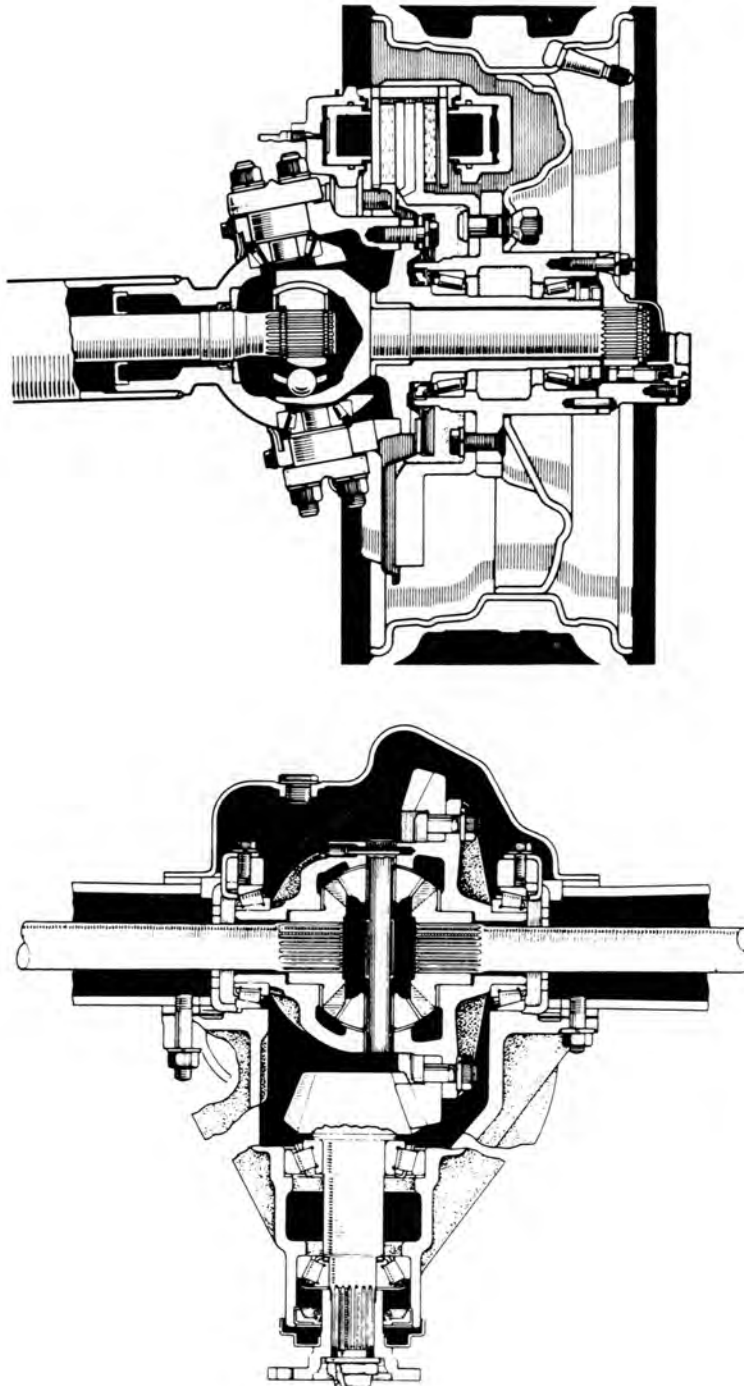


FRONT AXLE & SUSPENSION

	Page
CUTAWAY VIEW	6-2
STEERING KNUCKLE & AXLE SHAFT	6-3
DIFFERENTIAL	6-19
FREE WHEEL HUB	6-20
FRONT SUSPENSION	6-29
FRONT STABILIZER BAR	6-36
FRONT SHOCK ABSORBER	6-37
FRONT WHEEL AIGNMENT	6-39

CUTAWAY VIEW

Fig. 6-1



STEERING KNUCKLE & AXLE SHAFT

REMOVAL

Remove the parts in the numerical order shown in the figure.

Fig. 6-2

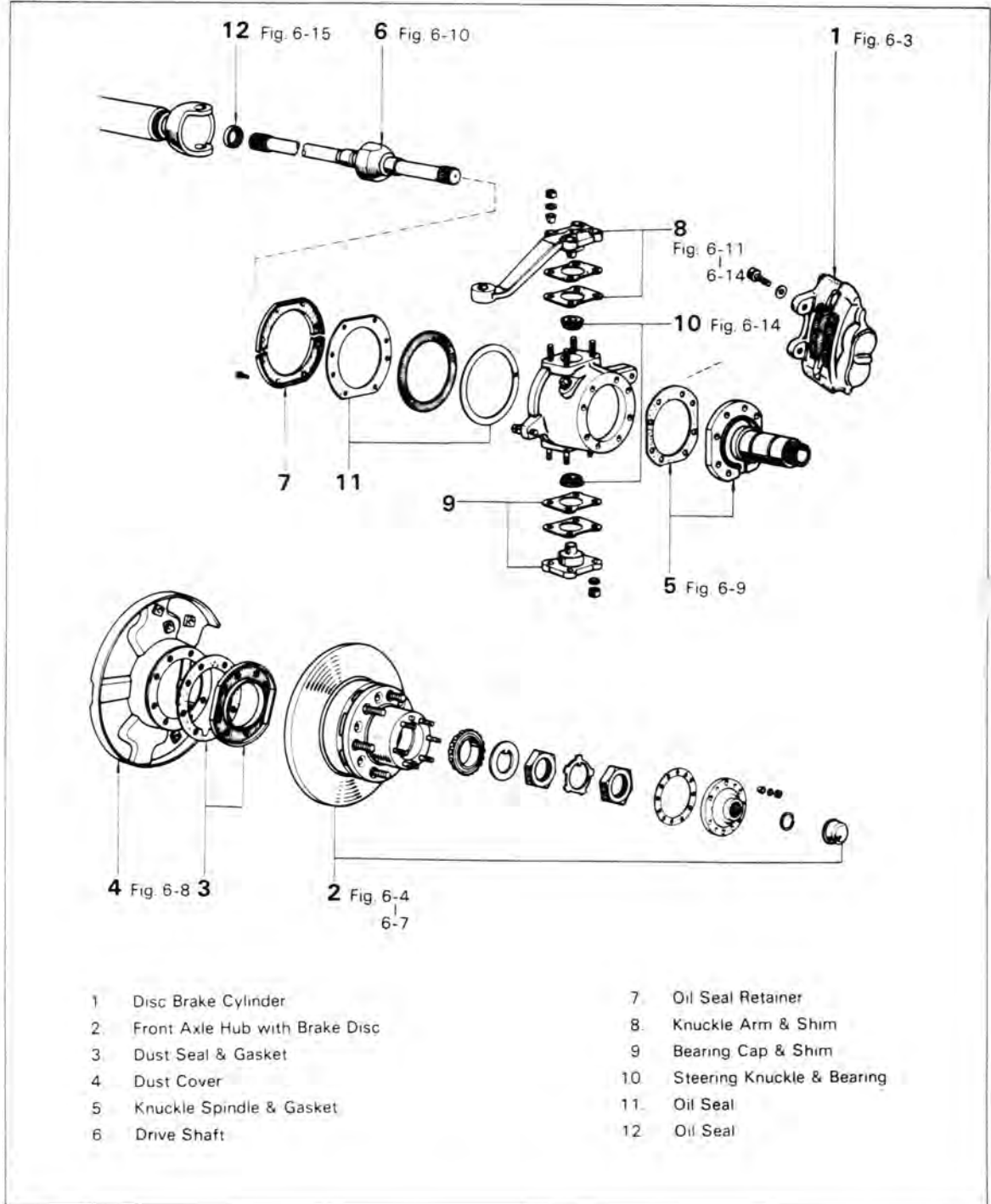
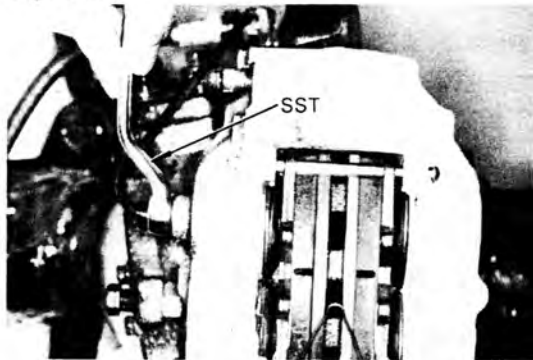


Fig. 6-3



Disconnect the brake tube with SST.
SST [09751-36011]

— Note —

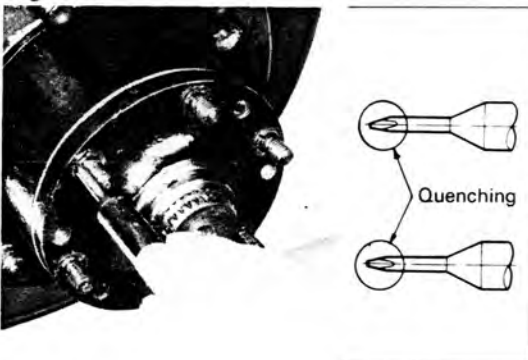
For drum brakes, do not disconnect the
brake tube or hose.

Fig. 6-4



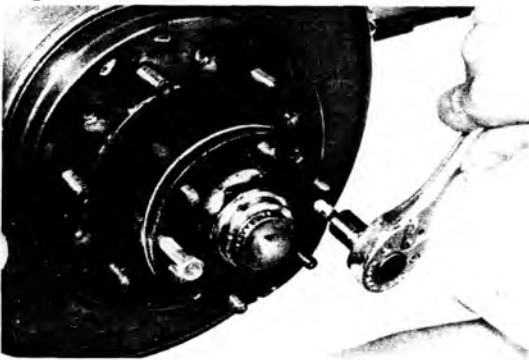
Remove the snap ring with SST.
SST [09905-00012]

Fig. 6-5



Remove the cone washers with a tapered
punch.

Fig. 6-6



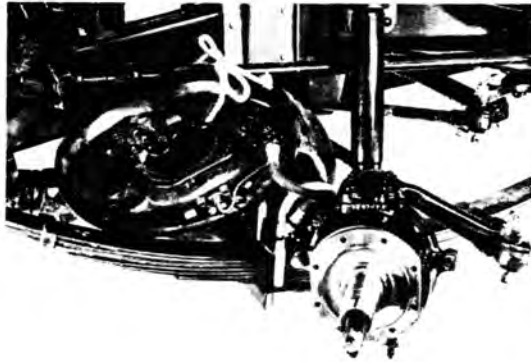
Remove the flange by tightening the bolts.

Fig. 6-7



Remove the lock nut and adjusting nut with SST.
SST [09607-60020]

Fig. 6-8



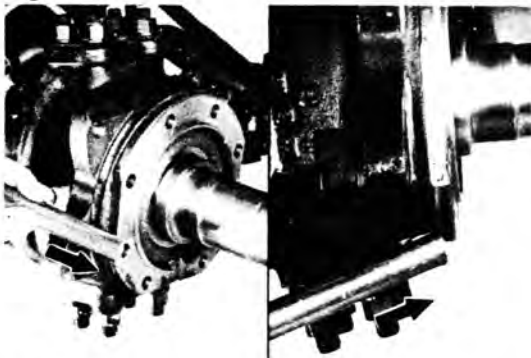
Remove the dust cover or backing plate assembly.

— Note —

For drum brakes, do not disconnect brake tube or hose.

With the steering wheel turned fully to one side, remove the backing plate assembly and keep it supported with a cord.

Fig. 6-9



If the spindle does not come off easily, tap it off with a drift.

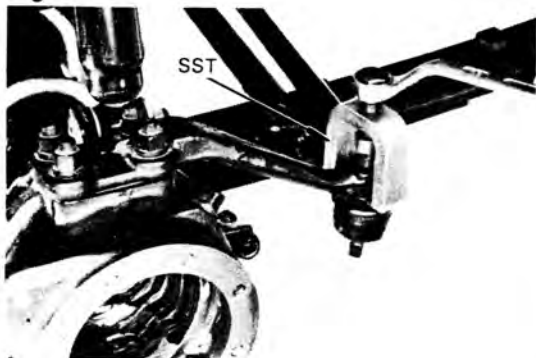
Fig. 6-10



Position one flat part of the outer shaft upward and pull out the driveshaft.

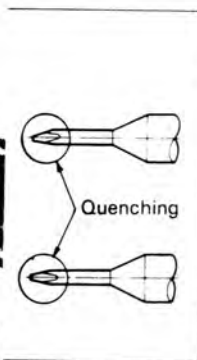
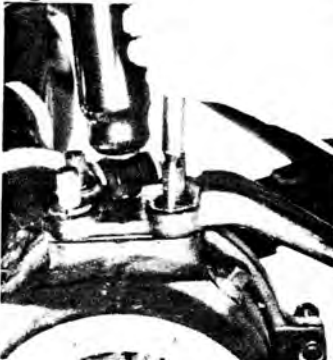


Fig. 6-11



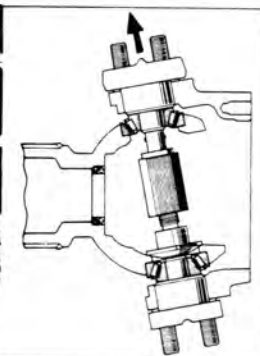
Remove the tie rod with SST.
SST [09611-22011]

Fig. 6-12



Remove the cone washers with a tapered punch.

Fig. 6-13



Remove the knuckle arm with SST.
SST [09606-60020]

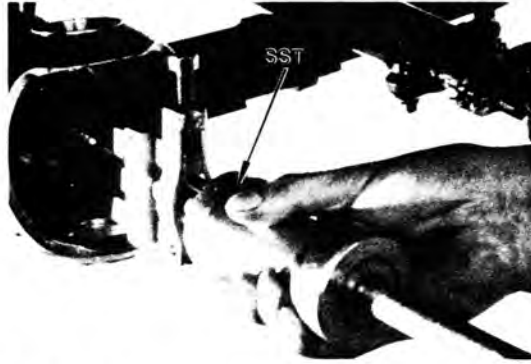
— Note —
Use SST without a collar.

Fig. 6-14



Mark the removed adjusting shims and bearings so as to enable reassembling them back to their proper positions.

Fig. 6-15



Remove the oil seal with SST.
SST [09308-00010]

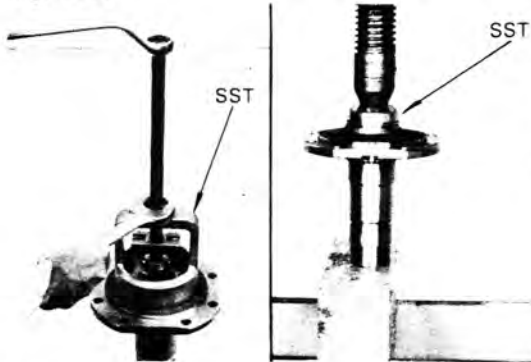
Fig. 6-16



INSPECTION & REPAIR Knuckle Spindle

Inspect for wear or damage.

Fig. 6-17



Replace The Bushing



1. Remove the bushing with SST.
SST [09612-65013]
2. Install a new bushing with a press and SST.
SST [09608-35013]

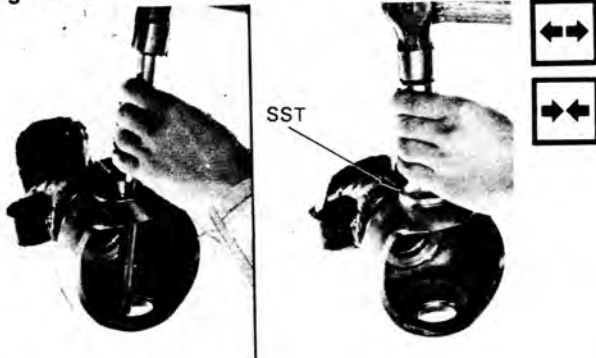
Fig. 6-18



Steering Knuckle Bearing

Inspect for wear or damage.

Fig. 6-19

**Replace The Bearing Outer Race**

1. Remove the outer races with a drift.
 2. Install the new outer races with SST.
- SST [09605-60010]

Fig. 6-20

**Drive Shaft**

Inspect the parts indicated by arrows for wear, damage or rusting.
Inspect the joint for excessive looseness.



Fig. 6-21

**Drive Shaft Inner Parts**

1. Hold the inner shaft in a vise.
2. Place a drift against the inner race and drive out the outer shaft.

Fig. 6-22



3. Take out the six bearing balls.

— Note —

Tilt the inner race and cage, and take out the bearing balls one by one.

Fig. 6-23



4. Remove the cage and inner race from the outer shaft.

— Note —

Fit the two large openings in the cage against the protruded parts of the outer shaft, and pull out the cage and inner race.

Fig. 6-24



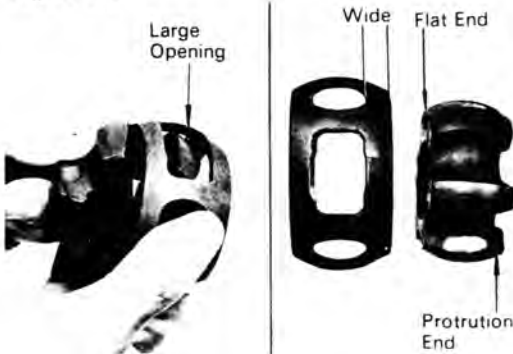
5. Take out the inner race from the cage through the large opening in the cage.

Fig. 6-25



6. Inspect the drive shaft inner parts for wear or damage.

Fig. 6-26



7. Assemble the inner race to the cage by inserting it through the large opening.

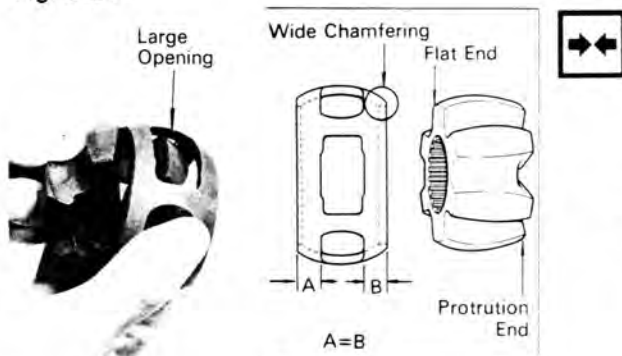
(1) For FJ, BJ, HJ4_series

Make sure to position the protrusion end of the race toward the wide side of cage.

— Note —

Coat with molybdenum disulphide lithium base grease before assembly.

Fig. 6-27

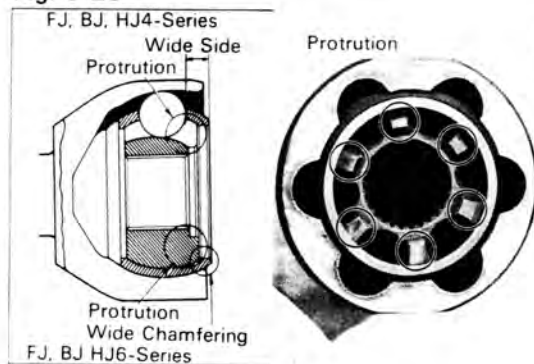


- (2) For FJ, BJ, HJ6_series
Make sure to position the protrusion end of the race toward the wide chamfering side of cage

— Note —

Coat with molybdenum disulphide lithium base grease before assembling.

Fig. 6-28



8. Assemble the cage and inner race to the outer shaft.

— Note —

FJ, BJ, HJ4_series

Make sure to position the cage wide side and race protrusion end toward the outside.

FJ, BJ, HJ6_series

Make sure to position the cage wide chamfering side end race protrusion end toward the outside.

Fig. 6-29

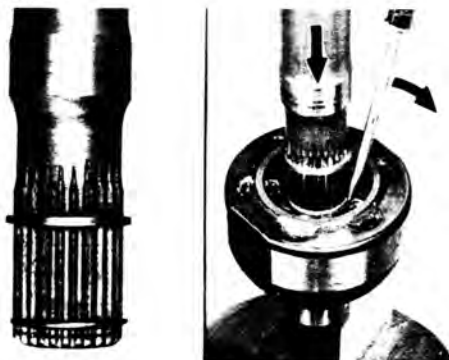


9. Fit the inner race and cage, and assemble the six bearing balls in the outer shaft.

— Note —

Pack molybdenum disulphide lithium base grease in the outer shaft without fail.

Fig. 6-30



10. Install new snap rings on the inner shaft.
11. Hold the outer shaft in a vise, and while keeping the snap ring (inner) compressed, install the inner shaft to the outer shaft.

— Note —

After installing, verify that the inner shaft will not pull out.

ADJUSTMENT

Whenever the axle housing or the steering knuckle is replaced, the front driveshaft alignment and knuckle bearing preload are adjusted with SST.

SST [09634-60013]

Fig. 6-31

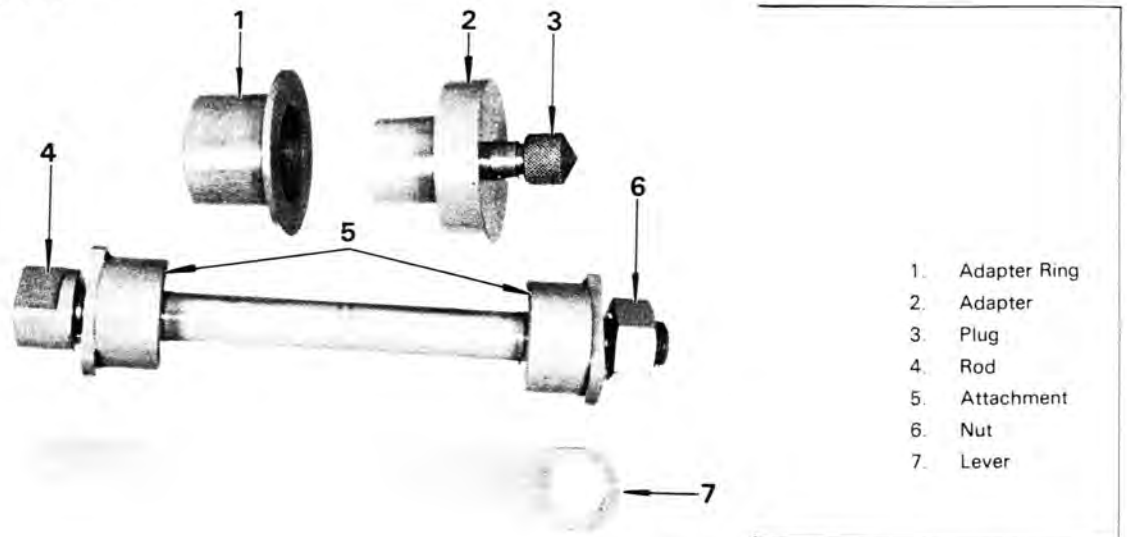
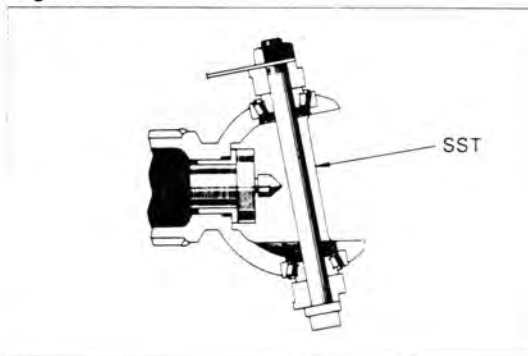


Fig. 6-32



1. Mount the SST on the housing.
SST [09634-60013]

— Note —

Coat knuckle bearings lightly with molybdenum disulphide lithium base grease.

Fig. 6-33



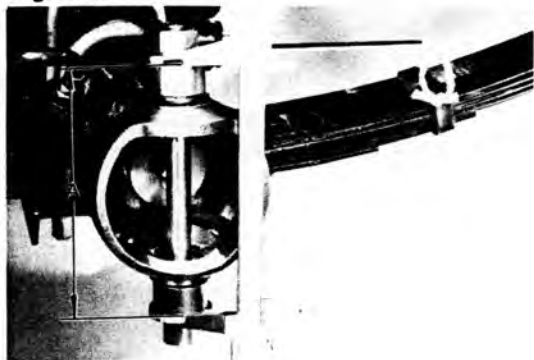
2. Add preload to the bearing by tightening the nut.

Preload (while turning):

1.8 – 3.8 kg

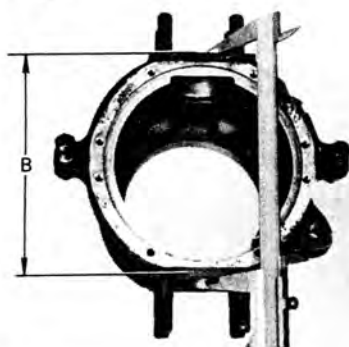
(4.0 – 8.4 lb)

Fig. 6-34



3. Measure the distance A.

Fig. 6-35

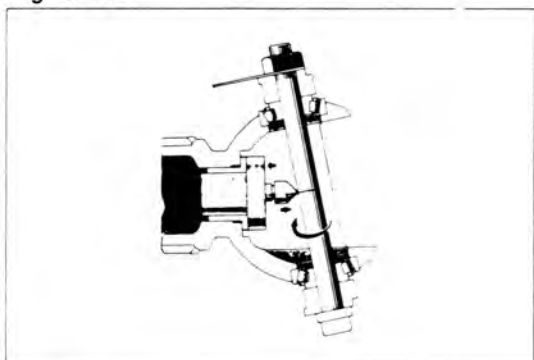


4. Measure the distance B.
5. The difference between A and B is the total adjusting shim thickness that is required to maintain the correct bearing preload.

$$\text{TOTAL SHIM THICKNESS } C$$

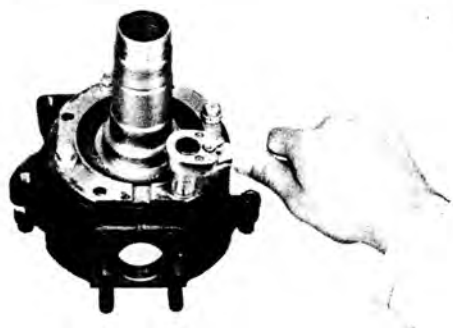
$$C = A - B$$

Fig. 6-36



6. Apply a light coat of red lead on the center part of rod (4).
7. Press the adapters (1) and (2) against the housing, press the plug (3) against the rod (5), and turn the lever (7) so as to have a line scribed on the rod (5).

Fig. 6-37

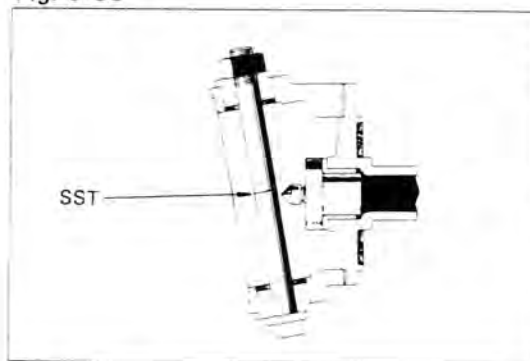


8. Bolt on the knuckle spindle to the knuckle.

— Note —

Install the bolt over two washers.

Fig. 6-38

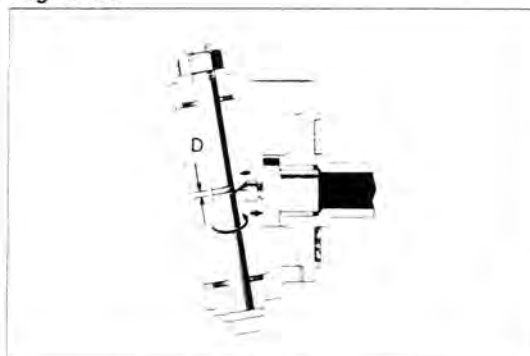


- 9 Dismount the SST from the housing, and mount it on the knuckle, SST [09634-60013]

— Note —

1. Use care not to erase the scribed line when dismounting and remounting the SST.
2. Make sure that the rod (5) is in the same vertical direction that it was when mounted on the housing.

Fig. 6-39



10. Turn the rod (5) and scribe another line on it.
11. Measure the distance D between the two scribed lines.
12. The thickness of the steering knuckle lower bearing shim E will be the distance D less 3 mm (0.12 in.)

LOWER SHIM THICKNESS E

$$E = D - 3\text{mm}$$

13. The thickness of the steering knuckle upper bearing shim F will be difference between the total adjusting shim thickness C and the shim thickness E

UPPER SHIM THICKNESS F

$$F = C - E$$

— Note —

Compare E and F with the thicknesses of the shims removed at disassembly. If there should be considerable difference, remeasure E and F.

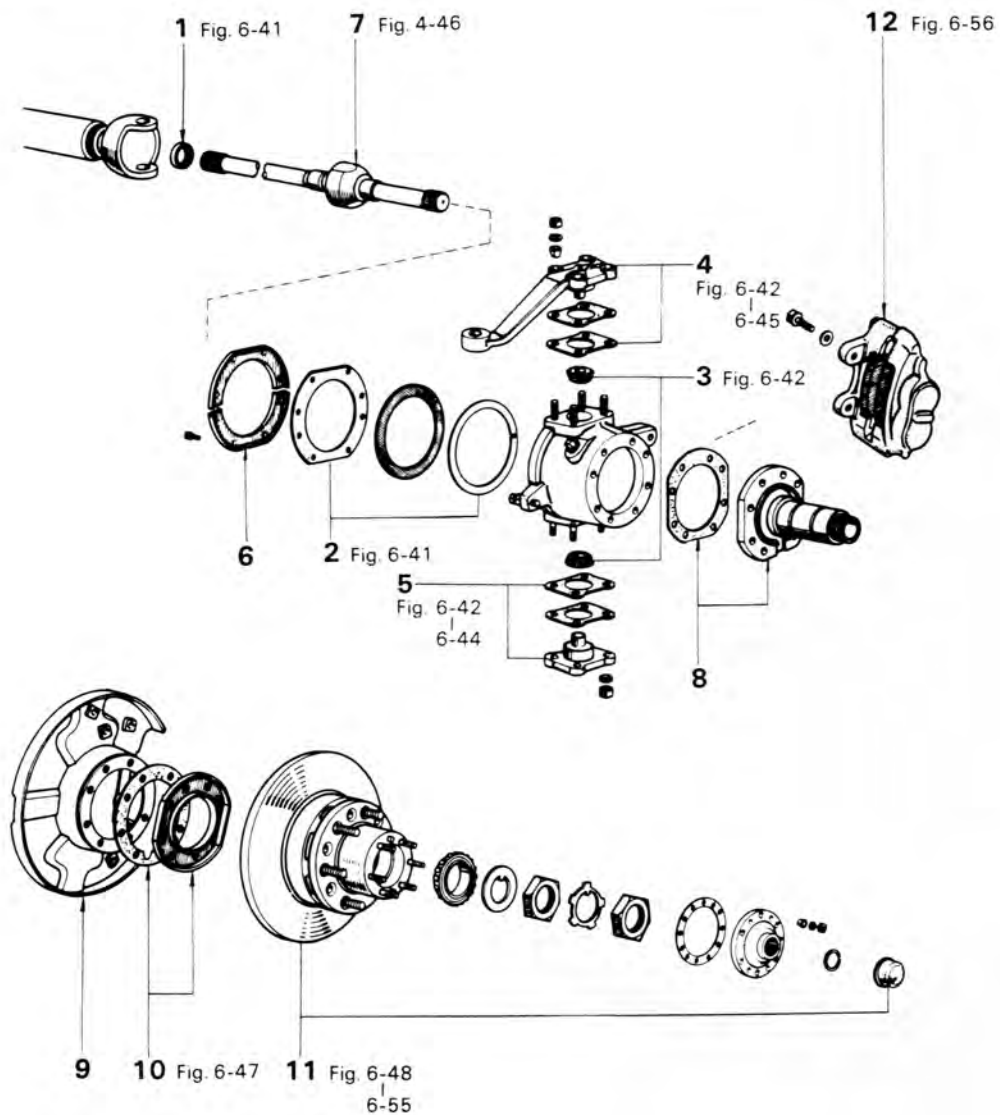
Adjusting shim sizes

Part No.	Thickness mm (in.)
43236-60010	0.1 (0.004)
43233-60011	0.2 (0.008)
43234-60011	0.5 (0.020)
43235-60010	1.0 (0.039)

INSTALLATION

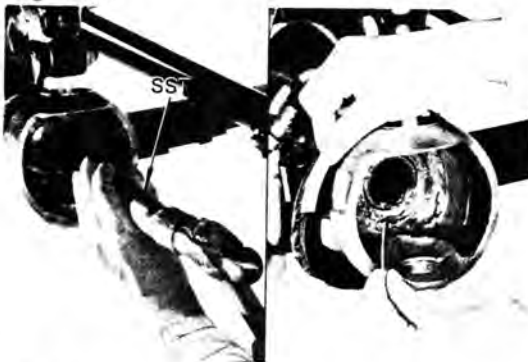
Install the parts in the numerical order shown in the figure.

Fig. 6-40



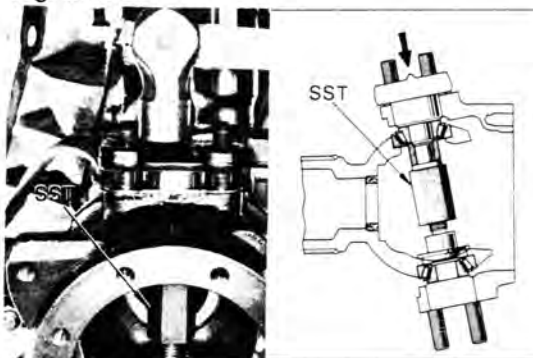
- | | |
|-------------------------------|------------------------------------|
| 1. Oil Seal | 7. Drive Shaft |
| 2. Oil Seal | 8. Knuckle Spindle & Gasket |
| 3. Steering Knuckle & Bearing | 9. Dust Cover |
| 4. Knuckle Arm & Shim | 10. Dust Seal & Gasket |
| 5. Bearing Cap & Shim | 11. Front Axle Hub with Brake Disc |
| 6. Oil Seal Retainer | 12. Disc Brake Cylinder |

Fig. 6-41



Install the oil seal with SST.
Apply MP grease on the oil seal lip.
SST [09618-60010]
Place the oil seal set in the housing.

Fig. 6-42



Apply molybdenum disulphide lithium base grease to the bearings, and install the knuckle and the bearings.

Hold the upper bearing inner race with SST.
SST [09606-60020]

Install the knuckle arm over the shims that were originally used or were selected as described in adjustment operations

— Note —

Use SST with a collar.

Install the lower bearing cap by the same procedure.

Fig. 6-43



The SST should be removed before tightening the knuckle arm and the bearing cap.

Tighten the knuckle arm and the bearing cap.

**Tightening torque: 8.5 – 11.0 kg-m
(62 – 79 ft-lb)**

Fig. 6-44



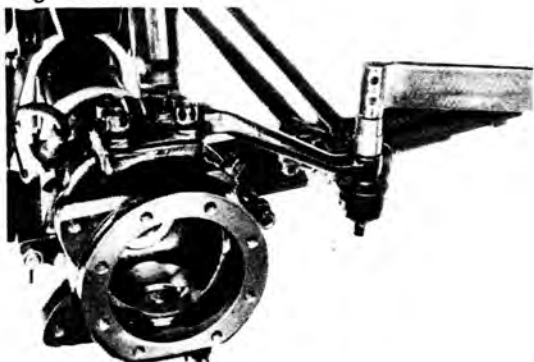
Measure the knuckle bearing preload

Preload (while rotating):

1.8 – 3.8 kg

(4.0 – 8.4 lb)

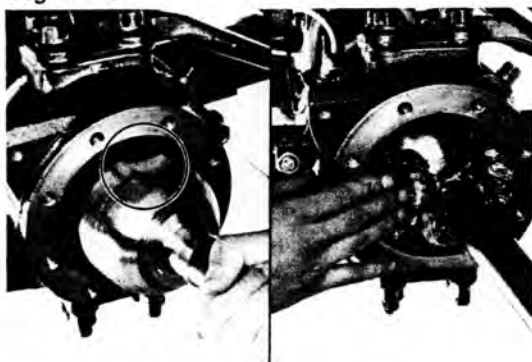
Fig. 6-45



Install the tie rod.

Tightening torque: 7.5 – 11.0 kg-m
(55 – 79 ft-lb)

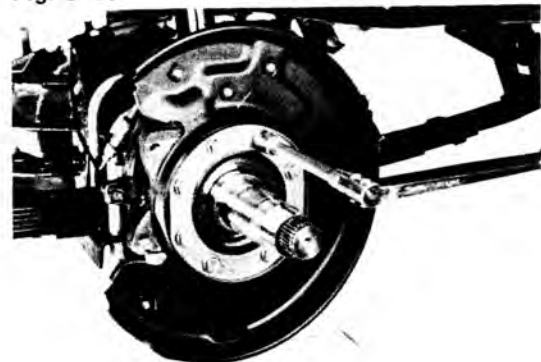
Fig. 6-46



Position one flat part of the outer shaft upward, and install the shaft.

Pack molybdenum disulphide lithium base grease into the knuckle to about three fourth of the knuckle volume.

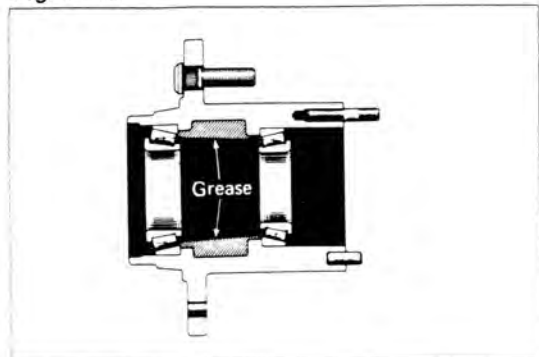
Fig. 6-47



Tighten the bolts.

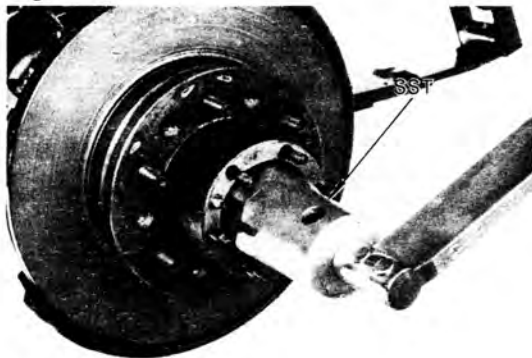
Tightening torque: 4.0 – 5.5 kg-m
(29 – 39 ft-lb)

Fig. 6-48



Pack MP grease into the hub.

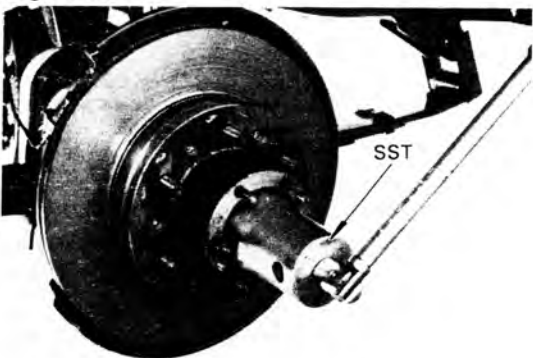
Fig. 6-49



Tighten the adjusting nut with SST and turn the hub left and right two or three times.
SST [09607-60020]

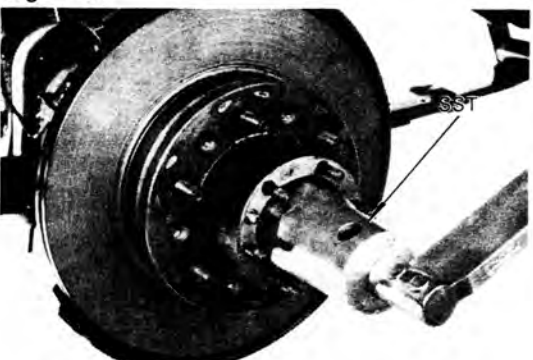
Tightening torque: 6.0 kg-m
(43 ft-lb)

Fig. 6-50



Loosen the adjusting nut.
SST [09607-60020]

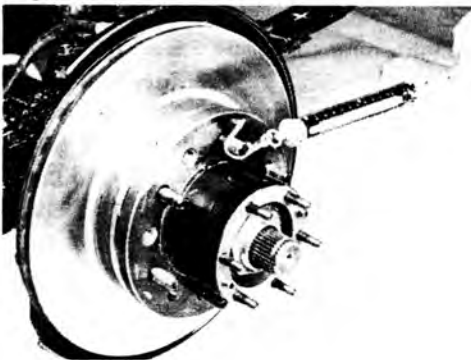
Fig. 6-51



Retighten the adjusting nut.

Tightening torque: 0.4 – 0.7 kg-m
(35 – 60 in.-lb)

Fig. 6-52



Measure the revolving weight at the hub bolt.

Preload (starting): 2.8 – 5.7 kg
(6.2 – 12.6 lb)

Fig. 6-53



Lock the adjusting nut by bending one of the lock washer teeth inward.

Fig. 6-54



Tighten the lock nut with SST.
SST [09607-60020]

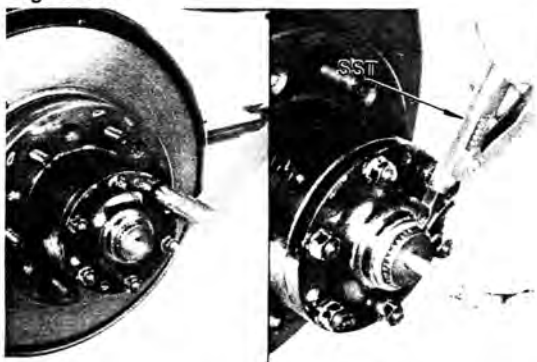
Tightening torque: 8.0 – 10.0 kg-m
(58 – 72 ft-lb)

Recheck the revolving weight.

Preload (starting): 2.8 – 5.7 kg
(6.2 – 12.6 lb)

Lock the lock nut by bending one of the lock washer teeth outward.

Fig. 6-55



Install the flange.

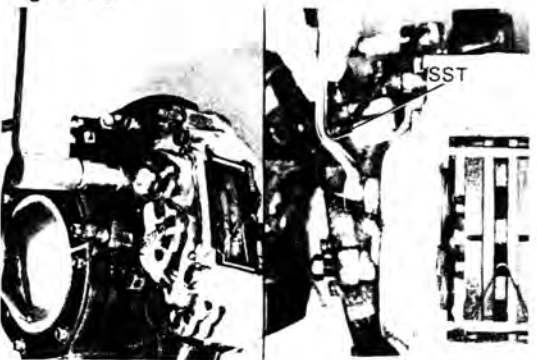
Tightening torque: 2.8 – 3.5 kg-m
(21 – 25 ft-lb)

Install the snap ring with SST.
SST [09905-00012]

— Note —

Grip the bolt and pull out the axle shaft to install the snap ring.

Fig. 6-56



Tighten the caliper mounting bolts.

Tightening torque: 7.5 – 10.5 kg-m
(55 – 75 ft-lb)

Connect the brake tube with SST.
SST [09751-36011]

Tightening torque: 1.3 – 1.8 kg-m
(10 – 13 ft-lb)

DIFFERENTIAL

REMOVAL

Remove the parts in the numerical order shown in the figure.

Fig. 6-57

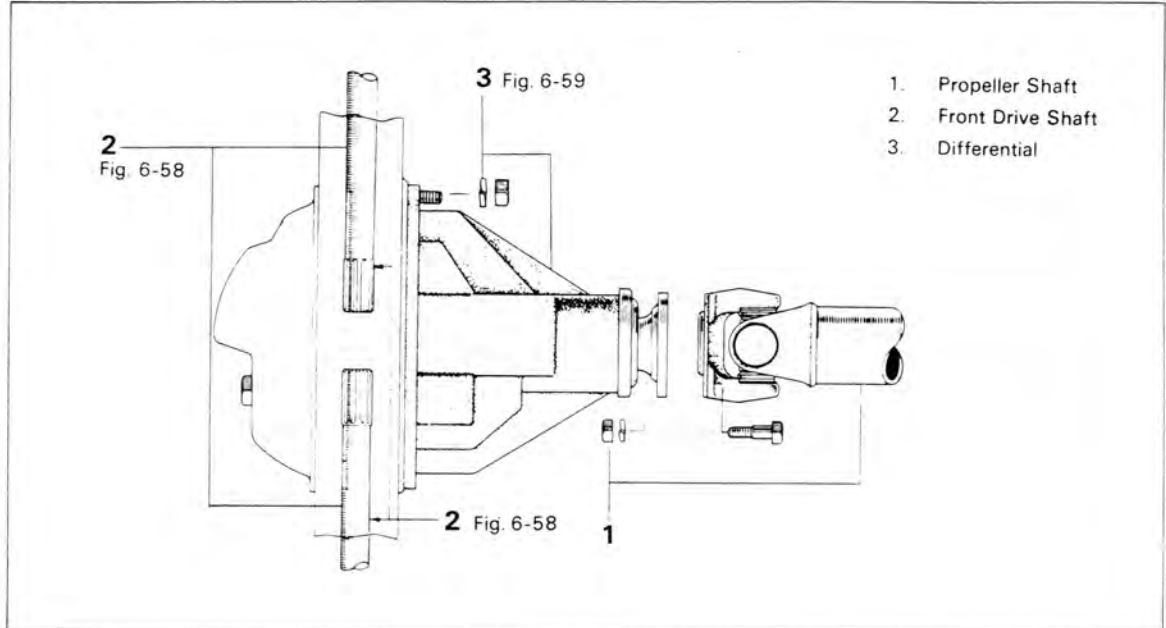


Fig. 6-58

SEE
STEERING KNUCKLE & AXLE
SHAFT REMOVAL SECTION
Fig. 6-3 to 6-15

Remove the axle shafts.

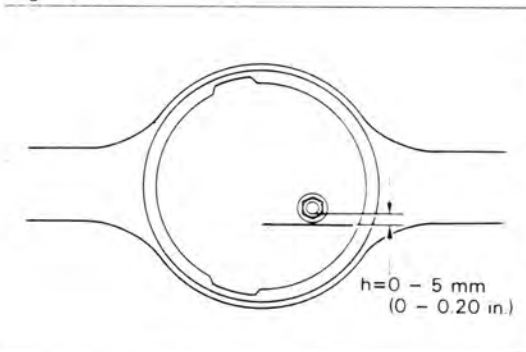
DISASSEMBLY & ASSEMBLY

Refer to the disassembly and assembly procedures for the differential in the Rear Axle and Rear Suspension Section.

INSTALLATION

Perform the removal in reverse order.

Fig. 6-59



After installing the axle shaft fill in hypoid gear oil SAE90, API GL-5.

Capacity:

STD

2.5 liters

(2.6 US qt, 2.2 Imp.qt)

FREE WHEEL HUB

REMOVAL

Remove the parts in the numerical order shown in the figure.

Fig. 6-60

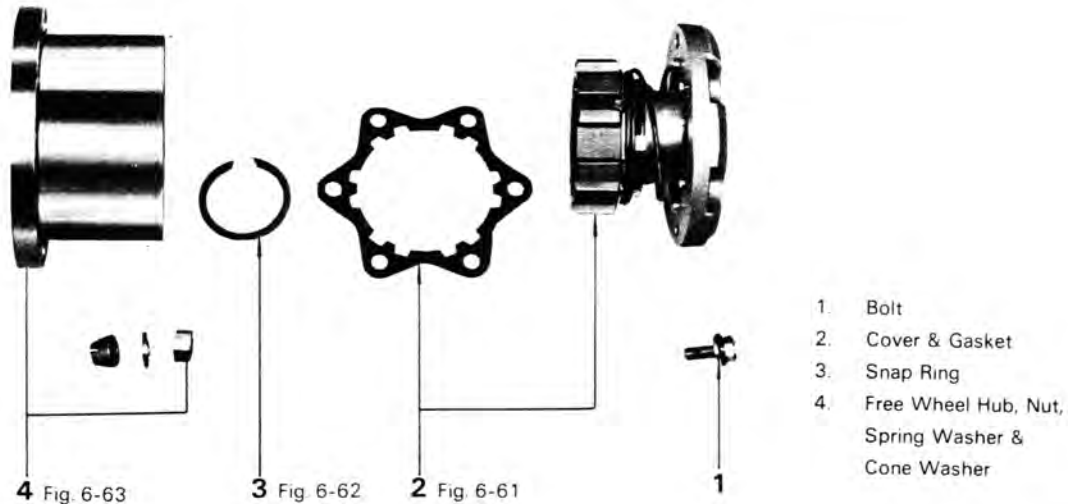


Fig. 6-61



Remove the free wheel hub cover.

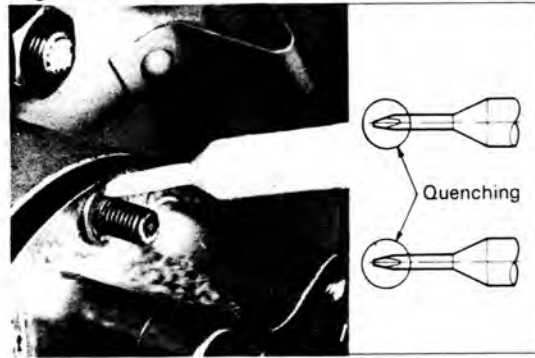
— Note —
The control handle should be set to FREE.

Fig. 6-62



Remove the snap ring with SST.
SST [09905-00012]

Fig. 6-63



Remove the cone washer.

DISASSEMBLY

Disassemble the parts in the numerical order shown in the figure.

Fig. 6-64

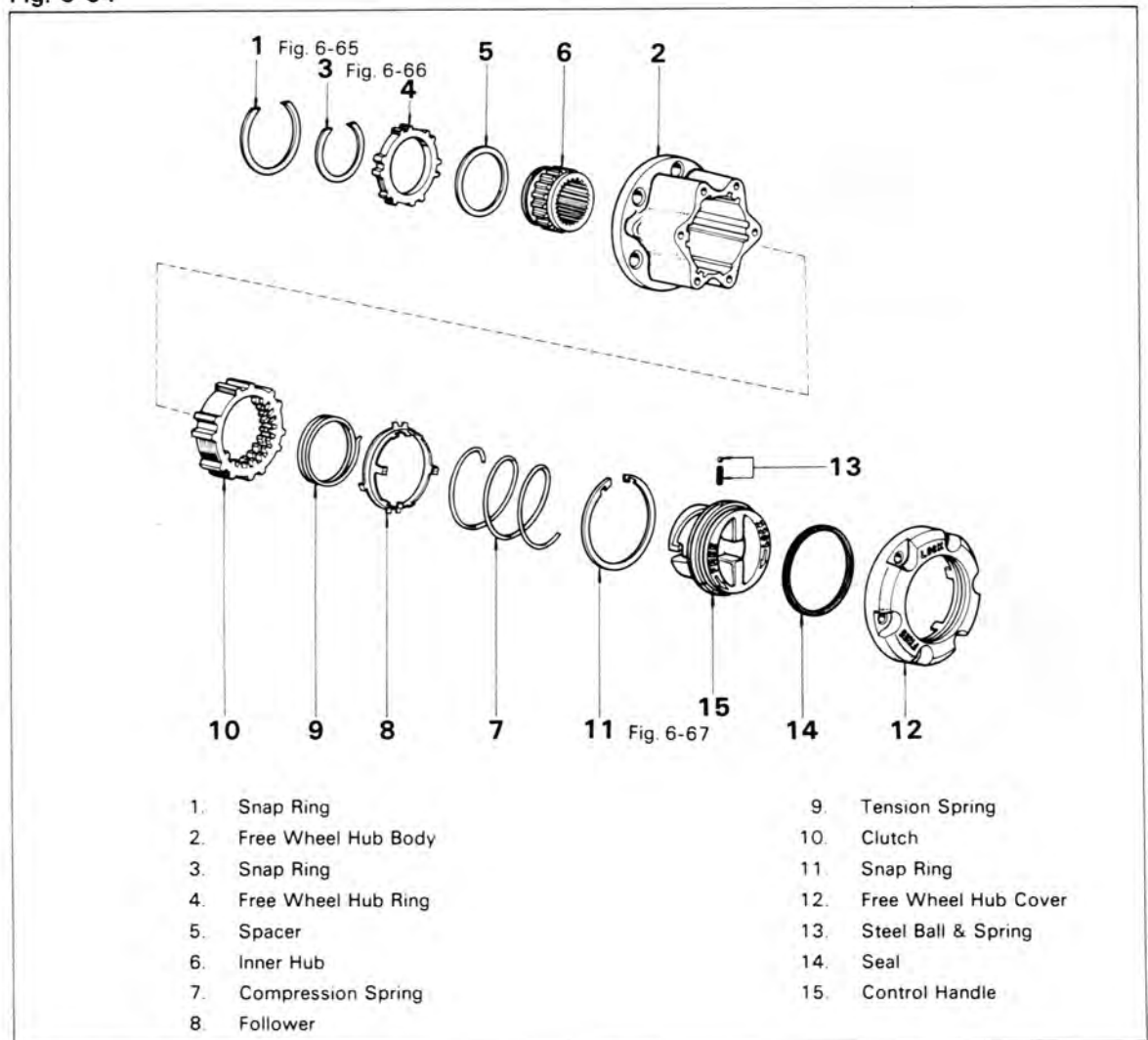
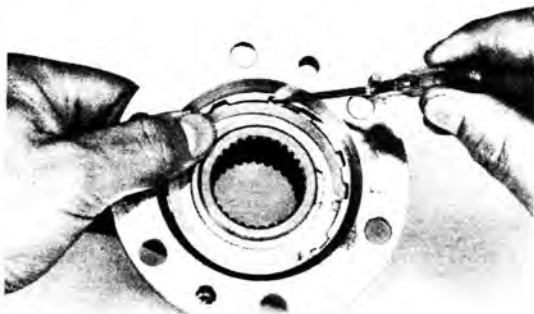
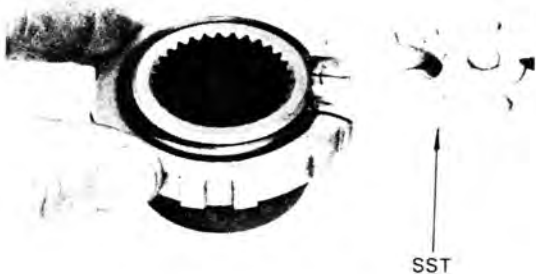


Fig. 6-65



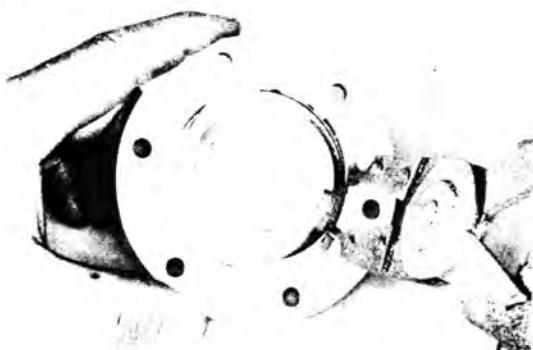
Remove the snap ring and free wheel hub ring.

Fig. 6-66



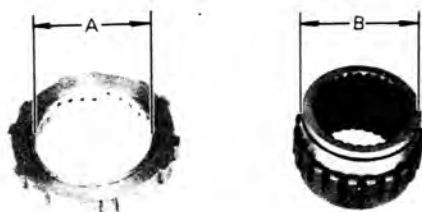
Remove the snap ring from the inner hub with SST.
SST [09905-00012]

Fig. 6-67



Remove the snap ring, cover and handle.

Fig. 6-68

**INSPECTION**

Wash the disassembled parts and inspect them on the following points.

**Inner & Free Wheel Hub Ring**

1. Inspect for wear or damage.
2. Measure the oil clearance.

Oil clearance (A - B):

Limit 0.3 mm
(0.012 in.)

Fig. 6-69

**Body & Clutch**

1. Inspect for wear, damage or rust.
2. Verify that the clutch moves smoothly in the body.

Fig. 6-70

**Cover, Handle & O Ring**

1. Inspect for wear or damage.

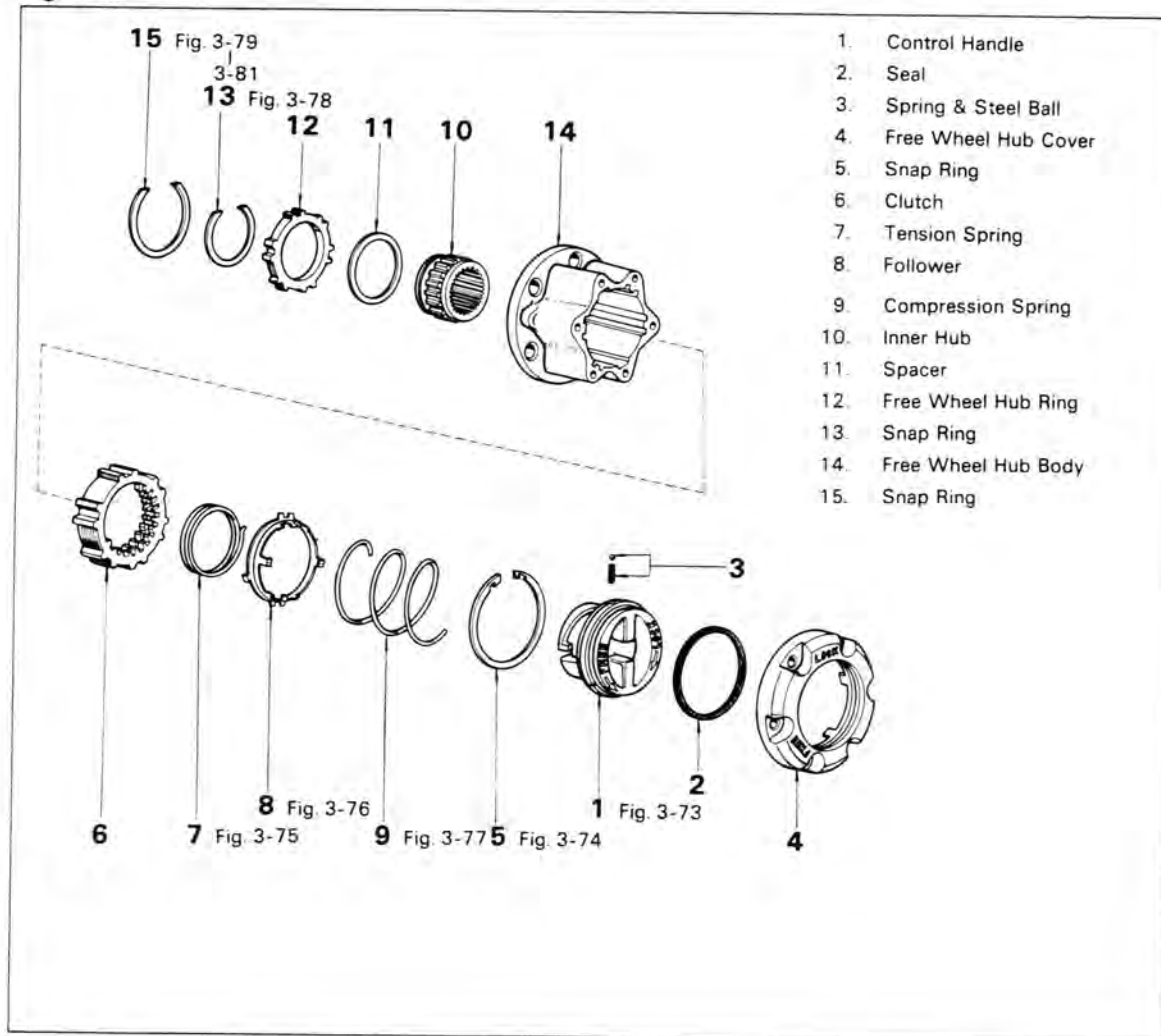
Fig. 6-71



2. Rotate the control handle of the hub back and forth to make sure that it moves smoothly and freely.

ASSEMBLY

Assemble the parts in the numerical order shown in the figure.

Fig. 6-72**Fig. 6-73**

MP grease



Apply MP grease on the arrow mark portion, before assembling.

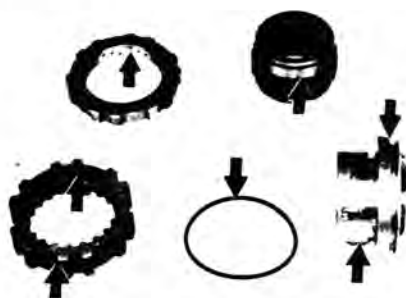
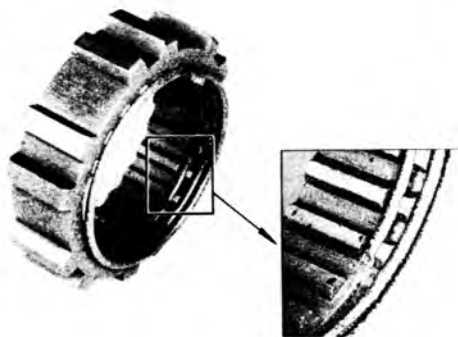


Fig. 6-74



Install the handle in the cover.

Fig. 6-75

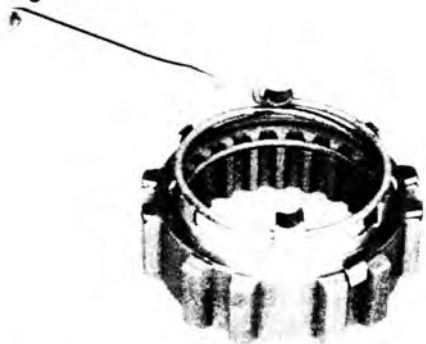


Install the tension spring in the clutch.

— Note —

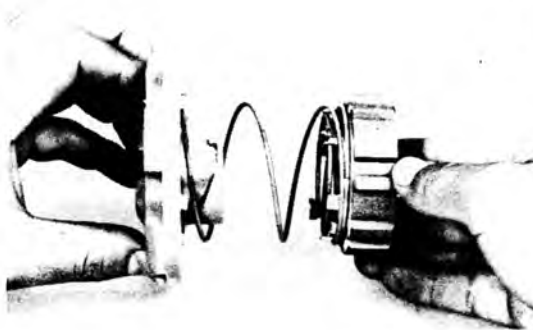
Fit the spring end into the clutch spring so as to be aligned with the initial groove.

Fig. 6-76



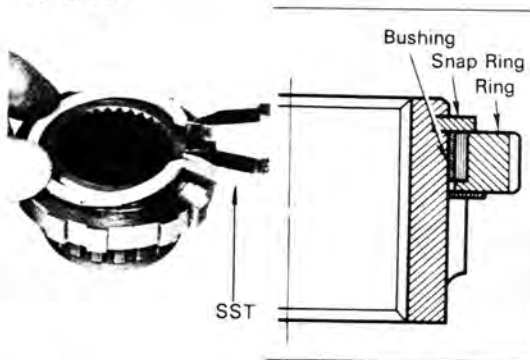
Fit follower pawl together with spring bent portion.

Fig. 6-77



Install the clutch and spring into the handle assembly.

Fig. 6-78



Install the spacer, free wheel hub ring, and snap ring to the inner with SST.
SST [09905-00012]

— Note —

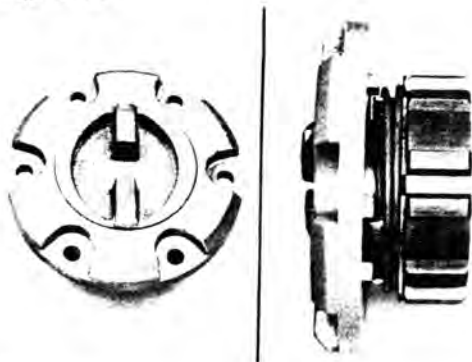
Make sure that ring is assembled in the correct direction as shown in the illustration.

Fig. 6-79



Install the inner assembly and snap ring in the body.

Fig. 6-80



1. Set the handle and clutch to the FREE position.

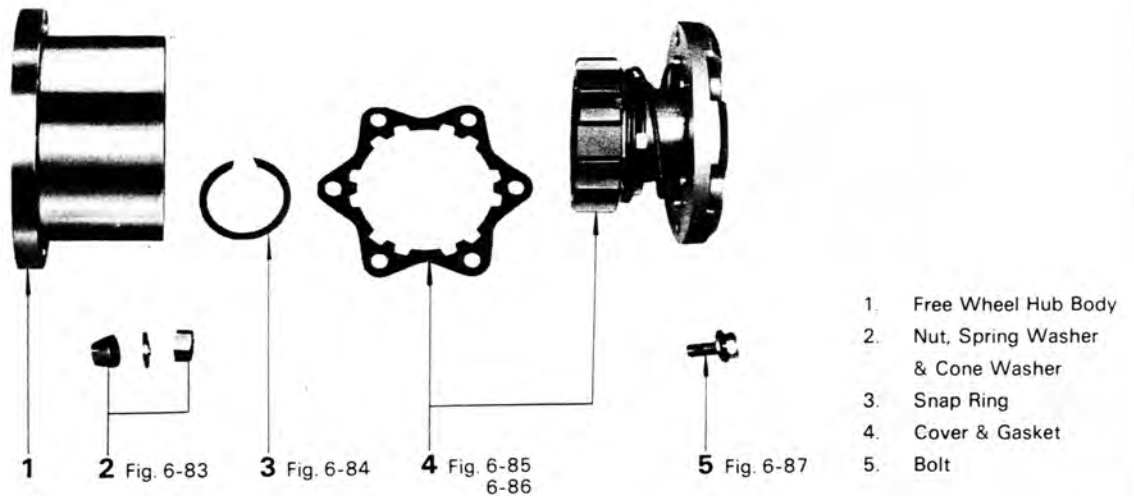
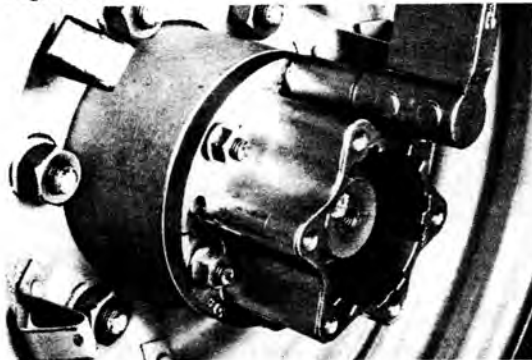
Fig. 6-81



2. Temporarily install the cover assembly to the body assembly.
3. Verify that the inner assembly turns smoothly.
4. Remove the cover assembly.

INSTALLATION

Install the parts in the numerical order shown in the figure.

Fig. 6-82**Fig. 6-83**

Tighten six nuts to the specified torque.

Tightening torque: 2.8 – 3.5 kg-m
 (21 – 25 ft-lb)

Fig. 6-84

Install the snap ring with SST.
 SST [09905-00012]

— Note —
 Gripping a bolt, pull the axle shaft out to install the snap ring.

Fig. 6-85

MP Grease



Apply MP grease on the portion indicated.



Fig. 6-86



Install the cover.

— Note —

Set the handle and the clutch to the FREE position.

Fig. 6-87



Tighten six bolts to the specified torque.

Tightening torque: 0.8 – 1.2 kg-m
(70 – 104 in.-lb)

— Note —

Verify that the control handle rotates smoothly.

FRONT SUSPENSION**LEAF SPRING****REMOVAL**

Remove the parts in the numerical order shown in the figure.

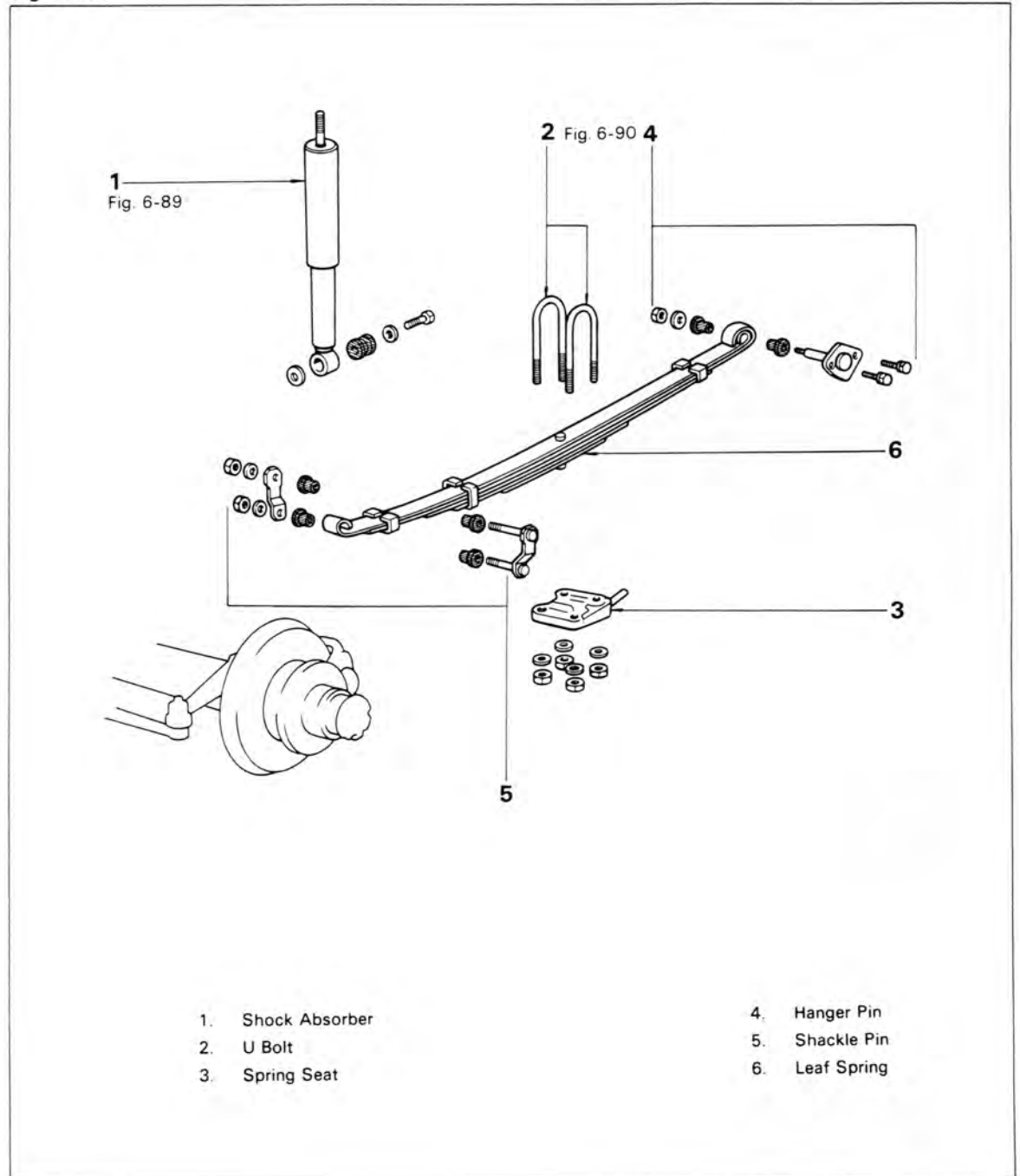
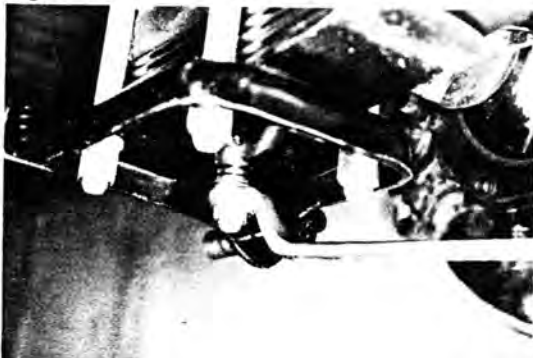
Fig. 6-88

Fig. 6-89



1. Jack up and support the frame on stands.
2. Remove the wheels.
3. Disconnect the shock absorber lower side.

Fig. 6-90



- Support the front axle housing with a jack, and remove the U bolts.

Fig. 6-91

**INSPECTION & REPAIR****U Bolt & Spring Seat**

Inspect for wear or damage

Fig. 6-92

**Shackle Pin, Hanger Pin & Bushing**

Inspect for wear or damage

Fig. 6-93



Replace The Leaf

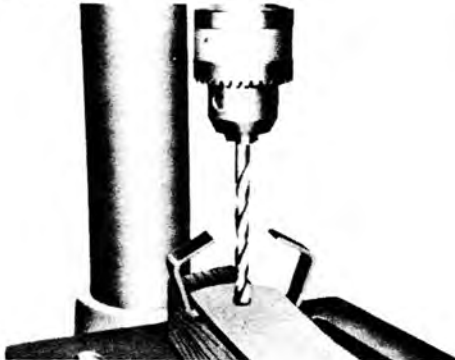
1. Pry up the spring clip.

Fig. 6-94



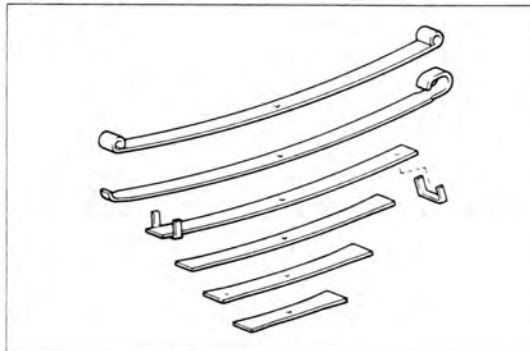
2. Secure the spring with a vise, and remove the spring center bolt.
3. Disassemble the leaf spring.

Fig. 6-95



4. Drill the rivetted head of the rivet, then drive it out.

Fig. 6-96



5. Inspect the leaves for damage or weakness.

Fig. 6-97



6. Using a press, install a new rivet into the holes of the leaf and clip.

Fig. 6-98



7. Secure the spring leaves with a vise, then install the spring center bolt and tighten firmly.

Fig. 6-99



8. Bend the clip into the position.

INSTALLATION

Install the parts in the numerical order shown in the figure.

Fig. 6-100

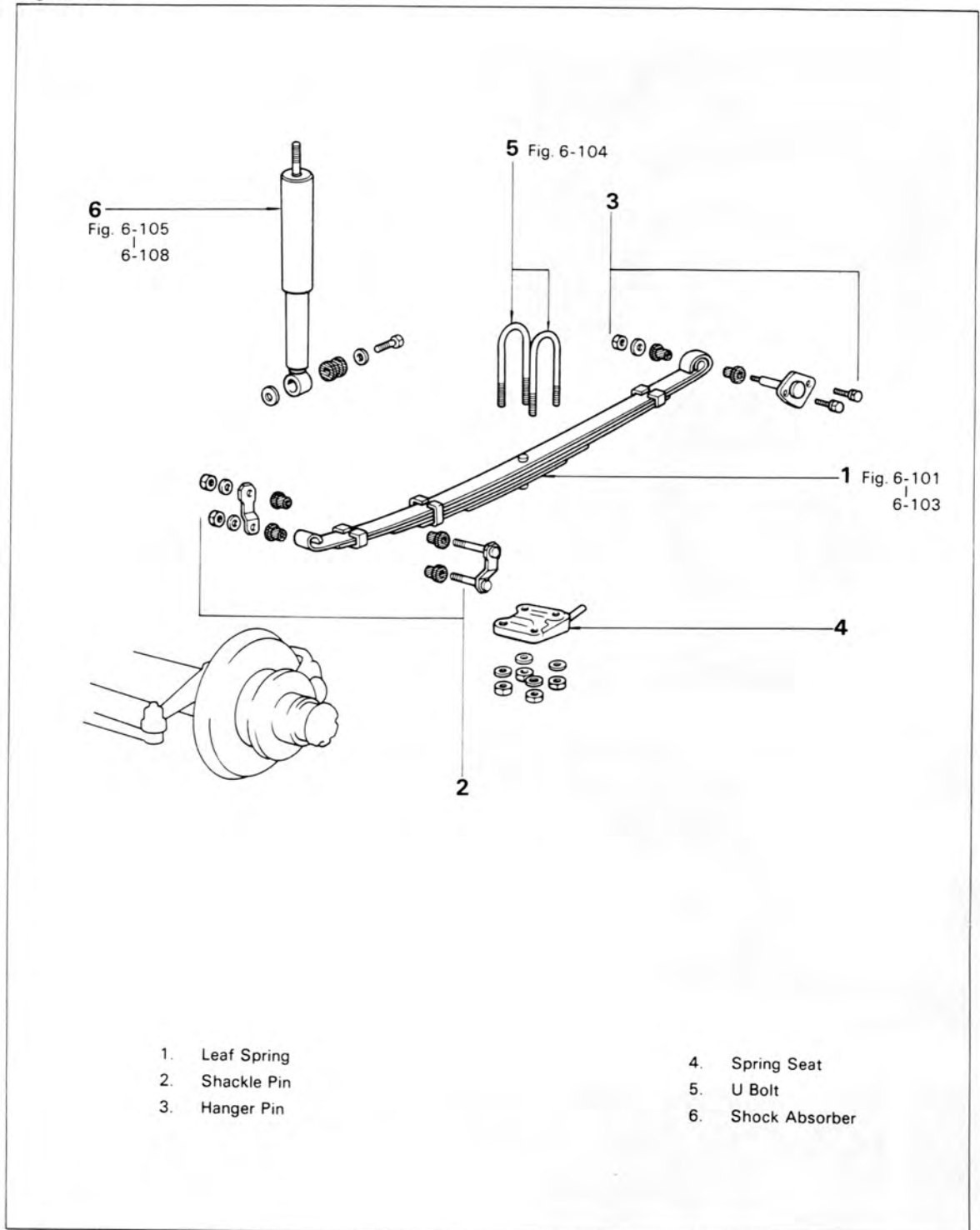
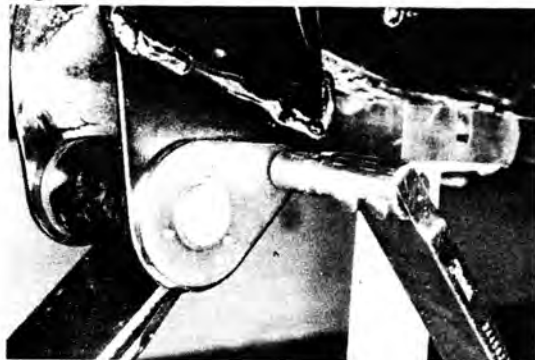


Fig. 6-101



Install the hanger pin.

Tightening torque: 1.0–1.6 kg-m
(8–11 ft-lb)

Fig. 6-102



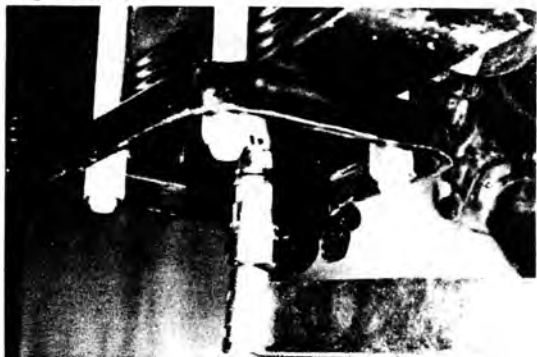
Finger tighten the nut.

Fig. 6-103



Finger tighten the shackle pin nuts.

Fig. 6-104



Install the U bolt.

Tightening torque:
10.0 – 15.0 kg-m
(73 – 108 ft-lb)

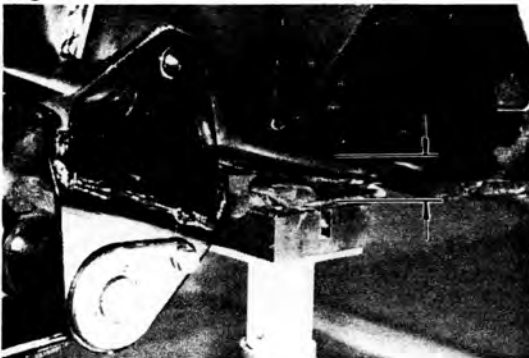
Fig. 6-105



Connect the shock absorber.

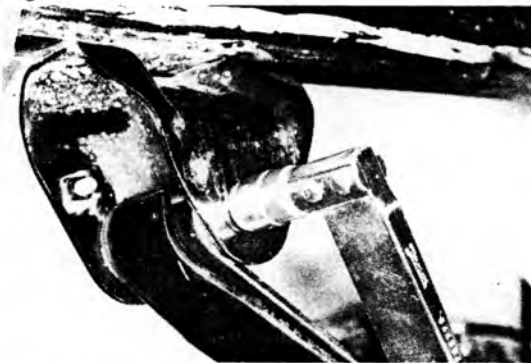
Tightening torque: 5.0 – 5.8 kg-m
(37 – 41 ft-lb)

Fig. 6-106



Raise the axle housing until the vehicle is free from the stands.

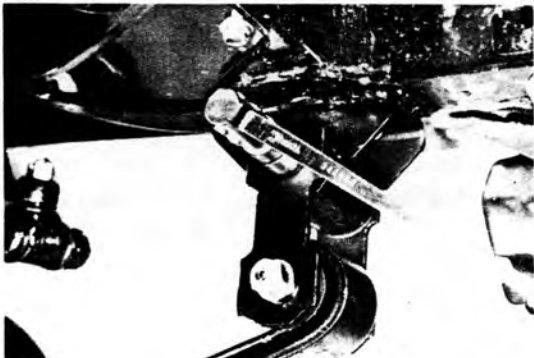
Fig. 6-107



Tighten the hanger pin nut.

Tightening torque: 7.5–11.0 kg-m
(55–79 ft-lb)

Fig. 6-108



Tighten the shackle pin nuts.

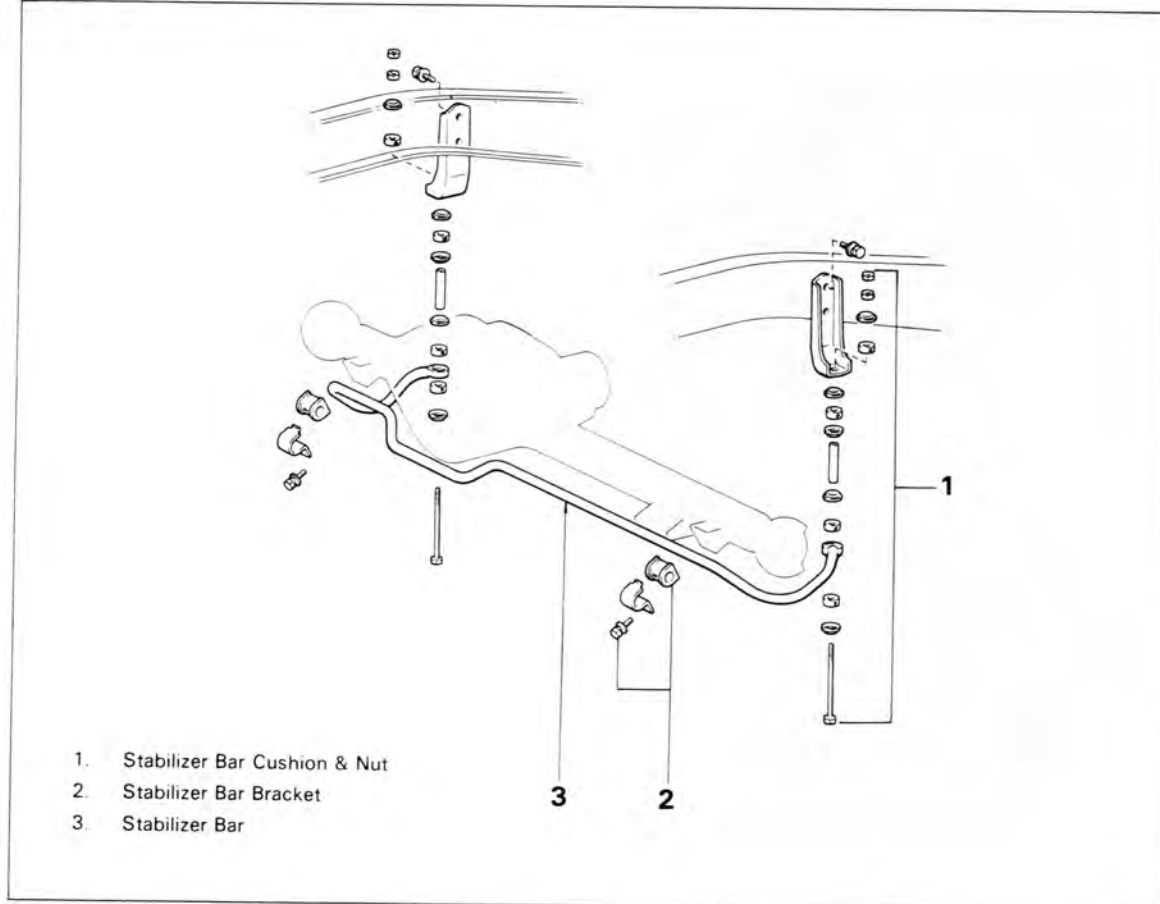
Tightening torque: 7.5–11.0 kg-m
(55–79 ft-lb)

FRONT STABILIZER BAR

REMOVAL

Remove the parts in the numerical order shown in the figure.

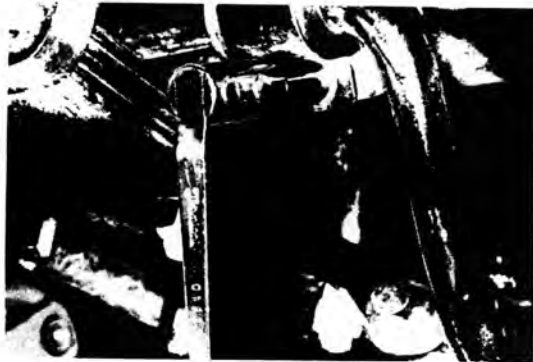
Fig. 6-109



INSTALLATION

Perform the removal procedure in reverse order.

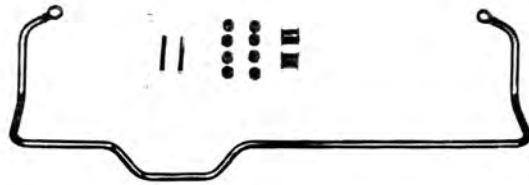
Fig. 6-110



Install the mounting bolts.

Tightening torque: 1.0–1.6 kg-m
(8–11 ft-lb)

Fig. 6-111

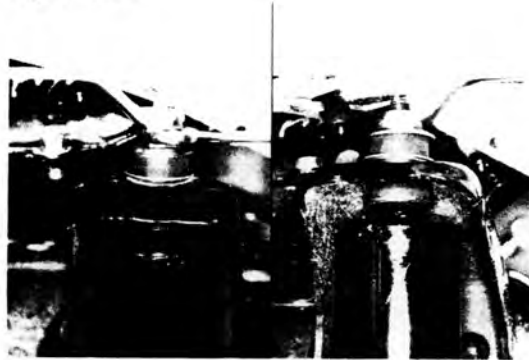


INSPECTION



Inspect the disassembled parts for wear, damage or cracks.

Fig. 6-112



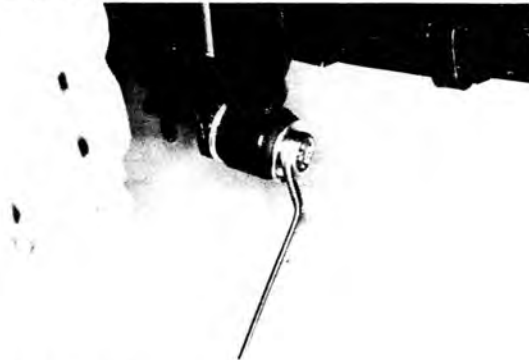
FRONT SHOCK ABSORBER



REMOVAL

Remove the lock nut and the mounting nut.

Fig. 6-113



Remove the lower mounting bolt.

Fig. 6-114



INSPECTION



1. Inspect the disassembled parts for wear, damage or oil leakage.

Fig. 6-115



2. Check the operation.
Apply an even pressure and insure that the tension is equal throughout the stroke.

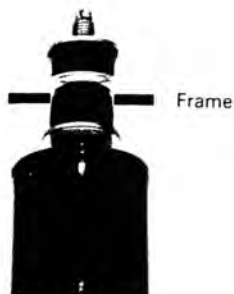
Fig. 6-116

**INSTALLATION**

Install the lower mounting bolt

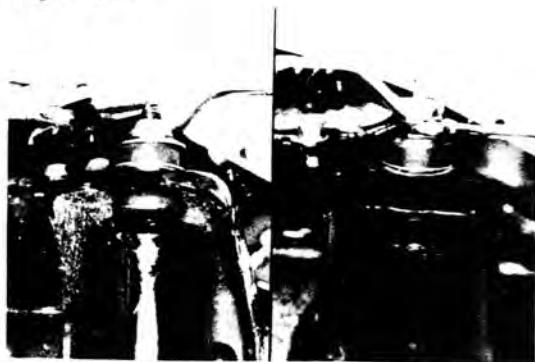
Tightening torque: 5.0 – 5.8 kg-m
(37 – 41 ft-lb)

Fig. 6-117



Install the bushings and retainers.

Fig. 6-118



Tighten the upper mounting nut and lock nut

Tightening torque: 1.9–3.1 kg-m
(14–22 ft-lb)

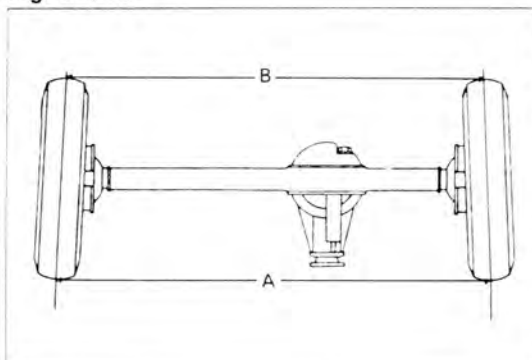
FRONT WHEEL ALIGNMENT

PRE-ALIGNMENT PREPARATIONS

Check the following points before performing the front wheel alignment:

1. Tire pressure, tire wear and difference in outer diameter measurements
2. Wheel play or unbalance
3. Play in the front wheel bearing
4. King pin play
5. Tie rod end and drag link play
6. Disalignment of wheel base left-right movement
7. Body leaning
8. Looseness of the spring U bolt, knuckle arm or steering gear housing
9. Improper movement of the shock absorbers
10. During alignment the vehicle must be empty and level

Fig. 6-119



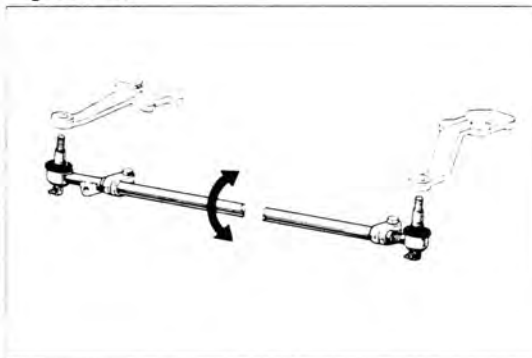
Toe-in

Measure the toe-in.

Toe-in:

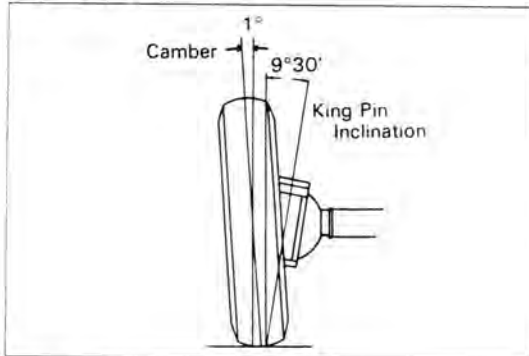
Bias tire	4 ± 2 mm (0.10 ± 0.08 in.)
Radial tire	1 ± 2 mm (0.04 ± 0.08 in.)

Fig. 6-120



To adjust, turn the tie rod adjusting tube

Fig. 6-121

**Camber & King Pin Angle**

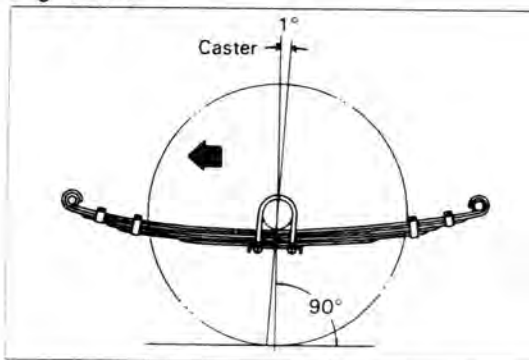
Measure the camber and king pin angle.

Camber angle: $1^\circ \pm 45'$ **King pin inclination:** $9^\circ 30'$

— Note —

If measurements are off standard, inspect each part thoroughly and adjust.

Fig. 6-122

**Caster**

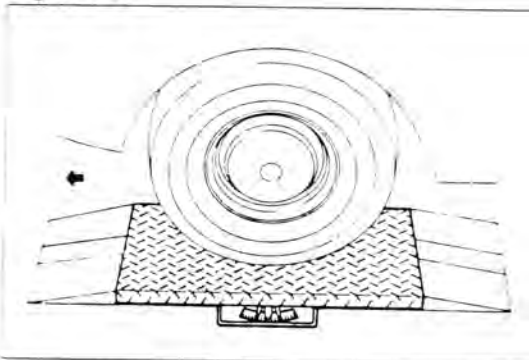
Measure the caster.

Caster angle:FJ, BJ, HJ4_series $1^\circ \pm 45'$ FJ, BJ, HJ6_series $1^\circ 05' \pm 45'$

— Note —

If measurements are off standard, inspect each part and adjust.

Fig. 6-123

**Side Slip**

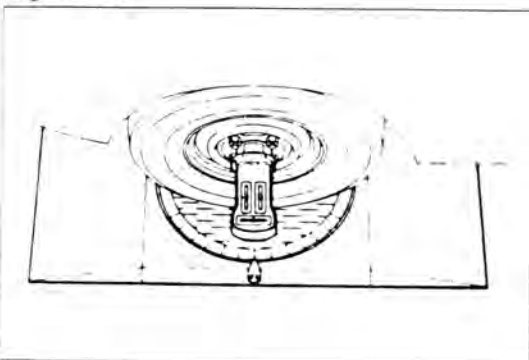
Measure the side slip.

Side slip: Within 3.0 mm/m
(0.12 in./3.3 ft)

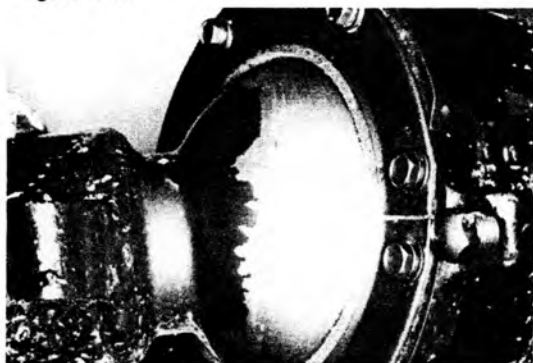
— Note —

If not within limit, adjust by lengthening or shortening the tie rod.

Fig. 6-124

**Turning Angle****Inside wheel angle:** $29 - 32^\circ$ **Outside wheel angle:** 30°

(Reference)

Fig. 6-125

If not within limits, adjust the steering angles to standard values with knuckle stopper.