

FRONT AXLE & FRONT SUSPENSION

SECTION **FA**

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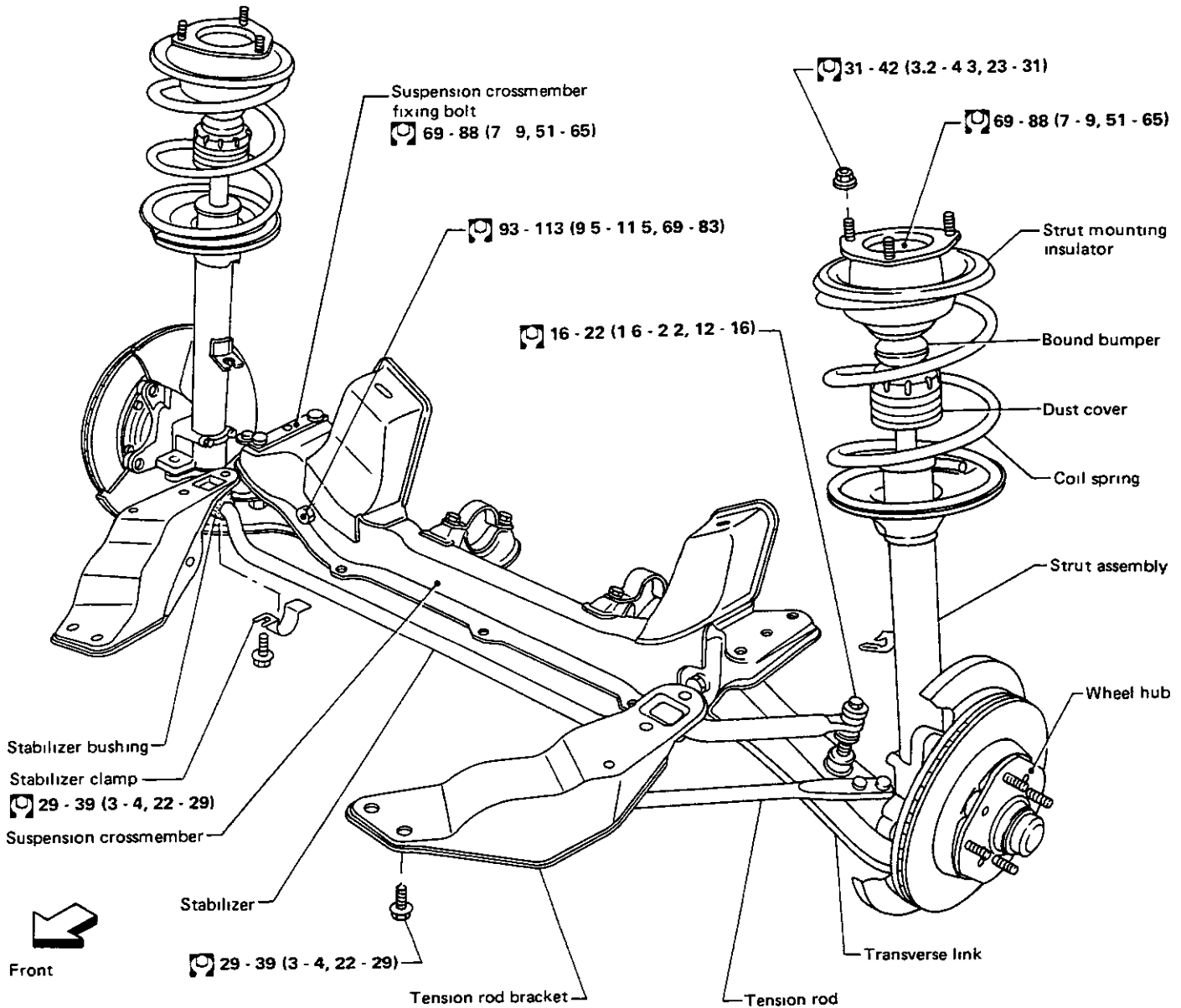
FA

FRONT AXLE AND FRONT SUSPENSION

Wheel alignment

- Camber, caster and kingpin inclination are preset at factory and cannot be adjusted
- The vehicle requires only toe-in adjustments
1 - 3 mm (0.04 - 0.12 in)

Refer to section MA for Checking Wheel Alignment



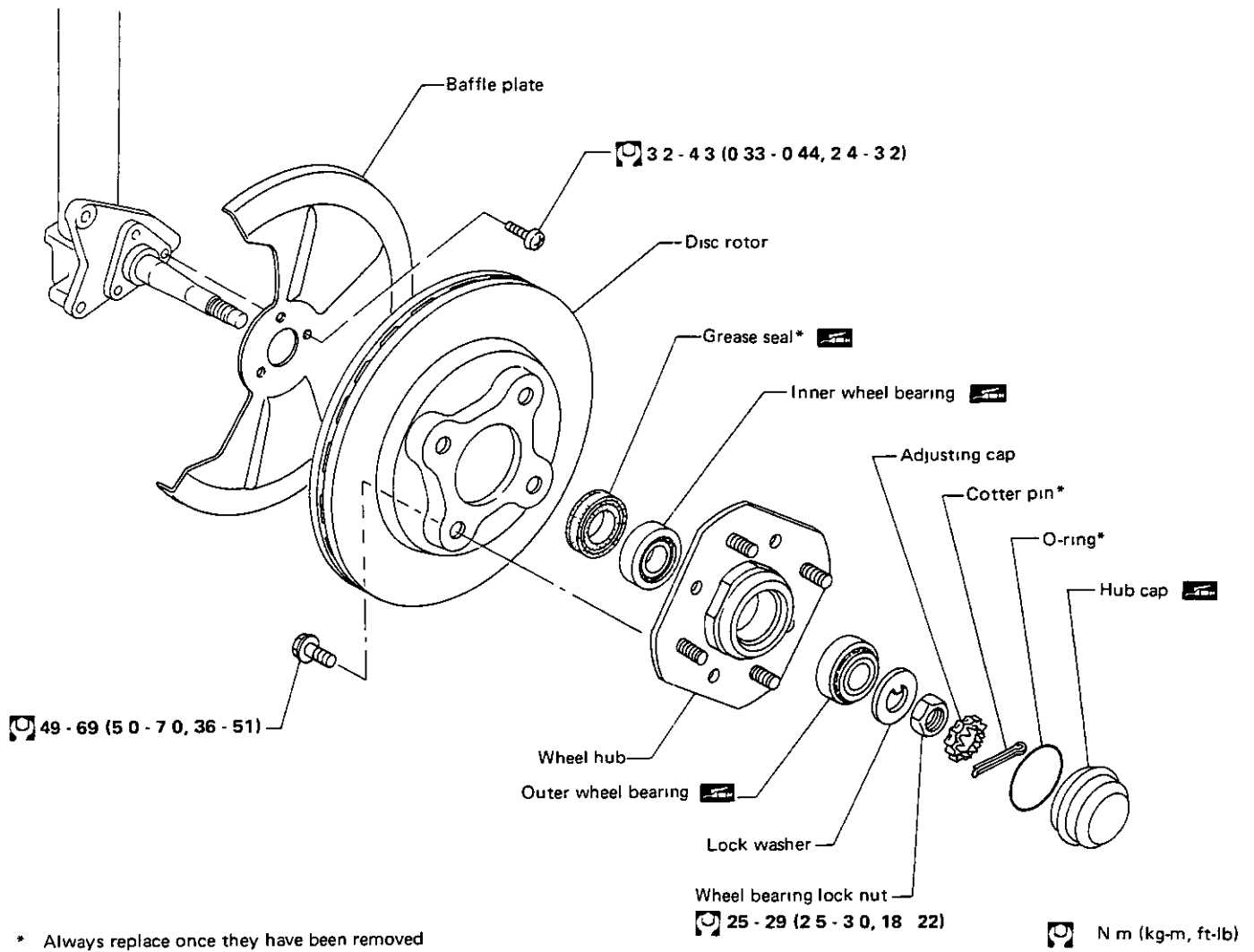
Wheel bearing

- Do not overtighten wheel bearing nut, as this can cause wheel bearing seizure
- Axial play 0 mm (0 in)
- Tightening torque 25 - 29 N·m (2.5 - 3.0 kg·m, 18 - 22 ft·lb)
- Return angle 60°
- Rotation starting torque
 - with new grease seal 0.39 - 0.83 N·m (4.0 - 8.5 kg·cm, 3.5 - 7.4 in·lb)
 - with used grease seal 0.10 - 0.44 N·m (1.0 - 4.5 kg·cm, 0.87 - 3.9 in·lb)
- As measured at wheel hub bolt
 - with new grease seal Less than 17.7 N (1.8 kg, 4.0 lb)
 - with used grease seal Less than 6.9 N (0.7 kg, 1.5 lb)
- When measuring starting torque, do not include "dragging" resistance with brake pads

\square N·m (kg·m, ft·lb)

SFA564

FRONT AXLE — Wheel Hub

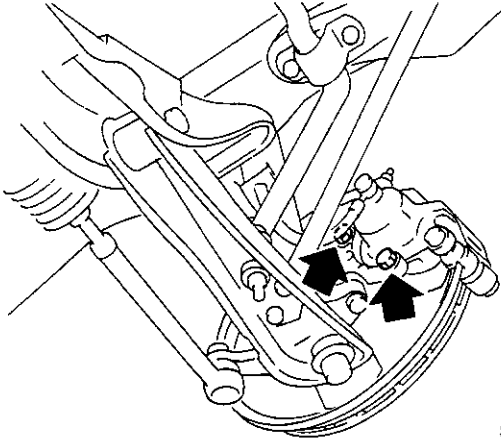


FRONT AXLE — Wheel Hub

Removal

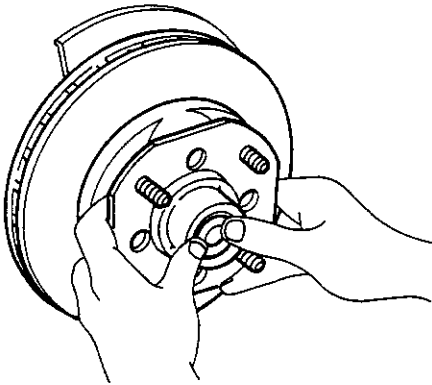
- 1 Remove brake caliper assembly

Brake hose must not be disconnected from brake caliper assembly



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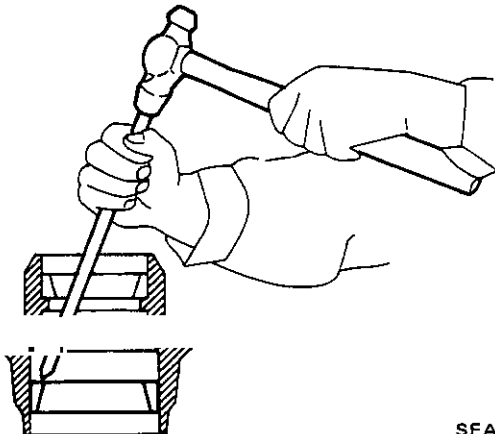
- 2 Remove wheel hub with disc brake rotor and wheel bearing from spindle



SFA568

Be careful not to drop outer bearing.

- 3 If it is necessary to replace bearing outer race, drive it out from hub with a brass drift and mallet



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Inspection

WHEEL BEARING

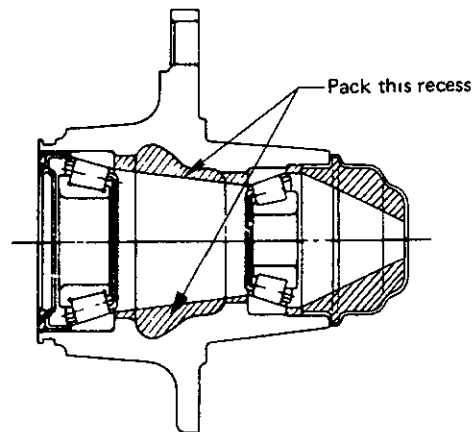
Check wheel bearing to see that it rolls freely and is free from noise, crack, pitting, or wear

WHEEL HUB

Check wheel hub for crack by means of a magnetic exploration or dyeing test, and replace if cracked

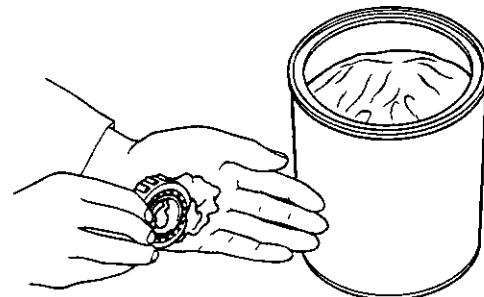
Installation

- Pack hub and hub cap with recommended multi-purpose grease up to shaded portions



FA261

- Coat each bearing cone with recommended multi-purpose grease.



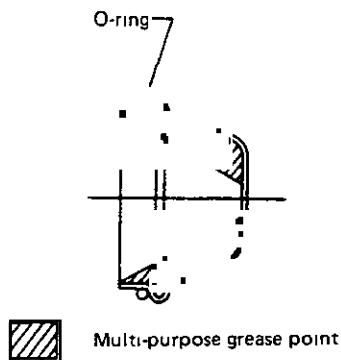
FA781

FRONT AXLE — Wheel Hub

Preload Adjustment


After wheel bearing has been replaced or front axle has been reassembled be sure to adjust wheel bearing preload as described below

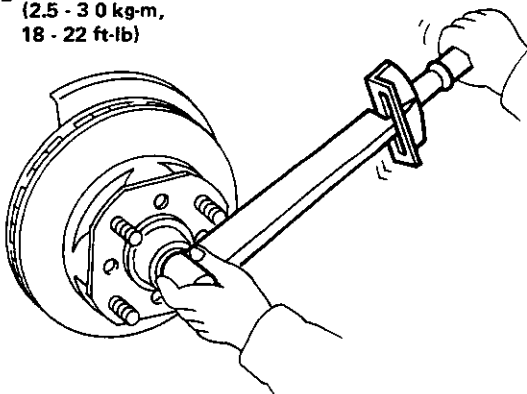
1. Before adjustment, thoroughly clean all parts to prevent dirt entry.
2. Apply recommended multi-purpose grease sparingly to the following parts
 - Threaded portion of spindle
 - Contact surface between lock washer and outer wheel bearing
 - Hub cap and O-ring
 - Grease seal lip



SMA203A

3. Tighten wheel bearing lock nut.

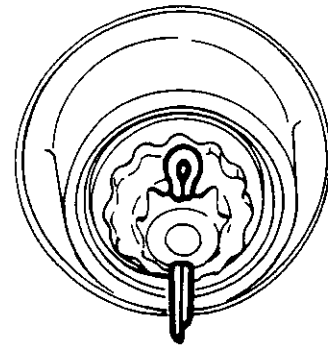
 25 - 29 N m
(2.5 - 3.0 kg-m,
18 - 22 ft-lb)



SFA587

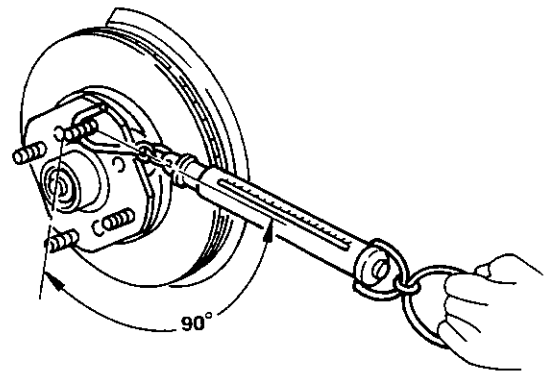
4. Turn wheel hub several times in both directions to seat wheel bearing correctly
5. Again tighten wheel bearing nut
6. Turn back wheel bearing lock nut within 60°.

7. Fit adjusting cap and new cotter pin.



SMA120

8. Measure wheel bearing preload and axial play

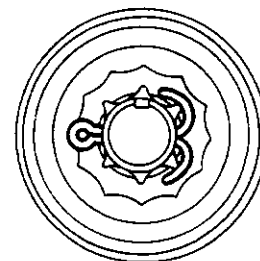


Axial play 0 mm (0 in)
When bearing preload
(As measured at wheel hub bolt)
With new parts
Less than 17.7 N (1.8 kg, 4.0 lb)
With used parts
Less than 6.9 N (0.7 kg, 1.5 lb)

SFA588

Repeat above procedures until correct starting torque is obtained

9. Spread cotter pin



SRA417

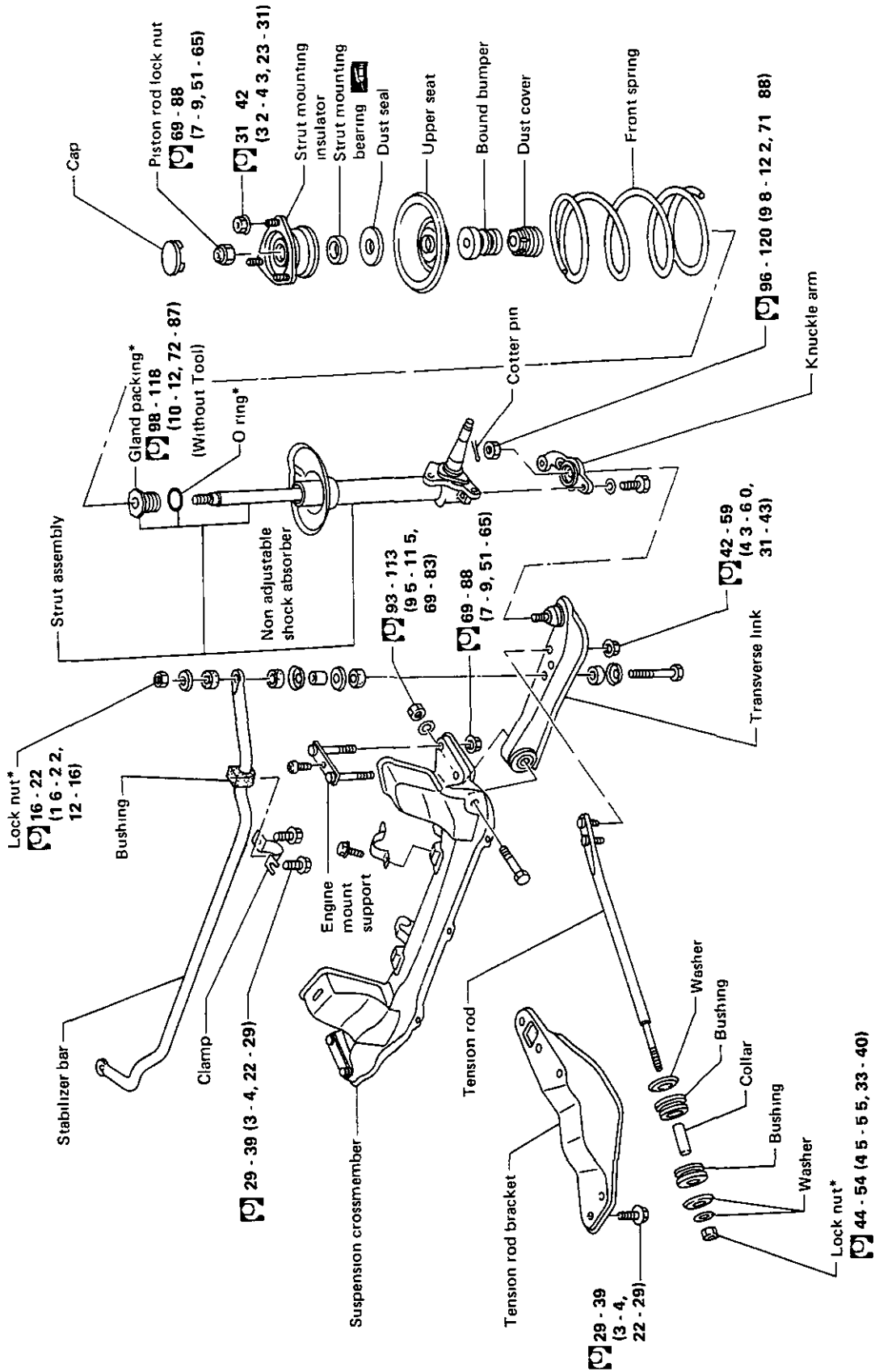
10. Install hub cap with new O-ring.

FRONT SUSPENSION

When removing each suspension part, check wheel alignment and adjust if necessary. Refer to section MA for front axle and front suspension. **When installing a bushing, do not allow it to project beyond the surface area of the washer.**

Do not allow the bushings and washers to come in contact with grease, oil, soapy water, etc.

* Always replace whenever disassembled

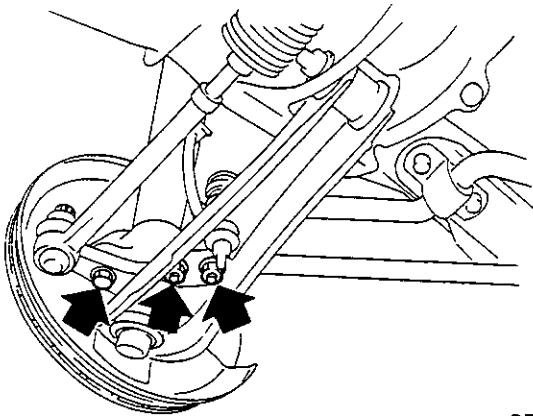


N m (kg m, ft-lb)

FRONT SUSPENSION — Spring and Strut Assembly

Removal and Installation

- Remove tension rod nuts and knuckle arm fixing bolts



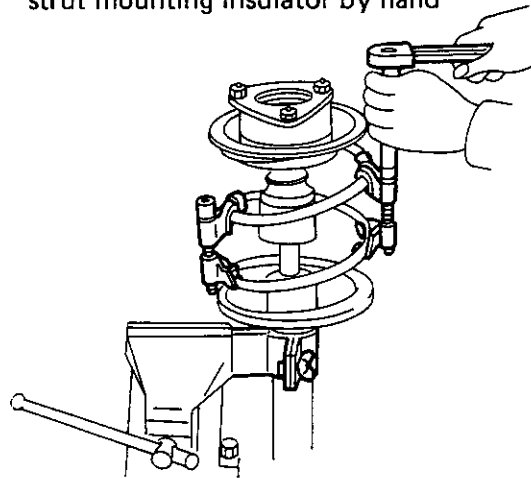
SFA570

Make sure brake hose is secure and not twisted.

Disassembly

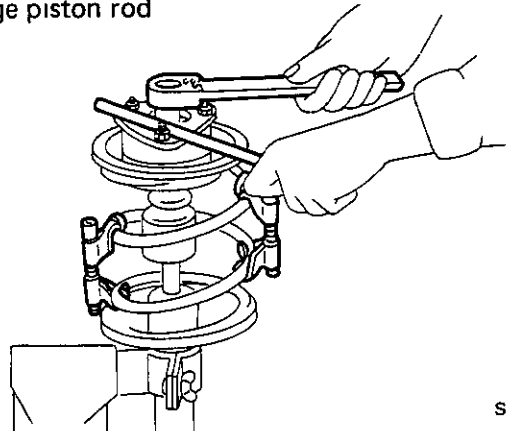
Avoid dirt and dust getting inside strut.

- Compress spring so as to permit turning of strut mounting insulator by hand



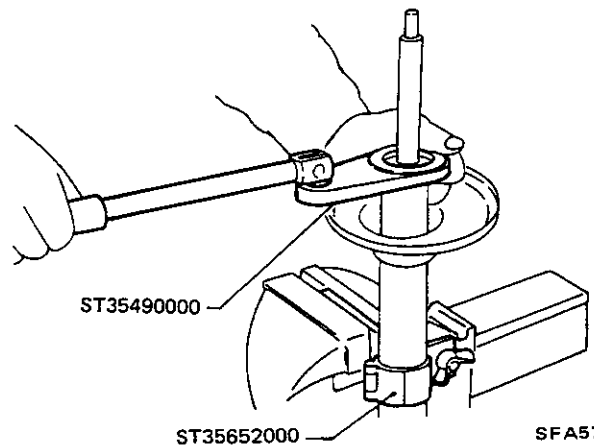
SFA571

- Remove piston rod lock nut so as not to damage piston rod



SFA572

- Remove gland packing with Tool Retract piston rod by pushing it down until it bottoms.



ST35490000

ST35652000

SFA573

- Slowly withdraw piston rod from cylinder together with piston guide.

FRONT SUSPENSION — Spring and Strut Assembly

Inspection

- Wash all parts, except for nonmetallic parts, clean with suitable solvent and dry with compressed air.
- Blow dirt and dust off of nonmetallic parts using compressed air
- a. Oil oozing out around gland packing does not call for strut replacement.
If oil leakage is evident on spring seat, check piston rod and gland packing to correct the cause of problem.
If oil leakage occurs on welded portion of outer strut casing, replace strut assembly.
- b. If shock absorber itself is malfunctioning, replace as shock absorber kit (including piston rod, cylinder, bottom valve and guide bushing).

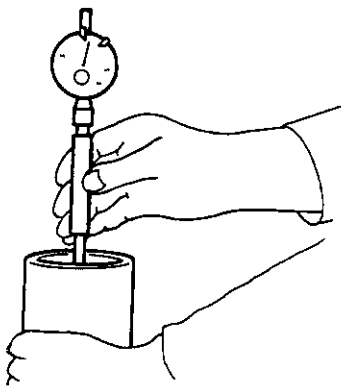
INNER CYLINDER AND OUTER CASING

- Inspect inner cylinder and outer casing for cracks, deformation or other damage. For inner cylinder damage, replace shock absorber. For outer casing damage, replace strut assembly

Inner diameter:

Inner cylinder

32.0 - 32.1 mm (1.260 - 1.264 in)

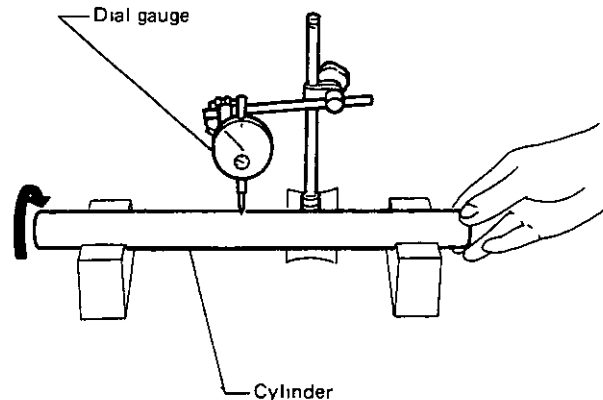


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Maximum runout.

Inner cylinder

Less than 0.2 mm (0.008 in)



SFA137

PISTON ROD

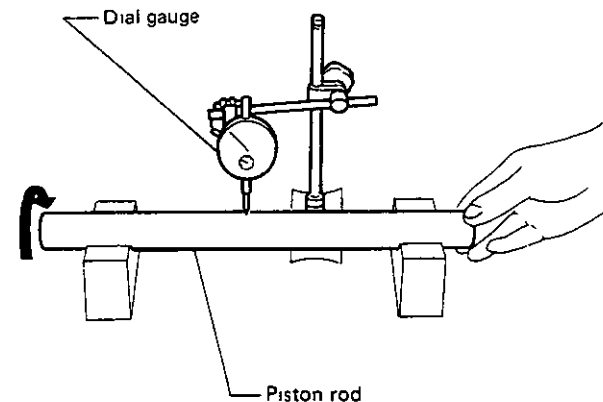
- Inspect piston rod for cracks, deformation or other damage. Replace shock absorber, if necessary
- Inspect threads for cracks or other damage. Replace shock absorber, if necessary.

Rod diameter:

21.78 - 21.94 mm (0.8575 - 0.8638 in)

Maximum runout

Less than 0.1 mm (0.004 in)



SFA137

STRUT MOUNTING INSULATOR

Replace if cemented rubber-to-metal portion are melted or cracked. Rubber parts should also be replaced, if deteriorated.

STRUT MOUNTING BEARING

Replace if inspection reveals abnormal noise or excessive rattle in axial direction

FRONT SUSPENSION — Spring and Strut Assembly

Assembly

Before assembly, keep away from dust to prevent entry of dust.

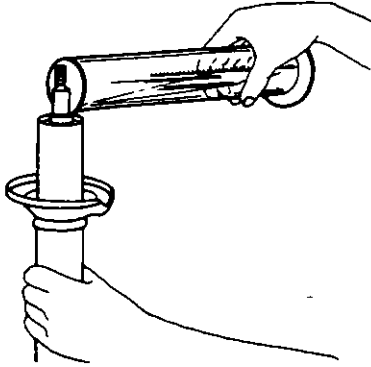
- Add correct amount of fluid

Use "NISSAN GENUINE STRUT FLUID" or equivalent.

Oil capacity is very important since performance of strut varies with amount of fluid in strut.

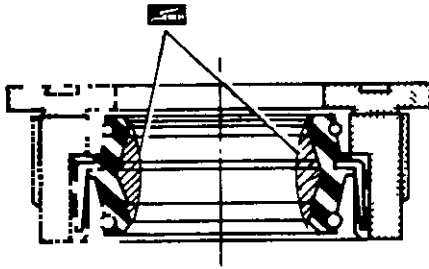
Capacity:

270 ml (9.1 US fl oz, 9.5 Imp fl oz)



FA065

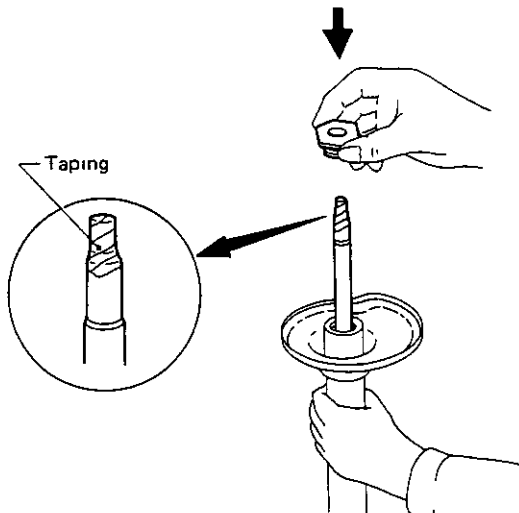
- Lubricate sealing lip of gland packing.



SFA141

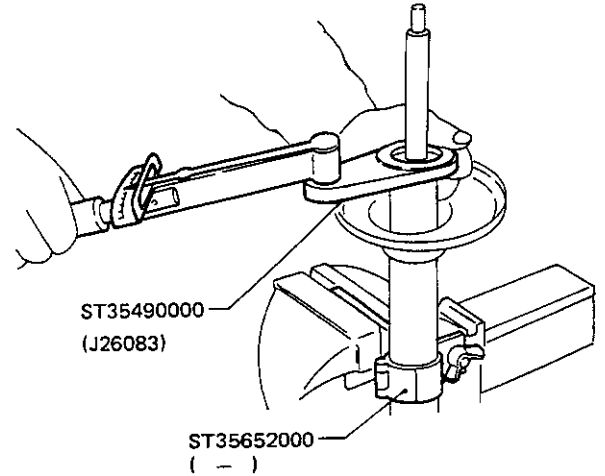
- Install gland packing

Be careful not to damage sealing lip.

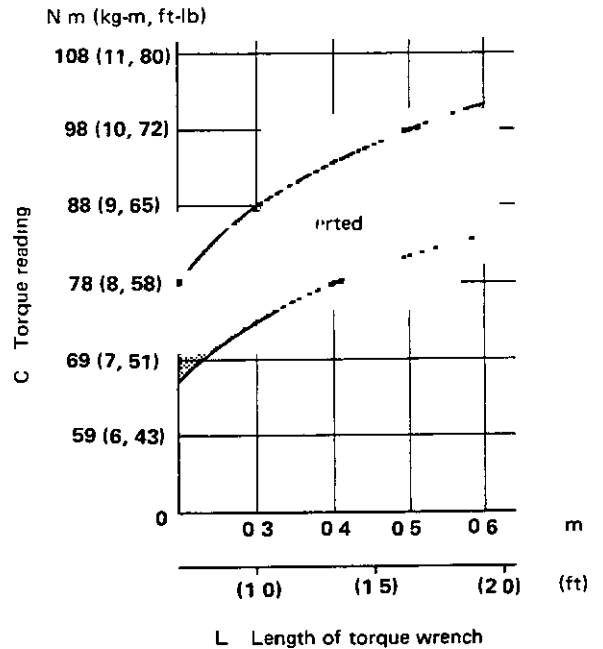
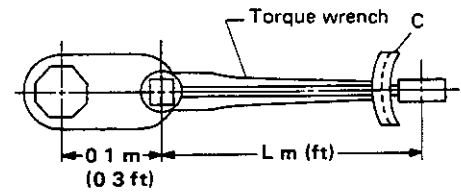


SFA574

- Tighten gland packing



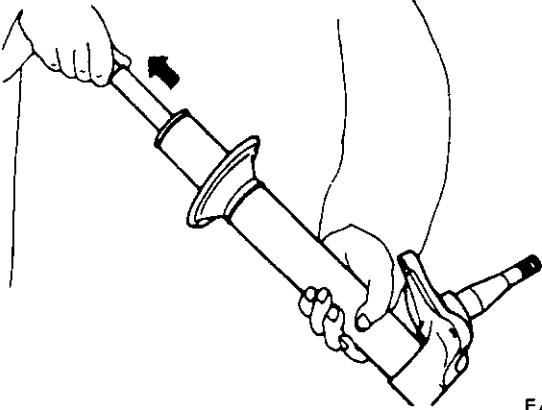
SFA591



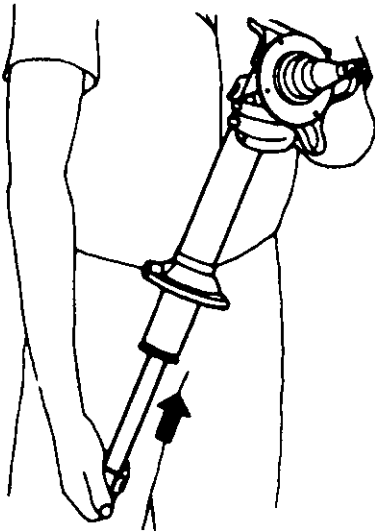
SFA144

FRONT SUSPENSION — Spring and Strut Assembly

Repeat following procedures several times so that air will be thoroughly bled from strut

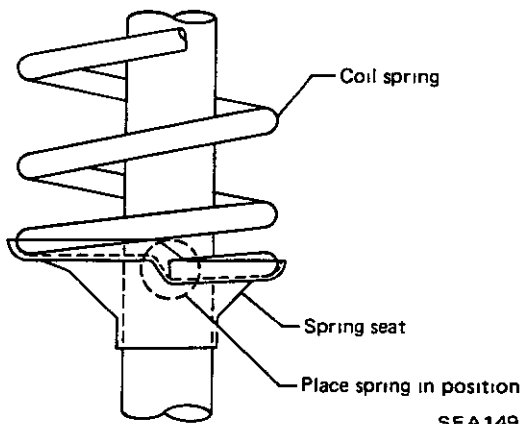


FA279



FA280

After placing spring in position between upper and lower spring seats, release compressor gradually.

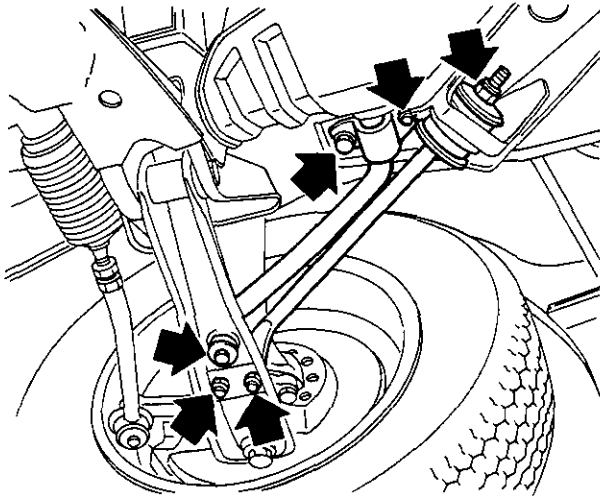


SFA149

TENSION ROD AND STABILIZER BAR

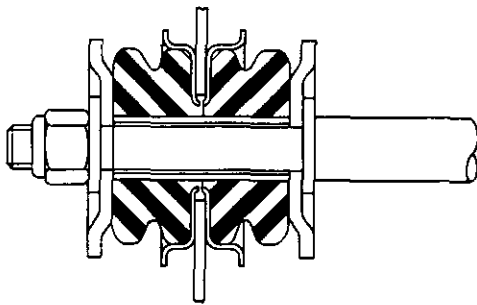
Removal and Installation

- Remove tension rod and stabilizer bar



SFA287

- Install tension rod as shown below.



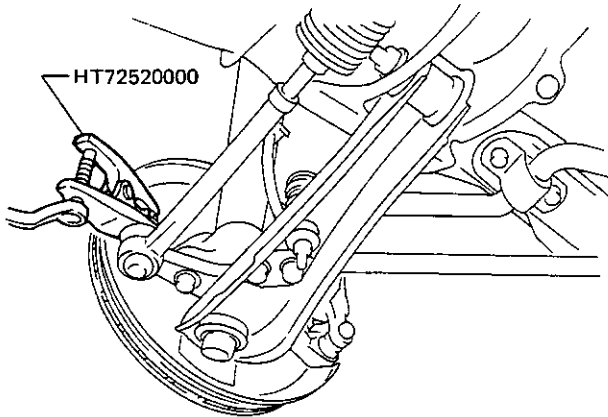
SFA289

- Final tightening should be carried out at curb weight with tires on ground.

TRANSVERSE LINK AND LOWER BALL JOINT

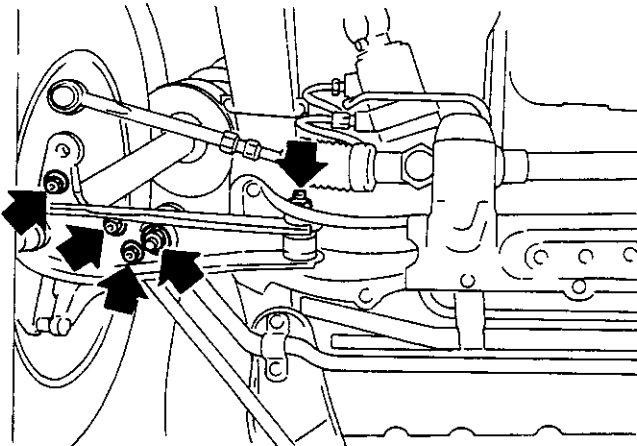
Removal and Installation

- Separate knuckle arm from tie-rod using Tool.



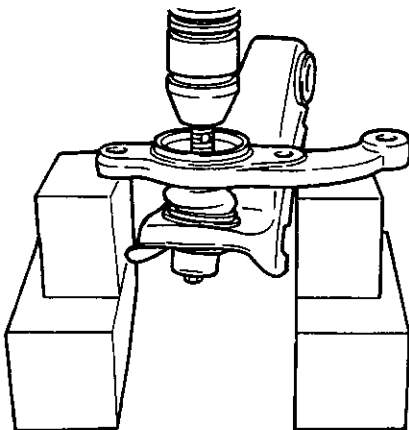
SFA575

- Separate knuckle arm from strut. Remove stabilizer, tension rod and transverse link



SFA576

- Separate ball joint from knuckle arm using press



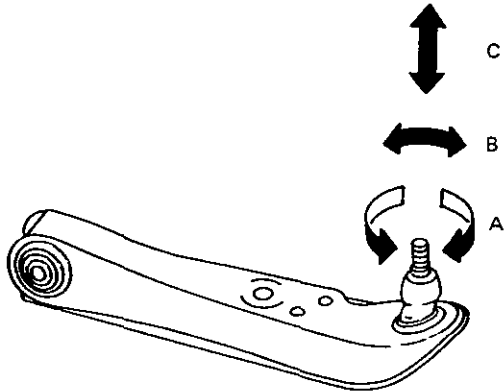
SFA577

- To install transverse link, first temporarily tighten nuts securing transverse link spindle which connects transverse link to suspension cross member.
- Final tightening should be carried out at curb weight with tires on ground.
- Make sure mating surface of bushing is clean and free from oil and grease.

TRANSVERSE LINK AND LOWER BALL JOINT

Inspection

- Check ball joint for play. If ball stud is worn, play in axial direction is excessive or joint is hard to swing, replace transverse link assembly.



SFA581

Turning torque "A":

New parts

1.5 - 4.9 N·m
(15 - 50 kg-cm, 13 - 43 in-lb)

Used parts

More than
1.0 N·m (10 kg-cm, 8.7 in-lb)

Turning torque "B":

New parts

1.5 - 4.9 N·m
(15 - 50 kg-cm, 13 - 43 in-lb)

Used parts

More than
1.0 N·m (10 kg-cm, 8.7 in-lb)

Axial play "C":

0.1 - 0.9 mm (0.004 - 0.035 in)

- Check condition of dust cover. Replace if necessary
- Check rubber bushing for damage, cracks and deformation, replace transverse link if necessary
- Check transverse link for damage, cracks, deformation; replace transverse link if necessary.
- To lubricate, remove plug and install grease nipple in its place
Pump grease slowly until old grease is completely forced out. After greasing, reinstall plug

When a high-pressure grease gun is used, operate the grease gun carefully so that grease is injected slowly and new grease does not come out from the clamp portion.

SUSPENSION CROSSMEMBER

Removal and Installation

Precaution

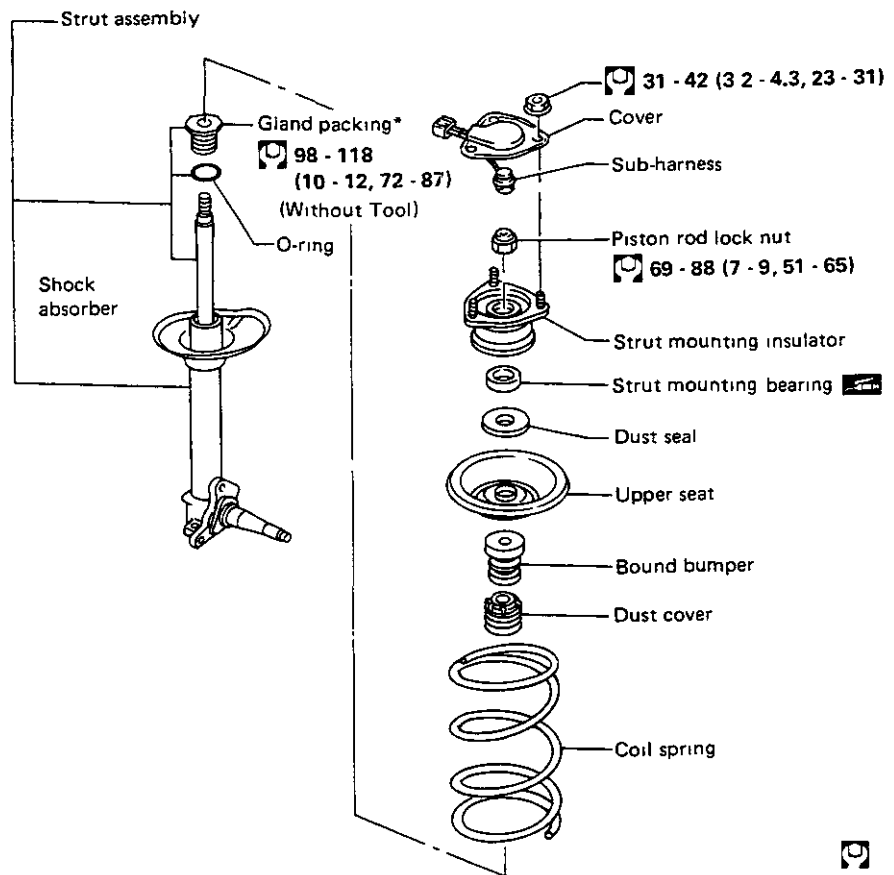
Support engine weight to remove load from engine mounting.

Inspection

Check suspension crossmember for deformation or cracking.

Replace if necessary.

ADJUSTABLE SHOCK ABSORBER



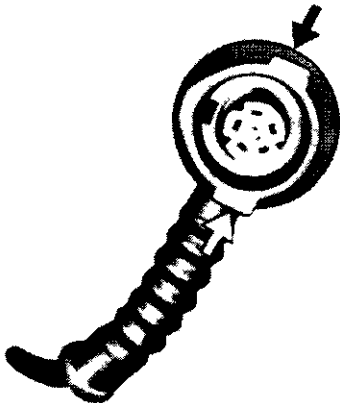
SFA589

Removal and Installation

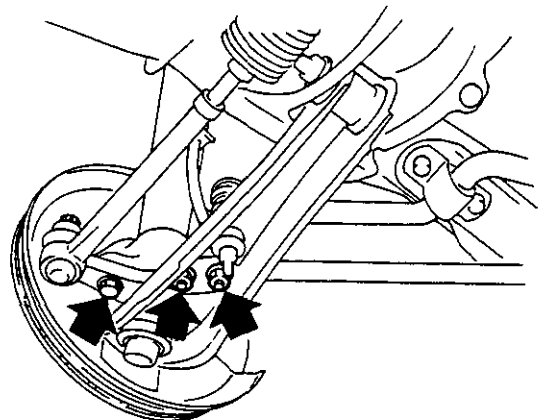
CAUTION:

Keep water and dust away from connector.

Disconnect connector gripping on both sides of sub-harness connector.



- Remove tension rod nuts and knuckle arm fixing bolts.



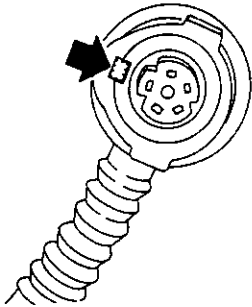
SFA570

Make sure brake hose is secure and not twisted.

ADJUSTABLE SHOCK ABSORBER

Removal and Installation (Cont'd)

- Connect sub-harness to connector within piston rod using guide. Be careful not to damage connector.



SRA469

Disassembly

Avoid dirt and dust getting inside strut

- Remove coil spring Refer to Front Suspension (Spring and Strut Assembly)
- Remove gland packing Refer to Front Suspension (Spring and Strut Assembly)

Inspection

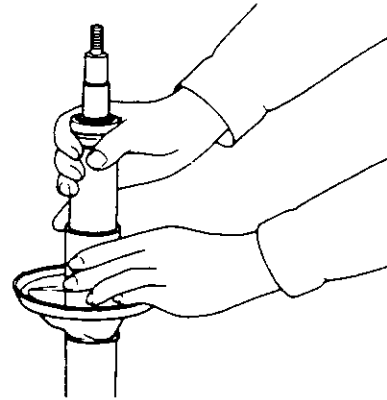
Refer to Front Suspension (Spring and Strut Assembly)

Assembly

- Carefully insert the shock absorber cartridge into the outer strut tube.

CAUTION:

Do not drop the shock absorber or otherwise mishandle it.

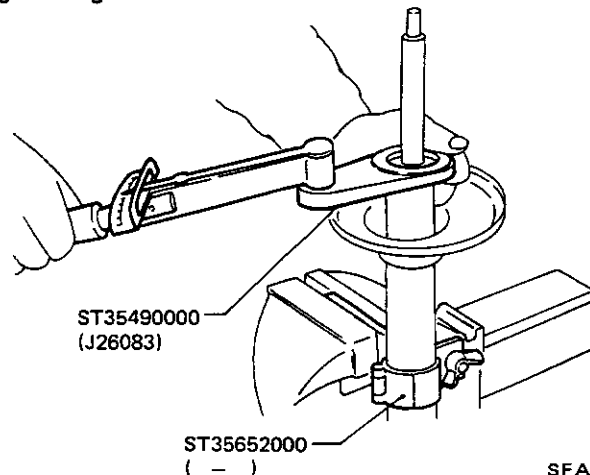


SFA165

- After the shock absorber has been inserted into the outer tube, gently shake the strut assembly right and left so that the shock absorber is centered.
- Install gland packing and tighten the gland packing with the Gland Packing Wrench and a torque wrench

Refer to Spring and Strut Assembly for assembly

Be careful not to damage the piston rod during tightening.

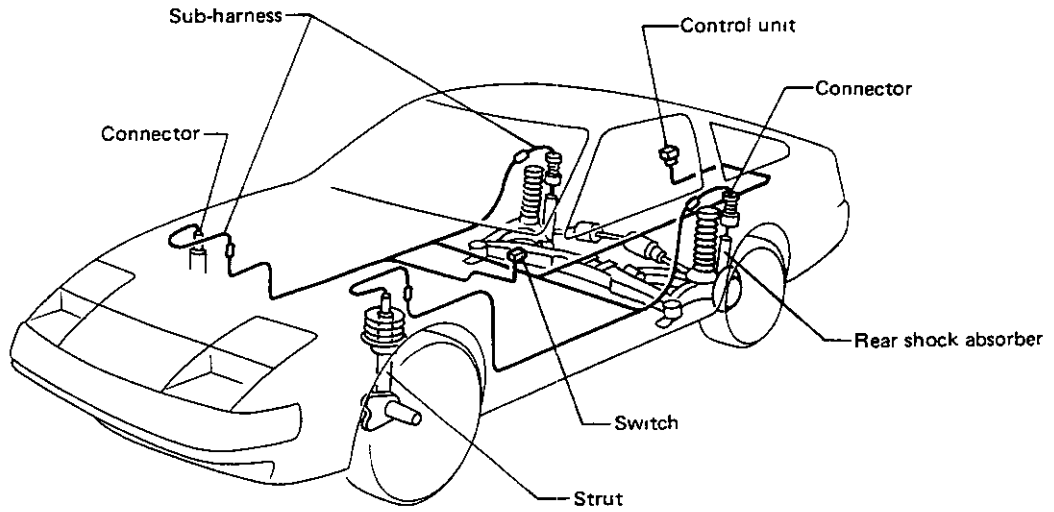


SFA591

- Further steps are the same procedure as the conventional strut assembly Refer to Spring and Strut Assembly for assembly

ADJUSTABLE SHOCK ABSORBER

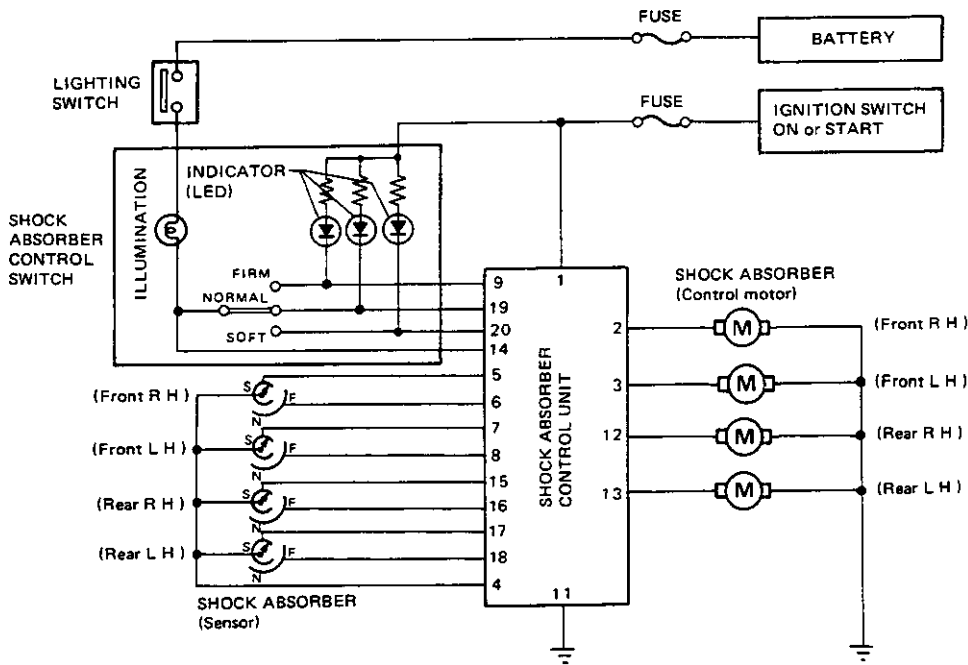
Harness Description



SFA590

Electrical Circuit

SCHEMATIC



When ignition switch is ON, each voltage is as follows

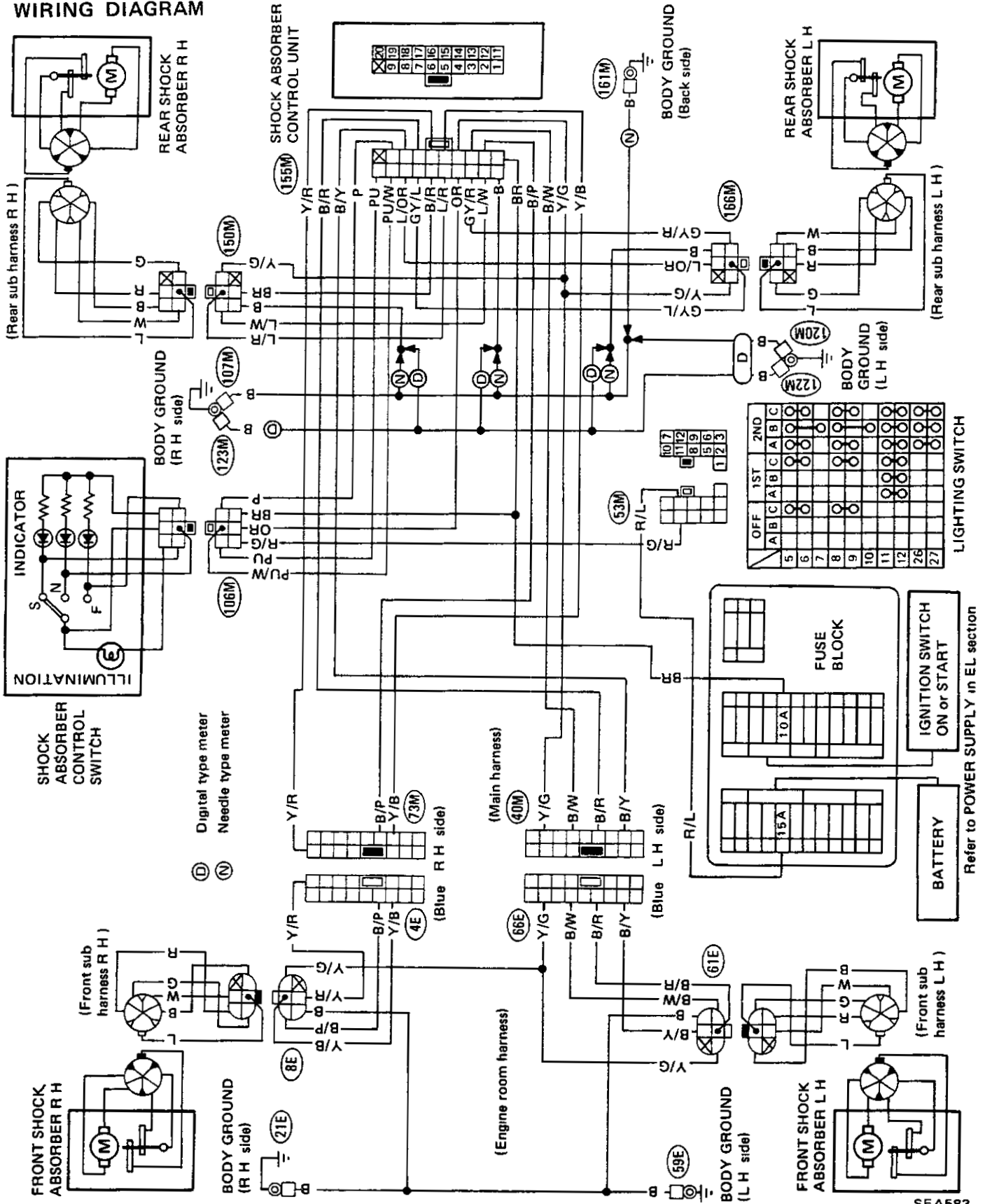
Front R H	11-5	FIRM 7.5 V SOFT NORMAL 0 V
	11-6	SOFT 7.5 V FIRM NORMAL 0 V
	11-4	0 V
Front L H	11-7	FIRM 7.5 V SOFT NORMAL 0 V
	11-8	SOFT 7.5 V FIRM NORMAL 0 V
	11-4	0 V
Rear R H	11-15	FIRM 7.5 V SOFT NORMAL 0 V
	11-16	SOFT 7.5 V FIRM, NORMAL 0 V
	11-4	0 V
Rear L H	11-17	FIRM 7.5 V SOFT, NORMAL 0 V
	11-18	SOFT 7.5 V FIRM, NORMAL 0 V
	11-4	0 V

SFA582

ADJUSTABLE SHOCK ABSORBER

Electrical Circuit (Cont'd)

WIRING DIAGRAM



SFA583

ADJUSTABLE SHOCK ABSORBER

Trouble Diagnoses

No	Phenomenon on switch	Possible cause	Checking method		Corrective action
			Checking procedure	Result	
1	3 lamps all off	<ul style="list-style-type: none"> Lamp burnt out Fuse blown Harness wire broken 	(1) Operate switch and check lamp for lighting condition	One lamp on	Replace burnt out lamp
			(2) Check fuse (3) Check power and grounding harnesses for broken wires	3 lamps all off	(1) Replace fuse (2) Replace 3 lamps (3) Repair harness
2	2 lamps off	<ul style="list-style-type: none"> Switch side harness shorted Switch out of order 	Operate switch and check lamp for proper lighting condition	One lamp on	Repair harness
				2 lamps always on	(1) Replace switch (2) Replace harness
3	3 lamps all on	<ul style="list-style-type: none"> Switch side harness shorted Switch out of order Controller out of order 	Operate switch, check lamp for proper lighting condition	One lamp off	(1) Replace harness (2) Replace switch (3) Replace controller
				3 lamps on	
4	One lamp on and 2 lamps on and off	<ul style="list-style-type: none"> Harness wire broken (Selected signal wire broken) 	Operate switch while lamp is going on and off Do this with key on.	Selected On Other On and off	Repair harness
		<ul style="list-style-type: none"> Motor harness wire broken, or shorted 	(1) Connect dummy actuators (motors) in 4 places, and operate switches (for F, N, S), check lamps for proper lighting condition (2) Check dummy actuators for normal operation in 4 places (Front-Right, Front-Left, Rear-Right, Rear-Left)	Selected On 2 others . On and off	Repair harness
				Any dummy actuator not operating	
	<ul style="list-style-type: none"> Position switch harness wire broken or shorted 	Connect dummy actuators in 4 places, and operate switches (for F, N, S), check lamps for proper lighting condition Further, check 4 places for any actuator operating longer than 4 seconds	Selected . On 2 others . On and off	Repair harness	
			Any place where any actuator is operating more than the specified time after lamp starts to go on and off		

ADJUSTABLE SHOCK ABSORBER

Trouble Diagnoses (Cont'd)

No	Phenomenon on switch	Possible cause	Checking method		Corrective action
			Checking procedure	Result	
4	One lamp on 2 lamps on and off (continued)	● Wire broken or shorted in motor harness of shock absorber	(1) Changing the connection combinations of the 3 dummy actuators, check 4 shock absorbers one by one using the operation described in (2) below (2) Turn switch to F, N, S and check lamp for proper lighting condition	Selected On 2 others On and off (When connected to shock absorber out of order)	Replace shock absorber
		● Wire broken or shorted in position switch harness of shock absorber	Same as above	Same as above	Same as above
		● Motor completely locked	Same as above	Same as above	Same as above
		● Motor overloaded (Temporary overload)	(1) Turn key off to stop the lamp from going on and off, then turn key on again and check lamp for proper lighting condition	Selected - On 2 others Off	Normal If it is frequent, take action as described in (3) below
			(2) Check power voltage	Below 9 V	Repair power system (Charge battery)
			(3)-1 Changing the connection combinations of the 4 actuators, check each of the 4 shock absorbers in one place described in (3)-2 below (3)-2 Turn switch to F, N, S, and check lamp for proper lighting condition.	Selected On 2 others On and off (when connected to overloaded shock absorber)	Replace shock absorber
		● Controller out of order	Replace with normal controller, and operate switch, check lamp for proper lighting condition	Selected On 2 others - On and off (Returned to normal state)	Replace controller

ADJUSTABLE SHOCK ABSORBER

Trouble Diagnoses (Cont'd)

No	Phenomenon on switch	Possible cause	Checking method		Corrective action
			Checking procedure	Result	
5	3 lamps on and off	● Switch malfunction	Turn key off to stop the lamp from going on and off, then turn key on again and check lamp for proper lighting condition	Selected On 2 others . Off	Replace switch
		● Switch contact out of order	(1) Operate switch, check lamp for proper lighting condition	Selected .. On 2 others .. Off	Replace switch
			(2) Turn switch to original position, and check lamp for occurrence of on and off condition	3 lamps . On and off	
		● Harness disconnected	Turn key off to stop the lamp from going on and off, then turn key on again and check lamp for proper lighting condition	3 lamps On and off	Repair harness

SERVICE DATA AND SPECIFICATIONS (S.D.S.)

General Specifications

Item	Engine	VG30ET			VG30E		
	Vehicle model	2 seater	2+2 seater	2 seater		2+2 seater	
	Grade	GL GL-L		SF GL	GL-L	GL GL-L	
Suspension		Strut with coil spring					
Coil spring							
Wire diameter	mm (in)	13.5 (0.531)					
Coil diameter	mm (in)	170 (6.69)					
Free length	mm (in)	293.5 (11.56)	300.0 (11.81)	293.5 (11.56)	300.0 (11.81)	306.0 (12.05)	
Spring constant	N/mm (kg/mm, lb/in)	23.83 (2.43, 136.1)					
Identification color		Red x 1, White x 1	Yellow x 1, White x 1	Red x 1, White x 1	Yellow x 1, White x 1	White x 1, White x 1	
Strut Type		Gas-filled double acting hydraulic			Double acting hydraulic		
		Adjustable			Non-adjustable		
Inner cylinder							
Inner diameter	mm (in)	35.0 - 35.1 (1.378 - 1.382)			32.0 - 32.1 (1.260 - 1.264)		
Maximum runout	mm (in)	Less than 0.2 (0.008)			Less than 0.2 (0.008)		
Piston rod							
Rod diameter	mm (in)	25 (0.98)			22 (0.87)		
Maximum runout	mm (in)	Less than 0.1 (0.004)			Less than 0.1 (0.004)		
Stroke		191.8 (7.551)/31.8 (1.252)					
Maximum/Minimum							
Damping force [at 0.3 m (1.0 ft)/sec]		Firm	Normal	Soft			
Expansion	N (kg, lb)	1,510 (154, 340)	1,226 (125, 276)	530 (54, 119)	981 (100, 221)		
Compression	N (kg, lb)	785 (80, 176)	637 (65, 143)	255 (26, 57)	441 (45, 99)		
Stabilizer bar diameter		22 (0.87)					
Tension rod diameter		18 (0.71)					

SERVICE DATA AND SPECIFICATIONS (S.D.S.)

Inspection and Adjustment

WHEEL ALIGNMENT (Unladen*1)

Camber	degree	-35' to 55'
Caster	degree	5° 50' to 7° 20'
Toe-in	mm (in)	1 to 3 (0.04 to 0.12)
	degree*2	6' to 17'
Kingpin inclination	degree	12° 15' to 13° 45'
Front wheel turning angle		
Toe-out-turn		
Inside/Outside	degree	22° 30' / 20°
Full turn		
Inside/Outside	degree	35° to 39° / 27° to 31°

- *1 Tankful of fuel, radiator coolant and engine oil full
Spare tire, jack, hand tools, mats in designed position
*2 On both sides

WHEEL BEARING

Wheel bearing axial play	mm (in)	0 (0)
Wheel bearing lock nut		
Tightening torque	N m (kg-m, ft-lb)	25 - 29 (2.5 - 3.0, 18 - 22)
Return angle	degree	60°
Wheel bearing starting torque	N m (kg-cm, in-lb)	
With new grease seal		0.39 - 0.83 (4.0 - 8.5, 3.5 - 7.4)
With used grease seal		0.10 - 0.44 (1.0 - 4.5, 0.87 - 3.91)
At wheel hub bolt	N (kg, lb)	
With new grease seal		6.86 - 14.61 (0.70 - 1.49, 1.54 - 3.29)
With used grease seal		1.67 - 7.75 (0.17 - 0.79, 0.37 - 1.74)


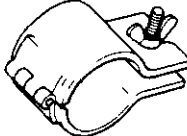
LOWER BALL JOINT

Stud end play	mm (in)	0.1 - 0.9 (0.004 - 0.035)
Turning torque	N m (kg-cm, in-lb)	
New part		1.5 - 4.9 (15 - 50, 13 - 43)
Used part		More than 1.0 (10, 8.7)

Tightening Torque

Item	N m	kg-m	ft-lb
Wheel hub			
Wheel bearing lock nut	25 - 29	2.5 - 3.0	18 - 22
Wheel hub to disc rotor	49 - 69	5.0 - 7.0	36 - 51
Wheel nut	78 - 98	8.0 - 10.0	58 - 72
Knuckle arm and knuckle spindle			
Knuckle arm to side rod	54 - 98	5.5 - 10.0	40 - 72
Knuckle arm to knuckle spindle	72 - 97	7.3 - 9.9	53 - 72
Torque member fixing bolt	72 - 97	7.3 - 9.9	53 - 72
Knuckle spindle to baffle plate	3.2 - 4.3	0.33 - 0.44	2.4 - 3.2
Side rod lock nut	78 - 98	8 - 10	58 - 72
Ball joint			
Lower ball joint to knuckle arm	96 - 120	9.8 - 12.2	71 - 88
Strut assembly			
Strut to knuckle arm	71 - 97	7.2 - 9.9	52 - 72
Strut mounting insulator fixing bolt	31 - 42	3.2 - 4.3	23 - 31
Piston rod lock nut	69 - 88	7 - 9	51 - 65
Gland packing	98 - 118	10 - 12	72 - 87
Transverse link			
Transverse link to suspension member	93 - 113	9.5 - 11.5	69 - 83
Tension rod			
Tension rod to tension rod bracket	44 - 54	4.5 - 5.5	33 - 40
Tension rod bracket to body	29 - 39	3 - 4	22 - 29
Tension rod to transverse link	42 - 59	4.3 - 6.0	31 - 43
Stabilizer bar			
Stabilizer bar clamp to body (tension rod bracket)	29 - 39	3 - 4	22 - 29
Stabilizer bar to transverse link	16 - 22	1.6 - 2.2	12 - 16
Suspension member			
Suspension member to body	69 - 88	7 - 9	51 - 65

SPECIAL SERVICE TOOLS

Tool number (Kent-Moore No)	Tool name
ST35490000 (J26083)	Gland packing wrench 
ST35652000 (-)	Clamp 
HT72520000 (J25730-A)	Ball joint remover 