

SECTION 4A

PROPELLER SHAFT

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MAIN DATA AND SPECIFICATIONS

REAR PROPELLER SHAFT

4x2 Model

mm(in)

		Short Wheel Base	
Engine Model		4ZD1	4JA1
Transmission Type		MT, 5	MT, 5
Outside Diameter	mm (in)	82.6 (3.25)	75.0 (2.95)
Inside Diameter	mm (in)	79.4 (3.13)	71.8 (2.83)
Length	1st	mm (in)	1293 (50.91)
	2nd	mm (in)	— —
Spline Outside diameter	mm (in)	29.87 (1.18)	29.87 (1.18)

		Long Wheel Base						
Engine Model		4ZE1		4ZD1	4JA1		4JB1T	4JG2T
Transmission Type		MT,5	AT	MT,5	MT,5	MT,5 (6ST)	MT,5	MT,5
Outside Diameter	mm	68.9	68.9	63.5	63.5	68.9	68.9	68.9
	(in)	(2.71)	(2.71)	(2.50)	(2.50)	(2.71)	(2.71)	(2.71)
Inside Diameter	mm	64.3	64.3	60.3	60.3	64.3	64.3	64.3
	(in)	(2.53)	(2.53)	(2.37)	(2.37)	(2.53)	(2.53)	(2.53)
Length 1st	mm	644.5	565.5	644.5	629.5	644.5	644.5	553.5
	(in)	(25.37)	(22.26)	(25.37)	(24.78)	(25.37)	(25.37)	(21.79)
2nd	mm	927	927	949	949	927	927	924
	(in)	(36.50)	(36.50)	(37.36)	(37.36)	(36.50)	(36.50)	(36.38)
Spline Outside diameter	mm	29.87	29.87	29.87	29.87	29.87	29.87	29.87
	(in)	(1.18)	(1.18)	(1.18)	(1.18)	(1.18)	(1.18)	(1.18)

- * AT – Automatic Transmission
- MT – Manual Transmission, 4 speed and 5 speed
- MT, 5 – Manual Transmission, 5 speed
- MT, 4 – Manual Transmission, 4 speed
- 6ST – Low gear Rear Axle and Transmission

4×4 Model

		Short Wheel Base			
Engine Model		4ZD1		4JA1	
Rear Axle size		MT,5	MT,5 (6WF)	MT,5	MT,5 (6WF)
Outside Diameter	mm	63.5	65	63.5	65
	(in)	(2.50)	(2.56)	(2.50)	(2.56)
Inside Diameter	mm	60.3	59.8	60.3	59.8
	(in)	(2.37)	(2.35)	(2.37)	(2.35)
Length 1st	mm	510.5	449.5	495.5	361.5
	(in)	(20.10)	(17.70)	(19.51)	(14.23)
2nd	mm	608	582	608	582
	(in)	(23.94)	(22.91)	(23.94)	(22.91)
Spline Outside diameter	mm	29.87	29.87	29.87	29.87
	(in)	(1.18)	(1.18)	(1.18)	(1.18)

		Long Wheel Base						
Engine Model		4ZE1	4ZD1		4JA1		4JB1T	4JG2T
Rear Axle size		MT,5	MT,5	MT,5 (6WF)	MT,5	MT,5 (6WF)	MT,5	MT,5
Outside Diameter	mm	68.9	63.5	68.9	63.5	68.9	68.9	68.9
	(in)	(2.71)	(2.50)	(2.71)	(2.50)	(2.71)	(2.71)	(2.71)
Inside Diameter	mm	64.3	60.3	64.3	60.3	64.3	64.3	64.3
	(in)	(2.53)	(2.37)	(2.53)	(2.37)	(2.53)	(2.53)	(2.53)
Length 1st	mm	451.5	510.5	451.5	495.5	482	482	363.5
	(in)	(17.78)	(20.10)	(17.78)	(19.51)	(19.00)	(19.00)	(14.31)
2nd	mm	927	949	927	949	927	927	924
	(in)	(36.50)	(37.36)	(36.50)	(37.36)	(36.50)	(36.50)	(36.38)
Spline Outside diameter	mm	29.87	29.87	29.87	29.87	29.87	29.87	29.87
	(in)	(1.18)	(1.18)	(1.18)	(1.18)	(1.18)	(1.18)	(1.18)

- * AT – Automatic Transmission
- MT – Manual Transmission, 4 speed and 5 speed
- MT,5 – Manual Transmission, 5 speed
- MT,4 – Manual Transmission, 4 speed
- 6WF – Low gear Transmission

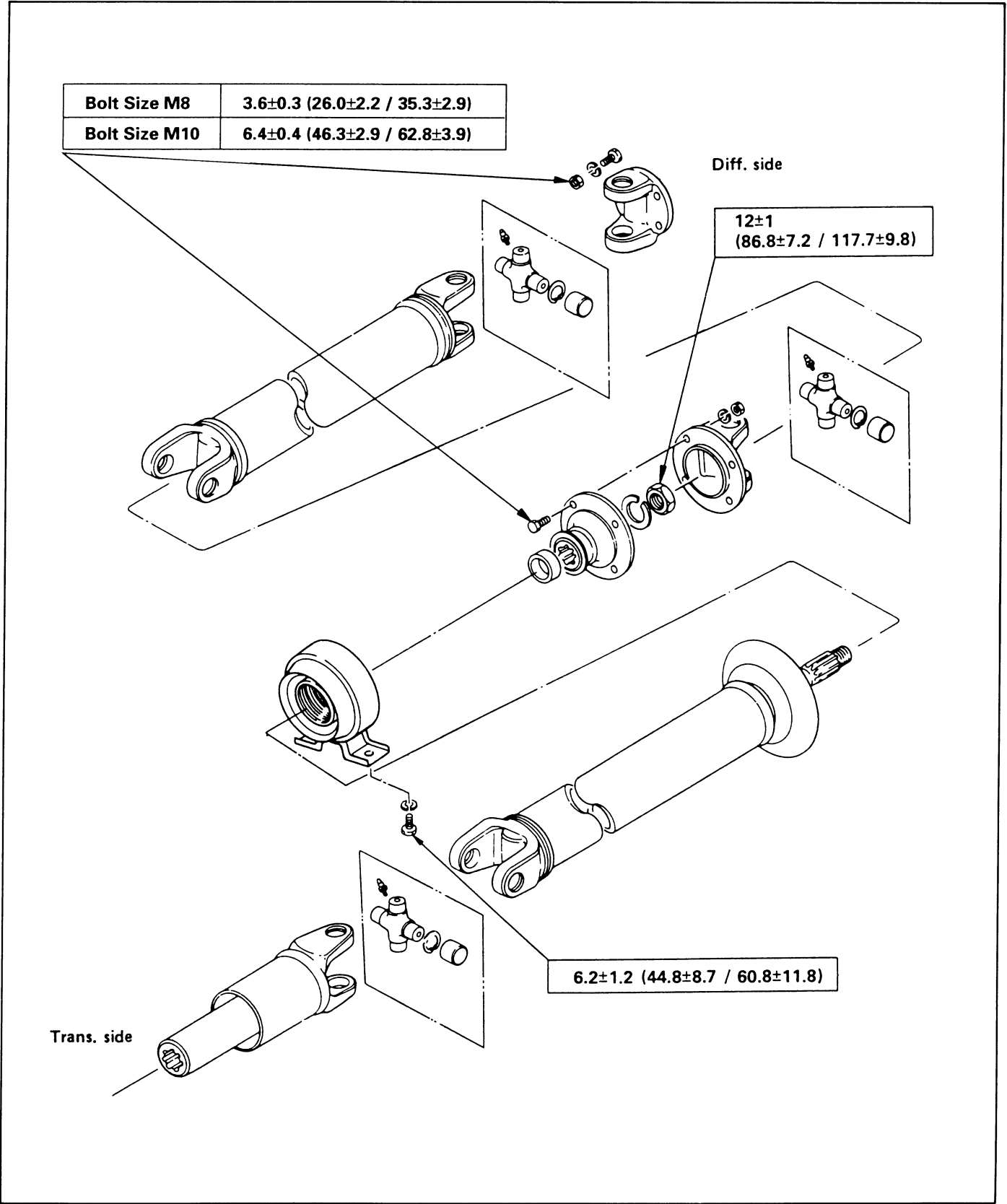


SPECIAL PARTS FIXING NUT AND BOLT

REAR PROPELLER SHAFT (Long Wheel Base Model)

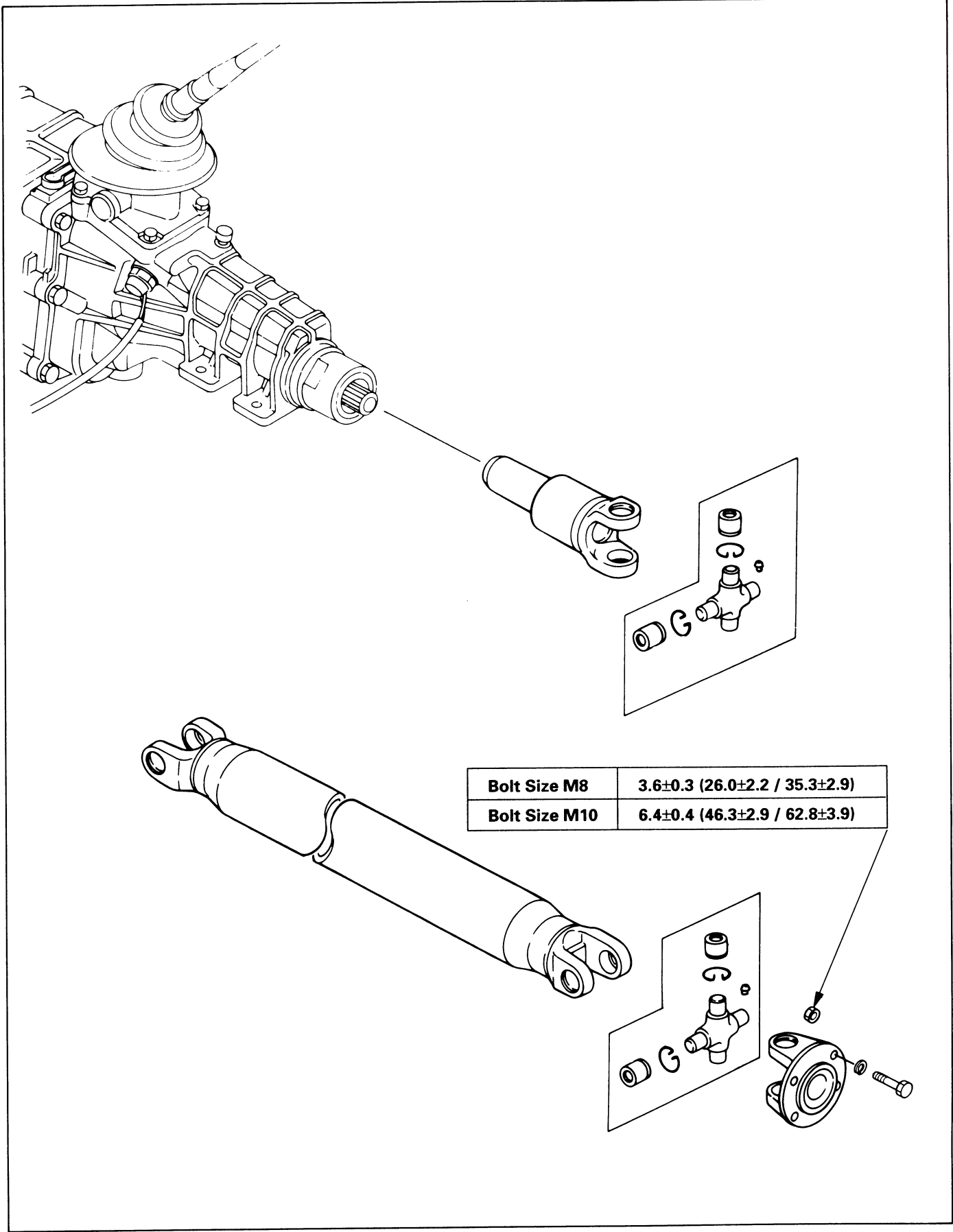
kg·m(lb.ft/N·m)

Bolt Size M8	3.6±0.3 (26.0±2.2 / 35.3±2.9)
Bolt Size M10	6.4±0.4 (46.3±2.9 / 62.8±3.9)



REAR PROPELLER SHAFT (Short Wheel Base Model)

kg·m(lb.ft/N·m)

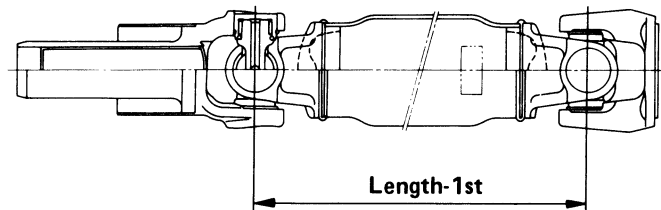


PROPELLER SHAFT ASSEMBLY

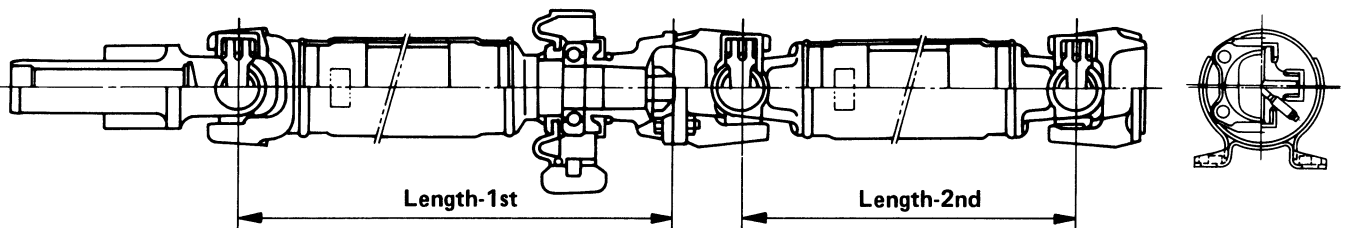
GENERAL DESCRIPTION

REAR PROPELLER SHAFT

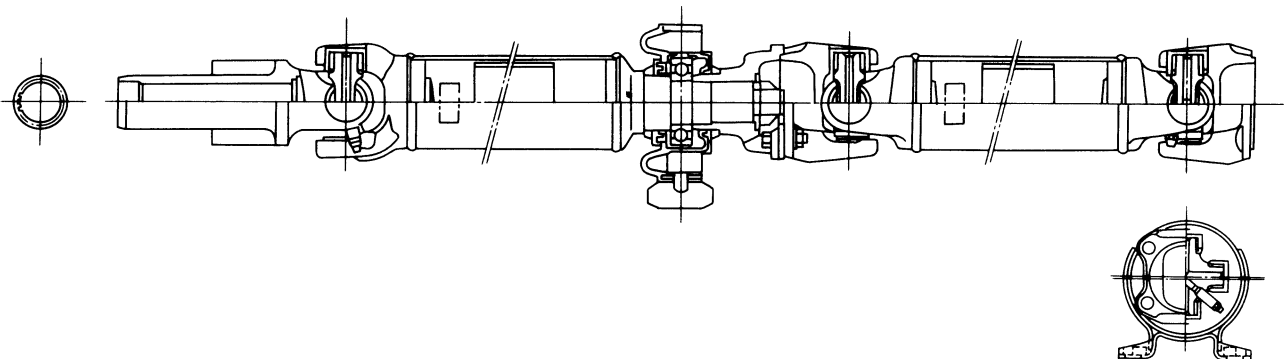
4 X 2 Short



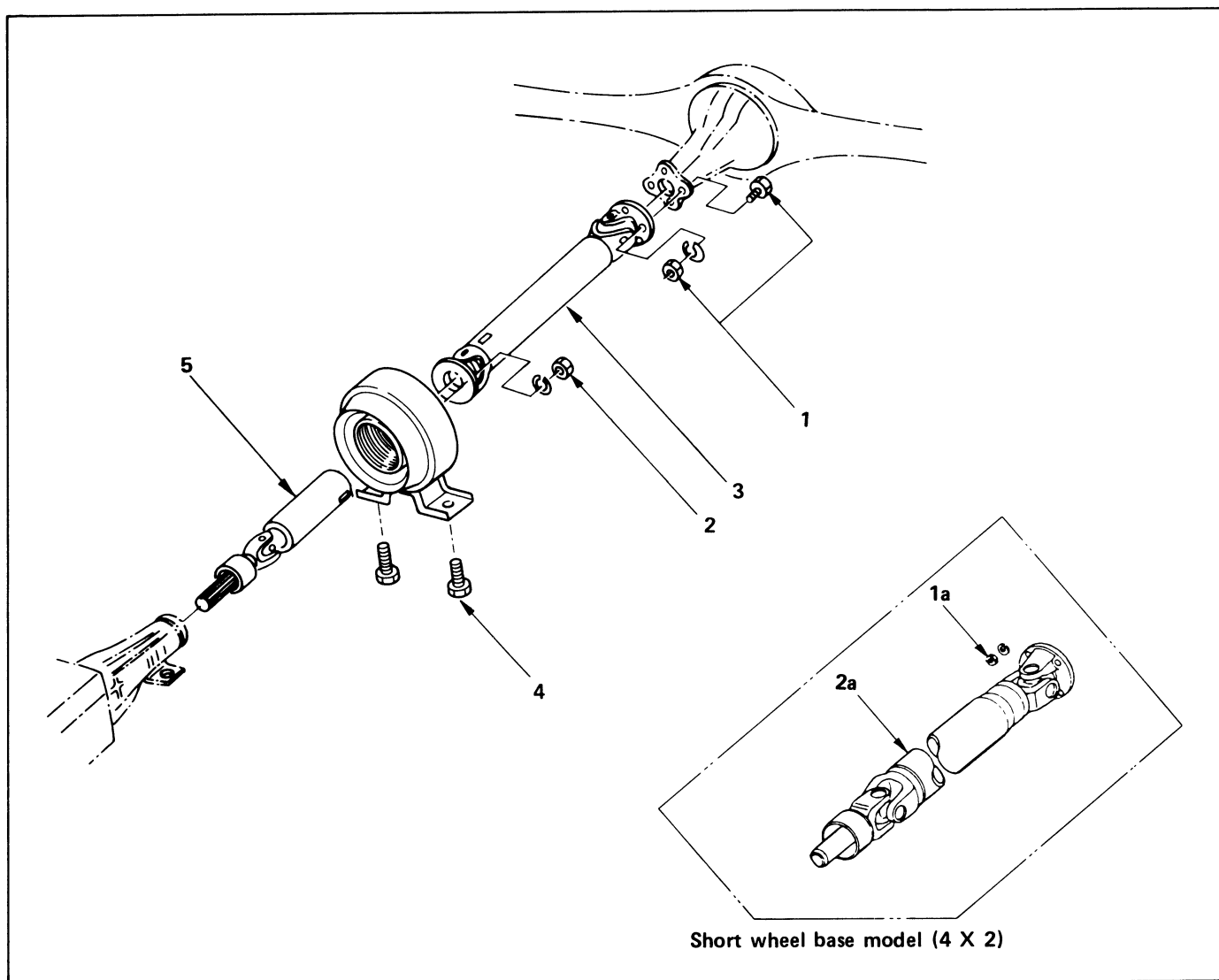
4 X 2 Long



4 X 4



↔ ↔ REMOVAL AND INSTALLATION



Since the propeller shaft assembly is carefully balanced, a scribe mark should be made on the flange before removal.

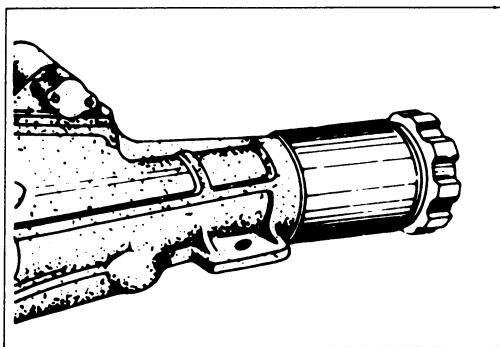
Install the parts by aligning scribe marks made during removal.

Removal Steps

- 1.1a Bolt ; differential side
- 2. Bolt ; flange
- ▲ 2a. Propeller shaft assembly
- 3. Propeller shaft assembly ; 2nd
- 4. Bolt ; center bearing bracket
- ▲ 5. Propeller shaft assembly ; 1st

Installation Steps

- 5. Propeller shaft assembly ; 1st
- ▲ 4. Bolt ; center bearing bracket
- 3. Propeller shaft assembly ; 2nd
- ▲ 2. Bolt ; flange
- 2a. Propeller shaft assembly
- ▲ 1.1a Bolt ; differential side



Important Operation – Removal

2a. Propeller Shaft Assembly

5. Propeller Shaft Assembly : 1st

Install a plug at the transmission rear cover to prevent loss of the transmission oil.



Important Operations – Installation



4. Bolt ; Center Bearing Bracket

Bolt Torque	kg·m(lb.ft/N·m)
6.2 ± 1.2 ($44.8 \pm 8.7/60.8 \pm 11.8$)	



2. Bolt ; Flange

Bolt Torque		kg·m(lb.ft/N·m)
Bolt size M10	6.4±0.4 (46.3±2.9/62.8±3.9)	
Bolt size M8	3.6±0.3 (26±2.2/35.3±2.9)	



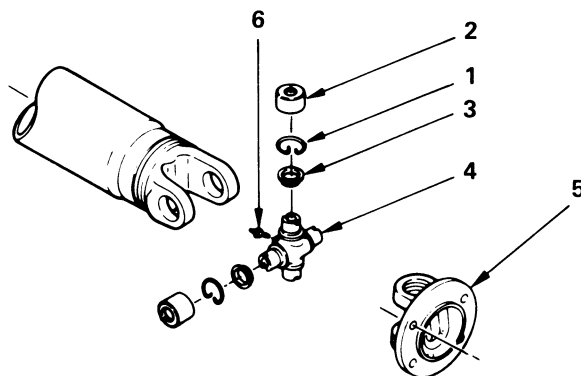
1.1a. Bolt ; differential side

Bolt Torque		kg·m(lb.ft/N·m)
Bolt size M10	6.4±0.4 (46.3±2.9/62.8±3.9)	
Bolt size M8	3.6±0.3 (26±2.2/35.3±2.9)	



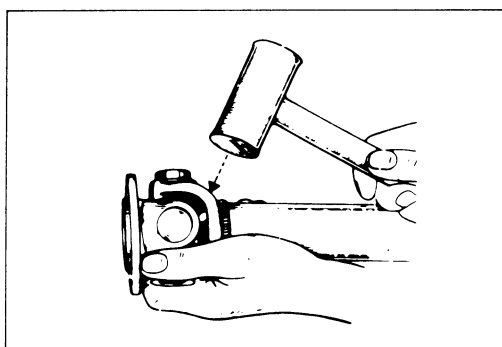
DISASSEMBLY

UNIVERSAL JOINT



Disassembly Steps

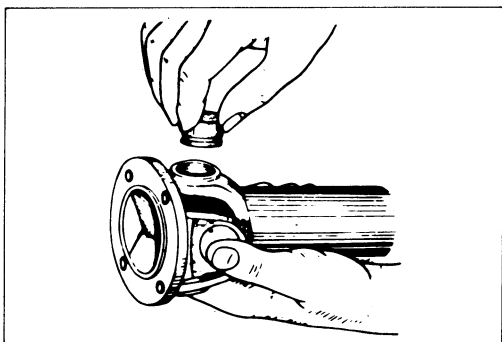
- | | |
|----------------------------|------------------------------------|
| 1. Snap ring | 4. Spider |
| ▲ 2. Needle roller bearing | 5. Flange yoke |
| 3. Seal | 6. Grease fitting (4x4 model only) |



Important Operation

2. Needle Roller Bearing

- (1) Tap out the bearing by gently striking the shoulder of the yoke.
Using a mallet or a copper hammer.
- (2) As the yoke is tapped, the needle roller bearing will come out gradually, permitting easy removal by hand.





INSPECTION AND REPAIR

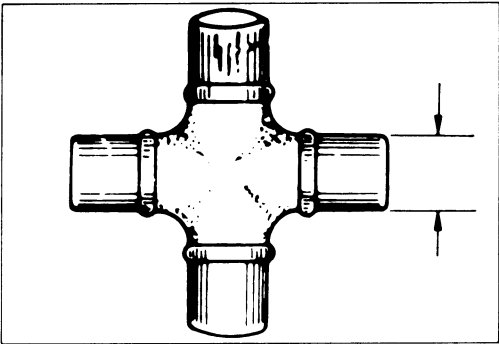
Make all necessary adjustments, repairs, and part replacements if wear, damage, or other problems are discovered during inspection.

- Spider
- Needle roller bearing
- Yoke
- Flange
- Center bearing
- Cushioning rubber
- Bracket



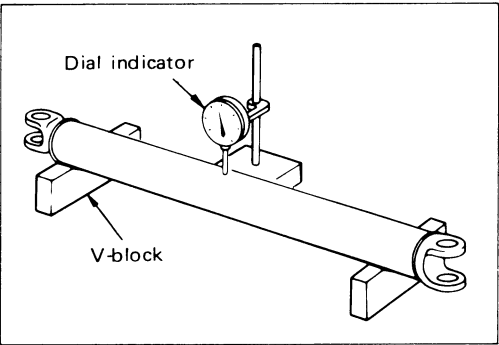
Visual Check

Inspect following parts for wear, damage, or other abnormal conditions.



Outside Diameter of Spider Pins

mm(in)	
Standard	Limit
17 (0.67)	16.90 (0.665)

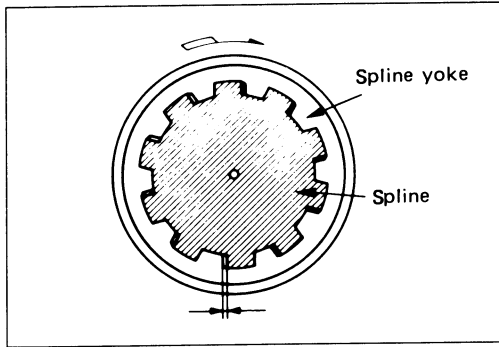


Propeller Shaft Run-Out

Support the ends of the propeller shaft on V-blocks and check for run-out by holding the probe of a dial indicator in contact with the center part of the shaft.

If the amount of run-out is beyond the standard value for assembly, correct with a bench press or replace the shaft with a new one.

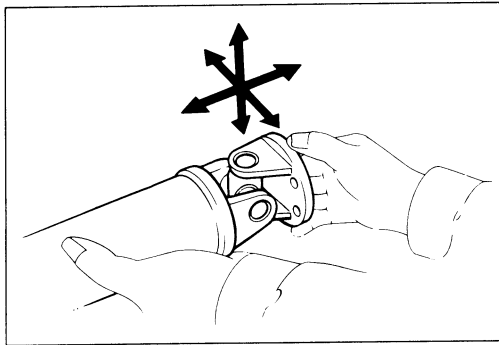
mm(in.)	
Standard	Limit
0.3 (0.012)	0.5 (0.02)



Play in the Splines in the Normal Direction of Rotation

Check the amount of play in the sleeve yoke and the propeller shaft splines in the direction of rotation using a pointed feeler gauge.

mm(in)	
Standard	Limit
0.06 — 0.14 (0.002 — 0.006)	0.3 (0.012)



Play in Spider Bearing

- (1) Check the spider bearings for wear or damage.
- (2) Check the amount of axial and radial play in spider bearing by moving the yoke back and forth on the spider axes and shaft axis.

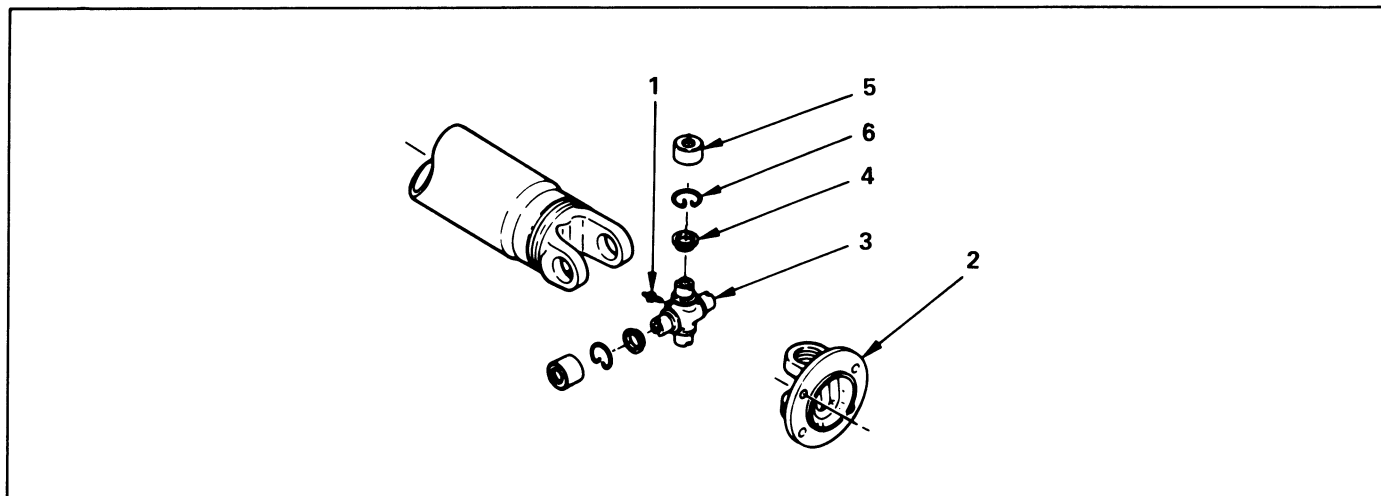
mm(in.)	
Limit	0.5 (0.02)

If the limit is exceeded, replace the shaft assembly.



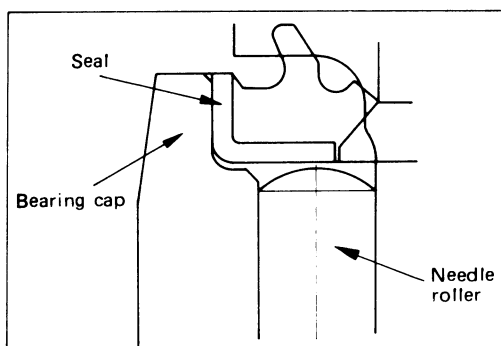
REASSEMBLY

UNIVERSAL JOINT



- 1. Grease fitting (4x4 model only)
- 2. Flange yoke
- 3. Spider

- ▲ 4. Seal
- ▲ 5. Needle roller bearing
- ▲ 6. Snap ring



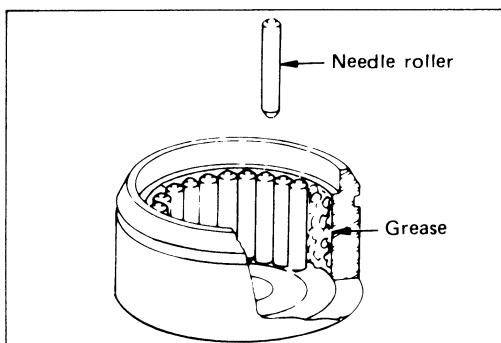
Important operations



4. Seal

Discard the used seal and install a new one.

Push the seal in until its outer surface is flush against the bearing cap surface.

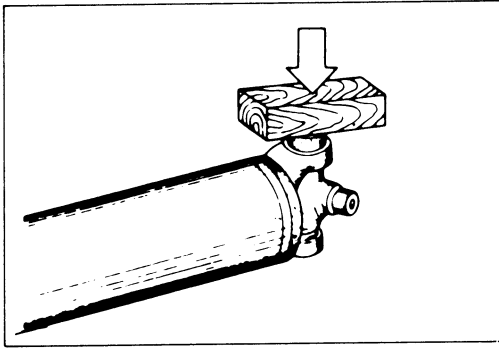


5. Needle Roller Bearing

- (1) Apply a molybdenum-disulfide grease or multipurpose type grease NLGI No. 2 to the bearing cap inner surface and seal lip.
Install the needle rollers.

Amount of grease required g(oz)

Approx. 1.2 (0.042)



- (2) Attach the spider to the yoke and then insert the needle roller bearing cap into the hole by using a wood block and a hammer or a press.

6. Snap Ring

When the bearing cap is in position, select and install a snap ring of suitable thickness so that the end play of the spider pin is held within 0.1 mm. (0.004 in.).

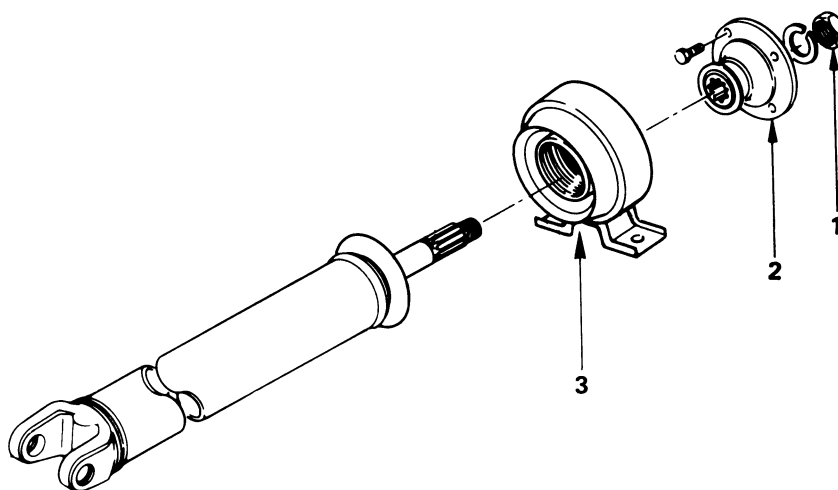
Select the thickest snap ring which can be fitted into the groove at the other end.

		mm(in.)
Snap ring thickness	Identify color	
1.5 (0.059)	Blue	
1.545 (0.061)	White	
1.59 (0.063)	Yellow	
1.635 (0.064)	Green	
1.68 (0.066)	Not color	

CENTER BEARING (4ZE1, 4JG2T, 4JB1T, 4ZD1, 4JA1 Engine)



DISASSEMBLY AND REASSEMBLY

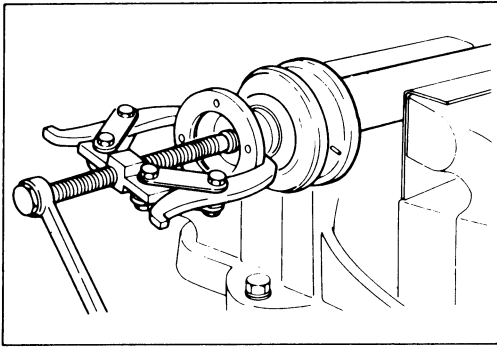


Disassembly Steps

1. Lock nut
- ▲ 2. Flange
3. Bearing assembly

Reassembly Steps

- ▲ 3. Bearing assembly
- ▲ 2. Flange
- ▲ 1. Lock nut

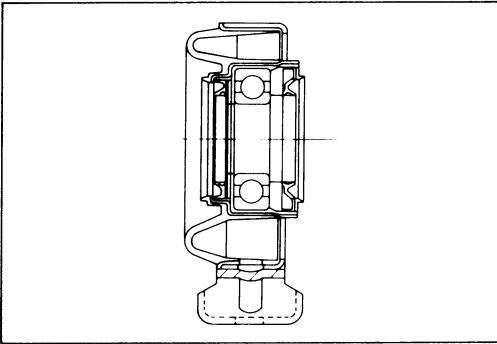


Important Operations — Disassembly



2. Flange

Use a suitable remover.



Important Operations — Reassembly



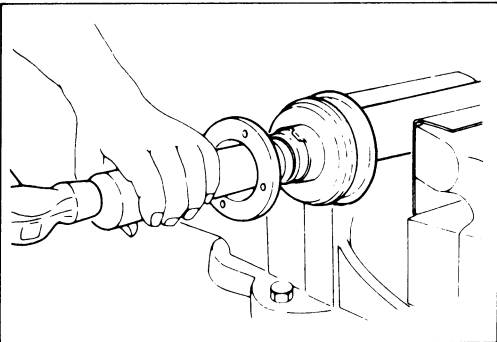
3. Bearing assembly

Clean the bearing fitting face.



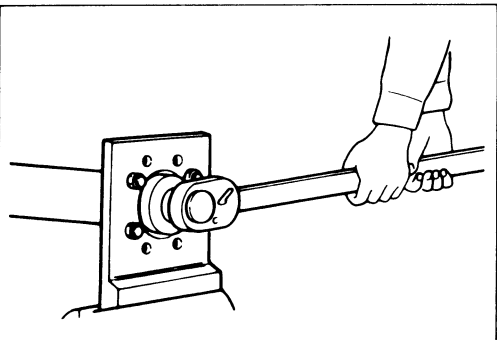
Repack the grease.

Amount of grease required	g(oz)	Approx. 12 (0.42)
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2. Flange

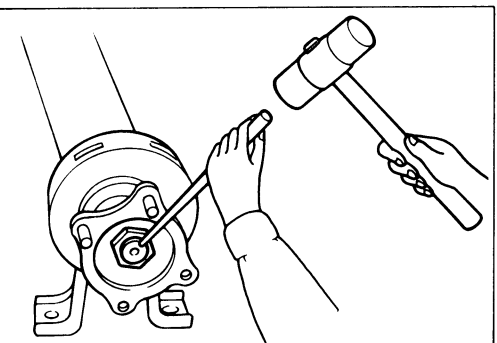
Installer : 5-8522-0034-0
(J-6403-C)



1. Lock nut

Lock nut Torque	kg·m(lb.ft/N·m)
	12 (86.8/117.7)

- (1) Discard the flange nut and install a new one.
- (2) Stake the outer face of the flange nut against the slot in the shaft.



SECTION 4B

REAR AXLE

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MAIN DATA AND SPECIFICATIONS

REAR AXLE

Ring gear size	mm(in)	194(7.64)	220(8.66)
Rear axle type		Banjo, semi-floating	
Rear axle capacity	kg(lb/N)	1680 (3700/16475)	
Rear axle case			
Axle tube section			
Outside diameter	mm(in)	75 (2.95)	
Thickness	mm(in)	4.5 (0.18)	
Final drive type		Single speed	
Final gear type		Hypoid	
Final gear ratio	(to 1)		
4ZD1 engine	(4×2)	4.555	4.555
	(4×4)	4.555	4.555 or 4.777
4JA1 engine	(4×2)	4.100 or 4.555	—
	(4×4)	4.555	4.555
4ZE1 engine	(4×2)	—	4.300
	(4×4)	—	4.555
4JB1-T engine	(4×2)	—	4.111 or 4.300
	(4×4)	—	4.555
4JG2-T engine	(4×2)	—	4.100
	(4×2)	—	4.300
Drive pinion bearing preload	kg-cm(lb.in)		
Starting torque (At drive pinion flange nut)		6.5-11.5 (5.6-10)	7-13 (6.1-11.3)
Preload adjusting method		Collapsible	
Final gear backlash	mm(in)	0.13-0.18 (0.005-0.007)	0.15-0.20 (0.006-0.008)
Differential carrier assembly			
Weight(Dry)	kg(lb/N)	21.2 (46.7/208)	29.0 (63.9/284)
Amount of hub grease	g(OZ)	80 (2.8)	
(one wheel)			
Lubrication			
Specified gear oil (API grade)		GL-5	
Oil capacity	lit(US/UK gal)	1.5 (0.4/0.33)	1.8 (0.48/0.4)

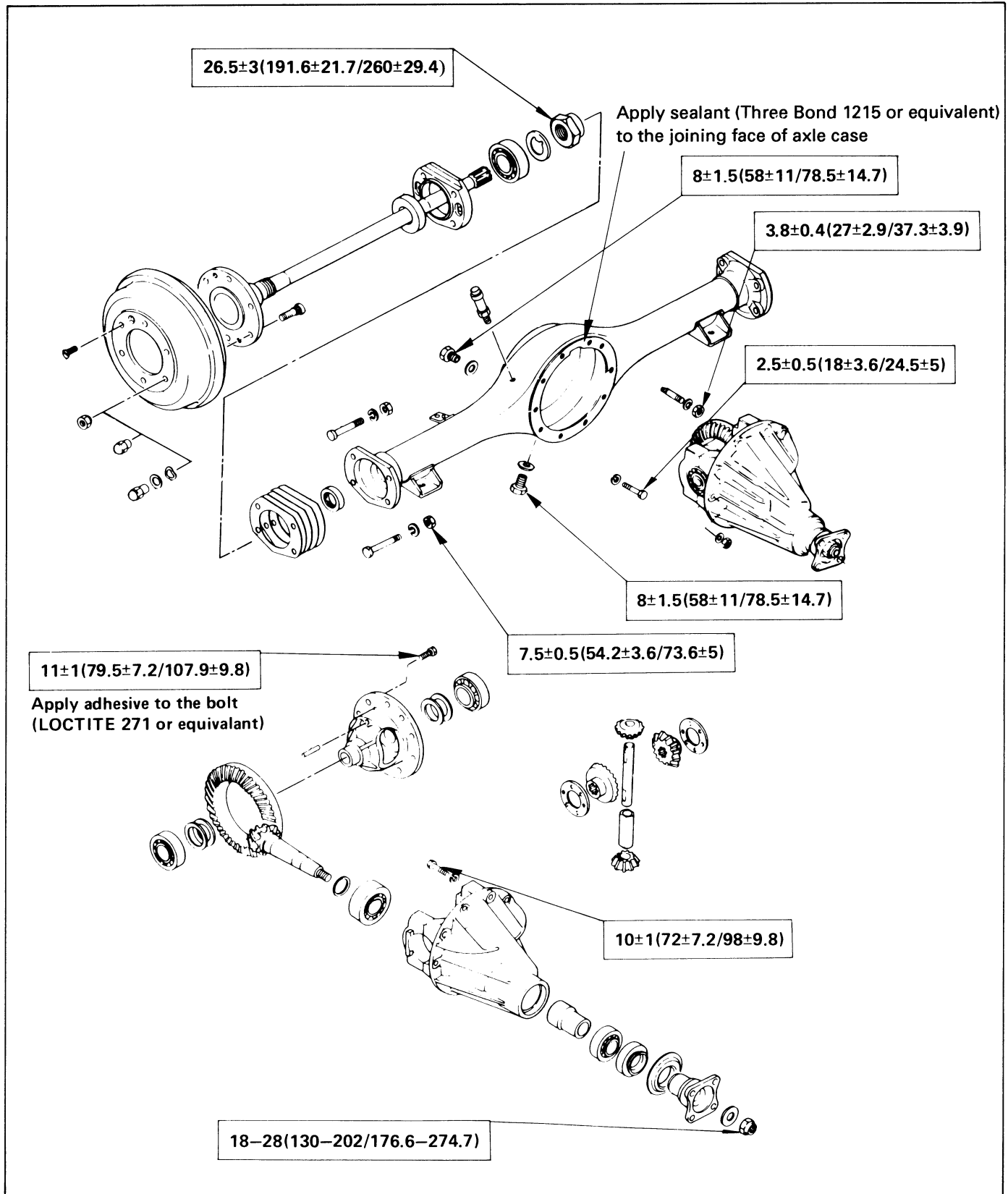


SPECIAL PARTS FIXING NUT AND BOLT

REAR AXLE AND DIFFERENTIAL

194 mm

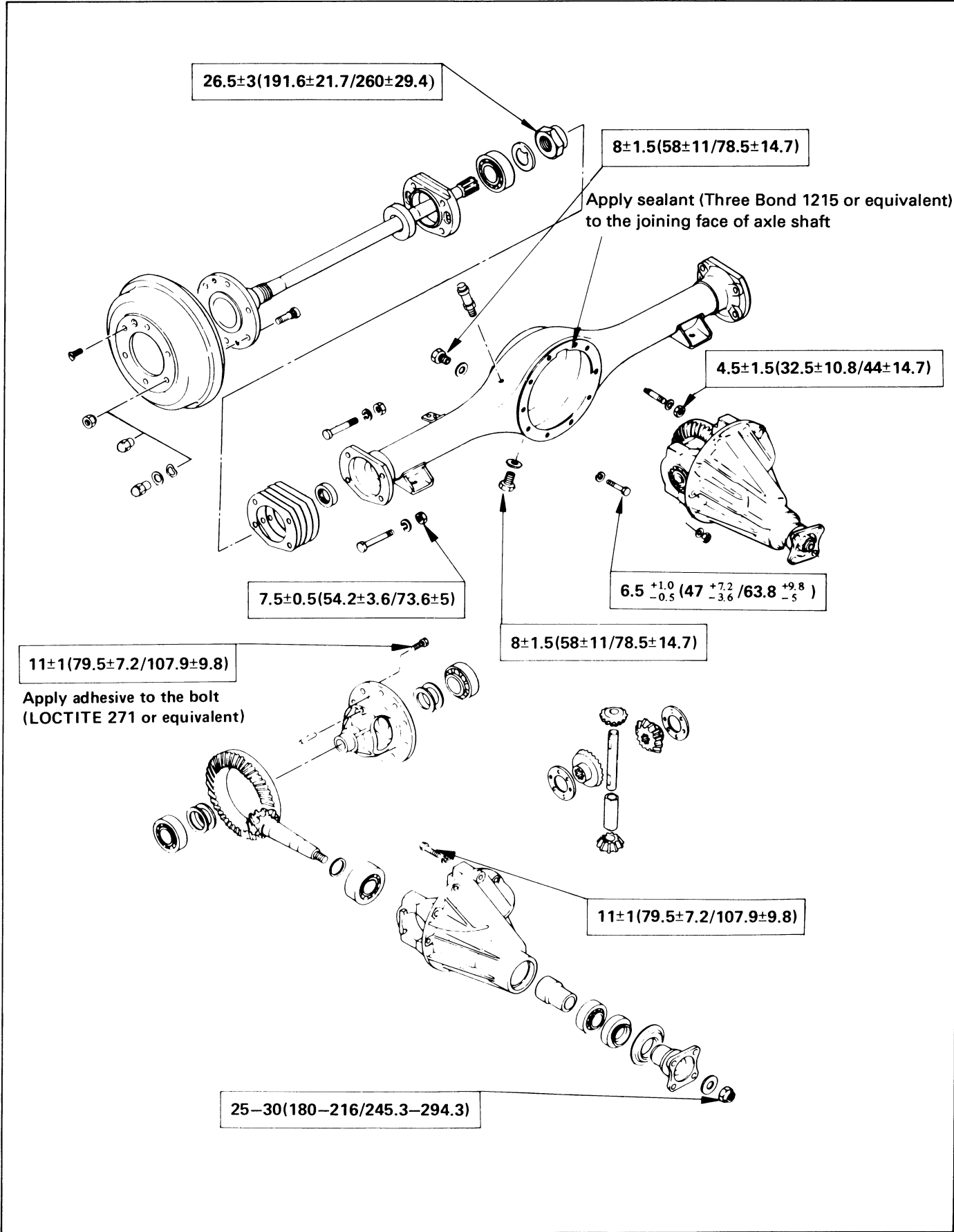
kg·m(lb·ft/N·m)



4B-4 REAR AXLE

220 mm

kg·m(lb·ft/N·m)





RECOMMENDED LIQUID GASKET

Type	Brand Name	Manufacturer	Remarks
RTV* Silicon Base	ThreeBond 1207B ThreeBond 1207C	Three Bond Three Bond	For Engine Repairs
	ThreeBond 1215	Three Bond	For Axle Case Repairs, T/M
Water Base	ThreeBond 1141E	Three Bond	For Engine Repairs
Solvent	ThreeBond 1104 BelcoBond 4 BelcoBond 401 BelcoBond 402	Three Bond Isuzu Isuzu Isuzu	For Engine Repairs
Anerobic	LOCTITE 515 LOCTITE 518	Loctite Loctite	All

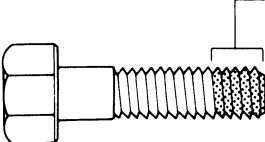
* RTV : Room Temperature Vulcanizer

Note:

1. It is very important that the liquid gaskets listed above or their exact equivalent be used on the vehicle.
2. Be careful to use the specified amount of liquid gasket.
Follow the manufacturer's instructions at all times.
3. Be absolutely sure to remove all lubricants and moisture from the connecting surfaces before applying the liquid gasket.
The connecting surfaces must be perfectly dry.
4. LOCTITE 515 and LOCTITE 518 harden upon contact with a metal surface.
Do not apply LOCTITE 515 or LOCTITE 518 between two metal surfaces having a clearance of greater than 0.25 mm (0.01 in). Poor adhesion will result.



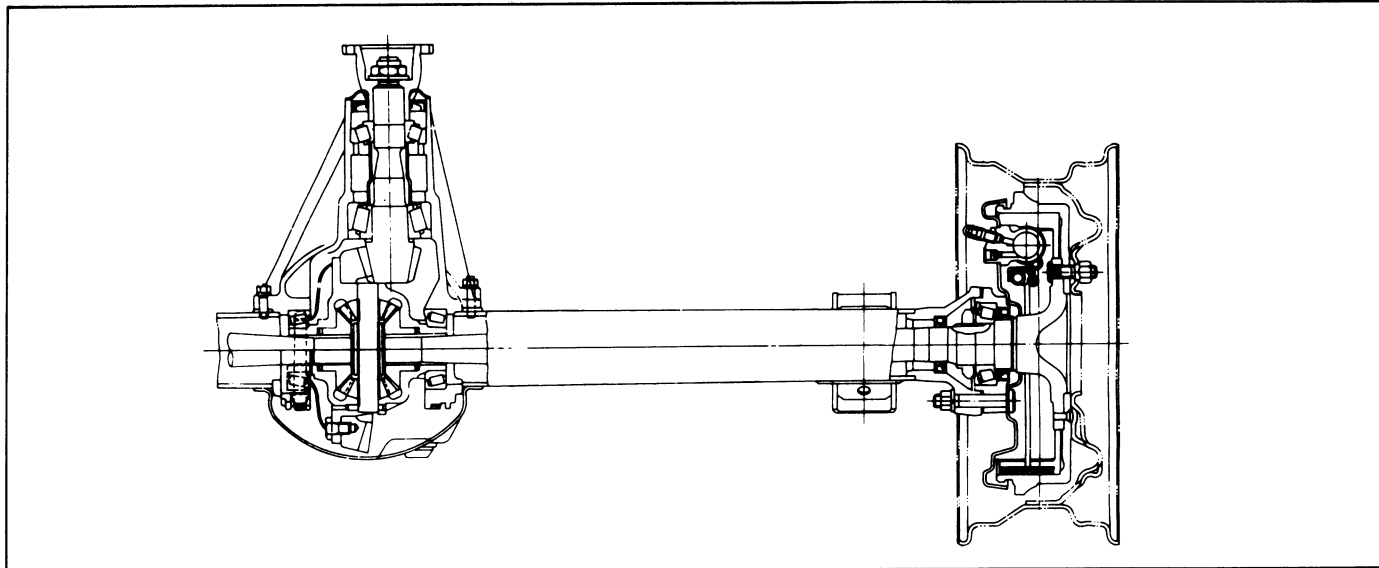
RECOMMENDED THREAD LOCKING AGENTS

LOCTITE Type	LOCTITE Color	Application Steps
LOCTITE 242	Blue	1. Completely remove all lubricant and moisture from the bolts and the female threaded surfaces of the parts to be joined. The surfaces must be perfectly dry. 2. Apply LOCTITE to the bolts.  3. Tighten the bolts to the specified torque. 4. Wait at least one hour before continuing the installation procedure.
LOCTITE 262	Red	
LOCTITE 270	Green	
LOCTITE 271	Red	

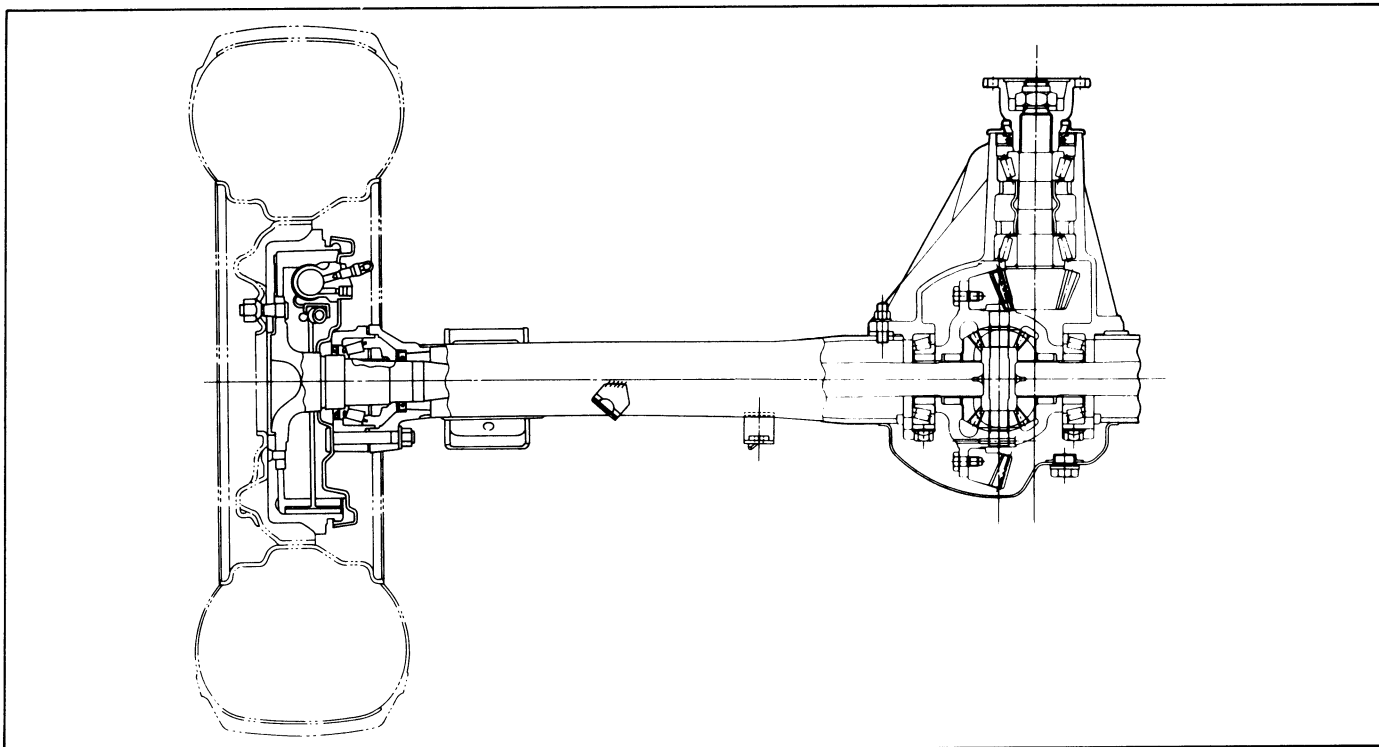
REAR AXLE ASSEMBLY

GENERAL DESCRIPTION

194 mm (7.6 in) / (4ZD1, 4JA1 Engine)



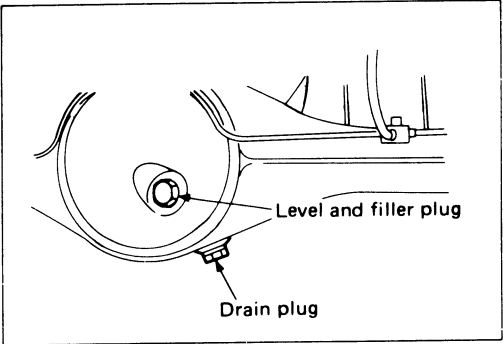
220 mm (8.6 in) / (4ZE1, 4JB1T, 4JG2T Engine)



The rear axle assembly consists of the rear axle case, the differential carrier assembly, the rear hub assembly, and the rear axle shaft.

The rear axle assembly supports the greater part of the vehicle weight including the load. It receives the engine torque through the clutch, the transmission, and the propeller shaft, magnifies the torque at the final gear, and delivers the torque at a right angle to the rear axle shaft.

SERVICING



Rear Axle Oil Replacement

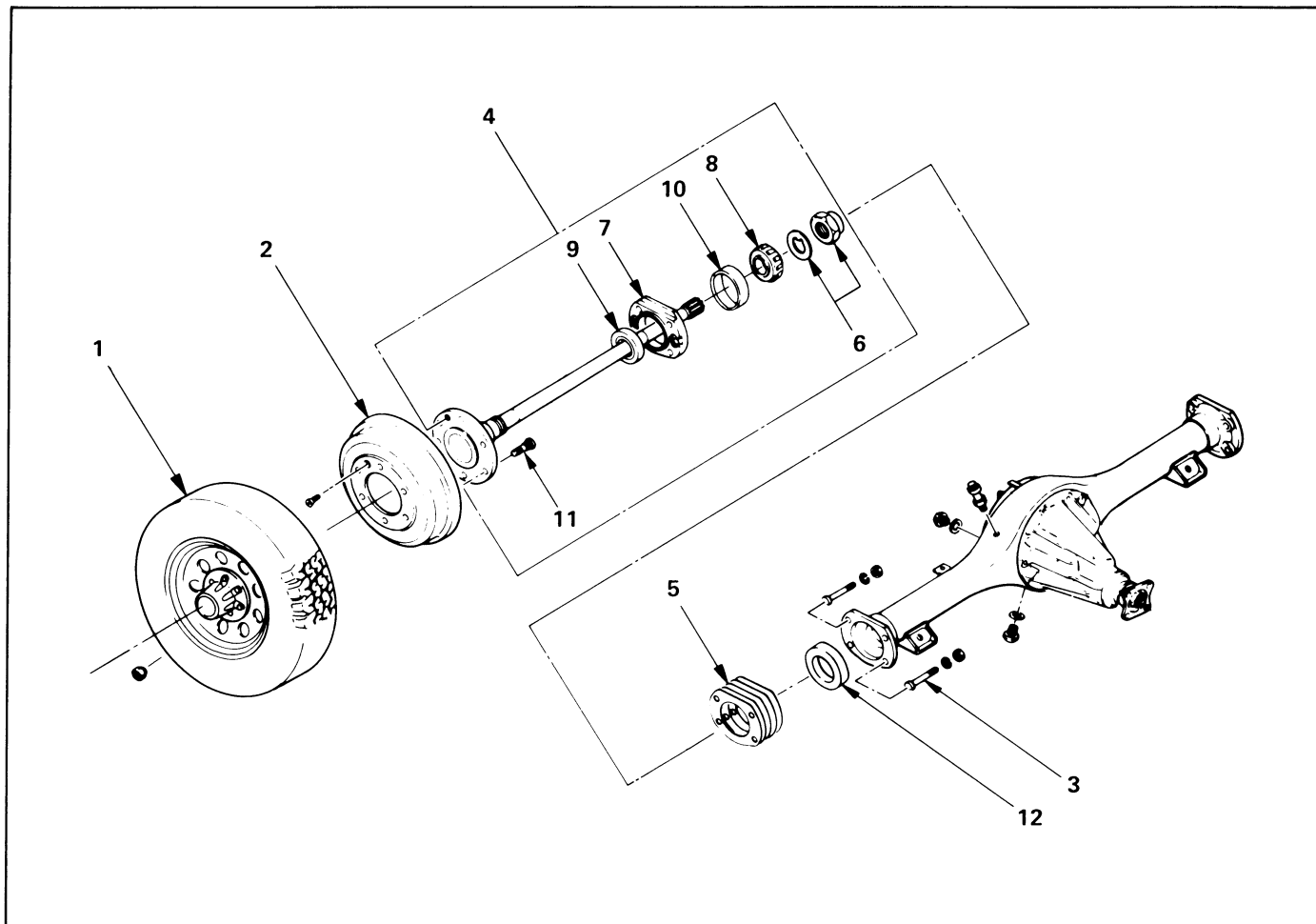
Oil Capacity		liters(US/UK gal.)
194 mm		1.5 (0.4/0.33)
220 mm		1.8 (0.48/0.4)
Specified gear oil		GL-5 (API grade)
Filler Plug and Drain Plug Troque		kg·m(lb.ft/N·m)
8 ± 1.5 (58 ± 11/78.5 ± 14.7)		

AXLE SHAFT



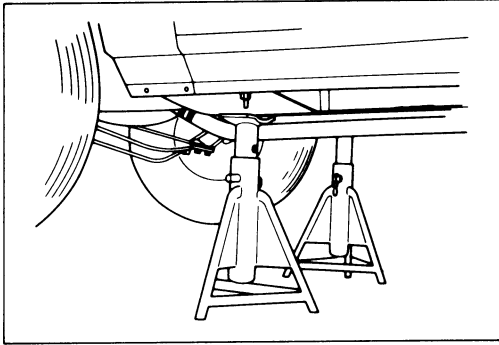
DISASSEMBLY

1. Refer to Section 3E "WHEEL and TIRE" for road wheel Disassembly procedure.
2. Refer to Section 5 "BRAKE" for rear brake removal procedure.



Disassembly Steps

- | | |
|----------------------------------|--------------------------|
| ▲ 1. Wheel and tire | ▲ 7. Bearing holder |
| 2. Brake drum | 8. Bearing |
| 3. Bolt and nut | 9. Oil seal |
| 4. Axle shaft assembly | ▲ 10. Bearing outer race |
| 5. Shim | ▲ 11. Wheel pin |
| ▲ 6. Bearing nut and lock washer | 12. Oil seal |

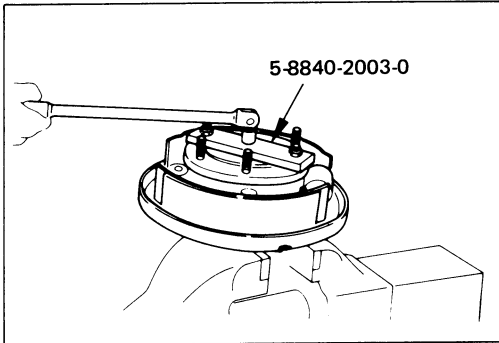


Important Operations

1. Wheel and Tire

Raise vehicle to the working level.

Support the axle assembly with the proper jack and chassis stands.

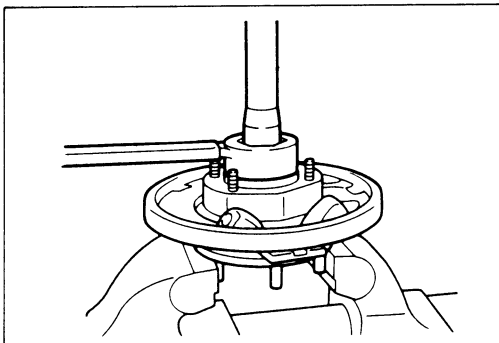


6. Bearing Nut and Washer

<Standard Type Axle shaft>

- (1) Remove the stake from the lock nut.
- (2) Mount axle shaft into vise, clamping vise jaws around the lock nut.
Vise should not be tightened excessively on lock nut.
- (3) Install special tool onto flange studs, lock into position with two wheel nuts, and turn axle shaft loose from lock nut.

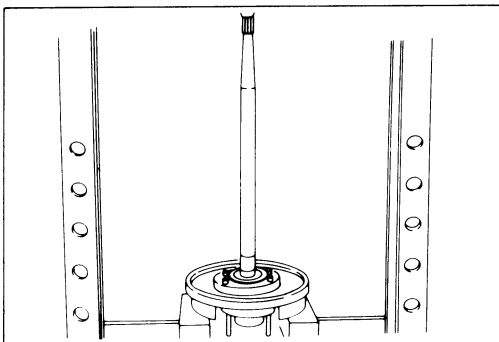
Remover and installer : 5-8840-2003-0 (J-24246)



<Heavy-Duty Type Axle shaft>

- (1) Remove the stake from the lock nut.
- (2) Install special tool onto lock nut, and remove the lock nut.

Remover and installer : 5-8840-2329-0

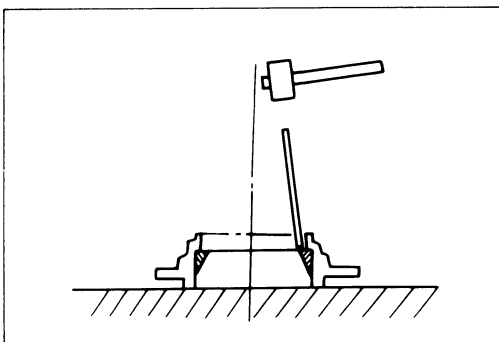


7. Bearing Holder

Remove the bearing holder and bearing from the axle shaft by means of a press.

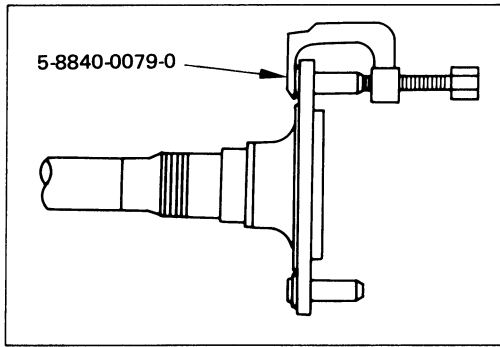
NOTE:

Only a slight amount of pressure from the press is required to separate the bearing from the shaft. Be sure to support the backing plate solidly, and to hold onto the axle shaft to prevent it from falling to the floor.



10. Bearing Outer Race

Drive off the bearing outer race using a brass drift.



11. Wheel Pin

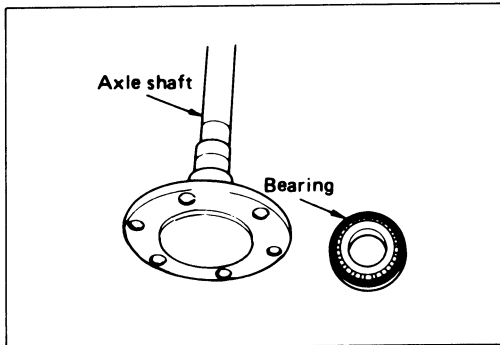
Remove the wheel pins from the axle shaft flange.

Remover : 5-8840-0079-0
(J-6627-A)



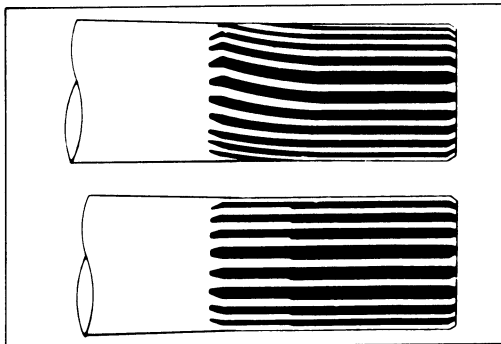
INSPECTION AND REPAIR

Make all necessary adjustments, repairs, and part replacements if wear, damage, or other problems are discovered during inspection.



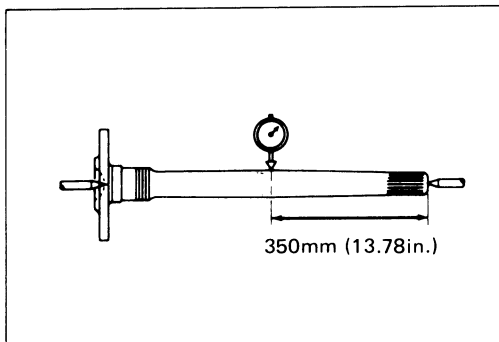
Visual Check

Inspect the following parts for wear, damage, or other abnormal conditions.



Axle Shaft

When checking the axle shaft, pay special attention to the splined portions and replace the shaft if distortion or step wear is noticeable. Correct slight step wear with a pencil grinder.



Axle Shaft Run-Out

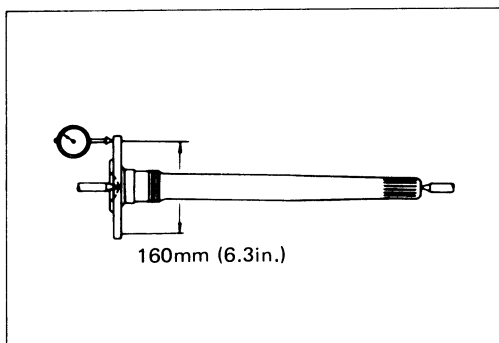
Check the shafts for bending with the use of a dial indicator in contact with the shaft. Rotate the shaft slowly and observe the dial indicator.

Limit	mm(in)
	1.0 (0.039)



NOTE:

Never use heat to correct bending.



Axle Shaft Flange Run-Out

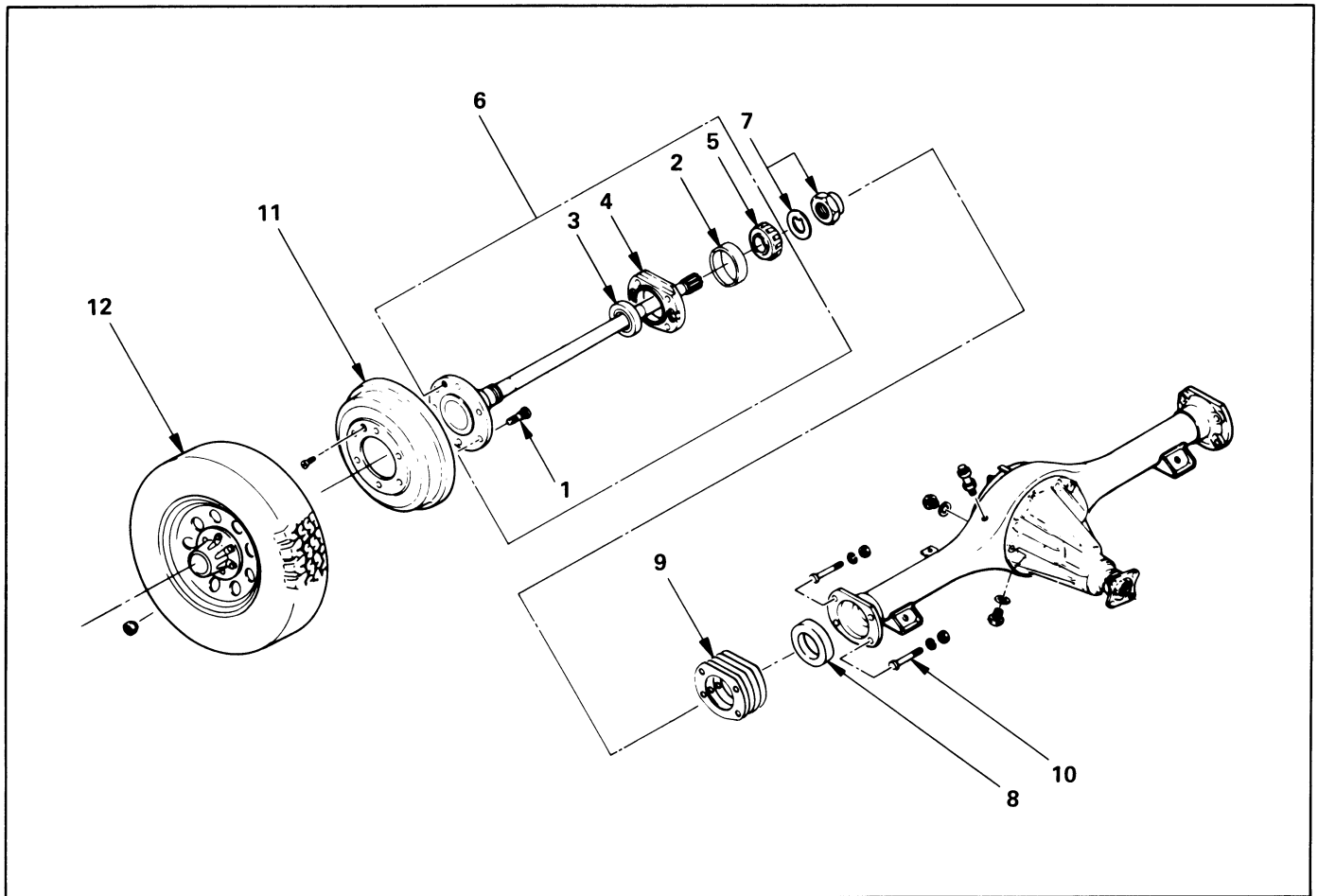
Check the axle shaft flange for run-out. Hold the probe of a dial indicator in contact with the flange. Rotate the shaft slowly and observe the dial.

Limit	mm(in)
	0.08 (0.003)



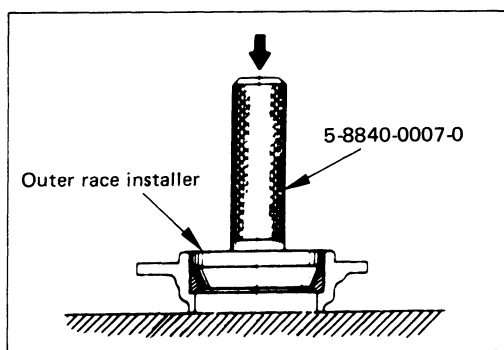
REASSEMBLY

1. Refer to Section 3E "WHEELS and TIRES" for road wheel reassembly procedure.
2. Refer to Section 5 "BRAKES" for rear brake installation procedure.



Reassembly Steps

- | | |
|--------------------------|----------------------------------|
| 1. Wheel pin | ▲ 7. Bearing nut and lock washer |
| ▲ 2. Bearing outer race | ▲ 8. Oil seal |
| ▲ 3. Oil seal | ▲ 9. Shim |
| 4. Bearing holder | ▲ 10. Bolt and nut |
| ▲ 5. Bearing | 11. Brake drum |
| ▲ 6. Axle shaft assembly | ▲ 12. Wheel and tire |

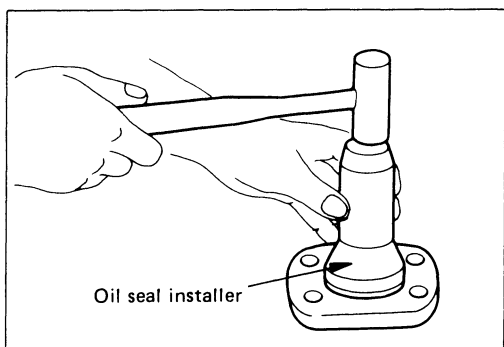


Important Operations



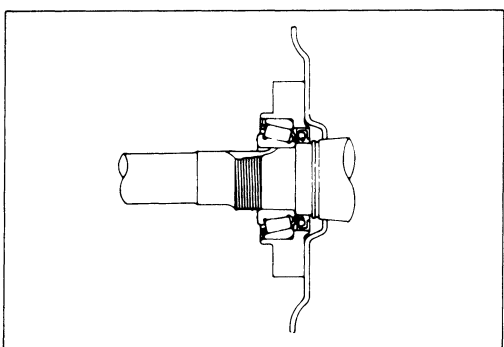
2. Bearing Outer Race

Installer : 9-8522-1268-0
 (194 mm standard suspension)
 (J-24259)
 : 5-8840-2235-0
 (194 mm heavy-duty suspension and 220 mm)
 Grip : 5-8840-0007-0 (J-8092)



3. Oil Seal ; Bearing Holder

Installer : 9-8522-1269-0
 (194 mm standard suspension)
 (J-24255)
 : 5-8840-2202-0 (194 mm H/D, 220 mm)

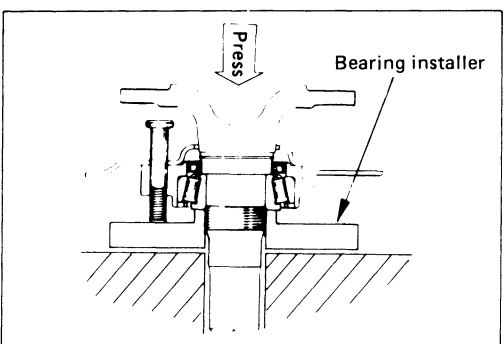


5. Bearing

Apply a generous amount of grease to the bearing inner race.

g(oz)

Approx 30 (1)

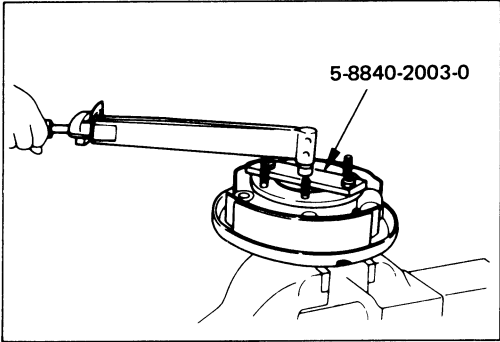


6. Axle Shaft Assembly

7. Bearing Nut and Lock Washer

- (1) Insert four through-bolts into the back plate.
- (2) Install bearing holder to the back plate.
- (3) Install the above parts onto the axle shaft.
- (4) Install bearing over axle shaft and press it into bearing holder.

Axle shaft bearing Installer : 9-8522-1271-0 (J-8609-01)

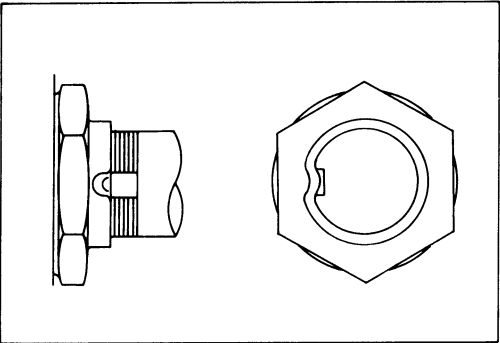


(5) Install the bearing nut into position by using a vise and the special tool.

Installer : 5-8840-2003-0
(J-24246)

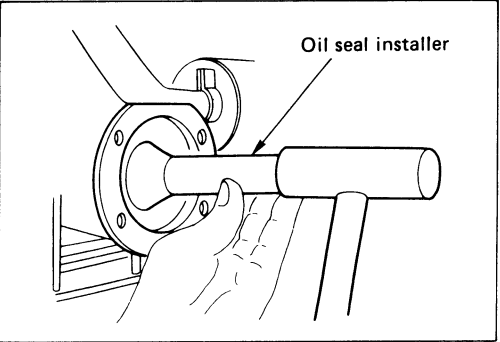


Torque	kg·m(lb.ft/N·m)
26.5 ± 0.5 ($192 \pm 3.6/260 \pm 5$)	



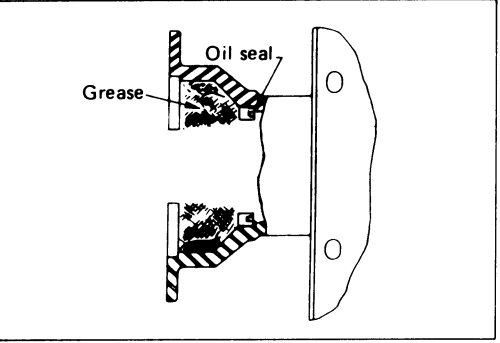
(6) Position the chisel perpendicular to the center of the lock nut groove.

Stake the lock nut.



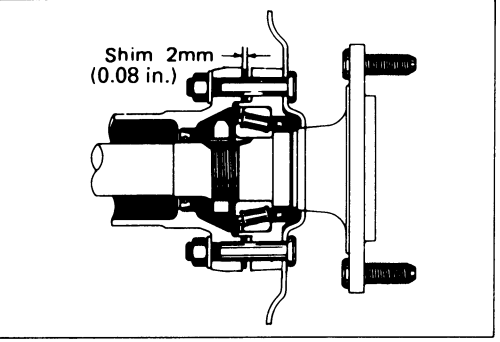
8. Oil Seal ; Axle Case

Oil seal installer : 9-8522-1272-0 (J-24254)



(1) Apply measured amount of good quality grease to the inner face of the rear axle case.

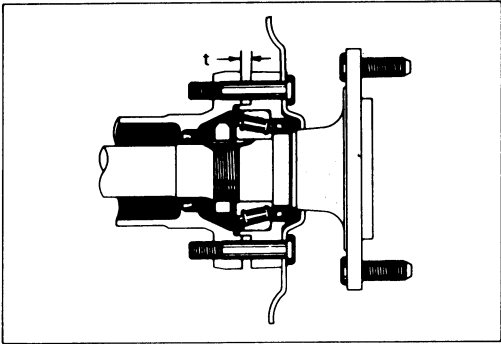
g(oz)	
Type of grease	Wheel bearing grease or Multipurpose type grease
Amount of grease required	80 (2.8)



9. Shim

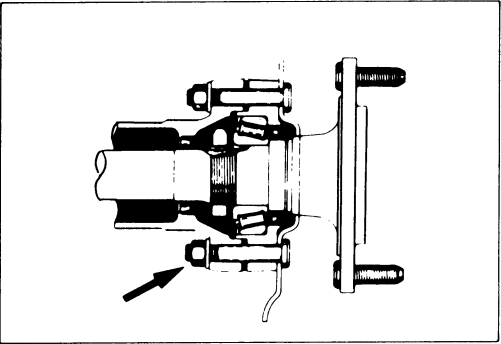
Install the axle shaft assembly to the axle case with a 2 mm (0.08 in) thick shim fit into position between the bearing holder and axle case flange. Install and tighten the bolts evenly in progression.

Torque	kg·m(lb.ft/N·m)
7.5 ± 0.5 ($54 \pm 3.6/74 \pm 5$)	



Install the axle shaft assembly on the opposite side and push it in until it fits against the differential thrust block. Then, measure the clearance (t) between the bearing holder and the axle case flange and determine the thickness of the shim to be installed by the following formula:
Measured clearance (t) + 0.3 mm (0.012 in) = thickness of shim to be installed

mm(in)	
Thickness of shims available	
1.0, 0.5, 0.13, 0.076, 0.05 (0.039, 0.026, 0.005, 0.003, 0.002)	

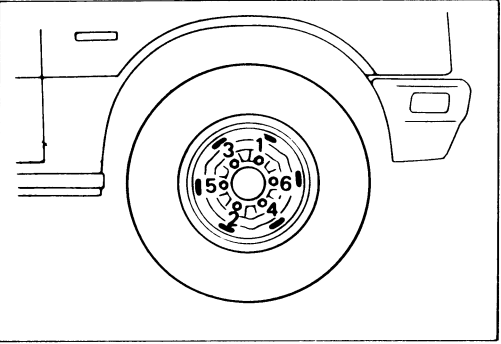


10. Bolt and Nut

Torque		kg·m(lb.ft/N·m)
		7.5 ±0.5 (54 ±3.6/74 ±5)

- Connect the brake lines to wheel cylinder.
- Connect the parking brake rear cable.
- Brake air bleeding, refer to servicing to Section 5 brake.

Note:
To install the axle shaft assembly, follow the reassembly procedure outline under the "BRAKE".



12. Wheel and Tire

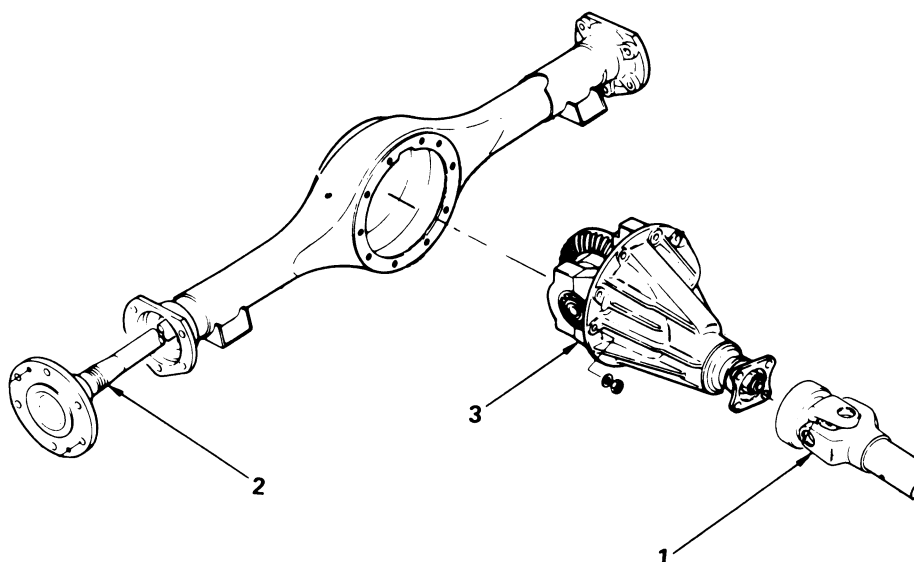
Tighten the wheel nut in numerical order.

		kg·m(lb.ft/N·m)
Alumi wheel	12 ±1 (87 ±7.2/117 ±9.8)	
Steel wheel	9 ±1 (65.1 ±7.2/88.3 ±9.8)	

DIFFERENTIAL



REMOVAL AND INSTALLATION



Removal Steps

1. Propeller shaft
- ▲ 2. Axle shaft
3. Differential assembly

Installation Steps

- ▲ 3. Differential assembly
- ▲ 2. Axle shaft
- ▲ 1. Propeller shaft

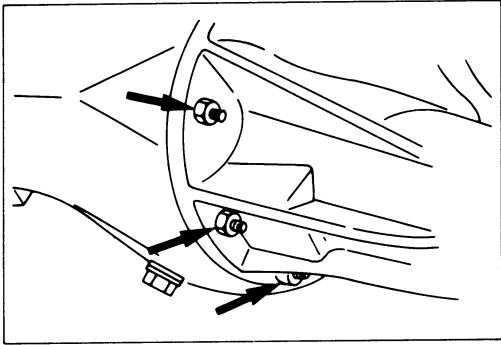
To remove the axle shaft assembly, follow the disassembly procedure outline in this Section "Axle shaft"



Important Operation — Removal

2. Axle Shaft

Disengage the axle shafts from the carrier assembly and partially withdraw the shafts from the axle tube. It is not necessary to completely remove the axle shafts. Move them only enough to allow the differential to be removed.



Important Operations — Installation



3. Differential Assembly

(194 mm)

Torque		kg·m(lb.ft/N·m)
NUT		3.8 ± 0.4 ($27 \pm 2.9/37.3 \pm 3.9$)
BOLT		2.5 ± 0.5 ($18 \pm 3.6/24.5 \pm 5$)

(220 mm)

Torque		kg·m(lb.ft/N·m)
NUT		4.5 ± 1.5 ($32.5 \pm 10.8/44 \pm 14.7$)
BOLT		6.5 ± 0.5 ($47 \pm 3.6/63.8 \pm 5$)

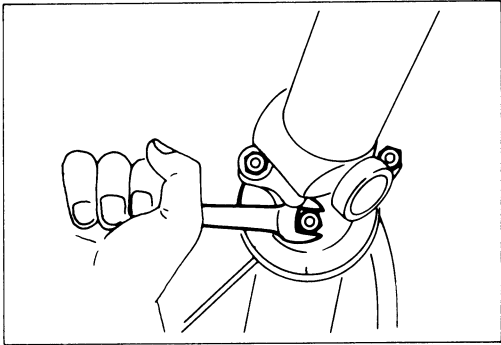
Apply the recommended liquid gasket or its equivalent to the sealing side of the axle case and the carrier.

To install the axle shaft assembly, follow the reassembly procedure outline in the “Rear axle shaft” Section.



2. Axle Shaft

Torque		kg·m(lb.ft/N·m)
		7.5 ± 0.5 ($54.2 \pm 3.6/73.6 \pm 5$)



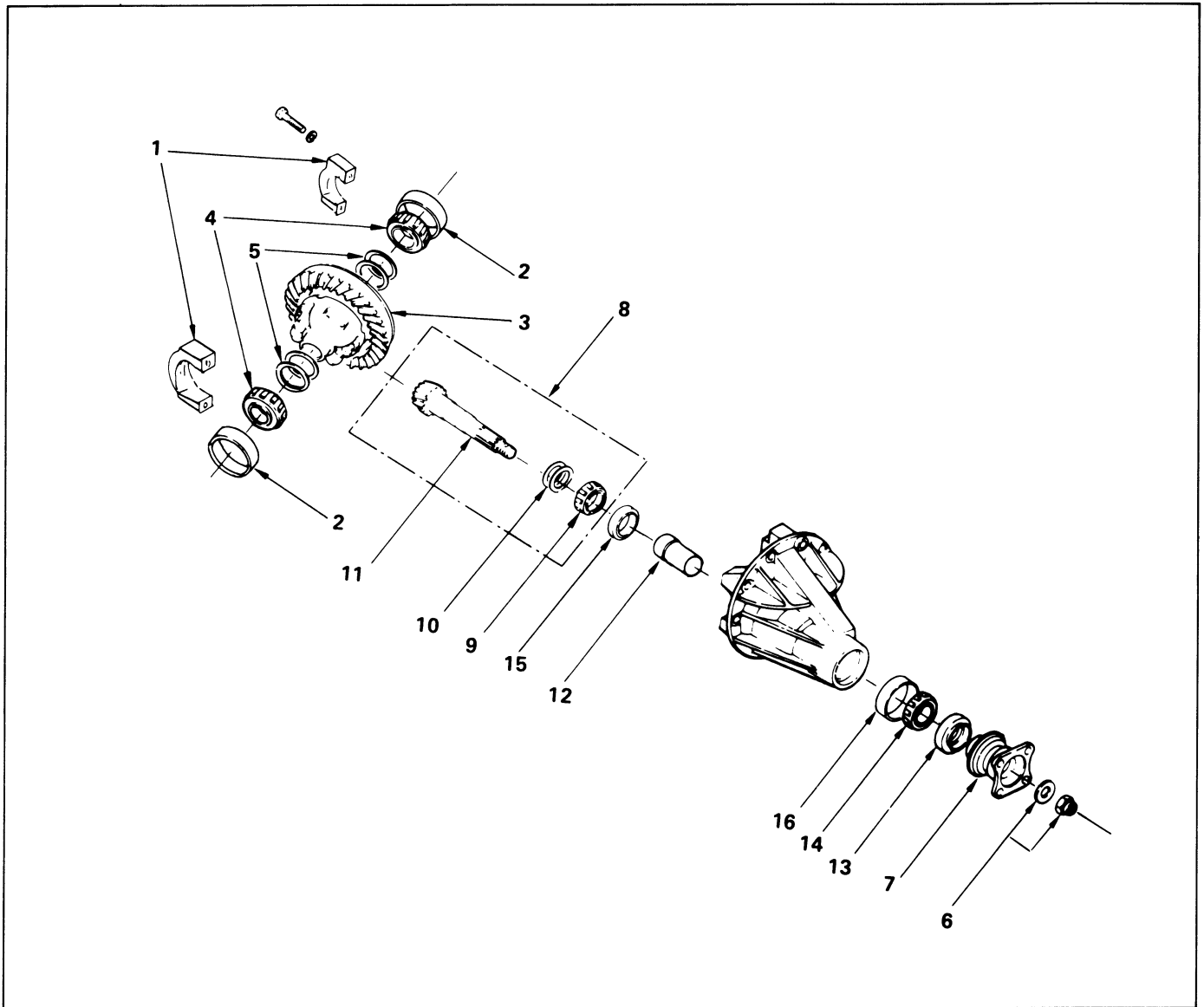
1. Propeller Shaft

Torque		kg·m(lb.ft/N·m)
194 mm		3.6 ± 0.3 ($26 \pm 2.2/35.3 \pm 2.9$)
220 mm		6.4 ± 0.4 ($46.3 \pm 2.9/62.8 \pm 3.9$)



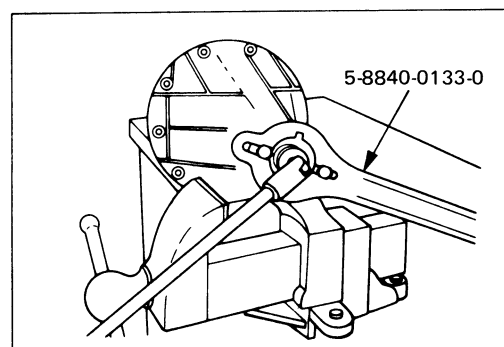
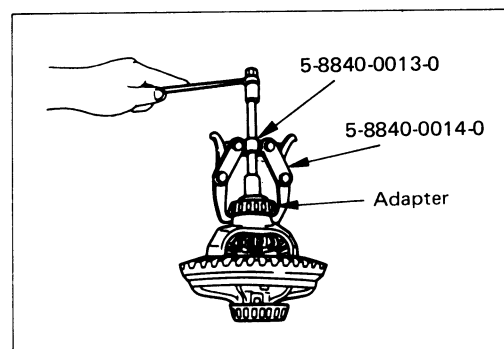
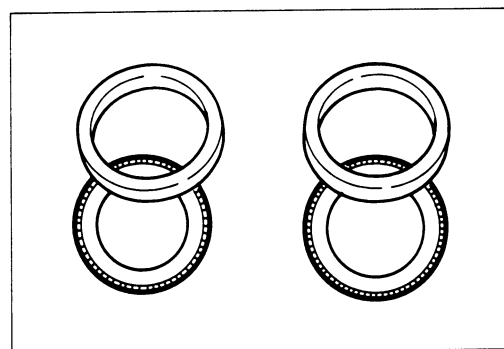
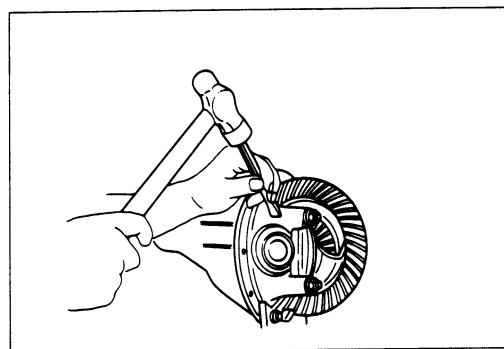
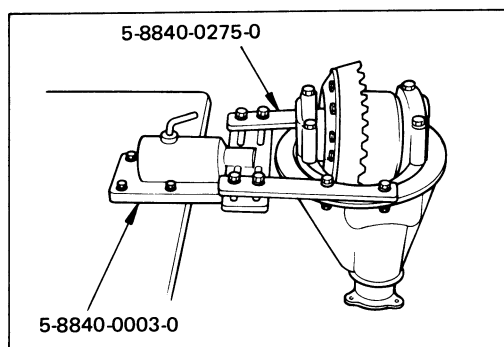
DISASSEMBLY

MAJOR COMPONENTS



Disassembly steps

- | | |
|---|----------------------------------|
| ▲ 1. Side bearing cap | ▲ 8. Drive pinion shaft assembly |
| ▲ 2. Side bearing outer race | ▲ 9. Inner bearing |
| 3. Differential cage assembly and ring gear | 10. Pinion depth adjusting shim |
| ▲ 4. Side bearing | 11. Drive pinion shaft |
| ▲ 5. Backlash and side bearing preload adjusting shim | 12. Collapsible spacer |
| ▲ 6. Flange nut and washer | 13. Oil seal |
| 7. Flange assembly | 14. Outer bearing |
| | ▲ 15. Inner bearing outer race |
| | ▲ 16. Outer bearing outer race |



Important Operations

Before disassembling, make a pattern check using the method described later in this section under "Gear Tooth Contact Pattern Check and Adjustments". This check will help determine what service should be performed on the differential components.

On some bench operations, it may be advantageous to use a holding fixture and a holding fixture base.

Tool 5-8840-0275-0 (J-37264) and 5-8840-0003-0 (J-3289-20) are available tools that work well for this purpose.

1. Bearing Cap

Apply an alignment mark to the side bearing cap and differential carrier.

2. Side Bearing Outer Race

After removal, keep the right and left side bearing assemblies separate to maintain inner and outer race combinations.



4. Side Bearing

5. Backlash and Side Bearing Preload Adjusting Shim

Remover : 5-8840-0013-0

5-8840-0014-0 (J-22888)

Adapter : 9-8521-1743-0 (J-8107-2) (194 mm)

: 5-8840-2196-0 (J-8107-4) (220 mm)

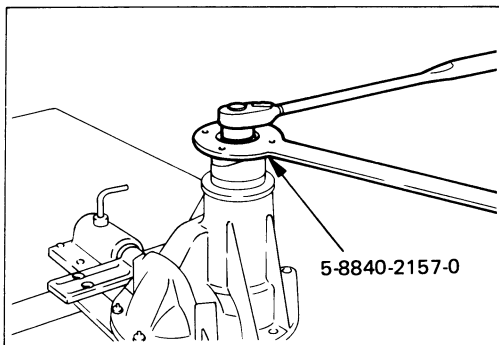
Carefully record the thickness of each side bearing and each shim pack. Keep them separated and in order for later reassembly.



6. Flange nut and washer (194 mm)

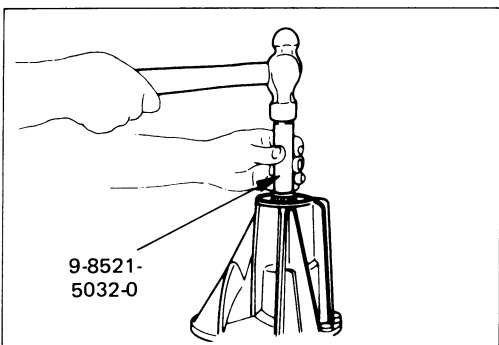
Holder : 5-8840-0133-0

(J-8614-01)



Flange Nut and Washer (220 mm)

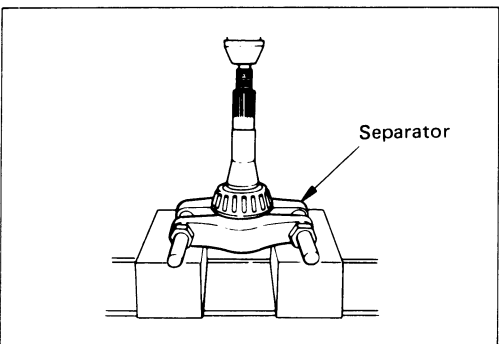
Holder : 5-8840-2157-0
(J-37221)



8. Drive Pinion Shaft Assembly

Hold a soft metal rod against the end of the drive pinion. Drive out the pinion from the carrier by tapping the hammer against the metal rod.

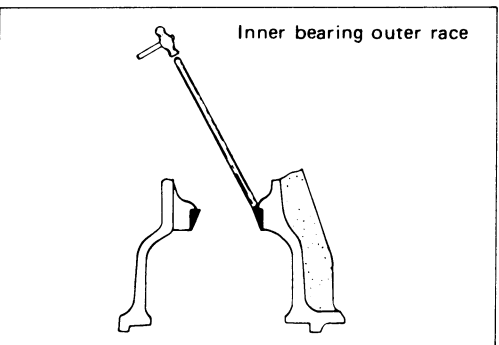
Installer : 9-8521-5032-0



9. Inner Bearing

Remove the pinion bearing using a separator and a press.

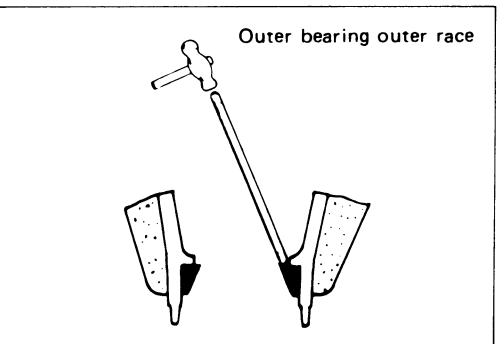
Separator : 5-8840-0015-0 (194 mm)
(J-22912-01)
: 5-8840-2197-0 (220 mm)
(J-37452)



15. Inner Bearing Outer Race

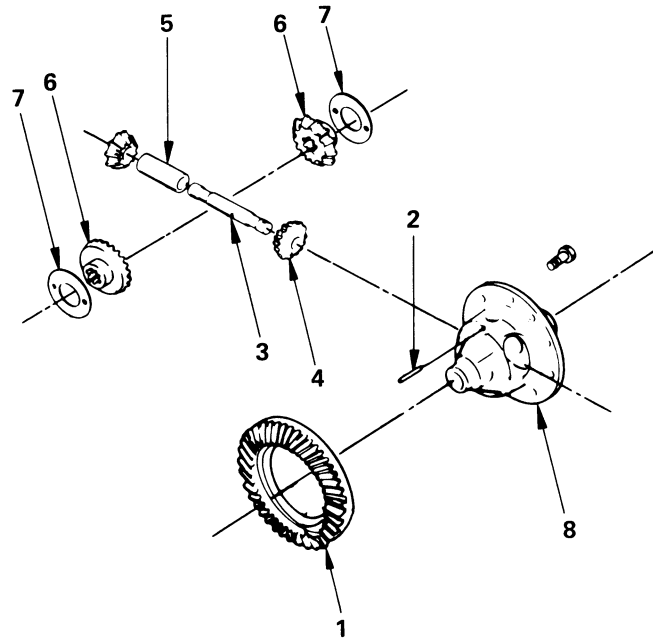
16. Outer Bearing Outer Race

Remove the inner bearing outer race and the outer bearing outer race by using a brass bar and a hammer.



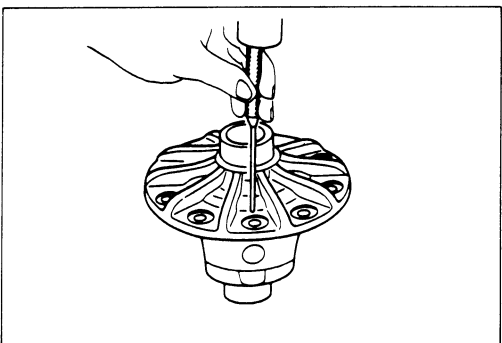
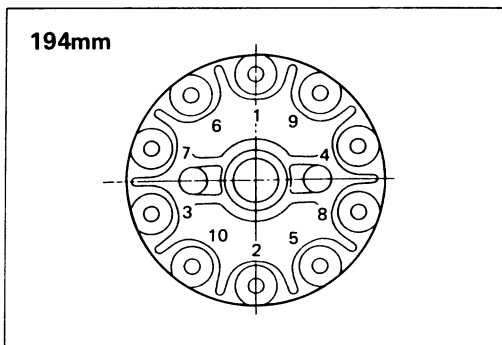
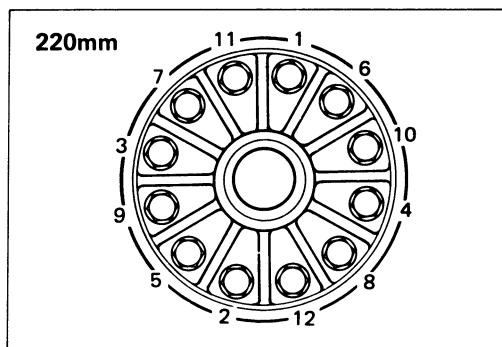
MINOR COMPONENTS

DIFFERENTIAL ASSEMBLY



Disassembly Steps

- | | |
|-----------------|----------------------|
| ▲ 1. Ring gear | 6. Side gear |
| ▲ 2. Lock pin | 7. Thrust washer |
| ▲ 3. Cross pin | 8. Differential cage |
| 4. Pinion gear | |
| 5. Thrust block | |



Important Operations

1. Ring Gear

Take care not to damage the ring gear or the differential case when removing the ring gear. Never try to wedge a tool between the two faces.



2. Lock Pin

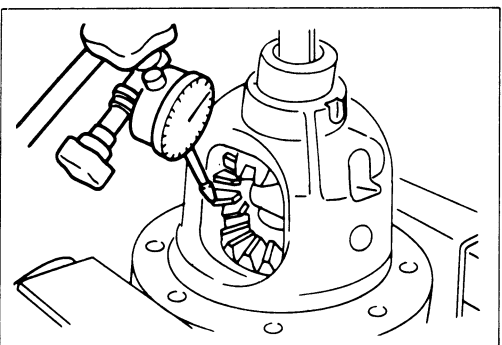
Drive out the pinion shaft lock pin with a long drift punch. It may be necessary to first remove the stakes in the lock pin with a 5 mm drill.



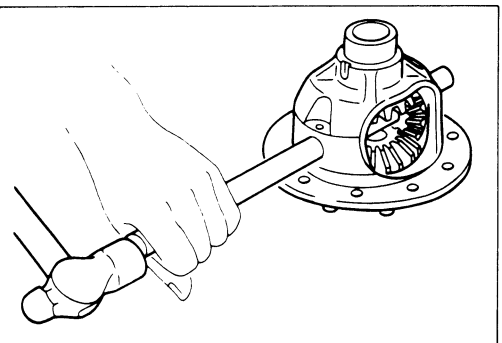
3. Cross Pin

(1) Check the amount of backlash before removal.

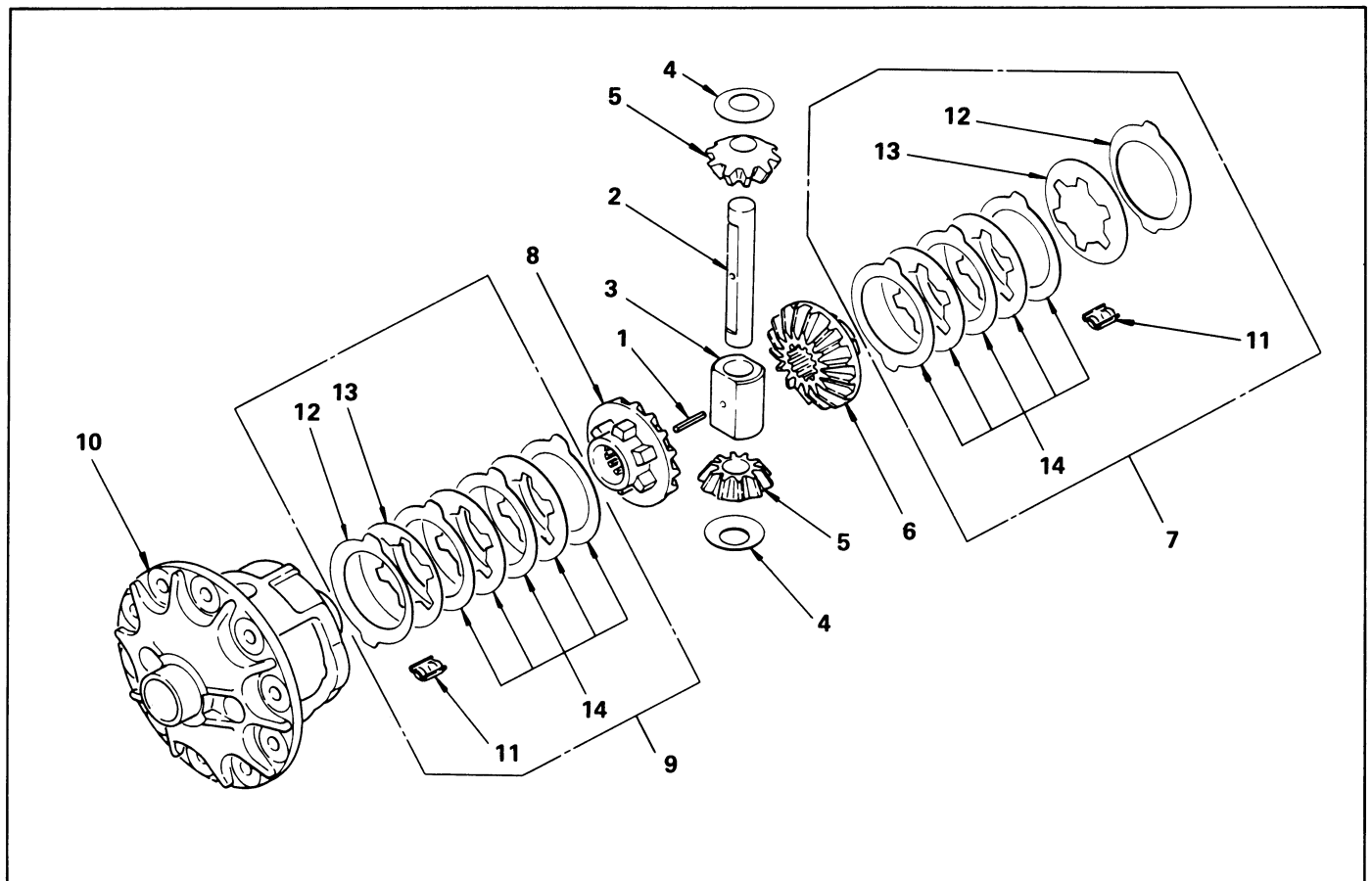
Backlash	mm(in)
194 mm	0.03—0.08 (0.001—0.003)
220 mm	0.13—0.18 (0.005—0.007)



(2) Remove the cross pin with a brass drift punch, and take out the pinion gears, side gears, thrust block and thrust washers from the differential cage.

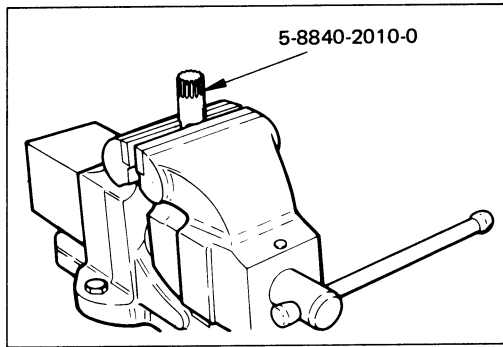


LIMITED SLIP DIFFERENTIAL (LSD) (FOR RING SIZE 194 mm)



Disassembly steps

- | | |
|-------------------------------------|-------------------------------------|
| 1. Spring pin | 8. Side gear |
| 2. Pinion spider | 9. Friction disc and plate assembly |
| 3. Thrust block | 10. Differential cage |
| ▲ 4. Pinion washer | 11. Sleeve |
| ▲ 5. Pinion gear | 12. Spring plate |
| 6. Side gear | 13. Disc spring |
| 7. Friction disc and plate assembly | 14. Disc and plate |



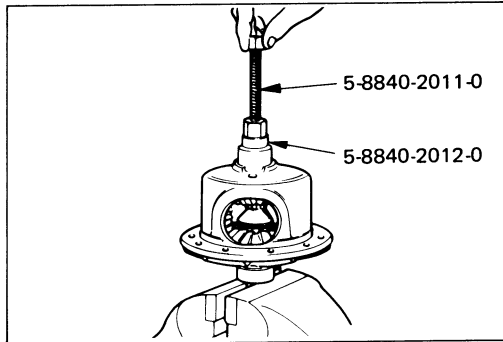
Important operations

4. Pinion washer

5. Pinion gear

- (1) Clamp special tool (side gear holder) into a vice. Set the LSD assembly.

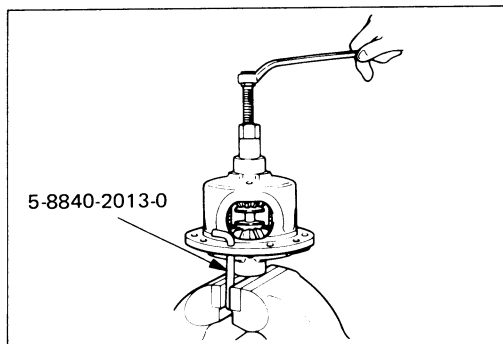
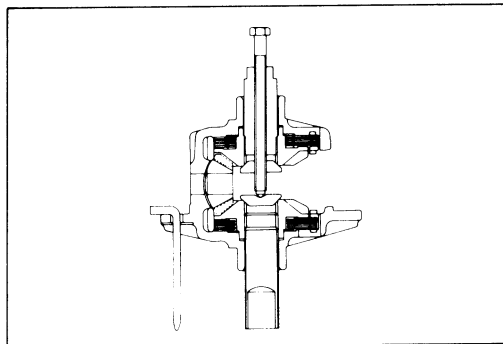
Holder : 5-8840-2010-0
(J-36563)



- (2) Set special tools (side pinion expanders and pinion rotator) to the LSD.

Expander : 5-8840-2011-0
(J-36564)

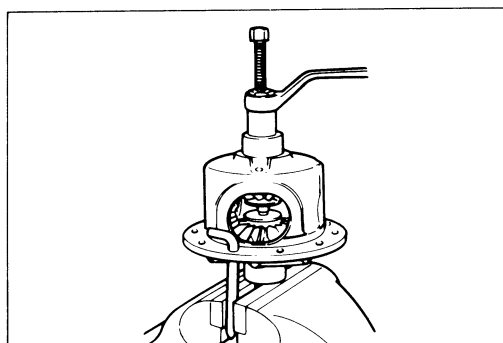
Rotor : 5-8840-2012-0
(J-36565)



- (3) Set special tool (cage lock bar) through a ring gear fixing hole to a vice.

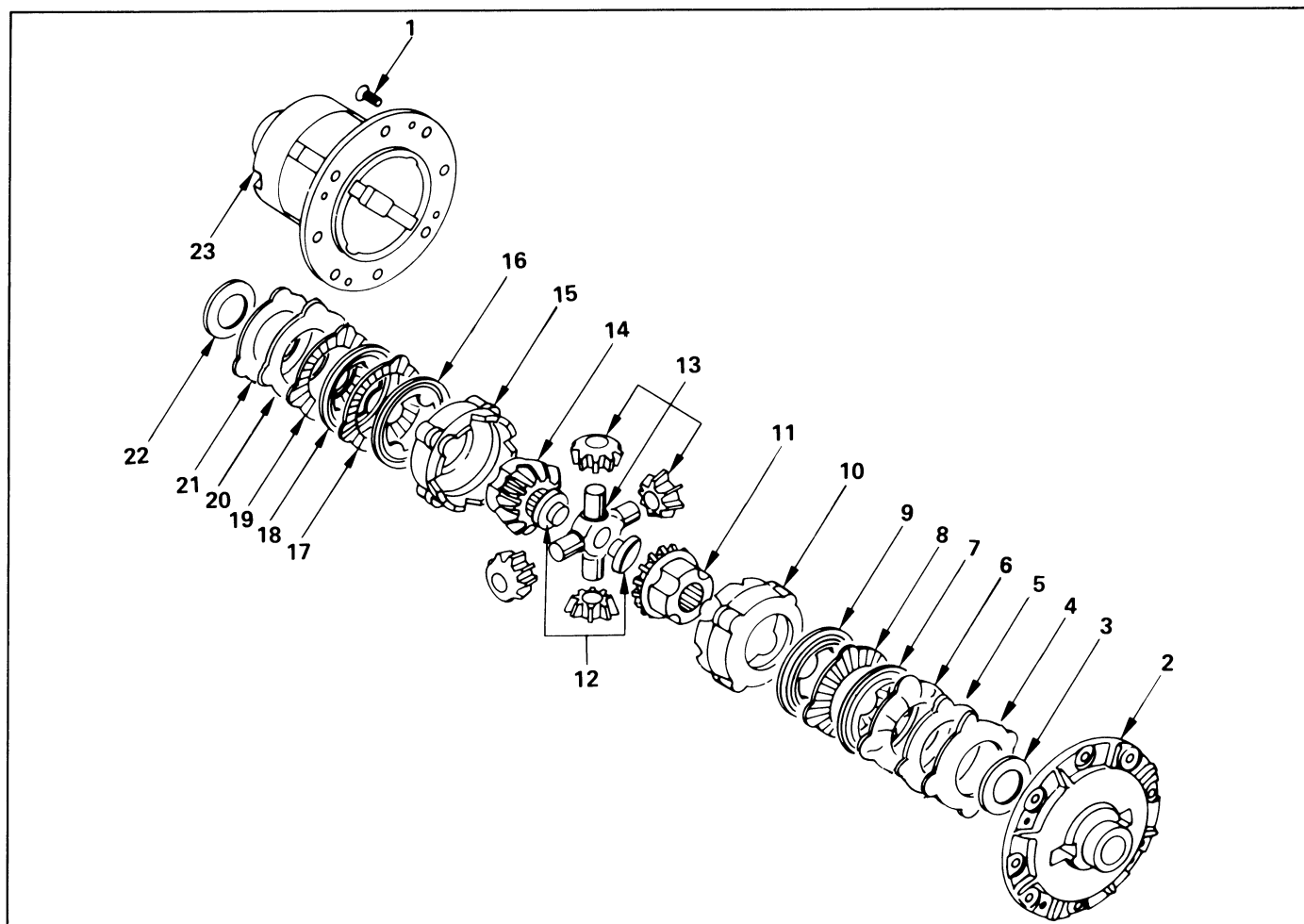
Then rotate side pinion expanders with a wrench one half to one full turn to provide backlash between the side and pinion gears.

Bar : 5-8840-2013-0
(J-36566)



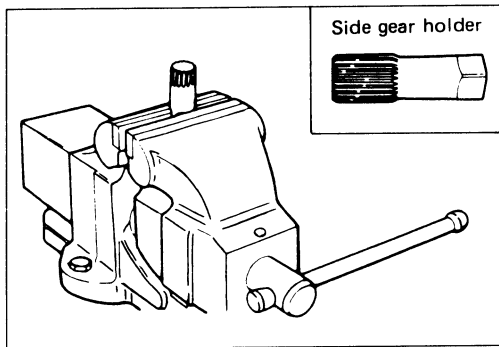
- (4) With a wrench, rotate special tool (pinion rotator) to remove the pinion gear and the pinion washer.

(FOR RING SIZE 220 mm)



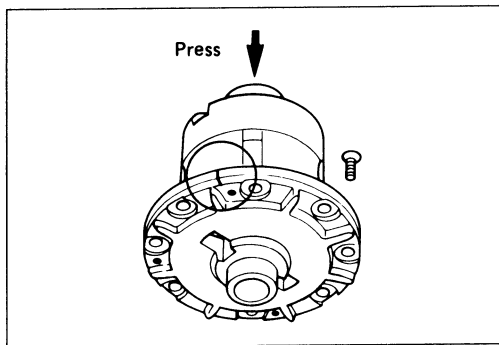
Disassembly Steps

- | | |
|----------------------------|-----------------------------------|
| ▲ 1. Bolt | 13. Pinion gear and pinion spider |
| 2. Differential cage cover | 14. Side gear |
| 3. Thrust washer | 15. Pressure ring |
| 4. Bellve disc | 16. Friction disc |
| 5. Bellve disc | 17. Friction plate |
| 6. Friction plate | 18. Friction disc |
| 7. Friction disc | 19. Friction plate |
| 8. Friction plate | 20. Bellve disc |
| 9. Friction disc | 21. Bellve disc |
| 10. Pressure ring | 22. Thrust washer |
| 11. Side gear | 23. Differential cage |
| 12. Thrust block | |



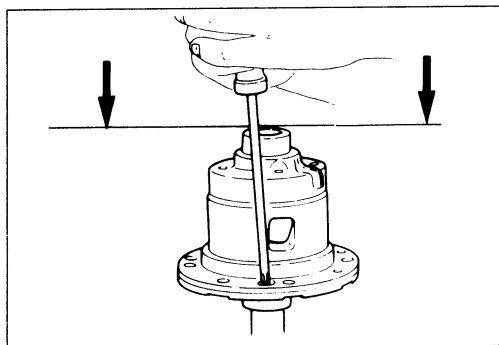
Important Operations

- Prepare a side gear holder (An axle shaft must be used) as shown in the left figure, clamp it with a stock vice, and set a differential.



1. Bolt

Apply a setting mark to the differential cage cover and differential cage and remove the bolt using the press.



- When the differential cage is pressed down with the press, loosen the four bolts fixing the differential cage evenly and remove them, and then disconnect the differential cage.



INSPECTION AND REPAIR

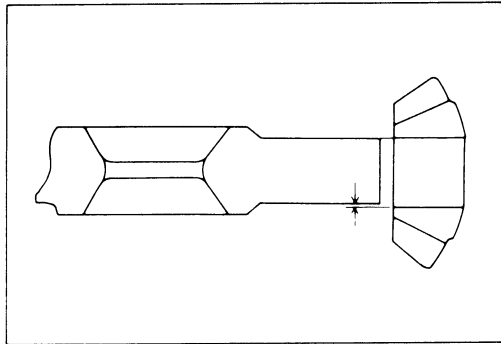
Make necessary correction or replace if wear, damage or any other abnormal conditions are found through inspection.

- Gear
- Bearing
- Differential box
- Drive pinion



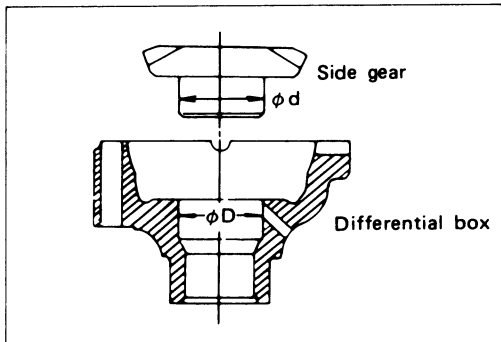
Visual Check

Check the following parts for wear, damage or other abnormal conditions.



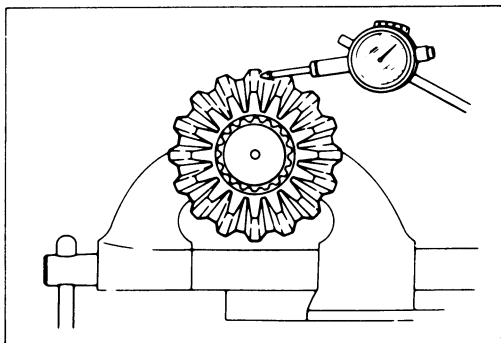
Clearance between pinion gear and cross pin:

194 mm and 220 mm		mm(in)
Standard	Limit	
0.06—0.12 (0.002—0.005)	0.2 (0.008)	



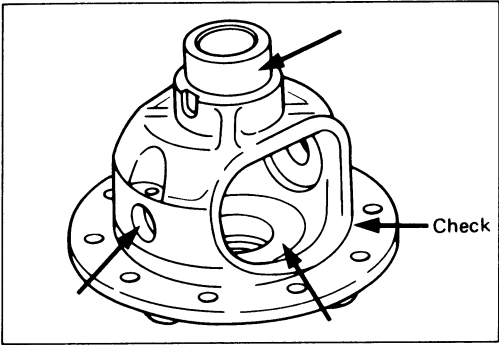
Clearance between side gear and differential cage.

mm(in)		
	Standard	Limit
194 mm	0.03—0.10 (0.001—0.004)	0.15 (0.006)
220 mm	0.05—0.11 (0.002—0.004)	0.15 (0.006)



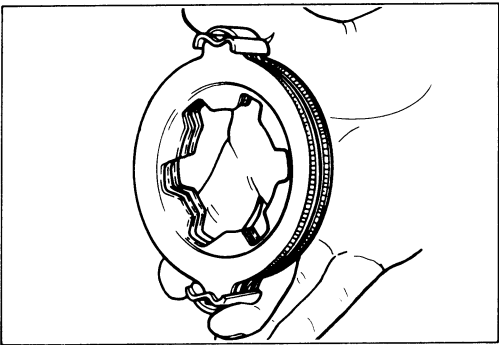
Play in splines between the side gear and axle shafts.

mm(in)		
	Standard	Limit
194 mm	0.08—0.36 (0.003—0.014)	0.5 (0.02)
220 mm	0.08—0.38 (0.003—0.015)	



Differential cage

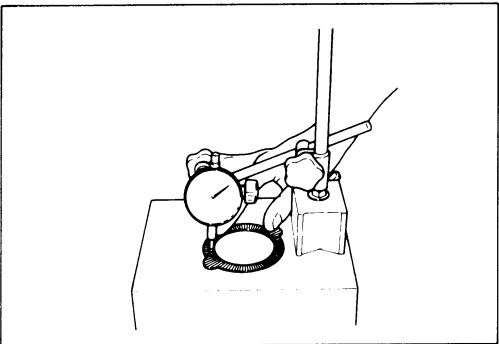
Check the ring gear the side gear fitting faces and the cross pin hole for scores or roughness. Correct as necessary. Slight scores or roughness may be corrected with an oil stone or fine sand paper.



<LSD FOR 194 mm>

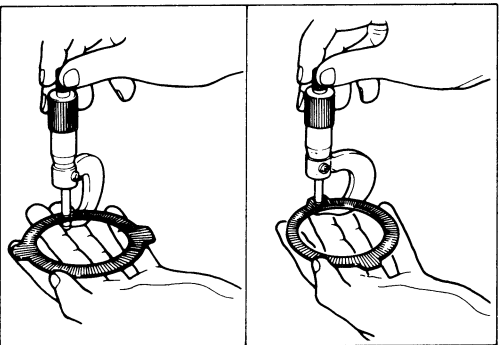
Friction disc and plate assembly

Check the parts for damage or other abnormal conditions.



Check the friction plate for distortion.

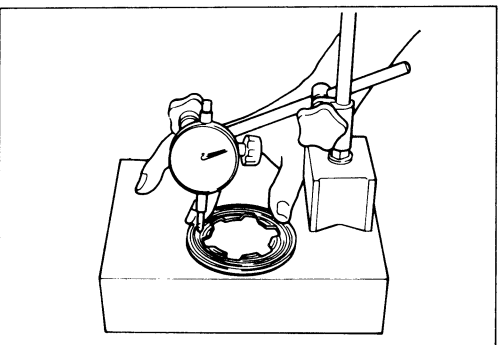
Limit	mm(in.)	0.07 (0.0027)
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Check the friction plate for wear.

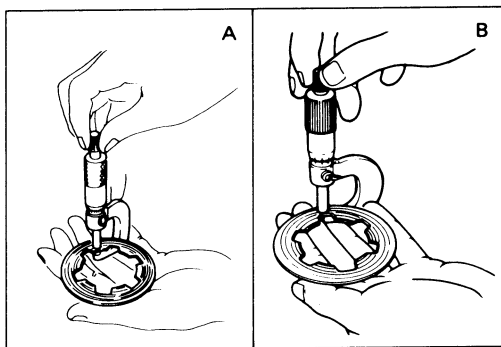
Limit (A-B)	mm(in.)	0.1 (0.0039)
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Note: A = Non-sliding face thickness
B = Sliding face thickness



Check the friction disc for distortion.

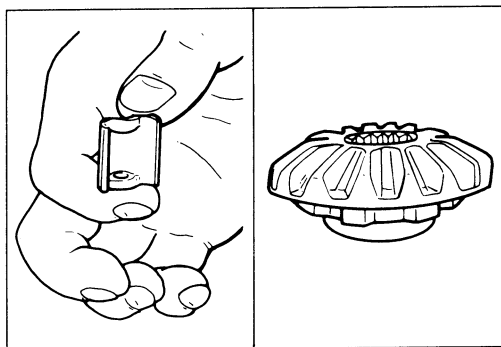
Limit	mm(in.)	0.07 (0.0027)
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Check the friction disc for wear.

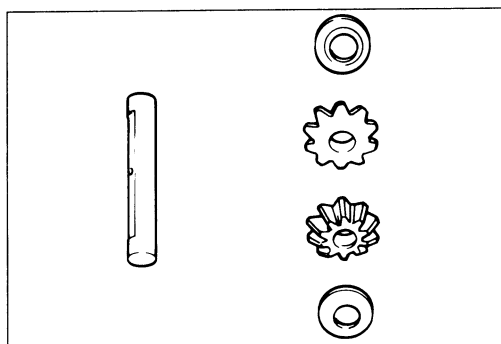
	mm(in)
Limit (A—B)	0.1 (0.0039)

Note: A = Non-sliding face thickness
B = Sliding face thickness



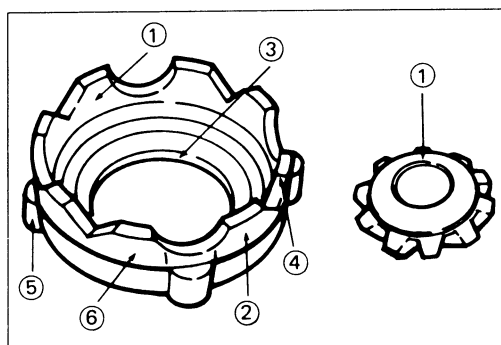
Slide gear and sleeve

Check the parts for damage or other abnormal conditions.



Pinion shaft and pinion gear

Check the parts for damage or other abnormal conditions.

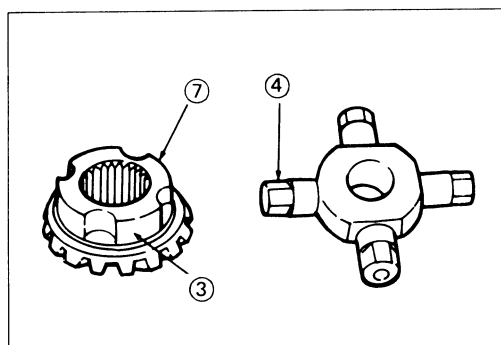


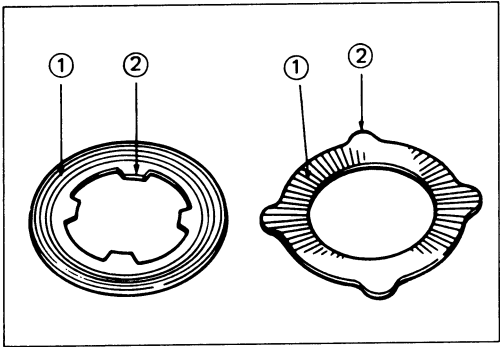
<LSD FOR 220 mm>

Pressure Ring

Check the parts for damage or other abnormal conditions.

- ① Sliding part for a pinion
- ② Sliding part for a disc
- ③ Sliding part for a gear
- ④ V-shape groove for the pinion spider
- ⑤ Fitting protrusion for a case
- ⑥ Fitting part for the inner surface of a case
- ⑦ Sliding part for a side gear or a case

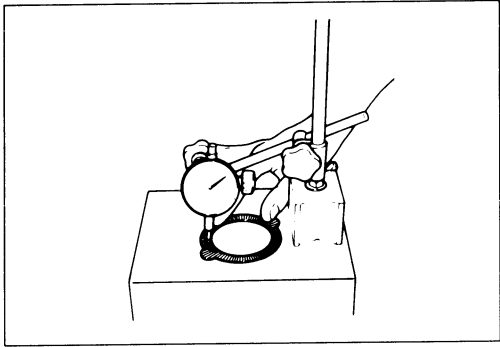




Friction Disc and Plate Assembly

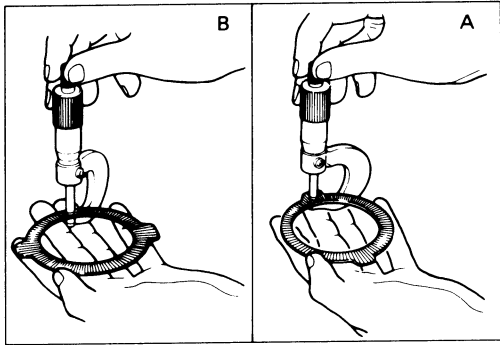
Check the parts for damage or other abnormal conditions.

- ① Sliding part
- ② Protrusion



Check the friction plate for distortion.

Limit	mm(in.)	0.08 (0.0031)
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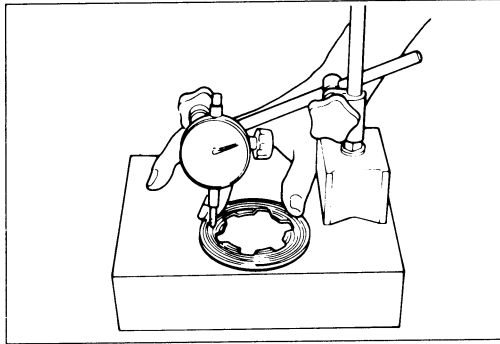
Check the friction plate for wear.

Limit (A—B)	mm(in.)	0.1 (0.0039)
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Note:

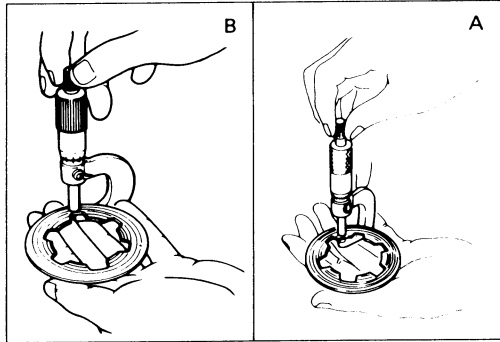
A = Non-sliding face thickness

B = Sliding face thickness



Check the friction disc for distortion.

Limit	mm(in.)	0.08 (0.0031)
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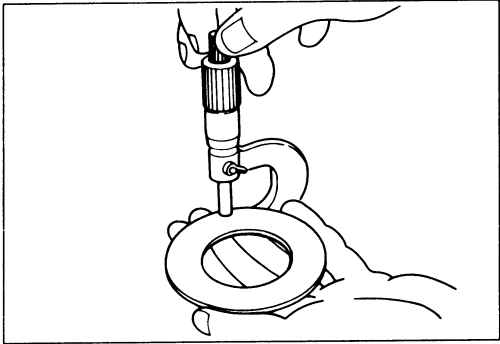
Check the friction disc for wear.

Limit (A—B)	mm(in.)	0.1 (0.0039)
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Note:

A = Non-sliding face thickness

B = Sliding face thickness



Check The Thrust Washer

Limit	mm(in.)	1.3 (0.051)
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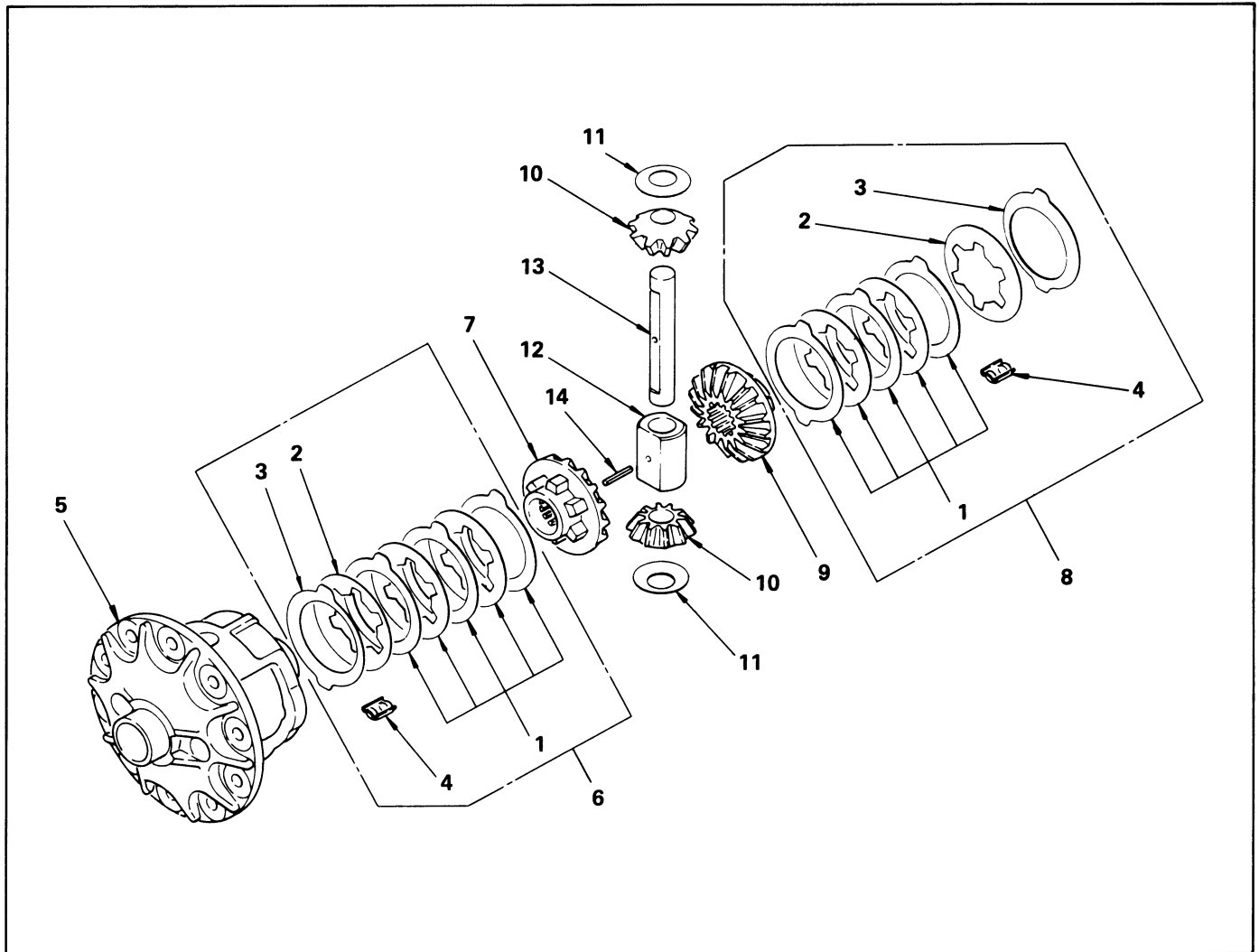


REASSEMBLY

MINOR COMPONENTS

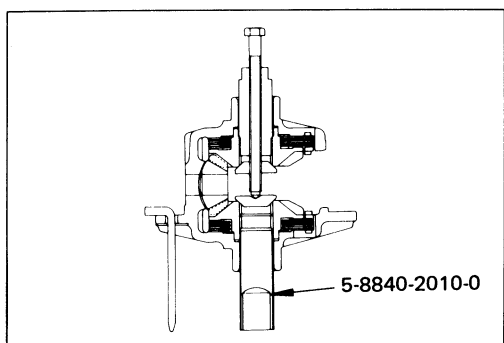
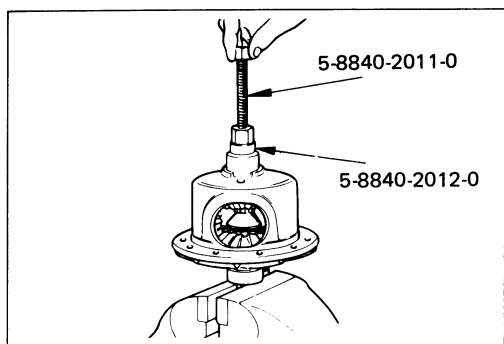
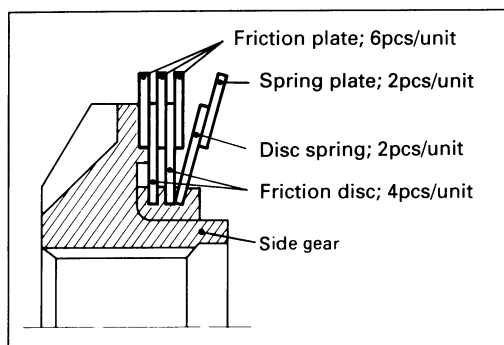
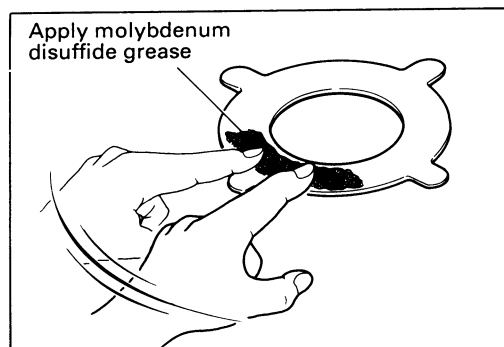
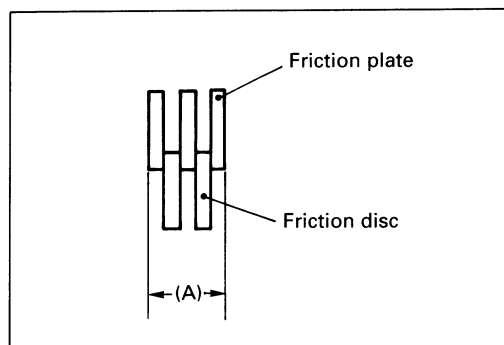
LIMITED SLIP DIFFERENTIAL (LSD)

<FOR RING SIZE 194 mm>



Reassembly steps

- | | |
|-------------------------------------|-------------------------------------|
| ▲ 1. Friction disc and plate | 8. Friction disc and plate assembly |
| ▲ 2. Disc spring | 9. Side gear |
| 3. Spring plate | ▲ 10. Pinion gear |
| 4. Sleeve | ▲ 11. Pinion washer |
| 5. Differential cage | 12. Thrust block |
| 6. Friction disc and plate assembly | 13. Pinion shaft |
| 7. Side gear | 14. Spring pin |



Important operations



1. Friction disc and plate

Measure the thickness of disc and plate pack (A).

Thickness (A)	mm (in.)	7 ± 0.1 (0.27 $\pm$ 0.004)
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If the thickness (A) is beyond the limits, adjust with a friction disc of selected thickness.

Thickness of friction discs available

mm(in.)	1.4 (0.055), 1.5 (0.059)
---------	--------------------------

Apply molybdenum disulfide grease to the friction discs and plates.



3. Spring plate

Install the spring plate with dished side turned to the differential cage side.



10. Pinion gear



11. Pinion washer

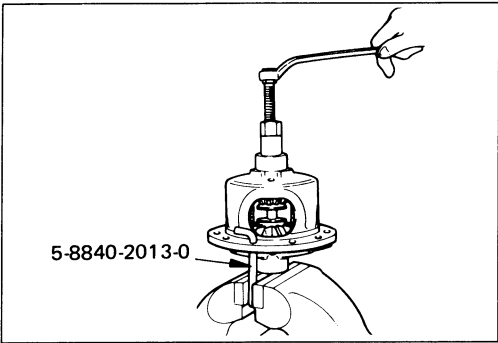
- Clamp special tool (side gear holder) into a vise. Set the LSD assembly.

Holder : 5-8840-2010-0
(J-36563)

- Set special tools (side pinion expanders and side pinion rotator) to the LSD.

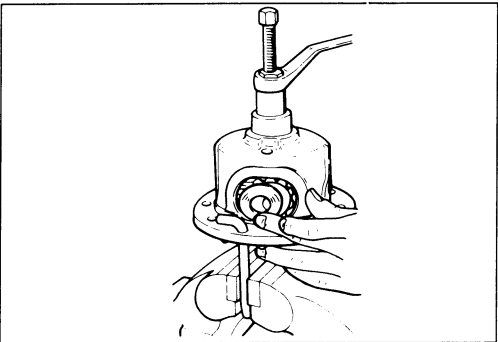
Expander : 5-8840-2011-0
(J-36564)

Rotator : 5-8840-2012-0
(J-36565)

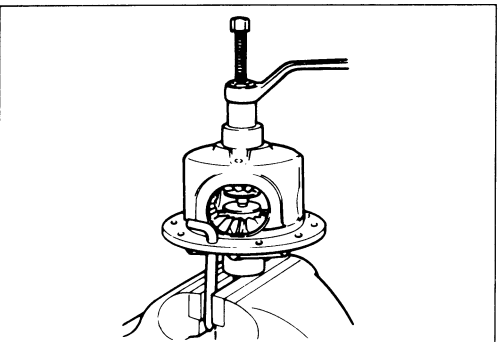


- (3) Set special tool (cage lock bar) through a ring gear fixing hole to a vice. Then rotate side pinion expanders with a wrench one half to one full turn to provide proper clearance to install the pinion gears.

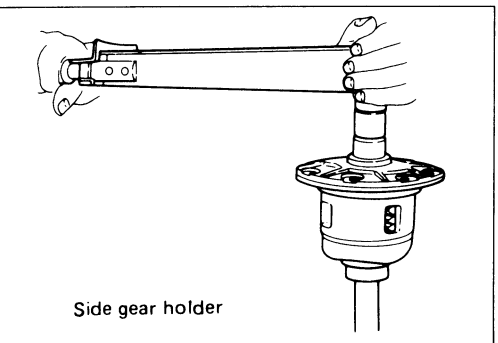
Bar : 5-8840-2013-0
(J-36566)



- (4) Attach the pinion gears and washers in the proper order to the left and right hand side of the differential cage.



- (5) With a wrench, turn special tool (pinion rotator) to align the pinion gear and washer holes with the pinion shaft holes on the differential cage.



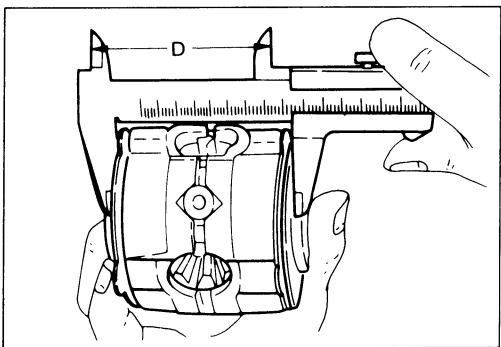
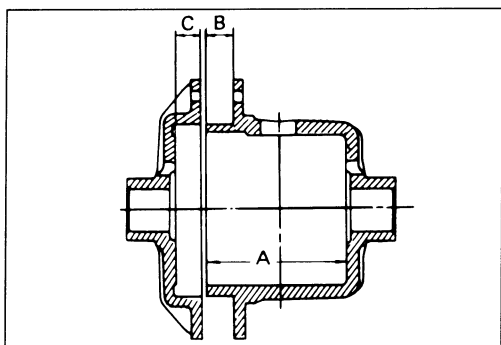
Confirmation of operation

Using the side gear holder, measure the starting of the side gear.

Starting Torque		kg·m(lbs./N·m)
Standard		15—23 (108—166/147—225)

Side gear holder : 5-8840-2010-0
(J-36563)

Side gear rotor : 5-8840-2012-0
(J-36565)



Adjustment of Clearance between Friction Disc and Plate

1) Measuring depth of differential case

	mm(in.)
Standard (A-B)	80.58 (3.17)
(C)	10.58 (0.41)

2) Measuring overall length of pressure ring, friction disc and plate assembly

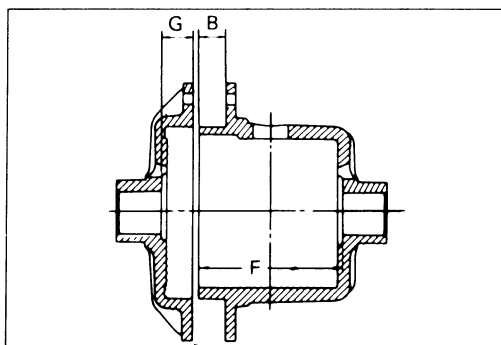
- Assemble pinion shaft with pressure ring, then friction disc and plate.
- Measure length between plates at both ends over V-shape groove. (D)

3) After A, B, C and D dimensions are measured, perform adjustment with the following procedure.

- Measure disc spring :
1.75 mm (0.069 in) x 2 pcs (E)
- Measure thickness of plate spring
Standard dimension :
1.75 mm (0.069 in.) x 2 pcs (F)

4) Select a friction disc or plate so that $((A-B) + C) - (D + E + F) = 0.06$ to 0.20 mm (0.002 to 0.008 in.) and also the difference in total dimension of friction disc and plate, plate spring and disc spring (left/right side) does not exceed 0.05 mm (0.002 in.).

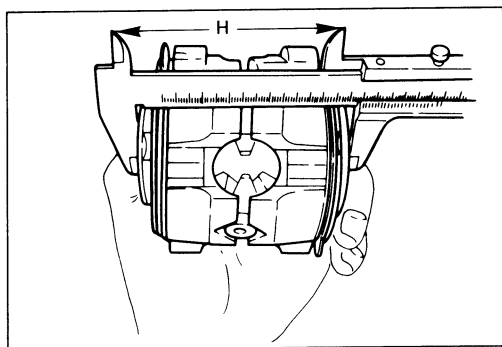
Thickness : 1.75, 1.85 mm



Adjusting Backlash of Side Gear in Axial Direction

1) Measuring depth of differential case

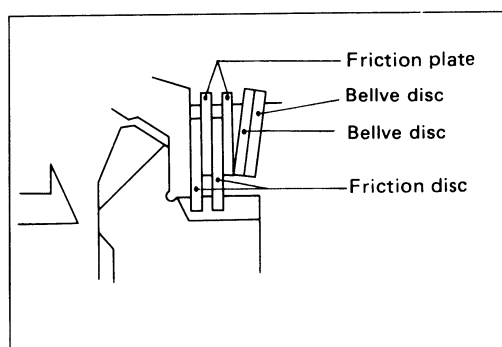
	mm(in.)
Standard (F-B)	82.03 (3.23)
(G)	12.03 (0.47)



- 2) Measuring dimension between thrust washers at both ends
 - Eliminate clearance by pushing pressure ring against the pinion shaft in axial direction.
 - Eliminate backlash by connecting side gear to the pinion.
 - Measure dimension between thrust washers at both ends. (H)

- 3) After each dimension is measured, perform adjustment with the following procedure.
Adjust so that $(F-B) + G-H = 0.05$ to 0.2 mm. Also, select a proper thrust washer so that the dimension difference from back face of the pressure ring to thrust washer (left/right side) does not exceed 0.05 mm.

Thickness : 1.5, 1.6, 1.7 mm



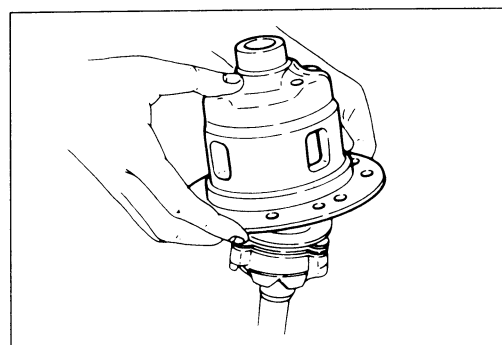
Important Operations



3. 19. Bellve disc

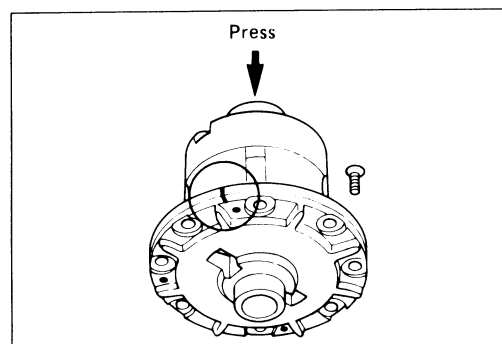
4. 18. Bellve disc

Install the Bellve disc with dished side turned to the differential cage side.



9. Pressure Ring

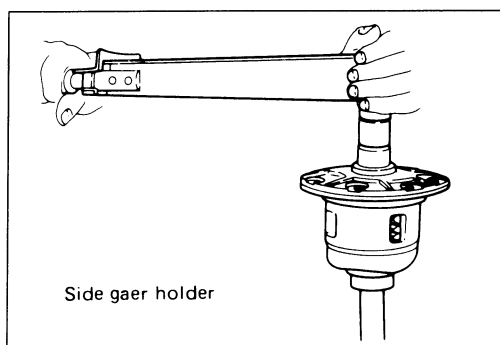
- 1) Fit two side gears in two pressure rings, one from under a ring and the other from above a ring.
- 2) Fit two pairs of a friction disc and a friction plate under it on and under these two pressure rings. Also, fit disc springs and plate springs for the discs and plates.



23. Bolt

Align the setting marks on the box and box cover and install the bolts using the press.

4B—38 REAR AXLE

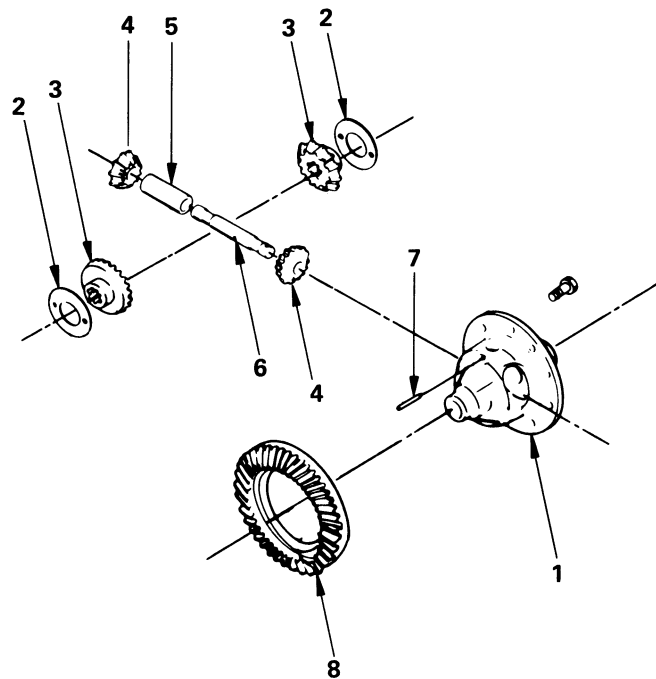


Confirmation of Operation

- Using the side gear holder, measure the starting torque of the side gear.

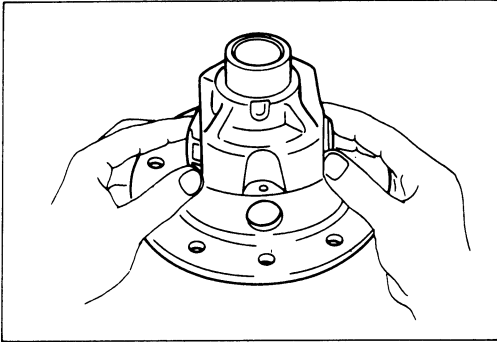
kg·m(lb.ft/N·m)	
Starting torque	6.5—15 (47—108/64—147)

DIFFERENTIAL ASSEMBLY (STD)



Reassembly Steps

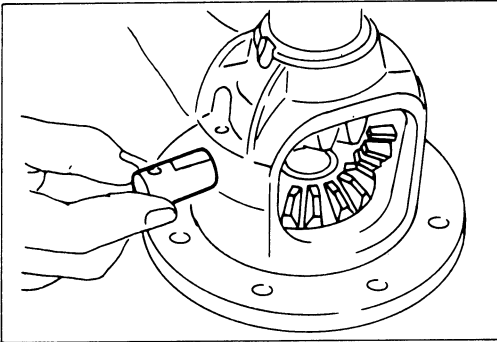
- | | |
|----------------------|----------------|
| 1. Differential cage | ▲ 6. Cross pin |
| 2. Thrust washer | ▲ 7. Lock pin |
| 3. Side gear | ▲ 8. Ring gear |
| ▲ 4. Pinion gear | |
| 5. Thrust block | |



Important Operations

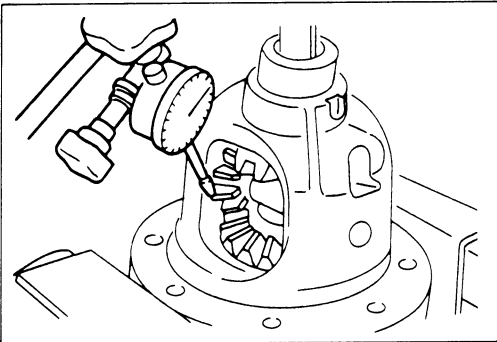
4. Pinion Gear

Install the pinion gear by engaging it with the side gears while turning both pinion gears simultaneously in the same direction.



6. Cross Pin

(1) Be sure to install the cross pin so that it is in alignment with the lock pin hole in the differential cage.

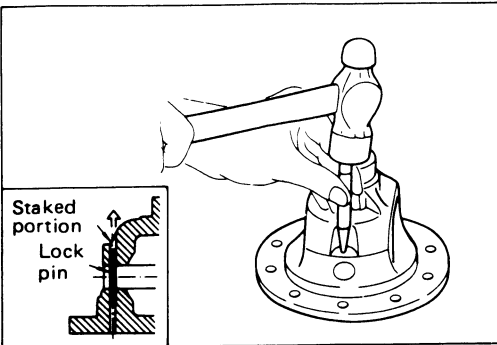


(2) Backlash between the side gear and the pinion gear.

Backlash		mm(in)
194 mm	0.03 – 0.08	(0.001 – 0.003)
220 mm	0.13 – 0.18	(0.005 – 0.007)

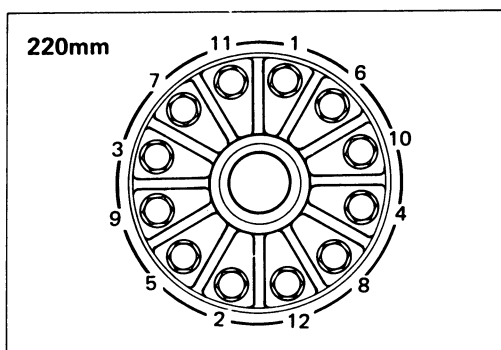
If the backlash is beyond the limits, adjust with a thrust washer of selected thickness.
Thicknesses of thrust washers available.

							mm(in)
194 mm	1.00 (0.039)	1.05 (0.041)	1.10 (0.043)				
220 mm	0.80 (0.031)	0.90 (0.035)	1.00 (0.039)	1.10 (0.043)	1.20 (0.047)	1.30 (0.051)	



7. Lock Pin

After lock pin installation, stake the cage to prevent the lock pin from falling out.

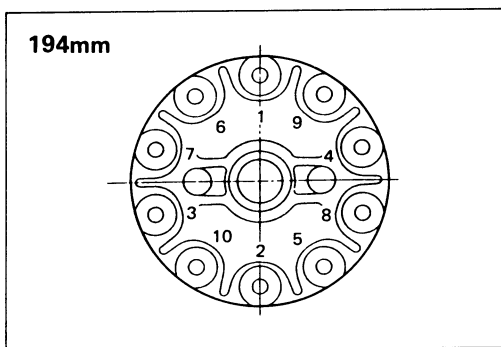


8. Ring Gear

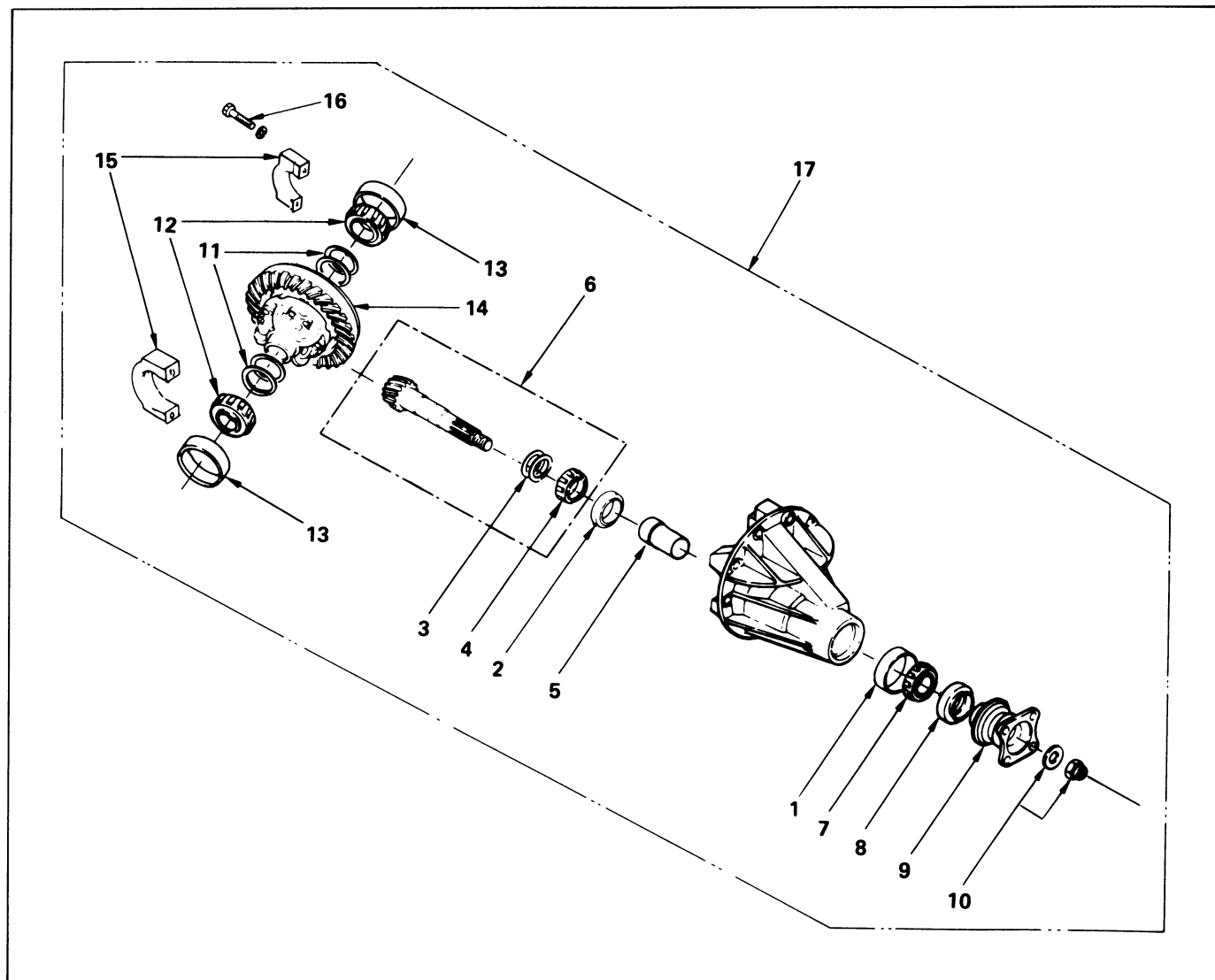
Discard used bolts and install new ones.

When installing the ring gear, apply the LOCTITE 271 or equivalent to the threaded holes and bolts after applying.

Ring Gear Bolt Torque	kg·m(lb.ft/N·m)
11 ± 1 (79.5 $\pm$ 7.2/107.9 $\pm$ 9.8)	

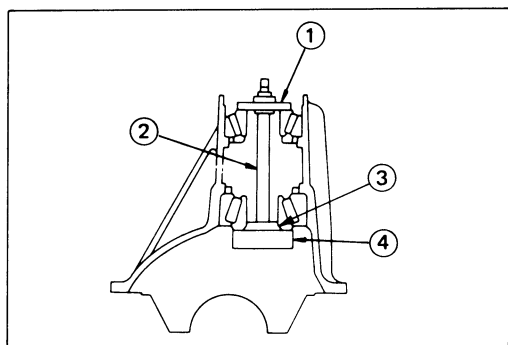
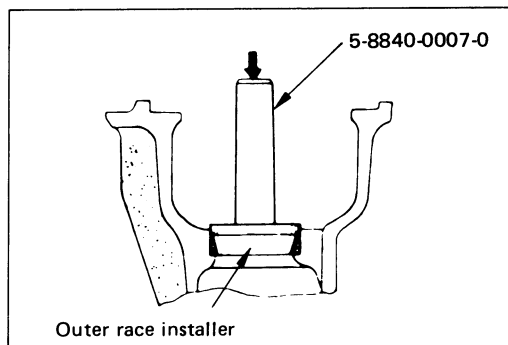
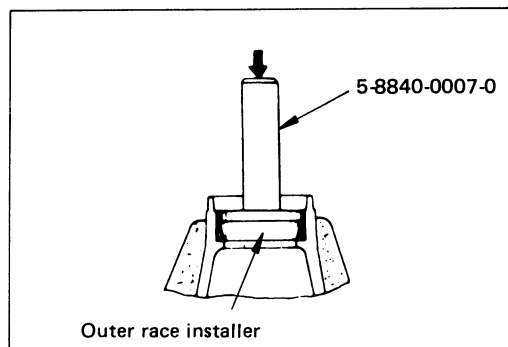


MAJOR COMPONENTS



Reassembly Steps

- | | |
|------------------------------------|--|
| ▲ 1. Outer bearing outer race | ▲ 10. Flange nut and washer |
| ▲ 2. Inner bearing outer race | ▲ 11. Backlash and pre-load adjusting shim |
| ▲ 3. Pinion depth adjusting ; shim | ▲ 12. Side bearings |
| ▲ 4. Inner bearing | ▲ 13. Side bearing outer race |
| ▲ 5. Collapsible spacer | ▲ 14. Differential cage assembly and ring gear |
| ▲ 6. Drive pinion assembly | ▲ 15. Bearing cap |
| ▲ 7. Outer bearing | ▲ 16. Bolt |
| ▲ 8. Oil seal | ▲ 17. Differential assembly |
| ▲ 9. Pinion flange assembly | |



Important Operations



1. Outer Bearing Outer Race

Installer : 9-8522-1141-0 (194 mm)
(J-24256)

5-8840-2164-0 (220 mm)
(J-37262)

Grip : 5-8840-0007-0
(J-8092)



2. Inner Bearing Outer Race

Installer : 9-8522-1274-0 (194 mm)
(J-24252)

5-8840-2163-0 (220 mm)
(J-37261)

Grip : 5-8840-0007-0
(J-8092)



3. Pinion Depth Adjusting ; Shim

Adjustment of drive pinion mounting distance.



- (1) Apply gear oil to the drive pinion bearing, inner and outer.



Clean all of the pinion setting gage sets.

Then install the gage set together with the inner and outer bearings.



For 194 mm

- ① Pilot : 5-8840-2085-0 (J-21777-42)
② Stud and nut : 5-8840-2089-0 (J-23597-9)
④ Gage plate : 5-8840-2087-0 (J-23597-7)

For 220 mm

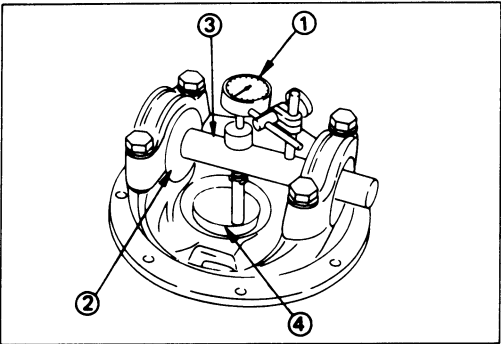
- ① Front pilot : 5-8840-2085-0 (J-21777-42)
② Stud and nut : 5-8840-0127-0 (J-21777-43)
③ Rear pilot : 5-8840-0129-0 (J-23597-12)
④ Gage plate : 5-8840-2166-0 (J-23597-42)



Tighten the nut to the specified torque.

194 mm and 220 mm kg-cm(lb.in)

23 (20)



- (2) Clean the side bearing bores. Install a dial indicator with discs and arbor. Then install and tighten the bearing caps to the specified torque.



Torque		kg·m(lb.ft/N·m)
194 mm	10 ± 1	(72 ± 7.2/98.1 ± 9.8)
220 mm	11 ± 1	(79.6 ± 7.2/107.9 ± 9.8)

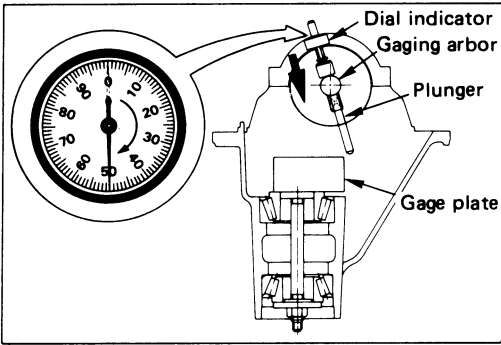


For 194 mm

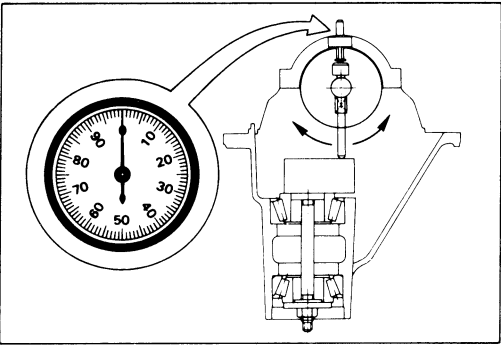
- ① Dial indicator : 5-8840-0126-0 (J-8001)
- ② Disc (2 pcs.) : 5-8840-2088-0 (J-23597-8)
- ③ Arbor : 5-8840-0128-0 (J-23597-1)
- ④ Gage plate : 5-8840-2087-0 (J-23597-7)

For 220 mm

- ① Dial indicator : 5-8840-0126-0 (J-8001)
- ② Disc (2 pcs.) : 5-8840-2167-0 (J-21777-86)
- ③ Arbor : 5-8840-0128-0 (J-23597-1)
- ④ Gage plate : 5-8840-2166-0 (J-23597-42)

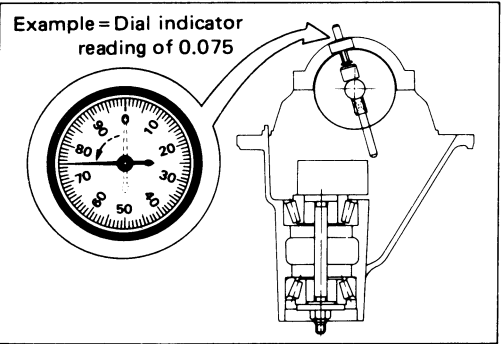


- (3) Set the dial indicator to "O". Place it on the mounting post of the gaging arbor with the contact button touching the indicator pad. Force the dial indicator downward until the needle has made a half turn clockwise. Tighten down the dial indicator in this position.

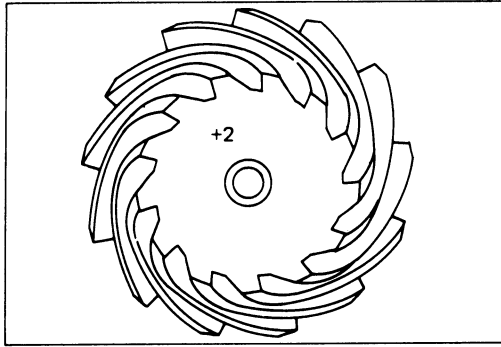


- (4) Position the plunger on the gage plate. Move the gaging arbor slowly back and forth and locate the position at which the dial indicator shows the greatest deflection. At this point, once again set the dial indicator to "O".

Repeat the procedure to verify the "O" setting.



- (5) After the ZERO setting is obtained, rotate the gaging arbor until the dial indicator rod does not touch the gaging plate. Record the number the dial indicator needle points to.



- (6) Record the pinion depth code on the head of the drive pinion.

The number indicates a necessary change in the pinion mounting distance. A plus number indicates the need for a greater mounting distance (which can be achieved by decreasing the shim thickness). A minus number indicates the need for a smaller mounting distance (which can be achieved by increasing the shim thickness). If examination reveals pinion depth code "0", the pinion is "nominal".

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(6) Select the shim using table below.

[194 mm]

[194 mm]

mm(in)

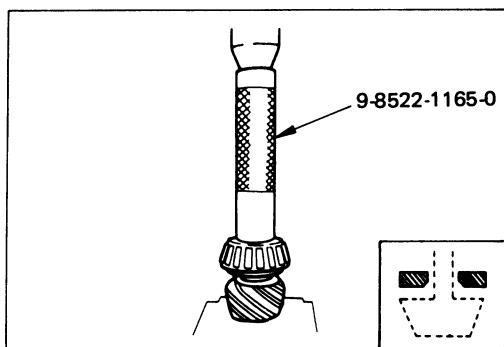
Pinion marking	+10	+8	+6	+4	+2	0	-2	-4	-6	-8	-10
Dial indicator reading (Inches)											
0.081											2.18(0.0858)
0.082										2.18(0.0858)	2.20(0.0866)
0.083									2.18(0.0858)	2.20(0.0866)	2.24(0.0882)
0.084								2.18(0.0858)	2.20(0.0866)	2.24(0.0882)	2.26(0.0890)
0.085						2.18(0.0858)	2.20(0.0866)	2.24(0.0882)	2.26(0.0890)	2.28(0.0898)	2.32(0.0914)
0.086					2.18(0.0858)	2.20(0.0866)	2.24(0.0882)	2.26(0.0890)	2.28(0.0898)	2.32(0.0914)	2.34(0.0921)
0.087				2.18(0.0858)	2.20(0.0866)	2.24(0.0882)	2.26(0.0890)	2.28(0.0898)	2.32(0.0914)	2.34(0.0921)	2.36(0.0929)
0.088			2.18(0.0858)	2.20(0.0866)	2.24(0.0882)	2.26(0.0890)	2.28(0.0898)	2.32(0.0914)	2.34(0.0921)	2.36(0.0929)	2.38(0.0937)
0.089		2.18(0.0858)	2.20(0.0866)	2.24(0.0882)	2.26(0.0890)	2.28(0.0898)	2.32(0.0914)	2.34(0.0921)	2.36(0.0929)	2.38(0.0937)	2.42(0.0953)
0.090	2.18(0.0858)	2.20(0.0866)	2.24(0.0882)	2.26(0.0890)	2.28(0.0898)	2.32(0.0914)	2.34(0.0921)	2.36(0.0929)	2.38(0.0937)	2.42(0.0953)	2.44(0.0961)
0.091	2.20(0.0866)	2.24(0.0882)	2.26(0.0890)	2.28(0.0898)	2.32(0.0914)	2.34(0.0921)	2.36(0.0929)	2.38(0.0937)	2.42(0.0953)	2.44(0.0961)	2.46(0.0969)
0.092	2.24(0.0882)	2.26(0.0890)	2.28(0.0898)	2.32(0.0914)	2.34(0.0921)	2.36(0.0929)	2.38(0.0937)	2.42(0.0953)	2.44(0.0961)	2.46(0.0969)	2.48(0.0977)
0.093	2.26(0.0890)	2.28(0.0898)	2.32(0.0914)	2.34(0.0921)	2.36(0.0929)	2.38(0.0937)	2.42(0.0953)	2.44(0.0961)	2.46(0.0969)	2.48(0.0977)	2.52(0.0992)
0.094	2.28(0.0898)	2.32(0.0914)	2.34(0.0921)	2.36(0.0929)	2.38(0.0937)	2.42(0.0953)	2.44(0.0961)	2.46(0.0969)	2.48(0.0977)	2.52(0.0992)	2.54(0.1000)
0.095	2.32(0.0914)	2.34(0.0921)	2.36(0.0929)	2.38(0.0937)	2.42(0.0953)	2.44(0.0961)	2.46(0.0969)	2.48(0.0977)	2.52(0.0992)	2.54(0.1000)	2.56(0.1008)
0.096	2.34(0.0921)	2.36(0.0929)	2.38(0.0937)	2.42(0.0953)	2.44(0.0961)	2.46(0.0969)	2.48(0.0977)	2.52(0.0992)	2.54(0.1000)	2.56(0.1008)	
0.097	2.36(0.0929)	2.38(0.0937)	2.42(0.0953)	2.44(0.0961)	2.46(0.0969)	2.48(0.0977)	2.52(0.0992)	2.54(0.1000)	2.56(0.1008)		
0.098	2.38(0.0937)	2.42(0.0953)	2.44(0.0961)	2.46(0.0969)	2.48(0.0977)	2.52(0.0992)	2.54(0.1000)	2.56(0.1008)			
0.099	2.42(0.0953)	2.44(0.0961)	2.46(0.0969)	2.48(0.0977)	2.52(0.0992)	2.54(0.1000)	2.56(0.1008)				
0.000	2.44(0.0961)	2.46(0.0969)	2.48(0.0977)	2.52(0.0992)	2.54(0.1000)	2.56(0.1008)					
0.001	2.46(0.0969)	2.48(0.0977)	2.52(0.0992)	2.54(0.1000)	2.56(0.1008)						
0.002	2.48(0.0977)	2.52(0.0992)	2.54(0.1000)	2.56(0.1008)							
0.003	2.52(0.0992)	2.54(0.1000)	2.56(0.1008)								
0.004	2.54(0.1000)	2.56(0.1008)									
0.005	2.56(0.1008)										
0.006											

[220 mm]

[220 mm]		mm(in)										
Pinion marking	+10	+8	+6	+4	+2	0	-2	-4	-6	-8	-10	
Dial indicator reading (Inches)												
0.073										1.94(0.0764)	1.96(0.0772)	
0.074									1.94(0.0764)	1.96(0.0772)	1.98(0.0779)	
0.075								1.94(0.0764)	1.96(0.0772)	1.98(0.0779)	2.00(0.0787)	
0.076						1.94(0.0764)	1.96(0.0772)	1.98(0.0779)	2.00(0.0787)	2.02(0.0795)	2.04(0.0803)	
0.077						1.96(0.0772)	1.98(0.0779)	2.00(0.0787)	2.02(0.0795)	2.04(0.0803)	2.06(0.0811)	
0.078				1.94(0.0764)	1.96(0.0772)	1.98(0.0779)	2.00(0.0787)	2.02(0.0795)	2.04(0.0803)	2.06(0.0811)	2.08(0.0819)	
0.079			1.94(0.0764)	1.96(0.0772)	1.98(0.0779)	2.00(0.0787)	2.02(0.0795)	2.04(0.0803)	2.06(0.0811)	2.08(0.0819)	2.10(0.0827)	
0.080	1.94(0.0764)	1.96(0.0772)	1.98(0.0779)	2.00(0.0787)	2.02(0.0795)	2.04(0.0803)	2.06(0.0811)	2.08(0.0819)	2.10(0.0827)	2.12(0.0835)	2.14(0.0842)	
0.081	1.96(0.0772)	1.98(0.0779)	2.00(0.0787)	2.02(0.0795)	2.04(0.0803)	2.06(0.0811)	2.08(0.0819)	2.10(0.0827)	2.12(0.0835)	2.14(0.0842)	2.16(0.0850)	
0.082	1.98(0.0779)	2.00(0.0787)	2.02(0.0795)	2.04(0.0803)	2.06(0.0811)	2.08(0.0819)	2.10(0.0827)	2.12(0.0835)	2.14(0.0842)	2.16(0.0850)	2.18(0.0858)	
0.083	2.00(0.0787)	2.02(0.0795)	2.04(0.0803)	2.06(0.0811)	2.08(0.0819)	2.10(0.0827)	2.12(0.0835)	2.14(0.0842)	2.16(0.0850)	2.18(0.0858)	2.20(0.0866)	
0.084	2.04(0.0803)	2.06(0.0811)	2.08(0.0819)	2.10(0.0827)	2.12(0.0835)	2.14(0.0842)	2.16(0.0850)	2.18(0.0858)	2.20(0.0866)	2.22(0.0874)	2.24(0.0882)	
0.085	2.06(0.0811)	2.08(0.0819)	2.10(0.0827)	2.12(0.0835)	2.14(0.0842)	2.16(0.0850)	2.18(0.0858)	2.20(0.0866)	2.22(0.0874)	2.24(0.0882)	2.26(0.0890)	
0.086	2.08(0.0819)	2.10(0.0827)	2.12(0.0835)	2.14(0.0842)	2.16(0.0850)	2.18(0.0858)	2.20(0.0866)	2.22(0.0874)	2.24(0.0882)	2.26(0.0890)	2.28(0.0898)	
0.087	2.12(0.0835)	2.14(0.0842)	2.16(0.0850)	2.18(0.0858)	2.20(0.0866)	2.22(0.0874)	2.24(0.0882)	2.26(0.0890)	2.28(0.0898)	2.30(0.0906)	2.32(0.0913)	
0.088	2.14(0.0842)	2.16(0.0850)	2.18(0.0858)	2.20(0.0866)	2.22(0.0874)	2.24(0.0882)	2.26(0.0890)	2.28(0.0898)	2.30(0.0906)	2.32(0.0913)	2.34(0.0921)	
0.089	2.16(0.0850)	2.18(0.0858)	2.20(0.0866)	2.22(0.0874)	2.24(0.0882)	2.26(0.0890)	2.28(0.0898)	2.30(0.0906)	2.32(0.0913)	2.34(0.0921)	2.36(0.0929)	
0.090	2.18(0.0858)	2.20(0.0866)	2.22(0.0874)	2.24(0.0882)	2.26(0.0890)	2.28(0.0898)	2.30(0.0906)	2.32(0.0913)	2.34(0.0921)	2.36(0.0929)		
0.091	2.22(0.0874)	2.24(0.0882)	2.26(0.0890)	2.28(0.0898)	2.30(0.0906)	2.32(0.0913)	2.34(0.0921)	2.36(0.0929)				
0.092	2.24(0.0882)	2.26(0.0890)	2.28(0.0898)	2.30(0.0906)	2.32(0.0913)	2.34(0.0921)	2.36(0.0929)					
0.093	2.26(0.0890)	2.28(0.0898)	2.30(0.0906)	2.32(0.0913)	2.34(0.0921)	2.36(0.0929)						
0.094	2.28(0.0898)	2.30(0.0906)	2.32(0.0913)	2.34(0.0921)	2.36(0.0929)							
0.095	2.32(0.0913)	2.34(0.0921)	2.36(0.0929)									
0.096	2.34(0.0921)	2.36(0.0929)										
0.097	2.36(0.0929)											

Note:

When ordering shims, find the part number in the Parts Catalog by using the thickness of the shims listed in the above table.



4. Inner Bearing

Place the shim on the drive pinion with the chamfered side turned toward the pinion head, then attach the inner bearing to the pinion using an installer and a press.

Installer : 9-8522-1165-0
(J-6133-01)



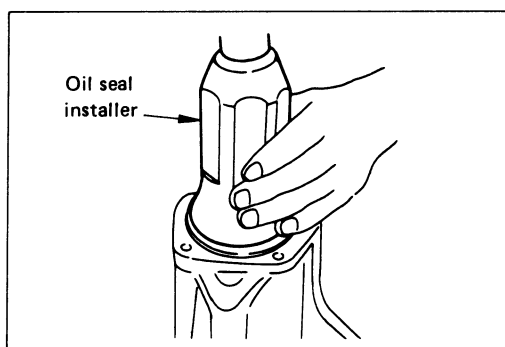
NOTE:

**Do not press on the roller cage.
Press only on the inner race.**



5. Collapsible Spacer

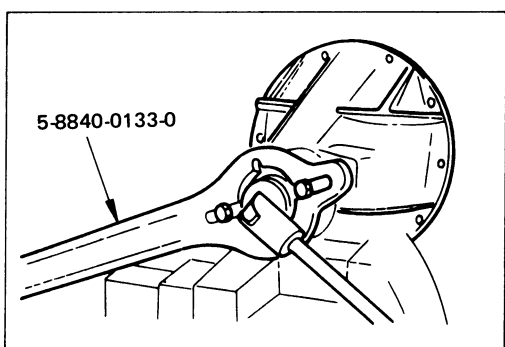
Discard the used collapsible spacer and install a new one.



8. Oil Seal

Use the oil seal installer to install a new oil seal that has been soaked in rear axle lubricant.

Installer : 9-8522-1275-0 (194 mm)
(J-24250)
: 5-8840-2165-0 (220 mm)
(J-37263)



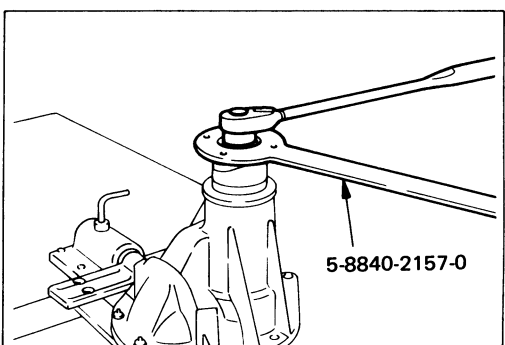
10. Flange Nut and Washer

- (1) Apply lubricant to pinion threads.
- (2) Tighten the nut to the specified torque using the pinion flange holder.

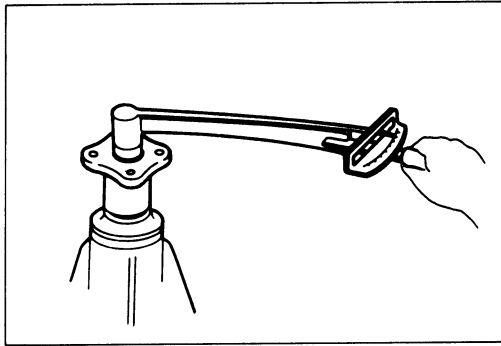
Pinion flange holder : 5-8840-0133-0 (194 mm)
(J-8614-01)
5-8840-2157-0 (220 mm)
(J-37221)



Flange Nut Torque	kg·m(lb.ft/N·m)
194 mm	18-28 (130.2-202.5/176.6-274.7)
220 mm	25-30 (180.8-217/245.3-294.3)



Discard used flange nuts and install new ones.

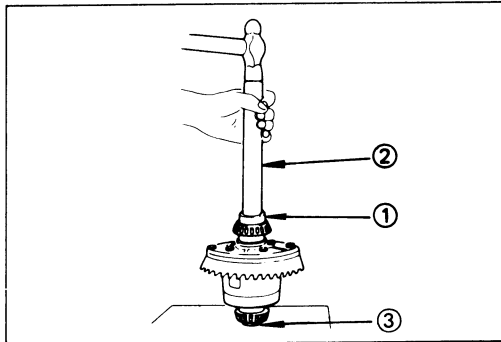


(3) Pinion bearing preload.

- Measure the bearing preload by using a torque wrench.
Note the scale reading required to rotate the flange.
- Continue tightening until the specified starting torque is obtained.

Pinion Bearing Preload Starting Torque kg-cm(lb.in/N-m)

194 mm	6.5-11.5 (5.6-10/0.6-1.1)
220 mm	7-13 (6.1-11.3/0.7-1.3)



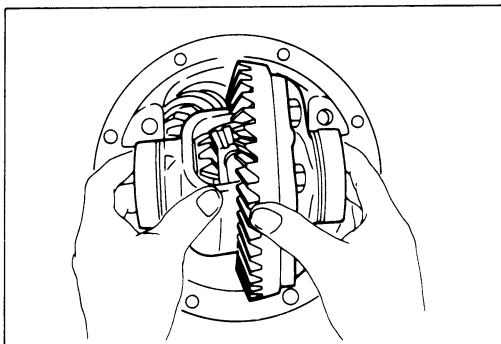
11. Backlash and Pre-load Adjusting Shim

- Attach the side bearing to the differential assembly without shims. Support the opposite side using a pilot to prevent bearing damage.

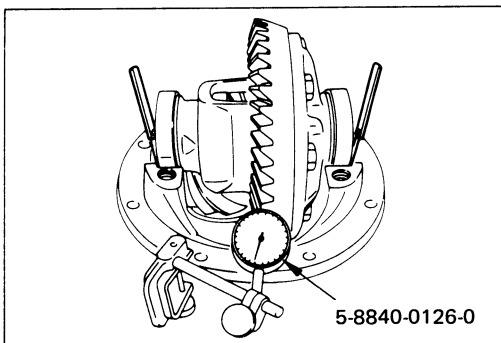
- ① Installer : 9-8522-1164-0 (194 mm)
(J-24244)
: 5-8840-2162-0 (220 mm)
(J-37257)

② Drive handle : 5-8840-0007-0
(J-8092)

③ Pilot : 9-8521-1743-0
(J-8107-2)

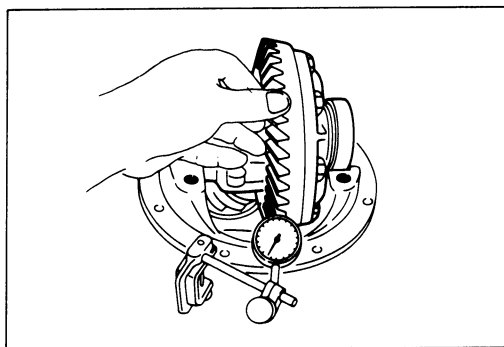


- Position the differential cage assembly with the bearing outer races to the side bearing bores of the carrier.



- Using two sets of feeler gauges, insert a feeler stock of sufficient thickness between each bearing outer race and the carrier to remove all end play. Make certain the feeler stock is pushed to the bottom of the bearing bores.
Mount the dial indicator on the carrier so that the indicator stem is at right angles to a tooth on the ring gear.

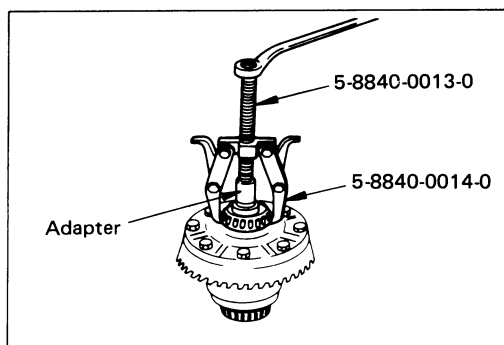
Dial indicator : 5-8840-0126-0
(J-8001)



- (4) Adjust the feeler gauge thickness from side to side until the ring gear backlash is in the specified range.

Backlash	mm(in)
194 mm	0.13–0.18 (0.005–0.007)
220 mm	0.15–0.20 (0.006–0.008)

With zero end play and correct backlash established, remove feeler gauge packs, determine the thickness of shims required and add 0.05 mm (0.002 in.) to each shim pack to provide side bearing preload. Always use new shims.



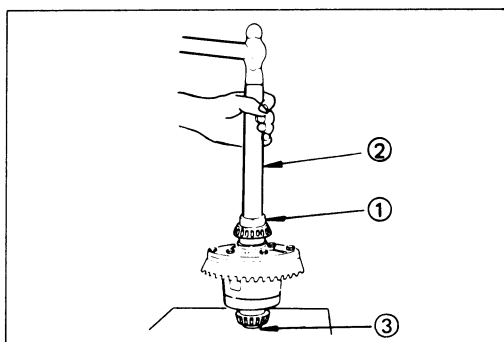
- (5) Remove side bearing

Remover : 5-8840-0013-0
(J-22888)

: 5-8840-0014-0
(J-22888-30)

Adapter : 9-8521-1743-0 (194 mm)
(J-8107-2)

: 5-8840-2196-0 (220 mm)
(J-8107-4)



12. Side Bearing

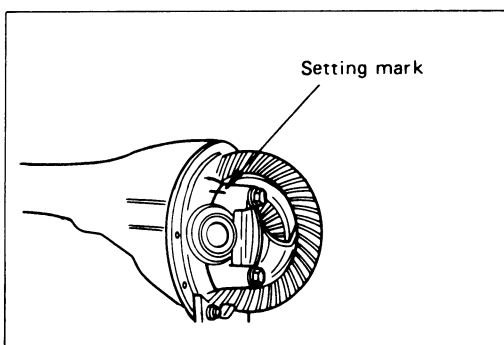
Install side bearings together with selected shims.

① Installer : 9-8521-1164-0 (194 mm)
(J-24244)

: 5-8840-2162-0 (220 mm)
(J-37257)

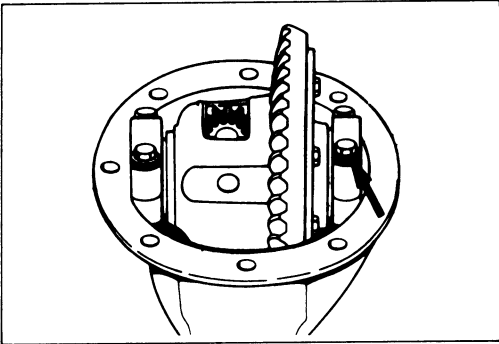
② Drive handle : 5-8840-0007-0 (J-8092)

③ Pilot : 9-8521-1743-0 (J-8107-2)



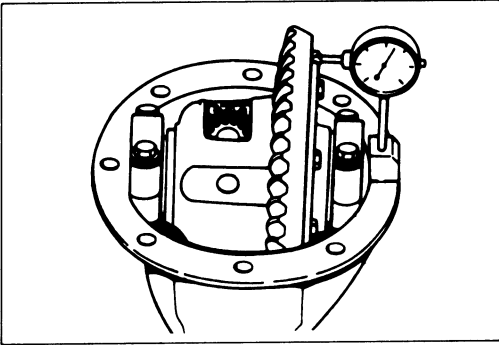
15. Bearing Cap

Align the setting marks applied at the time of disassembly.



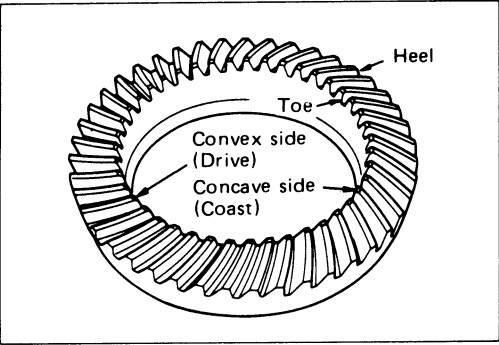
16. Bolt

Cap Bolt Torque		kg·m(lb.ft/N·m)
194 mm		10 ±1 (72 ±7.2/98 ±9.8)
220 mm		11 ±1 (79.5 ±7.2/107.9 ±9.8)



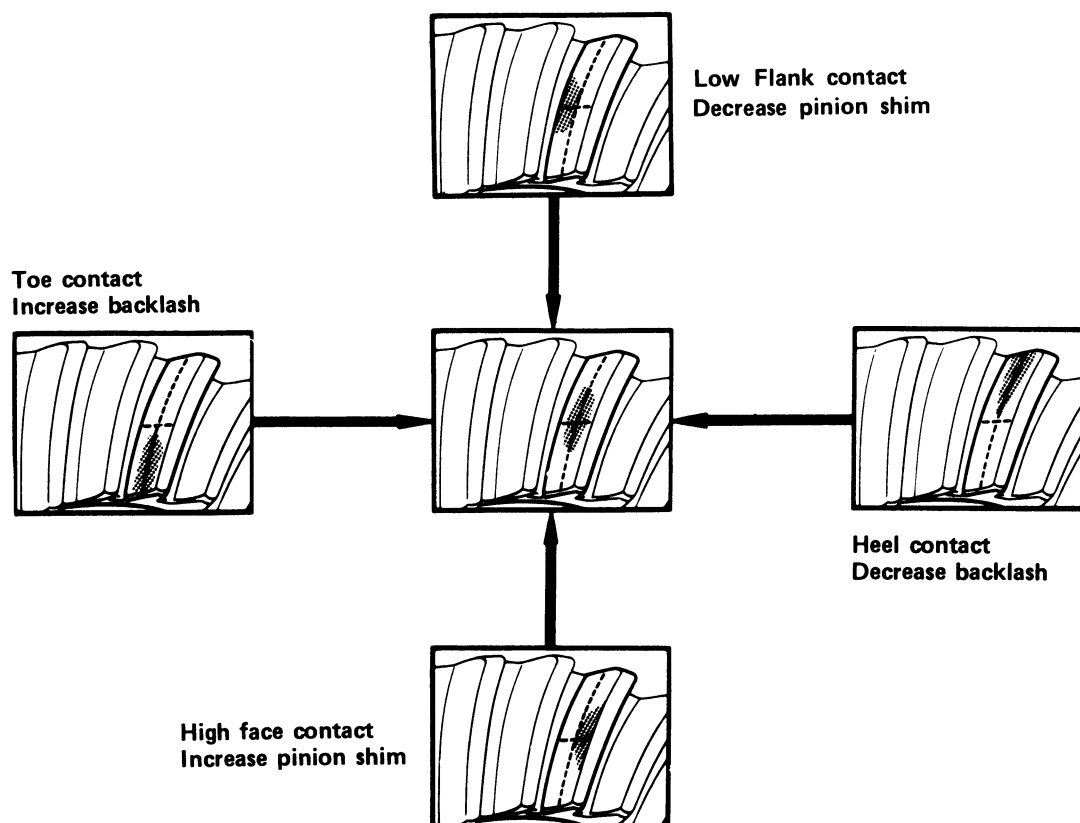
Measure the amount of run-out of the ring gear at its rear face.

Run-Out		mm(in)
	Standard	Limit
194 mm	0.02 (0.001)	0.05 (0.002)
220 mm		



Gear Tooth Contact Pattern Check and Adjustment

Apply a thin coat of prussian blue or equivalent to the faces of 7 — 8 teeth of the ring gear. Check the impression of contact obtained on the ring gear teeth and make necessary adjustment as described below if the contact is abnormal.



17. Differential Assembly

- (1) Clean the faces of the rear axle case and differential carrier and apply the recommended liquid gasket or its equivalent.



- (2) Mount the differential case and the carrier assembly to the rear axle case and tighten the nuts and bolts.

Torque kg·m(lb.ft/N·m)

194 mm	Nut	3.8 ± 0.4 (27 ± 2.9 / 37.3 ± 3.9)
	Bolt	2.5 ± 0.5 (18 ± 3.6 / 24.5 ± 5)
220 mm	Nut	4.5 ± 1.5 (32.5 ± 10.8 / 44 ± 14.7)
	Bolt	6.5 ± 0.5 (47 ± 3.6 / 63.8 ± 5)

- (3) Install the axle shaft assemblies as instructed earlier in this section under "Axle Shaft Reassembly".



- (4) Fill the axle case with hypoid gear lubricant to just below the filler hole.

Lubricant Capacity liter(US/UK gal.)

194 mm	1.5 (0.4/0.33)
220 mm	1.8 (0.48/0.4)



Check owners manual for correct type and viscosity of gear lubricant required.

TROUBLESHOOTING

Refer to this Section to quickly diagnose and repair rear axle problems.

Each troubleshooting chart has three headings arranged from left to right.

(1) Checkpoint (2) Trouble Cause (3) Countermeasure

This Section is divided into five sub-sections:

1. Abnormal Rear Axle Noise
 - 1) Noise when the engine is driving the vehicle
 - 2) Noise when the vehicle is coasting
 - 3) Intermittent noise
 - 4) Noise when the vehicle is turning
 - 5) Constant noise
2. Vibration
3. Oil Leakage
 - 1) Differential carrier leakage
 - 2) Axle case leakage
 - 3) Axle case to inside hub leakage
 - 4) Axle case to inside brake drum leakage
4. Power Not Being Transmitted to the Wheels (Propeller Shaft Operation is Normal)

1. ABNORMAL REAR AXLE NOISE

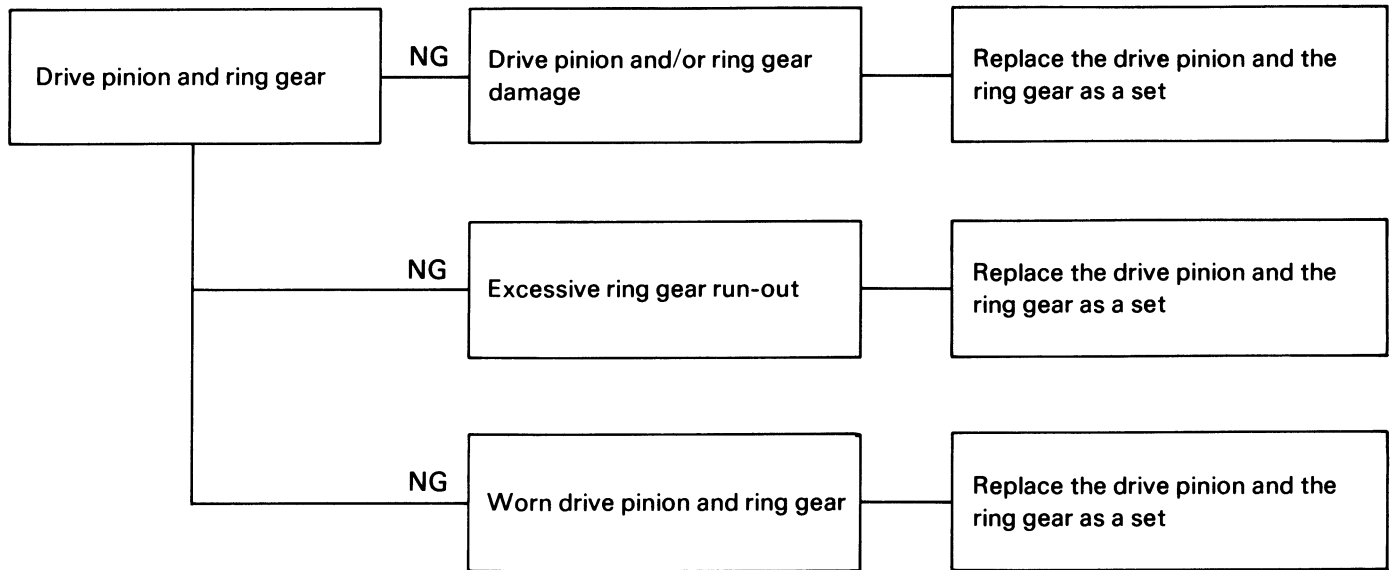
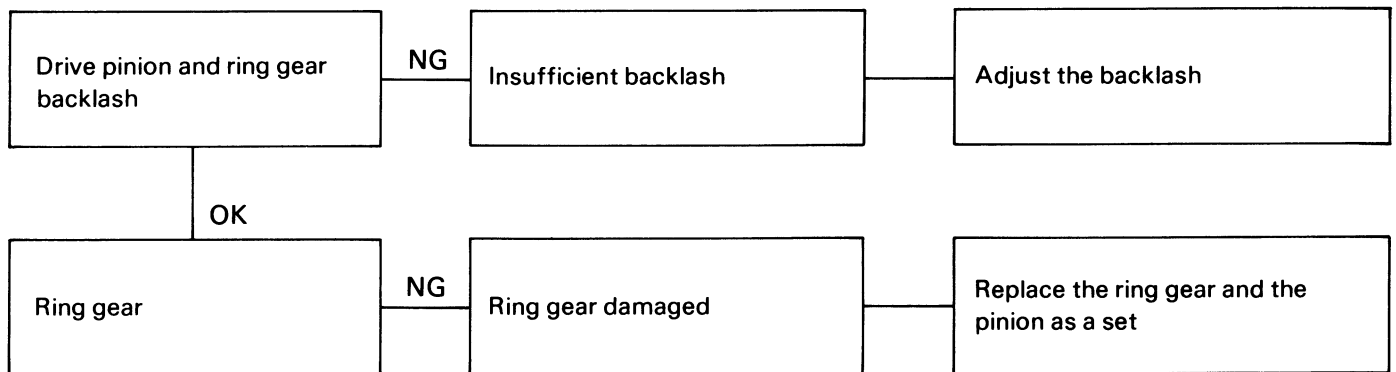
1) Noise when the Engine is Driving the Vehicle

Checkpoint		Trouble Cause	Countermeasure
Rear axle gear oil	NG	Insufficient gear oil	Replenish the gear oil
	NG	Wrong or poor grade gear oil	Replace the gear oil
OK			
Drive pinion to ring gear backlash	NG	Too much or too little backlash	Adjust the backlash
	OK		
Drive pinion end play	NG	Loose drive pinion bearings	Adjust the drive pinion bearing preload
	NG	Worn drive pinion bearings	Replace the drive pinion bearings
OK			
Differential side bearing	NG	Loose differential side bearings	Adjust the differential side bearing preload
	NG	Worn differential side bearings	Replace the differential side bearings
OK			

Continued on the next page

Checkpoint
Trouble Cause
Countermeasure

Continued from the previous page


2) Noise when the Vehicle is Coasting
Checkpoint
Trouble Cause
Countermeasure


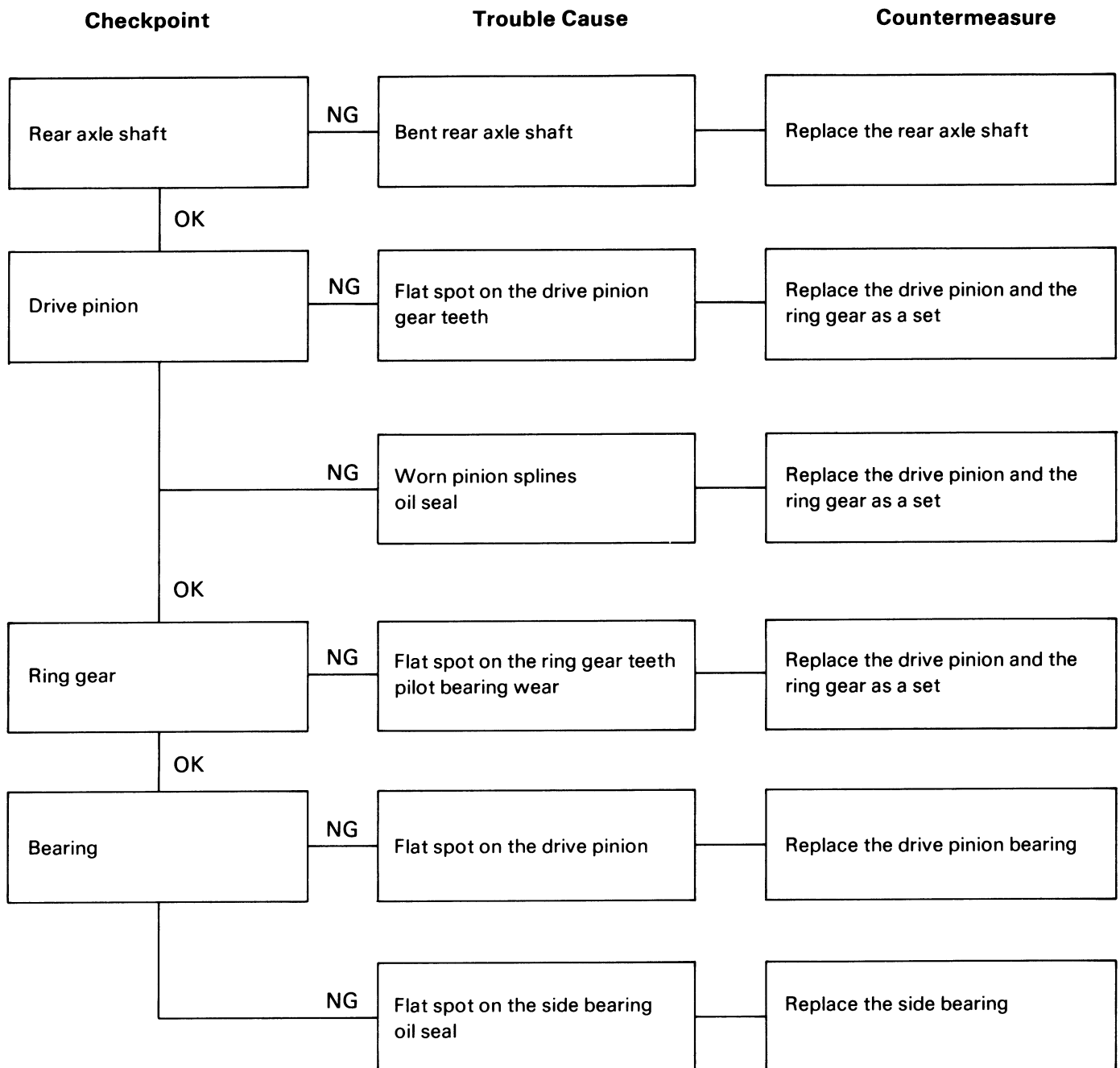
3) Intermittent Noise

Checkpoint		Trouble Cause	Countermeasure
Axle shaft	NG	Too much spline play	Replace the shaft
	OK		
Ring gear	NG	Warped ring gear	Replace the drive pinion and the ring gear as a set
	OK		
Differential cage	NG	Loose differential cage bolts	Tighten the differential cage bolts
	OK		
Axle case inside	NG	Foreign material in the axle case	Remove the foreign material

4) Noise when the Vehicle is Turning

Checkpoint		Trouble Cause	Countermeasure
Rear axle shaft	NG	Worn rear axle shaft splines	Replace the rear axle shaft
	OK		
Side gear	NG	Worn side gear	Replace the side gear
	OK		
Differential pinion	NG	Worn differential pinion	Replace the differential pinion
	OK		
Differential cross pin	NG	Worn differential cross pin	Replace the differential cross pin

5) Constant Noise



2. VIBRATION

Checkpoint		Trouble Cause	Countermeasure
Rear hub bearing	NG	Worn rear hub bearing	Replace the rear hub bearing
	OK		
Rear axle shaft	NG	Bent rear axle shaft	Replace the rear axle shaft

3. OIL LEAKAGE

1) Differential Carrier Leakage

Checkpoint		Trouble Cause	Countermeasure
Gear oil level	NG	Too much gear oil	Correct the oil level
OK			
Oil seal	NG	Worn or defective oil seal	Replace the oil seal
OK			
Air breather	NG	Clogged air breather	Clean the air breather
OK			
Differential carrier	NG	Loose bolts	Tighten the bolts to the specified torque
	NG	Liquid gasket seal bad	Reapply the liquid gasket
	OK		
Ring gear thrust bolt	NG	Loose lock nut and/or liquid	Reapply the liquid gasket and/or tighten the lock nut to the specified torque

2) Axle Case Leakage

Checkpoint		Trouble Cause	Countermeasure
Oil filler and drain plug	NG	Loose drain plug and/or defective gasket(s)	Tighten the drain plug and/or replace the gasket(s)
	OK		
Air breather	NG	Clogged air breather	Clean the air breather
	OK		
Axle case	NG	Cracked axle case	Replace the axle case
	OK		
Differential carrier	NG	Loose bolts	Tighten the bolts to the specified torque
	NG	Liquid gasket seal bad	Reapply the liquid gasket

3) Axle Case to Inside Brake Drum Leakage

Checkpoint		Trouble Cause		Countermeasure
Oil seal	NG	Worn or defective oil seal		Replace the oil seal

4. POWER NOT BEING TRANSMITTED TO THE WHEELS (PROPELLER SHAFT OPERATION IS NORMAL)

Checkpoint		Trouble Cause	Countermeasure
Rear axle shaft	NG	Broken rear axle shaft	Replace the rear axle shaft
	OK		
Drive pinion and ring gear	NG	Broken drive pinion and/or ring gear	Replace the drive pinion and the ring gear as a set
	OK		
Differential cage gears	NG	Broken differential cage gears and/or spider	Replace the differential gears and/or the spider

SECTION 4C

FRONT WHEEL DRIVE

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MAIN DATA AND SPECIFICATIONS

FRONT AXLE AND DIFFERENTIAL

Ring gear size mm(in)	167(6.6)	194(7.6)
Axle tube	It consists of the duce, a cast iron housing and the Axle tube.	
Type		
Gear type	Hypoid	
Gear ratio (to 1)		
4ZD1 engine	4.555	4.555 or 4.777
4ZE1 engine	4.555	4.555
4JA1 engine	4.555	4.555 or 4.777
4JB1T engine	—	4.555
4JG2T engine	—	4.300
Differential type	Two pinion	
Oil capacity liter	1.0	1.4
(US/UK gal)	(0.26/0.22)	(0.4/0.33)
Axle shaft type	Constant velocity joint (Birfield joint type and double offset joint).	
Hub locking type	Automatic locking and Manual locking free wheel hubs.	

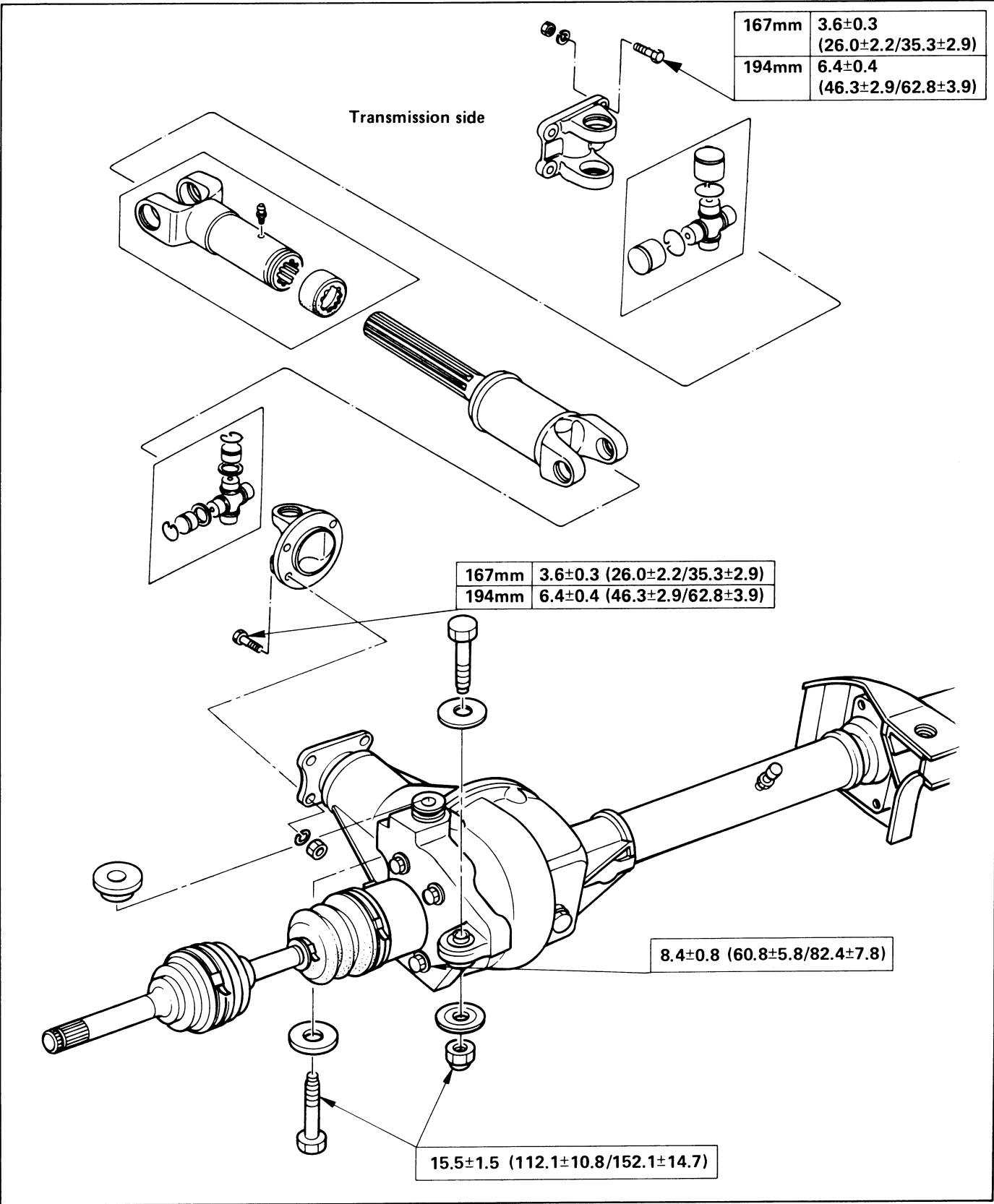
FRONT PROPELLER SHAFT

Transmission type	MSG	MUA
Outside diameter mm(in)	32(1.26)	40(1.57)
Inside diameter mm(in)	—	36.5(1.44)
Length mm(in) (between two spiders center)	407(16.02)	517(20.35)

SPECIAL PARTS FIXING NUTS AND BOLTS

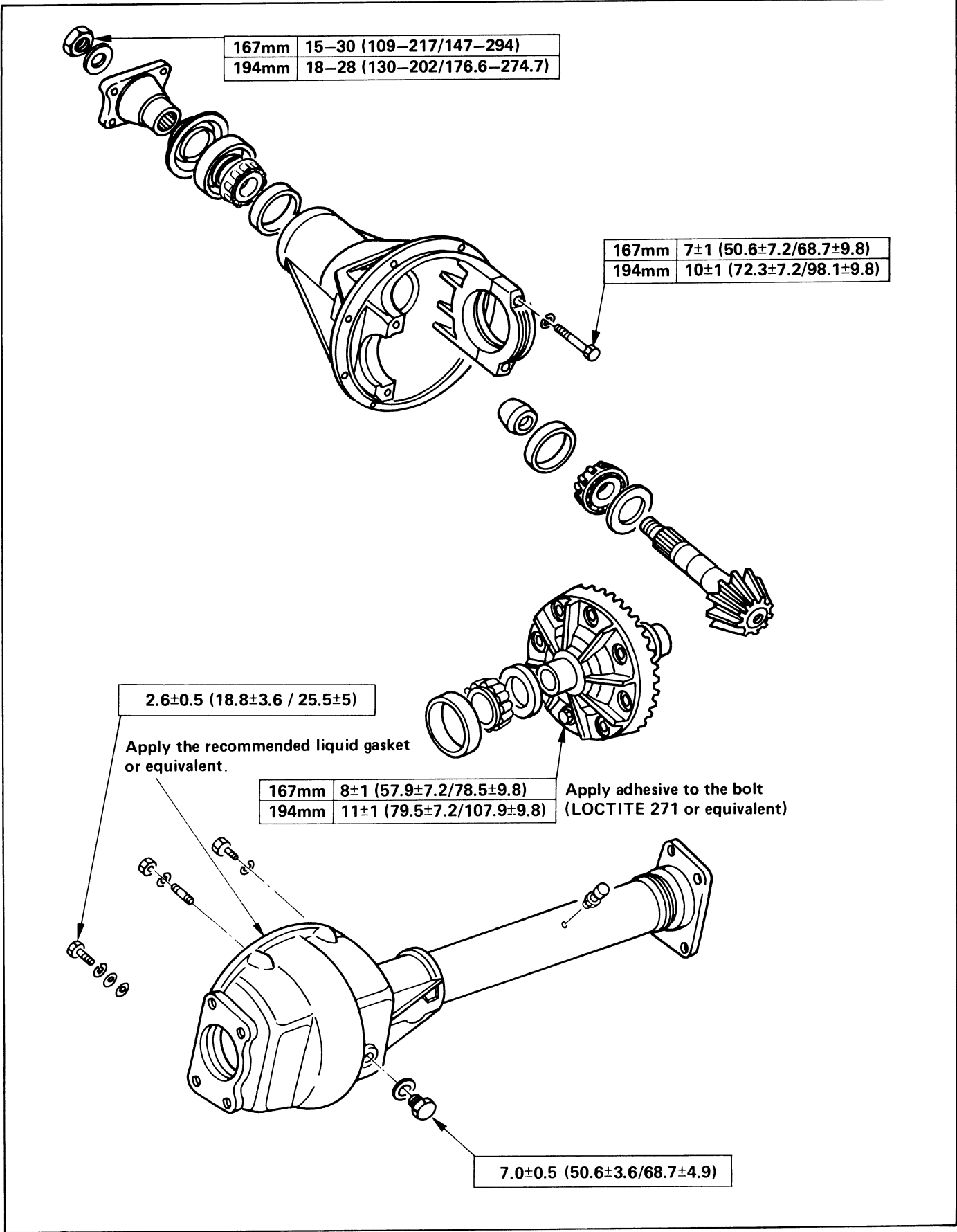
FRONT DRIVE AXLE AND PROPELLER SHAFT

kg·m(lb.ft./N·m)



FRONT DIFFERENTIAL

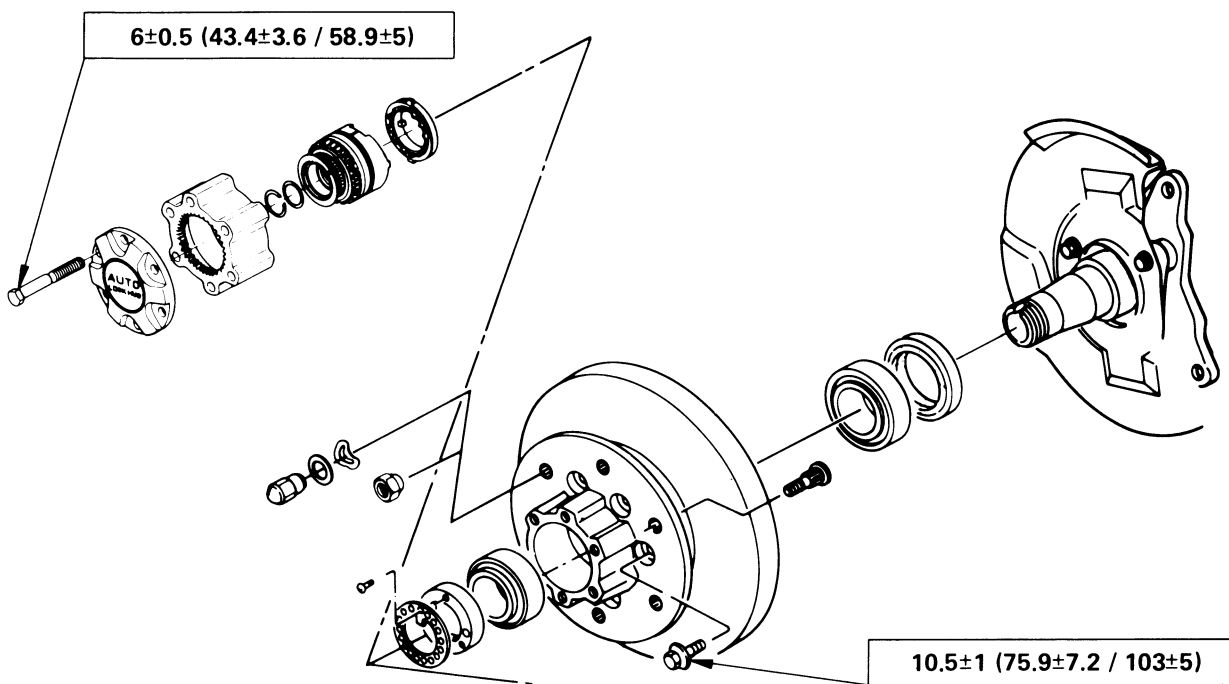
kg·m(lb.ft./N·m)



FREE WHEELING HUB

kg·m(lb.ft./N·m)

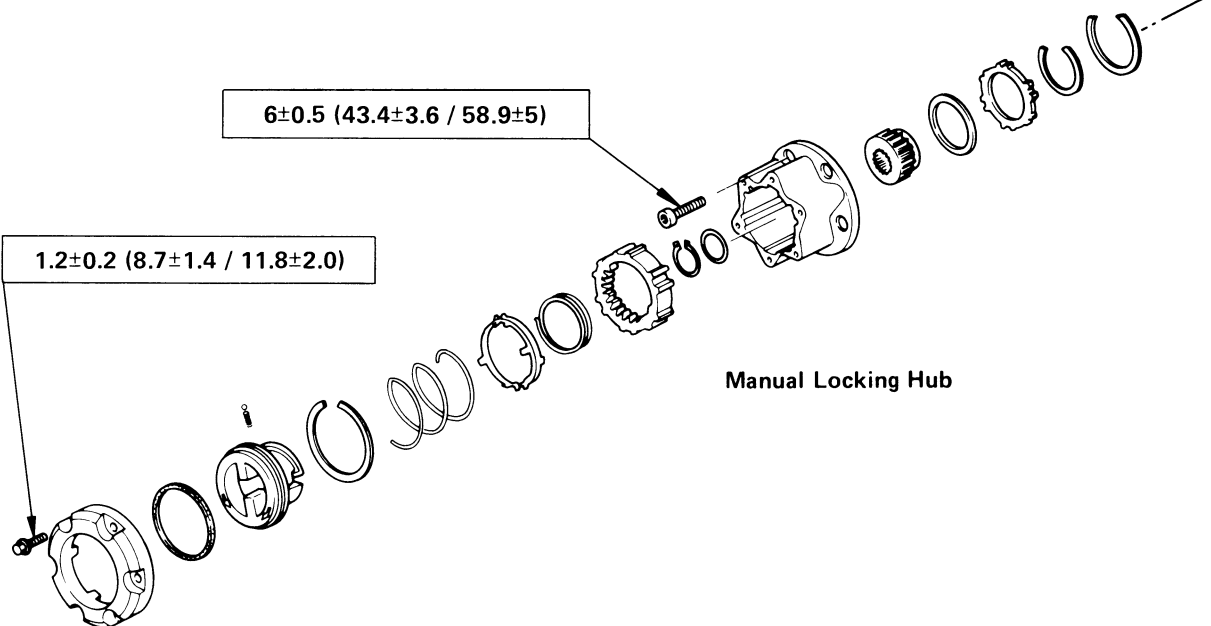
Automatic Locking Hub



6±0.5 (43.4±3.6 / 58.9±5)

1.2±0.2 (8.7±1.4 / 11.8±2.0)

Manual Locking Hub





RECOMMENDED LIQUID GASKET

Type	Brand Name	Manufacturer	Remarks
RTV* Silicon Base	ThreeBond 1207B ThreeBond 1207C	Three Bond Three Bond	For Engine Repairs
	ThreeBond 1215	Three Bond	For Axle Case Repairs, T/M
Water Base	ThreeBond 1141E	Three Bond	For Engine Repairs
Solvent	ThreeBond 1104 BelcoBond 4 BelcoBond 401 BelcoBond 402	Three Bond Isuzu Isuzu Isuzu	For Engine Repairs
Anerobic	LOCTITE 515 LOCTITE 518	Loctite Loctite	All

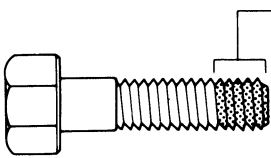
* RTV : Room Temperature Vulcanizer

Note:

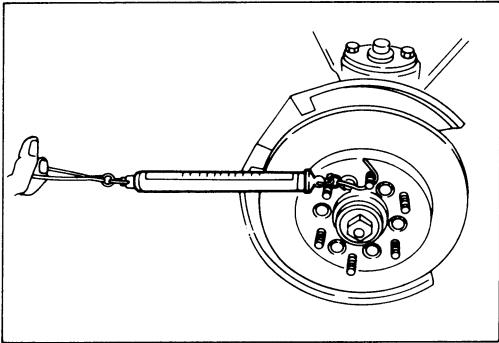
- It is very important that the liquid gaskets listed above or their exact equivalent be used on the vehicle.
- Be careful to use the specified amount of liquid gasket.
Follow the manufacturer's instructions at all times.
- Be absolutely sure to remove all lubricants and moisture from the connecting surfaces before applying the liquid gasket.
The connecting surfaces must be perfectly dry.
- LOCTITE 515 and LOCTITE 518 harden upon contact with a metal surface.
Do not apply LOCTITE 515 or LOCTITE 518 between two metal surfaces having a clearance of greater than 0.25 mm (0.01 in). Poor adhesion will result.



RECOMMENDED THREAD LOCKING AGENTS

LOCTITE Type	LOCTITE Color	Application Steps
LOCTITE 242	Blue	- Completely remove all lubricant and moisture from the bolts and the female threaded surfaces of the parts to be joined. The surfaces must be perfectly dry. - Apply LOCTITE to the bolts.  Apply LOCTITE to at least 1/3 of the bolt's threaded area
LOCTITE 262	Red	
LOCTITE 270	Green	
LOCTITE 271	Red	- Tighten the bolts to the specified torque. - Wait at least one hour before continuing the installation procedure.

SERVICING



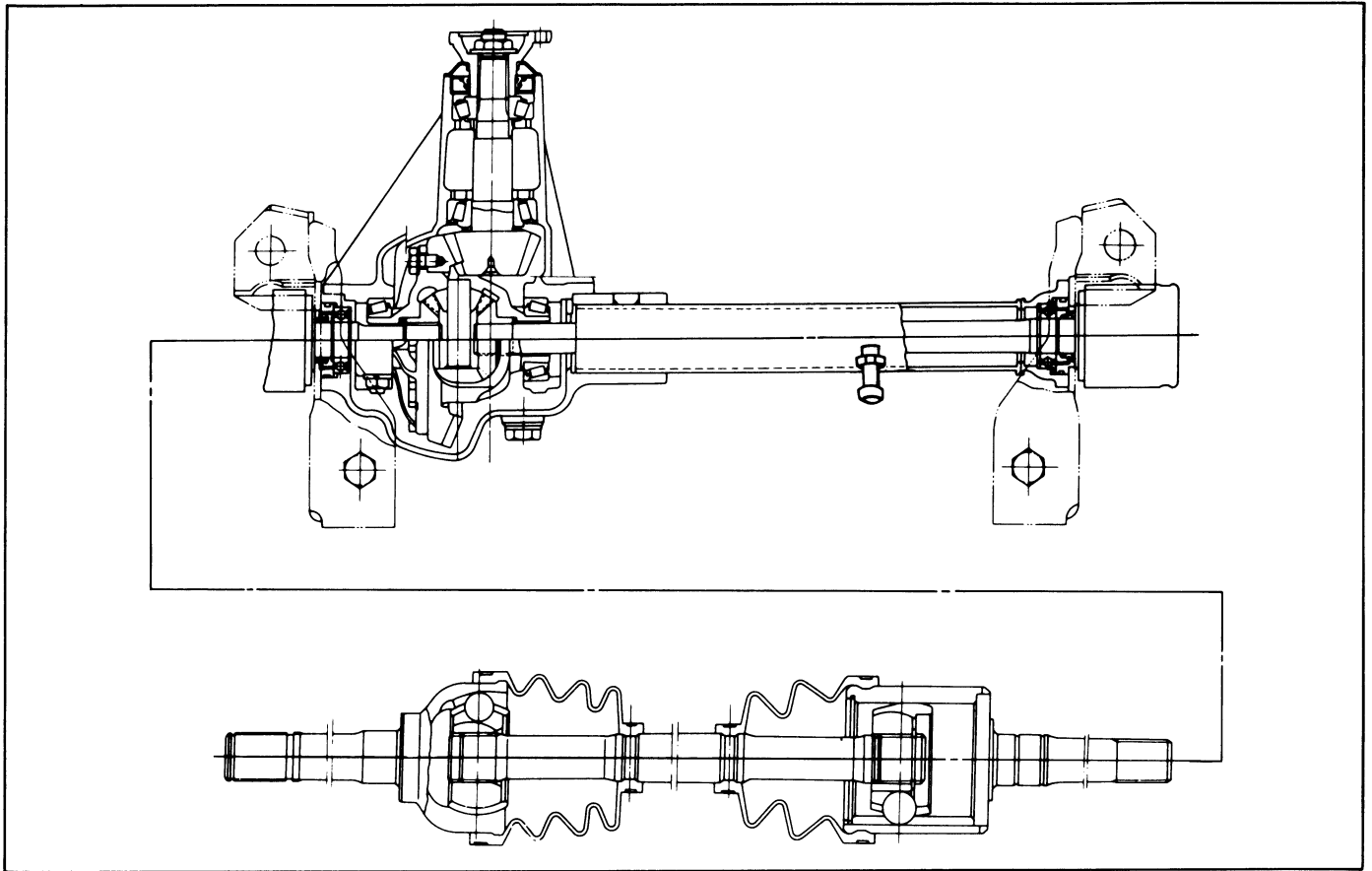
Hub Bearing Preload at the Wheel Pin

4 x 4 Model		kg (lb)
New bearing and New oil seal	2	— 2.5 (4.4—5.5)
Reuse bearing and New oil seal	1.2	— 1.8 (2.6—4.0)

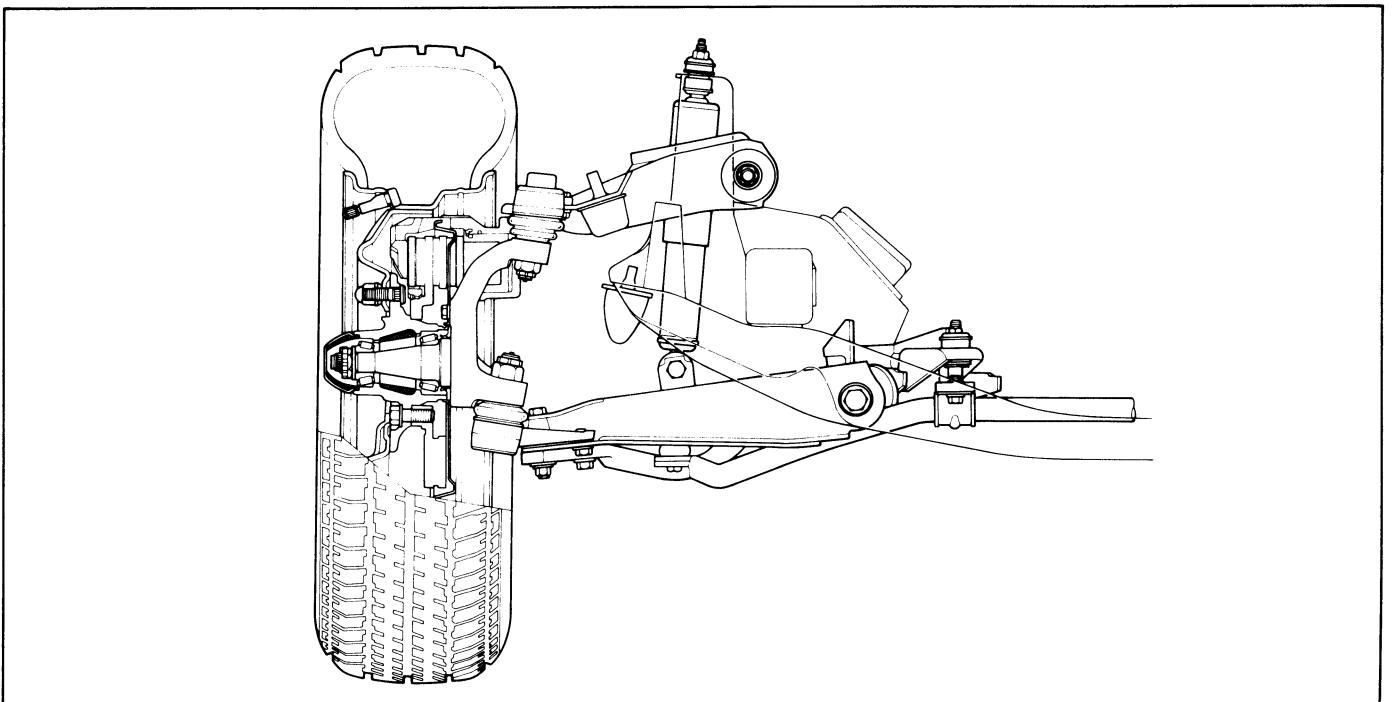
4 x 2 Model		kg (lb)
New bearing and New oil seal	0.8	— 1.0 (1.8—2.2)
Reuse bearing and New oil seal	0.8	— 1.0 (1.8—2.2)

GENERAL DESCRIPTION

FRONT DRIVE AXLE

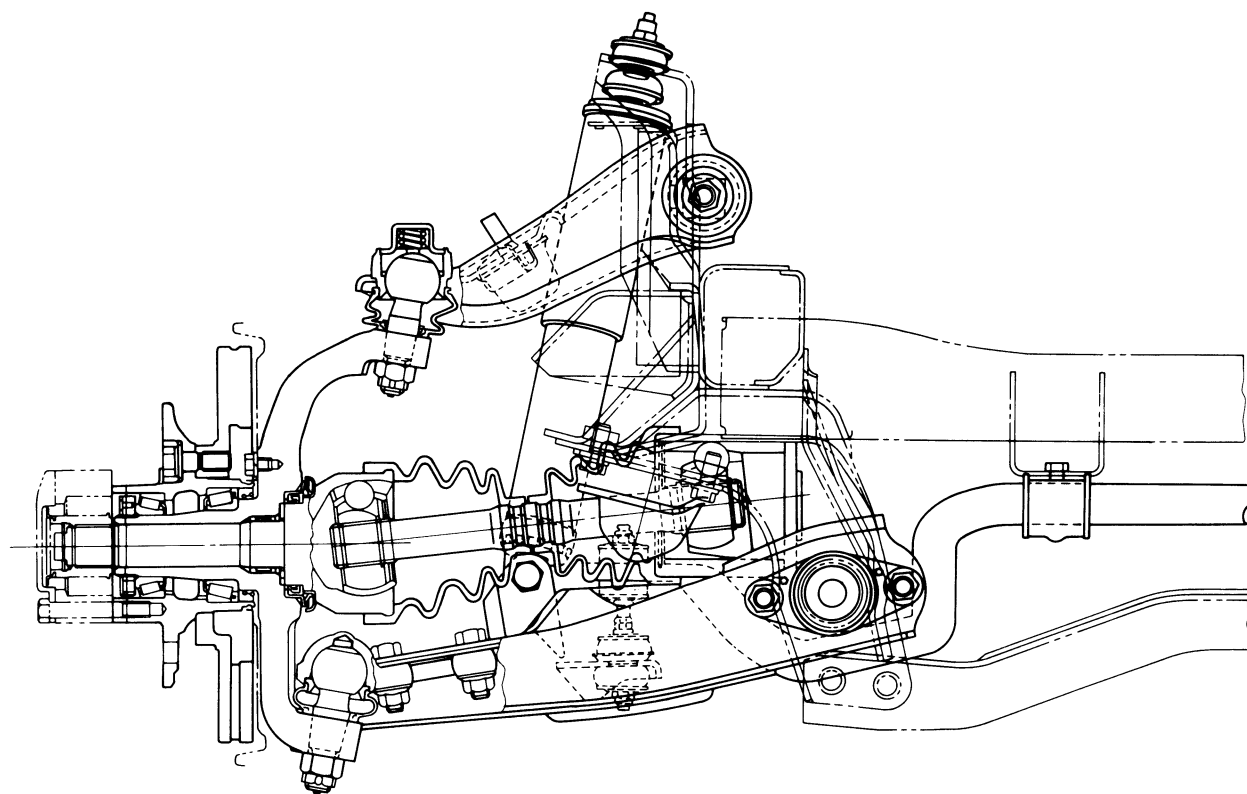


FRONT HUB AND DISC (4 x 2 model)



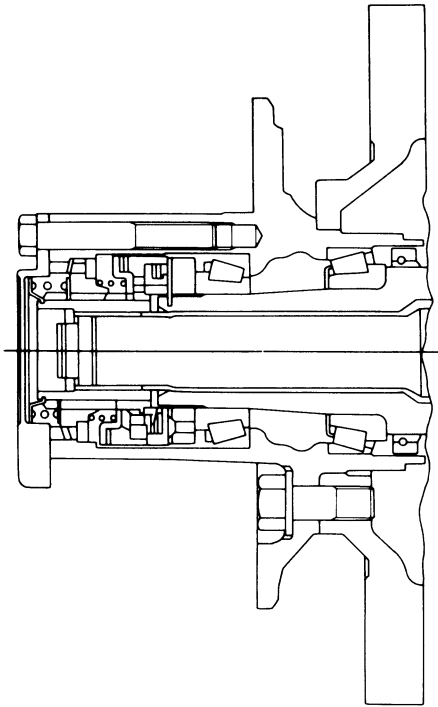
4C-10 FRONT WHEEL DRIVE

FRONT HUB AND DISC (4 x 4 model)

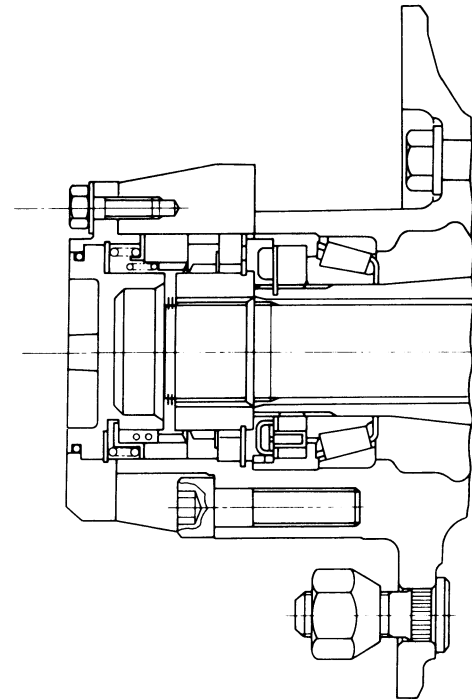


LOCKING HUB

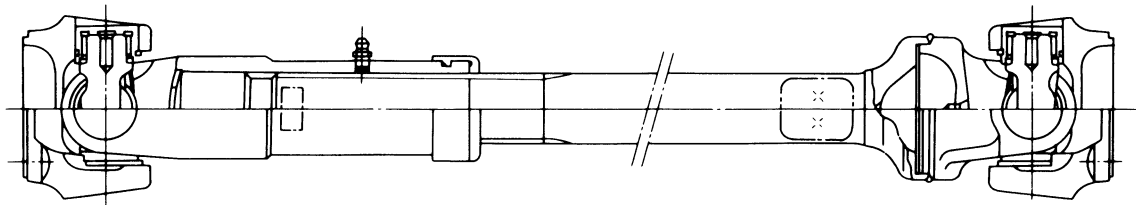
AUTOMATIC TYPE



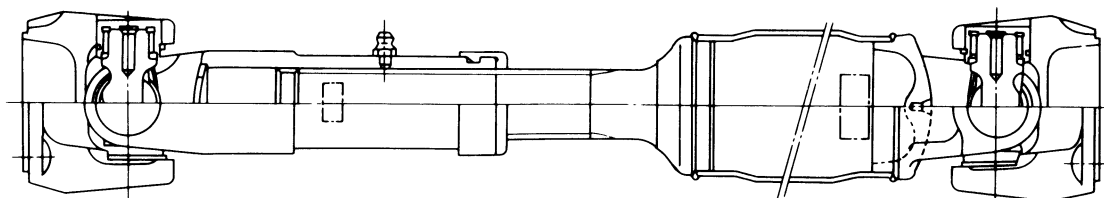
MANUAL TYPE



FRONT PROPELLER SHAFT



With 167mm Diff.



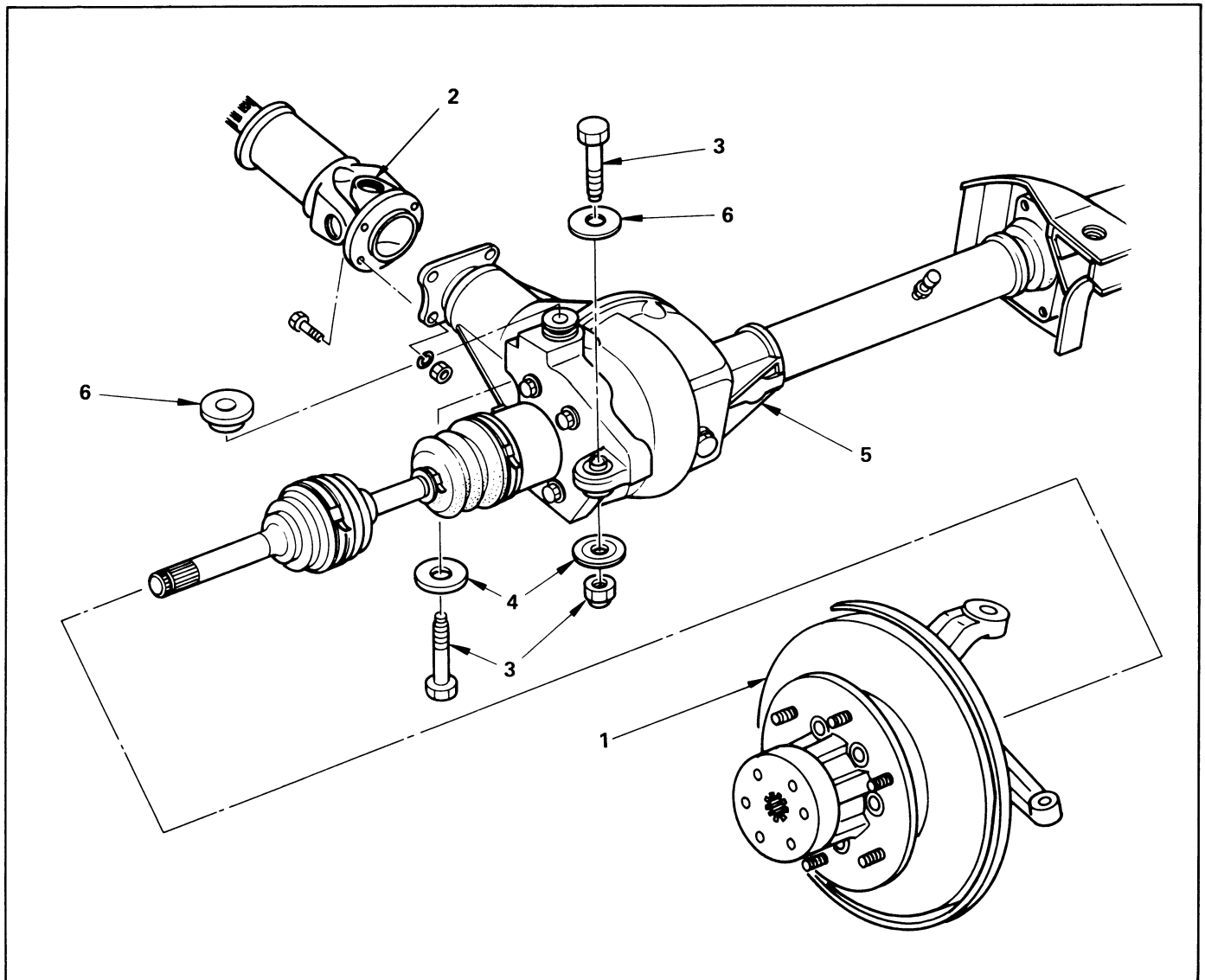
With 194mm Diff.

FRONT DRIVE AXLE ASSEMBLY



REMOVAL AND INSTALLATION

1. Refer to SECTION 3E "WHEEL AND TIRES" for road wheel Disassembly and Reassembly procedure.
2. Refer to SECTION 5 "BRAKES" for disc brake caliper removal and installation procedure.
3. Refer to SECTION 3B "STEERING" for Steering linkage removal and installation procedure.
4. Refer to SECTION 4C "FRONT WHEEL DRIVE" for Automatic hub disassembly and reassembly procedure.

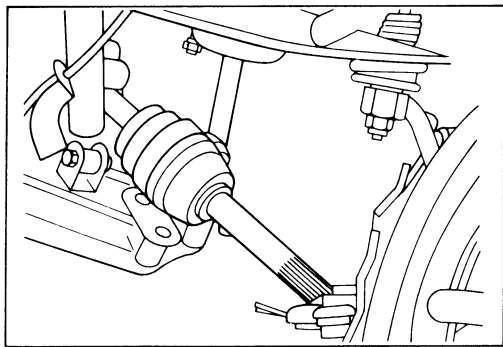


Removal Steps

- ▲ 1. Assembly of hub and disc, back plate, knuckle, knuckle arm, and lower end.
- ▲ 2. Propeller shaft
3. Nut and bolt
4. Washer
- ▲ 5. Front drive axle assembly
6. Washer

Installation Steps

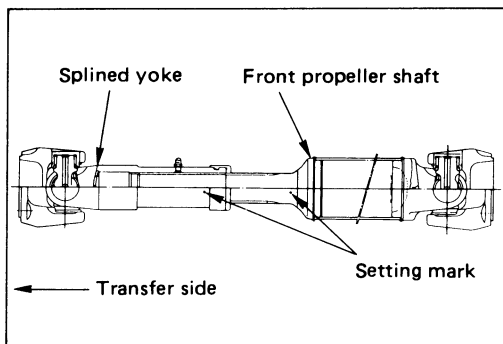
6. Washer
- ▲ 5. Front drive axle assembly
4. Washer
- ▲ 3. Nut and bolt
- ▲ 2. Propeller shaft
1. Assembly of hub and disc, back plate, knuckle, knuckle arm, and lower end.



Important Operations — Removal

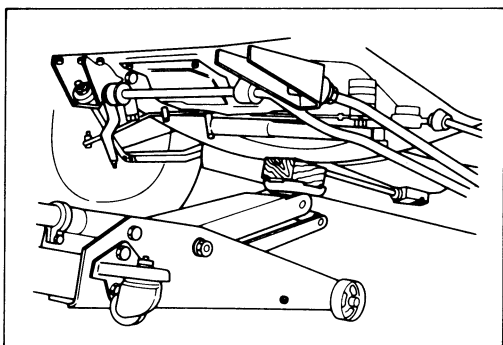
1. Assembly of hub and disc, back plate, knuckle, knuckle arm, and lower end.

Before removal, jack up the front of vehicle and support the frame with jack stands.



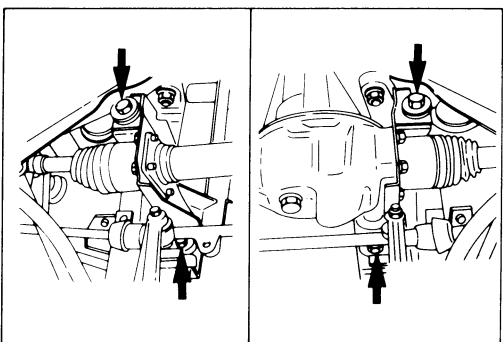
2. Propeller Shaft

Apply the setting marks.



5. Front Drive Axle Assembly

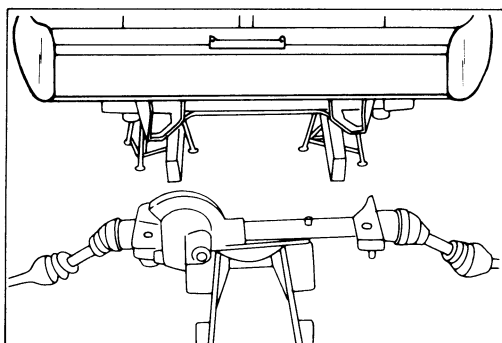
- (1) Put the lifting jack under the center part of the front.



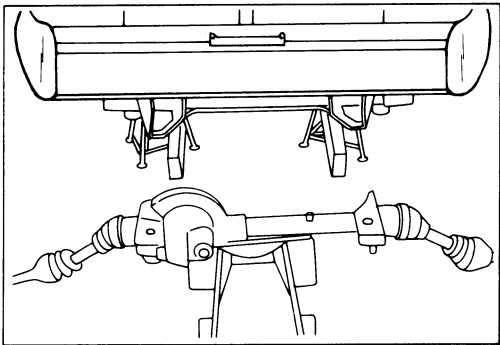
- (2) Remove four bolts fixing axle case mounting brackets to the frame.

Note :

Be careful not to damage birfield joints or double off-set joints when supporting axle shaft assembly.



- (3) Lower the front axle assembly and roll it out toward the front of the vehicle.
Take care not to damage the birfield joints or the double off-set joints.



Important Operations — Installation

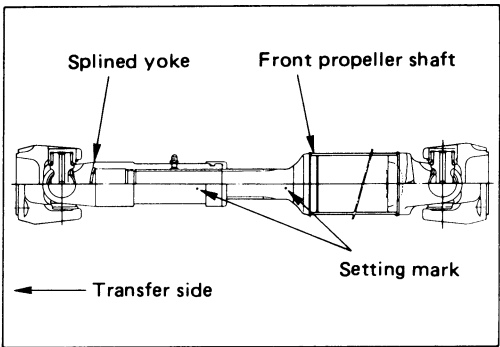
5. Front Drive Axle Assembly

Place the front axle assembly in position under the vehicle using a lifting jack.



3. Nut

Front Axle Mounting Nut Torque	kg·m(lb.ft./N·m)
15.5 ± 1.5 ($112.1 \pm 10.8/152.1 \pm 14.7$)	



2. Propeller Shaft

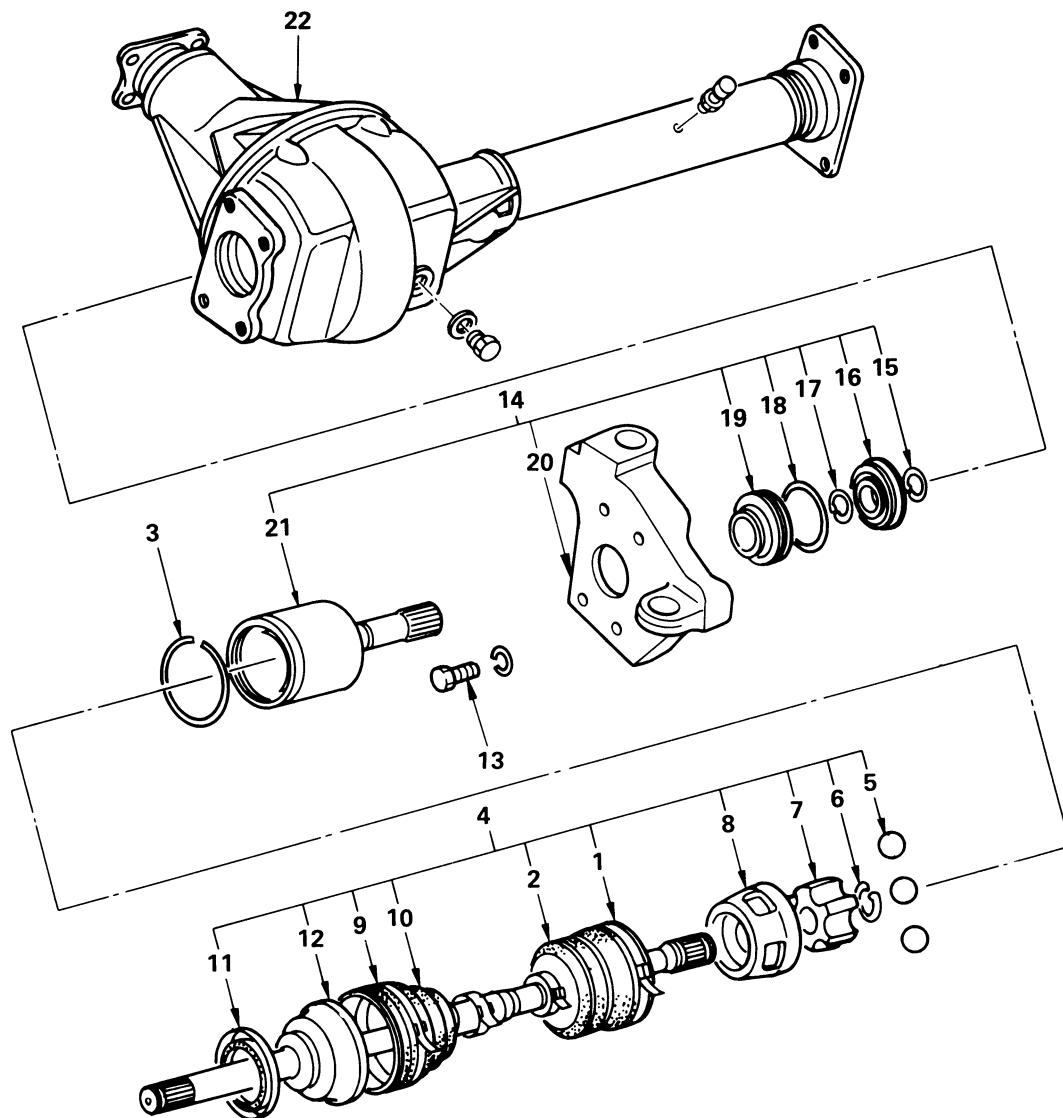
Align the setting marks applied the removal.



Bolt Torque		kg·m(lb.ft./N·m)
167 mm	3.6 ± 0.3 ($26.0 \pm 2.2/35.3 \pm 2.9$)	
194 mm	6.4 ± 0.4 ($46.3 \pm 2.9/62.8 \pm 3.9$)	

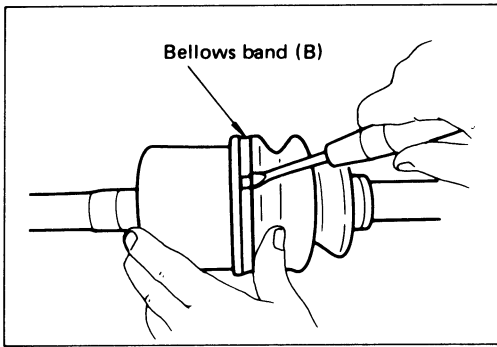


DISASSEMBLY



Disassembly Steps

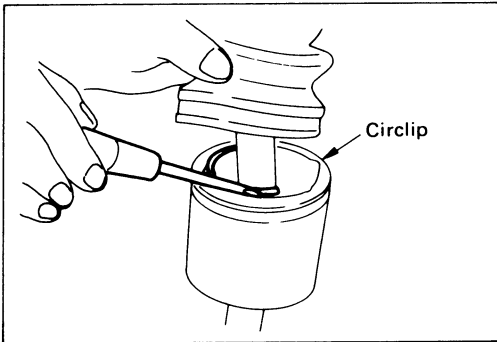
- | | |
|----------------------|--------------------------------|
| ▲ 1. Band | 12. BJ shaft |
| 2. Bellows | 13. Bolt |
| ▲ 3. Circlip | 14. DOJ case assembly |
| 4. BJ shaft assembly | 15. Snap ring |
| ▲ 5. Ball | 16. Bearing |
| ▲ 6. Snap ring | 17. Snap ring |
| 7. Ball retainer | 18. O-ring |
| 8. Ball guide | 19. Oil seal |
| ▲ 9. Band | 20. Bracket |
| 10. Bellows | 21. DOJ case |
| 11. Dust seal | 22. Axle case and differential |



Important Operations

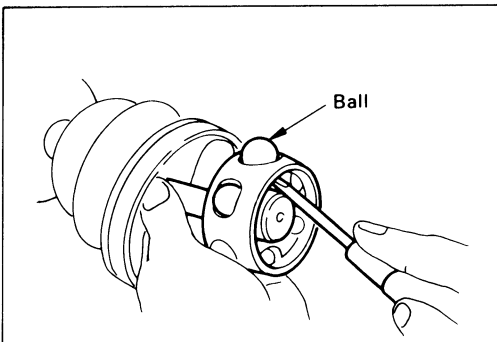
1. Band

Raise the hooked end of the band with a screwdriver or equivalent.



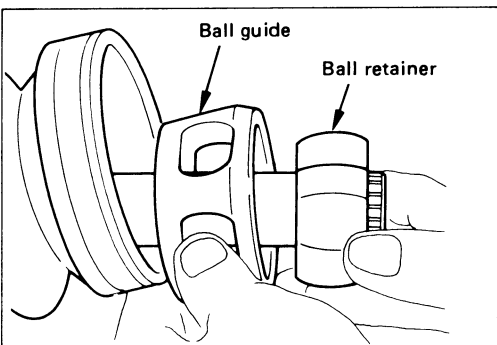
3. Circlip

Pry off with a screwdriver or equivalent.

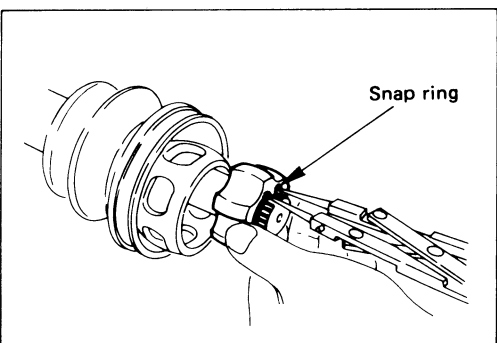


5. Ball

Remove the six balls with a screwdriver or equivalent.

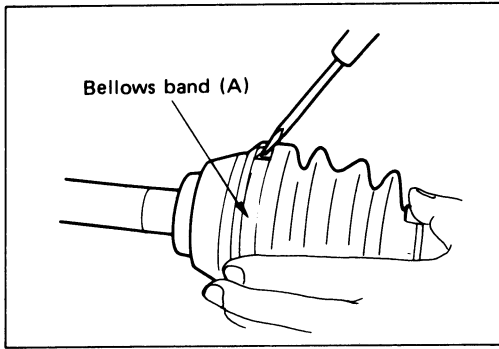


Rotate the case half a pitch to align the ball guide on the case with the projected portion of the ball retainer, then slide the case toward the bellows. The case can not be removed in the reverse direction.



6. Snap Ring

Remove the snap ring fastening the ball retainer to the center shaft.



9. Band

Raise the hooked end of the band with a screw driver or equivalent.



INSPECTION AND REPAIR

Make all necessary adjustments, repairs, and part replacements if wear, damage, or other problems are discovered during inspection.

- BJ assembly
- DOJ case, ball, ball guide ball retainer
- Bellows
- Bearing
- Dust seal, oil seal

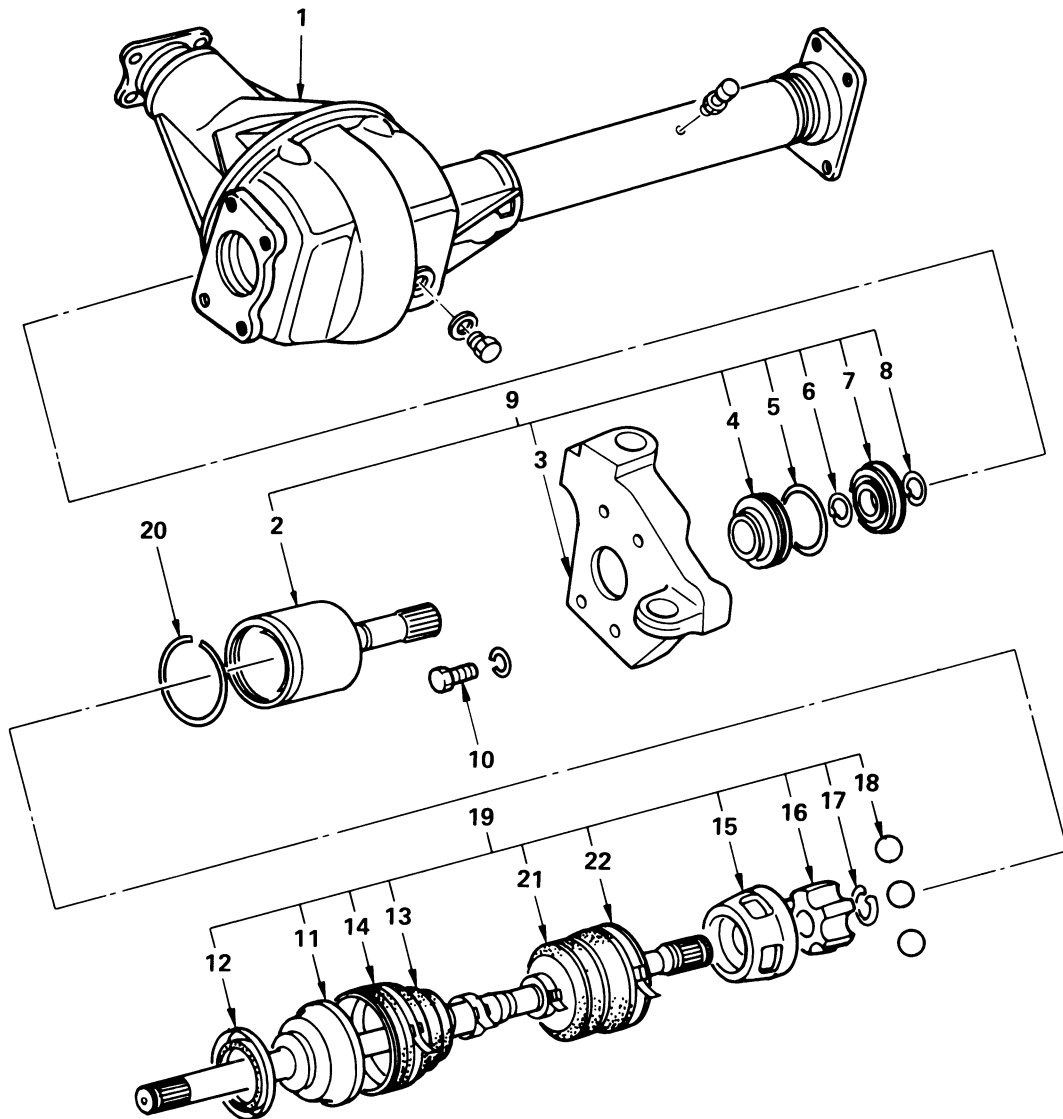


Visual Check

Inspect the following parts for wear, damage, or other abnormal conditions.

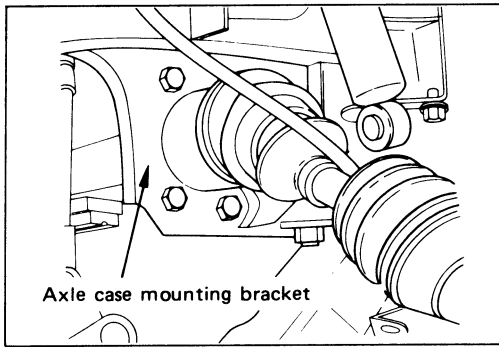


REASSEMBLY



Reassembly Steps

- | | |
|-------------------------------|-------------------------|
| 1. Axle case and differential | 12. Dust seal |
| 2. DOJ case | ▲ 13. Bellows |
| 3. Bracket | ▲ 14. Band |
| 4. Oil seal | ▲ 15. Ball guide |
| 5. O-ring | ▲ 16. Ball retainer |
| 6. Snap ring | ▲ 17. Snap ring |
| 7. Bearing | ▲ 18. Ball |
| 8. Snap ring | ▲ 19. BJ shaft assembly |
| 9. DOJ case assembly | ▲ 20. Circlip |
| ▲ 10. Bolt | ▲ 21. Bellows |
| 11. BJ shaft | ▲ 22. Band |



Important operations



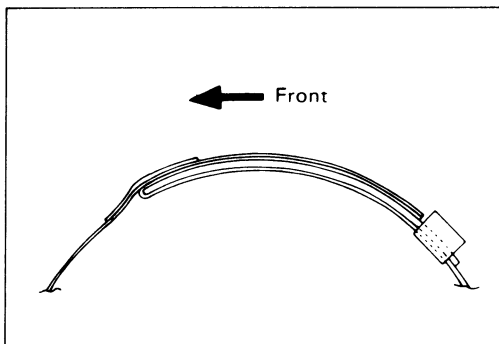
10. Bolt

Bolt Torque	kg·m(lb.ft./N·m)
	8.4 ± 0.8 ($60.8 \pm 5.8/82.4 \pm 7.8$)



13. Bellows

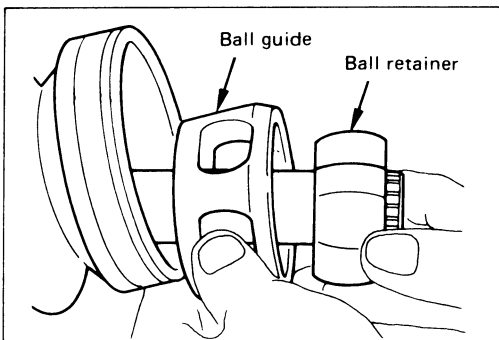
- (1) Apply a thin coat of grease to the shaft for smooth installation.
- (2) Apply specified grease to the 1/2 space of the bellows.



14. Band

Note the setting direction.

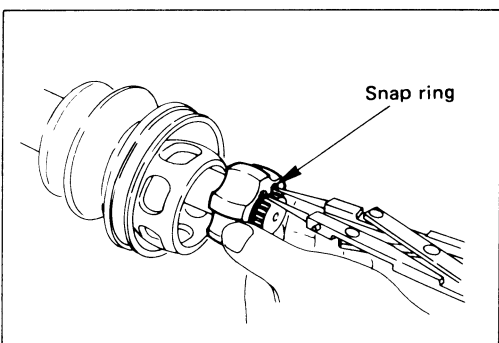
After installation, check that the bellows is free from distortion.



15. Ball Guide

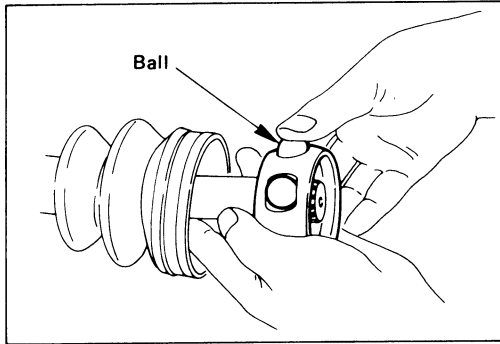
16. Ball Retainer

Install the ball guide with the smaller diameter side ahead onto the shaft.



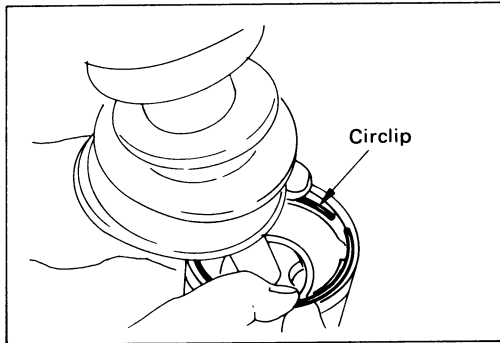
17. Snap Ring

Install the snap ring securing the ball retainer to the shaft.



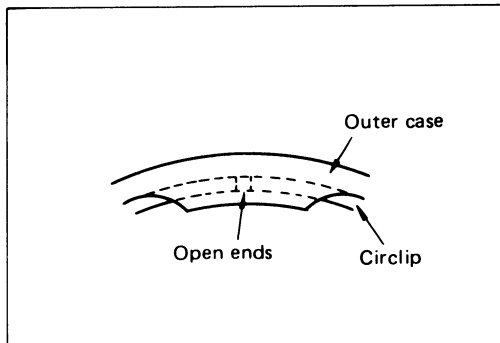
18. Ball

Bring the ball guide of the cage into alignment with the projected portion of the ring on the ball retainer, then turn the cage 1/2 pitch. Align the track on the ball retainer with the window in the cage and install the six balls into position.



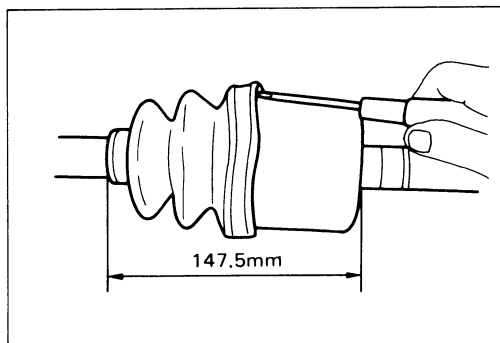
19. BJ Shaft Assembly

Apply specified grease to the half of the space of the DOJ case (Approx. 50g (1.8 oz))



20. Circlip

Install the circlip so that open ends are positioned away from the ball groove.



21. Bellows

- (1) Before installation, insert the appropriate amount of specified grease into the DOJ case.
- (2) Adjust the air pressure within the bellows by inserting a screwdriver or equivalent, so that it equals atmospheric pressure.



22. Band

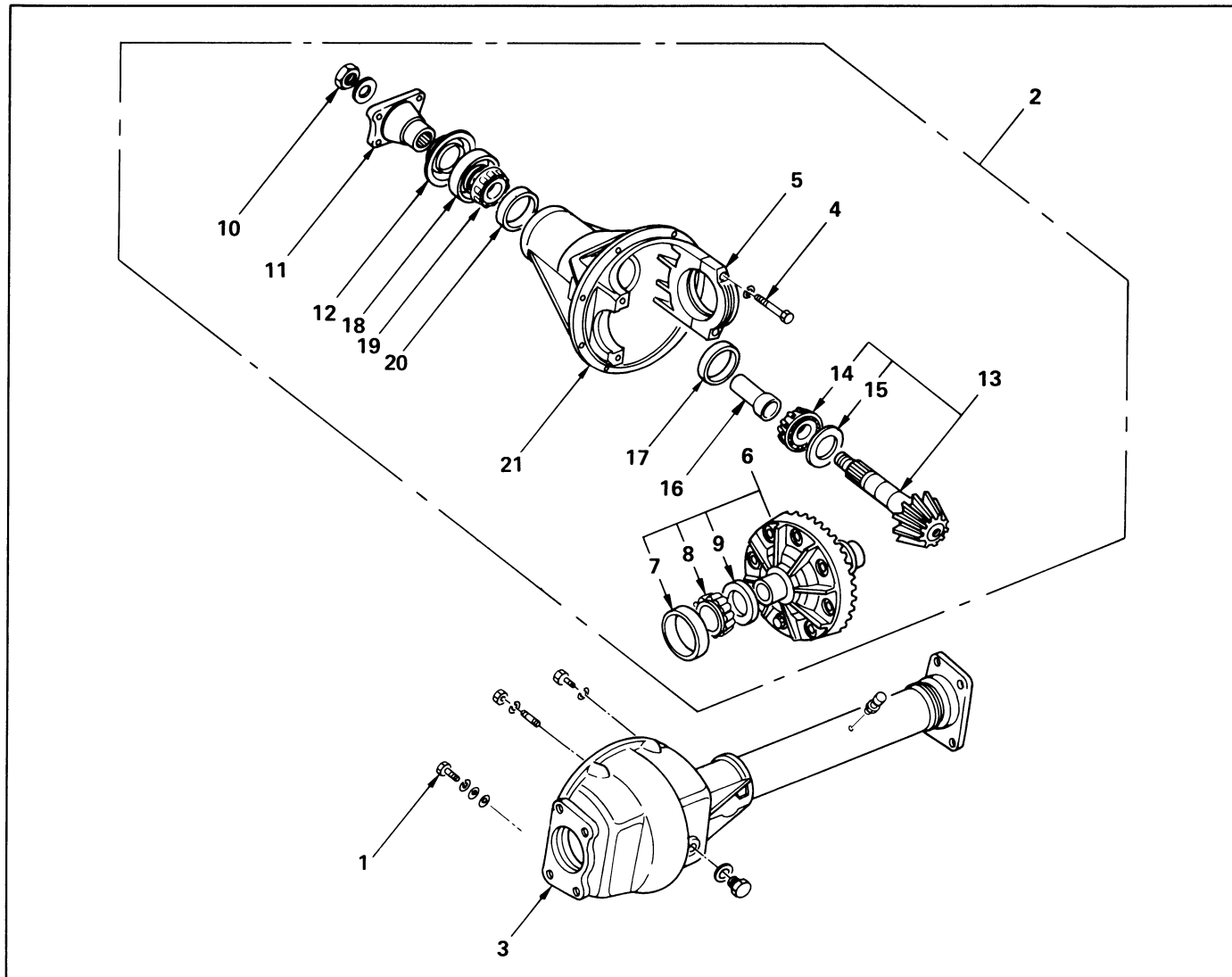
After installation, check that the bellows is free from distortion.

DIFFERENTIAL



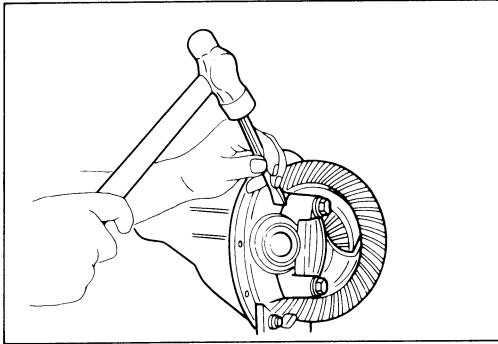
DISASSEMBLY

MAJOR COMPONENT



Disassembly Steps

- | | |
|------------------------------|--------------------------------|
| 1. Bolt | 12. Dust cover |
| 2. Differential assembly | ▲ 13. Pinion gear |
| 3. Axle case | ▲ 14. Inner bearing |
| 4. Bolt | 15. Adjust shim |
| ▲ 5. Bearing cap | 16. Collapsible spacer |
| 6. Diff. cage assembly | ▲ 17. Inner bearing outer race |
| ▲ 7. Side bearing outer race | 18. Oil seal |
| ▲ 8. Side bearing | 19. Outer bearing |
| ▲ 9. Adjust shims | ▲ 20. Outer bearing outer race |
| ▲ 10. Flange nut | 21. Diff. carrier |
| 11. Flange | |

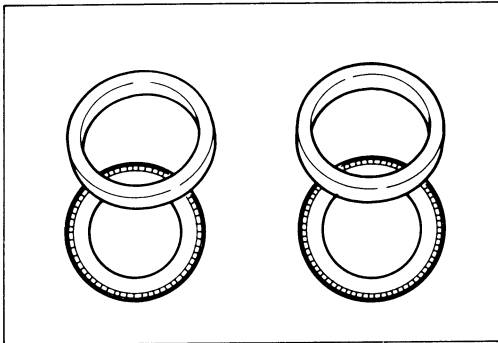


Important Operations



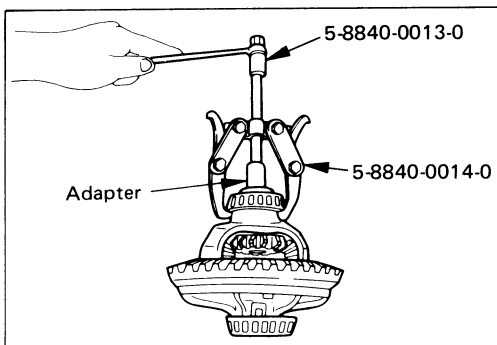
5. Bearing Cap

Apply a setting mark to the side bearing cap and the differential carrier.



7. Side Bearing Outer Race

After removal, keep the right and left hand side bearing assemblies separate to maintain inner and outer race combinations.

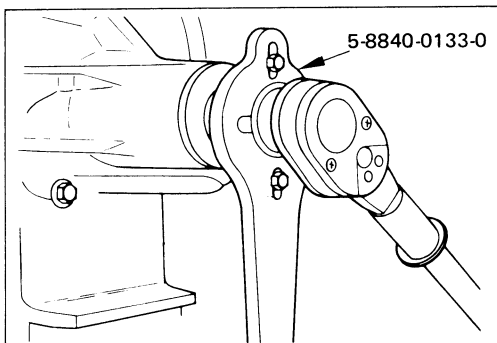


8. Side Bearing

Remover : 5-8840-0013-0
(J-22888)

5-8840-0014-0
(J-22888-30)

Adapter : 5-8521-0019-0 (167 mm)
9-8521-1743-0 (194 mm)
(J-8107-2)



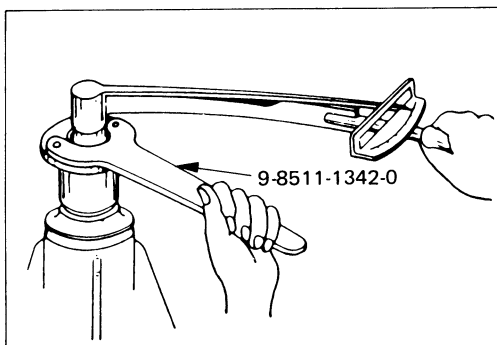
9. Adjust Shims

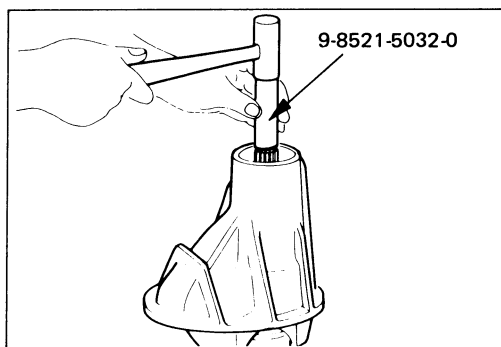
Note the thickness and position of the shims removed.

10. Flange Nut

Holding wrench : 5-8840-0133-0 (167 mm and 194 mm)
(J-8614-01)

or 9-8511-1342-0 (Only for 167 mm)

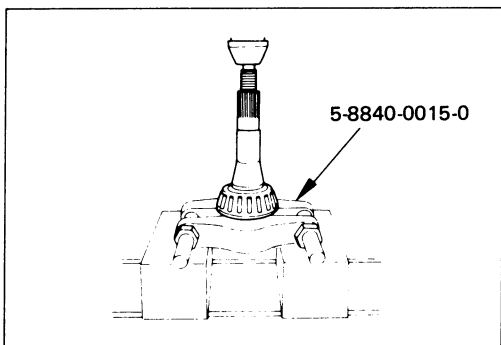




13. Pinion Gear

Remove the drive pinion assembly using a soft metal rod and a hammer.

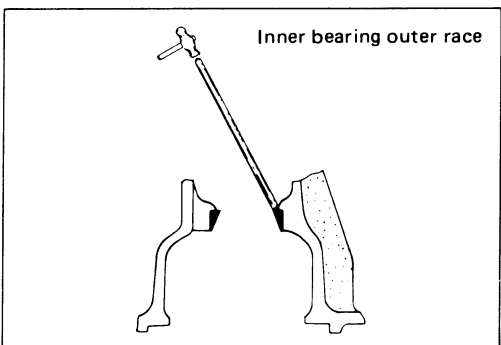
Spindle : 9-8521-5032-0



14. Inner Bearing

Remove the inner bearing using a separator and a press.

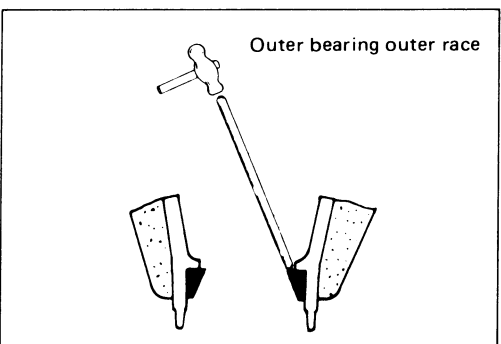
Separator : 5-8840-0015-0
(J-22912-01)



17. Inner Bearing Outer Race

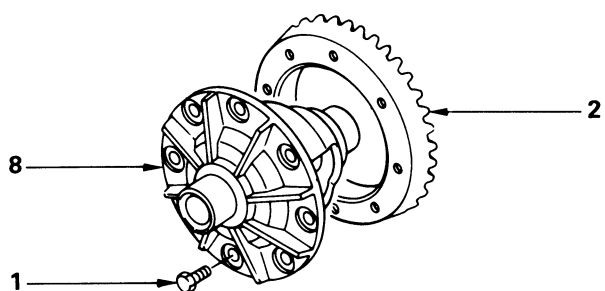
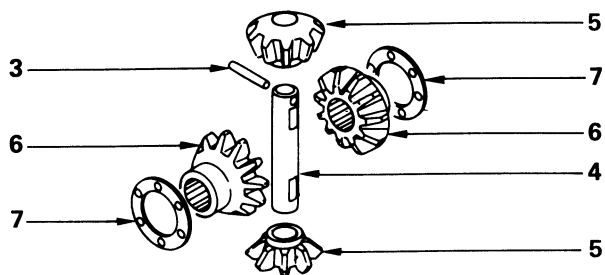
20. Outer Bearing Outer Race

Remove the inner bearing outer race and the outer bearing outer race by using a brass bar and a hammer.



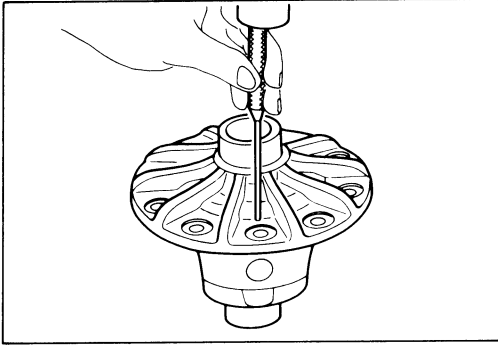


MINOR COMPONENTS



Disassembly Steps

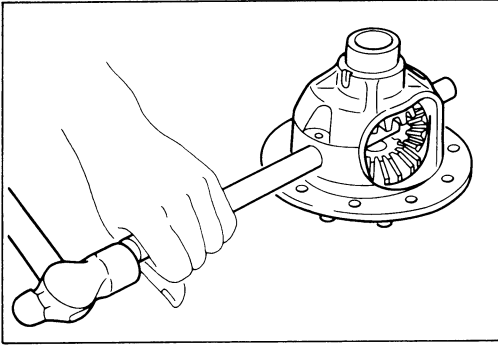
- | | |
|----------------|----------------------|
| 1. Bolt | 5. Pinion gear |
| 2. Ring gear | 6. Side gear |
| ▲ 3. Lock pin | 7. Thrust washer |
| ▲ 4. Cross pin | 8. Differential cage |



Important Operations

3. Lock Pin

Break staking on the lock pin using a 5 mm (0.20 in.) diameter drill.



4. Cross Pin

Remove the cross pin using a soft metal rod and a hammer.



INSPECTION AND REPAIR

Make all necessary adjustment, repairs, and part replacements if wear, damage, or other problems are discovered during inspection.

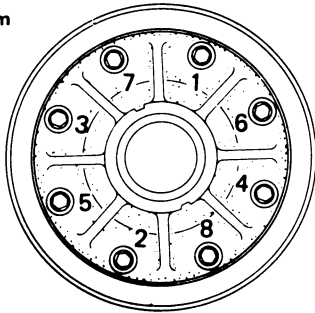
- Ring gear, pinion gear
- Bearing
- Side gear, pinion gear, cross pin
- Differential cage, carrier
- Thrust washer
- Oil seal



Visual Check

Inspect the following parts for wear, damage, or other abnormal conditions.

167mm

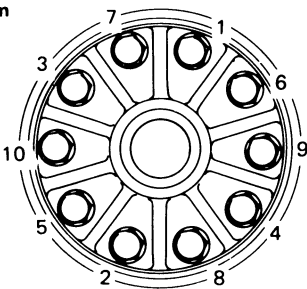


Ring Gear Replacement

- (1) The ring gear should always be replaced with the drive pinion as a set.
- (2) When installing the ring gear, apply LOCTITE 271 or equivalent to the threaded hole and bolt.
- (3) Tighten the fixing bolts in a diagonal sequence as illustrated.
- (4) Discard used bolts and install new ones.

Bolt Torque	kg·m(lb.ft/N·m)
167 mm	8 ± 1 ($57.9 \pm 7.2 / 78.5 \pm 9.8$)
194 mm	11 ± 1 ($79.6 \pm 7.2 / 107.9 \pm 9.8$)

194mm



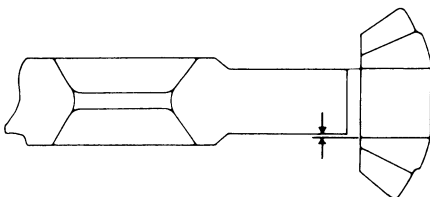
For 167 mm

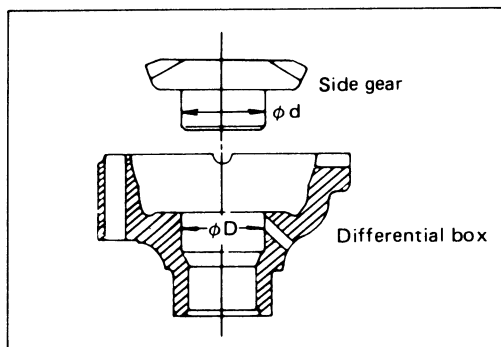
Note that all bolts have a left hand thread.



Clearance Between the Differential Pinion and the Cross Pin

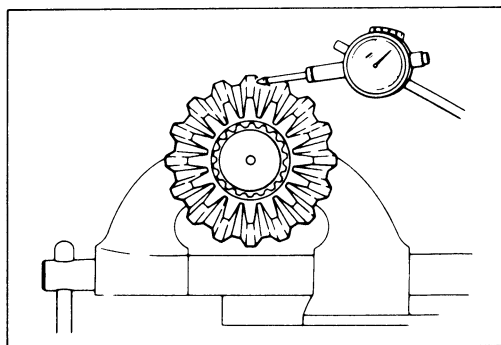
	Standard	Limit
167mm	0.06—0.12 (0.002—0.005)	0.2 (0.008)
194mm	0.05—0.10 (0.002—0.004)	0.2 (0.008)





Clearance Between the Side Gear and the Differential Box

		mm(in)
	Standard	Limit
167mm	0.03—0.11 (0.001—0.004)	0.15 (0.006)
194mm	0.03—0.10 (0.001—0.004)	0.15 (0.006)



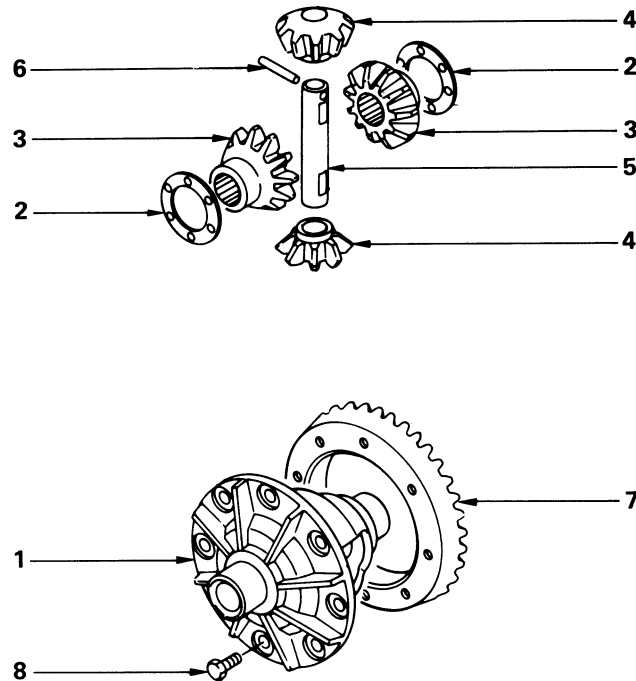
Play in Splines Between the Side Gear and the Axle Shaft

		mm(in)
	Standard	Limit
167mm	0.11—0.38 (0.004—0.015)	0.30 (0.012)
194mm	0.07—0.36 (0.003—0.014)	0.25 (0.010)



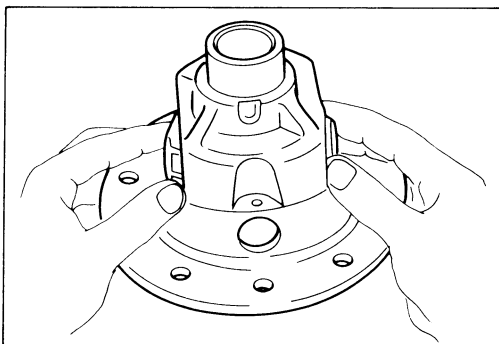
REASSEMBLY

MINOR COMPONENTS



Reassembly Steps

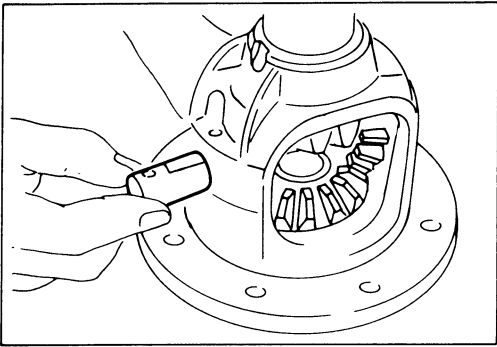
- | | |
|----------------------|----------------|
| 1. Differential cage | ▲ 5. Cross pin |
| 2. Thrust washer | ▲ 6. Lock pin |
| 3. Side gear | ▲ 7. Ring gear |
| ▲ 4. Pinion gear | ▲ 8. Bolt |



Important Operations

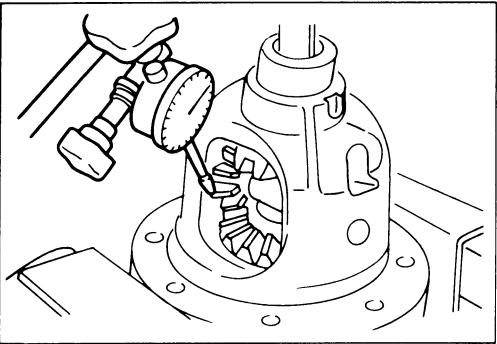
4. Pinion Gear

Install the pinion gear by engaging it with the side gears while turning both pinion gears simultaneously in the same direction.



5. Cross Pin

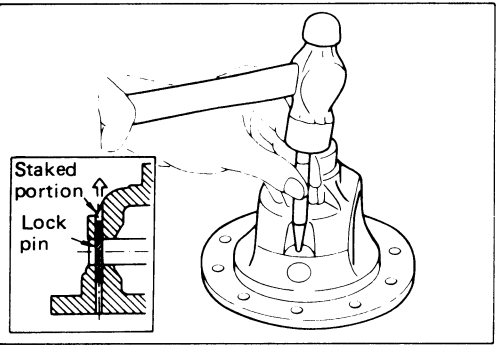
- (1) Be sure to install the cross pin so that it is in alignment with the lock pin hole in the differential cage.



- (2) Adjust the backlash between the side gear and the pinion gear.

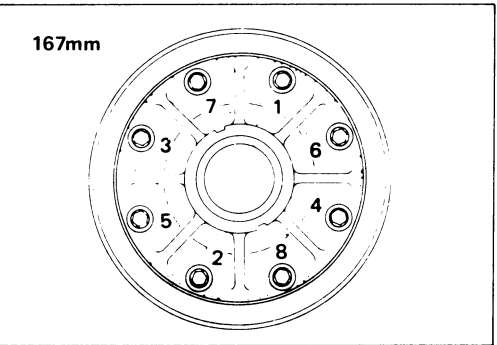
mm(in)	
Backlash	0.03 — 0.08 (0.001 — 0.003)

Thickness of thrust washers available	
mm(in)	
167 mm	1.05, 1.15, 1.25 (0.041, 0.043, 0.049)
194 mm	1.00, 1.05, 1.10 (0.039, 0.041, 0.043)



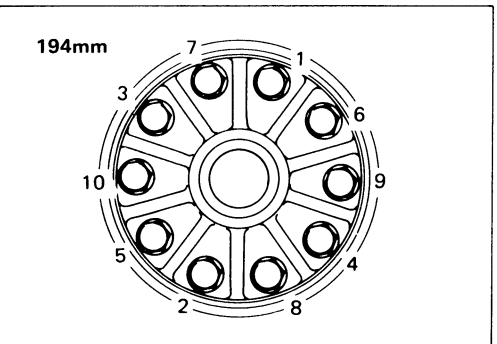
6. Lock Pin

After lock pin installation, stake the cage to prevent discharge of the lock pin.



7. Ring Gear

When installing the ring gear, apply LOCTITE 271 or equivalent to the threaded hole and bolt.



8. Bolt

Tighten the bolts in diagonal sequence as illustrated.

Bolt Torque	
kg·m(lb.ft/N·m)	
167 mm	8 ± 1 (57.9 ± 7.2/ 78.5 ± 9.8)
194 mm	11 ± 1 (79.6 ± 7.2/107.9 ± 9.8)



Note:

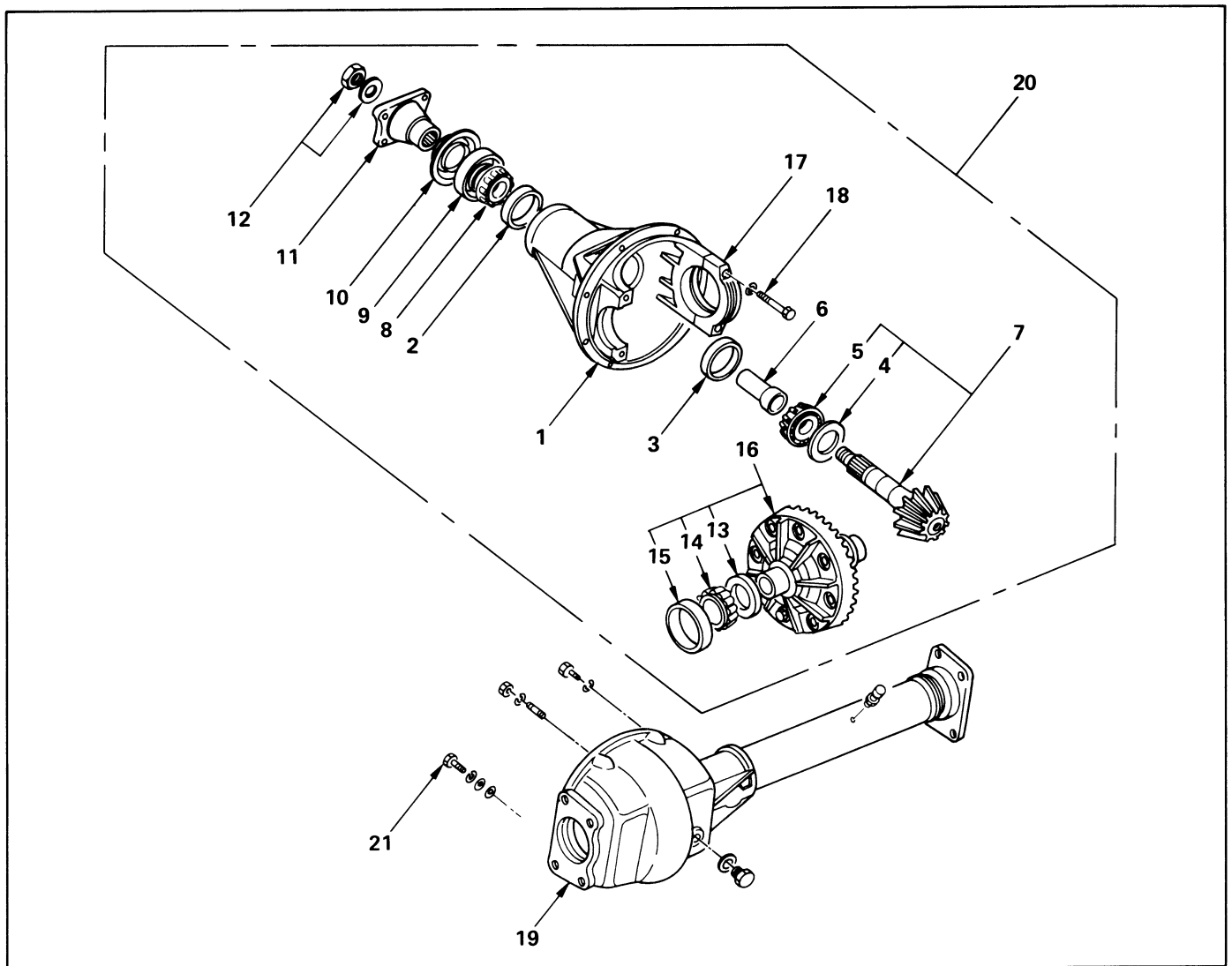
Discard used bolts and install new ones.

For 167 mm

Note that all bolts have a left hand thread.

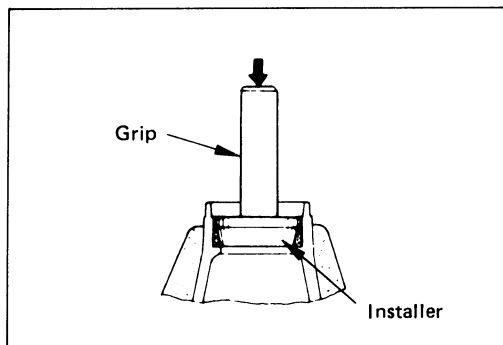


MAJOR COMPONENT



Reassembly Steps

- | | |
|-------------------------------|-----------------------------|
| 1. Diff. carrier | 11. Flange |
| ▲ 2. Outer bearing outer race | ▲ 12. Flange nut and washer |
| ▲ 3. Inner bearing outer race | ▲ 13. Adjust shim |
| ▲ 4. Adjust shim | ▲ 14. Side bearing |
| ▲ 5. Inner bearing | 15. Bearing outer race |
| ▲ 6. Collapsible spacer | 16. Diff. cage assembly |
| 7. Pinion gear | ▲ 17. Bearing cap |
| 8. Outer bearing | ▲ 18. Bolt |
| ▲ 9. Oil seal | 19. Axle case |
| 10. Dust cover | ▲ 20. Differential assembly |
| | 21. Bolt |



Important Operations

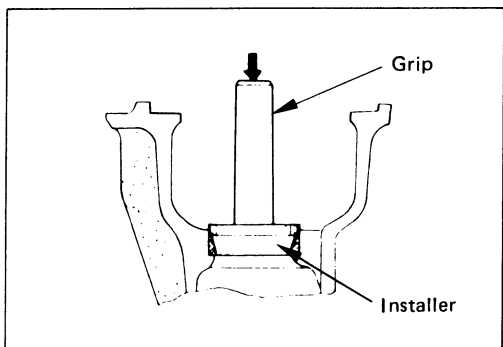


2. Outer Bearing Outer Race

Installer : 5-8522-0048-0 (167 mm)
(J-29038)

9-8522-1141-0 (194 mm)
(J-24256)

Grip : 5-8840-0007-0
(J-8092)

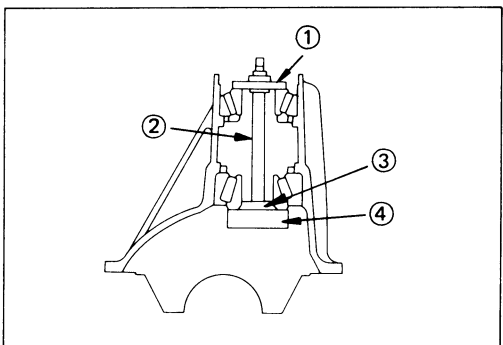


3. Inner Bearing Outer Race

Installer : 5-8522-0049-0 (167 mm)
(J-29039)

9-8522-1274-0 (194 mm)
(J-24252)

Grip : 5-8840-0007-0
(J-8092)



4. Adjust Shim

Adjustment of drive pinion mounting distance



(1) Apply gear oil to the inner and outer drive pinion bearing.

Clean the pinion setting gage set.



Then install the gage set together with the inner and outer bearings.



For 167 mm

① Pilot : 5-8840-2092-0
(J-23597-28)

② Nut and bolt : 5-8840-0127-0
(J-21777-43)

③ Rear pilot : 5-8840-2091-0
(J-23597-27)

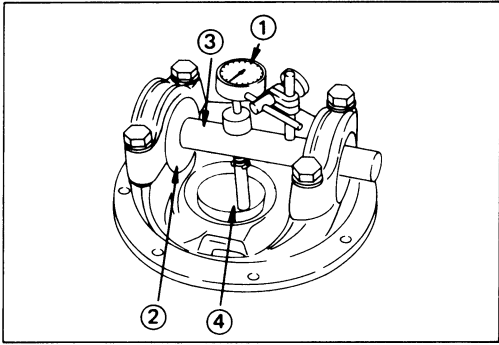
④ Gage plate : 5-8840-2090-0
(J-23597-26)

For 194 mm

① Pilot : 5-8840-2085-0
(J-21777-42)

② Nut and bolt : 5-8840-2089-0
(J-23597-9)

④ Gage plate : 5-8840-2087-0
(J-23597-7)



Tighten the nut to the specified torque.

	kg·cm(lb.in/N·m)
New bearing	23 (20/2.26)
Used bearing	10 — 12 (8.7 — 10.4/0.98 — 1.18)



(2) Clean the side bearing bores. Install the dial indicator with the discs and Arbor. Install and tighten the bearing caps to the specified torque.



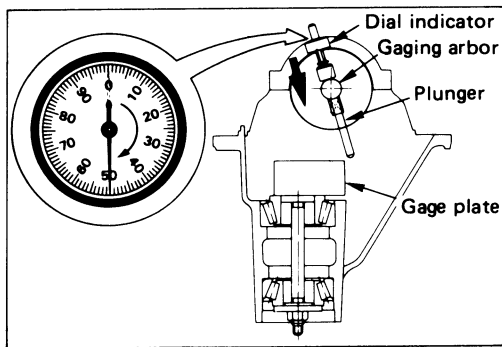
Torque	kg·m(lb.ft/N·m)
167 mm	7.0 ± 1.0 (50.6 ± 7.2/68.7 ± 9.8)
194 mm	10.0 ± 1.0 (72.3 ± 7.2/98.1 ± 9.8)

For 167 mm

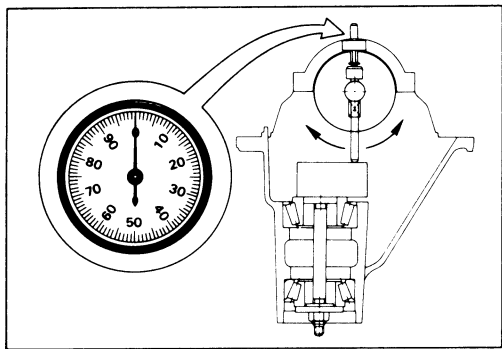
- ① Dial indicator : 5-8840-0126-0 (J-8001)
- ② Disc (2 pcs.) : 5-8840-2086-0 (J-23597-4)
- ③ Arbor : 5-8840-0128-0 (J-23597-1)
- ④ Gage plate : 5-8840-2090-0 (J-23597-26)

For 194 mm

- ① Dial indicator : 5-8840-0126-0 (J-8001)
- ② Disc (2 pcs.) : 5-8840-2088-0 (J-23597-8)
- ③ Arbor : 5-8840-0128-0 (J-23597-1)
- ④ Gage plate : 5-8840-2087-0 (J-23597-7)

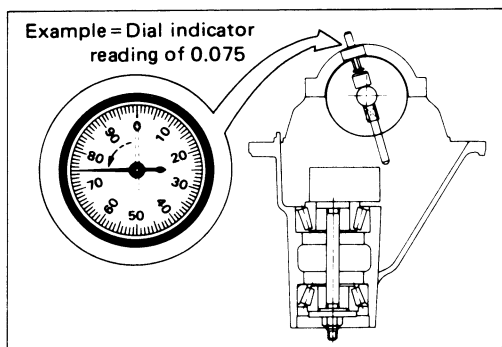


- (3) Set the dial indicator to "0". Place it on the mounting post of the gaging arbor with the contact button touching the indicator pad. Force the dial indicator downward until the needle has made a half turn clockwise. Tighten down the dial indicator in this position.

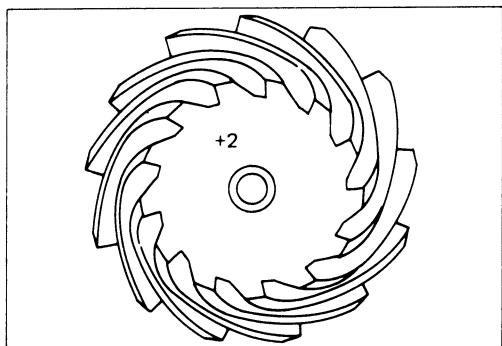


- (4) Position the plunger on the gage plate. Move the gaging arbor slowly back and forth and locate the position at which the dial indicator shows the greatest deflection. At this point, once again set the dial indicator to "0".

Repeat the procedure to verify the "0" setting.



- (5) After the ZERO setting is obtained, rotate the gaging arbor until the dial indicator rod does not touch the gaging plate. Record the number the dial indicator needle points to.



- (6) Record the pinion depth code on the head of the drive pinion.

The number indicates a necessary change in the pinion mounting distance. A plus number indicates the need for a greater mounting distance (which can be achieved by decreasing the shim thickness). A minus number indicates the need for a smaller mounting distance (which can be achieved by increasing the shim thickness). If examination reveals pinion depth code "0", the pinion is "nominal".

(6) Select the shim using the chart;

For 167 mm

mm(in)

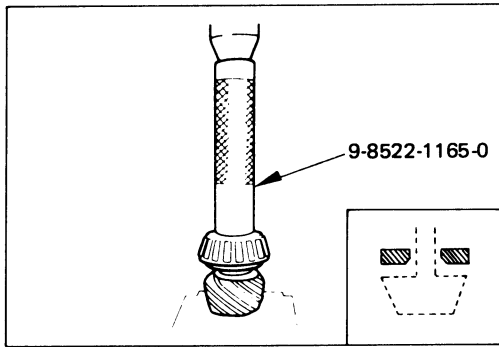
Pinion marking Dial indicator reading (Inches)	+6	+4	+2	0	-2	-4	-6
0.052							1.39(0.0547)
0.053						1.39(0.0547)	1.41(0.0555)
0.054					1.39(0.0547)	1.41(0.0555)	1.43(0.0563)
0.055				1.39(0.0547)	1.41(0.0555)	1.43(0.0563)	1.45(0.0571)
0.056		1.39(0.0547)	1.41(0.0555)	1.43(0.0563)	1.45(0.0571)	1.47(0.0579)	1.49(0.0587)
0.057	1.39(0.0547)	1.41(0.0555)	1.43(0.0563)	1.45(0.0571)	1.47(0.0579)	1.49(0.0587)	1.51(0.0594)
0.058	1.41(0.0555)	1.43(0.0563)	1.45(0.0571)	1.47(0.0579)	1.49(0.0587)	1.51(0.0594)	1.53(0.0602)
0.059	1.43(0.0563)	1.45(0.0571)	1.47(0.0579)	1.49(0.0587)	1.51(0.0594)	1.53(0.0602)	1.55(0.0610)
0.060	1.47(0.0579)	1.49(0.0587)	1.51(0.0594)	1.53(0.0602)	1.55(0.0610)	1.57(0.0618)	1.59(0.0626)
0.061	1.49(0.0587)	1.51(0.0594)	1.53(0.0602)	1.55(0.0610)	1.57(0.0618)	1.59(0.0626)	1.61(0.0634)
0.062	1.51(0.0594)	1.53(0.0602)	1.55(0.0610)	1.57(0.0618)	1.59(0.0626)	1.61(0.0634)	1.63(0.0642)
0.063	1.55(0.0610)	1.57(0.0618)	1.59(0.0626)	1.61(0.0634)	1.63(0.0642)	1.65(0.0650)	1.67(0.0657)
0.064	1.57(0.0618)	1.59(0.0626)	1.61(0.0634)	1.63(0.0642)	1.65(0.0650)	1.67(0.0657)	1.69(0.0665)
0.065	1.59(0.0626)	1.61(0.0634)	1.63(0.0642)	1.65(0.0650)	1.67(0.0657)	1.69(0.0665)	1.71(0.0673)
0.066	1.61(0.0634)	1.63(0.0642)	1.65(0.0650)	1.67(0.0657)	1.69(0.0665)	1.71(0.0673)	1.73(0.0681)
0.067	1.65(0.0650)	1.67(0.0657)	1.69(0.0665)	1.71(0.0673)	1.73(0.0681)	1.75(0.0689)	1.77(0.0697)
0.068	1.67(0.0657)	1.69(0.0665)	1.71(0.0673)	1.73(0.0681)	1.75(0.0689)	1.77(0.0697)	
0.069	1.69(0.0665)	1.71(0.0673)	1.73(0.0681)	1.75(0.0689)	1.77(0.0697)		
0.070	1.71(0.0673)	1.73(0.0681)	1.75(0.0689)				
0.071	1.75(0.0689)	1.77(0.0697)					
0.072	1.77(0.0697)						

For 194 mm

mm(in)

Pinion marking Dial indicator reading (Inches)	+10	+8	+6	+4	+2	0	-2	-4	-6	-8	-10
0.081											2.18(0.0858)
0.082										2.18(0.0858)	2.20(0.0866)
0.083									2.18(0.0858)	2.20(0.0866)	2.24(0.0882)
0.084								2.18(0.0858)	2.20(0.0866)	2.24(0.0882)	2.26(0.0890)
0.085							2.18(0.0858)	2.20(0.0866)	2.24(0.0882)	2.26(0.0890)	2.28(0.0898)
0.086						2.18(0.0858)	2.20(0.0866)	2.24(0.0882)	2.26(0.0890)	2.28(0.0898)	2.32(0.0914)
0.087					2.18(0.0858)	2.20(0.0866)	2.24(0.0882)	2.26(0.0890)	2.28(0.0898)	2.32(0.0914)	2.34(0.0921)
0.088				2.18(0.0858)	2.20(0.0866)	2.24(0.0882)	2.26(0.0890)	2.28(0.0898)	2.32(0.0914)	2.34(0.0921)	2.36(0.0929)
0.089			2.18(0.0858)	2.20(0.0866)	2.24(0.0882)	2.26(0.0890)	2.28(0.0898)	2.32(0.0914)	2.34(0.0921)	2.36(0.0929)	2.38(0.0937)
0.090		2.18(0.0858)	2.20(0.0866)	2.24(0.0882)	2.26(0.0890)	2.28(0.0898)	2.32(0.0914)	2.34(0.0921)	2.36(0.0929)	2.38(0.0937)	2.42(0.0953)
0.091	2.18(0.0858)	2.20(0.0866)	2.24(0.0882)	2.26(0.0890)	2.28(0.0898)	2.32(0.0914)	2.34(0.0921)	2.36(0.0929)	2.38(0.0937)	2.42(0.0953)	2.44(0.0961)
0.092	2.20(0.0866)	2.24(0.0882)	2.26(0.0890)	2.28(0.0898)	2.32(0.0914)	2.34(0.0921)	2.36(0.0929)	2.38(0.0937)	2.42(0.0953)	2.44(0.0961)	2.46(0.0969)
0.093	2.24(0.0882)	2.26(0.0890)	2.28(0.0898)	2.32(0.0914)	2.34(0.0921)	2.36(0.0929)	2.38(0.0937)	2.42(0.0953)	2.44(0.0961)	2.46(0.0969)	2.48(0.0977)
0.094	2.26(0.0890)	2.28(0.0898)	2.32(0.0914)	2.34(0.0921)	2.36(0.0929)	2.38(0.0937)	2.42(0.0953)	2.44(0.0961)	2.46(0.0969)	2.48(0.0977)	2.52(0.0992)
0.095	2.28(0.0898)	2.32(0.0914)	2.34(0.0921)	2.36(0.0929)	2.38(0.0937)	2.42(0.0953)	2.44(0.0961)	2.46(0.0969)	2.48(0.0977)	2.52(0.0992)	2.54(0.1000)
0.096	2.32(0.0914)	2.34(0.0921)	2.36(0.0929)	2.38(0.0937)	2.42(0.0953)	2.44(0.0961)	2.46(0.0969)	2.48(0.0977)	2.52(0.0992)	2.54(0.1000)	2.56(0.1008)
0.097	2.34(0.0921)	2.36(0.0929)	2.38(0.0937)	2.42(0.0953)	2.44(0.0961)	2.46(0.0969)	2.48(0.0977)	2.52(0.0992)	2.54(0.1000)	2.56(0.1008)	
0.098	2.36(0.0929)	2.38(0.0937)	2.42(0.0953)	2.44(0.0961)	2.46(0.0969)	2.48(0.0977)	2.52(0.0992)	2.54(0.1000)	2.56(0.1008)		
0.099	2.38(0.0937)	2.42(0.0953)	2.44(0.0961)	2.46(0.0969)	2.48(0.0977)	2.52(0.0992)	2.54(0.1000)	2.56(0.1008)			
0	2.42(0.0953)	2.44(0.0961)	2.46(0.0969)	2.48(0.0977)	2.52(0.0992)	2.54(0.1000)	2.56(0.1008)				
0.001	2.44(0.0961)	2.46(0.0969)	2.48(0.0977)	2.52(0.0992)	2.54(0.1000)	2.56(0.1008)					
0.002	2.46(0.0969)	2.48(0.0977)	2.52(0.0992)	2.54(0.1000)	2.56(0.1008)						
0.003	2.48(0.0977)	2.52(0.0992)	2.54(0.1000)	2.56(0.1008)							
0.004	2.52(0.0992)	2.54(0.1000)	2.56(0.1008)								
0.005	2.54(0.1000)	2.56(0.1008)									
0.006	2.56(0.1008)										

Note: When ordering shims, find the part number in the parts catalog by using the thickness of shims listed in the above table.



5. Inner Bearing

Place the shim on the drive pinion, with the chamfered side turned towards the pinion head then install the inner bearing on to the pinion using an installer and a press.

Installer : 9-8522-1165-0 (J-6133-01)



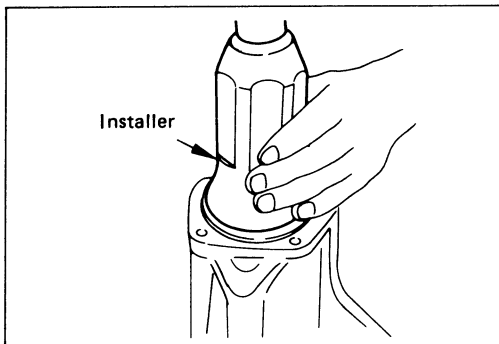
Note:

**Do not apply pressure to the roller cage.
Apply pressure only to the inner race.**



6. Collapsible Spacer

Discard the used collapsible spacer and install a new one.



9. Oil Seal

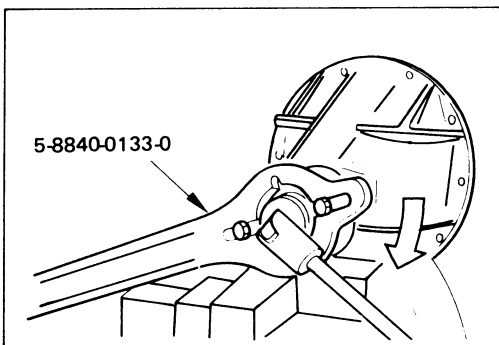
Use oil seal installer to install a new oil seal that has been soaked in rear axle lubricant.



Installer : 5-8522-0046-0 (J-26234) (For 167 mm)
9-8522-1275-0 (J-24250) (For 194 mm)

Note:

Take care not to use a rear differential oil seal instead of the front differential oil seal.



12. Flange Nut and Washer

For 194 mm



- (1) Apply lubricant to the pinion threads.
- (2) Tighten the nut to the specified torque using the pinion flange holder.

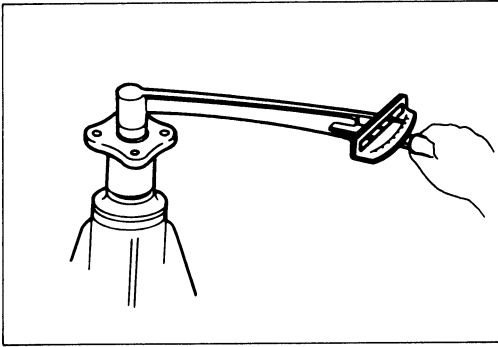
Pinion flange holder : 5-8840-0133-0
(J-8614-01)



Torque	kg·m(lb.ft/N·m)
18 — 28 (130 — 202/176.6 — 274.7)	



Discard used flange nut and install new one.

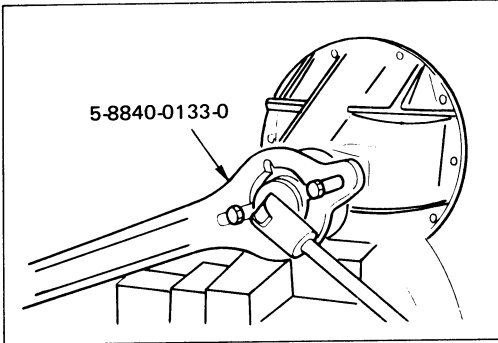


(3) Pinion bearing preload

- (a) Measure the bearing preload by using a torque meter. Note the scale reading required to rotate the flange.
- (b) Continue tightening until the specified starting torque is obtained.



Starting Torque	kg·cm(lb.in/N·m)
6.5 – 11.5 (5.7 – 9.9/0.63 – 1.13)	



For 167 mm

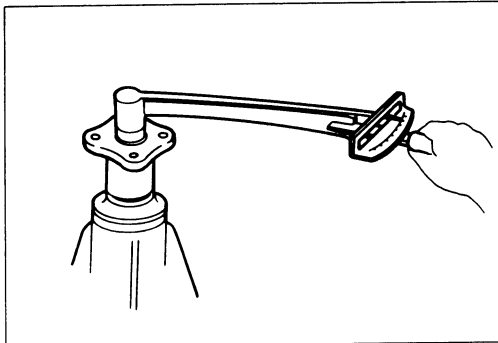
- (1) Apply lubricant to the pinion threads.
- (2) Tighten the nut to the specified torque using the pinion flange holder.

Pinion flange holder : 5-8840-0133-0 (J-8614-01)

Torque	kg·m(lb.ft/N·m)
12 – 13 (87 – 94/117 – 127)	

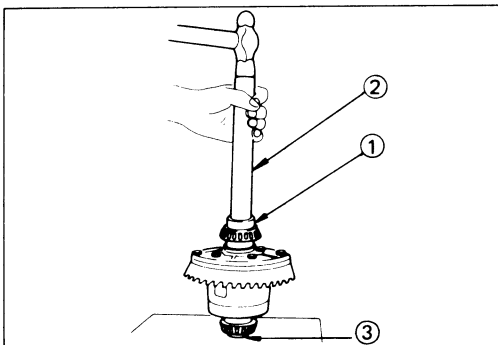


Discard used flange nut and install new one.



- (3) Continue tightening until the specified starting torque is obtained.

Starting Torque	kg·cm(lb.in/N·m)
6 – 11 (5.2 – 9.5/0.59 – 1.0)	



13. Adjust Shim

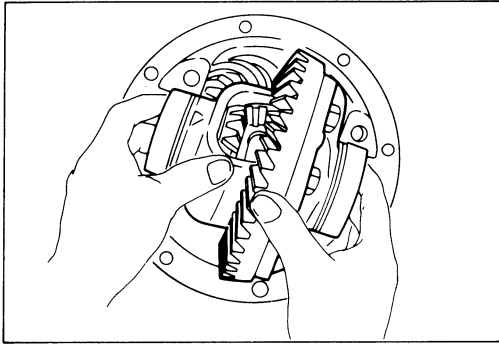
- (1) Attach the side bearing to the differential assembly without shims. Support the opposite side using a pilot to prevent bearing damage.

For 167 mm

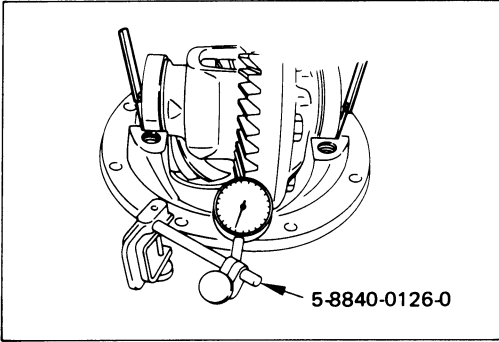
- ① Installer : 5-8840-0138-0 (J-29036)
- ② Drive handle : 5-8840-0007-0 (J-8092)
- ③ Pilot : 5-8521-0019-0

For 194 mm

- ① Installer : 9-8522-1164-0 (J-24244)
- ② Drive handle : 5-8840-0007-0 (J-8092)
- ③ Pilot : 9-8521-1743-0 (J-8107-2)

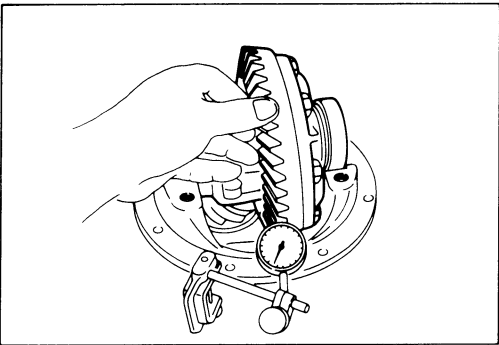


- (2) Insert the differential cage assembly with bearing outer races into the side bearing bores of the carrier.



- (3) Using two sets of feeler gauges, insert a feeler stock of sufficient thickness between each bearing outer race and the carrier to remove all end play. Make certain the feeler stock is pushed to the bottom of the bearing bores.
Mount the dial indicator on the carrier so that the indicator stem is at right angles to a tooth on the ring gear.

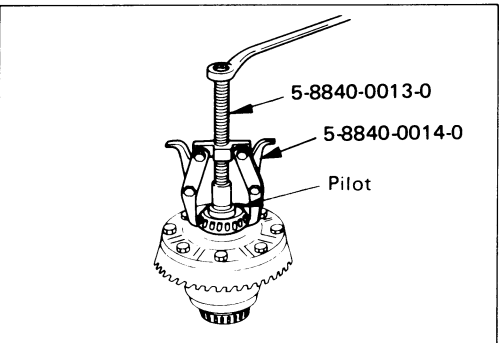
Dial indicator : 5-8840-0126-0
(J-8001)



- (4) Adjust feeler gauge thickness from side to side until ring gear backlash is in the specified range.

Backlash	mm(in)
	0.13 — 0.18 (0.005 — 0.007)

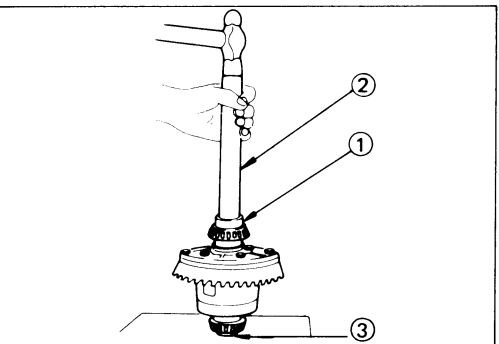
With zero end play and correct backlash established, remove the feeler gauge packs, determine the thickness of the shims required and add 0.05 mm (0.002 in) to each shim pack to provide side bearing preload. Always use new shims.



- (5) Remove side bearing

Remover : 5-8840-0013-0
(J-22888)
5-8840-0014-0
(J-22888-30)

Pilot : 5-8521-0019-0 (167 mm)
9-8521-1743-0 (194 mm)
(J-8107-2)



14. Side Bearing

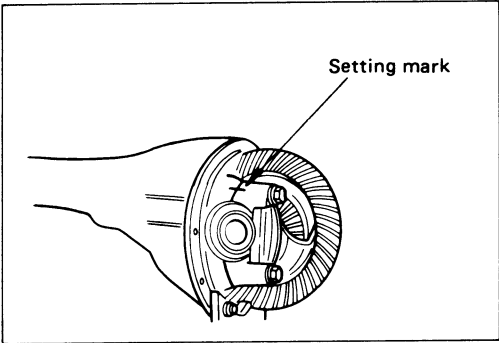
Install the side bearings together with the selected shims.

For 167 mm

- ① Installer : 5-8840-0138-0 (J-29036)
② Drive handle : 5-8840-0007-0 (J-8092)
③ Pilot : 5-8521-0019-0

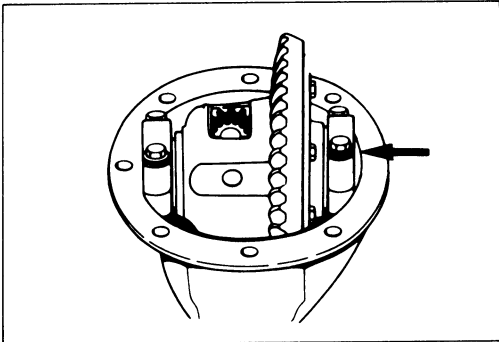
For 194 mm

- ① Installer : 9-8521-1164-0 (J-24244)
② Drive handle : 5-8840-0007-0 (J-8092)
③ Pilot : 9-8521-1743-0 (J-8107-2)



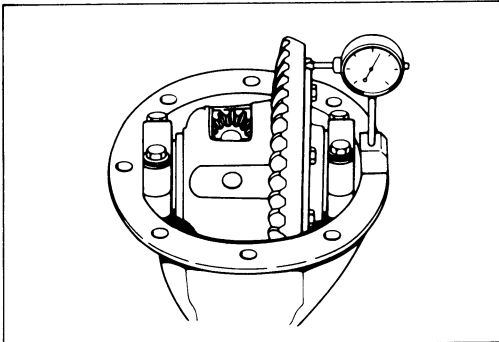
17. Bearing Cap

Align the setting marks applied at disassembly.



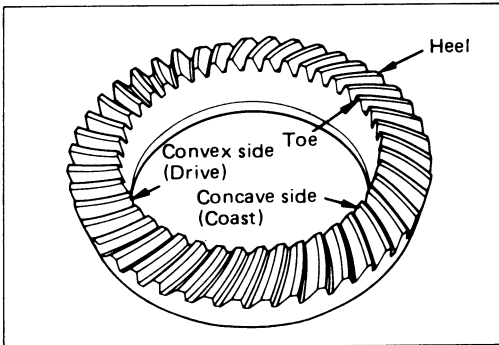
18. Bolt

Bolt Torque		kg·m(lb.ft/N·m)
167 mm	7 ± 1	(50.6 ± 7.2/68.7 ± 9.8)
194 mm	10 ± 1	(72.3 ± 7.2/98.1 ± 9.8)



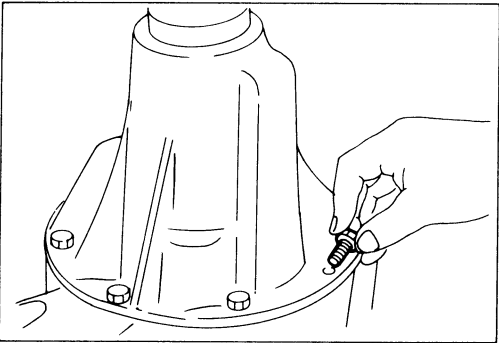
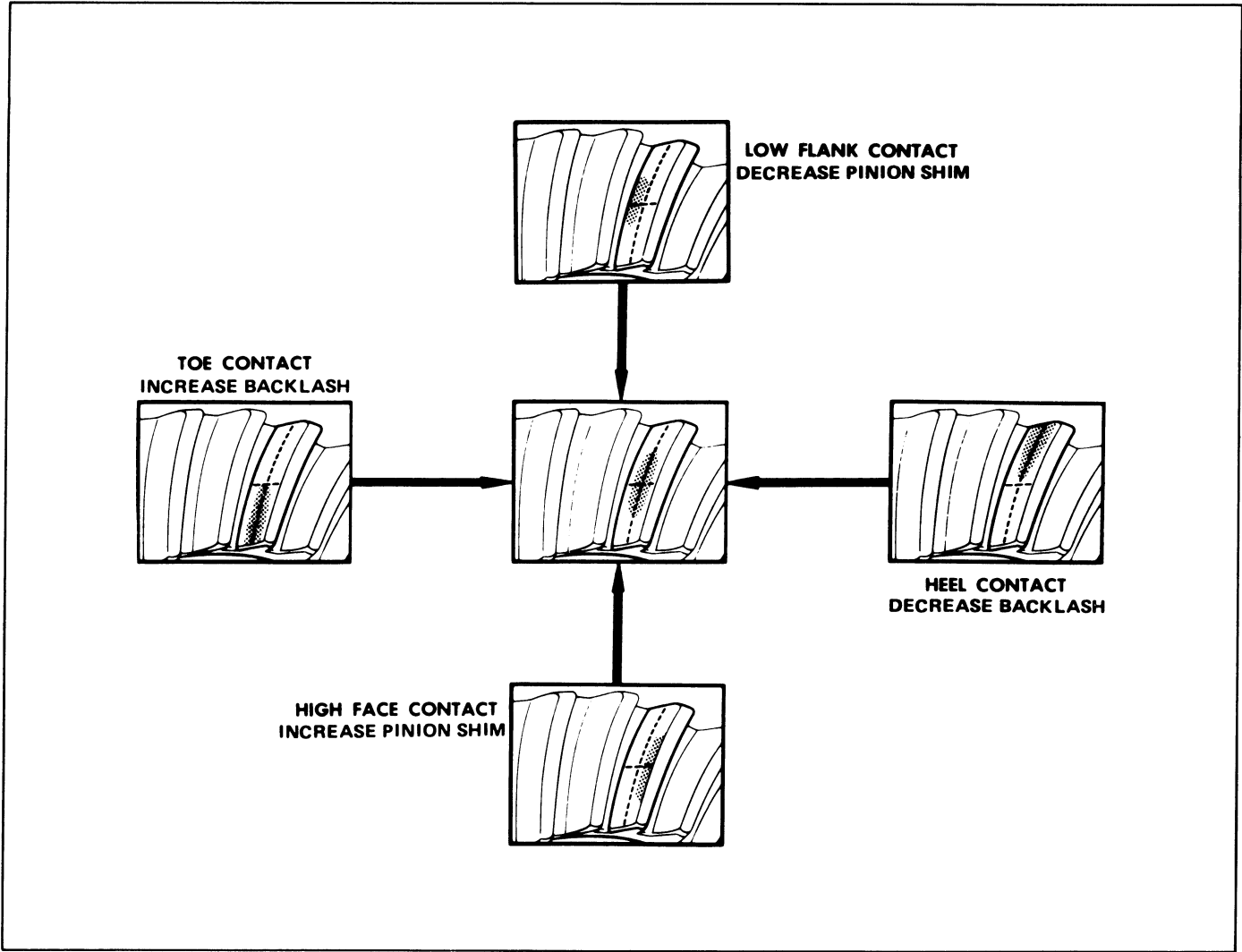
Measure the amount of run-out of the ring gear at its rear face.

		mm(in)
Standard		Limit
0.02 (0.001)		0.05 (0.002)



Gear Tooth Contact Pattern Check and Adjustment

Apply a thin coat of prussian blue or equivalent to the faces of the 7 — 8 teeth of the ring gear. Check the impression of contact on the ring gear teeth and make necessary adjustment as described below if the contact is abnormal.



20. Differential Assembly

- (1) Clean the faces of the front axle case and differential carrier.
Apply the recommended liquid gasket or its equivalent to the sealing side of the axle case and the carrier.
- (2) Attach the differential case and the carrier assembly to the front axle case and tighten the nuts and bolts. The axle case bolt is used for drainage.

Torque	kg·m(lb.ft/N·m)
2.6 ± 0.5 ($18.8 \pm 3.6/25.5 \pm 5$)	

- (3) Install the axle shaft assemblies as instructed earlier in this section under "Axle Shaft Replacement".
- (4) Fill the axle case with hypoid gear lubricant, to just below the filler hole.



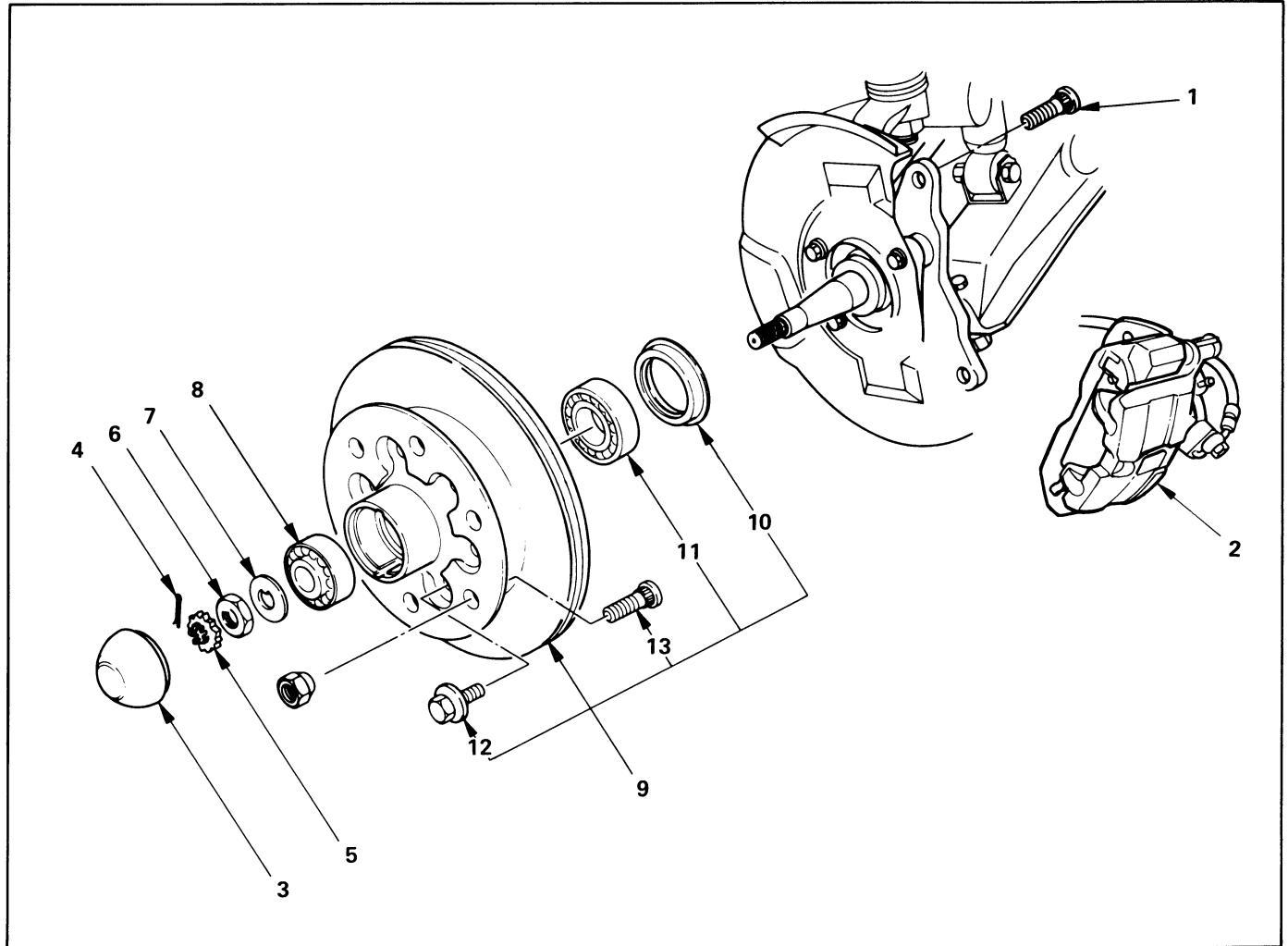
Lubricant capacity	liter (US/UK gal)
167 mm	1.0 (0.26/0.22)
194 mm	1.4 (0.37/0.31)

FRONT HUB AND DISC (4 x 2 model)



DISASSEMBLY

Refer to SECTION 3E "WHEEL AND TIRE" for wheel removal procedure.



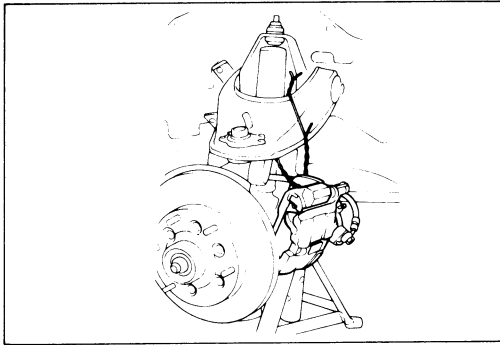
Disassembly Steps

- | | |
|--------------------|----------------------------------|
| 1. Bolt | 8. Outer bearing |
| ▲ 2. Brake caliper | ▲ 9. Hub and disc assembly |
| ▲ 3. Hub cap | 10. Oil seal |
| 4. Split pin | 11. Inner bearing and outer race |
| 5. Nut retainer | ▲ 12. Bolt |
| 6. Hub nut | ▲ 13. Wheel pin |
| 7. Lock washer | |



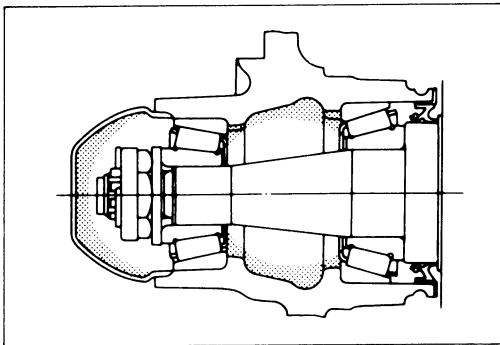
Important Operations

Before removal, jack up the front of vehicle and support frame with jack stands.



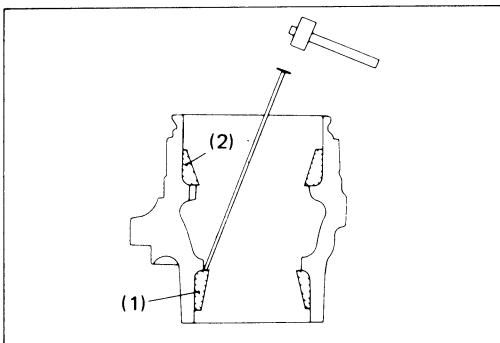
2. Brake Caliper

- (1) Remove the two bolts from the rear side of the knuckle arm, then remove the brake caliper, with the brake hose attached.
- (2) Use a wire etc., for attaching the brake caliper to the upper link.



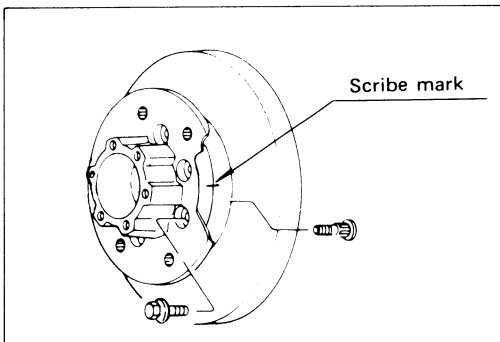
3. Hub Cap

When removing hub cap, exercise care so as not to scratch or distort hub fitting face.



9. Hub and Disc Assembly

Using a brass bar to remove the outer bearing outer race (1), oil seal, inner bearing and inner bearing outer race (2) from the hub.

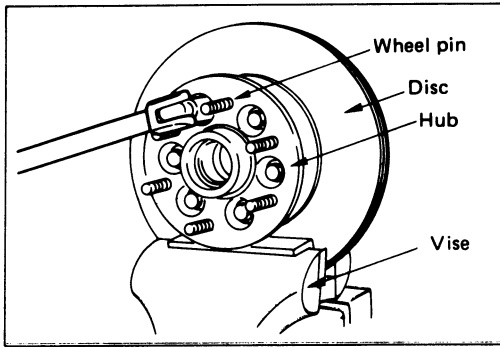


If necessary, replace the wheel pin in the following manner.

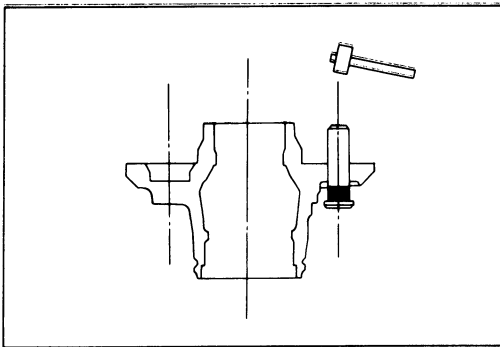
12. Bolt

13. Wheel Pin ; Front Hub

- (1) Scribe mark on hub to disc before disassembly to insure proper assembly.



- (2) Clamp hub and disc assembly in vise using protective pads and remove six (6) disc to hub retaining bolts.



- (3) Place hub on a suitable work surface and remove wheel studs, as required, using a hammer.



INSPECTION AND REPAIR

Make necessary correction or parts replacement if wear, damage or any other abnormal conditions are found through inspection.

- Hub
- Hub bearing
- Bearing outer race
- Disc
- Oil seal



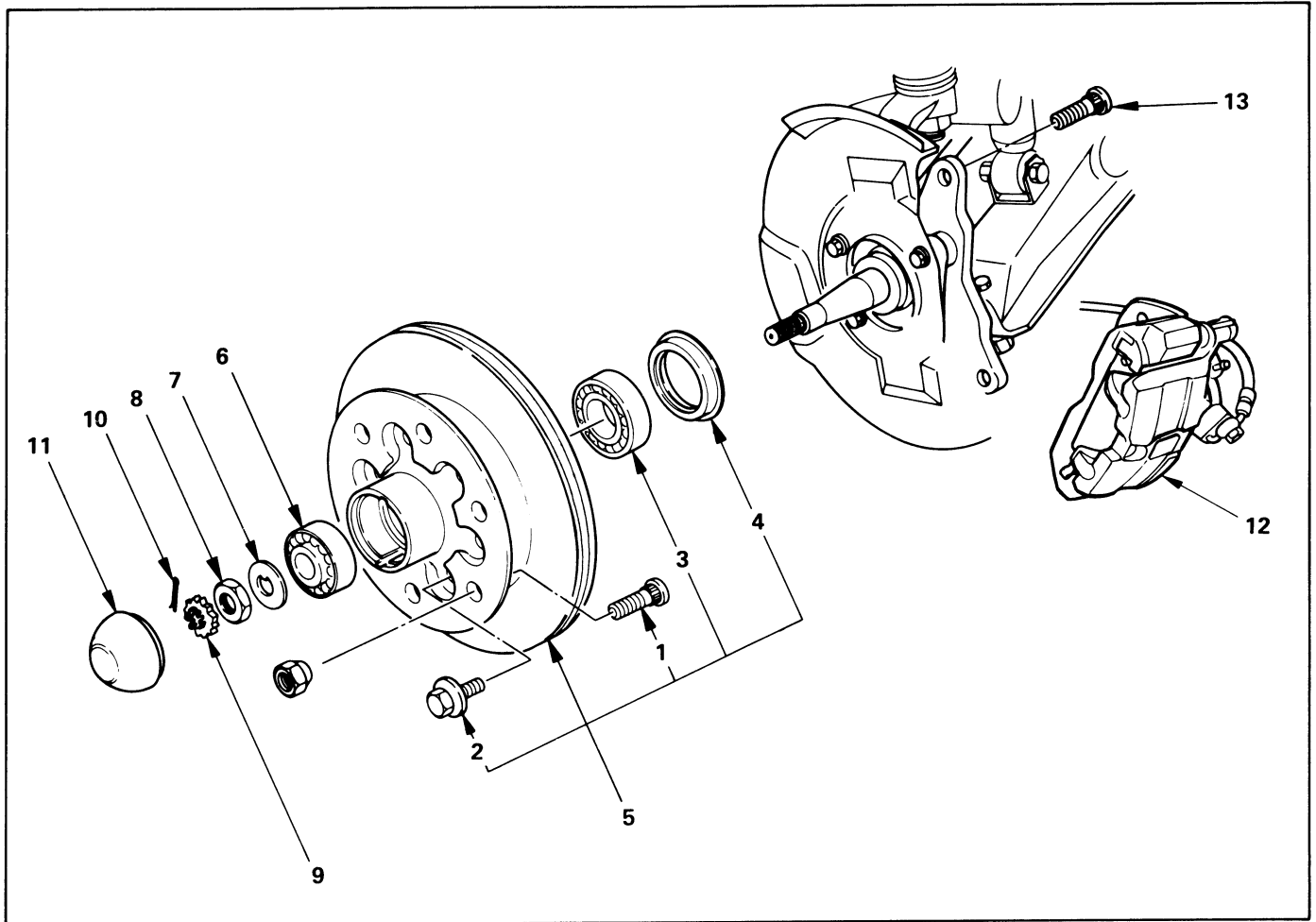
Visual Check

Check the following parts for wear, damage or other abnormal conditions.



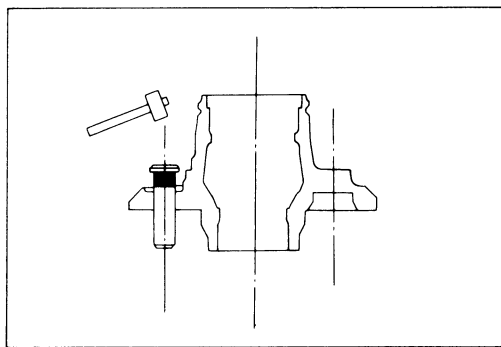
REASSEMBLY

Refer to SECTION 3E "WHEEL AND TIRE" for wheel installation procedure.



Reassembly steps

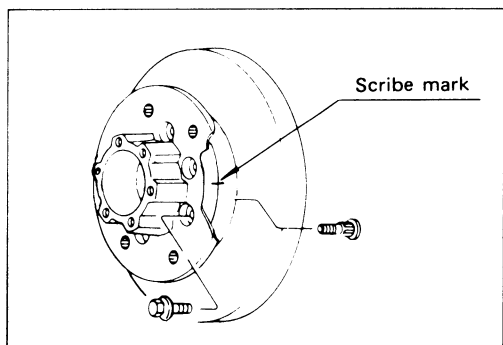
- | | |
|-----------------------------------|---------------------|
| ▲ 1. Wheel pin | ▲ 8. Hub nut |
| ▲ 2. Bolt | ▲ 9. Nut retainer |
| ▲ 3. Inner bearing and outer race | ▲ 10. Split pin |
| ▲ 4. Oil seal | ▲ 11. Hub cap |
| ▲ 5. Hub and disc assembly | ▲ 12. Brake caliper |
| ▲ 6. Outer bearing | ▲ 13. Bolt |
| ▲ 7. Lock washer | |



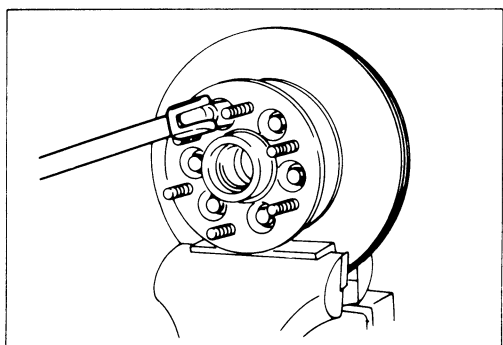
Important Operations

1. Wheel Pin

- (1) Place hub on a wood workbench or a block of wood, approx. 6" by 6" to protect the wheel stud ends and threads.
- (2) Install wheel stud using a hammer.
Be sure wheel stud is started squarely and seats completely.

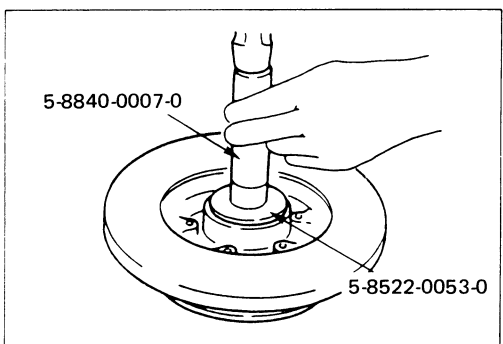


- (3) Align index marks and install hub to disc.



2. Bolt

Torque	kg·m(lb.ft/N·m)
10.5 ± 1	(75.9 ± 7.2/103 ± 5)

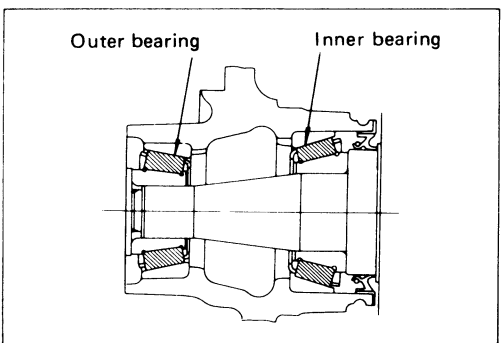


3. Inner Bearing and Outer Race

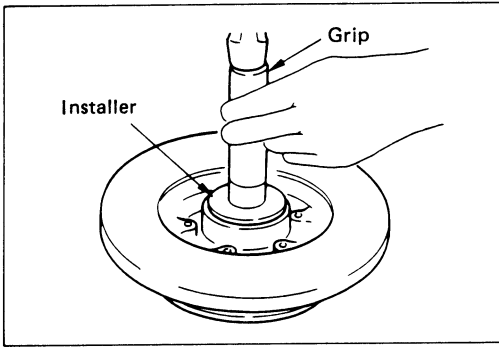
4. Oil Seal

▲ Outer Bearing Outer Race

- (1) Install the bearing outer race by driving into the hub.
 Installer (Outer) : 5-8822-0053-0 (J-29016)
 Installer (Inner) : 5-8822-0054-0 (J-29015)
 Drive handle : 5-8840-0007-0 (J-8092)



- (2) Install the outer and inner bearing into the hub with fingers.



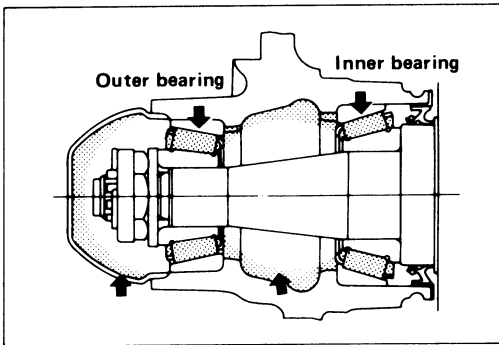
(3) Install oil seal using special tools.

Installer : 5-8522-0051-0

(J-33161)

Grip : 5-8840-0007-0

(J-8092)

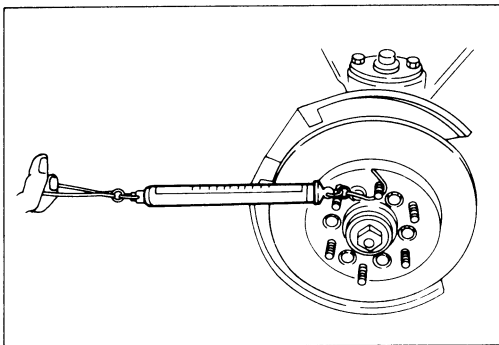


5. Hub and Disc Assembly

11. Hub Cap

Apply grease in the hub and hub cap.

	Amount g(oz)
Hub	50 (1.76)
Hub cap	20 (0.70)
Outer bearing	6.5 (0.23)
Inner bearing	12 (0.42)



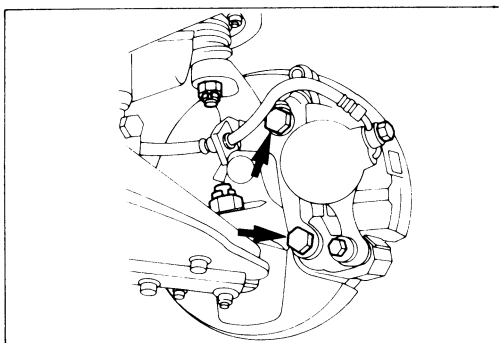
8. Hub nut

Adjustment of front wheel hub bearing preload

1. Tighten spindle nut to 3.0 kg·m (21.7 lb.ft/29.4 N·m) torque.
2. Turn the hub 2-3 turns and loosen the nut just enough so that it can be turned with the fingers.
3. Turn the nut all the way in with the fingers and check to be sure the hub has no free play.
4. Measure the bearing preload by pulling one of the wheel hub studs with a spring scale.
5. Tighten the spindle nut until specified bearing preload is obtained.

After reassembling, install the disc brake caliper assembly.

Bearing Preload	kg(lb)
New bearing and New oil seal	0.8—1.0 (1.8—2.2)
Reuse bearing and New oil seal	0.8—1.0 (1.8—2.2)



13. Bolt

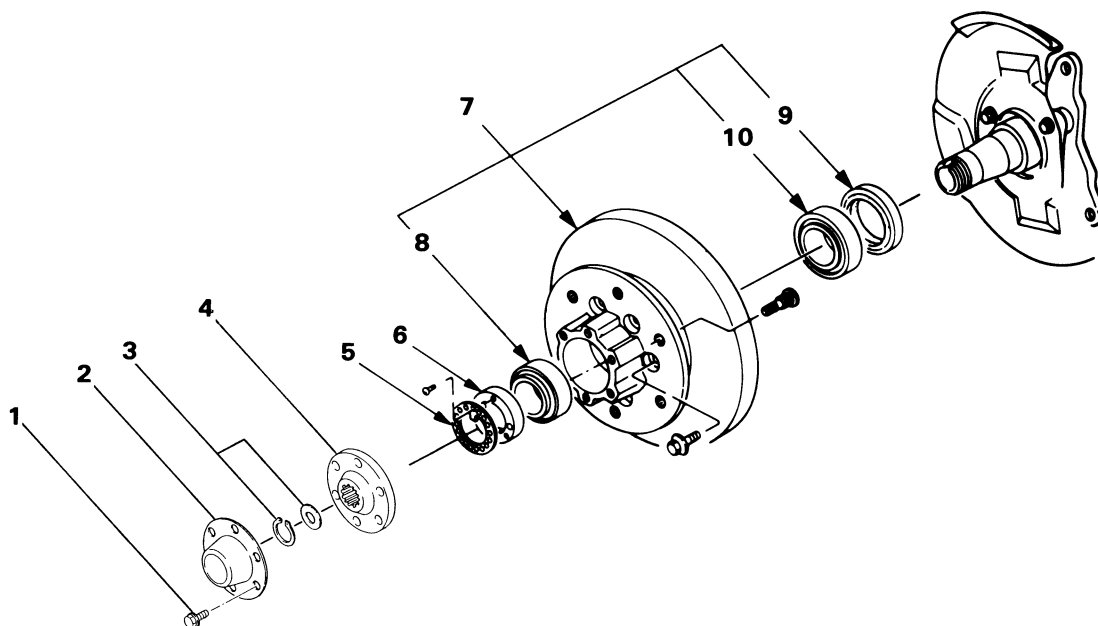
Torque	kg·m(lb.ft/N·m)
	15.8 ± 1.6 (114.3 ± 11.6/155 ± 15.7)

FRONT HUB AND DISC (4×4 model)



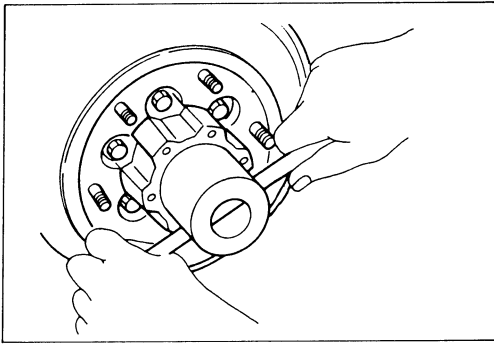
DISASSEMBLY

Refer to SECTION 3E "WHEEL AND TIRE" for wheel removal procedure



Disassembly steps

- | | |
|-----------------------|---------------------------|
| 1. Bolt | ▲6. Hub nut |
| 2. Hub cap | ▲7. Hub and disc assembly |
| 3. Snap ring and shim | 8. Outer bearing |
| 4. Flange | 9. Oil seal |
| 5. Lock washer | 10. Inner bearing |



Important operations



6. Hub nut

Wrench ;5-8840-2117-0
(J-36827)

7. Hub and disc assembly

Before disassembly, remove the disc brake caliper assembly and hang it on the frame with wires.

Refer to Section 5 "Brake" for disc brake caliper removal procedure.



INSPECTION AND REPAIR

Make necessary correction or parts replacement if wear, damage or any other abnormal conditions are found through inspection.

For inspection and servicing of disc caliper, and relative parts, refer to Section 5 "Service Brakes".

- Hub
- Hub bearing, oil seal
- Knuckle spindle
- Disc
- Caliper
- Free wheeling hub parts (Option)
- Clutch, knob, follower, inner, ring and spring



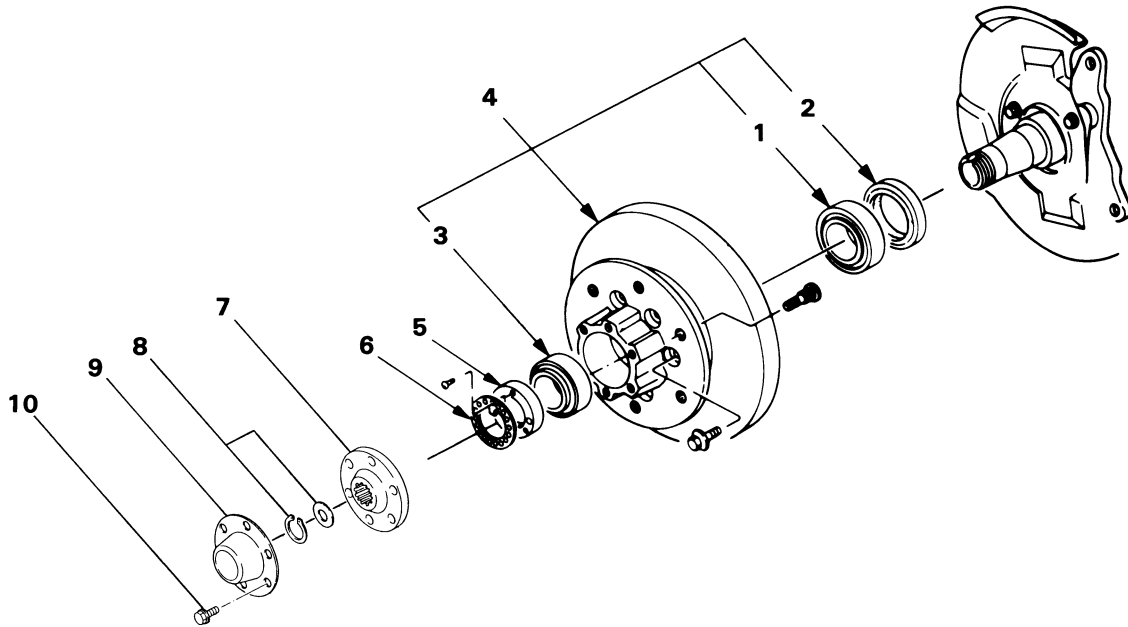
Visual Check

Inspect the following parts for wear, damage or other abnormal conditions.



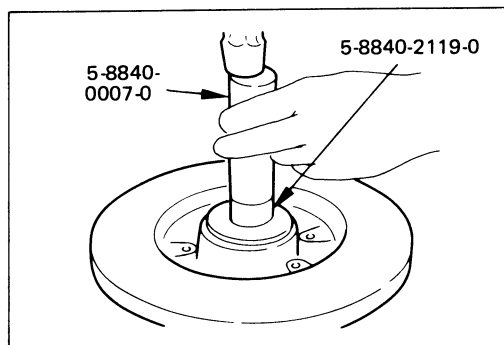
REASSEMBLY

Refer to SECTION 3E "WHEEL AND TIRE" for wheel installation procedure



Reassembly steps

- | | |
|----------------------------|-------------------------|
| ▲ 1. Inner bearing | ▲ 6. Lock washer |
| ▲ 2. Oil seal | 7. Flange |
| ▲ 3. Outer bearing | ▲ 8. Snap ring and shim |
| ▲ 4. Hub and disc assembly | 9. Hub cap |
| ▲ 5. Hub nut | ▲ 10. Bolt |



Important operations

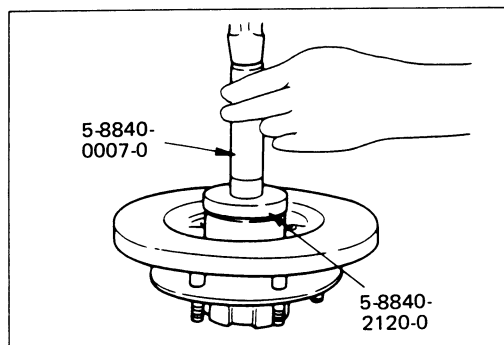


1. Inner Bearing

Outer race ; outer bearing
Install the outer race by driving it into the hub.

Installer : 5-8840-2119-0
(J-36829)

Grip : 5-8840-0007-0
(J-8092)



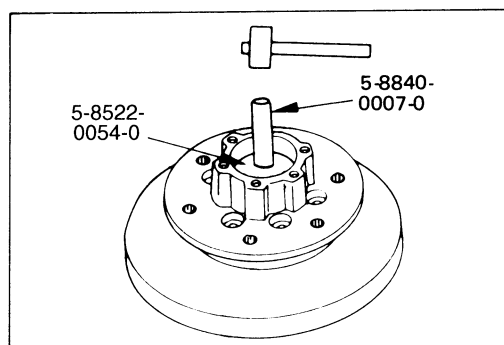
2. Oil Seal

Installer : 5-8840-2120-0
(J-36830)



Grip : 5-8840-0007-0
(J-8092)

Apply grease (Besco L-2 or equivalent) to the lip portion.



3. Outer bearing

Outer race ; outer bearing
Install the outer race by driving it into the hub.

Installer : 5-8522-0054-0
(J-29015)

Grip : 5-8840-0007-0
(J-8092)

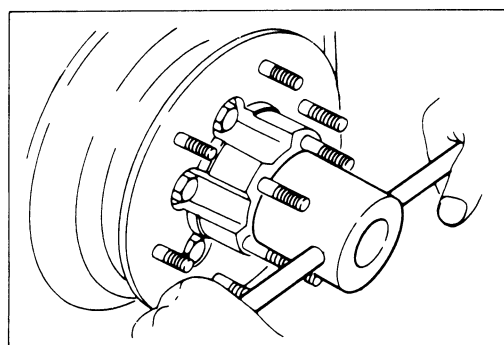


4. Hub and Disc Assembly

- (1) Apply grease in the hub.
- (2) Apply grease (Besco L-2 or equivalent) to the outer and inner bearing.

g(oz)

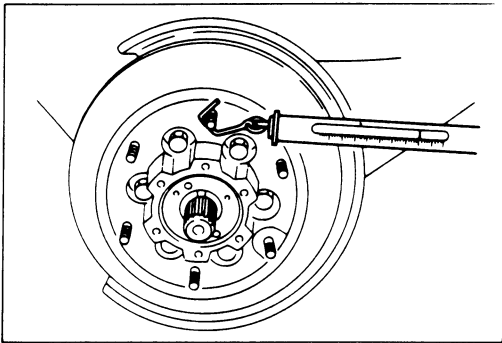
Hub	35 (1.23)
Outer bearing	10 (0.35)
Inner bearing	15 (0.53)



5. Hub Nut

- (1) Turn the place where there is a chamfer in the tapped hole to the outer side, and attach the nut.

Wrench : 5-8840-2117-0
(J-36827)



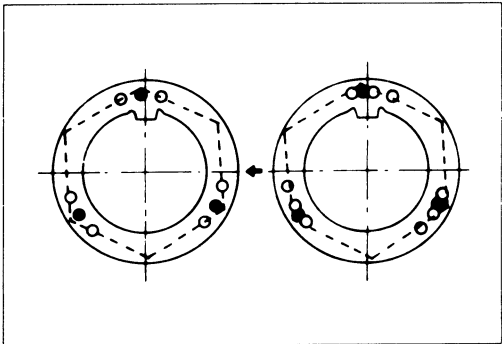
Preload Adjustment

Tighten the hub nut at 3 kg·m (21.716 lb.ft/29.4 N·m), then loosen the nut to the full.

Tighten the hub nut at the value given below, using a spring scale on the wheel pin.

Bearing Preload		kg(lb)
New bearing and New oil seal	2	— 2.5 (4.4—5.5)
Used bearing and New oil seal	1.2	— 1.8 (2.6—4.0)

If the measured bearing preload is outside the specifications, adjust it by loosening or tightening the bearing nut.

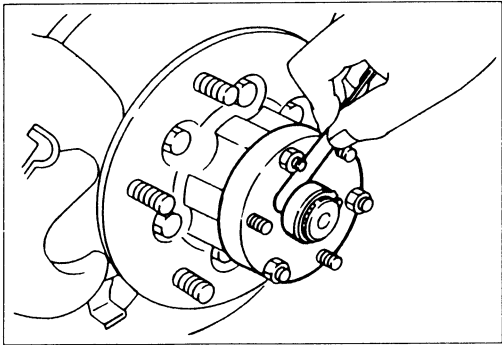


6. Lock Washer

Turn the side with larger diameter of the tapered bore to the vehicle outer side, and attach the washer.

If the bolt holes in the lock plate are not aligned with the corresponding holes in the nut, reverse the lock plate.

If the bolt holes are still out of alignment, turn in the nut just enough to obtain alignment. Screw is to be fastened tightly so its head may come lower than the surface of the washer.



8. Snap ring, shims

Adjust the clearance between the collar and the snap ring.

Clearance	mm(in.)	0—0.3 (0—0.01)
-----------	---------	----------------

Adjust shims available	mm(in.)
	0.2, 0.3, 0.5, 1.0 (0.008, 0.011, 0.020, 0.039)



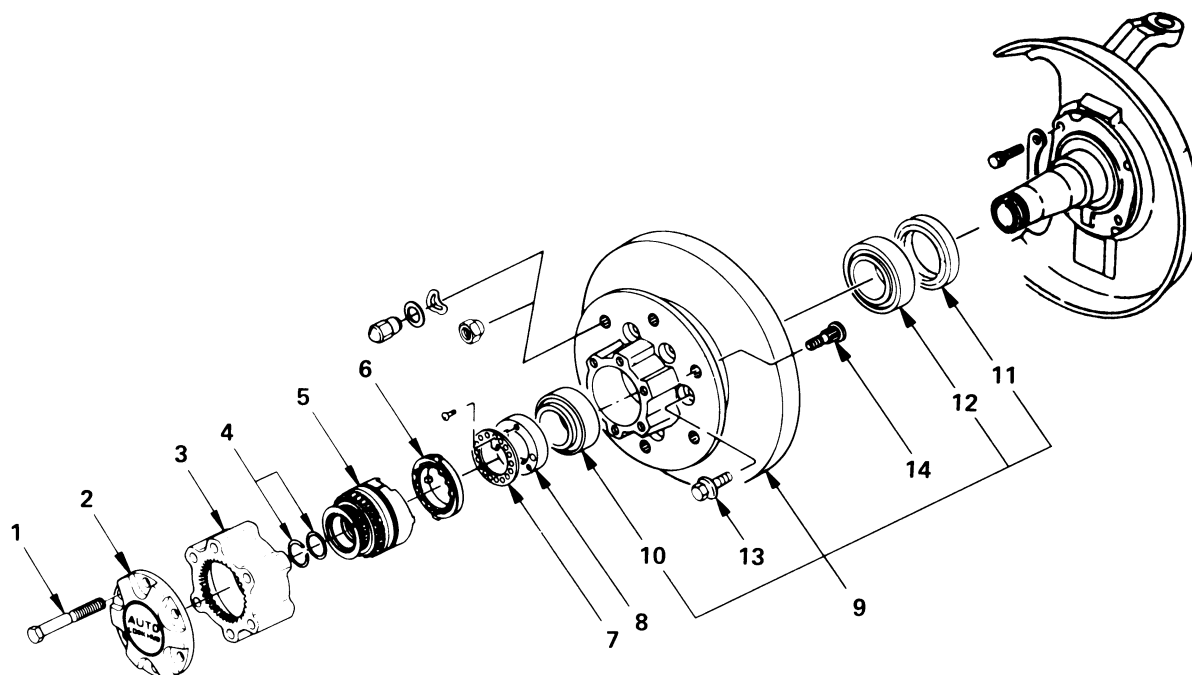
10. Bolt

Torque kg·m(lb.ft/N·m)	1.0—1.4 (7—10/10—14)
------------------------	----------------------

FRONT HUB AND DISC (Automatic Locking Hub)

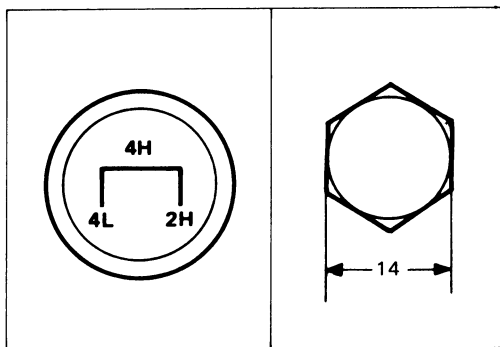


DISASSEMBLY



Disassembly Steps

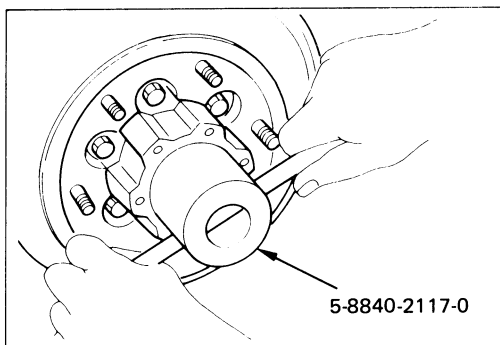
- | | |
|----------------------------|------------------------------------|
| ▲ 1. Bolt | ▲ 8. Hub nut |
| ▲ 2. Hub cap | ▲ 9. Hub and disc assembly |
| ▲ 3. Housing assembly | ▲ 10. Outer bearing and outer race |
| ▲ 4. Snap ring and shims | ▲ 11. Oil seal |
| ▲ 5. Drive clutch assembly | ▲ 12. Inner bearing and outer race |
| ▲ 6. Inner cam | ▲ 13. Bolt |
| ▲ 7. Lock washer | ▲ 14. Wheel pin |



Important Operations

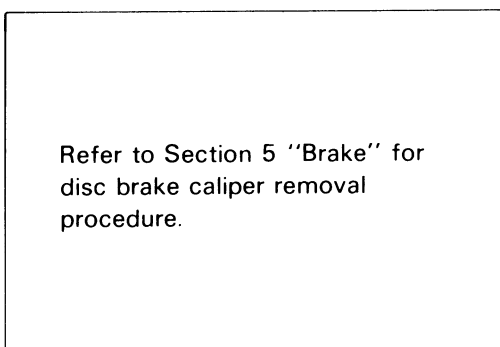
1. Bolt

Shift the transfer lever to the "2H" position and move the vehicle forward and rearward about one meter.
Remove the 14 mm hex bolts.



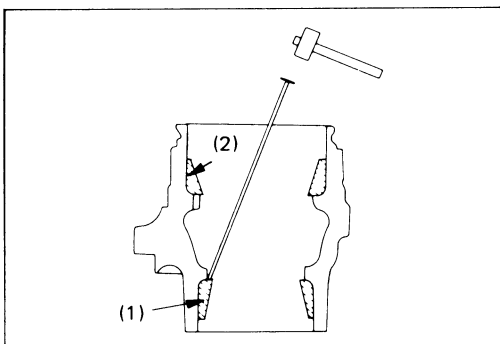
8. Hub Nut

Wrench : 5-8840-2117-0
(J-36827)



9. Hub and Disc Assembly

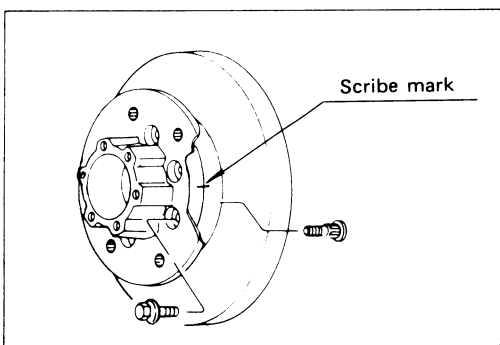
Before disassembly, remove the disc brake caliper assembly and hang it on the frame with wires.



10. Outer Bearing and Outer Race

12. Inner Bearing and Outer Race

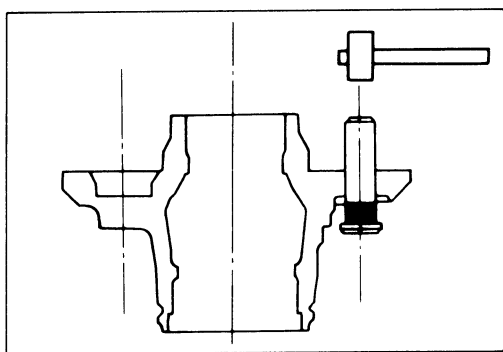
- (1) Remove the outer bearing from the hub with fingers. The inner bearing will remain in the hub and may be removed after prying out the inner bearing lip seal assembly.
- (2) Remove the outrace by driving out the race from the hub with a brass drift inserted behind the race in the notches in the hubs.



If necessary, replace the wheel pin in the following manner.

13. Bolt

- (1) Apply a scribe mark to disc to hub.
- (2) Clamp the hub and disc assembly in a vise using protective pads and remove the 6 disc to hub retaining bolts.



14. Wheel Pin

Place pins hub on a suitable work surface and remove the wheel studs, as required, using a hammer.



INSPECTION AND REPAIR

Make all necessary adjustments, repairs, and part replacements if wear, damage, or other problems are discovered during inspection.

For inspection and servicing of disc caliper, and relative parts, refer to Section 05 "Brakes".

- Hub
- Hub bearing, oil seal
- Knuckle spindle
- Disc
- Caliper
- Automatic locking hubs



Visual Check

Inspect the following parts for wear, damage, or other abnormal conditions.



Inside Diameter of Housing

mm(in)

Standard	Limit
65.04 (2.561)	65.24 (2.568)

Inspect flange surface A and B for excessive wear.



Drive Clutch Section Dimensions "L"

mm(in)

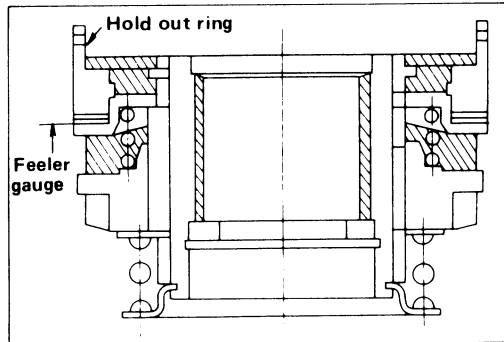
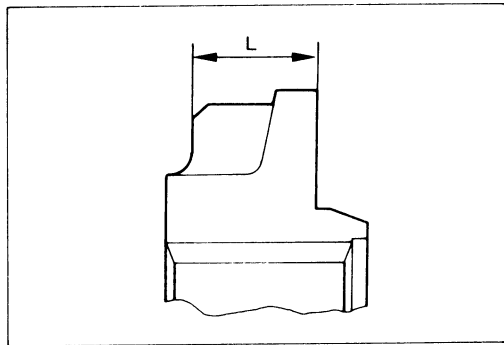
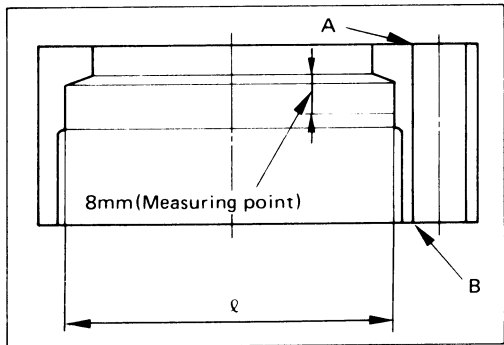
Standard	Limit
8.2 (0.323)	7.8 (0.307)

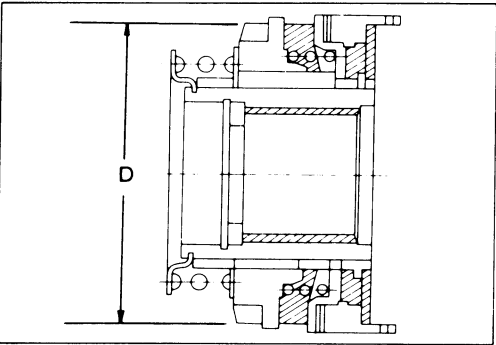


Holdout Ring Axial Play of the Drive Clutch Assembly

mm(in)

Standard	Limit
0.3 (0.012) or less	0.4 (0.016)



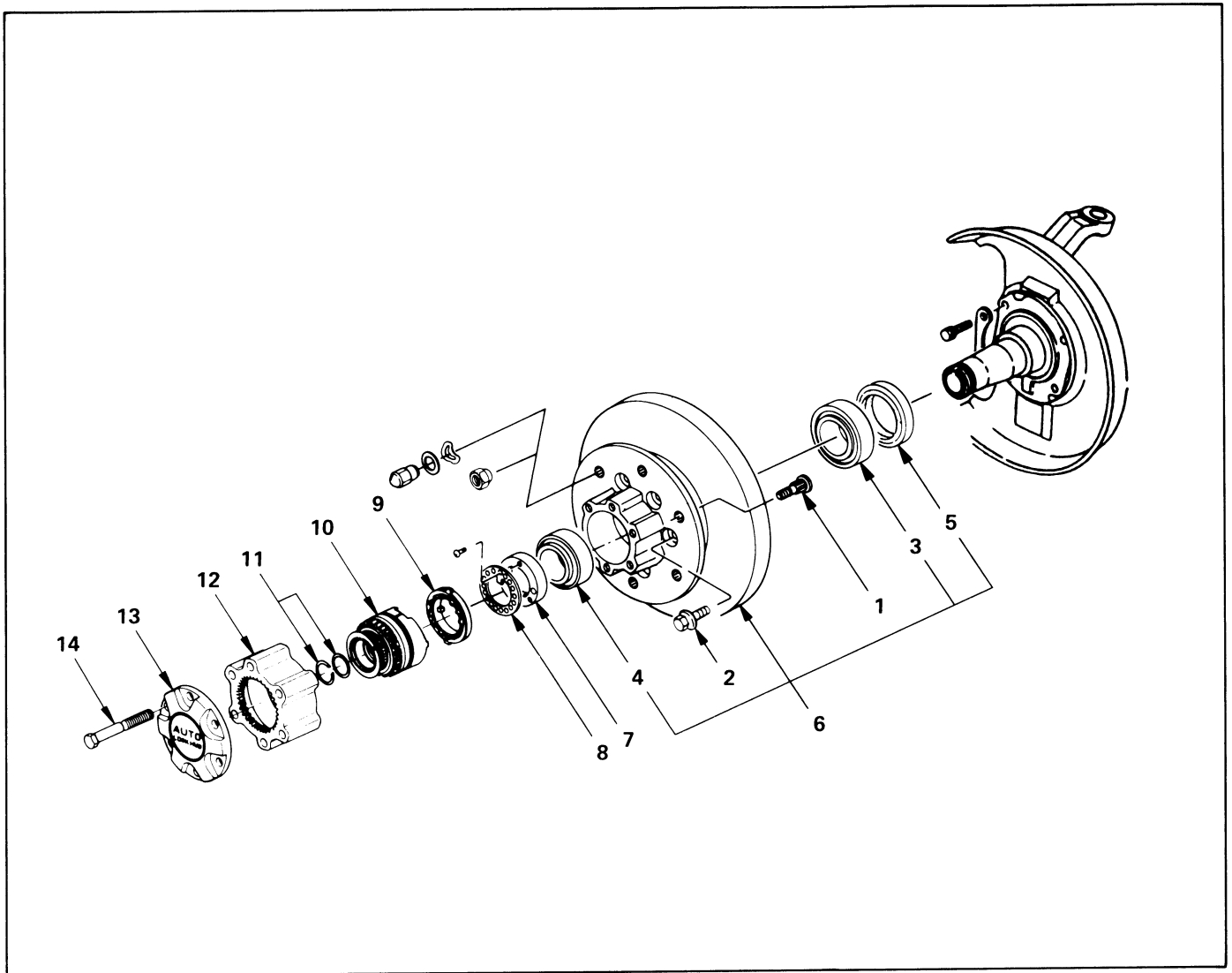


Outside Diameter of the Drive Clutch Assembly

mm(in)	
Standard	Limit
64.75 (2.55)	64.55 (2.54)

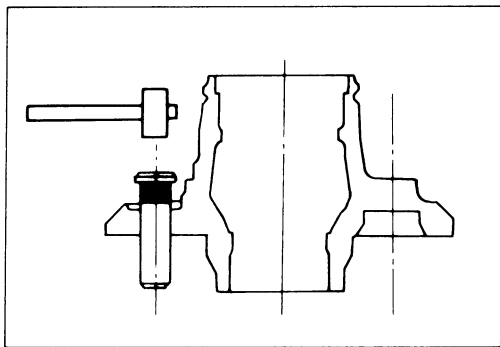


REASSEMBLY



Reassembly Steps

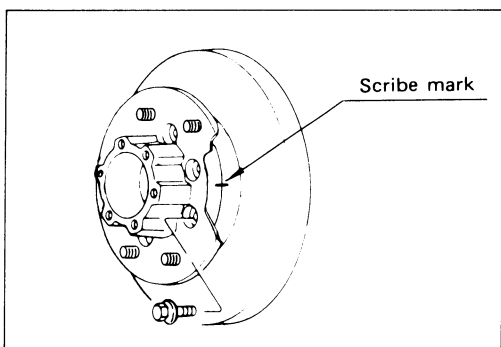
- | | |
|-----------------------------------|-----------------------------|
| ▲ 1. Wheel pin | ▲ 8. Lock washer |
| ▲ 2. Bolt | ▲ 9. Inner cam |
| ▲ 3. Inner bearing and outer race | ▲ 10. Drive clutch assembly |
| ▲ 4. Outer bearing and outer race | ▲ 11. Snap ring and shim |
| ▲ 5. Oil seal | ▲ 12. Housing assembly |
| ▲ 6. Hub and disc assembly | 13. Hub cap |
| ▲ 7. Hub nut | 14. Washer and bolt |



Important Operations

1. Wheel Pin

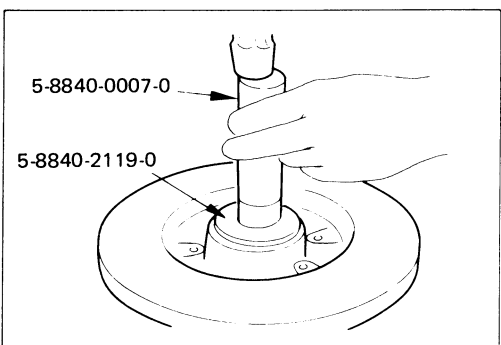
- (1) Place the hub on a wood workbench or a block of wood approx 6" by 6" to protect the wheel stud ends and threads.
 - (2) Insert a wheel stud using a hammer.
- Be sure the wheel stud is started squarely and seats completely.



2. Bolt

Align scribe marks and attach the hub to the disc.

Torque	kg·m(lb.ft/N·m)
10.5 ± 1 ($75.9 \pm 7.2/103 \pm 5$)	



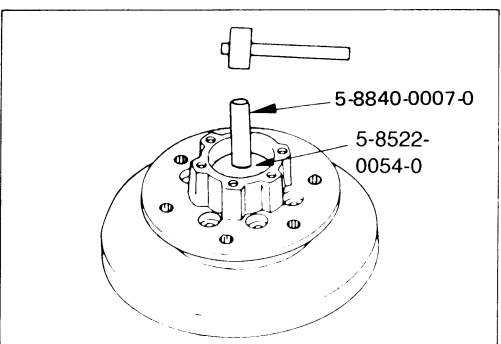
3. Inner Bearing and Outer Race

Outer race ; inner bearing

Install the outer race by driving it into the hub.

Installer : 5-8840-2119-0
(J-36829)

Grip : 5-8840-0007-0
(J-8092)



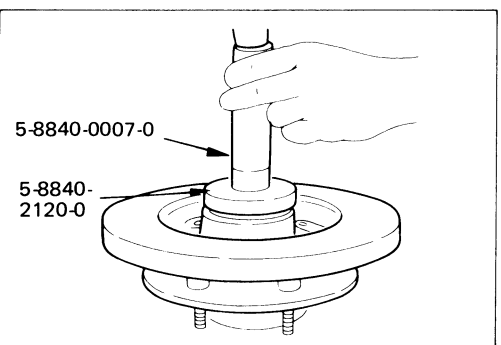
4. Outer Bearing and Outer Race

Outer race ; outer bearing

Install the outer race by driving it into the hub.

Installer : 5-8522-0054-0
(J-29015)

Grip : 5-8840-0007-0
(J-8092)



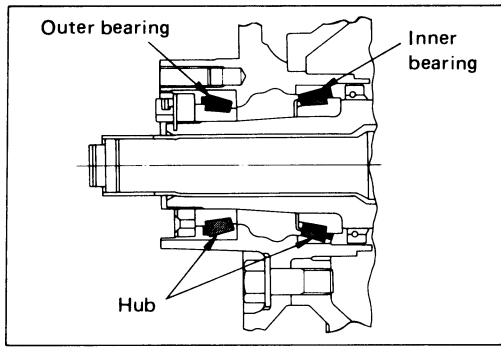
5. Oil Seal

Place the inner bearing onto the outer race in the hub and install a new oil seal and retaining ring.

Apply Besco L-2 or equivalent to the lip portion.

Installer : 5-8840-2120-0
(J-36830)

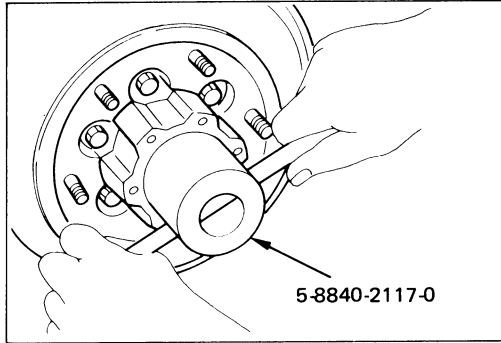
Grip : 5-8840-0007-0
(J-8092)



6. Hub and Disc Assembly

- (1) Put grease in the hub.
- (2) Apply Besco L-2 or equivalent to the outer and inner bearing.

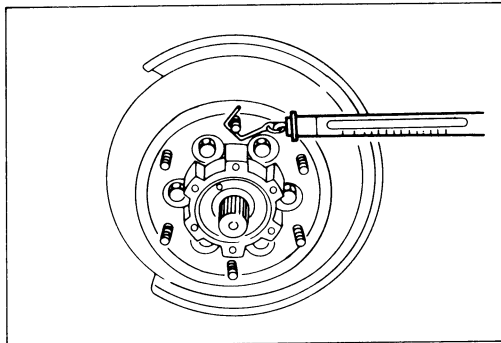
	g(oz)
Hub	35 (1.23)
Outer bearing	10 (0.35)
Inner bearing	15 (0.53)



7. Hub Nut

Turn the place where there is a chamfer in the tapped hole to the outer side, and attach the nut.

Wrench : 5-8840-2117-0
(J-36827)



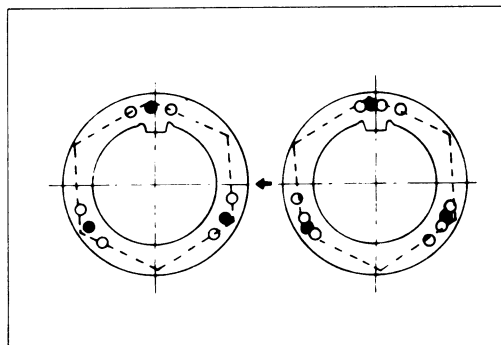
▲ Preload Adjustment

Tighten the hub nut at 3 kg·m (21.716 lb.ft/29.4 N·m), then loosen the nut to the full.

Tighten the hub nut at the value given below, using a spring scale on the wheel pin.

Bearing Preload	kg(lb)
New bearing and New oil seal	2 — 2.5 (4.4—5.5)
Used bearing and New oil seal	1.2 — 1.8 (2.6—4.0)

If the measured bearing preload is outside the specifications, adjust it by loosening or tightening the bearing nut.

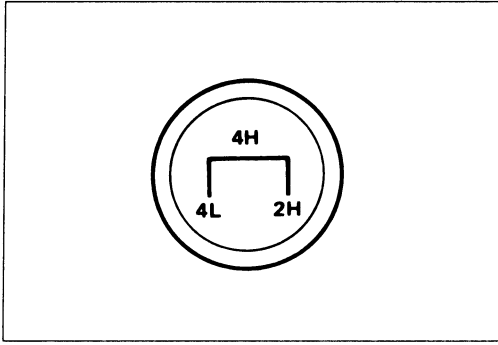


8. Lock Washer

Turn the side with larger diameter of the tapered bore to the vehicle outer side, and attach the washer.

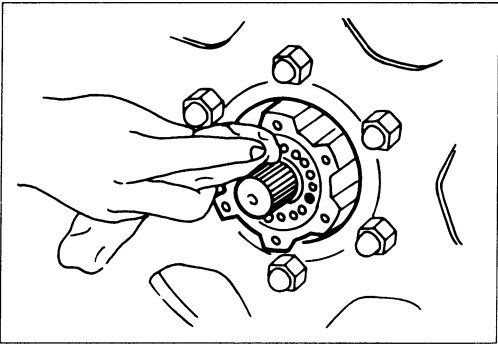
If the bolt holes in the lock plate are not aligned with the corresponding holes in the nut, reverse the lock plate.

If the bolt holes are still out of alignment, turn in the nut just enough to obtain alignment. Screw is to be fastened tightly so its head may come lower than the surface of the washer.

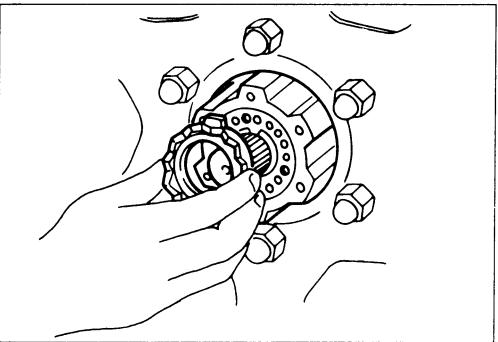


9. Inner Cam

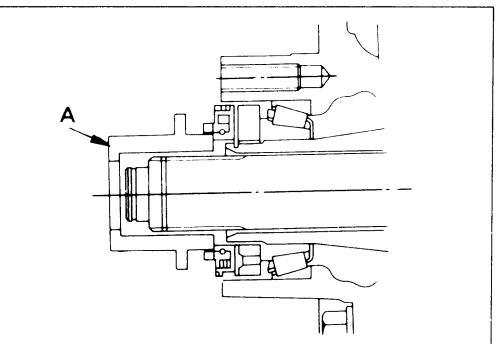
- (1) Before installation, shift the transfer lever to "2H" position.



- (2) Clean the flange surface of the hub, the thread holes, the surface of the lock washer and the spline portion of the axle shaft.



- (3) Install the inner cam by aligning the key way of the inner cam with the groove of the knuckle. Hit the inner cam lightly with plastic hammer or equivalent and make sure the inner cam is in contact with the lock washer.



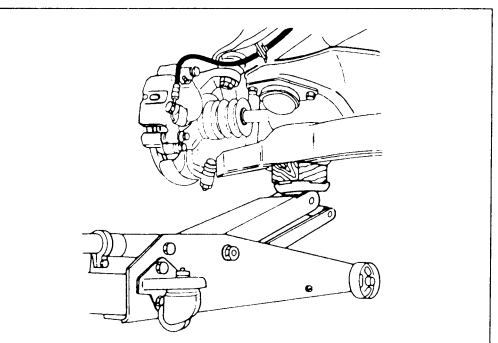
If it is difficult to install the inner cam, use the tool (installer) and a plastic hammer or the equivalent.

Install the special tool.

Use the plastic hammer to lightly tap around the special tool "A" surface as shown in the illustration.

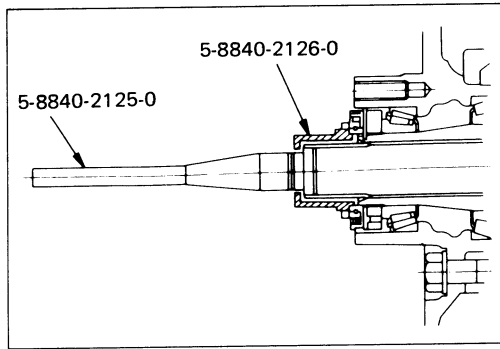
Installer : 5-8840-2137-0 (J-38194)

Note: Do not strike the inner cam gear teeth with the plastic hammer.

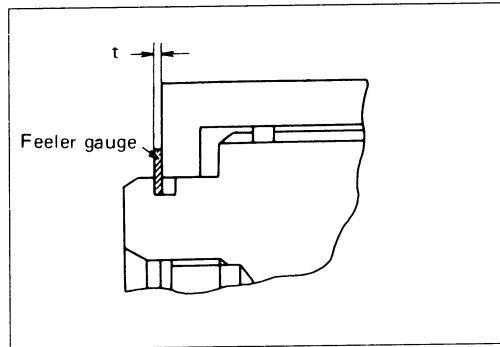


Shim Selection

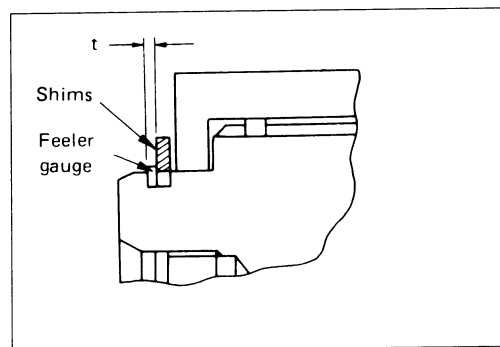
- (1) Lower vehicle from hoist.
- (2) Support lower link with floor jack, placing axle in normal horizontal position.



- (3) Install special tool 5-8840-2126-0 to axle shaft by 5-8840-2125-0 until it comes into contact with the lock washer.

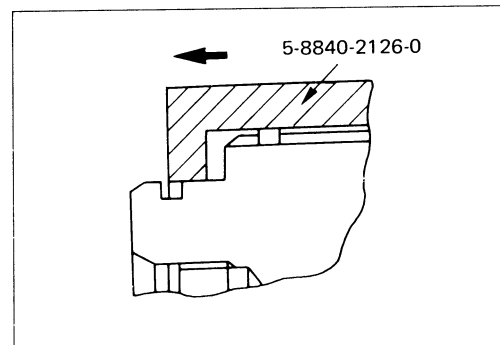


- (4) Using feeler gauge, measure clearance "t" between the special tool and the snap ring groove of the axle shaft.

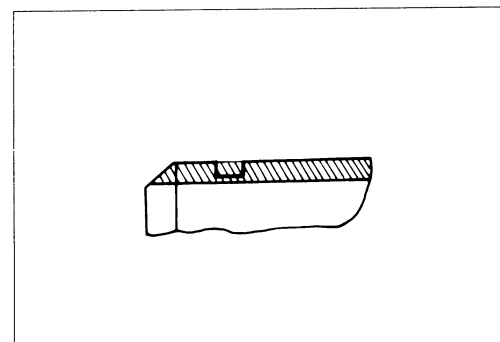


- (5) If clearance "t" is larger than snap ring groove, shims must be installed select shims so that clearance "t" is 0 to 0.1 mm (0 to 0.0039 in).

Thickness shims; 0.2, 0.3, 0.5, 1.0 mm



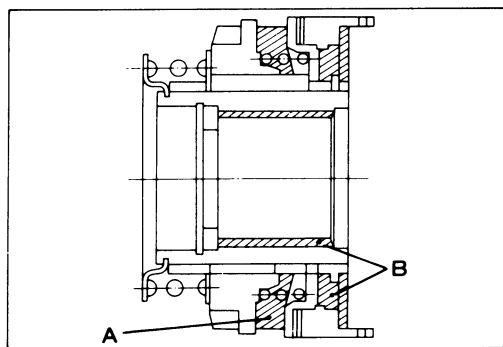
- (6) Remove special tool 5-8840-2126-0, leaving the inner cam in position.



10. Drive Clutch Assembly

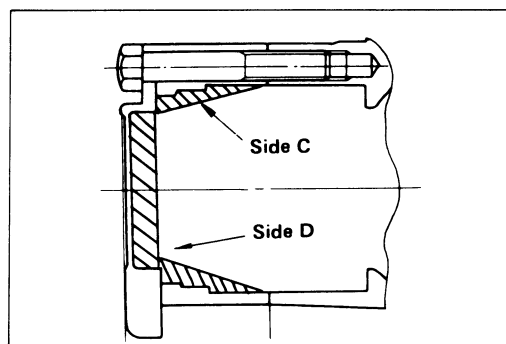
Apply multipurpose grease or hub bearing grease to the following portions.

- (1) Axle shaft splines



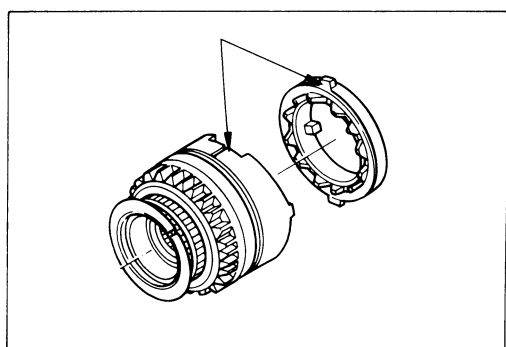
- "A" groove and "B" portion

	g(oz)
"A" Groove	7 (0.25)
"B" portion	3 (0.11)

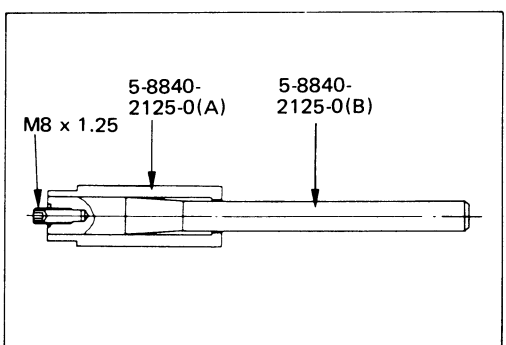


- "C" circumference and "D" portion

	g(oz)
"C" circumference	8 (0.29)
"D" portion	4 (0.15)



- (2) Align the cut part of the drive clutch assembly with the protudent part of inner cam.
- (3) Engage the cam teeth of the drive clutch assembly to that of the inner cam by turning the axle shaft.



11. Snap Ring and Shims

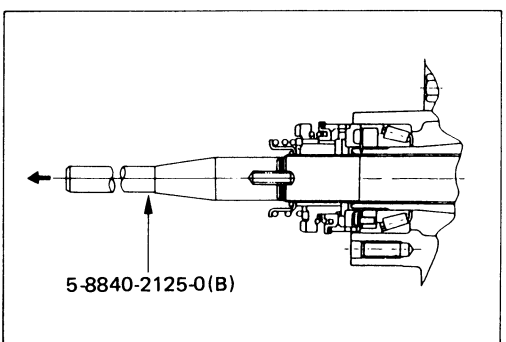
- (1) Install shims (selected above) to axle by hand.

Note:

Always use a new snap ring.

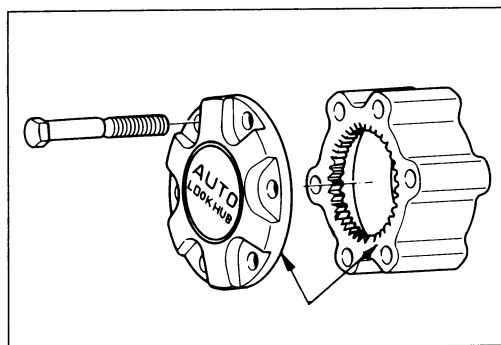
- (2) Install special tool 5-8840-2125-0 (B) to axle.
- (3) Install snap ring to tool.
- (4) Install tool driver 5-8840-2125-0 (A).
- (5) Pull out the axle shaft fully by pulling the tool 5-8840-2125-0 (B) and install snap ring to axle by pushing on tool driver 5-8840-2125-0 (A).
- (6) Remove tool from axle.

Snap ring installer : 5-8840-2125-0
(J-36835)



**Caution**

After installation of the shims and the snap ring, check the fitting condition of the snap ring.

**12. Housing Assembly**

- (1) Apply Loctite 515 or the equivalent to the flange surface of the housing assembly.
- (2) Make sure that the housing assembly turns smoothly. If it turns smoothly, the spacer selected above is correct.



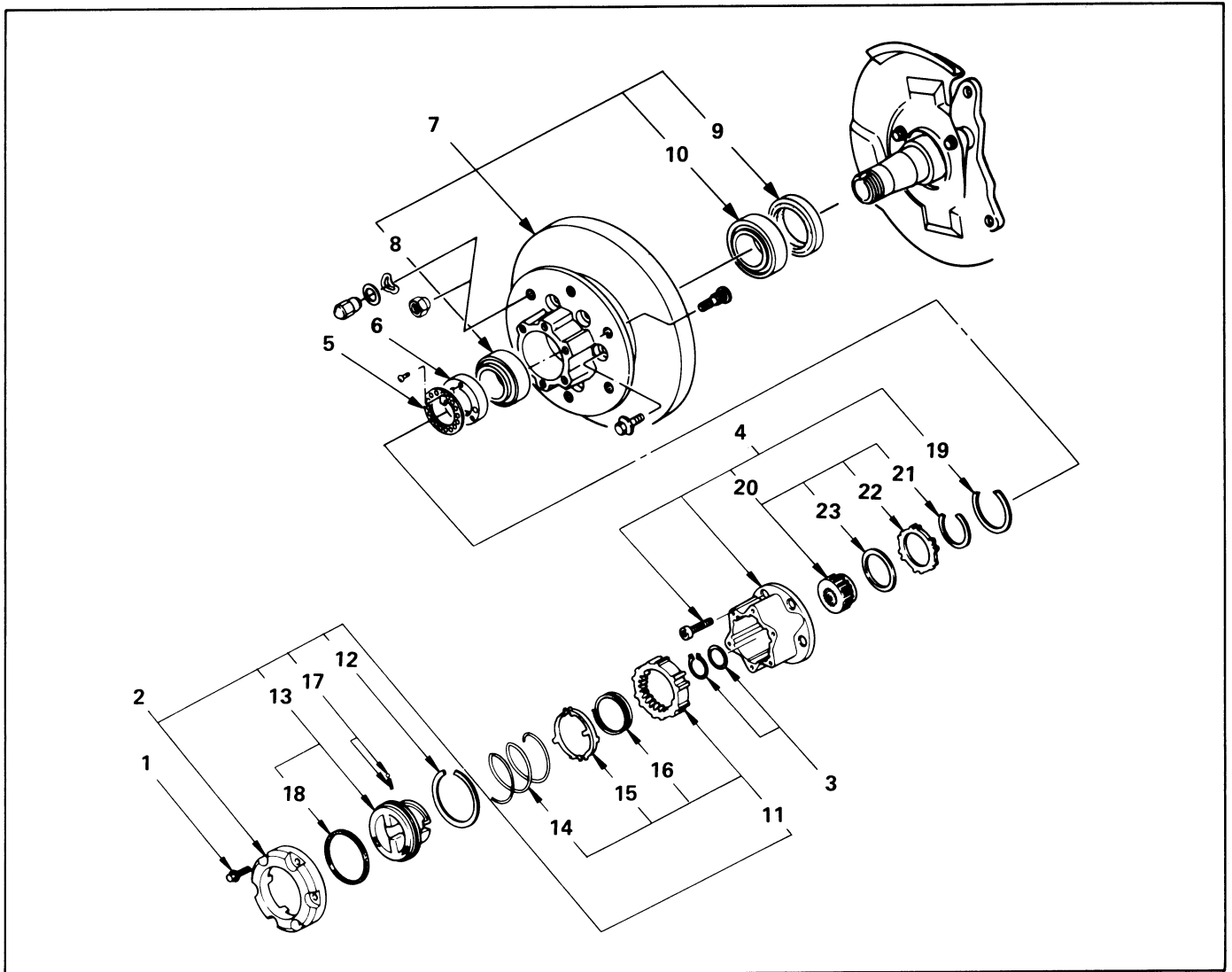
- (3) Bolt tightening torque:

Torque	kg·m(lb.ft/N·m)
6 ± 0.5 (43.4 $\pm$ 3.6/58.9 $\pm$ 5)	

FRONT HUB AND DISC (Manual Locking Hub)

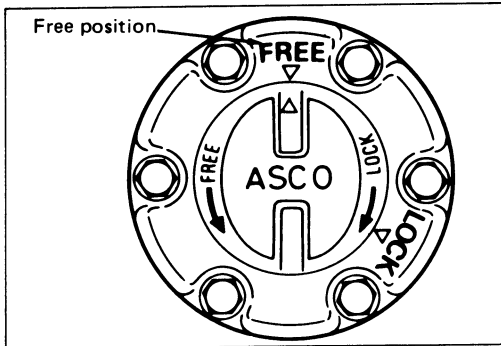


DISASSEMBLY



Disassembly Steps

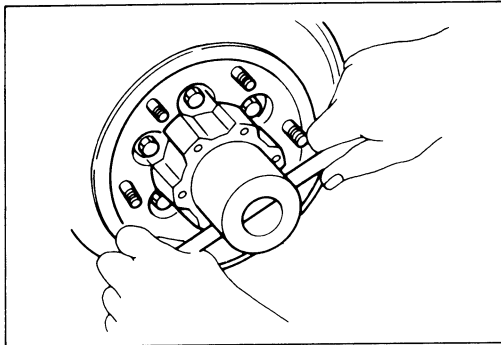
- | | |
|----------------------------|----------------------------|
| ▲ 1. Bolt | 12. Snap ring |
| 2. Housing assembly | 13. Knob |
| 3. Snap ring and shims | 14. Compression spring |
| 4. Body assembly | 15. Follower |
| 5. Lock washer | ▲ 16. Retaining spring |
| ▲ 6. Hub nut | 17. Detent ball and spring |
| ▲ 7. Hub and disc assembly | 18. X-ring |
| 8. Outer bearing | 19. Snap ring |
| 9. Oil seal | 20. Inner assembly |
| 10. Inner bearing | 21. Snap ring |
| ▲ 11. Clutch assembly | 22. Ring |
| | 23. Spacer |



Important Operations

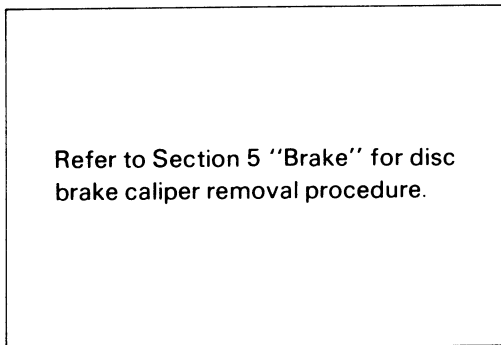
1. Bolt

Before removal, shift transfer lever into "2H" position and set free wheeling hub knob into "FREE" position.



6. Hub Nut

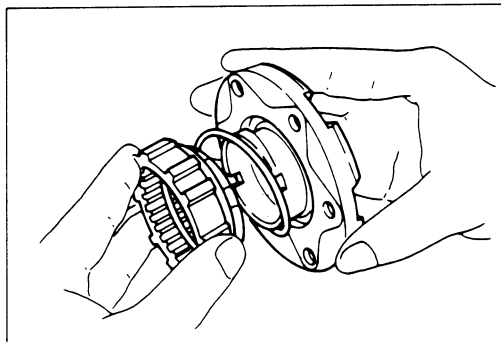
Wrench : 5-8840-2117-0
(J-36827)



Refer to Section 5 "Brake" for disc brake caliper removal procedure.

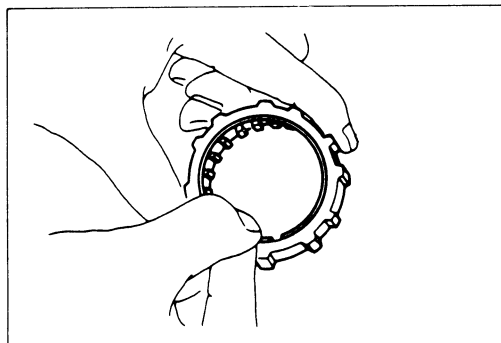
7. Hub and Disc Assembly

Before disassembly, remove the disc brake caliper assembly and hang it on the frame with wires.



11. Clutch Assembly

While pushing follower knob, turn clutch assembly clockwise and then remove clutch assembly from knob.



16. Retaining Spring

Remove retaining spring from clutch assembly by turning it counterclockwise.



INSPECTION AND REPAIR

Make necessary correction or parts replacement if wear, damage or any other abnormal conditions are found through inspection.

For inspection and servicing of disc caliper, and relative parts, refer to Section 05 “Service Brakes”.

- Hub
- Hub bearing, oil seal
- Knuckle spindle
- Disc
- Caliper
- Free wheeling hub parts (Option)
- Clutch, knob, follower, inner, ring and spring

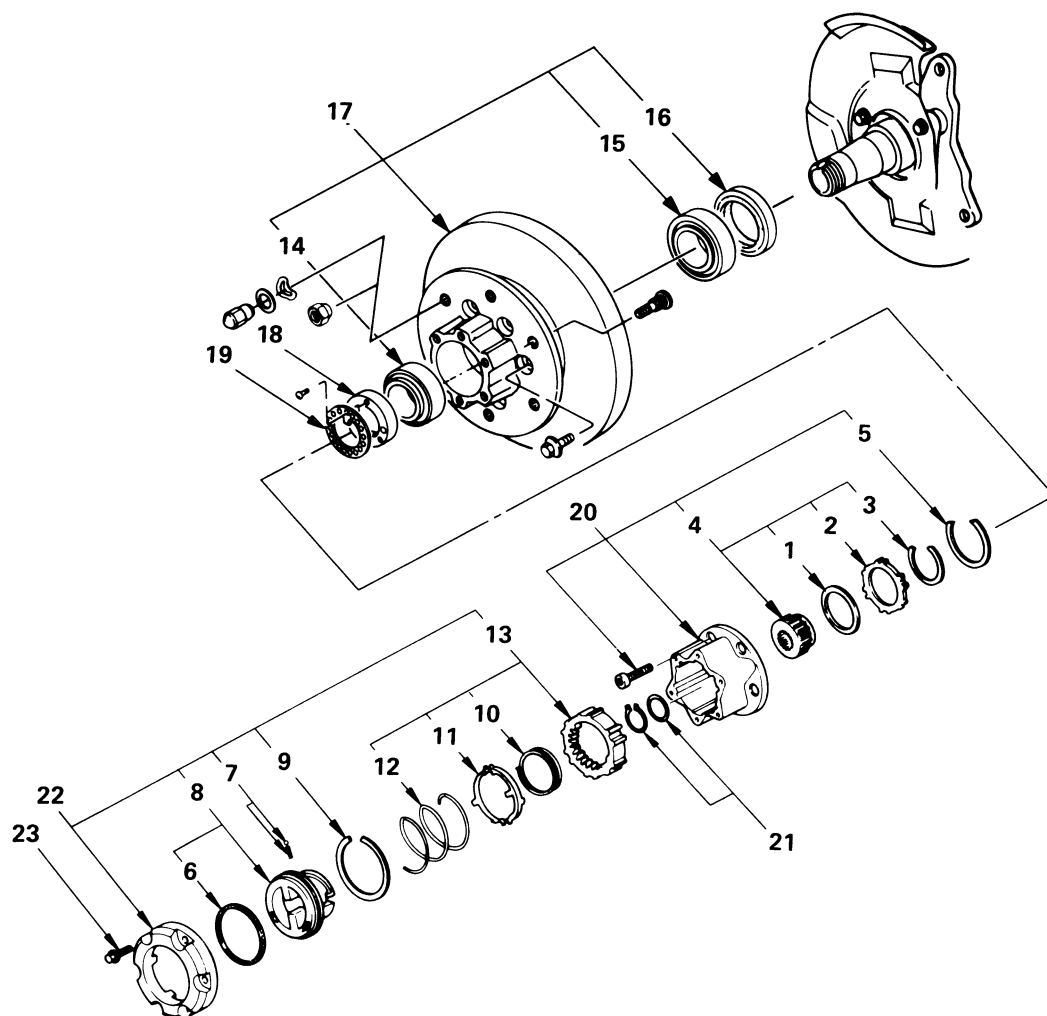


Visual Check

Inspect the following parts for wear, damage or other abnormal conditions.

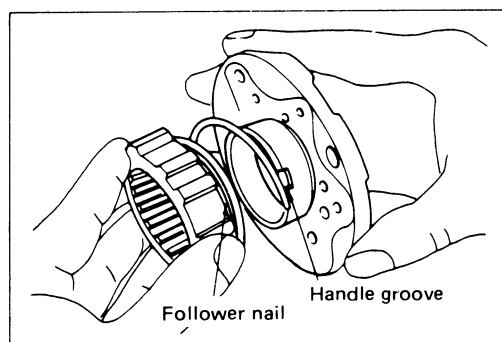
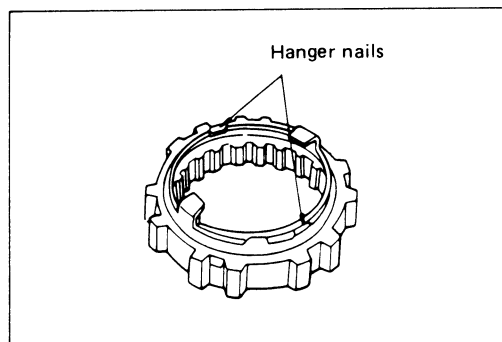
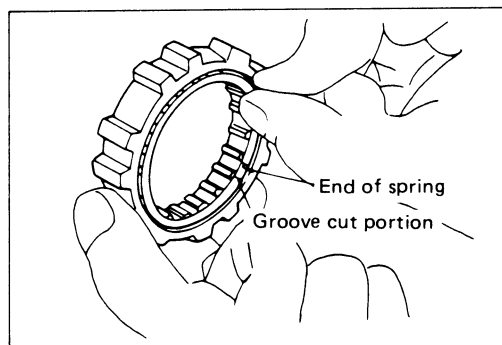
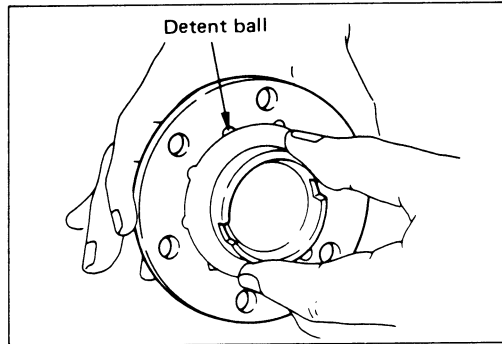
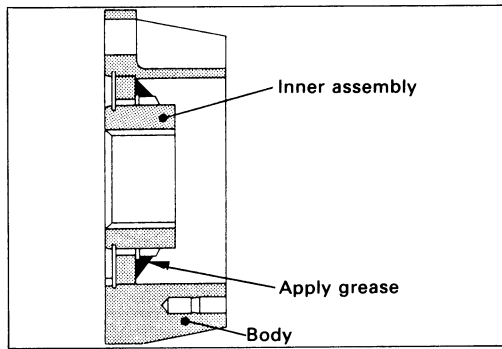


REASSEMBLY



Reassembly Steps

- | | |
|-----------------------------|-----------------------------|
| ▲ 1. Spacer | ▲ 13. Clutch assembly |
| ▲ 2. Ring | ▲ 14. Outer bearing |
| ▲ 3. Snap ring | ▲ 15. Inner bearing |
| ▲ 4. Inner assembly | ▲ 16. Oil seal |
| ▲ 5. Snap ring | ▲ 17. Hub and disc assembly |
| ▲ 6. X-ring | ▲ 18. Hub nut |
| ▲ 7. Detent ball and spring | ▲ 19. Lock washer |
| ▲ 8. Knob | ▲ 20. Body assembly |
| ▲ 9. Snap ring | ▲ 21. Snap ring and shims |
| ▲ 10. Retaining spring | ▲ 22. Cover assembly |
| ▲ 11. Follower | ▲ 23. Bolt |
| ▲ 12. Compression spring | |



Important Operations



1. Spacer

Apply grease to both faces of spacer.



4. Inner Assembly

Apply grease wheel bearing to inside face of ring.

g(oz)	
Amount of grease	3 (0.10)



8. Knob

- (1) Apply grease wheel bearing to outer circumference of knob and inner circumference of cover.
- (2) Align detent ball to either groove of cover.



9. Snap Ring

Turn the smoother face to knob side.



10. Retaining Spring

Align the end of spring to the end of cut portion of clutch spring groove.



11. Follower

Install follower to clutch so that follower nail will come closer to the bent portion of retaining spring by aligning follower stopper nail to outer teeth of clutch. Then, hook retaining spring onto upper portion of hanger nails of follower.

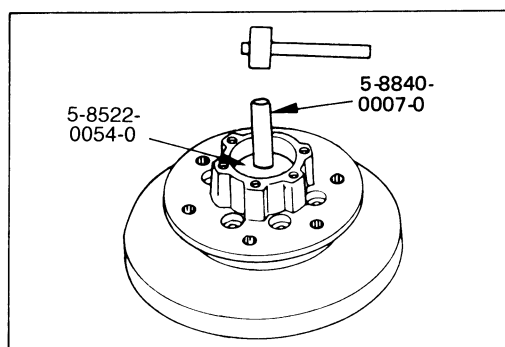
12. Compression Spring.

Turn the smaller diameter side to follower.



13. Clutch Assembly

Align follower nail to handle groove, and then assemble clutch with knob by pushing and turning clutch counterclockwise to knob.



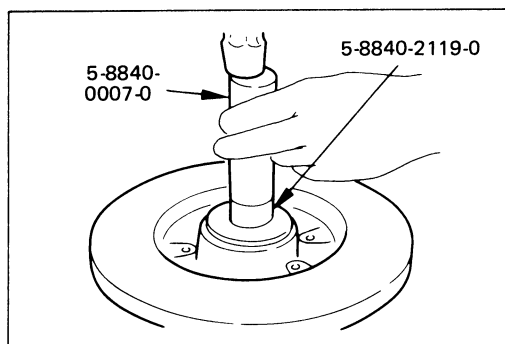
14. Outer Bearing

Outer race ; outer bearing
Install the outer race by driving it into the hub.

Installer : 5-8522-0054-0

(J-29015)

Grip : 5-8840-0007-0
(J-8092)



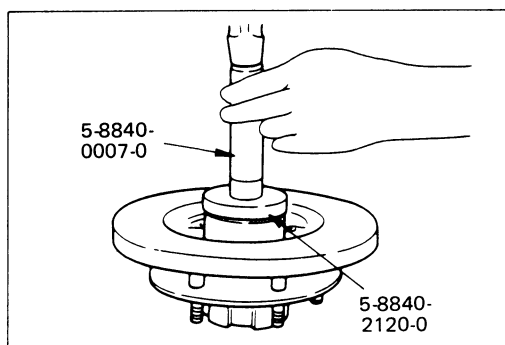
15. Inner Bearing

Outer race ; inner bearing
Install the outer race by driving it into the hub.

Installer : 5-8840-2119-0

(J-36829)

Grip : 5-8840-0007-0
(J-8092)



16. Oil Seal

Installer : 5-8840-2120-0

(J-36830)



Grip : 5-8840-0007-0
(J-8092)

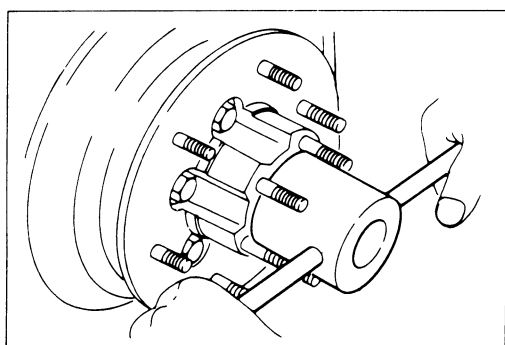
Apply grease (Besco L-2 or equivalent) to the lip portion.



17. Hub and Disc Assembly

- (1) Apply grease in the hub.
- (2) Apply grease (Besco L-2 or equivalent) to the outer and inner bearing.

	g(oz)
Hub	35 (1.23)
Outer bearing	10 (0.35)
Inner bearing	15 (0.53)

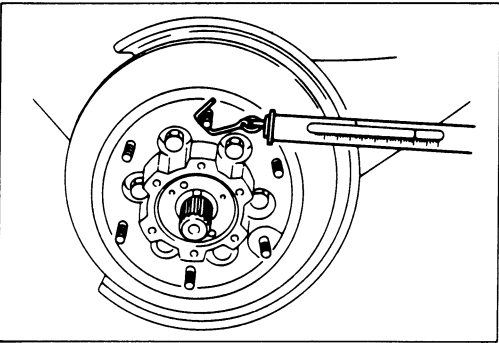


18. Hub Nut

- (1) Turn the place where there is a chamfer in the tapped hole to the outer side, and attach the nut.

Wrench : 5-8840-2117-0

(J-36827)



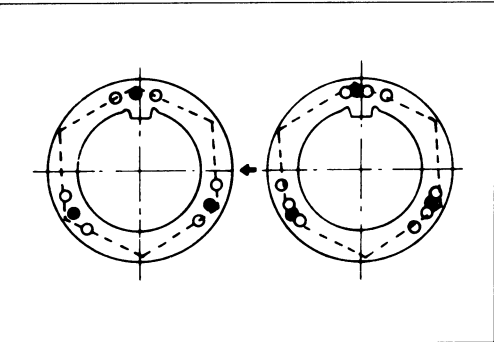
Preload Adjustment

Tighten the hub nut at 3 kg·m (21.716 lb.ft/29.4 N·m), then loosen the nut to the full.

Tighten the hub nut at the value given below, using a spring scale on the wheel pin.

Bearing Preload		kg(lb)
New bearing and New oil seal	2	— 2.5 (4.4—5.5)
Used bearing and New oil seal	1.2—1.8	(2.6—4.0)

If the measured bearing preload is outside the specifications, adjust it by loosening or tightening the bearing nut.

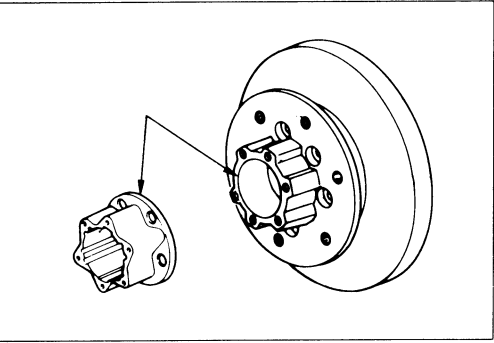


19. Lock Washer

Turn the side with larger diameter of the tapered bore to the vehicle outer side, and attach the washer.

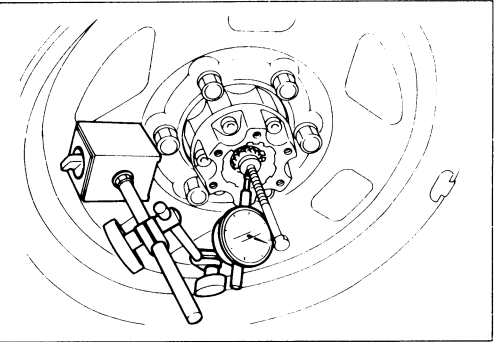
If the bolt holes in the lock plate are not aligned with the corresponding holes in the nut, reverse the lock plate.

If the bolt holes are still out of alignment, turn in the nut just enough to obtain alignment. Screw is to be fastened tightly so its head may come lower than the surface of the washer.



20. Body Assembly

Apply adhesive (Loctite 515 or equivalent) to the both joining faces.

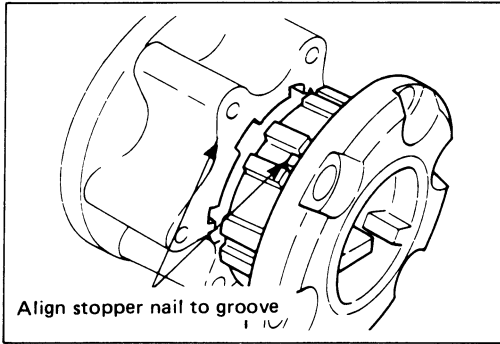


21. Snap Ring and Shims

Adjust the clearance between the free wheeling hub body and the snap ring.

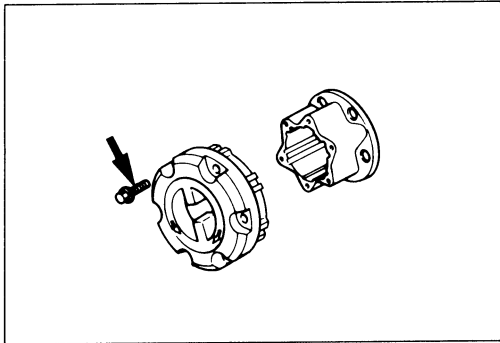
Clearance	mm(in)
0 — 0.3	(0 — 0.01)

Adjust Shims Available	mm(in)
0, 2, 0.3, 0.5, 1.0	(0.008, 0.011, 0.020, 0.039)



22. Cover Assembly

Align stopper nails to grooves of body.

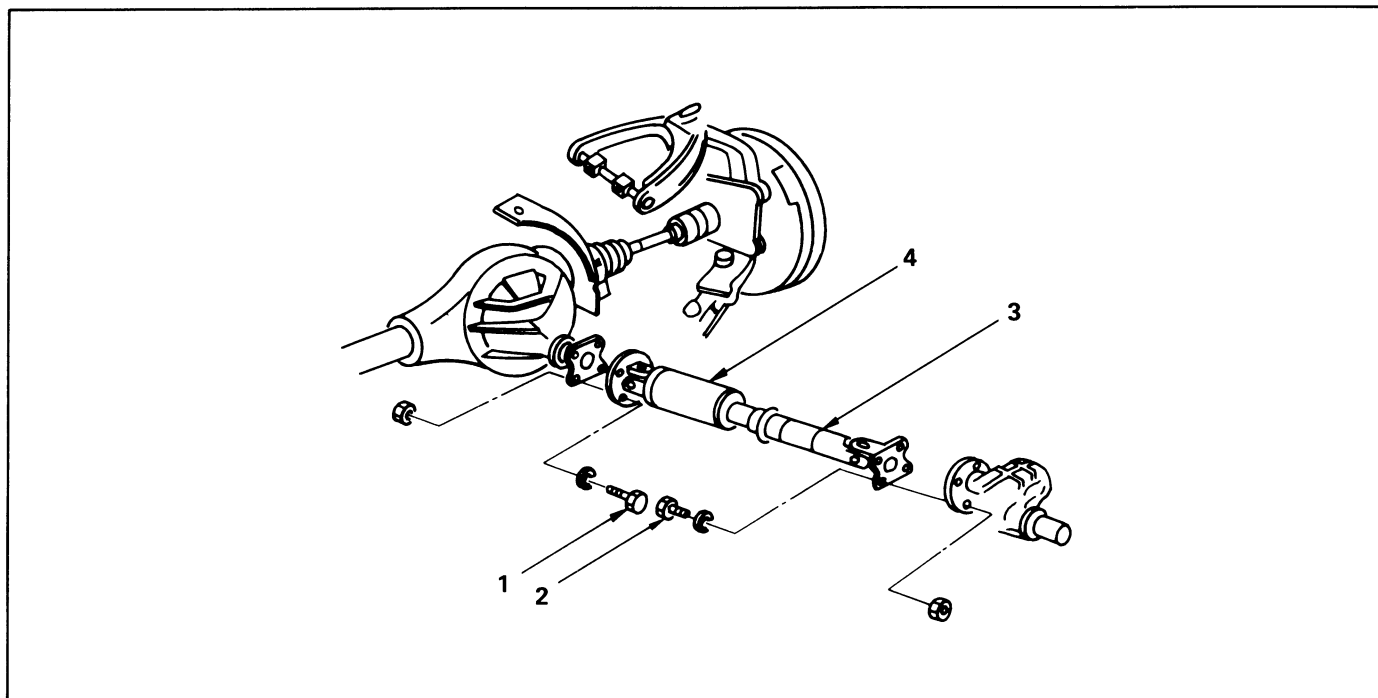


23. Bolt

Torque	kg·m(lb.ft/N·m)
1.2 ± 0.2 ($8.7 \pm 1.4/11.8 \pm 2.0$)	

FRONT PROPELLER SHAFT

REMOVAL AND INSTALLATION



Since the propeller shaft assembly is carefully balanced, a setting mark should be applied to the flange before removal to indicate correct position.

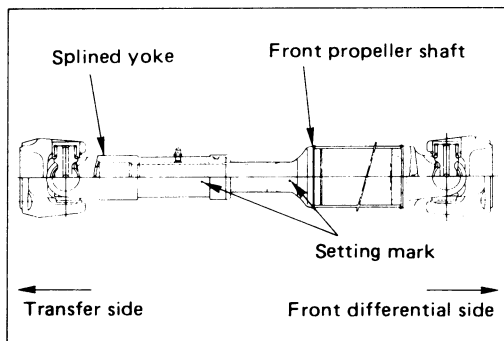
Install the parts by aligning the setting marks made at removal.

Removal Steps

1. Bolt ; differential side
2. Bolt ; transfer side
3. Propeller shaft assembly ; rear side
4. Propeller shaft assembly ; front side

Installation Steps

- ▲ 4. Propeller shaft assembly ; front side
- ▲ 3. Propeller shaft assembly ; rear side
- ▲ 2. Bolt ; transfer side
- ▲ 1. Bolt ; differential side



Important Operation — Installation



3. Propeller Shaft Assembly ; Rear Side

Align the indexing marks (about 3 mm dia. punched mark) on the propeller shaft end and the splined yoke.



2. Bolt ; Transfer Side

Torque		kg·m(lb.ft/N·m)
2.6L Engine	6.4 ±0.4	(46.3 ±2.9/62.8 ±3.9)

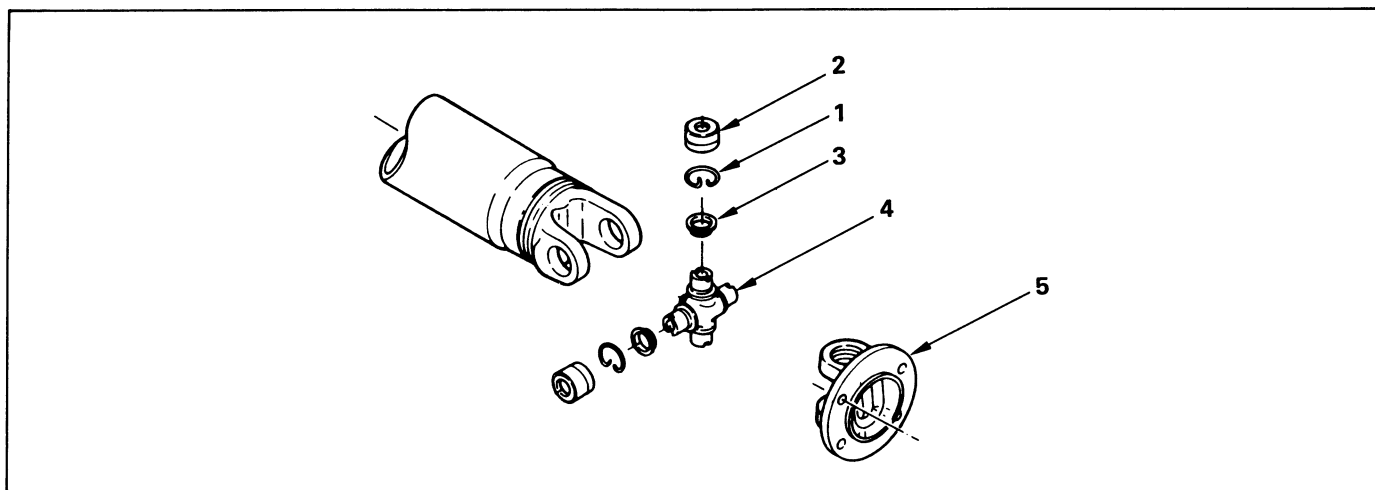


1. Bolt ; Differential Side

Torque		kg·m(lb.ft/N·m)
2.6L Engine	6.4 ±0.4	(46.3 ±2.9/62.8 ±3.9)

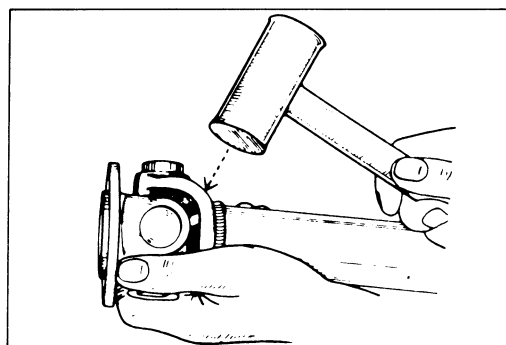


DISASSEMBLY



Disassembly Steps

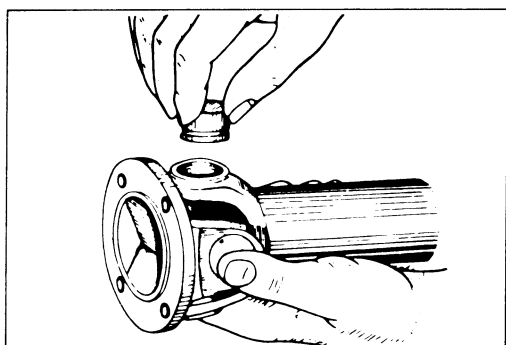
1. Snap ring
- ▲ 2. Needle roller bearing
3. Seal
4. Spider
5. Flange yoke



Important Operation

2. Needle Roller Bearing

- (1) Tap out the bearing by striking the shoulder of the yoke using a mallet or a copper hammer. Remove the needle roller bearing in position by tapping lightly on the spider. Remove the remaining bearings in the similar manner.
- (2) As the yoke is tapped, the needle roller bearing comes out gradually, permitting easy removal with hand.





INSPECTION AND REPAIR

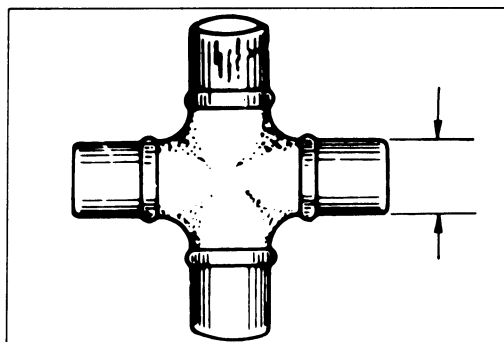
Make all necessary adjustments, repairs, and part replacements if wear, damage, or other problems are discovered during inspection.

Spider
Needle roller bearing
Yoke
Flange
Center bearing
Cushioning rubber
Bracket



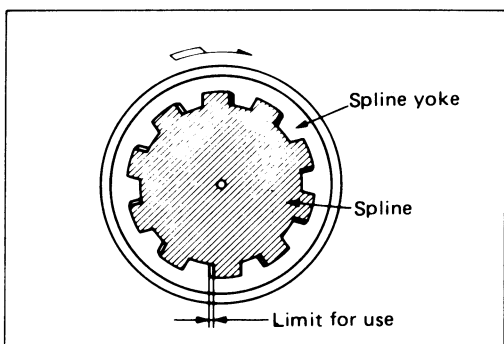
Visual Check

Inspect following parts for wear, damage, or other abnormal conditions.



Outside Diameter of Spider Pins

mm(in)	
Standard	Limit
17.000 (0.669)	16.90 (0.665)



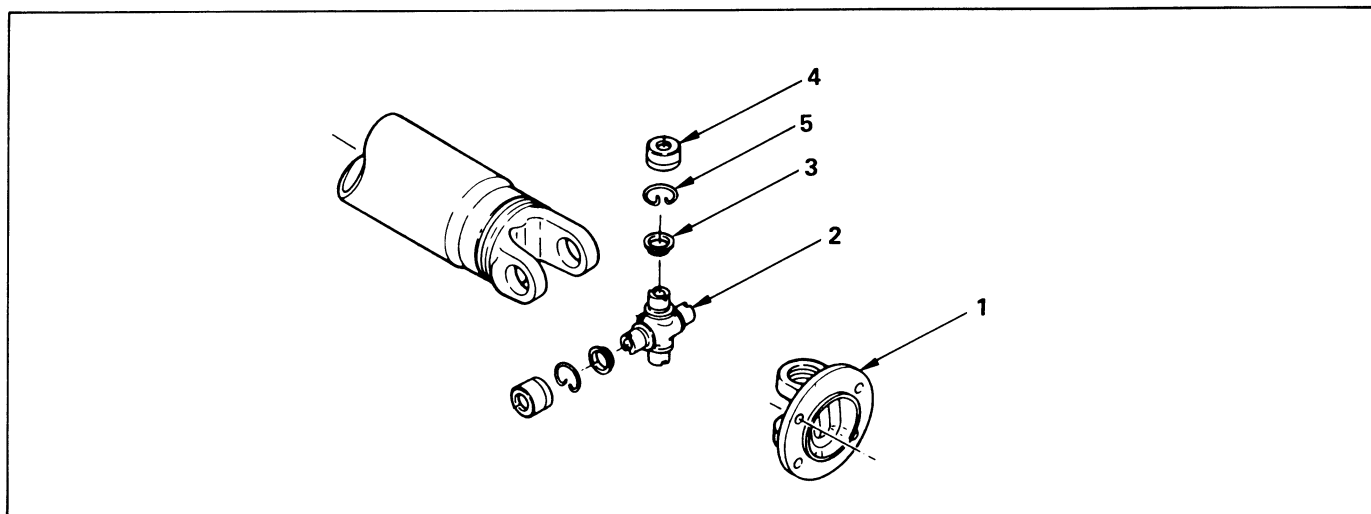
Play in Splines in Normal Direction of Rotation

Check the amount of play in the sleeve yoke and propeller shaft splines in the direction of rotation, using a pointed feeler gauge.

mm(in)	
Standard	Limit
0.074 — 0.156 (0.003 — 0.006)	0.3 (0.012)



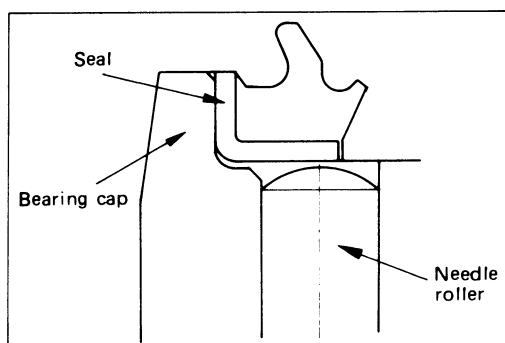
REASSEMBLY



Reassembly Steps

1. Flange yoke
2. Spider
- ▲ 3. Seal

- ▲ 4. Needle roller bearing
- ▲ 5. Snap ring



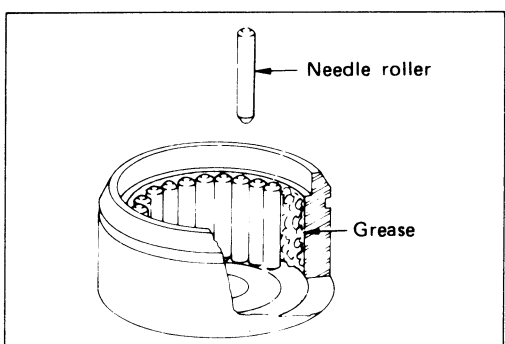
Important Operations



3. Seal

Discard the used seal and install a new one.

Push the seal in until its outer surface is flush against the bearing cap surface.

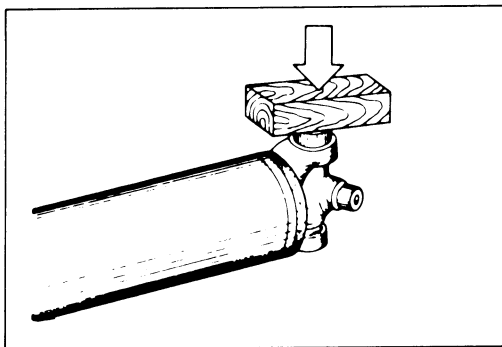


4. Needle Roller Bearing

- (1) Apply a molybdenum-disulfide grease or a multipurpose type grease NLG1 No. 2 to the bearing cap inner surface.

Install the needle rollers.

Amount of grease required	g(oz)
Approx. 1.2 (0.042)	



- (2) Attach the spider to the yoke and then insert the needle roller bearing cap into the hole by using a wood block and a hammer or a press.



5. Snap Ring

When the bearing cap is in position, select and attach a snap ring of suitable thickness so that the end play of the spider pin is held within 0.1 mm (0.004 in.).

		mm(in)
Snap ring thickness		Identify color
1.5	(0.059)	Blue
1.545	(0.061)	White
1.59	(0.063)	Yellow
1.635	(0.064)	Green
1.68	(0.066)	Not color

TROUBLESHOOTING

Refer to this Section to quickly diagnose and repair front axle problems. Each troubleshooting chart has three headings arranged from left to right.

(1) Checkpoint (2) Trouble Cause (3) Countermeasure

This Section is divided into ten sub-sections:

4 x 2 Model

1. Wanders and pulls
2. Front wheel shimmy

4 x 4 Model

1. Oil leak at front axle
2. Oil leak at pinion shaft
3. Noises in front axle drive shaft joint
4. Noises in front axle
5. Wanders and pulls
6. Front wheel shimmy
7. Automatic locking free wheel hub
 - 1) Does not lock or locks only on one side
 - 2) Does not freewheel or freewheels only to one side
 - 3) Noises in automatic locking free wheel hub

Propeller Shaft

1. Noise
2. Vibration

4 x 2 MODEL

1. WANDERS AND PULLS

Checkpoint		Trouble Cause	Countermeasure
Wheel bearing preload	NG	Too tight	Adjust the wheel bearing preload
OK			
Front alignment	NG	Incorrect	Adjust the front alignment
OK			
Steering linkage	NG	Loose or worn	Tighten or replace
OK			
Steering gear out of adjustment	NG	Incorrect or broken	Adjust the steering gear out of adjustment or replace
OK			
Tire	NG	Worn or improperly inflated	Replace or adjust the inflation
OK			
Suspension	NG	Front or rear suspension parts loose or broken	Tighten or replace

2. FRONT WHEEL SHIMMY

Checkpoint		Trouble Cause	Countermeasure
Wheel bearing	NG	Worn or improperly adjusted	Adjust or replace
OK			
Shimmy damper	NG	Worn	Replace the shimmy damper
OK			
Front alignment	NG	Incorrect	Adjust the front alignment
OK			
Ball joint or bush	NG	Worn	Replace the ball joint or bush
OK			
Steering linkage	NG	Loose or worn	Tighten or replace
OK			
Steering gear out of adjustment	NG	Incorrect or broken	Tighten or replace
OK			
Tire	NG	Worn or improperly inflated	Replace or adjust the inflation
OK			
Shock absorber	NG	Worn	Replace the shock absorber

4 x 4 MODEL

1. OIL LEAK AT FRONT AXLE

Checkpoint		Trouble Cause	Countermeasure
Oil seal	NG	Worn or defective oil seal	Replace the oil seal
OK			
Front axle housing	NG	Cracked	Repair or replace

2. OIL LEAK AT PINION SHAFT

Gear oil level	NG	Too much gear oil	Correct the oil level
OK			
Oil seal	NG	Worn or defective	Replace the oil seal
OK			
Pinion flange	NG	Loose or damaged	Tighten or replace

3. NOISES IN FRONT AXLE DRIVE SHAFT JOINT

Drive shaft joints and bellows (B.J and DOJ)	NG	Broken or worn	Replace the drive shaft joints and bellows
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4. NOISES IN FRONT AXLE

Checkpoint		Trouble Cause	Countermeasure
Oil level	NG	Insufficient gear oil	Replenish the gear oil
	NG	Wrong or poor grade gear oil	Replace the gear oil
OK			
Drive pinion to ring gear backlash	NG	Too much or too little backlash	Adjust the backlash
OK			
Ring gear, pinion gear or side gear	NG	Worn or chipped	Replace the ring gear pinion gear or side gear
OK			
Pinion shaft bearing	NG	Worn	Replace the pinion shaft bearing
OK			
Wheel bearing	NG	Worn	Replace the wheel bearing
OK			
Differential bearing	NG	Loose or worn	Tighten or replace

5. WANDERS AND PULLS

Checkpoint		Trouble Cause	Countermeasure
Wheel bearing preload	NG	Too tight	Adjust the wheel bearing preload
OK			
Front alignment	NG	Incorrect	Adjust the front alignment
OK			
Steering linkage	NG	Loose or worn	Tighten or replace
OK			
Steering gear out of adjustment	NG	Incorrect or broken	Adjust the steering gear out of adjustment or replace
OK			
Tire	NG	Worn or improperly inflated	Replace or adjust the inflation
OK			
Suspension	NG	Front or rear suspension parts loose or broken	Tighten or replace

6. FRONT WHEEL SHIMMY

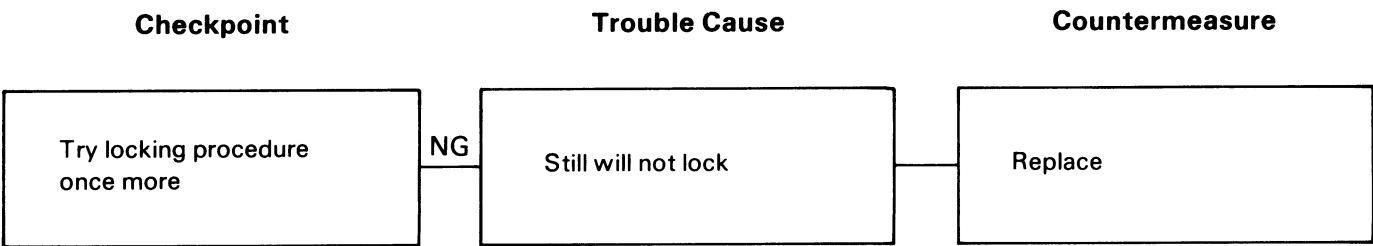
Checkpoint		Trouble Cause	Countermeasure
Wheel bearing	NG	Worn or improperly adjusted	Adjust or replace
	OK		
Shimmy damper	NG	Worn	Replace the shimmy damper
	OK		
Front alignment	NG	Incorrect	Adjust the front alignment
	OK		
Ball joint or bush	NG	Worn	Replace the ball joint or bush
	OK		
Steering linkage	NG	Loose or worn	Tighten or replace
	OK		
Steering gear out of adjustment	NG	Incorrect or broken	Tighten or replace
	OK		
Tire	NG	Worn or improperly inflated	Replace or adjust the inflation
	OK		
Shock absorber	NG	Worn	Replace the shock absorber

7. AUTOMATIC LOCKING FREE WHEEL HUB

(1) DOES NOT LOCK OR LOCKS ONLY ON ONE SIDE

Note:

1. Stop the vehicle
2. Shift the transfer lever to 4H or 4L
3. Now start driving the vehicle and the hubs will lock automatically.
4. Once the hubs are locked, they will remain locked, even if the transfer lever is shifted from 4L or 4H into 2H, as long as the vehicle travels in a same direction.

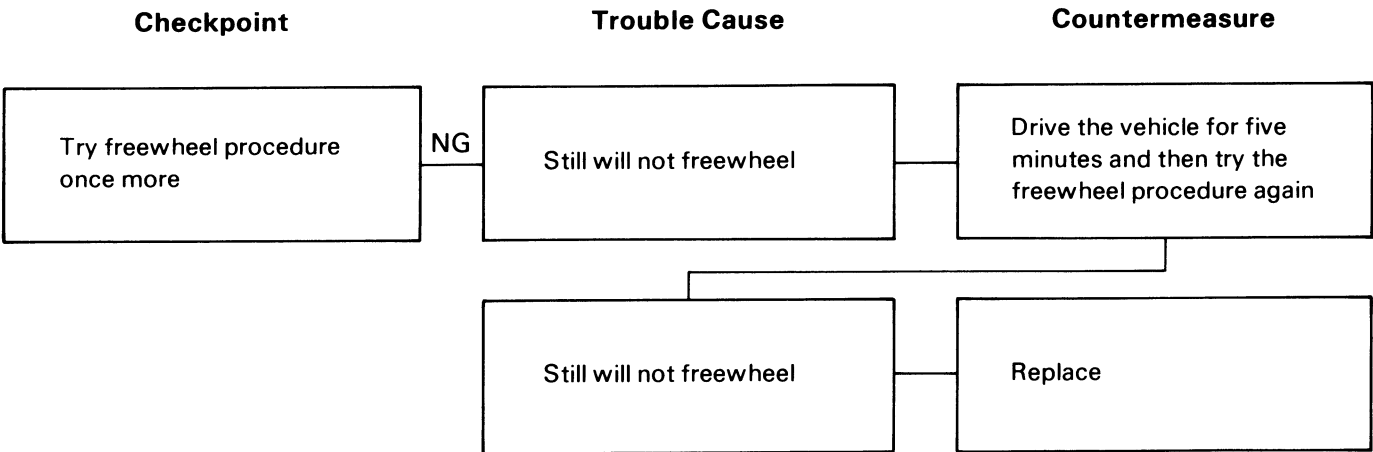


(2) DOES NOT FREEWHEEL OR FREEWHEELS ONLY TO ONE SIDE

Note:

Freewheel operation

1. Stop the vehicle
2. Shift the transfer lever to 2H
3. Back up the vehicle for three or four feet; this will disengage the front differential.



(3) NOISES IN AUTOMATIC LOCKING FREE WHEEL HUB

Note:
Some noise at the time of shifting from "LOCK" to "FREE" or vice versa is normal. It is not a sign of trouble.

Checkpoint		Trouble Cause	Countermeasure
Holdout ring axial play	NG	Excessive axial play	Connect the axial play or replace the driven clutch
OK			
Operating of automatic locking free wheel hub	NG	One side operating	Replace the driven clutch
OK			
Front axle or joint	NG	Damaged or loose	Replace or tighten

PROPELLER SHAFT

1. NOISE

Checkpoint		Trouble Cause	Countermeasure
Yoke spline	NG	Damaged or worn	Replace
OK			
Spider bearing	NG	Worn or jammed	Replace

2. VIBRATION

Shaft runout	NG	Incorrect	Replace
OK			
Shaft balance	NG	Unbalance	Adjust
OK			
Transmission rear housing bushing, transfer case housing bushing	NG	Worn	Replace
OK			
Yoke spline	NG	Jammed	Replace