

ENGINE FUEL AND EMISSION CONTROL SYSTEM

Fuel injector: A new type, which can supply 1.4 times as much fuel as the former, has been adopted to match the high-powered engine.

Fuel pump: The flow rate and relief pressure have been modified to accommodate the turbocharger.

E.F.I. control unit: A cold start pulse arithmetic program has been added so that a cold start can be performed by the injector. Consequently, the cold start valve and thermotime switch have been eliminated.

Air regulator: A hot-water passage has been provided in the air regulator body to prevent a temperature drop in the vicinity of the bimetal.

Throttle chamber: Modification has been made to suit to the adoption of the turbocharger.

Air flowmeter: A new addition following the adoption of the turbocharger.

Air piping parts: Newly provided.

Air cleaner: The air inlets are now provided in two places,.

ENGINE ELECTRICAL

*Detonation control system: A device to prevent knocking and improve fuel consumption has been adopted which incorporates a detonation sensor and control unit.

Ignition coil and distributor: Both are now high-powered to match the adopted turbocharger.

Spark plug: In order to increase durability, the BPR6ES-N11 has been adopted which uses a side electrode made of different materials to improve its resistance to electrical abrasion.

E.F.I. injector cooling blower motor: Now employed as standard equipment.

ENGINE MOUNT

The engine mount insulator has been changed to reduce interior noises.

EXHAUST SYSTEM

In order to lower the loss of the exhaust system, the exhaust diameter has been increased from 50.8 to 63.5 mm (2.000 to 2.500 in), and the pre-muffler capacity and main muffler capacity increased respectively from 2.4 to 5.2ℓ (2-1/8 to 4-5/8 Imp qt) and 9.8 to 15.3ℓ (8-5/8 to 13-1/2 Imp qt). Further, the pre-muffler has been stuffed with glass wool to improve noise reduction.

CHASSIS

CLUTCH

Clutch disc

The 240TBL strengthened clutch disc has been adopted to match the increased output of the engine.

Clutch cover

The C240S clutch is now used. The set load is 550 kg (1,213 lb).

Master cylinder

The same as a model using an engine without a turbocharger.

Operating cylinder

A new operating cylinder has been installed to match a new transmission.

***TRANSMISSION**

The FS5R90A transmission (model T-5 by Borg-Warner of U.S.A.) has been adopted to match the increased output of the engine.

A speedometer pinion is now included.

Vol. 98

**PRODUCT
BULLETIN**

DATSUN

280ZX TURBO

MODEL S130 SERIES

Modification Information



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FOREWORD

The 1983 Datsun 280ZX, model S130 series destined for Europe, now includes a model equipped with the L28ET engine (with a turbocharger).....
This L28ET engine model provides high-speed performance, which can drive continuously over 200 (124 MPH), and exceptional acceleration capability. The following improvements have been made by the addition of this high-powered engine.

- The improved This product bulletin has been prepared to provide information necessary for smooth and efficient service activities on the DATSUN 280ZX TURBO models.
- With the Please read this bulletin thoroughly in order to gain a proper understanding of the features, specifications and mechanism of this new model.

- Brake specifications have been improved.
- Measures to In this bulletin, emphasis is placed on the description of those points that have been changed or modified from the DATSUN 280ZX (Non-turbo) models.

A summary of The descriptions and specifications contained in this bulletin are based on the vehicle at the time it newly entered production.

- On the basis of Rights for alteration of specifications at any time are reserved.

- The new DATSUN 280ZX TURBO model entered production starting with the following vehicle identification numbers (VIN):

JN1HGS130U0975001

- The following material (English version) which describes the units in detail is available as a reference.

- INSTRUCTOR'S MANUAL
- Vol. 16 TURBOCHARGER

- Turbocharger: A recent addition which provides improved power performance.
- Exhaust outlet: A new provision to meet the demands of the turbocharger.
- Cylinder block: Fitting screws for the detonation sensor have been added.
- Camshaft: A new addition to improve driveability and exhaust performance.

ENGINE LUBRICATION AND COOLING SYSTEM

- Oil pump: In order to supply oil to the turbocharger, the width of the gears has been increased from 35 to 40 mm (1.38 to 1.57 in), thereby increasing the discharge of the oil pump.
- Oil cooler: Adopted to insure durability in high-speed operation. This is the same as in the L28E engine which does not have a turbocharger.
- Oil pan: A pipe has been added to return the turbocharger lubricating oil to the oil pan.
- Hot-water piping: The hot-water passages leading to the air regulator and the throttle chamber have been modified.

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OUTLINE

The 1983 Datsun 280ZX, model S130 series destined for Europe, now includes a model equipped with the L28ET engine (with a turbocharger).

This L28ET engine model provides high-speed performance, which can drive continuously over 200 km/h (124 MPH), and exceptional acceleration capability. The following improvements have been made by the addition of this high-powered engine.

- The improvement in the suspension geometry and the adoption of low-profile tires (215/60 VR15) assures increased steering stability at high speeds.
- With the adoption of a front and a rear air spoiler, the vehicle offers easier high-speed handling and greater side-wind stability.
- Brake specifications have been improved.
- Measures to reduce noise and vibration are incorporated to make high-speed operation more comfortable.

A summary of the major modifications is as follows. For items indicated by an asterisk "*", see the detailed explanation given in this bulletin.

ENGINE

- On the basis of the L28E engine mounted on the European S130 vehicle, a turbocharger has been added to improve power performance.
- The engine has been improved to meet the ECE15-04 exhaust emission control regulations.

ENGINE MECHANICAL

- *Piston: The piston head has been reshaped to match the new compression ratio of the turbocharged engine. Also, in order to cope with the increased combustion pressure, the stiffness has been improved by incorporating measures to reduce blow-by gases.
- *Intake manifold: A new intake manifold is now employed to match the increased amounts of air suction.
- *Exhaust manifold: A 3-split type exhaust manifold, which is connected by flexible tubes, is now used to increase durability.
- *Turbocharger: A recent addition which provides improved power performance.
- Exhaust outlet: A new provision to meet the demands of the turbocharger.
- Cylinder block: Fitting screws for the detonation sensor have been added.
- Camshaft: A new addition to improve driveability and exhaust performance.

ENGINE LUBRICATION AND COOLING SYSTEM

Oil pump: In order to supply oil to the turbocharger, the width of the gears has been increased from 35 to 40 mm (1.38 to 1.57 in), thereby increasing the discharge of the oil pump.

Oil cooler: Adopted to insure durability in high-speed operation. This is the same as in the L28E engine which does not have a turbocharger.

Oil pan: A pipe has been added to return the turbocharger lubricating oil to the oil pan.

Hot-water piping: The hot-water passages leading to the air regulator and the throttle chamber have been modified.

REAR SUSPENSION

PROPELLER SHAFT

The 2S71A type propeller shaft has been employed for greater strength.

*** DIFFERENTIAL CARRIER**

The R200 type differential carrier, which is used in those models not equipped with turbocharged engines has attained a new gear ratio change to 3.364.

*** Differential gear oil cooler**

This oil cooler is used to cool the differential gear oil during high-speed operation.

Drive shaft

Fitting bolts coated with Scotch Grip #2353 are now used to prevent the loosening of the drive shaft fitting bolts caused by high engine torque.

BRAKE

Front brake

The front brake uses the reinforced model CL28VL, collet type ventilation disc brake. This is basically the same as the model CL28V except that the shapes of the cylinder body and torque member have been redesigned.

The rotor diameter has been increased from 252 to 274 mm (9.92 to 10.79 in).

The pad now has five slits.

Rear brake

The strengthened CL14HL, collet type disc brake is now used for the rear brake. This is basically the same as the model CL14H except that the caliper body and mounting support have been redesigned.

The rotor has been increased in diameter from 258 to 290 mm (10.16 to 11.42 in).

Brake booster

The brake booster is the same size as those used in the models without turbochargers. However, the magnification of the input to the output has been lowered from 1:4 to 1:3, in order to increase the foot pressure so that the brake pedal responds with a slight increase in resistance.

NP-valve

In order to improve the brake performance during high speed operation the split point of the NP-valve has been changed from 3,923 kPa (39.2 bar, 40 kg/cm², 569 psi) to 2,942 kPa (29.4 bar, 30 kg/cm², 427 psi).

STEERING SYSTEM

- A rack and pinion type steering gear with power assist has been adopted as standard equipment.
- By changing the control valve, the effort required to turn the steering wheel has been increased, thereby improving the capability to maintain a straight course during high-speed operation.

*** FRONT SUSPENSION**

The front suspension employs a strut type independent suspension system, as found in the models without turbochargers. However, the capability to maintain a straight course at high speeds has been improved by changing the suspension geometry and by giving the front toe linear characteristics.

*** REAR SUSPENSION**

The rear suspension uses a semi-trailing arm type IRS, just as in models without turbochargers. However, for improved driving stability, the suspension geometry has been changed to make the toe change in rolling understeered.

TIRE AND ROAD WHEEL

Tire

The 215/60 VR15 tires are now employed.

The 165-15 space saver spare tires (Fold Flex Favorite) have been employed.

Road wheel

A 2-piece type aluminum road wheel is employed. Further, the reference position for mounting the wheel to the vehicle has been changed from the conventional nut hole to the center hole.

BODY

- Reinforcement has been added to the inner hood to prevent it from floating during high-speed operation.
- *● A front air spoiler has been provided to improve the high-speed performance of the vehicle. Likewise, a rear air spoiler has been installed to the back.
- The radiator grille has been redesigned to improve the cooling efficiency of the engine.
- The front pillar is now provided with an air deflector to reduce the noises caused by the turbulent air flow.
- The rear lower panel now has an increased number of slits for greater thermal diffusion.

BODY ELECTRICAL

COMBINATION METER

- A 10 km/h switch and amplifier for the differential gear oil cooler have been added.
- A boost meter has been added and the voltmeter has been discontinued.
- A differential gear oil warning lamp has been added and the charge warning lamp has been relocated.

WIPER

The wiper arm on the driver's side now has provided a large-sized fin to prevent the arm from floating.

HARNESS

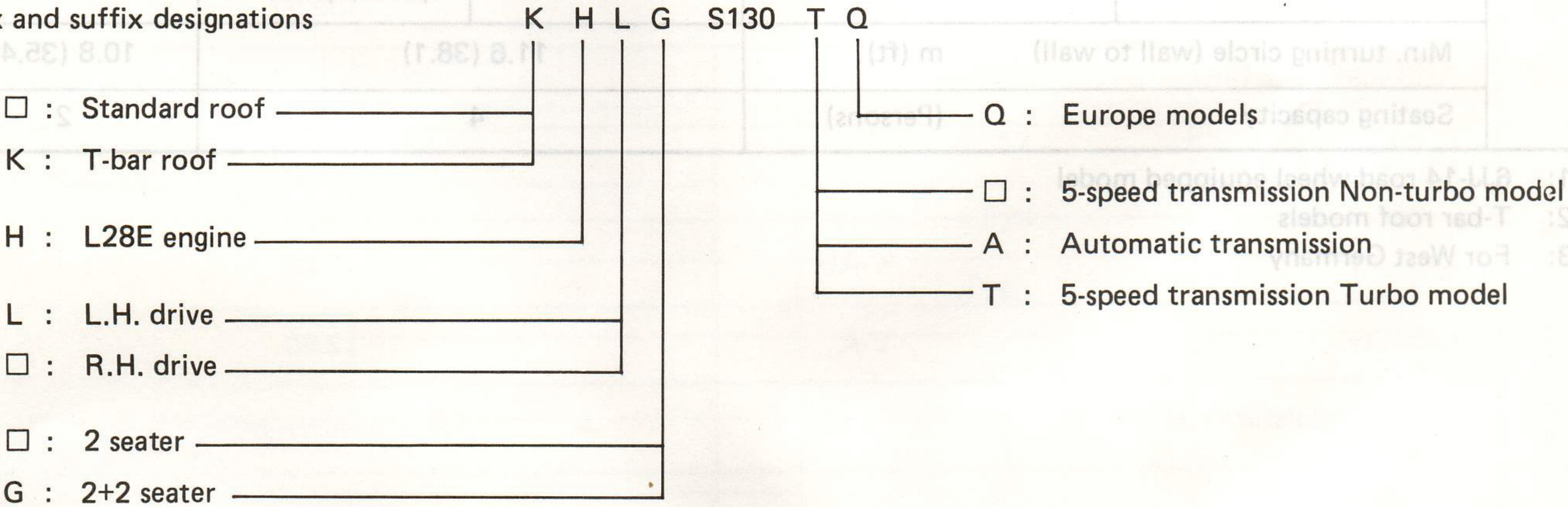
- A differential gear oil cooler circuit has been added.
- A boost meter circuit has been added.
- The E.F.I. harness has been changed.
- The one-touch switch on the power windows has been discontinued in vehicles destined for West Germany.

MODEL VARIATION

Destination	Class	Model		Engine	Transmission	Differential carrier	Wheel & Tire
		L.H. drive	R.H. drive				
Europe	2 seater	HLS130Q	HS130Q	L28E	FS5W71B	R200	6JJ-14 205/70VR14 (5-1/2JJ-14) *3 200/ 65HR370
		HLS130AQ	HS130AQ		3N71B	R180	
	2+2 seater	HLGS130Q	HGS130Q		FS5W71B	R200	
		HLGS130AQ	HGS130AQ		3N71B	R180	
	T-bar roof	KHLGS130Q	KHGS130Q		FS5W71B	R200	
		KHLGS130AQ	KHGS130AQ		3N71B	R180	
	2+2 seater	HLGS130TQ	—	L28ET (Turbo)	FS5R90A*1	R200*2	6JJ-15 215/60VR15
	T-bar roof	KHLGS130TQ	—				

- *1: Borg-Warner T-5
 *2: With oil cooler
 *3: Denovo tire for R.H. drive model

Prefix and suffix designations



GENERAL SPECIFICATIONS

Item		Model	Turbo 2 + 2 seater	Non-turbo		
				2 + 2 seater	2 seater	
Dimensions and weight	Overall length		mm (in)	4,620 (181.9)		4,420 (174.0)
	Overall width		mm (in)	1,690 (66.5)		
	Overall height		mm (in)	1,300 (51.2)	1,300 (51.2) 1,295 (51.0) *3	1,290 (50.8)
	Wheelbase		mm (in)	2,520 (99.2)		2,320 (91.3)
	Tread	Front	mm (in)	1,395 (54.9)	1,385 (54.5), 1,395 (54.9) * 1	
		Rear	mm (in)	1,410 (55.5)	1,380 (54.3), 1,390 (54.7) * 1	
	Min. ground clearance		mm (in)	145 (5.7)		
	Overhang	Front	mm (in)	1,000 (39.4)		
		Rear	mm (in)	1,100 (43.3)		
	Room space	Length	mm (in)	1,520 (59.8)		805 (31.7)
		Width	mm (in)	1,420 (55.9)		
		Height	mm (in)	1,085 (42.7) 1,080 (42.5) *2		1,075 (42.3)
	Curb weight	kg (lb)	M/T models	1,340 (2,955)	1,260 (2,780) 1,320 (2,910) *3	1,195 (2,635)
			A/T models	—	1,250 (2,755) 1,310 (2,890) *3	1,185 (2,615)
	Min. turning circle (wall to wall)		m (ft)	11.6 (38.1)		10.8 (35.4)
Seating capacity		(Persons)	4		2	

*1: 6JJ-14 road wheel equipped model

*2: T-bar roof models

*3: For West Germany

Item		Model	Turbo	Non-turbo
		Engine	L28ET	L28E
Engine general specifications	Classification	Gasoline		
	Cycle	4		
	No. of cylinders and arrangement	6, in-line		
	Valve arrangement	O.H.C. (Overhead cam)		
	Bore x stroke	mm (in)	86 x 79 (3.39 x 3.11)	
	Displacement	cm ³ (cu in)	2,753 (168.0)	
	Compression ratio		7.4	9.4 8.3*1
	Max. horse power (DIN)	PS (kW)/rpm	204 (150)/5,600 200 (147)/5,600*2	150 (110)/5,200 140 (103)/5,200*1
	Max. torque (DIN)	N·m (kg-m, ft-lb)/rpm	297 (30.3, 219)/4,400 290 (29.6, 214)/4,400*2	221 (22.5, 163)/4,200 202 (20.6, 149)/4,000*1

*1: For Sweden and Switzerland

*2: EEC data

GENERAL SPECIFICATIONS

Model			Turbo		Non-turbo	
Item						
Lubrication system	Oil pump type		Trochoid gear			
	Oil filter type		Paper element (Cartridge)			
Cooling system	Engine coolant		Anti-freeze (L.L.C.) 50%			
	Radiator type		Corrugated fin and tube			
	Water pump type		Centrifugal			
	Thermostat operating temperature °C (°F)		88 (190)			
Engine fuel system	Electronic fuel injection type		L-jetronic			
	Fuel pump type		Electrical			
	Air cleaner filter type		Viscous paper			
	Air flow meter type		Flap and potentiometer			
Engine fuel system	Injector	Type	Electromagnetic			
		Fuel pressure kPa (bar, kg/cm ² , psi)	299.1 (2.991, 3.05, 43.4)		250.1 (2.501, 2.55, 36.3)	
	Throttle chamber type		1-barrel			
	Air regulator type		Bimetal			
	Cold start valve type		—		Electromagnetic	
	Battery	Model		N60MF		
Capacity V-AH		12-60				
Alternator	Capacity V-A		12-60			
	Voltage regulator type		I.C. regulator, built-in			
Starting motor	Capacity kW		1.0, 1.2			

Model			Turbo	Non-turbo
Item				
Ignition system	Firing order		1-5-3-6-2-4	
	Distributor	Type	Pick-up coil type IC ignition unit	
		Model	D6K81-07	M/T : D6K81-04 A/T : D6K81-05 Swiss & Sweden : D6K9-17
	Spark plug model		BPR6ES-N11	BPR6ES-11
Clutch	Disc model		240TBL	
	Cover	Model	C240S	C240S D240K
		Full-load N (kg, lb)	5,394 (550, 1,213)	4,904 (500, 1,103)
	Clutch control method		Hydraulic	
	Master cylinder inner diameter mm (in)		15.88 (5/8)	
	Operating cylinder	Type	Non-adjustable	
Inner diameter mm (in)		19.05 (3/4)		
Manual transmission	Model		FS5R90A (Borg-Warner T-5)	FS5W71B
	Gear ratio	1st	3.500	3.062
		2nd	2.144	1.858
		3rd	1.357	1.308
		4th	1.000	1.000
		5th	0.780	0.745
		Rev.	3.394	3.026
Automatic transmission	Model			3N71B
	Model code number			X2706
	Gear ratio	1st		2.458
		2nd		1.458
		3rd		1.000
		Rev.		2.182

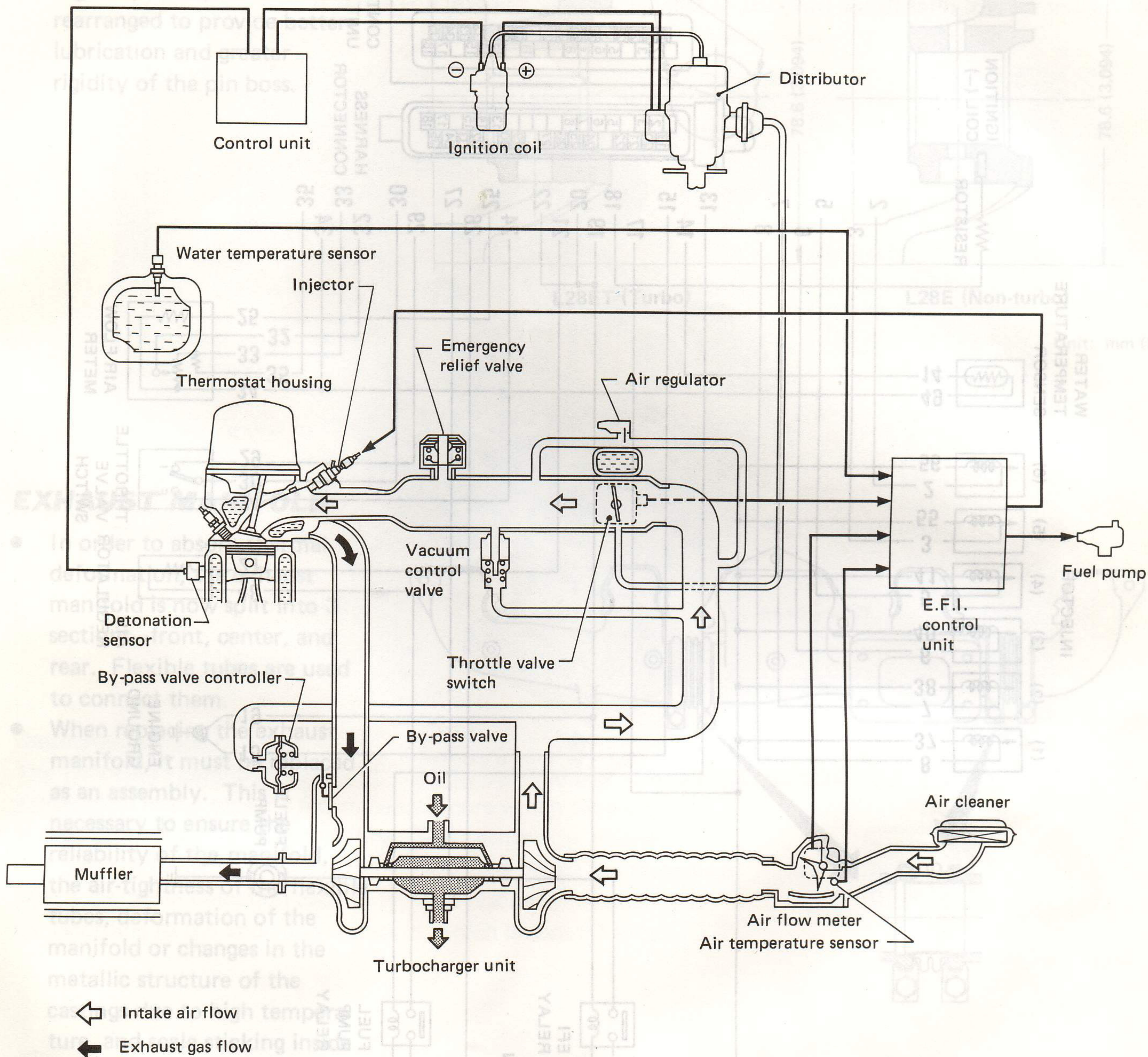
Model				Turbo	Non-turbo
Item					
Propeller shaft	Model			2S71A	2S63A
	Model			R200*1	M/T : R200, A/T : R180
Differential carrier			M/T	3.364	3.900
	Gear ratio		A/T	—	3.545
	Gear type & no. of pinion gears			Straight bevel gear, 2 side gears and pinion mates	
	Front axle and suspension type			Independent struts with coil spring	
Rear axle and suspension type			Independent semi-trailing arms with coil spring		
Brake system	Type-Model	Front		Disc-CL28VL	Disc-CL28V
		Rear		Disc-CL14HL	Disc-CL14H
	Master cylinder inner diameter		mm (in) 23.81 (15/16)		
	Brake booster model		M90		
	Pressure control valve type		Proportioning type		
	Parking brake type		Mechanically operated on rear wheel		
Wheel and tire	Road wheel	Size [Offset mm (in)]		6JJ-15 [10 (0.39)] 5J-15 [15 (0.59)] *2	5-1/2J-14 [15 (0.59)] 6JJ-14 [10 (0.39)] 5J-14 [15 (0.59)] *2 125X370DL [15 (0.59)] *3
	Tire size		215/60VR15 165-15*2	205/70VR14, C78-14*2 200/65HR370*3	
Steering system	Manual gear	Type		—	Rack and pinion
		Model		—	RP15L
	Power gear	Type		Rack and pinion	
		Model		IPRP15L	
	Column shaft type			Collapsible	
Perform- ance	Top gear speed at 1,000 rpm	km/h (MPH)	M/T	44.0 (27.3)	39.7 (24.7)
			A/T	—	32.5 (20.2)

*1: With oil cooler

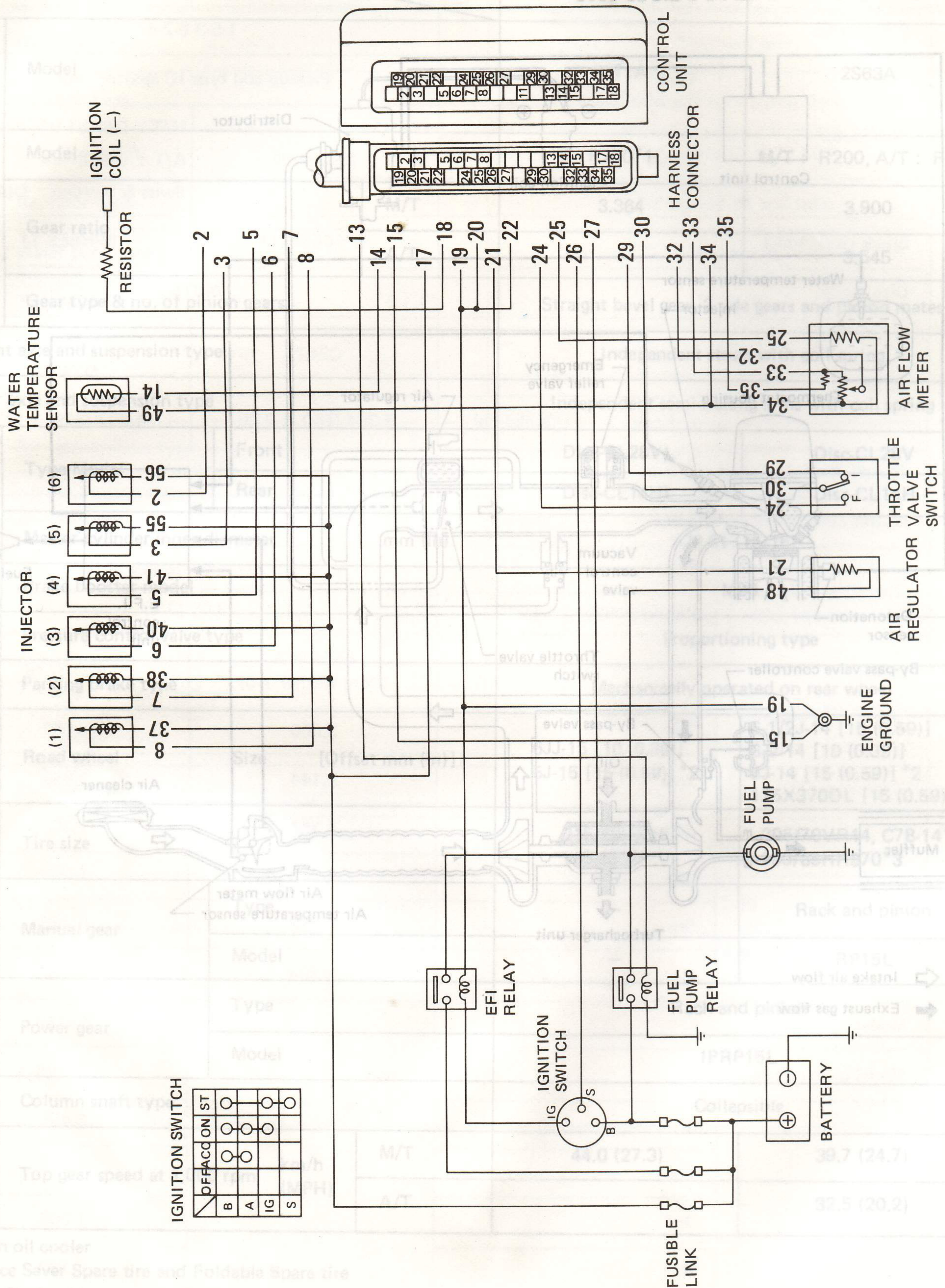
*2: Space Saver Spare tire and Foldable Spare tire

*3: For England

EFI SYSTEM DIAGRAM



EFI CIRCUIT DIAGRAM

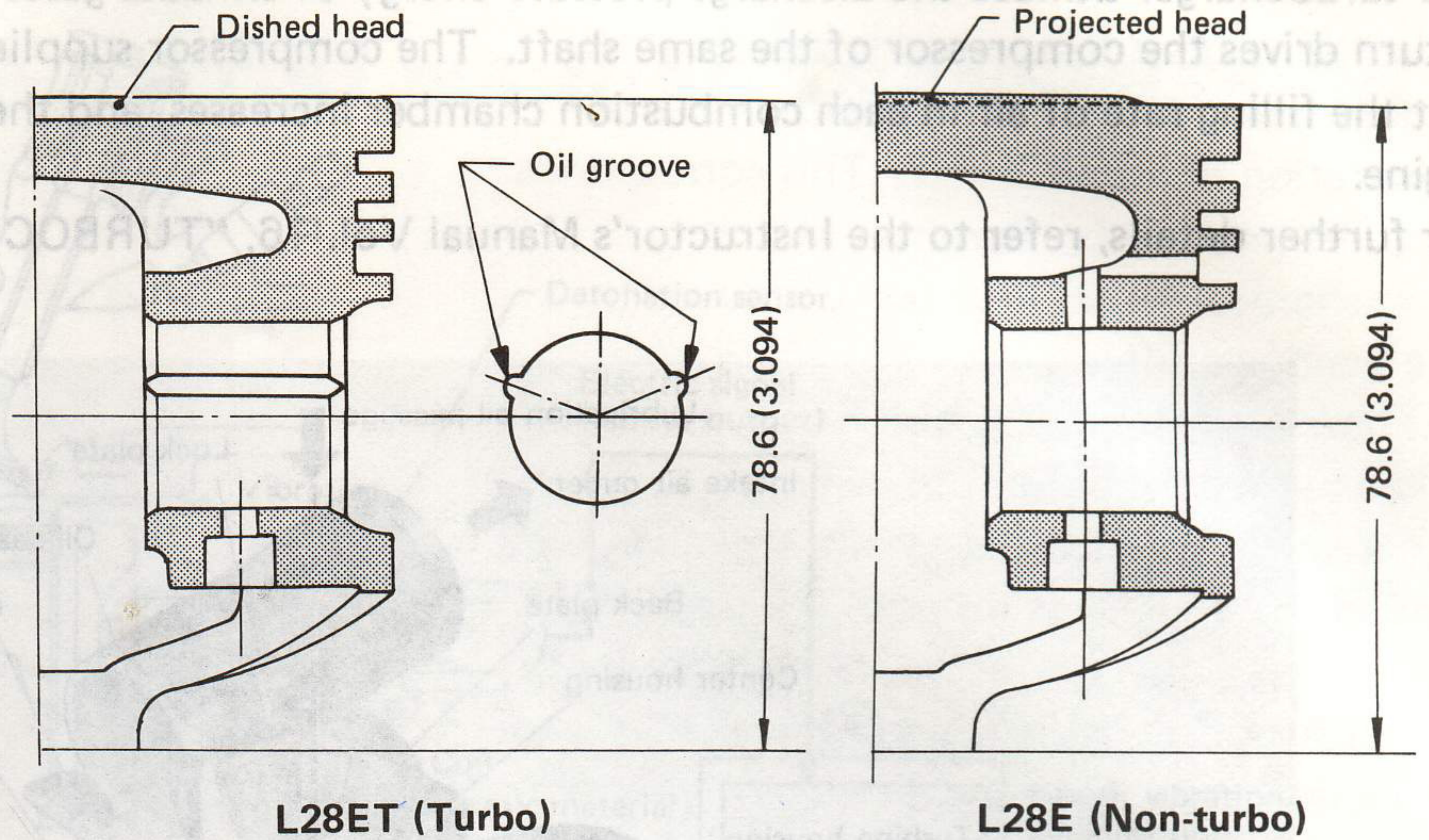


- *1: With oil cooler
- *2: Space Saver Spare tire and Foldable Spare tire
- *3: For England

ENGINE ELECTRICAL MECHANICAL

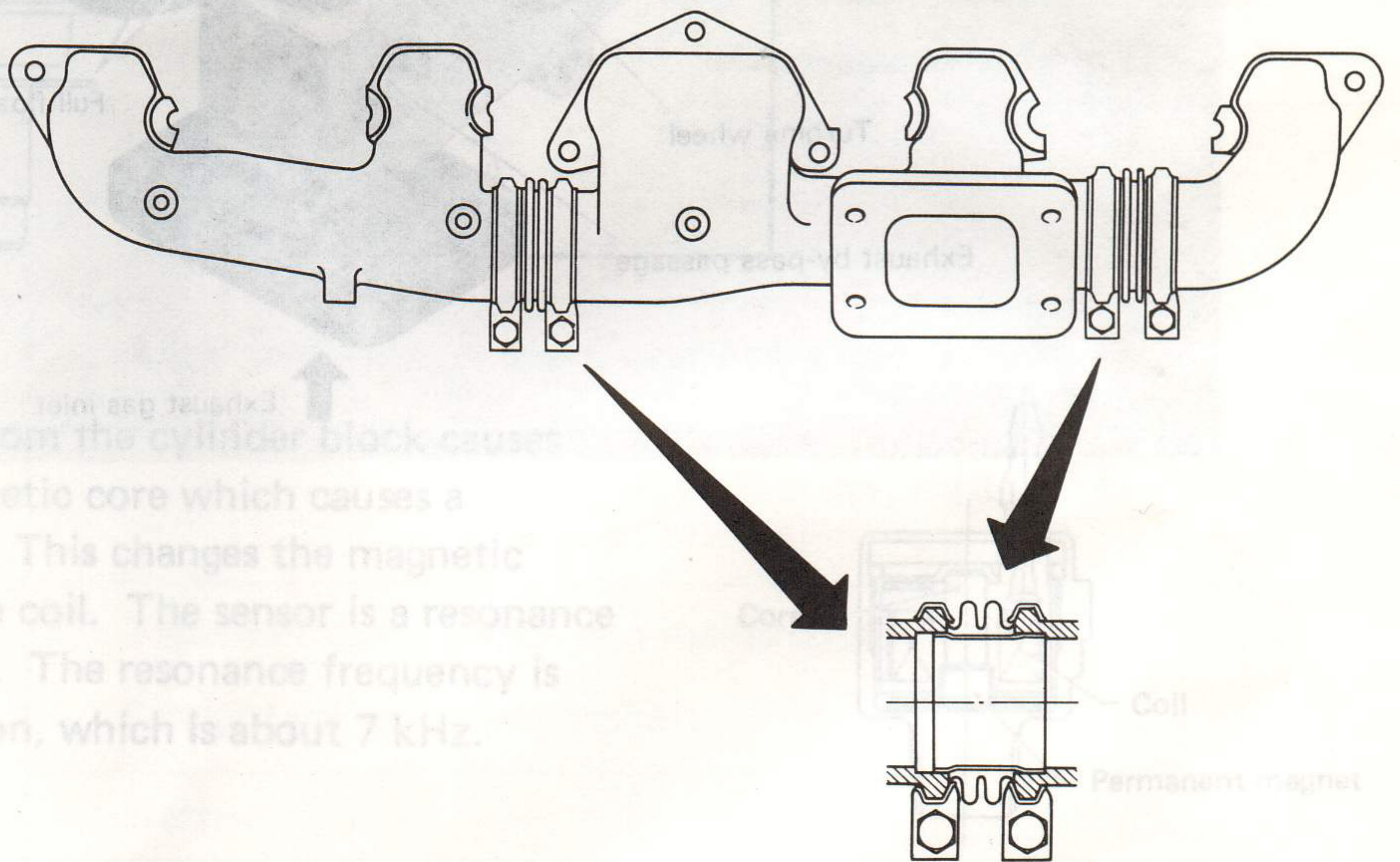
PISTON

- The oil grooves for lubricating the piston pin have been rearranged to provide better lubrication and greater rigidity of the pin boss.



EXHAUST MANIFOLD

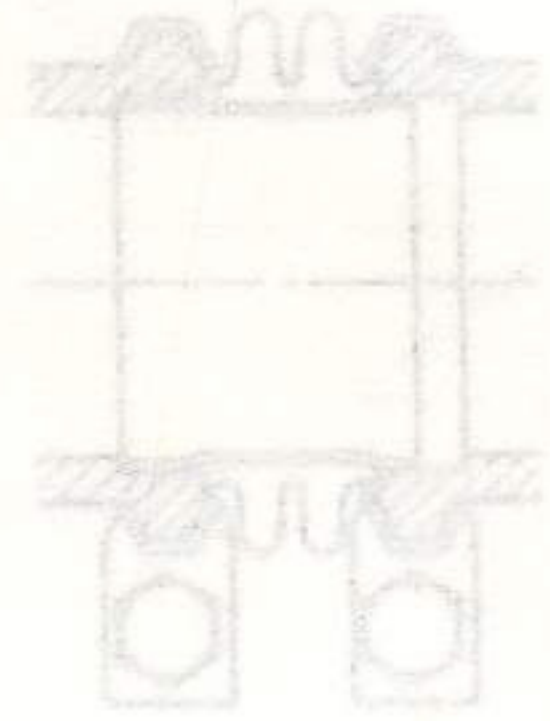
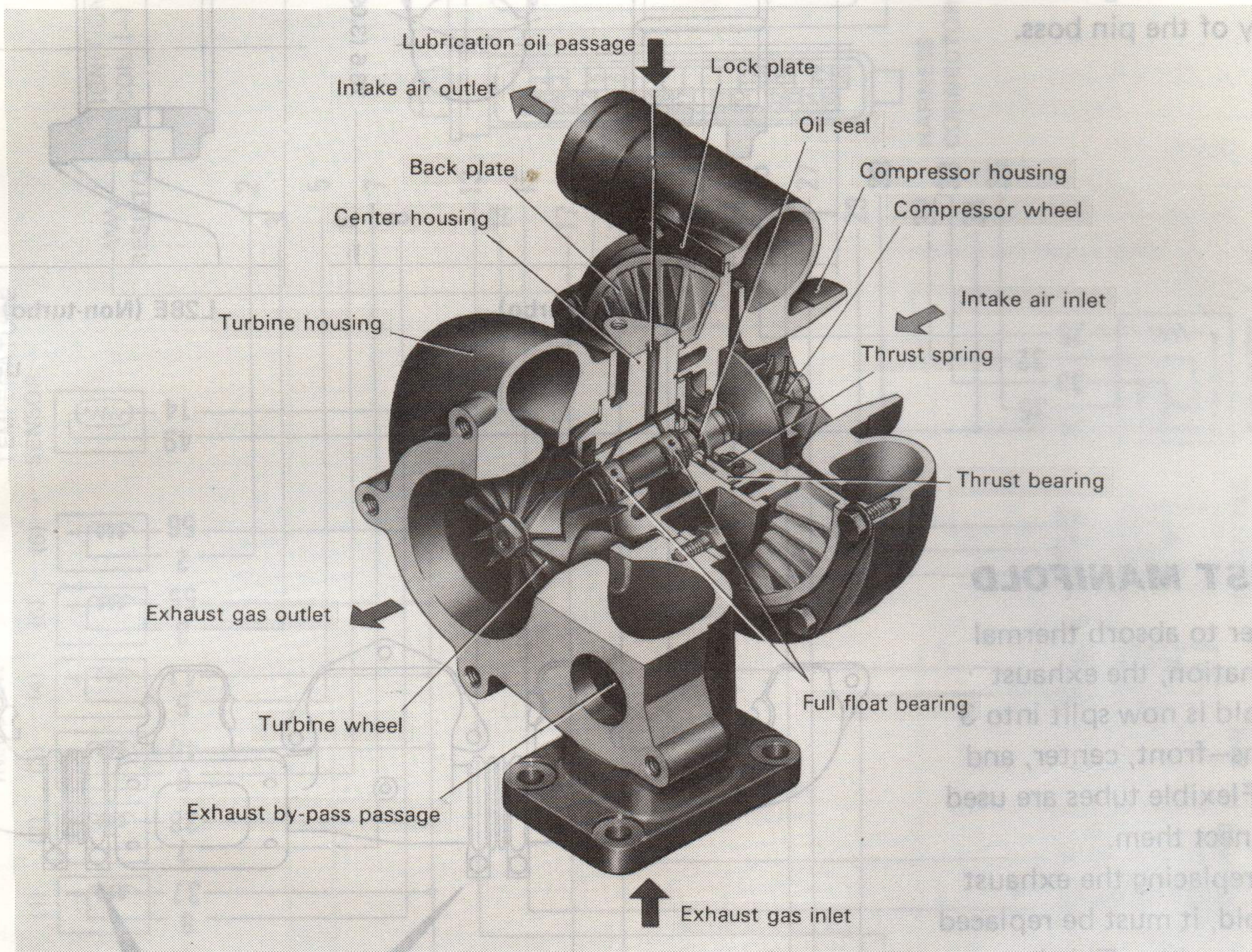
- In order to absorb thermal deformation, the exhaust manifold is now split into 3 sections—front, center, and rear. Flexible tubes are used to connect them.
- When replacing the exhaust manifold, it must be replaced as an assembly. This is necessary to ensure the reliability of the manifold, the air-tightness of the flexible tubes, deformation of the manifold or changes in the metallic structure of the castings due to high temperature, and scale sticking inside the manifold due to exhaust gases, etc.



TURBOCHARGER

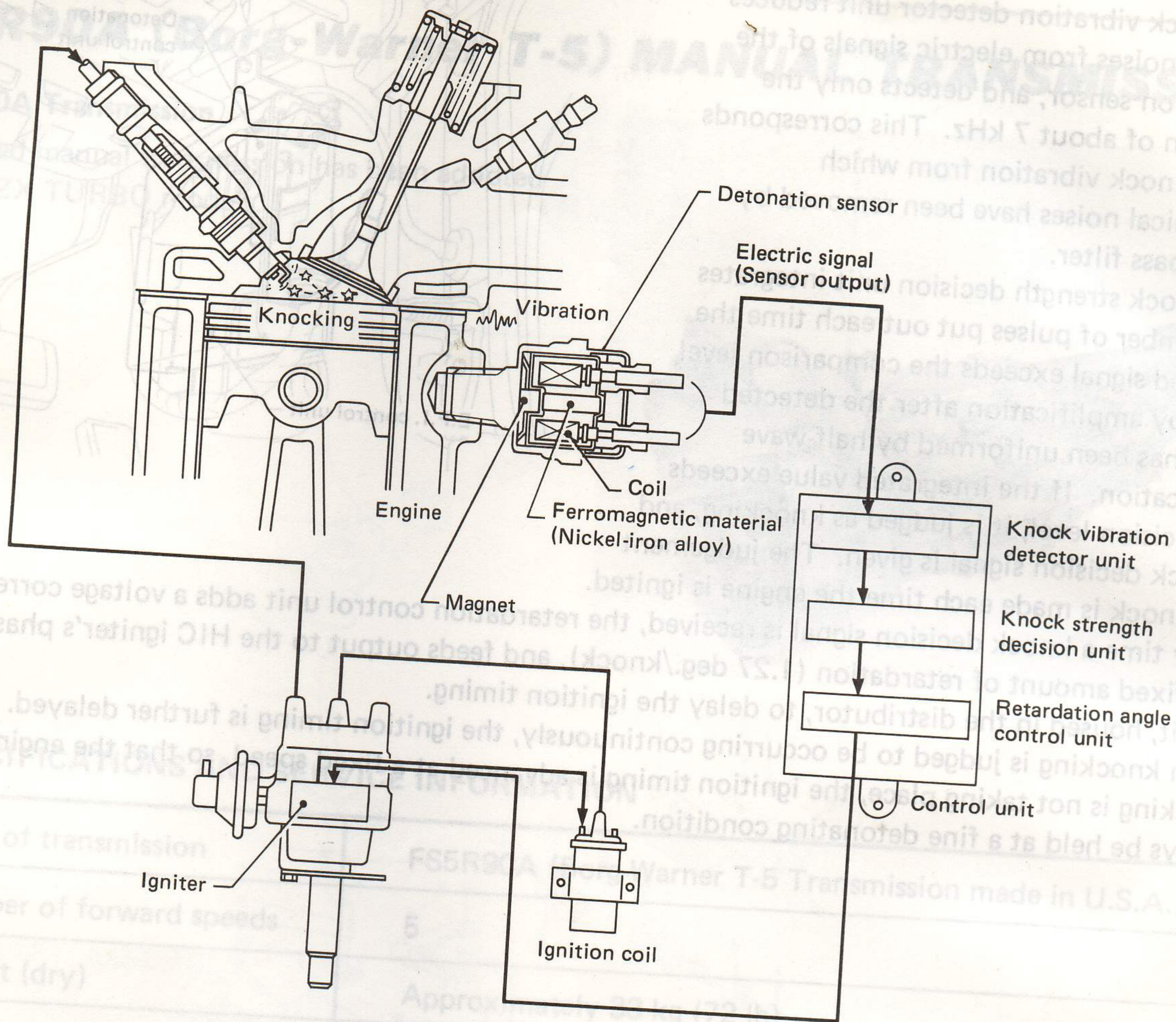
The turbocharger utilizes the discharge pressure energy of exhaust gases to turn the exhaust turbine. This in turn drives the compressor of the same shaft. The compressor supplies compressed air to the engine, so that the filling rate of air in each combustion chamber increases, and thereby increasing the output of the engine.

For further details, refer to the Instructor's Manual Vol. 16, "TURBOCHARGER".



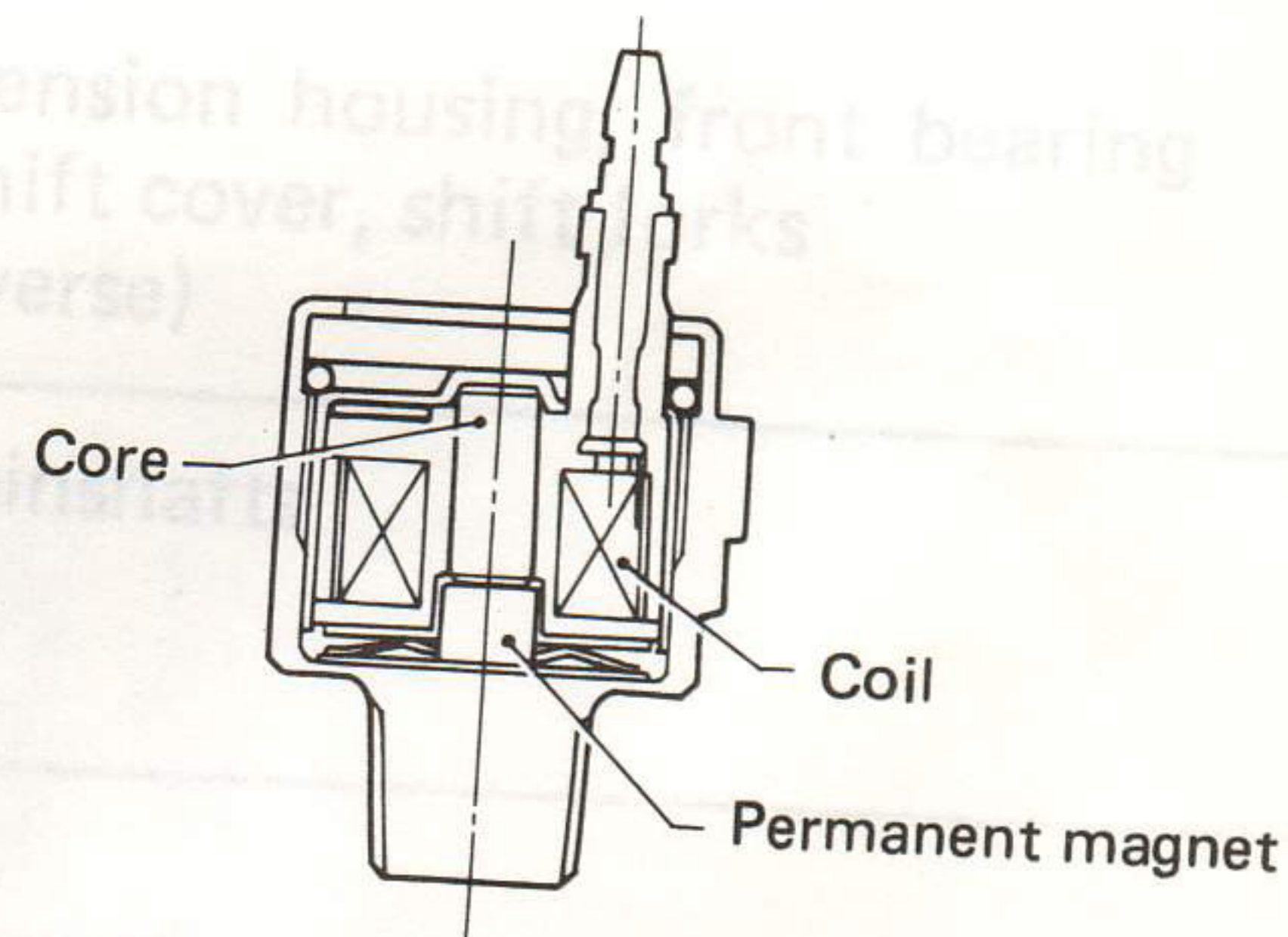
IGNITION SWITCH									

ENGINE ELECTRICAL DETONATION CONTROL SYSTEM



Detonation sensor

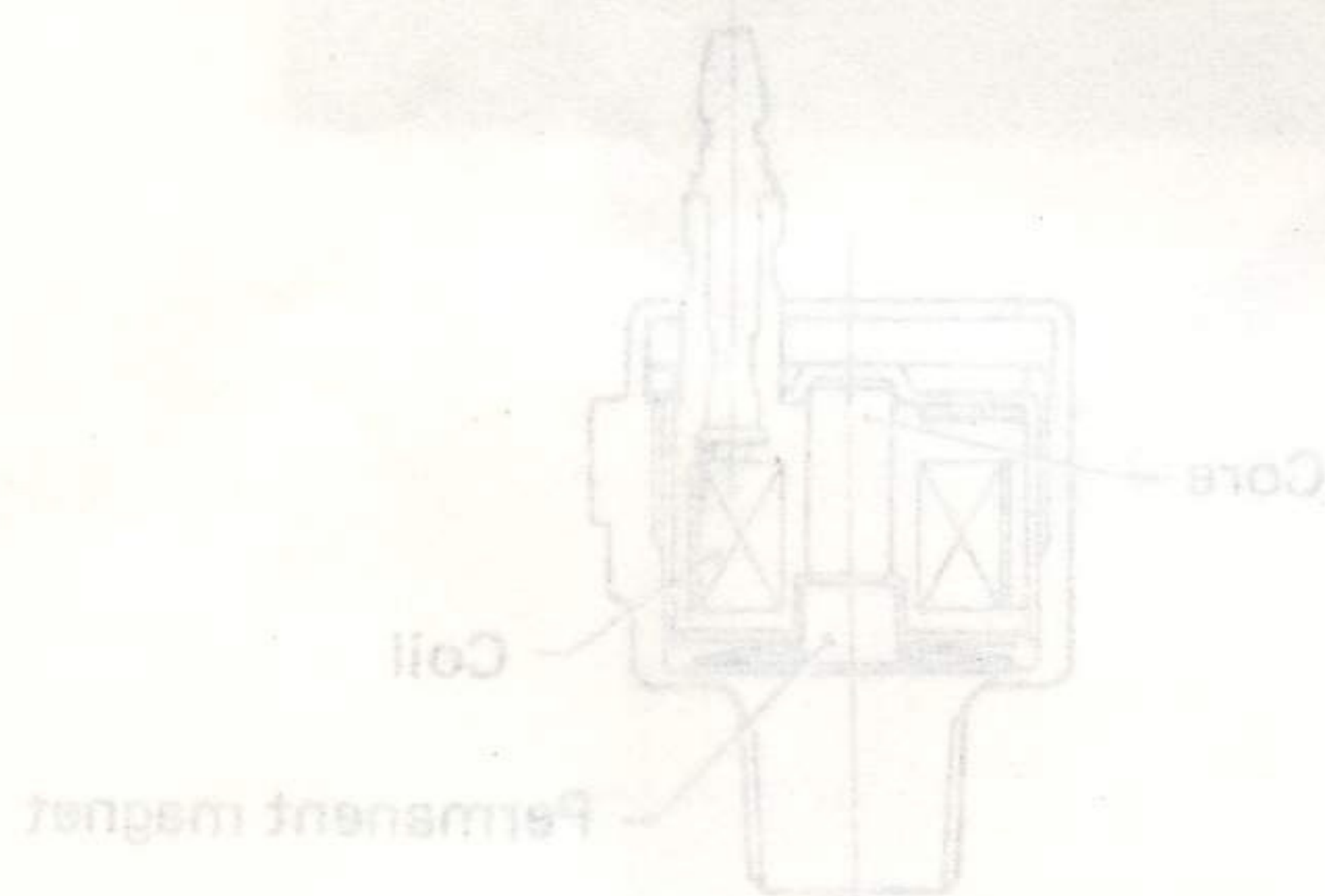
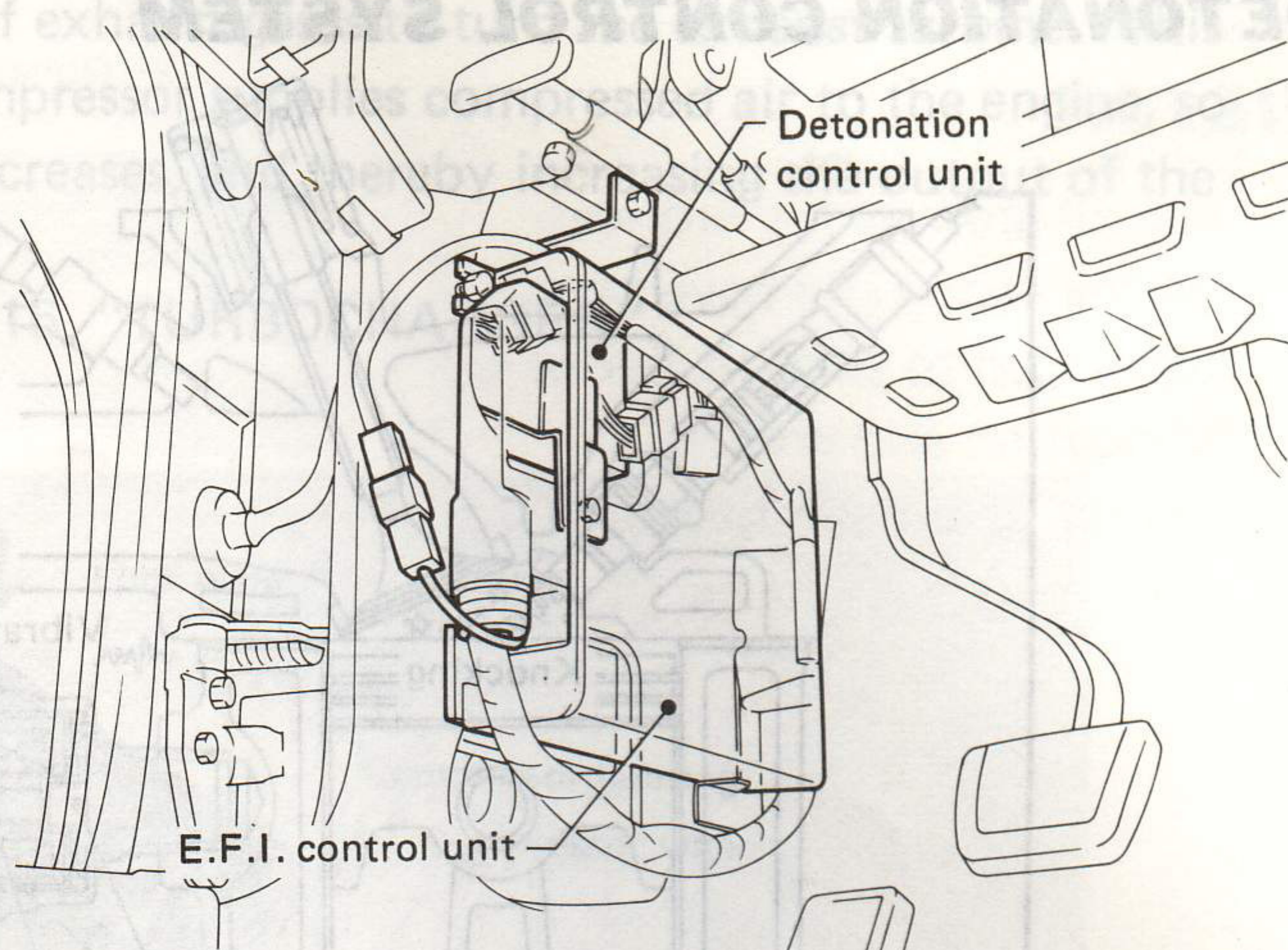
The knocking vibration transferred from the cylinder block causes a distortion in the sensor's ferromagnetic core which causes a change in the magnetic permeability. This changes the magnetic flux density, inducing a voltage in the coil. The sensor is a resonance type, superior in detection capability. The resonance frequency is set according to the knocking vibration, which is about 7 kHz.



Control unit

- (1) The knock vibration detector unit reduces ignition noises from electric signals of the detonation sensor, and detects only the vibration of about 7 kHz. This corresponds to the knock vibration from which mechanical noises have been removed by a bandpass filter.
- (2) The knock strength decision unit integrates the number of pulses put out each time the detected signal exceeds the comparison level made by amplification after the detected signal has been uniformed by half-wave rectification. If the integrated value exceeds the decision level, it is judged as knocking, and a knock decision signal is given. The judgement of a knock is made each time the engine is ignited.
- (3) Every time a knock decision signal is received, the retardation control unit adds a voltage corresponding to a fixed amount of retardation (1.27 deg./knock), and feeds output to the HIC igniter's phase control circuit, housed in the distributor, to delay the ignition timing.

When knocking is judged to be occurring continuously, the ignition timing is further delayed. When knocking is not taking place, the ignition timing is advanced at a fixed speed, so that the engine can always be held at a fine detonating condition.



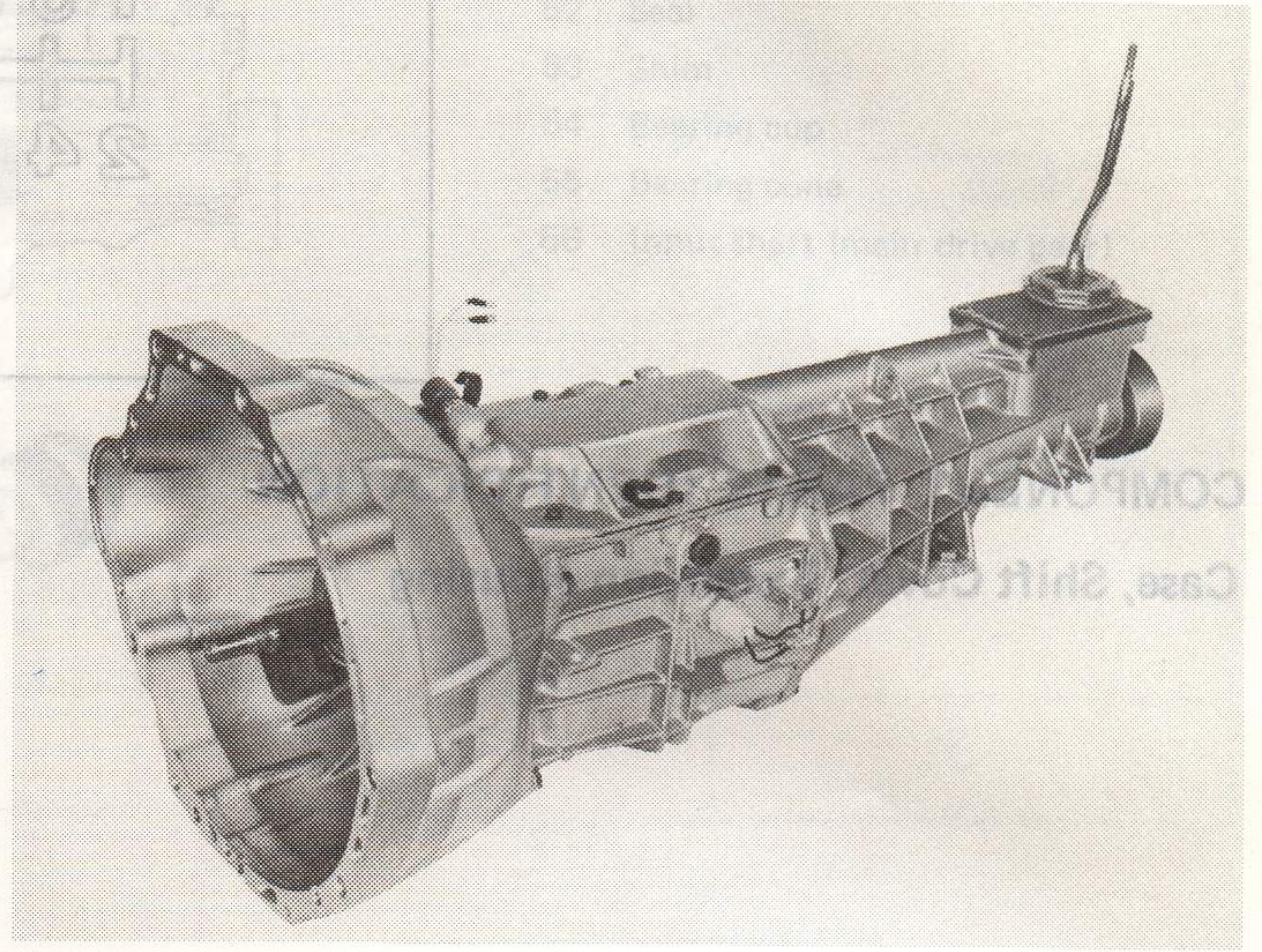
The knocking vibration transferred from the cylinder block causes a distortion in the sensor's ferromagnetic core which causes a change in the magnetic permeability. This changes the magnetic flux density, inducing a voltage in the coil. The sensor is a resonance type, superior in detection capability. The resonance frequency is set according to the knocking vibration, which is about 7 kHz.

CHASSIS

FS5R90A (Borg-Warner T-5) MANUAL TRANSMISSION

FS5R90A Transmission

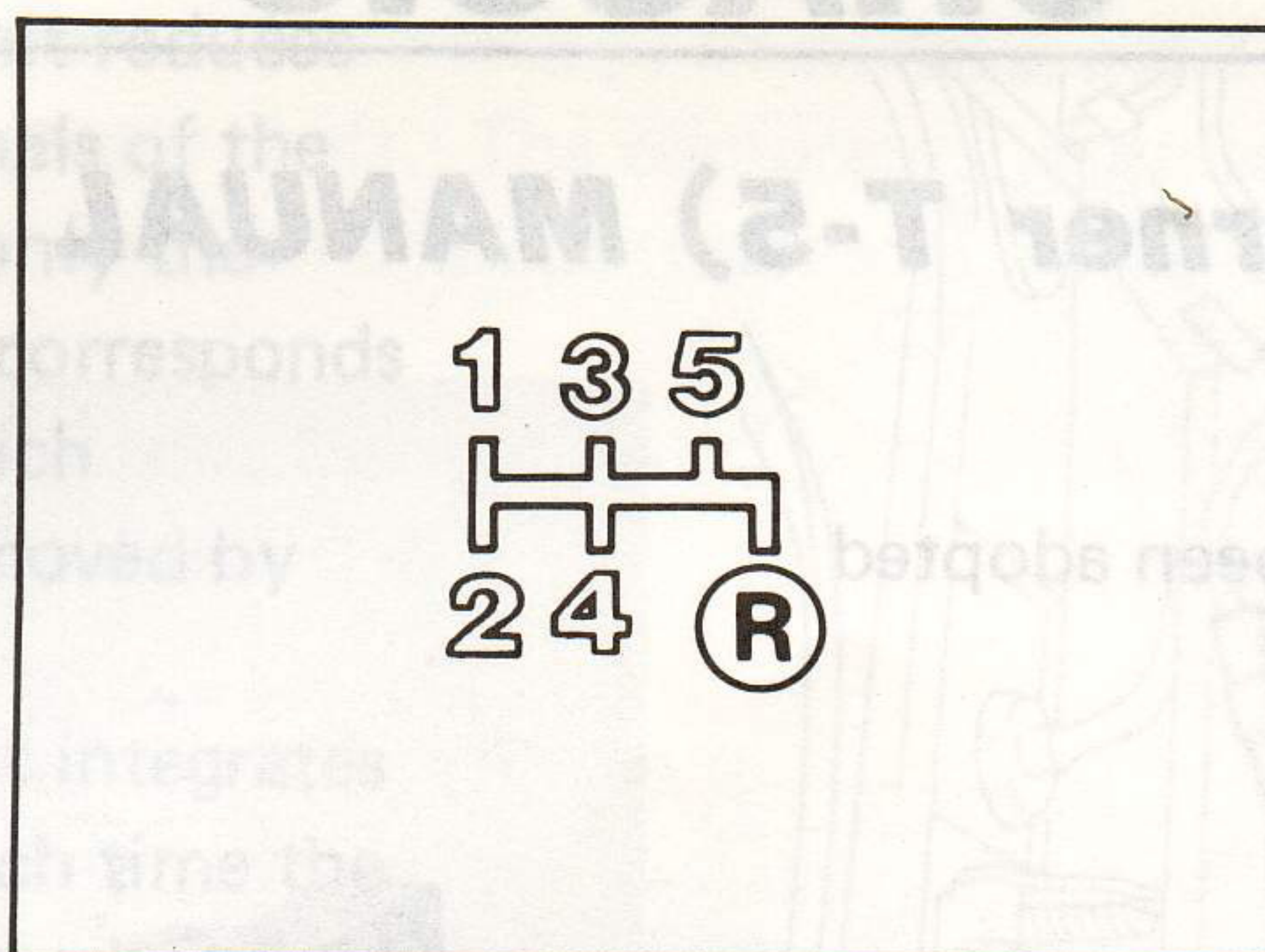
A 5-speed manual transmission has been adopted for 280ZX TURBO models.



SPECIFICATIONS AND SERVICE INFORMATION

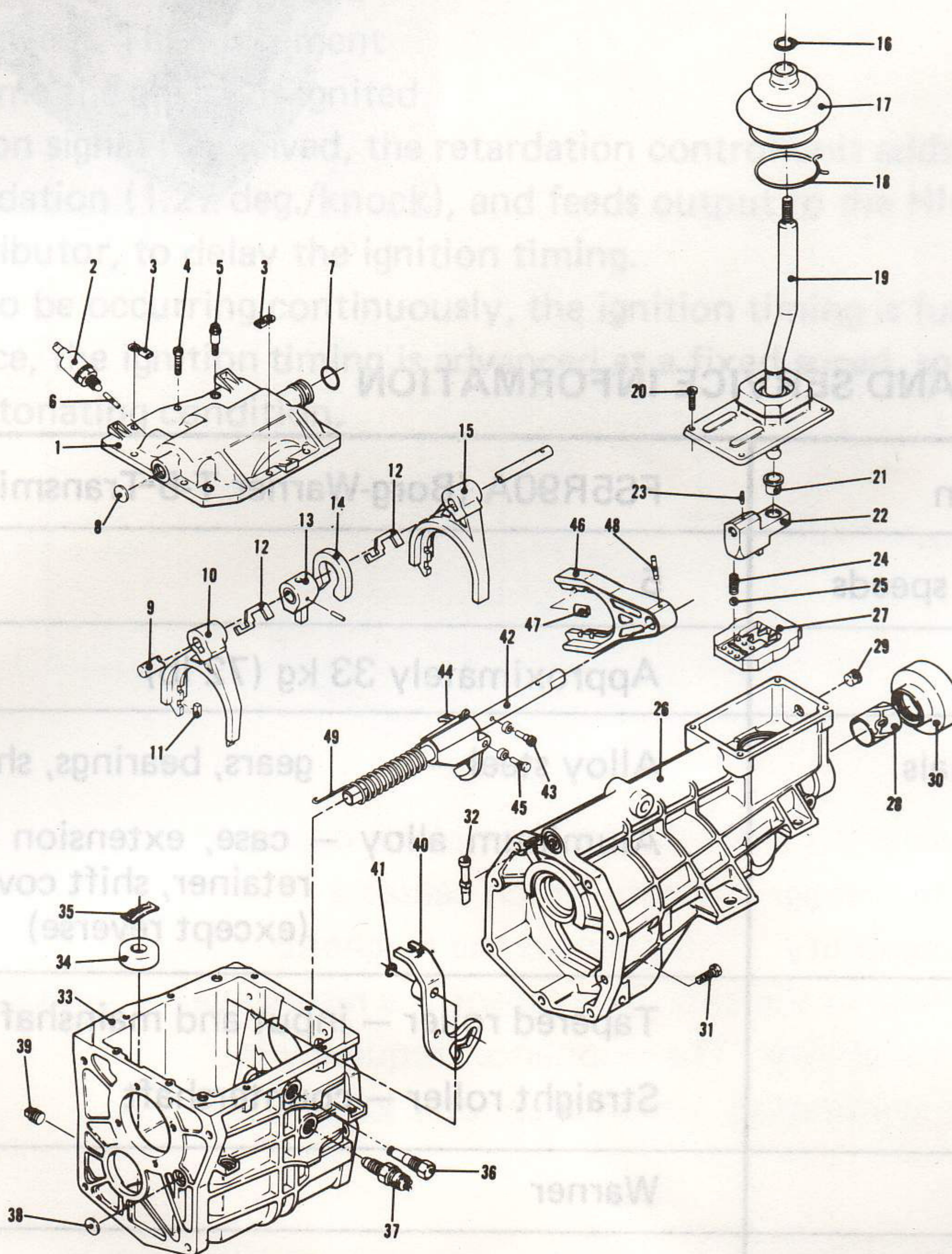
Type of transmission	FS5R90A (Borg-Warner T-5 Transmission made in U.S.A.)
Number of forward speeds	5
Weight (dry)	Approximately 33 kg (72 lb)
Construction materials	Alloy steel — gears, bearings, shafts Aluminum alloy — case, extension housing, front bearing retainer, shift cover, shift forks (except reverse)
Bearing types	Tapered roller — input and mainshafts Straight roller — countershaft
Synchromesh type	Warner
Rated input torque	312 N·m (31.8 kg-m, 230 ft-lb)
Controls	Integral shift lever
Recommended lubricant	"Dexron" type automatic transmission fluid
Oil capacity	1.9 liters (3-3/8 Imp pt)
Speedometer gear ratio	16/6

SHIFT PATTERN



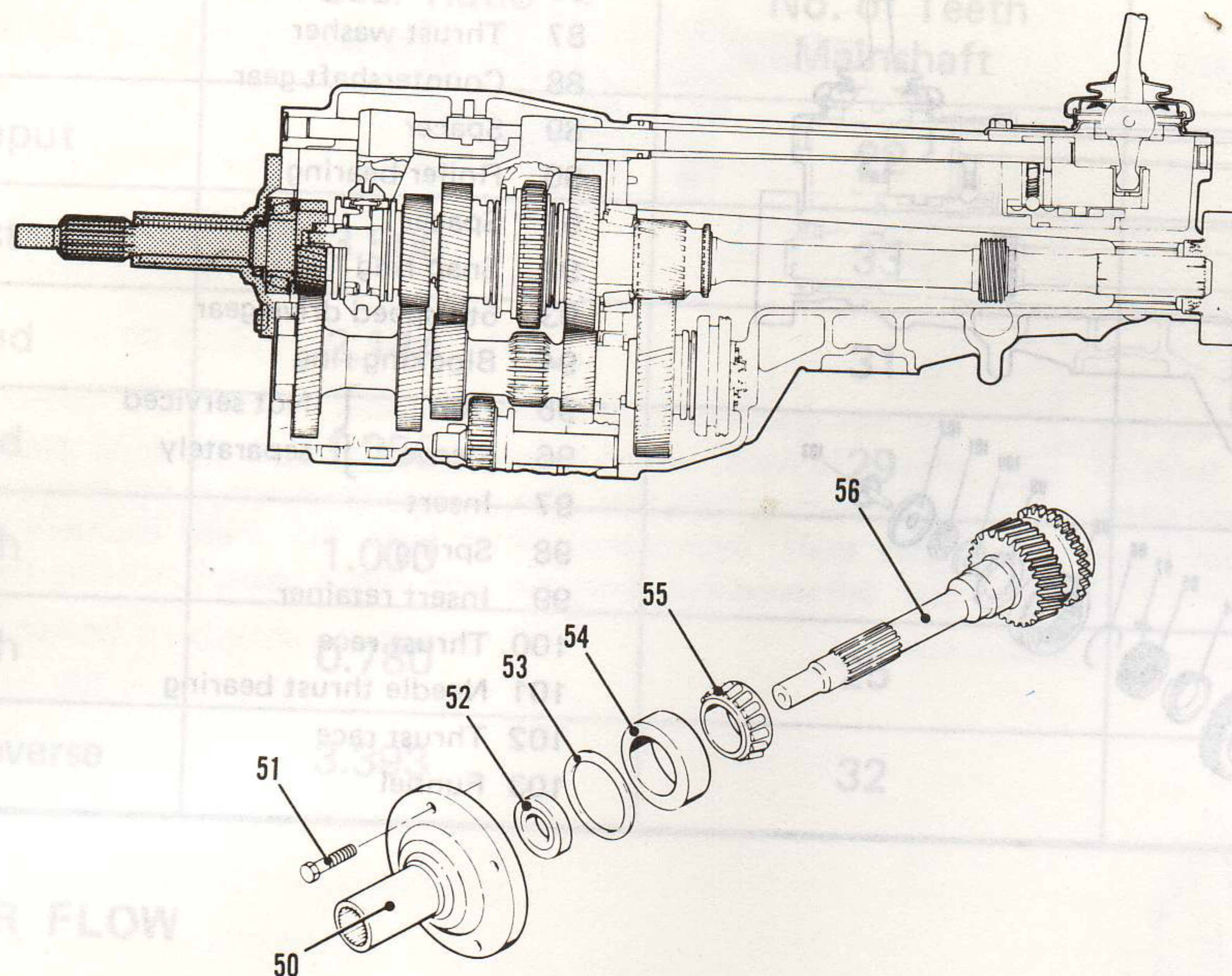
COMPONENT PARTS IDENTIFICATION

Case, Shift Cover, Extension Housing



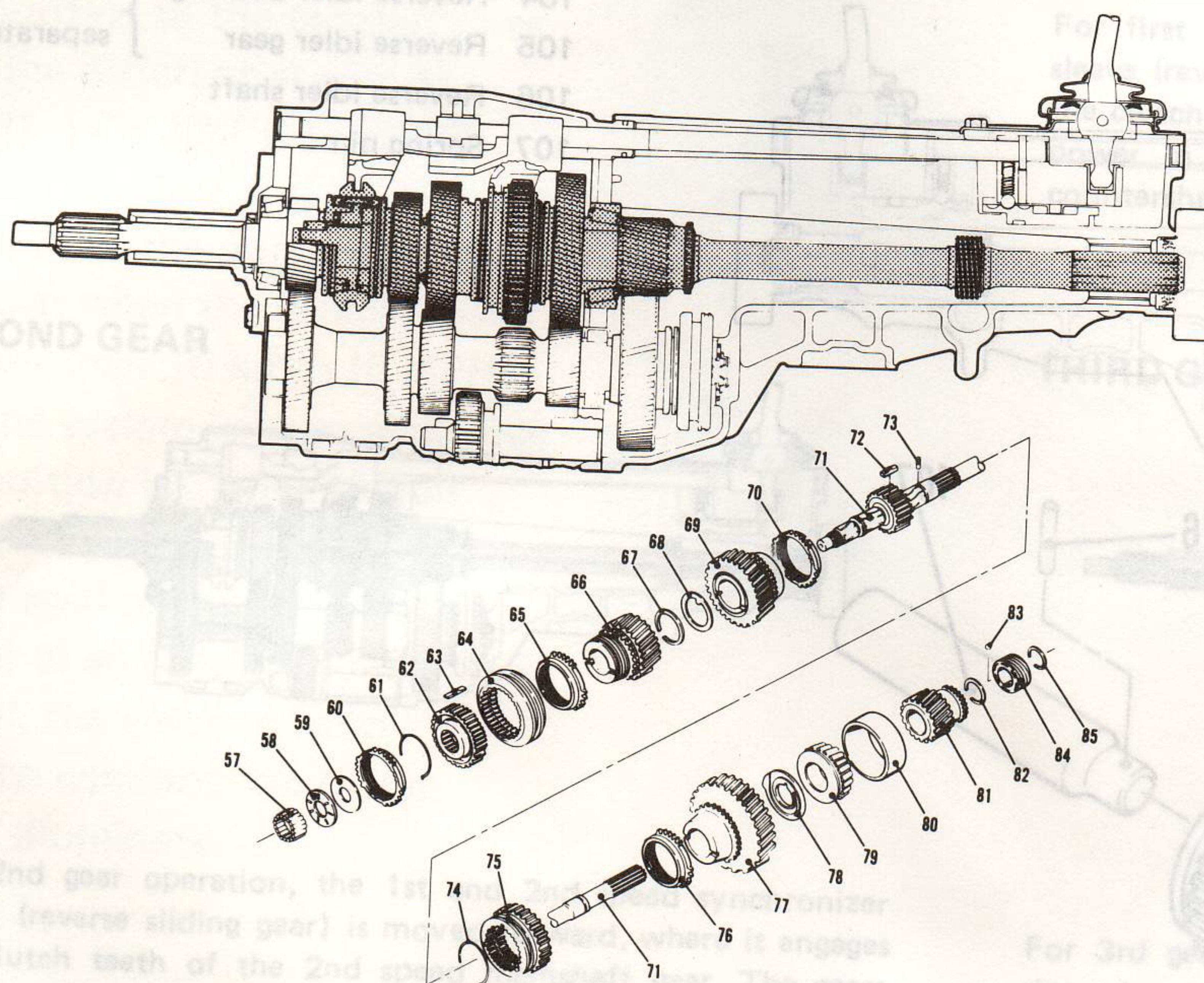
- | | | | |
|--------------------------|-----------------------------------|--------------------------------|---------------------------|
| 1 Case cover | 17 Boot | 33 Case | 49 Spring |
| 2 Neutral switch | 18 Boot retainer | 34 Magnet | |
| 3 Wiring clip | 19 Control lever/housing assembly | 35 Clip | |
| 4 Hex head bolt | 20 Control housing screw | 36 Pivot pin | |
| 5 Hex head shoulder bolt | 21 Damper sleeve | 37 Back-up lamp switch | |
| 6 Pin | 22 Offset lever | 38 Welsch plug | |
| 7 "O"-ring | 23 Spring-pin | 39 Pipe plug | |
| 8 Welsch plug | 24 Detent spring | 40 5th and reverse relay lever | |
| 9 Shifter shaft | 25 Ball | 41 Retaining ring | |
| 10 3-4 shift fork | 26 Extension housing | 42 5th and reverse shift rail | } Not serviced separately |
| 11 Shift fork insert | 27 Detent & guide plate | 43 Roller cam and pin | |
| 12 Selector plate | } Not serviced separately | 44 Reverse shift fork | } Not serviced separately |
| 13 Control selector arm | | 45 Roller cam and pin | |
| 14 Interlock plate | | 46 5th gear shift fork | |
| 15 1-2 shift fork | | 47 Insert | |
| 16 Boot retainer | | 48 Spring-pin | |

INPUT SHAFT ASSEMBLY



- 50 Input shaft bearing retainer
- 51 Hex head bolt
- 52 Seal
- 53 Shim
- 54 Bearing cup
- 55 Bearing cone
- 56 Input shaft (main drive gear)

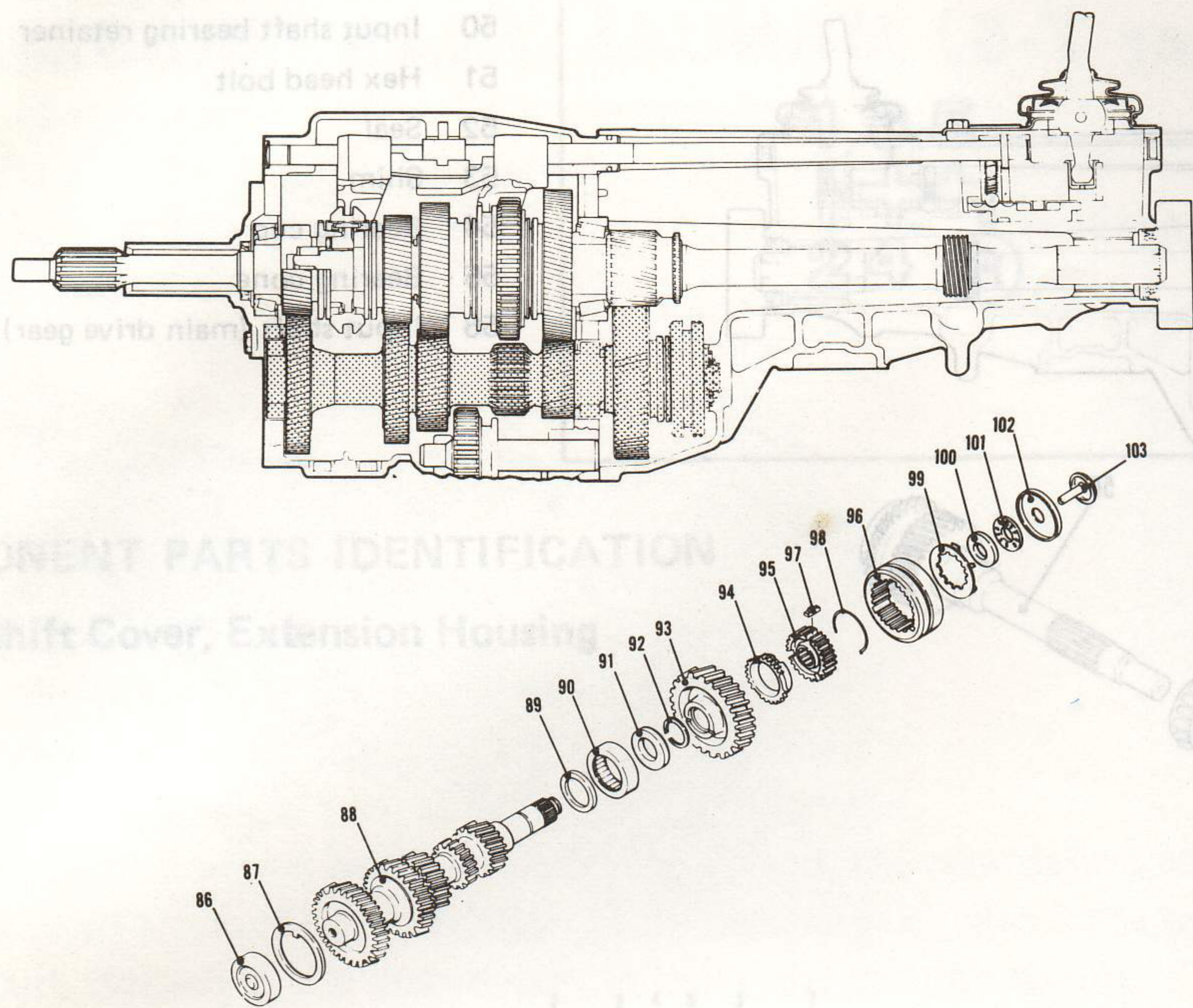
OUTPUT SHAFT ASSEMBLY



- 57 Needle rollers
- 58 Needle thrust bearing
- 59 Thrust bearing race
- 60 Blocking ring
- 61 Spring
- 62 Hub
- 63 Insert
- 64 Sleeve
- 65 Blocking ring
- 66 3rd speed gear
- 67 Snap ring
- 68 2nd speed thrust washer
- 69 2nd speed gear
- 70 Blocking ring
- *71 Output shaft and hub assembly
- 72 Insert
- 73 Pin
- 74 Spring
- *75 Reverse sliding gear
- 76 Blocking ring
- 77 1st speed gear
- 78 Thrust washer
- 79 Bearing cone
- 80 Bearing cup
- 81 5th speed driven gear
- 82 Snap ring
- 83 Ball
- 84 Speedometer gear
- 85 Snap ring

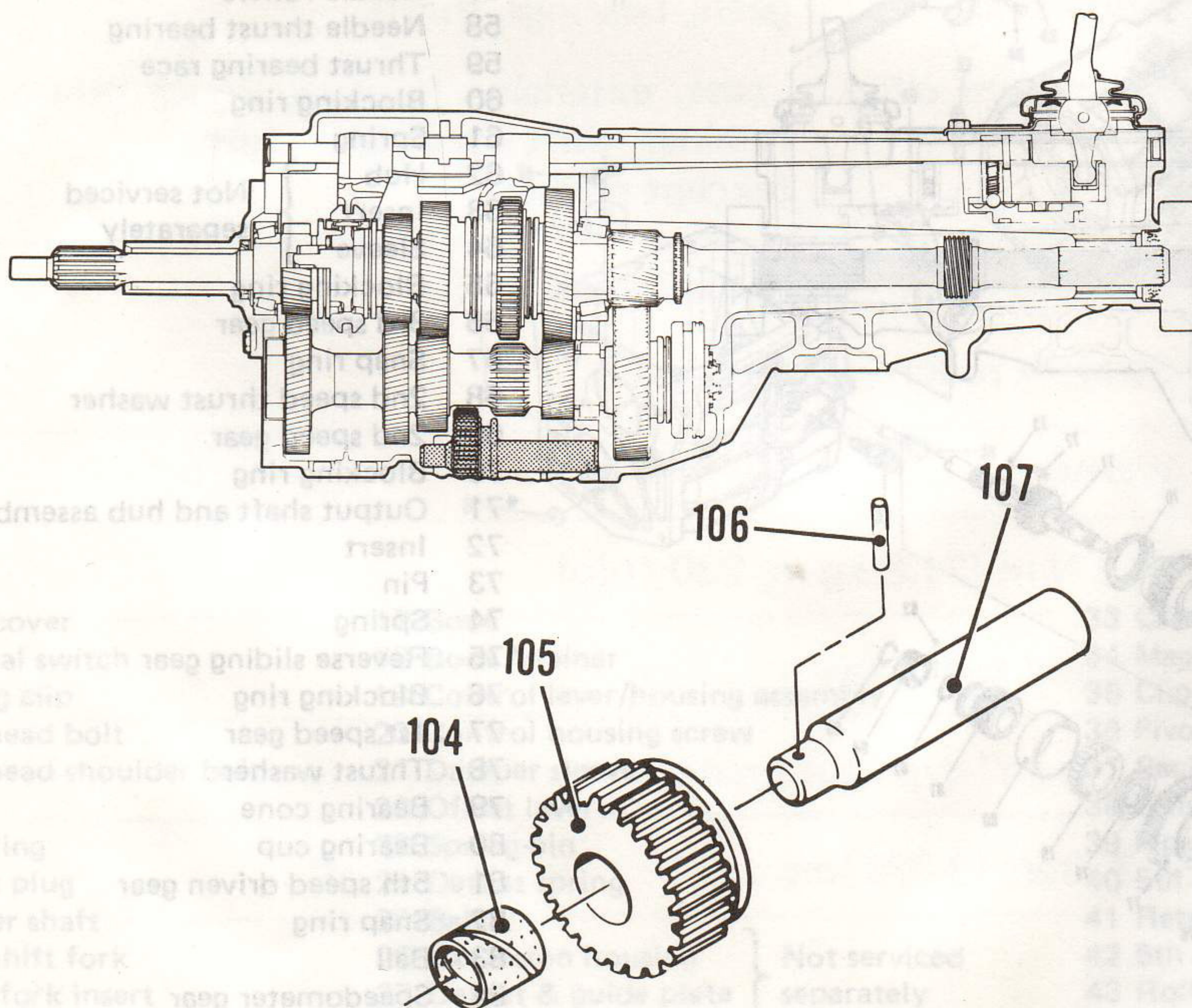
*71, *75 Not serviced separately

COUNTERSHAFT ASSEMBLY



- 86 Roller bearing
 - 87 Thrust washer
 - 88 Countershaft gear
 - 89 Spacer
 - 90 Roller bearing
 - 91 Spacer
 - 92 Snap ring
 - 93 5th speed drive gear
 - 94 Blocking ring
 - 95 Hub
 - 96 Sleeve
 - 97 Insert
 - 98 Spring
 - 99 Insert retainer
 - 100 Thrust race
 - 101 Needle thrust bearing
 - 102 Thrust race
 - 103 Funnel
- Not serviced separately

REVERSE IDLER ASSEMBLY



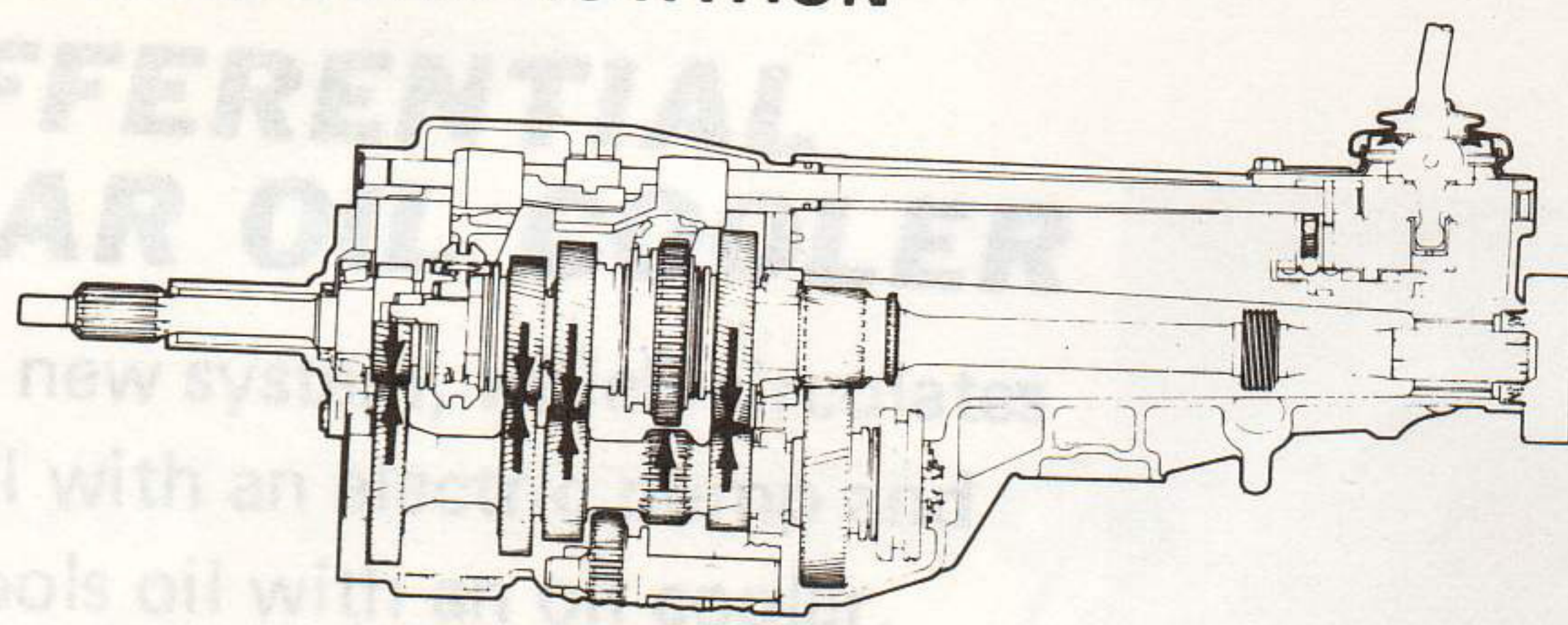
- 104 Reverse idler bushing
 - 105 Reverse idler gear
 - 106 Reverse idler shaft
 - 107 Spring pin
- Not serviced separately

GEAR RATIO INFORMATION

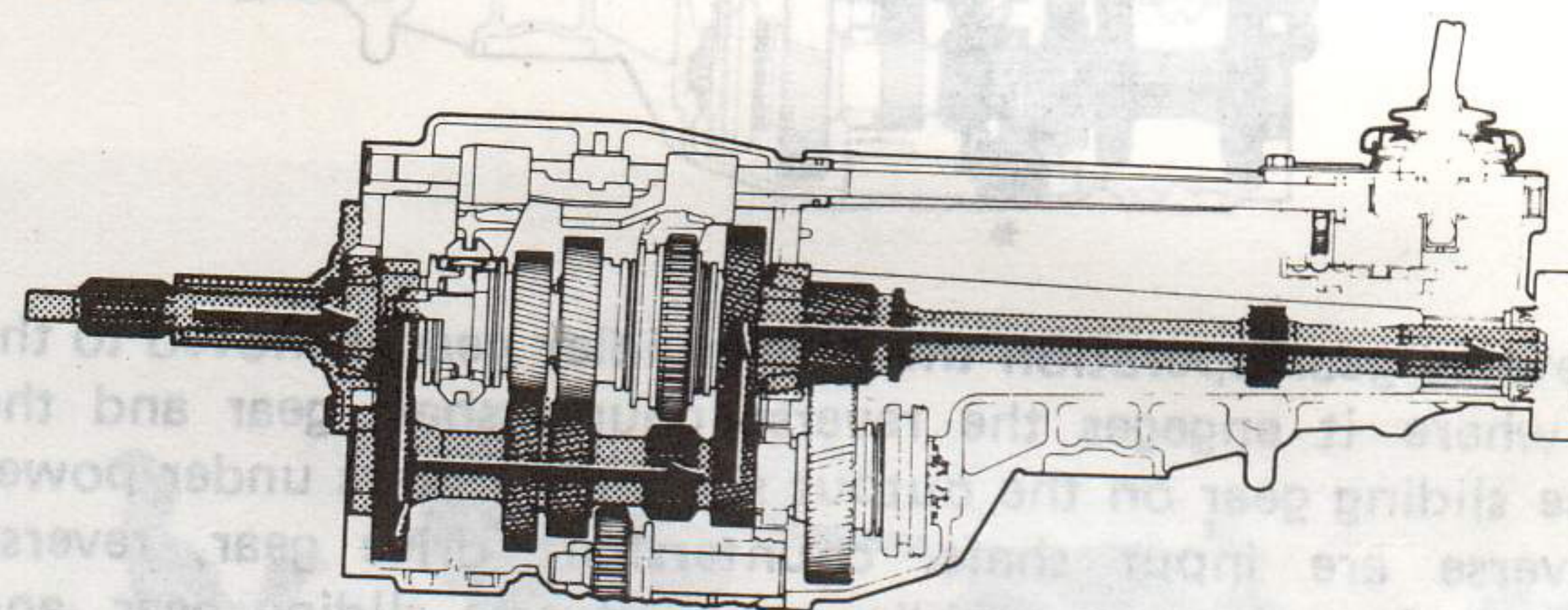
	Gear Ratio	No. of Teeth Mainshaft	No. of Teeth Countershaft	No. of Teeth Reverse Idler
Input		22	35	
1st	3.500	33	15	
2nd	2.144	31	23	
3rd	1.356	29	34	
4th	1.000			
5th	0.780	25	51	
Reverse	3.393	32	15	20

POWER FLOW

NEUTRAL GEAR ROTATION

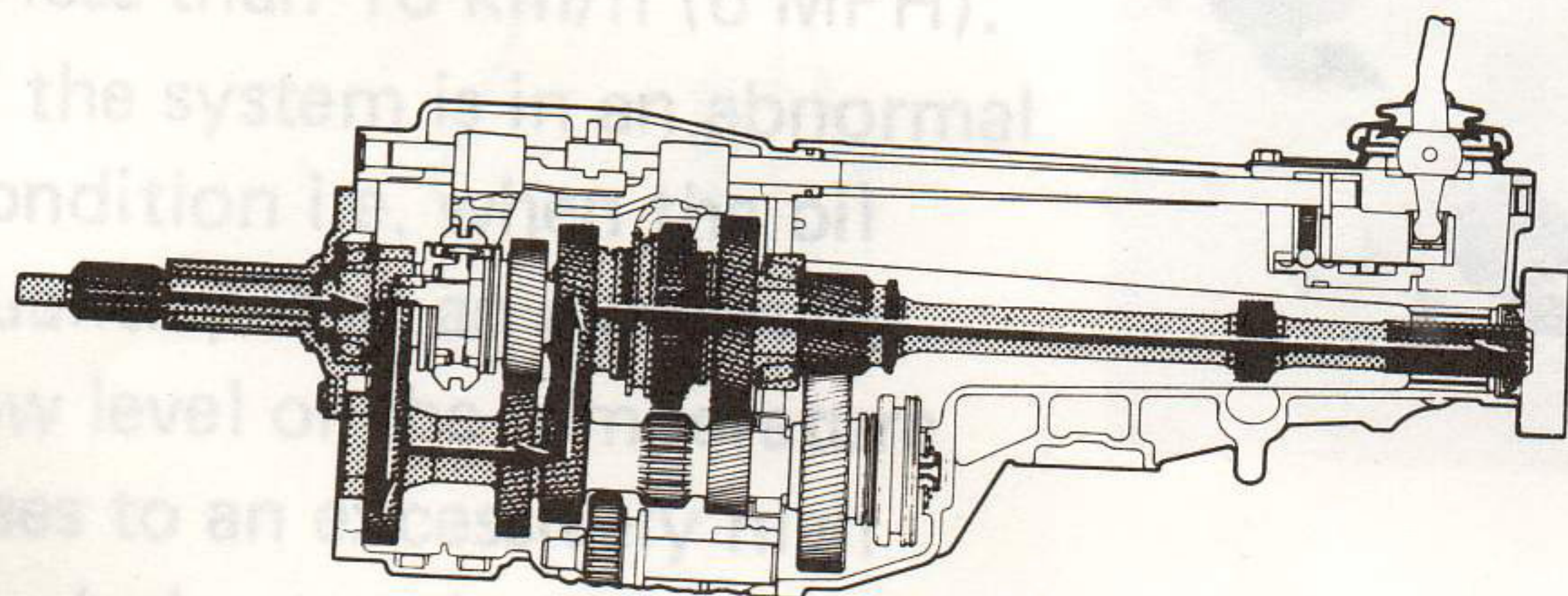


FIRST GEAR



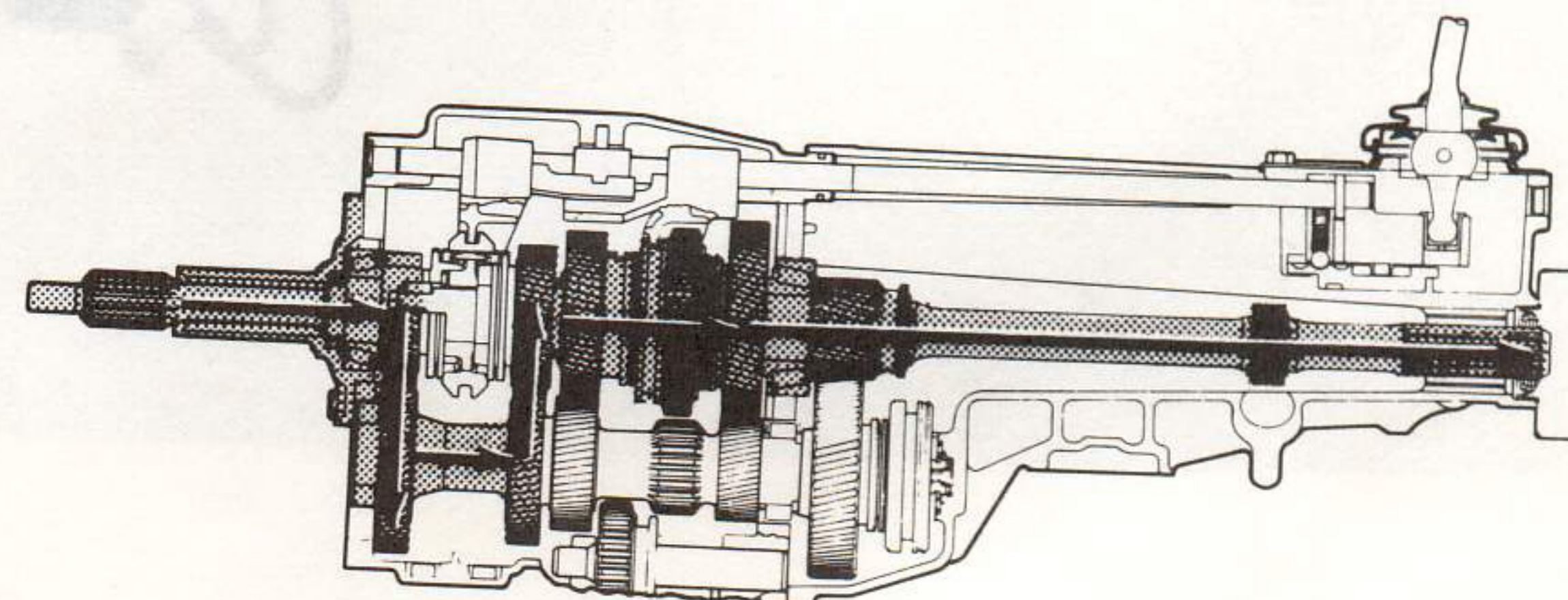
For first gear operation, the 1st and 2nd speed synchronizer sleeve (reverse sliding gear) is moved to the rear, where it engages the clutch teeth of the 1st speed mainshaft gear. The gears under power in 1st speed are input shaft, countershaft drive gear, countershaft 1st gear, 1st mainshaft gear, and output shaft.

SECOND GEAR



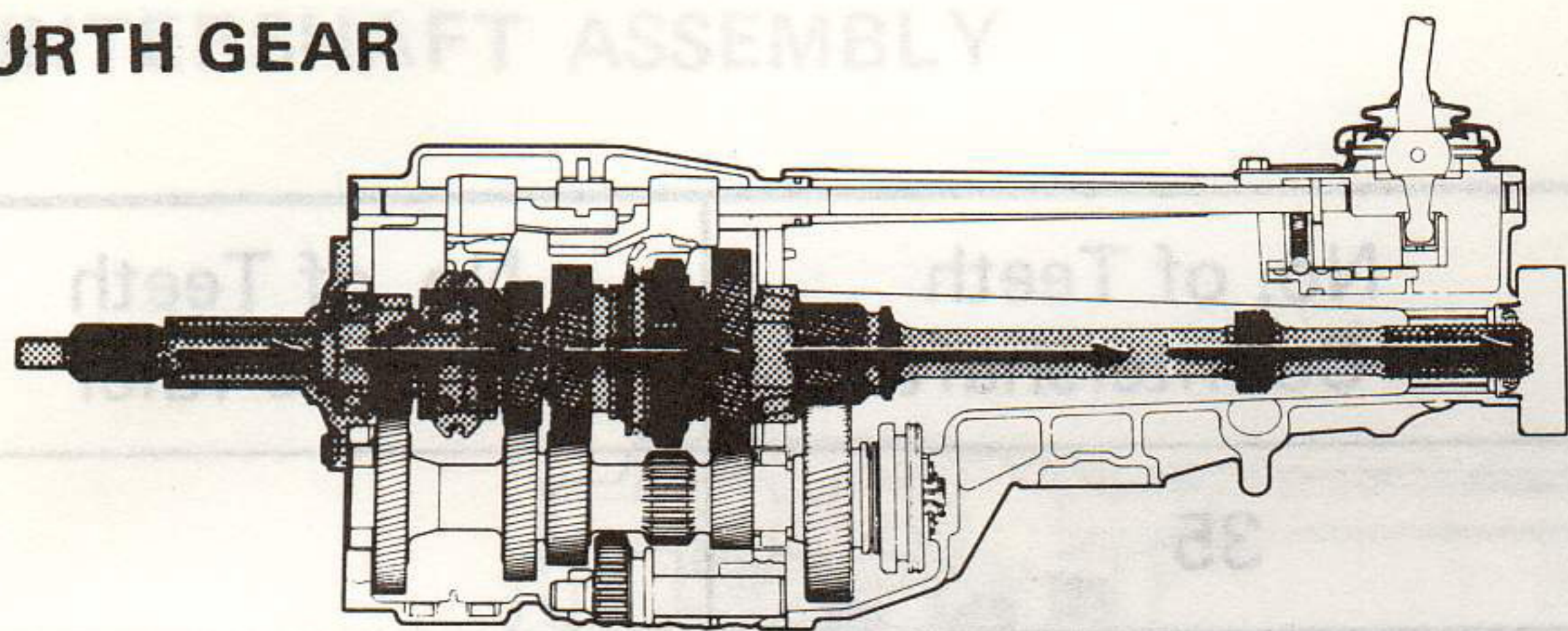
For 2nd gear operation, the 1st and 2nd speed synchronizer sleeve (reverse sliding gear) is moved forward, where it engages the clutch teeth of the 2nd speed mainshaft gear. The gears under power in 2nd speed are input shaft, countershaft drive gear, countershaft 2nd gear, 2nd mainshaft gear, and output shaft.

THIRD GEAR



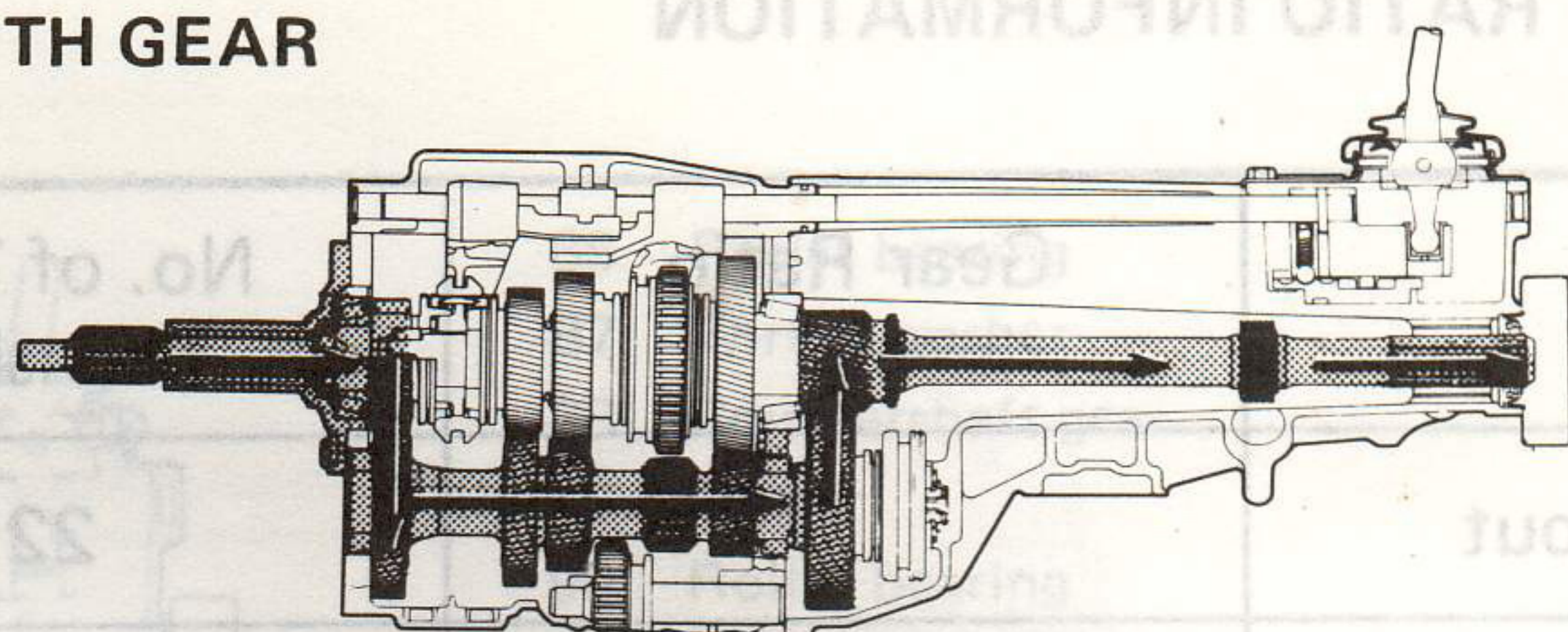
For 3rd gear operation, the 3rd and 4th speed synchronizer sleeve is moved to the rear, where it engages the clutch teeth of the 3rd speed mainshaft gear. The gears under power in 3rd speed are input shaft, countershaft drive gear, countershaft 3rd gear, 3rd mainshaft gear, and output shaft.

FOURTH GEAR



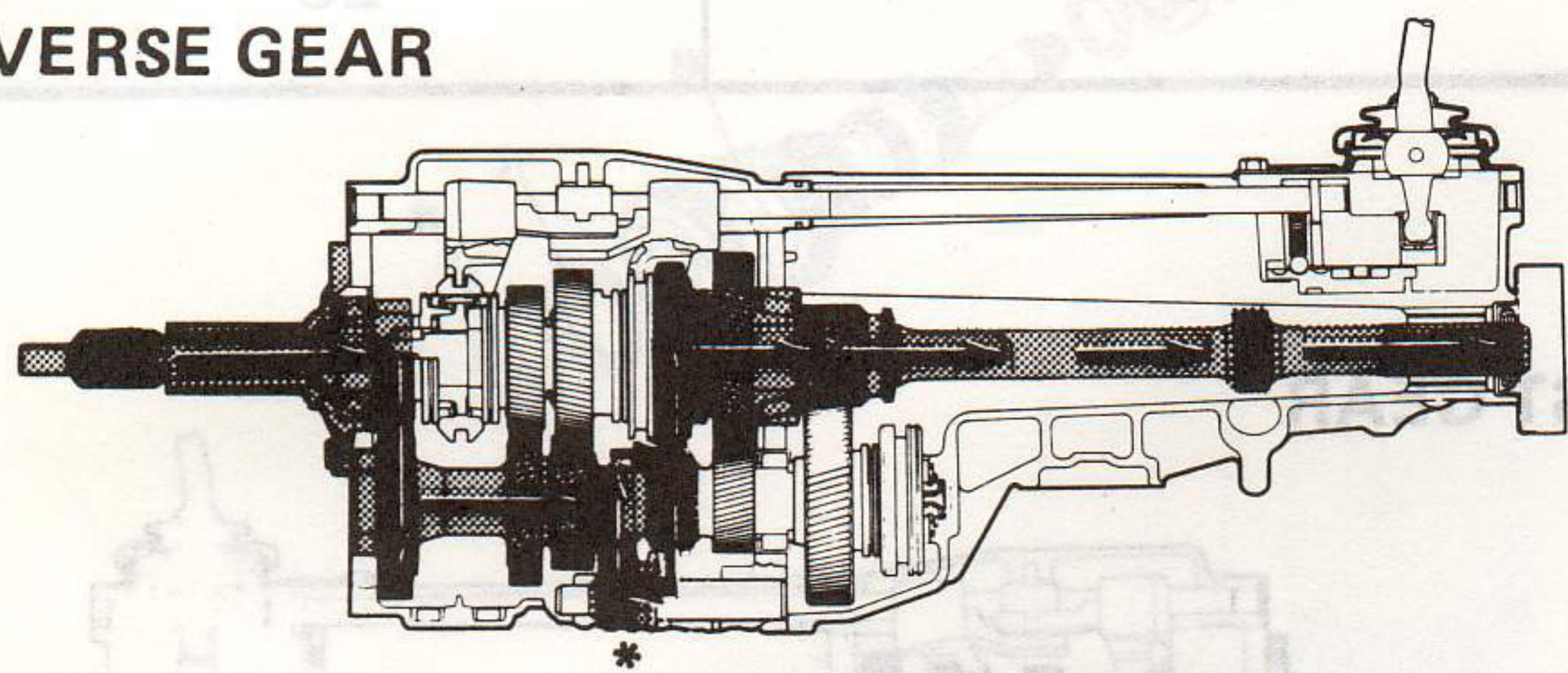
For 4th gear operation, the 3rd and 4th speed synchronizer sleeve is moved forward, where it engages the clutch teeth of the input shaft (main drive gear). The power flow is then transferred straight through the transmission, directly from input shaft to output shaft.

FIFTH GEAR



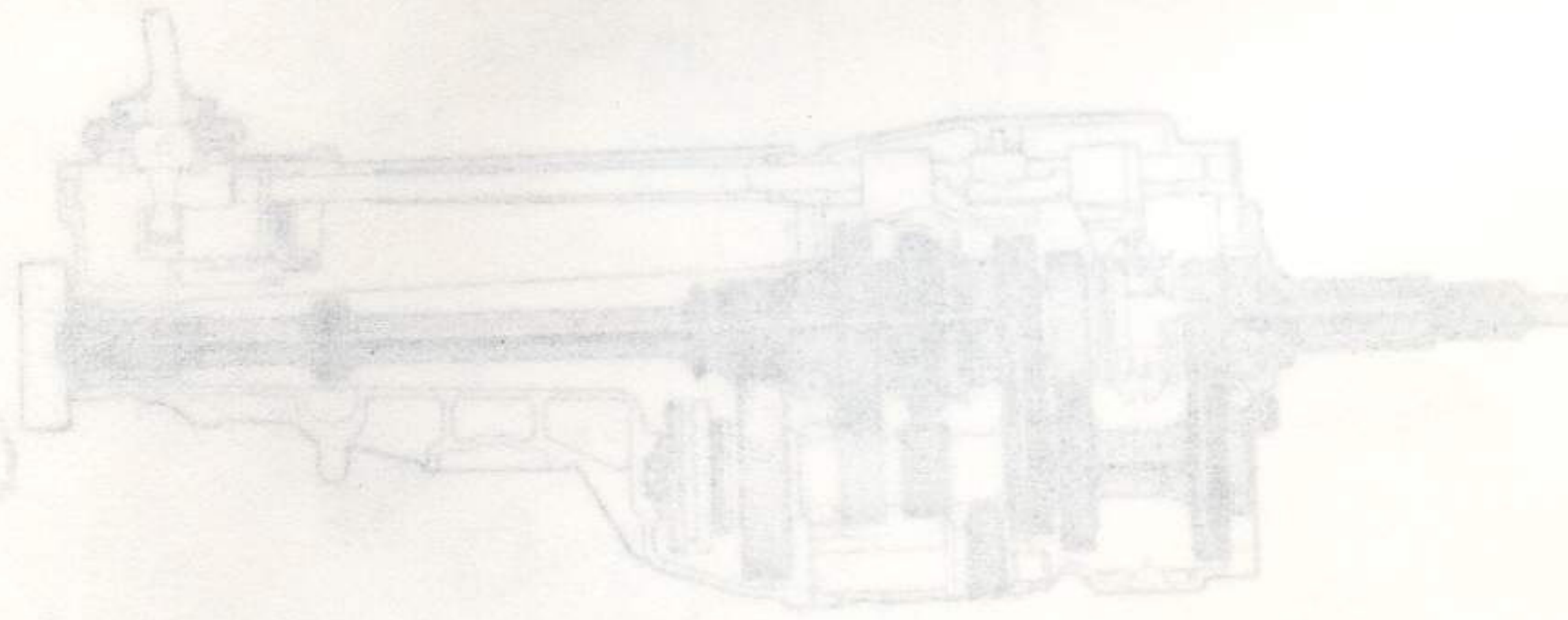
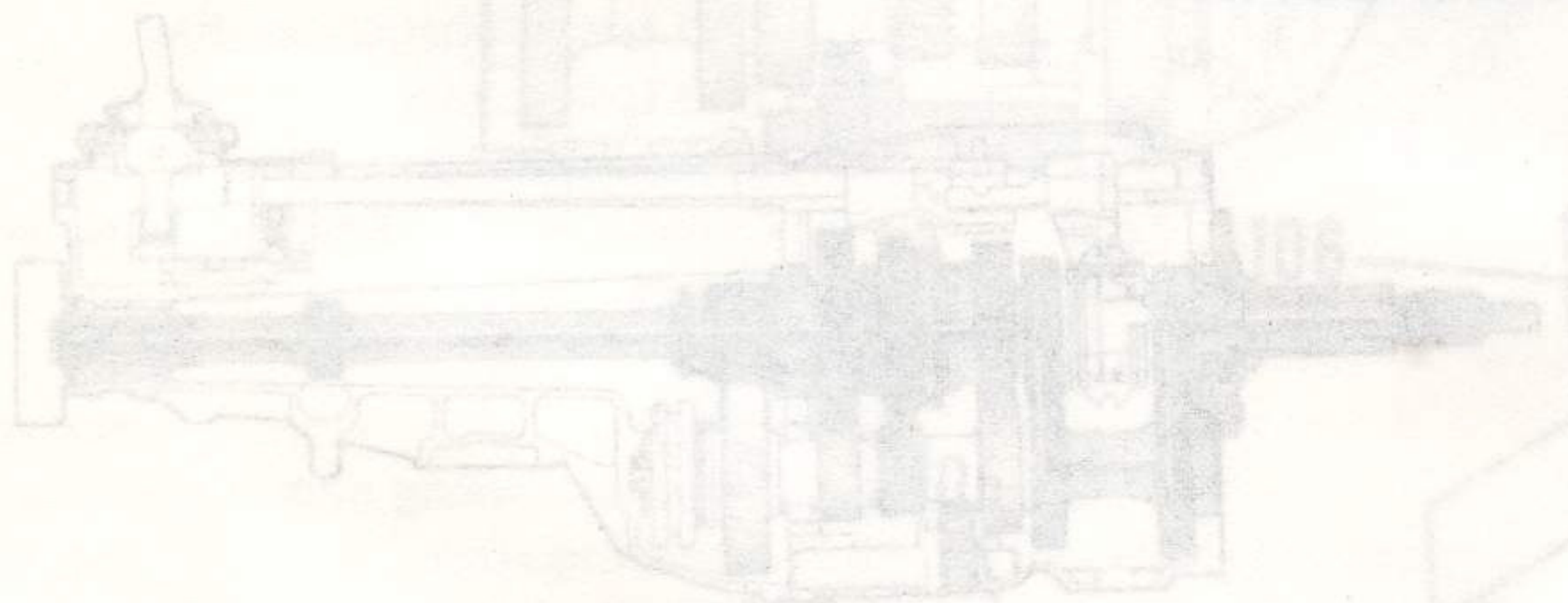
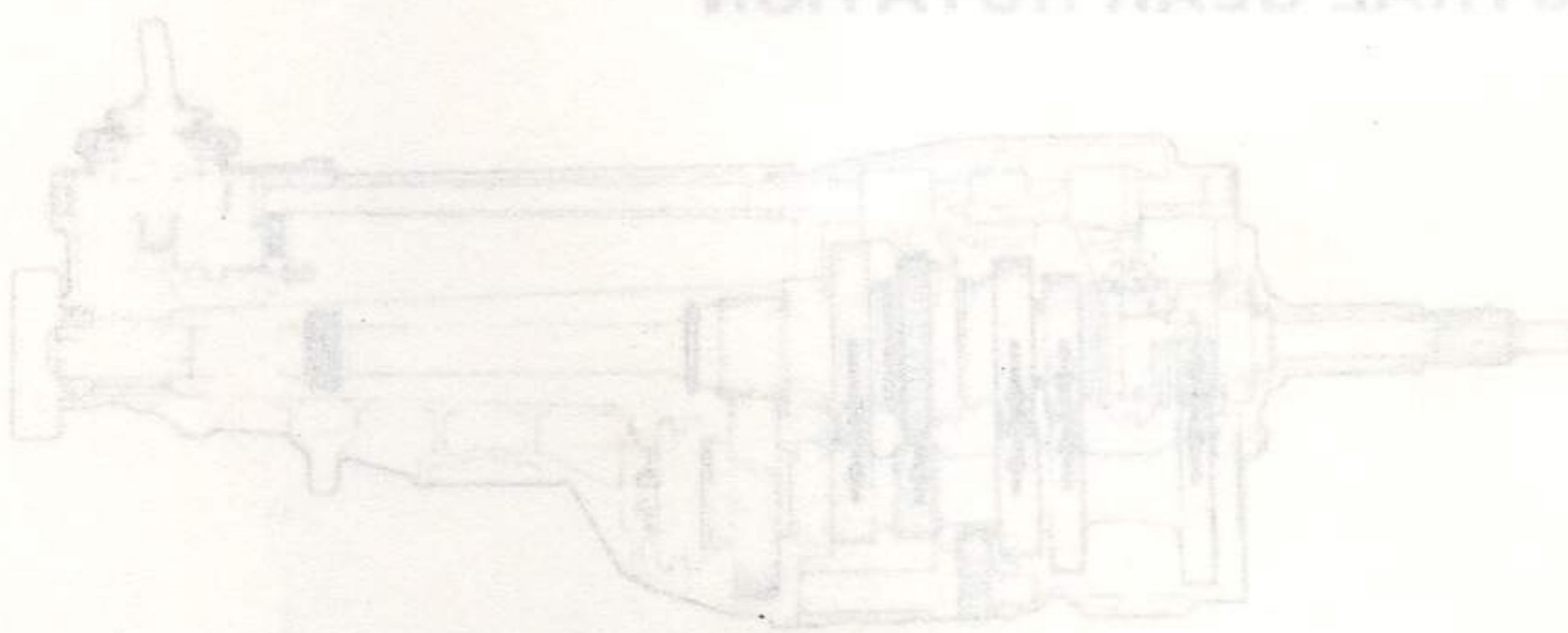
For 5th gear operation, the 5th speed synchronizer sleeve is moved forward, where it engages the clutch teeth of the 5th speed countershaft gear. The gears under power in 5th speed are input shaft, countershaft drive gear, 5th speed countershaft gear, 5th speed mainshaft gear, and output shaft.

REVERSE GEAR



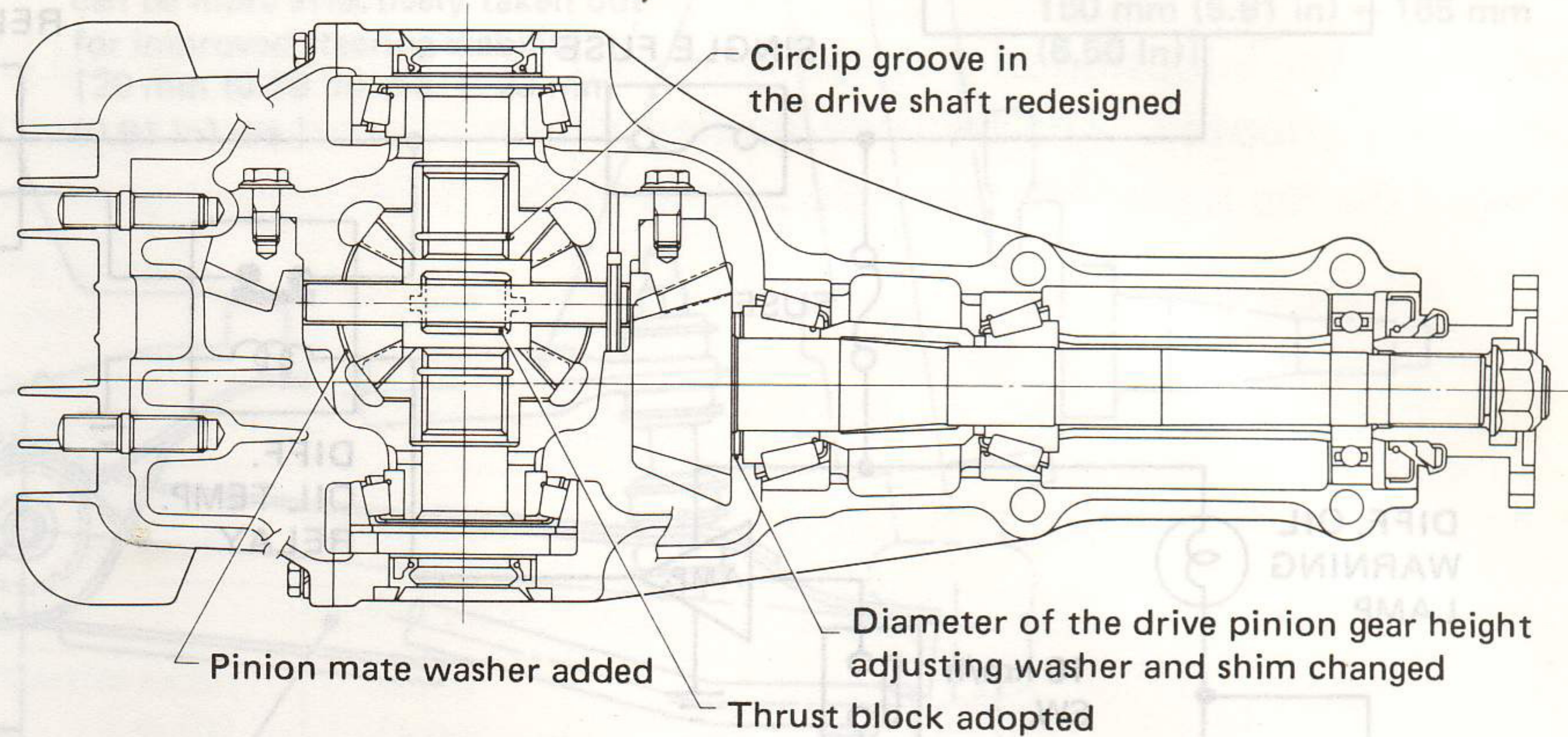
For reverse gear operation the reverse idler gear is moved to the rear, where it engages the reverse countershaft gear and the reverse sliding gear on the output shaft. The gears under power in reverse are input shaft, countershaft drive gear, reverse countershaft gear, reverse idler gear, reverse sliding gear, and output shaft.

* Note: This is not the actual location of the reverse idler gear in the case. It is placed in the drawing in this location for diagrammatic purposes only.



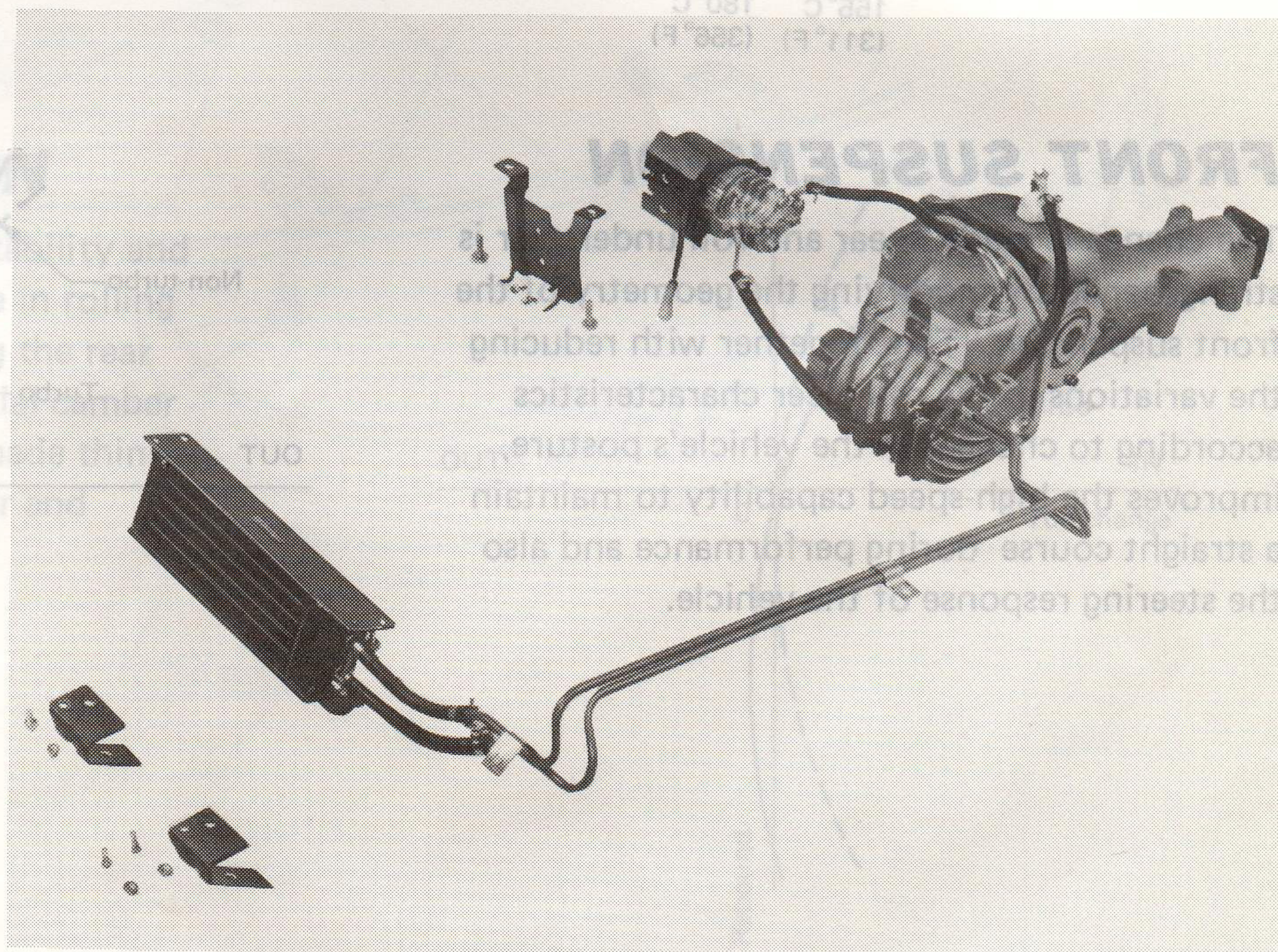
DIFFERENTIAL CARRIER

- The circlip groove in the drive shaft has been changed in shape and a thrust block added, thus reducing the raps of the differential gear during starting and shifting.
- In order to reduce differential gear noises, the height washer seating diameter and height washer diameter of the hypoid drive pinion have been increased in diameter from 46 to 54 mm (1.81 to 2.13 in).
- The pinion mate now uses additional thrust washers for added wear resistance.

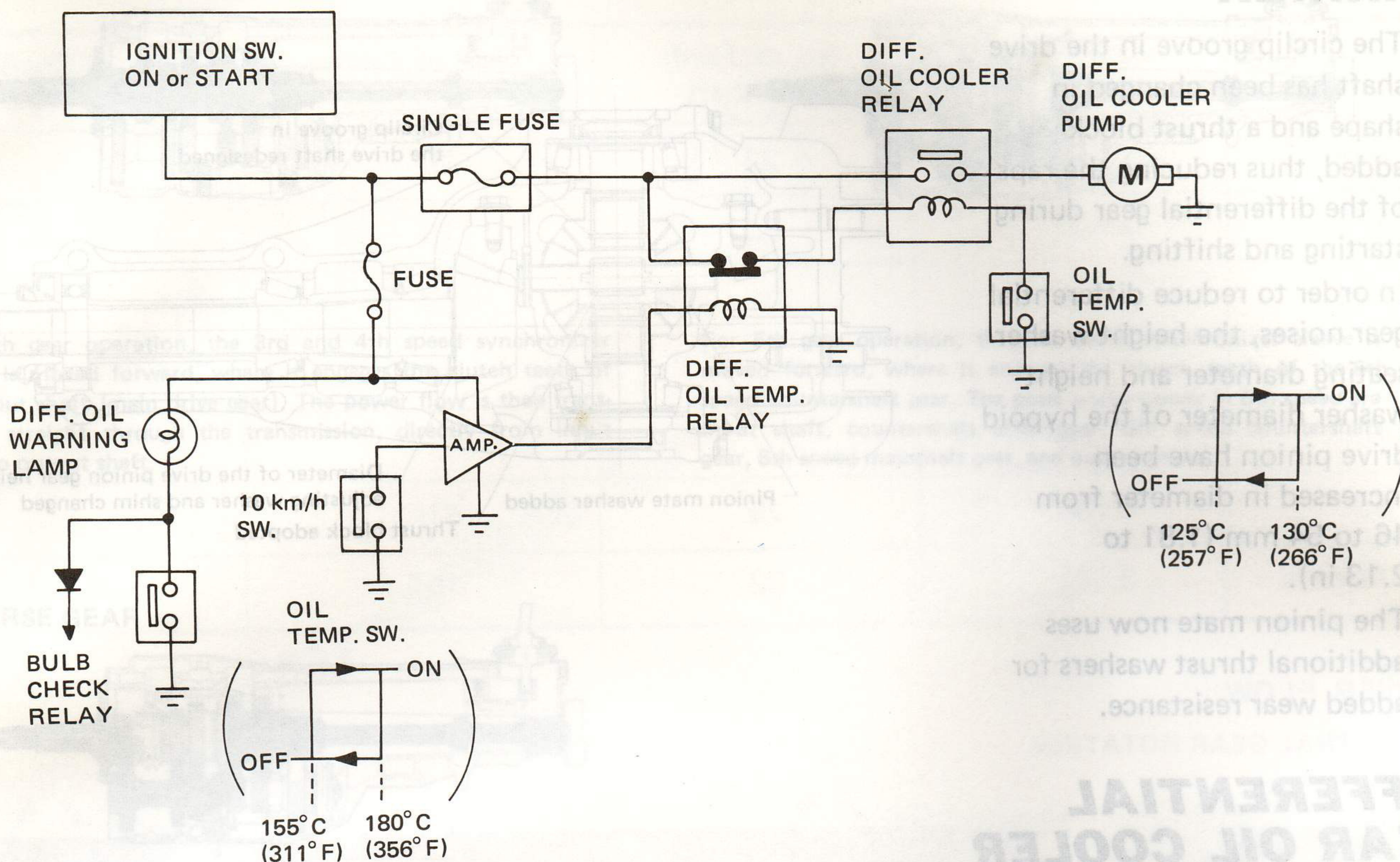


DIFFERENTIAL GEAR OIL COOLER

- A new system, which circulates oil with an electric pump and cools oil with an oil cooler, has been adopted.
- The pump automatically repeats on-off operation according to the temperatures of the differential gear oil. [Off → On 130°C (266°F), On → Off 125°C (257°F)]. However, the pump will not operate when the vehicle speed is less than 10 km/h (6 MPH).
- If the system is in an abnormal condition i.e. when the oil quantity is at an extremely low level or the temperature rises to an excessively high level, the warning lamp in the combination meter will illuminate.

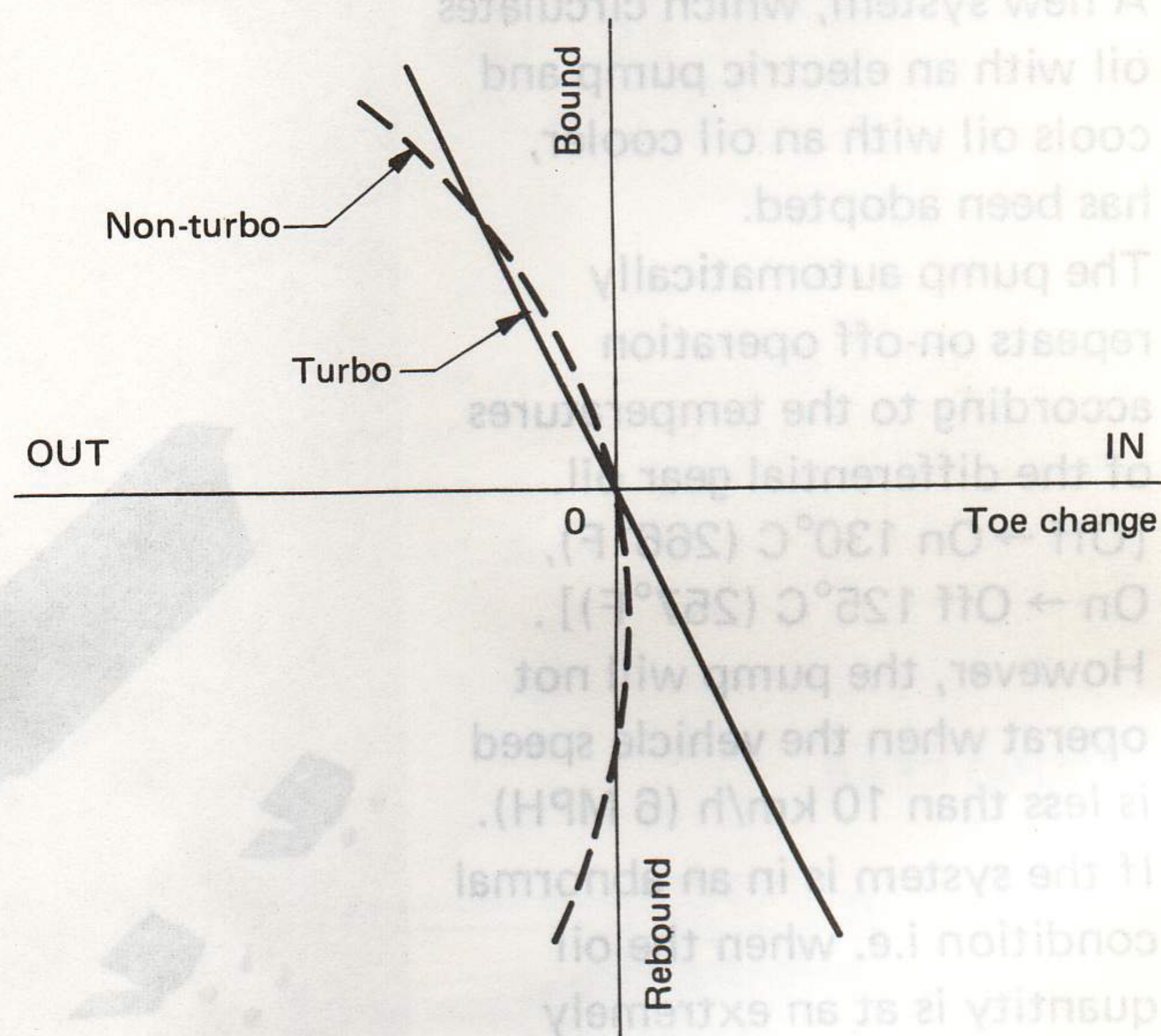


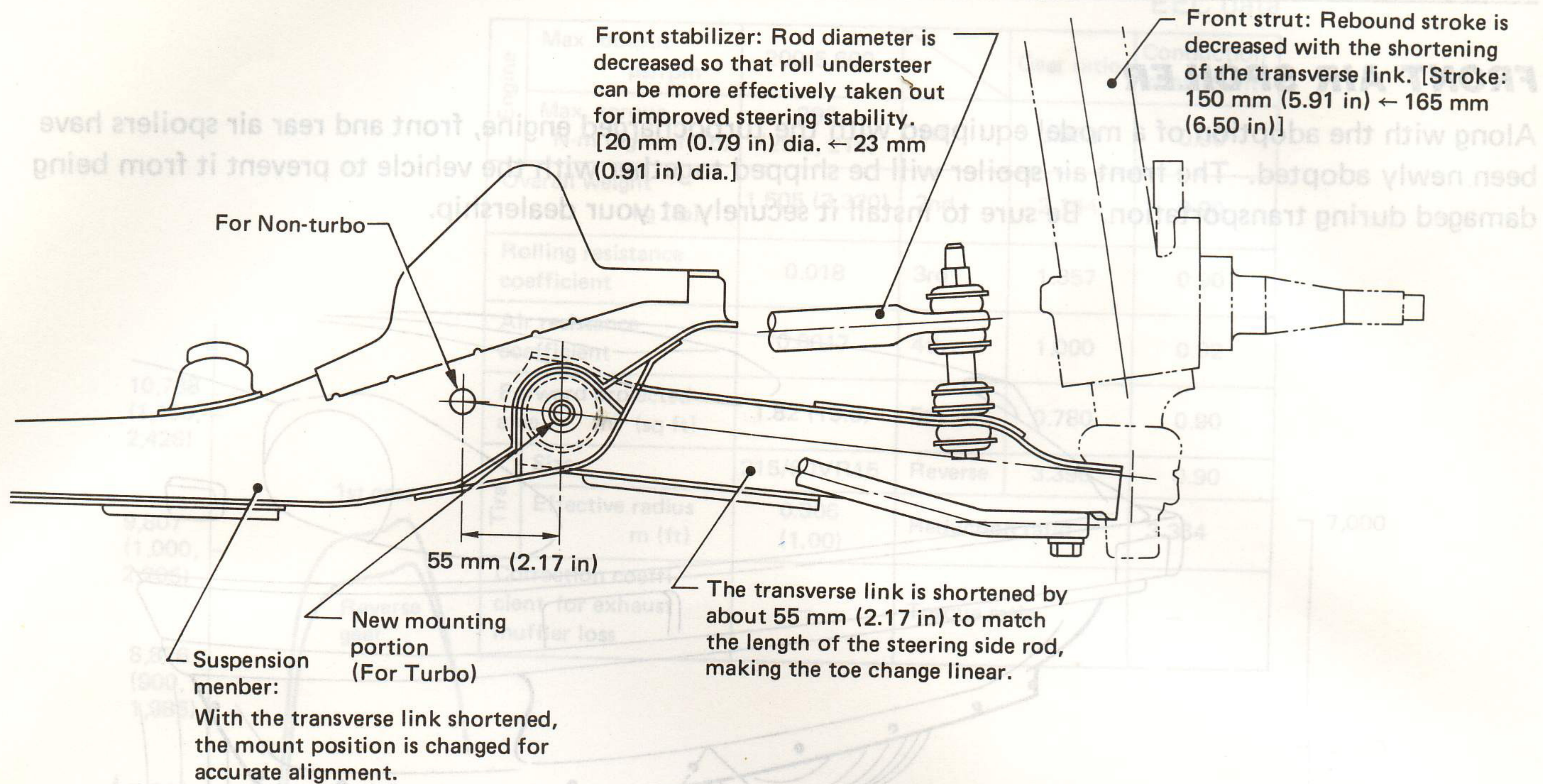
SYSTEM SCHEMATIC



FRONT SUSPENSION

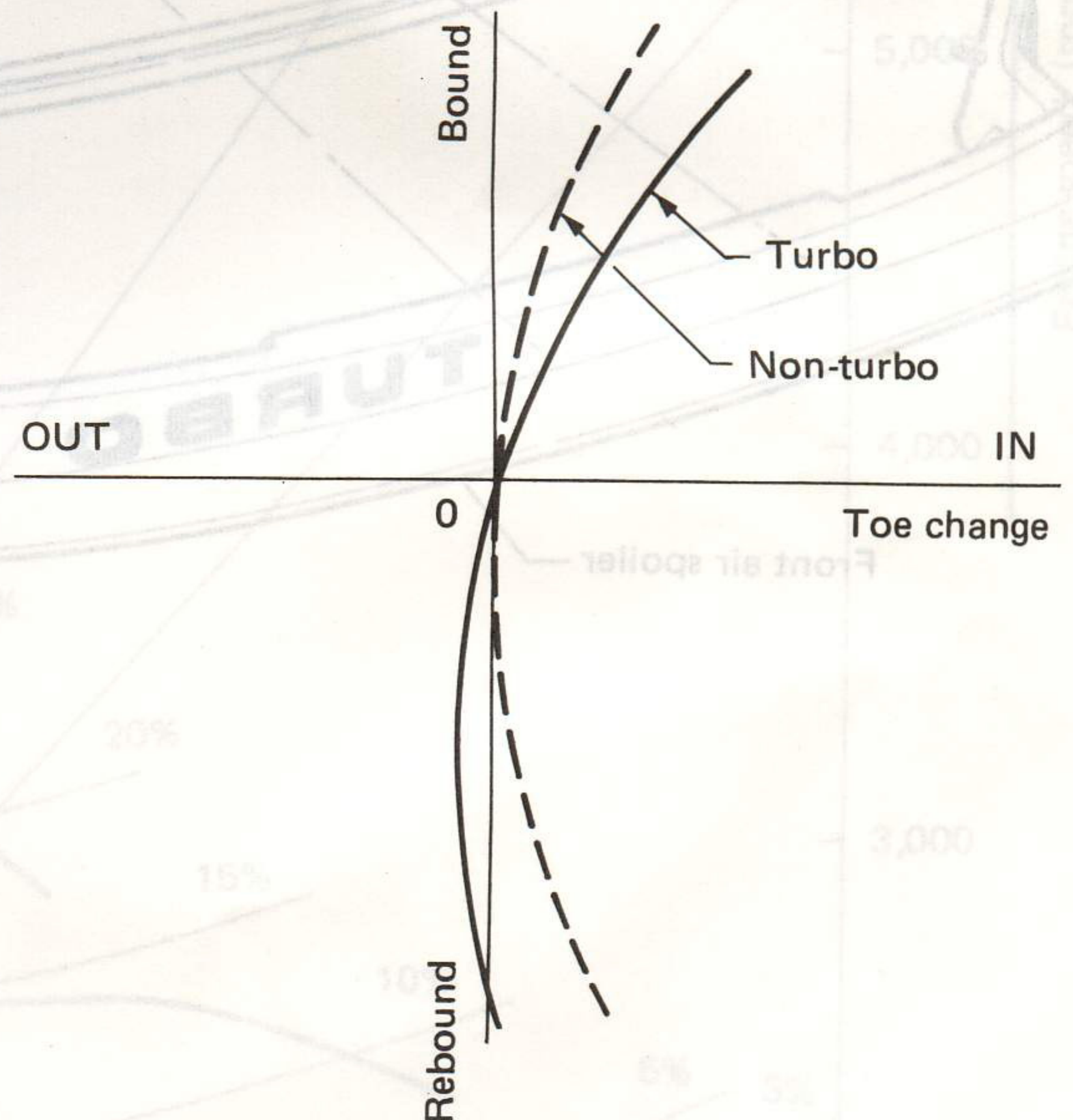
Toe change is made linear and roll understeer is strengthened by modifying the geometry of the front suspension. This, together with reducing the variations in the roll steer characteristics according to changes in the vehicle's posture, improves the high-speed capability to maintain a straight course during performance and also the steering response of the vehicle.





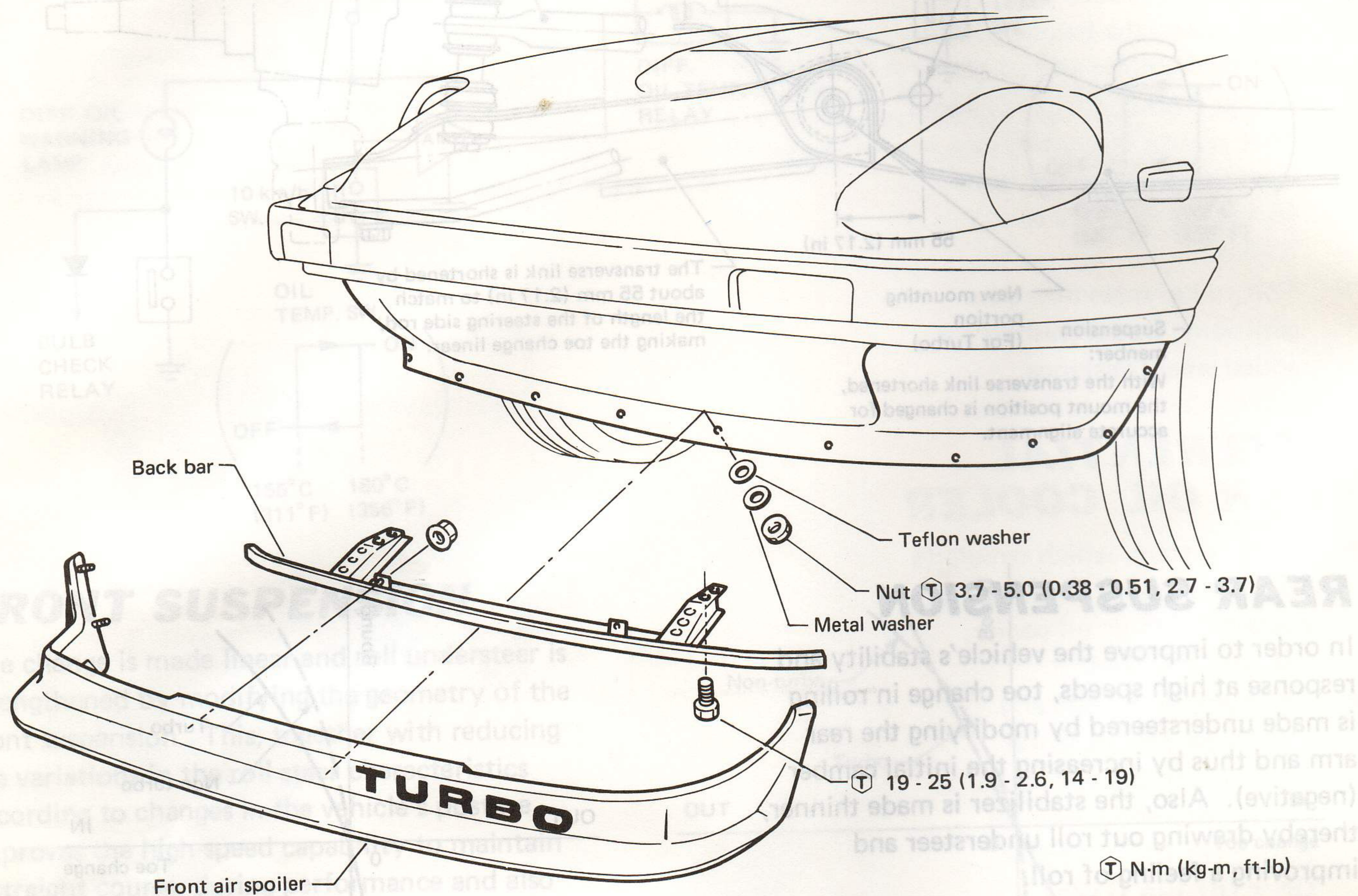
REAR SUSPENSION

In order to improve the vehicle's stability and response at high speeds, toe change in rolling is made understeered by modifying the rear arm and thus by increasing the initial camber (negative). Also, the stabilizer is made thinner, thereby drawing out roll understeer and improving a feeling of roll.



FRONT AIR SPOILER

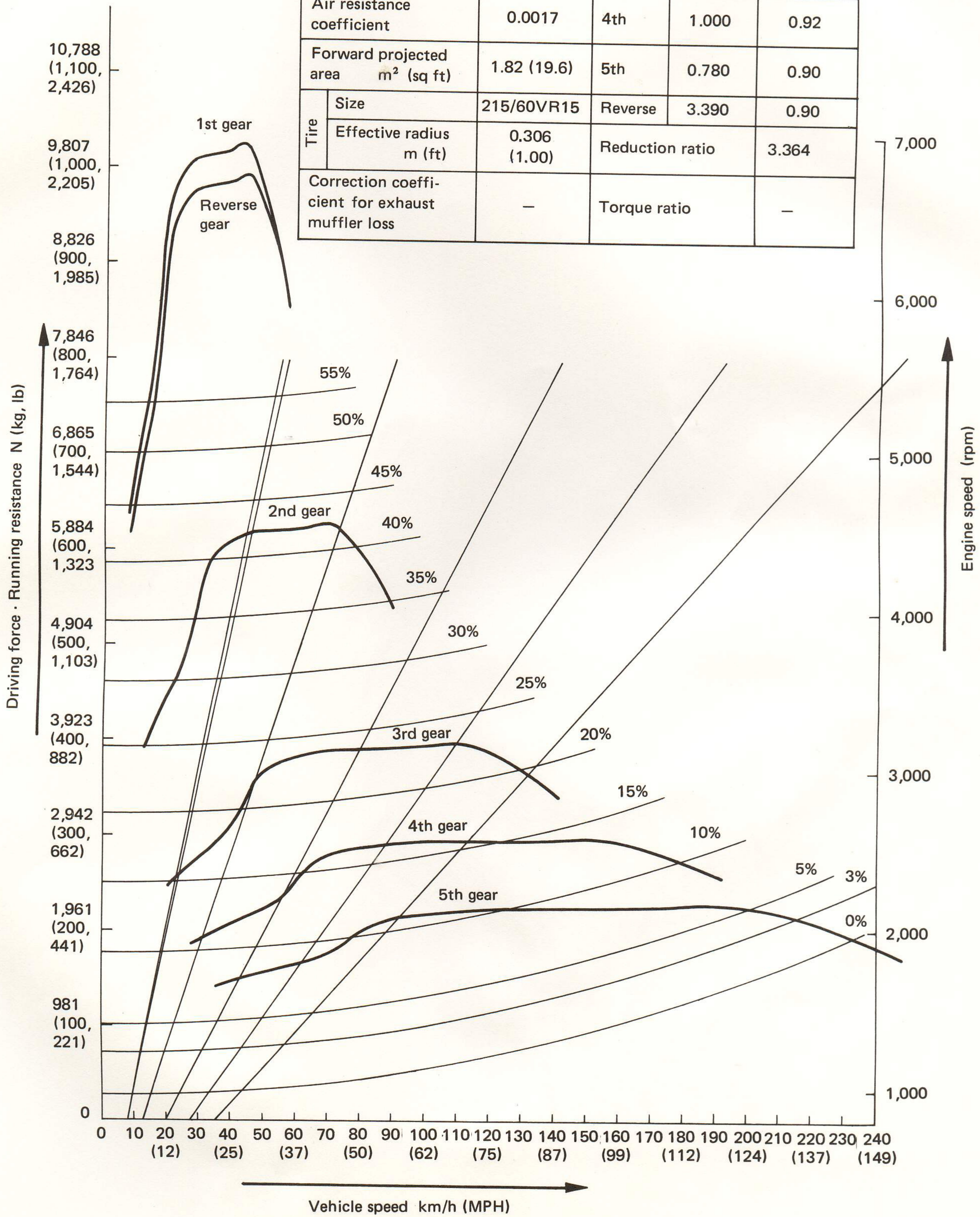
Along with the adoption of a model equipped with the turbocharged engine, front and rear air spoilers have been newly adopted. The front air spoiler will be shipped together with the vehicle to prevent it from being damaged during transportation. Be sure to install it securely at your dealership.



ENGINE PERFORMANCE CURVE

EEC data

Engine	Max. output ps/rpm	200/5,600		Gear ratio	Conduction coefficient
	Max. torque N·m (kg·m, ft·lb)	290 (29.6, 214)			
Overall weight kg (lb)		1,505 (3,320)	2nd	2.144	0.90
Rolling resistance coefficient		0.018	3rd	1.357	0.90
Air resistance coefficient		0.0017	4th	1.000	0.92
Forward projected area m ² (sq ft)		1.82 (19.6)	5th	0.780	0.90
Tire	Size	215/60VR15	Reverse	3.390	0.90
	Effective radius m (ft)	0.306 (1.00)	Reduction ratio		3.364
Correction coeffi- cient for exhaust muffler loss		—	Torque ratio		—



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