

16. SUSPENSION

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16-1. Description

Front suspension is Macpherson type independent suspension system as shown in the Fig. 16-1, and consists of coil springs, front suspension struts, steering knuckles, stabilizer bar, and front suspension arms. In this type of construction, shock applied to wheels is distributed through steering knuckles from front suspension struts, coil springs, to front suspension arms, and are absorbed.

Rear suspension is of dead axle type using leaf springs, and consists of leaf springs, bump stoppers, and shock absorbers.

16-2. Front Suspension

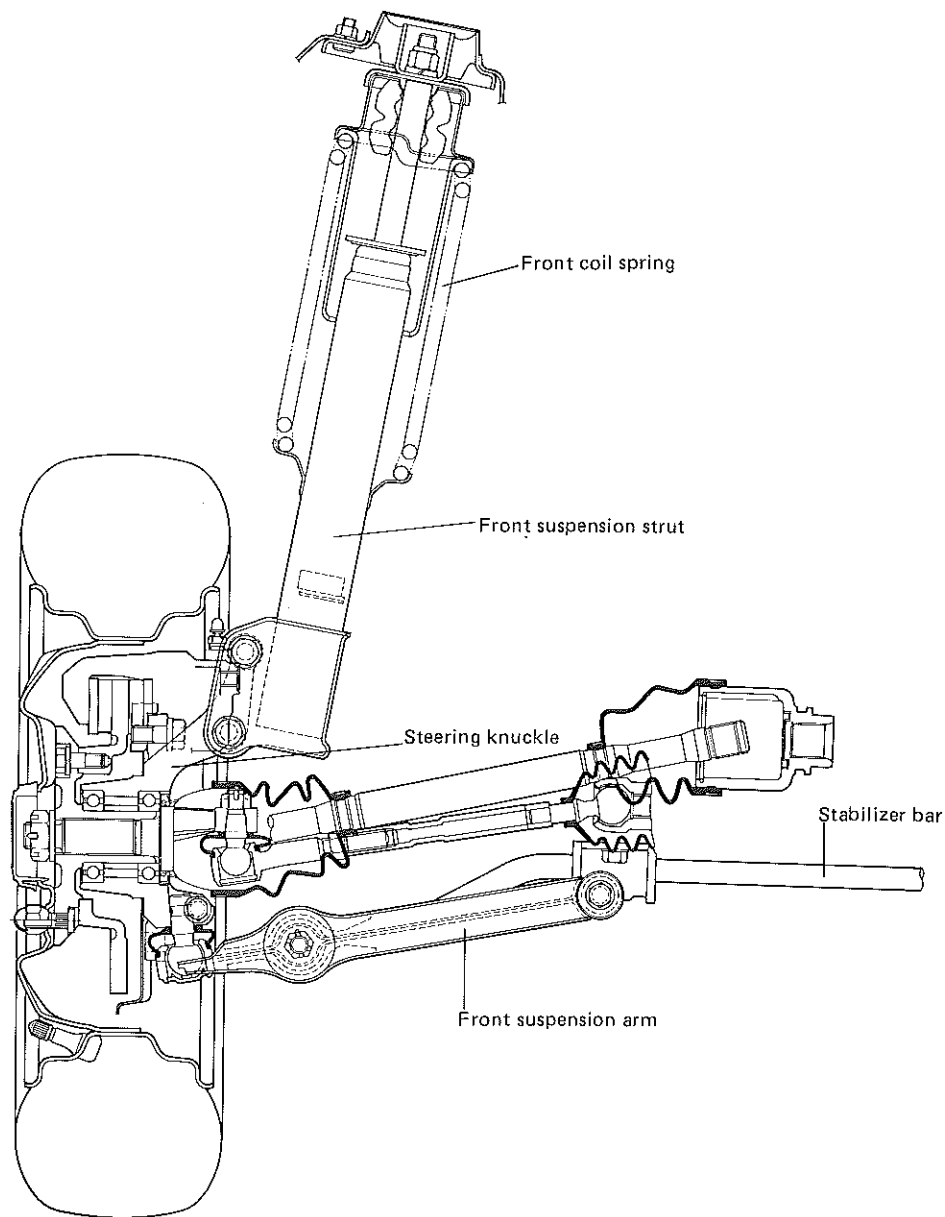


Fig. 16-1 Front suspension

16-3. Front Suspension Specification

Front suspension struts

Attenuation force (extending side)	40 kg (88 lb)
Attenuation force (contracting side)	20 kg (44 lb)
Stroke	135 mm (5.3 in)

NOTE:

The attenuation force of the shock absorber is for a piston speed of 0.3 m/sec (1.0 ft/sec).

Front coil springs

Spring rate	1.48 kg/mm (83 lb/in.)
Free length	352 mm (13.9 in)

16-4. Front Suspension Removal

Front coil spring

- 1) Lift the front end of the machine by jacking after loosening hub nuts, and support it with safety stands.
- 2) Take off a wheel.

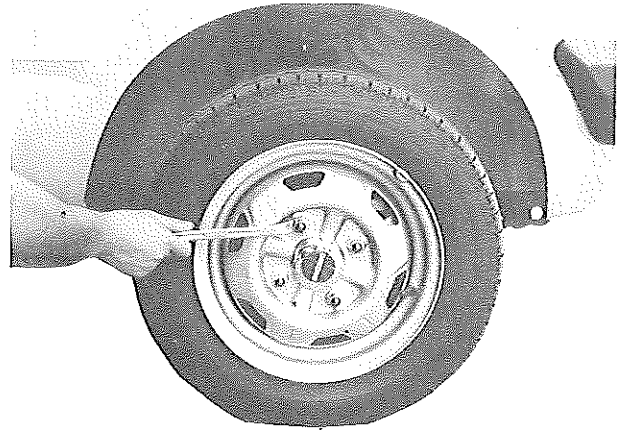


Fig. 16-2

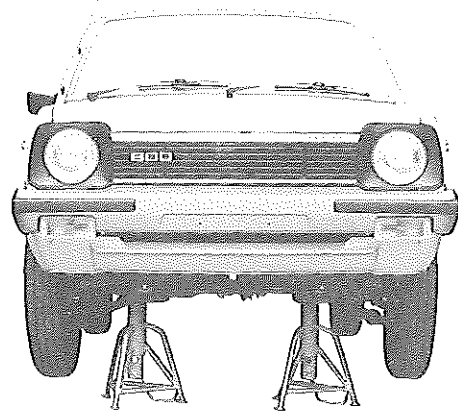


Fig. 16-3

- 3) Disconnect the brake flexible hoses and brake pipe, and remove the flexible hoses from the suspension strut.

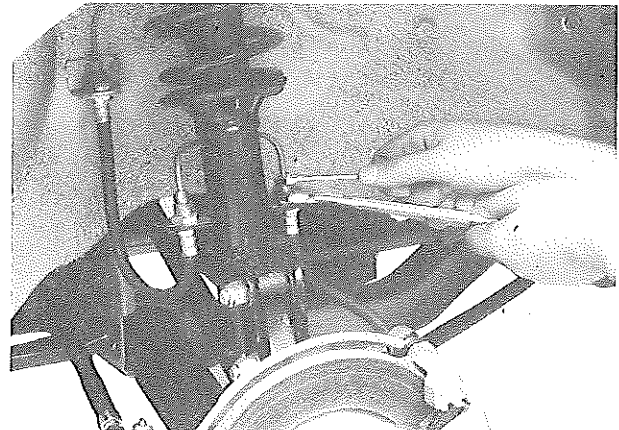


Fig. 16-4

- 4) Remove the 2 bolts securing the strut to the steering knuckle.

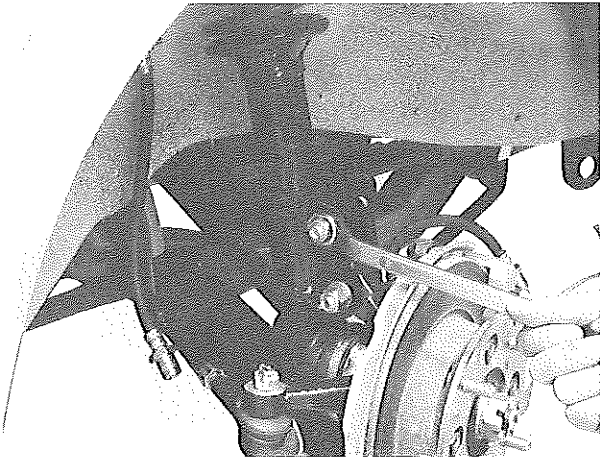


Fig. 16-5

- 5) Remove the strut by loosening the strut support nuts.

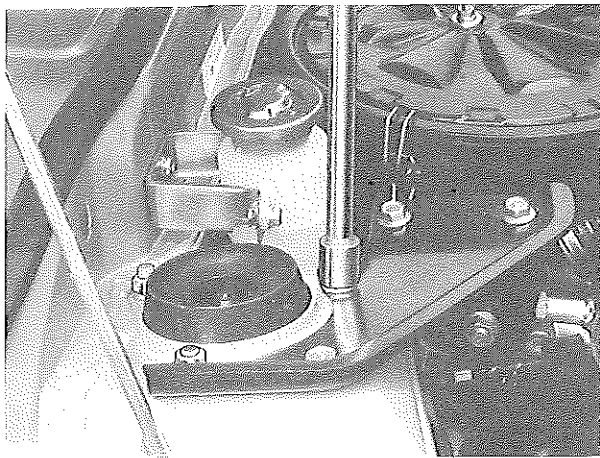


Fig. 16-6

- 6) Compress coil spring using special tool, front coil spring tool (A) (09943-25810) until play between coil spring and spring seat is obtained. Remove lock nut of front suspension strut, and then remove strut support, bearing, dust seal, rubber seat, bump stopper and coil spring.

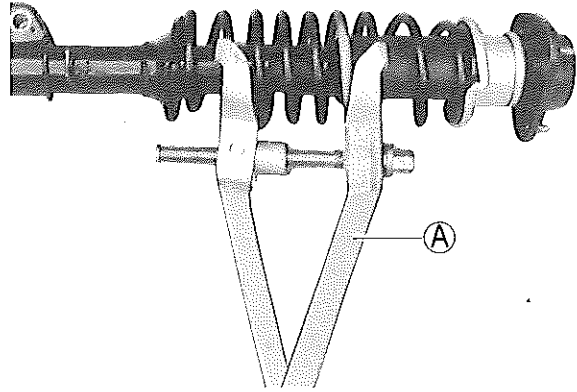


Fig. 16-7

Tie rod end

Detach the tie rod end from the steering knuckle by using special tool (A) (09913-65210).

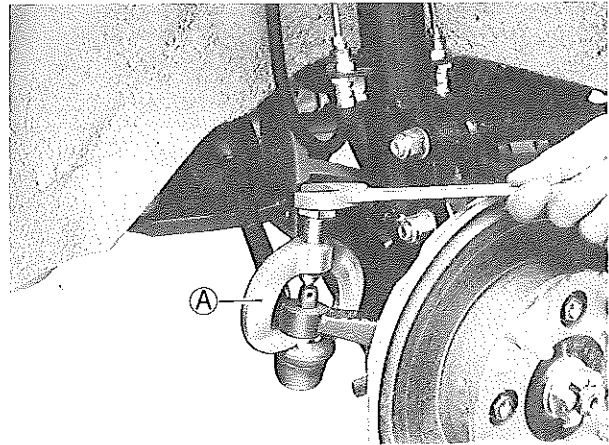


Fig. 16-8

Front wheel bearings

- 1) Lift the front end of the machine by jacking, and support it with safety stands, after loosening hub nuts.
- 2) Take off a wheel.
- 3) Remove the drive shaft castle nut.

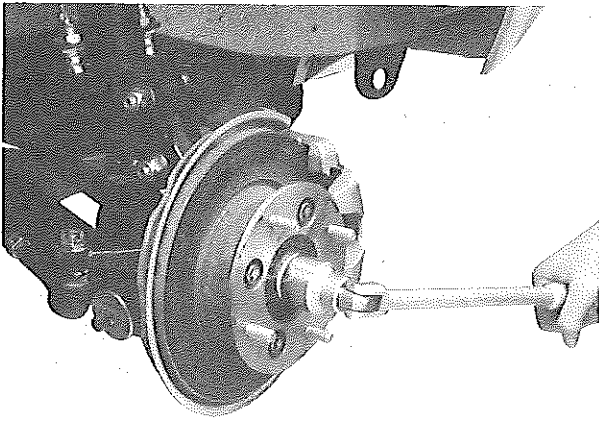


Fig. 16-9

- 4) Remove the caliper body from the steering knuckle.

NOTE:

Be careful not to damage the brake flexible hose after removing the caliper body.

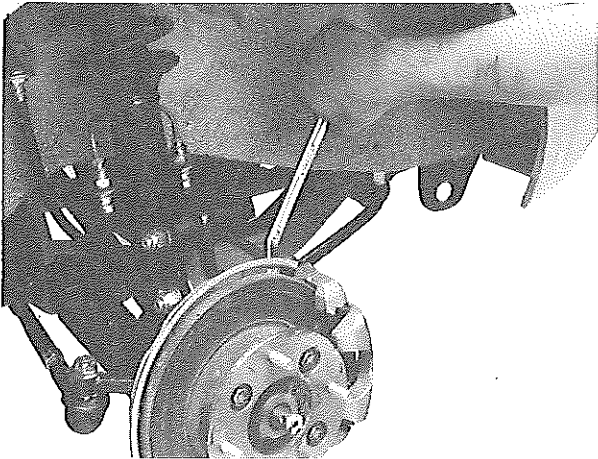


Fig. 16-10

- 5) Install the special tool ⑥ (09943-17910) by utilizing the hub bolts. Using the sliding hammer ③ (09942-15510), draw out the wheel hub and brake disc.

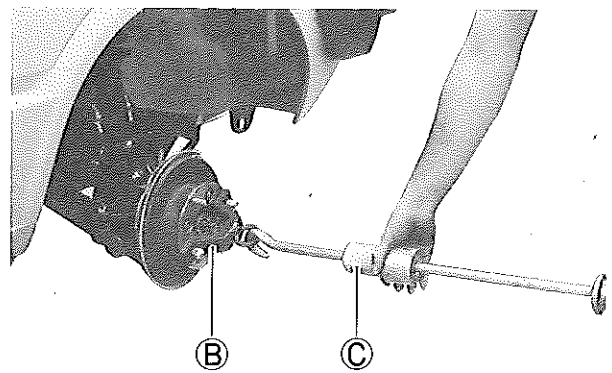


Fig. 16-11

- 6) Detach the tie rod end from the steering knuckle by using special tool ① (09913-65210).

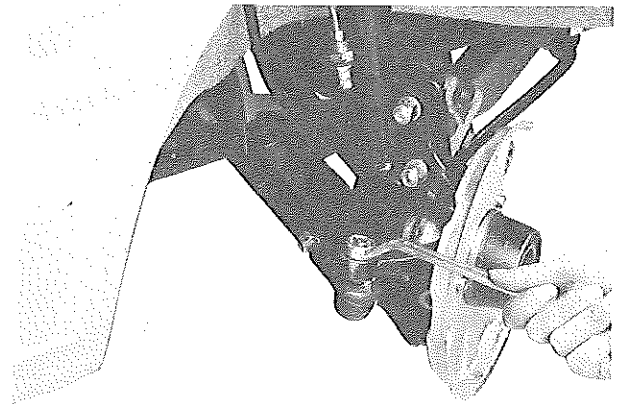


Fig. 16-12

- 7) Loosen the front suspension arm ball joint stud bolt and strut mounting bolts to remove the steering knuckle.

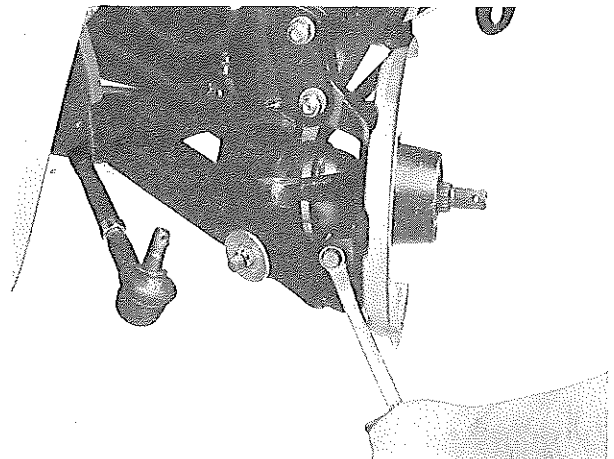


Fig. 16-13

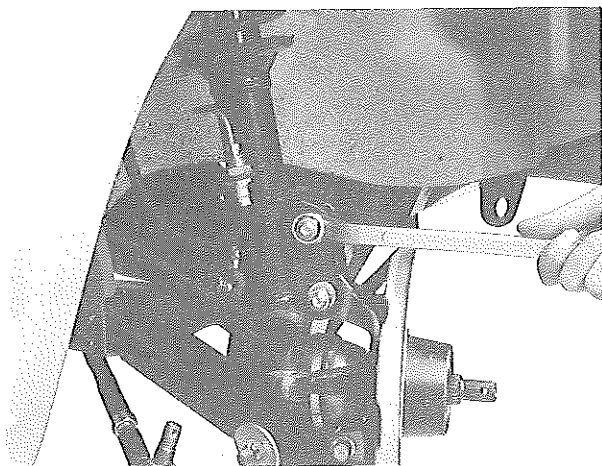


Fig. 16-14

8) Remove the inner and outer bearings.

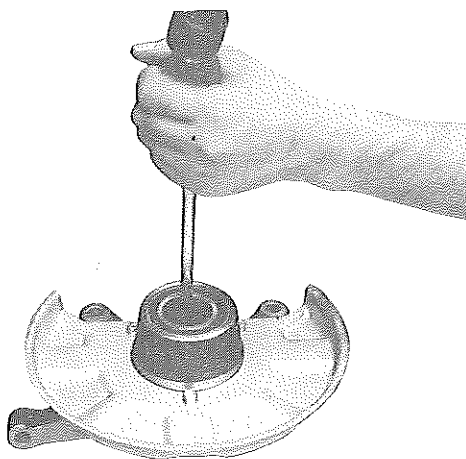


Fig. 16-15

16-5. Maintenance Service (Front)

Front suspension strut

Since the front suspension strut services as both the oil damper and steering king pin, this unit should be checked in respect of these two functions. Following shows the check items.

- Check for the roadability of the vehicle and rattling sound while driving on rough roads.
- Push the body hard, and if it jolts 3-4 times the damping force of the shock absorber is considered to have decreased.
- Check the absorber for oil leakage. If the absorber is found faulty, replace it as a assembling unit, because it can not be dis-assembled.

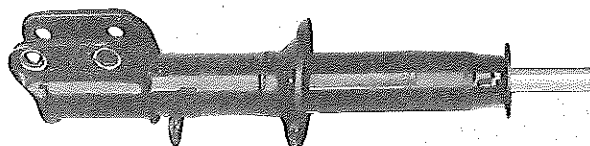


Fig. 16-16

Front suspension coil spring

Front coil spring itself is almost trouble free, but when it is found weak after a long time of use, it should be replaced.

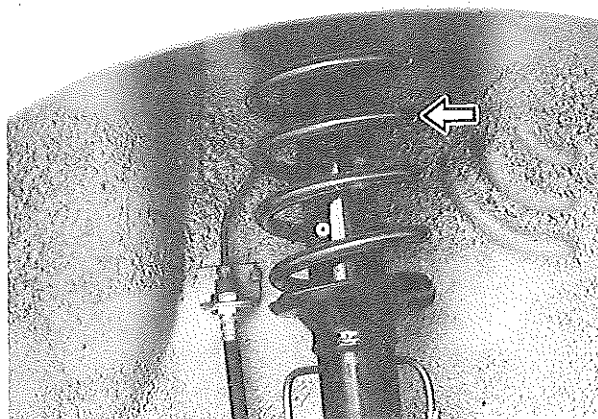


Fig. 16-17

Tie rod end ball joint and suspension lower arm ball joint

- 1) Check the boots for breakage and replace if broken.

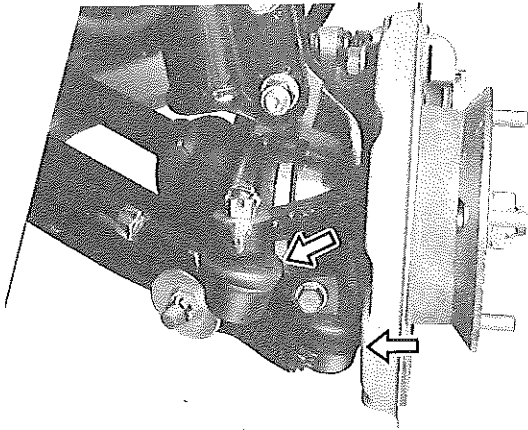


Fig. 16-18

- 2) Check each ball joint for wear. If it is worn and play is found between the ball joint stud and the bush in the joint case, replace defective parts.

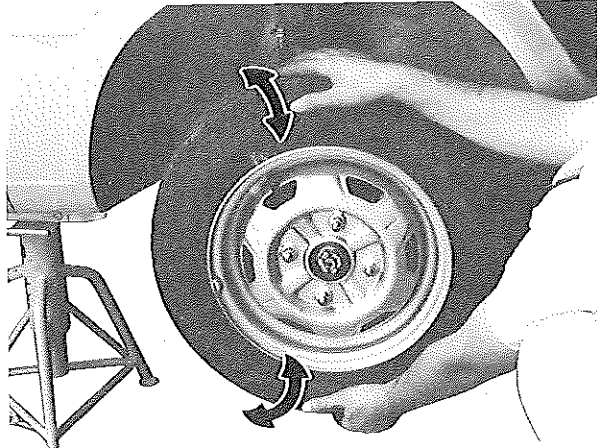


Fig. 16-19

16-6. Important Steps in Installation (Front)

Tightening torque

	Fastening parts	N·m	kg·m (lb·ft)
①	Strut support nuts	18 - 28	1.8 - 2.8 (13.0 - 20.0)
②	Strut lock nuts	40 - 60	4.0 - 6.0 (29.0 - 43.0)
③	Front brake disc carrier bolt	70 - 100	7.0 - 10.0 (50.5 - 72.0)
④	Strut bracket lock nuts	70 - 90	7.0 - 9.0 (51.0 - 65.0)
⑤	Stabilizer bar mount bolts	30 - 55	3.0 - 5.5 (22.0 - 39.5)
⑥	Stabilizer bar castle nuts	40 - 90	4.0 - 9.0 (29.0 - 65.0)
⑦	Ball joint stud bolts	50 - 70	5.0 - 7.0 (36.5 - 50.5)
⑧	Drive shaft castle nuts	150 - 270	15.0 - 27.0 (108.5 - 195.0)
⑨	Wheel nuts	50 - 70	5.0 - 7.0 (36.5 - 50.5)
⑩	Lower arm bolts	50 - 70	5.0 - 7.0 (36.5 - 50.5)

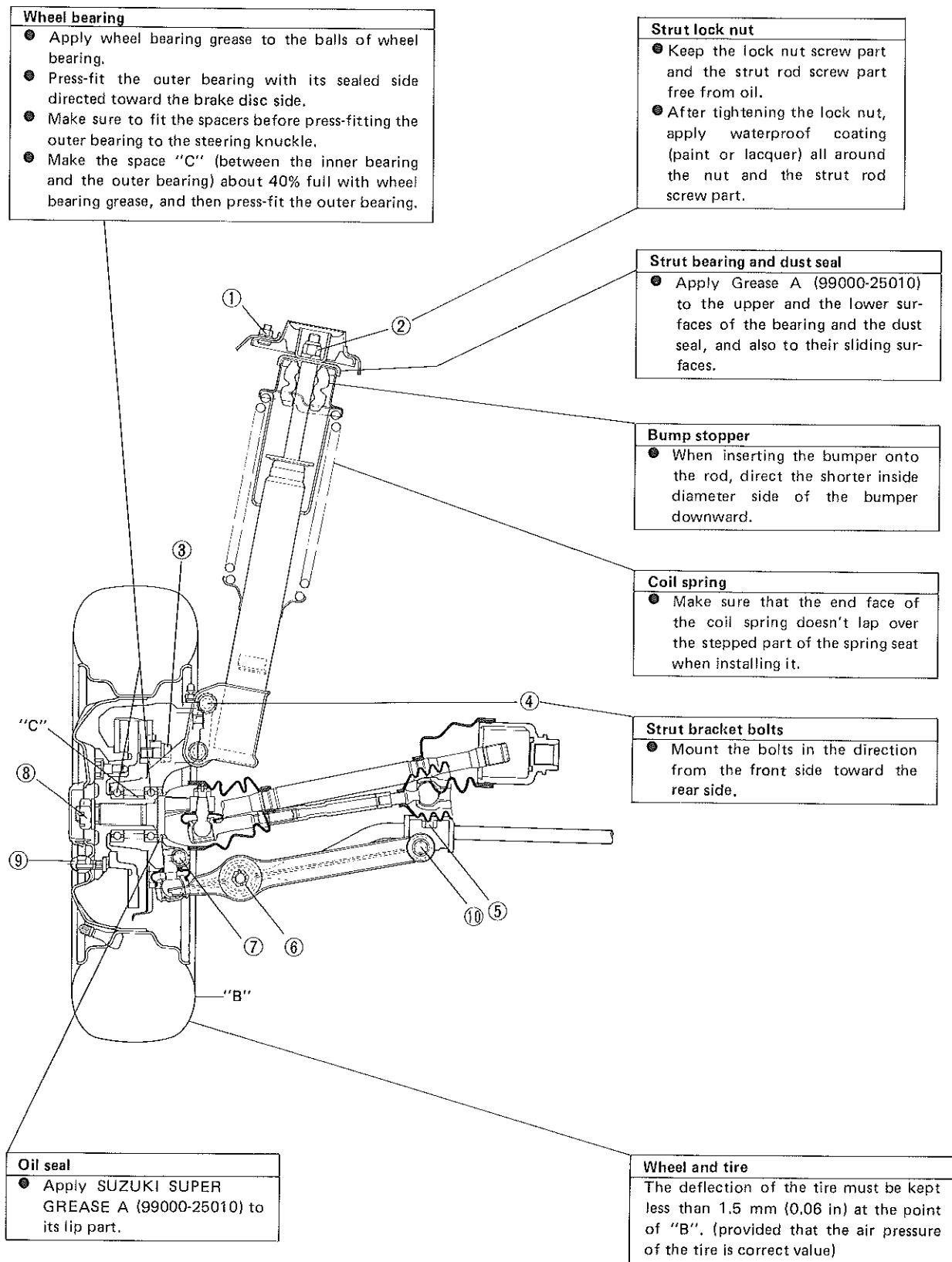


Fig. 16-20

16-7. Rear Suspension

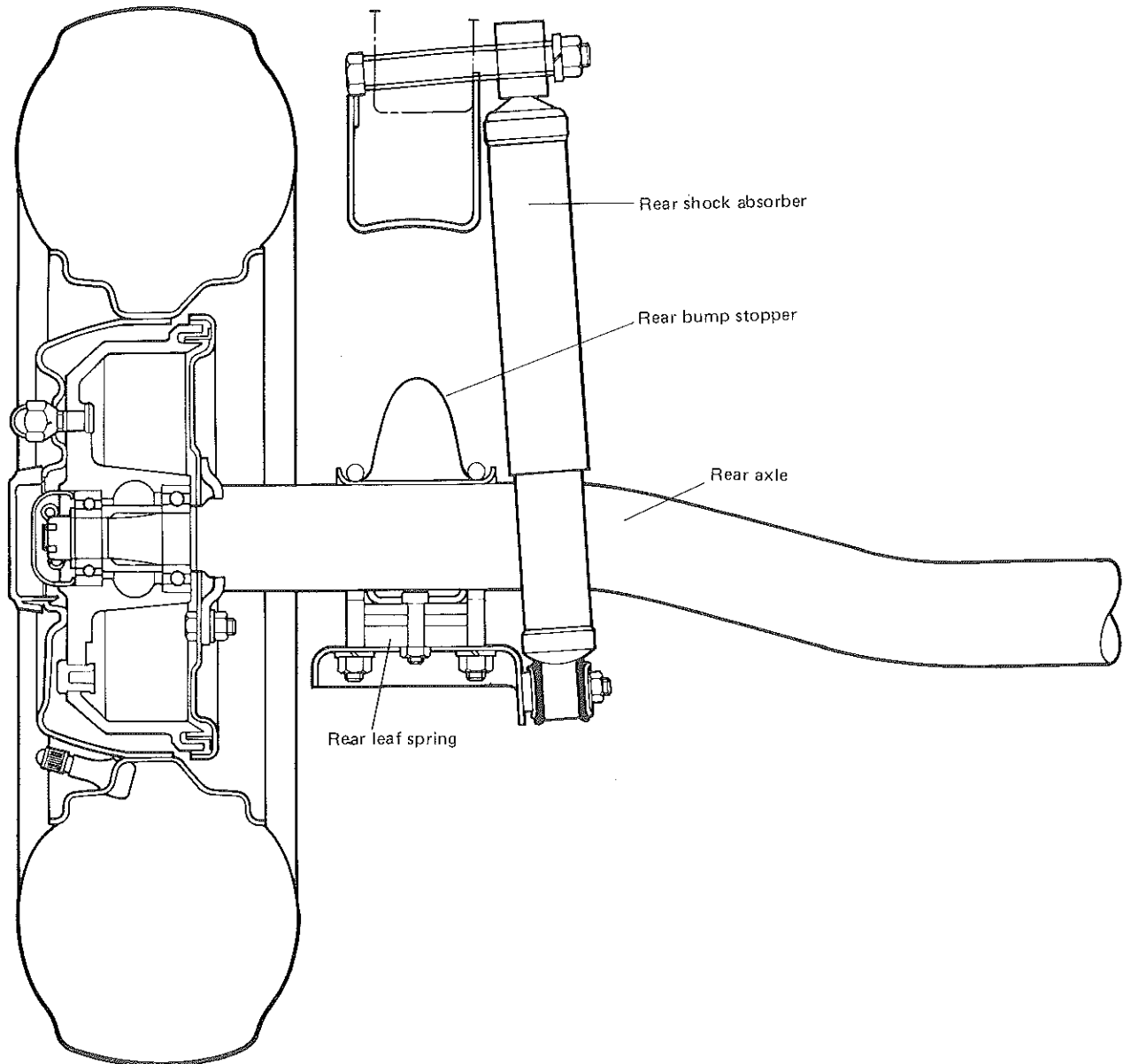


Fig. 16-21

16-8. Rear Suspension Specification

Rear leaf springs

	Leaf spring of one-leaf type	Leaf spring of three-leaf type
Spring rate	2,17 kg/mm (122 lb/in.)	2,6 kg/mm (145,6 lb/in.)
Free height H	135,5 mm *127,5 mm (5,33 in.) (5,02 in.)	156 mm (6,1 in.)

* For right side leaf spring of left hand steering vehicle.

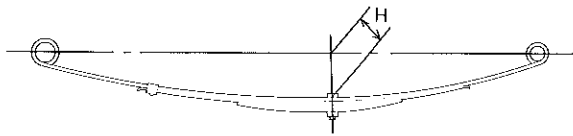


Fig. 16-22

Rear shock absorbers

	Absorbers for one-leaf spring type	Absorbers for three-leaf spring type
Stroke	160 mm (6,3 in.)	175 mm (6,9 in.)

16-9. Maintenance Service (Rear)

Rear leaf springs

If the chassis is found lower than the normal position owing to the excessive fatigue of the leaf spring, check the height of the spring from the center bolt. If the fatigue of the spring is excessive, replace the spring.

(Refer to Fig. 16-22)

Rear shock absorbers

The absorbers are of double-acting type. By trying to contract and extend each absorber by hand, the effectiveness of its damping action can be told. Absorbers found with oil leak or with inadequate damping effectiveness must be replaced.

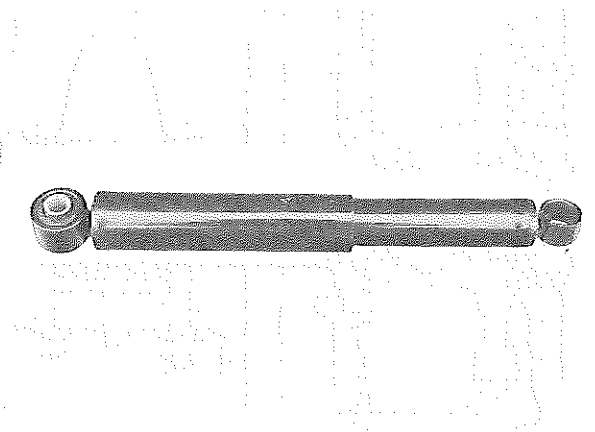


Fig. 16-23

Shackle pin bushes and leaf spring bushes

Check leaf spring bolts or pins for play caused by wear of each bush. Also check each bush for crack or damage. If a defective bush is found, replace it.

16-10. Important Steps in Installation (Rear)

Rear leaf spring

- Mount shackle pins and front bolts in the direction toward the center of the car.

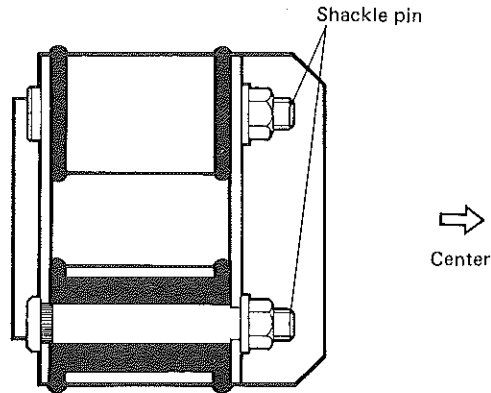


Fig. 16-24

Tighten the four U bolt nuts uniformly so that the size "C" of each of the four is the same.

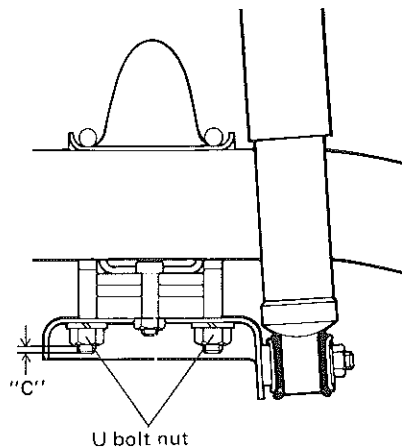


Fig. 16-25

Wheel bearing

- Make the space "D" (between the inner bearing and the outer bearing) about 40% full with wheel bearing grease.
- Press-fit the inner bearing with its sealed side directed toward the backing plate side.

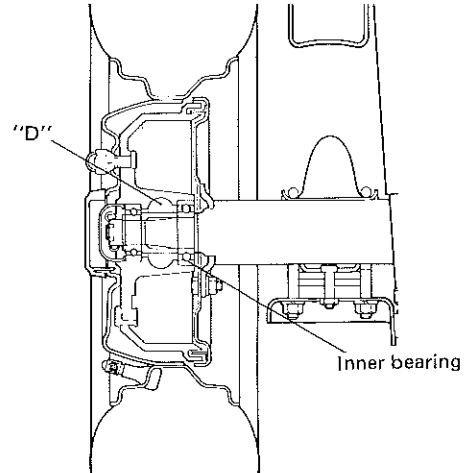


Fig. 16-26

Hub bolts

When mounting the hub bolts into the drum, make sure to fit the head securely in the stepped part of the drum.

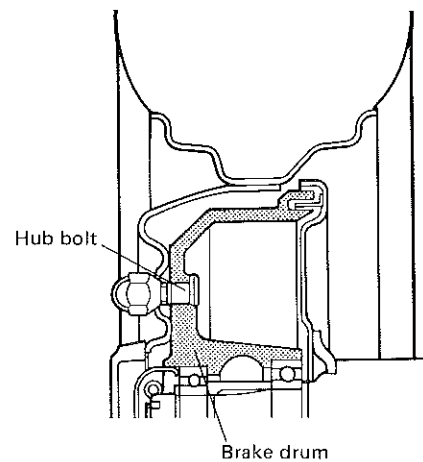


Fig. 16-27

Tightening torque

	Fastening parts	N·m	kg-m (lb-ft)
①	Rear axle castle nuts	80 - 120	8.0 - 12.0 (58.0 - 86.5)
②	Rear shock absorber upper nuts	45 - 70	4.5 - 7.0 (33.0 - 50.5)
③	Rear shock absorber lower nuts	11 - 17	1.1 - 1.7 (8.0 - 12.0)
④	Rear brake backing plate nuts	18 - 28	1.8 - 2.8 (13.5 - 20.0)
⑤	U bolt nuts	30 - 45	3.0 - 4.5 (21.5 - 33.0)
⑥	Rear leaf spring front nuts	45 - 70	4.5 - 7.0 (33.0 - 50.5)
⑦	Rear leaf spring shackle pin nuts	30 - 55	3.0 - 5.5 (22.0 - 39.5)
⑧	Wheel nuts	50 - 70	5.0 - 7.0 (36.0 - 51.0)

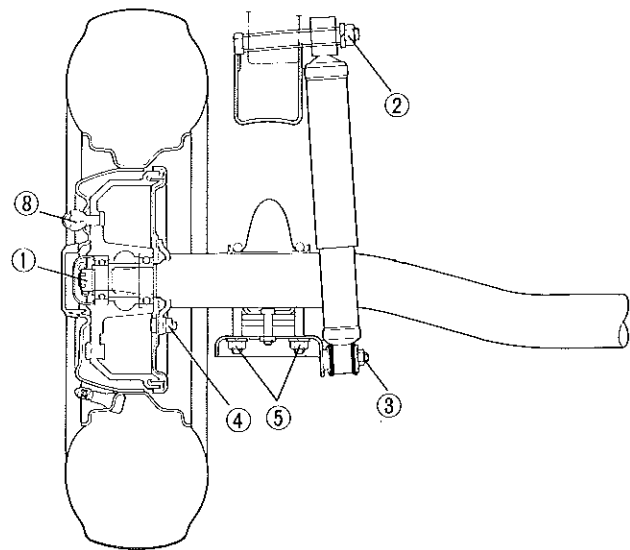


Fig. 16-28

Rear shock absorber

After installing the absorber in correct position as shown in Fig. 16-29, tighten the lower nut first and then tighten the upper nut.

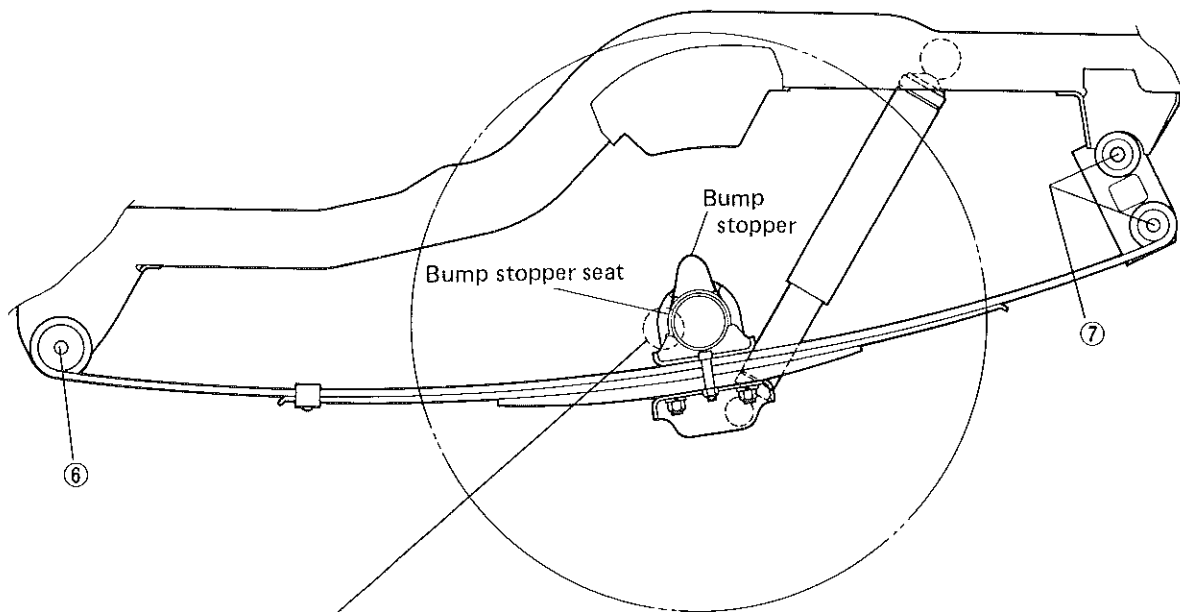


Fig. 16-29

Rear bump stopper

Install the rear bump stopper bringing one end of its seat into contact with the rear axle, and a proper degree is obtained.