SERVICE MANUAL

DATSUN 240Z SPORTS
MODEL S30 SERIES

CHASSIS & BODY



NISSAN

NISSAN MOTOR CO., LTD.
TOKYO, JAPAN

SECTION PD

PROPELLER SHAFT & DIFFERENTIAL CARRIER

PD

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PROPELLER SHAFT AND UNIVERSAL JOINT

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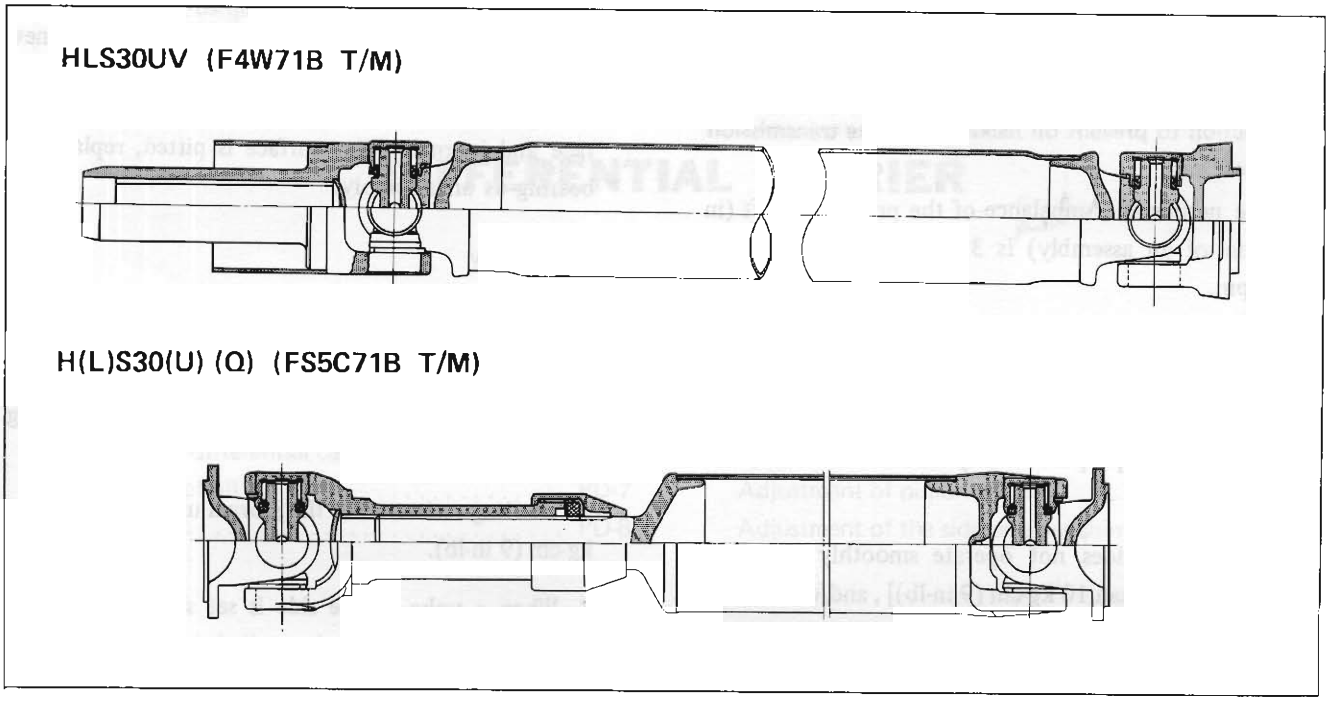


Fig. PD-1 Cross-sectional view of propeller shaft

DESCRIPTION

The propeller shaft is of a 2-joint type. The sliding part of the propeller shaft for the F4W71B transmission is on the rear extension of transmission unit in form of an involute spline, and is lubricated with gear oil.

The propeller shaft for the FS5C71B transmission differs from that for the F4W71B. For the FS5C71B transmission, the sliding part is on the propeller shaft and is lubricated with multi-purpose grease.

REMOVAL, INSPECTION, AND REPAIR

1. The propeller shaft is balanced as an assembly. When removing the propeller shaft, verify the spline/flange yoke match marks in two places. When the match marks are unverifiable, put match marks by means of punching for convenience' sake during reassembling.

2. Remove the submuffler, remove four bolts and nuts from the propeller shaft rear end flange yoke and differential carrier flange connecting unit, and remove the propeller shaft.

Note: Carry out this operation carefully so as not to damage the spline and rear oil seal. Take proper action to prevent oil leaking from the transmission rear end.

3. The permissible unbalance of the propeller shaft (in condition of an assembly) is 35 gr-cm (0.49 in-oz) at 6,000 rpm.

Journal

Before disassembling, check the journal (without removing from the propeller shaft) for the movement; and when,

1. The journal does not operate smoothly [Bending resistance: more than 10 kg-cm (9 in-lb)], and/or,

2. The yoke in one side is set stationarily, a load of 10 kg (22 lb) is applied to the other yoke alternately, and the relative displacement toward the yoke axial direction is more than 0.1 mm (0.039 in);

Disassemble the journal and inspect the components and alignment.

Before disassembling the journal, verify the component alignment and relationship so that the yoke direction and snap ring thickness are not changed (When the yoke direction and/or snap ring thickness is changed, the tube and journal center alignment is deviated and the propeller shaft is unbalanced.) because the journal is balanced as an assembly.

It is desired not to disassemble the propeller shaft so that the alignment is not unbalanced.

Removal

1. Lightly tap the yoke unit with a wooden mallet (or copper hammer), and remove the bearing race from the yoke.

2. Tap and remove both bearing races from the yoke, and remove the journal from the yoke carefully so as not to damage the journal.

Inspection and repair

Check the clearance toward the thrust direction (clearance between the journal and bearing assembly) and replace if excessively worn. The clearance of a new journal is 0.006 to 0.037 mm (0.0002 to 0.0015 in). When the roller is damaged or rusted and/or bearing race and journal sliding surface is pitted, replace the bearing as an assembly.

Reassembly

The component parts are reassembled in reverse sequence of disassembly. When reassembling, select and use a proper snap ring out of the following types (eight types) so that the journal moves under the following conditions:

1. Bending resistance of the journal unit is less than 10 kg-cm (9 in-lb).

2. When a yoke in one side is set stationarily and a load of 10 kg (22 lb) is applied to the other yoke alternately, the relative displacement of the yoke toward the axial direction is less than 0.02 mm (0.0008 in).

Snap rings:

White	2.00 mm (0.0787 in)
Yellow	2.02 mm (0.0795 in)
Red	2.04 mm (0.0803 in)
Green	2.06 mm (0.0811 in)
Blue	2.08 mm (0.0819 in)
Black	2.10 mm (0.0827 in)
Cream	2.12 mm (0.0835 in)
Pink	2.14 mm (0.0843 in)

SERVICE DATA

Permissible dynamic unbalance	35 gr-cm (0.49 in-oz)/6,000 rpm

Axial play of spider journal	Less than 0.02 mm (0.0008 in)
Spider journal swinging torque	Less than 10 kg-cm (9 in-lb)
Clearance between bearing assembly and journal	0.006 to 0.037 mm (0.0002 to 0.0015 in)

Available snap ring thickness

White	2.00 mm (0.0787 in)	Blue	2.08 mm (0.0819 in)
Yellow	2.02 mm (0.0795 in)	Black	2.10 mm (0.0827 in)
Red	2.04 mm (0.0803 in)	Cream	2.12 mm (0.0835 in)
Green	2.06 mm (0.0811 in)	Pink	2.14 mm (0.0843 in)

Tightening torque

Companion flange fixing nuts	2.5 to 3.2 kg-m (18 to 23 ft-lb)

DIFFERENTIAL CARRIER

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DESCRIPTION

The gear carrier assembly, designed for use in the rear independent suspension is made of malleable cast iron. The gears used are hypoid bevel gears. To serve as part of the suspension, its housing is highly rigid, basically in a combined cylindrical and oval form.

Adjustment figures stamped on screws, adjusting shims, washers, differential case, drive pinion and carrier are given in meters in accordance with the metric standardization of parts recently adopted.

The front part of the gear carrier assembly is mounted on the center of the rear suspension member with four bolts and the rear part is mounted on the body through a leaf spring with rubber insulators to prevent vibration from the road condition.

The gear housing requires a proper lubrication, or otherwise, durability of the gear is affected causing troubles.

The lubricant should be checked each 5,000 km (3,000 miles) and replenished as necessary.

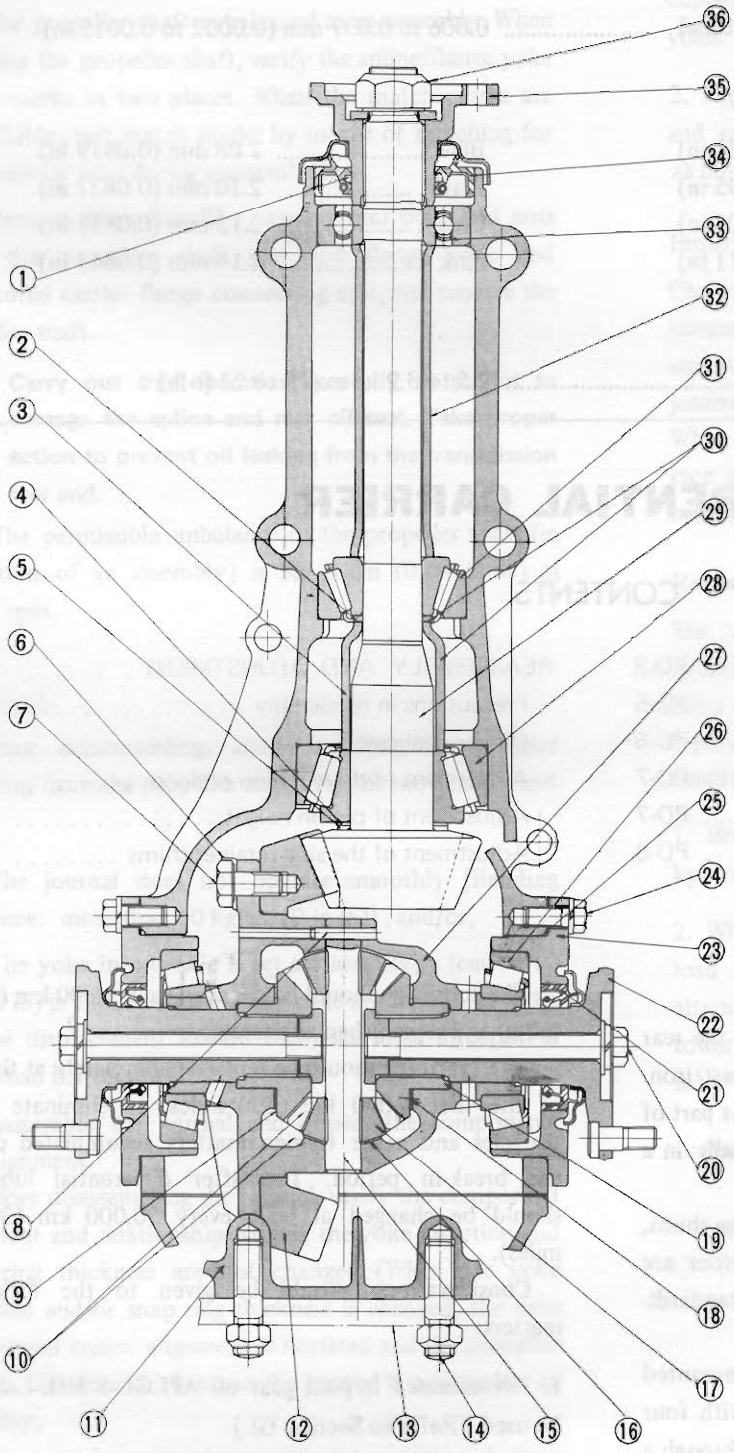
The lubricant should be replaced completely at the end of the first 1,000 km (600 miles) to eliminate metal particles and other foreign matters accumulated during the break-in period. Thereafter differential lubricant should be changed at least every 50,000 km (30,000 miles).

Considerations should be given to the following matters:

1. Nominated hypoid gear oil API.GL-5 MIL-L-2105B be used. (Refer to Section GI.)

2. It is prohibited to use any gear oil having different viscosity. The same brand must always be selected.

3. The standard oil capacity is about 1.0 ltr. (0.22 US gal).



1	Supply multi-purpose grease to oil seal lip at assembly.
2	Pinion bearing adjusting washer
3	Pinion bearing adjusting spacer
4	Pinion height adjusting shims
5	Pinion height adjusting washer
6	Lock strap
7	Bolt drive gear T=7.0 to 8.0 kg-m (50.6 to 57.8 ft-lb) Tighten by tapping bolt head with 1/4 lbs. hammer
8	Lock pin
9	Adjust the clearance between the differential case and the rear face of the side gear to 0.1 to 0.2 mm (0.0039 to 0.0079 in) by side gear thrust washer.
10	Tooth contact of differential gear is more than 3/4 of its width and backlash is 0.1 to 0.2 mm (0.0039 to 0.0079 in)
11	Rear cover
12	Drive gear
13	Diff. mounting member
14	Bolt diff. to diff. mounting member T=6.0 to 8.0 kg-m (43.4 to 7.8 ft-lb)
15	Shaft pinion mate
16	Thrust washer
17	Pinion mate
18	Thrust washer
19	Side gear
20	Bolt side flange T=1.9 to 2.6 kg-m (13.7 to 18.8 ft-lb)
21	Oil seal. Supply chassis grease to oil seal lip at assembly.
22	Side flange
23	Side retainer
24	Bolt side retainer T=0.9 to 1.2 kg-m (6.5 to 8.7 ft-lb)
25	O-ring
26	Side bearing
27	Diff. gear case
28	Pinion rear bearing
29	Drive pinion
30	Adjust pinion bearing preload by selecting pinion bearing adjusting spacer and washer
31	Pinion front bearing
32	Spacer-front pilot bearing
33	Front pilot bearing
34	Oil seal
35	Companion flange
36	Drive pinion nut T=17 to 20 kg-m (122.9 to 144.6 ft-lb)

Fig. PD-2 Sectional view of gear carrier

INSPECTION BEFORE DISASSEMBLY

Check the parts and components to be disassembled or being disassembled carefully so that the causes for the defects can be determined definitely.

1. Place the carrier assembly on the Gear Carrier, Strut & Steering Gear Box Attachment (Special tool ST06270000).

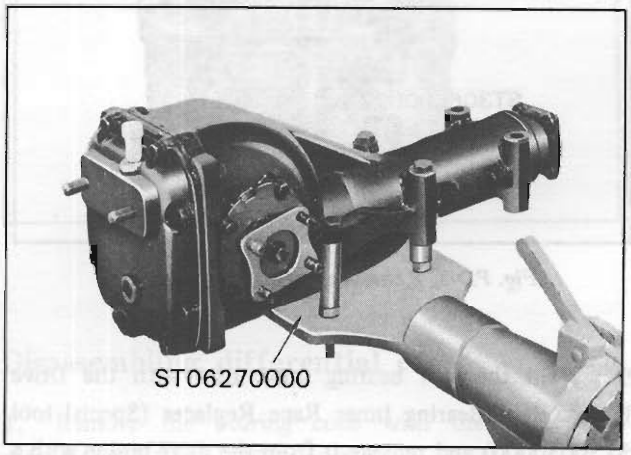


Fig. PD-3 Holding differential carrier

2. Check the tooth contact pattern (2 or 3 points) with lead oxide.

Note: For the tooth contact pattern, see paragraph dealing with "tooth contact pattern adjustment."

3. Measure the backlash between the drive gear and pinion using a dial indicator [backlash: 0.10 to 0.20 mm (0.0039 to 0.0079 in)].

4. Check the drive gear for run-out at the rear, and make sure that the tooth contact pattern or the backlash is normal. [run-out limit: 0.08 mm (0.0031 in)].

5. Measure the turning torque of the driven pinion. [Turning torque: 3 to 15 kg-cm (2.6 to 13.0 in-lb)].

DISASSEMBLY

1. Remove the clamp bolt that holds the flange.
2. Attach the Gear Carrier Side Flange Stand (Special tool ST33730000) to the side flange and extract the flange using the Sliding Hammer (Special tool ST36230000).

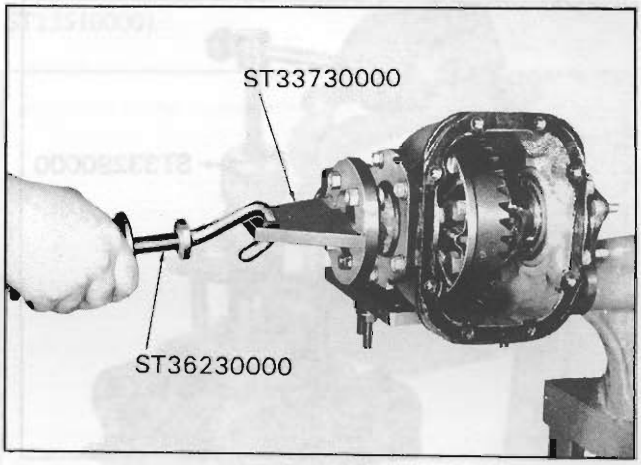


Fig. PD-4 Removing side flange

3. Remove the left and right side retainers using the Gear Carrier Side Retainer Attachment [(Special tool ST33710000) and standard puller].

Note: a. Provide the right and left side retainers with identification marks before removal.

b. Be careful not to confuse the right and left hand side retainers and shims so that reassembly will be made with the same parts in the original position.

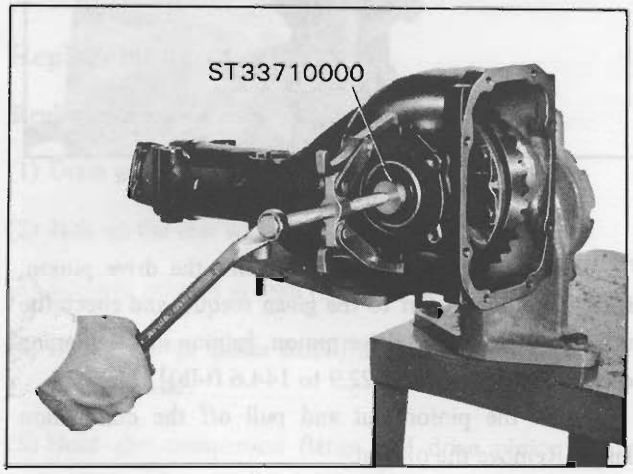


Fig. PD-5 Removing side retainer

4. Remove the differential case from the gear carrier.

5. When replacing the side thrust bearing, remove the bearing outer race from the side retainer using the Gear Carrier Oil Seal Puller (Special tool ST33290000).



Fig. PD-6 Removing side bearing outer race

6. Hold the companion flange with the Drive Pinion Flange Wrench (Special tool ST31530000) and loosen the drive pinion nut.

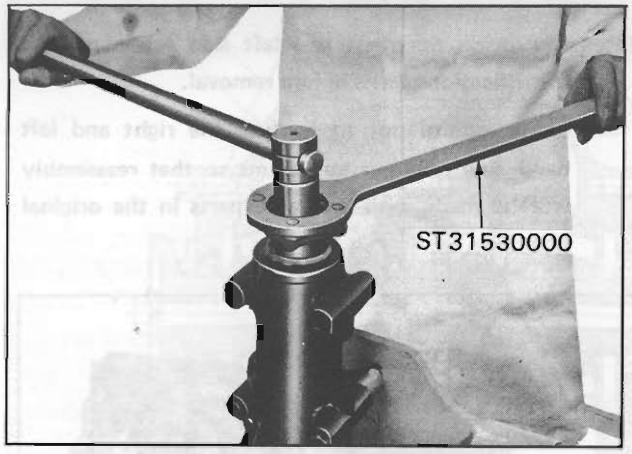


Fig. PD-7 Removing drive pinion nut

7. Insert the companion flange into the drive pinion, tighten the pinion nut to the given torque, and check the turning torque of the drive pinion. [pinion nut tightening torque: 17 to 20 kg-m (122.9 to 144.6 ft-lb)].

Loosen the pinion nut and pull off the companion flange. Remove the oil seal.

8. Remove the drive pinion from the gear carrier with a press. Disassemble the front pilot bearing with pilot bearing drift (Special tool ST30650000). The drive pinion can be removed together with the front and rear bearing inner races, bearing spacers and adjusting washers.

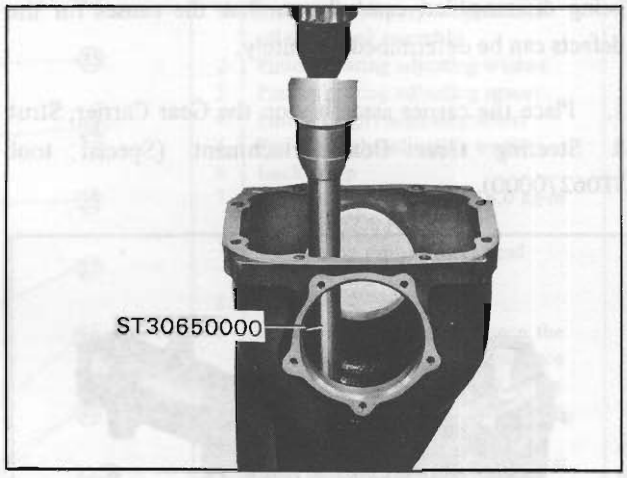


Fig. PD-8 Removing front pilot bearing

9. Hold the rear bearing inner race with the Drive Pinion Rear Bearing Inner Race Replacer (Special tool ST30030000) and remove it from the drive pinion with a press.



Fig. PD-9 Removing rear bearing inner race

Note: As the result of inspection before disassembly, if proper tooth contact pattern has been obtained and the drive gear, drive pinion carrier, rear bearing, washers, etc. can be reused without replacing, the proper tooth contact pattern can be obtained without a pinion height adjustment. Consequently, it is not necessary to remove the bearing inner race.

10. Remove the front and rear bearing outer races by the use of a press and the Drive Pinion Outer Race Drift Assembly (Special tool ST30610000).

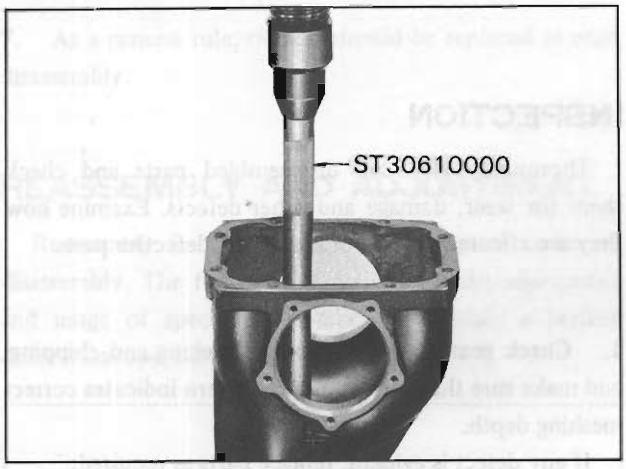


Fig. PD-10

Disassembling differential case

1. Remove the bearing cone with the Puller and Adapter (Special tool ST33012000).

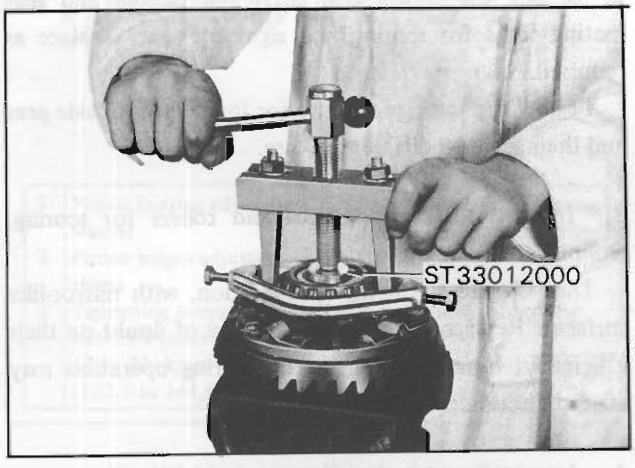


Fig. PD-11 Remvoing side bearing cone

Remove the left hand one after removing the drive gear.

Note: a. The puller should be handled carefully so as to catch the edge of bearing inner race.

b. Be careful not to confuse the right and left hand parts.

2. Remove the hypoid drive gear by spreading out the lock strap and loosening the drive gear bolts.

Note: Loosen the bolts diagonally and alternately.

3. Punch off the pinion mate shaft lock pin from the drive gear side with the Solid Punch (Special tool ST23510000).



Fig. PD-12 Punching off lock pin

Note: The lock pin is caulked at the pin hole mouth on the differential case. Do not punch it off forcibly without checking how it is caulked.

4. Draw out the pinion mate shaft and remove the pinion mate gears, side gears and thrust washers.

Note: The left, right, front and rear gears as well as thrust washers should be marked or preserved separately.

Replacement of oil seal

Replacing front oil seal

(1) Drain gear oil.

(2) Jack up the rear wheel.

(3) Remove exhaust system (Refer to Section FE.).

(4) Detach the propeller shaft from the companion flange of the carrier.

(5) Hold the companion flange and drive pinion companion flange with a Drive Pinion Flange Wrench (Special tool ST31530000) and remove pinion nuts.

(6) Remove the companion flange and the front retainer with a standard puller.

(7) Remove the oil seal from the front retainer with the Gear Carrier Oil Seal Puller (Special tool ST33290000).

(8) Install the new oil seal in position by the use of the Gear Carrier Oil Seal Drift (Special tool ST33252000).

Note: Lubricate the seal lips with grease when driving in the oil seal.

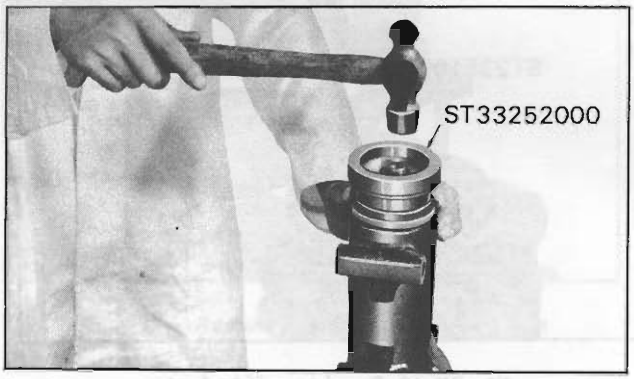


Fig. PD-13 Removing front retainer

(9) Re-install the front retainer when the oil seal is replaced, in reverse sequence of removal.

Replacing side oil seal

(1) Remove the drive shaft from the side flange of the gear carrier.

(2) Remove the side flange by the use of the Sliding Hammer (Special tool ST36230000) and Gear Carrier Side Flange Stand (Special tool ST33730000).

(3) Remove the oil seal.

(4) Install the new oil seal by the use of the Gear Carrier Oil Seal Drift (Special tool ST33270000).

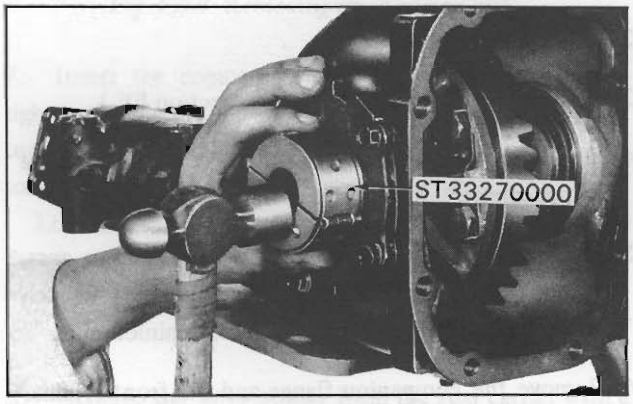


Fig. PD-14 Remvoing side flange

Note: Lubricate the oil seal lips with grease.

INSPECTION

Thoroughly clean all disassembled parts and check them for wear, damage and other defects. Examine how they are affected. Repair or replace all defective parts.

1. Check gear teeth for scoring, cracking and chipping, and make sure that tooth contact pattern indicates correct meshing depth.

If any defect is evident, replace parts as required.

Note: Drive pinion and drive gear are supplied for replacement as a set, therefore, should either parts be damaged, replace as a set.

2. Check the pinion gear shaft and pinion, and gear mating faces for scoring and signs of wear. Replace as required.

Follow the same procedure for inner faces of side gear and their seats on differential case.

3. Inspect all bearing races and rollers for scoring, chipping or excessive wear.

They should be in tiptop condition, with mirror-like surfaces. Replace if there is a shadow of doubt on their efficiency, because an incorrect bearing operation may result in noisiness and gear seizure.

4. Inspect thrust washer faces.

Minor defects may be corrected with emery paper.

When the backlash between the side gear and the pinion mate exceeds 0.2 mm (0.0079 in) and the clearance between the side gear and thrust washer exceeds 0.3 mm (0.0118 in), replace the thrust washer.

Three types of thrust washers are available.

5. Measure the run-out of the drive gear at its rear side with a dial indicator.

When the run-out exceeds 0.08 mm (0.0031 in), replace the drive gear and pinion gear as a set.

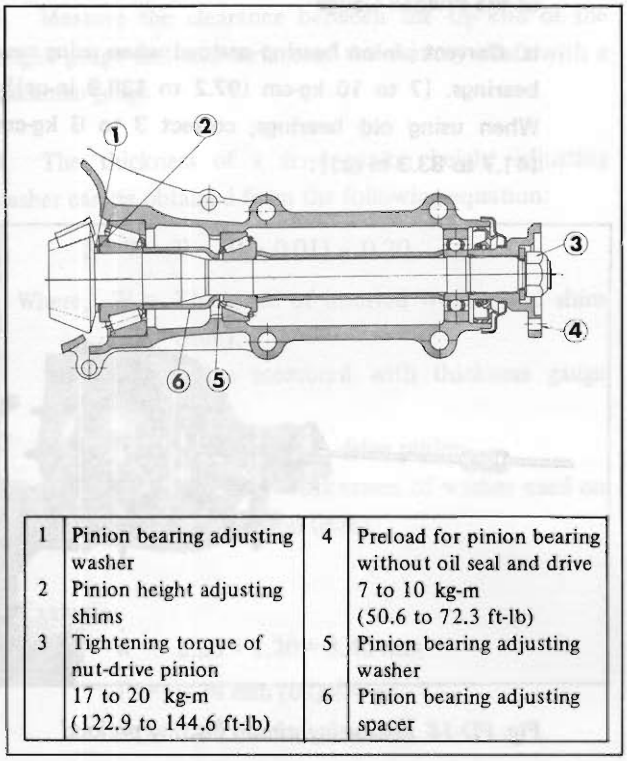
6. Inspect carrier and differential case for cracks or distortion.

If cracked or distorted, replace.

7. As a general rule, oil seal should be replaced at each disassembly.

REASSEMBLY AND ADJUSTMENT

Reassembly can be proceeded in reverse order of disassembly. The following directions for the adjustment and usage of special tools enable to obtain a perfect differential operation.



1	Pinion bearing adjusting washer	4	Preload for pinion bearing without oil seal and drive 7 to 10 kg-m (50.6 to 72.3 ft-lb)
2	Pinion height adjusting shims	5	Pinion bearing adjusting washer
3	Tightening torque of nut-drive pinion 17 to 20 kg-m (122.9 to 144.6 ft-lb)	6	Pinion bearing adjusting spacer

Fig. PD-15 Sectional view of drive pinion

Precautions in reassembly

1. Arrange shims, washers and other relative parts in order so that they will be installed correctly.

2. Thoroughly clean the surfaces on which shims, washers, bearings and bearing retainers are installed.

3. Apply gear oil when installing bearings.

4. Apply grease to the lips when fitting oil seal.

Differential case

1. Install the side gear and pinion mate in the differential case using the corresponding thrust washers.

2. Fit the pinion shaft to the differential case so that it meets the lock pin holes.

3. Measure the clearance between the differential case and the rear face of the side gear.

If the clearance is deviated from the normal range, use a suitable side gear thrust washer to bring the clearance to normal.

Note: Normal clearance between the side gear and thrust washer is 0.1 to 0.2 mm (0.0039 to 0.0079 in).

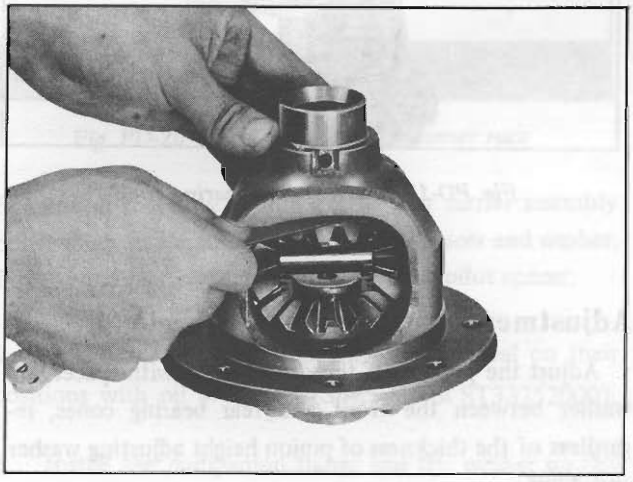


Fig. PD-16 Measuring the clearance between the side gear and thrust washer

4. Lock the pinion shaft lock pin using a punch after it is secured into the place.

5. Apply oil to the gear tooth surfaces and thrust surfaces and make sure that they turn properly.

6. Fit the drive gear to the differential case and tighten the bolts to the given torque.

Tightening torque: 7.0 to 8.0 kg-m
(50.6 to 57.8 ft-lb)

Note: a. Only genuine drive gear bolts and new lock bolts straps should be used.

b. Tighten the clamp bolts in the diagonal order by tapping its head.

7. Before replacing the side bearing, measure the bearing width using a 2.5 kg (5.5 lb) weight block.

The normal bearing width is 20.00 mm (0.787 in).

8. Press fit the side bearing cone in the differential case with Gear Carrier Side Bearing Drift (Special tool ST33230000).

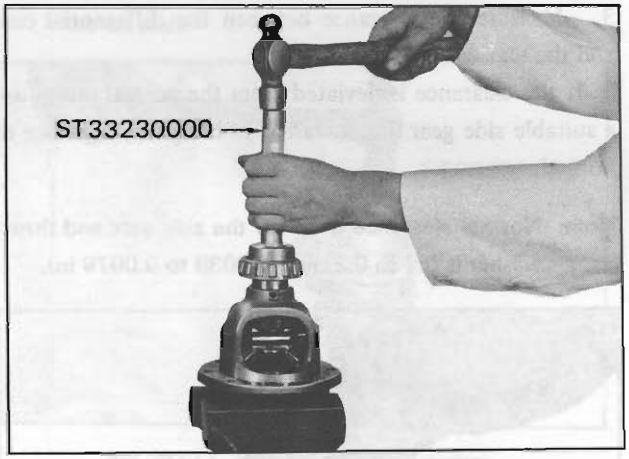


Fig. PD-17 Pressing side bearing cone

Adjustment of drive pinion preload

Adjust the preload of the drive pinion with spacer and washer between the front and rear bearing cones, regardless of the thickness of pinion height adjusting washer and shims.

This adjustment must be carried out without the oil seal inserted.

1. Press fit the front and rear bearing outer races into the gear carrier, using Drive Pinion Outer Race Drift Assembly (Special tool ST30610000).

2. Insert pinion height adjusting washer, shims and rear bearing inner race into a dummy shaft to facilitate adjustment of the pinion height: Gear Carrier Height Gauge Assembly (Special tool ST31210000).

Note: Re-use the old washer and shims if they have been found with normal tooth contact pattern during inspection before disassembly.

3. Apply drive pinion bearing spacer, washer, front bearing, drive Pinion Collar (Special tool ST31500000) and companion flange in that order to a dummy shaft and tighten the drive pinion nut to the given torque to secure them.

[Pinion nut tightening torque: 17 to 20 kg-m (122.9 to 144.6 ft-lb)]

Note: Replace the bearing washer and spacer with ones having proper thickness if the pinion cannot be turned by hand while it is being tightened.

4. Measure the pinion bearing preload, and select proper washer and spacer that will provide the required preload.

Note: a. The initial turning torque is measured by means of the Preload Gauge

b. Correct pinion bearing preload when using new bearings. [7 to 10 kg-cm (97.2 to 138.9 in-oz)]. When using old bearings, correct 3 to 6 kg-cm (41.7 to 83.3 in-oz)].

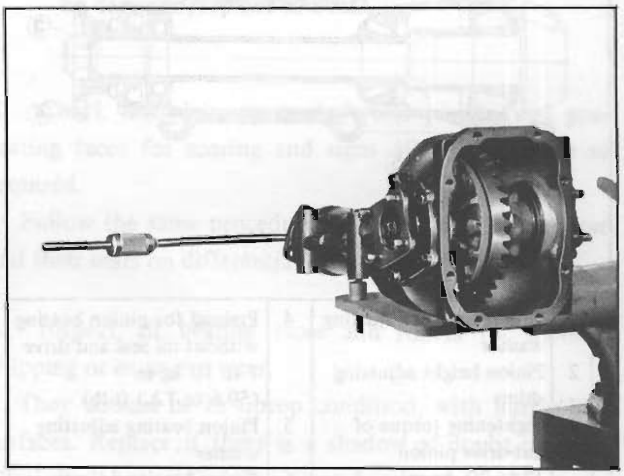


Fig. PD-18 Measuring pinion bearing preload

Adjustment of pinion height

Adjust the pinion height with washer applied between the rear bearing cone and the back of the pinion gear.

1. Install the Dummy Pinion (Special tool ST31210000), the Dummy Spacer (Special tool ST31850000), the Drive Pinion Collar (Special tool ST31500000) in the gear carrier case.

2. Install the Height Gauge (Special tool ST31210000) on the carrier, with the dummy pinion mounted.

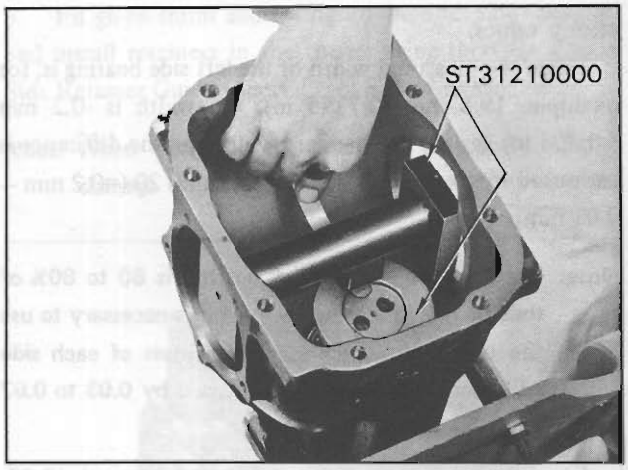


Fig. PD-19 Measuring the clearance

3. Measure the clearance between the tip end of the height gauge and end surface of the dummy shaft with a thickness gauge.

4. The thickness of a drive pinion height adjusting washer can be obtained from the following equation:

$$S = W + T - (H \times 0.01) - 0.20$$

Where, W = Thickness of inserted washer and shim (mm).
T = Value measured with thickness gauge (mm).
H = Head figure on drive pinion
S = Required thicknesses of washer used on drive pinion (mm).

Example

W = 2.20 + 1.20 = 3.40 mm
T = 0.24 mm (0.0094 in)
H = −2

$$S = 3.40 + 0.24 - (-2 \times 0.01) - 0.20 = 3.46 \text{ mm}$$

5. Fit the selected pinion height adjusting washer in the drive pinion, and press fit the rear bearing inner race in it (Special tool ST30030000).

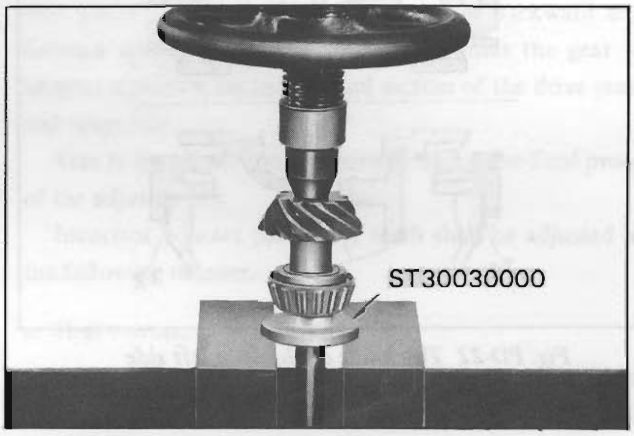


Fig. PD-20 Pressing rear bearing inner race

6. Install the drive pinion on the gear carrier assembly onto which fit the drive pinion bearing spacer and washer, front bearing inner race and front bearing pilot spacer.

7. Install the front pilot bearing and oil seal on their positions with oil seal draft (Special tool ST33252000).

8. Install the companion flange and flat washer on the drive pinion, and secure them in position by tightening the nut to the given torque.

Note: a. The drive pinion lock nut tightening torque is 17 to 20 kg-m (122.9 to 144.6 ft-lb)
b. If the drive pinion lock nut is worn, replace it.

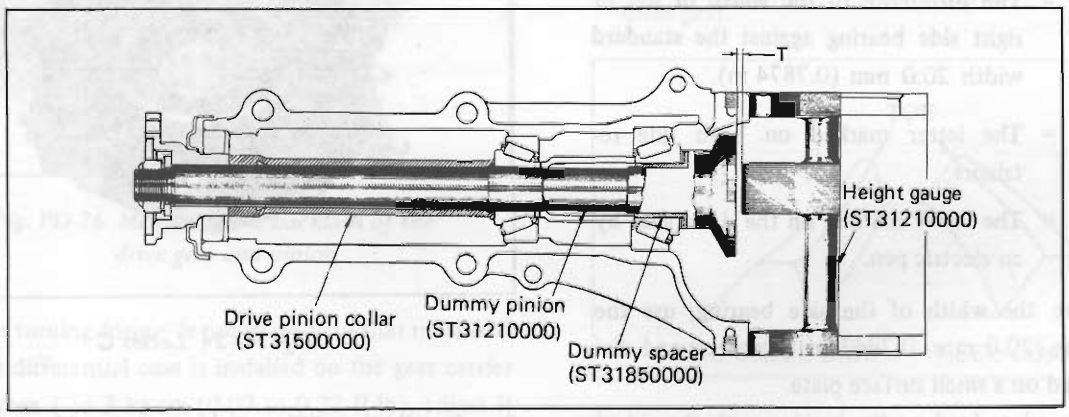


Fig. PD-21 Adjusting pinion height

Adjustment of the side retainer shims

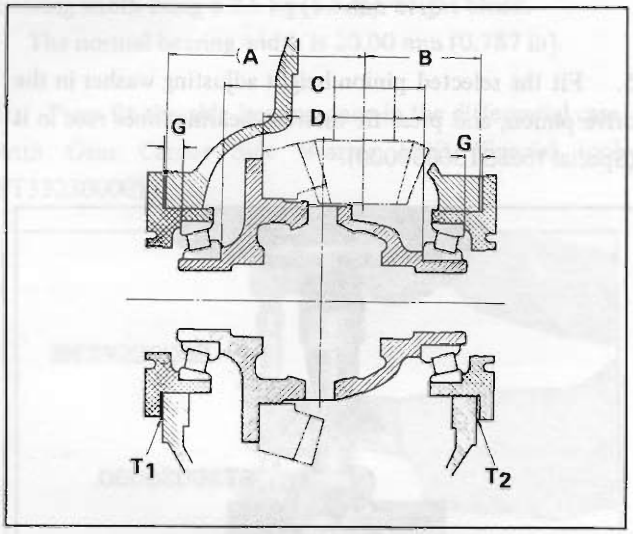


Fig. PD-22 Thickness of shims in left side
Thickness of shims in right side

1. When the carrier, differential case, side bearing or side bearing retainer are replaced with new ones, adjust the side bearing preload with adjusting shim. The required thicknesses of the left and right retainer shims can be obtained from the following equations:

T1 (left) = (A + C + G – D + H) x 0.01 + 0.76 – E
T2 (right) = (B + D + G – H) x 0.01 + 0.76 – F

The letters of A,B,C,D,G and H show dimensional variations in a unit of 1/100 mm against the individual standard measurements.

Where

A & B = The letters marked on the gear carrier
C & D = The letters marked on the differential case
E & F = The difference of the width of left or right side bearing against the standard width 20.0 mm (0.7874 in).
G = The letter marked on both side retainers.
H = The letter marked on the drive gear by an electric pen.

To measure the width of the side bearing, use the standard gauge (20.0 mm, 0.7847 in thickness) and dial indicator placed on a small surface plate.

In this case, place load on the bearing with the aid of weight block of about 2.5 kg (5.5 lb) to acquire the steady values.

When the measured width of the left side bearing is, for example, 19.8 mm (0.7795 in), the width is -0.2 mm (-0.008 in) against the standard width and the diffirence is expressed by excluding the minus sign, as 20 (=0.2 mm – 0.01 mm).

Note: Normally preload of use bearing is 60 to 80% of that of new one. Therefore, if it is necessary to use the old bearing again, the thickness of each side adjusting shims must be increased by 0.03 to 0.07 mm (0.001 to 0.003 in).

E1, E2 and E3 represent 19.99, 19.88, and 19.97, respectively.



Fig. PD-23 Letters C & D

G: Numerical figure given on side retainers.

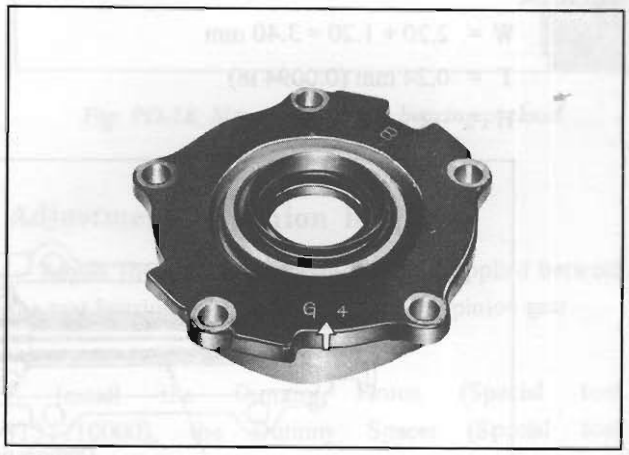


Fig. PD-24 Letter G

2. Install the differential case assembly in the gear carrier in reverse order of disassembly.

3. Fit given shims and O-rings in the both side retainers, and install retainers in the carrier using the Gear Carrier Side Retainer Guide (Special tool ST33720000).

Note: When installing the retainers, be careful not to damage the side bearing outer races with the roller.



Fig. PD-25 Installation of side retainer

4. Measure the backlash of the drive gear and the drive pinion by using the dial indicator, and adjust it to 0.10 to 0.20 mm (0.0039 to 0.0079 in), if required.

If it is less than the prescribed value, move the shim from the right to the left. If it is excessive, move it inversely.

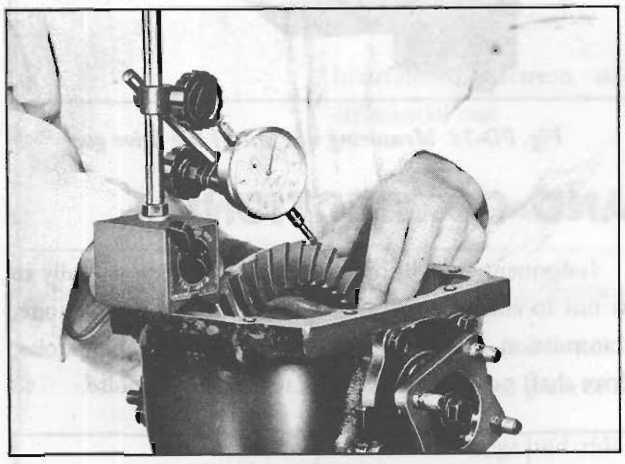


Fig. PD-26 Measuring the backlash of the drive gear and pinion

5. If the turning torque is not more than that measured before the differential case is installed on the gear carrier in range from 1 to 3 kg-cm (0.07 to 0.22 ft-lb), adjust it with side retainer shims.

Incidentally, decrease or increase in the thickness of the shims changes the drive gear and the pinion backlash.

Thus, make sure that they have the proper backlash.

6. Check and adjust the tooth contact pattern of the drive gear and drive pinion.

Apply red lead slightly and evenly to 4 to 5 teeth at two places of the drive gear, and turn it backward and forward several times by hand. This causes the gear to impress a pattern on the painted section of the drive gears and coast side.

This is the tooth contact pattern that is the final proof of the adjustments.

Incorrect contact pattern of teeth shall be adjusted in the following manner.

a. Heel contact

Increase the thickness of drive pinion adjusting shim and washer so that the drive pinion is moved to the drive gear.

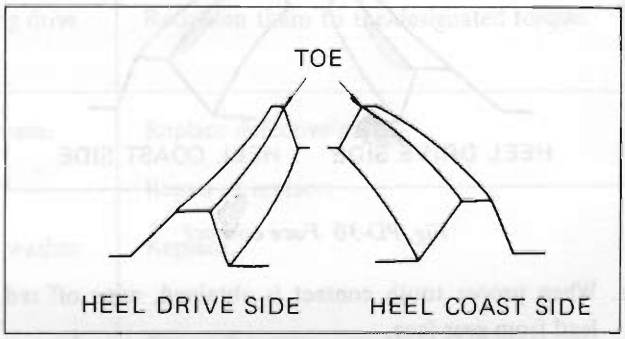


Fig. PD-27 Heel contact

b. Toe contact

Reduce the thickness of drive pinion adjusting shim and washer so that drive pinion is moved away from drive gear.

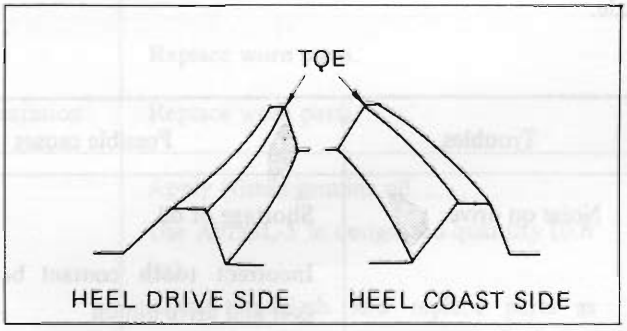


Fig. PD-28 Toe contact

c. Flank contact (low and shallow contact)

Adjust in the manner similar to b.

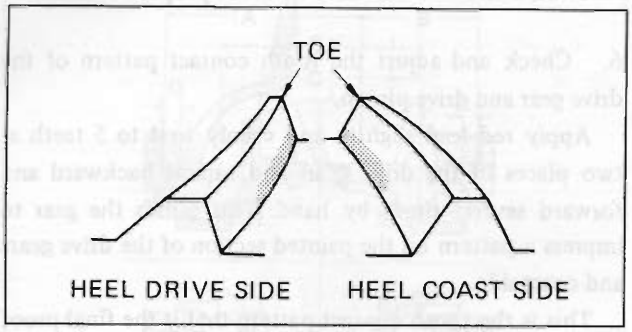


Fig. PD-29 Flank contact

d. Face contact (high and shallow contact)

Adjust in the manner similar to a.

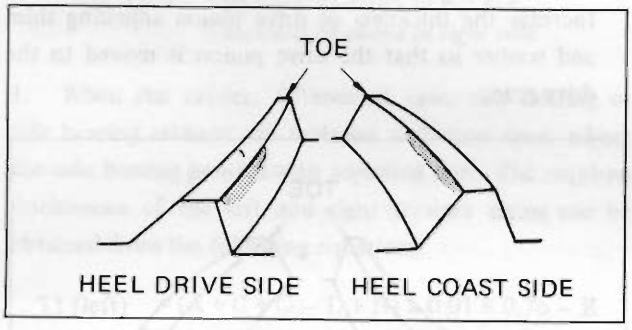


Fig. PD-30 Face contact

e. When proper tooth contact is obtained, wipe off red lead from gear face.

A correct contact pattern means that it lies in the range of 2/3 to 3/4 from the tip of the tooth under no load.

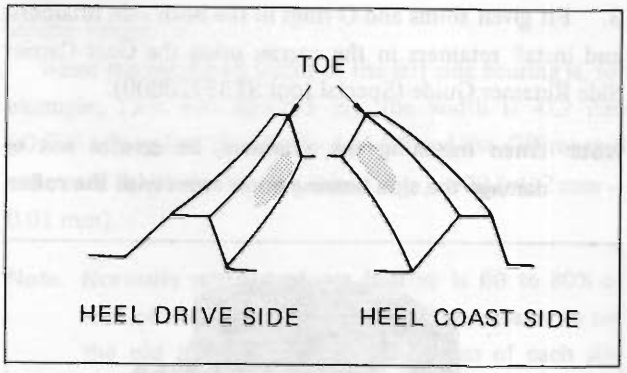


Fig. PD-31 Correct contact

Note: Change in the thickness of the adjusting washer or shim is accompanied by change in backlash. Check it when installing the gear.

7. Make sure that the run out of the drive gear rear side is within 0.08 mm (0.0031 in).

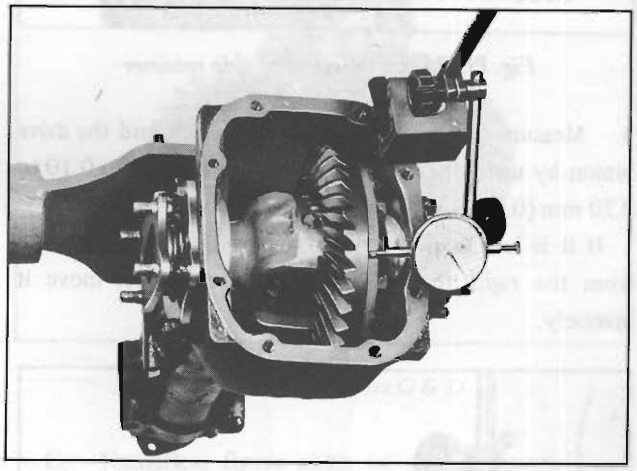


Fig. PD-32 Measuring run out of the drive gear

TROUBLE DIAGNOSES AND CORRECTIONS

When the rear axle is in trouble, noise occurs. In other words, when noise occurs, there is a trouble in the rear axle.

Judgement should, however, be made very carefully so as not to confuse with other noises such as engine noise, transmission noise, exhaust noise, universal joint noise, drive shaft noise, wheel bearing noise and tire noise.

Troubles	Possible causes	Corrective actions
Noise on drive	Shortage of oil	Supply gear oil.
	Incorrect tooth contact between drive gear and drive pinion	Adjust tooth contact.
	Damaged gear	Replace defective parts.

Noise on coast	Incorrect backlash between drive gear and drive pinion	Adjust backlash.
	Incorrect adjustment of drive pinion bearing	Adjust correctly.
Noise on drive and coast	Worn or damaged drive pinion bearings.	Disassemble and replace as required.
	Incorrect tooth contact pattern	Adjust backlash or replace the hypoid gear set.
	Damaged side gear, drive gear, drive pinion teeth surface	Replace parts as required.
	Seized drive gear and drive pinion	Replace hypoid gear set.
	Pinion bearing under inadequate preload	Adjust preload.
	Seized, damaged or broken side bearing	Replace the bearing.
	Seized, damaged or broken side bearing	Replace the side bearing.
	Swinging differential case	Replace the differential case.
	Loose clamp bolts and nuts holding drive gear, side retainers, etc	Retighten them to the designated torque.
Noise on turn	Side gear jammed in differential case.	Replace defective parts.
	Pinion gears too tight on their shaft	Repair or replace.
	Worn or damaged side gear thrust washer and pinion thrust washer	Replace.
	Interference between side flange and differential case	Repair the parts involved for interference, or replace the side flange and differential case.
	Seized or damaged side bearing	Replace the side bearing.
Excessive backlash	Incorrect backlash between drive gear and drive pinion	Adjust backlash.
	Worn differential gears or case	Replace worn parts.
	Worn side flange and side gear serration	Replace worn parts.
Seizure	Insufficiently oiled	Apply Nissan genuine oil.
	Improper oil used	Use API.GL-5 in designated quantity (0.8 ltr).
	Insufficient backlash.	Adjust backlash and replace parts as required.

Breakage of differential	Shortage of oil or use of improper oil	Disassemble differential and replace parts as required.
	An excessive loading, and/or improper use of clutch	After adjusting preload of bearings, backlash and engaging condition of gears, secure parts and apply specified volume of genuine gear oil.
	Incorrect adjustment of bearings	
	Incorrect adjustment of drive gear and drive pinion	Adjust correctly.
	Excessive backlash due to defacement of side gear and thrust washer	Operate the vehicle under proper and correct manner.
	Loose bolts and nuts, such as drive gear clamp bolt	Retighten bolts and nuts.
Oil leakage	Worn-out, damaged or improperly installed front oil seal, or bruised, dented or abnormally worn slide face of companion flange	Install oil seal correctly or replace if necessary Ammend the affected flange with sand paper or replace if necessary.
	Worn, damaged or improperly installd side flange oil seal, or bruised, dented or abnormally worn slide face of side flange	Treat as above.
	Loose side flange or side retainer installation	Retighten the bolts to the designated torque.
	Defective O-rings for these parts	Replace defective O-rings with new ones.
	Damaged rear cover or rear cover gasket	Tighten the bolts to the designated torque. Replace the defective gasket with a new one.
	Loose filler or drain plug	Retighten.
	Clogged or damaged breather	Repair or replace.

SERVICE DATA AND SPECIFICATIONS

Final gear type	Hypoid
Final gear ratio (number of teeth)	
with 4-speed T/M	3.900 : 1 (39 : 10)
with 5-speed T/M	3.364 : 1 (37 : 11)

Drive pinion

Initial turning torque (without oil seal)	7 to 10 kg-cm (0.506 to 0.723 ft-lb)
Depth from axle center	Approximately 48.5 mm (1.909 in)
Thickness of pinion height adjusting washer	From 3.09 to 3.66 mm spacing 0.03 mm (From 0.1217 to 0.1441 in spacing 0.0012 in)
Length of drive pinion bearing adjusting spacers	From 52.20 to 53.20 mm spacing 0.20 mm (From 2.055 to 2.094 in spacing 0.0079 in)
Thickness of drive pinion bearing adjusting washers	From 2.31 to 2.70 mm spacing 0.02 mm (From 0.0909 to 0.106 spacing 0.0008 in)

Drive gear

Backlash between drive gear and pinion	0.10 to 0.20 mm (0.0039 to 0.0079 in)
Run-out of rear side of drive gear	Less than 0.08 mm (0.0031 in)

Side gear and pinion mate

Thickness of side gear thrust washer	0.775, 0.825, 0.875 mm (0.0305, 0.0325, 0.0344 in)
Clearance between side gear and thrust washer	0.10 to 0.20 mm (0.0039 to 0.0079 in)

Side retainer

Thickness of side retainer adjusting shims	0.20, 0.25, 0.30, 0.40, 0.50 mm (0.0079, 0.0098, 0.0118, 0.0157, 0.0197)

TIGHTENING TORQUE

Drive pinion nuts	17.0 to 20.0 kg-m (122.9 to 144.6 ft-lb)
Drive gear bolts	7.0 to 8.0 kg-m (50.6 to 57.8 ft-lb)
Side retainer bolts	0.9 to 1.2 kg-m (6.5 to 8.7 ft-lb)
Side flange fix bolts	1.9 to 2.6 kg-m (13.7 to 18.8 ft-lb)
Rear cover fix bolts	1.9 to 2.6 kg-m (13.7 to 18.8 ft-lb)
Gear carrier to rear differential mounting member lock nuts	7.5 to 9.5 kg-m (54.2 to 68.7 ft-lb)

Final drive

Companion flange to propeller shaft fix nuts	2.5 kg-m (18 ft-lb)

Differential to drive shaft fix nuts	7.0 to 8.0 kg-m (50.6 to 57.8 ft-lb)
Gear carrier to front differential mounting insulator bolt	6.0 to 8.0 kg-m (43.4 to 57.8 ft-lb)

SERVICE JOURNAL OR BULLETIN REFERENCE

DATE	JOURNAL or BULLETIN No.	PAGE No.	SUBJECT

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