SERVICE MANUAL

Datsun

MODEL 510 SERIES

CHASSIS and BODY

SECTION FA

FRONT AXLE & FRONT SUSPENSION

FA

FRONT AXLE AND FRONT SUSPENSION

CONTENTS

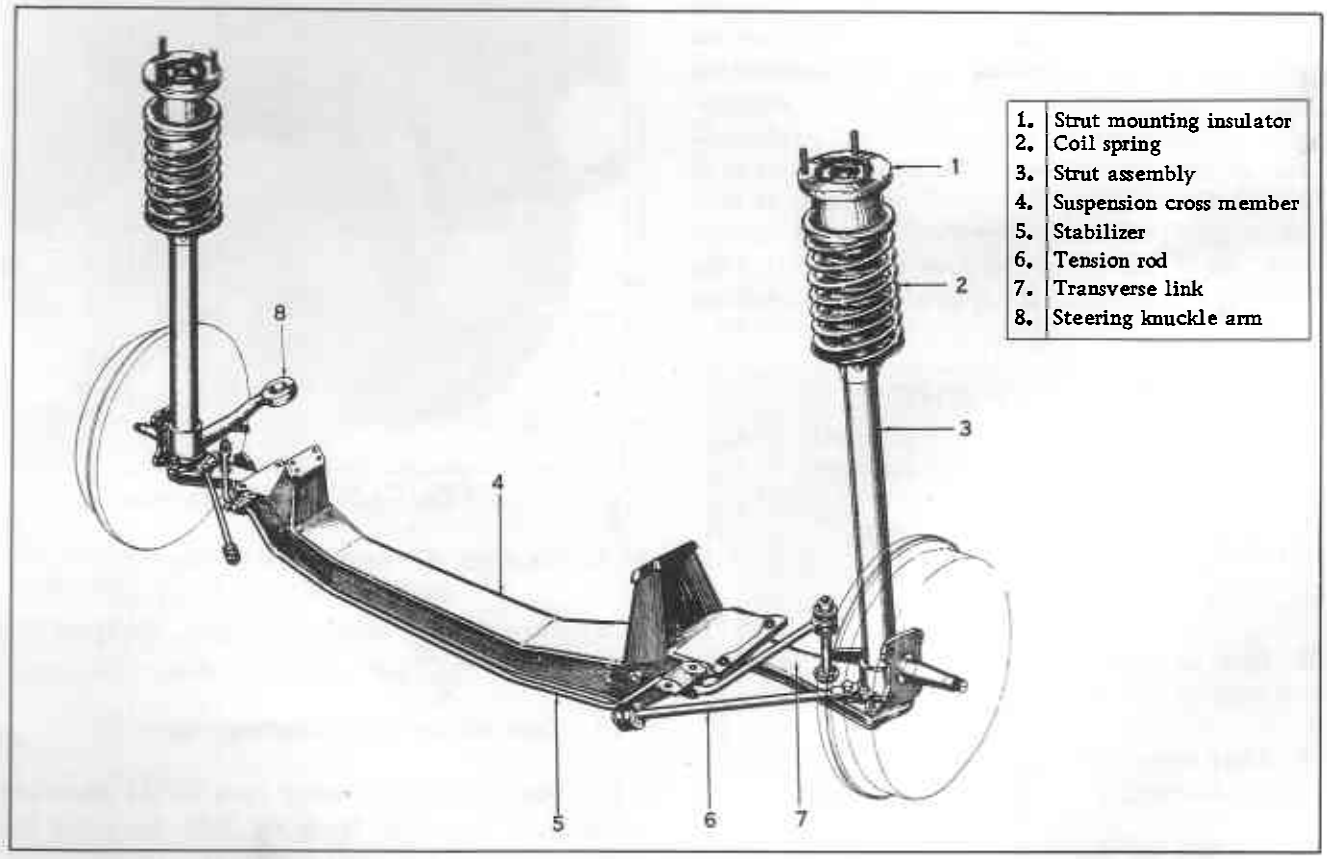


Fig. FA-1 Front suspension assembly

GENERAL DESCRIPTION

The front suspension adopted is of Strut-type in which the shock absorber and the spindle both made into a single unit are supported by the coil-spring on the upper end and by the transverse link on the lower end.

Its mechanical details are explained below: The spindle is welded to the bottom end 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 they are fitted to the suspension member via a rubber bush. Also the strut outer casing contains the shock absorber mechanism. The inner cylinder and the piston rod are positiond securely in the outer casing by the gland packing and the piston rod guide, and a coil-spring is encased between the upper end of the piston rod and the spring seat which is welded to the outer casing. And these components, as a single unit, are fitted through the thrust bearing, on their upper part, to the chassis frame. Also, the transverse link supports, by means of the tension rod, which is fitted to the chassis through a rubber bush, the forward and backward movements of the whole strut. The torsion-bar-type stabilizer is so made that the strut maintains connections on its right and left sides. Therefore, this suspension mechanism is such a refined system to absorb into the chassis efficiently the forces of 3 directions, i.e., to absorb the force of forward and backward directions by the tension rod, the force of up and down directions by the strut and finally the force of sideway directions by the transverse-link.

WHEEL-HUB AND WHEEL BEARING (Car equipped with drum-type brakes)

Removal

1. Place wedges behind rear wheels.

2. Jack up front wheels and support the car by the stands.

3. After wheel nuts are removed, detach wheels and brake drums.

4. Remove the hub and the cap.

5. Remove the cotter pin and the front spindle nut.

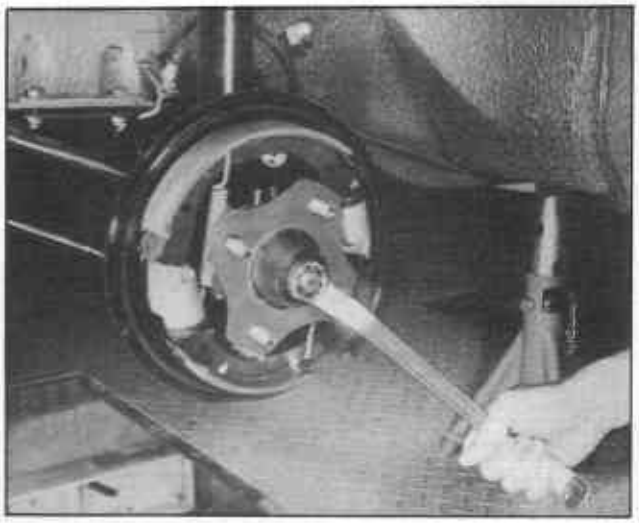


Fig. FA-2 Spindle nut removal

6. Remove the front wheel bearing washer.

7. Detach the hub assembly from the spindle.

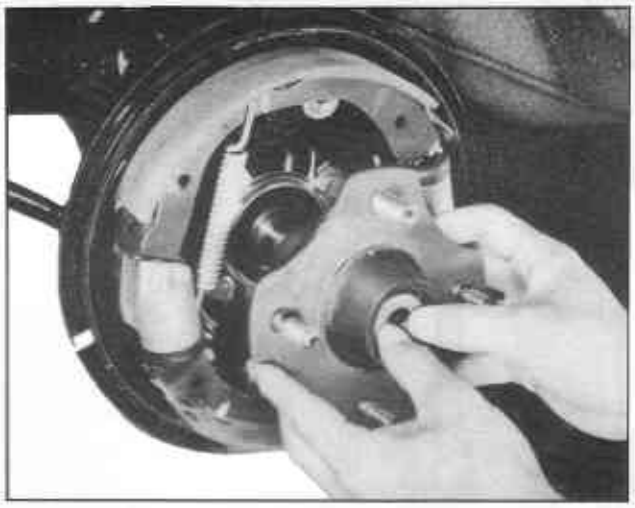


Fig. FA-3 Wheel-hub removal

8. Take out the outer bearing cage.

9. Take out, by using a driver, the front hub grease seals.

10. Take out the inner bearing cage.

11. Punch out each outer race of the inner and the outer bearings from the hub, by using the drift. Front hub drift assembly ST49120000.

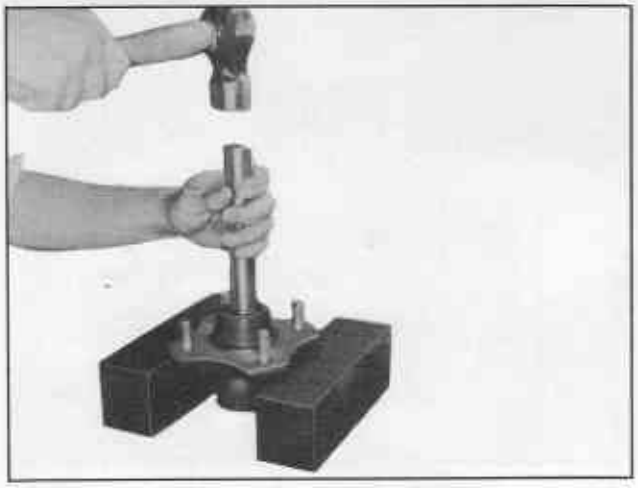
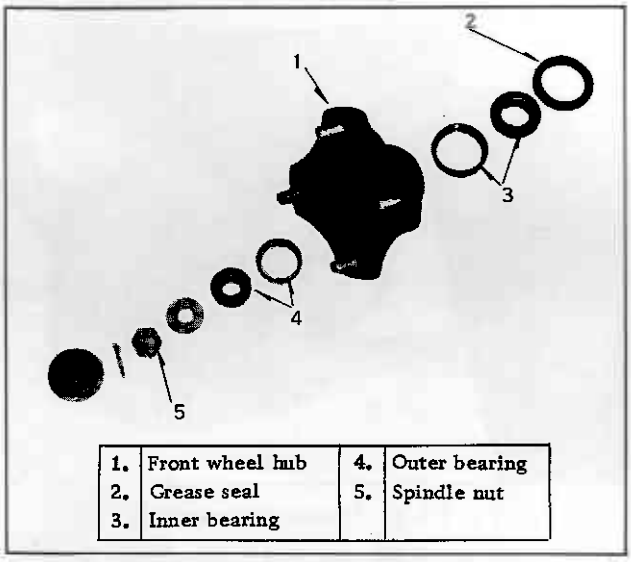


Fig. FA-4 Wheel bearing removal

Inspection



1.	Front wheel hub	4.	Outer bearing
2.	Grease seal	5.	Spindle nut
3.	Inner bearing		

Fig. FA-5 Exploded view of front wheel hub assembly

1. After removal, all parts should be thoroughly washed.

2. Replace damaged bearings and hubs.

3. Replace grease seals with new ones, in principle, after each dismantling.

4. Replace grease for wheel bearing, in principle, after each disassembling

Installation

1. Installation is done in the exact reverse of removal.

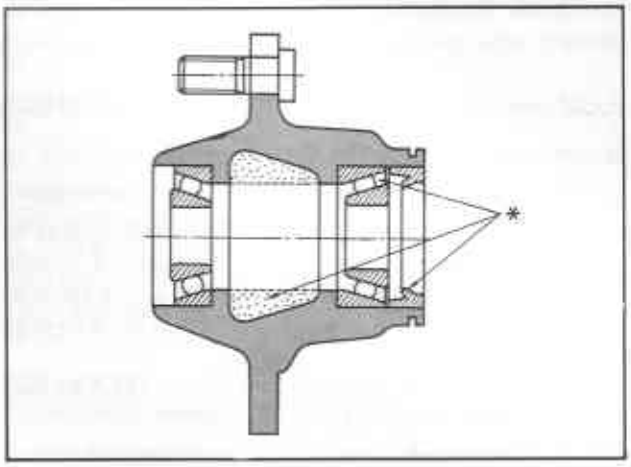


Fig. FA-6

2. Apply MP2 or MP3 grease to the parts (marked with *) inside the hub.

3. Apply grease also to the hub cap.

Note: Cars with disc brakes use only MP3 type of grease.

Spindle nut tightening

1. Tighten the spindle nut to 3.0 to 3.5 kg-m (21.7 to 25.3 ft-lb) torque.

2. Rotate the hub a few times to run in the bearing and again tighten the spindle nut to 3.0 to 3.5 kg-m (21.7 to 25.3 ft-lb) torque.

3. Return the spindle nut a quarter rotation (90°) and fit the hole at the spindle with one of the grooves on the spindle nut.
Install the cotter pin into this hole to lock the spindle nut.

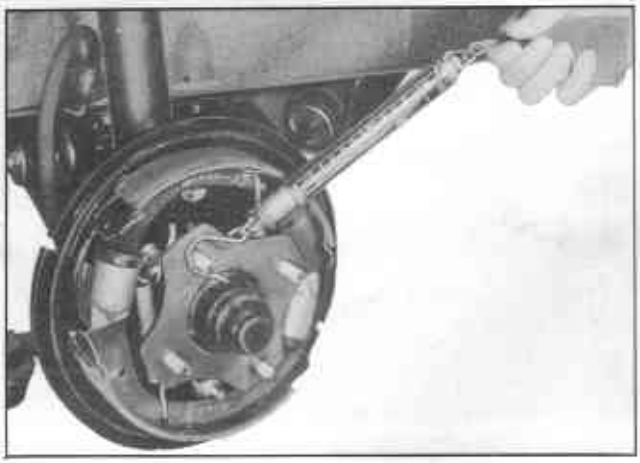


Fig. FA-7 Measurement of hub tarning resistance

4. Check the following specifications and if the results are out of specifications, adjust again.

Axial end play of hub	0 mm (0 in.)
Hub turning resistance	
When a new bearing and a grease seal are used,	less than 7 kg-cm (97.2 in-oz)
In case of readjustment,	less than 4 kg-cm (55.5 in-oz)

Note: Tightening torque 3 to 3.5 kg-m (21.7 to 15.3 lb-ft) should be strictly observed.

WHEEL HUB AND WHEEL BEARING (Car equipped with disc brakes)

Removal

1. Jack up the car.
2. After wheel nuts are removed, detach wheels.
3. Detach the brake hose connector (on the frame side).

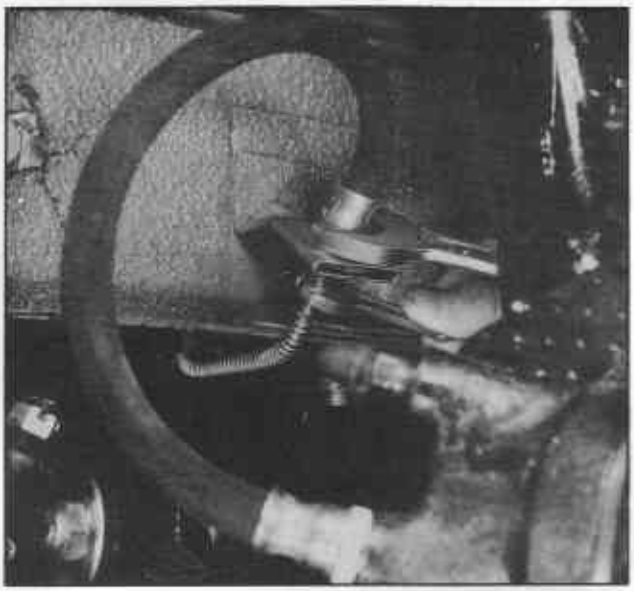


Fig. FA-8 Detaching brake pipe

4. After caliper-fitting bolts are removed, detach the caliper assembly.
5. Remove the hub cap.

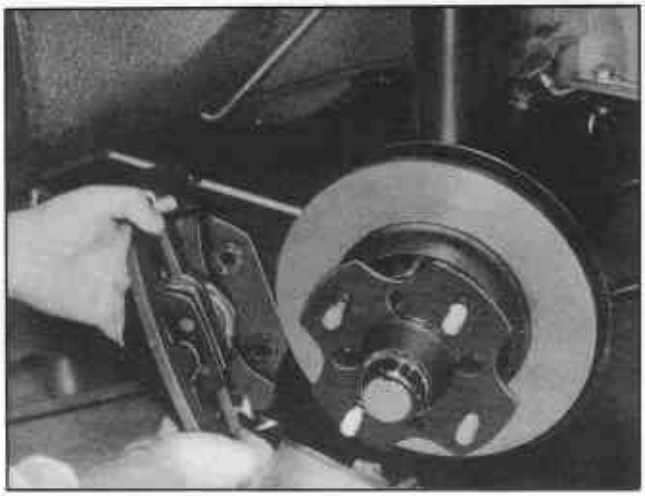


Fig. FA-9 Caliper removal

6. Remove the cotter pin and the front spindle nut.

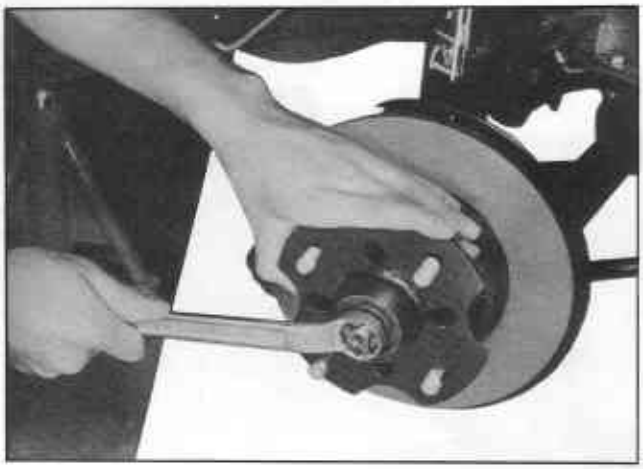


Fig. FA-10 Spindle nut removal

7. Remove the front wheel bearing washer.
8. Detach the front wheel hub and the rotor.

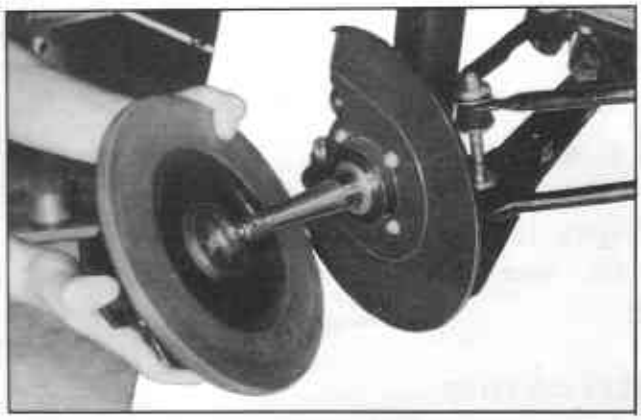


Fig. FA-11 Wheel-hub and rotor removal

9. Remove the bearing collar.

10. Take out the outer bearing cage.

11. Scrape out, with a driver, the front hub grease seal.

12. Take out the inner bearing cage.

13. Punch out each outer race of the inner and the outer bearings, by using a drift.

14. After rotor-fitting bolts are removed, detach the rotor.

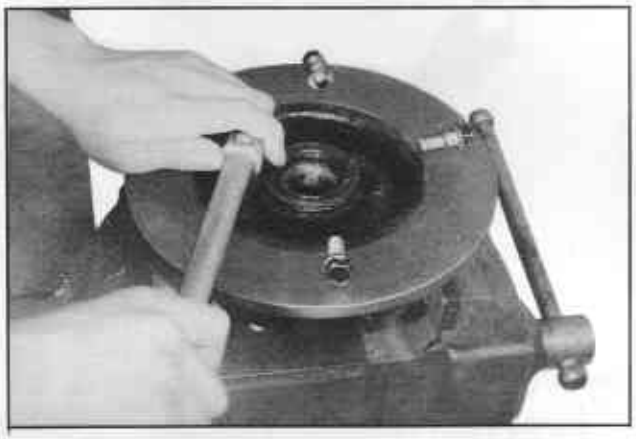
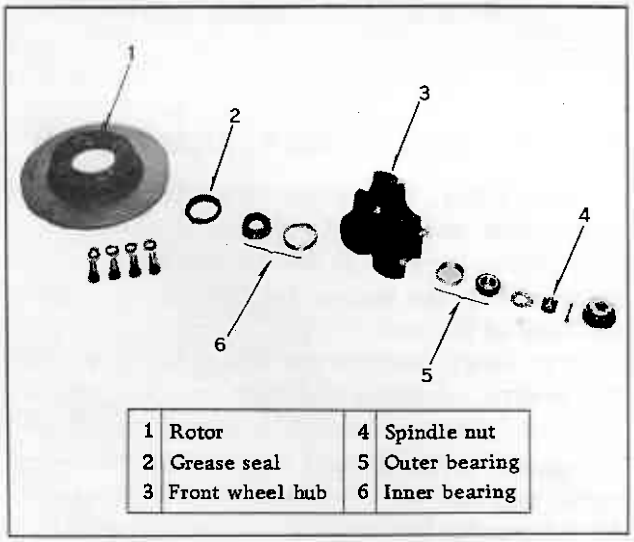


Fig. FA-12 Detaching rotor

Inspection

1. After removal, all parts should be replaced.



1	Rotor	4	Spindle nut
2	Grease seal	5	Outer bearing
3	Front wheel hub	6	Inner bearing

Fig. FA-13 Exploded view of front wheel hub assembly

2. Damaged bearings and hubs should be replaced.

3. Replace grease seals with new ones, in principle, after each disassembling.

Installation

1. Installation is done in the exact reverse of removing.

2. Apply MP3 type grease to the inside of hub cap in the hub.
(See the section on car with drum brakes, the front wheel hub on p. FA-3).

Tightening torque

Spindle nut	Refer to p. FA-3
Caliper fixing bolts	7.3 to 9.9 kg-m (52.8 to 71.6 ft-lb)
Rotor fixing bolts	3.9 to 5.3 kg-m (28.2 to 38.3 ft-lb)
Back plate fixing bolt	2.7 to 3.7 kg-m (19.5 to 26.8 ft-lb)

STABILIZER

Removal

1. Remove stabilizer-fitting bolts (the transverse link side) ① (on both sides).

2. After the frame-side bracket of the stabilizer ② is removed, the stabilizer can be easily taken out (on both sides).

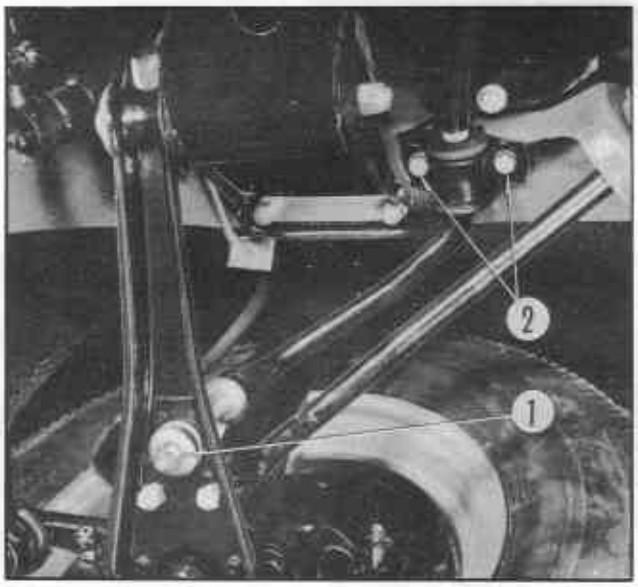


Fig. FA-14 Stabilizer removal

Inspection

Deformation and cracks on the bar, and damages of rubber parts should be checked.

Installation

Do the exact reverse of removal.

Tightening torque of stabilizer fixing

Transverse link bracket side	1.2 to 1.7 kg-m (8.7 to 12.3 ft-lb)
Frame bracket side	1.9 to 2.5 kg-m (13.7 to 18.1 ft-lb)

TENSION ROD

Removal

1. Remove the fitting nuts ① on the body-frame side.

2. Remove fitting bolts ② on the transverse link side, and the tension rod can be easily taken out.

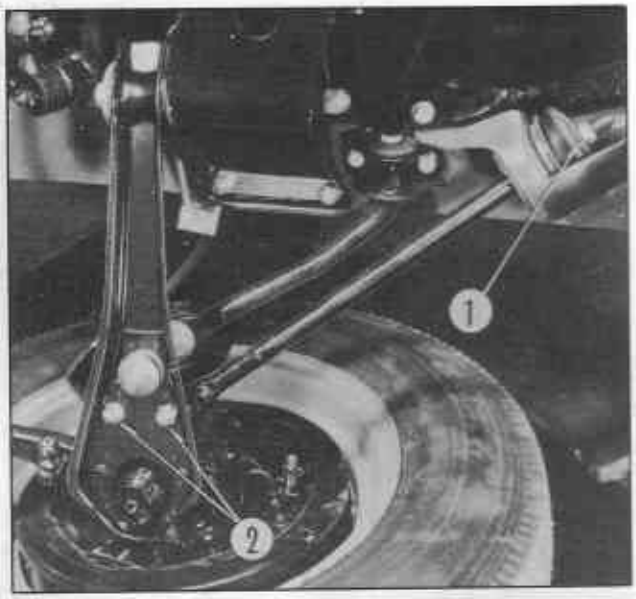


Fig. FA-15 Tension rod removal

Inspection

Check whether there is any deformation or cracks on the bar and any damage on rubber parts.

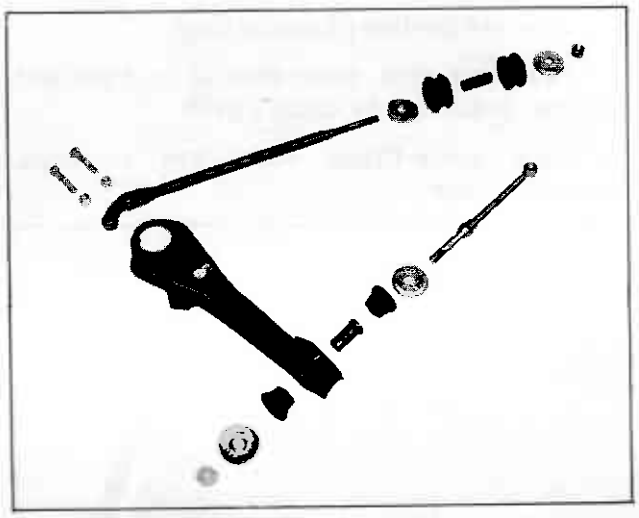


Fig. FA-16 Tension rod and transverse link

Installation

Do the exact reverse of removing.

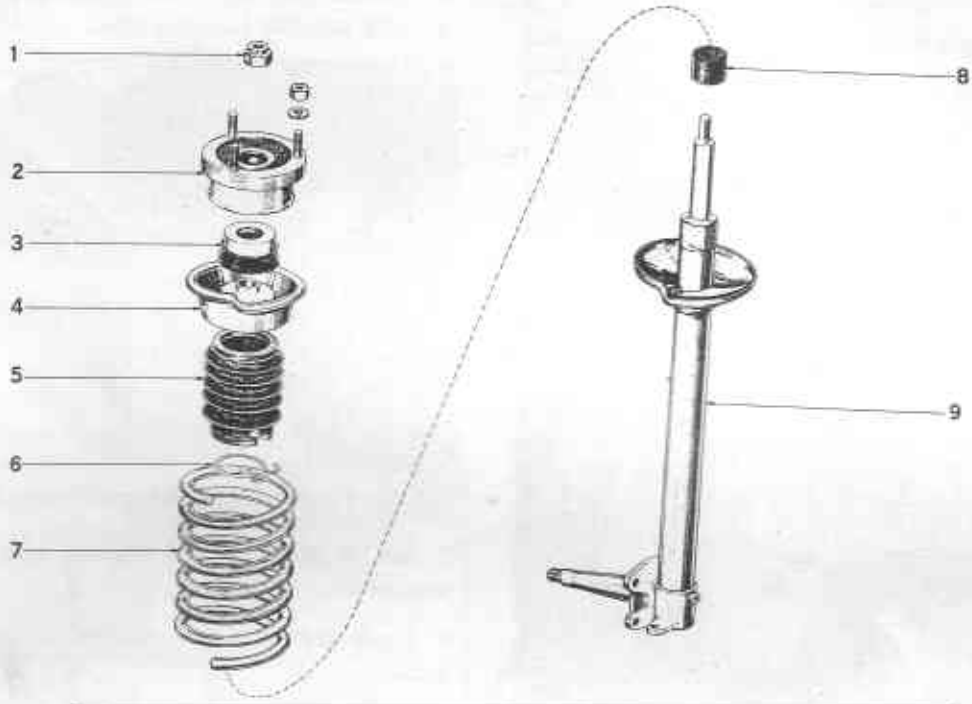
Tightening torque

Frame bracket side	7.2 to 9.6 kg-m (52.1 to 69.4 ft-lb)
Transverse link side	4.9 to 6.3 kg-m (35.4 to 45.6 ft-lb)

SPRING AND STRUT ASSEMBLY

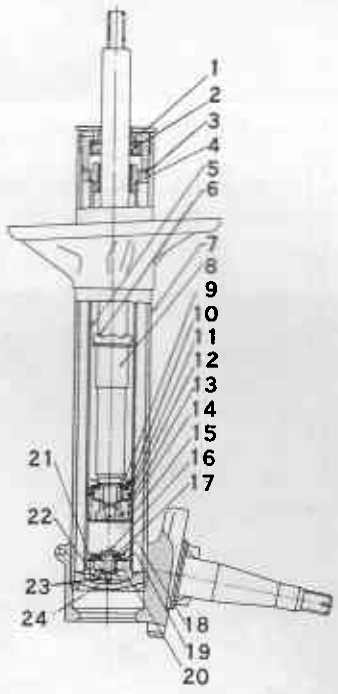
The front suspension unit consists of a strut-outer casing with spindle, inside which is a cylinder, located at the top by the piston rod guide and at the bottom by the bottom valve in the base of the unit.

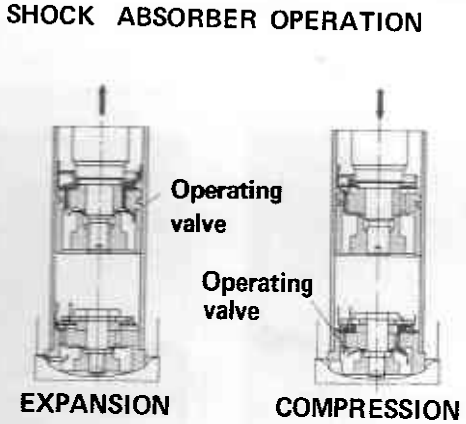
The inner components are assembled under the severe condition and hate any dirt or alien matters. These components (piston rod, piston rod guide, cylinder and bottom valve) are serviced together as an assembly, not separately. So, whenever the replacement is intended, the inner components should be replaced as an assembly.



1.	Self locking nut	4.	Upper spring seat	7.	Coil spring
2.	Suspension mounting insulation	5.	Dust cover	8.	Bumper rubber
3.	Thrust bearing	6.	Clip	9.	Strut assembly

Fig. FA-17 Exploded view of suspension unit





1.	Gland packing ass'y
2.	Oil seal
3.	"O" ring
4.	Piston rod guide ass'y
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-18 Sectional view of strut assembly

Removal

1. Place wedges behind rear wheels.

2. Jack up the car and support it by the stands.

3. Remove wheels.

4. Detach the brake-hose connector, remove the lock spring, and disconnect the brake-hose from the brake tube.

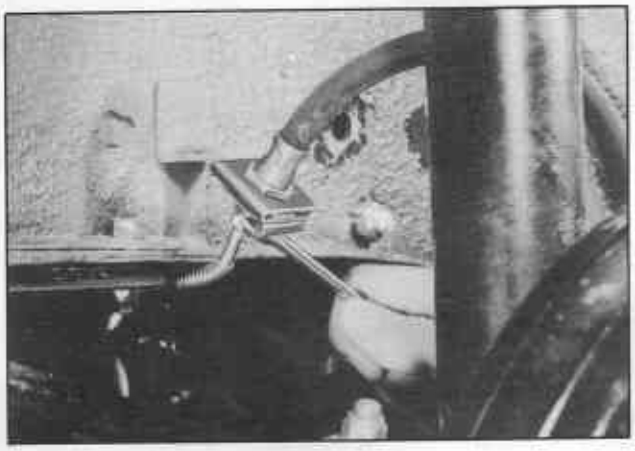


Fig. FA-19

Note: Plug up the end of the disconnected tube with a rubber cap, so that brake fluid will not be lost.

5. Detach the tension-rod-fitting bolts ① and the stabilizer-fitting nuts ② and separate them from the transverse link.

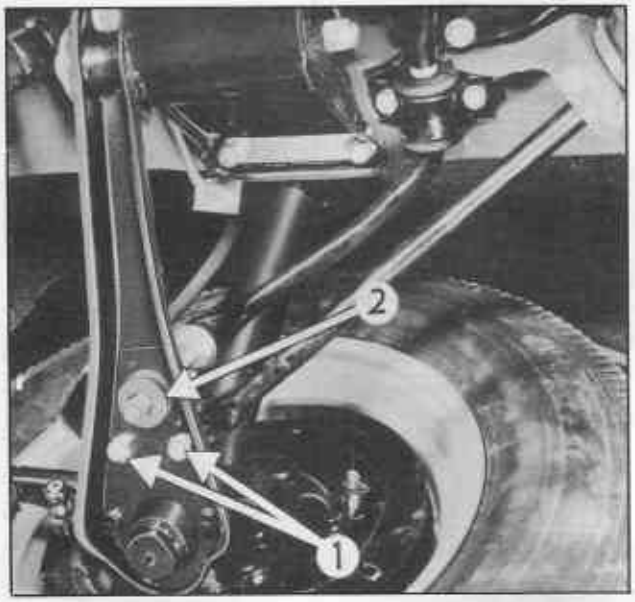


Fig. FA-20 Transverse link removal

6. Detach the two bolts connecting the strut assembly and the knuckle arm.

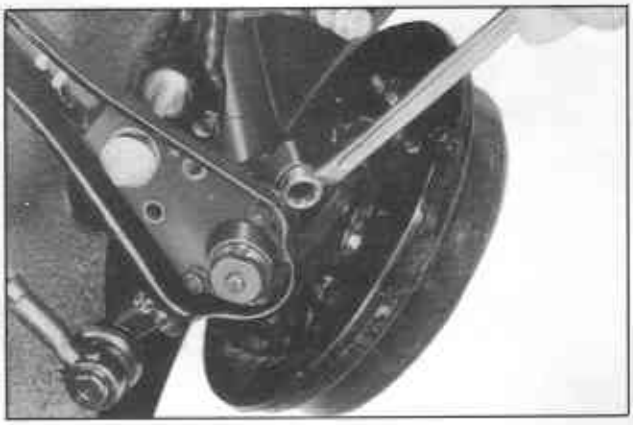


Fig. FA-21 Detaching knuckle arm to strut bolts

7. Set a jack at the bottom end of the strut assembly.

8. Open the hood and remove the nuts fitting the strut.

Fig. FA-22 Strut mounting bolts removal

9. By lowering the jack slowly, the strut assembly, with springs attached, can be taken out from the body-frame.

Fig. FA-23 Strut assembly removal

Disassembly

Disassembling and reassembling should be carried out in a clean place, in order to prevent dirt and other align matters from sticking to the component parts.

1. Fit the strut assembly to the attachment.

2. Take off the dust-cover snap-ring.

3. Fit the coil spring compressor and compress the suspension coil spring slightly.
Special tool: ST49100000

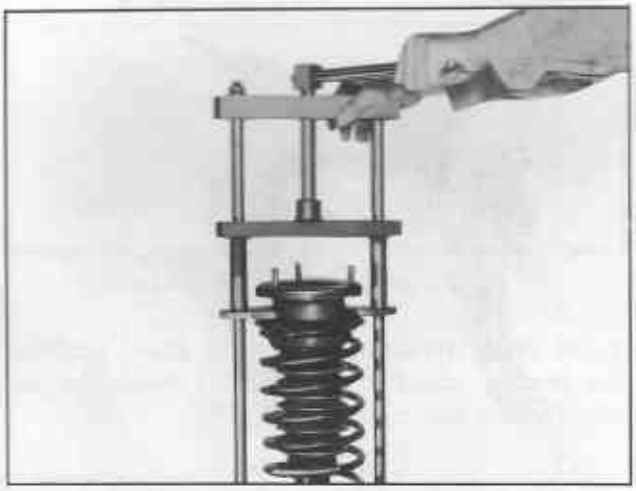


Fig. FA-24 Coil spring compressor

4. Take off the self-locking nut which retains the upper thrust bearing assembly.

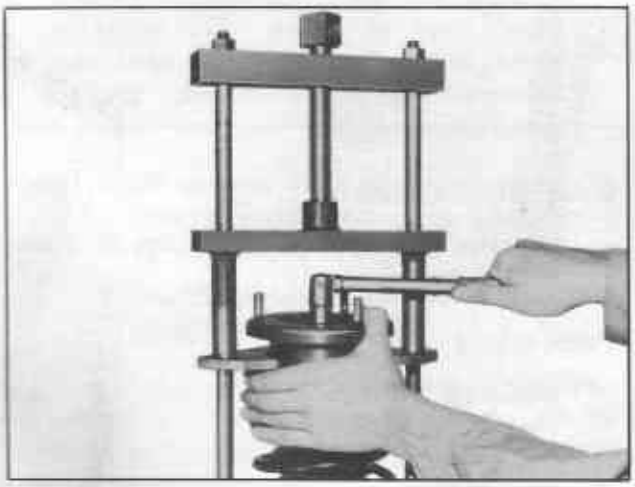


Fig. FA-25 Taking off the self-locking nut

5. **Detach the strut-mounting insulator, the thrust bearing, the spring seat and the bumper rubber.**

6. Loosen the spring compressor and take out the coil spring.

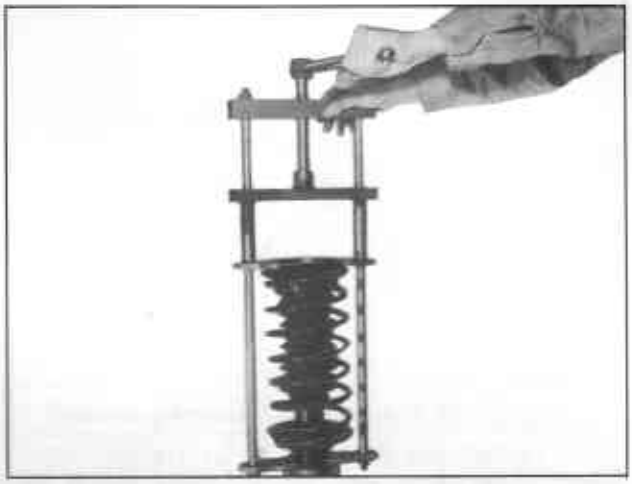


Fig. FA-26 Coil spring removal

7. Remove the gland packing.
Special tool: Gland packing wrench ST49130000

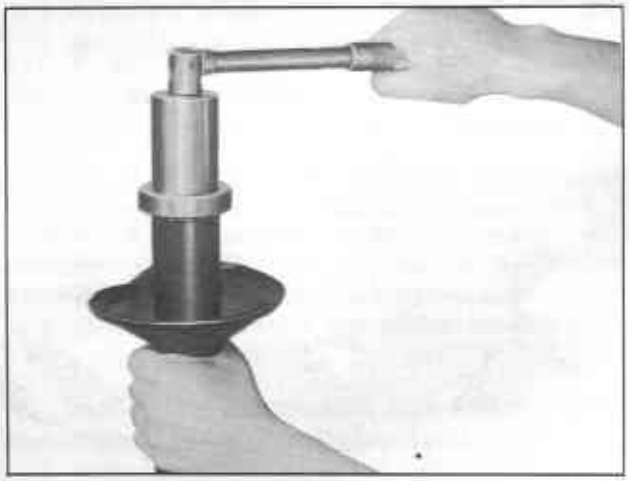


Fig. FA-27 Gland packing removal

Note: Before starting the work, push down the piston rod to the lowest position, and clean the mud and dirt sticking to the gland packing and its environment.
When the gland packing is caulked, first break the caulking and then start the work.

8. Remove the O-ring from above the piston rod guide.

9. Remove the piston rod and cylinder assembly by lifting the piston rod upwards slowly.

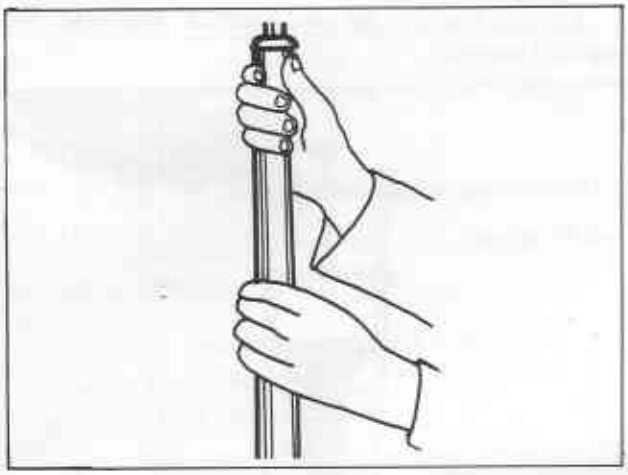


Fig. FA-28 Shock absorber assembly removal

Note: The piston rod and its guide should not be removed from the cylinder. They are serviced together as an assembly, not separately.

10. Empty the fluid into a suitable waste container.

11. Wash all components in a suitable bath.

12. Drain the remaining oil completely from the strut-outer casing.

Note: This procedure should be strictly observed because the performance of the shock absorber is easily influenced by the amount of the damping oil. When assembling the amount of the damping oil should be measured strictly.

Inspection

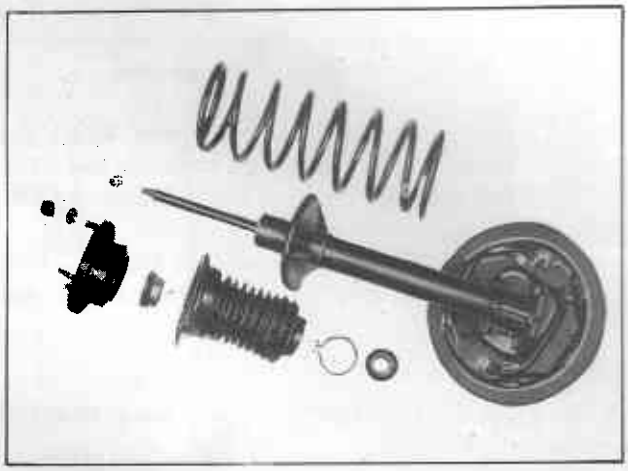


Fig. FA-29 Exploded view of spring and strut assembly

1. All parts except non-metal parts should be first washed with gasoline or thinner, and then dirt and other alien matters should be removed by air-blowing.

2. Non-metal parts should be cleaned only by air-blowing.

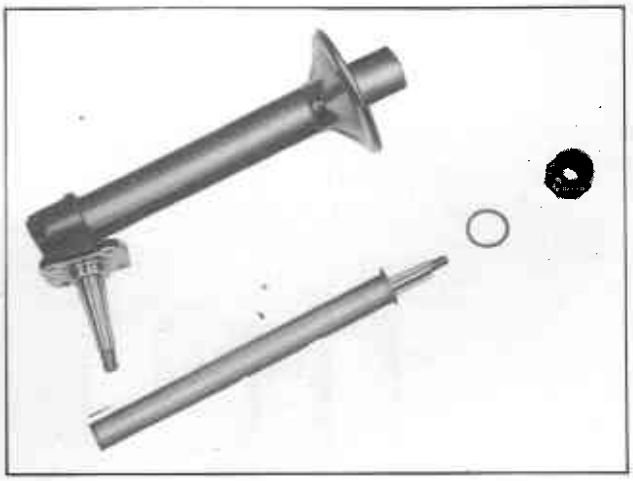


Fig. FA-30 Shock absorber assembly

3. At each disassembling, the gland packing, the O-ring and the damping oil should be replaced with new ones without fail.

Strut-outer casing

Deformed, cracked or damaged casing should be replaced.

Spindle

Care must be taken when checking, if there is any crack on the base and the screw portion of the spindle. Replace, if found abnormal.

Spring and rubber parts

Replace, if cracked, worn out or otherwise damaged.

Thrust bearing

Replace, if worn out, deformed or otherwise damaged.

Assembly

Note: a. All parts are precision finished, and, therefore, should not be dropped or scratched.

b. When reassembling, all component parts should be thoroughly cleaned, and it should be ascertained that the dirt and other alien matters are completely removed.

c. When working, never use waste cotton or gloves.

1. Fix the strut-outer casing to the adapter.

2. Fit the piston rod and cylinder assembly into the strut-outer casing.

3. Fill the strut-outer casing with the correct quantity of oil.

Fig. FA-31 Filling shock absorber oil

Applied models	All sedan models Ex. PS10-UTK, PL510-TK and L510-S	All wagon models	PS10-UTK, PL510-TK and L510-S
Oil quantity	300 cc	325 cc	290 cc

Note: a. Oil quantity has a close relationship with damping power, and precise measurement. by a measuring cylinder is necessary.

b. Use Nissan genuine oil (NISSEKI SHOCK ABSORBER OIL A-1).

4. Place the rubber O-ring on top of the piston rod guide and fit the gland packing. Do not damage the oil seal when installing the gland packing.
Special tool: Gland packing guide A, B
ST49340000

Note: Before tightening the gland packing pull the Piston rod upward by aproximately 90 mm (3.54 in.). This will give the best condition for bleeding the shock absorber system.

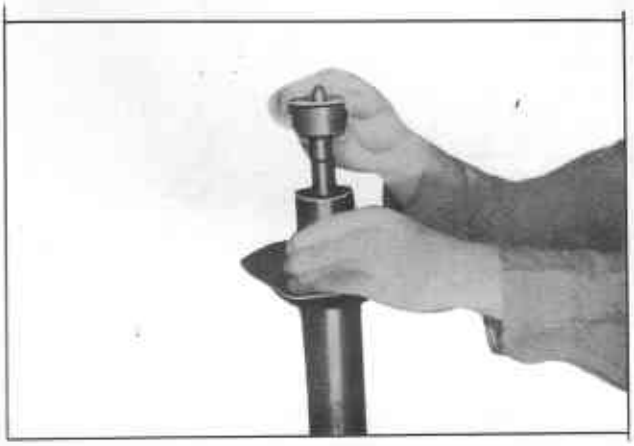


Fig. FA-32 Gland packing installation

5. Tighten the gland packing to 6 to 6.5 kg-m (43.4 to 47.0 lb-ft) torque.
Special tool: ST49130000

6. Bleed the shock absorber system by moving the piston rod up and down.

(1) Position the spindle down, when the piston rod is pulled out upwards, and position the spindle up when the piston is inserted.

(2) Repeat this procedure 4 or 5 times, and the bleeding is completed.

(3) Complete bleeding can be ascertained by the fact that there is no change of feeling of pressure, when the piston rod is given stroke motions.

7. Position the suspension coil spring, bump rubber and spring seat with dust cover on the top of the piston rod, which should be in fully extended position. Compress the spring, using the Special tool: ST49100000.

8. Fit the strut mounting insulator and bearing assembly and secure with the self-locking nut.

Tightening torque: 6 to 7.5 kg-m
(43.4 to 54.2 lb-ft)

Installation

1. Installing is a reversal procedure of the removal.

2. After reassembling the strut and spring assembly, apply grease thoroughly to the portions marked with * as shown in Figure FA-33.

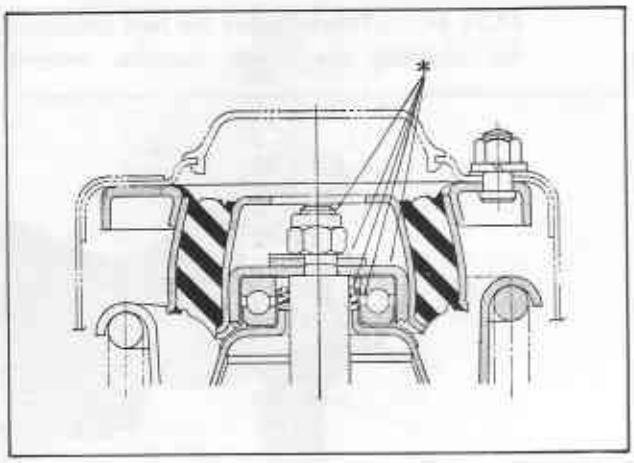


Fig. FA-33 Sectional view of strut mounting insulator

3. The work of fitting the strut assembly can be performed more easily, if the dust cover on the hood ledge is removed.

Tightening torque

Nuts fixing the strut assembly to body	3.9 to 5.2 kg-m (28.2 to 37.6 ft-lb)
Bolts fixing knuckle arm to strut	6.0 to 8.0 kg-m (43.4 to 57.8 ft-lb)
Nut fixing tension rod to transverse link	4.9 to 6.3 kg-m (35.4 to 45.6 ft-lb)
Stabilizer fixing bolts	
Transverse link bracket side	1.2 to 1.7 kg-m (8.7 to 12.3 ft-lb)
Frame bracket side	1.9 to 2.5 kg-m (13.7 to 18.1 ft-lb)

Note: The self-locking nuts should be replaced whenever disassembled.

TRANSVERSE LINK

Removal

1. Place wedges behind rear wheels.
2. Jack up the car and support it by the stands.
3. Separate the tension rod ① and the stabilizer ② from the transverse link ③.
4. Remove bolts ④ for fitting the lower ball-joint.

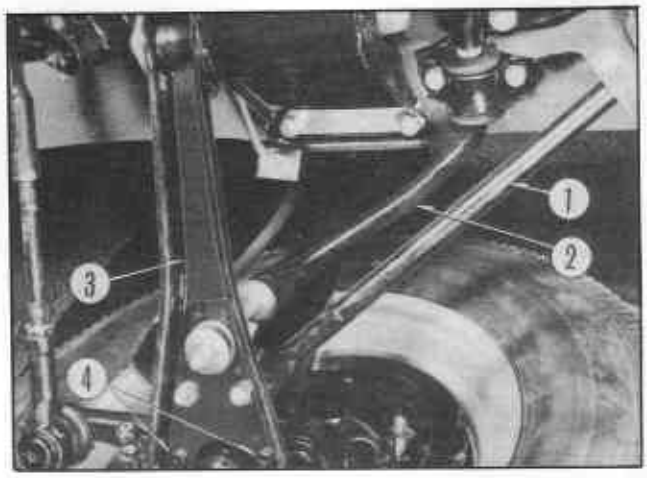


Fig. FA-34 Underside view of front axle

5. Remove nut ①, then the transverse link can be easily taken out.

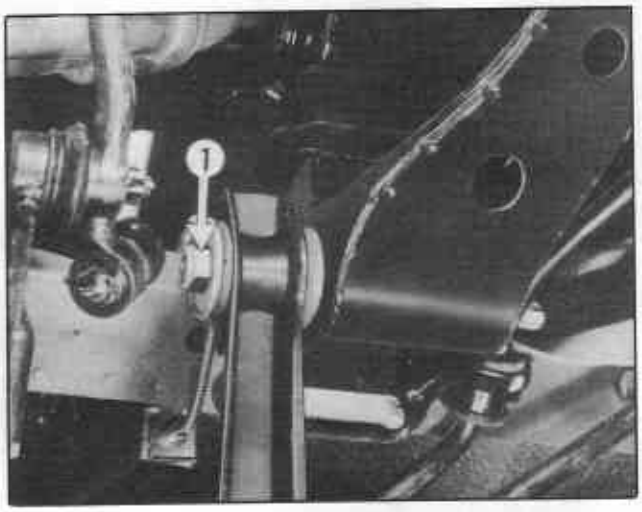


Fig. FA-35 Transverse link removal

Inspection

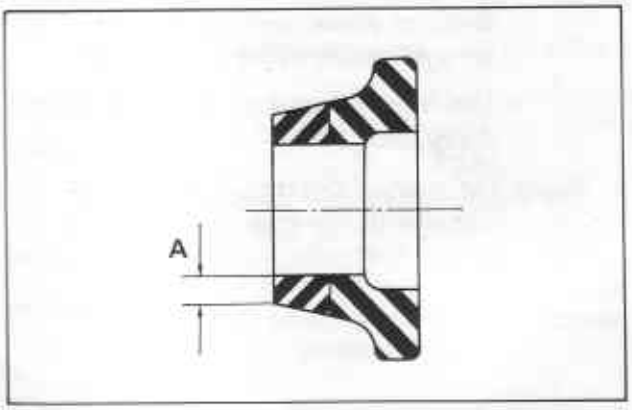


Fig. FA-36 Transverse link bush

1. Replace the cracked, deformed or otherwise damaged link.

2. Check the abrasion of rubber parts, and, if measurement A as shown in Figure FA-36 is less than 1 mm (0. 03937 in.), replace the rubber parts with new ones.

Installation

Do the exact reverse of removing.

Tightening torque

Transverse link to cross member	12.2 to 13.5 kg-m (88.2 to 97.6 ft-lb)
Lower ball joint	1.9 to 2.5 kg-m (13.7 to 18.1 ft-lb)
Tension rod to transverse link	4.9 to 6.3 kg-m (35.4 to 45.6 ft-lb)
Stabilizer to transverse link	1.2 to 1.7 kg-m (8.7 to 12.3 ft-lb)

LOWER BALL JOINT

Removal

1. Separate the tension rod ① and the stabilizer ② from the transverse link ③.

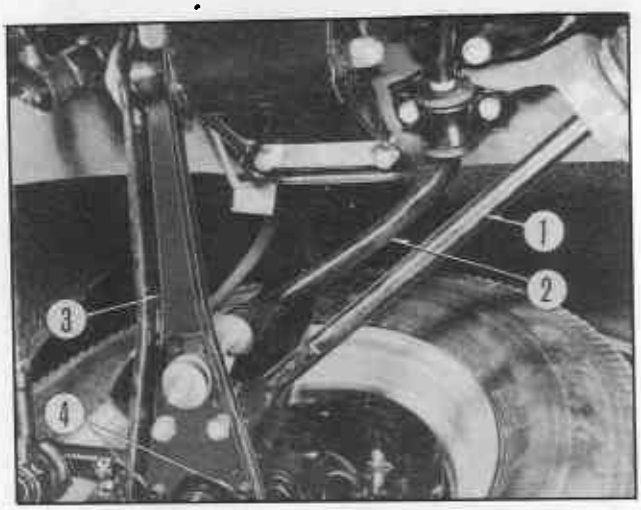


Fig. FA-37 Underside view of front axle

2. Remove the bolt connecting the strut and the knuckle arm.

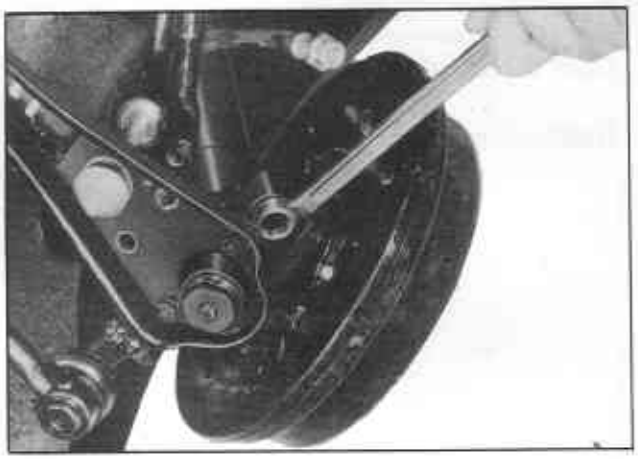


Fig. FA-38 Detaching knuckle arm front strut

3. Remove the cotter pin and the lower ball joint nut.

4. Separate the lower ball joint from the knuckle arm.

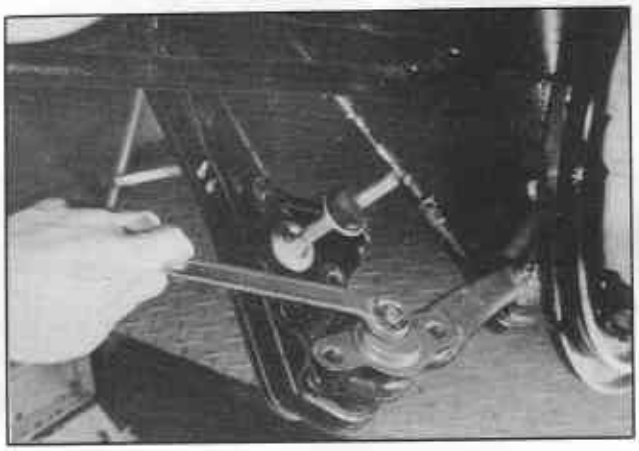


Fig. FA-39 Detaching ball joint from knuckle arm

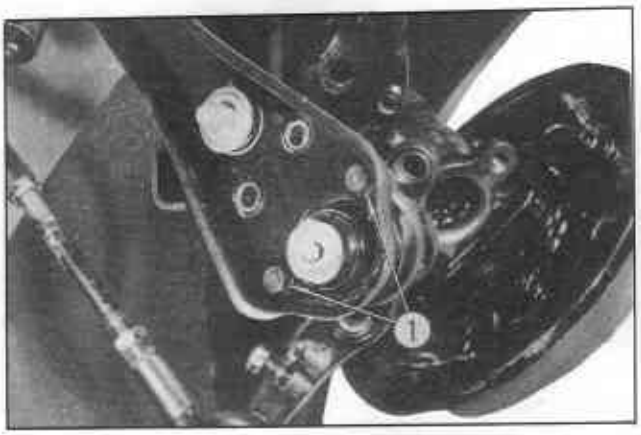
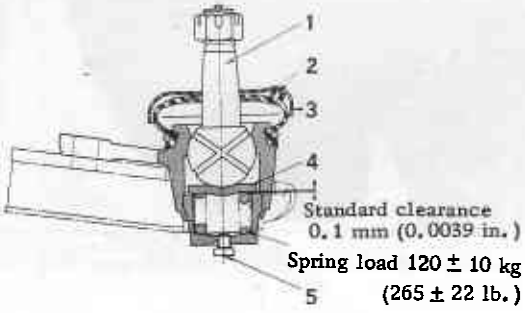


Fig. FA-40 Detaching ball joint from transverse link

5. Remove bolts for fitting the lower ball joint, and the transverse link can be easily separated from the lower ball joint.

Inspection



1	Ball stud	4	Spring seat
2	Grease bleeder	5	Plug
3	Outer cover		

Fig. FA-41 Construction of ball joint

1. Replace the damaged dust cover and other parts.

2. As it is a non-disassembling type, assembling cannot be done.

Ball joint repair standard of replacement

End play (axial direction)	0.03 to 0.6 mm (0.0012 to 0.0136 in)
Shaking torque	20 to 90 gr-cm (0.28 to 1.25 in-oz.)

Note:
a. When greasing up, fit the grease nipple, fill in the grease, until the old grease inside is completely removed, and then fit the plug again.
b. When using a high-pressure grease gun, take care to fill in grease slowly, so that grease will not come out from the clamp portion, excepting for draining old grease.

Installation

Do the exact reverse of removal.

Tightening torque

Lower ball joint to transverse link	1.9 to 2.5 kg-m (13.7 to 18.1 ft-lb)
Ball stud nut	5.5 to 7.6 kg-m (39.8 to 55.0 ft-lb)
Steering knuckle arm to strut	6.0 to 8.0 kg-m (43.4 to 57.8 ft-lb)
Tension rod to transverse link	4.9 to 6.3 kg-m (35.4 to 45.6 ft-lb)
Stabilizer to transverse link	1.2 to 1.7 kg-m (8.7 to 12.3 ft-lb)

SUSPENSION MEMBER

Removal

1. Place wedges behind rear wheels.

2. Jack up the car and support it by the stands.

3. Separate the tension rod ① and the stabilizer ② from the transverse link ③.

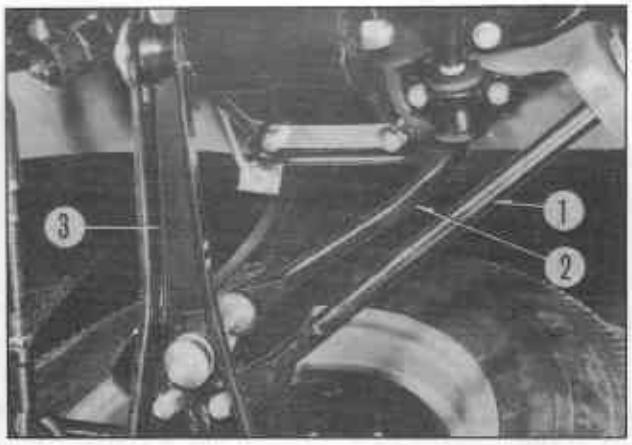


Fig. FA-42 Underside view of front axle

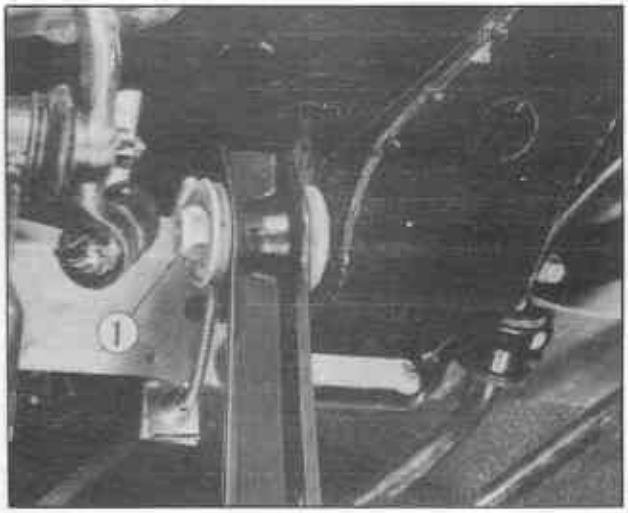


Fig. FA-43 Transverse link removal

4. Remove nut ① for fitting the transverse link and then take out the transverse link (both on the left and the right sides).

Note: **Be careful not to damage the throttle linkage and remote-control linkage of the engine.**

5. Support the engine, slightly hanging it up.

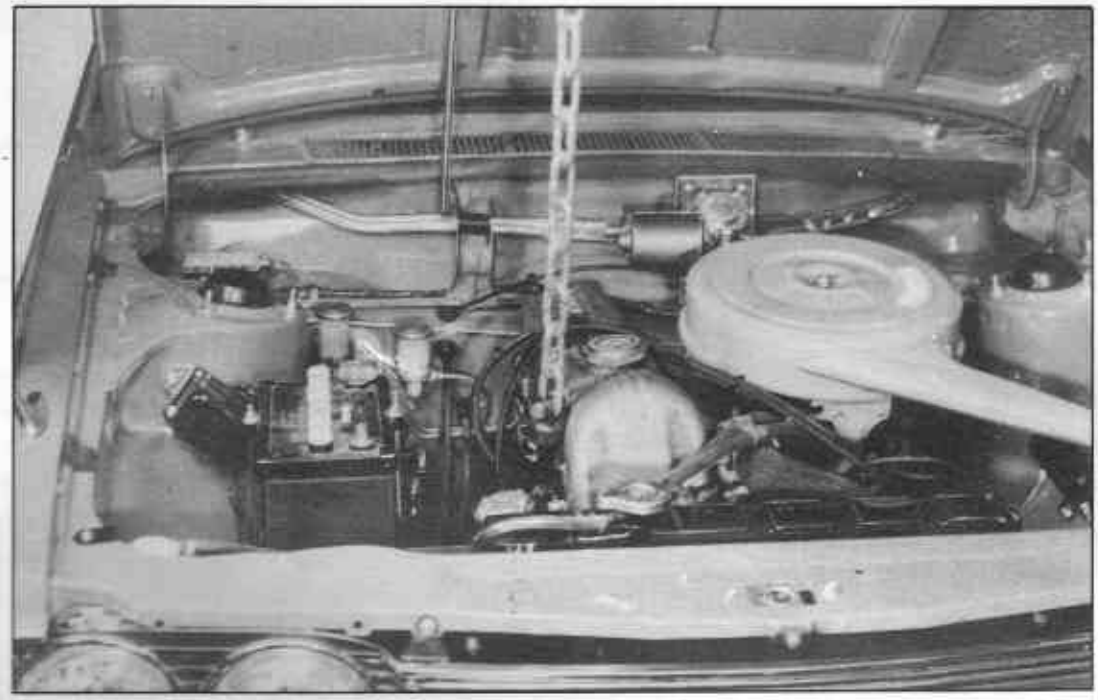


Fig. FA-44 Supporting the engine

6. Remove the engine-mounting bolts (marked with arrows) (both on the left and the right sides).

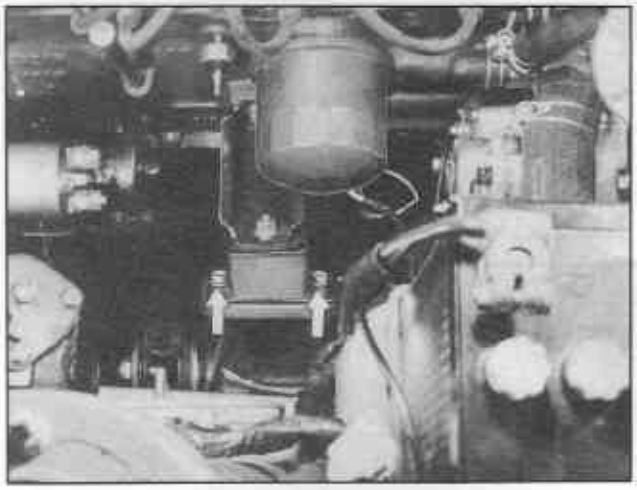


Fig. FA-45 Engine mounting bolts removal

7. Remove bolts (marked with arrows) for fitting the suspension member, and then the suspension member can be easily taken out.

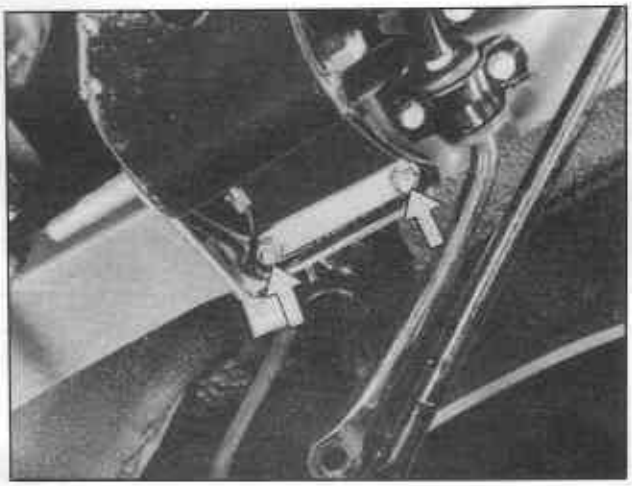


Fig. FA-46 Suspension member bolts removal

Inspection

Replace, if it is found cracked, deformed (especially at the portion fitted to the car body) or otherwise damaged.

Installation

Do the exact reverse of removal.

ADJUSTMENT

CONTENTS

ADJUSTMENT

1. Wheel alignment should be carried out on a flat surface and with air pressure of tires adjusted to normal pressure.

2. A thorough check should be made of all parts of the steering and suspension systems and all defective parts should be corrected, before the alignment is carried out.

3. The camber and caster angles are preset and cannot be adjusted. Only the toe-in and vehicle level should be adjusted.

ADJUSTMENT DATA (Vehicle unladen)

Wheel alignment

Applied model		All sedan models except L510-S	L510-S	All wagon models
Caster		1° 40'	1° 40'	2° 00'
Camber		1° 00'	1° 30'	2° 10'
King pin inclination		8° 00'	7° 30'	7° 50'
Toe-in		6 to 9 mm (0.236 to 0.354 in.)	9 to 12 mm (0.354 to 0.472 in.)	3 to 6 mm (0.118 to 0.236 in.)
Steering angle	(In)	38 ° to 39°		
	(Out)	22° 30' to 33° 30'		

Tire pressure unit: kg/cm^2 (lb/in^2)

Applied model	Normal condition		High speed condition	
	front	rear	front	rear
All models	1.7 (24)	1.7 (24)	2.0 (28)	2.0 (28)

Road clearance (at the suspension cross member)

All sedans except 510-(S)U and L510-(S)	187.4 mm	(7.38 in.)
510-(S)U and L510-(S)	197.4 mm	(7.77 in.)
All wagons	227.4 mm	(8.95 in.)

ADJUSTMENT OF WHEEL ALIGNMENT

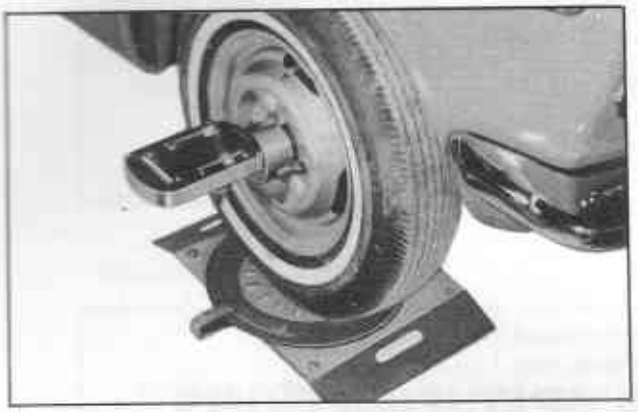


Fig. FA-47 Measurement of camber and caster

1. The measurement should be carried out on a flat surface and with air pressure of tires adjusted to normal pressure.

2. A turning radius gauge and an alignment gauge should be used for the measurement.

ADJUSTMENT OF VEHICLE LEVEL

1. Adjustment of vehicle level is carried out by changing springs.

2. The car equipped with an air-conditioner is supplied with springs encased in the air-conditioner kit, and these springs should be used for adjustment of vehicle level.

ADJUSTMENT OF TOE-IN

1. Measurement should be made with a toe-in gauge.

Fig. FA-48 Measurement of toe-in

2. The length of the side rod (marked with an arrow) should be adjusted to the standard length.

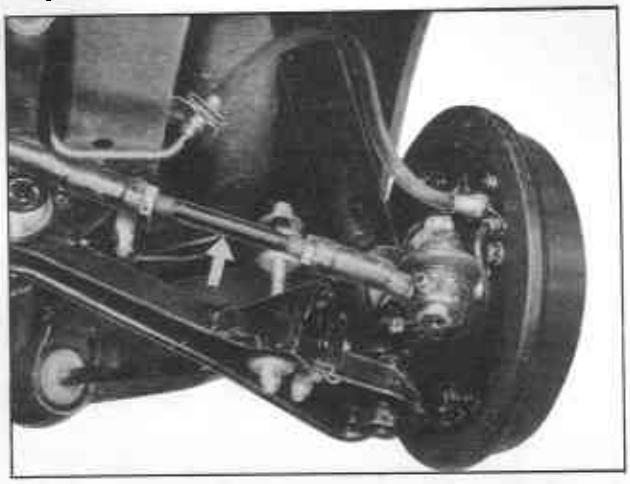


Fig. FA-49 Adjustment of toe-in

Note: **The right and the left side rod ball joints should be of the same distance measured from the center of the knuckle joints.**
The standard distance between the side rod ball joints on each side respectively is 309.5 mm (12.19 in.).

ADJUSTMENT OF STEERING ANGLE

1. Place the car on a turn table.

Fig. FA-50 Measurement of steering angle

2. Adjust the steering angle to the designated angle with the bolt for adjusting steering angle (marked with an arrow) on both sides.

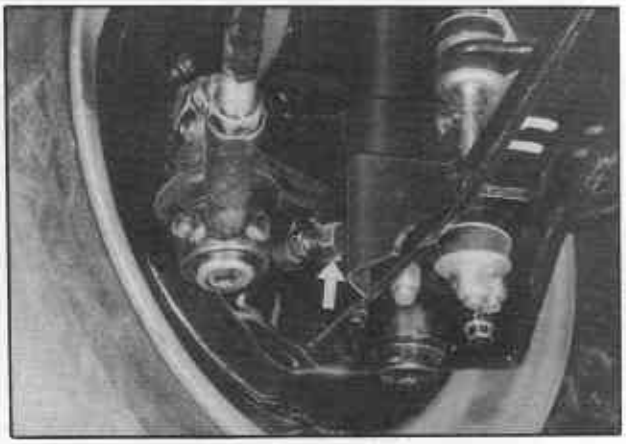


Fig. FA-51 Adjustment of steering angle

SERVICE DATA AND SPECIFICATIONS

Wheel alignment (vehicle unladen)

Applied model		All sedan models except L510-S	L510-S	All wagon models
Caster		1° 40'	1° 40'	2° 00'
Camber		1° 00'	1° 30'	1° 10'
King pin inclination		8° 00'	7° 30	7° 50'
Toe-in		6 to 9 mm (0.236 to 0.354 in.)	9 to 12 mm (0.354 to 0.472 in.)	3 to 6 mm (0.118 to 0.236 in.)
Steering angle	(In)	38° to 39°		
	(Out)	22° 30' to 33° 30'		

Tire pressure unit: kg/cm^2 (lb/in^2)

Applied model	Normal condition		High speed driving condition	
	front	rear	front	rear
All models	1.7 (24)	1.7 (24)	2.0 (28)	2.0 (28)

Coil spring

Applied model	Left side spring for all models Right side spring for L.H. models (Ex. L510-S)	Right side spring for all R.H. models and L510-S Left side spring for L510-S	Left and right side spring for all models equipped with air conditioner
Wire diameter	12 mm (0.472 in.)	12 mm (0.472 in.)	12 mm (0.472 in.)
Coil diameter	130 mm (5.12 in.)	130 mm (5.12 in.)	130 mm (5.12 in.)
Coil turns	8.0	8.0	8.0

Coil effective turns	6.5	6.5	6.5
Free length	354.5 mm (13.94 in.)	369.5 mm (14.55 in.)	384.5 mm (15.14 in.)
Installed height/load	187/243 mm/kg (7.36/536 in/lb)	202/243 mm/kg (7.95/536 in/lb)	217/243 mm/kg (8.54/536 in/lb)
Spring constant	1.45 kg/mm	1.45 kg/mm	1.45 kg/mm

Strut assembly

Applied models	All sedans with drum brakes. Ex. L510-S	Sedans with disc brakes Ex. SSS	All wagons with drum brakes.	Wagons with disc brakes.	SSS (P510-UTK and PL510-TK)	L510-S
Strut outer diameter mm (in.)	50.8 (2.0)	50.8 (2.0)	50.8 (2.0)	50.8 (2.0)	50.8 (2.0)	50.8 (2.0)
Piston rod diameter mm (in.)	20 (0.787)	20 (0.787)	20 (0.787)	20 (0.787)	22 (0.866)	22 (0.866)
Cylinder inner diameter mm (in.)	30 (1.181)	30 (1.181)	30 (1.181)	30 (1.181)	32 (1.260)	32 (1.260)
Damping force at piston speed 0.3 m/s (1.08 ft/s)						
Expansion kg (lb)	67 ± 10 (147.7 ± 22)	67 ± 10 (147.7 ± 22)	67 ± 10 (147.7 ± 22)	67 ± 10 (147.7 ± 22)	80 ± 12 (176.3 ± 22)	67 ± 10 (147.7 ± 22)
Compression kg (lb)	25 ± 4 (55.1 ± 8.8)	25 ± 4 (55.1 ± 8.8)	25 ± 4 (55.1 ± 8.8)	25 ± 4 (55.1 ± 8.8)	40 ± 6 (88.2 ± 13.2)	25 ± 4 (55.1 ± 8.8)
Shock absorber inner cylinder length mm (in.)	410 (16.1)	410 (16.1)	435 (17.1)	435 (17.1)	410 (16.1)	410 (16.1)

Tightening torque

Front wheel spindle nut	3 to 3.5 kg-m	(21.7 to 25.3 ft-lb)
Front disc brake back plate to strut assembly	2.7 to 3.7 kg-m	(19.5 to 26.7 ft-lb)
Disc brake caliper fixing bolts	7.3 to 9.9 kg-m	(52.8 to 71.6 ft-lb)
Disc brake rotor fixing bolts	3.9 to 5.3 kg-m	(28.2 to 38.3 ft-lb)
Stabilizer fixing bolts (transverse link bracket side)	1.2 to 1.7 kg-m	(8.7 to 12.3 ft-lb)

Stabilizer fixing bolts (frame bracket side)	1.9 to 2.5	kg-m	(13.7 to 18.1 ft-lb)
Tension rod to frame bracket bolts	7.2 to 9.6	kg-m	(52.1 to 69.2 ft-lb)
Tension rod to transverse link bolts	4.9 to 6.3	kg-m	(35.4 to 45.6 ft-lb)
Strut assembly upper support nuts	3.9 to 5.2	kg-m	(28.2 to 37.6 ft-lb)
Steering knuckle arm to strut assembly	6.0 to 8.0	kg-m	(43.4 to 57.8 ft-lb)
Transverse link to suspension cross member fixing nut	12.2 to 13.5	kg-m	(88.2 to 97.6 ft-lb)
Lower ball joint to transverse link fixing nut	1.9 to 2.5	kg-m	(13.7 to 18.1 ft-lb)
Lower ball joint stud nut	5.5 to 7.6	kg-m	(39.8 to 55.0 ft-lb)
Suspension cross member mounting bolts	1.9 to 2.5	kg-m	(13.7 to 18.1 ft-lb)
Engine mounting bracket bolts	1.3 to 1.7	kg-m	(9.4 to 12.3 ft-lb)
Pistion rod self-locking nut	6.0 to 7.5	kg-m	(43.4 to 54.2 ft-lb)
Gland packing	6.0 to 6.5	kg-m	(43.4 to 47.0 ft-lb)
Wheel nuts	8.0 to 9.0	kg-m	(57.8 to 65.1 ft-lb)

TROUBLE DIAGNOSES AND CORRECTIONS

Troubles	Possible causes	Remedies
Vibration, shock and shimmying of steering wheel.	Improper air pressure of tire.	Adjust.
Vibration: Too much backlash of the steering gear, abrasion of each part of linkage and vibration of front wheels are, in many cases, transmitted to the steering wheel. This is very much noticeable when travelling over bad roads and at higher speeds.	Imbalance and deformation of load-wheel.	Correct the imbalance or replace.
	Uneven wear of tire and insufficient tightening.	Replace or tighten.
	Improper adjusting or wear of front wheel bearing.	Adjust or tighten.
	Faulty wheel alignment.	Adjust.
	Wear of bushings for fitting transverse link and tension rod.	Replace.
Shock: When the front wheels are travelling over bumpy roads, the shock they get are transmitted to the steering wheel. This is also very much noticeable when travelling over bad roads and at higher speeds.	Damage of idler arm.	Replace.
	Insufficient tightening of steering gear box.	Tighten more.
	Wear of steering linkage.	Replace defective parts.
	Wear of suspension ball-joint.	Replace.

Shimmying: This is abnormal vibrations of the front suspension group and the whole steering linkage, which occur when a specific speed is attained.	Improper adjustment of steering gear (Insufficient backlash).	Adjust.
	Malfunction of shock absorber (inside the strut) or loose bolts for its fitting.	Replace or tighten.
	Imbalance of vehicle level.	Correct the imbalance.
Wandering of car in one direction. When driving with hands off the steering wheel over a flat road, the car gently swerves to one side of the road. **Note:** **A defective rear suspension may also be the cause of this tendency, 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.
	Collapsing or twisting of front spring.	Replace.
	Incorrect wheel alignment.	Adjust.
	Incorrect adjustment of brakes (binding).	Adjust.
	Abrasion of rubber bushes for fitting transverse link and tension rod.	Replace.
	Deformation of steering linkage and suspension link.	Replace.
	Imbalance of vehicle level.	Correct the imbalance.
Instability of car.	Improper air pressure of tire.	Adjust.
	Abrasion or rubber bushes for fitting transverse link and tension rod.	Adjust.
	Incorrect wheel alignment.	Adjust.
	Wear and deformation of steering linkage and suspension link.	Replace.
	Incorrect adjustment of steering gear.	Adjust.
	Deformation and imbalance of wheel.	Correct or replace.
Heavy feeling caused by operation of steering wheel.	Improper air pressure of tire.	Adjust.
	Insufficient lubricating oil or mixing impurities in gear box.	Replenish gear oil or replace gear box.

(The order of checking up.) Jack up front wheels, detach the steering gear and operate the steering wheel, and then, -- If it is light, check up steering linkage, suspension and accelerator groups. If it is heavy, check up steering gear and steering column groups.	Insufficient lubricating oil or mixing impurities in steering linkage or its abnormal abrasion.	Replenish grease or replace the part.
	Stiffness, damage or insufficient grease in suspension ball-joint.	Replace.
	Abrasion or incorrect adjustment of wheel bearing.	Replace or adjust.
	Abrasion or damage of steering gear and bearing.	Replace.
	Incorrect adjustment of steering gear.	Adjust.
	Deformation of steering linkage.	Replace.
	Incorrect wheel alignment.	Adjust.
	Damage of bearing at upper end of strut.	Replace.
	Damage or stiffness of piston or rod of shock absorber (in the strut).	Replace.
	Interference of steering column with turn signal switch.	Adjust.
Too much play of steering wheel.	Incorrect adjustment of steering gear.	Adjust.
	Abrasion of steering linkage and idler arm.	Replace.
	Improper fitting of gear box.	Tighten.
	Incorrect adjustment of wheel bearing.	Adjust.
	Abrasion of bushes for fitting transverse link and tension rod.	Replace.
Noises.	Improper air pressure of tire.	Adjust.
	Insufficient lubricating oil and grease for suspension ball joint and steering linkage, or their breakage.	Replenish lubrication oil and grease, or replace.
	Loose bolts for steering gear, linkage and suspension groups.	Tighten more.
	Defective shock absorber (inside the strut).	Replace.
	Defective wheel bearing.	Replace.
	Abrasion of steering linkage and steering gear.	Replace.

	Abrasion of bushes for fitting transverse link and tension rod.	Replace.
	Breakage or collapsing of coil spring.	Replace.
	Loose nuts, that tighten strut mounting insulator.	Tighten more.
Grating noise of tire.	Improper air pressure of tire.	Adjust.
	Incorrect wheel alignment.	Adjust.
	Deformation of knuckle spindle and suspension linkage.	Replace.
Jumping of disc wheel.	Improper air pressure of tire.	Adjust.
	Imbalance of wheels.	Adjust.
	Defective shock absorber.	Replace.
	Defective tire is used.	Replace.
	Deformation of wheel rim.	Replace.
Excessive abration or partial abrasion of tire.	Improper air pressure of tire.	Adjust.
	Incorrect wheel alignment.	Adjust.
	Defective wheel bearing.	Replace.
	Incorrect adjustment of brakes.	Adjust.
	Improper shifting (rotation) of tires.	Adjust.
	Hard and cruel driving.	Driving more gently.

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