

REAR AXLE & SUSPENSION

	Page
CUTAWAY VIEW	7-2
REAR AXLE SHAFT	7-4
REAR AXLE HUB	7-11
DIFFERENTIAL	7-17
LIMITED SLIP DIFFERENTIAL	7-31
REAR SUSPENSION	7-41

CUTAWAY VIEW

Fig. 7-1

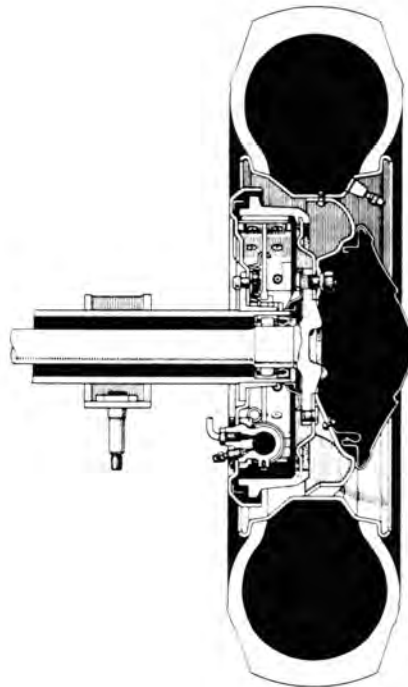
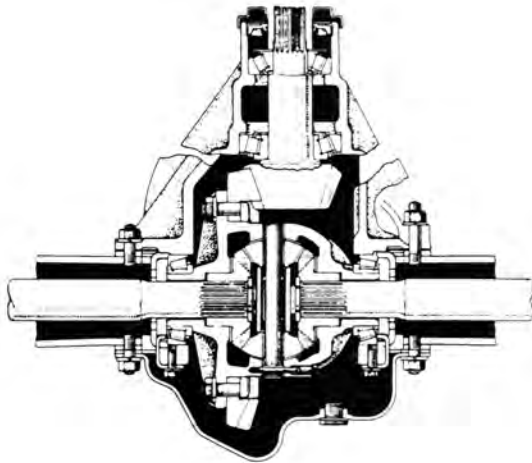
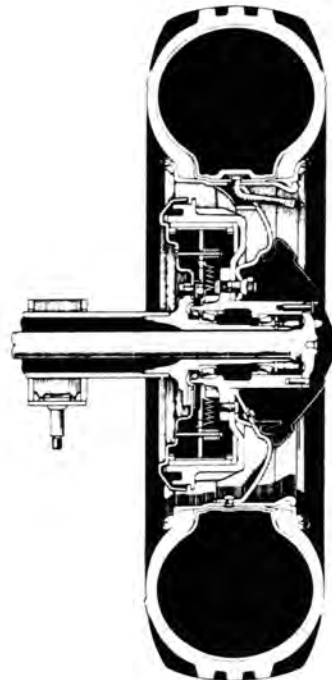
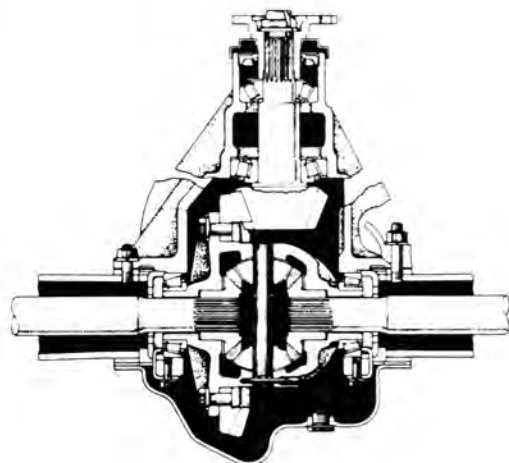
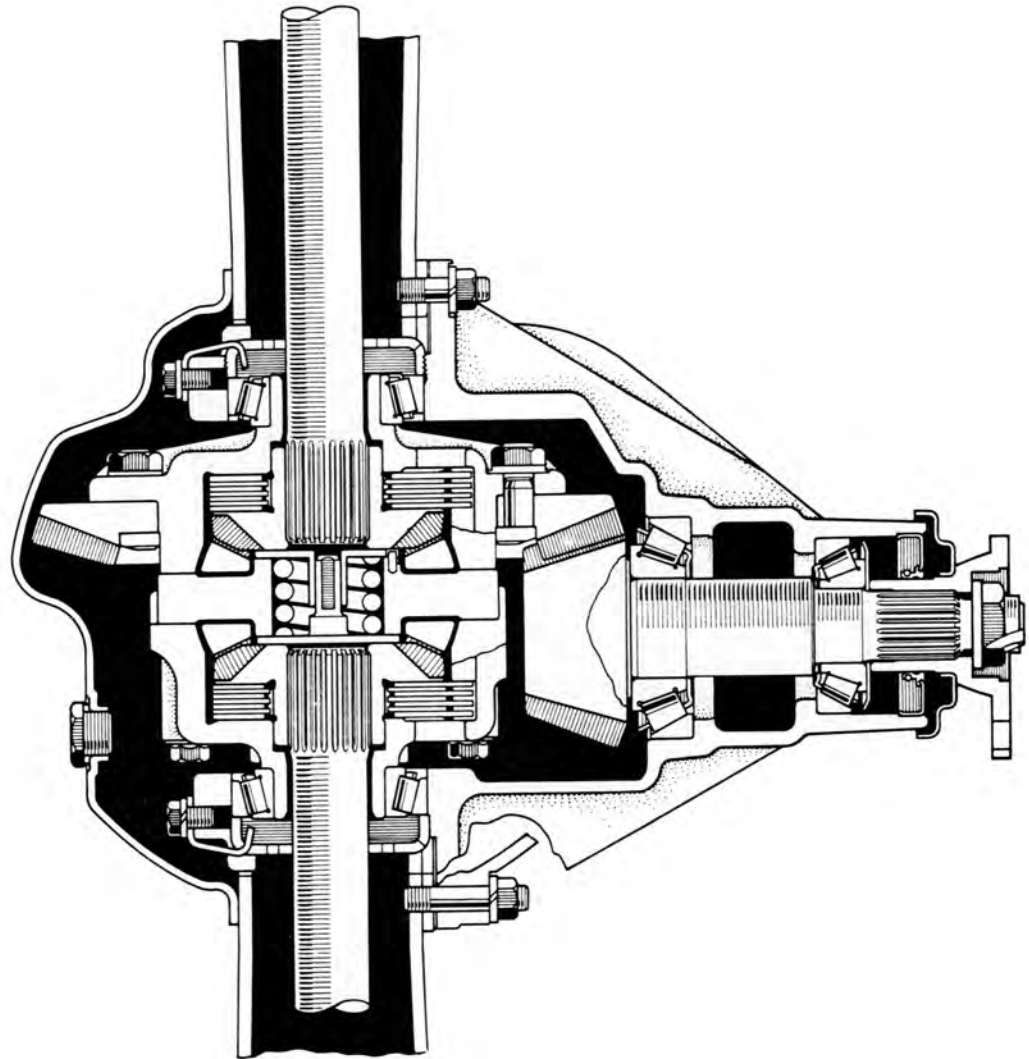
Semi-Floating Type**Full Floating Type**

Fig. 7-2

LIMITED SLIP DIFFERENTIAL



REAR AXLE SHAFT (SEMI-FLOATING TYPE)

REMOVAL

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

Fig. 7-3

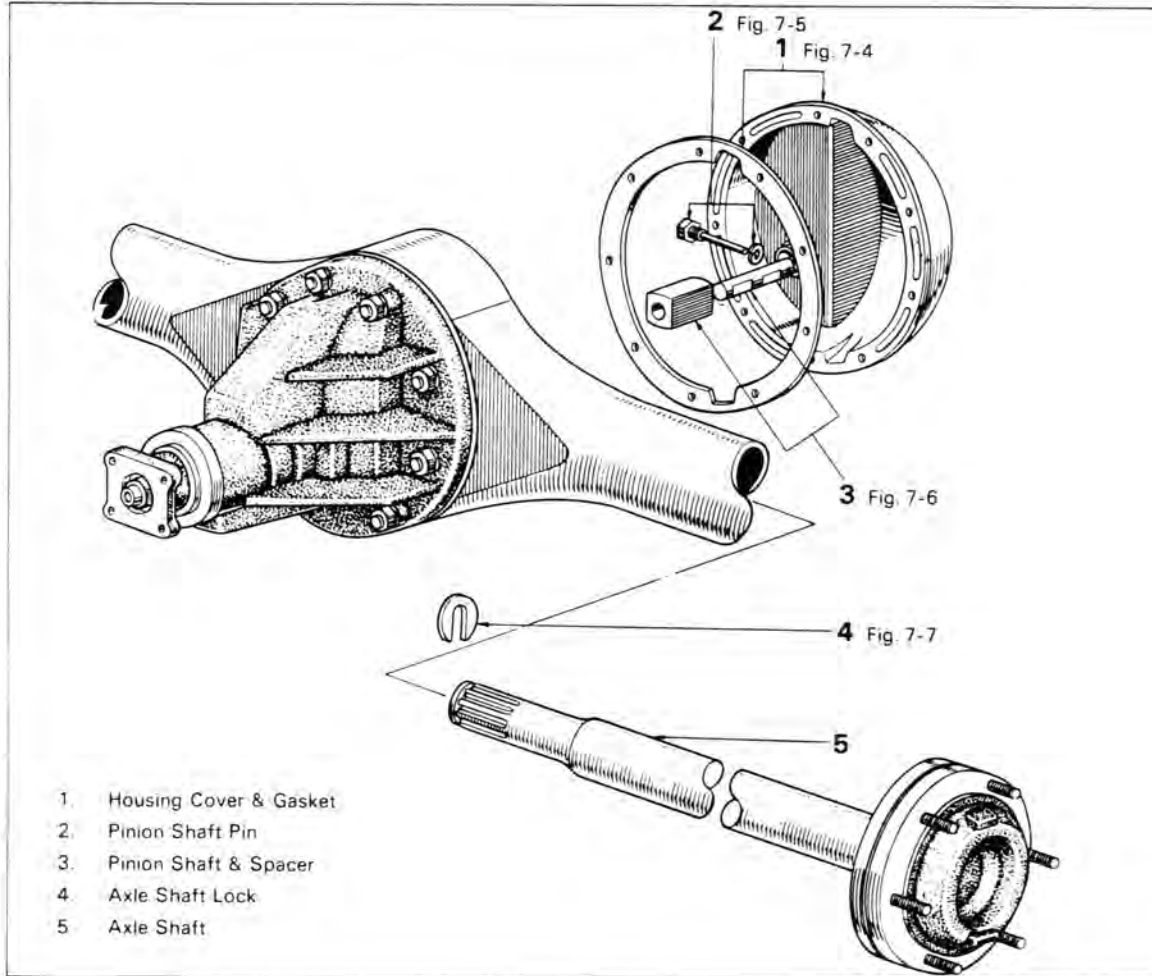
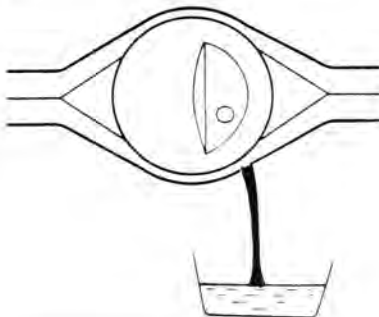
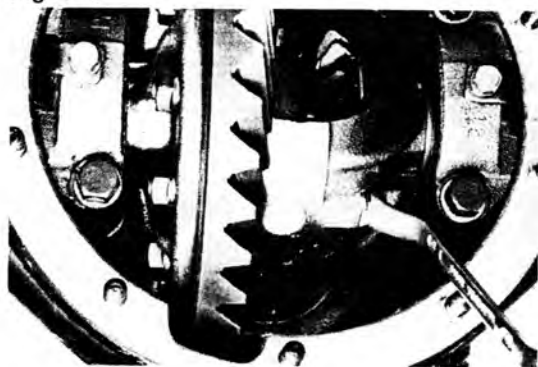


Fig. 7-4



Remove the drain and filler plugs and drain the oil.

Fig. 7-5



Remove the pinion shaft pin.

Fig. 7-6



Draw out the pinion shaft and spacer.

Fig. 7-7



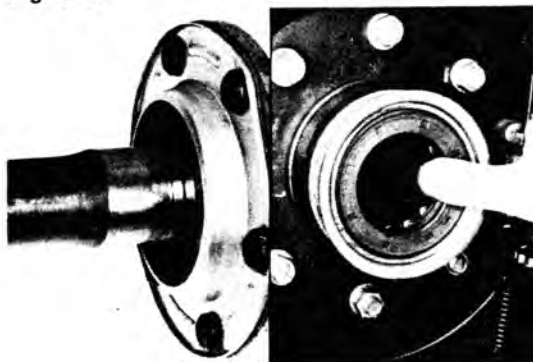
Push the axle shaft to the center of vehicle and remove the axle shaft lock.

Fig. 7-8

**INSPECTION****Axle Shaft & Pinion Shaft Spacer**

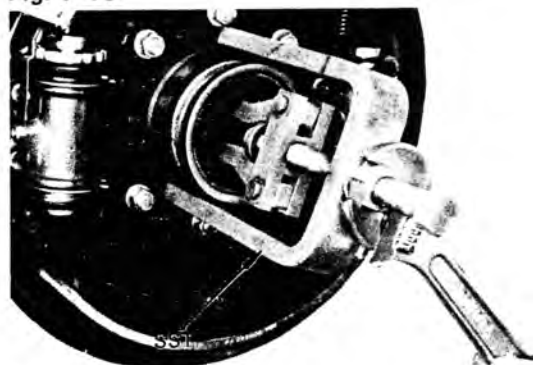
Inspect for wear or damage.

Fig. 7-9

**Axle Shaft Bearing**

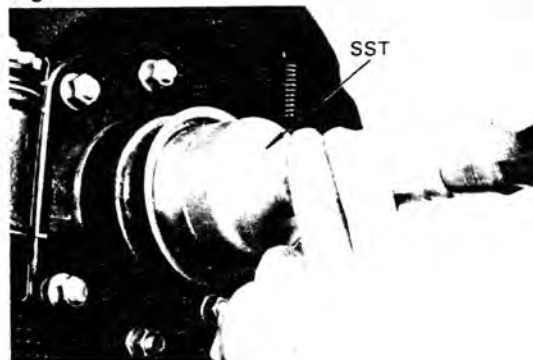
Inspect for wear or damage.

Fig. 7-10

**Replace The Axle Shaft Bearing**

1. Remove the bearing and oil seal together with SST.
SST [09514-35011]

Fig. 7-11



2. Drive in the bearing and oil seal with SST.
SST [09515-35010]

INSTALLATION

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

Fig. 7-12

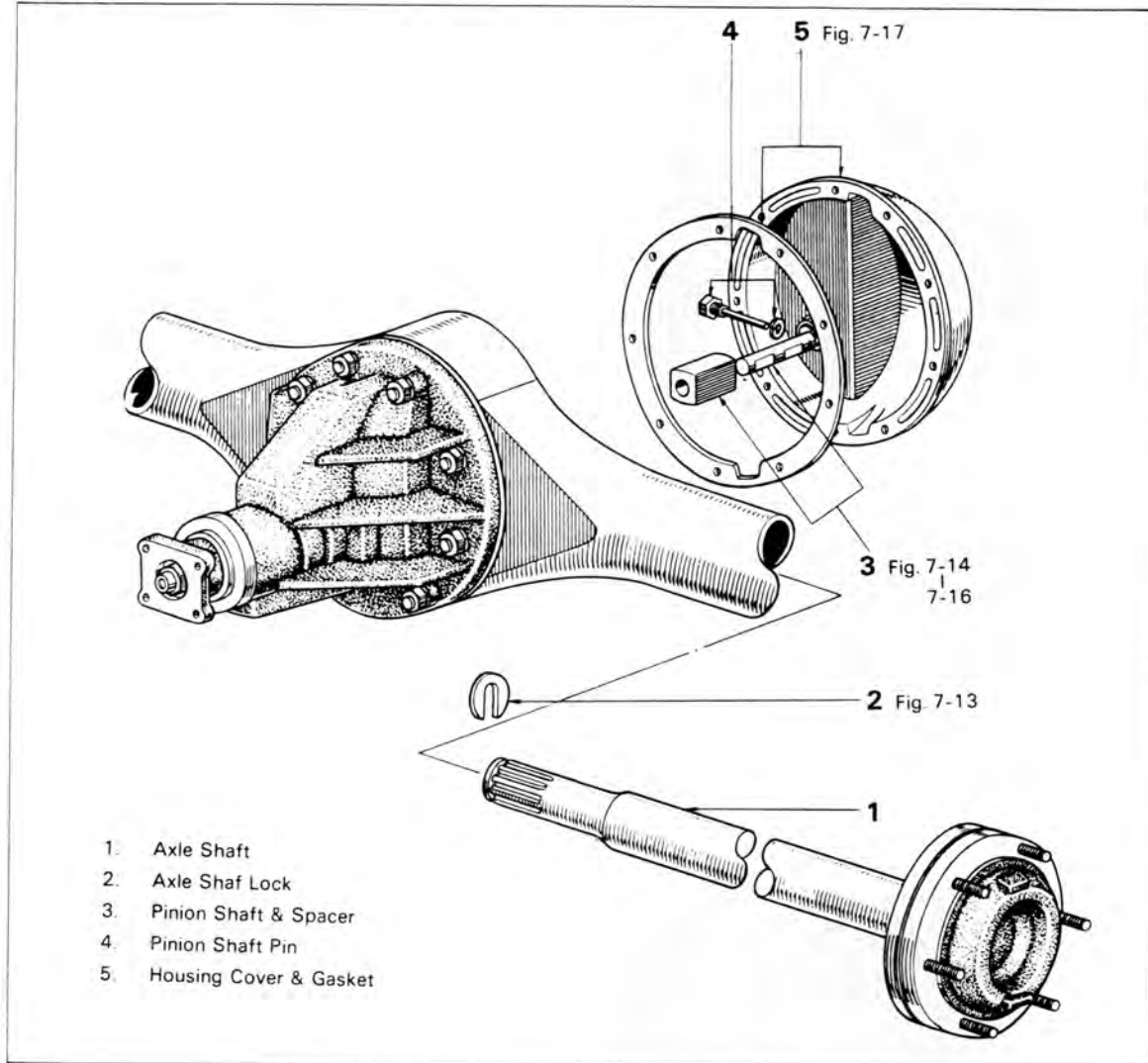
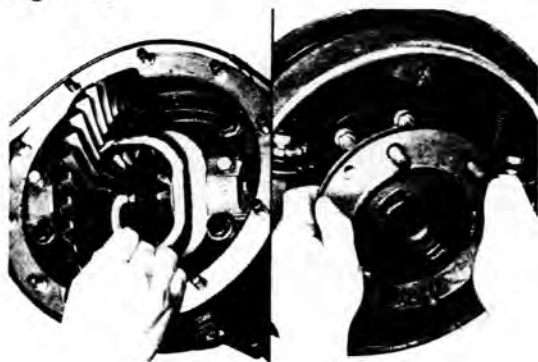


Fig. 7-13



After installing the lock to the shaft, pull the shaft fully toward the outer side of vehicle.

Fig. 7-14



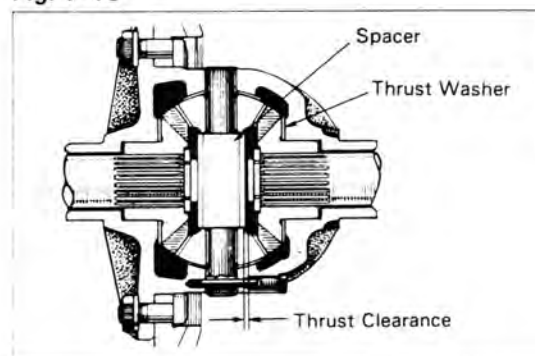
Measure the differential gear backlash.

1. Hold the side gear steady and measure the backlash of the pinion.

Backlash:

STD 0.02 – 0.20 mm
(0.0008 – 0.0079 in.)

Fig. 7-15



2. If outside the standard value range, correct by selecting proper size side gear thrust washers.

Thrust washer thickness

Part No.	Thickness mm (in.)
41361-60010	1.55 – 1.65 (0.0610 – 0.0650)
41361-60020	1.70 – 1.80 (0.0670 – 0.0709)
41361-60030	1.85 – 1.95 (0.0728 – 0.0768)
41361-60040	2.00 – 2.10 (0.0787 – 0.0827)

Fig. 7-16



Rear axle shaft end thrust clearance.

Select pinion shaft spacer of the thickness that will set the thrust clearance to the standard value.

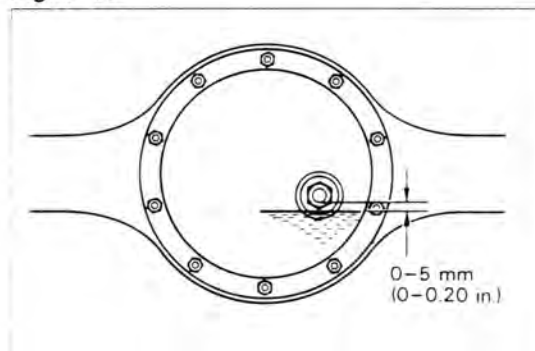
Clearance:

STD 0.060 – 0.465 mm
(0.0024 – 0.0183 in.)

Spacer thickness

Part No.	Thickness mm (in.)
41344-35010	29.8 (1.173)
41345-35010	30.2 (1.189)
41346-35010	30.6 (1.205)
41347-35010	29.0 (1.142)
41348-35010	24.9 (1.157)

Fig. 7-17



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)

—Note—

With LSD fill in hypoid gear oil LSD, SAE90, API GL-5.

REAR AXLE SHAFT (FULL FLOATING TYPE) COMPONENTS

Fig. 7-18

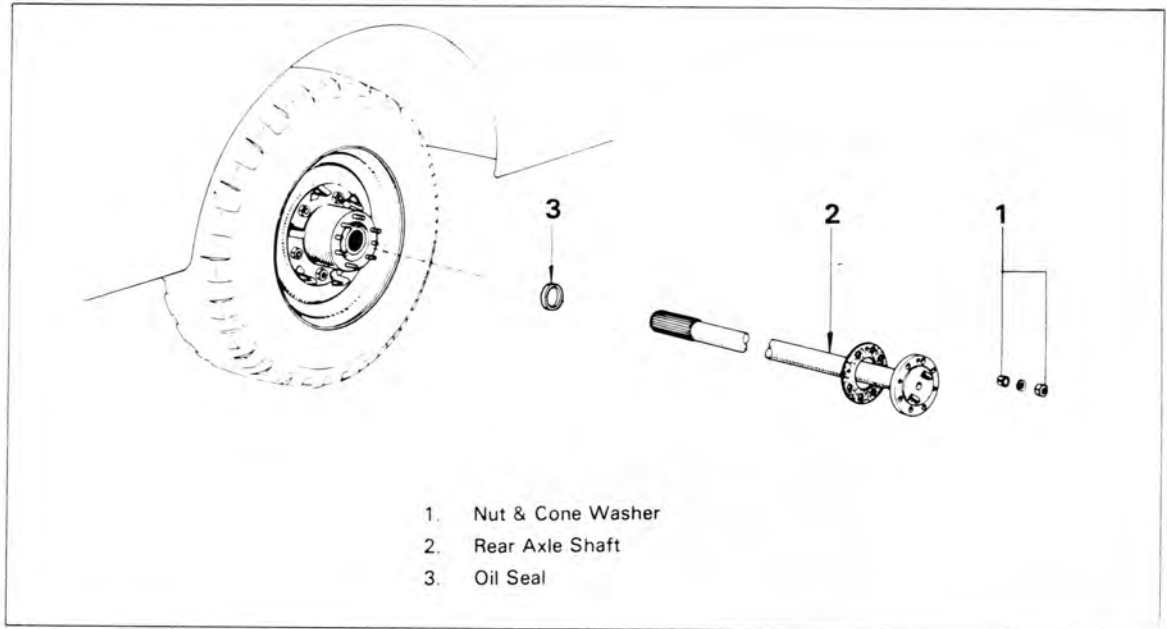
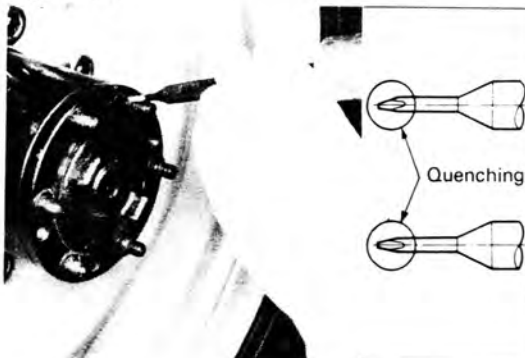


Fig. 7-19

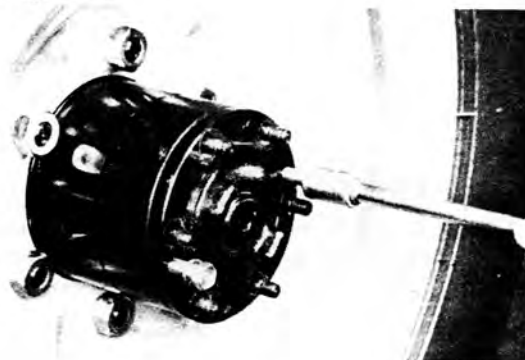


REMOVAL



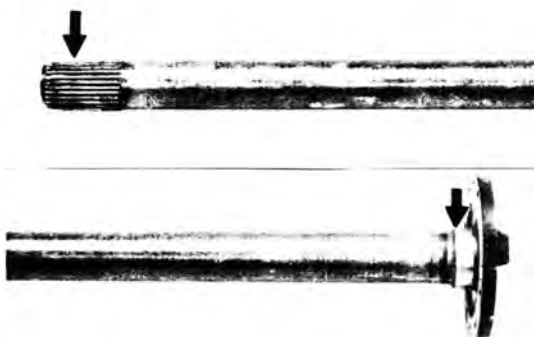
1. Remove the nuts and cone washers with a tapered punch.

Fig. 7-20



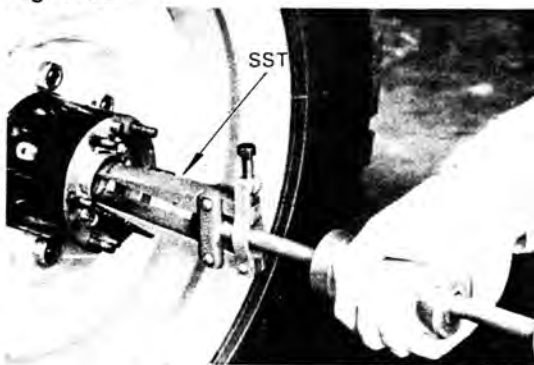
2. Remove the rear axle shaft by tightening the bolts.

Fig. 7-21

**INSPECTION & REPAIR****Rear Axle Shaft**

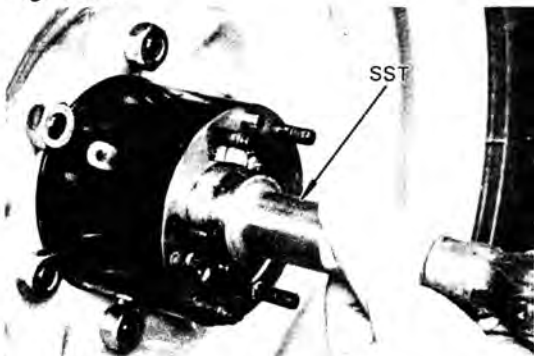
Inspect the parts identified by arrows for wear or damage.

Fig. 7-22

**Replace The Rear Axle Shaft Oil Seal**

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

Fig. 7-23



2. Install the new oil seal with SST.
SST [09517-36010]
3. Apply MP grease on the oil seal.



Fig. 7-24

**INSTALLATION**

Install the rear axle shaft and tighten the nuts.

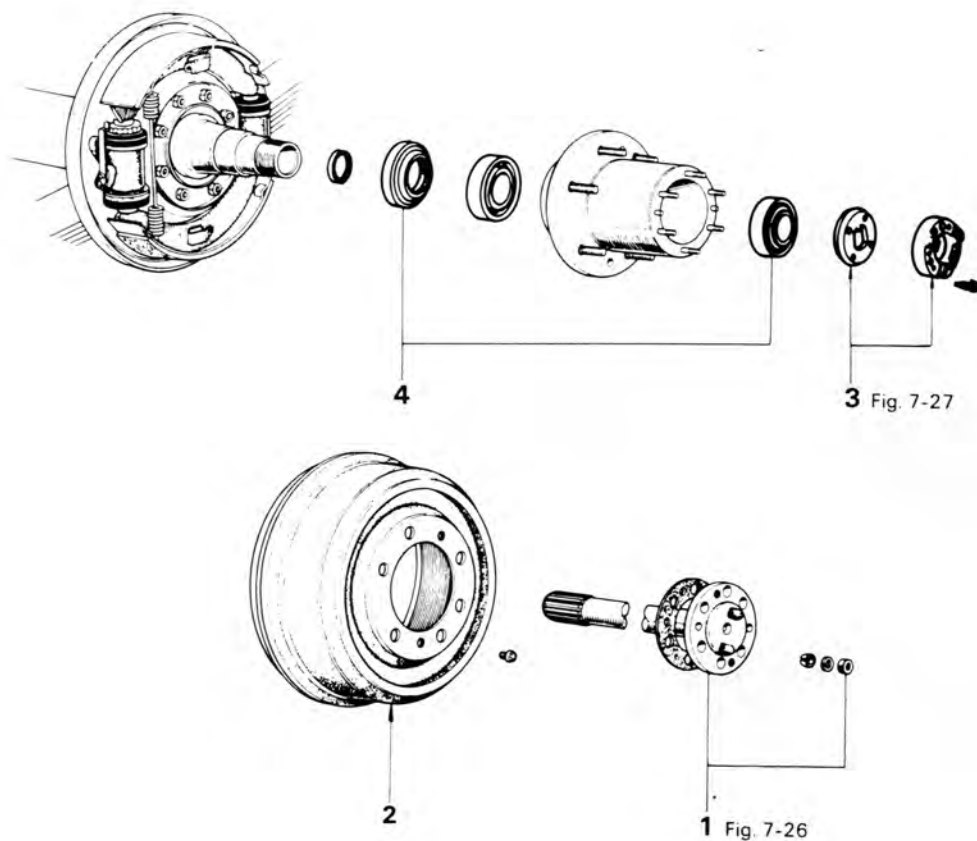
Tightening torque: 2.8 – 3.5 kg-m
(21 – 25 ft-lb)

REAR AXLE HUB (FULL FLOATING TYPE)

REMOVAL

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

Fig. 7-25



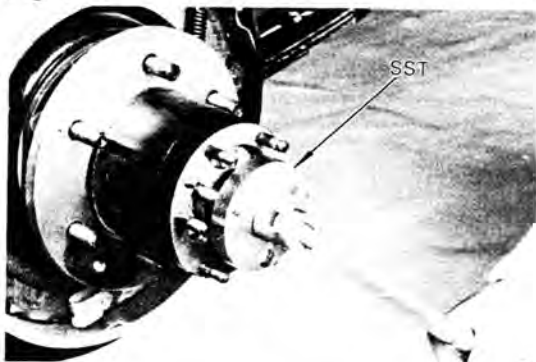
1. Rear Axle Shaft
2. Brake Drum
3. Adjusting Nut & Lock Washer
4. Axle Hub

Fig. 7-26

SEE
REAR AXLE SHAFT
(FULL FLOATING TYPE)
REMOVAL SECTION
Fig. 7-19 & 7-20

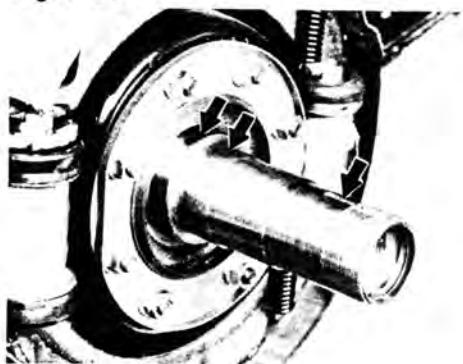
Remove the rear axle shaft.

Fig. 7-27



Remove the adjusting nut with SST.
SST [09509-25011]

Fig. 7-28

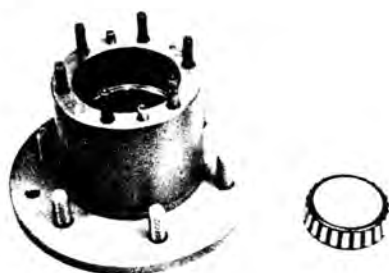


INSPECTION & REPAIR

Rear Axle Housing

Inspect the parts indicated by arrows for wear or damage.

Fig. 7-29



Rear Axle Hub & Bearing

Inspect the bearings and oil seal for wear or damage.

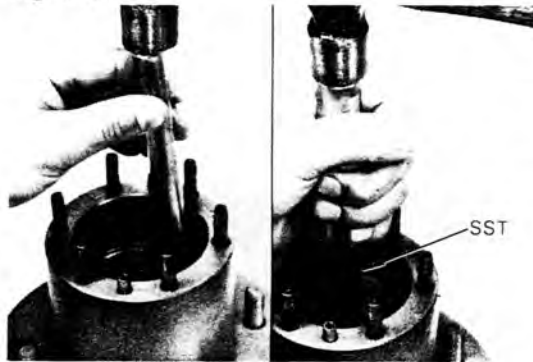
Fig. 7-30



Replace The Bearing

1. Remove the oil seal with a screw driver.

Fig. 7-31

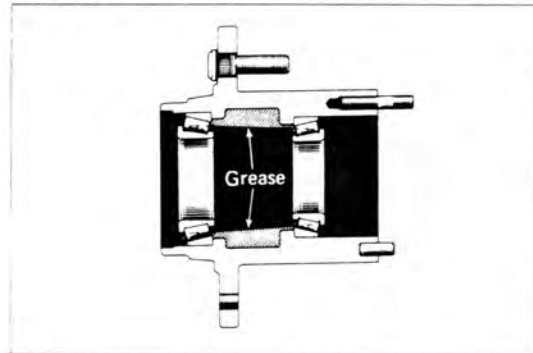


2. Remove the bearing outer races with a drift.



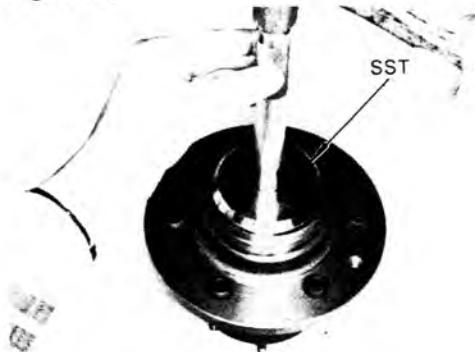
3. Install the new bearing outer races with SST.
SST [09608-35013]

Fig. 7-32



4. Pack MP grease into the hub and bearings.

Fig. 7-33



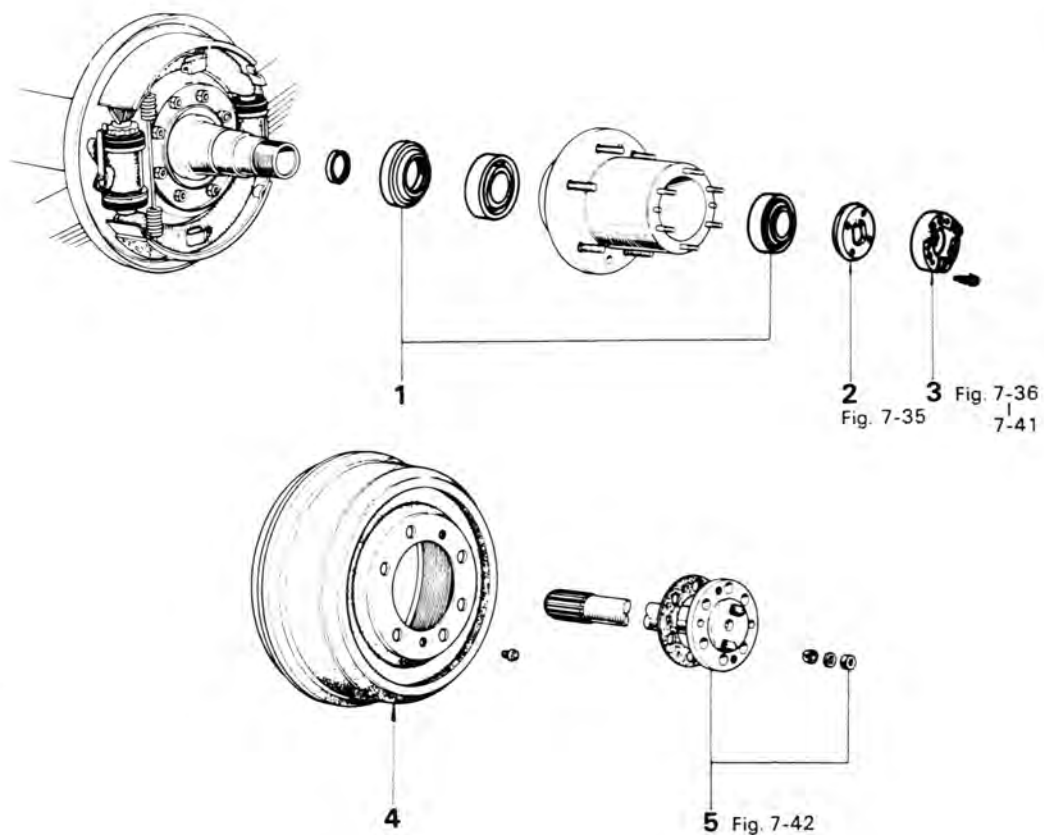
5. Install the inner bearing and oil seal with SST.
SST [09608-35013]



6. Apply MP grease on the oil seal.

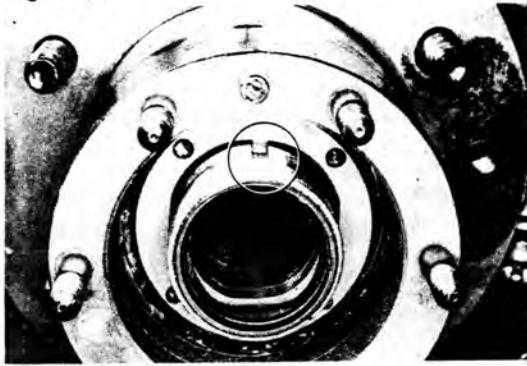
INSTALLATION

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

Fig. 7-34

1. Rear Axle Hub
2. Lock Plate
3. Adjusting Nut
4. Brake Drum
5. Rear Axle Shaft

Fig. 7-35



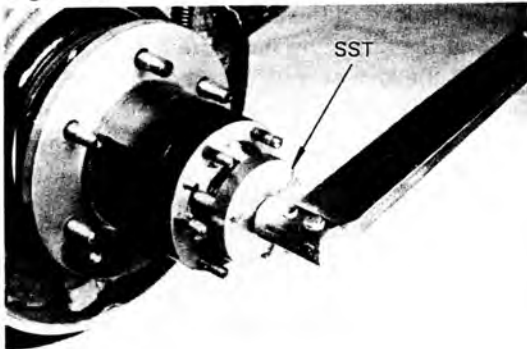
Install the lock plate.



—Note—

After fully pushing in the outer bearing, position the protrusion of the lock plate into axle housing groove.

Fig. 7-36



Tighten the adjusting nut with SST.
SST [09509-25011]

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

Fig. 7-37



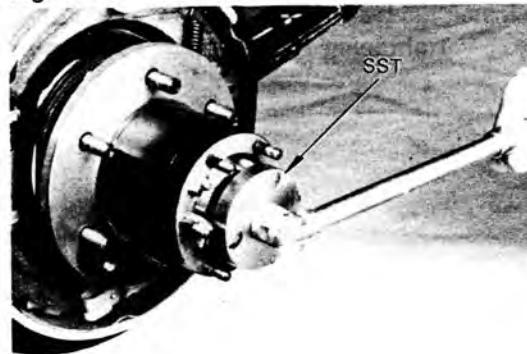
Rotate the rear axle hub about three times to snug down the bearings.

Retighten the adjusting nut.



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

Fig. 7-38



With SST, loosen the adjusting nut until it can be rotated by hand.

Then, add the preload a little at a time by tightening the nut.

SST [09509-25011]

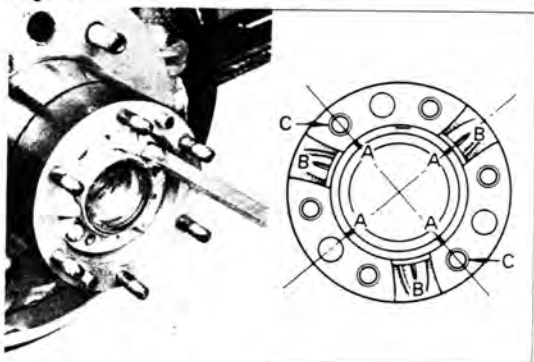
Fig. 7-39



Measure the preload at the hub bolt.

Preload (starting): 2.6 – 5.7 kg
(5.7 – 12.6 lb)

Fig. 7-40



Align the one of the axle housing slots A with one of the adjusting nut slots B.

Install the lock screws into the holes C which are at right angles to the aligned slots A and B.

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

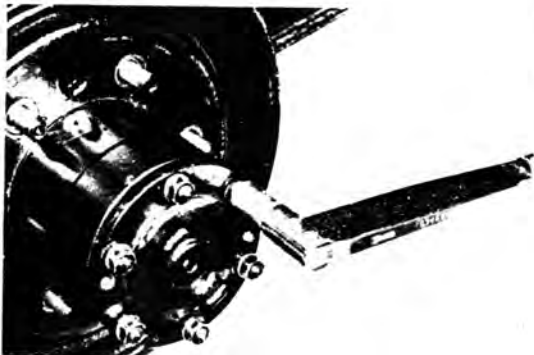
Fig. 7-41



Recheck the preload at the hub bolt.

Preload (starting): 2.6 – 5.7 kg
(5.7 – 12.6 lb)

Fig. 7-42



Install the rear axle shaft.

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

DIFFERENTIAL

REMOVAL

After draining out the oil, remove the parts in the numerical order shown in the figure.

Fig. 7-43

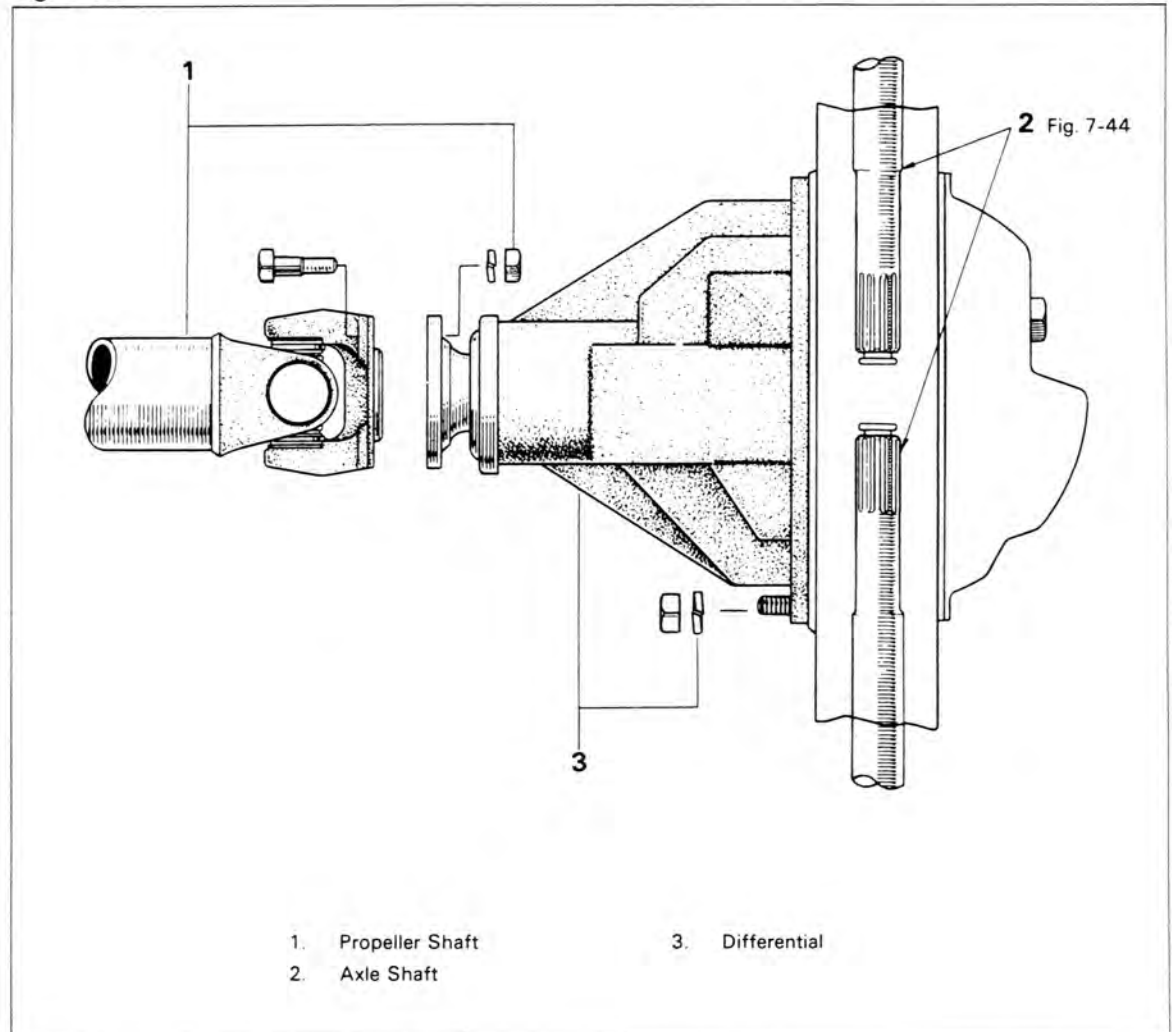


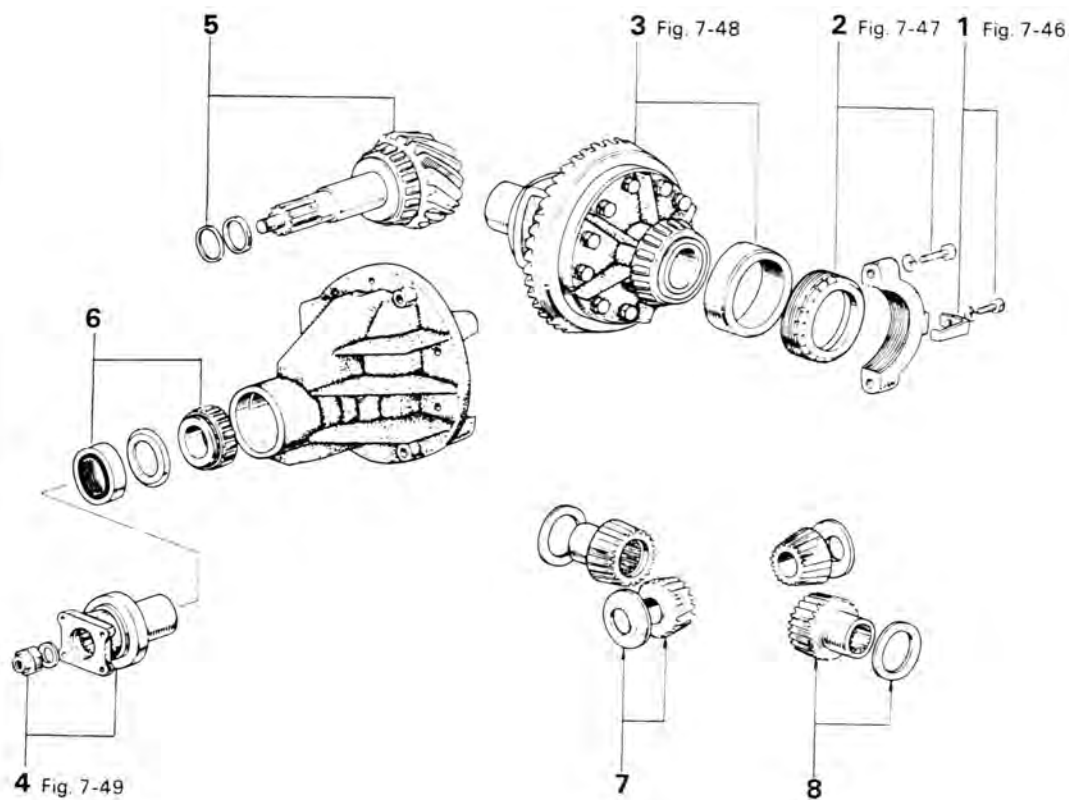
Fig. 7-44

SEE
REAR AXLE SHAFT
(SEMI-FLOATING TYPE)
REMOVAL SECTION
Fig. 7-4 to 7-7,
7-19 & 7-20

Remove the axle shafts.

DISASSEMBLY

Disassemble the parts in the numerical order shown in the figure

Fig. 7-45

1. Adjust Nut Lock
2. Bearing Cap & Adjusting Nut
3. Ring Gear, Cap & Bearing
4. Joint Flange

5. Drive Pinion, Bearing, Shim & Washer
6. Oil Seal, Slinger & Bearing
7. Pinion & Thrust Washer
8. Side Gear & Thrust Washer

Fig. 7-46



Before starting disassembly, measure the runout of the ring gear back face.

Runout:

**Limit 0.10 mm
(0.0039 in.)**

Fig. 7-47



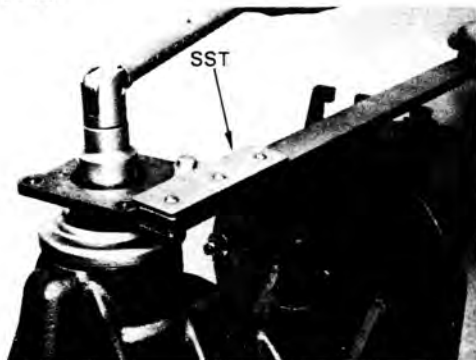
Place matchmarks on the bearing caps.

Fig. 7-48



Place tags on the bearing outer races to differentiate the left and right side usage.

Fig. 7-49

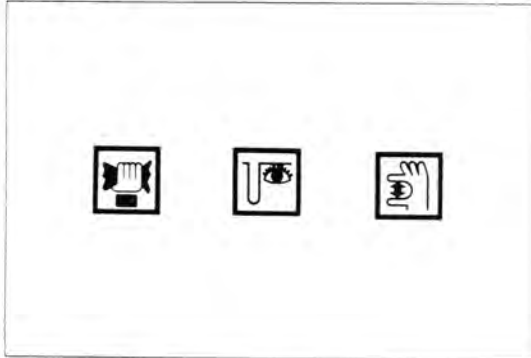


Loosen the staked parts of the nut, and remove the nut with SST.
SST [09330-00020]

—Note—

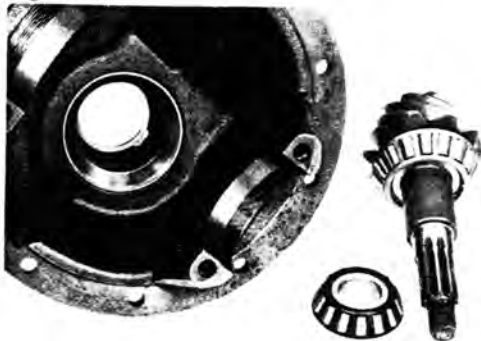
Hold the gear part of the drive pinion with hand, and remove the flange by tapping the pinion gear with a plastic hammer.

Fig. 7-50

**INSPECTION**

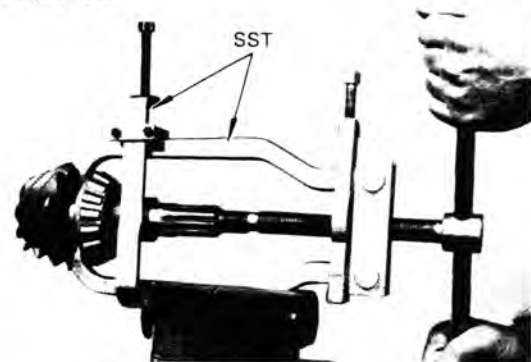
Wash the disassembled parts and inspect them on the following points.
Replace any part found defective.

Fig. 7-51

**Drive Pinion & Bearing**

1. Inspect the drive pinion gear teeth for damage, wear or burning.
2. Inspect the bearings for wear or damage.
3. Measure the shim and adjust washer thickness.

Fig. 7-52

**Replace The Bearing**

1. Remove the bearings with SST
SST [09950-20014]

—Note—

If there is not enough clearance for the SST to hook on, draw out the bearing slightly with a chisel.

Fig. 7-53



2. Remove the bearing outer race with SST
SST [09608-35013]

Fig. 7-54

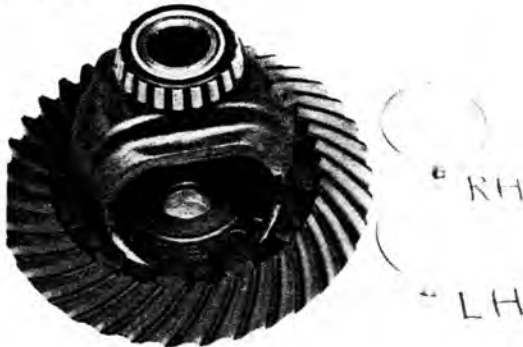


3. Install the new bearing outer race with SST.
SST [09608-35013]

—Note—

Make sure to reinstall the shim to the back side of outer race at gear side that was removed at disassembly.

Fig. 7-55



Differential Case, Side Bearing & Ring Gear

1. Inspect the ring gear teeth for damage, wear or burning.
2. Inspect the side bearings for wear or damage.
3. Inspect the case for cracks.

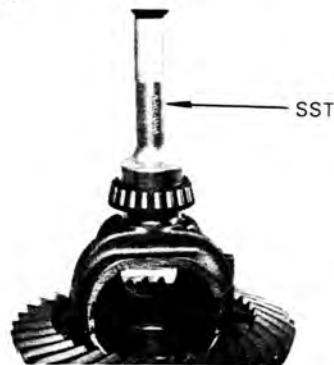
Fig. 7-56



Replace The Side Bearing

1. Remove the bearing with SST.
SST [09950-20014]

Fig. 7-57



2. Install the bearing with SST.
SST [09505-20010]

Fig. 7-58

**Replace The Ring Gear**

1. Loosen the attaching bolts uniformly, and remove the ring gear by tapping it with a plastic hammer.

Fig. 7-59



2. Heat the ring gear to 90 – 110°C (194 – 230°F) and quickly fit it into the case. Tighten the nuts at the specified torque.

Tightening torque:

10.5 – 12.0 kg-m
(76 – 86 ft-lb)

Fig. 7-60

**Pinion, Side Gear & Washer**

Inspect for wear or damage.

Fig. 7-61

Differential Adjusting Procedure

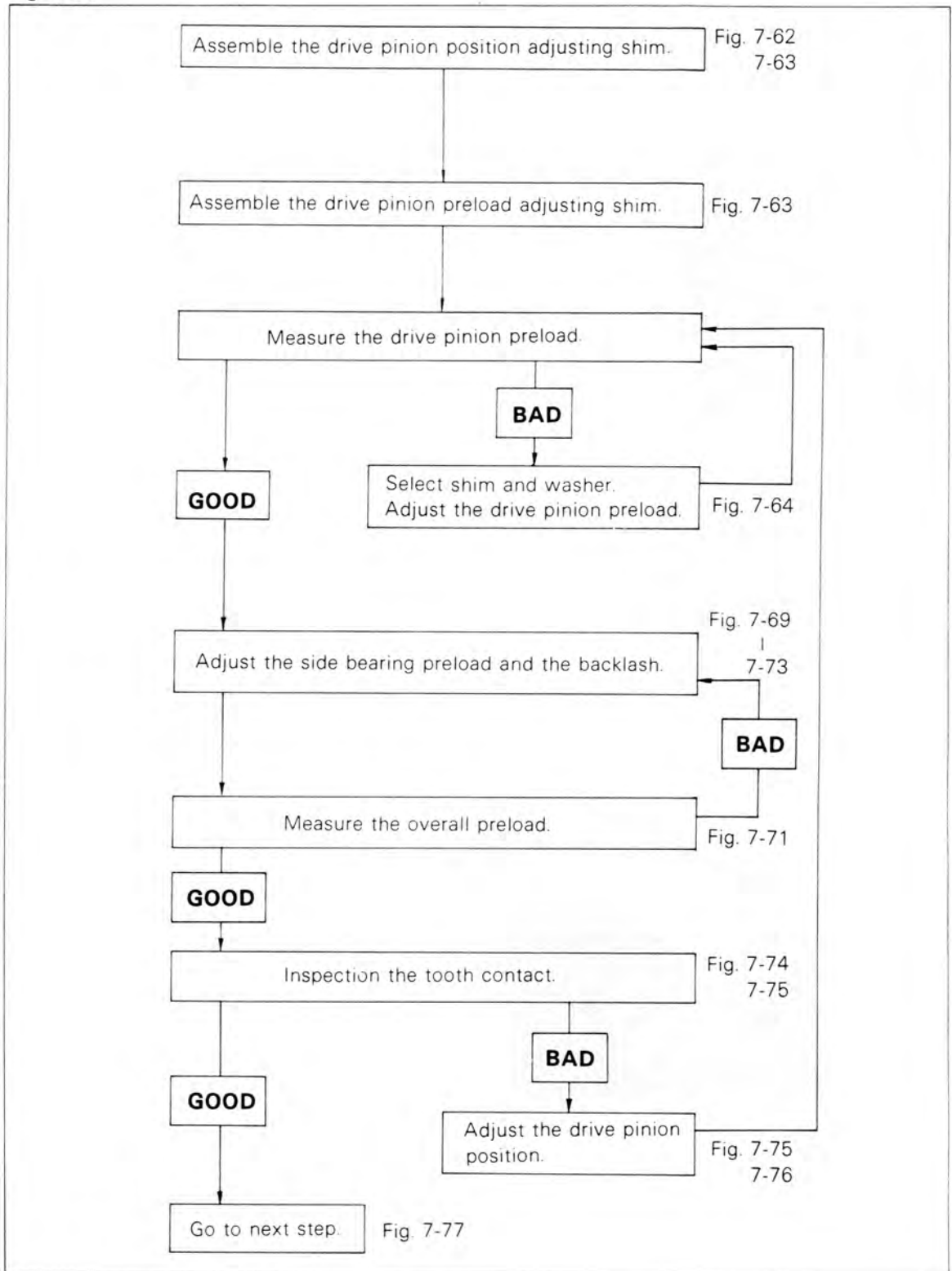
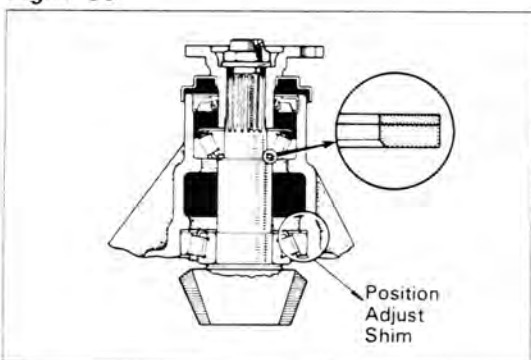


Fig. 7-62



Install the bearing to the drive pinion with
SST
SST [09506-35010]

Fig. 7-63



Install the drive pinion assembly to the
differential carrier as shown in the figure, and
tighten the nut at the specified torque.

**Tightening torque: 20.0 – 24.0 kg-m
(145 – 173 ft-lb)**

–Note–

1. Have the bearings lubricated with hypoid gear oil.
2. Install the same size shims and washer that were used before disassembly.
(for position and preload adjusting shim)

Fig. 7-64



Measure the preload.

Preload (starting):

New bearing

**19 – 26 kg-cm
(16.5 – 22.6 in.-lb)**

Reused bearing

**9 – 13 kg-cm
(7.8 – 11.3 in.-lb)**

If the preload is not within the specified limits,
correct by selecting suitable adjusting washer
and increasing or decreasing the number of
adjusting shims (limited to 4 shims)

Adjusting shim & washer thickness

Part No.	Thickness mm (in.)	Part No.	Thickness mm (in.)
90564-30035	0.25 (0.0098)	90560-30188	2.86 – 2.88 (0.1126 – 0.1134)
90560-30184	2.74 – 2.76 (0.1079 – 0.1087)	90560-30190	2.89 – 2.91 (0.1138 – 0.1146)
90560-30185	2.77 – 2.79 (0.1091 – 0.1098)	90560-30191	2.92 – 2.94 (0.1150 – 0.1157)
90560-30186	2.80 – 2.82 (0.1102 – 0.1110)	90560-30192	2.95 – 2.97 (0.1161 – 0.1169)
90560-30187	2.83 – 2.85 (0.1114 – 0.1122)	90560-30199	2.98 – 3.00 (0.1173 – 0.1181)

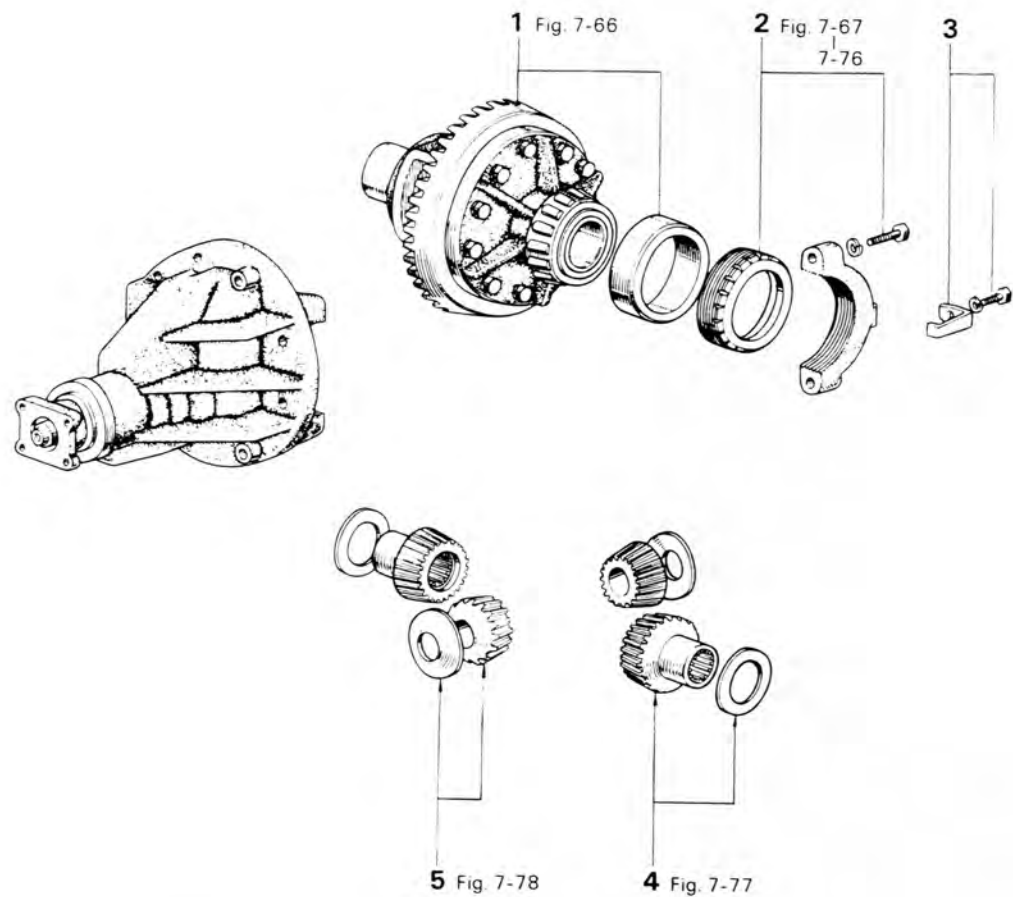
ASSEMBLY & ADJUSTMENT

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

Fig. 7-65

—Note—

Coat hypoid gear oil on the bearings, thrust washers, and similar parts before assembling them.



1. Ring Gear, Case & Bearing
2. Bearing Cap & Adjusting Nut
3. Adjusting Nut Lock

4. Thrust Washer & Side Gear
5. Thrust Washer & Pinion

Fig. 7-66

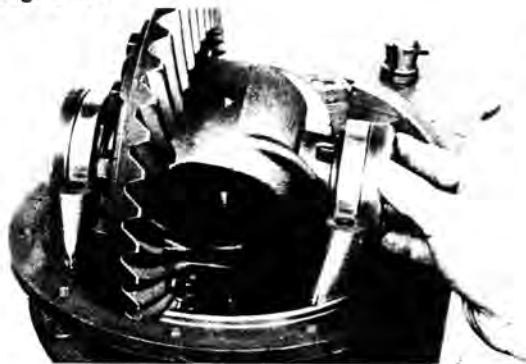


Assemble the bearing cups to the side bearings and install the differential case to the carrier.

—Note—

1. Use care not to intermix the left and right bearing cups.
2. Make sure that backlash has been provided between the ring gear and drive pinion.

Fig. 7-67



1. Assemble the adjusting nuts to their respective carriers with the threads fitted on properly.

Fig. 7-68

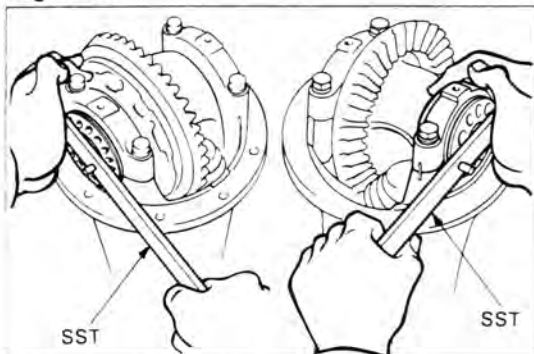


2. Screw in the two bearing cap bolts two or three turns and press down the bearing cap with hand.

—Note—

1. If the bearing cap does not fit tightly on the carrier, the adjusting nut threads are not fitting properly so that operations 1 and 2 above must be repeated.
2. Make sure that the bearing cap matchmarks are aligned with that on the carrier.

Fig. 7-69

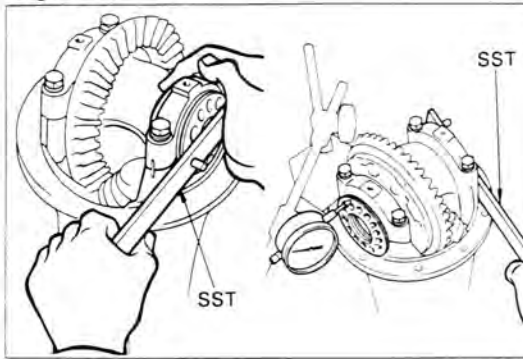


Adjust The Side Bearing Preload

SST [09504-00010]

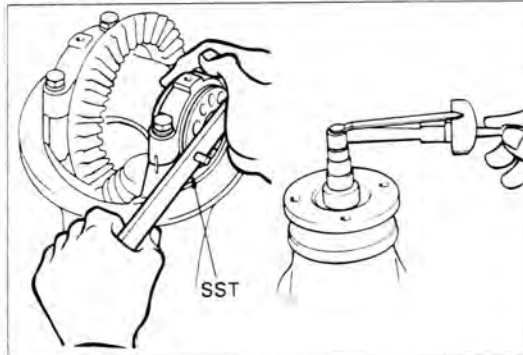
1. Tighten the bearing cap bolts until the spring washers are slightly compressed.
2. Tighten the adjusting nut on the ring gear side with SST so that the ring gear has a backlash of about 0.2 mm (0.008 in.).
3. With SST, tighten firmly the adjusting nut on the drive pinion side in order to snug down the bearing in the carrier.
4. Check to see if tightening of the adjusting nut creates ring gear backlash.

Fig. 7-70



5. With SST, sufficiently loosen the side bearing adjusting nut on the drive pinion side.
6. Set the adjusting nut to the zero preload position for the side bearing.
 - (1) Place a dial gauge on top of the bearing outer race.
 - (2) Tighten the other adjusting nut until the dial gauge pointer begins to move.

Fig. 7-71



7. Tighten adjusting nut 1 – 1.5 clicks from the zero preload position.
8. Measure the overall preload.

Preload (starting):

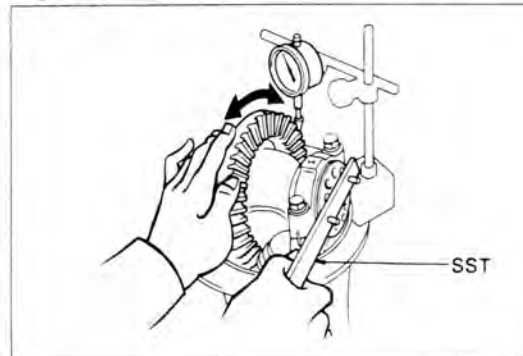
(For both new and reused bearing)

4 – 6 kg-cm

(3.5 – 5.2 in.-lb)

+ Drive pinion preload

Fig. 7-72



Adjust The Backlash

1. Adjust the backlash to the specified value with SST, turning the left and right adjusting nuts by equal amounts (such as loosening the left side one click and tightening the right side one click).

Backlash: 0.15 – 0.20 mm

(0.0059 – 0.0079 in.)

Fig. 7-73



2. Tighten the bearing cap bolts at the specified torque.

Tightening torque:

9.0 – 11.0 kg-m

(66 – 79 ft-lb)

Fig. 7-74

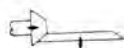
**Inspect The Tooth Contact**

1. Inspect the contact between the ring gear and drive pinion teeth by coating red lead on the ring gear teeth.

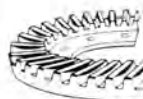
—Note—

1. Hold the companion flange steady with hand and rotate the ring gear, and inspect the contact pattern formed.
 2. If the teeth are not contacting properly, correct by method shown in the figure.
2. Install the adjusting lock nut on each bearing cap, and stake the companion flange nut

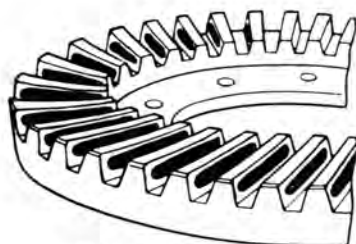
Fig. 7-75

(1) Heel Contact

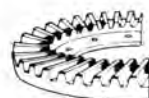
Select Adjusting Shim That Will Bring Drive Pinion Closer To Ring Gear

(3) Face Contact

Adjust By Same Method As In (1)



Proper Contact

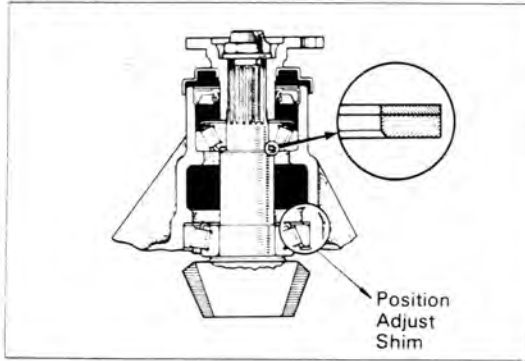
(2) Toe Contact

Select Adjusting Shim That Will Shift Drive Pinion Away From Ring Gear

(4) Flank Contact

Adjust By Same Method As In (2)

Fig. 7-76


Position
Adjust
Shim


Adjusting shim thickness

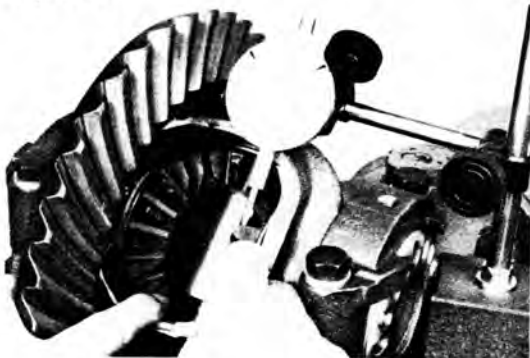
Part No.	Thickness	mm (in.)
90564-68001	0.25	(0.0098)
90564-68002	0.30	(0.0118)
90564-68003	0.35	(0.0138)
90564-68004	0.40	(0.0157)
90564-68005	0.45	(0.0177)

Fig. 7-77



Install the thrust washers and side gears.

Fig. 7-78



Measure the differential gear backlash.

1. Hold the pinion gear steady with hand, and measure the side gear backlash.

Backlash:

STD 0.02 – 0.20 mm
(0.0008 – 0.0079 in.)

2. If outside the specified limit, correct by selecting proper thickness side gear thrust washers.

—Note—

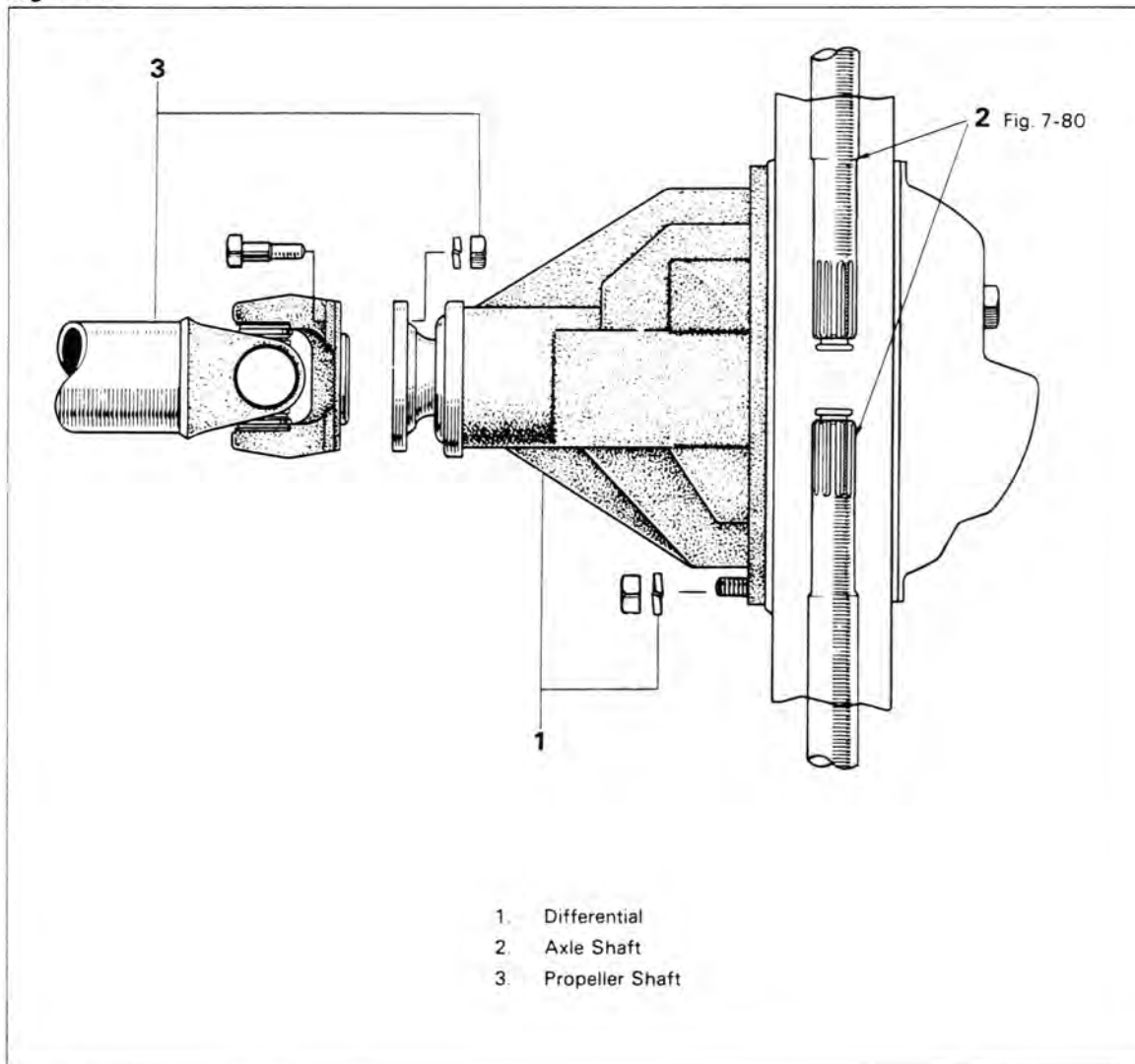
All efforts should be taken to use same thickness thrust washers at the left and right sides.

Thrust washer thickness

Part No.	Thickness	mm (in.)
41361-60010	1.55 – 1.65 (0.0610 – 0.0650)	
41361-60020	1.70 – 1.80 (0.0669 – 0.0709)	
41361-60030	1.85 – 1.95 (0.0728 – 0.0768)	
41361-60040	2.00 – 2.10 (0.0787 – 0.0827)	

INSTALLATION

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

Fig. 7-79**Fig. 7-80**

SEE
REAR AXLE SHAFT
(SEMI-FLOATING TYPE)
INSTALLATION SECTION
Fig. 7-13 to 7-17, 7-24

Install the axle shafts.

—Note—
Measurement of differential gear backlash
shall be excluded.

LIMITED SLIP DIFFERENTIAL DIFFERENTIAL CASE

DISASSEMBLY

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

Fig. 7-81

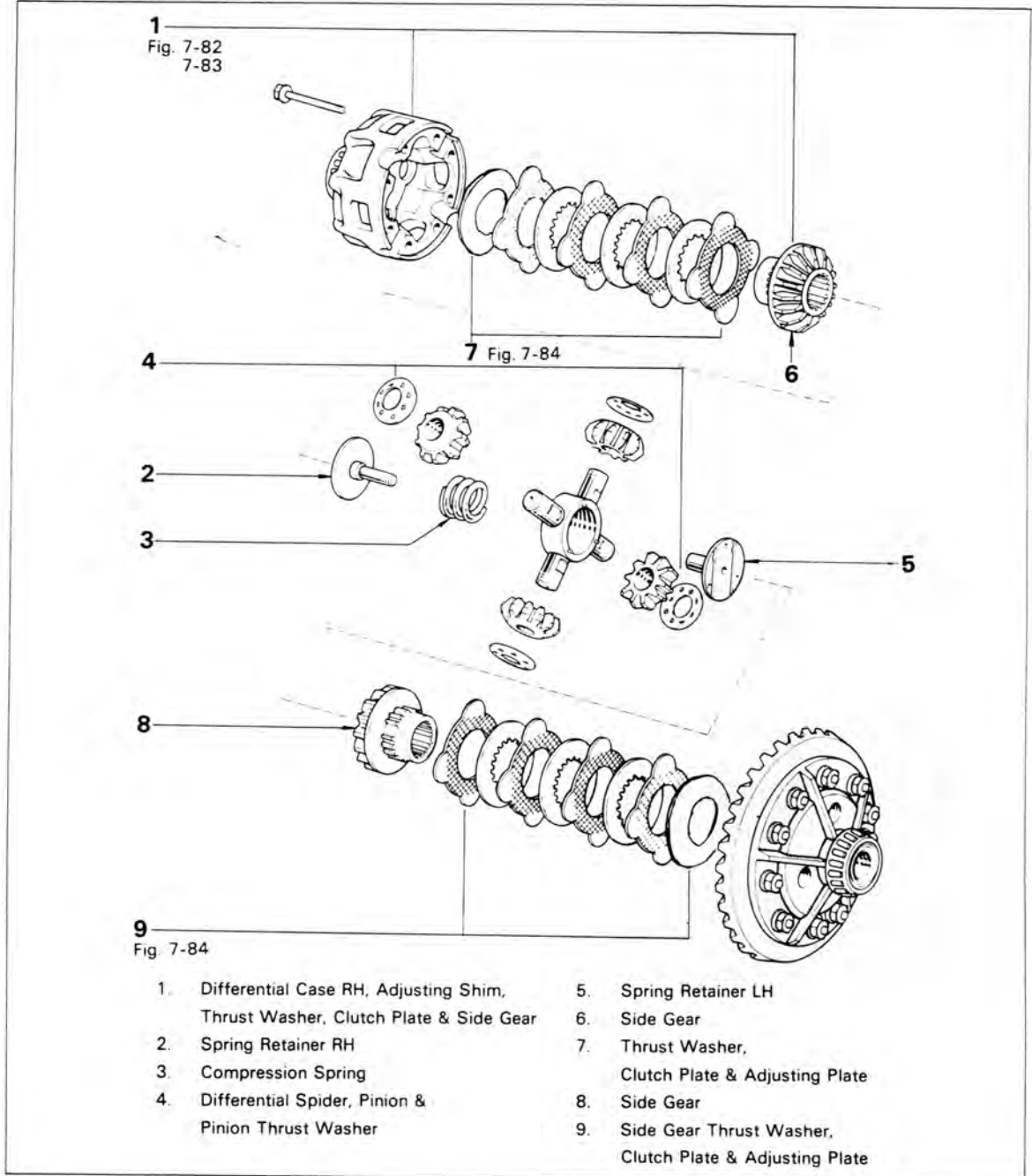


Fig. 7-82



Place matchmarks on the RH and LH differential case.

Fig. 7-83



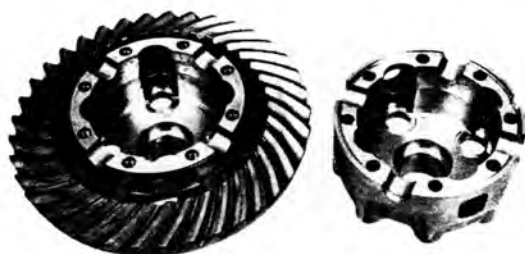
Loosen each bolt a little at a time, and in the sequence shown in the figure.

Fig. 7-84



Arrange the clutch plate, side gear and thrust washer in order.

Fig. 7-85



INSPECTION

Differential Case

Check for wear or damage.

Fig. 7-86



Defferential Spider, Pinion & Pinion Thrust Washer

Check for wear or damage.

Fig. 7-87



Spring Retainer & Compression Spring

Check for wear or damage.

Fig. 7-88

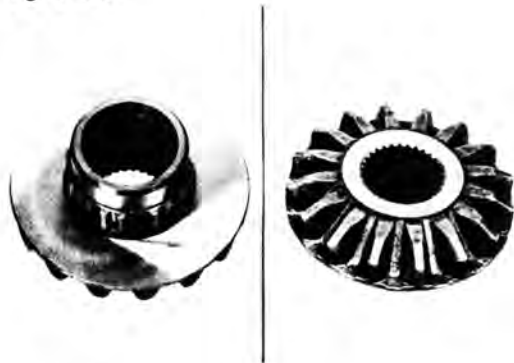


Measure the free length of the spring.

Free length:

Compression spring 38.6 mm
(1.520 in.)

Fig. 7-89

**Side Gear**

Check for wear or damage.

—Note—

If replacing the side gear, also replace the side gear thrust washer making contact with it.

Fig. 7-90

**Clutch Plate & Side Gear Thrust Washer**

Check for wear or damage.

Thrust washer thickness:**(Reference only)****Wear**

Limit 1.93 mm
(0.0760 in.)

Clutch plate thickness:**(Reference only)****Wear**

Limit 1.93 mm
(0.0760 in.)

Fig. 7-91

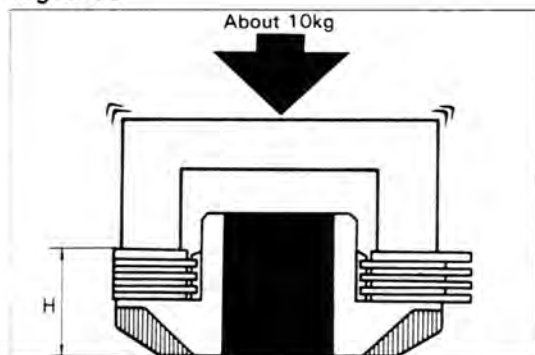
**Select The Adjusting Shim**

1. Assemble the side gear thrust washer and clutch plate on the side gear.

—Note—

Do not assemble the adjusting shim.

Fig. 7-92



2. Using a suitable tool as shown, press down with about 10 kg (22 lb) of pressure, and measure the dimension H.

Fig. 7-93



3. Select the adjusting shim thickness.
Adjusting shim thickness T
 $T = 31.02 - H$

4. Select a proper adjusting shim according to the following table.

Shim thickness

Part No.	Thickness	mm (in.)
90564-54001	0.20	(0.0079)
90564-54002	0.25	(0.0098)
90564-54003	0.30	(0.0118)
90564-54004	0.35	(0.0138)

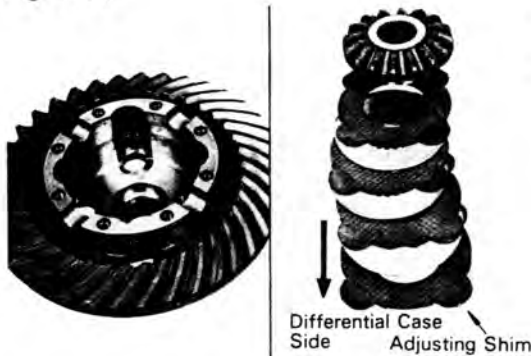
Fig. 7-94

SEE
SELECT THE SIDE GEAR
THRUST WASHER
Fig. 7-91 to 7-93



5. In the same manner, select the another thrust washer for the others.

Fig. 7-95



6. Assemble the following parts in the case.
 - (1) Adjusting shim
 - (2) Thrust washer
 - (3) Clutch plate
 - (4) Thrust washer
 - (5) Clutch plate
 - (6) Thrust washer
 - (7) Clutch plate
 - (8) Thrust washer
 - (9) Side gear

Fig. 7-96



7. Install the spring retainer, pinion and thrust washer
8. Secure the side gear and measure the backlash while pushing in the spring retainer.

Backlash: 0.02 – 0.24 mm
(0.0008 – 0.0094 in.)

—Note—

1. Measure at all four locations.
2. Measure the others in the same manner.
3. If one of the backlashes are not within specification, change that pinion gear with another and measure again.

ASSEMBLY

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

Fig. 7-97

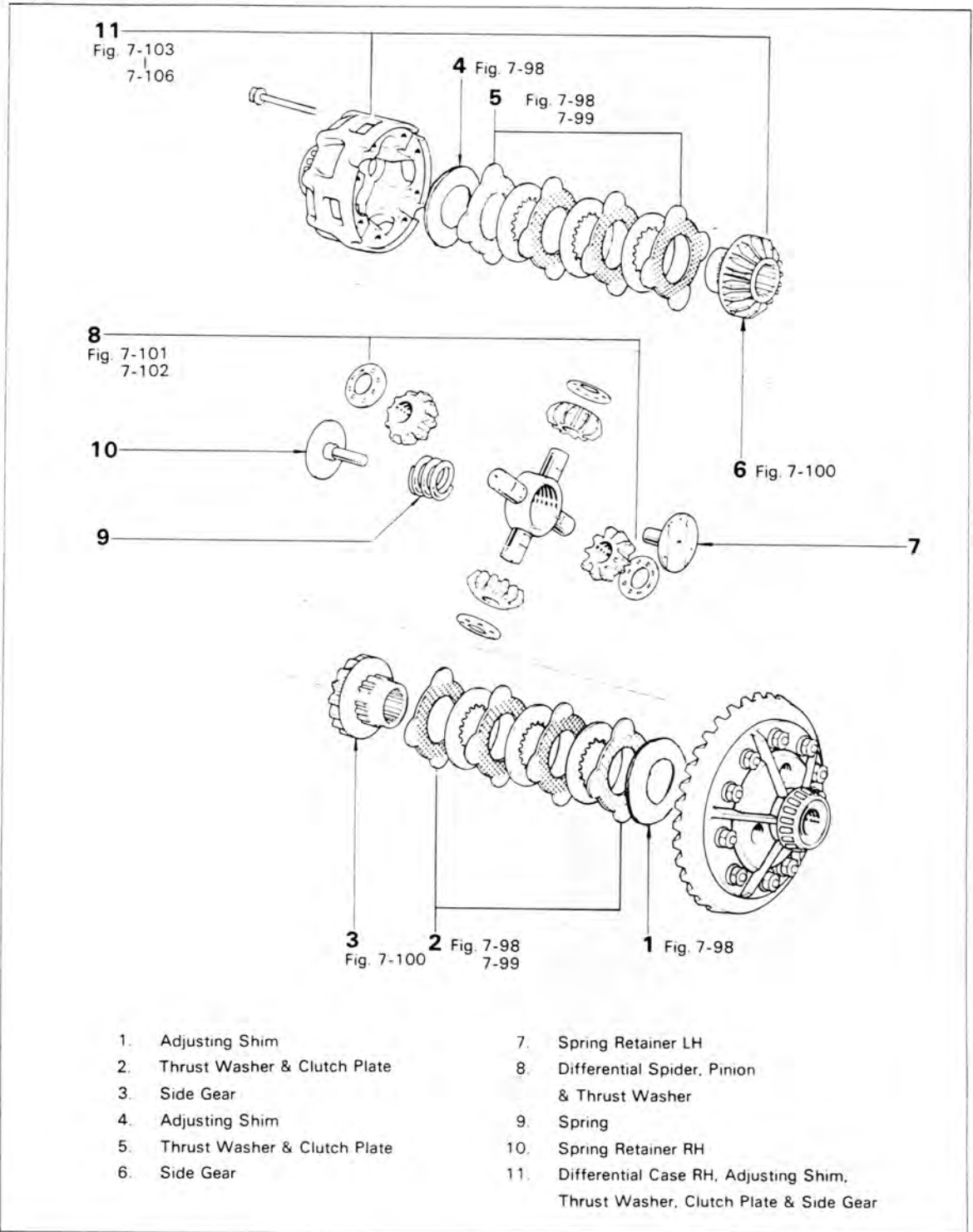
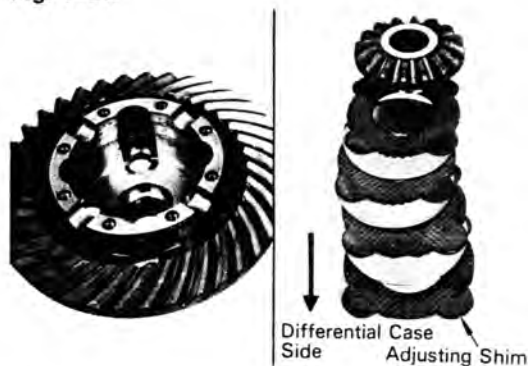


Fig. 7-98



Assemble the thrust washer with the surface without an oil groove facing the case.

—Note—

Coat the thrust washer with hypoid gear oil LSD.

Fig. 7-99



Assemble the clutch plate and thrust washer.

—Note—

Coat the clutch plate and thrust washer with hypoid gear oil LSD.

Fig. 7-100



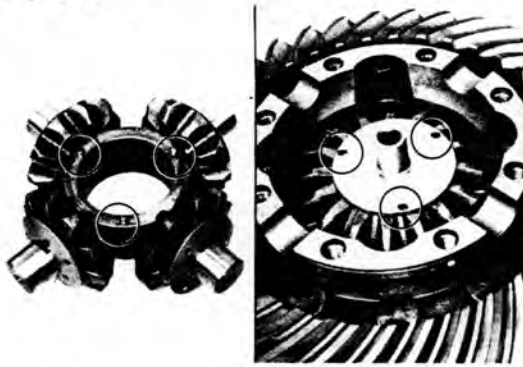
Coat the side gear with hypoid gear oil LSD.

Fig. 7-101



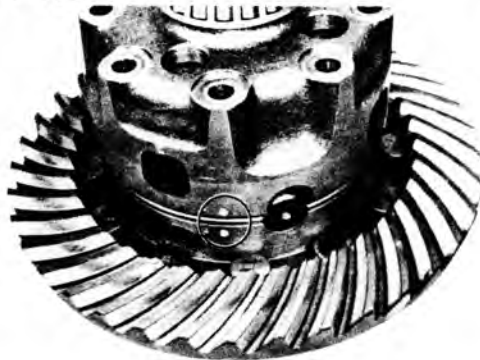
Coat the pinion gear with hypoid gear oil LSD.

Fig. 7-102



Align the protrusion of the spider and hole of the spring retainer.

Fig. 7-103



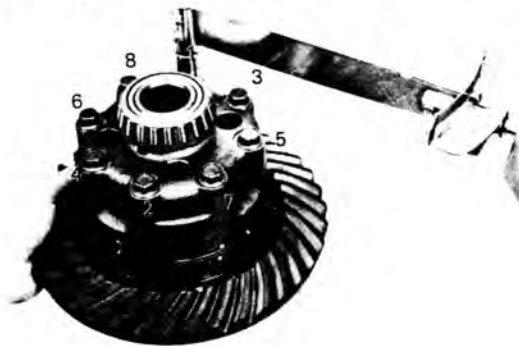
Align the matchmarks and assemble the differential cases.

Fig. 7-104



Mesh the side gear and pinion gears.

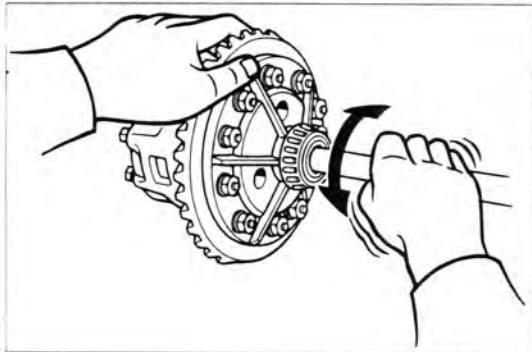
Fig. 7-105



Tighten each bolt a little at a time to the specified torque, in the sequence shown in the figure.

Tightening torque: 3.9 – 5.7 kg-m
(29 – 41 ft-lb)

Fig. 7-106



Turn the side gears with axle shaft or other means and check to see that they turn smoothly.

—Note—

Reselect thrust washer if side gear does not turn smoothly.

REAR SUSPENSION COMPONENTS

Fig. 7-107

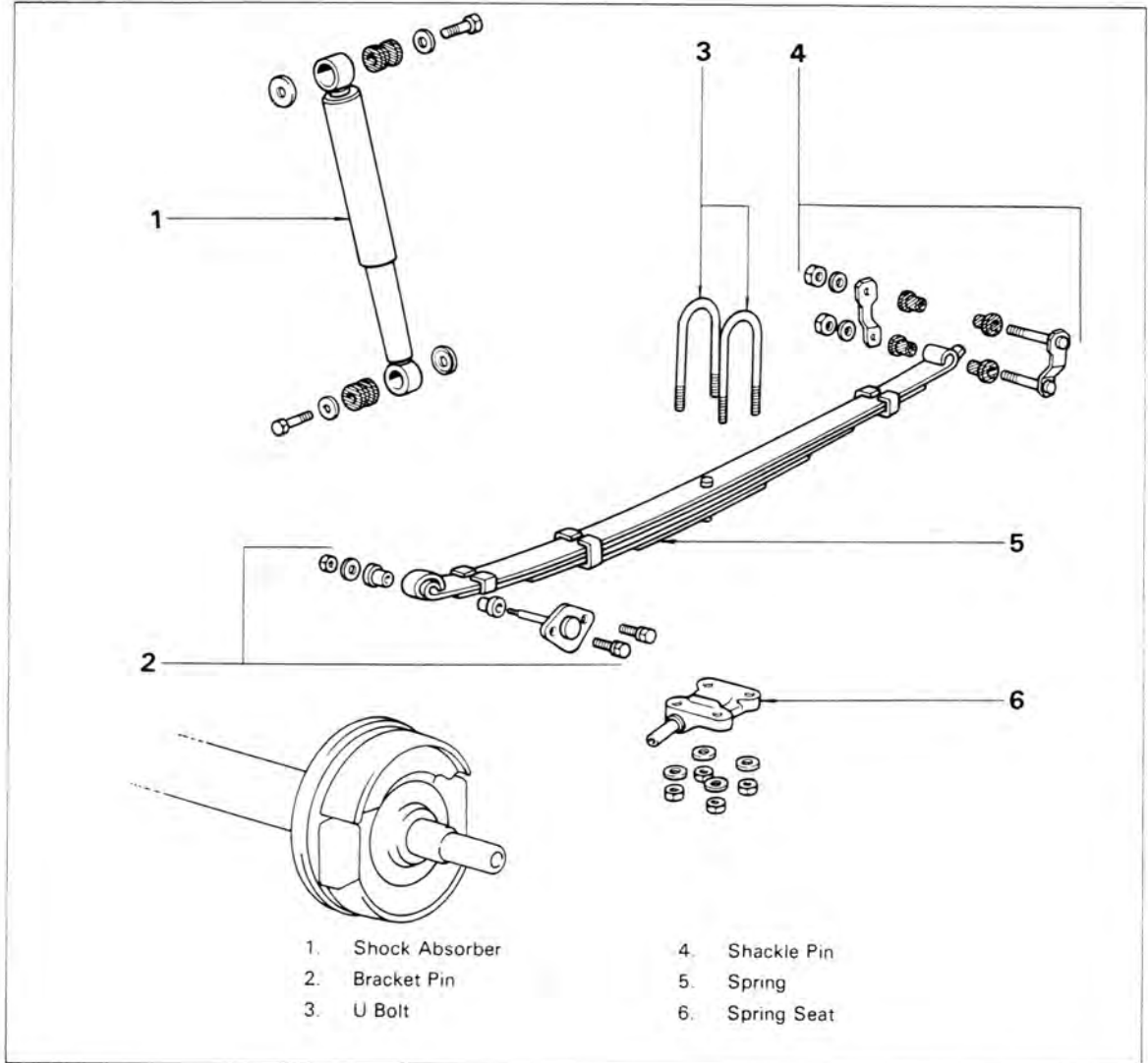


Fig. 7-108

SEE
FRONT SUSPENSION
SECTION
Fig. 6-88 to 6-118

Disassemble and assemble the rear suspension.