONIC: A9520 69200)
I.D.: 6.07 mm
W: 1.78 mm
92470 N8210
(CALSONIC: 86000 69200)
I.D.: 6.07 mm
W: 1.85 mm
I.D.: 6.8 mm
W: 1.87 mm
92471 N8210
(CALSONIC: A9520 69220)
10 mm
92474 N8200
(CALSONIC: A9530 69200)
I.D.: 7.5 mm
W: 1.78 mm
N/A
12 mm
92471 N8200
(CALSONIC: A9540 69200)
I.D.: 10.8 mm
W: 1.78 mm
92475 W1000
(CALSONIC: A9540 69210)
I.D.: 10.7 mm
W: 2.3 mm
92475 71L00
(CALSONIC: A9540 69215)
I.D.: 11.0 mm
W: 2.4 mm
I.D.: 10.9 mm
W: 2.43 mm
92472 N8210
(CALSONIC: A9540 69220)
TC970636

Figure 2

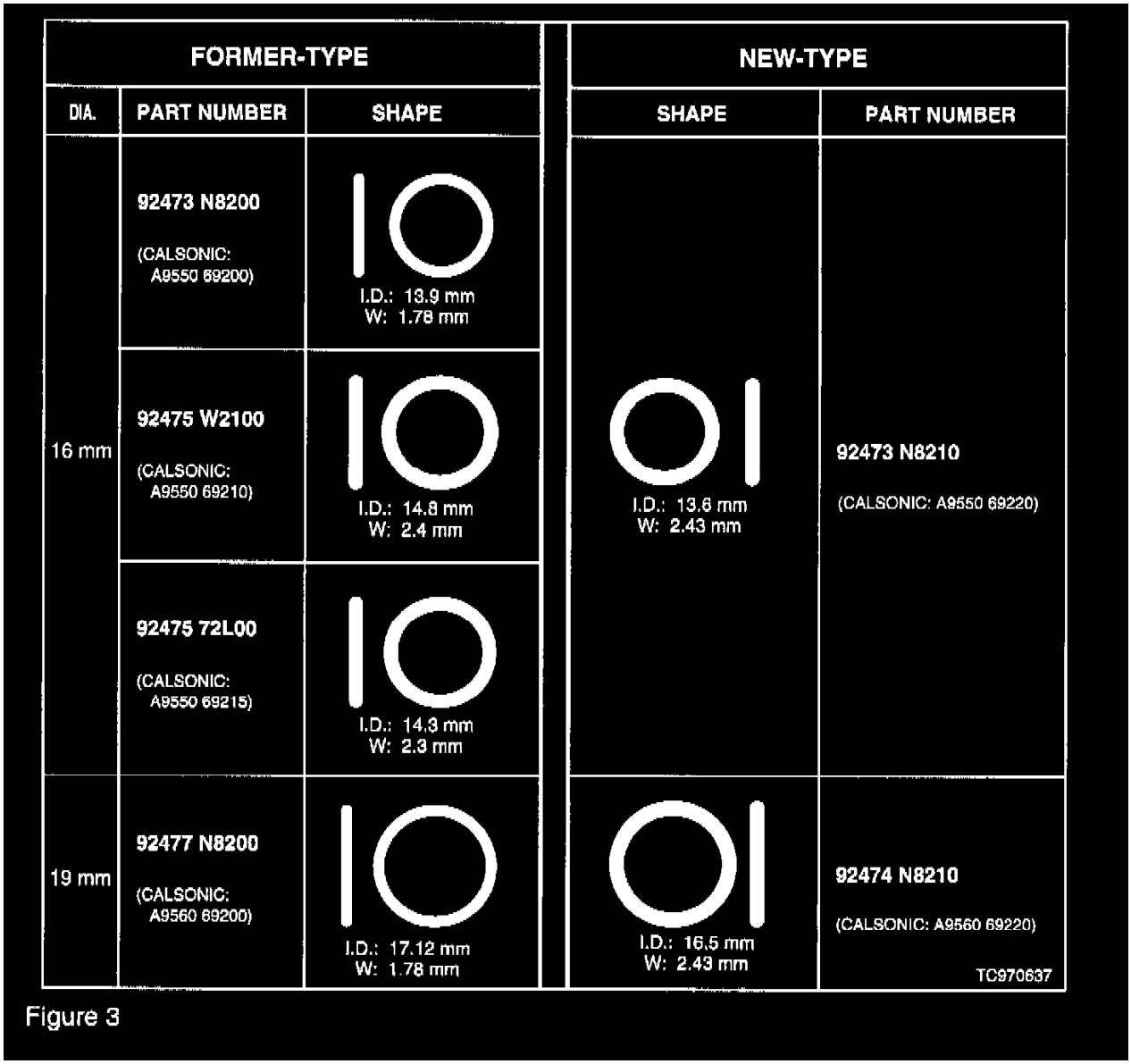


Figure 3

When servicing the A/C refrigeration loop, refer to the charts (Figure 2 and 3) to identify the correct 0-ring type. The charts list both NEW and FORMER 0-ring types and illustrates the 0-rings in full-scale size.

IMPORTANT POINTS

^ There is NO interchangeability between NEW and FORMER connection type 0-rings. Improper use will cause refrigerant leaks. Therefore, the correct type 0-ring must be used with each application.

^ Nissan vehicles requiring A/C 0-ring replacement should be checked for proper 0-ring part numbers through the applicable parts microfiche.

^ Insure correct 0-ring installation onto tube (see Figure 1).

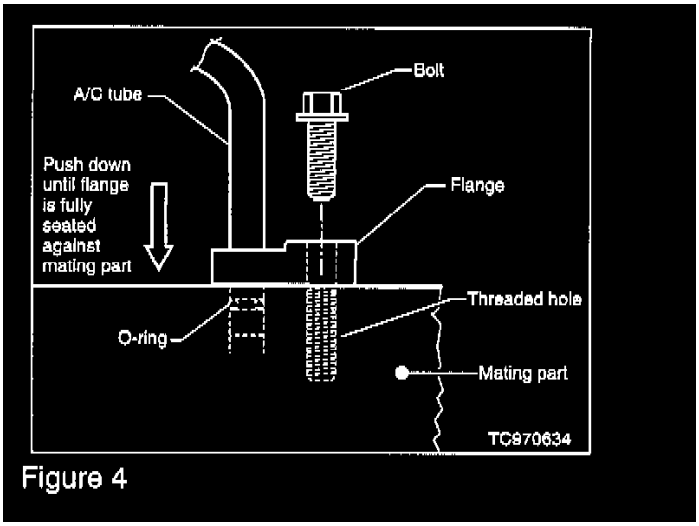


Figure 4

CAUTION:
When installing high pressure tubes (with flange connections) to their mating parts, make sure the flange is fully seated onto the mating part before the securing bolt is installed and tightened (see Figure 4). If the securing bolt is installed and tightened before the tube flange is seated onto its mating part, 0-ring damage and leaks can result.

Technical Service Bulletin # **TS87122** Date: **870901**

M/T Shift Boot - Loose

Reference: Date:
TECHNICAL BULLETIN TS87-122 September 7, 1987
Classification: Section: Models:
MT87-006 Manual Transmission 1980-1986 720 Trucks

TRANSMISSION SHIFT BOOT

APPLIED MODEL: 1980-1986 720 Trucks with 71B Manual Transmission

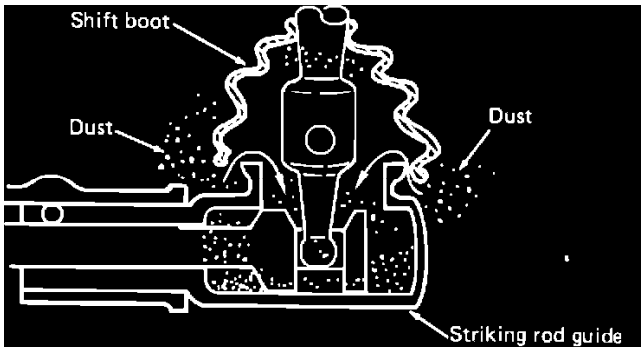


FIGURE 1

SERVICE INFORMATION

The shift boot on some 720 trucks with the 71B manual transmission may become loose due to oil and/or ozone contamination. When this condition occurs, dust and water may enter the transmission through the striking rod guide (see Figure 1).

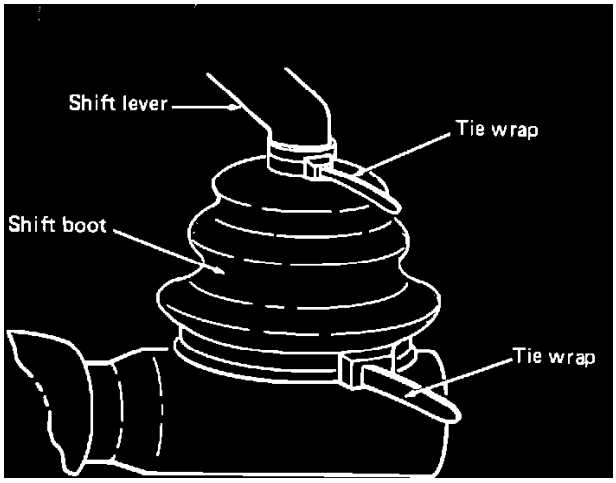


FIGURE 2

To correct this condition, tighten the shift boot with two plastic tie wraps (see Figure 2). If the shift boot is cracked or damaged, replace it with a new boot, and tighten it with two plastic tie wraps.
PARTS INFORMATION

NEW

PART DESCRIPTION	PART NUMBER	PART NUMBER
Plastic tie wrap (2.5 mm x 90 mm)	24216-V5000	-
Plastic tie wrap (2.5 mm x 200 mm)	24216-33G00	-

Shift boot -
^ Vehicles produced from 11/82 - ^ 32862-E9801 32862-E9800
^ Vehicles produced from 6/79 - 10/82 ^ Use same boot as original P/N 32862-E9300

WARRANTY INFORMATION

Refer to 1st Revision 1987 Warranty Flat Rate Manual, Section HF, Key 2.
Technical Service Bulletin # **94-100** Date: **941108**

Fluids - Recommended Fluids, Lubricants & Chemicals

Models: All
Section: General Information
Classification: GI94-008
Bulletin No.: NTB94-100
Date: November 8, 1994

RECOMMENDED FLUIDS, LUBRICANTS, and CHEMICALS FOR NISSAN VEHICLES

APPLIED VEHICLES:
All

SERVICE INFORMATION:

RECOMMENDED FLUIDS, LUBRICANTS and CHEMICALS FOR NISSAN VEHICLES: FLUIDS

DESCRIPTION	USE	SPECIFICATIONS	NISSAN PART NO.	RECOMMENDED AFTERMARKET PRODUCT
A/C Compressor Oil R-12 Systems	Compressor Lubrication	■ Mineral based	SUN150-5GS	Call (800) 285-8587 for local Distributor
Quest A/C — R-12 Compressor Oil	Compressor Lubrication 1993 Quest Only	—	999MP-CD000	—
Quest A/C — R-134a Compressor Oil	Compressor Lubrication 1994 Quest Only	—	KLH00-PAGQU	—
A/C Compressor Oil R-134A Systems Type-R	Compressor Lubrication	—	KLH00-PAGR1	—
A/C Compressor Oil R-134A Systems Type-S	Compressor Lubrication	—	KLH00-PAGS1	—
A/C Freon R-12	A/C Pressure Media	—	999MP-A4001	—
A/C Suva R-134A	A/C Pressure Media	—	999MP-R134A	
Brake Fluid	Brake Pressure Media Seal Lubricant	■ DOT 3 ■ Satisfy FMVSS #116	999MP-A4100	—
Engine Coolant	Engine Cooling and Boil Protection	■ Ethylene Glycol ■ Sufficient corrosion inhibitors (reserve alkalinity) to protect all aluminum alloy surfaces	—	BASF Zerex® or Equivalent
Engine Oil	Engine Lubrication	■ API SH ■ 5W-30 (All temperatures) ■ 10W-30 > (Above 0°F) ■ 10W-40 > ■ 20W-40 > (Above 50°F) ■ 20W-50 > ■ Mineral or Synthetic	—	—
Manual Transmission Gear Oil	Transmission Gear Lubrication	■ 75W-90 (FWD) ■ 80W-90 (RWD) ■ GL-4 or GL-5 ■ Mineral or Synthetic	—	■ Castrol Hypoid "C" or Equivalent ■ Castrol Synthetic Gear Oil 75W90, P/N 00672 or Equivalent
Differential Oil	Conventional or Viscous Coupling Limited Slip Differential	■ Sulphur-Phosphorus ■ GL-5 ■ Hypoid ("severe service")	—	Castrol Hypoid "C", or Equivalent
Differential Oil	Clutch Plate Limited Slip Differential	■ Special Limited Slip Differential Oil ■ See NTB93-140 (G193-011) for application	—	Pennzoil #4096 Limited Slip Differential Oil, P/N 020796

RECOMMENDED FLUIDS, LUBRICANTS and CHEMICALS FOR NISSAN VEHICLES: LUBRICANTS

DESCRIPTION	USE	SPECIFICATIONS	NISSAN PART NO.	RECOMMENDED AFTERMARKET PRODUCT
Constant Velocity Joint Grease	—	■ High temperature, NLGI-2 ■ Molybdenum Disulfide-based 3% or Poly-urea-based ■ Extreme pressure	—	—
	NOTE: Each axle = (2) joints — requires approximately 140 grams			
Locking Hub Lubricant	Lubrication for Locking Hubs	—	—	Shell Aerogrease No. 7*
PBC Grease	Brake Contact Areas	—	99990-00939	—
Silicone Grease	Ignition Systems/ General	—	999MP-AB002	—
White Lithium Grease	Body/Frame Components	—	999MP-A3030	Permatex "White Lithium Grease", P/N 81981-195DA
Teflon Grease	Body/Frame Components	■ -10°F → 350°F ■ Synthetic	—	**-Aerosol (11oz.)** Permatex "SuperLube" P/N 82327-31110 **-Tube (3oz.)** Permatex "SuperLube" P/N 82325-21033
Teflon Lubricant	Body/Frame Components	—	—	L.P.S. "Magnum" P/N 00616 or Equivalent
"Greasless" Lubricant	Electrical System Body/Frame Components	—	—	L.P.S. #1 Lubricant P/N 00116 or Equivalent
General Purpose Lubricant	Body/Frame Components	—	—	L.P.S. #2 Lubricant P/N 00216 or Equivalent
Rust Penetrant	Fasteners Exhaust Fittings	—	999MP-A3020	L.P.S. "Torque" LST; P/N 01916; Permatex "Fast Break", P/N 80052-68DA
Rust Preventative	Corrosion-Protection for Fasteners and Panels	—	999MP-A6000	L.P.S. #3 Long-Term Preservative, P/N 00316 or Equivalent

* Fourteen (14) ounce cartridges of Shell Aerogrease No. 7 are usually available through your local Shell Industrial Lubricants dealer. Additionally, this grease may be ordered by mail (3 tube minimum) through:

L.T. Sawyer, Inc. — Shell Jobber
Shell Oil and Chemical Products
P.O. Box 369
Van Nuys, CA 91408
(818) 786-8180 or 785-0902

RECOMMENDED FLUIDS, LUBRICANTS and CHEMICALS FOR NISSAN VEHICLES: CHEMICALS

DESCRIPTION	USE	SPECIFICATIONS	NISSAN PART NO.	RECOMMENDED AFTERMARKET PRODUCT
Anaerobic Liquid Gasket	Manual Transmission: Reverse Light Switch Various Bushings and Hardware Attached Components Automatic Transmission: Torque Converter Side Cover Transmission Case Reverse Light Switch Various Bushings and Hardware	■ Anaerobic curing ■ High temperature	—	Loctite Anaerobic Liquid Gasket, P/N 51813
Pipe Thread Sealant	Gasoline and Oil Fittings	■ High temperature ■ Vibration-resistant ■ Solvent/fuel/oil resistant	—	Loctite Thread Sealant, P/N 56521 or Equivalent
RTV Silicone Sealant	Engine: Oil Pan Timing Chain Cover Valve Cover	■ Oil resistant ■ Withstand up to 625°F (Intermittent) ■ Non-corrosive ■ Oxygen sensor safe	999MP-A7007	Loctite Ultra Grey Import Gasket Maker, P/N 599 or Equivalent
RTV Silicone Sealant	Engine: Coolant Connector Thermostat Water Pump Water Outlet	■ Oil resistant ■ Withstand up to 500°F (Intermittent) ■ Non-corrosive ■ Oxygen sensor safe	999MP-A7007	Loctite Ultra Blue, P/N 587 or Equivalent
Threadlocker	■ Bolts ■ Nuts ■ Studs ■ Bearing Fixtures	■ Low Strength ■ Medium Strength ■ Medium Strength Oil Resistant ■ High Strength ■ High Strength; High Temperature	— — — — —	Loctite Worldtech 222 or Equivalent Loctite Worldtech 242 Loctite Worldtech 243 or Equivalent Loctite Worldtech 271 Loctite Worldtech 272 or Equivalent

Included in this bulletin are lists of component-specific fluids, lubricants and chemicals which are recommended for service repairs.

In some cases, a Non-Nissan chemical product has been identified which is equivalent to the Factory product in application, material compatibility, temperature range, and solvent-resistance.

If other products are selected, they must be equivalent to Nissan's specifications in order to assure appropriate performance.

Always refer to the Material Safety Data Sheets for these products for more complete information about them.

Technical Service Bulletin # **89-131** Date: **890831**

Brakes - Silicone and PBC Greases

Classification:
BR89-007

Reference:
TS89-131

Date:
AUGUST 31, 1989

SILICONE & PBC GREASES

APPLIED VEHICLE(S)
All Models

SERVICE INFORMATION

Silicone grease (P/N 99990-00974) and PBC grease (P/N 99990-00939) are available and recommended for use on Nissan brake components.

NOTE:

- ^ Silicone grease may be applied to all brake grease points on disc and drum brakes. Silicone grease is very effective at the contact point between brake shoes and brake backing plate, to reduce squeaking.
- ^ PBC grease may be applied to pad shim-to-pad contact surfaces on disc brakes. PBC grease in these areas can help reduce brake squeal.
- ^ DO NOT use Silicone or PBC greases where rubber greases are specified.
- ^ Use all safety precautions when using these products. Read the labels thoroughly before using.

See the Brake Section of the appropriate Service Manual for specific application points of these products. Service Bulletin BR81-004A (TS81-040A) describes specific application points for 1981 vehicles and older. Service Bulletin BR89-005 (TS89-106) describes specific application points for 1985-88 Maxima, 1987-89 Stanza and 1984-89 300ZX.

Technical Service Bulletin # **89131** Date: **890831**

Brakes - Silicone & PBC Greases

Models All Models

Section Brake

Classification BR89-007

Bulletin No. TS89-131

Date August 31, 1989

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Technical Service Bulletin # **PI95-006** Date: **950322**

Brakes - Noise Explanation

Classification:

Reference:
PI95-006

Date:
March 22, 1995

BRAKE NOISE

APPLIED VEHICLE(S):
ALL MODELS

SERVICE INFORMATION

This bulletin has been released to assist dealership service managers, service advisors and technicians in identifying factors which may contribute to

brake system noise complaints.

Some noises are normal and no repair action should be taken by dealers. Noises not considered normal should be investigated and repaired according to approved methods (refer to applicable released Technical Service Bulletins). When necessary, dealers should request support from regional technical staff members.

^ Brake Materials

During normal operation various noises may be emitted by the brake system whether equipped with disc brakes, drum brakes, with or without ABS.

Nissan, along with other automotive manufacturers, has significantly reduced the amount of asbestos used in its products. As a result, Nissan adopted semi-metallic brake linings with excellent performance.

However, because of the metal-to-metal contact with semi-metallic pads, the noises generated from the brake system are greater than vehicles equipped with the previous asbestos linings. Semi-metallic brake linings are characteristically more noisy under normal operation than were asbestos linings.

To reduce the noise level of the braking systems, especially for disc brakes, Nissan has begun introducing non-asbestos organic (NAO) brake pads on several models and will phase in additional models as soon as possible (refer to applicable Technical Service Bulletins).

Brake Design

Brake designs must meet very tight operating specifications and Federally mandated requirements. And they must do this under a variety of operating conditions without compromising safety. A few of the factors considered when designing a brake system are:

- stopping distances
- extreme hot and cold temperature
- dry/dusty and wet/mud conditions
- pedal travel and effort
- front/rear brake proportioning
- parking brake effort/function
- pad/lining wear and service life
- road salt corrosion
- humidity, etc..

Depending upon the local environment, weather conditions and customer driving patterns, there may be occurrences of noises from the braking system. The following section addresses some of the noises.

^ Common Brake Noises

The following noises are normal and are considered generally characteristic of all braking systems (including competitors). These noises do not indicate any malfunction in the brake system or improper operation.

- Loud Squeal Noise

  For disc brake pads with wear indicators, an audible continuous warning noise is made when the pads need replacement.

- Grinding Noise

- Noise common primarily on rear brake drums and on some front disc brakes during first few stops. This is primarily due to formation of trace corrosion occurring at the metal surfaces during vehicle non-use or storage.

- Trace Squeak/Squeal Noise

  Normally occurs with front semi-metallic brake linings at medium speeds with light/medium pedal force.
  This can occasionally occur on rear brakes during the first few stops with cold brakes (especially morning) and/or high humidity.

- Groan Noise

  On automatic transmission equipped vehicles, a slight groan may be heard when coming to an abrupt stop or when allowing the vehicle to creep forward slowly from a stop.

- ABS Self Check

  This noise will occur when the vehicle is initially started and will be felt as a slight pulsation at the brake pedal.

^ Dealer Investigation

In all of the above cases, dealer personnel must verify the customer complaints and fully understand the noise and the condition under which the

noise occurs. The following factors should be considered:

- Verify the Complaint

  Customers typically will complain of a brake noise and may not be able to distinguish whether it's from the front or rear. An unnecessary repair and unsatisfied customer will result if a misdiagnosis occurs.

- Inspect for Unusual Use

  Any unusual vehicle use should be identified. Presence of mud, excessive salt, flooding damage or other contaminants can be significant factors.

- Collision Damage

  Inspect the vehicle for presence of related collision damage. Advise customer if the noise results from a vehicle collision.

- Improper Use

  If a rear noise complaint, inspect for evidence of heat effects from a hand brake (parking brake) inappropriately engaged or dragging during driving.

Handling Customer Comments

In all cases, dealers must verify the noise and establish whether it is normal or not. When the noise is considered normal and characteristic of that vehicle the customer should be carefully advised that the brakes are operating properly and provided with a careful explanation based on the information in this bulletin. Dealers should explain to the customer that Nissan brake materials have been carefully designed to provide optimum braking performance under various driving conditions and that this noise does not indicate a malfunction in brake system function or performance. There are no known repair procedures to eliminate these normal noises which are the result of removing asbestos from brake pads as required by current law.

When the noise is not one of the normal noises mentioned in this bulletin, appropriate repairs should be taken as required and/or regional staff advised.

Technical Service Bulletin # **PI95006** Date: **950322**

Brake System - Noise Concern Explanation

Date: March 22, 1995

Reference: PI95-006

BRAKE NOISE

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Some noises are normal and no repair action should be taken by dealers. Noises not considered normal should be investigated and repaired according to approved methods (refer to applicable released Technical Service Bulletins). When necessary, dealers should request support from regional technical staff members.

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- road salt corrosion
- humidity, etc.

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- ABS Self Check

  This noise will occur when the vehicle is initially started and will be felt as a slight pulsation at the brake pedal.

^ DEALER INVESTIGATION

In all of the above cases, dealer personnel must verify the customer complaints and fully understand the noise and the condition under which the noise occurs. The following factors should be considered:

- Verify the Complaint

  Customers typically will complain of a brake noise and may not be able to distinguish whether it's from the front or rear. An unnecessary repair and unsatisfied customer will result if a mis-diagnosis occurs.

- Inspect for Unusual Use

  Any unusual vehicle use should be identified. Presence of mud, excessive salt, flooding damage or other contaminants can be significant factors.

- Collision Damage

  Inspect the vehicle for presence of related collision damage.
  Advise customer if the noise results from a vehicle collision.

- Improper Use

  If a rear noise complaint, inspect for evidence of heat effects from a hand brake (parking brake) inappropriately engaged or dragging during driving.

HANDLING CUSTOMER COMMENTS

In all cases, dealers must verify the noise and establish whether it is normal or not. When the noise is considered normal and characteristic of that vehicle the customer should be carefully advised that the brakes are operating properly and provided with a careful explanation based on the information in this bulletin. Dealers should explain to the customer that Nissan brake materials have been carefully designed to provide optimum braking performance under various driving conditions and that this noise does not indicate a malfunction in brake system function or performance. There are no known repair procedures to eliminate these normal noises which are the result of removing asbestos from brake pads as required by current law.

When the noise is not one of the normal noises mentioned in this bulletin, appropriate repairs should be taken as required and/or regional staff advised.

Technical Service Bulletin # **BR86001** Date: **860422**

Brakes - Automatic Parking Brake Adjustment

Sentra/Pulsar/Stanza/
Models Stanza Wagon/Truck

Section Brakes

Classification BR86-001

Bulletin No. TS86-024

Date April 22, 1986

AUTOMATIC PARKING BRAKE ADJUSTMENT, SENTRA/PULSAR/STANZA/STANZA WAGON/TRUCK

APPLIED MODELS: Sentra, Pulsar, Stanza, Stanza Wagon and Truck

SERVICE INFORMATION

Nissan passenger vehicles with drum rear brakes and some trucks have an automatic brake adjuster that operates by applying and releasing the parking brake. On other Nissan trucks, the adjuster operates when the service brakes are applied while the vehicle is moving in reverse. These mechanisms will automatically adjust the rear brakes and, providing the parking brake cable is properly adjusted, maintain the proper number of "clicks" at the parking brake lever.

IMPORTANT: Rear brake performance and brake shoe life are not affected by parking brake adjustment.

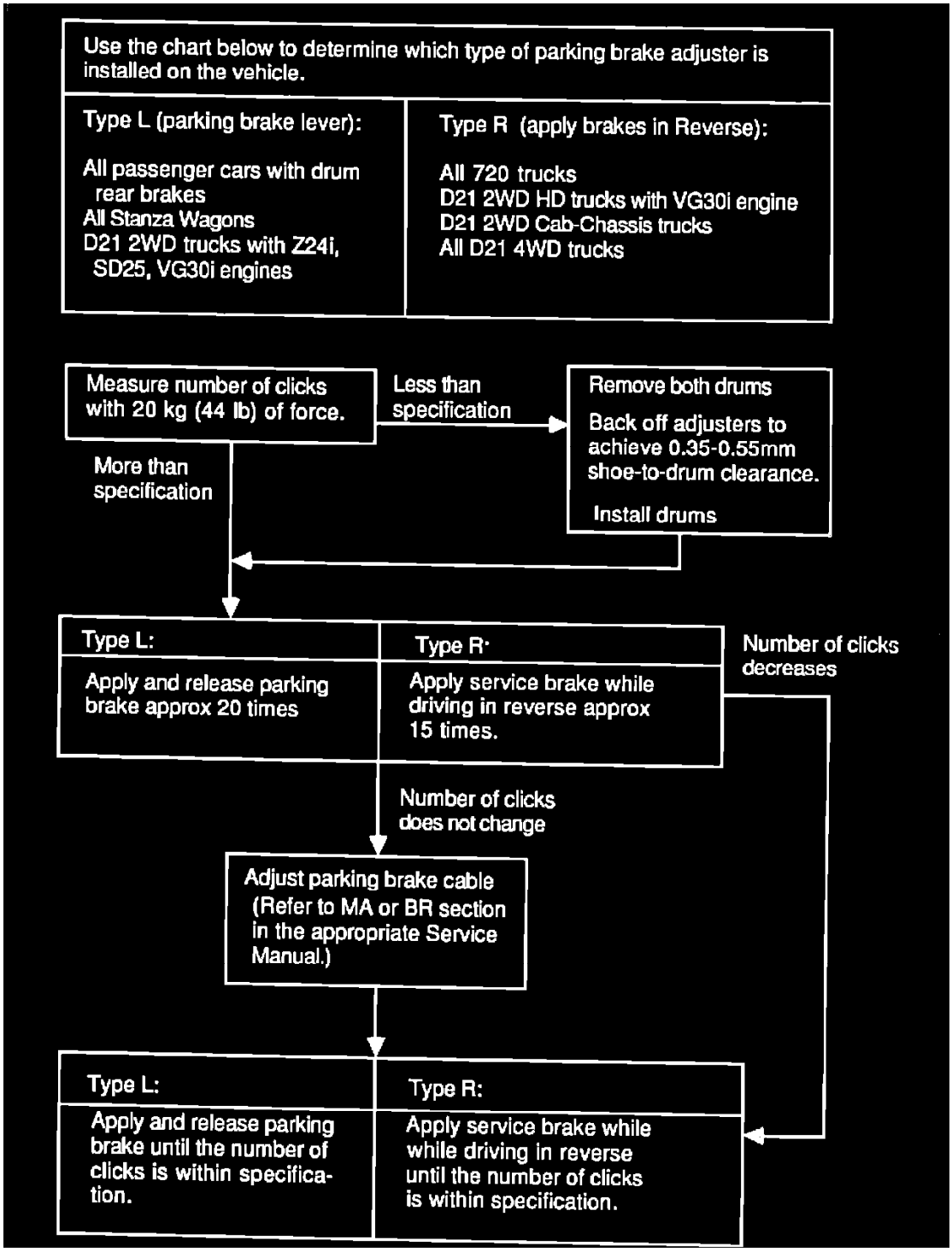
The number of clicks at the parking brake lever depends on the model and parking brake lever type. It is measured by pulling on the lever with 20 kg (44 lb) of force and counting the "clicks".

MODEL	PARKING BRAKE TYPE	NUMBER OF CLICKS
Sentra (B11) Pulsar (N12)	Floor mount	6-7
Sentra (B12) Stanza (T12)	Floor mount	11-13
Stanza (T11)	Floor mount	7-8
Stanza Wagon (M10)	Floor mount (4WD) Dash mount (2WD)	8-9 11-17
Truck (720)	Dash mount	13-16
Truck (D21)	Floor mount Dash mount (2WD) Dash mount (4WD)	10-12 10-12 9-11

"CLICK" SPECIFICATIONS

PARKING BRAKE ADJUSTMENT CHECK

Use the flow chart to check the adjustment of the parking brake.



CHECK PROCEDURE
Technical Service Bulletin # **93071** Date: **930401**

Oil - Recommended Fluids, Lubricants and Chemicals

Classification:
G193-004

Section:
General Information

Reference:
TECHNICAL BULLETIN NTB93-071

Models:
All

Date:
April 1993

RECOMMENDED FLUIDS, LUBRICANTS, and CHEMICALS FOR NISSAN VEHICLES

Nissan-Datsun Truck PL720 2WD L4-1952cc 2.0L SOHC (Z20)

APPLIED VEHICLES: All

SERVICE INFORMATION:

RECOMMENDED FLUIDS, LUBRICANTS and CHEMICALS FOR NISSAN VEHICLES: FLUIDS

DESCRIPTION	USE	SPECIFICATIONS	NISSAN PART NO.	RECOMMENDED AFTERMARKET PRODUCT
A/C Compressor Oil R-12 Systems	Compressor Lubrication	■ Mineral based	—	—
Quest A/C Compressor Oil	Compressor Lubrication 1993 Quest Only		999MP-CD000	
A/C Compressor Oil R-134A Systems Type-R	Compressor Lubrication	—	KLH00-PAGRO	—
A/C Compressor Oil R-134A Systems Type-S	Compressor Lubrication	—	KLH00-PAGSO	—
A/C Freon R-12	A/C Pressure Media	—	999MP-A4001	—
A/C Suva R-134A	A/C Pressure Media	—	999MP-R134A	—
Brake Fluid	Brake Pressure Media Seal Lubricant	■ DOT 3 ■ Satisfy FMVSS #116	999MP-A4100	—
Engine Coolant	Engine Cooling and Boil Protection	■ Ethylene Glycol ■ Sufficient corrosion inhibitors (reserve alkalinity) to protect all aluminum alloy surfaces	—	BASF Zerex® or equivalent
Engine Oil	Engine Lubrication	■ API SF/SG ■ Energy Saving I/II ■ Mineral or synthetic ■ 5W-30 (All temperatures) ■ 10W-30, 10W-40 (Above 0°F) ■ 20W-40, 20W-50 (Above 50°F	— —	—
Manual Transmission Gear Oil	Transmission Gear Lubrication	■ 75W-90 (FWD) ■ 80W-90 (RWD) ■ Mineral or synthetic ■ GL-4 or GL-5	—	Castrol Hypoid "C" Mobil Synthetic 75W90 or equivalent
Power Steering Fluid	Power Steering Gear Lubrication	■ Dexron I C/D ■ Mineral or synthetic	—	Pentosin CHF 11S (synthetic)

RECOMMENDED FLUIDS, LUBRICANTS and CHEMICALS FOR NISSAN VEHICLES: LUBRICANTS

DESCRIPTION	USE	SPECIFICATIONS	NISSAN PART NO.	RECOMMENDED AFTERMARKET PRODUCT
Constant Velocity Joint Grease	—	■ High temperature, NLGI-2 ■ Molybdenum Disulfide-based 3% or Poly-urea-based ■ Extreme pressure	—	—
	NOTE: Each axle = (2) joints — requires approximately 140 grams			
Locking Hub Lubricant	Lubrication for Locking Hubs	—	—	Shell Aerogrease No. 7*
PBC Grease	Brake Contact Areas	—	99990-00939	—
Silicone Grease	Ignition Systems/ General	—	999MP-AB002	—
White Lithium Grease	Body/Frame System	—	999MP-A3030	—

* Fourteen (14) ounce cartridges of Shell Aerogrease No. 7 are usually available through your local Shell Industrial Lubricants dealer. Additionally, this grease may be ordered by mail (3 tube minimum) through:

L.T. Sawyer, Inc. — Shell Jobber
Shell Oil and Chemical Products
P.O. Box 369
Van Nuys, CA 91408
(818) 786-8180; 785-0902

RECOMMENDED FLUIDS, LUBRICANTS and CHEMICALS FOR NISSAN VEHICLES: CHEMICALS

DESCRIPTION	USE	SPECIFICATIONS	NISSAN PART NO.	RECOMMENDED AFTERMARKET PRODUCT
Anaerobic Liquid Gasket	Manual Transmission: Reverse Light Switch Various Bushings and Hardware Attached Components Automatic Transmission: Torque Converter Side Cover Transmission Case Reverse Light Switch Various Bushings and Hardware	■ Anaerobic curing ■ High temperature	KP610-00250	Loctite Anaerobic Liquid Gasket, P/N 51813
Pipe Thread Sealant	Gasoline and Oil Fittings	■ High temperature ■ Vibration-resistant ■ Solvent/fuel/oil resistant	—	Loctite Thread Sealant, P/N 56521 or equivalent
RTV Silicone Sealant	Engine: Oil Pan Timing Chain Cover Valve Cover	■ Oil resistant ■ Withstand up to 625°F (Intermittent) ■ Non-corrosive ■ Oxygen sensor safe	KP510-00150	Loctite Ultra Grey Import Gasket Maker. P/N 599
RTV Silicone Sealant	Engine: Coolant Connector Thermostat Water Pump Water Outlet	■ Oil resistant ■ Withstand up to 500°F (Intermittent) ■ Non-corrosive ■ Oxygen sensor safe	999MP-A7007	Loctite Ultra Blue. P/N 587
Threadlocker	■ Bolts ■ Nuts ■ Studs ■ Bearing Fixtures	■ Low Strength ■ Medium Strength ■ Medium Strength Oil Resistant ■ High Strength ■ High Strength High Temperature	— — — — —	Loctite Worldtech 222 or equivalent Loctite Worldtech 242 Loctite Worldtech 243 or equivalent Loctite Worldtech 271 Loctite Worldtech 272 or equivalent

Included in this Bulletin are lists of component-specific fluids, lubricants, and chemicals which are recommended for usage during service repairs.

In some cases, a Non-Nissan product is referenced. However, in those cases, a chemical product has been selected which is equivalent to the Factory product in application, material compatibility, temperature-range, and solvent-resistancy.

Technical Service Bulletin # **91049** Date: **910516**

Alignment - Toe Specification Clarification

Models All Models

Section General Information

Classification G191-005

Bulletin No. NTB91-049

Date May 16, 1991

A CLARIFICATION OF TOE SPECIFICATIONS FOR WHEEL ALIGNMENT

APPLIED MODELS: All

SERVICE INFORMATION:

Toe, front or rear, is the position of the tire and wheel assembly in relation to the center line of the vehicle, as viewed from the top. This alignment measurement influences the track holding characteristics of the vehicle. Incorrect Toe alignment can cause excessive tire wear.

Nissan service manuals give toe specifications as either "total toe-in" or "total too-out." Total toe-in or -out, means that one-half (1/2) of the listed dimension should be applied, equally, to each wheel.

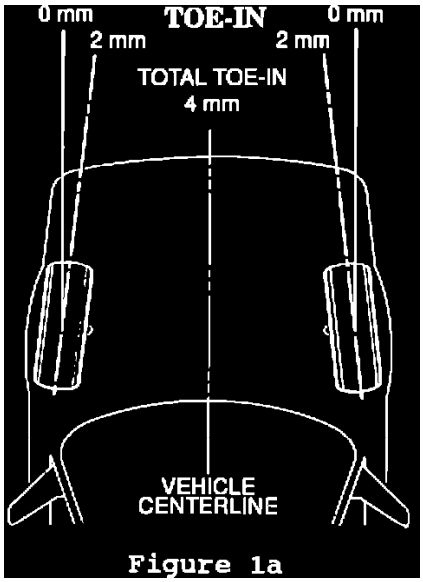


Figure 1a

^ Toe-In is present when the tire is closer to the center line at the front (Figure 1a).

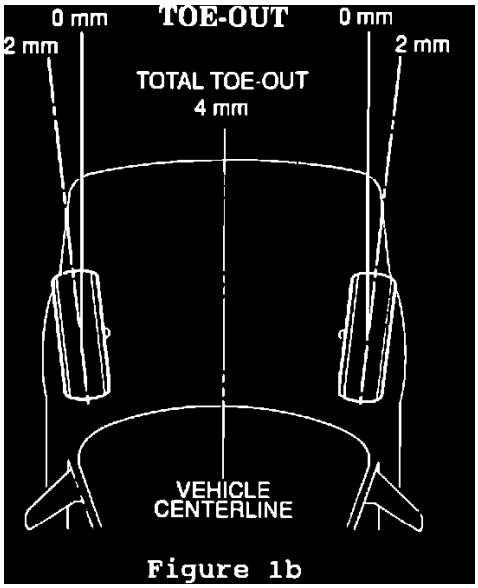


Figure 1b

^ Toe-Out is present when the tire is closer to the center line at the rear (Figure 1b).

ADJUSTMENTS

1. Toe should be the last alignment specification adjusted. Refer to the Front Axle (FA) and Rear Axle (RA) sections of the appropriate Service Manual to determine the proper locations to adjust the front and rear Toe.
2. Toe should be equal, side-to-side.
3. Toe-In

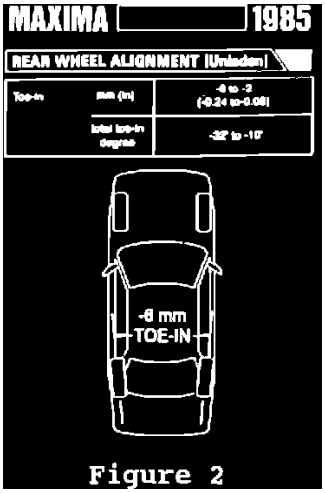


Figure 2

When the specification is labeled "Toe-In" and dimensions are negative numbers (ie: -6 to -2 mm), the wheels should be adjusted to the "Toe-Out" position (Figure 2).

NOTE: Positive (+) Toe-In specification = Toe-In wheel setting.
Negative (-) Toe-In specification = Toe-out wheel setting.

Toe-Out

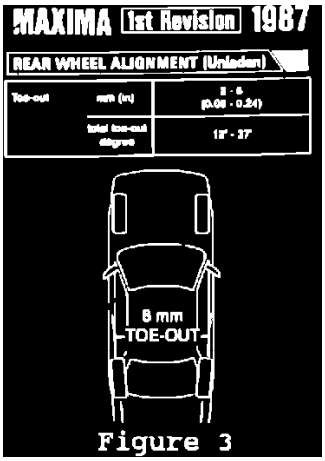


Figure 3

When the specification is labeled "Toe-Out" and the dimensions are positive (+) numbers (ie: 2 to 6 mm), the wheels should be adjusted to the "Toe-Out" position (Figure 3).

NOTE: Positive (+) Toe-out specification = Toe-Out wheel setting. Negative (-) Toe-Out specification = Toe-In wheel setting.

4. Rear Toe is adjustable on some Nissan vehicles with independent rear suspensions. Usually, the adjustment, itself, is not difficult but, it is extremely important.

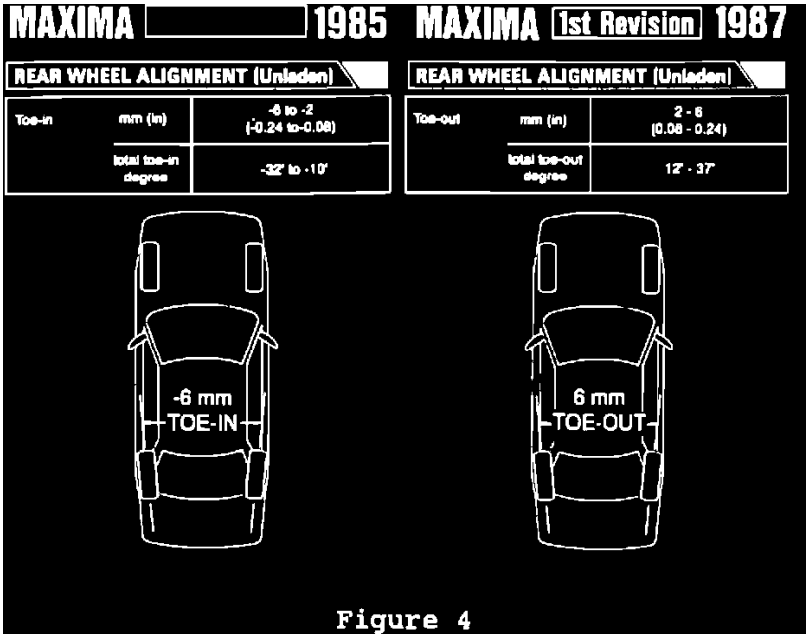


Figure 4

Nissan uses two (2) different terms to describe "Rear Toe". "Toe-In" and "Toe-Out". Contemporary wheel alignment equipment measures rear "Toe-In" and, if the wheels are actually "Toed-Out", displays the measured values as a negative (Figure 4).

5. Toe is measured as a distance or as an angle. When measuring toe as a distance, it is found by measuring the difference between the center of the front of the tire and the center of the rear of the tire at spindle height. The difference between the distances is Total Toe.

   When measured as an angle, the center line of the vehicle is zero degrees (0~, 0.00~, or 0~00') and the angle of a line drawn through the center of the tire and wheel, as viewed from the top, is the Toe angle for the individual wheel.

6. Nissan Total Toe specifications are given two (2) ways:

Distance: Millimeters and Decimal Inches

Angle: Degrees and Minutes

TOE
UNIT CONVERSIONS

Units	Conversions			
fractional inches	1/16"	1/8"	3/16"	1/4"
decimal inches	.062"	.125"	.188"	.250"
millimeters	1.60 mm	3.18 mm	4.76 mm	6.35 mm
decimal degrees	0.125°	0.25°	0.375°	0.5°
degrees & minutes	0° 8'	0° 15'	0° 23'	0° 30'
fractional degrees	1/8°	1/4°	3/8°	1/2°

Figure 5

The chart (Figure 5) shows the relationship between the common units of Total Toe measurement. Conversions vary with wheel size. Reference the appropriate service manual for exact specifications.

NOTE: When adjusting Total Toe on a vehicle with oversized tires, use the angle values on the alignment machine. Oversized tires have a larger diameter.

Technical Service Bulletin # **BF87026** Date: **870727**

Seat Belts - Extender Availability

Nissan-Datsun Truck PL720 2WD L4-1952cc 2.0L SOHC (Z20)

Models All Models

Section Body & Frame

Classification BF87-026

Bulletin No. TS87-114

Date July 27, 1987

FRONT SEAT BELT EXTENDERS, LONGER FRONT SEAT BELTS

This Technical Bulletin contains a complete list of seat belt extenders and longer seat belt sets currently available for use on all Nissan Models except 1987 Maxima vehicles with automatic seat belts. These assemblies should be used when body size or driving position do not allow for proper fit of the factory installed lap-shoulder belts. Use the information in this bulletin in place of that found in previously issued Technical Bulletin BF86-012 (TS86-082). Make note of this on page BF-30 of the 1986 Technical Bulletin Reprint Manual.

When a customer requests information regarding better fitting seat belts:

- ^ Inspect the original lap-shoulder belt assembly to ensure proper function. Refer to Section MA of the appropriate model Service Manual.
- ^ Inform the customer that the extenders/longer seat belts are designed for his/her specific use only. Individuals who can use the standard seat belt may not receive full restraint system protection when using an extender/longer belt.
- ^ If a longer belt is installed, return the old belt to the customer for use if and when the extended length belt is no longer required.

Listed below are the revised part numbers for the extenders and longer seat belts with the applied models. These belts should be provided to the customer free of charge, and should be ordered through the Parts Department system. They are available only in black.

I. EXTENDERS

PART NUMBER	APPLIED MODEL
86848-01A00	*1974-78 B210 (NSK Warner) 1975-78 280ZX 1974-76 610 1976-78 F10 1974-77 710 1977-80 810
86848-01A01	1979-81 210 (2-Door) 1979-81 280ZX 1979-81 310
86848-01A02	1981 Maxima

I. EXTENDERS (CONTINUED)

PART NUMBER	APPLIED MODEL
86848-01A03	1982 210 (2-Door) 1982-84 Maxima 1982 310 1982-83 280ZX
86848-01A04	1984-86 300ZX 1986-87 Stanza Wagon 1985-87 Maxima
86848-01A05	*1974-76 B210 (Takata) 1976-78 620
86848-01A06	*1977-78 B210 (Takata) 1979 Truck 1977-79 200SX
86848-01A07	1979-82 210 (4-Door) 1980-81 200SX
86848-01A08	1982.5-86 Sentra (4-Door) 1987 Pathfinder 1983-86 Pulsar (4-Door) **1983-87 Truck 1982-86 200SX (Applied date: prior to 2/86)
86848-01A09	1980-82 Truck
86848-01A10	1978-81 510
86848-01A11	1987 Sentra 1987 Van 1986-87 200SX (Applied Date: from 2/86)
86848-01A12	1987 Pulsar NX 1987 300ZX

1987 Stanza

II. LONGER SEAT BELTS (CONTINUED)

PART NUMBER	APPLIED MODEL
86840-D0124 (R.H.) 86841-D0124 (L.H.)	1982-86 Stanza (4-Door/5-Door)
86840-D1024 (R.H.) 86841-D1024 (L.H.)	1982-84 Stanza (2-Door)
86840-37A24 (R.H) Complete Belt Set ONLY 86841-37A24 (L.H.) Complete Belt Set ONLY	1982.5-86 Sentra (2-Door) 1983-86 Pulsar NX (2-Door)

* 1974-78 B210 - Two seat belt manufacturers were used: NSK Warner and Takata. Be sure to check the belt for the manufacturers name before ordering.

**No special extenders are available for 1984-1986 720 and some 1986.5 D21 U.S.A. produced trucks. However, the extender listed for 1983-1987 trucks on page 2/3 can be used if a replacement seat belt set is ordered from the parts catalogue as noted below:

1984-86 720 Truck

For U.S.A. produced 720 trucks (VIN prefix 1N6...) order the belt set for the equivalent Japanese produced 720 truck (VIN Prefix JN6...) and the extender listed on page 2/3 will fit. Do not order any replacement seat belt set with an "S" in the 6th digit of the part number. Example: For a 1984 Brown 2WD (K/Cab) order (Brown C-134) P/N 86840-10W11. Do not order (Brown C-134 USA make) P/N 86840-S3601.

1986.5 D21 Truck

Check the manufacturer's identification on the female buckle in the D21 truck. If the buckle is marked "TK - ", no new belt set is needed, just order the extender listed on page 2/3 of this bulletin. If the buckle is marked with "NSK/Warner", order the correct color replacement seat belt set (male and female halves) listed in the D21 parts catalog, and the extender listed on page 2/3 will fit. All replacement seat belt sets listed in the D21 catalog are compatible with the extender.

NOTE:
If an extender is needed for a U.S.A. produced 720 or D21 truck, the replacement seat belt set and the installation is available at no charge to the consumer.

WARRANTY INFORMATION

CS	PNC	CT	OPERATION	OP CODE	FLAT RATE
9Y	868EX	99	Install Longer Belt	SH99AA	0.4/hr.
9Y	868EX	99	Install Extender(s)	SH16AA	0.2/hr.

Technical Service Bulletin # **91052** Date: **910523**

A/C - Refrigerant Oil Availability/Recommendation

Models: All Models

Section: Heater & Air Conditioner

Classification: HA91-010

Bulletin No.: NTB91-052

Date: May 23, 1991

A/C COMPRESSOR OIL - NISSAN

APPLIED MODELS: ALL MODELS

SERVICE INFORMATION:

The recommended refrigerant oil for all Nissan A/C systems is SUNISO 5GS. SUNISO 5GS is now available from SUNISO distributors in one quart containers. When ordering the oil, specify part number L315, which is the number for a single, one quart container.

Dealers are encouraged to use one quart containers to prevent oil contamination. When left open to the atmosphere, compressor oil will absorb moisture that renders it unfit for use. To avoid this, order one quart containers, open only one at a time, and keep them tightly sealed when not in

use.

Due to the higher operating temperatures of our latest generation of A/C compressors, a 5GS oil is required to ensure optimum compressor performance. The use of lighter viscosity oil commonly found at auto parts supply stores can cause premature compressor failure.

JOHNSTONE BRANCH ROSTER

BR #	CITY, STATE, ZIP	STREET ADDRESS	BRANCH MANAGER	PHONE #
38	ALBUQUERQUE, NM 87197	2501 PHOENIX AVE NE ZIP 87107; P O BOX 6525	MARY MARTIN	505 884-0824
32	ANAHEIM, CA 92805	518 E. BALL ROAD	LAWRENCE ROBINSON	714 533-8413
* 40	ANCHORAGE, AK 99518	549 WEST INTERNATIONAL AIRPORT RD, #A-4	DAN KENNEDY	907 563-4004
100	ANNAPOLIS, MD 21401	1805 VIRGINIA AVENUE	STEVE DALTON & JOHN BRINSTER	301 280-0101
55	AUSTIN, TX 78759	3007 LONGHORN BLVD., SUITE 106	BILL LAMBDIN	512 834-0346
+ 13	BAKERSFIELD, CA 93301-4113+	+300 GOLDEN STATE AVE.	PAUL DUDEK	+805 861-1100
106	BALDWIN, NY 11510	1593 GRAND AVENUE	MARK STRAUSS	516 223-5511
21	BALDWIN PARK, CA 91706	957 BALDWIN PARK BLVD.	DIRK SQUIBB	818 962-7138
+ 20	BILLINGS, MT 59108-0150+	850 PARKWAY LN. ZIP 59101; P O BOX 80150+	KATHY KENEALLY	406 252-1207
88	BIRMINGHAM, AL 35222	4000 4TH TERRACE N.	MICKAEL DAVIS	205 591-3440
128	BOHEMIA, NY 11716	600 JOHNSON AVENUE	CHARLES SOLON	516 567-4800
+ 7	BOISE, ID 83704	+525 N. STEELHEAD WAY	DICK KAUPHUSMAN	208 377-1600
80	BOTHELL, WA 98011	11715 NORTH CREEK PARKWAY S., STE 101	JIM DAVIS	206 487-3939
107	BROOKLYN, NY 11230	1600 CONEY ISLAND AVENUE	MICHAEL SOLON	718 252-2700
90	BROOKLYN HEIGHTS, OH 44131	4916 VAN EPPS ROAD	GEORGE A ELLS SR.	216 661-9922
114	BUFFALO, NY 14225	375 HAGEL DRIVE	JIM & DEBI RUNGE	716 683-7435
52	CAPE MAY COURT HOUSE, NJ 08210	12 N. WILDWOOD BLVD.	JOHN DI DOMENICO	609 465-9671
78	CARBONDALE, IL 62902	NEW HIGHWAY 13 WEST; P O BOX 3591	D. ANDREW EVANS	618 549-7365
122	CHARLOTTE, NC 28206	1501-C N. GRAHAM STREET	TOM KECK	704 332-6441
	(SEND MAIL TO P O BOX 21266, GREENSBORO NC 27420)			
121	CHATTANOOGA, TN 37408	1601 CENTRAL AVENUE	SIDNEY MARLER	615 265-2515
101	CINCINNATI, OH 45246 (1)	1640 EAST KEMPER ROAD	GREG GRIMME	513 772-4328
102	CINCINNATI, OH 45210 (2)	24 WEST MCMICKEN AVENUE	MARK GRIMME	513 651-4328
30	COLORADO SPRINGS, CO 80903	531 EAST CIMARRON	JEFF WIELAND	719 520-0222
131	COLUMBIA, SC 29203	95-A SUNBELT BLVD.	VINCE WOLFF/BILL RATHBUN	803 735-9979
77	COLUMBUS, OH 43216	1000B EDGEHILL ROAD 43212; P O BOX 911	GEORGE ELLS JR.	614 421-4345
22	COMMERCE, CA 90091	P O BOX 91-1127	BILL SALPAKA	213 722-6500
	SHIP TO ADDRESS: 8040 E. SLAUSON, MONTEBELLO, CA 90640			
99	CONCORD, CA 94520	2231 COMMERCE AVENUE, UNIT E	KAREN HOGAN	415 682-6100
76	CORPUS CHRISTI, TX 78469	2701 AGNES STREET ZIP 78405; P O BOX 9490	LARRY MONTGOMERY	512 882-8896
+ 56	DALLAS, TX 75354	2505 WILLOWBROOK, #200, Z 75220; POB 542926	+JACK DRINKARD	214 357-0835
116	DAYTON, OH 45401	P O BOX 1382; 15 TROY STREET, ZIP 45404	J. KRATZER & G. BAUMGARDNER	513 222-4311
5	DENVER, CO 80204	930 WYANDOT STREET; P O BOX 4605	CARLA WOLFE	303 573-5626
123	EASTON, PA 18043	2609 DEARBORN STREET ZIP 18042; PO BOX 3849	TOM WALLACE	215-258-5651
97	EL CAJON, CA 92020	1385 NORTH MAGNOLIA AVENUE	STEVE FREDRICK	619 579-9575
29	ELK GROVE VILLAGE, IL 60007	145 LIVELY BLVD.	TONY SULLIVAN	708 956-0810
83	EL PASO, TX 79915	7198-C1 MERCHANT	BOB TUTTLE	915 779-5736
+ 43	ESCONDIDO, CA 92029	+2402 VINEYARD AVE.	+DAVE WILCOX	619 746-4746
6	EUGENE, OR 97402	2621-D W. 5TH AVENUE	BILL KOUMOUNGIS	503 342-4861
53	EXTON, PA 19341	263 S. WHITFORD ROAD	CRAIG MEADE	215 363-9000
50	FAYETTEVILLE, NC 28302	520 E. RUSSELL ST. ZIP 28301; P O BOX 149	JEFF MUSGROVE	919 483-5517
67	FENTON, MO 63026	1781 LARKIN WILLIAMS ROAD	RON STOGSDILL	314 343-0136
36	FORT LAUDERDALE, FL 33309	6626-30 NW 20TH AVENUE	ORAL GOBLE	305 971-9350
94	FORT MYERS, FL 33916	4010 WAREHOUSE ROAD	JEFF CARLIN	813 337-4008
74	FORT WAYNE, IN 46895-5738	3676 WELLS STREET ZIP 46808; P O BOX 5738	BUD MILLER III	219 482-3778
57	FORT WORTH, TX 76117	6500 MIDWAY ROAD, #150	BOBBY CHILDRESS	817 834-2255
75	FRESNO, CA 93703	1530 N. THESTA	DANNY KALMBACH	209 237-9000
73	GAINESVILLE, FL 32609	2908 NE 21ST WAY	DOUG ALLEN	904 378-2430
68	HAWTHORNE, CA 90250	11725 INGLEWOOD AVENUE	GREG PAULSON	213 644-7711
118	HIALEAH, FL 33014	2740 W. 81ST STREET, 33016; P O BOX 4683	MARK HICKS	305 824-0441
39	HOUSTON, TX 77007	501 N. SHEPHERD DRIVE	GARY CRANE	713 868-8967
82	HOUSTON, TX 77033 (HOUSTON 2)	5985 SOUTH LOOP EAST	DAVID EDSON	713 645-0085
96	HOUSTON, TX 77036 (HOUSTON 3)	7028 HARWIN DRIVE	STEVE ANDERSON	713 952-4601
120	HOUSTON, TX 77090 (HOUSTON 4)	15631 BLUE ASH #160	JOHN LEHWALD	713 872-5200
113	HYATTSVILLE, MD 20781	5405 LAFAYETTE PLACE	DWIGHT ARMIGER	301 779-2727
62	IDAHO FALLS, ID 83403	650 N. EASTERN AVE, 83402; P O BOX 2526	LARRY THOMPSON	208 523-7755
10	INDIANAPOLIS, IN 46202	1661 W. 16TH STREET	JERRY HUGHES	317 634-4447
71	JACKSON, MS 39284-7796	520 HWY 80 WEST 39204; P O BOX 7796	WARREN FARIES	601 948-4335
44	JACKSONVILLE, FL 32204	1131 FOREST STREET	WALTER WARE JR.	904 354-0282

*Added +Changed Chicago 1 & 2 removed 12/90

UPDATED 3/1/91

BR #	CITY, STATE, ZIP	STREET ADDRESS	BRANCH MANAGER	PHONE #
+28	KANSAS CITY, MO 64108	1760 WEST 29TH ST.	LEE UHLIG	+816 756-3250
92	KENILWORTH, NJ 07033	130 MARKET STREET	BOB & BUD ZIMMERMANN	201 298-1212
51	KNOXVILLE, TN 37917	612 EAST DEPOT AVENUE	BETTY COPELAND	615 525-6296
125	LANCASTER, CA 93534	41781 12TH STREET WEST, SUITE A	RICHARD PENDELL	805 940-1169
	(SEND MAIL TO: 41781 12TH STREET WEST, SUITE A, PALMDALE, CA 93551)			
84	LAS VEGAS, NV 89102	2319 SO. WESTERN AVE, STE H	DAVID SPAINE	702 387-6940
105	LENEXA, KS 66215	14701 WEST 101ST TERRACE	MARK THROCKMORTON	913 541-0079
126	LEXINGTON, KY 40555-4306	524 CODELL DRIVE ZIP 40509; P O BOX 54306	CARMELLA RUNYON	606 269-7244
109	LINCOLN, NE 68504	3233 CORNHUSKER HWY.	RON MCKENZIE	402 466-5122
127	LITTLE ROCK, AR 72209	5901 MURRAY DRIVE	LARRY WARD	501 562-8484
93	LONG BEACH, CA 90806	2810 TEMPLE AVENUE	JIM TOWNSEND	213 427-7801
18	LOS ANGELES, CA 90006	1433 VENICE BLVD.	SANG W. LEE	213 383-5500
42	LUBBOCK, TX 79407	5291 34TH	DAN FIKE	806 792-2493
111	MARIETTA, GA 30067	3061-B KINGSTON COURT, SE	RANDY BONE	404 859-0660
132	MELBOURNE, FL 32904	6953 SONNY DALE DRIVE, UNIT B	LARRY SHARKEY	407-676-4177
61	MEMPHIS, TN 38112	3078 BROAD AVENUE	HARRY GAYDEN	901 324-1111
86	MESA, AZ 85210	218 W. HAMPTON #6	JIM ADKINS	602 962-7972
17	MIDLAND, TX 79702-801	3405 BANKHEAD HWY ZIP 79701; P O BOX 801	BOBBY ALEXANDER	915 694-6621
72	MILWAUKEE, WI 53225	9709 W. APPLETON AVENUE	GURCHARAN CHAWLA	414 527-4422
64	MODESTO, CA 95351	1601 CUMMINS DRIVE, STE 1	ED HARVEY	209 527-5223
12	MORTON GROVE, IL 60053	6420 CHESTNUT STREET	CHARLES WILSON	708 966-2700
8	MUSKEGON, MI 49442	1840 INDUSTRIAL BLVD.	CAL GARBRECHT	616 777-2727
87	NAPERVILLE, IL 60563	530 INDUSTRIAL DRIVE; P O BOX 585	BOB TUSZYNSKI	708 983-9373
115	NAPLES, FL 33942	3484 DOMESTIC AVENUE	DAVID RESCH	813 643-3446
66	NASHVILLE, TN 37203	609 9TH AVE. S.	JAMES BROWN	615 254-0702
79	NEW ORLEANS, LA 70123	1400 EDWARDS AVE; POB 23358, HARAHAN 70183	HAROLD PETIT JR.	504 733-1495
49	NORCROSS, GA 30071	6019 GOSHEN SPRINGS ROAD	CHARLES GAYLOR & DON MEYER	404 446-0400
91	NORTHRIDGE, CA 91324	18850 1/2 PARTHENIA STREET	MARVIN EK	818 701-6951
23	OAKLAND, CA 94604	2140 LIVINGSTON ST. ZIP 94606; P O BX 12184	DOUG PLOOR	415 534-6755
16	OKLAHOMA CITY, OK 73148-0129	2120 SW 15TH ZIP 73108; P O BOX 82129	LEE KETNER & MARK TEMPLE	405 232-8576
+9	OMAHA, NE 68137	4444 S. 108TH STREET	+RICK SCOTT	402 339-2342
58	ORLANDO, FL 32805	32 KENT AVENUE	TONY QUINN	407 849-0573
*139	PELHAM, AL 35244-2222	175 BUSINESS CENTER DRIVE	LINDA MCKEEN	205 988-3440
129	PHILADELPHIA, PA 19144	4700 WISSAHICKON AVE, UNIT B;	DAVE WHITNACK	215 849-5755
	(SEND MAIL TO P O BOX 43144, PHILADELPHIA, PA 19129-9998			
26	PHOENIX, AZ 85061	3126 N. 30TH AVENUE ZIP 85017; P O BOX 27490	JIL MAHEU	602 269-9354
1	PORTLAND, OR 97214	1010 SE ASH STREET; P O BOX 14728	GREG POPHA	503 234-7221
*124	RALEIGH, NC 27604	2013J NEW HOPE CHURCH ROAD	CHARLES MELHINCH	919 850-9314
85	RICHMOND, VA 23230	2409 WESTWOOD AVENUE; P O BOX 11395	TIM RITCHIE	804 257-5475
14	ROCKFORD, IL 61109	3358 PYRAMID DRIVE	AL KUNZE	815 874-8256
+27	SACRAMENTO, CA 95815+	+2701 ACADEMY WAY	DEBBIE GLESSMAN	916 922-6503
135	SALEM, OR 97301	1030 BROADWAY STREET N.E.	GLENN CROSSWAY	503 370-7817
2	SALT LAKE CITY, UT 84126	2940 S. 300 WEST ZIP 84115; P O BOX 26056	CRAIG WHITTEMORE	801 486-4401
41	SAN ANTONIO, TX 78217	2450 BROCKTON	JIM JOHNSON	512 829-1934
34	SAN BERNARDINO, CA 92408	1483 SOUTH GAGE	LEROY ERICKSON	714 796-5377
+24	SAN DIEGO, CA 92110	4320 PACIFIC HWY.	+JOHN MAUTINO	619 298-7168
25	SAN JOSE, CA 95112	836 JURY COURT	RICHARD ENGLISH	408 287-1450
+15	SANTA ANA, CA 92705	3015 SOUTH KILSON DRIVE	+AL BIANCO	714 556-4822
98	SANTA ROSA, CA 95406	477-A QUILLCO CT, ZIP 95407; P O BX 11782	SASHO NIKOLIC	707 528-1991
3	SEATTLE, WA 98138-2010	18205 ANDOVER PK W, ZIP 98188; P O BX 88010	LONSON DAVIS	206 575-0755
48	SIOUX FALLS, SD 57102	311 E. 8TH STREET	JIM ENTENMAN	605 338-2652
117	SOUTH BEND, IN 46628	1626 COMMERCE DRIVE	GUY PIPER	219 288-2843
110	SOUTH SAN FRANCISCO, CA 94080	1445 SAN MATEO AVENUE	PAT NEWELL	415 589-5800
65	SPARKS, NV 89431	1395 GREG STREET, STE 114	GEORGE HATCHER	702 356-6668
4	SPOKANE, WA 99201	1320 N. HOWARD STREET	LARRY BROWN	509 325-4588
19	SPRINGFIELD, MO 65802	1359 E. TRAFFICWAY	ROY WILLIAMS	417 866-1225
70	ST. PAUL, MN 55114	2550 WABASH AVENUE	RUSTY MACE	612 641-0602
37	ST. PETERSBURG, FL 33714	3232 44TH AVENUE, N.	IVAN HARDEN	813 525-1175
119	STAMFORD, CT 06902	58 COMMERCE ROAD	JACK DOMINICE	203 359-2626
89	STOCKTON, CA 95205	1207 N. UNION STREET	PHILL BROWN	209 463-1212
33	SUN VALLEY, CA 91352	8705 TAMARACK	IVAN PENDELL	818 768-8890

*Added +Changed

Updated 3/1/91

BR #	CITY, STATE, ZIP	STREET ADDRESS	BRANCH MANAGER	PHONE #
11	TACOMA, WA 98405	2134 TACOMA AVE, S. ZIP 98402; P O BOX 5887	JOHN SADLIER	206 627-0125
130	TALLAHASSEE, FL 32304	572-A SQ. APPLEYARD DRIVE	JERRY SMARTLEY	904 576-5922
46	TAMPA, FL 33607	1102 N. ROME AVENUE	GREGG POLK	813 251-4545
95	TROY, MI 48083	1161 RANKIN DRIVE	JIM BENNETT	313 589-3130
35	TROY, NY 12180	2600 SIXTH AVENUE	GEORGE M. BEJIAN	518 272-5922
54	TUCSON, AZ 85719	601 E. 20TH STREET	LARRY O'DAY	602 624-0991
63	TULSA, OK 74146	9749 EAST 54TH STREET	MARK TEMPLE	918 664-1990
112	UPLAND, CA 91786	1336 W. 9TH STREET	JEANNINE TUTTLE	714 949-2215
81	VENTURA, CA 93003	4526 TELEPHONE ROAD, UNIT 201	GARRY FISHMAN	805 658-6555
59	VIRGINIA BEACH, VA 23462	403 SOUTH WITCHDUCK ROAD	JOHN BARDEN	804 499-6600
69	WEST PALM BEACH, FL 33409	1029 N. FLORIDA MANGO ROAD, #10-12	BOB JACKSON	407 689-3366
108	WEST WARWICK, RI 02893	1343 MAIN STREET	MIKE AMORE	401 823-7010
45	WICHITA, KS 67201	255 N. CLEVELAND ZIP 67214; P O BOX 3031	PETE SCHREPFERMAN	316 267-3629
60	WOODSIDE, NY 11377	27-01 BROOKLYN-QUEENS EXPRESSWAY W.	PHIL GARDA	718 545-4896
31	YAKIMA, WA 98907	106 W. LINCOLN AVENUE, 98902; P O BOX 1050	NEAL EADES	509 248-8300
	PORTLAND, OR (CORP. OFFICE)	P O BOX 3010, 97208 11632 NE AINSWORTH CIRCLE, PTLD OR 97220 FAX -- 503-256-3798	JERRY SCHULTZ	503 256-3663
	PORTLAND, OR (PTLD DIST CTR)	11632 NE AINSWORTH CIRCLE, PTLD OR 97220 FAX -- 503-256-3872	JERRY QUILLING	503 256-3663
	MEMPHIS, TN (MEMPHIS DIST CTR)	4570 SHELBY AIR DRIVE, 38118 FAX -- 901-366-7240	JOE CORDER	901 366-9420

BRANCH	FAX NUMBER
ALBUQUERQUE	505-881-1739
ANAHEIM	714-956-5209
BAKERSFIELD	805-832-1184
BALDWIN (NY)	516-867-2307
BALDWIN PARK	818-960-2254
BILLINGS	406-248-4862
BIRMINGHAM	205-591-3458
BOHEMIA	516-567-6005
BOISE	208-375-1254
BOTHELL	206-487-1983
BROOKLYN	718-692-4546
BROOKLYN HEIGHTS	216-661-9926
BUFFALO	716-683-8068
CAPE MAY COURT HSE	609-465-7136
*CHARLOTTE	704-386-1279
CHATTANOOGA	615-265-2516
CHICAGO 1	312-226-7339
CINCINNATI 1	513-772-4328
CINCINNATI 2	513-721-3616
COLORADO SPRINGS	719-471-7216
COLUMBUS	614-421-4353
COMMERCE	213-722-2657
CORPUS CHRISTI	512-882-4704
DALLAS	214-351-5901
DAYTON	513-222-3437
DENVER	303-825-5678
EASTON	215-258-9332
EL CAJON	619-579-0386
ELK GROVE	708-956-1095
*EL PASO	915-772-0381
ESCONDIDO	619-746-5901
*EUGENE	503-344-8248
EXTON	215-524-9052
FAYETTEVILLE	919-483-5583
FENTON	314-343-9380
FRESNO	209-237-8231
FT. LAUDERDALE	305-970-8018
FT. MYERS	813-337-4038
GAINESVILLE	904-378-8553
HAWTHORNE	213-644-8346
HIALEAH	305-824-9102
HOUSTON I	713-868-3045
HYATTSVILLE	301-779-0127
IDAHO FALLS	208-523-7784
INDIANAPOLIS	317-634-4425
JACKSON	601-948-4341
JACKSONVILLE	904-354-2209
KANSAS CITY	816-842-0776
KENILWORTH	201-298-1290
KNOXVILLE	615-637-1804
LAS VEGAS	702-387-7866
*LEXINGTON	606-266-5673
LINCOLN	402-466-5202
LITTLE ROCK	501-562-8490
LONG BEACH	213-426-4392
LOS ANGELES	213-389-3794
LUBBOCK	806-792-9787
MEMPHIS	901-324-1190
MIDLAND	915-694-7072
MORTON GROVE	708-966-2794
MUSKEGON	616-777-1730
+NASHVILLE	615-255-1783
NEW ORLEANS	504-733-0616
NORCROSS	404-242-9295
OAKLAND	415-534-1857
OKLAHOMA CITY	405-232-8768
OMAHA	402-339-3045
ORLANDO	407-849-0598
PHILADELPHIA	215-849-7642
PHOENIX	602-269-9583
PORTLAND	503-231-2553
RICHMOND	804-257-5572
ROCKFORD	815-874-9293
SACRAMENTO	916-922-7233
SALT LAKE CITY	801-486-1802
SAN ANTONIO	512-829-1509
SAN BERNARDINO	714-796-0749
SAN DIEGO	619-297-6756
SANTA ANA	714-662-2328
SEATTLE	206-575-4171
SIOUX FALLS	605-338-9535
SPOKANE	509-325-6203
ST. PAUL	612-646-1802
ST. PETERSBURG	813-526-8659
STAMFORD	203-967-3606
SUN VALLEY	818-768-3072
TACOMA	206-383-1038
TALLAHASSEE	904-576-7732
TAMPA	813-251-3836
TROY, NY	518-272-5950
TUCSON	602-620-0041
TULSA	918-622-9599
VENTURA	805-658-6802
VIRGINIA BEACH	804-490-8399
WEST WARWICK	401-823-7351
WOODSIDE	718-274-4972
*YAKIMA	509-248-2205
CORPORATE OFFICE	503-256-3798
PORTLAND DIST CTR	503-256-3872
MEMPHIS DIST CTR	901-366-7240
KENNEDY & OLSON	503-225-0381

*Added +Changed Updated 9/11/90

A list of Johnstone Supply outlets who stock SUNISO 5GS oil in one quart containers . There may also be other oulets in your area that carry SUNISO 5GS. This would most commmonly be a firm specializing in industrial A/C and refrigeration supplies.

WARRANTY INFORMATION:

When billing for "SUNISO 5GS" on warranty claims, use "local" part number: LOCALCOMPR.

Technical Service Bulletin # **95106** Date: **951018**

A/C - Refrigerant Oil Identification

Classification: HA95-017

Reference: NTB95-106

Date: October 18, 1995

AIR CONDITIONING (A/C) LUBRICANT/OIL FOR NISSAN VEHICLES

This bulletin supersedes HA94-001. (94-013, 02/01/94)

APPLIED VEHICLES: All equipped with A/C

SERVICE INFORMATION

Description	Part Number	Application
R12 Refrigerant oil	999MP-CD000*	1993 Quest with R12 refrigerant (produced before 11/29/93)
R12 Refrigerant oil	Suniso 5GS or equivalent (obtain locally)	All Nissan models except 1993 Quest
Type F-R134a PAG lubricant	KLH00-PAGQF*	1994 and later Quest with R134a refrigerant (produced on or after 11/29/93)
Type R-R134a PAG lubricant	KLH00-PAGR1**	Vehicles with rotary (vane) A/C compressors & R134a refrigerant
Type S-R134a PAG lubricant	KLH00-PAGS1**	Vehicles with swash plate A/C compressors & R134a refrigerant

The above chemical products are not interchangeable and should not be mixed. To ensure compatibility with factory fill A/C lubricant/oil, the above specified fluids should be utilized. Prior to use, review the Material Data Safety Sheet for each of these products.

* Order through NissanNet.

** Order through Apollo America order desk via facsimile. Refer to Parts Bulletin NPB/94-005 for ordering information.

Nissan has four different A/C lubricant/oil products available. Different systems will require different types of lubricants/oils. All R134a equipped vehicles have a label under the hood that specifies the type of lubricant required for the system on that vehicle. A description of the type of compressor and lubricant/oil required is also listed in the Service Data and Specifications at the end of the HA section in the appropriate service manual. During A/C servicing, if lubricant/oil needs to be added to the system, please refer to the list of PAG (poly alkaline glycol) lubricants and refrigerant oils listed in this bulletin.

NOTE:
Quest vehicles produced on or after November 29, 1993 with R134a refrigerant, will require a special compressor lubricant. The recommended compressor lubricant for this vehicle only is: Type F-R134a PAG lubricant, part number KLH00-PAGQF.

Technical Service Bulletin # **HA91002** Date: **910214**

A/C - Refrigerant Oil Recommendations

Classification: HA91-002

Section: Heater And Air Conditioner

Reference: TECHNICAL BULLETIN NTB91-014

Models: ALL MODELS

Date: FEBRUARY 14, 1991

A/C SYSTEM REFRIGERANT OIL

APPLIED MODEL: All Models equipped with A/C System

SERVICE INFORMATION:

When service repairs on a Nissan A/C system require that lubricant be added to the system, please be advised that the recommended refrigerant oil for all Nissan A/C systems is SUNISO 5GS. This oil applies to all rotary, lateral piston, and variable displacement Nissan A/C compressors.

SUNISO 5GS is available throughout the continental U.S. The name and location of the nearest SUNISO 5GS distributor may be obtained by contacting the Virginia KMP Corporation at 1-800-527-7960.

Technical Service Bulletin # **GI87012** Date: **870504**

Towing Information - Trucks With Manual Transmission

Models 1986.5-1987 Trucks

Section General Information

Classification GI87-012

Bulletin No. TS87-080

Date May 4, 1987

TOWING TRUCKS WITH MANUAL TRANSMISSION

SERVICE INFORMATION

We have received several inquiries about the limitations on speed and distance when towing Nissan manual transmission Trucks with four wheels on the ground (such as towing vehicle behind a motorhome).

The Service Manual and Owner's Manual state that speeds below 30 m.p.h. and distances of less than 40 miles should be observed when towing with four wheels on the ground. However, the Factory informs us that there are no limitations on speed or distance when towing 1986.5 and 1987 2WD or 4WD manual transmission Trucks. On 4WD models, tow with the manual front hubs unlocked and the transfer case in the Neutral position.

Please note that the restrictions on towing automatic transmission vehicles are correct, and should be observed to prevent damage to the transmission.

The Service Manual and Owner's Manual are being revised.

Technical Service Bulletin # **BF89024** Date: **890907**

Exterior Trim - Cleaning Textured Plastic Surfaces

Classification: BF89-024
Section: Body & Frame
Reference: TECHNICAL BULLETIN TS89-126
Models: All Models

Date: September 7, 1989

CLEANING TEXTURED PLASTIC SURFACES

SERVICE INFORMATION

The white streaks caused by car wax left on the textured plastic surfaces on some vehicles, can be removed with a small bristle brush using Vinyl Cleaner (Nissan P/N 999MP-A5060).

- Spray the Vinyl Cleaner onto the white streaked area.
- Scrub the surface in a circular motion with a small, soft bristle brush (e.g., a toothbrush).
- Wipe the surface with a clean towel.

For additional protection from streaking, apply Vinyl Protectant (Nissan P/N 999MP-A5055) according to the directions on the container.

Technical Service Bulletin # **95-120A** Date: **030110**

Fuel System - Cold Weather Engine Starting Tips

Classification: PI95-005A

Reference: NTB95-120A

Date: January 10, 2003

COLD WEATHER STARTING TIPS

This bulletin supersedes PI95-005. The Service Information has been amended. Please discard all paper copies of PI95-005

APPLIED VEHICLE(S):
All models

SERVICE INFORMATION

In case a vehicle is hard to start during cold weather, we suggest the following procedure.

^ These steps are a review of the procedure outlined in the Owner's Manual.

^ Use these steps when the weather is cold and the engine is hard to start.

1. Press the accelerator pedal down approximately 1/3 of the way to the floor.
2. Hold the accelerator pedal in this position while cranking the engine.
3. Once the engine has started release the accelerator pedal.

NOTE:
Do not race the engine while warming it up.

4. If the engine does not start within 15 seconds, stop cranking, wait at least 10 seconds. Then repeat steps 1 through 3.

Once an engine is started in cold weather condition:

^ You should keep the engine running for a minimum of 2-3 minutes before shutting it off.

^ Starting and stopping of the engine over a short period of time may make the vehicle more difficult to restart.

^ It may also adversely affect a vehicle's fuel economy.

Another factor which may affect a vehicles "startability" is the viscosity or thickness of the oil that is used.

^ SAE 5W-30 viscosity engine oil is preferred for all temperatures, all year-round for most models.

^ SAE 5W-30 viscosity oil makes it easier to start the engine and maintain a stable idle during warm-up.

Please communicate these cold weather starting tips to your customers.

Technical Service Bulletin # **06-076** Date: **061107**

Wheels - Chrome Wheel Handling When Mounting Tires

Classification: WT06-002

Reference: NTB06-076

Date: November 7, 2006

PRECAUTIONS FOR HANDLING CHROME TYPE WHEELS

APPLIED VEHICLE:
All Nissan vehicles with chrome type wheels

SERVICE INFORMATION

The appearance of chrome type wheels can be damaged if they are not handled correctly during wheel and tire service.

Tire Changing:

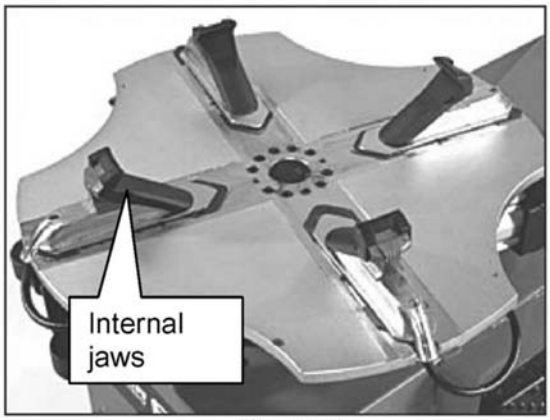


Figure 1

^ Make sure to use tire changing equipment that clamps (secures) the wheel from the inside (internal jaws).

^ Do not use any metal tools that may touch the outside of the wheel.

^ Tools and machine equipment that touch the outside of the rim should be made of plastic, or have rubber/plastic protective covers.

Wheel Balancing:

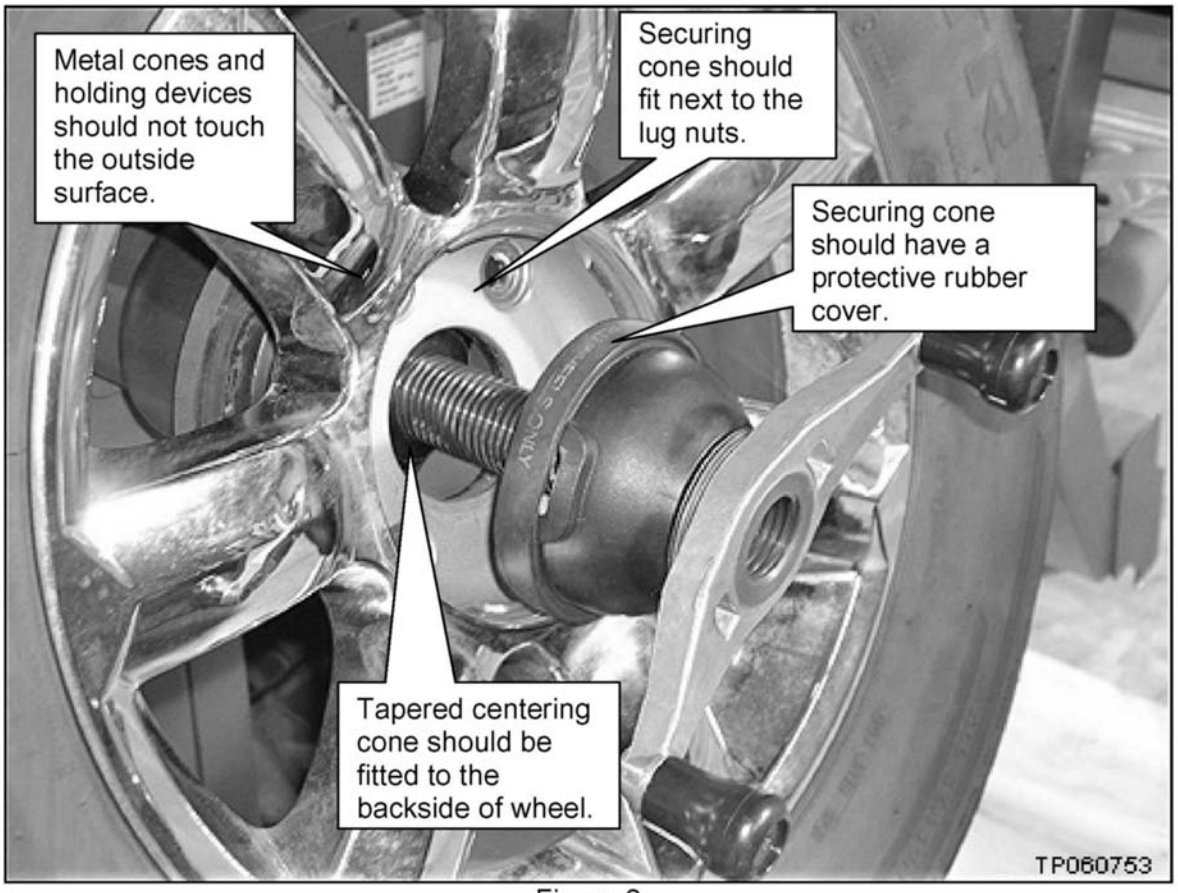


Figure 2

^ Any tools, equipment cones, or other wheel balancing equipment items should not touch the outside surface of chrome type wheels.

Wheel Alignment:

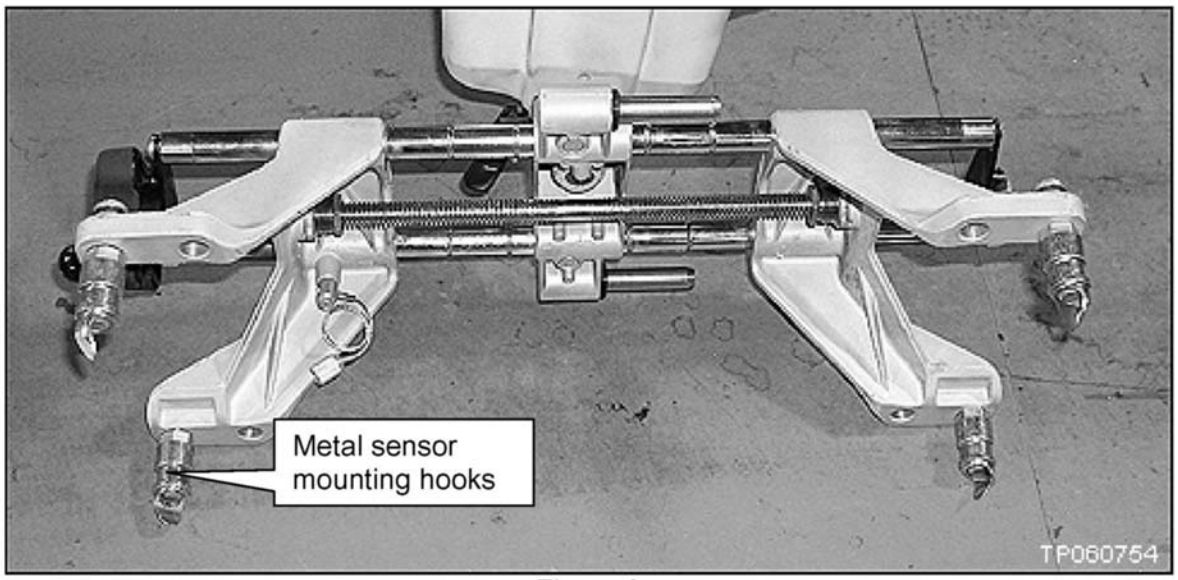


Figure 3

^ Alignment sensors with metal mounting hooks should not be used on chrome type wheels.

^ Some alignment equipment manufacturers may have protective rubber pads available that can be used to cover the metal mounting hooks.

Technical Service Bulletin # **00-033D** Date: **070808**

Brakes - Judder/Pedal Feel/Noise Diagnosis/Repair

Classification: BR00-004d

Reference: NTB00-033d

Date: August 8, 2007

ALL NISSAN; BRAKE NOISE/JUDDER/PEDAL FEEL DIAGNOSIS AND REPAIR

This bulletin has been amended. The Applied Vehicles have been updated. Please discard all previous versions of this bulletin.

APPLIED VEHICLE(S):
All Nissan

SERVICE INFORMATION

^ This bulletin is to assist you in responding to customer questions about brake operation, and provides diagnostic and repair information for each item listed, if any should occur.

^ Most brake incidents fall into the following categories:

a. Brake Noise: A squeak, squeal, clunk, or groan that occurs when the brakes are applied or released.

b. Brake Judder: A vibration that can be felt in the vehicle, steering wheel or brake pedal when the brakes are applied.

c. Pedal Feel: The effort needed to operate the brakes is too high or too low.

SERVICE PROCEDURE

1. Verify the condition by road testing the vehicle with the customer.

2. Determine the specific brake incident based on the description in the Service Information above.

3. Follow the appropriate repair procedure(s), shown below, for your specific incident.

Nissan-Datsun Truck PL720 2WD L4-1952cc 2.0L SOHC (Z20)

BRAKE NOISE

^ Brakes can make a range of noises when applied or released. Some noises are normal and no repair action should be taken.

^ Use the following descriptions to identify the specific type of brake noise and the appropriate repair:

Squeak noise when the brakes are cold:

^ Usually occurs during the first few stops in the morning.

^ This is a normal condition. No service action is necessary.

Squeak noise with the brakes at normal operating temperatures:

^ Refer to technical bulletins specific to the model of vehicle regarding this incident.

^ If there are no bulletins for the car you are working on, install OE type pads using the information listed under Brake Service shown in this bulletin and the appropriate Service Manual procedures.

Notes about brake pads and brake noise:

Original Equipment (OE) brake pads are installed on all current Nissan vehicles at the factory.

^ The OE pads use a Non-asbestos Organic (NAO) compound. The NAO material provides state of the art resistance to squeal noise.

^ These pads are available as service parts and must be used if replacing brake pads under the terms of the Nissan new car warranty.

Key Value brake pads are also available as a high quality service replacement part at a very attractive price.

^ These pads use a semi-metallic compound, similar to the material used in Nissan OE pads prior to the introduction of the NAO compound.

^ Key Value semi-metallic pads offer excellent braking performance but do not offer the same level of noise resistance as the OE-NAO pads.

^ Service customers have varying sensitivity to brake noise and the individual customer must decide which product best suits his or her requirements, balancing price and noise resistance.

^ Make sure the Service Advisor adequately explains the differences between Key Value brake pads and Nissan OE-NAO brake pads to the customer when discussing brake service.

Loud continuous squeak/squeal noise:

^ Occurs with or without braking.

^ This is a normal brake function. It occurs when the brake pad wear indicators contact the rotor.

^ It indicates the brake pads are worn out and need to be replaced. Install new brake pads using the information listed under Brake Service shown in this bulletin and the appropriate Service Manual procedures.

Groan noise when slightly releasing the brakes after coming to a stop:

^ This is sometimes called "creep groan".

^ It is a normal condition. No repair or service is necessary.

Groan noise during stopping:

^ Usually caused by glazing of the rotor's surface as a result of heavy or frequent braking.

^ Refer to technical bulletins specific to the model of vehicle regarding this incident.

^ Replace the brake pads, then resurface the rotors and finish them with sand paper. Refer to Brake Service shown in this bulletin for additional detail.

Single clunk noise from front suspension when applying the brakes:

^ The noise is a result of the brake pads shifting in the direction of rotor rotation when the brakes are applied.

^ Can be duplicated by lightly touching the brake pedal.

^ If the brake pedal is pushed hard, the noise is less likely to occur.

^ Make sure the brake pads and pad hardware (shims, springs, clips, etc) are installed correctly.

^ Refer to ASIST for vehicle specific brake service information.

^ Refer to Brake Service shown in this bulletin for additional detail.

Multiple clunk noise and/or pedal pulsation that occurs only one time after the engine is started:

^ This is a normal ABS Self Check noise. No service action is necessary.

^ The vehicle's ABS system performs a self check. On some models this self check occurs with the first application of the brakes after the engine is started. On other models the self check occurs the first time the vehicle reaches 5 mph after the engine is started.

Rear Brake Squeal:

^ Usually due to an accumulation of brake dust and dirt between the pads/shoes and rotors or drums.

^ Clean all dust and dirt from the brake shoes, backing plates and related components.

WARNING:
Brake dust may be hazardous if inhaled. Refer to the Service Manual (ESM) for brake dust precautions and use approved brake cleaning equipment.

^ Refer to ASIST (Service Bulletins and ESM) for correct installation and lubrication of brake pads, caliper parts, and hardware.

CAUTION:
Do not get grease on the brake pad friction surface.

BRAKE JUDDER

^ Brake Judder is caused by rotor thickness variation and/or rotor run out.

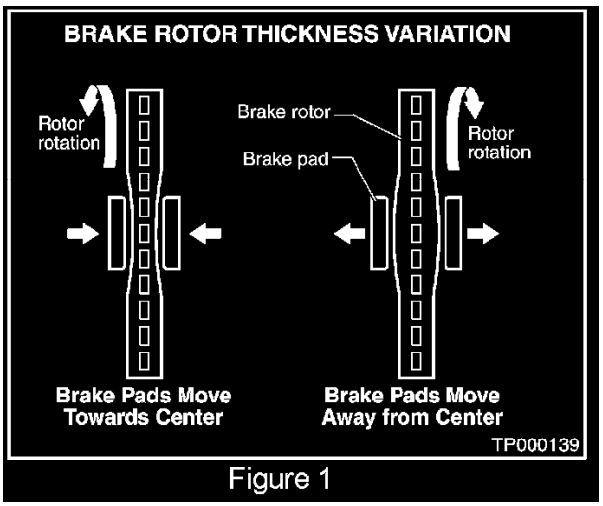


Figure 1

Rotor Thickness Variation: When the inner and outer surface of the rotor are not flat and not parallel, the brake pads will travel in and out as they follow the low and high spots on the rotor (see Figure 1).

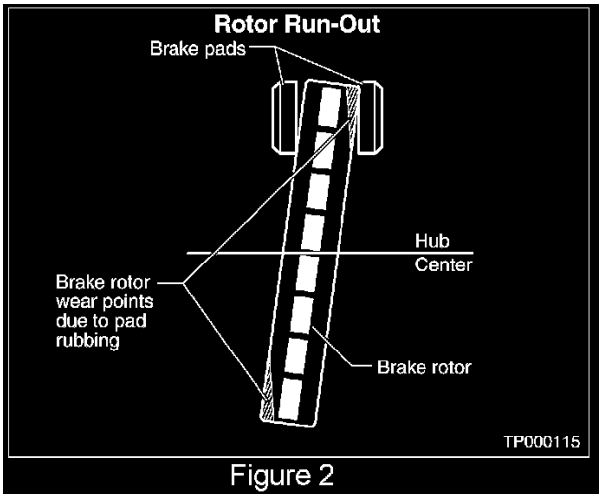


Figure 2

Rotor Run Out: If the brake rotor is not true to the hub center, the brake pads contact one point on each side of the rotor with each wheel rotation, even if the brakes are not applied. Over time, this point contact will cause the rotor to wear more in these areas and cause rotor thickness variation (see Figure 2).

^ This motion of the brake pads is transferred through the caliper pistons and is felt in the brake pedal as a pulsation. In severe cases it can also cause a back and forth oscillation in the steering wheel.

Vehicle Storage:

^ If the vehicle is not operated for periods of time, the area of the brake rotors not covered by the brake pads will rust.

^ The friction characteristics between the rusted and un-rusted areas of the rotor braking surface will be different.

^ This difference may cause brake judder at low and/or high mileage, even after the rust wears off.

Lug Nut Overtorque:

^ Another contributor of brake judder is lug nut overtorque. This can occur if the lug nuts are over tightened, especially with an air impact wrench.

Brake Judder Repair

^ Brake judder incidents must be corrected by turning the rotors with a ProCut(TM) PFM series On-Car Brake Lathe.

^ Refer to NTB04-094 for information on using this lathe.

^ If the rotors are replaced, make sure you index them to the axle hub to ensure minimum runout (see Rotor Indexing shown in this bulletin).

PEDAL FEEL

^ Some customers may say that the brake pedal feels too high or low when applying the brakes.

^ This may indicate the brake system needs service or it may be the result of the customer comparing the feel of the brakes in a new car with the feel of the brakes in a previous car.

^ Road test the vehicle with the customer. Compare brake operation to a "know good vehicle and determine if brake service is necessary. If so, refer to the following service items:

a. Inspect the brake calipers and make sure they are correctly installed and sliding freely.

b. Inspect the front and rear brakes and make sure the brake pads and/or shoes are properly installed.

c. Bleed all air from the brake system.

d. Make sure the brake pedal stroke and free play are adjusted correctly. Refer to the BR section of the appropriate service manual.

NOTE:
Use Essential Tool J-46532 (Brake Pedal Height Tool) for brake pedal height check and adjustment. This tool is available from TECH-MATE.

BRAKE SERVICE

To ensure a high quality brake service be sure to:

1. Finish rotors properly.

   ^ This is one of the most important aspects of preventing and eliminating brake noise.

   ^ Use the ProCut(TM) PFM series on-car brake lathe. It has been chosen as the approved tool for rotor resurfacing (refer to NTB04-094 for additional information).

2. Correctly install pads and shims.

   IMPORTANT:
   Correct installation and lubrication of brake pads and all caliper parts and hardware is essential for proper brake operation and will help dampen noise-causing movement and vibrations.

   ^ Refer to ASIST (Service Bulletins and ESM) for correct installation and lubrication of brake pads, caliper parts, and hardware.

   CAUTION:
   Do Not get grease on the brake pad friction surface.

3. Perform the following post-installation checks.

   ^ Confirm that brake pads fit snugly in the calipers. Replace worn components as necessary.

   ^ Test drive after repairs and burnish the new brakes. This will influence brake performance, including noise.

   a. Drive the vehicle on a straight smooth road at about 30 mph (50 kph).

   b. Use medium brake pedal/foot effort to bring the vehicle to a complete stop from about 30 mph (50 kph). Adjust your pedal/foot pressure so that the vehicle stopping time is 3-5 seconds.

   c. Cool the brake system by driving at about 30 mph (50 kph) for approximately one minute without stopping.

   d. Repeat steps 1, 2, and 3 ten times to complete the burnishing process.

4. Follow-up to ensure customer satisfaction, safety, and proper brake performance.

   ^ Confirm the procedures described in steps 2 - 4 above have been strictly followed.

ROTOR INDEXING

When installing a new rotor, a rotor that has been surfaced off the car, or a rotor that has been removed for any reason, use the following indexing procedure to ensure the minimum amount of rotor run-out.

1. Make sure the rotor is fully contacting the hub. Clean the rotor-to-hub surface if it is rusty.

   NOTE:
   For cleaning the hub surface, specifically around the wheel studs, it is recommended to use the Wheel Hub Cleaning Kit # J-42450-A, which can be ordered from Nissan TECH-MATE.

2. Install the rotor and all lug nuts. Tighten the lug nuts to 40 ft-lbs (for this indexing process only).

3. Place a reference mark on the rotor and hub.

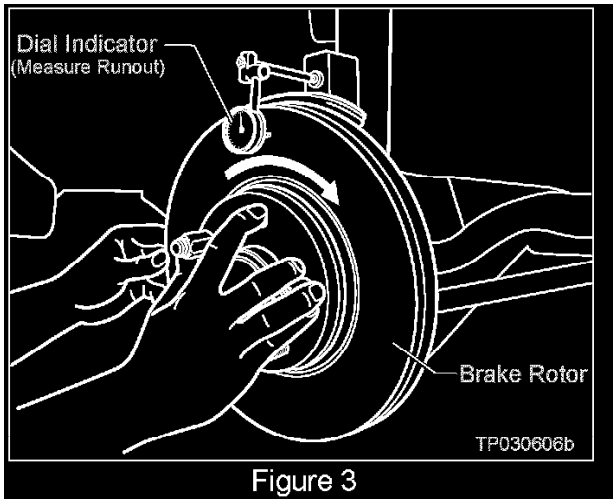


Figure 3

4. Measure rotor run-out with a dial indicator. If the run-out is above limit continue with step 5.

   For more detail of the run-out limit refer to the ESM.

5. Remove the lug nuts and shift the position of the rotor one lug clockwise, then reinstall the lug nuts and torque to 40 ft-lbs (again, for this indexing process only).

   ^ Repeat step 4 and 5 until the rotor is positioned with the least amount of runout.

6. After you find the position with the least amount of runout, if the runout is still more than the limit, you'll need to turn (resurface) the new rotors using the ProCut(TM) PFM Series on-car brake lathe.

CLAIMS INFORMATION

Please reference the current Nissan "Warranty Flat Rate Manual" and submit your claim(s) using the Operation Code (Op Code) or combination of Op Codes that best describes the operations performed.

Technical Service Bulletin # **99-048U** Date: **080808**

Battery/Starting/Charging System - Testing

Classification: EL99-016U

Reference:L NTB99-048U

Date: August 8, 2008

BATTERY / STARTING / CHARGING SYSTEM TESTING

This bulletin has been amended to apply to all current production models. Please discard all earlier versions.

APPLIED VEHICLES:
All Nissans including Altima Hybrid HEV* 12 volt battery

*For information on using this tool with Altima Hybrid 12 volt batteries, refer to NTB07-007.

SERVICE INFORMATION

The Midtronics GR-8 Battery and Electrical Diagnostic Station is the factory-approved battery, starter, and alternator tester.

^ For warranty documentation purposes; as of September 30, 2008 the GR-8 is the only approved diagnostic tool for batteries, starters, and alternators.

^ Print-outs from this tester are required for claim reimbursements related to batteries, starters, and/or alternators.

^ For additional information regarding claims reimbursements refer to the current Nissan Assurance Products Resource Manual.

Nissan-Datsun Truck PL720 2WD L4-1952cc 2.0L SOHC (Z20)

^ For the complete GR-8 User Guide, refer to ASIST - TOOLS & EQUIPMENT.

^ Additional tools and replacement parts can be ordered from TECH-MATE option 1.

^ This essential tool was shipped to your dealership and invoiced to your Nissan Non-Vehicle account in three equal installments of $641.00 (plus applicable taxes) in accordance with your dealer agreement with Nissan North America, Inc. This price includes both the GR8-1200-NI and the EXP-800-NI shipped in April 2008.