SERVICE MANUAL

DATSUN 260Z
MODEL S30 SERIES

NISSAN

NISSAN MOTOR CO., LTD.
TOKYO, JAPAN

SECTION FA

FRONT AXLE AND FRONT SUSPENSION

FA

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FRONT AXLE AND FRONT SUSPENSION

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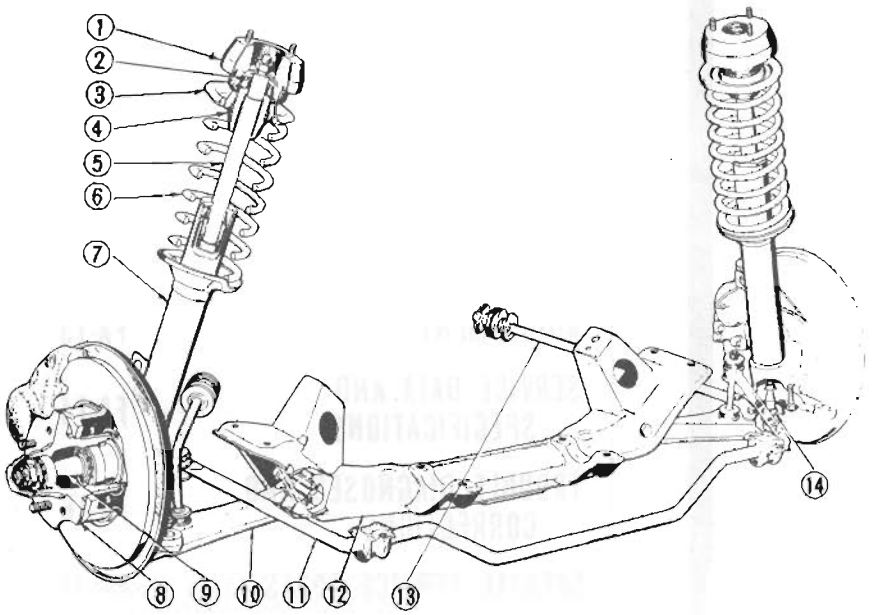
DESCRIPTION

The front suspension is of a strut type. The shock absorber and spindle are assembled into a single unit which is supported by the coil spring at the upper end and by the transverse link at the lower end.

The spindle is welded on the bottom of the strut outer casing.

A ball-joint is attached to the lower part of the spindle. The ball-joint and the transverse link (lower link) are connected and are fitted to the suspension member through a rubber bushing. The shock absorber mechanism is built in the strut outer casing. A coil-spring is placed between the upper end of the piston rod and spring seat welded to the outer casing. These components, assembled as a single unit, are fitted to the chassis frame at their upper part through the thrust bearing. Moreover, the transverse link supports the overall forward and backward strut movements by means of the compression rod fitted to the chassis through a rubber bushing. The rubber bushing adopts a non-linear shape with which the forward and rearward rigidities are changed. The torsion-bar type stabilizer adopted in the suspension system is used so that the strut maintains connection between both side struts.

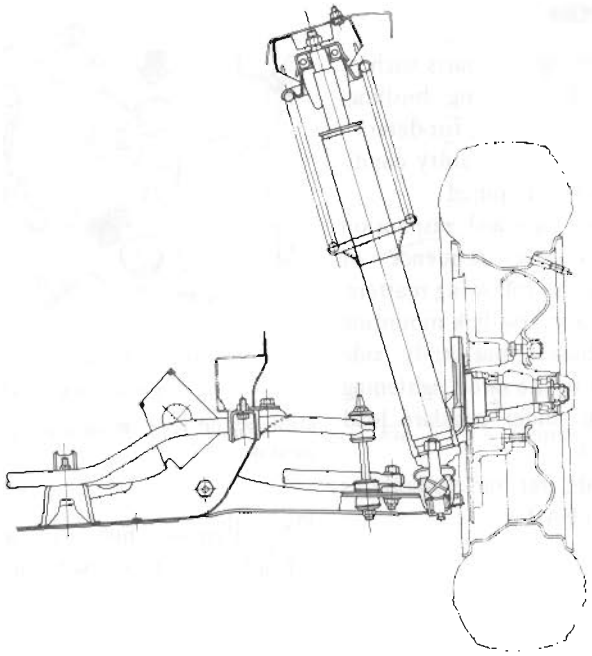
Thus, this suspension mechanism absorbs shocks toward all directions into the chassis effectively and efficiently; the compression rod absorbs forward and backward shocks, the strut absorbs vertical shock, and the transverse-link absorbs shock applied toward sideway.



1 Strut mounting insulator
2 Strut mounting bearing
3 Upper spring seat
4 Bumper rubber
5 Piston rod
6 Front spring
7 Strut assembly
8 Hub assembly
9 Spindle
10 Transverse link
11 Stabilizer
12 Suspension member
13 Compression rod
14 Ball joint

FA435

Fig. FA-1 Front axle and suspension assembly



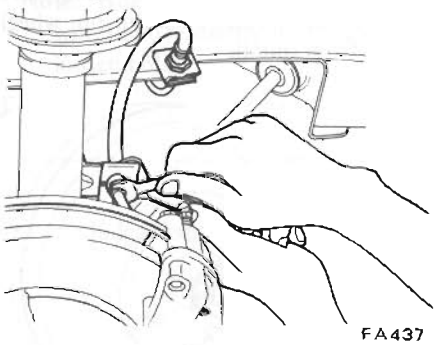
FA436

Fig. FA-2 Cross-sectional view of front axle

FRONT AXLE AND SUSPENSION ASSEMBLY

REMOVAL

1. Jack up car, and support car with stands. See the Section GI.
2. Remove hub nuts and wheels.
3. Remove splash board.
4. Loosen brake tube, remove brake hose locking spring, withdraw plate, and remove brake hose from strut assembly bracket. See Figure FA-3.



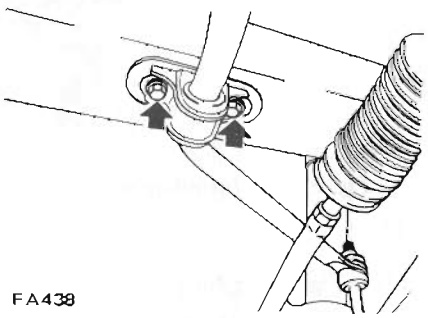
FA437

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

Fig. FA-3 Disconnecting brake hose

Note: Be careful not allow dust to enter brake hose.

5. Disconnect stabilizer from body. See Figure FA-4.

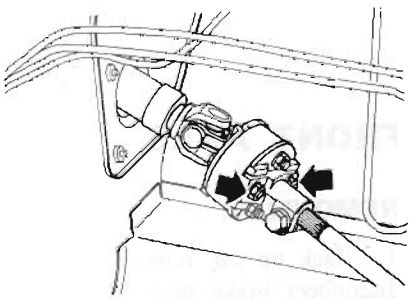


FA438

Tightening torque:
1.9 to 2.5 kg-m (14 to 18 ft-lb)

Fig. FA-4 Disconnecting stabilizer

6. Remove steering coupling bolts and remove steering shaft at rubber coupling unit. See Section ST. See Figure FA-5.

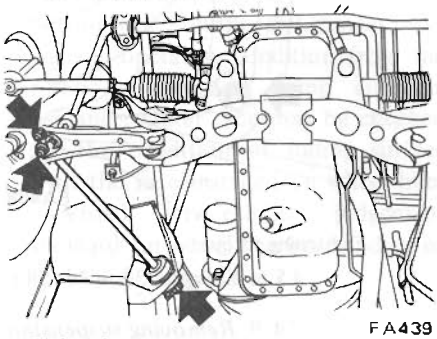


ST432

Tightening torque:
1.7 to 2.0 kg-m (12 to 14 ft-lb)

Fig. FA-5 Removing steering coupling bolts

7. Loosen compression rod securing bolts and nuts, and remove compression rod.
See Figure FA-6.

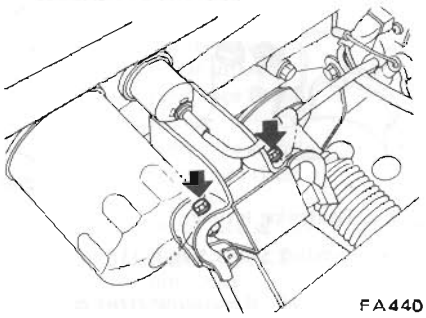


FA439

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

Fig. FA-6 Removing compression rod

8. Support engine, remove engine mounting bolts and separate suspension crossmember from engine assembly. See Figure FA-7.

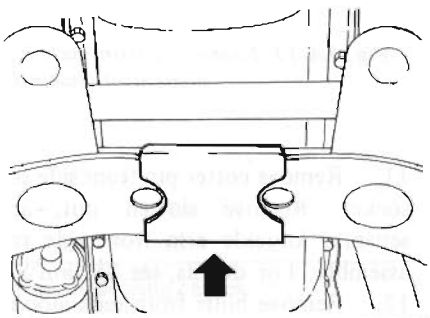


FA440

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

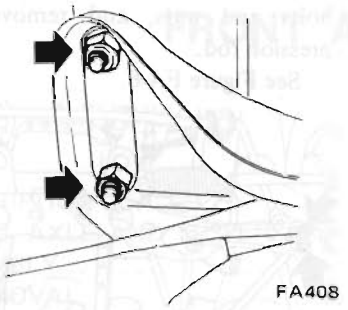
Fig. FA-7 Removing engine mounting bolts

9. Apply a jack to patch unit to support suspension crossmember. Loosen bolts, and separate suspension crossmember from body.
See Figures FA-8 and FA-9.



FA441

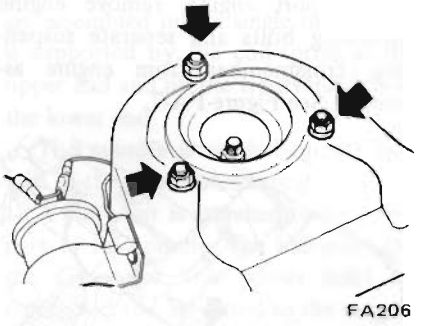
Fig. FA-8 Jack-up point of suspension crossmember



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

Fig. FA-9 Removing suspension crossmember

10. Loosen strut assembly securing nuts, and holding strut assembly, dismount front suspension assembly.
See Figures FA-10 and FA-11.



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

Fig. FA-10 Removing strut assembly holding nuts

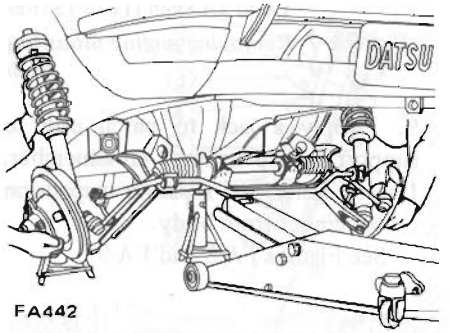


Fig. FA-11 Removing front axle and suspension assembly

11. Remove cotter pin from side rod socket. Remove slotted nut, and separate knuckle arm from side rod assembly. For details, see Section ST.
12. Remove bolts from rack mounting bracket, and separate steering gear assembly from suspension member. For details, see Section ST.

INSTALLATION

1. First, check rubber parts such as compression rod mounting bushing, stabilizer bar bushing, etc. for deterioration, crack, and other faulty conditions, and replace as required.
2. Install front axle and suspension assembly in reverse sequence of removal, noting the following matters.
(1) Tighten transverse link mounting bolts and stabilizer bar body side installation bolt to the rated tightening torque with car under standard load (two passengers).
(2) Install stabilizer bar correctly as shown in Figure FA-12.

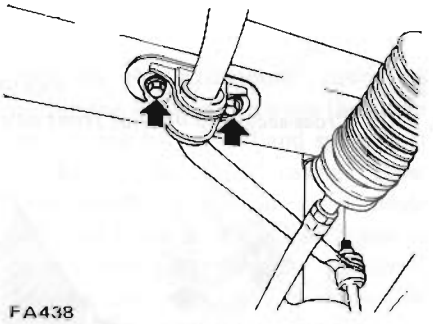


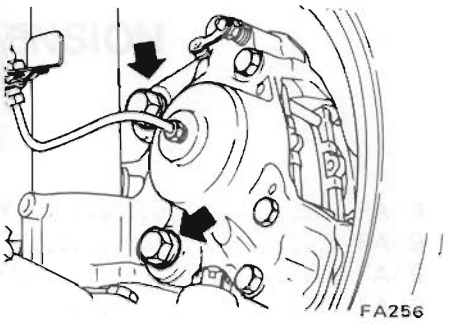
Fig. FA-12 Installing stabilizer bar

(3) Tightening torque:
Slotted nut of side rod socket:
5.5 to 7.6 kg-m
(40 to 55 ft-lb)
Rack mounting bracket bolt and nut:
Bolt to welded nut:
2.6 to 3.0 kg-m
(19 to 22 ft-lb)
Lock nut:
3.1 to 3.5 kg-m
(22 to 25 ft-lb)

FRONT AXLE

REMOVAL

1. Jack up car, remove wheels and disconnect brake hose. (For details, see Removal of Front Axle and Suspension Assembly.)
2. Remove caliper fitting bolts, and remove caliper assembly.
See Figure FA-13.



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

Fig. FA-13 Removing caliper fitting bolts

3. Remove hub cap with a flat-headed (−) screwdriver or other proper tool and hammer as shown in Figure FA-14.

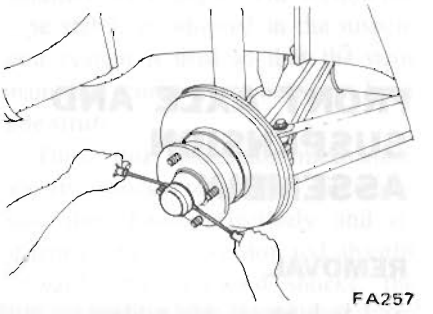
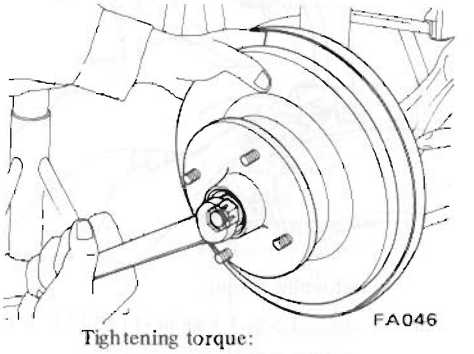


Fig. FA-14 Removing hub cap

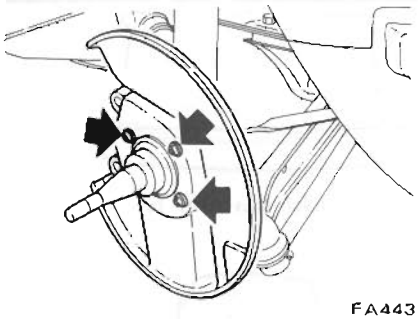
4. Remove cotter pin and wheel bearing lock nut.
See Figure FA-15.
5. Remove wheel hub with wheel bearing washer, wheel bearing and brake disc rotor installed on wheel hub, from spindle.



Tightening torque:
2.5 to 3.0 kg-m (18 to 22 ft-lb)

Fig. FA-15 Removing wheel bearing lock nut

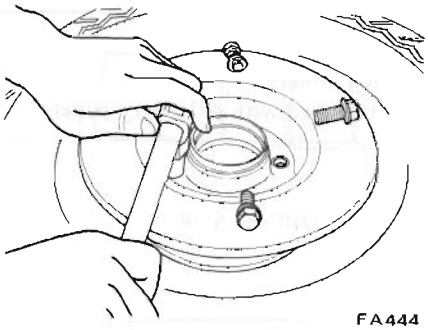
6. Remove set screws and baffle plate.
See Figure FA-16.



FA443

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

Fig. FA-16 Removing baffle plate screws

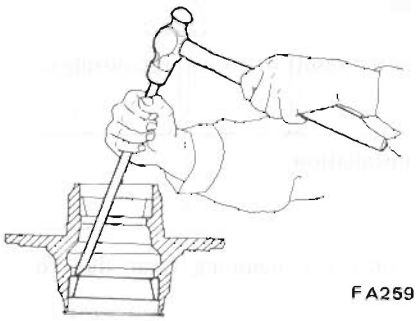


FA444

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

Fig. FA-18 Removing brake disc rotor fitting bolts

7. Utilizing two grooves inside wheel hub, tap and remove wheel bearing outer race from hub.
See Figure FA-17.



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Fig. FA-17 Removing wheel bearing outer race

8. Remove four brake disc fitting bolts, and remove brake disc rotor from wheel hub assembly. See Figure FA-18.

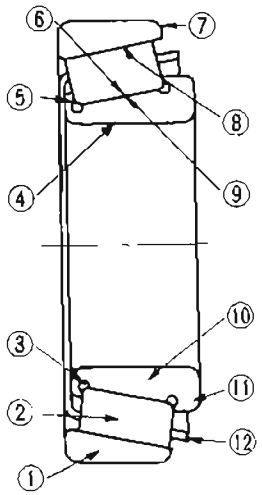
Note: When removing bolts, put wheel hub assembly into wheel, and loosen bolts.

INSPECTION

1. Wheel bearing

Remove used grease from wheel bearing with solvent, and inspect bearing for operating condition from the rotation, operating sound and appearance. Outer race may be checked for the condition of rolling surface with the race installed on wheel hub.

Visual serviceability judgement standard for wheel bearing is indicated in the following table.



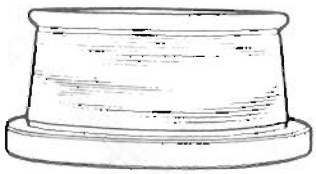
1 Outer race
2 Roller
3 Small collar
4 Collar surface
5 Inner race fitted surface
6 Inner race surface
7 Outer race fitted surface
8 Outer race surface
9 Roller rolling surface
10 Inner race
11 Large collar
12 Supporter

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Fig. FA-19 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. a, b)	×			Shortened service life due to one of the following causes: • Abnormal load (overload). • Improper handling or installing.

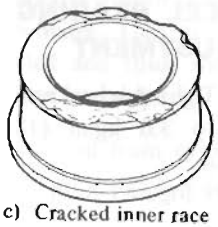
Judgement	× : Unserviceable △ : May be used when minor * : Rust should be removed with # 0 emery paper			
Components	Race and roller: Rolling surface	Race and roller: Fitted surface	Supporter	Cause
Crack (Fig. c, d)	×	×	×	• Excessive tightening. • Excessive gap and a considerable shock received from the outside. • Rapid heat generation on the race due to creep . • Bitten supporter with seized rollers. • Abnormal thrust load. • Tapped with a hammer while removing.
Seizure	×	×	×	In the most cases, seizure occurs as the result of grown discoloring or flaking.
Scratch	△	△	△	• Shock is given carelessly during installation. • Bit foreign matter.
Recess or wear made by pressing or striking (Fig. e, f, g)	△	△	△	• Careless installation, removal, or other handling (scar due to striking). • Recess made by bit foreign matter.
Wear	△	△	△	• Poor lubricant quality or deteriorated lubricant. • Intrusion of dust. Fitted surface is worn remarkably. • Wear due to excessive preliminary pressure.
Biting	△	△	△	• Excessive preliminary pressure of 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. h)	△*	△*	△*	• Temperature increased during operation lowers when the bearing stops, moisture inside the bearing is condensed, becoming fine drips, and the grease is moistened. • The bearing has been placed in a 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 become like oxidized oil stain due to grease. • In the most cases, this occurs when preliminary pressure is too high.



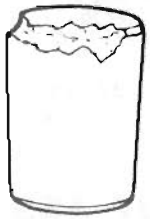
a) Inner race flaking



b) Roller flaking



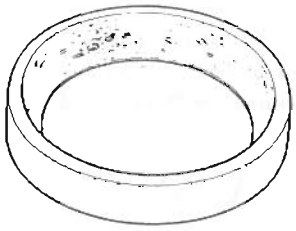
c) Cracked inner race



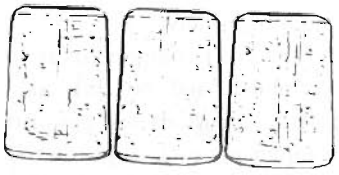
d) Cracked roller



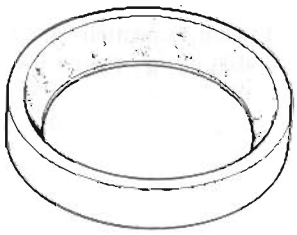
e) Recess on inner race



f) Recess on outer race



g) Recess on roller



h) Rust on outer race

FA267

Fig. FA-20 Bearing's appearance

2. Grease seal

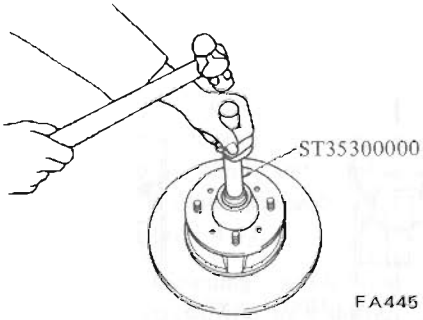
(1) When grease leakage is detected during disassembly, replace.

(2) Replace grease seal, if worn or cracked.

INSTALLATION

1. Reinstall wheel bearing in reverse sequence of removal.

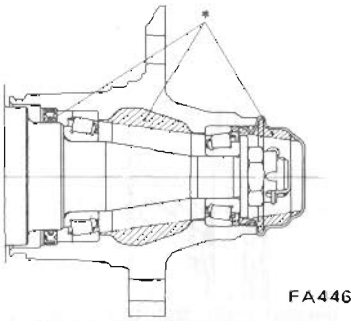
2. Install bearing outer race with Front Wheel Bearing Drift ST35300000.



FA445

Fig. FA-21 Installing wheel bearing outer race

3. Fill wheel hub and hub cap with multi-purpose grease up to the line indicated in Figure FA-22.



FA446

Fig. FA-22 Creasing points of hub assembly

4. Fill the spaces between wheel bearing rollers and grease seal lip pocket with multi-purpose grease sufficiently. See Figures FA-23 and FA-24.



FA064

Fig. FA-23 Filling grease seal lip pocket with grease



FA262

Fig. FA-24 Filling spaces between wheel bearing rollers with grease

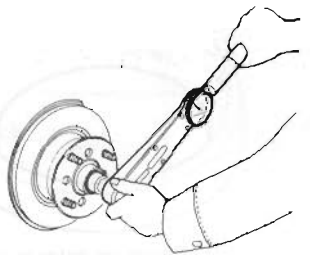
5. Apply a coating of multi-purpose grease to spindle shaft and threads, wheel bearing washer, and wheel bearing lock nut surfaces.

6. Install wheel bearing and grease seal on wheel hub, and install them on spindle.

Note: In order to provide bearing with a proper prepressure and to extend the bearing service life, install wheel bearing, grease seal, washer, and lock nut carefully so that no dust and foreign matters stick to grease.

WHEEL BEARING ADJUSTMENT

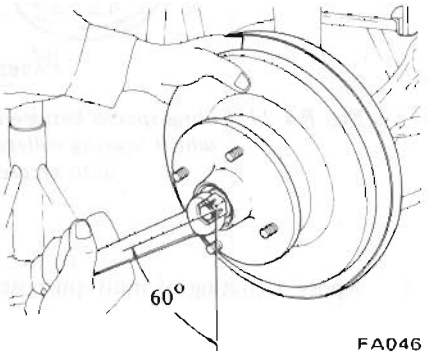
1. Tighten wheel bearing lock nut to 2.5 to 3.0 kg-m (18 to 22 ft-lb) torque.
See Figure FA-25.



FA263

Fig. FA-25 Tightening wheel bearing lock nut

2. Turn wheel hub clockwise and counterclockwise a few turns to settle down bearing, and retighten wheel bearing lock nut to the same torque.
3. Return wheel bearing lock nut 60° and align with cotter pin hole on spindle. When wheel bearing lock nut is returned 60° and not aligned properly, turn the nut toward loosening direction within the range of 15° and correctly align it with cotter pin hole. See Figure FA-26.



FA046

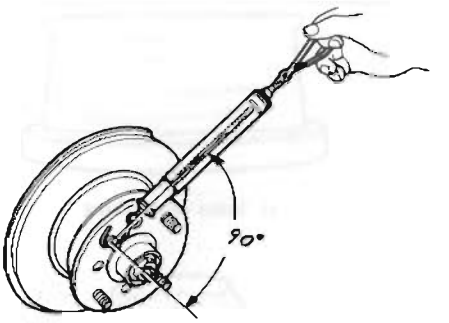
Fig. FA-26 Returning wheel bearing lock nut 60°

4. Again turn wheel hub clockwise and counterclockwise a few turns to allow the bearing breaking-in, measure bearing rotation starting torque, install cotter pin to secure the nut (if the measured starting torque is within the rated value), and install hub cap.

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)

- No slackness should exist in the axial direction.
- Be sure to remove brake pad.
- Correctly measure starting force toward tangential direction against hub bolt. See Figure FA-27.



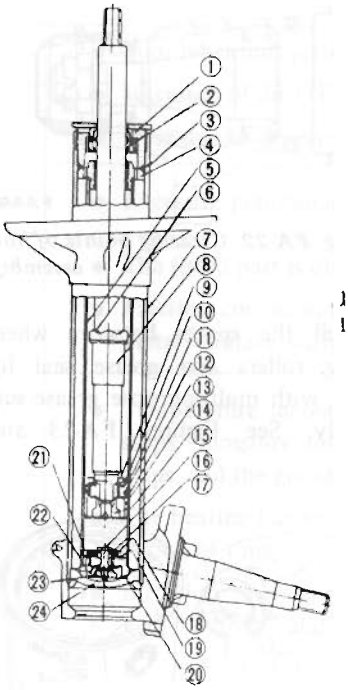
FA264

Fig. FA-27 Measuring wheel bearing rotation starting torque

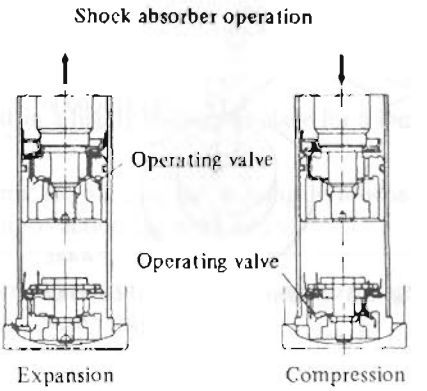
STRUT ASSEMBLY

The strut assembly, consisting of a strut-outer casing with spindle, forms a cylinder between the piston rod guide and bottom valve.

The inner components are precisely assembled, and no dirt and foreign matter intrusions are permitted. The components such as piston rod, piston rod guide, cylinder, and bottom valve are handled together as an assembly. When replacing them, be sure to replace the inner components as an assembly.



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



FA268

Fig. FA-28 Sectional view of strut assembly

DISASSEMBLY

Disassemble and reassemble strut assembly in a place free from dirt and other foreign matters.

1. Jack up car, remove wheels. Remove stabilizer bar and compression rod from transverse link. Loosen knuckle arm fixing bolts, and separate strut assembly from ball-joint. Loosen strut securing nuts to the upper portion of strut, and remove strut assembly. (See Removal of Front Axle and Suspension Assembly for details.)
See Figures FA-29 and FA-30.

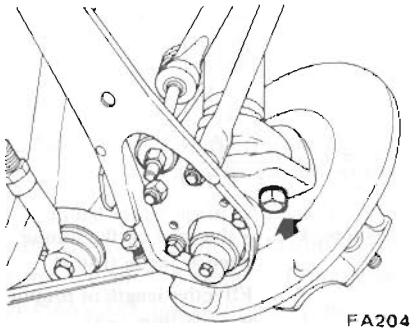


Fig. FA-29 Removing knuckle arm fixing bolts

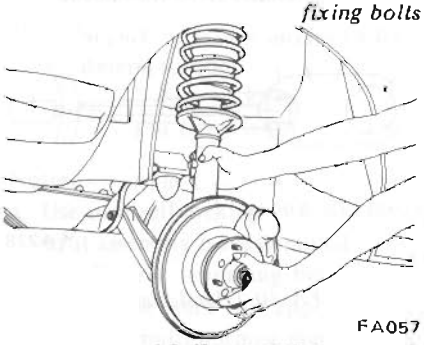


Fig. FA-30 Removing front strut Assembly

2. Install a Strut Attachment ST3565S000 on strut outer casing, and place strut assembly in a vise.
3. Install Coil Spring Compressor ST3565S000 on spring, compress spring until strut mounting insulator is readily turned by hand, and remove self-locking nut (used to hold down spring). See Figure FA-31.

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.

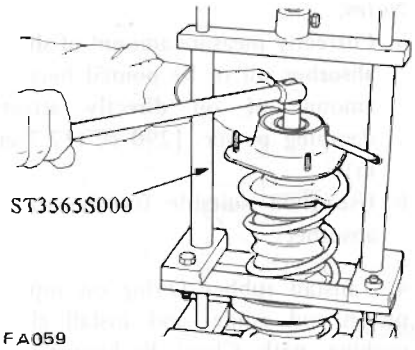


Fig. FA-31 Removing self-locking nut

4. Remove strut mounting insulator, strut mounting bearing, and upper spring seat.
5. Remove spring from strut with Coil Spring Compressor ST3565S000.
6. Depress piston rod down to the bottom and remove gland packing with Gland Packing Wrench ST35500001. See Figure FA-32.

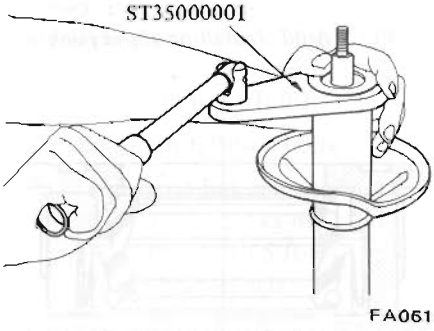


Fig. FA-32 Removing gland packing

Note: Remove mud and other foreign matters from gland packing.

7. Remove O-ring from the upper portion of piston rod guide.
8. Carefully separate piston rod and cylinder assembly from strut tube.
See Figure FA-33.

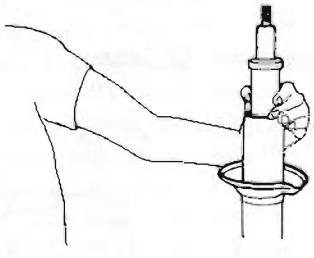


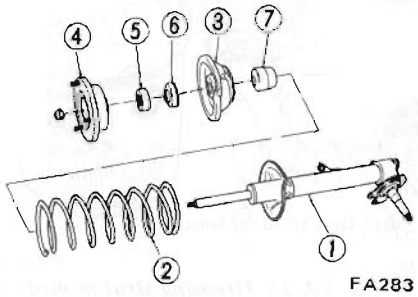
Fig. FA-33 Removing piston rod and cylinder assembly

Note: Do not remove piston rod and guide from cylinder. They are precisely assembled and thus, should be handled as an assembly.

9. Drain damping oil from cylinder and strut outer casing into a clean container.

Note: This procedure should be strictly observed because shock absorber performance is directly affected by amount of damping oil. When refilling, measure amount of damping oil correctly.

INSPECTION



1 Strut assembly
2 Coil spring
3 Spring upper seat
4 Strut mounting insulator
5 Bearing
6 Dust seal
7 Damper rubber

Fig. FA-34 Exploded view of strut assembly

1. Be sure to replace gland packing, O-ring and damping oil whenever strut assembly is disassembled.
2. Wash all disassembled parts, except for nonmetal parts, with gasoline or thinner, and remove dirt and other foreign matters with compressed air.
3. Clean the nonmetal parts with compressed air.

- **Strut outer casing**
Replace, if deformed, cracked or damaged.

- **Spindle**
Check spindle for hair crack on the base and damaged threaded portion. Replace strut assembly, if faulty condition exists.

- **Strut mounting insulator**
  Replace if rubber and metal joint is melted or cracked.
  Replace rubber parts, if they are deteriorated.
- **Front spring**
  Replace, if weakened or cracked.
- **Strut mounting bearing**
  Replace, if unusual sound occurs during rotation or slackness toward the axial direction is excessive.
  When installing strut mounting bearing, be sure to fill it with multi-purpose grease. See Figure FA-35.



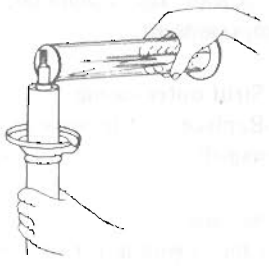
FA064

Fig. FA-35 Greasing strut mounting bearing

ASSEMBLY

Be careful not to drop or scratch parts since all parts are precisely finished. When assembling, thoroughly clean all component parts, and make sure that dirt and other foreign matters are completely removed. During reassembly, do not use cloth or gloves.

1. Place strut outer casing in a vise.
2. Insert piston rod and cylinder assembly into strut outer casing.
3. Fill strut outer casing with correct amount of oil. See Figure FA-36.



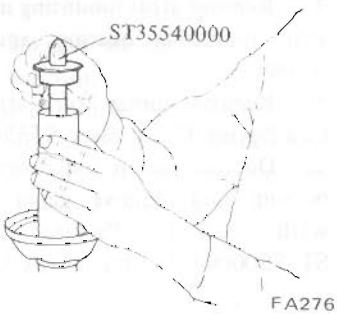
FA330

Fig. FA-36 Pouring shock absorber oil

Notes:

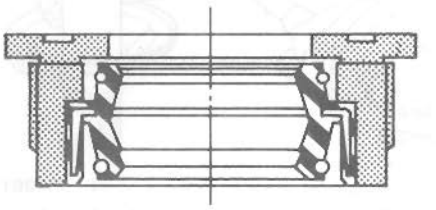
a. Correctly measure amount of shock absorber oil to be poured because amount of oil directly affects damping power. [290 cc (17.7 cu in)]
b. Use fluid suitable for the shock absorber.

4. Install rubber O-ring on top of piston rod guide, and install gland packing with Gland Packing Guide ST35540000. See Figure FA-37.



FA276

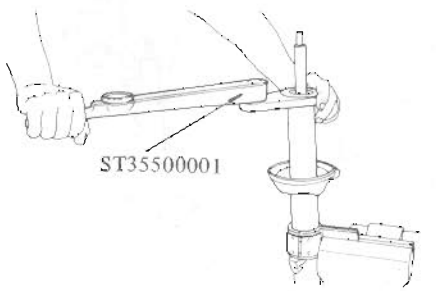
Fig. FA-37 Installing gland packing



FA447

Fig. FA-38 Sectional view of gland packing

5. Tighten gland packing to 6.0 to 6.5 kg-m (43 to 47 ft-lb) with a Gland Packing Wrench ST35500001.
   See Figure FA-39.



FA068

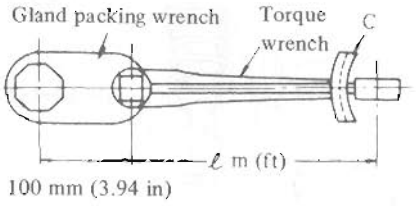
Fig. FA-39 Tightening gland packing

Notes:

a. Before tightening gland packing, pull piston rod approximately 90 mm (3.54 in) upward. This will provide the shock absorber system with the best condition for bleeding.
b. Gland packing tightening torque is rated at 6.0 to 6.5 kg-m (43 to 47 ft-lb). However, arm length of this tool is extended by 100 mm (3.94 in) as shown in Figure FA-40. Thus, when actually tightening gland packing, measure effective length (ℓ) of a torque wrench to be used, and set up torque wrench value based on the following formula.

$$C = 6 \times \left(\frac{\ell}{\ell + 100}\right)$$

where, C ... Value read on the torque wrench [kg-m (ft-lb)]
ℓ ... Effective length of torque wrench [mm (in)]



FA278

Fig. FA-40 Gland packing wrench

6. Conduct air bleeding on shock absorber system.
   (1) Stand strut assembly vertically with spindle side down, and pull piston rod within its stroke. Turn over strut assembly (with spindle side up), and depress piston rod to the full stroke.
   (2) Repeat the above operations several times.
   (3) Make sure that there is no feeling variation on pressure while pushing or pulling piston rod. Thus, air bleeding completes. See Figure FA-41.

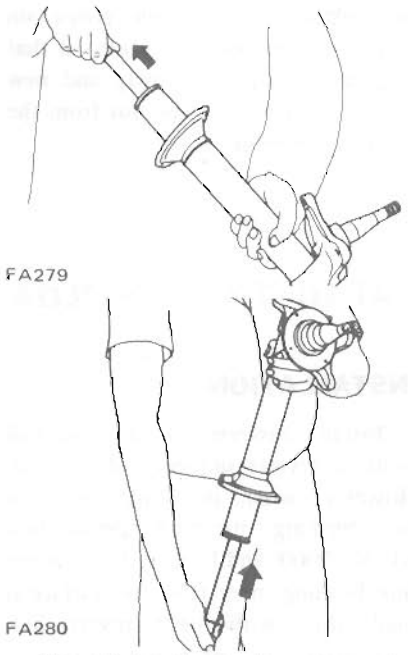


Fig. FA-41 Conducting air bleeding on shock absorber system

7. Place front spring on lower spring seat correctly, compress front spring with Coil Spring Compressor ST3565S000, install upper spring seat, strut mounting bearing, and strut mounting insulator, and tighten self-locking nut.

Tightening torque:
7.5 to 9.5 kg-m
(54 to 69 ft-lb)

Notes:

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

b. Install strut mounting bearing correctly. Be sure to apply recommended multi-purpose grease to the portion indicated by arrows in Figure FA-42.

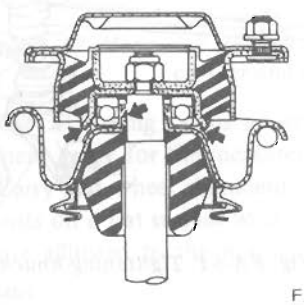


Fig. FA-42 Strut mounting bearing greasing point

8. Release coil spring gradually from Coil Spring Compressor, and set spring on upper and lower spring seats correctly. See Figure FA-43.

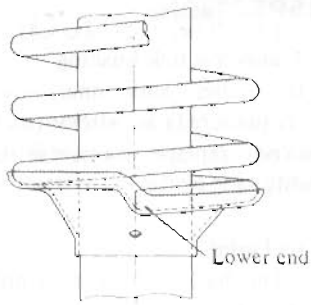


Fig. FA-43 Installing front spring

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)

Nut used to install the compression rod on the 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
(8.7 to 19.5 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 suspension member with rubber bushing both inner and outer tubes of which are adhered, the transverse link is also connected to strut assembly through lower ball joint, and thus, the front suspension link mechanism is formed. See Figure FA-44.

The lower ball joint is of a non-disassembled type. Lubricate lower ball joint at specified intervals. See Figure FA-45.

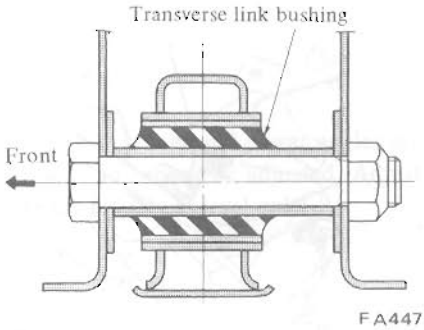
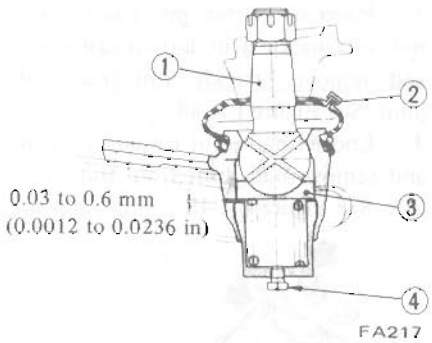


Fig. FA-44 Sectional view of transverse link bushing



1 Ball stud
2 Grease bleeder
3 Spring seat
4 Plug

Fig. FA-45 Sectional view of ball joint

REMOVAL

1. Jack up car, remove wheels and remove stabilizer bar and compression rod from transverse link. Loosen knuckle arm fixing bolts, and separate ball joint from strut assembly. (See Removal of Front Axle and Suspension Assembly for details.)

See Figure FA-46.

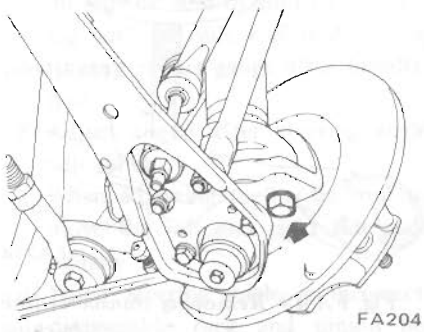


Fig. FA-46 Loosening knuckle arm fixing bolts

2. Loosen transverse link mounting bolt, and separate transverse link from suspension member.

See Figure FA-47.

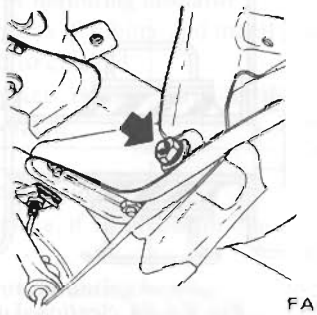


Fig. FA-47 Loosening transverse link mounting bolt

3. Remove cotter pin from castle nut on knuckle arm, loosen castle nut, and remove knuckle arm from ball joint. See Figure FA-48.
4. Loosen ball joint installation nut, and remove ball joint from transverse link. See Figure FA-48.

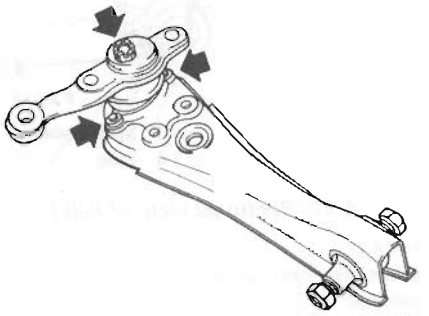


Fig. FA-48 Removing knuckle arm

5. Withdraw transverse link bushing from transverse link with Front Transverse Link Bushing Replacer ST36710000 and a press. See Figure FA-49.

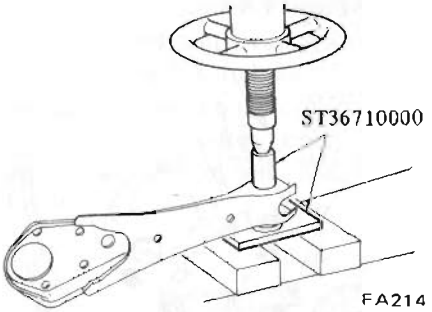


Fig. FA-49 Removing transverse link bushing

INSPECTION

- **Transverse link bushing**

If rubber and inner/outer tube joints (adhered) are sticky (melted) or cracked, replace transverse link assembly.

- **Ball joint**

1. The ball joint is of a non-disassembled type.

Measure end play toward the axial direction and shaking torque, and replace, when deviated from the standards. See Figure FA-50.

Standard end play (axial direction):
0.03 to 0.6 mm
(0.0012 to 0.0236 in)

Shaking torque:
20 to 90 gr-cm
(0.28 to 1.25 in-oz)

[At the cotter pin opening position:
3.9 to 17.3 kg
(8.6 to 38.1 lb)]

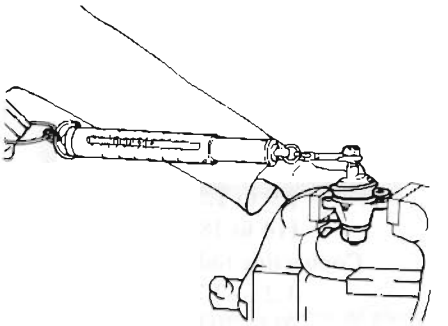


Fig. FA-50 Measuring ball joint shaking torque

2. Replace ball joint when dust cover is cracked.
3. Lubricate ball joint with multipurpose grease at specified intervals.

Install a grease nipple on plug hole, and apply grease so that old grease is forced out. Be sure to reinstall plug when completely greased.

Note: When a high-pressure grease gun is used, operate it 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. However, when installing transverse link bushing, use the special tool ST36710000, and fit it until transverse link bushing inner tube end surface is made flush with the transverse link end surface. Carefully align bushing direction correctly (front and rear). (See Figure FA-44.)

First, tighten transverse link mounting bolt temporarily, and then tighten to the rated tightening torque with the car under the standard load (two passengers). See Figure FA-51.

Tightening torque:
Ball joint bolt:
6.1 to 7.1 kg-m
(44 to 51 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)

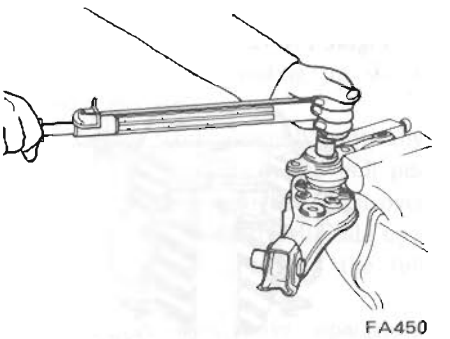


Fig. FA-51 Tightening knuckle arm castle nut

ADJUSTMENT

1. Carry out wheel alignment on a flat surface with tire air pressure adjusted to the normal pressure.
2. Thoroughly check all component parts of steering and suspension systems, and repair or replace faulty parts before starting the wheel alignment.
3. The camber and caster angles are preset and cannot be adjusted. Adjust the toe-in and car level only.

ADJUSTMENT DATA

Wheel alignment (175HR-14)

Condition	Camber degree	Caster degree	Kingpin inclination degree	Toe-in (The extreme front and rear of the tire center) mm (in)	Toe-in (The total angle of the both tires) degree
Unladen	46' ±45'	2°54' ±45'	12°10' ±30'	2 to 5 (0.079 to 0.197)	0°10' to 0°26'
Laden *	30' ±45'	3° ±45'	12°25' ±30'	0 to 3 (0 to 0.118)	0° to 0°16'

* 2 crews – 68 kg (150 lb) each

Steering angle

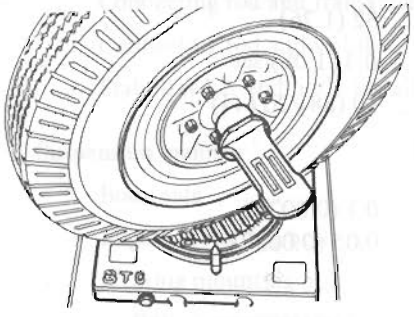
In	degree	33° ±30'
Out	degree	31.7° ±30'

Tire pressure (to be measured when tire is cold)

175HR-14 195/70 HR 14

Under 160 km/h (100 MPH)	kg/cm² (psi)	2.0 (28)
Over 160 km/h (100 MPH)	kg/cm² (psi)	2.3 (32)

MEASUREMENT OF WHEEL ALIGNMENT



FA032

Fig. FA-52 Measuring steering angle, camber and caster

1. Use a turning radius gauge and alignment gauge for the measurement.
2. Carry out wheel alignment measurements on a flat surface with tire air pressure adjusted to the normal pressure.

ADJUSTMENT OF VEHICLE LEVEL

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

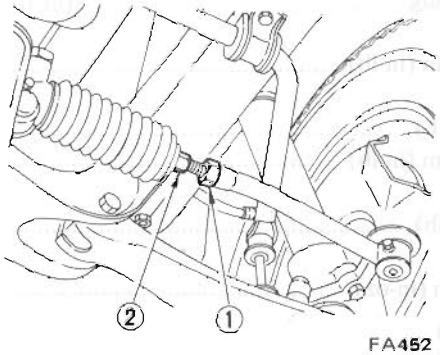
ADJUSTMENT OF TOE-IN

1. Measure toe-in with a toe-in gauge. See Figure FA-53.



FA451

Fig. FA-53 Measuring toe-in



FA452

Fig. FA-54 Adjusting toe-in

2. Loosen side rod lock nut (1), and adjust length of side rod (2) properly to the standard value. See Figure FA-54.

Notes:

a. Distance between centers of side rods at any point should be equal. Standard distance between side rod ball joint centers: 275.5 mm (10.846 in).
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.

SERVICE DATA AND SPECIFICATIONS

Wheel alignment (175HR-14)

Condition	Camber degree	Caster degree	Kingpin inclination degree	Toe-in (The extreme front and rear of the tire center) mm (in)	Toe-in (The total angle of the both tires) degree
Unladen	46′ ±45′	2°54′ ±45′	12°10′ ±30′	2 to 5 (0.079 to 0.197)	0°10′ to 0°26′
Laden *	30′ ±45′	3°±45′	12°25′ ±30′	0 to 3 (0 to 0.118)	0° to 0°16′

* 2 crews – 68 kg (150 lb) each

Steering angle

In	degree	33° ±30′
Out	degree	31.7°±30′

Coil spring		L.H.	R.H.
Wire diameter	mm (in)	11.5 (0.453)	11.5 (0.453)
Coil diameter	mm (in)	100 (3.94)	100 (3.94)
Coil turns		10.75	10.75
Coil effectgive turns		9.25	9.25
Free length	mm (in)	383.2 (15.087)	394.0 (15.512)
Installed height/load	mm/kg (in/lb)	221/300 (8.70/661)	221/320 (8.70/705)
Spring constant	kg/mm (in/lb)	1.85 (104)	1.85 (104)

* "With standard load" means total weight of two riders or weighing 68 kg (150 lb) each.

Strut assembly

Strut outer diameter	mm (in)	50.8 (2.000)
Piston rod diameter	mm (in)	25 (0.98)
Piston diameter	mm (in)	32 (1.26)
Damping force at piston speed	m (ft)/sec.	0.3 (1.08)/sec.
Expansion/Compression	kg (lb)/kg (lb)	40 (88)/20 (44)
Piston rod		
Bend limit	mm (in)	0.1 (0.0039)
Wear limit	mm (in)	0.05 (0.0020)
Piston cylinder		
Bend limit	mm (in)	0.2 (0.0079)
Wear limit	mm (in)	0.1 (0.0039)
Stabilizer bar diameter	mm (in)	18 (0.71)
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 shaking torque	gr-cm (in-oz)	20 to 90 (0.28 to 1.25)
Ball joint end play (axial direction)	mm (in)	0.03 to 0.6 (0.0012 to 0.0136)

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)
Steering coupling nut	1.7 to 2.0 (12 to 14)

Strut assembly	kg-m (ft-lb)
Gland packing tightening torque	6.0 to 6.5 (43 to 47)
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	6.1 to 7.1 (44 to 51)
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)
Hub nut	kg-m (ft-lb)	8.0 to 9.0 (58 to 65)

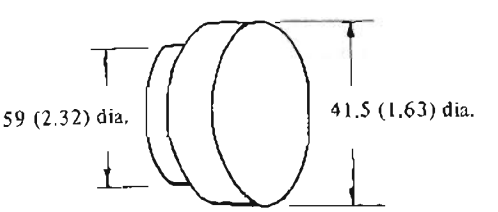
TROUBLE DIAGNOSES AND CORRECTIONS

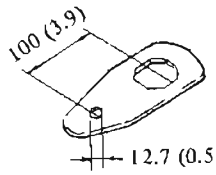
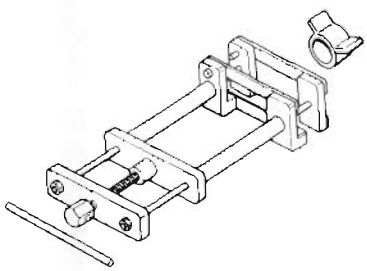
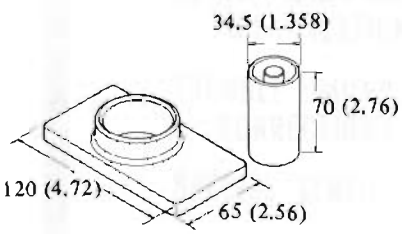
Condition	Probable cause	Corrective action
Vibration, shock and shimmying of steering wheel. **Vibration:** Loose connection of the serration parts and rubber coupling parts, damaged rubber coupling and wear of each part of linkage and vibration of front wheels are, in many cases, transmitted to the steering wheel. This is very noticeable when travelling over rough road. **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 rough road. **Shimmying:** Abnormal vibrations of the front suspension group and the whole steering linkage, which occur when a specific speed is attained.	Improper air pressure of tire.	Adjust.
	Unbalance and deformation of road-wheel.	Correct or replace.
	Unevenly worn tire or insufficient tightening.	Replace or tighten.
	Improperly adjusted or worn front wheel bearing.	Adjust or replace.
	Faulty wheel alignment.	Adjust.
	Worn fitting transverse link bushings.	Replace.
	Insufficiently tightened steering gear housing.	Retighten.
	Wear of steering linkage.	Replace worn parts.
	Worn suspension ball-joint.	Replace.
	Excessive backlash due to improper adjustment of the retainer parts.	Adjust correctly.
	Damaged rubber coupling, or loose connection of rubber coupling (serration parts) and loose bolts.	Check the parts for tightness, and retighten if necessary. Otherwise, replace the rubber coupling.
	Worn column bearing, weakened column bearing spring, or loose clamp.	Check and replace.
	Malfunction of shock absorber (inside the strut) or loose installation bolts.	Replace or retighten.
	Unbalance of car level.	Correct.
Car pulls to right or left. When driving with hands off the steering wheel over a flat road, the car gently pulls to one side. Note: **A faulty rear suspension may also be the cause of this condition and, therefore, see also the chapter dealing with the rear suspension.**	Improper air-pressure of tire 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.
	Collapsed or twisted front spring.	Replace.
	Incorrect wheel alignment.	Adjust.
	Incorrect brake adjustment (binding).	Adjust.
	Worn rubber bushing for transverse link and compression rod.	Replace.
	Deformed steering linkage and suspension link.	Replace.
	Unbalanced car level.	Correct.

Condition	Probable cause	Corrective action
Instability of car.	Improper air pressure of tire.	Adjust.
	Worn rubber bushings for transverse link and compression rod.	Replace.
	Incorrect wheel alignment.	Adjust.
	Worn or deformed steering linkage and suspension link.	Replace.
	Incorrect adjustment of steering gear.	Adjust.
	Deformed unbalanced wheel.	Correct or replace.
Stiff steering wheel (checking up procedure) Jack up front wheels, detach the steering gear and operate the steering wheel, and; If it is light, check steering linkage, and suspension groups. If it is heavy, check steering gear and steering column groups.	Improper air pressure of tire.	Adjust.
	Insufficient lubricants or mixing impurities in steering linkage or excessively worn steering linkage.	Replenish grease or replace the part.
	Stiff or damaged suspension ball-joint, or lack of grease.	Replace.
	Worn or incorrectly adjusted wheel bearing.	Replace or adjust.
	Worn damaged steering gear and bearing.	Replace.
	Incorrectly adjusted steering gear.	Adjust.
	Deformed steering linkage.	Replace.
	Incorrect wheel alignment.	Adjust.
	Damaged strut upper end bearing.	Replace.
	Damaged or stuck piston or shock absorber rod (in the strut).	Repalce.
	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 compression fitting bushings.	Replace.
Noises.	Improper air pressure of tire.	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.
	Faulty shock absorber (inside the strut).	Replace.
	Faulty wheel bearing.	Replace.
	Worn steering linkage.	Replace.

Condition	Probable cause	Corrective action
	Worn transverse link and compression rod fitting bushings.	Replace.
	Broken collapsed coil spring.	Replace.
	Loose strut mounting insulator tightening nuts.	Retighten.
Grating tire noise.	Improper air pressure of tire.	Adjust.
	Incorrect wheel alignment.	Adjust.
	Deformed knuckle spindle and suspension linkage.	Replace.
Jumping of disc wheel.	Improper air pressure of tire.	Adjust.
	Unbalanced wheels.	Adjust.
	Faulty shock absorber.	Replace.
	Faulty tire.	Replace.
	Deformed wheel rim.	Replace.
Excessively or partially worn tire.	Improper air pressure of tire.	Adjust.
	Incorrect wheel alignment.	Adjust.
	Faulty 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-21

No.	Tool number & tool name	Description (Unit: mm (in))	For use on	Reference page or figure No.
2.	ST35500001 Ground packing wrench	This tool is used to remove or install gland packing at the top end of strut.  Width across flats: 55 (12.7) SE220	S30 610 510	Fig. FA-32 Fig. FA-39
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	Fig. FA-37
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 B110	Fig. FA-31 Page FA-11
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.  SE222	S30 610 510	Fig. FA-49