

FRONT AND REAR AXLES

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OUTLINE

SPECIFICATIONS

Item		12A powered vehicle		13B powered vehicle		
Axle housing		Banjo type				
Axle shaft support		Semi-floating type				
Differential	Type	Standard	LSD	Standard	LSD	
	Reduction gear		Hypoid gear			
	Reduction ratio		3.909		4.076	
	Differential gear		Straight-bevel gear			
	Number of teeth	Ring gear	43		53	
		Drive pinion	11		13	
		Side gear	14		16	
		Pinion gear	10		10	
Oil	Type	API service GL-5: atmospheric temp. -18°C (0°F) or lower... SAE 80W atmospheric temp. -18°C (0°F) or higher... SAE90				
	Amount	1.2 liters (1.3 U.S. qts)	1.6 liters (1.7 U.S. qts)	1.2 liters (1.3 U.S. qts)	1.6 liters (1.7 U.S. qts)	

57U09X-067

TROUBLESHOOTING GUIDE

Front axle

Problem	Possible Cause	Remedy	Page
Excessive or irregular tire wear	Worn wheel bearing(s) or improperly adjusted preload Malfunction of wheels and tires	Replace or adjust See section 12	9-4, 6
Steering wheel vibration	Worn wheel bearing(s), or improperly adjusted preload Malfunction of wheels and tires	Replace or adjust See section 12	9-4, 6
Uneven (one-sided) braking	Worn wheel bearing(s), or improperly adjusted preload Malfunction of wheels and tires	Replace or adjust See section 12	9-4, 6
Steering wheel doesn't return properly, or pulls to one side (pulls to either left or right while vehicle is moving on a level road surface)	Worn front wheel bearing(s), or improperly adjusted preload Malfunction of wheels and tires	Replace or adjust See section 12	9-4, 6
General driving instability	Worn wheel bearing(s), or improperly adjusted preload Malfunction of wheels and tires	Replace or adjust See section 12	9-4, 6
Excessive steering wheel play	Improperly adjusted front wheel bearing preload Malfunction of wheels and tires	Adjust See section 12	9-6

Axle shaft and axle casing

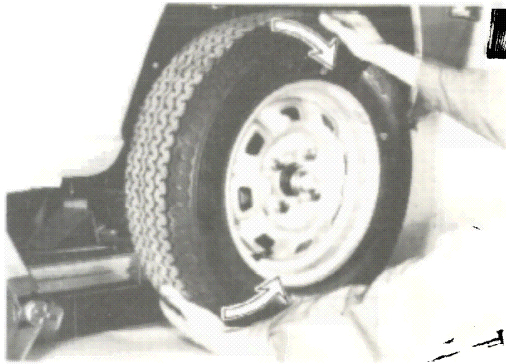
Problem	Possible Cause	Remedy	Page
Abnormal noise	Bent casing	Replace	9-10
	Bent axle shaft	Replace	9-10
	Worn or damaged axle shaft bearing	Replace	9-10
	Loose bearing collar	Replace	9-10
	Worn axle shaft spline	Replace	9-10
Oil leakage	Worn or damaged oil seal	Replace	9-10
	Cracked casing	Replace	9-10

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Differential

Problem	Possible Cause	Remedy	Page
Abnormal noise	Insufficient oil	Add oil	9-4
	Incorrect Lubricant oil	Replace	9-4
	Improperly adjusted backlash of final gear	Adjust	9-24
	Poor contact of teeth of final gear	Adjust	9-25
	Worn or damaged side bearing	Replace	9-16
	Worn or damaged final gear	Replace	9-16
	Worn or damaged drive-pinion bearing	Replace	9-16
	Worn or damaged pinion and side gear	Replace	9-16
	Seizure of side gear and case	Replace	9-16
	Worn spline of side gear	Replace	9-16
	Worn pinion shaft	Replace	9-16
	Loose companion-flange nut	Tighten	9-12
	Worn side-gear thrust washer	Replace	9-12
	Improperly adjusted side-bearing preload	Adjust	9-24
	Improperly adjusted drive-pinion-bearing preload	Adjust	9-19
Worn spline of output shaft	Replace	9-10	
Heat build-up	Insufficient oil	Add oil	9-9
	Insufficient backlash of each gear	Adjust	9-20, 24
	Excessive bearing preload	Adjust	9-19
Oil leakage	Excessive oil	Remove oil, leaving only the prescribed amount	9-10
	Clogged air breather	Repair	9-12, 16
	Poorly tightened differential carrier; malfunction of oil seal	Tighten or repair	9-12, 16
	Worn or damaged oil seal	Replace	9-16

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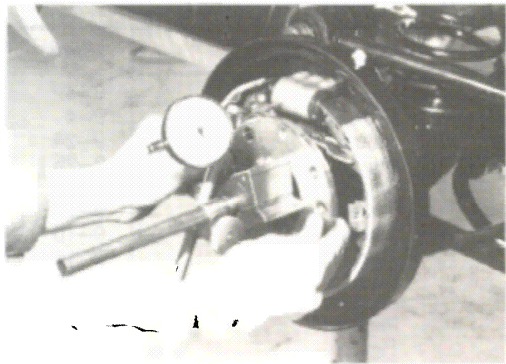


57U12X-005

INSPECTION

CHECKING FRONT WHEEL BEARING

1. Raise the front end of the vehicle until the wheels clear the ground and support it with stand.
2. Grip the tire and shake it sideways. If considerable play is noticed, this indicates that the bearings are rough.

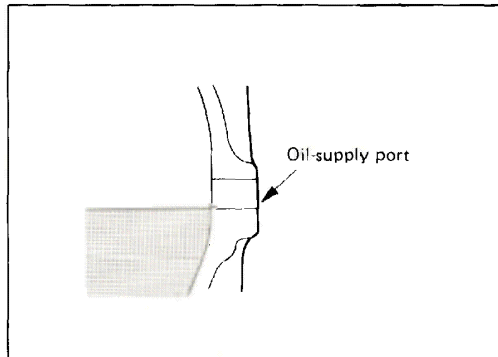


57U09X-002

CHECKING REAR WHEEL BEARING PLAY

1. After jacking up the rear of the vehicle and supporting it with safety stands, remove the wheel and brake drum.
2. Mount a dial gauge and push and pull the shaft, and measure the longitudinal play of the shaft.

Standard side play: 0 ~ 0.1 mm (0 ~ 0.004 in)



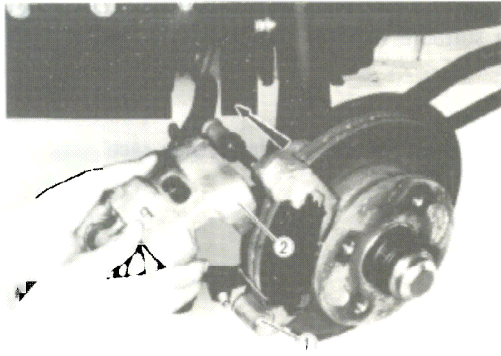
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CHECKING DIFFERENTIAL OIL LEVEL

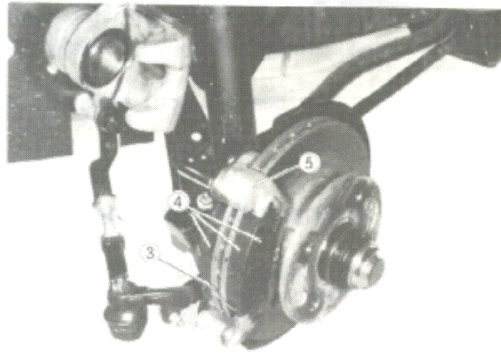
Remove the oil-supply port plug, and check whether the oil level is near the port.

If the level is below the specified amount, add oil of the specified type.

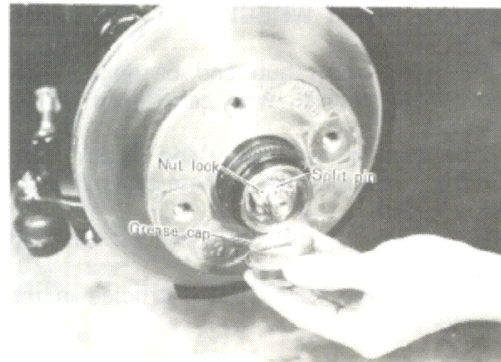
FRONT WHEEL HUB AND BEARINGS



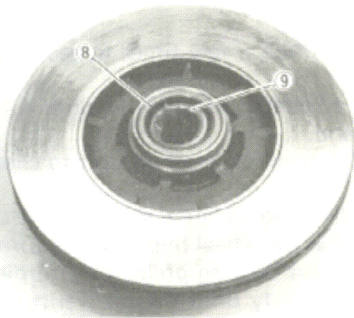
57U12X-006



57U12X-007



57U12X-008



57U12X-009

REMOVAL

Raise the front end of the vehicle and support it with stands, and remove the front wheel.

Remove the following parts.

1. Caliper attaching bolt (lower side)
2. Caliper

Hang the caliper assembly to the coil spring with a piece of wire.

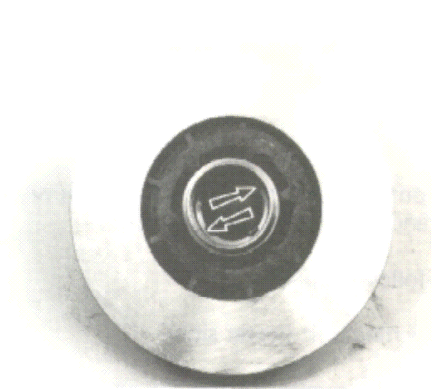
Never allow the caliper assembly to hang from the brake hose, as damage may occur.

3. Anti-rattle spring
4. Disc brake pads and shims
5. Caliper bracket

6. Grease cap, split pin, nut lock and adjusting nut
7. Washer and outer bearing

8. Grease seal
9. Inner bearing

9 FRONT WHEEL HUB AND BEARINGS, REAR WHEEL BEARINGS

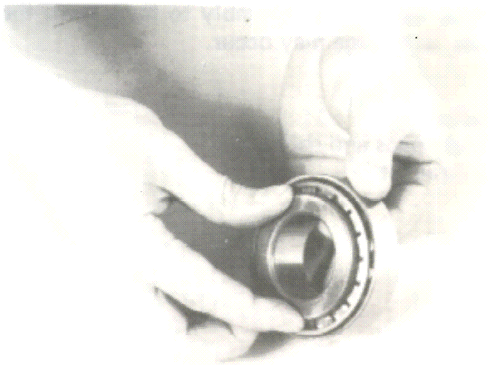


47U12X-009

To remove the bearing outer race, drive out the race using a suitable drift in the slots provided for this purpose.

Caution

Do not remove the bearing outer race unless it needs replaced.



57U12X-010

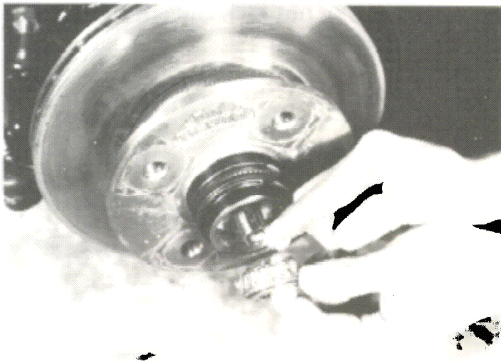
INSPECTION

1. Clean the lubricant off the inner and outer bearing outer races with solvent and inspect the outer races for scratches, pits, excessive wear and other damage.
2. Thoroughly clean the bearing with solvent and dry it thoroughly.

Caution

Do not spin the bearings with compressed air.

3. Inspect the bearing rollers for damage, wear and other defects. Replace the bearing if necessary.
4. Clean the spindle and inside of the hub with solvent to remove all old grease.

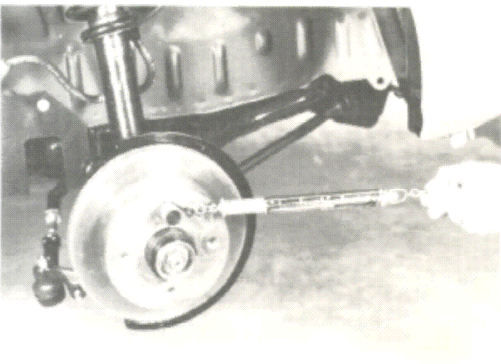


57U12X-011

INSTALLING FRONT WHEEL HUB AND BEARING

Install the front wheel hub and bearings in the reverse order of removal, with care taken on the following points.

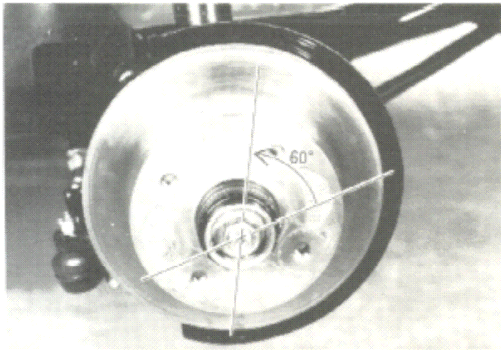
1. Clean the bearings thoroughly and repack them with lithium grease (lithium base NLGI No. 2)
Do not overpack.
2. Fill the hub cavity with lithium grease (lithium base NLGI No. 2).
3. Adjust the bearing preload, as instructed in the next paragraph.



57U12X-012

ADJUSTING FRONT WHEEL BEARING

1. Tighten the adjusting nut to **25 ~ 30 N·m (18 ~ 22 ft·lb)**.
2. Turn the wheel hub a few times to seat the bearing properly.
3. Loosen the adjusting nut slightly until it can be turned by hand.
4. Hook a spring scale on the hub bolt to check the oil seal drag.
5. Pull the spring scale squarely and take the oil seal drag value when the wheel hub starts to turn.
6. Adjust the wheel bearing preload by turning the adjusting nuts slowly until the oil seal drag value determined in step 5 plus **0.45 ~ 0.65 kg (0.99 ~ 1.43 lb)** is obtained.



47U12X-013

Caution

Before checking the oil seal drag and preload, turn the wheel hub a few times.

7. Fit the nut lock onto the adjusting nut. Align the nut lock slots with the spindle hole and fit a new split pin. Install the grease cap.

Caution

Always tighten the adjusting nut to next castellation if necessary to fit the split pin.

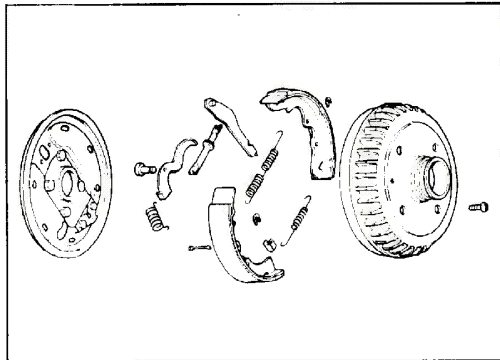
REAR AXLE SHAFT

REMOVAL

Raise the rear end of the vehicle and support the rear axle housing with stands.

Vehicles equipped with rear drum brake.

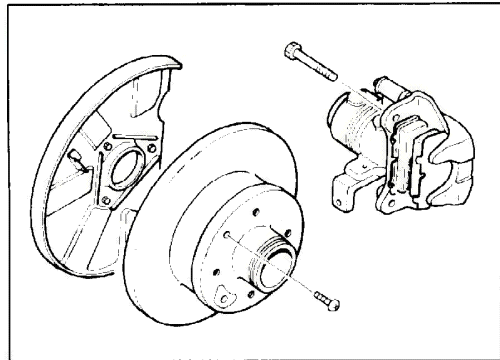
1. Remove the wheel.
2. Remove the following parts.
 - (1) Brake drum
 - (2) Return spring
 - (3) Brake shoe assembly
 - (4) Backing plate attaching nuts
 - (5) Parking brake cable clip
 - (6) Parking brake cable
 - (7) Brake pipe



57U09X-003

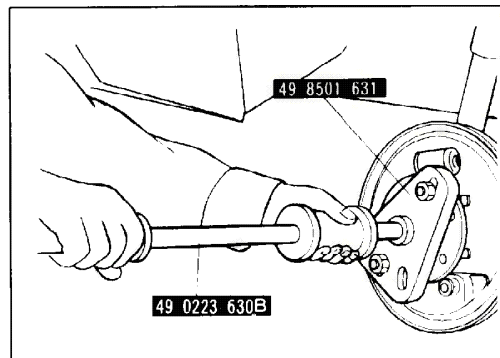
Vehicles equipped with rear disc brake.

1. Remove the wheel.
2. Remove the following parts.
 - (1) Bolt
 - (2) Brake caliper
 - (3) Dust cover attaching nuts



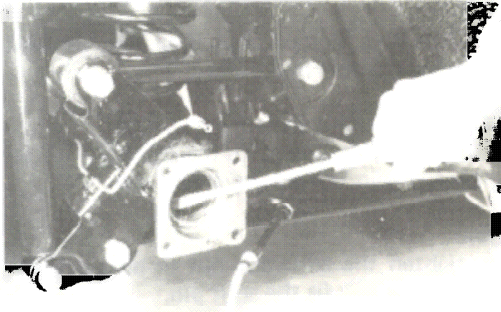
57U09X-004

3. Remove the axle shaft and backing plate assembly by using the **rear axle shaft puller** (49 0223 630B) and **rear axle shaft puller attachment** (49 8501 631).



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9 REAR AXLE SHAFT

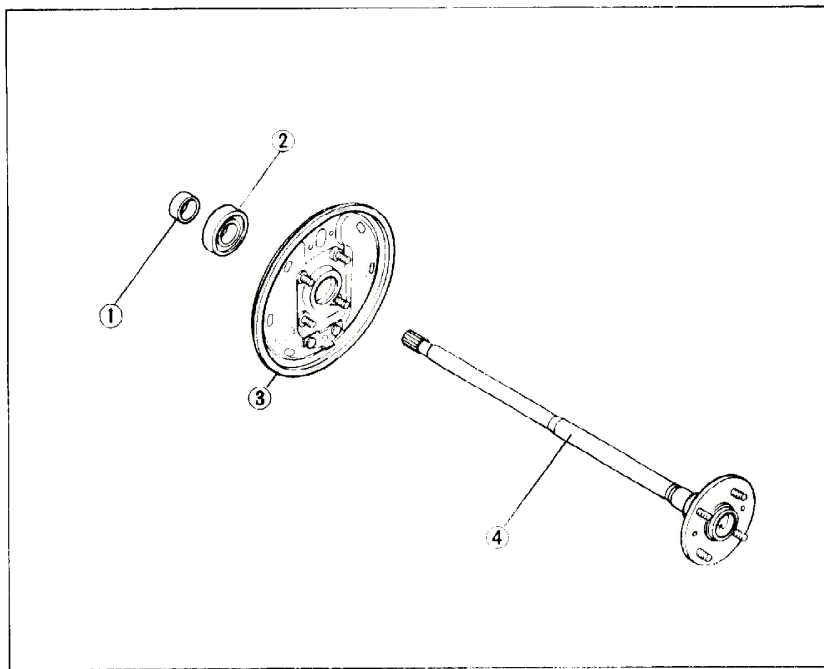


47U09X-007

4. Remove the oil seal.
Unless it needs replaced, do not remove the oil seal.

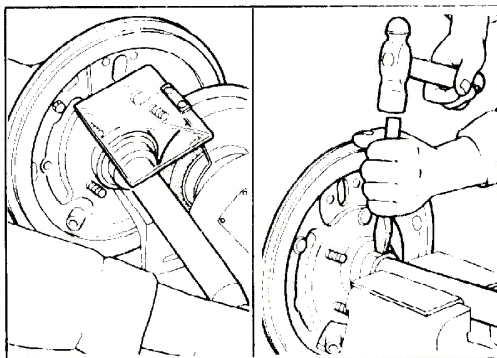
DISASSEMBLY AND ASSEMBLY

Disassemble in the numbered order shown in the figure. Assembly is the reverse order of disassembly.



- 1 Bearing collar
- 2 Wheel bearing
- 3 Back plate
- 4 Rear-axle shaft

47U09X-008



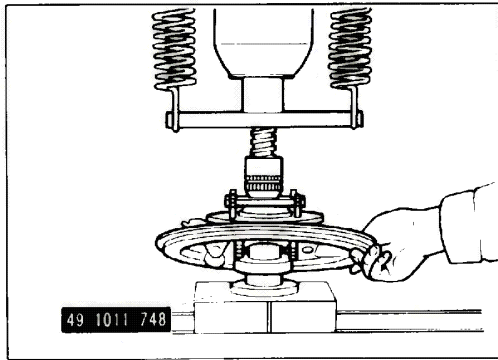
47U09X-009

Bearing collar

Use a grinder to grind one part of the bearing collar until only 0.5 mm (0.020 in) remains, and then break that part with a chisel. The collar can then be removed from the shaft.

Caution

Be careful not to damage the shaft when using the grinder and chisel.



57U09X-010

Installation is in the following order:

1. Thoroughly clean the bearing collar, and the part of the axle shaft where it will be installed, with clean rags.

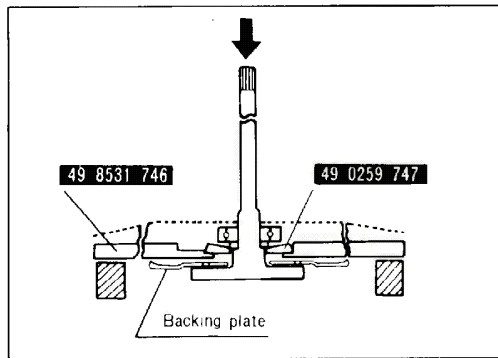
Caution

Be very careful never to allow oil or grease to get onto the collar or shaft.

2. Press-fit the new bearing collar to the shaft with the **bearing separator attachment** (49 1011 748).

Caution

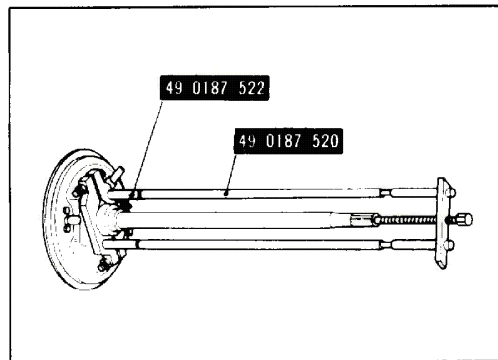
If the press-fit force of the collar is 2.7 tons (5,952 lb) or less, replace the collar or the shaft.



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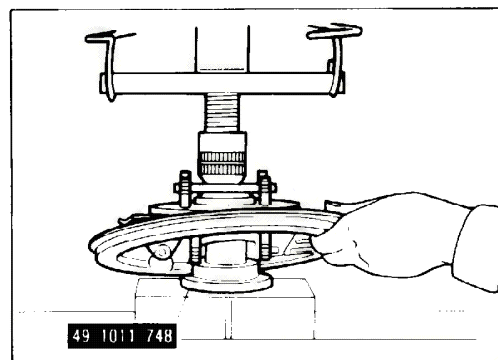
Wheel bearing

Using the **bearing separator** (49 8531 746) and **bearing separator attachment** (49 0259 747), support the spacer and press the axle shaft out of the bearing.



47U09X-012

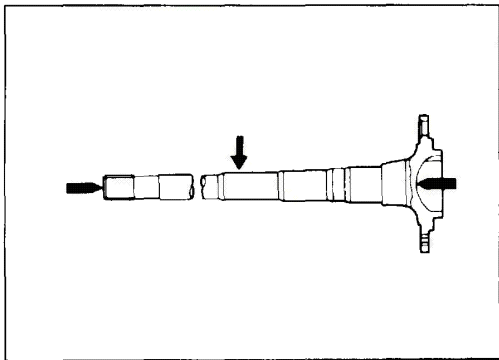
If the **bearing separator** (49 8531 746) and **bearing separator attachment** (49 0259 747) can not available, use the **bearing puller** (49 0187 520).



57U09X-013

Press-fit the bearing to the shaft with the **bearing separator attachment** (49 1011 748).

9 REAR AXLE SHAFT



47U09X-014

INSPECTION

Check each of the following parts for the items noted. If any problem is found, replace the part.

Rear-axle shaft

Bent or cracked

Deflection limit (at center): 1.5 mm (0.0591 in)

Worn or damaged spline

Back plate

Deformed, cracked, damaged

Wheel bearing

Check play and rotation.

Caution

a) Rotate the bearing while applying force from the center toward the outer part.

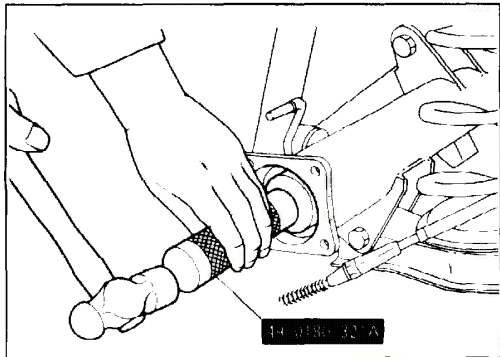
b) Do not clean with gasoline or similar substances.

Oil seal

Worn or damaged lip.



57U09X-015



47U09X-016

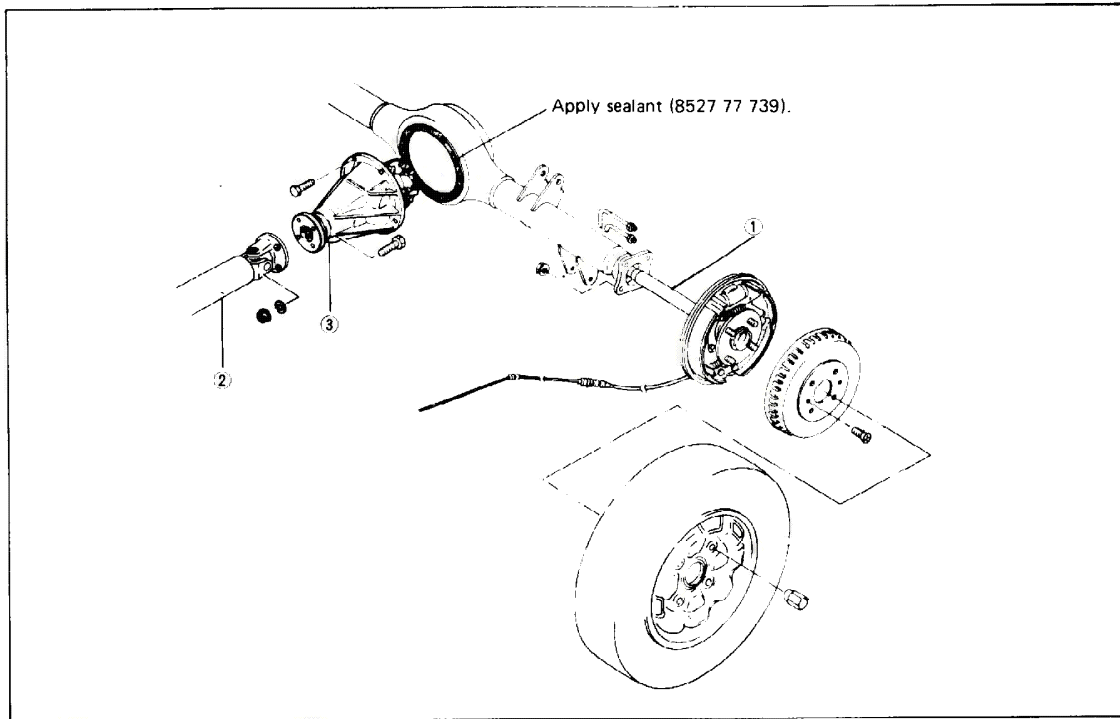
INSTALLATION

1. Install the oil seal into the axle housing with **main drive gear installer (49 0180 321A)**.
2. Apply the grease to oil seal lip.
3. Install the rear axle shaft assembly in the reverse order of removing, being careful not to damage the oil seal lip.

DIFFERENTIAL

REMOVAL AND INSTALLATION

After jacking up the rear of the vehicle and supporting it with safety stands, drain the differential gear oil, and remove the parts in the numbered order shown in the figure. Installation is the reverse order of the removal.

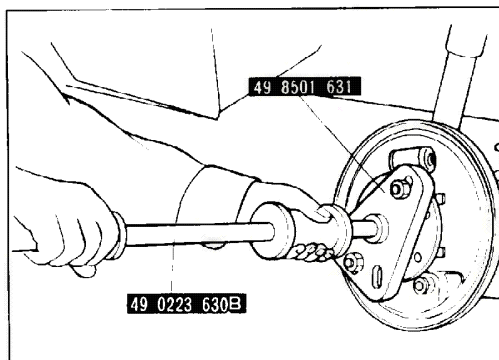


47U09X-017

- 1 Rear axle shaft (Refer to page 9-5)
- 2 Propeller shaft (Refer to page 8-3)
- 3 Rear axle

After installation:

1. Bleed air from the brake line.
2. Supply the specified amount and quality of differential gear oil.



47U09X-018

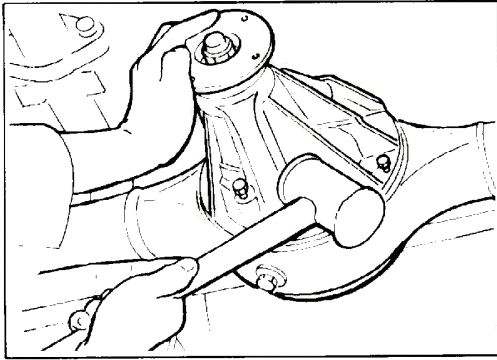
Back plate and rear-axle shaft assembly

Pull out the back plate and rear-axle shaft assembly from the axle casing by using the **rear axle shaft puller** (49 0223 630B) and the **rear axle shaft puller attachment** (49 8501 631), as shown in the figure.

Caution

Be careful, when removing and installing the shaft, not to scratch the oil seal.

9 DIFFERENTIAL

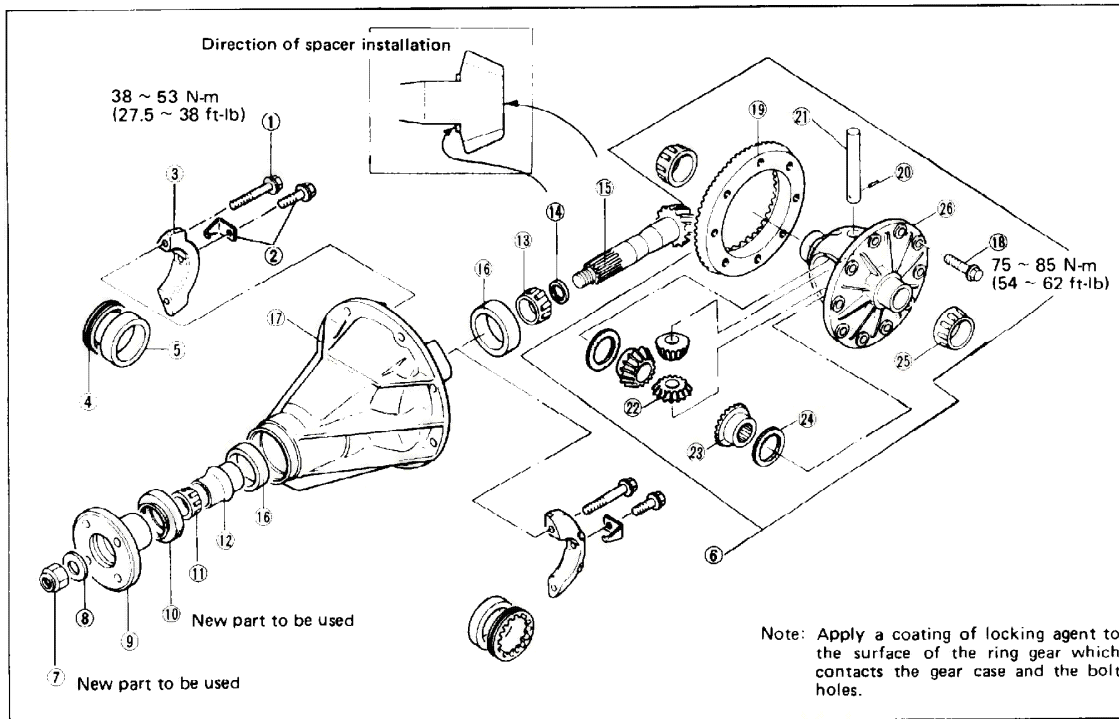


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Differential

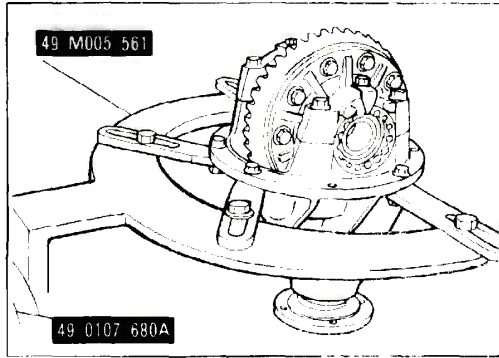
To prevent the differential from dropping, leave the two bolts which is tighten loosely. Then hit the differential carrier with a wooden hammer.

DISASSEMBLY



47U09X-020

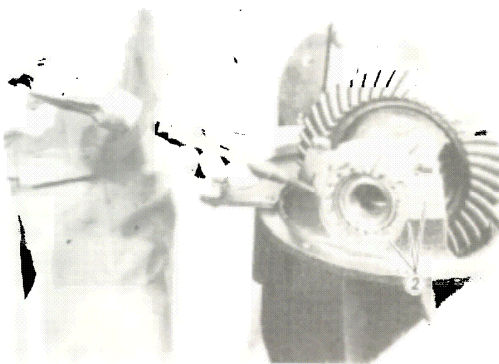
- | | | |
|------------------------------|------------------------|-------------------|
| 1 Bolts | 10 Oil seal | 19 Ring gear |
| 2 Lock plates | 11 Front bearing | 20 Knock pin |
| 3 Bearing caps | 12 Collapsible spacer | 21 Pinion shaft |
| 4 Adjustment screws | 13 Rear bearing | 22 Pinion gears |
| 5 Bearing outer race | 14 Spacer | 23 Side gears |
| 6 Differential gear assembly | 15 Drive pinion | 24 Thrust washers |
| 7 Lock nut | 16 Bearing outer races | 25 Bearings |
| 8 Washer | 17 Carrier | 26 Gear case |
| 9 Companion flange | 18 Bolts | |



47U09X-021

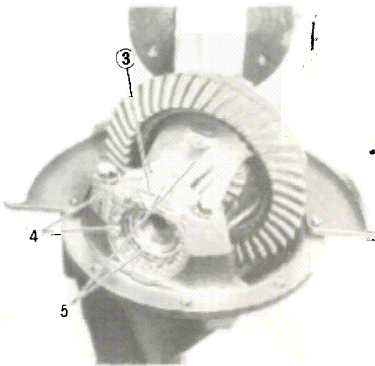
Differential gear assembly

1. Mount the rear axle assembly on the **engine stand** (49 0107 680A) and the **attachments** (49 0419 561 and 49 0223 561A) or **differential carrier hanger** (49 M005 561).



47U09X-022

2. Place a mark on one of the bearing caps so that the left and right caps won't get mixed. Use this mark for matching at the time of assembly.

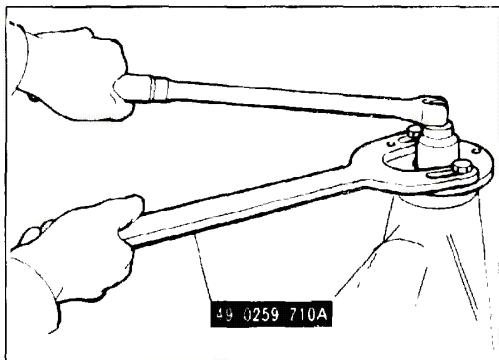


47U09X-023

3. Remove the adjuster lock plates.
4. Remove the bearing caps and adjusters.
5. Remove the differential assembly and bearings.

Caution

Make certain that each bearing outer race remains with its respective bearing.

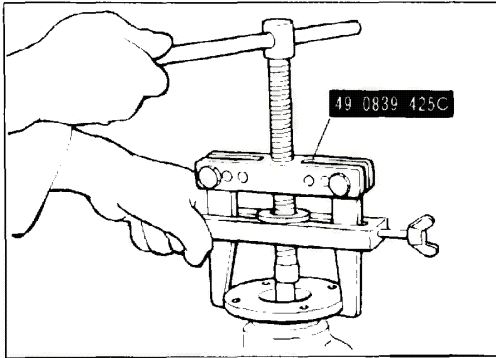


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Drive pinion

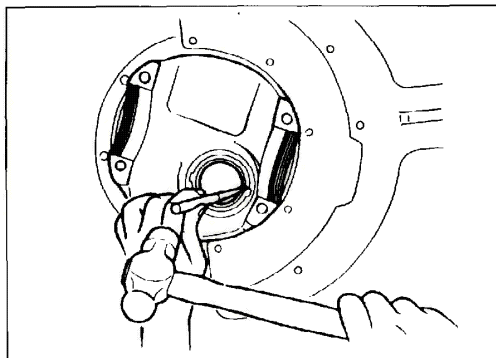
1. Hold the companion flange with the **coupling flange holder** (49 0259 710A) and remove the drive pinion nut.

9 DIFFERENTIAL



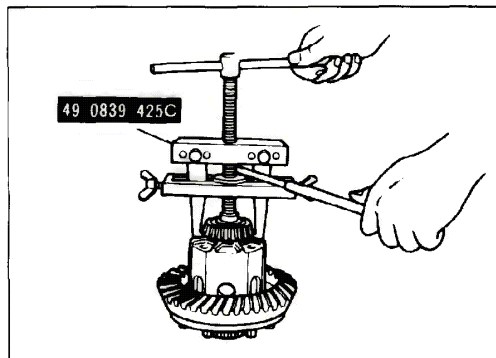
47U09X-025

2. Pull the companion flange out by using the parts included in the **bearing puller set** (49 0839 425C).
3. Remove the drive pinion, spacer, rear bearing and collapsible spacer assembly from the carrier.
4. Remove the oil seal and front bearing.



47U09X-026

5. If necessary, remove the bearing outer races by using a drift in slots provided for this purpose.



47U09X-027

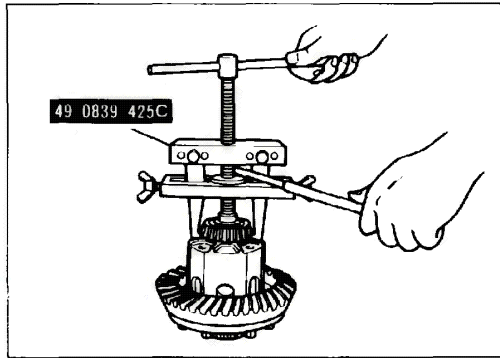
Differential (Standard model)

1. Remove the side bearings by using a **bearing puller set** (49 0839 425C).
2. Remove the ring gear.



47U09X-028

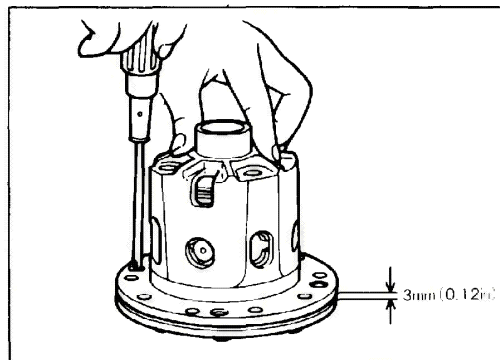
3. Drive the pinion shaft lock pin out with a suitable drift.
4. Remove the pinion shaft.
5. Remove the pinion gears.
6. Remove the side gears and thrust washers.



47U09X-029

Differential (LSD model)

1. Remove the side bearings by using a **bearing puller set (49 0839 425C)**.
2. Remove the ring gear.

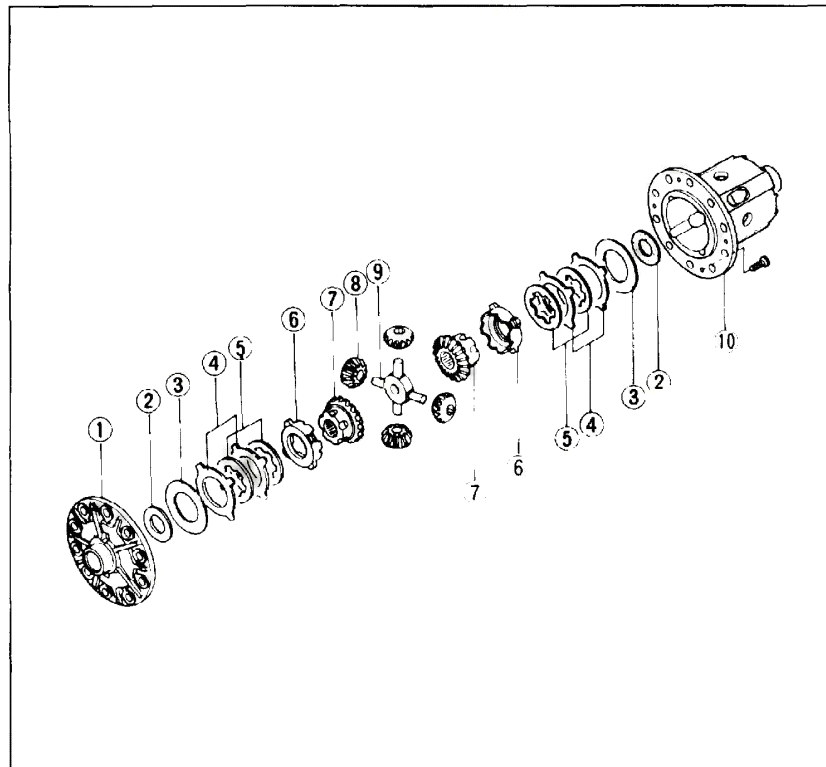


57U09X-030

3. Loosen the attaching screws so that the right half and the left half of the differential case is separated.

Note

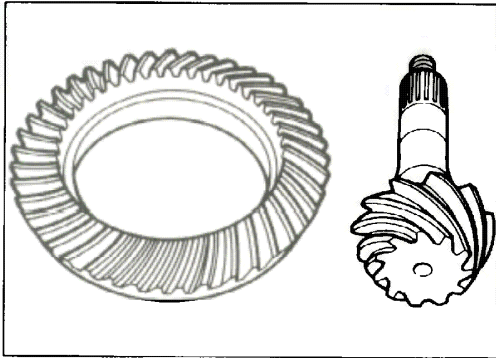
Loosen the four attaching screws gradually until the distance between the left half and the right half of the differential case is about 3 mm (0.12 in).



47U09X-031

4. Remove the following parts.
 - 1) Differential case left
 - 2) Thrust washer
 - 3) Conical spring
 - 4) Friction plate
 - 5) Friction disc
 - 6) Pressure ring
 - 7) Side gear
 - 8) Pinion gear
 - 9) Spider
 - 10) Differential case right

9 DIFFERENTIAL



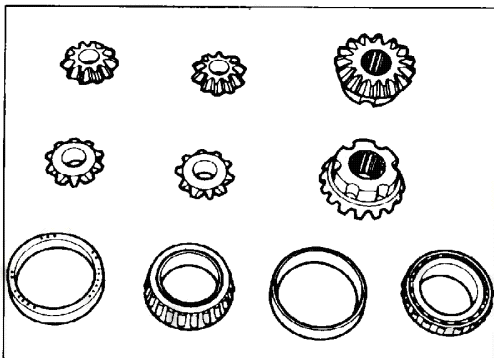
47U09X-032

INSPECTION

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

Drive pinion and ring gear

Check the drive pinion for damaged or excessively worn teeth, damaged bearing journals and splines. Inspect the ring gear for worn or chipped teeth. If any of above conditions is found, replace both drive pinion and ring gear as they are available only in a set.



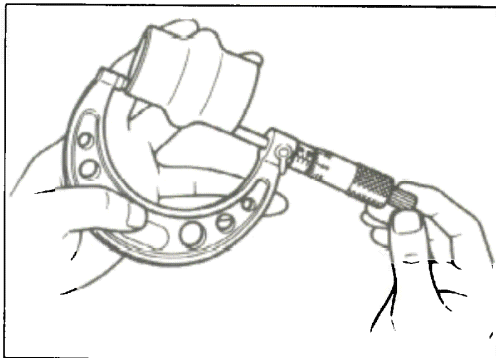
47U09X-033

Differential gears

Check the differential side gears and pinion gears for cracks, chipped teeth or any damage.

Bearing

Check the differential bearings and pinion bearings for wear, flaking or any damage.

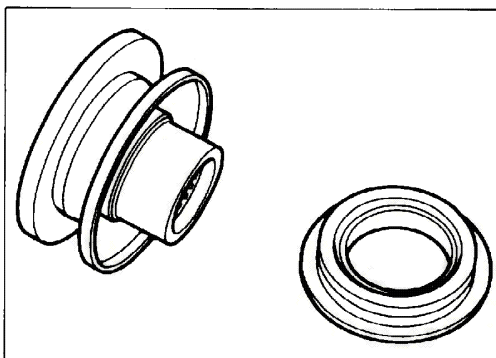


47U09X-034

Collapsible spacer

Measure the length of the collapsible spacer with a micrometer.

**Standard length: 56.85 ~ 57.15 mm
(2.238 ~ 2.250 in)**



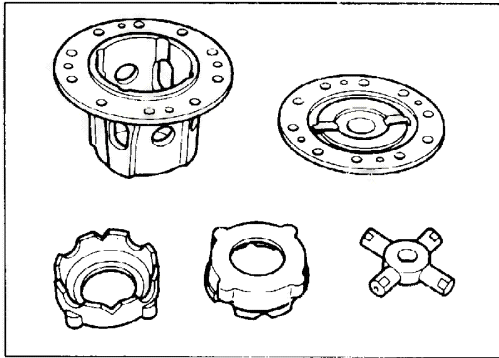
47U09X-035

Oil seal

Check the oil seal for wear or damage.

Companion flange

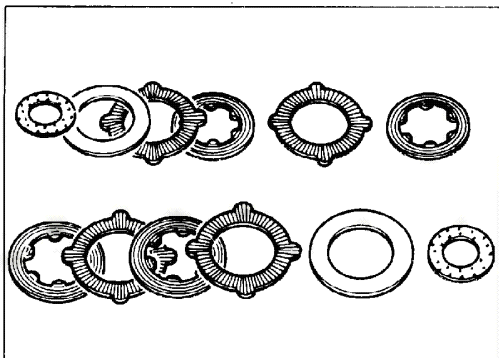
Check the companion flange for cracks, worn splines, or rough oil seal contacting surface.



47U09X-036

Differential case, pressure ring and spider (LSD model)

Check the differential cases, pressure rings, and spider for wear or any other damage.



47U09X-037

Friction plate, friction disc, conical spring and thrust washer (LSD model)

Check the friction plates, friction discs, conical springs, and thrust washers for wear or damage. Measure the thickness of each part with a micrometer.

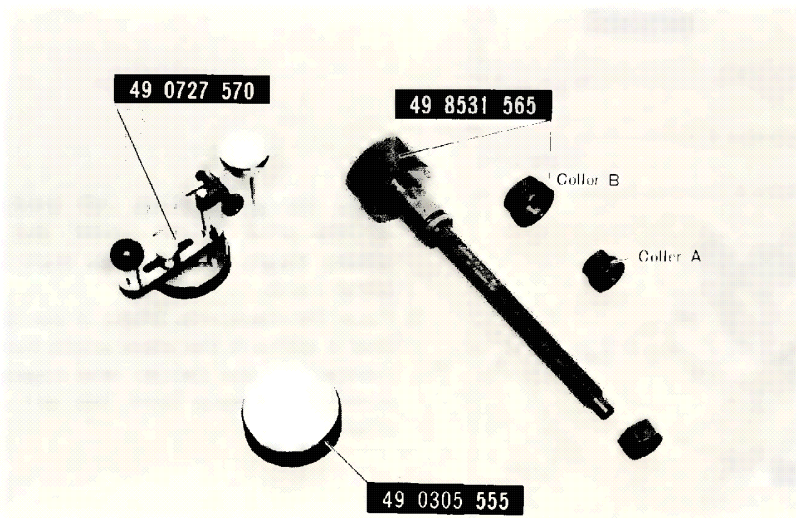
Thickness

	Standard	Limit	Over size
Friction plate	2.0 mm (0.0787 in)	1.9 mm (0.0748 in)	
Friction disc	2.0 mm (0.0787 in)	1.9 mm (0.0748 in)	2.1 mm (0.0827 in)
Thrust washer	1.6 mm (0.0630 in)	1.4 mm (0.0551 in)	1.8 mm (0.0709 in)

ASSEMBLY

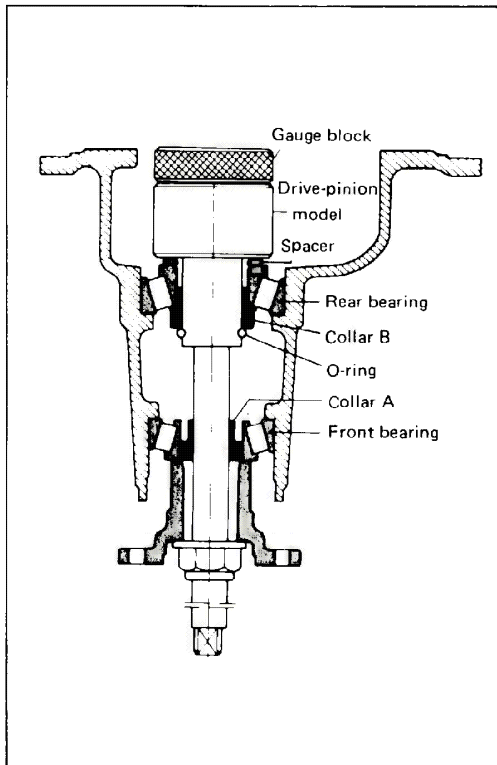
Adjustment of pinion height

Make the adjustment in the following order, with the **pinion mode** (49 8531 565), the **pinion height adjust gauge body** (49 0727 570), and the **gauge block** (49 0305 555).

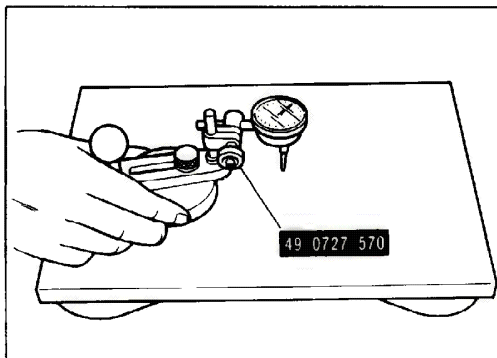


57U09X-038

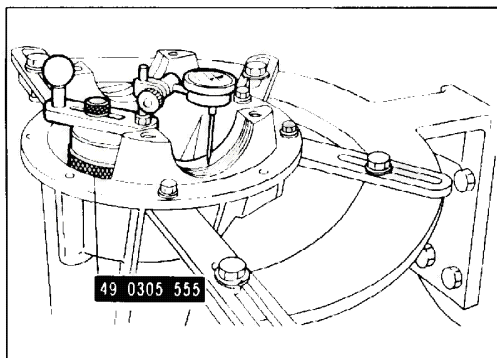
9 DIFFERENTIAL



47U09X-039



57U09X-040



57U09X-041

1. Make certain that the differential bearing support bores are free of dirt and burrs.
2. Install the front and rear bearing races (if necessary replace with new ones) into the differential carrier.
3. Install a spacer, rear bearing and **collar B** (49 8531 568) on the **pinion model** (49 8531 565) and secure them with "O" ring.
4. Install them in the carrier.

Cautions

a) **Never use the collapsible spacer.**

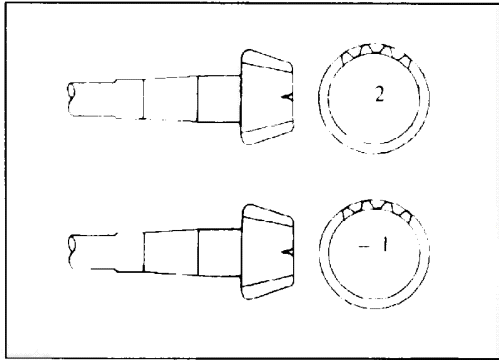
b) **The head portion of the drive pinion model is the screw in type, so you make sure that the head is not loose.**

5. Install the front bearing, **collar A** (49 8531 567), companion flange and washer.
6. Tighten the nut so that the drive pinion model turns smoothly.

7. Install a dial indicator to the **pinion height adjust gauge body** (49 0727 570). Place the gauge body on the surface plate and set up the dial indicator to "Zero".

8. Place the **gauge block** (49 0305 555) on top of the drive pinion model, and then set the **pinion height adjust gauge body** on top of the gauge block.

9. Place the measuring probe of the dial indicator so that it contacts the place where the side bearing is installed in the carrier, and measure the lowest position. Measure both the left and the right sides.



57U09X-042

Mark	Thickness	Mark	Thickness
08	3.08 mm (0.1213 in)	29	3.29 mm (0.1295 in)
11	3.11 mm (0.1224 in)	32	3.32 mm (0.1307 in)
14	3.14 mm (0.1224 in)	35	3.35 mm (0.1319 in)
17	3.17 mm (0.1248 in)	38	3.38 mm (0.1331 in)
20	3.20 mm (0.1260 in)	41	3.41 mm (0.1343 in)
23	3.23 mm (0.1271 in)	44	3.44 mm (0.1354 in)
26	3.26 mm (0.1283 in)	47	3.47 mm (0.1366 in)

10. Add the two (left and right) values obtained by the measurements taken in step 9, and then divide the total by 2. From this result, subtract the result obtained by dividing the number inscribed on the end surface of the drive pinion by 100. (If there is no figure inscribed, use 0.) This is the pinion-height adjustment value.

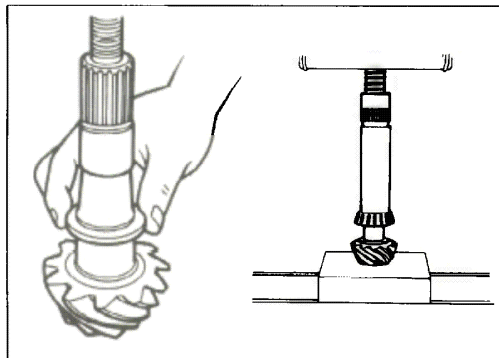
Cautions

- a) The number is inscribed by a electric marking pen, not stamping.
- b) If, for example, the measured results obtained in step 9 are 0.06 mm and 0.04 mm, and the figure inscribed on the end of the drive pinion is -2:

$$\frac{0.06 + 0.04}{2} - \frac{-2}{100} = 0.07 = \text{pinion-height adjustment value}$$

Thus, a spacer which is 0.07 mm thicker than the one now used should be used.

Note that spacer thicknesses are available for each 0.03 mm. Select the spacer thickness that is closest to that necessary.



57U09X-043

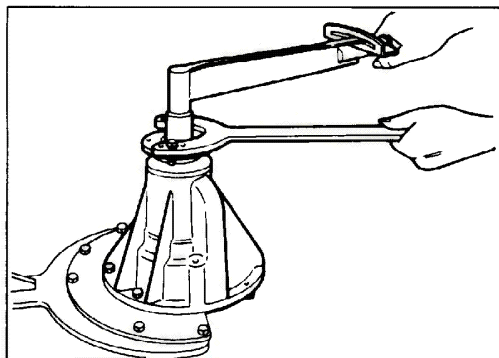
Adjustment of drive pinion

1. Position the selected spacer on the drive pinion and press in the pinion rear bearing on the drive pinion.
2. Install the collapsible spacer onto the drive pinion and install them in the carrier.
3. Install the pinion front bearing on the front end of the drive pinion.
4. Apply gear lubricant to the pinion oil seal lip and install the pinion oil seal into the carrier.
5. Install the companion flange on the pinion by tapping with a plastic hammer.
6. Install the pinion washer and nut. Before tightening the nut (when the pinion preload is zero), check the drag of the oil seal by using a torque wrench.
7. Tighten the pinion nut to **130 N-m (94 ft-lb)** and check the preload.

Caution

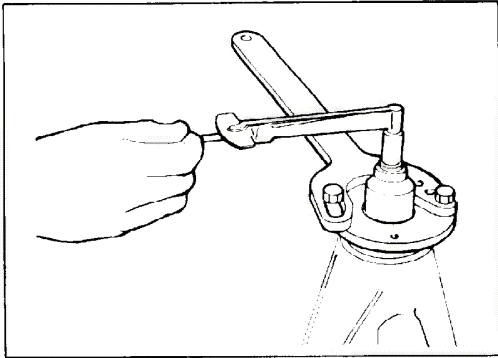
The pinion nut should be tightened only a little at a time and preload should be checked after each slight amount of tightening. The maximum tightening torque of the nut is 180 N-m (130 ft-lb).

If the specified preload is not obtained after tightening the nut to the maximum torque of 180 N-m (130 ft-lb), replace the collapsible spacer with a new one.



47U09X-044

9 DIFFERENTIAL



47U09X-045

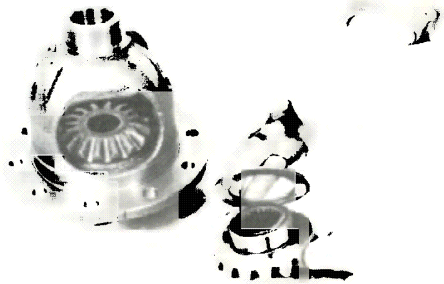
- Carefully set the preload drag to **0.9 ~ 1.4 N-m (7.8 ~ 12.2 in-lb)** without oil seal drag determined in Step 6.

Caution

If the preload is measured by using a spring scale at the bolt hole of the companion flange, the preload drag is **25 ~ 40 N (5.5 ~ 8.8 lb)**.

Assembly of differential (Standard type)

- Install the thrust washers on each differential side gear and install these in the gear case.



47U09X-046

- Through the openings of the gear case, insert each of two pinion gears exactly **180** degrees opposite each other.
- Rotate the gears **90** degrees so that the pinion shaft holes of the case come into alignment with the holes in the pinion gears.
- Insert the pinion shaft through the case and pinion gears.



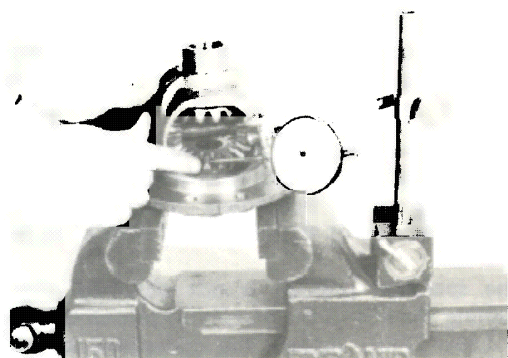
47U09X-047

- Check and adjust the backlash of the side gear and pinion gear by inserting a proper thickness of thrust washer.

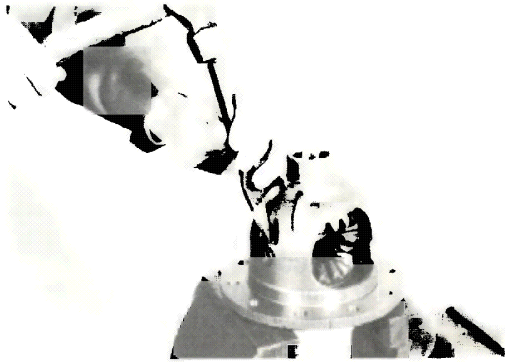
Standard backlash: 0 ~ 0.1 mm (0 ~ 0.004 in)

Thrust washer thickness:

Identification mark	Thickness
0	2.00 mm (0.0787 in)
05	2.05 mm (0.0807 in)
1	2.10 mm (0.0827 in)
15	2.15 mm (0.0846 in)
2	2.20 mm (0.0866 in)

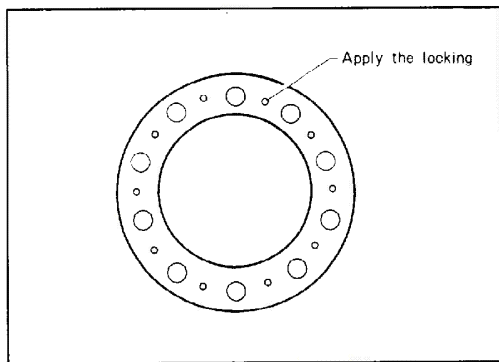


47U09X-048



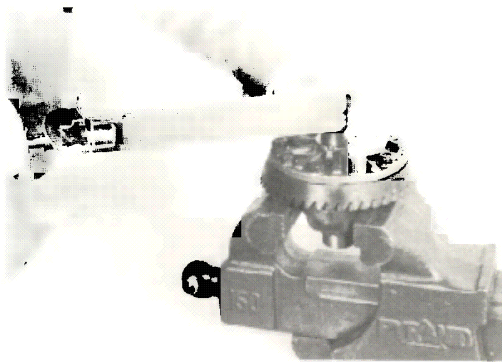
47U09X-049

6. Install the lock pin to secure the pinion shaft. Stake the lock pin into position with a punch to prevent it from working out.



47U09X-050

7. Apply the locking in the back of ring gear shown in figure.



47U09X-051

8. Install the ring gear to the case and torque the bolts to **75 ~ 85 N·m (51 ~ 61 ft·lb)**.
9. Press in each differential bearing to the gear case.
10. Press-fit the side bearings into the gear case by using a pipe with an inner diameter of 41 mm (1.614 in) or more, and an outer diameter of 47 mm (1.850 in) or less.

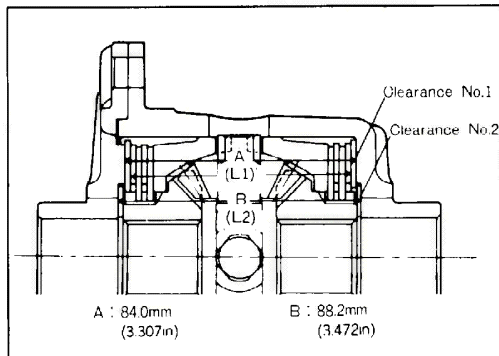
Note

Press-fit until the press-fitting force suddenly increases.

Adjusting differential gears (LSD model)

Clearance No. 1

1. Measure the thickness of the two conical springs and record the values.
2. Measure the **L1** (excluding the conical spring) dimension with a micrometer.
3. Check clearance **No. 1** by subtracting the value and dimension obtained by above 1 and 2 respectively from the **(A)** dimension shown in the figure.
4. In case the clearance is too broad, adjust with a friction disc for over size.



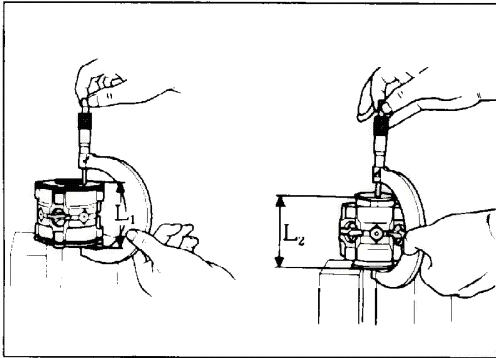
57U09X-052

Standard clearance: 0 ~ 0.20 mm (0 ~ 0.0079 in)

Limit clearance: 1.0 mm (0.0394 in)

Over size friction disc: 2.1 mm (0.0827 in)

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47U09X-053

Clearance No. 2

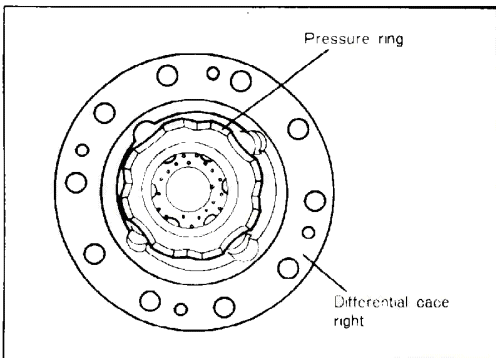
1. Measure the **L2** (including the thrust washer) dimension with a micrometer.
2. Check clearance **No. 2** by subtracting **L2** dimension obtained by above 1 from **(B)** dimension.
3. In case the clearance is too broad, adjust with thrust washer for over size.

Standard clearance:

0.16 ~ 0.42 mm (0.0063 ~ 0.0165 in)

Limit clearance: 0.8 mm (0.0315 in)

Over size thrust washer: 1.8 mm (0.0709 in)



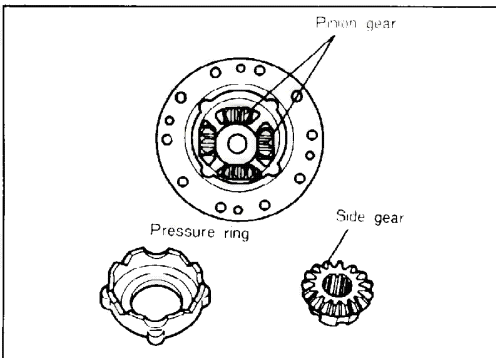
47U09X-054

Assembly of differential (LSD model)

1. Install the following parts to differential case right in the following order.
 - (1) Thrust washer
 - (2) Conical spring
 - (3) Friction plate
 - (4) Friction disc
 - (5) Friction plate
 - (6) Friction disc
 - (7) Pressure ring

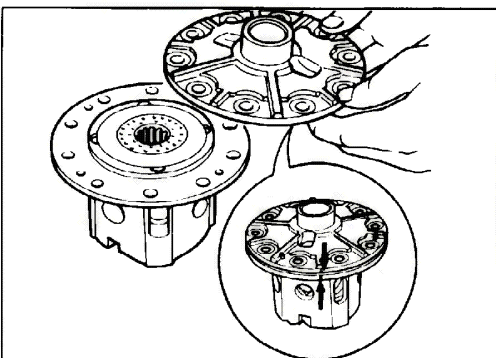
Note

Centralize the friction discs so that the splines of the side gear can be easily inserted into friction discs.



47U09X-055

- (8) Side gear
- (9) Pinion gear and spider assembly
- (10) Side gear
- (11) Pressure ring

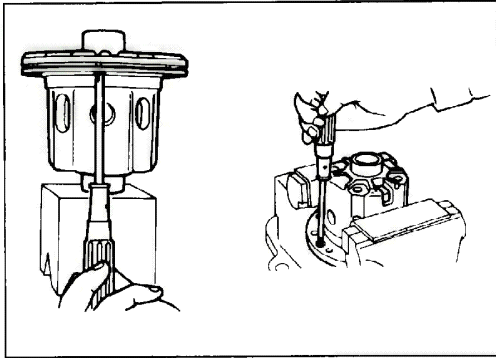


47U09X-056

- (12) Friction disc
- (13) Friction plate
- (14) Friction disc
- (15) Friction plate
- (16) Conical spring
- (17) Thrust washer
- (18) Differential case left

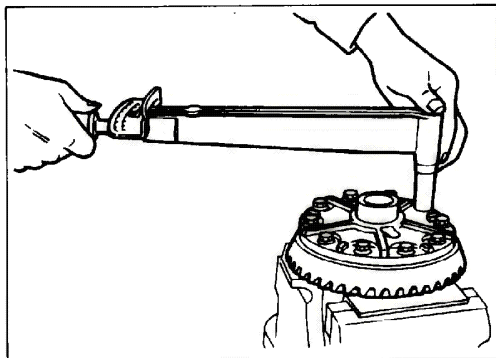
Caution

When installing the differential case left onto the differential case right, align the identification marks on the differential cases and tighten the attaching screws temporarily.



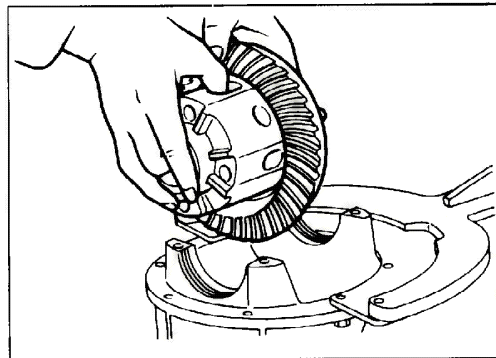
57U09X-057

2. Invert the differential case assembly and hold the case assembly in a vice being careful not to damage it.
Tighten the case attaching screws securely.



47U09X-058

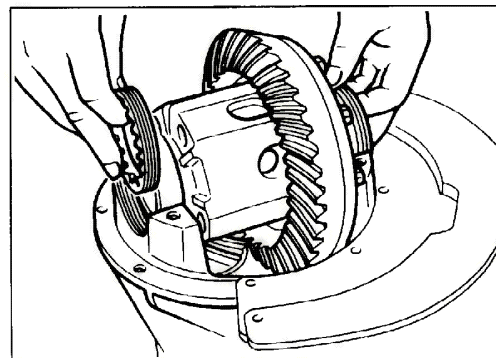
3. Install the ring gear to the case and torque the bolts to **70 ~ 85 N·m (51 ~ 61 ft·lb)**.
4. Press in each differential bearing to the gear case.
5. Install the differential bearing outer races to their respective bearings.



47U09X-059

Installation of differential

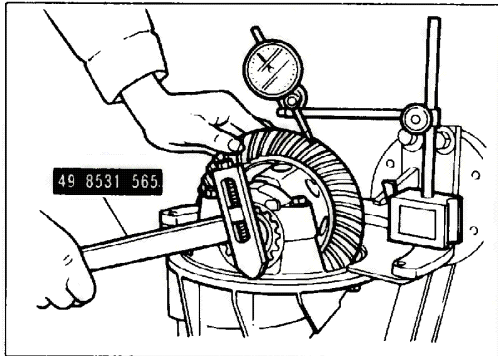
1. Install the differential gear assembly in the carrier.



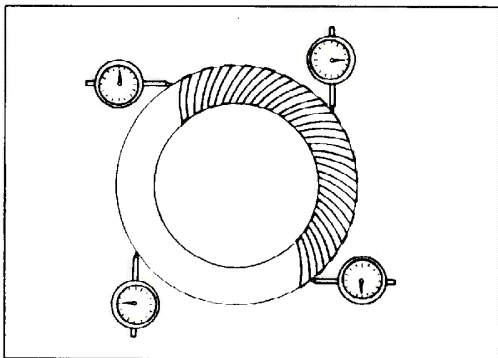
47U09X-060

2. Note the identification marks on the adjusters and install each adjuster to its respective side.
3. Install the differential bearing caps making sure that the identification marks on the caps correspond with those on the carrier and install the attaching bolts.
4. Slightly tighten one of the bearing cap bolts on each side and adjust the backlash, as instructed in the following paragraph.

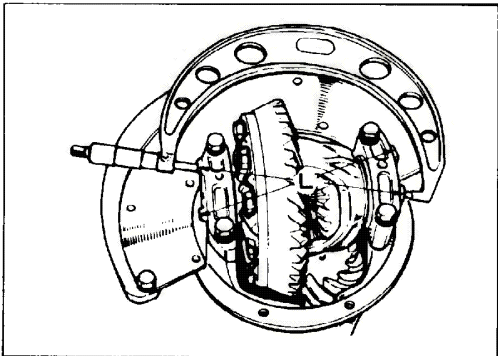
9 DIFFERENTIAL



47U09X-061



47U09X-062



47U09X-063

Adjusting backlash

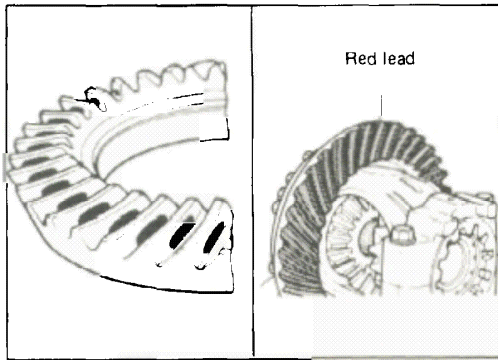
1. Mark the ring gear at four points at approx. 90° intervals gear and mount a dial indicator to the carrier so that the feeler comes in contact at right angle with one of the ring gear teeth.
2. Turn the both bearing adjusters equally until the backlash becomes **0.09 ~ 0.11 mm (0.0035 ~ 0.0043 in)** by using the **differential wrench (49 0259 720)**.
3. Check the backlash at the three other marked points and make sure that the minimum backlash is more than **0.05 mm (0.002 in)**, and difference value of the maximum and minimum backlash is less than **0.07 mm (0.0028 in)**.

4. After adjusting the backlash, tighten the adjusters equally until the distance between both pilot sections on bearing caps becomes **185.43 ~ 185.50 mm (7.3004 ~ 7.3033 in)**.

Note

When adjusting the differential bearing preload, care must be taken not to affect the backlash of the drive pinion and ring gear.

5. Tighten the bearing cap bolts to a torque of **38 ~ 53 N·m (27 ~ 38 ft·lb)**.
6. Install the adjuster lock plates on the bearing caps to prevent the adjusters from loosening.

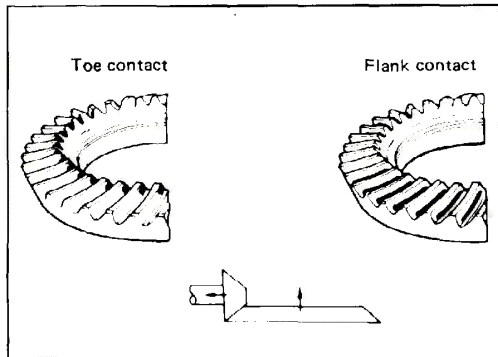


47U09X-064

Inspection and adjustment of drive pinion/ring gear engagement

The inspection and adjustment procedure is as follows:

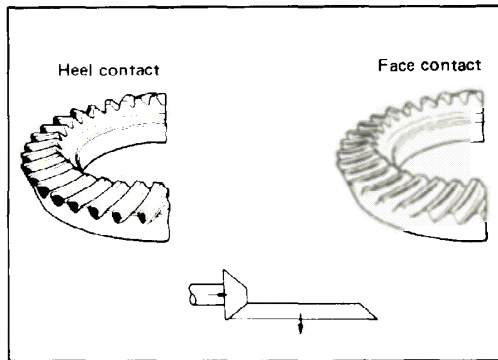
1. Coat both surfaces of 6 ~ 8 teeth of the ring gear uniformly with a thin coating of red lead.
2. While moving the ring gear back and forth by hand, rotate the drive pinion several times and check the tooth contact.
3. If the tooth contact is good, wipe off the coating of red lead.
4. If it is not good, adjust the pinion height, and then adjust the backlash.



47U09X-065

- (1) Toe and flank contact

Replace the spacer with a thinner one, and move the drive pinion outward.



47U09X-066

- (2) Heel and face contact

Replace the spacer with a thicker one, and bring the drive pinion closer in.