DATSUN 280Z
MODEL S30 SERIES

NISSAN

NISSAN MOTOR CO., LTD.
TOKYO, JAPAN

SECTION FA

FRONT AXLE & FRONT SUSPENSION

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DESCRIPTION

All models employ a strut type front suspension in which the shock absorber and spindle are assembled into a single unit. It is supported by a coil spring at the top and by the transverse link at the bottom.

The spindle and outer casing are of an integral design. The ball joint, located at the outer end of the transverse link, serves as a pivot for the movement of the spindle.

These are assembled on the suspension member through a rubber bushing to avoid metal to metal contact.

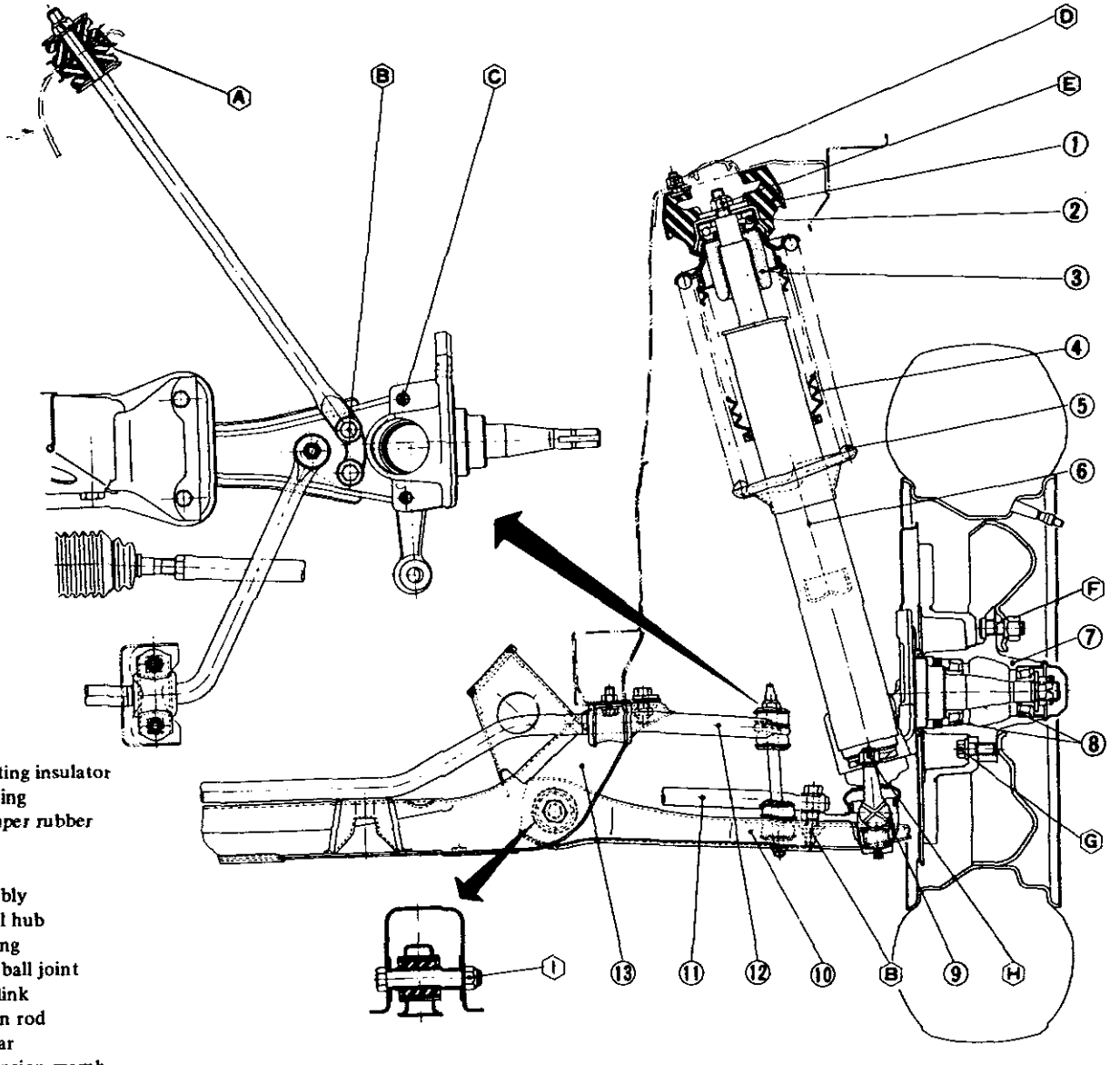
The shock absorber is basically a double-acting hydraulic ram consisting mainly of an outer casing, an inner casing, a piston and a piston rod.

The gland packing and piston guide keep the rod in place and prevent leakage, and dust cover keeps out mud and water.

The coil spring is placed on the piston rod with its seat on the bottom.

The seat is welded to the outer casing. These are mounted on the chassis frame through the thrust bearing at the top. The transverse link, compression rod and rubber bushing take thrusts from front and rear.

The stabilizer uses a torsion bar; it takes thrusts from either side of the car. Thus, the entire suspension handles thrusts from any angle: i.e. those from front and rear by the compression rod, those in a vertical direction with the strut, and those from either side of the car by means of the transverse link.



FA455

1 Strut mounting insulator
2 Thrust bearing
3 Bound bumper rubber
4 Dust cover
5 Coil spring
6 Strut assembly
7 Front wheel hub
8 Wheel bearing
9 Suspension ball joint
10 Transverse link
11 Compression rod
12 Stabilizer bar
13 Front suspension member

Tightening torque (T) of bolts and nuts kg-m (ft-lb)

Ⓐ T : 4.5 to 5.5 (33 to 40)
Ⓑ T : 6.1 to 7.1 (44 to 51)
Ⓒ T : 7.3 to 10.0 (53 to 72)
Ⓓ T : 2.5 to 3.5 (18 to 25)
Ⓔ T : 7.5 to 9.5 (54 to 69)
Ⓕ T : 8 to 9 (58 to 65)
Ⓖ T : 3.9 to 5.3 (28 to 38)
Ⓗ T : 5.5 to 7.5 (40 to 54)
Ⓘ T : 11.1 to 14.0 (80 to 101)

Fig. FA-1 Front axle and suspension assembly

INSPECTION AND ADJUSTMENT

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INSPECTION

Periodically inspect in accordance with the specified maintenance schedule.

SUSPENSION PARTS

1. Jack up the front of car until front wheels clear the floor.
2. Shaking each front wheel by grasping the upper and lower surfaces of tire, check suspension parts for looseness, wear, or damage. Tighten all loose bolts and nuts to the specified torque. Replace all worn parts as described under "Front Suspension".
3. Check wheel bearings. If any axial end-play is present, adjust bearings to specifications. Replace worn or damaged bearings as described under "Front Axle".
4. Check shock absorbers assembled into strut. If these are not in good condition, car posture and wheel alignment may be affected.

ADJUSTMENT

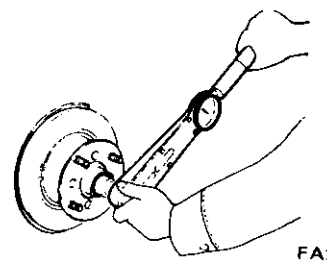
WHEEL BEARING

Improper adjustment of wheel bearings causes abnormal wear and score on the bearings and knuckle spindle.

To obtain proper preload on wheel bearings, proceed as follows:

Note: **In order to assure correct bearing preload and to extend service life of wheel bearings, be sure to prevent dirt and foreign particles from getting in bearings, grease seal and spindle nut.**

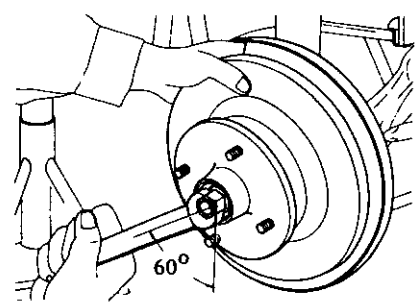
1. Jack up and support car with stands. See the section GI.
2. Remove pad. Refer to section BR for "Pad Replacement".
3. Tighten wheel bearing lock nut to 2.5 to 3.0 kg-m (18 to 22 ft-lb) torque. See Figure FA-2.



FA263

Fig. FA-2 Tightening wheel bearing lock nut

4. Rotate wheel hub a few turns in both directions to seat wheel bearing correctly. Then, retighten spindle nut to the above torque.
5. Loosen wheel bearing lock nut 60 degrees. Install adjusting cap and align groove of nut with hole in spindle. If groove does not align with hole, relocate adjusting cap. If the hole and groove still do not come into alignment, loosen wheel bearing lock nut as much as 15 degrees more.



FA456

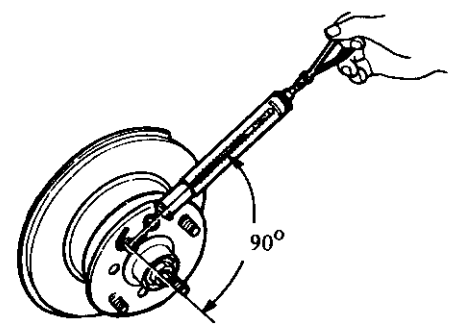
Fig. FA-3 Loosen wheel bearing lock nut 60°

6. Again spin wheel hub several turns in both directions to see if it rotates freely. Then, measure bearing preload using a spring balance as follows:

Wheel bearing rotation starting torque:

New parts: 4.0 to 8.5 kg-cm
(3.5 to 7.4 in-lb)
As measured at wheel hub bolt:
0.7 to 1.5 kg (1.5 to 3.3 lb)

Adjustment with old parts:
1.0 to 4.5 kg-cm
(0.9 to 3.9 in-lb)
As measured at wheel hub bolt with old parts:
0.2 to 0.8 kg (0.4 to 1.8 lb)



FA264

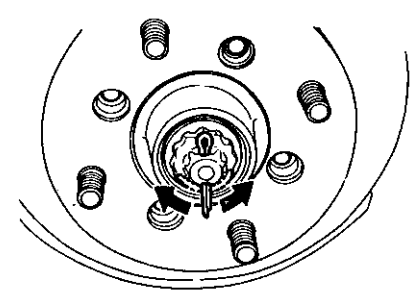
Fig. FA-4 Measuring wheel bearing rotation starting torque

Repeat above procedures until correct preload is obtained.

Notes:

a. To measure bearing preload, attach a spring balance to hub bolt and pull it at right angle to a line drawn through center of bearing and hub bolt to which it is attached.
b. The slightest shaft play cannot be tolerated here.

7. Insert a new cotter pin with the legs through adjusting cap and spindle, and spread legs away from each other against sides of adjusting cap to secure the installation. See Figure FA-5.



FA457

Fig. FA-5 Installing cotter pin

8. Install hub cap.

WHEEL ALIGNMENT

Correct front wheel alignment assures proper vehicle handling characteristics and minimum steering effort with the least amount of tire wear.

Before adjusting front wheel alignment, be sure to carry out a preliminary inspection of the front end parts as follows:

1. Tire pressure
2. Wheel bearings and spindle nuts
3. Steering gear play
4. Steering gear housing (loose at suspension member.).
5. Steering linkage and connections
6. Shock absorber action

When using the equipment for front wheel alignment inspection, follow the instructions furnished with the equipment. Moreover, the inspection should be made with the car set level and at curb weight.

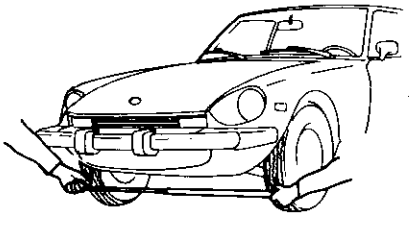
Camber and caster

Camber and caster are preset at factory and cannot be adjusted.

Car requires only toe-in and leveling adjustments.

Toe-in

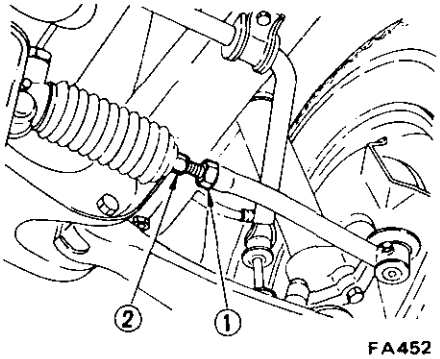
1. Measure toe-in with a toe-in gauge. See Figure FA-6.



FA467

Fig. FA-6 Measuring toe-in

2. Loosen side rod lock nut ①, and adjust length of side rod ② properly to the standard value. See Figure FA-7.



FA452

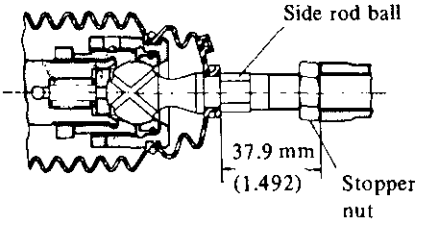
Fig. FA-7 Adjusting toe-in

Notes:

a. **Distance between centers of side rods at any point should be equal.**

Standard length of side rod:
37.9 mm (1.492 in)

See Figure FA-8.

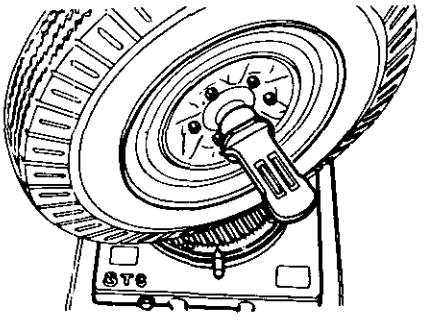


ST447

Tightening torque:
8 to 10 kg-m (58 to 72 ft-lb)

Fig. FA-8 Standard length of side rod

b. **When steering gear housing is removed, be sure to adjust the steering angle at side rod unit with a turning radius gauge after installation.**
c. **Adjust toe-in after steering angle adjustment.**
d. **When adjusting toe-in, be sure to move the left and right side rods equally.**
e. **When steering angle is incorrect, disassemble rack and pinion because incorrectly assembled rack and pinion cause improper steering angle.**
f. **Side rod lock nut end surface comes into contact with steering gear housing end forming a steering stopper.**



FA032

Fig. FA-9 Measuring steering angle, camber and caster

CAR LEVEL

Adjustment can be made by selecting spring which will keep car in a normal, level position.

		S30	GS30 (2+2 seats)
Toe-in	mm (in)	0 to 3 (0 to 0.118)	0 to 3 (0 to 0.118)

FRONT AXLE

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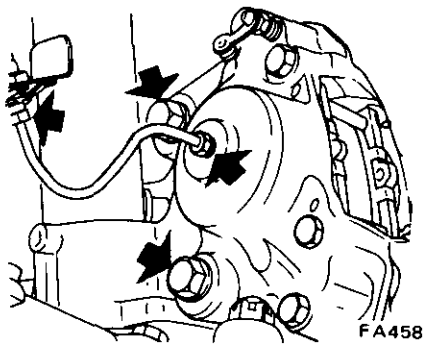
FRONT AXLE

REMOVAL

1. Jack up car until wheel drops to full down position.

Remove wheels and disconnect brake tube. See Figure FA-10.

2. Remove bolts retaining brake caliper and take out caliper assembly. See Figure FA-10.



Tightening torque:

Brake tube flare nut
1.5 to 1.8 kg-m (11 to 13 ft-lb)
Caliper fixing bolt
7.3 to 9.9 kg-m (53 to 72 ft-lb)

Fig. FA-10 Removing brake tube and caliper fixing bolts

3. Work off hub cap from end of spindle using two screwdrivers or any other suitable tool as shown in Figure FA-11. If necessary, tap around it with a soft hammer while removing cap.

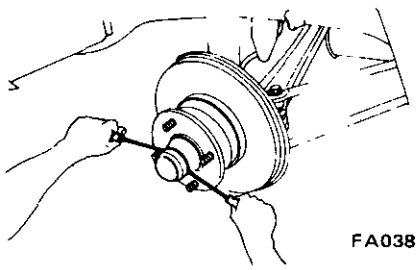


Fig. FA-11 Removing hub cap

Note: During this operation, use caution to avoid damaging O-ring.

4. Pry off cotter pin; take out adjusting cap and wheel bearing lock nut.

5. Remove wheel hub from spindle with bearing installed.

6. Wheel hub may be removed together with disc rotor.

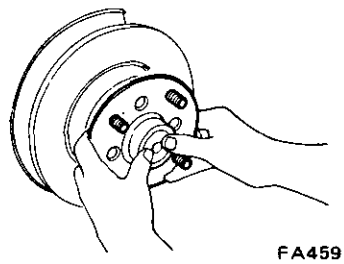


Fig. FA-12 Removing wheel hub

7. Utilizing two grooves inside hub, drive out wheel bearing outer race from hub with a brass drift.

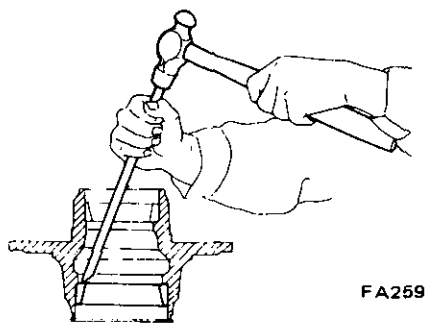
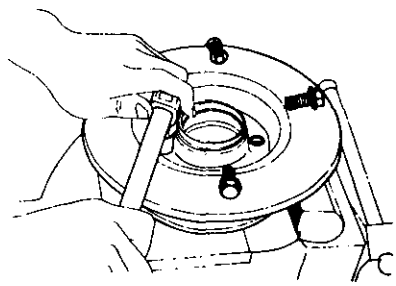


Fig. FA-13 Removing wheel bearing outer race

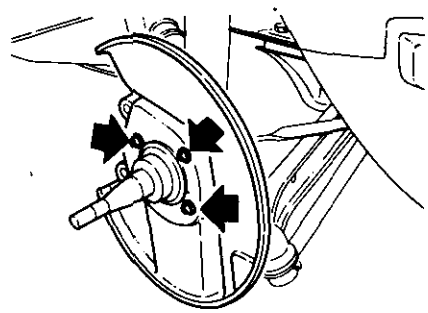
8. Loosen four bolts securing brake disc in position; remove disc brake rotor from wheel hub assembly.



Tightening torque:
3.9 to 5.3 kg-m (28 to 38 ft-lb)

Fig. FA-14 Removing disc brake rotor

9. Loosen screws securing baffle plate in position; take out baffle plate.



Tightening torque:
0.32 to 0.44 kg-m (2.3 to 3.2 ft-lb)

Fig. FA-15 Removing baffle plate screws

INSPECTION

Wheel hub

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

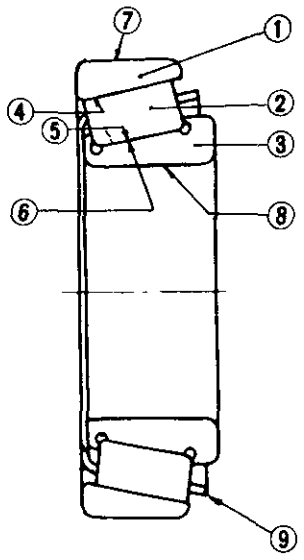
Grease seal

Replace grease seal every disassembly even if it appears good.

Wheel bearing

Thoroughly clean grease and dirt from wheel bearing with cleaning solvent, and dry with compressed air free of moisture. Check wheel bearing to see that it rolls freely and is free from noise, crack, pitting, or wear. Also, check condition of outer race. Removal of outer race from hub is not necessary.

Note below chart: "Visual Serviceability Standard for Wheel Bearing".



1 Outer race
2 Roller
3 Inner race
4 Outer race rolling surface
5 Inner race rolling surface
6 Roller rolling surface
7 Outer race fitted surface
8 Inner race fitted surface
9 Supporter

FA266

Fig. FA-16 Wheel bearing

Judgement	× : Unserviceable △ : May be used when minor * : Rust should be removed with # 0 emery paper			
Components	Race and roller		Supporter	Cause
	Rolling surface	Fitted surface		
Flaking (Fig. FA-17. a,b)	×			Shortened service life due to rolling fatigue. Occurring before normal end of service life, probable causes are: • Abnormal load (overload). • Improper handling or installing.
Crack (Fig. FA-17. c,d)	×	×	×	• Excessive tightening. • Excessive gap coupled with substantial external shock. • Rapid heat generation on the race due to creep. • Bitten supporter with seized rollers. • Abnormal thrust load. • Tapped with a hammer while being removed.
Seizure	×	×	×	In the most cases, seizure occurs as a result of progressive discoloring or flaking.
Scratch	△	△	△	• Shock resulting from careless installation. • Foreign matter.
Recess or wear made by pressing or striking (Fig. FA-17. e,f,g)				• Careless installation, removal, or other rough handling (scar due to striking). • Recess made by foreign matter.

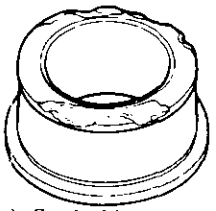
Judgement	× : Unserviceable △ : May be used when minor * : Rust should be removed with # 0 emery paper			
Components	Race and roller		Supporter	Cause
	Rolling surface	Fitted surface		
Wear	△	△	△	• Poor lubricant quality or deteriorated lubricant. • Intrusion of dust. Fitted surface worn excessively. • Wear due to excessive preliminary pressure.
Bite	△	△	△	• Excessive preliminary pressure or faulty lubrication.
Fretting	△ *	△ *	△ *	• The fitted part is discolored to brown or black. • Fretting corrosion (rust on fitted part) means fine relative slip on metal contact surface.
Rust (Fig. FA-17. h)	△ *	△ *	△ *	• Temperature increased during operation decreases when the bearing stops, moisture inside the bearing is condensed, becoming fine drops, and the grease is moistened. • The bearing has been placed in highly moistened place for a long period of time. • Intrusion of moisture, chemicals, etc., or the bearing is touched with bare hand and no rustproof action has been taken.
Discoloring	The wheel bearing is serviceable if discoloring can be removed with solvent or by polishing.			• Slight discoloring may look like oxidized oil stain due to grease. • In the most cases, this occurs when preliminary pressure is too high.



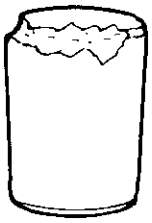
a) Inner race flaking



b) Roller flaking



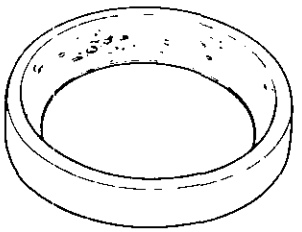
c) Cracked inner race



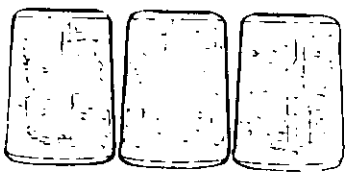
d) Cracked roller



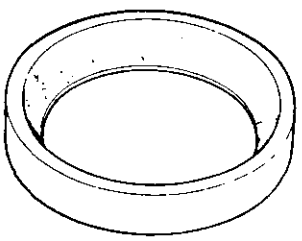
e) Recess on inner race



f) Recess on outer race



g) Recess on roller



h) Rust on outer race

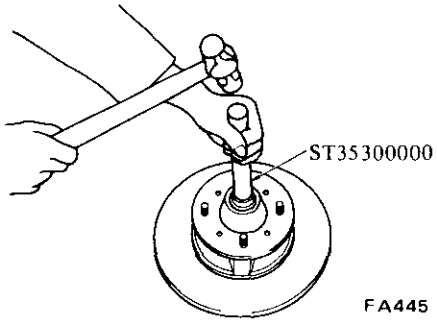
FA267

Fig. FA-17 Bearing's appearance

INSTALLATION

Install front axle in the reverse order of removal, noting the following:

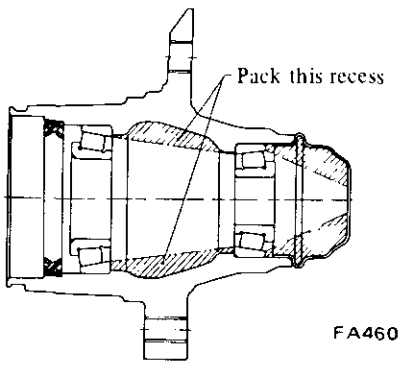
1. Install baffle plate to knuckle spindle, tighten screws to 0.32 to 0.44 kg-m (2.3 to 3.2 ft-lb).
2. Install disc brake rotor to wheel hub, tighten to 3.9 to 5.3 kg-m (28 to 38 ft-lb).
3. Install bearing outer race with Front Wheel Bearing Drift ST35300000.



FA445

Fig. FA-18 Installing wheel bearing outer race

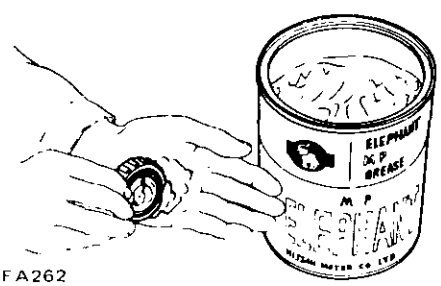
4. Pack the inside of hub and hub cap with recommended multi-purpose grease to the specified level. See Figure FA-19.



FA460

Fig. FA-19 Lubricating points of wheel hub

5. Pack cavities of each bearing cone and grease seal lip pocket with grease.



FA262

Fig. FA-20 Filling bearing cone with grease



FA064

Fig. FA-21 Filling grease seal lip pocket with grease

6. Put inner bearing cone in hub and install a new grease seal. Be sure to lubricate sealing lips of the grease seal before installation.
7. Put hub assembly on spindle and then install outer bearing cone.
8. Apply sparingly grease to washer and threaded parts of spindle and spindle nut. Then, install washer and spindle nut. Adjust the installation as outlined under "Wheel Bearing Adjustment"

Note: In order to assure correct bearing preload and to extend service life of wheel bearings, be sure to avoid dirt and foreign particles getting in bearings, grease seal, washer and spindle nut.

9. Install caliper and connect brake tube.

10. After lowering car to the ground, tighten wheel nut, bleed brake system.

FRONT SUSPENSION

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SPRING AND STRUT ASSEMBLY

DESCRIPTION

The front suspension employs struts, right and left. Each strut consists of an outer casing, a piston, a piston rod and an inner cylinder.

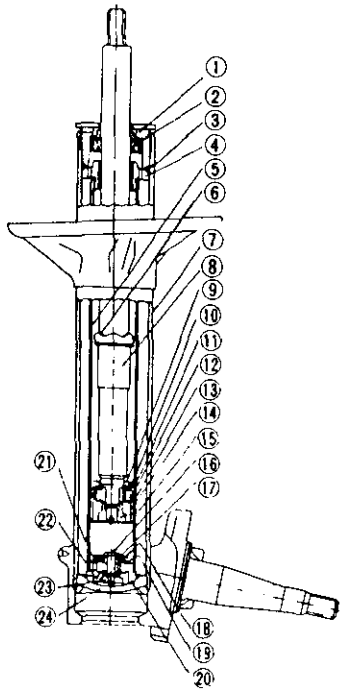
The cylinder incorporates a piston rod guide at the top and a check valve at the bottom.

The piston rod, piston rod guide, cylinder and bottom valve should be handled as a matched set.

If any of these parts becomes faulty, all the parts must be replaced as a unit.

The spring comes in few types with individual markings.

When a spring requires replacement, use the one having the same color identification. If this is not done, the car may not settle in a normal level posture.



1 Gland packing assembly
2 Oil seal
3 O-ring
4 Piston rod guide assembly
5 Cylinder
6 Rebound stopper
7 Strut-outer casing
8 Piston rod
9 Check valve spring retainer
10 Check valve spring
11 Check valve plate
12 Piston ring
13 Valve plate
14 Piston body
15 Nut
16 Bolt
17 Distance collar
18 Spring retainer
19 Check valve spring
20 Bottom valve body
21 Check valve plate
22 Valve plate
23 Nut
24 Bottom plate

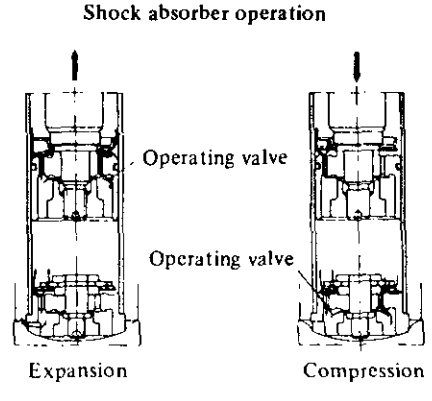
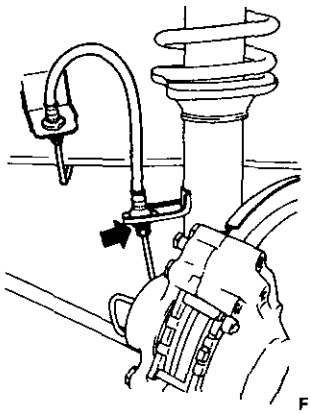


Fig. FA-22 Sectional view of strut assembly

REMOVAL

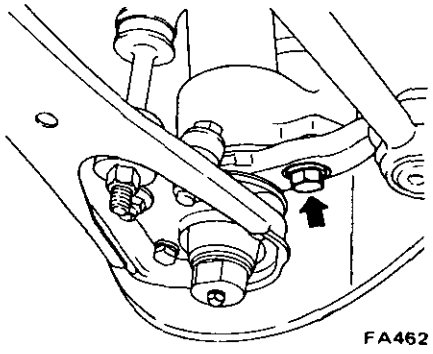
1. Jack up car and support it with safety stands. Remove wheel.
2. Loosen brake tube, remove brake hose locking spring, withdraw plate, and remove brake hose from strut assembly bracket.



Tightening torque:
1.5 to 1.8 kg-m (11 to 13 ft-lb)

Fig. FA-23 Disconnecting brake hose

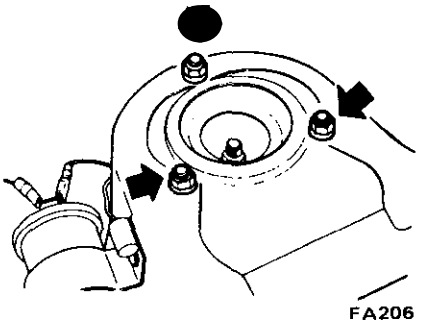
3. Loosen bolts retaining caliper in place; take out caliper as an assembled unit.
4. Remove bolts connecting strut to knuckle arm. See Figure FA24.



Tightening torque:
7.3 to 10.0 kg-m (53 to 72 ft-lb)

Fig. FA-24 Removing bolts connecting knuckle arm

6. Detach knuckle arm from bottom of strut. This can be done by forcing transverse link down with a suitable bar.
7. Place jack under strut to receive its weight when nuts are removed.
8. Lift engine hood to gain access to nuts holding strut in place on car body. See Figure FA-25.



Tightening torque:
2.5 to 3.5 kg-m (18 to 25 ft-lb)

Fig. FA-25

9. With springs attached, lower jack slowly while holding strut by hand; take out strut.

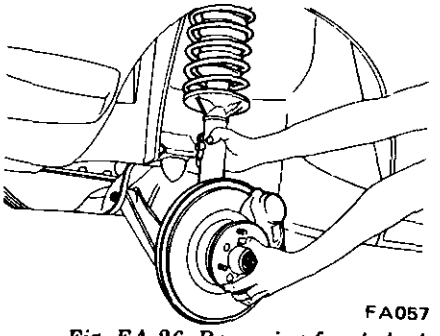


Fig. FA-26 Removing front strut Assembly

DISASSEMBLY

When disassembling a strut, caution should be exercised to prevent dirt and dust from getting inside strut. This dirt and dust is extremely abrasive and, if permitted to enter strut, causes internal leaks and premature wear of moving parts.

1. Install attachment on bottom of strut; secure above assembly in jaws of a suitable vise. See Figure FA-28.
2. Pry snap ring off dust cover.
3. Set up Spring Compressor ST3565S000 on spring. Compress spring just far enough to permit turning of strut insulator by hand. Remove self-locking nut. See Figure FA-27.

Note: When loosening self-locking nut, use a screwdriver as a shifter. Moreover, when loosening self-locking nut (used to hold down *spring), install a nut on bolt (used* to install strut on the body) and apply screwdriver to nut so that the thread of bolt is not damaged.

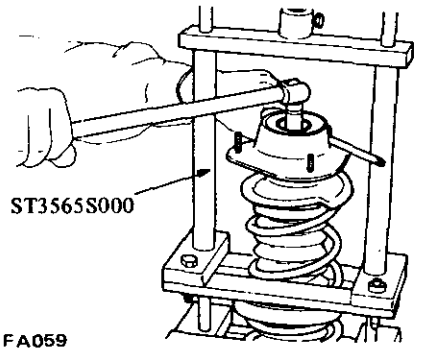


Fig. FA-27 Removing self-locking nut

4. Take out strut insulator, strut bearing, oil seal, upper spring seat and bound bumper rubber in the order listed.
5. Remove spring from strut with Spring Compressor ST3565S000 left on spring.
6. Retract piston rod by pushing it down until it bottoms. Without disturbing the above setting, remove gland packing with Gland Packing Wrench KV40100800. See Figure FA-28.

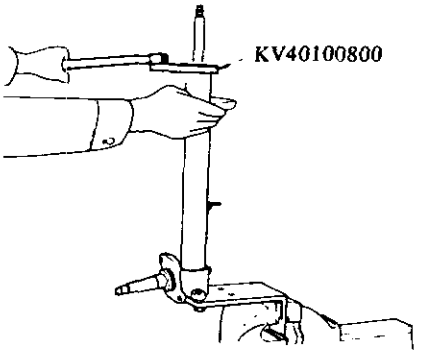


Fig. FA-28 Removing gland packing

Note: Clean gland packing of mud and other accumulated foreign particles.

7. Remove O-ring from top of piston rod guide.
8. Lift out piston rod together with cylinder. See Figure FA-29.

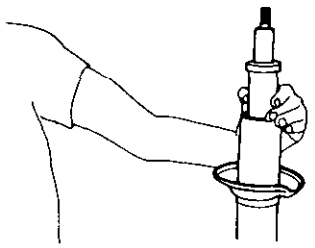

FA275

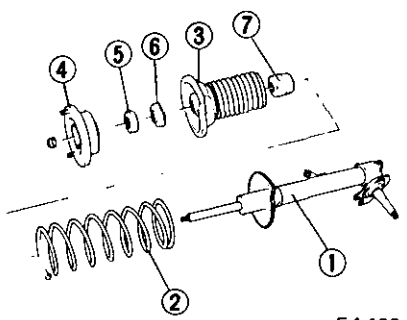
Fig. FA-29 Removing piston rod and cylinder

Note: Under no circumstances should piston and piston rod guide be removed from cylinder since these are adjusted to each other to provide precision mating surfaces and should be handled as a matched set.

9. Drain fluid thoroughly from inner cylinder. Use a suitable container to receive fluid drained.
10. Wash all parts in cleaning solvent.
11. Drain fluid which collects inside outer casing thoroughly.

Note: This operation is very important since performance of strut varies with amount of fluid initially filled.

INSPECTION



FA463

1 Strut assembly
2 Coil spring
3 Spring upper seat
4 Strut mounting insulator
5 Thrust bearing
6 Dust seal
7 Bound bumper rubber

Fig. FA-30 Exploded view of strut assembly

1. Replace gland packing, O-ring and fluid with new ones or fresh oil whenever strut is disassembled.
2. Wash all parts, except for non-metalic parts, with solvent and dry with compressed air.
3. Blow dirt and dust off of non-metalic parts using compressed air.

- **Outer casing**
  Check outer casing for evidence of deformation, cracking or other damage. If necessary, replace.
- **Spindle**
  Check spindle for hair cracks on base and damaged threads. Replace strut if any of above conditions exceed limits.
- **Strut mounting insulator**
  Replace if rubber and metal joints are melted or cracked. Rubber parts should be replaced if deteriorated.
- **Thrust bearing**
  Replace if inspection reveals abnormal noise or excessive rattle in axial direction.
- **Front coil spring**
  Replace if weakened or cracked.

ASSEMBLY

When assembling strut, be careful not to drop or scratch parts since they are precisely machined to very close tolerances. Before assembly, clean away all dirt to prevent any possible entry of dirt into strut.

1. Set attachment in place on bottom of strut and place attachment in jaws of a suitable vise.
2. Install piston rod and cylinder into place in outer casing.
3. Pour correct amount of fluid into outer casing. See Figure FA-31.

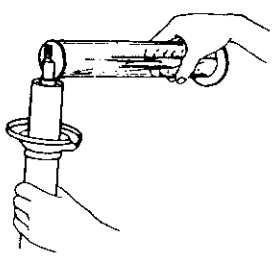

FA330

Fig. FA-31 Filling outer casing with fluid

Notes:

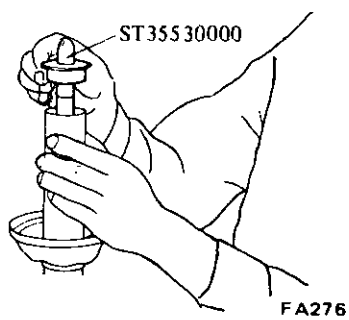
a. **It is important that correct amount of fluid be poured into strut to assure correct damping force of shock absorber.**

Amount of oil:
340 cc (20.7 cu in)

b. **Use Nissan genuine shock absorber oil "NISSAN GENUINE STRUT OIL" or equivalent.**

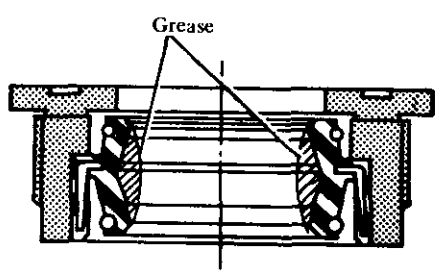
4. Place rod guide on top of piston rod guide; install gland packing using Gland Packing Guide ST35530000. See Figure FA-32.

Lubricate sealing lip, asterisked in Figure FA-33, with recommended multi-purpose grease.



FA276

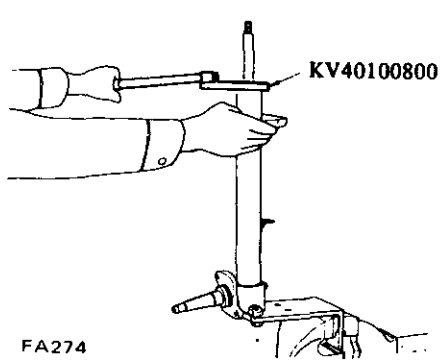
Fig. FA-32 Installing gland packing



FA464

Fig. FA-33 Sectional view of gland packing

5. Tighten gland packing to 7 to 13 kg-m (51 to 94 ft-lb) torque. See Figure FA-34.



FA274

Fig. FA-34 Tightening gland packing

Notes:

a. When tightening gland packing, it is important that piston rod be extended approximately 120 mm (4.72 in) from end of outer casing to expel most of air out of strut.

b. Gland packing should be tightened to 7.0 to 13.0 kg-m (51 to 94 ft-lb) torque with the aid of Gland Packing Wrench **KV40100800**. When doing so, the amount of torque to be read beneath wrench needle should be modified according to the following formula:

$$C\ \text{kg-m} = 7 \times \left(\frac{\ell}{\ell + 0.1}\right) \text{ or}$$

$$C\ \text{ft-lb} = 51 \times \left(\frac{\ell}{\ell + 0.33}\right)$$

Where,

C ..Value read on the torque wrench [kg-m (ft-lb)]

ℓ.. Effective length of torque wrench [m (ft)]

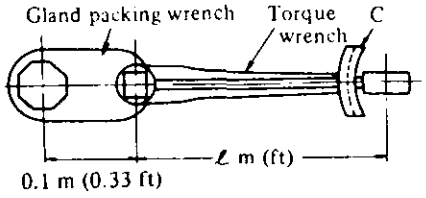


Fig. FA-35 Gland packing wrench

6. After the above steps have been completed, air should be removed from shock absorber system in the following manner.

(1) Hold strut by hand with its spindle end facing down; without disturbing the above setting, pull out piston rod completely. Then, turn strut upside down so that spindle end is now facing up. Under this condition, retract piston rod all the way. See Figure FA-36.

(2) Repeat the above procedure several times so that air will be completely bled from strut.

(3) If, during the above step, equal pressure is felt through the hand gripping piston rod on both strokes, it is an indication that air has been completely expelled from strut.

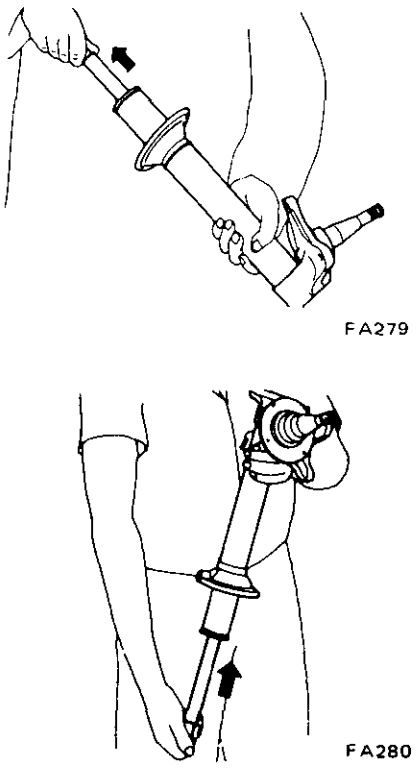


Fig. FA-36 Bleeding air from strut

7. Place attachment in jaws of a vise.

8. Before proceeding any further, pull piston rod all the way out to the limit of its stroke; install bound bumper rubber to prevent piston rod from falling by its own weight.

9. Place front spring on lower spring seat and compress spring with Spring Compressor ST3565S000.

Install dust cover, upper spring seat, mounting bearing and insulator in the order listed.

10. Lubricate parts, indicated by arrow in Figure FA-37, with recommended multi-purpose grease.

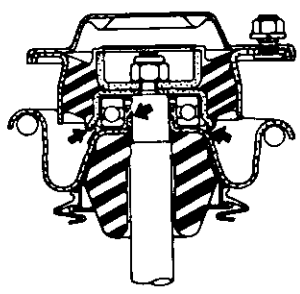


Fig. FA-37 Strut mounting bearing greasing point

Notes:

a. Use care to avoid damaging piston rod during disassembly and assembly. Do not use pliers or the like to extract piston rod.

b. Install mounting bearing so that it points in correct direction. See Figure FA-37.

11. Tighten piston rod self-locking nut to 7.5 to 9.5 kg-m (54 to 69 ft-lb) torque.

Note: Use new self-locking nuts whenever strut assembly is reassembled.

12. After placing spring in position (Figure FA-38) between upper and lower spring seats, release compressor gradually.

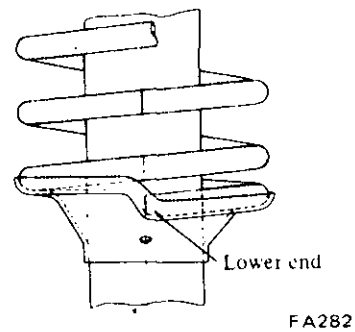


Fig. FA-38 Installing front spring

13. Raise bound bumper rubber to upper spring seat.

INSTALLATION

Install the strut and spring assembly in the reverse order of removal.

Tightening torque:

Nuts used to install the strut assembly on the body:

2.5 to 3.5 kg-m
(18 to 25 ft-lb)

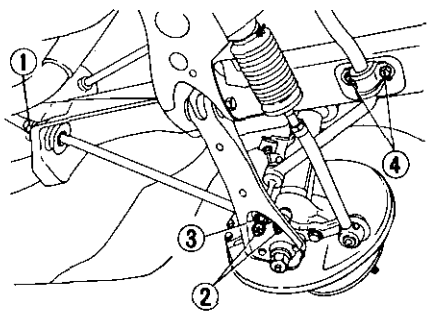
Bolts used to install the knuckle arm to strut:

7.3 to 10.0 kg-m
(53 to 72 ft-lb)

COMPRESSION ROD AND STABILIZER BAR

REMOVAL

1. Jack up car and support it with safety stands; remove wheel.
2. Remove splash board.
3. Back off nut ① securing compression rod to bracket, and remove bolts ② which secure compression rod to transverse link. Compression rod can then be taken out.
4. Remove nut ③ connecting stabilizer connecting rod to transverse link.
5. Take out bolts ④ securing stabilizer bracket in position. Remove stabilizer from car frame. See Figure FA-39.



FA465

Fig. FA-39 Removing stabilizer and compression rod

INSPECTION

1. Check compression rod and stabilizer for evidence of deformation and cracking; if necessary, replace.
2. Check rubber parts such as compression rod and stabilizer bushings to be sure they are not deteriorated or cracked.

INSTALLATION

Install compression rod and stabilizer bar in the reverse order of removal, noting the following:

1. Ensure that stabilizer is correctly installed to the portion of the left and right sides.
2. Check to be sure that compression rod bushing is properly centered in its seat.

Tightening torque:

Nut used to install compression rod on transverse link:
6.1 to 7.1 kg-m
(44 to 51 ft-lb)

Stabilizer installation bolts
Transverse link side:
1.2 to 2.7 kg-m
(9 to 20 ft-lb)
Frame bracket side:
1.9 to 2.5 kg-m
(14 to 18 ft-lb)
Connecting rod side:
1.2 to 2.7 kg-m
(9 to 20 ft-lb)

TRANSVERSE LINK AND LOWER BALL JOINT

The transverse link is connected to the suspension member through a rubber bushing and to the strut through a ball joint.

The lower ball joint is assembled at the factory and cannot be disassembled. Lubricate ball joints with recommended multi-purpose grease at specified intervals.

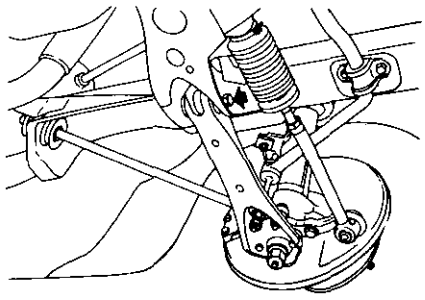
REMOVAL

1. Jack up car and support it with safety stands; remove wheel.
2. Remove splash board.
3. Pry cotter pin off side rod socket ball joint. Remove castle nut and separate side rod socket from knuckle arm.
4. Loosen bolts holding knuckle arm in place. Separate knuckle arm from bottom end of strut. For details, refer to "Spring and Strut Assembly".
5. Remove compression rod and stabilizer bar.

For details, refer to "Compression Rod and Stabilizer Bar" section.

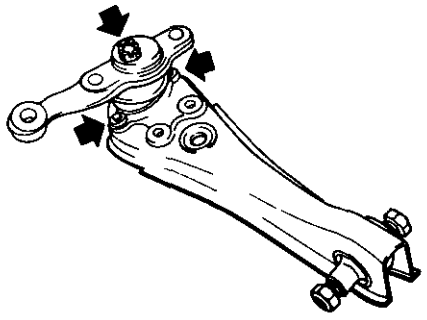
6. Loosen transverse link mounting bar and separate transverse link from suspension member.

Remove transverse link with suspension ball joint and knuckle arm See Figures FA-40 and FA-41.



FA466

Fig. FA-40 Removing transverse link

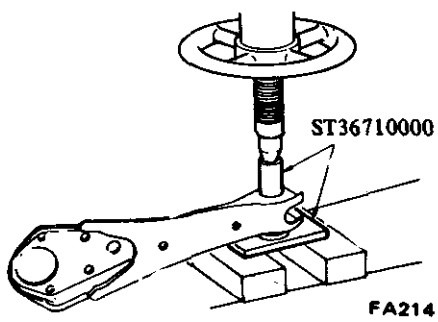


FA448

Fig. FA-41 Removing knuckle arm

Note: Knuckle arm is taper-fit to ball joint. If knuckle arm can not be easily removed, screw nut onto threaded portion of ball stud and hammer on top of nut.

7. Place transverse link in a vise, loosen bolt securing ball joint to transverse link and remove ball joint from transverse link.
8. Withdraw transverse link bushing from transverse link using Front Transverse Link Bushing Replacer Set ST36710000 and a press.



FA214

Fig. FA-42 Removing transverse link bushing

INSPECTION

Transverse link

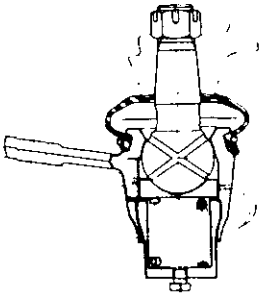
1. Check for signs of cracks, distortion or other damage. Replace if any of above conditions are beyond repair.
2. If rubber bushing shows evidence of cracking, replace with a new one.

Ball joint

1. Ball joint is assembled at factory and cannot be disassembled. Check ball stud turning torque with nut in place.

Turning torque:

New parts	75 to 125 kg-cm (65 to 109 in-lb)
Used parts	More than 50 kg-cm (43 in-lb)



FA217

Fig. FA-43 Sectional view of lower ball joint

2. Check conditional dust cover. If found to be cracked excessively beyond use, replace ball joint with a new one.
3. At specified intervals, lubricate ball joint with recommended multipurpose grease.

To lubricate, remove plug and install grease nipple in its place.

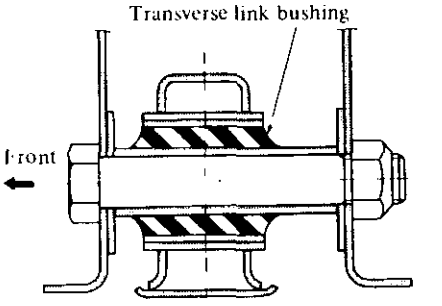
Pump grease slowly until old grease is completely forced out. After greasing, reinstall plug.

Note: 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.

INSTALLATION

Install transverse link and lower ball joint in reverse sequence of removal, noting the following:

1. When installing transverse link bushing, use the special tool ST36710000, and fit it until transverse link bushing outer tube end surface is made flush with the transverse link end surface. Carefully align bushing direction correctly (front and rear). See Figure FA-44.



FA447

Fig. FA-44 Sectional view of transverse link bushing

2. When installing knuckle arm to ball joint, wipe off any grease on the tapered and threaded portions. Tighten nut to 5.5 to 7.5 kg-m (39.8 to 54.2 ft-lb) torque.

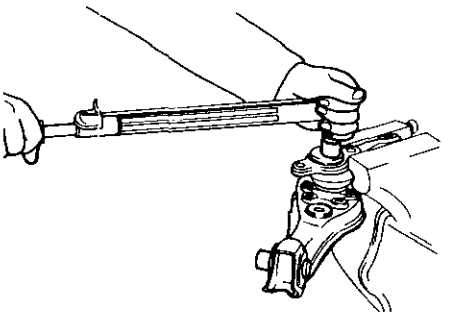
Align cotter pin hole with nut groove by retightening nut within the range of 60 degrees. Insert new cotter pin in hole and spread pin legs to secure the installation. See Figure FA-45.

Tightening torque:

Ball joint bolt:
1.9 to 2.5 kg-m
(13.7 to 18.0 ft-lb)

Ball joint castle nut:
5.5 to 7.5 kg-m
(39.8 to 54.2 ft-lb)

Transverse link mounting bolt:
11.1 to 14.0 kg-m
(80 to 101 ft-lb)



FA450

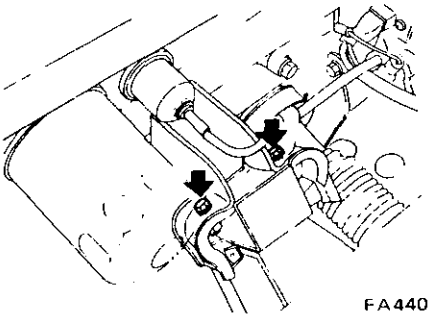
Fig. FA-45 Tightening knuckle arm castle nut

3. First, tighten transverse link mounting bolt temporarily, and then tighten to the rated torque with the car under the standard load.

SUSPENSION CROSSMEMBER

REMOVAL

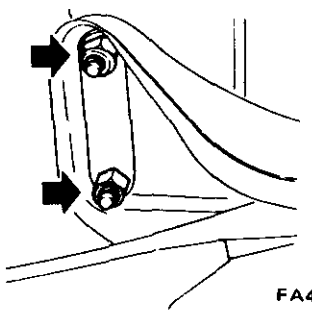
1. Jack up car and support it with safety stands: remove wheels.
2. Remove splash board.
3. Remove steering gear box from suspension member. Refer to section ST.
4. Remove transverse link. For details, refer to "Transverse Link and Lower Ball Joint".
5. With an overhead hoist and lifting cable, support weight of engine to remove load from mountings.
6. Remove engine mounting bolts and nuts indicated by arrows in the sketch below. Separete suspension crossmember from engine.



FA440

Tightening torque:
1.6 to 2.1 kg-m (12 to 15 ft-lb)

Fig. FA-46 Removing engine mounting bolts



Tightening torque:
4.5 to 5.0 kg-m (33 to 36 ft-lb)

Fig.FA-47 Removing suspension crossmember

INSPECTION

1. Check suspension crossmember for evidence of deformation and cracking; if necessary, replace.

INSTALLATION

Install suspension crossmember in the reverse order of removal.

Tightening torque:
Suspension member to frame
4.5 to 5.0 kg-m
(33 to 36 ft-lb)

SERVICE DATA AND SPECIFICATIONS

Wheel alignment

		S30	GS30 (2 + 2 seats)
Camber degree		0°18′ to 1°48′	0°21′ to 1°51′
Caster degree		2°3′ to 3°33′	2°3′ to 3°33′
Kingpin inclination degree		11°14′ to 12°44′	11°14′ to 12°44′
Toe-in mm (in)		0 to 3 (0 to 0.118)	0 to 3 (0 to 0.118)
*Steering angle degree	In	33°54′ to 34°54′	36°18′ to 37°18′
	Out	32°6′ to 34°6′	34°24′ to 36°24′

*With the exception of steering angle, all chart specifications are based upon unloaded condition.
Steering angle is based upon loaded condition.

Coil spring

	S30	GS30
Active turns of coil	9.5	8.5
Free length mm (in)	406 (15.98)	399 (15.71)
Spring constant kg/mm (lb/in)	1.84 (103.0)	2.06 (115.4)

Strut assembly

Damping force at piston speed
0.3 m (0.98 ft)/sec.
Expansion/Compression kg (lb)/kg (lb) ..... 55 (121)/30 (66)

Front wheel bearing rotation starting torque

New parts	kg-cm (in-lb)	4.0 to 8.5 (3.5 to 7.4)
As measured at wheel hub bolt	kg (lb)	0.7 to 1.5 (1.5 to 3.3)
Adjustment with old parts	kg-cm (in-lb)	1.0 to 4.5 (0.9 to 3.9)
As measured at wheel hub bolt	kg (lb)	0.2 to 0.8 (0.4 to 1.8)

Ball joint turning torque

New parts	kg-cm (in-lb)	75 to 125 (65 to 109)
Used parts	kg-cm (in-lb)	More than 50 (43)

Tightening torque

Front axle	kg-m (ft-lb)
Brake disc rotor and hub assembly tightening bolt	3.9 to 5.3 (28 to 38)
Brake tube installation nut	1.5 to 1.8 (11 to 13)
Wheel bearing lock nut	2.5 to 3.0 (18 to 22)
Disc brake caliper fixing bolt	7.3 to 9.9 (53 to 72)
Baffle plate installation screw	0.32 to 0.44 (2.3 to 3.2)

Strut assembly	kg-m (ft-lb)
Gland packing tightening torque	7 to 13 (51 to 94)
Piston rod self-locking nut	7.5 to 9.5 (54 to 69)
Nut used to install the strut assembly on the body	2.5 to 3.5 (18 to 25)

Transverse link and ball joint	kg-m (ft-lb)
Bolts used to install the knuckle arm to strut	7.3 to 10.0 (53 to 72)
Ball joint castle nut	5.5 to 7.5 (40 to 54)
Bolts used to install the transverse link to ball joint	1.9 to 2.5 (13.7 to 18.0)
Transverse link mounting bolt	11.1 to 14.0 (80 to 101)

Compression rod	kg-m (ft-lb)
Transverse link side	6.1 to 7.1 (44 to 51)
Body side	4.5 to 5.5 (33 to 40)

Stabilizer bar	kg-m (ft-lb)
Connecting rod and transverse link installation nut	1.2 to 2.7 (8.7 to 19.5)
Connecting rod and stabilizer bar installation nut	1.2 to 2.7 (8.7 to 19.5)
Stabilizer bar and body installation bolt	1.9 to 2.5 (14 to 18)

Suspension member	kg-m (ft-lb)
Body side	4.5 to 5.0 (33 to 36)
Engine mounting bolt	1.6 to 2.1 (12 to 15)
Steering mounting bolt	
Bolt to welded nut	2.6 to 3.0 (19 to 22)
Lock nut	3.1 to 3.5 (22 to 25)

Side rod socket and knuckle arm	kg-m (ft-lb)	5.5 to 7.5 (40 to 54)
Wheel nut	kg-m (ft-lb)	8.0 to 9.0 (58 to 65)

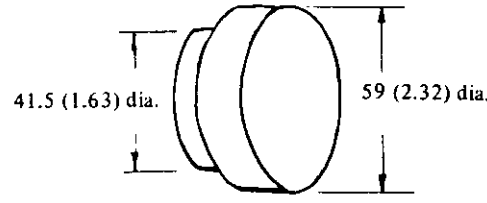
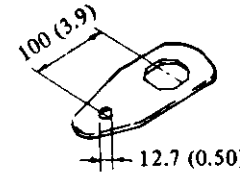
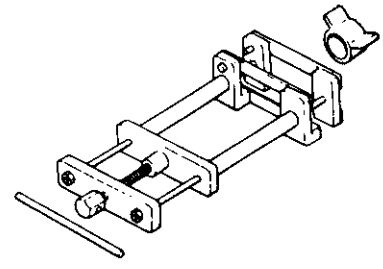
TROUBLE DIAGNOSES AND CORRECTIONS

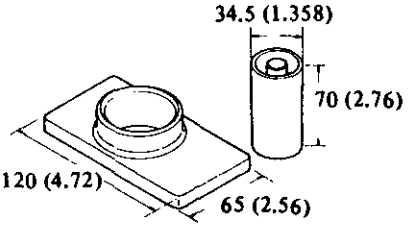
Condition	Probable cause	Corrective action
Vibration, shock and shimmying of steering wheel.	Improper tire pressure.	Adjust.
	Imbalance and deformation of roadwheel.	Correct the imbalance or replace.
Vibration: Loose connection of the serration parts and wear of each part of linkage cause vibration of front wheels, which in turn is transmitted to the steering wheel. This is very noticeable when travelling over rough roads.	Unevenly worn tire or insufficient lightening.	Replace or tighten.
	Improperly adjusted or worn front wheel bearing.	Adjust or tighten.
	Faulty wheel alignment.	Adjust.
	Worn fitting transverse link bushings.	Replace.
Shock: When the front wheels are travelling over bumpy roads, the play of the steering linkage is transmitted to the steering wheel. This is especially noticeable when travelling on rough roads.	Insufficiently tightened steering gear housing.	Retighten
	Wear of steering linkage.	Replace faulty. parts.
	Worn suspension ball-joint.	Replace.
	Excessive backlash due to improper adjustment of the retainer parts.	Adjust correctly.
Shimmying: Abnormal vibration of the front suspension group and the whole steering linkage, which occur when a specific speed is attained.	Damaged idler arm.	Replace.
	Worn column bearing, weakened column bearing spring, or loose clamp.	Replace or retighten.
	Malfunction of shock absorber (inside the strut) or loose installation bolts.	Replace or retighten.
	Imbalance of vehicle level.	Correct the imbalance.
Vehicle pulls to right or left When driving with hands off the steering wheel over a flat road, the car gently swerves to right or left.	Improper tire pressure or insufficient tightening of wheel nuts.	Adjust or tighten.
	Difference in height of right and left tire treads.	Replace tires.
	Incorrect adjustment or abrasion of front wheel bearing.	Adjust or replace.
Note: A faulty rear suspension may also be the cause of this trouble, therefore, see also the chapter dealing with the rear suspension.	Collapsed or twisted front spring.	Replace.
	Incorrect wheel alignment.	Adjust.
	Incorrect brake adjustment (binding).	Adjust.
	Worn rubber bushings for transverse link and compression rod.	Replace.
	Deformed steering linkage and suspension link.	Replace.
	Imbalance of car level.	Correct the imbalance.
Instability of car	Improper tire pressure.	Adjust.
	Worn rubber bushings for transverse link and tension rod.	Replace.
	Incorrect wheel alignment.	Adjust.

Condition	Probable cause	Corrective action
Instability of car	Worn or deformed steering linkage and suspension link.	Replace.
	Incorrect adjustment of steering gear.	Adjust.
	Deformed or imbalanced wheel.	Correct or replace.
Stiff steering wheel (check-up procedure)	Improper tire pressure.	Adjust
	Insufficient lubricants or mixing impurities in steering linkage or excessively worn steering linkage.	Replenish grease or replace the part.
Jack up front wheels, detach the steering gear and operate the steering wheel, and;	Stiff or damaged suspension ball-joint, or lack of grease.	Replace.
	Worn or incorrectly adjusted wheel bearing.	Replace or adjust.
If it is light, check steering linkage, and suspension groups.	Worn damaged steering gear and bearing.	Replace.
If it is heavy, check steering gear and steering column groups.	Incorrectly adjusted steering gear.	Adjust.
	Deformed steering linkage.	Replace.
	Incorrect wheel alignment.	Adjust.
	Worn strut upper end bearing.	Replace.
	Damaged or stiff piston or shock absorber rod (in the strut).	Replace.
	Interference of steering column with turn signal switch.	Adjust.
Excessive steering wheel play	Incorrectly adjusted steering gear housing.	Adjust.
	Worn steering linkage.	Replace.
	Improperly fitted gear box.	Retighten.
	Incorrectly adjusted wheel bearing.	Adjust.
	Worn transverse link and tension rod fitting bushings.	Replace.
Noises	Improper tire pressure.	Adjust.
	Insufficient lubricating oil and grease for suspension ball joint and steering linkage, or their breakage.	Replenish lubricating oil and grease, or replace.
	Loose steering gear bolts, linkage and suspension groups.	Retighten.
	Damaged shock absorber (inside the strut).	Replace.
	Worn wheel bearing.	Replace.
	Worn steering linkage and steering gear.	Replace.
	Worn transverse link and tension rod fitting bushings.	Replace.
	Broken or collapsed coil spring.	Replace.
	Loose strut mounting insulator tightening nuts.	Retighten.
	Loose stabilizer bolt.	Retighten.

Condition	Probable cause	Corrective action
Grating tire noise	Improper tire pressure.	Adjust.
	Incorrect wheel alignment.	Adjust.
	Deformed knuckle spindle and suspension linkage.	Replace.
Jumping of disc wheel	Improper tire pressure.	Adjust.
	Imbalance wheels.	Adjust.
	Damaged shock absorber.	Replace.
	Faulty tire.	Replace.
	Deformed wheel rim.	Replace.
Excessively or partially worn tire.	Improper tire pressure.	Adjust.
	Incorrect wheel alignment.	Adjust.
	Worn wheel bearing.	Replace.
	Incorrect brake adjustment.	Adjust.
	Improper tire shifting (rotation).	Adjust.
	Rough and improper driving manner.	Drive more gently.

SPECIAL SERVICE TOOLS

No.	Tool number & tool name	Description Unit: mm (in)	For use on	Reference page or figure No.
1.	ST35300000 Front wheel bearing drift	This tool is used to assemble front wheel bearing.  	S30	Fig. FA-18
2.	KV40100800 Ground packing wrench	This tool is used to remove or install gland packing at the top end of strut.  Width across flats; 55 (2.17) SE220	S30	Fig. FA-28 Fig. FA-34
3.	ST35540000	This tool is used as a guide in installing gland packing by covering shock absorber shaft to prevent the marring of oil seal in packing.  SE093	S30 610 510 C130 C110	Fig. FA-32
4.	ST3565S000 Coil spring compressor ST35651001 Body ST35652001 Clamp	This tool is used to compress coil spring in disassembling or assembling strut assembly.  SE221	S30 610 510 B120 C130 C110	Fig. FA-27 Page FA-14

No.	Tool number & tool name	Description Unit: mm (in)	For use on	Reference page or figure No.
5.	ST36710000 Transverse link bushing replacer ST36710010 Drift ST36710020 Support base	This tool is used to replace transverse link bushing. In its application, align the tool with the bushing center by using a press.  	S30 610 510	Fig. FA-42

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