

FRONT AXLE & FRONT SUSPENSION

SECTION **FA**

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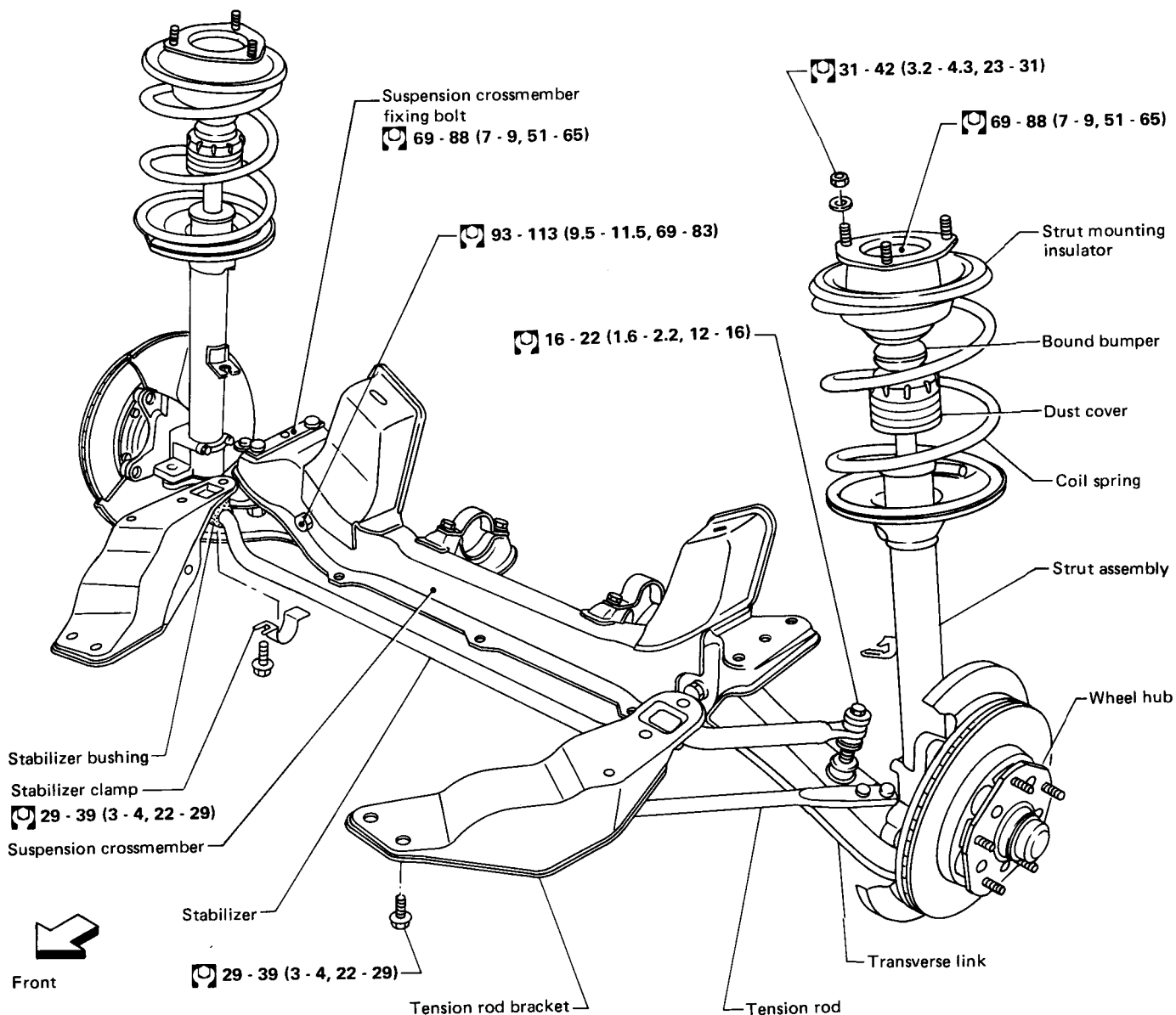
FA

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 adjustment.
1 - 3 mm (0.04 - 0.12 in)
6' - 17' (Total toe-in)

Refer to section MA for Checking Wheel Alignment.



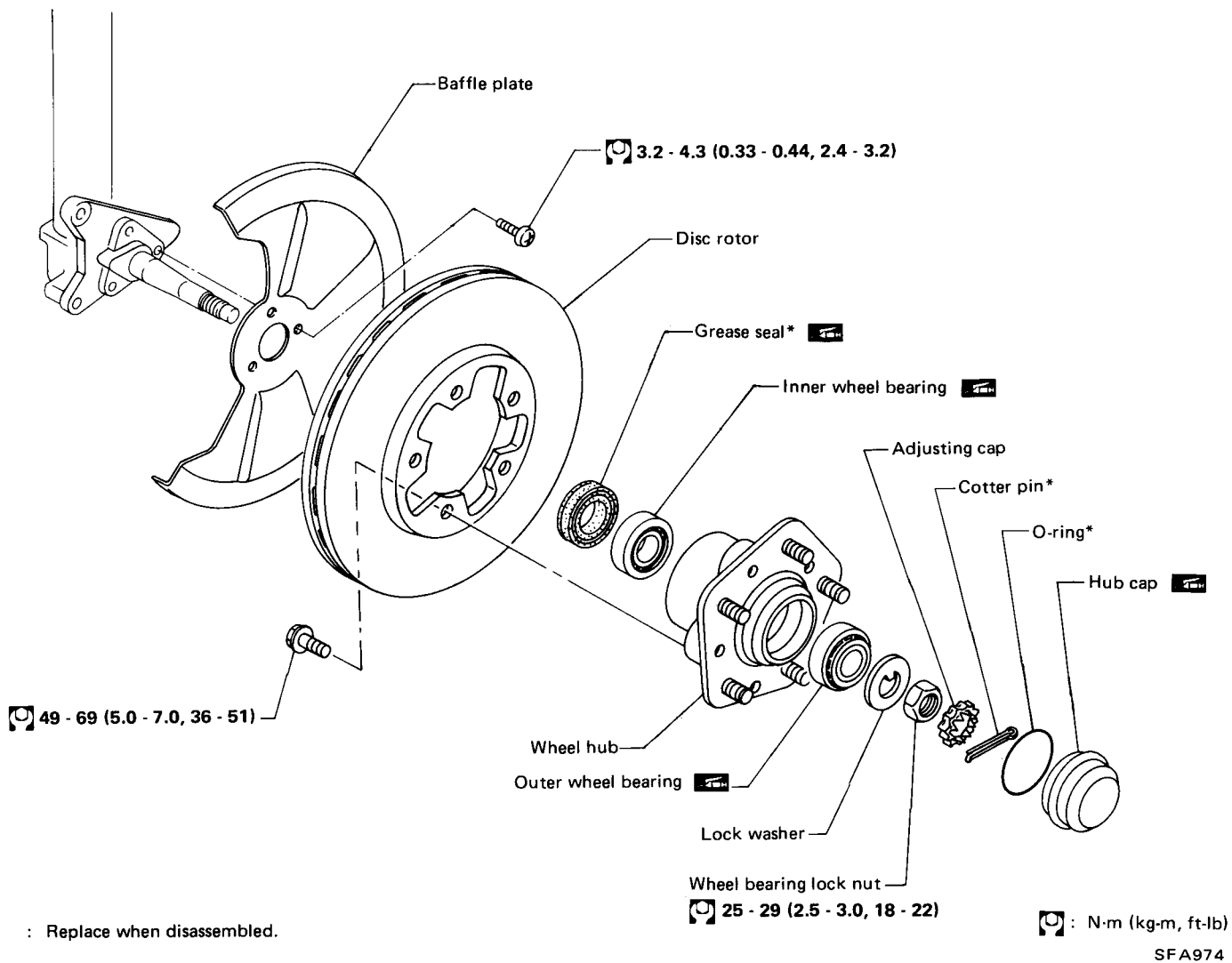
Wheel bearing

- 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 - 3.91 in-lb)
- As measured at wheel hub bolt
 - with new grease seal 6.86 - 14.61 N (0.70 - 1.49 kg, 1.54 - 3.29 lb)
 - with used grease seal 1.67 - 7.75 N (0.17 - 0.79 kg, 0.37 - 1.74 lb)
- When measuring starting torque, do not include "dragging" resistance with brake pads.

: N·m (kg-m, ft-lb)

SFA973

FRONT AXLE — Wheel Hub

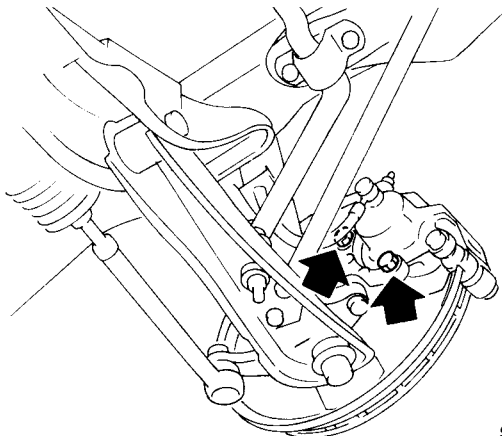


FRONT AXLE — Wheel Hub

Removal

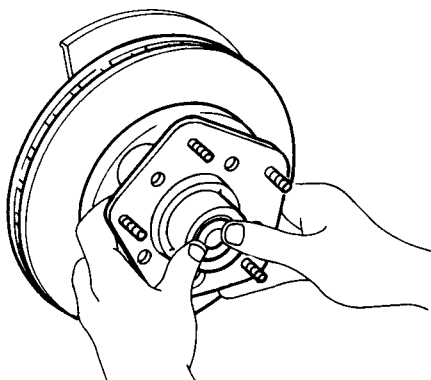
1. Remove brake caliper assembly.

Brake hose does not need to be disconnected from brake caliper assembly.



SFA567

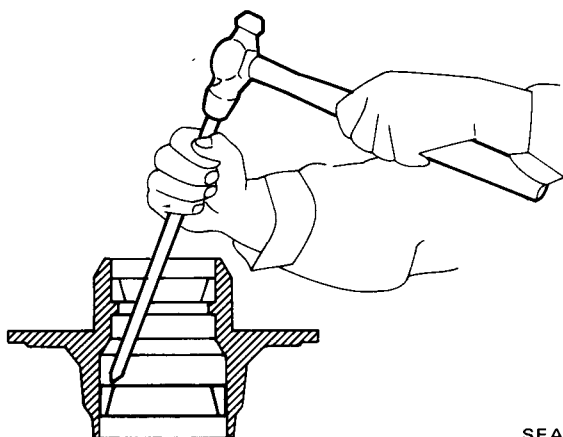
2. Remove wheel hub with disc brake rotor and wheel bearing from spindle.



SFA975

Be careful not to drop outer bearing.

3. If replacement of outer race is necessary, drive it out from hub with a brass drift and mallet.



SFA580

Inspection

WHEEL BEARING

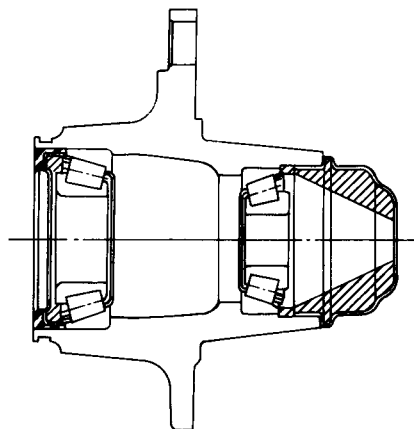
Make sure wheel bearing rolls freely and is free from noise, crack, pitting or wear.

WHEEL HUB

Check wheel hub for cracks by using a magnetic exploration or dyeing test, and replace if cracked.

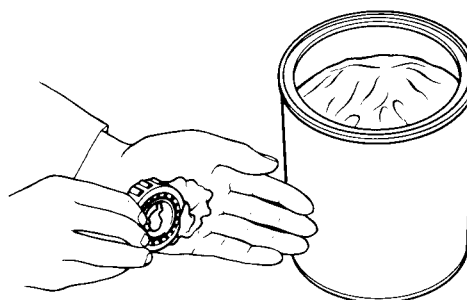
Installation

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



SFA966

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



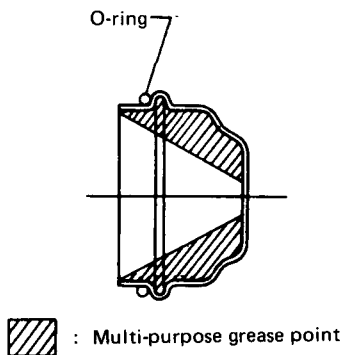
FA781

FRONT AXLE — Wheel Hub

Preload Adjustment

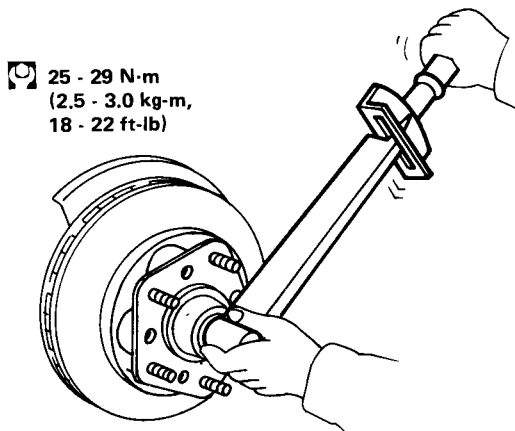
After wheel bearing has been replaced or front axle has been reassembled, adjust wheel bearing preload.

1. Thoroughly clean all parts to prevent dirt entry before adjustment.
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

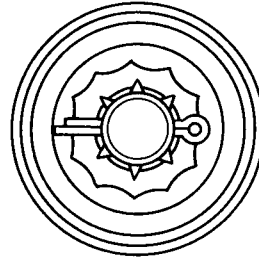
3. Tighten wheel bearing lock nut.



SFA976

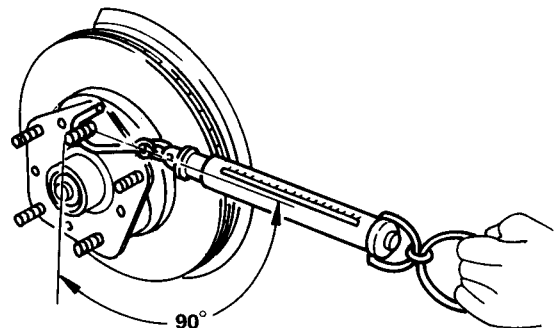
4. Turn wheel hub several times in both directions to seat wheel bearing correctly.
5. Again tighten wheel bearing nut.
6. Turn back wheel bearing lock nut within 60°.

7. Install adjusting cap and new cotter pin.



SFA967

8. Measure wheel bearing preload and axial play.

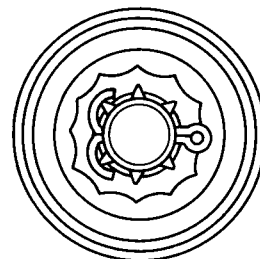


Axial play: 0 mm (0 in)
When bearing preload
(As measured at wheel hub bolt):
With new parts
6.86 - 14.61 N (0.70 - 1.49 kg, 1.54 - 3.29 lb)
With used parts
1.67 - 7.75 N (0.17 - 0.79 kg, 0.37 - 1.74 lb)

SFA977

Repeat above procedures until correct starting torque is obtained.

9. Spread cotter pin.



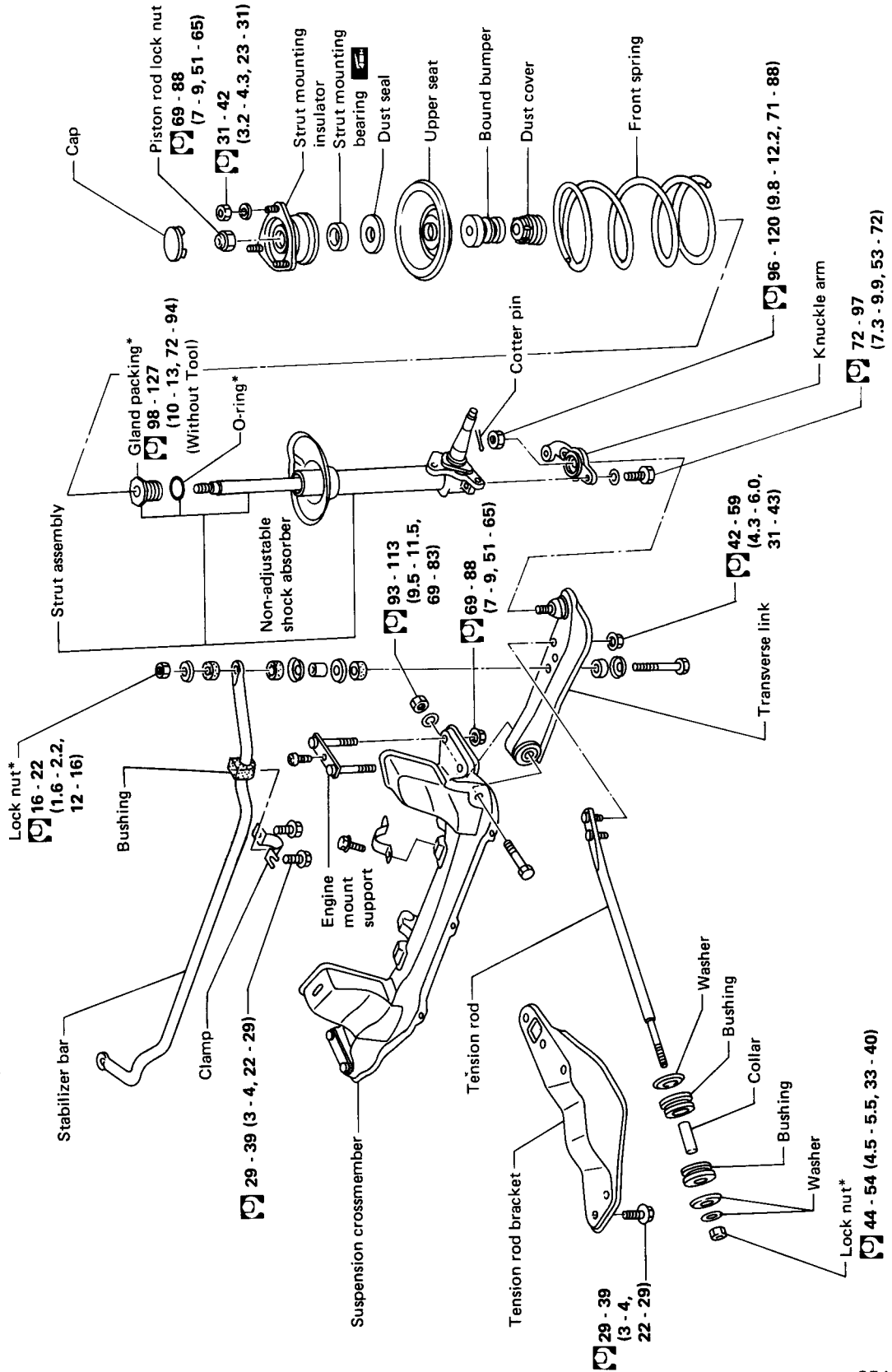
SFA968

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 M/A for front axle and front suspension.
Final tightening requires to be carried out with tires on ground.
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, or soapy water.

*: Replace when disassembled.



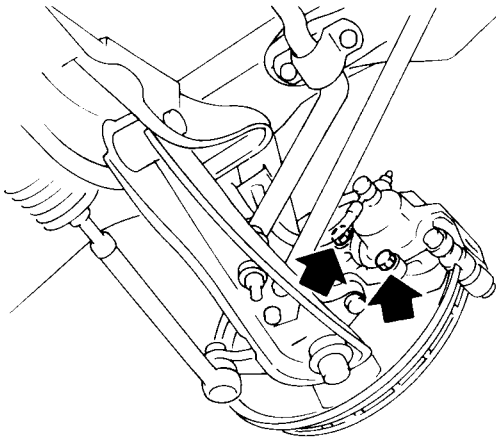
: N-m (kg-m, ft-lb)

SFA013A

FRONT SUSPENSION — Spring and Strut Assembly

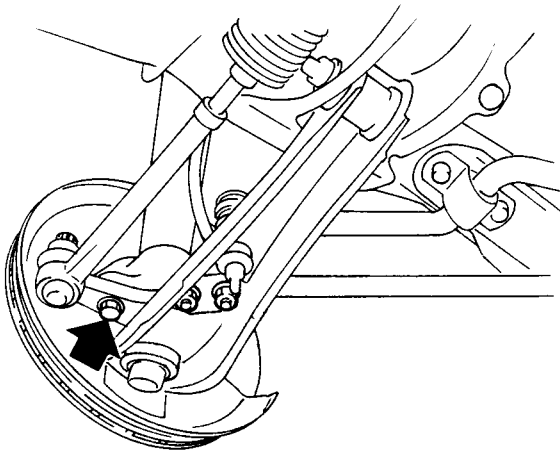
Removal and Installation

- Remove brake caliper assembly without disconnecting brake line.



SFA567

- Remove knuckle arm fixing bolts.



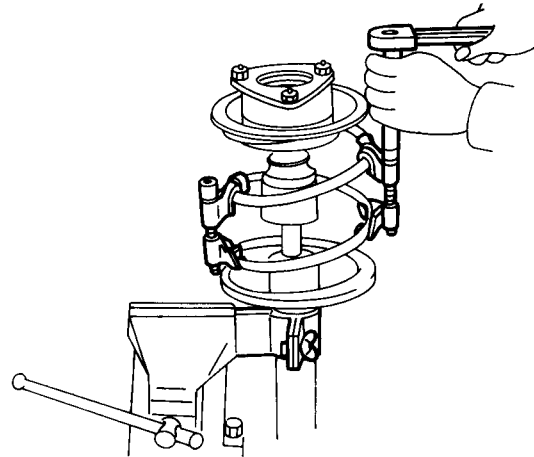
SFA978

Make sure brake hose is secure.

Disassembly

Avoid dirt and dust getting inside strut.

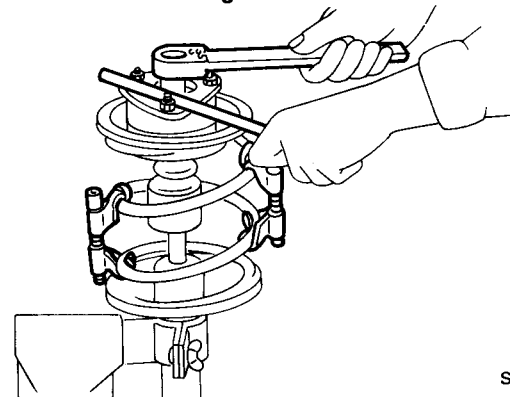
- Compress spring to permit turning of strut mounting insulator by hand.



SFA571

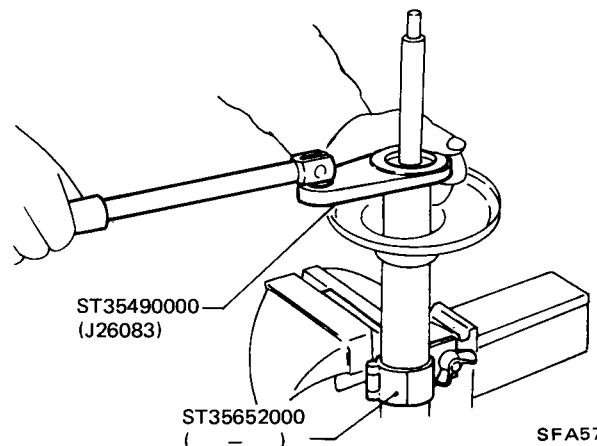
- Remove piston rod lock nut.

Be careful not to damage bolts.



SFA572

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



SFA573

- Slowly withdraw piston rod and cylinder.

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 with compressed air.
- a. Oil leakage around gland packing does not need strut replacement.
If oil leakage is evident on spring seat, check piston rod, gland packing and O-ring.
If oil leakage occurs on welded portion of outer strut casing, replace strut assembly.
- b. If shock absorber is damaged, replace as shock absorber kit (including piston rod, cylinder, bottom valve, guide bushing and O-ring).

GLAND PACKING

Check gland packing for oil leakage. Replace gland packing if necessary.

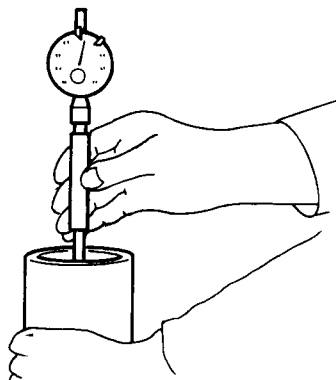
INNER CYLINDER AND OUTER CASING

- Check 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)

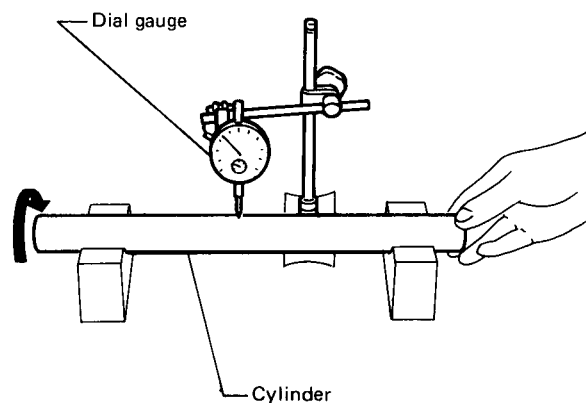


SFA136

Maximum runout:

Inner cylinder

Less than 0.2 mm (0.008 in)



SFA137

PISTON ROD

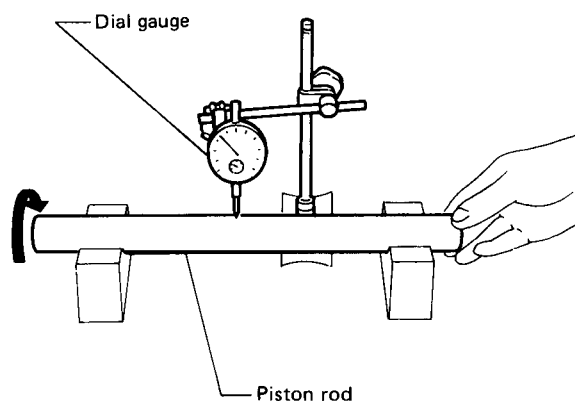
- Check piston rod for cracks, deformation or other damage. Replace shock absorber, if necessary.
- Check threads for cracks or other damage. Replace shock absorber, if necessary.

Rod diameter:

Refer to S.D.S.

Maximum runout:

0.1 mm (0.004 in)



SFA137

STRUT MOUNTING INSULATOR

Replace if cemented rubber-to-metal portion are melted or cracked. Rubber parts need replacement, if deteriorated.

STRUT MOUNTING BEARING

Check strut mounting bearing for noise or rattle in axial direction. Replace if necessary.

FRONT SUSPENSION — Spring and Strut Assembly

Assembly

Before assembly, keep all parts away from dust.

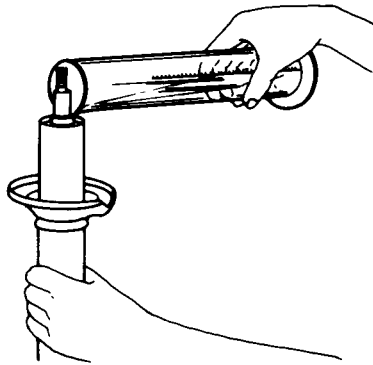
- Add oil.

Use "NISSAN GENUINE STRUT FLUID" or equivalent.

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

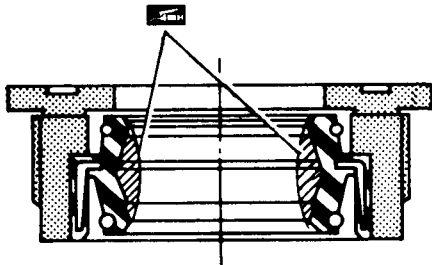
Capacity:

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



FA065

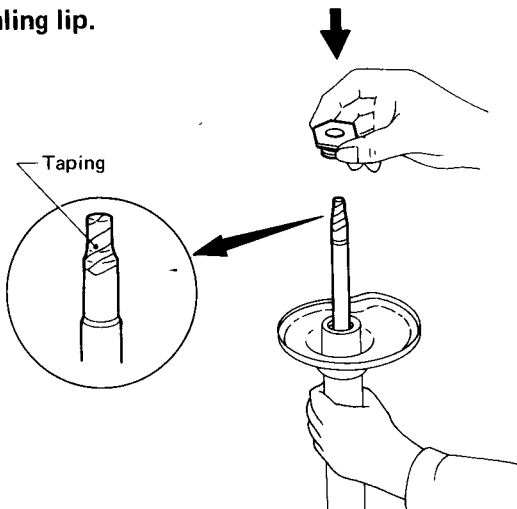
- Lubricate sealing lip of gland packing.



SFA141

- Install gland packing.

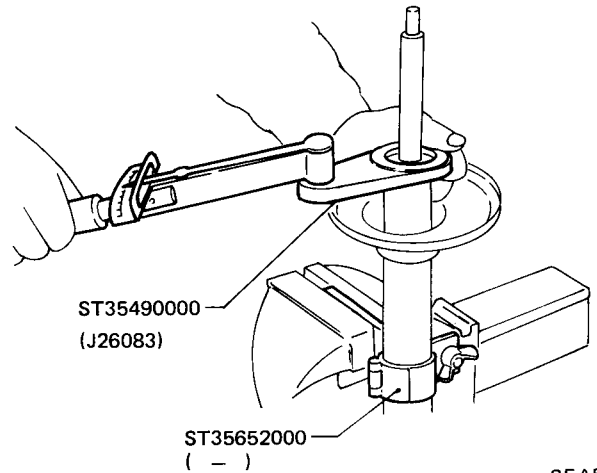
Cover piston rod with tape so as not to damage sealing lip.



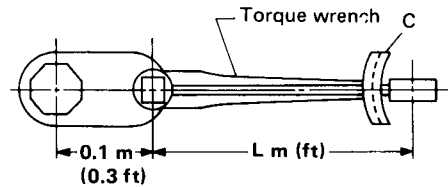
SFA574

- Tighten gland packing with Tool.

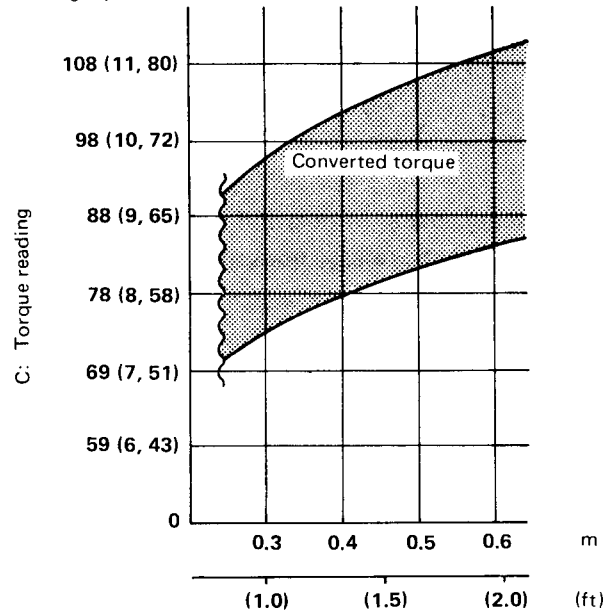
Be careful not to damage piston rod.



SFA591



N·m (kg·m, ft·lb)

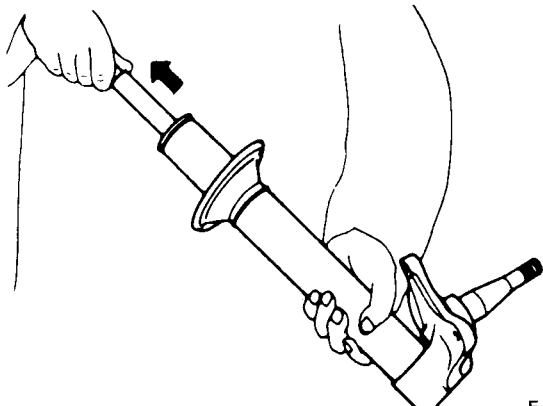


L: Length of torque wrench

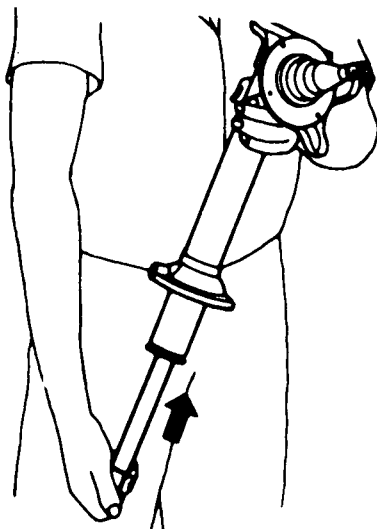
SFA672

FRONT SUSPENSION — Spring and Strut Assembly

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

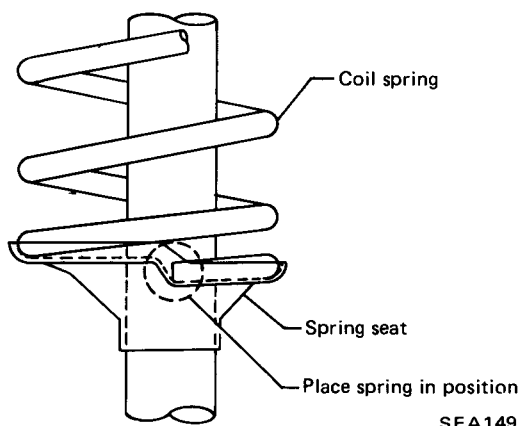


FA279



FA280

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

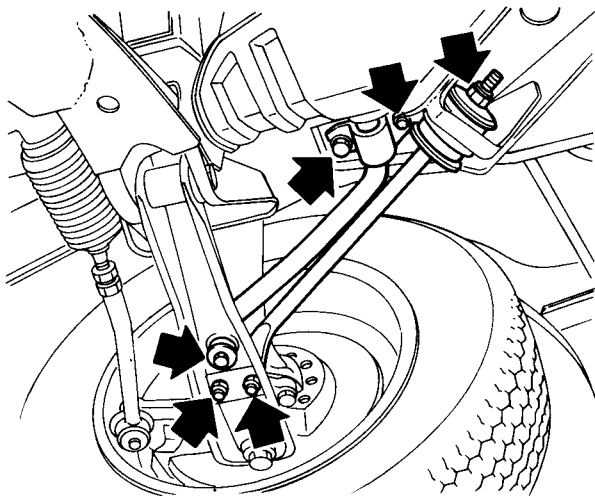


SFA149

FRONT SUSPENSION — Tension Rod and Stabilizer Bar

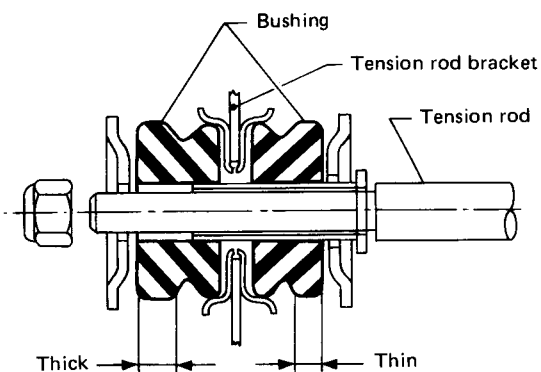
Removal and Installation

- Remove tension rod and stabilizer bar.



SFA287

- Install tension rod as shown below.



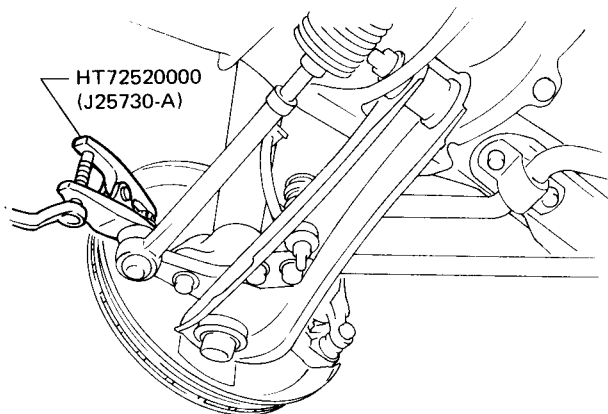
SFA969

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

FRONT SUSPENSION — Transverse Link

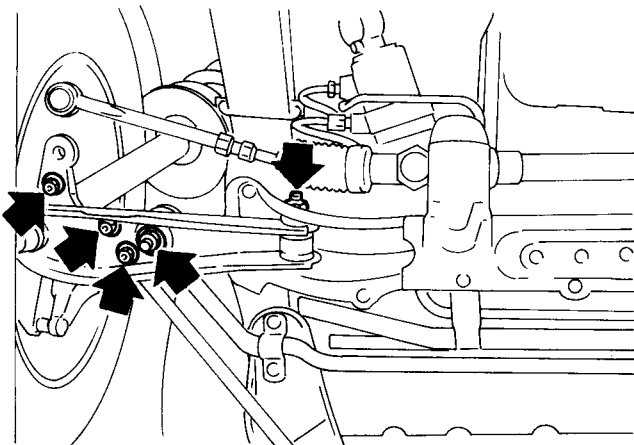
Removal and Installation

- Separate knuckle arm from tie-rod with Tool.



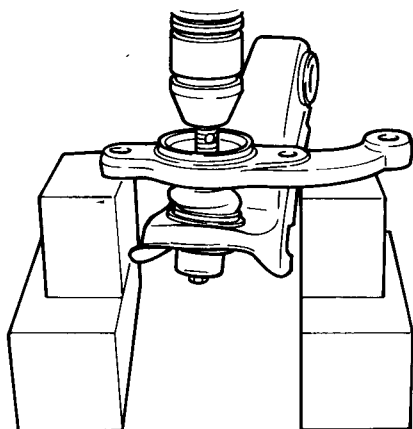
SFA575

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



SFA576

- Separate ball joint from knuckle arm with press.



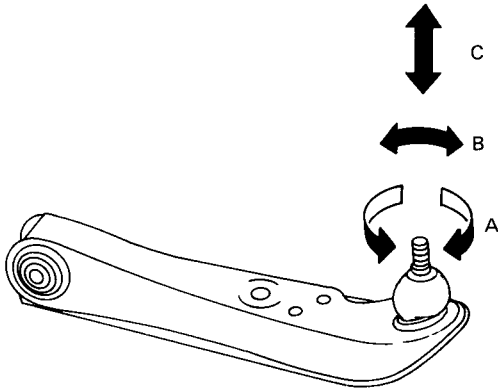
SFA577

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

FRONT SUSPENSION — Transverse Link

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

1.0 N·m (10 kg-cm, 8.7 in-lb) or more

Turning torque "B":

New parts

1.5 - 4.9 N·m

(15 - 50 kg-cm, 13 - 43 in-lb)

Used parts

1.0 N·m (10 kg-cm, 8.7 in-lb) or more

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 cracks, deformation or other damage; bush assembly if necessary.
- Check transverse link for cracks, deformation or other damage; replace transverse link if necessary.
- 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.

FRONT SUSPENSION — Suspension Crossmember

Removal and Installation

Inspection

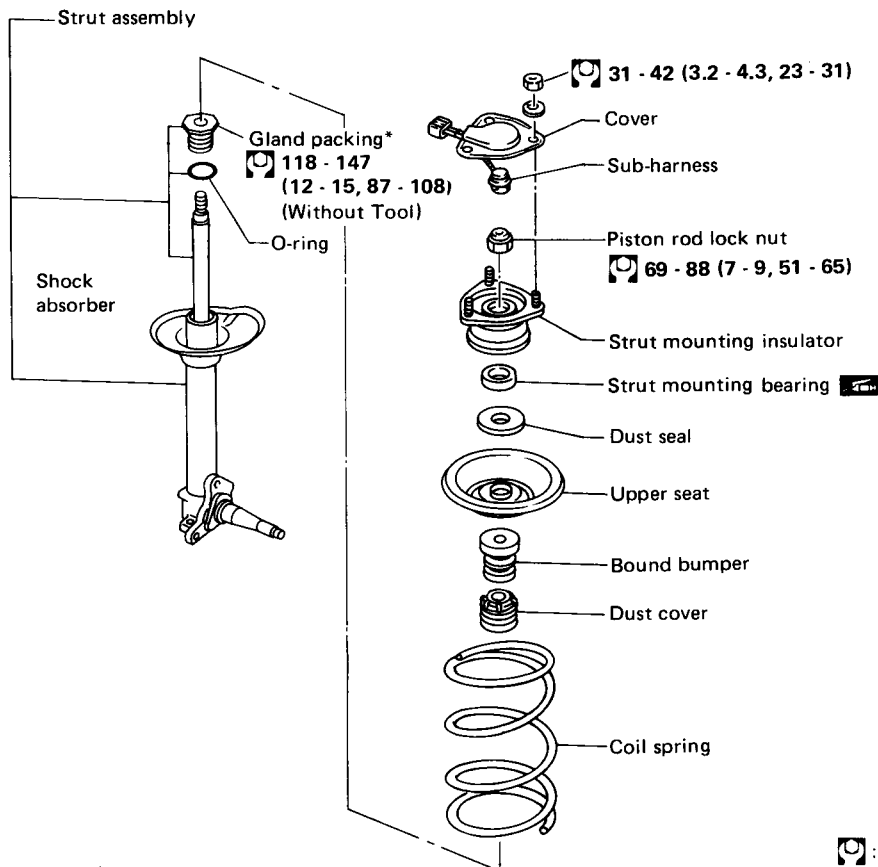
Precaution

Support engine to remove load from engine mounting.

Check suspension crossmember for deformation or cracking:

Replace if necessary.

ADJUSTABLE SHOCK ABSORBER



* Always replace once disassembled.

□ : N·m (kg·m, ft·lb)

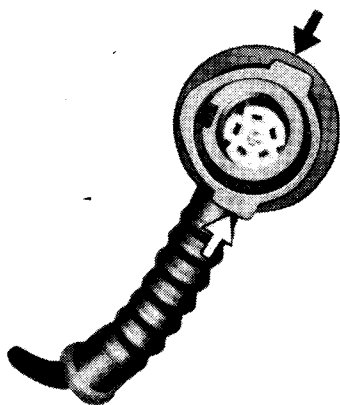
SFA979

Removal and Installation

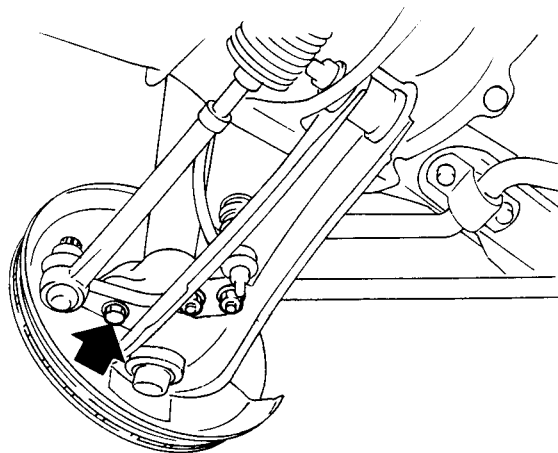
CAUTION:

Keep water and dust away from connector.

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



- Remove strut and knuckle arm fixing bolts.



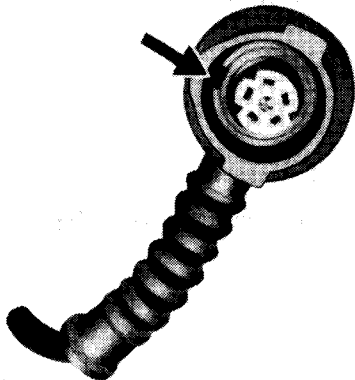
SFA978

Make sure that brake hose is secure.

ADJUSTABLE SHOCK ABSORBER

Removal and Installation (Cont'd)

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



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

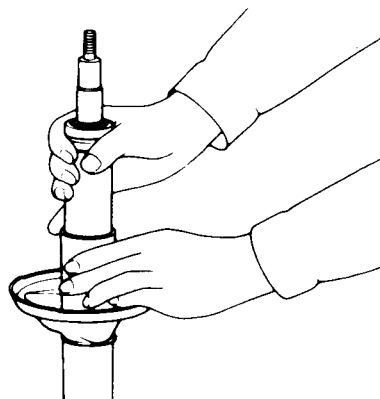
Refer to Front Suspension (Spring and Strut Assembly).

Assembly

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

CAUTION:

Do not drop the shock absorber.



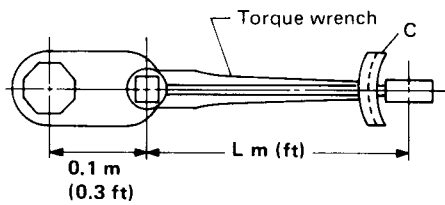
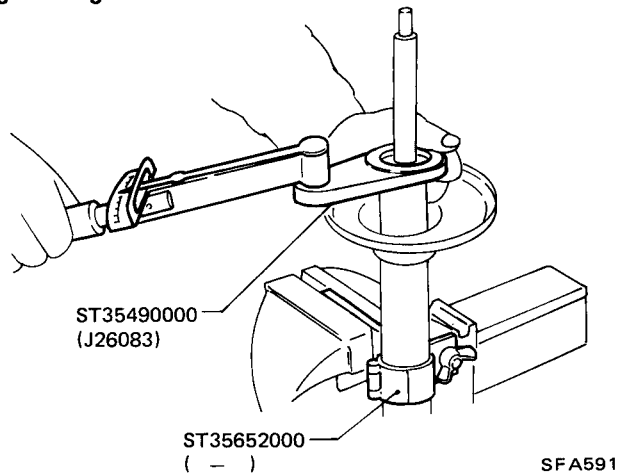
SFA165

- 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.

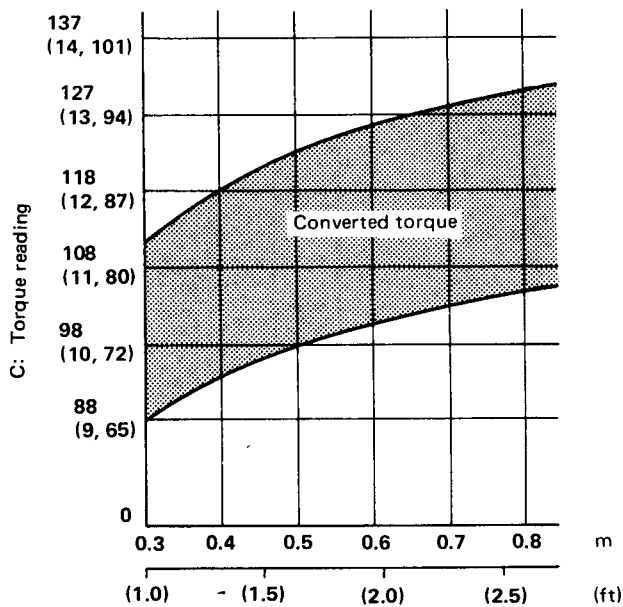
ADJUSTABLE SHOCK ABSORBER

Assembly (Cont'd)

Be careful not to damage piston rod when tightening.



N-m (kg-m, ft-lb)

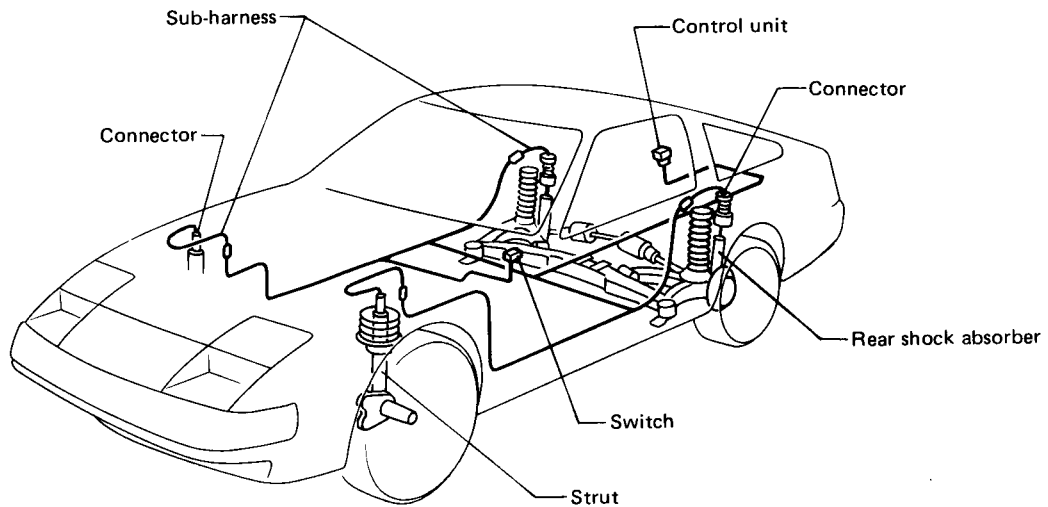


SFA671

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

ADJUSTABLE SHOCK ABSORBER

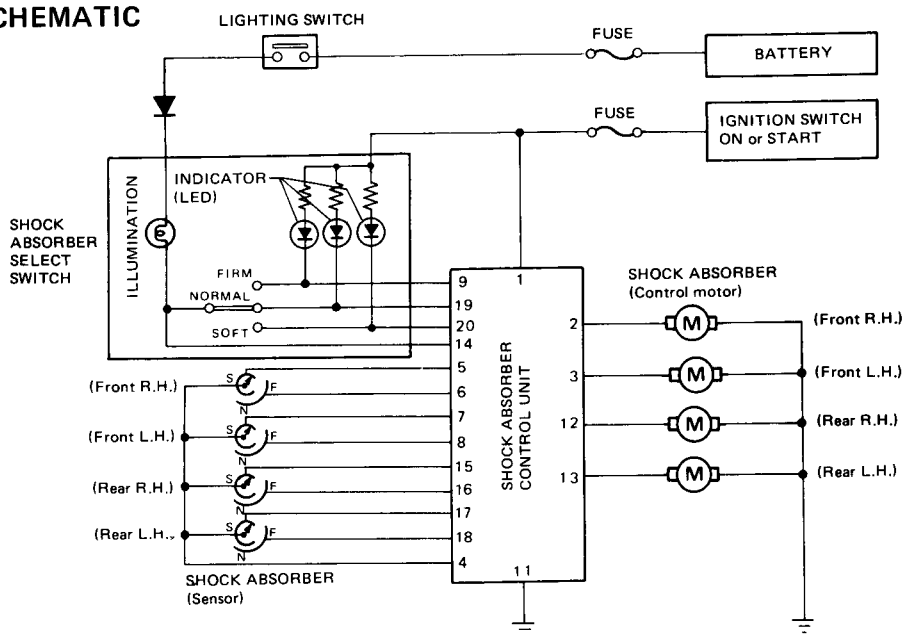
Harness Description



SFA590

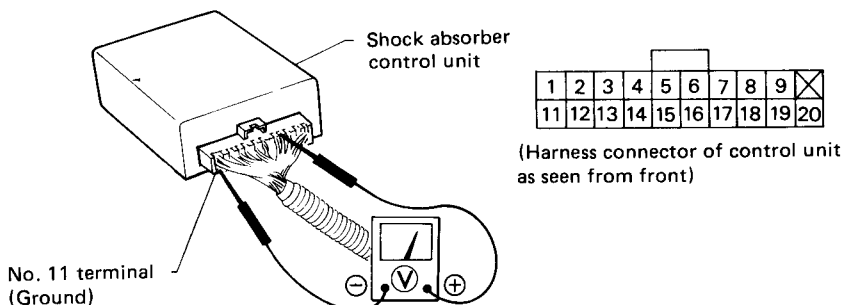
Electrical Circuit

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

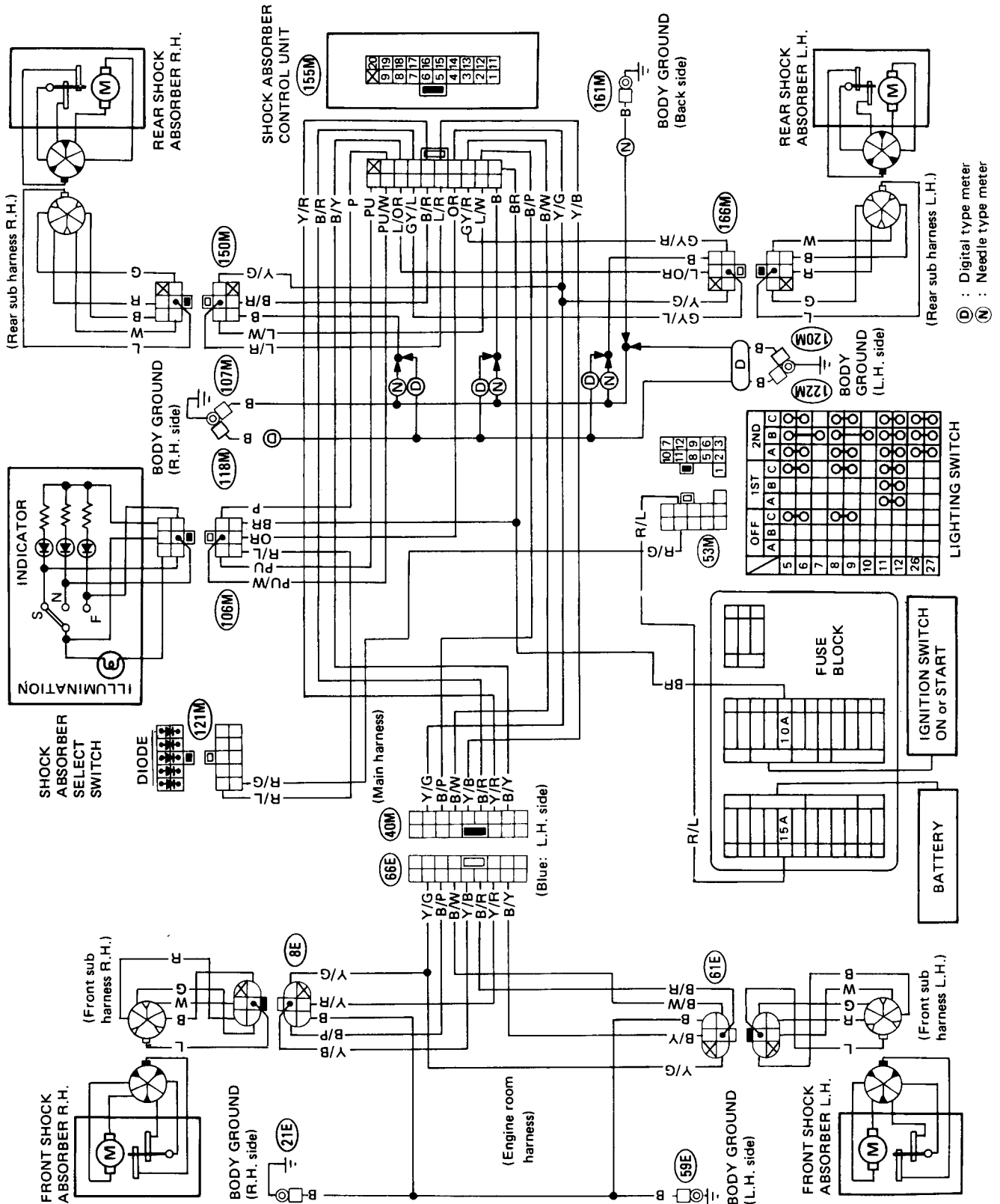


SFA014A

ADJUSTABLE SHOCK ABSORBER

Electrical Circuit (Cont'd)

WIRING DIAGRAM



SFA015A

ADJUSTABLE SHOCK ABSORBER

Trouble Diagnoses

Make sure that connectors are connected properly and that battery is in good condition before starting trouble diagnoses.

No.	Phenomenon on switch	Possible cause	Checking procedure
1	3 lamps all off	- Lamp burnt out - Fuse blown - Harness wire broken - Select switch out of order	<pre> graph TD Start1[Turn off the ignition switch, then change position on select switch. Turn the ignition switch on again, then check lamp for lighting condition.] --> One or two lamps on. ReplaceSwitch1[Replace select switch.] Start1 --> 3 lamps all off. CheckFuse[Check fuse.] CheckFuse --> Blown. ReplaceFuse[Replace fuse.] CheckFuse --> Good. CheckHarness1[Check power and grounding harness for open circuit.] CheckHarness1 --> N.G. RepairHarness[Repair harness.] CheckHarness1 --> Good ReplaceSwitch2[Replace the select switch.] </pre>
2	2 lamps on	- Switch side harness shorted - Select switch out of order	<pre> graph TD Start2[Turn off the ignition switch, then change position on select switch. Turn the ignition switch on again, then check lamp for lighting condition.] --> Good RepairHarness2[Repair switch side harness.] Start2 --> 2 lamps on for other 2 selected positions. CheckHarness2[Check harness.] CheckHarness2 --> N.G. RepairHarness2 CheckHarness2 --> Good ReplaceSwitch3[Replace select switch.] </pre>

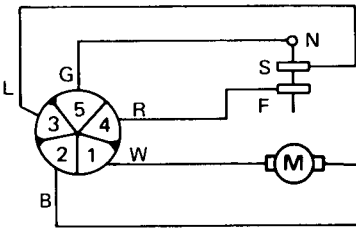
ADJUSTABLE SHOCK ABSORBER

Trouble Diagnoses (Cont'd)

No.	Phenomenon on switch	Possible cause	Checking procedure
3	3 lamps all on	- Switch side harness shorted - Select switch out of order - Control unit out of order	Turn off the ignition switch, then change the position on the select switch. Turn the ignition switch on again, then check the lamp for lighting condition. One lamp on and two lamps off for other 2 selected positions. N.G. Replace the select switch. Repair switch side harness. N.G. Check lighting condition. O.K. END Replace the control unit.
4	3 lamps on and off	- Select switch contact out of order - Open circuit or short circuit is select switch	Turn off the ignition switch, then change the position on the select switch. Turn the ignition switch on again, then check the lamp for lighting condition. O.K. END N.G. Check switch side harness for open circuit or short circuit. O.K. Replace the select switch. N.G. Repair harness.

ADJUSTABLE SHOCK ABSORBER

Trouble Diagnoses (Cont'd)

No.	Phenomenon on switch	Possible cause	Checking procedure								
5	One lamp on and 2 lamps on and off	- Shock absorber damage - Open circuit in sub-harness - Control unit damage - Open circuit in main harness	Turn the select switch to the S position with the ignition key off. Turn the ignition switch on and then turn it off <u>in 2 or 3 seconds</u>. The motors might not turn to the S position if the ignition key is turned off in less than 2 seconds, and the motors will turn to the N position if the ignition key is turned on for more than 6 seconds. Check continuity of the sensor using the sub-harness connector.  <table><thead><tr><th>Position</th><th>Continuity</th></tr></thead><tbody><tr><td>S</td><td>3 - 5</td></tr><tr><td>F</td><td>4 - 5</td></tr><tr><td>N</td><td>3 - 5 4 - 5</td></tr></tbody></table> N.G. (0 continuity) Remove the sub-harness. Then check its continuity. N.G. → Replace the sub-harness. O.K. → Replace the shock absorber. O.K. Check continuity of the control unit using SCHEMATIC. N.G. → Replace the control unit. O.K. Check continuity of the main harness and the body harness using WIRING DIAGRAM. N.G. → Repair the main harness or the body harness. O.K. Repeat the above procedure setting the select switch to the N or F position.	Position	Continuity	S	3 - 5	F	4 - 5	N	3 - 5 4 - 5
Position	Continuity										
S	3 - 5										
F	4 - 5										
N	3 - 5 4 - 5										

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

General Specifications

Item	Engine	VG30ET	VG30E		
	Vehicle model	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)	13.8 (0.543)	14.0 (0.551)	13.8 (0.543)	
Coil diameter	mm (in)	170 (6.69)			
Free length	mm (in)	294.5 (11.59)	300.0 (11.81)	306.0 (12.05)	312.5 (12.30)
Spring constant					
N/mm (kg/mm, lb/in)		25.5 (2.6, 146)	23.8 (2.43, 136.1)		
Identification color		Yellow x 1, White x 1	Yellow x 1, White x 1	White x 1, White x 1	Blue x 1, White x 1
Strut Type		Gas-filled double acting hydraulic	Double acting hydraulic		
		Adjustable	Non-adjustable		
Innter 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					
Maximum/Minimum	mm (in)	191.8 (7.551)/31.8 (1.252)			
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	mm (in)	22 (0.87)			
Tension rod diameter	mm (in)	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: Total toe-in

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)

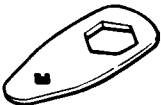
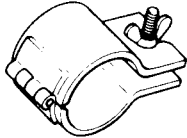
LOWER BALL JOINT

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		1.0 (10, 8.7) or more

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 (Strut assembly)			
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
Tie 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 mounting insulator fixing bolt	31 - 42	3.2 - 4.3	23 - 31
Piston rod lock nut	69 - 88	7 - 9	51 - 65
Gland packing			
Adjustable	118 - 147	12 - 15	87 - 108
Non-adjustable	98 - 127	10 - 13	72 - 94
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 