Driveshaft and Axle

GENERAL

GENERAL EIUC0010

PROPELLER SHAFT

TOTAL LENGTH (FRONT/REAR)

Classification		Specification (mm/in.)			
		T2 (T26)	TC (D4BF)	4D56TCI (D4BH)	SIRIUS II (2.4L)
Short wheel base (No.6)	M/T	1709 (927/782) 67.3 (36.5/30.8)	1709 (927/782) 63.3 (36.5/30.8)	1653 (888/765) 65.1 (35/30.2)	1726 (944/782) 68 (37.2/30.8)
	A/T	1536 (754/782) 60.5 (29.7/30.8)	1536 (754/782) 60.5 (29.7/30.8)	1536 (754/782) 60.5 (29.7/30.8)	1585 (803/782) 62.4 (31.6/30.8)
Short wheel base (No.7)	M/T	1692 (927/765) 66.6 (36.5/30.2)	-	1653 (888/765) 65.1 (35/30.2)	-
	A/T	1519 (754/765) 59.8 (29.7/30.2)	-	1519 (754/765) 59.8 (29.7/30.2)	-
Long wheel base (No.6)	M/T	1980 (927/1053) 78 (36.5/41.5)	1980 (927/1053) 78 (36.5/41.5)	1919 (888/1031) 75.6 (35/40.6)	1997 (944/1053) 78.6 (39.1/41.5)
	A/T	1807 (754/1053) 71.1 (29.7/41.51)	1807 (754/1053) 71.1 (29.7/41.51)	1807 (754/1053) 71.1 (29.7/41.51)	1859 (803/1053) 73.2 (31.6/41.5)
Long wheel base (No.7)	M/T	1958 (927/1031) 77.1 (365/40.3)	-	1919 (888/1031) 75.6 (35/40.6)	1975 (944/1031) 79.8 (39.1/40.6)
	A/T	1785 (754/1031) 70.3 (29.7/40.6)	-	1785 (754/1031) 70.3 (29.7/40.6)	1834 (803/1031) 72.2 (31.6/40.6)
4WD (No.7)	M/T	-	Front: 401 (15.8) 277 (552.5/724.5) 50.3 (21.8/28.5)	Front: 439 (17.3) 1242 (482/706) 48.9 (19/27.8)	-
	A/T	-	-	Front: 465 (18.3) 1216 (456/760) 47.9 (18/30)	-
Run-out		0.5 mm (0.02 in.) or less			

FRONT AXLE AND DRIVESHAFT

Classification	Specification	
	2WD	4WD
Front axle hub bearing type	Taper roller bearing	←
Driveshaft joint type - Outer - Inner	—	A.C G.I
Front differential - Reduction gear type - Reduction gear ratio	— —	Hypoid 4.625 (No.7) : 4D56TCI 4.875 (No.7) : T/C, 2.4 MPI

REAR AXLE

Classification		Specification
Axle housing type		Banjo type
Differential		
- Reduction gear type		Hypoid gear
- Reduction gear ratio		
	2WD	**3.909 (No.6)** - (Wagon, short wheel base, 4D56T/C) - (Wagon, short wheel base, 4D56TCI, A/T) - (Wagon, long wheel base, 4D56T/C) - (Wagon, long wheel base, 4D56TCI 7/9 persons) **4.222 (No.6)** - (Wagon, short wheel base, T-2 or 2.4 MPI) - (Wagon, long wheel base, T-2 or 2.4 MPI) - (Wagon, long wheel base, 4D56TCI, A/T, 12 persons) **3.909 (No.7)** - (Wagon, short wheel base, 4D56TCI, 9 persons) - (Wagon, long wheel base, 4D56TCI, 9 persons) - (VAN, 4D56TCI, 6 persons) **4.222 (No.7)** - (VAN, T-2 or 2.4 MPI) - (VAN, 4D56TCI, A/T, 3 persons)
	4WD	**4.625 (No.7)** - (Wagon, 4D56TCI) **4.875 (No.7)** - (Wagon, TC or 2.4 MPI)

LUBRICATIONS EIUC0020

Items	Specified lubricants	Quantity
Propeller shaft joint	ALVANIA EP Grade No.2	As required
Front driveshaft - A.C joint - G.I joint	 Century One Luber GKN	 185 ± 10 gr. 200 ± 10 gr.
Differential - Front	(Hipoid gear oil) - General and frigid zone : API GL-5 class (SAE 80W/90) - Severs heat zone : API GL-4 class (SAE 140)	Fill the reservoir to the plug hole.
- Rear	- General zone (-30°C - +30°C) : API GL-4 class (SAE 90) - Severs heat zone (+30°C MIN.) : API GL-4 class (SAE 140) - Severe frigid zone (-30°C MAX.) : API GL-5 class (SAE 80)	Fill the reservoir to the plug hole.
- With LSD	API GL-4 class (SAE 90), Mobile Korea infilrex 33 or equivalent	

TORQUE SPECIFICATIONS EIUC0030

Items	Nm	Kg·cm	lb·ft
Propeller shaft			
Yoke flange mounting nut (Front, Rear)	50 - 60	500 - 600	37 - 44
VL assembly to transfer flange mounting nut	30 - 40	300 - 400	23 - 29
Center bearing mounting self locking flange nut	40 - 50	400 -500	29 -37
Center bearing mounting bracket	70 - 95	700 - 950	-
Self locking nut to center yoke mounting lock nut (2WD)	230 - 250	2300 - 2500	168 - 183
Wheel nut - 2WD - 4WD	 150 - 200 120 - 140	 1500 - 2000 1200 - 1400	 111 - 148 88 - 103.6
Front/Rear steel band	19 - 28	190 - 280	14 - 21
Front hub to brake disc mounting	50 - 60	500 - 600	37 - 44
Upper arm ball joint to knuckle mounting	120 - 180	1200 - 1800	88 - 132
Lower arm ball joint to knuckle mounting	120 - 180	1200 - 1800	88 - 132
Knuckle to tie rod end mounting	35 - 45	350 - 450	26 - 33
Front shock absorber lower mounting	90 -105	900 - 1050	67 - 78
Driveshaft to inner shaft mounting	80 - 100	800 - 1000	59 - 74
Rear axle housing to bearing case	50 - 60	500 - 600	37 - 44
Oil filler plug	40 - 60	400 - 600	29 - 44
Oil drain plug	50 - 70	500 - 700	37 - 51
Differential self-locking nut	190 - 250	1900 - 2500	141 - 185
Free wheel hub mounting bolt	50 - 60	500 - 600	37 - 44

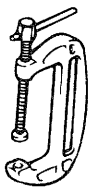
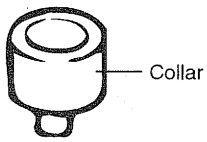
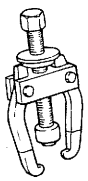
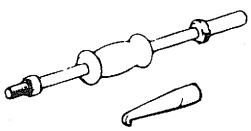
⚠ *CAUTION*

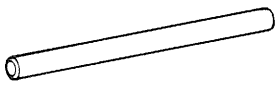
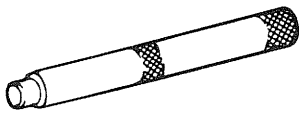
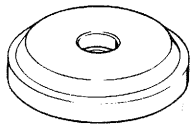
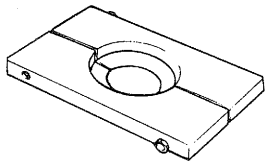
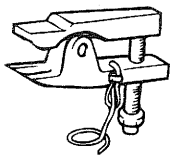
Replace self-locking nuts with new ones after removal.

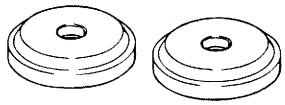
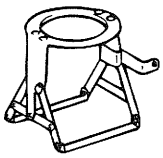
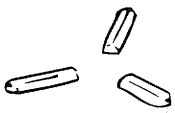
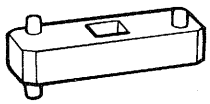
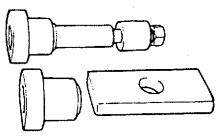
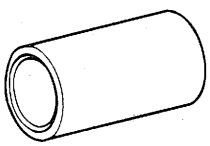
SEALANTS AND ADHESIVES EIUC0040

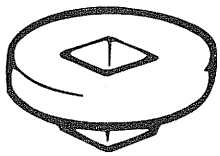
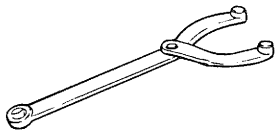
Items	Specified sealants and adhesives
Contact surface of the free wheel hub and hub	LOCKTITE #587 or equivalent
Differential cover installation surface (to gear carrier)	THREEBOND #1215 or equivalent
Contact surface of the rear axle housing and bearing case	LOCKTITE #587 or equivalent

SPECIAL TOOL EIUC0050

Tool (Number and Name)	Illustration	Use
09493-43000 Universal joint remover and installer	 D9343000	Removal and installation of the journal bearing (Use with 09432-43100)
09493-43100 Universal joint remover adapter	 D9343100	Removal and installation of the journal bearing (Use with 09452-43000)
09517-43001 Bearing and gear puller	 E1743001	• Removal of the center bearing • Removal of the differential side bearing
09526-11100 Sliding hammer	 AU52-04A	Removal of the oil seal

Tool (Number and Name)	Illustration	Use
09517-21400 Draft	 E1721400	• Removal of the rear hub bearing outer race • Removal of the front hub outer bearing outer race and inner bearing outer race
09500-21000 Bar	 E0021000	• Installation of the axle shaft bearing outer race • Installation of the drive pinion bearing outer race • Installation of the oil seal
09432-33400 Bearing race installer	 AU52-04F	
09527-4A000 Removing plate	 E274A000	Removal of the drive pinion rear bearing inner race
09568-34000 Ball joint puller	 E6834000	Disconnection of the tie rod
09532-31200 Oil seal installer	 E3212000	• Installation of the drive pinion outer race (Use with 09500-11000) • Installation of the front hub outer bearing outer race (Use with 09500-11000)

Tool (Number and Name)	Illustration	Use
09532-32000 Bearing installer	 E3232000	Installation of the drive pinion front bearing outer race
09517-43400 Working base	 E1743400	Support for the differential carrier
09517-43500 Adapter	 AU52-05B	
09521-43001 Side bearing adjust spanner	 AU52-05I	Adjustment of the side bearing nut
09500-43131 (NO. 6) 09500-4A000 (NO. 7) Pinion height gauge	 AU52-05D	Measurement of the drive pinion height
09500-4A100 (NO. 7) Pinion height gauge base	 E004A100	

Tool (Number and Name)	Illustration	Use
09532-11600 Preload socket	 E3211600	Measurement of the drive pinion starting torque (Use with torque wrench)
09517-21700 Eng yoke holder	 E1721700	Removal and installation of the companion flange

TROUBLESHOOTING EIUC0060

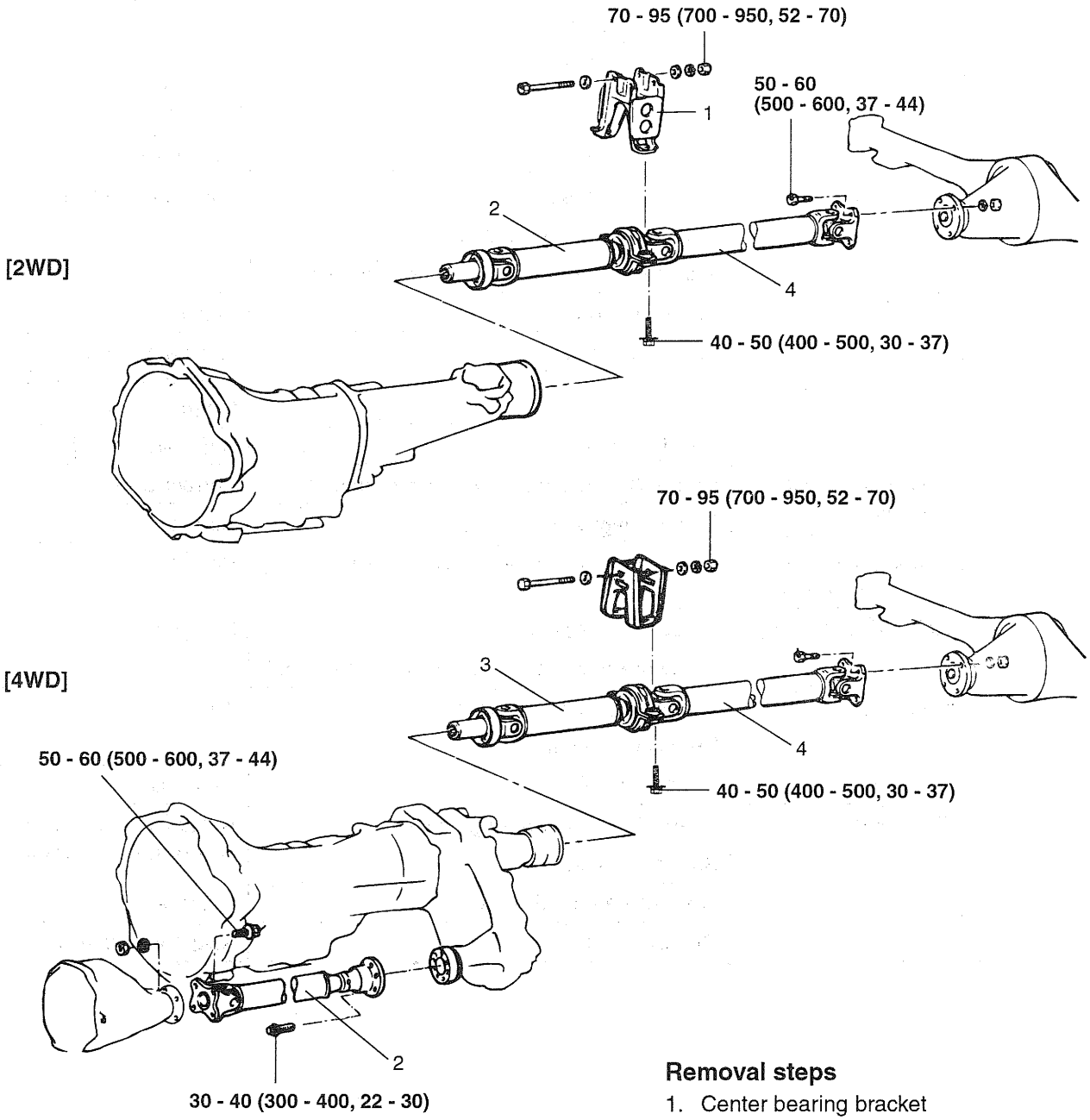
Symptom		Probable cause	Remedy
Propeller shaft	Noise at start	Worn journal bearing	Replace
		Worn sleeve yoke spline or flange yoke	Replace
		Loose propeller shaft installation	Retighten
	Noise and vibration at high speed	Unbalanced propeller shaft	Replace
		Improper snap ring selection	Adjust the clearance
		Worn journal bearing	Replace
Axle shaft, axle housing	Noise while wheels are rotating	Bent axle shaft	Replace
		Worn or scarred axle shaft bearing	Replace
	Grease leakage	Worn or damaged oil seal	Replace
		Malfunction of bearing seal	Replace
Driveshaft, inner shaft	Noise while wheel rotation	Housing tube bent	Replace
		Inner shaft bent	Replace
		Inner shaft bearing worn, pounding	Replace
		Driveshaft assembly worn damaged, bent	Check or replace
	Noise due to excessive play of wheel in turning direction	Inner shaft and side gear serration play	Replace
		Driveshaft and side gear serration play	Replace
		Driveshaft and drive flange serration play	Replace
	Noise due to excessive wheel end play	Driveshaft and drive flange end play	Adjust or replace
		Drive flange looseness	Tighten or replace

Symptom		Probable cause	Remedy
Differential	Constant noise	Improper drive gear and drive pinion gear tooth contact	Correct or replace
		Loose, worn or damaged side bearing Loose, worn or damaged drive pinion bearing	
		Worn drive gear, drive pinion Worn side gear thrust washer or pinion shaft Deformed drive gear of differential case Damaged gear	
		Foreign material	Eliminate the foreign (Replace the parts if necessary)
		Insufficient oil	Replenish
	Gear noise while driving	Poor gear engagement Improper gear adjustment Improper drive pinion preload adjustment	Correct or replace
		Damaged gear	Replace
		Foreign material	Eliminate the foreign material and check (Replace the parts if necessary)
		Insufficient oil	Replenish
	Gear noise while coasting	Improper drive pinion preload adjustment	Correct or replace
		Damaged gear	Replace
	Bearing noise while driving or coasting	Cracked or damaged drive pinion rear bearing	Replace
	Noise while turning	Loose side bearing Damaged side gear, pinion gear or pinion shaft	Replace
	Heat	Improper gear backlash Excessive preload	Adjust
		Insufficient oil	Replenish
	Oil leakage	Differential carrier not tightened Seal malfunction	Retighten, apply sealant, or replace the gasket
		Worn or damaged oil seal	Replace
		Excessive oil	Adjust the oil level

PROPELLER SHAFT ASSEMBLY

PROPELLER SHAFT

COMPONENTS EIUC0070



Removal steps

1. Center bearing bracket
2. Front propeller shaft assembly
3. Center propeller shaft assembly
4. Rear propeller shaft assembly

TORQUE : Nm (kg·cm, lb·ft)

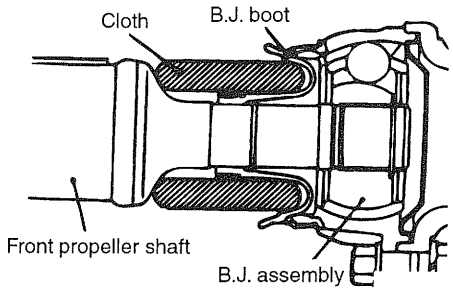
EIUB007A

REMOVAL EIUC0080

1. Remove the tightening bolts of the differential companion flange and flange yoke and remove the propeller shaft.

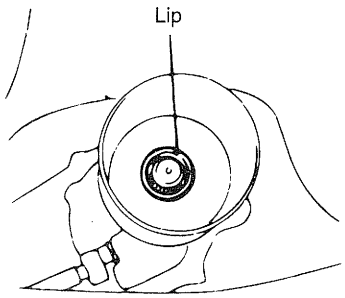
NOTE

When removing the propeller shaft, be careful not to damage the boot. Insert a piece of cloth into the boot to prevent it from being damaged.



H7PS0280

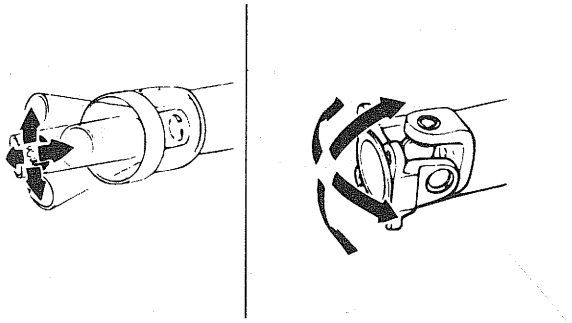
2. Use the plug as a cover so that no foreign material gets into the transmission or transfer case.



AU49-05A

INSPECTION EIUC0090

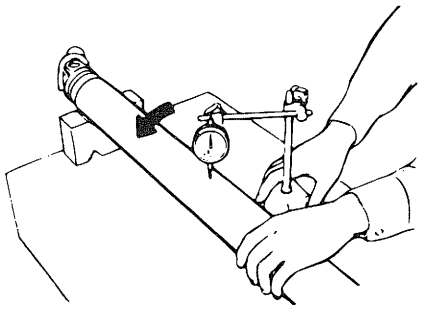
1. Check the sleeve yoke, center yoke and flange yoke for wear, damage or cracks.
2. Check the propeller shaft yokes for wear, damage or cracks.
3. Check the propeller shaft for bends, twisting or damage.
4. Check the universal joints for smooth operation in all directions.
5. Check the center bearing for smooth movement.
6. Check the center bearing mounting rubber for damage or deterioration.



EIUC009A

7. Measure the propeller shaft runout with a dial indicator.

Limit : 0.5 mm (0.02 in.)

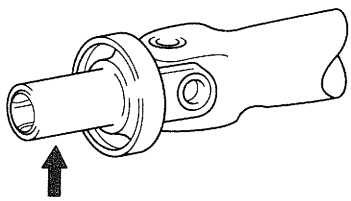


AU49-05C

INSTALLATION SERVICE POINTS EIUC0100

1. Apply the specified hypoid gear oil to the sleeve yoke.

Specified gear oil:
Hypoid gear oil API classification GL-4 or higher/SAE viscosity 80W, 75W/85W

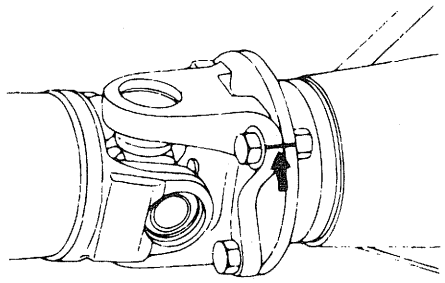


EIUC010A

2. Install the propeller shaft to the companion flange, aligning with matchmark as closely as possible.

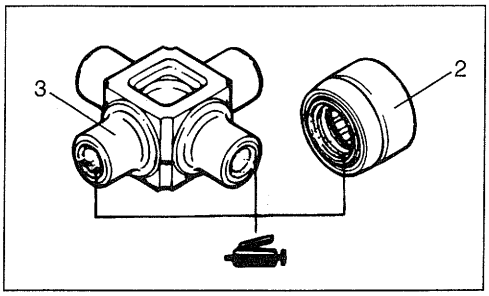
⚠ *CAUTION*

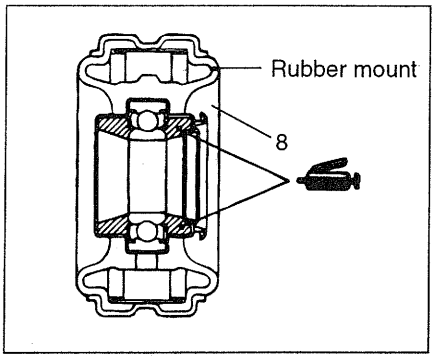
- *Be careful not to damage the lip section of the oil seal when installing the propeller shaft.*
- *If there is grease on the thread parts, wash it off not to loosen them.*



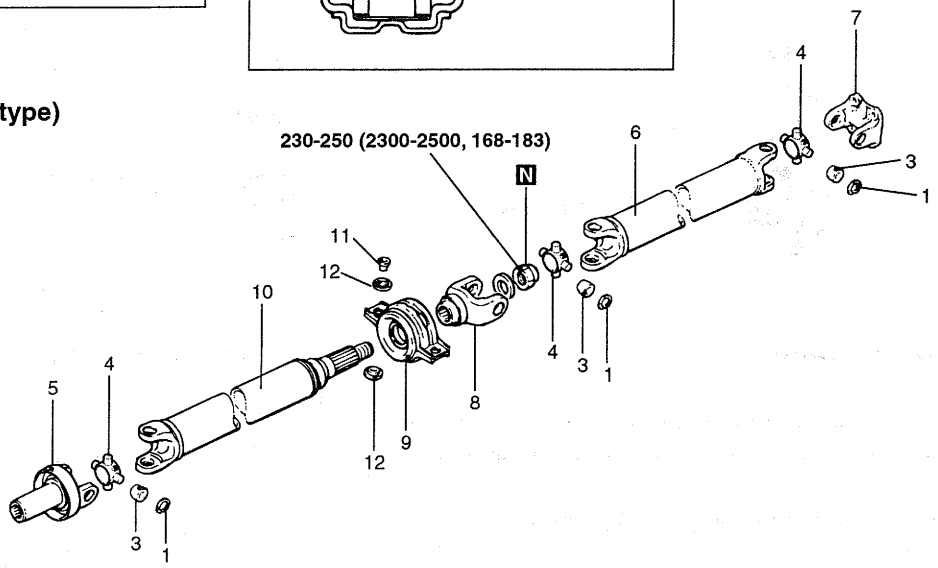
AU49-04B

DISASSEMBLY AND REASSEMBLY EIUC0110

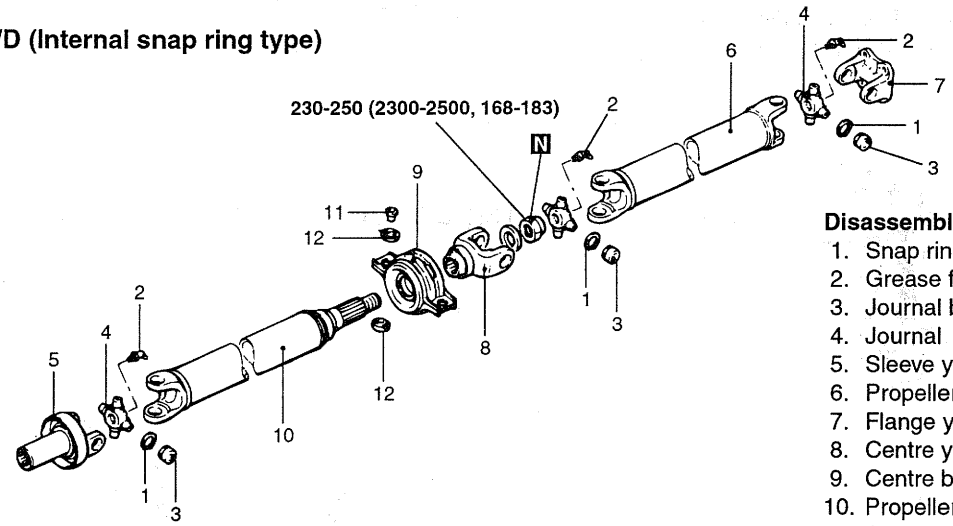




2WD (External snap ring type)



4WD (Internal snap ring type)



Disassembly steps

1. Snap ring
2. Grease fitting
3. Journal bearing
4. Journal
5. Sleeve yoke
6. Propeller shaft (rear)
7. Flange yoke
8. Centre yoke
9. Centre bearing assembly
10. Propeller shaft (front)
11. Spacer
12. Insulator

CAUTION

- **N : Replace the parts with new one after removal.**

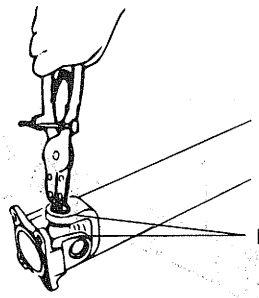
TORQUE : Nm (kg·cm, lb·ft)

EIUB011A

DISASSEMBLY SERVICE POINTS EIUC0120

SNAP RING

1. Make matchmark on the yokes of the universal joint that is to be disassembled.
2. Remove the snap rings from the yoke with snap ring pliers.

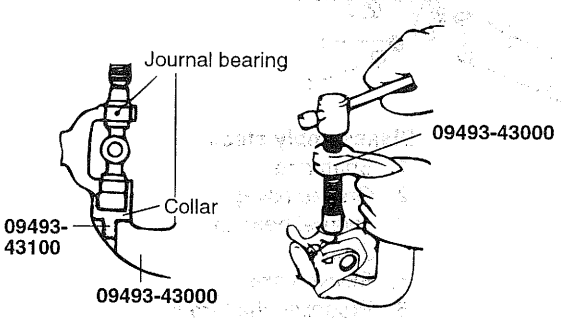


EIMB110A

JOURNAL BEARING

Force out the journal bearings from the propeller shaft yoke with a special tool by the following procedures.

1. Install collar to the special tool properly.
2. Press a journal bearing by using the special tool to force out the journal bearing on opposite side.

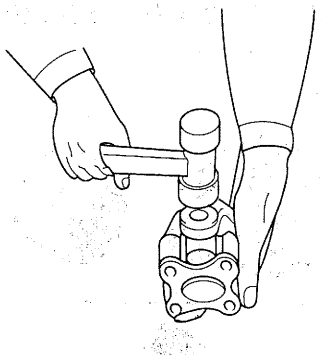


AU49-06C

3. Remove the journal bearing from the yoke.

⚠ ***CAUTION***

Do not tap the journal bearings to remove them, as this will up set the balance of the propeller shaft.



AU49-06D

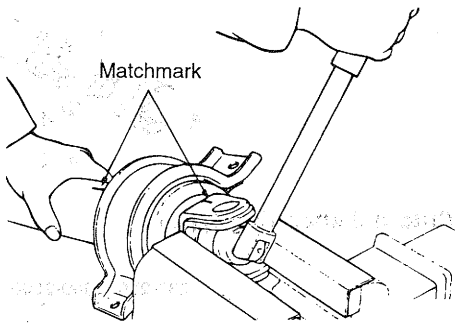
4. Press the journal shaft using the special tool to remove the remaining bearing, and remove the yoke.

CENTER YOKE

Make matchmark on the propeller shaft and center yoke. Then, remove the lock nut from the center yoke and remove the center yoke.

⚠ ***CAUTION***

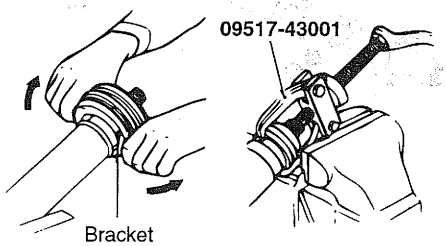
Do not reuse the lock nut.



H7PS0130

CENTER BEARING

After removing the rubber mount, remove the center bearing by using the special tool.



EIMB110C

REASSEMBLY EIUC0130

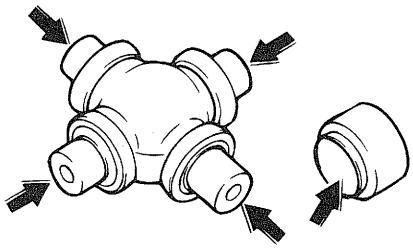
JOURNAL AND JOURNAL BEARING

1. Apply specified grease to the following parts of universal joint kit.:
   1) Shafts and grease sumps of journal.
   2) Dust seal lips.
   3) Needle roller of bearings.

Specified grease : ALVANIA EP GRADE NO.2

⚠ ***CAUTION***

Use of excessive amounts of grease may result in difficulty in assembling unit and incorrect selection of snap rings.

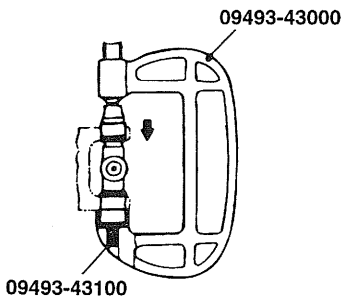


H7RA1110

2. Use the special tool to press the journal bearing into the yoke until the snap ring groove is fully visible.
3. Use the special tool to press the opposite side journal bearing into the yoke.

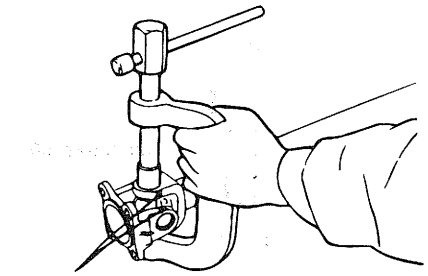
⚠ ***CAUTION***

Be careful when pressing the journal bearings, as if they are pressed at an angle, the inside of the journal bearing will be damaged by the journal.



H7PS0200

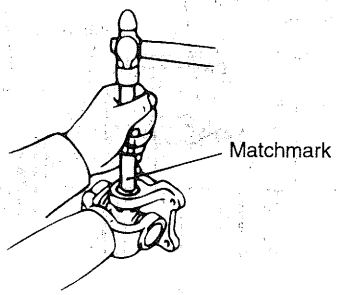
4. Align the matchmark on the yoke and propeller shaft, and install the propeller shaft journal bearings in the method described in 2 and 3 above.



H7PS0210

ADJUSTMENT OF JOURNAL END PLAY

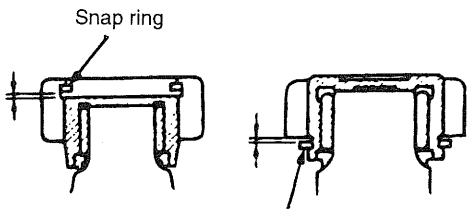
1. Install the snap rings of the same thickness onto both sides of each yoke with the snap ring pliers.
2. Press the bearing and journal into one side with the brass bar.



AU49-07D

3. Measure the clearance shown in the illustration with a feeler gauge. If the clearance exceeds the standard value, adjust by changing the thickness of the snap ring.

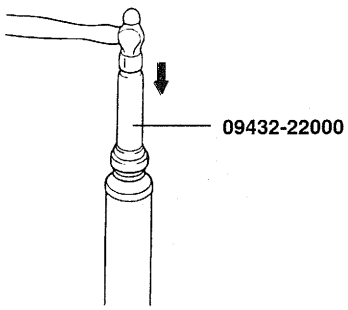
Standard value : 0 - 0.03 mm (0 - 0.0012 in.) or less



H7PS0330

CENTER BEARING ASSEMBLY/CENTER YOKE

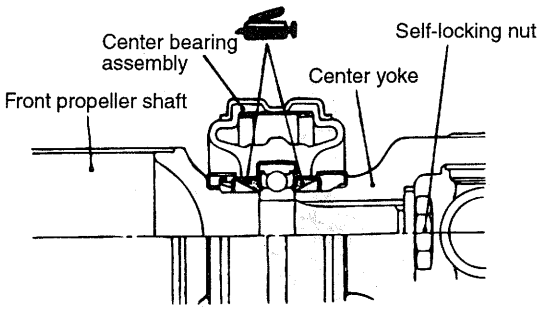
1. Install the center bearing assembly to the front propeller shaft as shown in the illustration.



H7PS0260

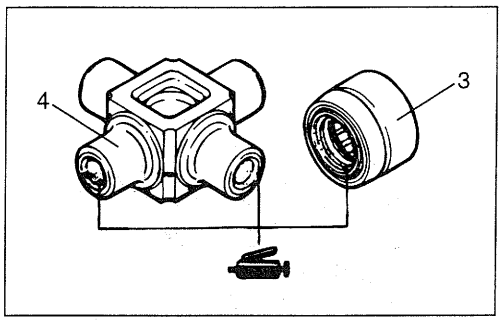
2. Align the matchmark on the center yoke and front propeller shaft.

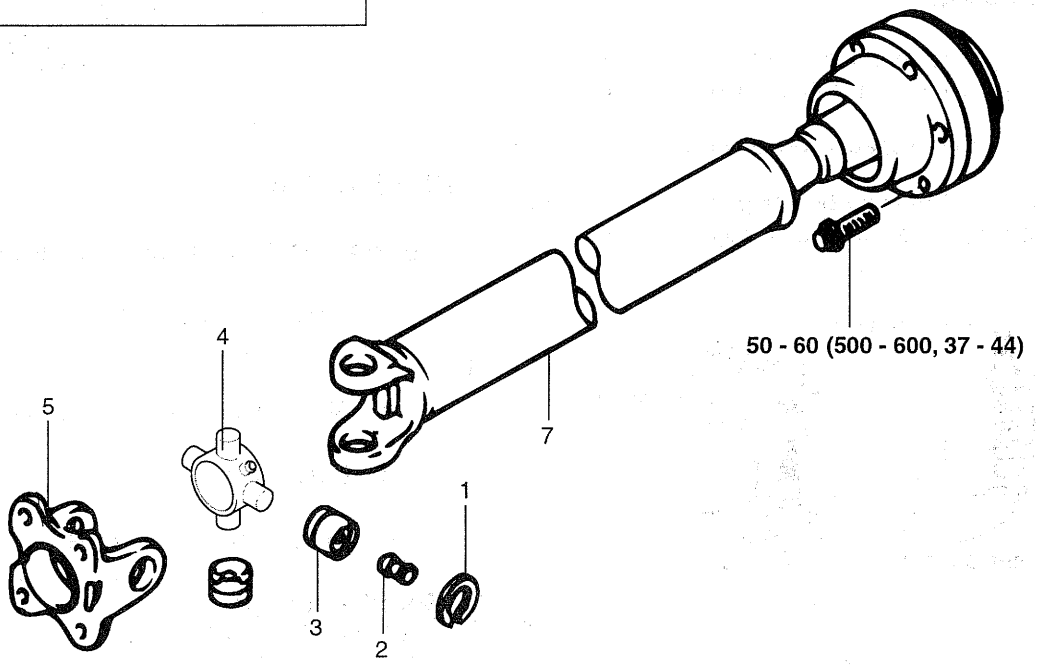
3. Press fit the center bearing with the center yoke while tightening the self-locking nut.



H7PS0170

COMPONENTS EIUC0140





1. Snap ring
2. Grease fitting
3. Journal bearing
4. Journal
5. Flange yoke
6. Sleeve flange
7. Front propeller shaft assembly

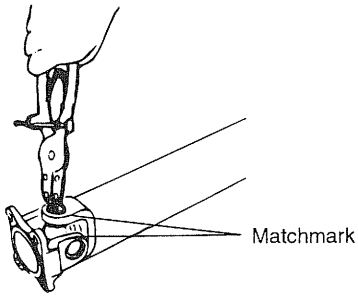
TORQUE : Nm (kg·cm, lb·ft)

EIUB012A

DISASSEMBLY SERVICE POINTS EIUC0150

SNAP RING

1. Make matchmark on the yokes of the universal joint that is to be disassembled.
2. Remove the snap rings from the yoke with snap ring pliers.

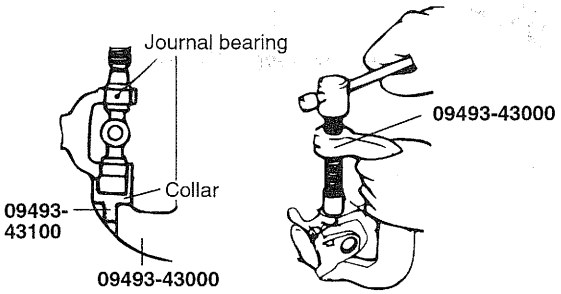


EIMB110A

JOURNAL BEARING

Force out the journal bearings from the propeller shaft yoke with a special tool by the following procedures.

1. Install collar to the special tool properly.
2. Press a journal bearing by using the special tool to force out the journal bearing on opposite side.

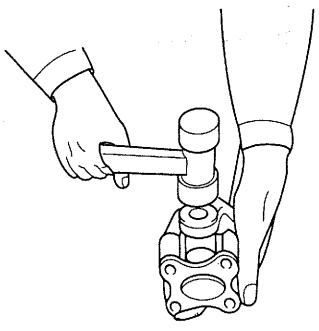


AU49-06C

3. Remove the journal bearing from the yoke.

⚠ *CAUTION*

Do not tap the journal bearings to remove them, as this will up set the balance of the propeller shaft.

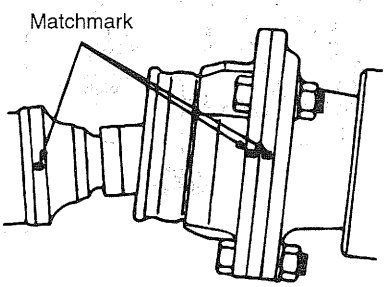


AU49-06D

4. Press the journal shaft using the special tool to remove the remaining bearing, and remove the yoke.

SLEEVE FLANGE REMOVAL

Place a matchmark on the sleeve flange and front propeller shaft assembly, remove the sleeve flange.



H7PS0310

REASSEMBLY EIUC0160

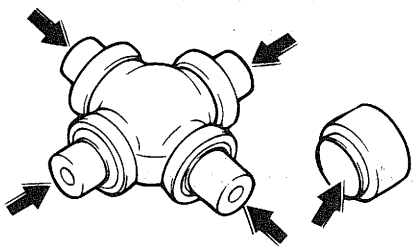
JOURNAL AND JOURNAL BEARING

1. Apply specified grease to the following parts of universal joint kit.:
   1) Shafts and grease sumps of journal.
   2) Dust seal lips.
   3) Needle roller of bearings.

Specified grease :
ALVANIA EP GRADE NO.2

⚠ *CAUTION*

Use of excessive amounts of grease may result in difficulty in assembling unit and incorrect selection of snap rings.

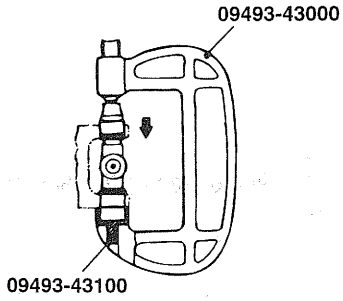


H7RA1110

2. Use the special tool to press the journal bearing into the yoke until the snap ring groove is fully visible.
3. Use the special tool to press the opposite side journal bearing into the yoke.

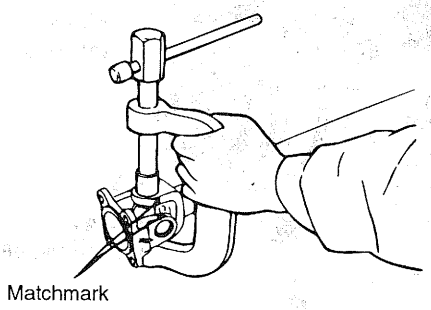
⚠ *CAUTION*

Be careful when pressing the journal bearings, as if they are pressed at an angle, the inside of the journal bearing will be damaged by the journal.



H7PS0200

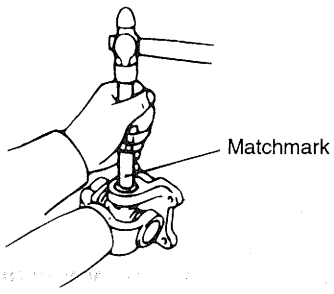
4. Align the matchmark on the yoke and propeller shaft, and install the propeller shaft journal bearings in the method described in 2 and 3 above.



H7PS0210

ADJUSTMENT OF JOURNAL END PLAY

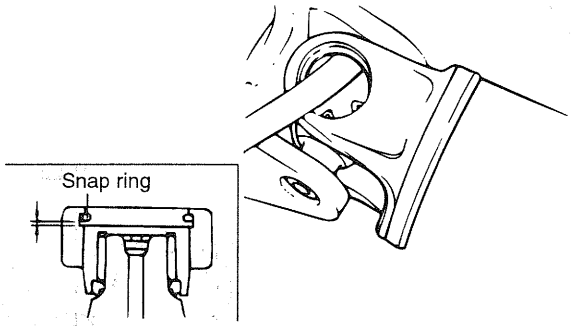
1. Install the snap rings of the same thickness onto both sides of each yoke with the snap ring pliers.
2. Press the bearing and journal into one side with the brass bar.



AU49-07D

3. Measure the clearance shown in the illustration with a feeler gauge. If the clearance exceeds the standard value, adjust by changing the thickness of the snap ring.

Standard value : 0 - 0.03 mm (0 - 0.0012 in.) or less

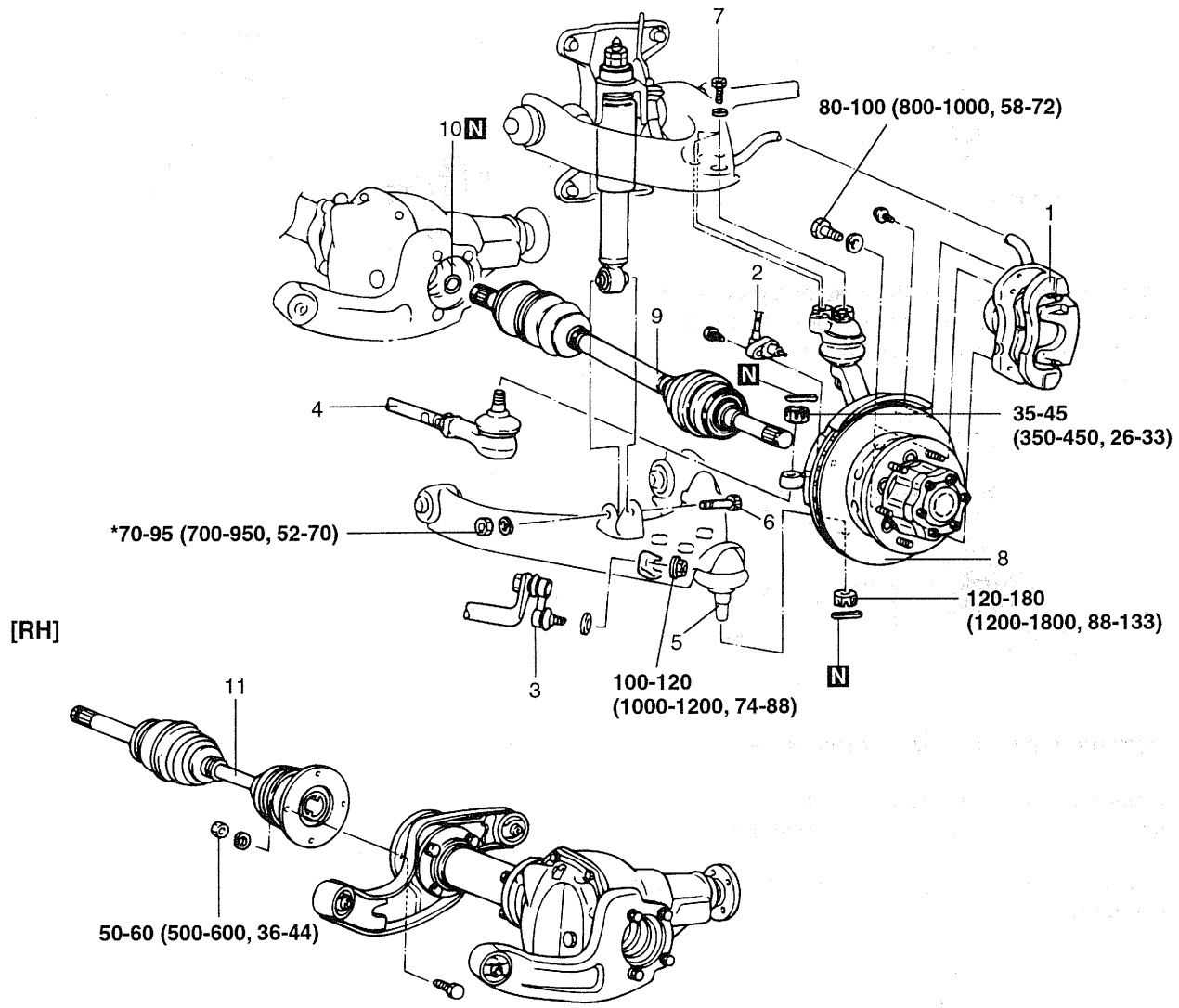


AU49-08A

DRIVESHAFT

FRONT DRIVESHAFT ASSEMBLY

COMPONENTS (4WD) EIUC0360



1. Caliper assembly
2. Front speed sensor (Vehicle with ABS)
3. Stabilizer link connection
4. Tie rod end connection
5. Lower ball joint connection
6. Shock absorber lower mounting bolt
7. Upper ball joint mounting bolt
8. Knuckle and front hub assembly
9. Driveshaft assembly
10. Circlip

CAUTION

*** : Indicates parts which should be temporarily tightened, and then fully tightened with the vehicle on the ground in the unladen condition.**

N : Replace the parts with new one after removal.

TORQUE : Nm (kg·cm, lb·ft)

EIUC036A

REMOVAL SERVICE POINTS EIUC0370

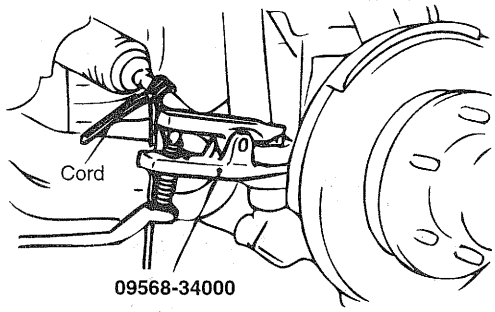
CALIPER ASSEMBLY REMOVAL

Secure the removed caliper assembly with wire so that it does not fall.

TIE ROD END DISCONNECTION

CAUTION

1. ***Use the special tool (09568-34000) to loosen the nut only; do not remove it from the ball joint.***
2. ***Tie the special tool with a cord not to let it fall off.***



H7FA0510

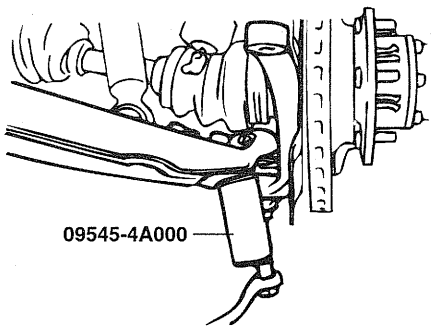
LOWER BALL JOINT DISCONNECTION

CAUTION

Use the special tool to loosen the nut only; do not remove it from the lower ball joint.

NOTE

Do not remove it until disassembling the upper arm and knuckle.



H7FA0520

KNUCKLE AND FRONT HUB ASSEMBLY REMOVAL

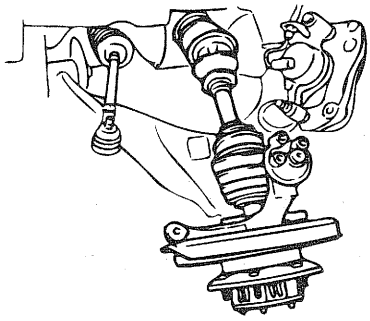
1. Press down lower arm and remove upper knuckle towards you.

CAUTION

Do not damage upper ball joint nipple with upper arm.

NOTE

Pull the D.O.J. side of the driveshaft assembly out slightly from the front differential carrier.

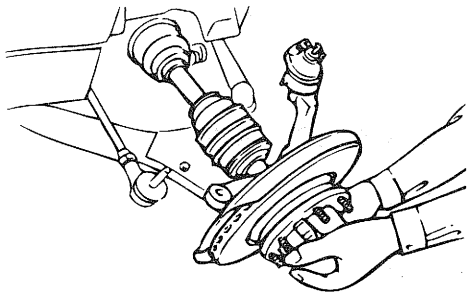


H7FA0530

2. Slightly back off driveshaft from knuckle. Remove lower ball joint and knuckle holding nut.
3. Disconnect knuckle and lower ball joint.
4. Remove knuckle and front hub assembly from driveshaft assembly.

CAUTION

Do not damage knuckle oil seals with driveshaft spline.

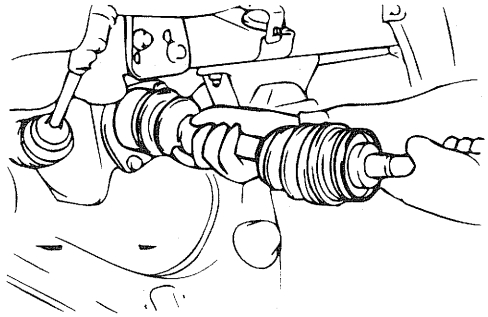


H7FA0540

DRIVESHAFT (LEFT SIDE) REMOVAL

CAUTION

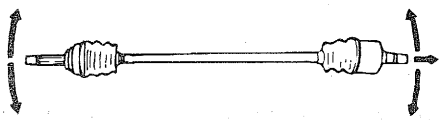
When pulling the driveshaft out from the differential carrier, be careful that the spline part of the driveshaft does not damage the oil seal.



H7FA0550

INSPECTION EIUC0380

1. Check the boot for damage or deterioration.
2. Check the ball joint for operating condition and excessive looseness.
3. Check the splines for wear or damage.
4. Check the differential carrier oil seal (L.H.) for damaged.



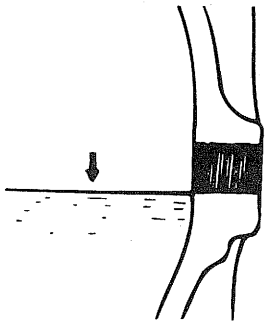
S5DS008A

INSTALLATION SERVICE POINTS EIUC0390

1. DRIVESHAFT (LEFT SIDE)

⚠ *CAUTION*

- ***Do not damage the oil seal of the differential carrier by the driveshaft splines.***
- ***Replace the circlip which is attached to the B.J side spline part with a new one.***
- ***Check the quantity of oil in the differential carrier and fill if it is insufficient.***



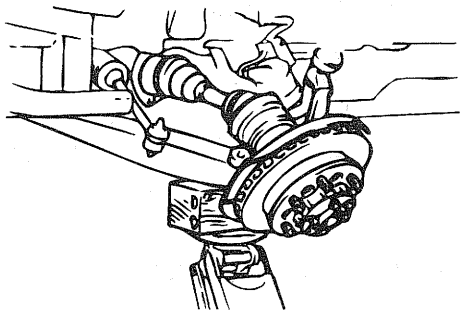
EIJA010A

2. KNUCKLE AND FRONT HUB ASSEMBLY

1) Insert knuckle and front hub assembly to driveshaft.

⚠ *CAUTION*

Do not damage knuckle oil seal with driveshaft spline.



H7FA0560

2) Assemble knuckle and lower ball joint and temporarily tighten slotted nut.
3) Press up lower arm and lock upper ball joint onto upper arm.
4) Tighten lower ball joint mounting nuts to specified torque.

3. SHOCK ABSORBER LOWER MOUNTING BOLT INSTALLATION

Insert the shock absorber lower mounting bolt from the rear of the vehicle.

📝 *NOTE*

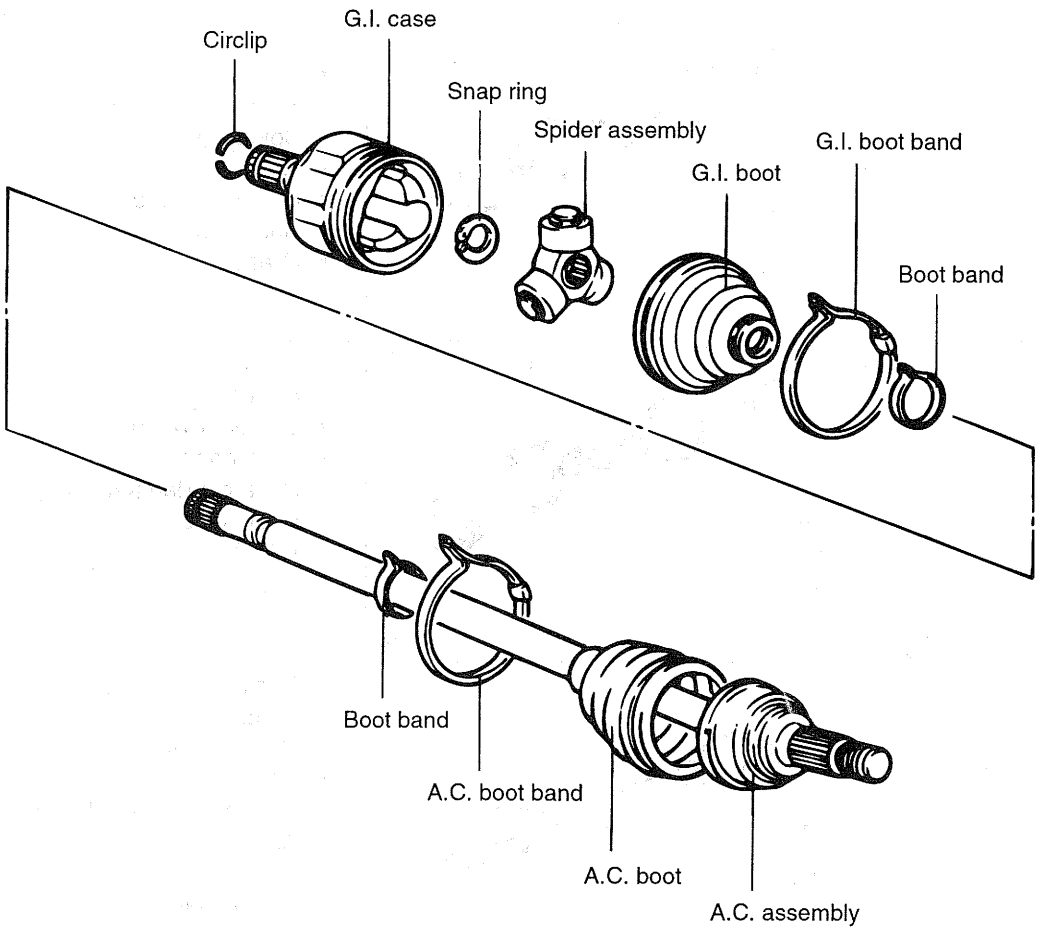
DO not insert from the front of the vehicle, or your may have trouble tightening the nut.

4. STABILIZER LINK INSTALLATION

Use an Allen key to tighten the nut while making sure that the stud on the stabilizer link does not turn as well.

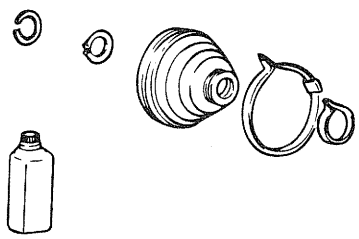
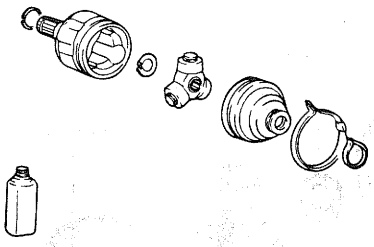
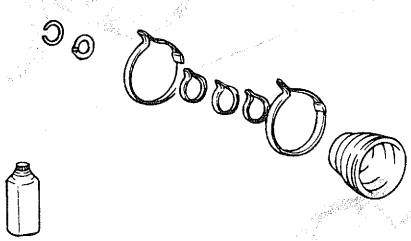
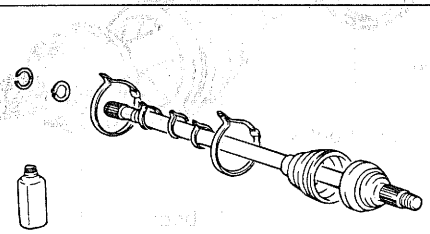
FRONT DRIVESHAFT(G.I-A.C TYPE)

COMPONENTS EIUC0400



H7PS0340

REPAIR KITS

Kit name	Illustration	Contents
G.I. boot kit	 V5DS010B	• Circlip • Snap ring • G.I. boot • G.I. boot band • Boot band • Grease
G.I. joint kit	 V5DS010C	• Circlip • G.I. case • Snap ring • Spider assembly • G.I. boot • G.I. boot band • Boot band • Grease
A.C. boot kit	 V5DS010D	• Circlip • Snap ring • G.I. boot band • Boot band • Dynamic damper band • Boot band • A.C. boot • Grease
A.C. joint and shaft kit	 V5DS010E	• Circlip • Snap ring • G.I. boot band • Boot bands • Dynamic damper band • A.C. boot band • A.C. boot • A.C. assembly • Grease

DISASSEMBLY EIUC0410

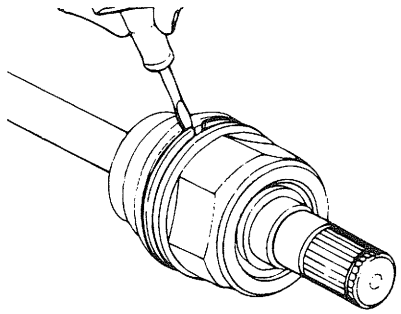
NOTE

- *Do not disassemble the spider assembly.*
- *The driveshaft joint uses special grease. Do not substitute with another type of grease.*
- *The boot band should be replaced with a new one.*

1. Remove the G.I. boot bands and pull the G.I. boot from the G.I. case.

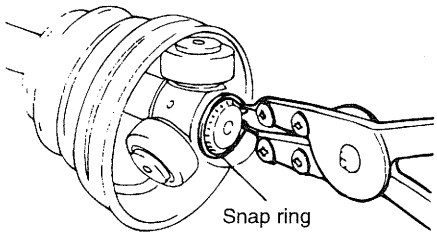
NOTE

Be careful not the damage the boot.



EIDA301A

2. Remove the snap ring and spider assembly from the driveshaft.



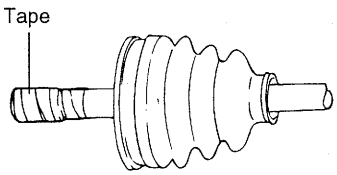
EIA9301B

3. Clean the spider assembly.

4. Remove the A.C. boot bands and pull out the G.I. boot and A.C. boot.

NOTE

If the boot is to be reused, wrap tape around the driveshaft splines to protect the boot.



EIDA251D

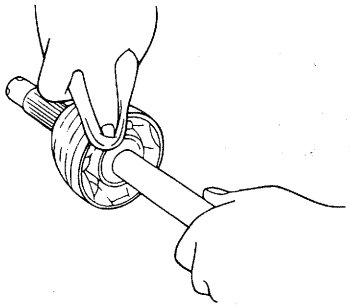
INSPECTION AFTER DISASSEMBLY EIUC0420

1. Check the driveshaft spline part for wear or damage.

2. Check for entry of water and/or foreign material into A.C.

3. Check the spider assembly for roller rotation, wear or corrosion.

4. Check the groove inside G.I. case for wear or corrosion.



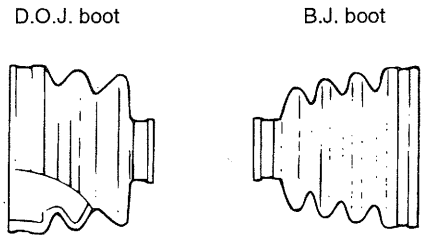
EIDA252A

REASSEMBLY EIUC0430

1. Wrap tape around the driveshaft splines (G.I. side) to prevent damage to the boots.

2. Apply grease to the driveshaft and install the boots.
Recommended lubricant

A.C. boot grease : CENTURY G.I. boot grease : ONE LUBER GKN

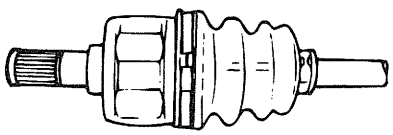


S5DS012A

3. Apply grease into the G.I. boot and install the boot.

G.I. boot grease gr. (oz) : 200 ± 10 (7.0 ± 0.3)

4. Tighten the G.I. boot band.



V5DS013C

5. Add to the A.C. as much specified grease as was wiped away at the time of inspection.

6. Install the boots.

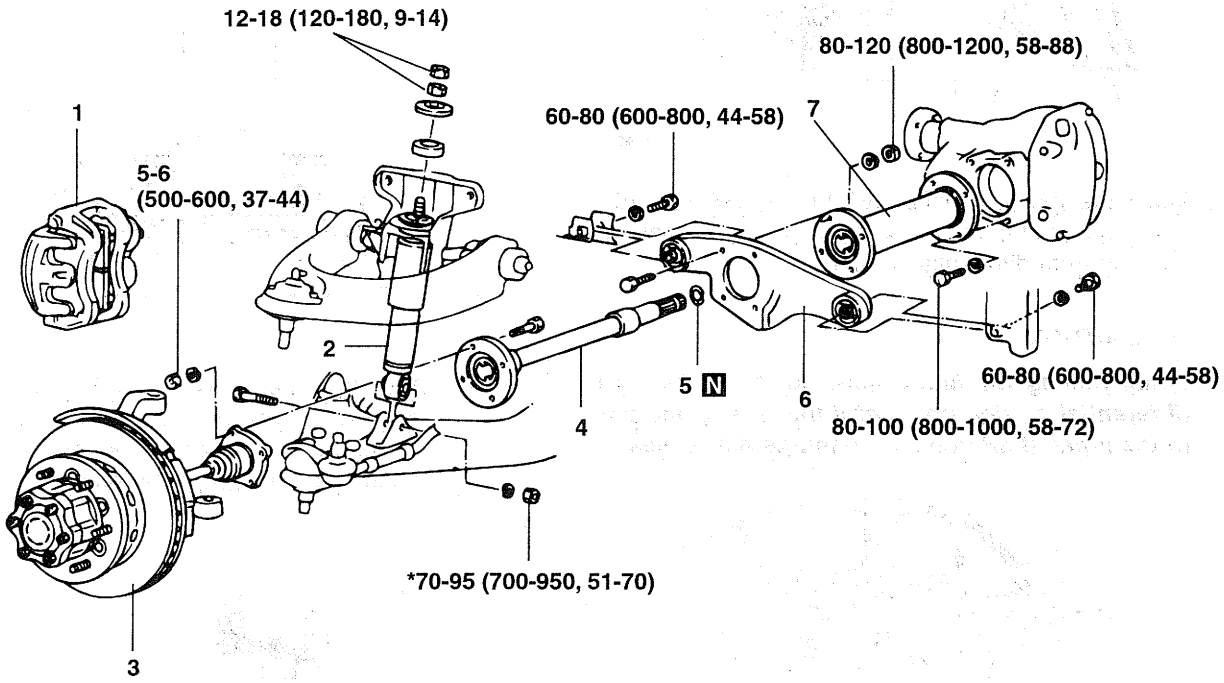
7. Tighten the A.C. boot bands.

8. To control the air in the G.I. boot, keep the specified distance between the boot bands when they are tightened.

CENTER BEARING AND INNER SHAFT

INNER SHAFT (4WD) EIUC0440

COMPONENTS



1. Caliper assembly
2. Shock absorber
3. Hub assembly, knuckle, driveshaft
4. Inner shaft
5. Circlip
6. Differential mounting bracket (RH)
7. Housing tube assembly

CAUTION

*** Indicates parts which should be temporarily tightened, and then fully tightened with the vehicles on the ground in the unladen condition.**

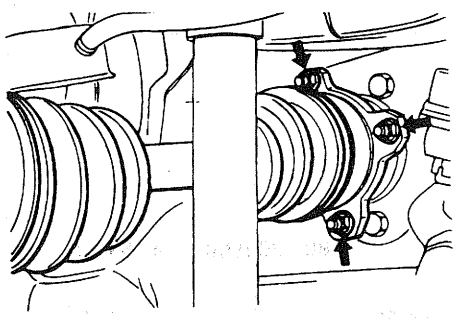
N : Replace the parts with new one after removal.

TORQUE : Nm (kg·m, lb·ft)

EIUC044A

REMOVAL EIUC0450

1. Remove the front hub and knuckle.
2. Remove the right driveshaft (RH).

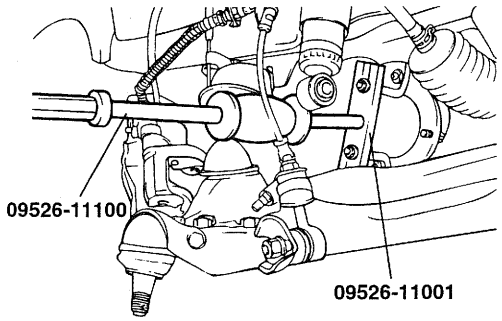


H7FA0250

3. Attach the special tools(09526-11001, 09526-11100) to the flange of the shaft, and pull the inner shaft out from the front differential carrier.

⚠ ***CAUTION***

When pulling the inner shaft out from the front differential carrier, be careful that the spline part of the inner shaft does not damage the oil seal.



H7FA1226

INSPECTION EIMB2700

1. Check the inner shaft for bends.
2. Check the bearing for wear or damage.
3. Check the housing tube for crack.
4. Check the dust seal for crack or damaged.

INSTALLATION EIMB2750

1. Installation is the reverse of removal.
2. Using the special tools(09526-11001, 09526-11100), install the inner shaft to the differential carrier.

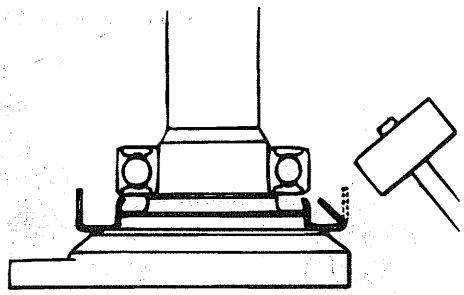
⚠ ***CAUTION***

Be careful not the damage the lip of the dust seal and oil seal.

DISASSEMBLY EIMB2800

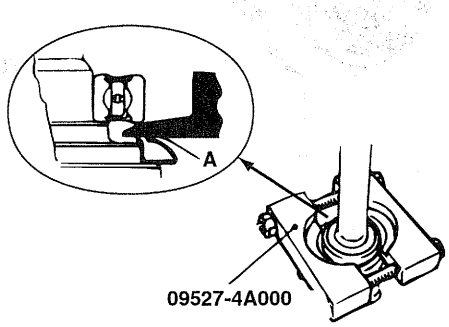
1. REMOVAL OF BEARING

   1) Bend the outside periphery of dust cover inward with a hammer.



H7FA0610

   2) After the special tool(09527-4A000) has been installed as shown, tighten the nut of the special tool until the portion "A" of the special tool touches the bearing outer race.

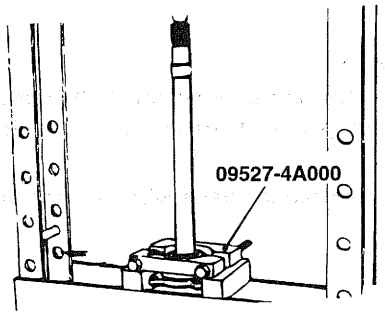


EIMB275A

   3) Press out the inner shaft from the bearing.

⚠ ***CAUTION***

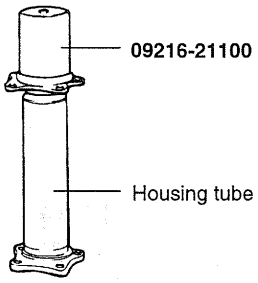
Do not allow the inner shaft to drop.



H7FA0630

REASSEMBLY EIMB2900

1. INSTALLATION OF DUST SEAL
   Press-fit the new dust seal into the housing tube using the special tool(09216-21100) until it is flush with the housing tube end face.



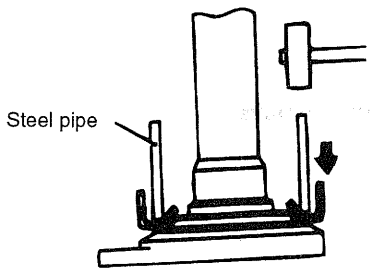
EIMB380A

2. INSTALLATION OF DUST COVER
   Using a steel pipe, force a new dust cover onto the inner shaft.

Steel pipe	mm (in.)
Overall length	50 (1.97)
Outside diameter	75 (2.95)
Wall thickness	4 (0.16)

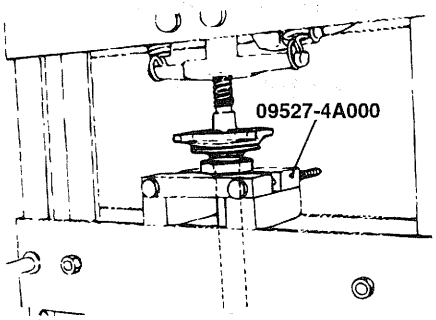
⚠ ***CAUTION***

After installing the dust cover, apply 5 gr. more than of the grease (LIG-2) on around rip.



EIMB290A

3. BEARING INSTALLATION
   Use the special tool to press-fit the bearing onto the inner shaft.

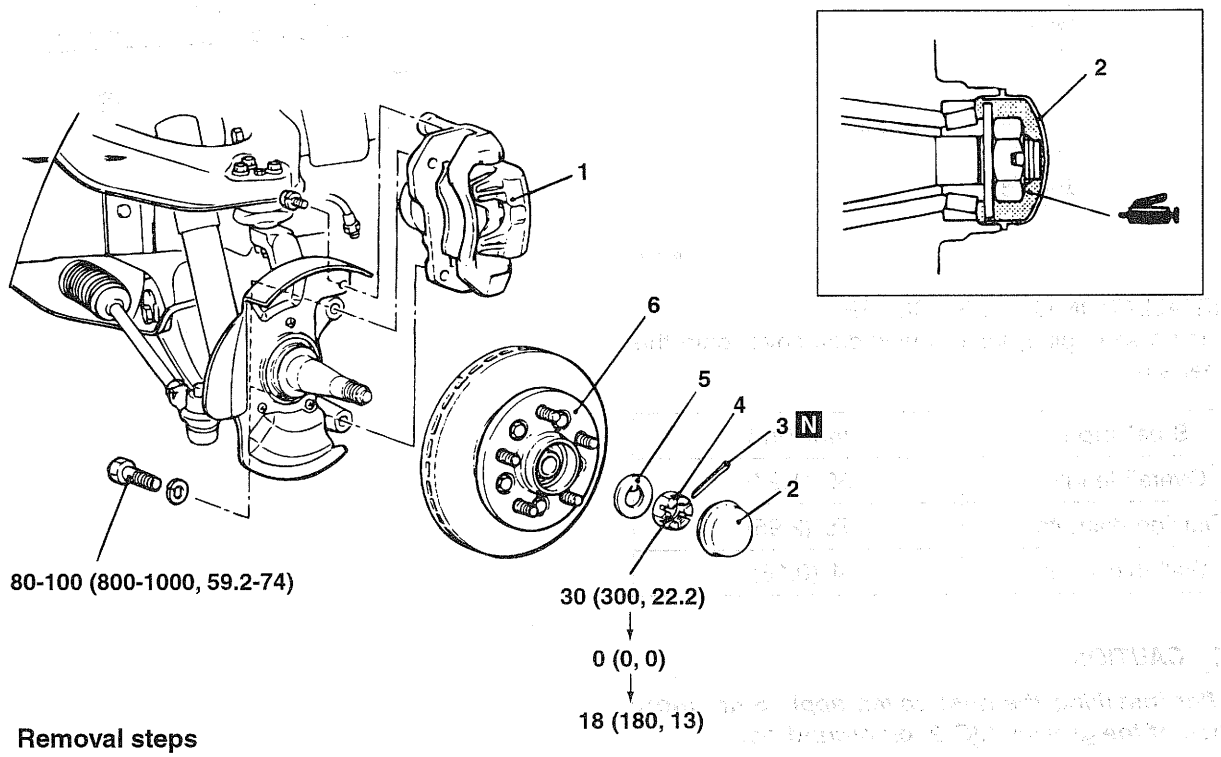


H7FA0660

FRONT AXLE

FRONT HUB/KNUCKLE

COMPONENTS (2WD) EIUC0170



Removal steps

1. Caliper assembly
2. Hub cap
3. Split pin
4. Wheel bearing nut
5. Washer
6. Front hub assembly

CAUTION

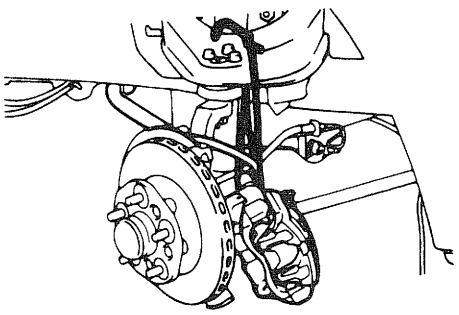
N: Replace the split pin with new one after removal

TORQUE : Nm (kg·cm, lb·ft)

EIUC017A

REMOVAL EILB0150

CALIPER ASSEMBLY



AU51-06A

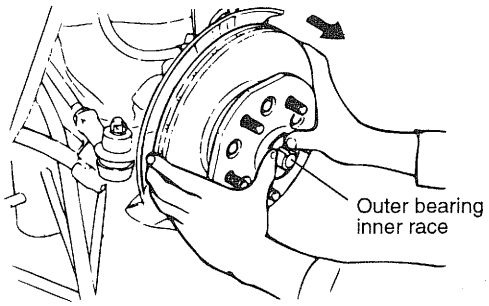
1. Remove the caliper assembly with the brake hose connected.
2. Use wire to suspend the caliper assembly from the upper arm so that the caliper assembly won't fall.

CAUTION

Do not twist the brake hose.

FRONT HUB ASSEMBLY

Remove the front hub assembly from the knuckle so that the outer bearing inner race doesn't fall.



ESRDS07C

INSPECTION EILB0160

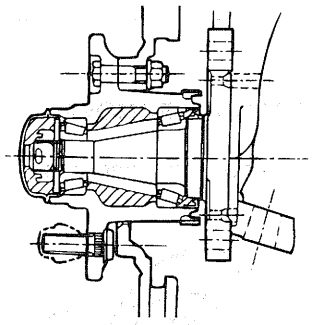
1. Check the oil seal for cracks and damage.
2. Check the bearings for seizure and discoloration.
3. Check the front hub for cracks.
4. Check grease in front hub.

INSTALLATION EIUC0200

1. Pack entire inner hub wall with specified grease before installing front hub assembly to knuckle.

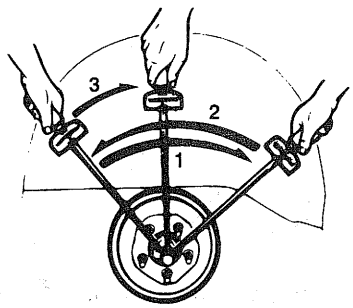
Specified grease :

LIG-2 (MS 511-7) or SUN LIGHT #2.



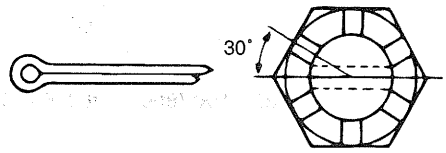
KIUB018A

2. **WHEEL BEARING NUT**
   a. After tightening the wheel bearing nut to 30Nm (300 kg·cm, 22.2 lb·ft), rotate the front hub and disc above 3 times to install the hub bearing securely.
   b. Loosen the wheel bearing nut to 0Nm (0 kg·cm, 0 lb·ft).
   c. Re-tighten the wheel bearing nut to 18 Nm (180 kg·cm, 13 lb·ft).



AU51-06D

d. Install the split pin. If the knuckle spindle hole and the hub bearing nut groove are not in alignment, turn the wheel bearing nut back within 30° maximum.



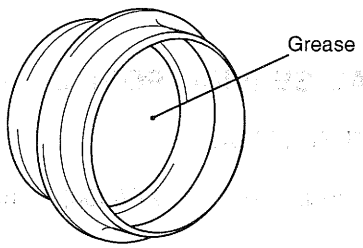
AU51-06E

3. **GREASING HUB CAP**

   Fill cap with specified grease.

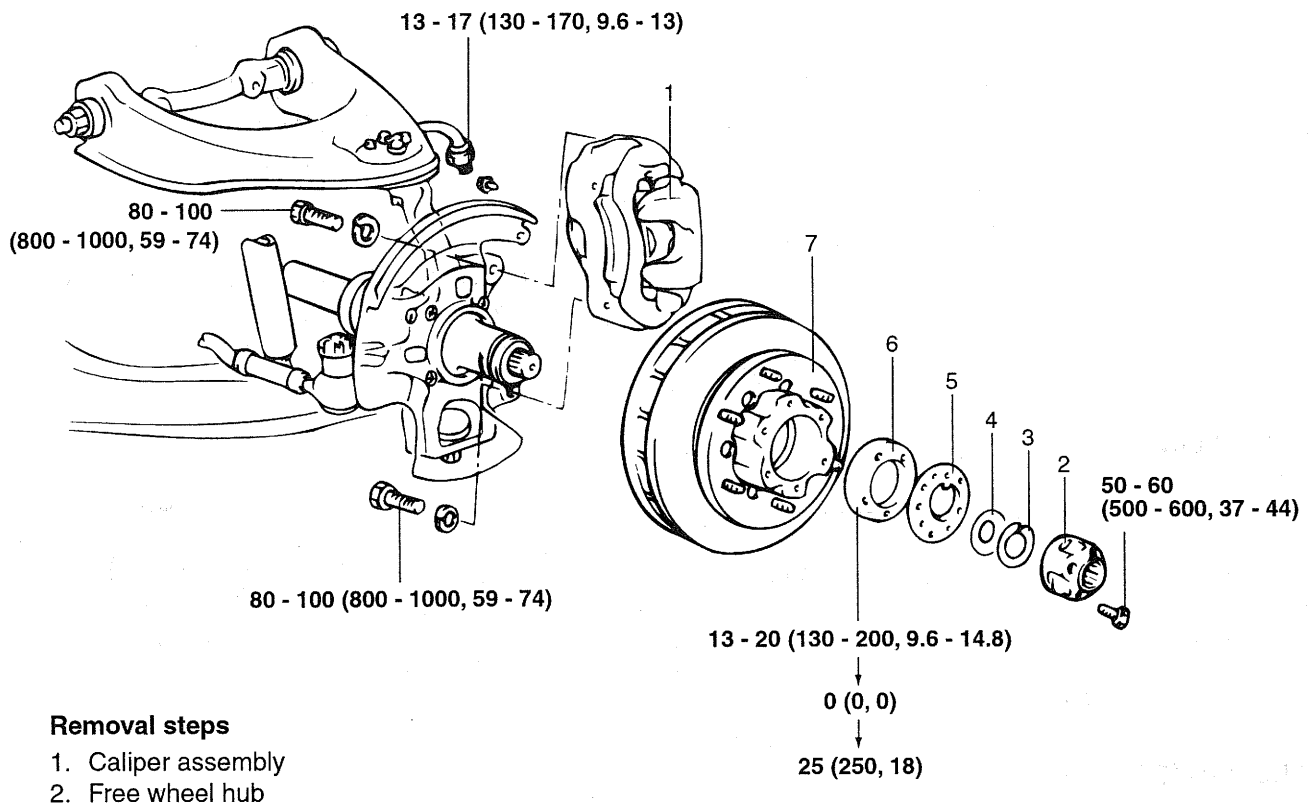
Specified grease :

LIG-2 (MS 511-7) or SUN LIGHT #2.



AU51-07A

COMPONENTS (4WD) EIUC0210



Removal steps

1. Caliper assembly
2. Free wheel hub
3. Snap ring
4. Wear washer
5. Lock washer
6. Lock nut
7. Front hub assembly

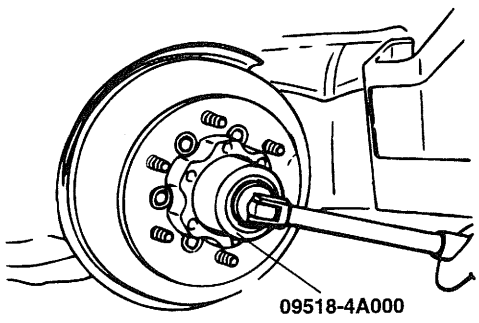
TORQUE : Nm (kg·cm, lb·ft)

EIUC021A

REMOVAL SERVICE POINTS EIUC0220

LOCK NUT REMOVAL

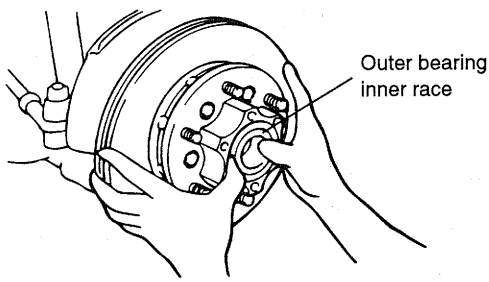
Using the special tool (09518-4A000), remove the lock nut.



KHPDS06A

FRONT HUB ASSEMBLY REMOVAL

Do not drop the outer bearing inner race.



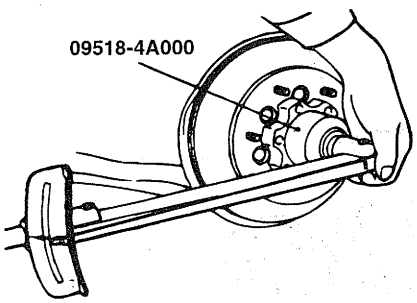
H7FA030A

INSTALLATION SERVICE POINTS EIUC0230

LOCK HUT INSTALLATION

Using the special tool (09518-4A000), tighten the lock nut by the following procedures.

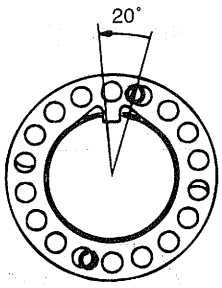
1. Tighten the lock nut to 13 - 20 Nm (130 - 200 kg·cm, 9.6 - 14.8 lb·ft), and then turn the front hub assembly to run in the bearings.
2. Loosen the nuts to 0 Nm (0 kg·cm, 0 lb·ft).
3. After re-tightening to 25 Nm (250 kg·cm, 18 lb·ft), loosen the lock nuts by approximately 30° - 40°.



H7FA0310

LOCK WASHER INSTALLATION

Install the lock washer. If the hole position is not aligned with the lock nut, move it within a range of not more than 20° until the holes are aligned.



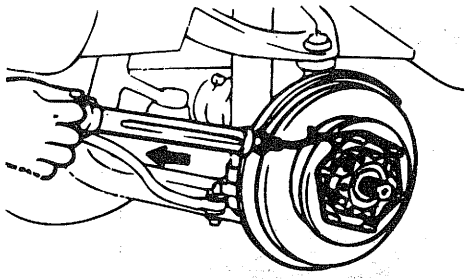
KHPD673A

HUB STARTING TORQUE AND WHEEL BEARING END PLAY ADJUSTMENT

1. Use a spring balance to measure the hub starting torque as shown in the illustration.

Standard value :

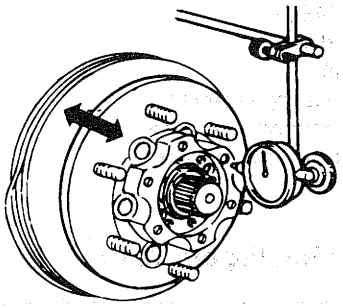
1.1 - 1.6 Nm (0.5 - 16 kg·cm, 0.8 - 1.2 lb·ft)



KSRDS40A

2. If the hub starting torque is not within the standard value, remove the lock washer and adjust by the following procedure.
   1) If the starting torque is lower than the standard value, tighten the lock nut.
   2) If the starting torque is higher than the standard value, loosen the lock nut.
3. Install a dial gauge as shown in the illustration, and then move the hub in the axial direction and measure how far the front wheel bearing moves.

Standard value : 0.05 mm (0.002 in.) or less

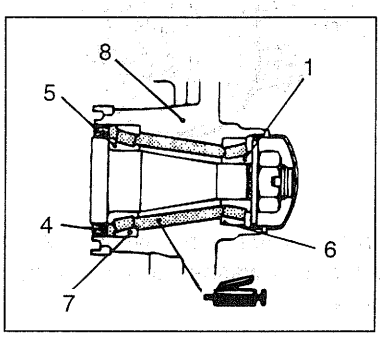


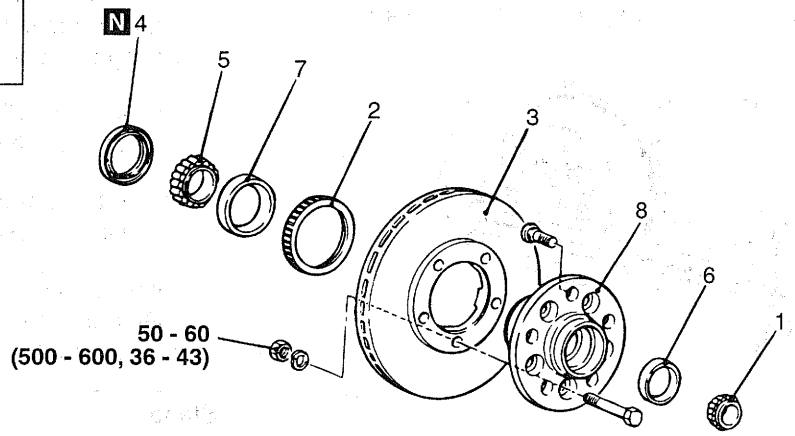
H7FA0340

4. If the distance exceeds the standard value, remove the lock washer and tighten the lock nut.
5. If adjustment is not possible, disassemble the hub and inspect each part.

DISASSEMBLY AND REASSEMBLY EIUC0240

COMPONENTS





Removal steps

1. Outer bearing inner race
2. Rotor (ABS)
3. Brake disc
4. Oil seal
5. Inner bearing inner race
6. Outer bearing outer race
7. Inner bearing outer race
8. Front hub

CAUTION

N : Replace the oil seal with new one after removal.

TORQUE : Nm (kg·cm, lb·ft)

EIUC024A

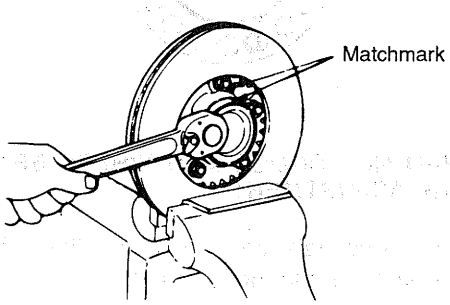
DISASSEMBLY EILB0190

BRAKE DISC

1. Make the matchmark on the brake disc and front hub, and then separate the front hub and brake disc, if necessary.

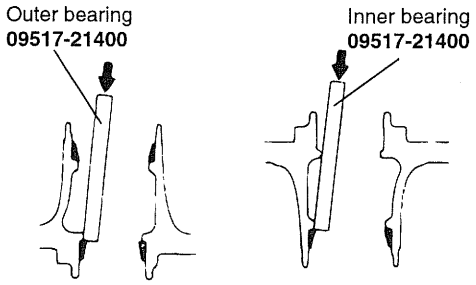
CAUTION

When mounting the disc in vice, fix copper or aluminum board to the jaws of it.



ESRDS69A

2. Using the special tool (09517-21400), drive out the inner and outer bearing outer races by tapping them equally.



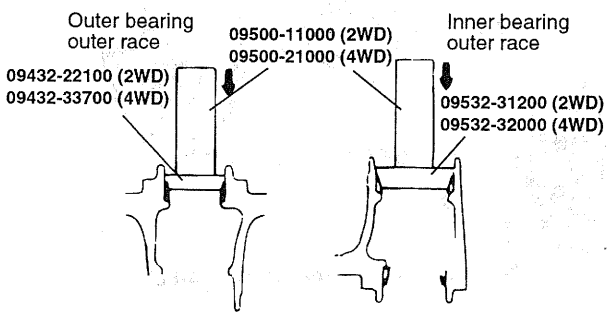
ESRDS71A

REASSEMBLY EIUC0260

1. Press-fit the inner bearing outer race and outer bearing outer race.

NOTE

The bearing inner race and baring outer race should be replaced as an assembly.

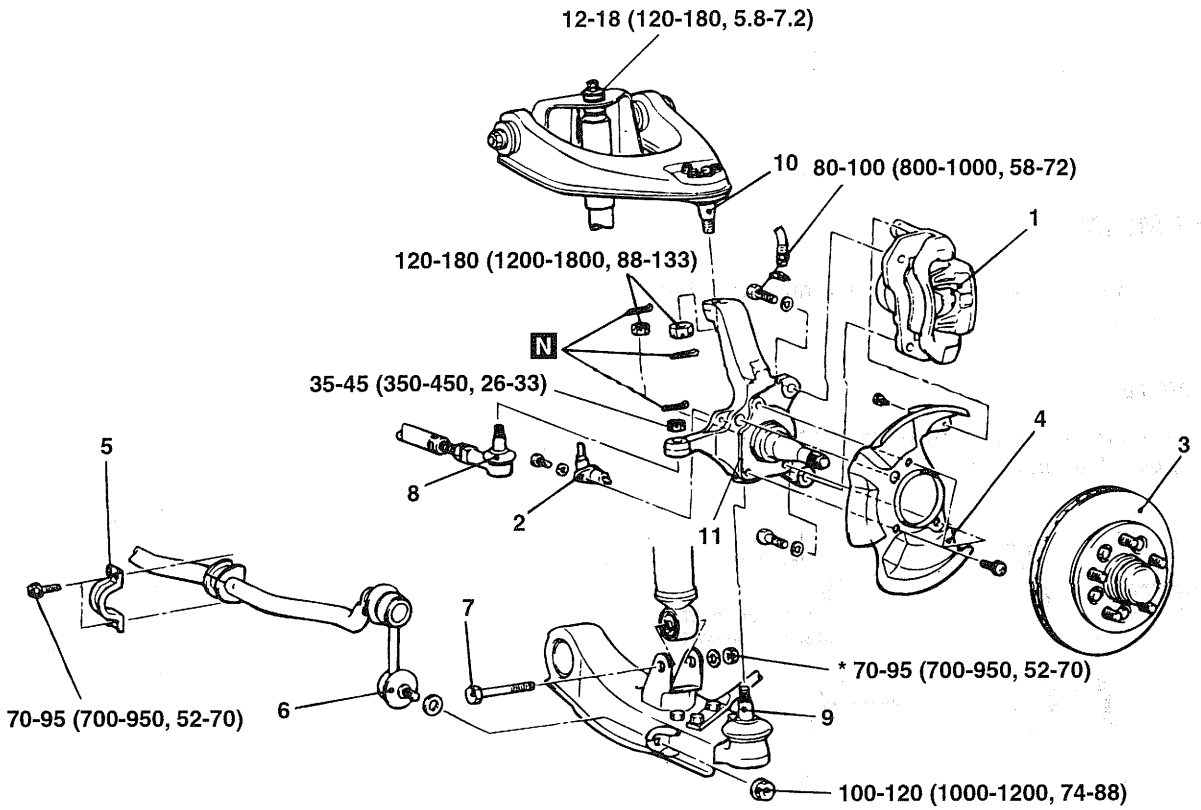


EIUC026A

2. Press-fit new oil seal into the front hub, until it is flush with the front hub end face.

KNUCKLE (2WD) EIUC0270

COMPONENTS



Removal steps

1. Caliper assembly
2. Front speed sensor <vehicles with ABS>
3. Hub assembly
4. Dust shield
5. Clamp
6. Stabilizer link
7. Shock absorber lower mounting bolt
8. Tie rod end connection
9. Lower arm connection
10. Upper arm connection
11. Knuckle

CAUTION

*** : Indicates parts which should be temporarily tigntened, and then fully tightened with the vehicles on the ground in the unladen condition.**

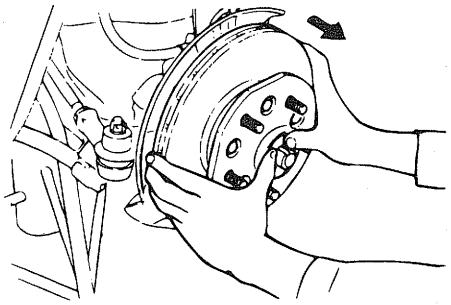
N : Replace the split pin with new one after removal.

TORQUE : Nm (kg·cm, lb·ft)

H7FA0160

REMOVAL EIUC0280

1. Remove the front hub assembly from the knuckle together with the outer bearing and washer.

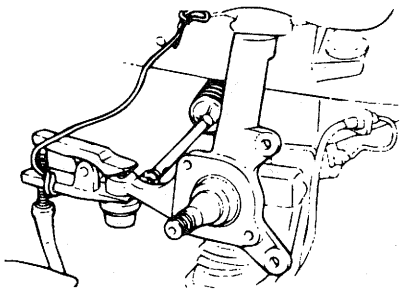


EIUC028A

2. Disconnect the tie rod assembly and knuckle with the special tool.

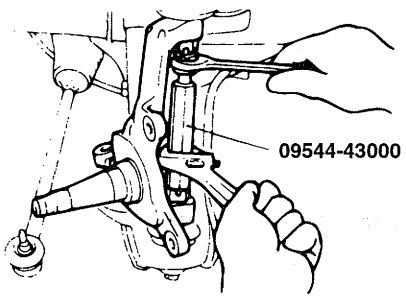
⚠ ***CAUTION***

Loosen nut but do not remove.



AU51-11A

3. Disconnect the upper/lower ball joint from the knuckle with the special tool. (09544-43000)



AU51-11B

INSPECTION EILB0230

1. Check the knuckle for cracks and deformation.
2. Check the knuckle spindle for wear and damage.

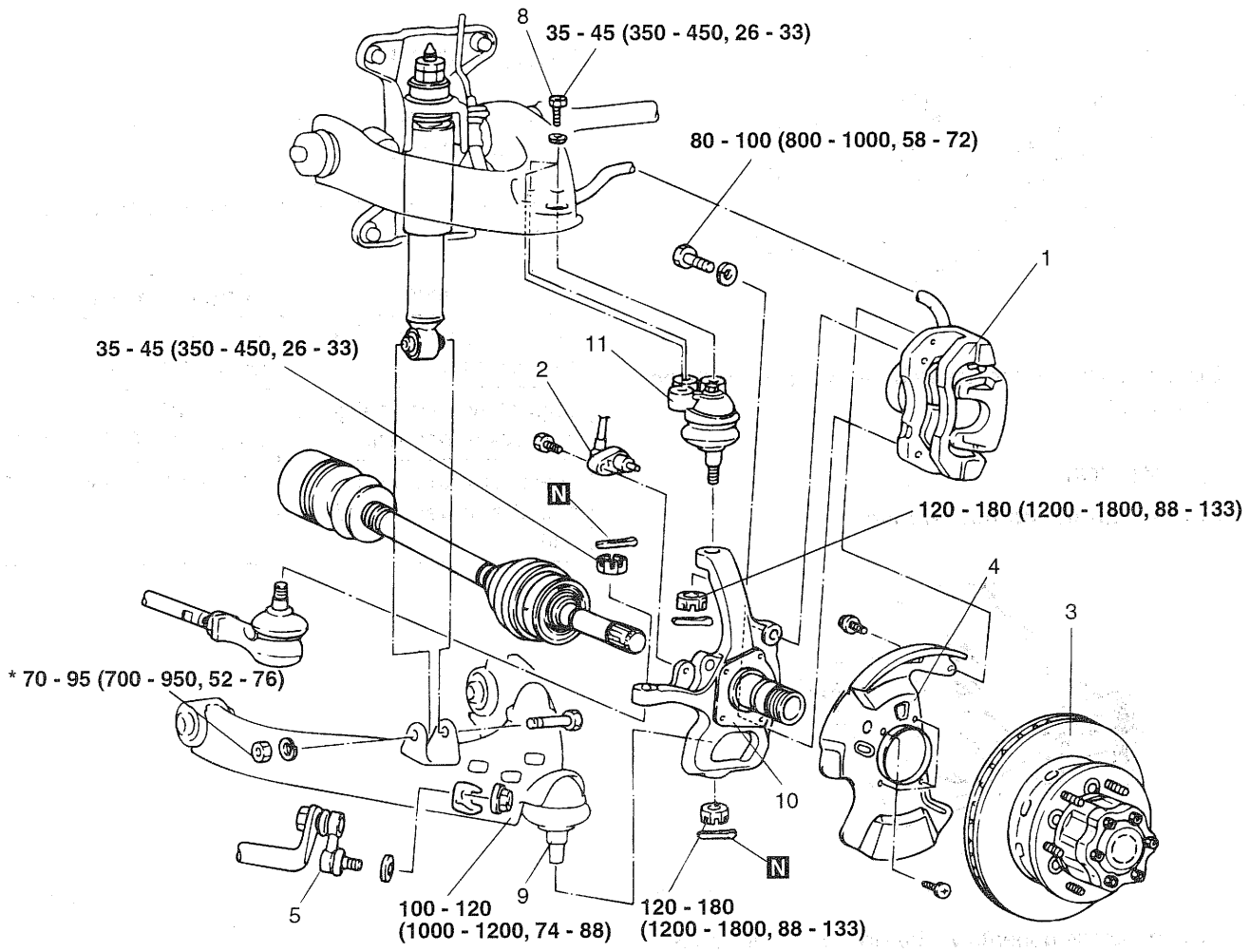
INSTALLATION EIUC0300

1. Insert the shock absorber lower mounting bolt in the front of the vehicle.
2. Tighten the components below to the specified torque :

Items	Torque Nm (kg·cm, lb·ft)
Knuckle to tie rod end mounting nut	35 - 45 (350 - 450, 26 - 33)
Upper/lower arm ball joint to knuckle mounting	120 - 180 (1200 - 1800, 88 - 133)
Lower arm to shock absorber lower mounting bolt	70 - 95 (700 - 950, 52 - 70)

KNUCKLE (4WD) EIUC0310

COMPONENTS



Removal steps

1. Caliper assembly
2. Front speed sensor (Vehicle with ABS)
3. Hub assembly
4. Dust shield
5. Stabilizer link connection
6. Tie rod end connection
7. Shock absorber lower mounting bolt
8. Upper ball joint mounting bolt
9. Lower ball joint connection
10. Knuckle
11. Upper ball joint

CAUTION

*** : Indicates parts which should be temporarily tightened, and then fully tightened with the vehicle on the ground in the unladen condition.**

TORQUE : Nm (kg·cm, lb·ft)

EIUC031A

REMOVAL SERVICE POINTS EIUC0320

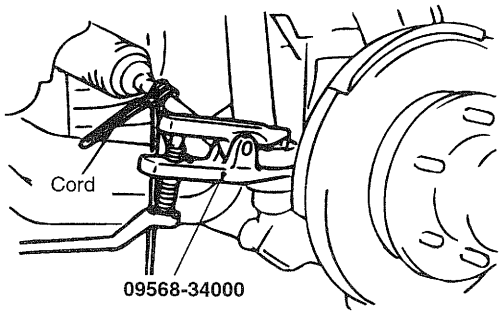
1. CALIPER ASSEMBLY REMOVAL

Secure the removed caliper assembly with wire so that it does not fall.

2. TIE ROD END DISCONNECTION

⚠ *CAUTION*

- ***Use the special tool to loosen the nut only; do not remove it from the ball joint.***
- ***Tie the special tool with a cord not to let it fall off.***



H7FA0370

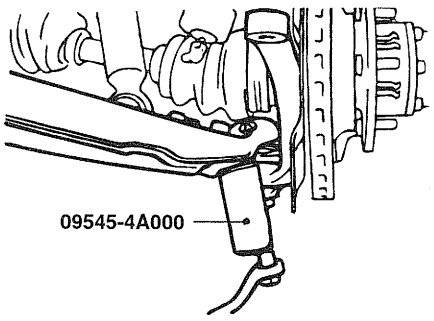
3. LOWER BALL JOINT DISCONNECTION

⚠ *CAUTION*

The nut should be loosened only, not removed.

📖 *NOTE*

Leave nut on lower ball joint until knuckle and upper arm are disconnected.



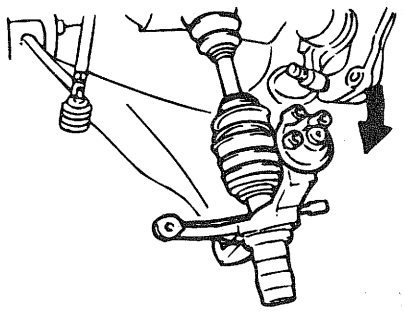
H7FA0380

4. KNUCKLE REMOVAL

1) Press down lower arm and remove upper knuckle toward you.

⚠ *CAUTION*

Do not damage upper ball joint nipple with upper arm.

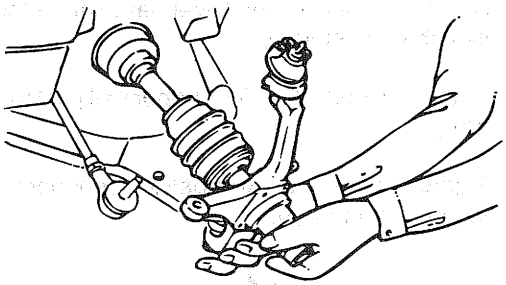


H7FA0390

2) Slightly back off driveshaft from knuckle. Remove lower ball joint and knuckle holding nut.
3) Disconnect knuckle and lower ball joint.
4) Remove knuckle and front hub assembly from driveshaft assembly.

⚠ *CAUTION*

Do not damage knuckle oil seals with driveshaft spline.

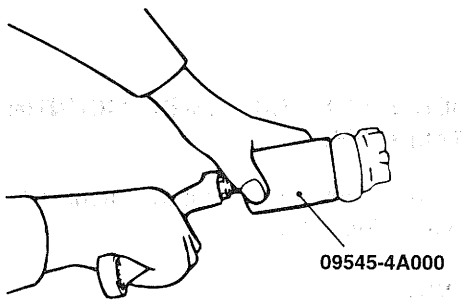


H7FA0400

5. UPPER BALL JOINT DISCONNECTION

⚠ *CAUTION*

The nut should be loosened only, not removed.



H7FA0410

INSTALLATION SERVICE POINTS EIUC0330

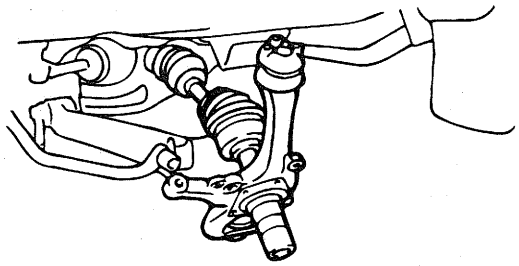
1. KNUCKLE INSTALLATION

1) Install upper ball joint on knuckle. Temporarily tighten slotted nut.

2) Insert knuckle into driveshaft.

⚠ ***CAUTION***

Do not damage oil seal with driveshaft spline.

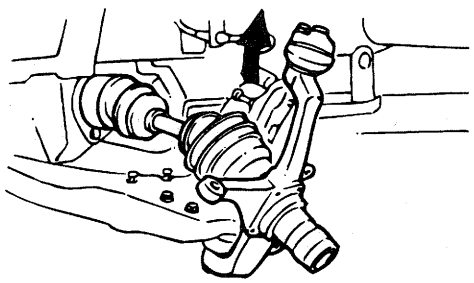


H7FA0420

3) Assemble knuckle and lower ball joint. Temporarily tighten slotted nut.

4) Push up lower arm to lock upper ball joint to upper arm.

5) Tighten upper and lower ball joint connecting nut to specified torque.



H7FA0430

2. SHOCK ABSORBER LOWER MOUNTING BOLT INSTALLATION

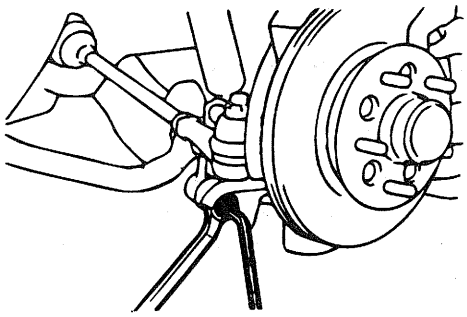
Insert the shock absorber lower mounting bolt from the rear of the vehicle.

📖 ***NOTE***

Do not insert from the front of the vehicle, or you may have trouble tightening the nut.

3. STABILIZER LINK INSTALLATION

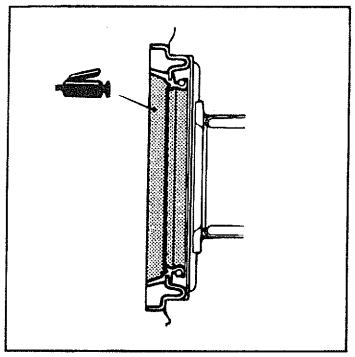
Use an Allen key to tighten the nut while making sure that the stud on the stabilizer link does not turn as well.

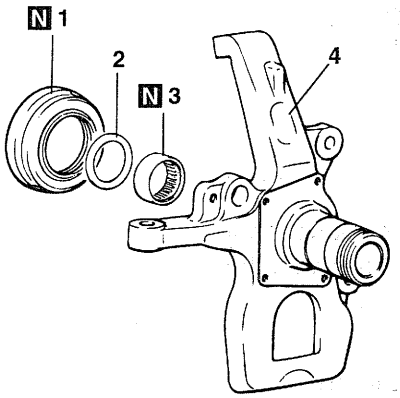


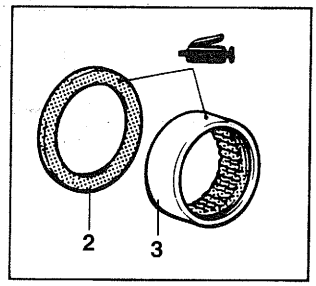
H7FA0440

KNUCKLE EIUC0340

COMPONENTS







Disassembly steps

1. Oil seal
2. Spacer
3. Needle bearing
4. Knuckle

N : Replace the parts with new one after removal.

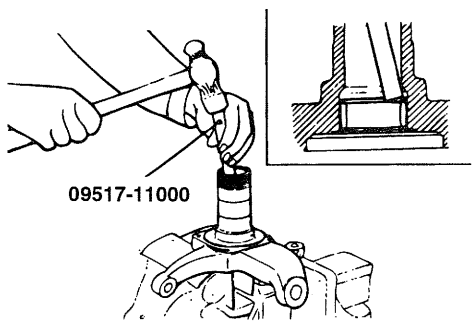
EHPDS12B

DISASSEMBLY EIMB3700

1. Remove the oil seal and take out the spacer.
2. Drive out the needle bearing by tapping the needles uniformly.

CAUTION

Once removed, the needle bearing must not be reused.



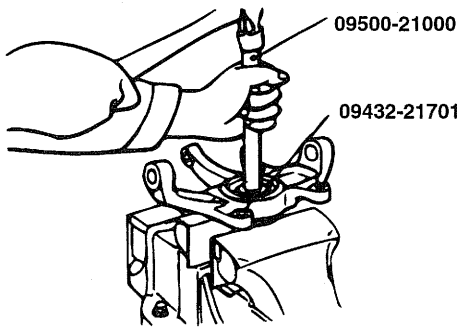
H7FA0460

REASSEMBLY EIMB3800

1. Use the special tools to press-fit the needle bearing until it is flush with the knuckle end face.

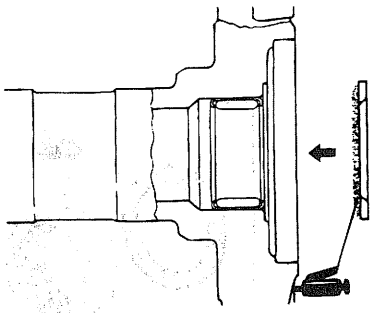
CAUTION

Care to prevent driving the needle bearing too far in.



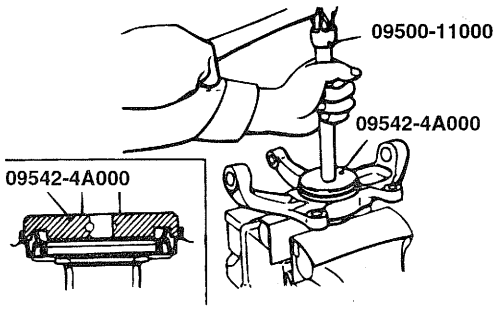
KIMB200A

2. Apply multi-purpose grease(LIG-2 or equivalent) to the contact surface of the spacer and install the spacer to knuckle.



H7FA0480

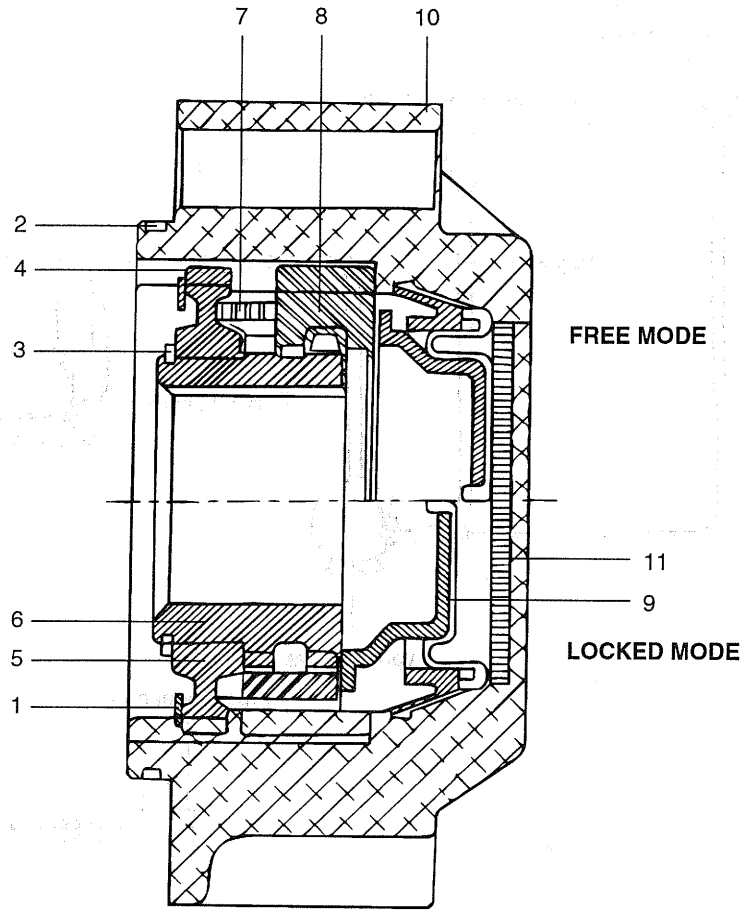
3. Use the special tools(09500-11000, 09542-4A000) to press-fit the new oil seal until it is flush with the knuckle end face.



H7FA0490

FREE WHEEL HUB ASSEMBLY

COMPONENTS EIUC0500



1. Body retainer ring
2. O-ring
3. Retainer ring
4. Bronze bush
5. Wear washer
6. Inner drive gear
7. Return spring
8. Clutch ring
9. Piston
10. Body
11. Filter

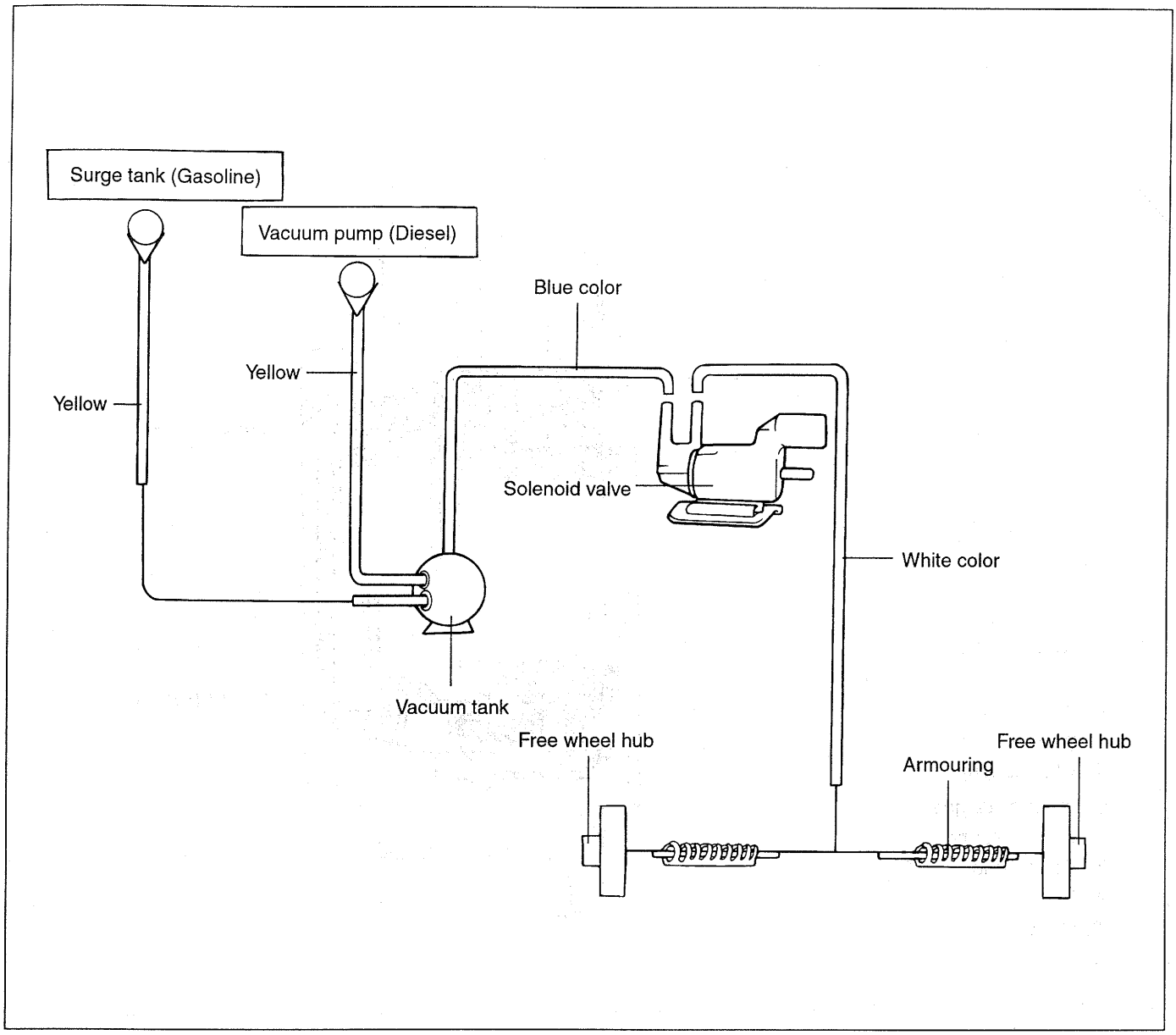
EIUB040A

DESCRIPTION EIUC0510

Auto vacuum type free wheel hub assembly is actuated by vacuum which is generated in the surge tank or vacuum pump. When the solenoid valve energized, it allows the vacuum from the vacuum tank to act on the free wheel hub.

The vacuum pull the piston and clutch ring toward the front hub assembly to engage the clutch ring with the inner drive gear. This results in the power flow to continue from the CV joint to the front hub via free wheel hub (Locked Mode). When the solenoid value de-energized the vacuum no longer acts on the free wheel hub. Therefore the return spring inside the free wheel hub returns the piston and clutch ring to their original position and disengages the power flow from the C.V. joint to the free wheel hub (Free Mode).

SCHEMATIC DRAWING EIUC0520



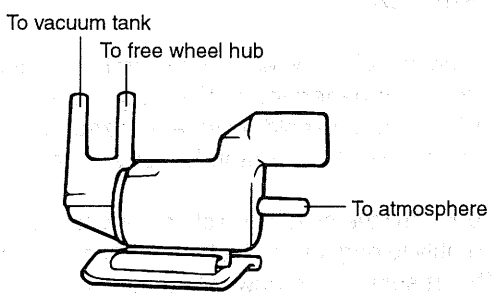
EIUB042A

SOLENOID VALVE INSPECTION EIUC0520

NOTE

When disconnecting the vacuum hoses, make identification marks on it so it can be reconnected to its original position.

1. Disconnect the vacuum hoses from the solenoid valve.
2. Detach the harness connector.

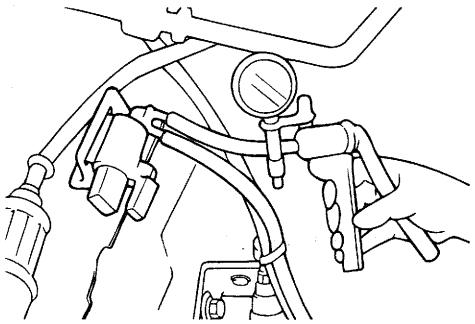


EIUB043A

3. Connect the vacuum pump to the nipple which was connected to the vacuum tank hose (Blue stripe).

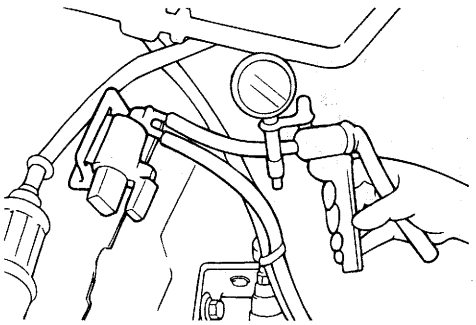
4. Apply vacuum and check when the voltage is applied or disconnected to the solenoid valve.

Battery Voltage	Normal condition
When disconnected	Vacuum is maintained
When applied	Vacuum is released



H7FA1225

5. Connect the vacuum pump to the nipple which was connected to the free wheel hub hose (white stripe)



H7FA1225

6. Apply the vacuum and check when the voltage is applied or disconnected to the solenoid valve.

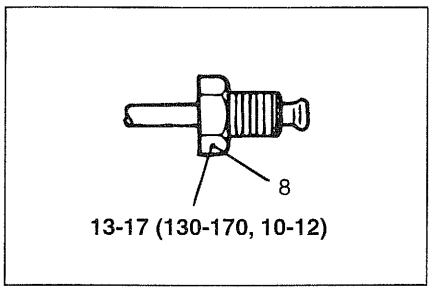
Battery Voltage	Nipple to atmosphere	Normal condition
When disconnected	Plugged	Vacuum is maintained
When disconnected	Opened	Vacuum is released
When connected	-	Vacuum is released

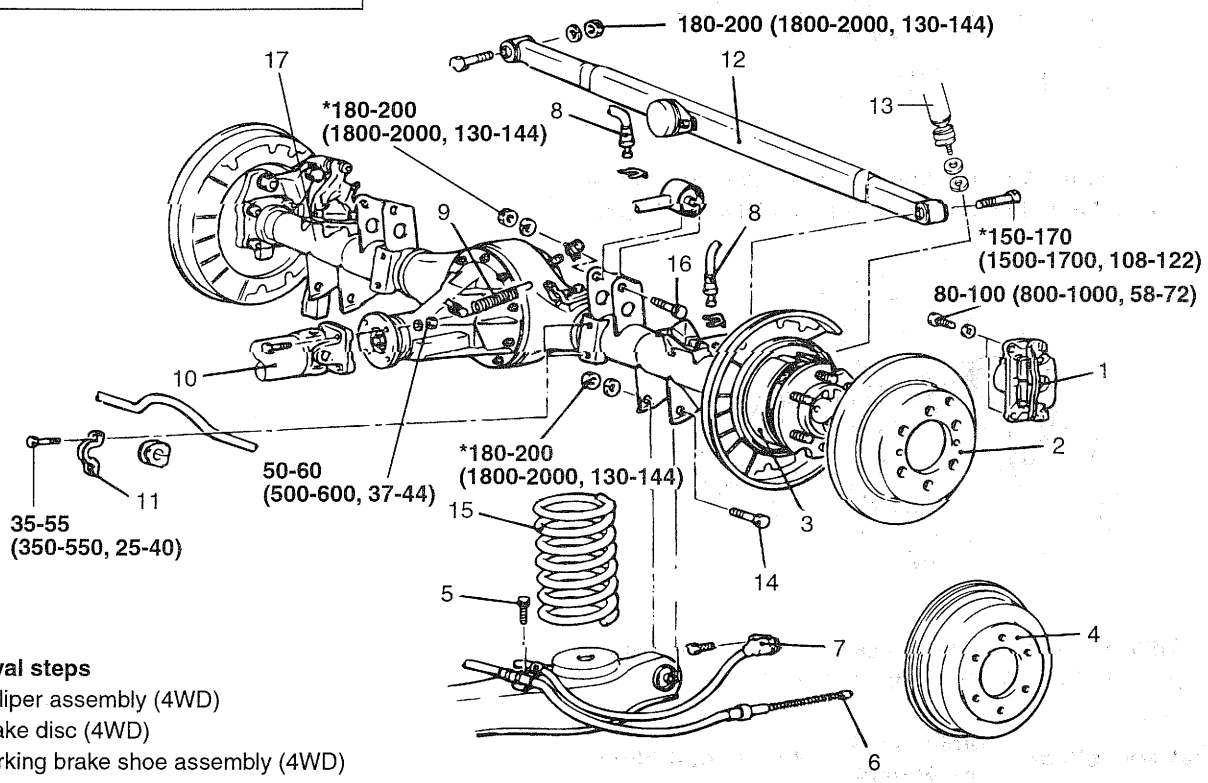
REAR AXLE

REAR AXLE ASSEMBLY EIUC0540

REMOVAL AND INSTALLATION

COMPONENTS (WITH COIL SPRING TYPE)





Removal steps

1. Caliper assembly (4WD)
2. Brake disc (4WD)
3. Parking brake shoe assembly (4WD)
4. Brake drum (2WD)
5. Parking brake cable speed sensor (vehicle with ABS) mounting bolt
6. Parking brake cable connection
7. Speed sensor connection (ABS)
8. Brake tube connection
9. Load sensing spring connection
10. Propeller shaft connection
11. Clamp
12. Lateral rod
13. Shock absorber connection
14. Lower arm mounting bolt
15. Rear spring
16. Upper control arm mounting bolt
17. Axle assembly

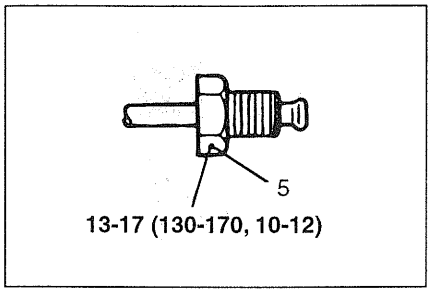
CAUTION

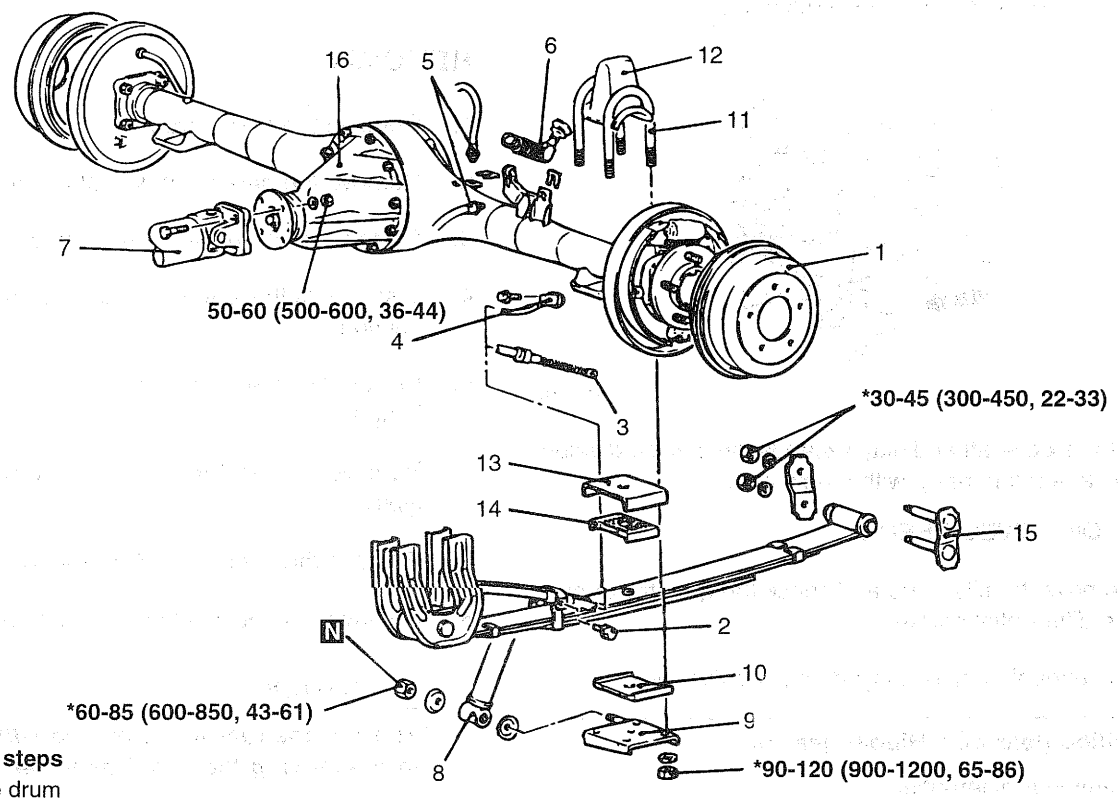
*** : Indicates parts which should be temporarily tightened, and then fully tightened with the vehicle on the ground in the unladen condition.**

TORQUE : Nm (kg·cm, lb·ft)

EIUC054A

COMPONENTS (WITH LEAF SPRING TYPE)





Removal steps

1. Brake drum
2. Parking brake cable, speed sensor (Vehicles with ABS) mounting bolt
3. Parking brake cable connection
4. Speed sensor connection (Vehicles with ABS)
5. Brake tube connection
6. Load sensing proportioning valve connection
7. Propeller shaft connection
8. Shock absorber connection
9. U-bolt seat
10. Spring pad, lower
11. U-bolts
12. Bump stopper
13. Clamp
14. Spring pad, upper
15. Shackle assembly
16. Axle assembly

CAUTION

*** : Indicates parts which should be temporarily tightened, and then fully tightened with the vehicle on the ground in the unladen condition.**

N : Replace the parts with new one after removal.

TORQUE : Nm (kg·cm, lb·ft)

EIUC054B

SERVICE INSPECTION PROCEDURE EIUC0550

AXLE SHAFT END PLAY CHECK

1. Measure the axle shaft end play using a dial indicator.

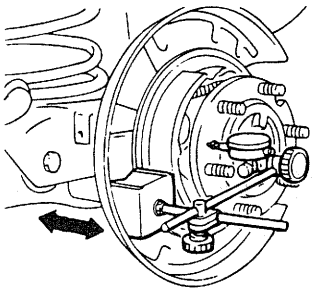
Standard value

CBS (Conventional Brake System) :

0.05 - 0.20 mm (0.0093 - 0.0079 in.)

ABS (Anti-lock Brake System) :

0 - 0.25 mm (0 - 0.0098 in.)



KHPDS47A

2. If the axle shaft end play exceeds the standard value, replace the bearing with a new one.

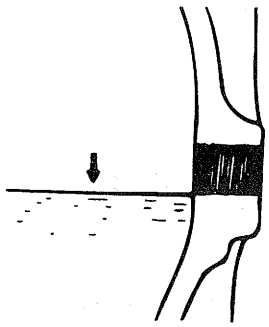
GEAR OIL LEVEL CHECK

1. Remove the filler plug and check the quantity of oil in the differential carrier.
2. It is enough if oil is applied until the filler plug.

Specified gear oil : Hipoid gear oil

Conventional differential
- General zone (-30°C - +30°C) : API GL-4 class (SAE90)
- Severe heat zone (+30°C MIN.) : API GL-4 class (SAE140)
- Severe frigid zone (-30°C MAX.) : API GL-5 class (SAE80)

With LSD :
- Mobil Korea infilrex 33 or equivalent (API GL-4 class SAE90)



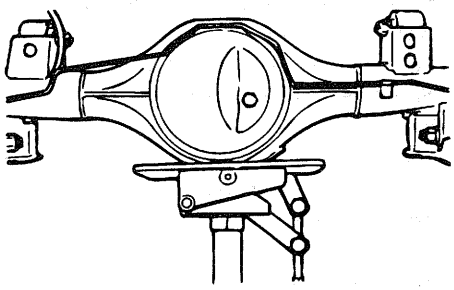
EIJA010A

REMOVAL EIUC0560

1. Remove the brake drum.
2. Remove the parking brake cable and speed sensor.
3. Disconnect the brake tube connection.
4. Disconnect the load sensing proportioning valve connection.
5. Disconnect the propeller shaft from the companion flange.
6. Remove the stabilizer bar mounting clamp (Coil spring type)
7. Remove the lateral rod (Coil spring type)
8. Remove the shock absorber assembly.

⚠ ***CAUTION***

Support the rear axle housing with rigid jack before removing the shock absorber mounting nut.



H7RA0600

9. Remove the lower arm and upper control arm assembly (Coil spring type)

⚠ ***CAUTION***

Be careful not to drop the axle assembly

INSTALLATION EIUC0570

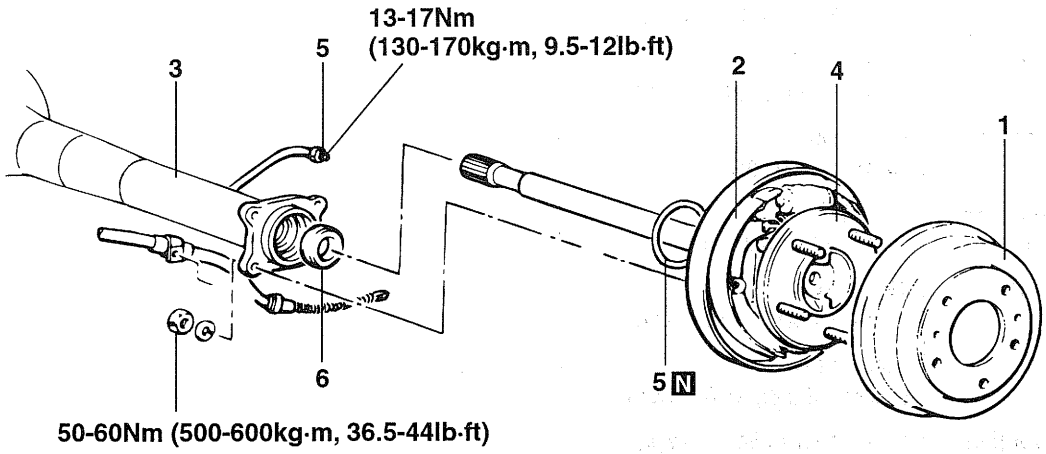
1. Installation is the reverse of removal.

2. Tighten the parts with the specified torque as follows :

Items	Specified torque Nm(kg·cm, lb·ft)
Wheel nut mounting	120 - 140 (1200 - 1400, 88 - 103.6)
Brake caliper mounting bolt	80 - 100 (800 - 1000, 58 - 73)
Rear shock absorber lower mounting nut	65 - 85 (650 - 850, 48 - 63)
Rear upper control arm mounting	180 - 200 (1800 - 2000, 130 - 144)
Rear lower arm mounting	180 - 200 (1800 - 2000, 130 - 144)
Lateral rod mounting nut (Rear axle side)	150 - 170 (1500 - 1700, 108 - 122)
Lateral rod mounting (Frame side)	180 - 200 (1800 - 2000, 130 - 144)

REAR AXLE SHAFT ASSEMBLY

COMPONENTS EIMB5100



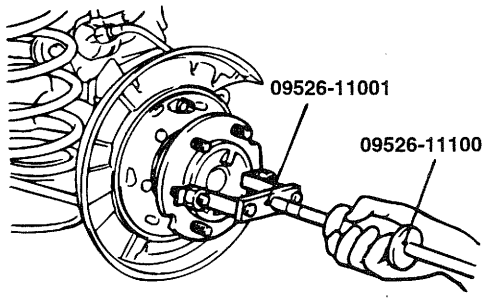
1. Brake drum/Disc
2. Shoe-lining assembly
3. Rear axle housing
4. Axle shaft assembly
5. O-ring
6. Oil seal

N : Replace the parts with new one after removal.

EHPDS46A

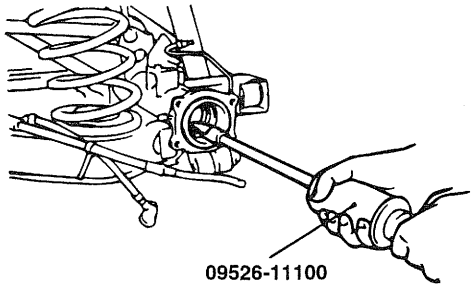
REMOVAL EIMB5200

1. Remove the brake drum.
2. Remove the shoe-lining assembly.
3. Remove the parking brake cable and speed sensor cable.
4. Disconnect the brake hose and tube connection.
5. Remove the rear axle housing and axle shaft mounting bolt.
6. Using the special tools(09526-11001, 09526-11100), remove the axle shaft from the rear axle housing.



H7RA0540

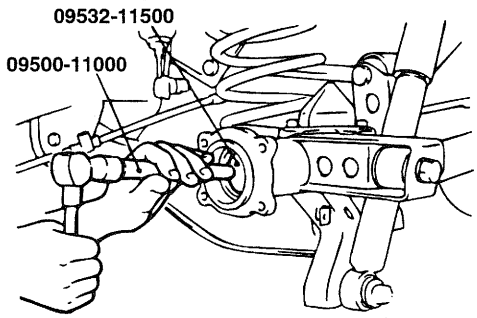
7. Using the special tool(09526-11100), remove the oil seal.



H7RA0550

INSTALLATION EIMB5300

1. Installation is the reverse of removal.
2. Apply grease to the oil seal lip.
3. Using the special tools(09500-11000, 09532-11500), install the oil seal.

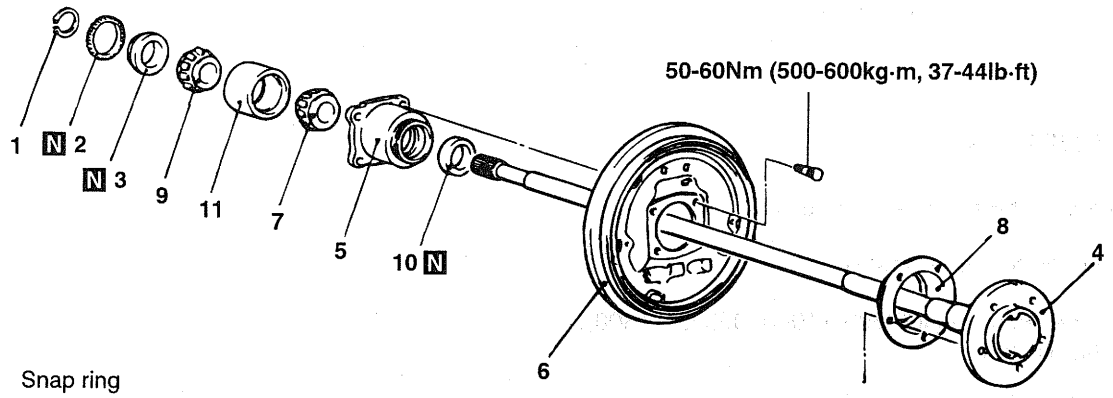


H7RA0560

4. After installing the axle shaft, bleed the brake line.
5. Adjust the parking brake lever stroke.

DISASSEMBLY AND REASSEMBLY EIMB5400

COMPONENTS



1. Snap ring
2. Rotor (Vehicles with ABS)
3. Retainer
4. Axle shaft
5. Bearing case
6. Backing plate
7. Outer bearing inner race
8. Dust cover
9. Inner bearing inner race
10. Oil seal
11. Bearing outer race

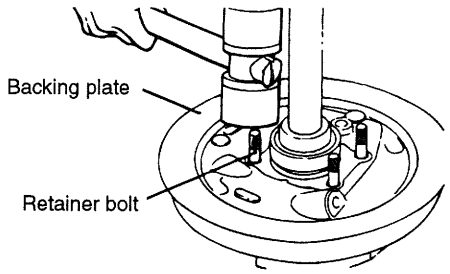
N : Replace the parts with new one after removal.

TORQUE : Nm (kg·m, lb·ft)

EIMB620A

DISASSEMBLY EIMB5500

1. Remove the snap ring.
2. Remove the retainer bolt from the backing plate.

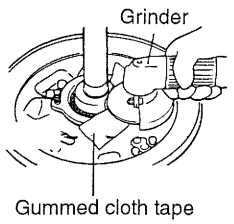


EHPDS33B

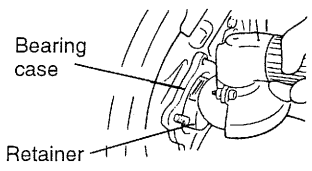
3. Apply gummed cloth tape around the edge of the bearing case for protection.
4. As shown in the figure, fix the axle shaft and shave off with grinder a point of its circumference locally until the wall thickness on the side of axle shaft of retainer becomes approximately 1.0-1.5mm (0.039-0.059in.).

⚠ ***CAUTION***

Be careful not to damage the bearing case and the axle shaft.



H7RA1120



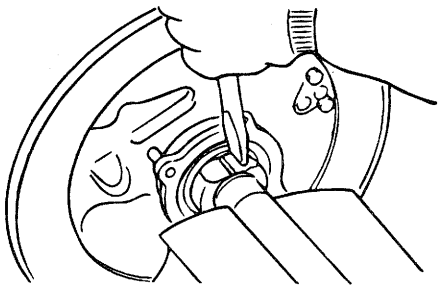
H7RA1130

EIMB630A

5. Cut in with a chisel the place where the retainer ring has been shaven.

⚠ CAUTION

Be careful not to damage the axle shaft.

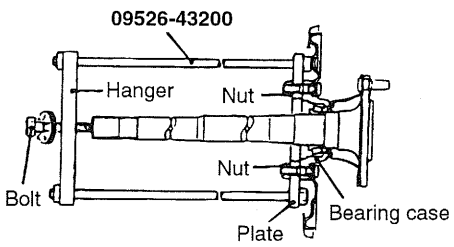


H7RA1140

6. Install the special tool(09526-43200) and then separate the bearing case and backing plate from the axle shaft.

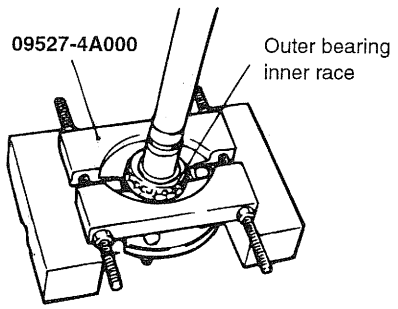
NOTE

Secure the plate of the special tool(09526-43200) and bearing case with the bolts (length : 100mm or longer).



EIMB550A

7. Using the special tool(09527-4A000), remove the outer bearing inner race from the axle shaft.



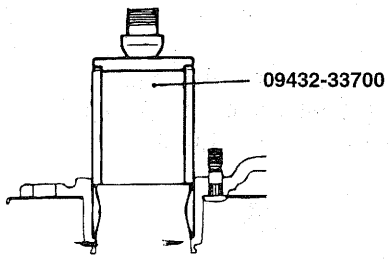
EIMB550B

INSPECTION EIMB5600

1. Check the axle shaft spline part for wear or damage.
2. Check the backing plate for deformation and damage.
3. Check the bearing for seizure and discoloration.
4. Check the axle shaft for bend, wear or damage.

REASSEMBLY EIMB5700

1. Press-fit bearing outer race to the bearing case.



H7RA0750

2. Apply multi-purpose grease to the roller surface and ends of the bearing inner race and fit it to the bearing case.

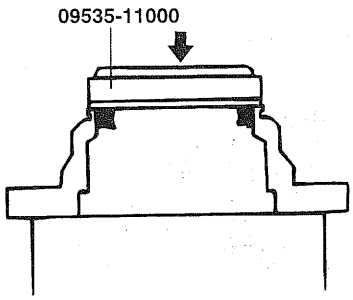
Specified grease : CENTOPLEX 278 (MS511-7)

3. Press-fit the oil seal into the bearing case until it is flush with the face of the bearing case using the special tool(09535-11000).

NOTE

Apply multi-purpose grease to the lip of the oil seal.

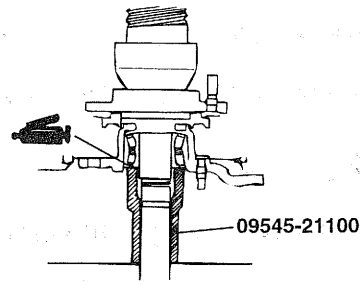
Specified grease : CENTOPLEX 278 (MS511-7)



H7RA1260

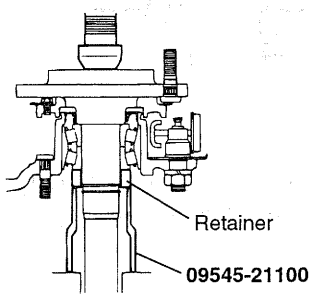
4. Install the backing plate.

5. Using the special tool(09545-21100), press-fit the bearing case, inner bearing inner race, and outer bearing inner race to the axle shaft.



H7RA0730

6. Using the special tool(09545-21100), press-fit the retainer at the initial force of 5,000kg or more and at the final force of 10,000-11,000kg.



EHPDS51A

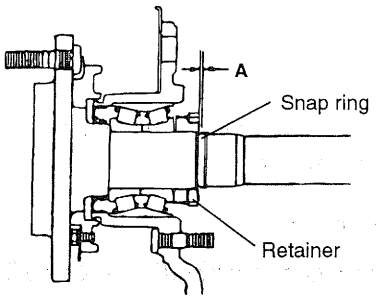
7. After installing the snap ring, measure the clearance(A) between the snap ring and the retainer.

Standard value(A) : 0-0.166mm (0-0.0065in.)

NOTE

If the clearance exceeds the standard value, change the snap ring so that the clearance is at the standard value.

Thickness of snap ring (mm)	Identification color
2.17	Blue
2.01	Violet
1.85	Red
1.69	Yellow
1.53	-

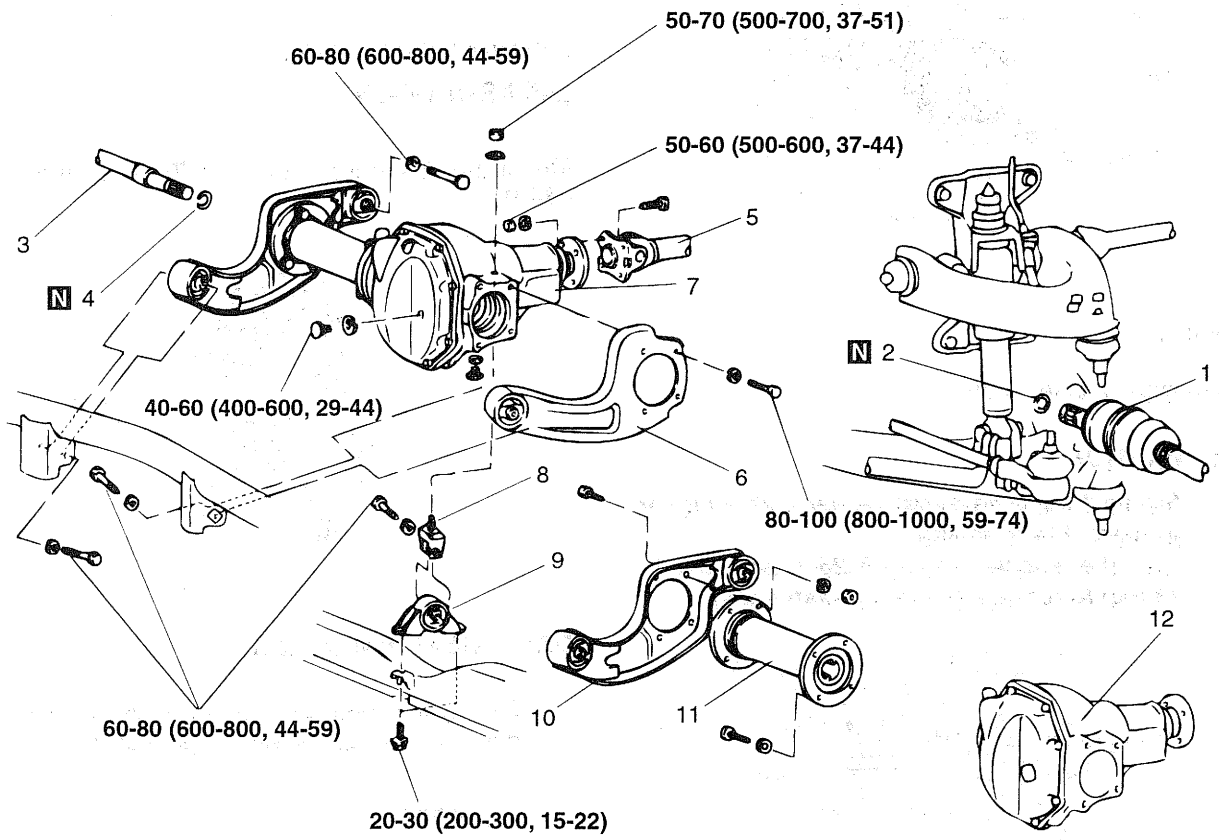


EHPDS48A

DIFFERENTIAL CARRIER ASSEMBLY

FRONT DIFFERENTIAL CARRIER

COMPONENTS EIUC0640



Removal steps

1. Driveshaft
2. Circlip
3. Inner shaft
4. Circlip
5. Front propeller shaft connection
6. Differential mounting bracket (L.H.)
7. Front differential, housing tube, differential bracket (R.H.)
8. Differential support bracket
9. Differential mount insulator assembly
10. Differential mounting bracket (R.H.)
11. Housing tube
12. Front differential carrier assembly

N : Replace the parts with new one after removal.

TORQUE : Nm (kg·cm, lb·ft)

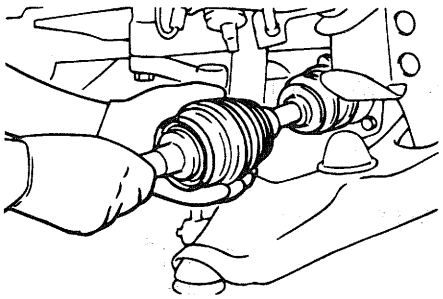
EIUB044A

REMOVAL EIUC0650

1. Remove the hub and knuckle (Refer to "Front hub/knuckle" for the detail).
2. Remove the driveshaft.

⚠ ***CAUTION***

When removing the driveshaft, be careful not to damage the differential carrier oil seal by interference of spline part.

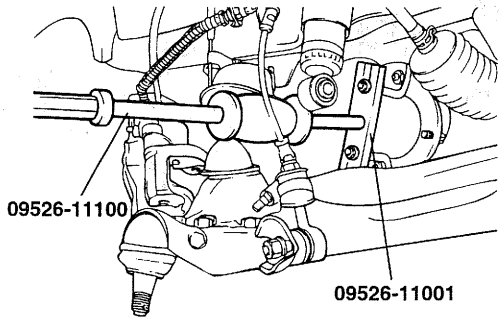


KHPDS13A

3. Drain oil.
4. Remove the inner shaft.

⚠ ***CAUTION***

- ***Support the differential carrier with a jack to prevent it from falling.***
- ***Use the special tools(09526-11001, 09526-11100) to remove the inner shaft easily.***

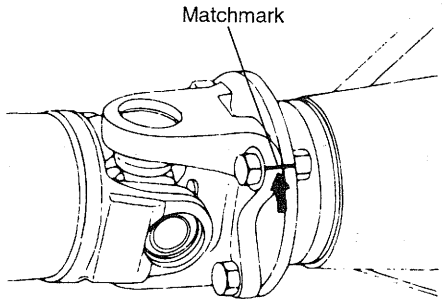


H7FA1226

5. Remove the front propeller shaft.

NOTE

Make matchmark on the flange yoke and differential companian flange to avoid any mistake when installing them again.

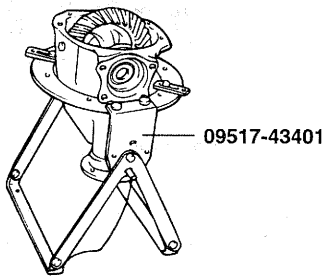


EIMB080A

6. Remove the differential carrier.

INSPECTION BEFORE DISASSEMBLY EIUC0660

Mount the differential carrier on the special tool(09517-43401).



H7FS0600

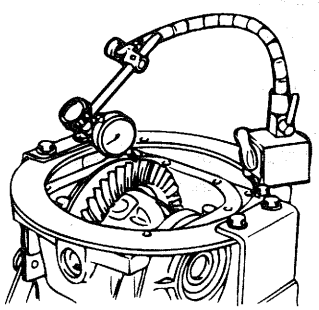
DRIVE GEAR BACKLASH

1. Fix the drive gear so it cannot move and measure the drive gear backlash with a dial indicator.

NOTE

Measure at four points or more on the circumference of the drive gear.

Standard value : 0.11-0.16mm (0.0043-0.0063in.)



H7FA0690

2. If the backlash is beyond the standard value, adjust it using the side bearing spacers.

NOTE

After adjustment, inspect the contact of the drive gear.

DRIVE GEAR RUNOUT

Check the back-face lash as follows:

1. Place a dial gauge on the back-face of the drive gear and measure the runout.

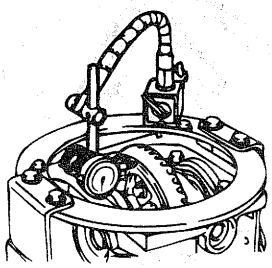
Limit : 0.05 mm (0.0020 in.)

2. If the runout is beyond the limit, check that there are no foreign substances between the drive gear and differential case and, that the bolts fixing the drive gear are not loose.

3. If nothing is wrong in check (2), adjust the drive gear depth and remeasure.

NOTE

If these adjustments are impossible, replace the case or install a new drive gear/drive pinion as a set.



H7FA0700

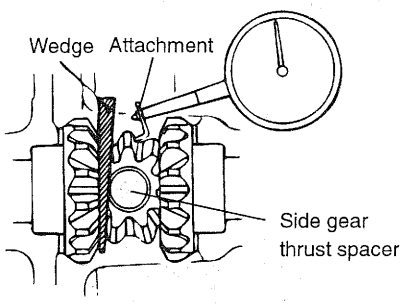
DIFFERENTIAL GEAR BACKLASH

1. Fix the side gear with a wedge so it cannot move and measure the differential gear backlash with a dial indicator on the pinion gear.

NOTE

Take the measurements at two places (4 places for LSD) on the pinion gear.

Standard value : 0-0.076 mm (0-0.003 in.) Limit : 0.2 mm (0.008 in.)



A7FA0710

2. If the backlash exceeds the limit, adjust using side bearing spacers.

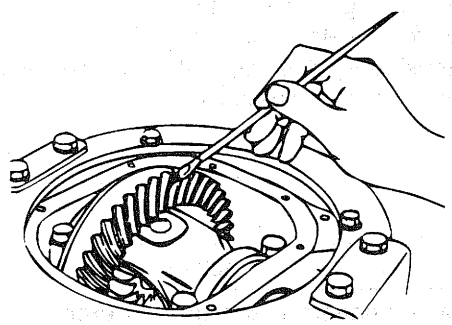
NOTE

If adjustment is impossible, replace the side gear and pinion gears as a set.

DRIVE GEAR TOOTH CONTACT

Check the drive gear tooth contact by following the steps below :

1. Apply the same amount of machine blue slightly to both surfaces of the drive gear teeth.



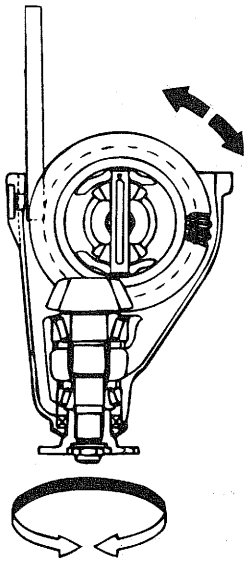
H7FA0720

2. Insert a brass rod between the differential carrier and the differential case, and then rotate the companion flange by hand (once in the normal direction, and then once in the reverse direction) while applying a load to the drive gear so that some torque (approximately 25-30 kg·cm) is applied to the drive pinion.

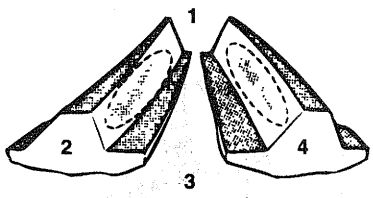
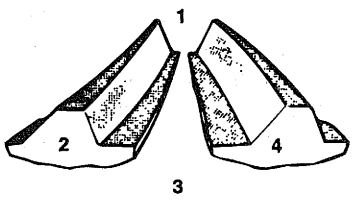
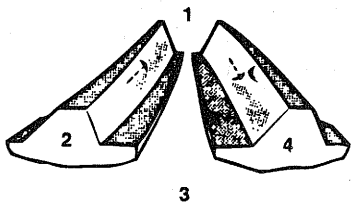
CAUTION

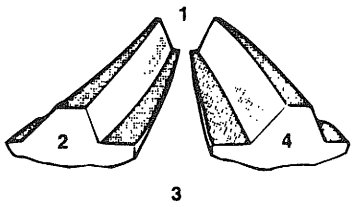
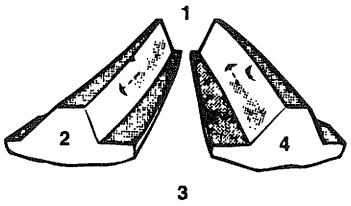
If the drive gear is rotated too much, the tooth contact pattern will become unclear and difficult to check.

3. Check the tooth contact pattern.



EIJA001B

Standard tooth contact pattern 1. Narrow tooth side 2. Drive-side tooth surface (the side receiving power during acceleration) 3. Wide tooth side 4. Coast-side tooth surface (the side receiving power during coast-down)	 EIJA0011
Problem	Solution
Tooth contact pattern resulting from excessive pinion height  EIJA0012 The drive pinion is positioned too far from the center of the drive gear.	 EIJA0013 Increase the thickness of the pinion height adjusting shim, and position the drive pinion closer to the center of the drive gear. Also, for backlash adjustment, reposition the drive gear further from the drive pinion.

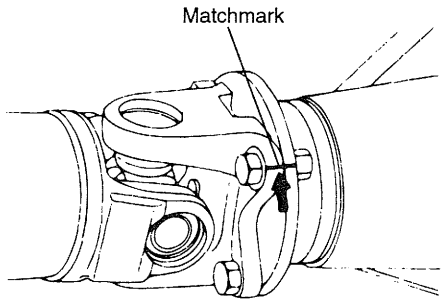
Tooth contact pattern resulting from insufficient pinion height  EIJA0014	 EIJA0015
The drive pinion is positioned too close to the center of the drive gear.	Decrease the thickness of the pinion height adjusting shim, and position the drive pinion further from the center of the drive gear. Also, for backlash adjustment, reposition the drive gear closer to the drive pinion.

NOTE

- *Tooth contact pattern is a method for judging the result of the adjustment of drive pinion height and final drive gear backlash. The adjustment of drive pinion height and final drive gear backlash should be repeated until the tooth contact patterns are similar to the standard tooth contact pattern.*
- *When you cannot obtain a correct pattern, the drive gear and drive pinion have exceeded their limits. Both gears should be replaced as a set.*

INSTALLATION EIMB6100

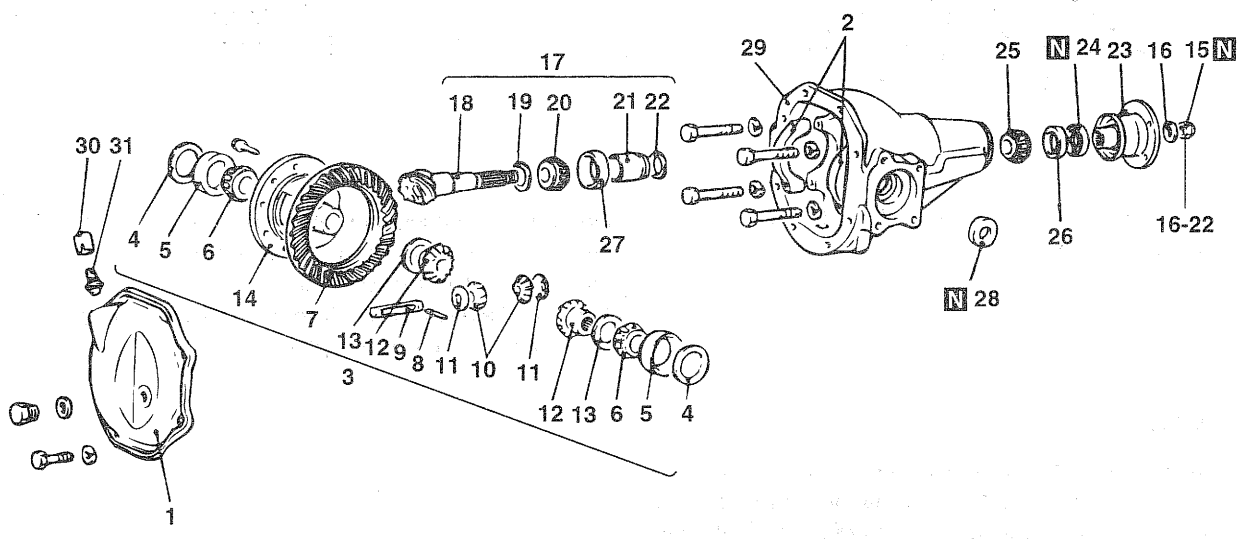
1. Installation is the reverse of removal.
2. Align the matchmark on the flange yoke and the companion flange.
   Tighten the propeller shaft and the front differential carrier.



EIMB080A

DISASSEMBLY EIMB6200

COMPONENTS



Disassembly steps

1. Cover
2. Bearing cap
3. Differential case assembly
4. Side bearing spacer
5. Side bearing outer race
6. Side bearing innter race
7. Drive gear
8. Lock pin
9. Pinion shaft
10. Pinion gear
11. Pinion washer
12. Side gear
13. Side gear spacer
14. Differential case
15. Self-locking nut
16. Washer
17. Drive pinion assembly
18. Drive pinion
19. Drive pinion (for pinion height adjustment)
20. Drive pinion front bearing inner race
21. Drive pinion spacer
22. Drive pinion rear shim (for turning torque adjustment)
23. Companion flange
24. Oil seal
25. Drive pinion rear bearing inner race
26. Drive pinion rear bearing outer race
27. Drive pinion front bearing outer race
28. Oil seal
29. Gear carrier
30. Plug cover
31. Vent plug

N : Replace the parts with new one after removal.

TORQUE : Nm (kg·cm, lb·ft)

EIMB510A

DISASSEMBLY EIMB6300

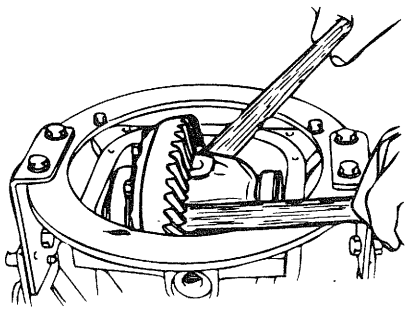
1. **REMOVAL OF THE DIFFERENTIAL CASE ASSEMBLY**

⚠ ***CAUTION***

Remove the differential case assembly slowly and carefully. Be careful so that the side bearing outer race is not dropped.

NOTE

Keep the right and left side bearings separate so that they are not mixed during reassembly.

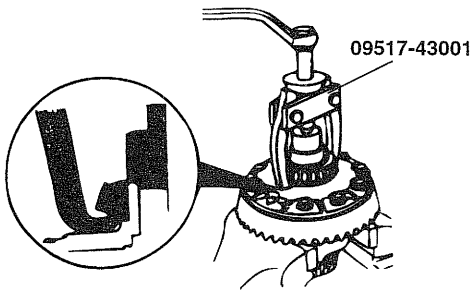


H7FA0740

2. **REMOVAL OF THE SIDE BEARING INNER RACES**
Fit the nut on top of the differential case, and then use the special tool(09517-43001) to remove the side bearing inner race.

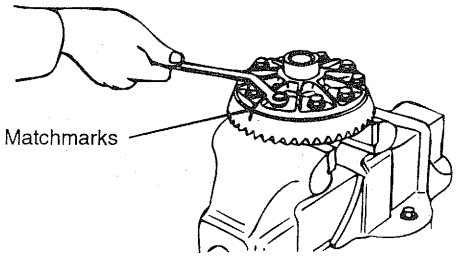
NOTE

Attach the prongs of the special tool to the inner race of the side bearing through the notched section in the differential case.



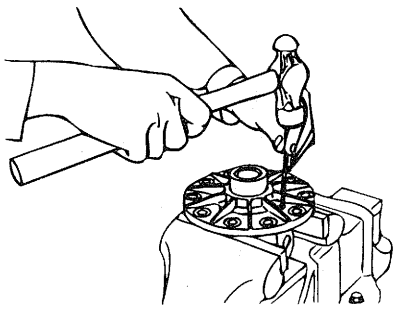
H7FA0750

3. **REMOVAL OF DRIVE GEAR**
   a. Make the matchmarks to the differential case and the drive gear.
   b. Loosen the drive gear attaching bolts in diagonal sequence to remove the drive gear.



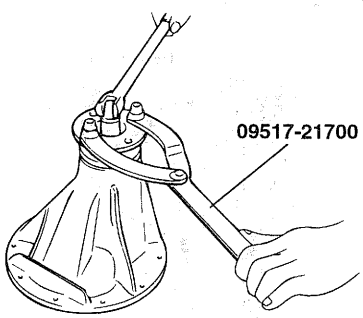
A7FA0760

4. **REMOVAL OF LOCK PIN (FOR CONVENTIONAL DIFFERENTIAL)**



H7FA0770

5. **REMOVAL OF SELF-LOCKING NUT**



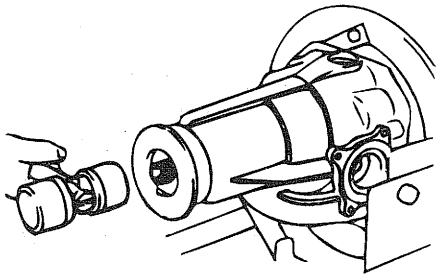
H7RA1100

6. **REMOVAL OF DRIVE PINION**
   a. Make the matchmarks to the drive pinion and companion flange.

⚠ ***CAUTION***

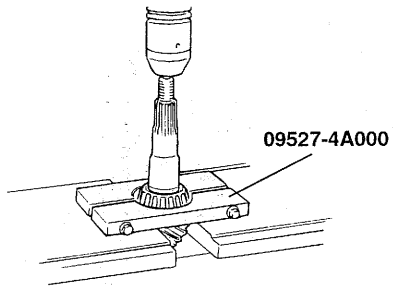
Matchmarks should not be made to the contact surfaces of the companion flange and the propeller shaft.

   b. Drive out the drive pinion together with the drive pinion spacer and drive pinion front shims.



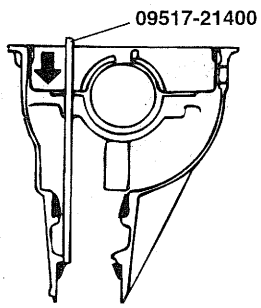
H7FA0790

7. **REMOVAL OF DRIVE PINION REAR BEARING INNER RACE**



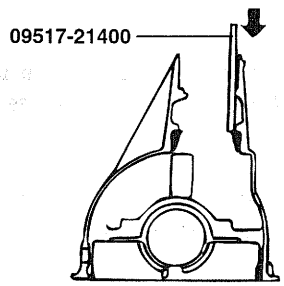
H7RA1090

8. **REMOVAL OF OIL SEAL / DRIVE PINION FRONT BEARING INNER RACE / DRIVE PINION FRONT BEARING OUTER RACE**



KIMB520D

9. **REMOVAL OF DRIVE PINION REAR BEARING OUTER RACE**



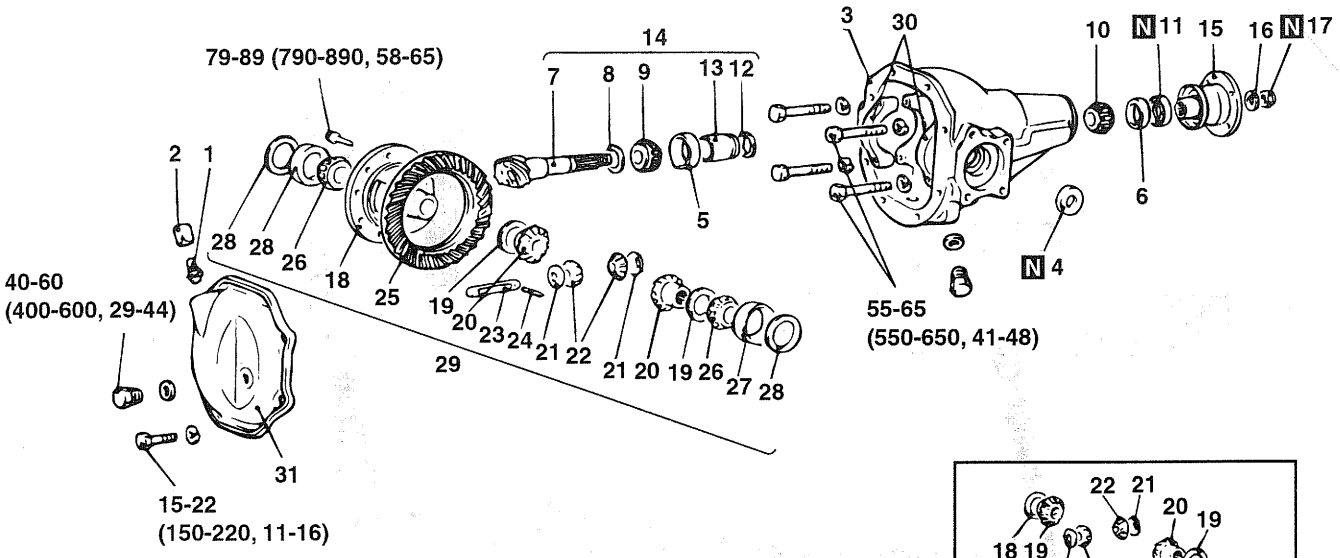
KIMB520E

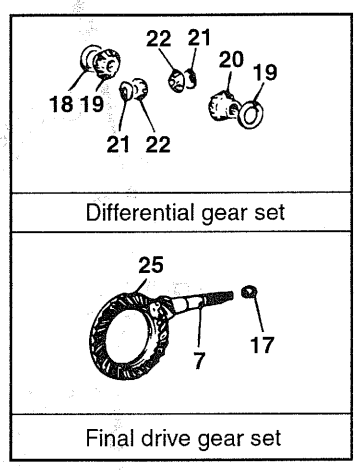
INSPECTION EIJB0490

1. Check the companion flange for wear or damage.
2. Check the bearings for wear or discoloration.
3. Check the gear carrier for cracks.
4. Check the drive pinion and drive gear for wear or cracks.
5. Check the side gears, pinion gears and pinion shaft for wear or damage.
6. Check the side gear spline for wear or damage.

REASSEMBLY EIUC0710

COMPONENTS





Disassembly steps

1. Vent plug
2. Plug cover
3. Gear carrier
4. Oil seal
5. Drive pinion front bearing outer race
6. Drive pinion rear bearing outer race
- Pinion height adjustment
7. Drive pinion
8. Drive pinion front shim (for pinion height adjustment)
9. Drive pinion front bearing inner race
10. Drive pinion rear bearing inner race
11. Oil seal
12. Drive pinion rear shim (for turning torque adjustment)
13. Drive pinion spacer
14. Drive pinion assembly
15. Companion flange
16. Washer
17. Self-locking nut
18. Differential case
19. Side gear spacer
20. Side gear
21. Pinion washer
22. Pinion gear
- Differential gear backlash adjustment
23. Pinion shaft
24. Lock pin
25. Drive gear
26. Side bearing innter race
27. Side bearing outer race
28. Side bearing adjustment spacer
- Drive gear backlash adjustment
29. Differential case assembly
30. Bearing cap
31. Cover

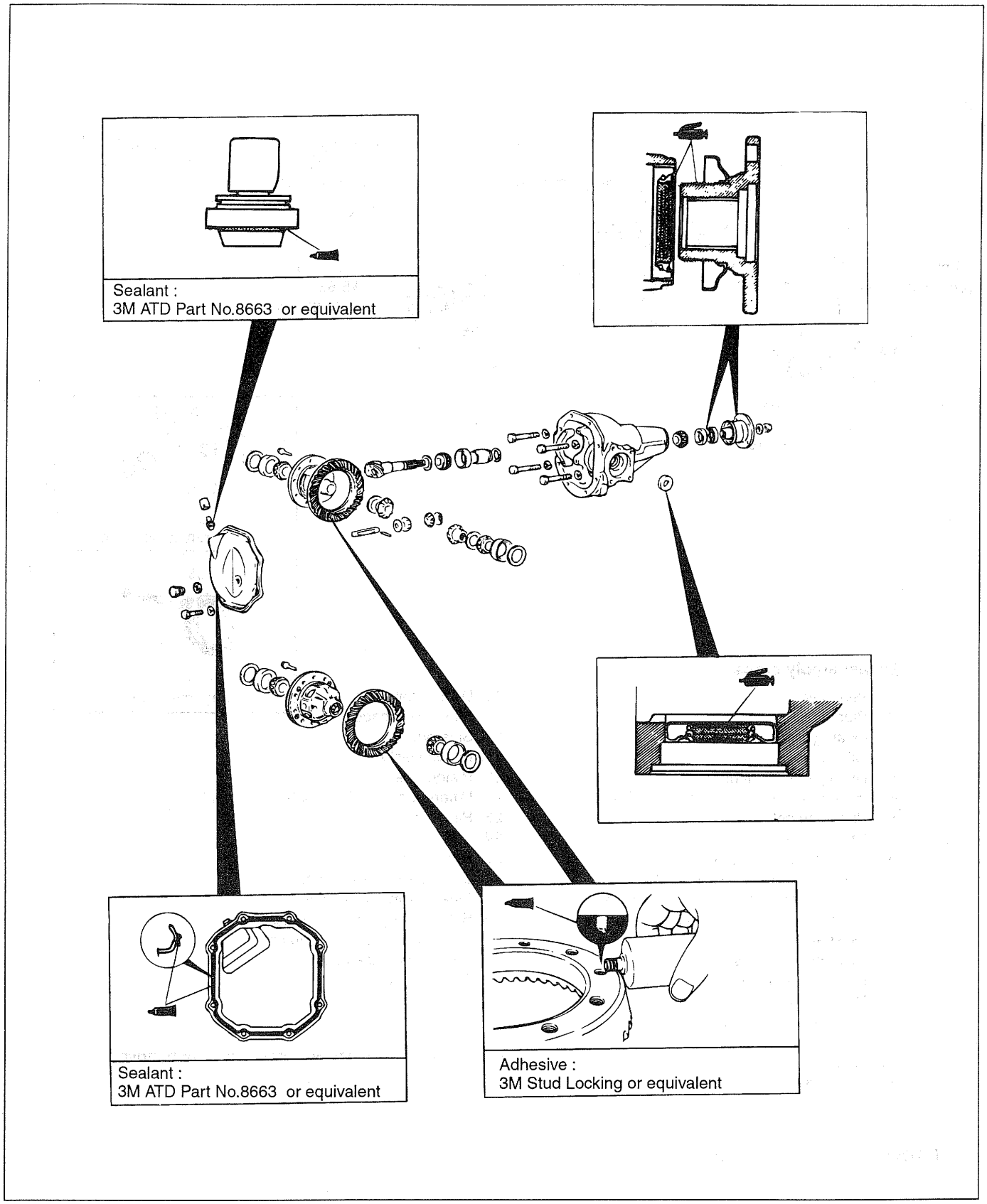
N : Replace the parts with new one after removal.

TORQUE : Nm (kg·cm, lb·ft)

EIUC071A

LUBRICATION, SEALING AND ADHESIVE POINTS EIMB6600

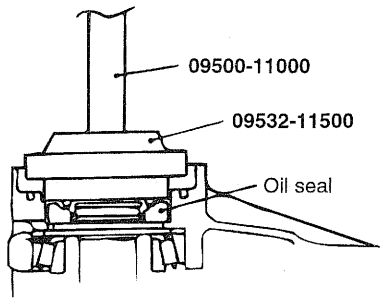
COMPONENTS



EIMB530A

REASSEMBLY EIMB6700

1. PRESS-FITTING OF IL SEAL

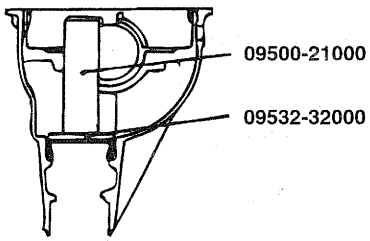


EIMB670A

2. DRIVE PINION FRONT BEARING OUTER RACE INSTALLATION

⚠ ***CAUTION***

When press-fitting the outer race, do not incline it.

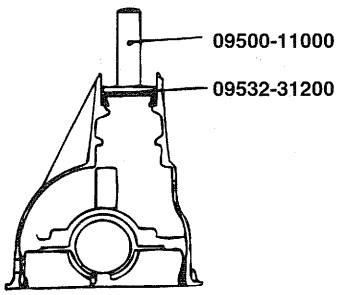


H7FA0860

3. DRIVE PINION REAR BEARING OUTER RACE INSTALLATION

⚠ ***CAUTION***

When press-fitting the outer race, do not incline it.



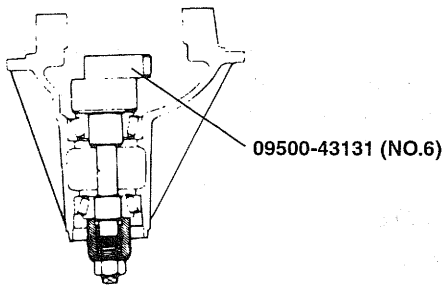
H7FA0870

4. ADJUSTMENT OF PINION HEIGHT
Adjustment the drive pinion height by the following procedure.

1) Install the special tool, drive pinion front and rear bearing inner races to the gear carrier.

⚠ ***CAUTION***

Apply multipurpose grease to the washer of the special tool(09500-43131).



EIMB670B

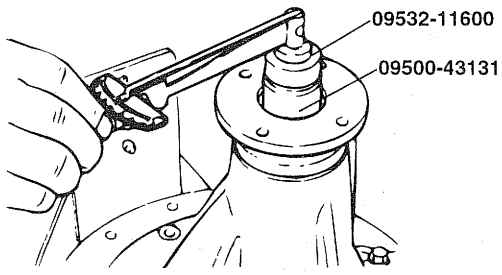
2) Tighten the nut of the special tool(09500-43131) slowly until the standard value of drive pinion turning torque(without oil seal) is obtained.

EIMB670C

Bearing division	Bearing lubrication	Rotation torque
New	None (With anti-rust agent)	0.5 - 0.7Nm
New or reusing	Gear oil applied	0.3 - 0.4Nm

📖 ***NOTE***

- *Gradually tighten the nut of the special tool while checking the drive pinion turning torque.*
- *Because the special tool cannot be turned one rotation, turn it several times within the range that it can be turned. After obtaining smooth bearing operation, measure the rotation torque.*

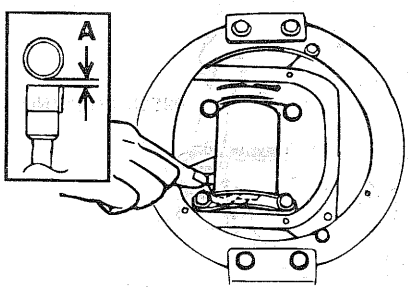


KIMB540A

5. Position the special tool in the side bearing seat of the gear carrier and select a drive pinion rear shim of a thickness which corresponds to the gap between the special tools.

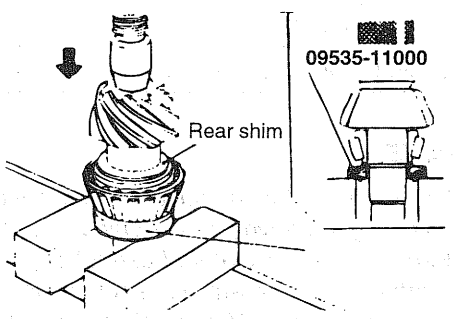
NOTE

- *Clean the side bearing seat thoroughly. When positioning the special tool, confirm that the cut-out sections of the special tool touch the side bearing seat very closely.*
- *When selecting the drive pinion rear shims, use the fewest number of shims necessary.*



KHPD736A

6. Fit the selected drive pinion rear shim(s) to the drive pinion, and press-fit the drive pinion rear bearing inner race using the special tool(09535-11000).



AIJA030A

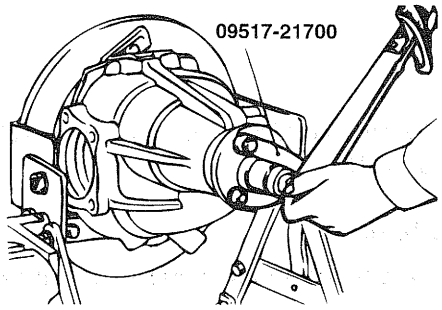
7. ADJUSTMENT OF DRIVE PINION PRELOAD
Adjust the drive pinion turning torque according to the following procedures :

1) Fit the drive pinion front shim(s) between the drive pinion spacer and the drive pinion front bearing inner race.

NOTE

Do not install the oil seal.

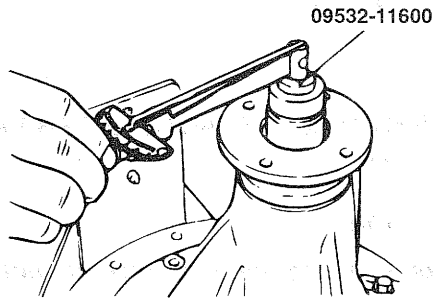
2) Tighten the companion flange self-locking nut to the specified torque using the special tool.



H7FA0930

3) Measure the drive pinion turning torque (without the oil seal) using the special tool.

Standard value :
0.15-0.25Nm (1.5-2.5kg·cm, 0.12-0.18lb·ft)



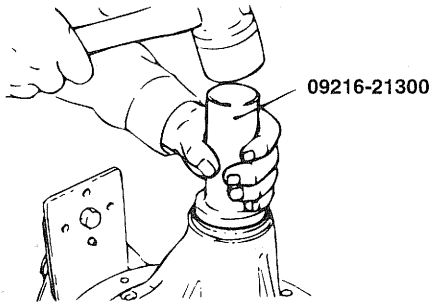
H7FA0940

4) If the drive pinion turning torque is not within the range of the standard value, adjust the turning torque by replacing the drive pinion front shim(s) or the drive pinion spacer.

NOTE

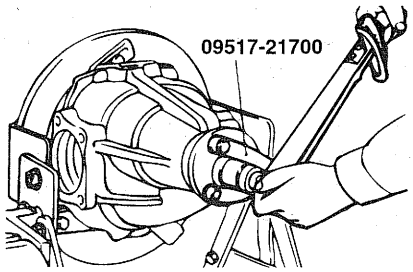
When selecting the drive pinion front shim pack use the minimum number of shims.

5) Remove the companion flange and drive pinion once again.
Insert the oil seal into the gear carrier front lip using the special tool(09216-21300).
Apply multipurpose grease to the oil seal lip.



H7FA0960

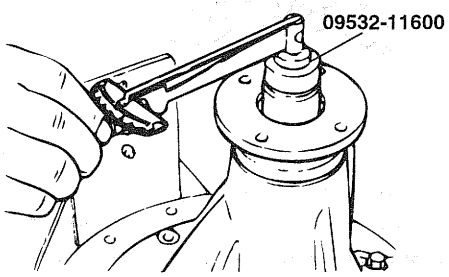
6) Install the drive pinion assembly, shim packs and companion flange with matchmarks properly aligned, and tighten the companion flange self-locking nut to the specified torque using the special tool(09517-21700).



H7FA0970

7) Measure the drive pinion turning torque using the special tool(09532-11600).

Standard value :
0.35-0.45Nm (3.5-4.5kg·cm, 0.26-0.33lb·ft)



H7FA0980

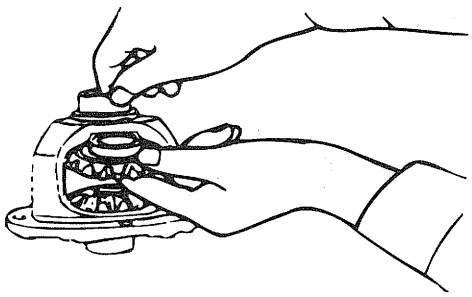
8) If it is beyond the standard value, verify the torque of the companion flange self-locking nut or the fit of the oil seal.

8. ADJUSTMENT OF DIFFERENTIAL GEAR BACKLASH
Adjust the differential gear backlash according to the following procedures :

1) Assemble the side gears, side gear spacers, pinion gears, and pinion washers into the differential case.

2) Temporarily install the pinion shaft.

NOTE
Do not install the lock pin yet.

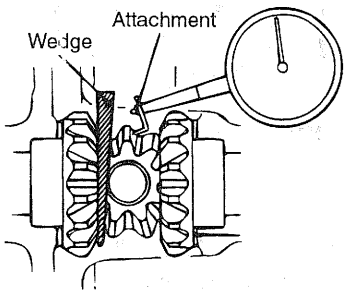


H7FA0990

3) Insert a wedge in the side gear and measure the differential gear backlash with a dial indicator on the pinion gear.

NOTE
Measure both pinion gears separately.

Standard value : 0-0.076 mm (0-0.0003 in.)
Limit : 0.2 mm (0.008 in.)



A7FA1000

4) If the differential gear backlash exceeds the limit, adjust the backlash by selecting thicker side gear thrust spacers.

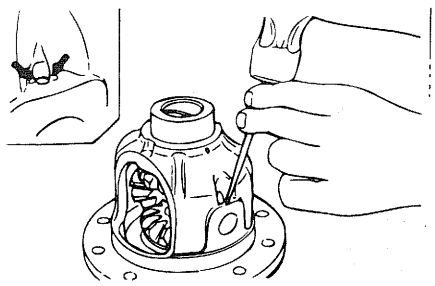
5) Measure the differential gear backlash once again, and confirm that it is within the limit.

NOTE
- *After adjustment, check that the backlash is within the limit and the differential gear rotates smoothly.*
- *When adjustment is impossible, replace the side gear and the pinion gear as a set.*

9. INSTALLATION OF THE LOCK PIN

1) Align the pinion shaft lock pin hole with the differential case lock pin hole, and drive in the lock pin.

2) Fix the lock pin in place by staking two points around the lock pin hole with a punch.

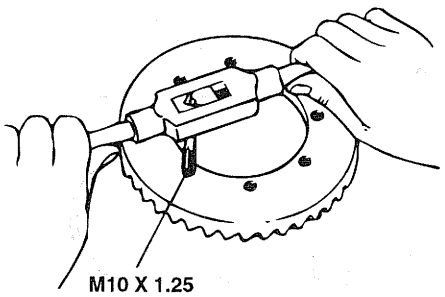


H7FA1010

10. INSTALLATION OF THE DRIVE GEAR

1) Clean the drive gear attaching bolts.

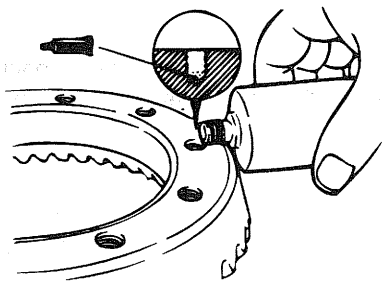
2) Remove the adhesive on the threaded holes of the drive gear use a tap (M10 x 1.25), and then clean the threaded holes with compressed air.



H7FA1020

3) Apply the specified adhesive to the threaded holes of the drive gear.

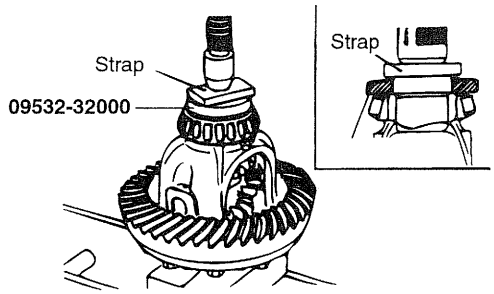
Specified adhesive : LOCTITE #262 or equivalent



H7FA1030

4) Install the drive gear in the differential case with the matchmarks properly aligned. Tighten the bolts to the specified torque in a diagonal sequence.

11. PRESS THE SIDE BEARING INNER RACE



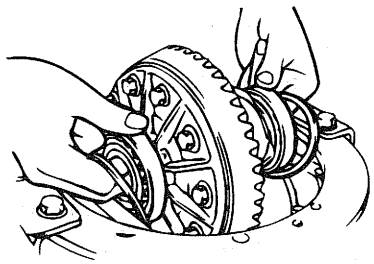
EIMB670D

12. ADJUSTMENT OF FINAL DRIVE GEAR BACKLASH
Adjust the final drive gear backlash according to the following procedures :

1) Install side bearing spacers which are thinner than those removed, to the side bearing outer races, and then mount the differential case assembly into the gear carrier.

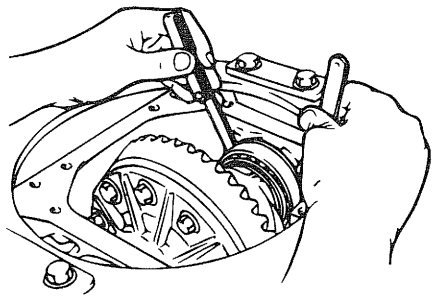
NOTE

Select side bearing spacers with the same thickness for both the drive pinion side and the drive gear side.



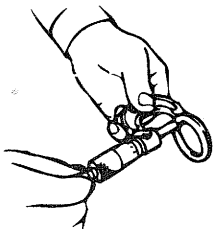
H7FA1050

2) Push the differential case to one side, and measure the clearance between the gear carrier and the side bearing with a feeler gauge.



H7FA1060

3) Select two pairs of spacers which correspond to the value calculated according to the expression in the illustration. Install one pair each to the drive pinion side and the drive gear side.

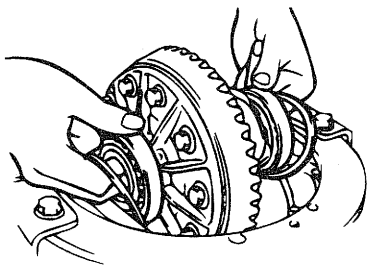


$$+\frac{\text{Clearance}}{2}+0.05\text{ mm}$$

= Thickness of the spacer on one side

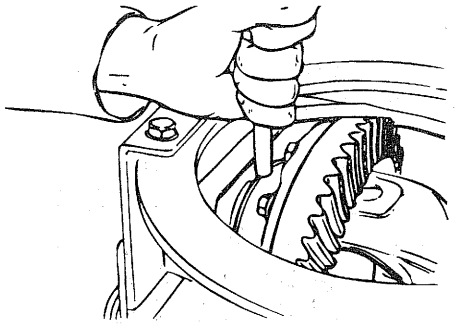
A7FA1070

4) Install the side bearing spacers and differential case assembly, as shown in the illustration, to the gear carrier.



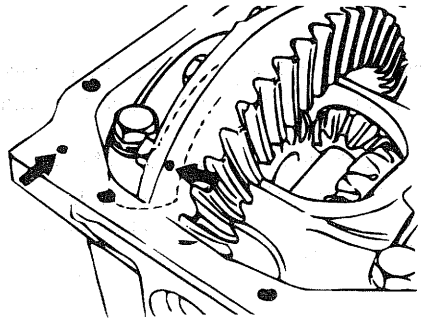
H7FA1080

5) Tap the side bearing spacers with a brass bar to fit them to the side bearing outer race.



H7FA1090

6) Align the matchmarks on the gear carrier and the bearing cap and tighten the bearing cap.



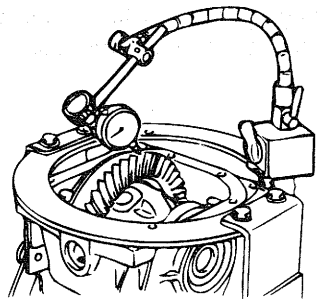
H7FA1100

7) With the drive pinion locked in place, measure the final drive gear backlash with a dial indicator on the drive gear.

NOTE

Measure at four points or more on the circumference of the drive gear.

Standard value : 0.11-0.16mm (0.0043-0.0063in.)

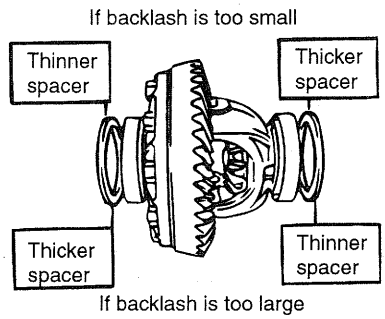


H7FA1110

8) Change the side bearing spacers as illustrated and then adjust the final drive gear backlash between the drive gear and the drive pinion.

NOTE

When increasing the number of side bearing spacers, use the same number for each and as few as possible.

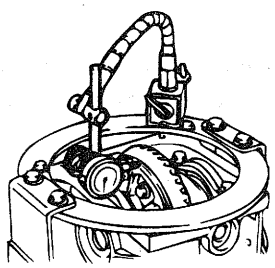


A7FA1120

9) Check the drive gear and drive pinion for tooth contact. If poor contact is evident, adjust again.

10) Measure the drive gear runout at the shoulder on the reverse side of the drive gear.

Limit : 0.05 mm (0.002 in.)

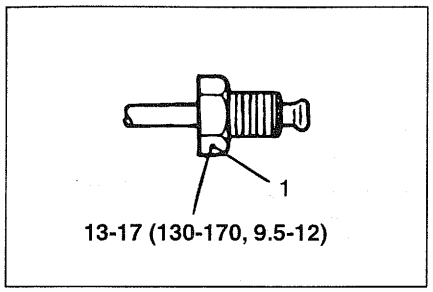


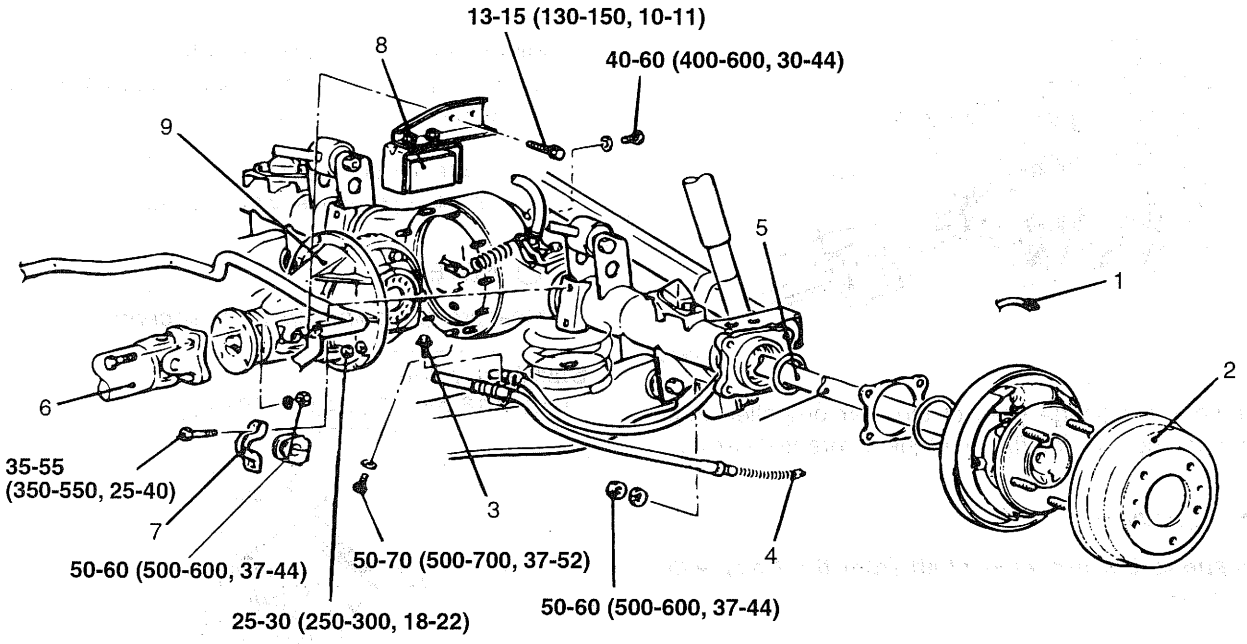
H7FA1130

11) If the drive gear runout exceeds the limit, reinstall by changing the position of the drive gear and differential case, and remeasure.

REAR DIFFERENTIAL CARRIER

COMPONENTS EIUC0740





Removal steps

1. Brake tube connection
2. Brake drum (2WD)
3. Parking brake attaching bolt
4. Parking brake cable connection
5. Rear axle shaft
6. Propeller shaft connection
7. Stabilizer bar clamp
8. Dynamic dumper
9. Differential carrier

TORQUE : Nm (kg·cm, lb·ft)

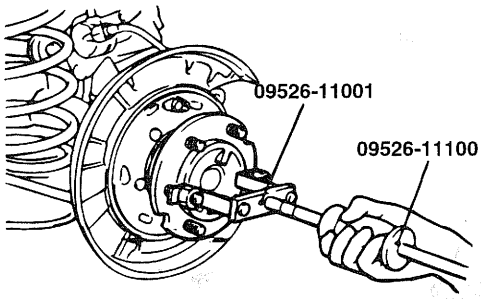
EIUB065A

REMOVAL EIUC0750

1. Drain the differential gear oil.
2. Remove the rear brake drum.
3. Remove the parking brake cable attaching bolt.
4. Remove the brake tube connection.
5. Pull out the right and left axle shaft using the special tools(09526-11001, 09526-11000) after removing the coupling nuts.

⚠ CAUTION

Be careful not to damage the oil seal when pulling axle shaft.



H7RA0870

6. Remove the flange yoke of the rear propeller shaft from the companion flange of the differential carrier.

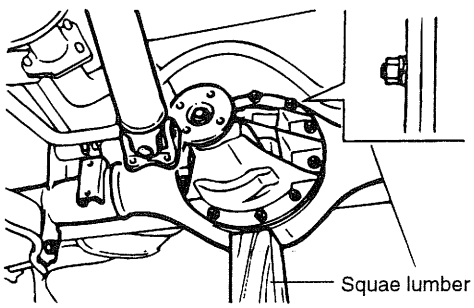
⚠ CAUTION

Suspend the propeller shaft from the body with wire, etc.

7. Remove the attaching nuts and strike the lower part of differential carrier assembly with a piece of times several times to loosen, then remove the differential carrier assembly.

NOTE

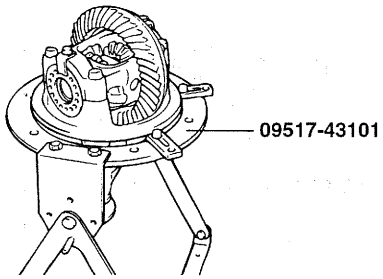
Use care not to strike the companion flange.



EIMB660A

INSPECTION BEFORE DISASSEMBLY EIUC0760

Secure the special tool(09517-43101) and install the differential carrier assembly with the attachment. Then carry out the following inspection.



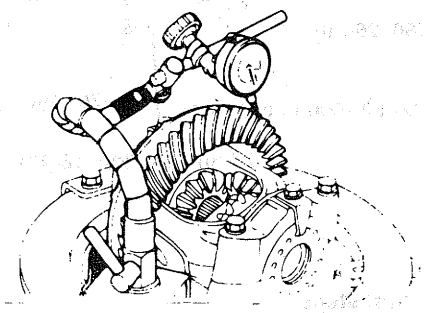
H7RA1070

1. FINAL DRIVE GEAR BACKLASH
   Check the final drive gear backlash by the following procedure.
   1) Place the drive pinion and move the drive gear to check backlash is within the standard range.

NOTE

Measure at 4 points on the gear periphery.

Standard value
0.01-0.16 mm (0.0043-0.0063 in.)

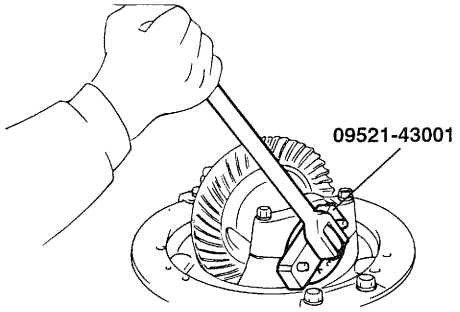


AU52-23B

   2) Adjust with the side bearing nuts if backlash values are not within standard range.

NOTE

After adjusting, check the state of the final drive gear's tooth contact.

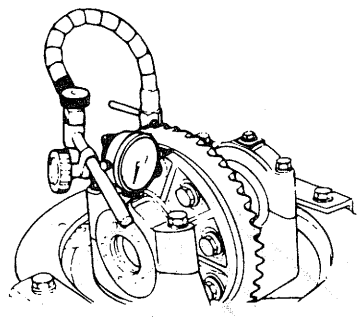


KHPD019A

2. DRIVE GEAR RUNOUT
Check the back-face lash as follows:

1) Place a dial gauge on the back-face of the drive gear and measure the runout.

Limit : 0.05mm (0.0020in.)



AU52-32A

2) If the runout is beyond the limit, check that there are no foreign substances between the drive gear and differential case and, that the bolts fixing the drive gear are not loose.

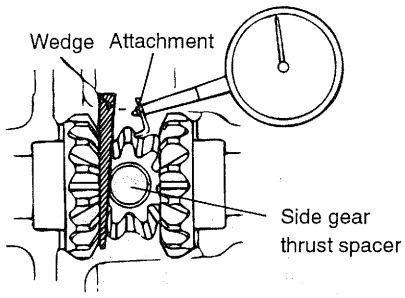
3. DIFFERENTIAL GEAR BACKLASH

1) Fix the side gear with a wedge so it cannot move and measure the differential gear backlash with a dial indicator on the pinion gear.

NOTE

Take the measurements at two places on the pinion gear.

Standard value : 0.01-0.076 mm (0.0004-0.003 in.)
Limit : 0.2 mm (0.008 in.)



A7FA0710

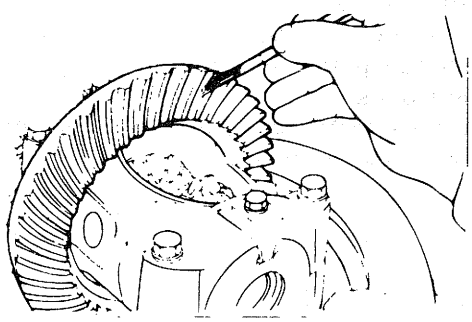
2) If the backlash exceeds the limit, adjust using side bearing spacers.

NOTE

If adjustment is impossible, replace the side gear and pinion gears as a set.

4. FINAL DRIVE GEAR TOOTH CONTACT
Check the final drive gear tooth contact by following the steps below :

1) Apply the same amount of machine blue slightly to both surfaces of the drive gear teeth.



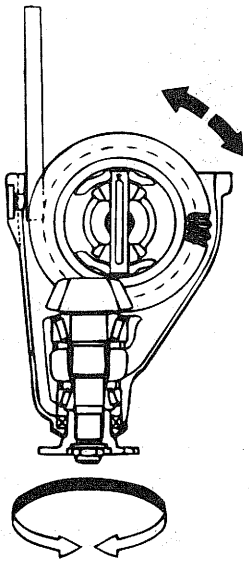
AU52-24B

2) Insert a brass rod between the differential carrier and the differential case, and then rotate the companion flange by hand (once in the normal direction, and then once in the reverse direction) while applying a load to the drive gear so that some torque (approximately 25-30kg·cm) is applied to the drive pinion.

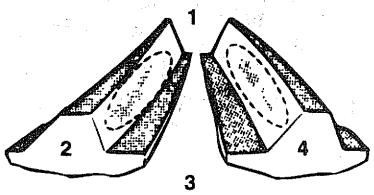
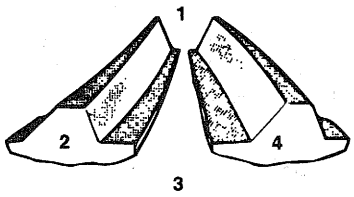
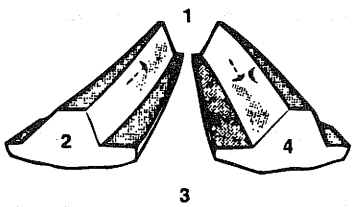
CAUTION

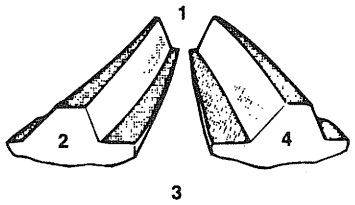
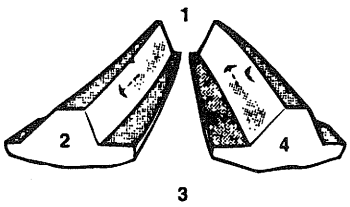
If the drive gear is rotated too much, the tooth contact pattern will become unclear and difficult to check.

3) Check the tooth contact pattern.



EIJA001B

Standard tooth contact pattern 1. Narrow tooth side 2. Drive-side tooth surface (the side receiving power during acceleration) 3. Wide tooth side 4. Coast-side tooth surface (the side receiving power during coast-down)	 EIJA0011
Problem	Solution
Tooth contact pattern resulting from excessive pinion height  EIJA0012 The drive pinion is positioned too far from the center of the drive gear.	 EIJA0013 Increase the thickness of the pinion height adjusting shim, and position the drive pinion closer to the center of the drive gear. Also, for backlash adjustment, reposition the drive gear further from the drive pinion.

Tooth contact pattern resulting from insufficient pinion height	
 EIJA0014	 EIJA0015
The drive pinion is positioned too close to the center of the drive gear.	Decrease the thickness of the pinion height adjusting shim, and position the drive pinion further from the center of the drive gear. Also, for backlash adjustment, reposition the drive gear closer to the drive pinion.

NOTE

- *Tooth contact pattern is a method for judging the result of the adjustment of drive pinion height and final drive gear backlash. The adjustment of drive pinion height and final drive gear backlash should be repeated until the tooth contact patterns are similar to the standard tooth contact pattern.*
- *When you cannot obtain a correct pattern, the drive gear and drive pinion have exceeded their limits. Both gears should be replaced as a set.*

INSTALLATION EIUC0770

1. **DIFFERENTIAL CARRIER ASSEMBLY**
   Apply specified sealant to axle housing flange surface, and install the differential carrier assembly.

Specified sealant : Three bond 1215 or equivalent

2. **PROPELLER SHAFT**
   Install the propeller shaft to the companion flange, aligning with matchmark as closely as possible.

Tightening torque 50-60Nm (500-600kg·cm, 37-44lb·ft)

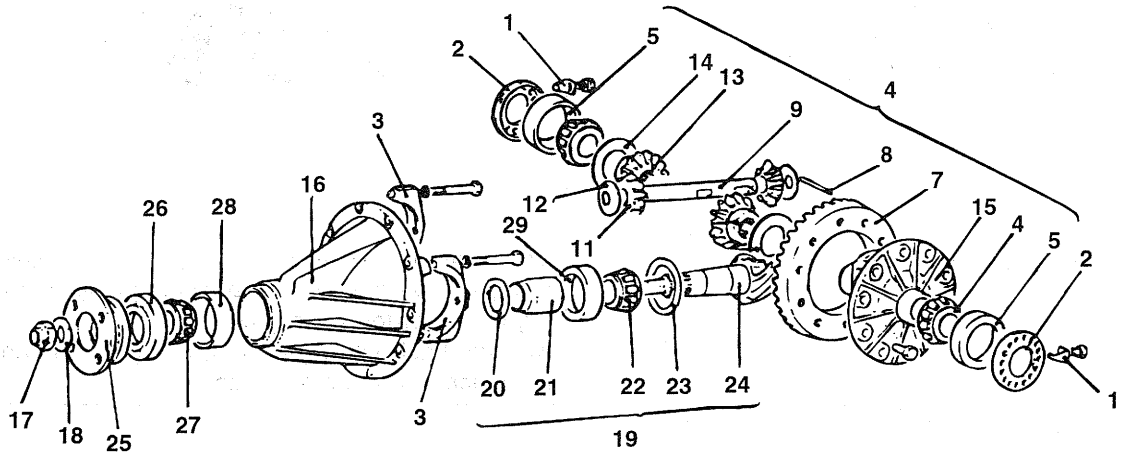
3. **AXLE SHAFT ASSEMBLY**

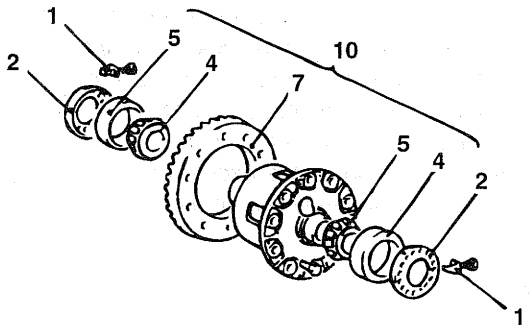
   1) Apply specified sealant to the axle housing and bearing case end faces.

Specified sealant : Three bond 1104

   2) Install the axle shaft assembly after installing new O-ring into the axle shaft.

COMPONENTS EILB0330





Disassembly steps

1. Lock plate
2. Side bearing nut
3. Bearing cap
4. Differential case assembly
5. Side bearing inner race
7. Drive gear
8. Lock pin
9. Pinion shaft
10. Differential case assembly
11. Pinion gear
12. Pinion washer
13. Side gear
14. Side gear thrust spacer
15. Differential carrier case
16. Differential carrier
17. Self-locking nut
18. Washer
19. Dirve pinion assembly
20. Drive pinion front shim
    (For preload adjustment)
21. Drive pinion spacer
22. Drive pinion rear bearing inner race
23. Drive pinion rear shim
    (For drive pinion height adjustment)
24. Drive pinion
25. Companion flange
26. Oil seal
27. Drive pinion front bearing inner race
28. Drive pinion front bearing outer race
29. Drive pinion rear bearing outer race

EILB033A

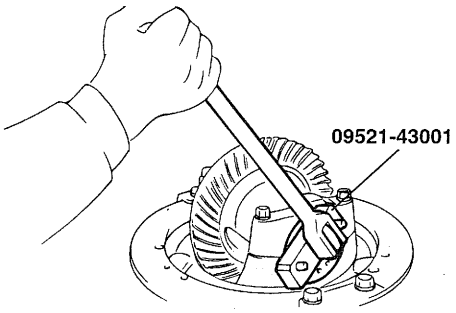
DISASSEMBLY EIMB7300

1. **SIDE BEARING NUT**

   Using the special tool (09521-43001), remove the side bearing nut.

   NOTE

   Keep the right and left side bearing nuts separate so that they are not mixed during reassembly.

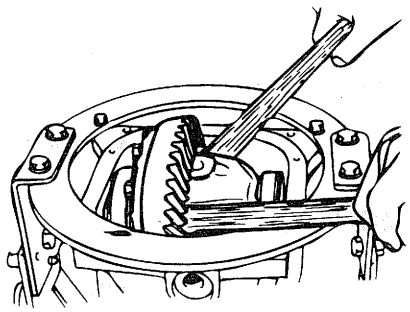


AU52-25B

2. **REMOVAL OF THE DIFFERENTIAL CASE ASSEMBLY**

   CAUTION

   - ***Remove the differential case assembly slowly and carefully.***
   - ***Be caurful so that the side bearing outer race is not dropped.***
   - ***Keep the right and left side bearing outer races separate so that they are not mixed during reassembly.***

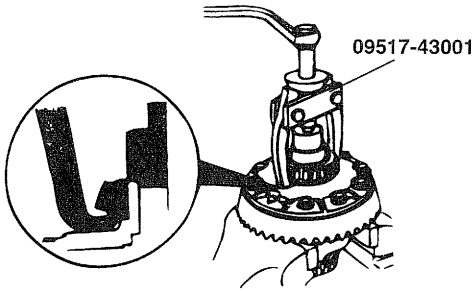


H7FA0740

3. **REMOVAL OF THE SIDE BEARING INNER RACES**
   Fit the nut on top of the differential case, and then use the special tool to remove the side bearing inner race.

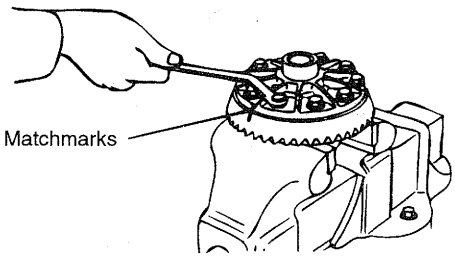
   NOTE

   Attach the prongs of the special tool(09517-43001) to the inner race of the side bearing through the notched section in the differential case.



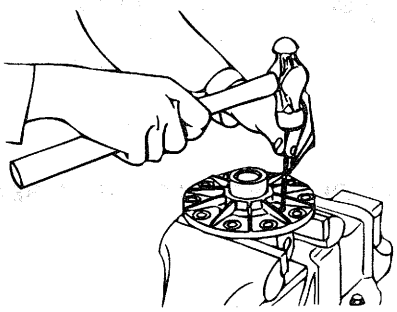
H7FA0750

4. **REMOVAL OF DRIVE GEAR**
   a. Make the matchmarks to the differential case and the drive gear.
   b. Loosen the drive gear attaching bolts in diagonal sequence to remove the drive gear.



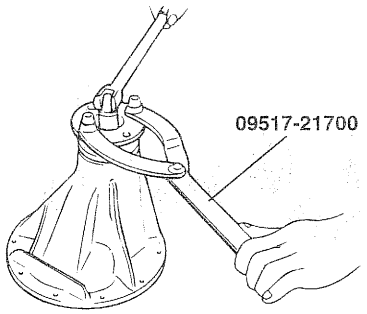
A7FA0760

5. **REMOVAL OF LOCK PIN (FOR CONVENTIONAL DIFFERENTIAL)**



H7FA0770

6. **REMOVAL OF SELF-LOCKING NUT**



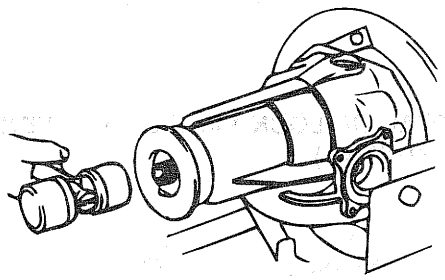
H7RA1100

7. REMOVAL OF DRIVE PINION
   a. Make the matchmarks on the drive pinion and companion flange.

   ⚠ *CAUTION*

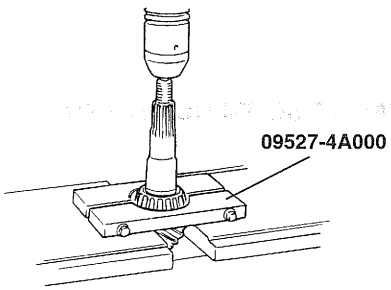
   Matchmarks should not be made on the contact surfaces of the companion flange and the propeller shaft.

   b. Drive out the drive pinion together with the drive pinion spacer and drive pinion front shims.



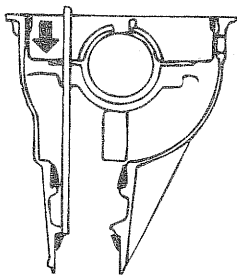
H7FA0790

8. REMOVAL OF DRIVE PINION REAR BEARING INNER RACE



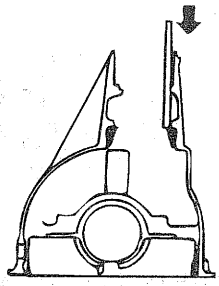
H7RA1090

9. REMOVAL OF OIL SEAL / DRIVE PINION FRONT BEARING INNER RACE / DRIVE PINION FRONT BEARING OUTER RACE



H7FA0810

10. REMOVAL OF DRIVE PINION REAR BEARING OUTER RACE



H7FA0820

INSPECTION EIJB0490

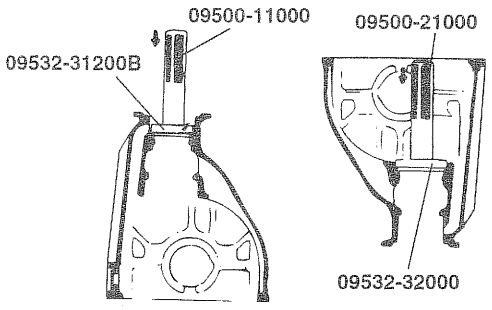
1. Check the companion flange for wear or damage.
2. Check the bearings for wear or discoloration.
3. Check the gear carrier for cracks.
4. Check the drive pinion and drive gear for wear or cracks.
5. Check the side gears, pinion gears and pinion shaft for wear or damage.
6. Check the side gear spline for wear or damage.

REASSEMBLY EIUC0810

Install the drive pinion rear bearing outer race and drive pinion front bearing outer race using the special tools (09500-11000, 09500-21000, 09532-31200B and 09532-32000).

⚠ *CAUTION*

Be careful not to press in the outer race when it is inclined.



EIJA005C

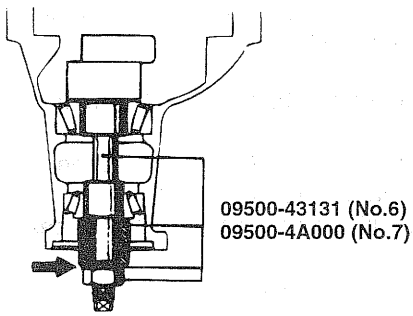
ADJUSTMENT OF PINION HEIGHT

Adjust the drive pinion height according to the following procedures:

1. Install the drive pinion inner and outer bearing races to the special tools (09500-43131, 09500-4A000) in sequence shown in the illustration.

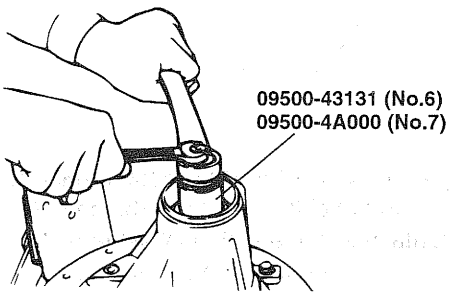
NOTE

Apply a thin coat of the multipurpose grease on the mating face of the washer of the special tool.



EIUC081A

2. Tighten the nut of the special tool slowly until the standard value of drive pinion turning torque is obtained.



EIUC081B

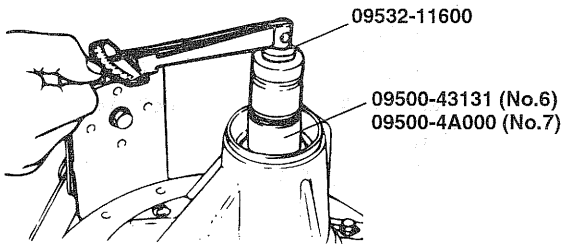
3. Measure the drive pinion turning torque (without the oil seal) using the special tool (09532-11600).

STANDARD VALUE :

Bearing division	Bearing lubrication	Rotation torque Nm (kg·cm)
New	None (with anti-rust agent)	0.6-0.9 (6-9)
New or reused	Oil application	0.4-0.9 (4-9)

NOTE

- *Gradually tighten the nut of the special tool (09500-43131, 09500-4A000) while checking the drive pinion turning torque.*
- *Because the special tool cannot be turned one rotation, turn it several times within the range that it can be turned. After obtaining smooth bearing operation, measure the rotation torque.*



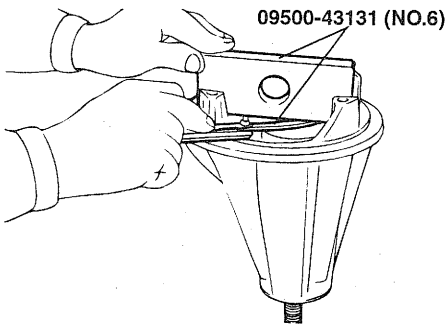
EIUC081C

4. Position the special tool in the side bearing seat of the gear carrier and select a drive pinion rear shim of a thickness which corresponds to the gap between the special tools.

NOTE

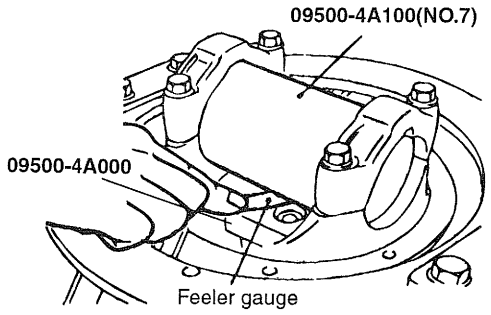
- *Clean the side bearing seat thoroughly. When positioning the special tool, confirm that the cut-out sections of the special tools touch the side bearing seat very closely.*
- *When selecting the drive pinion rear shims, use the fewest number of shims necessary.*

[NO. 6]



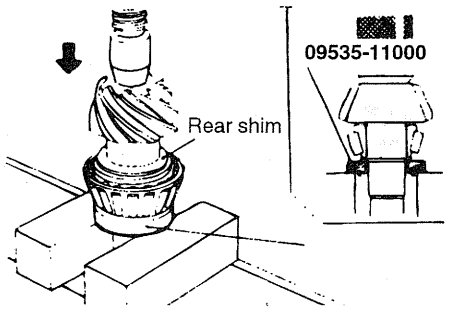
ESRDS53C

[NO. 7]



EIUC081D

5. Fit the selected drive pinion rear shim(s) to the drive pinion, and press-fit the drive pinion rear bearing inner race using the special tool (09535-11000).



AIJA030A

ADJUSTMENT OF DRIVE PINION PRELOAD

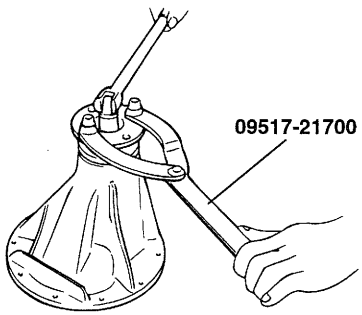
Adjust the drive pinion turning torque according to the following procedures :

1. Fit the drive pinion front shim(s) between the drive pinion spacer and the drive pinion front bearing inner race.

2. Tighten the companion flange to the specified torque using the special tool (09517-21700).

NOTE

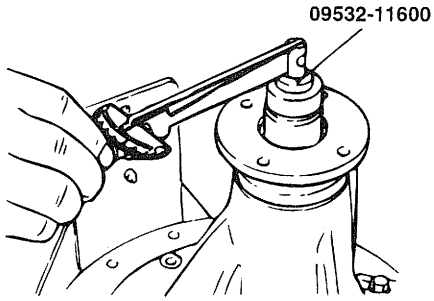
Do not install the oil seal.



H7RA1100

3. Measure the drive pinion turning torque (without the oil seal) using the special tool (09532-11600).

Standard value :
0.4 - 0.5 Nm (4 - 5 kg·cm, 0.296 - 0.37 in.)



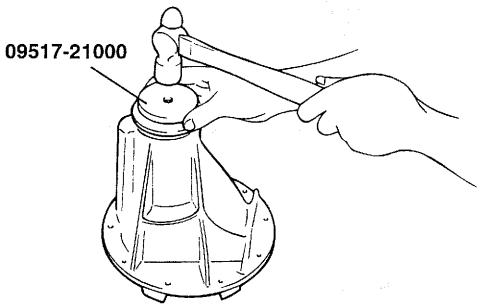
H7FA0940

4. If the drive pinion turning torque is not within the range of the standard value, adjust the turning torque by replacing the drive pinion front shim(s) or the drive pinion spacer.

NOTE

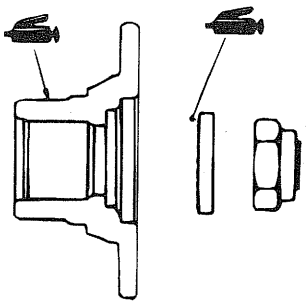
When selecting the drive pinion front shim pack, use the minimum number of shims.

5. Remove the companion flange and drive pinion once again.
Insert the oil seal into the gear carrier front lip using the special tool (09517-21000).
Apply multipurpose grease to the oil seal lip.



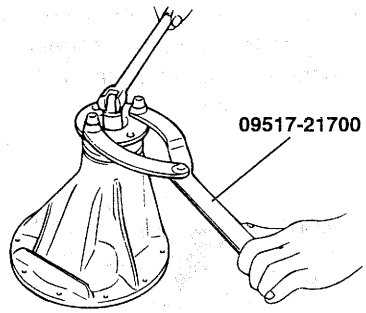
H7RA1080

6. Apply a thin coat of multipurpose grease to the contacting surface of the oil seal in the companion flange and contacting surface of the washer of the flange before installing the drive pinion assembly.



EIJA007B

7. Install the drive pinion assembly, shim packs and companion flange with matchmarks properly aligned, and tighten the companion flange self-locking nut to the specified torque using the special tool (09517-21700).



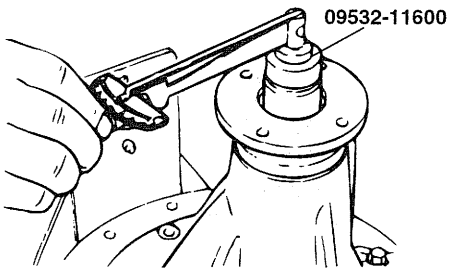
H7RA1100

8. Measure the drive pinion turning torque (with oil seal) by using the special tool (09552-11600) to verify that the drive pinion turning torque is within the standard value.

STANDARD VALUE :

Bearing use	Bearing lubrication	Rotation torque Nm (kg·cm)
New	None (with anti-rust agent)	0.8 - 1.1 (8 - 11)
New or reused	Oil application	0.6 - 0.7 (6 - 7)

9. If it is beyond the standard value, check the torque of the companion flange self-locking nut, or the assembly condition of the oil seal.



H7FA0980

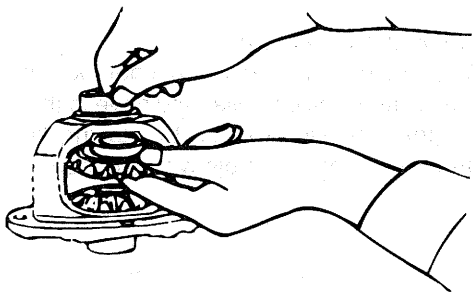
ADJUSTMENT OF DIFFERENTIAL GEAR BACKLASH

Adjust the differential gear backlash according to the following procedures :

1. Assemble the side gears, side gear spacers, pinion gears, and pinion washers into the differential case.
2. Temporarily, install the pinion shaft.

NOTE

Do not install the lock pin yet.



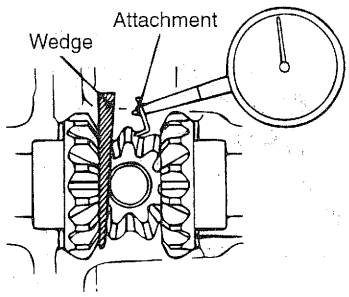
H7FA0990

3. Insert a wedge in the side gear and measure the differential gear backlash with a dial indicator on the pinion gear.

NOTE

Measure both pinion gears separately.

Standard value : 0-0.076mm (0-0.003in.)



A7FA1000

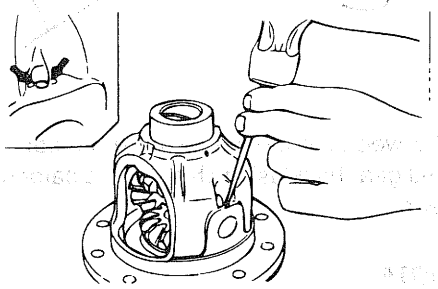
4. If the differential gear backlash exceeds the limit, adjust the backlash by installing thicker side gear thrust spacers.

5. Measure the differential gear backlash once again, and confirm that it is within the limit.

NOTE

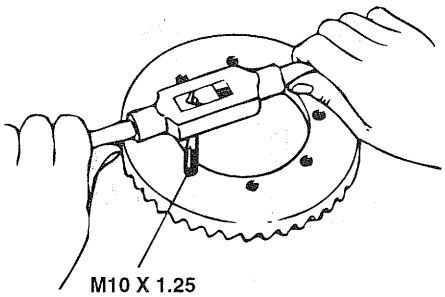
- *After adjustment, check that the backlash is within the limit and the differential gear rotates smoothly.*
- *When adjustment is impossible, replace the side gear and the pinion gear as a set.*

6. Installation of the lock pin
   a. Align the pinion shaft lock pin hole with the differential case lock pin hole, and drive in the lock pin.
   b. Fix the lock pin in place by staking two points around the lock pin hole with a punch.



H7FA1010

7. Installation of the drive gear
   a. Clean the drive gear attaching bolts.
   b. Remove the adhesive on the threaded holes of the drive gear with a tap (M10 x 1.25), and then clean the threaded holes with compressed air.

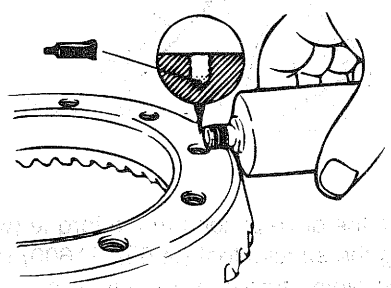


H7FA1020

   c. Apply the specified adhesive to the threaded holes of the drive gear.

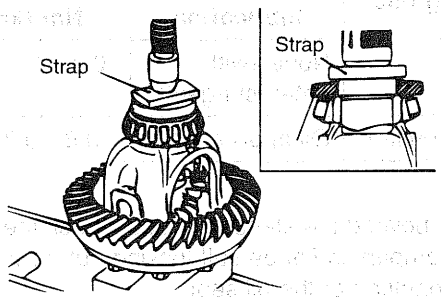
Specified adhesive : LOCKTITE #262 or equivalent

   d. Install the drive gear in the differential case with the matchmarks properly aligned. Tighten the bolts to the specified torque (80-90 Nm, 800-900 kg·cm) in a diagonal sequence.



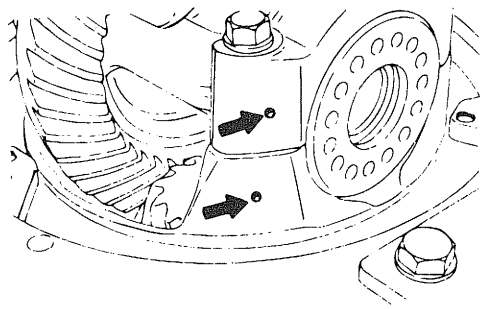
H7FA1030

8. Press-fit the side bearing inner race



A7FA1040

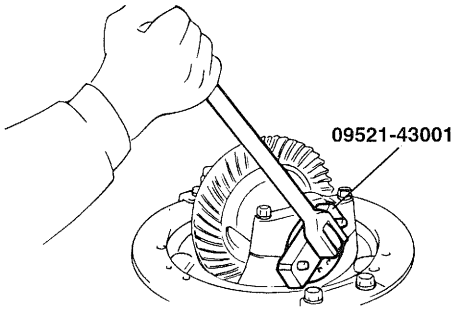
9. Align the matchmark on the gear carrier and the bearing cap, and then tighten the bearing cap.



AU52-31D

10. ADJUSTMENT OF FINAL DRIVE GEAR BACKLASH
Adjust final drive gear backlash as follows :

1) Using the special tool(09521-43001), temporarily tighten the side bearing nut until it is in the state just before preloading of the side bearing.



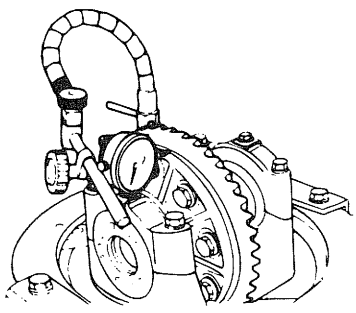
AU52-25B

2) Measure the final drive gear backlash.

Standard value
No. 6 : 0.11-0.16 mm (0.0043-0.0063 in.)
No. 7 : 0.13-0.18 mm (0.0051-0.0071 in.)

NOTE

Measure at lease 4 point on the drive gear periphery.

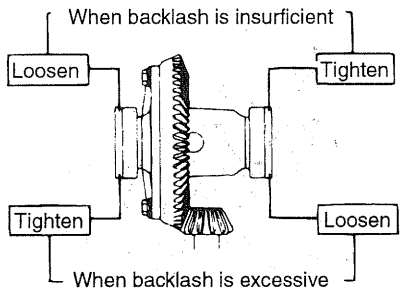


AU52-32A

3) Using the special tool(09521-43001), adjust the backlash to standard value by moving the side bearing nut as shown.

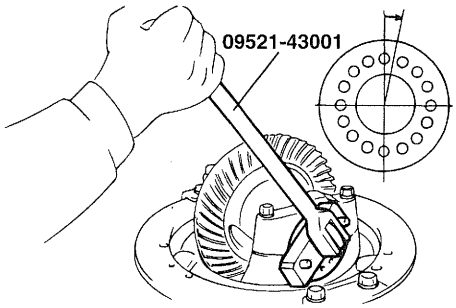
NOTE

First turn the side bearing nut for loosening, and then turn(by the same amount) the side bearing nut for tightening.



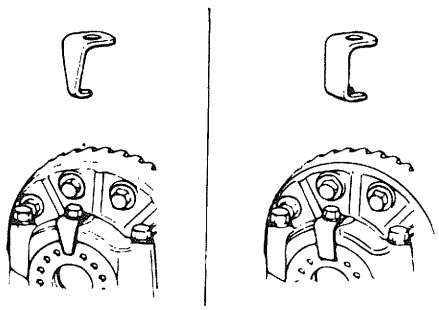
EIMB750D

4) Using the special tool(09521-43001) to apply the preload, turn down both right and left side bearing nut on half the distance between centers of two neighboring holes.



AU52-32C

5) Choose and install the lock plates two kinds.



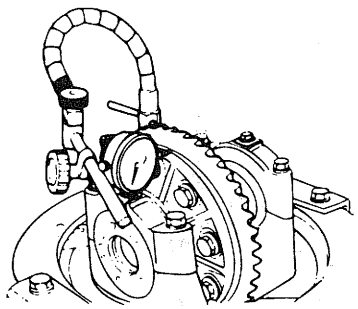
AU52-32D

6) Check the final drive gear tooth contact. If poor contact is evident, make adjustment.

7) Measure the drive gear runout.

Limit : 0.05mm (0.0020in.)

8) When drive gear runout exceeds the limit, remove the differential case and then the drive gears, moving them to different positions and reinstalling them.

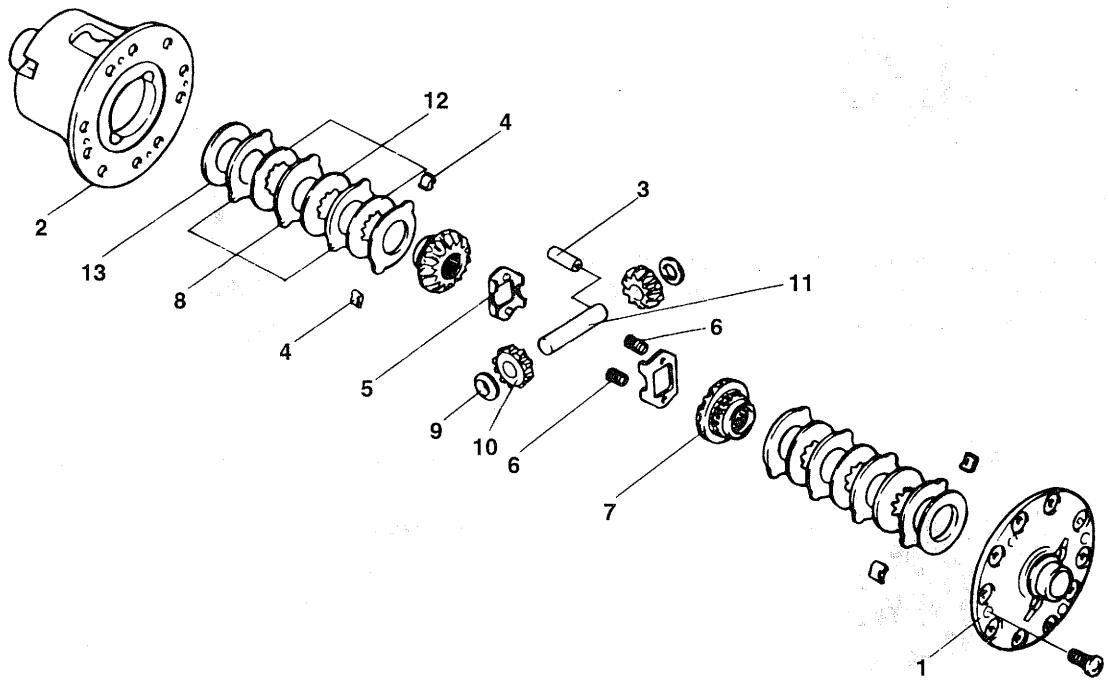


AU52-32A

LIMITED SLIP DIFFERENTIAL (LSD)

LIMITED SLIP DIFFERENTIAL (NO.6) EILB0350

COMPONENTS



1. Differential case (LH)
2. Differential case (RH)
3. Differential shaft lock pin
4. Differential clutch disc guide
5. Differential clutch preload spring guide
6. Differential clutch preload spring
7. Differential clutch side gear
8. Differential clutch friction disc, eared
9. Differential pinion thrust washer
10. Differential pinion gear
11. Differential pinion shaft
12. Differential clutch friction disc, splined
13. Differential clutch disc shim

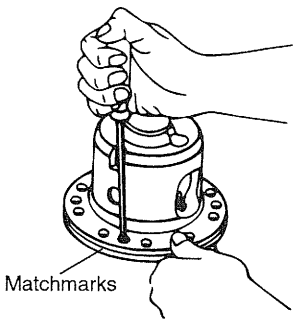
AU52-33A

DISASSEMBLY EILB0360

1. Using a screw driver, remover the 4 screws on the flange.

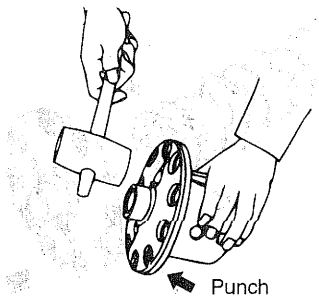
NOTE

- *Before removal, make matchmarks.*



AIJA0301

- *If the case halves are not separated, tap the heads of the screws lightly with a punch and a hammer as shown in illustration.*

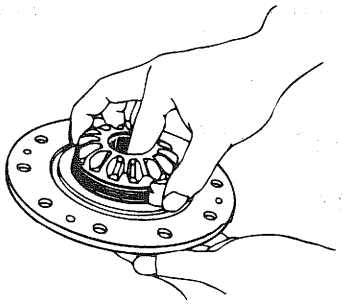


AIJA0302

2. Remove the screws, L.H. case, L.H. shim, L.H. gear sub-assembly (side gear, disc pack, and ear guides), preload plate and two preload springs from the R.H. case assembly.

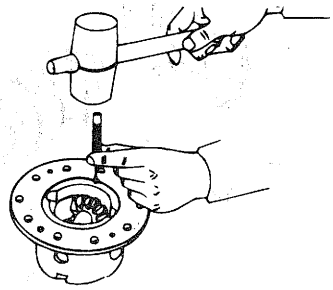
NOTE

Keep these parts separate so that they can be reassembled in the same location as they were originally.



EIJA0303

3. Drive out the cross shaft lock pin using a 4 mm diameter rod and a hammer.

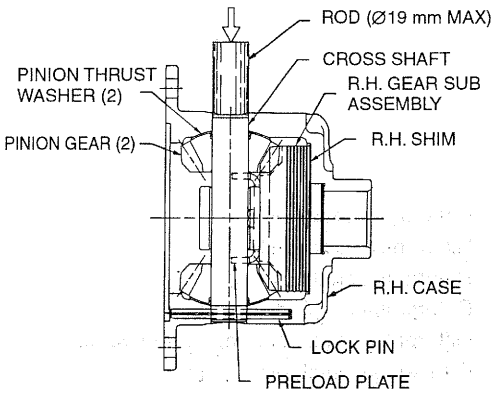


EIJA0304

4. Remove the cross shaft from the side gear.

NOTE

The cross shaft must be removed toward the side where the lock pin hole is located as shown in the illustration.



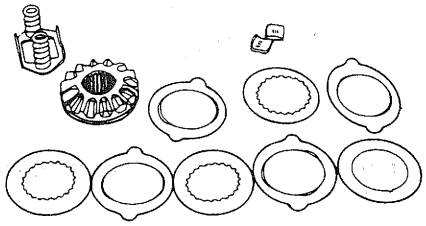
1. DRIVE OUT LOCK PIN
2. DRIVE OUT CROSS SHAFT
3. REMOVE REMAINING PARTS

AIJA0305

5. Follow the same procedure for the opposite side case.

NOTE

Do not mix R.H. and L.H. parts.



EIJA0306

INSPECTION EIJB0530

1. Check the side gears, pinions, pinion thrust washers, and cross shaft for wear or damage. If there is excessive wear, cracks, nicks, grooves or galling, replace the parts.

2. Inspect the carbon surfaces. After cleaning with a solvent, the carbon surface should appear a course weave fabric with flat spots on the peaks of the weave. If the surface is smooth, either from wear or from the weave filled with debris, replace the entire disc pack.

3. Measure the thickness of the carbon friction discs. If the measurements is below the limit value, replace the disc.

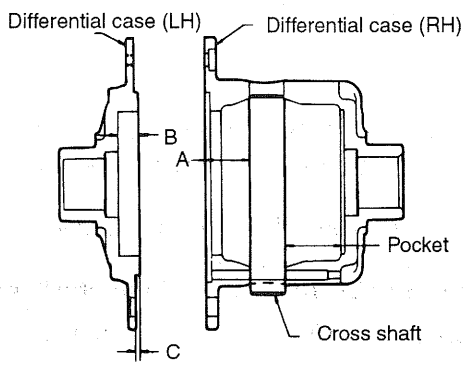
Clutch discs	Limit value
Double sided discs	2.06 mm
Single sided disc	1.65 mm

4. Inspect the splined friction discs. If they have grooves or are polished, replace the entire disc pack. Small scratches on them are O.K.

SHIM SELECTION FOR CLUTCH DISC

1. Measurement for R.H. pocket
   Measure the R.H. pocket with the pinion shaft installed as shown in illustration.

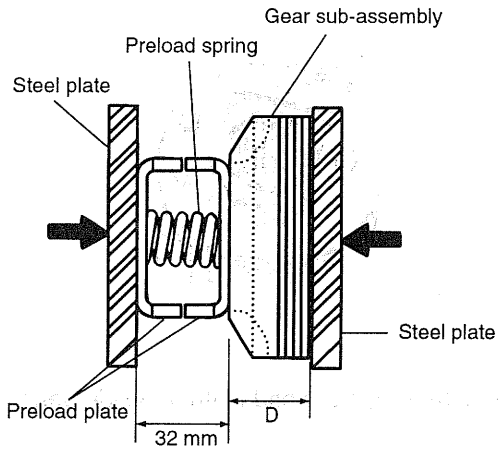
2. Measurement for L.H. pocket
   Measure the L.H. pocket with the pinion shaft installed according to the following formula as shown in illustration.
   L.H. POCKET = A + B - C



Measurement for the pocket (LH/RH)

AIJA0307

3. Measurement for the side gear sub height.
   As shown in illustration, install the clutch disc, side gear, preload spring and spring plate, and then adjust the clearance of the preload spring by applying the pressure at both sides till it is 32mm as shown in illustration. At this time, measure the height of side gear sub at RH, LH sides by measuring the length of "D"



AIJA0308

4. Seclecting shims by the side gear sub height
   a. Used disc

Shim thickness = RH(LH) pocket - RH(LH) side gear sub height - 6.45

b. New disc
Shim thickness = RH(LH) pocket - RH(LH) side gear sub height - 6.20

NOTE

- *Adjust the shim thickness within 0.08mm.*
- *When replacing one disc, replace all of the discs.*

5. The specifications of the clutch disc shim

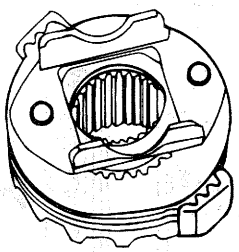
Part No. (EATON NO.)	Shim thickness
EDS98754 - 10	0.010′
EDS98754 - 15	0.015′
EDS98754 - 20	0.020′
EDS98754 - 30	0.025′
EDS98754 - 35	0.030′
EDS98754 - 40	0.035′
EDS98754 - 45	0.040′

REASSEMBLY EILB0370

1. Install the clutch disc guide and clutch disc in order.

NOTE

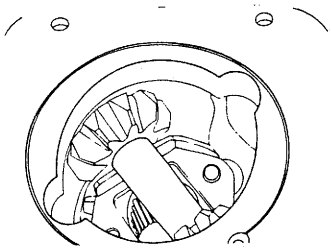
Apply grease to the clutch disc guide and clutch disc before reassembly.



EIJA0309

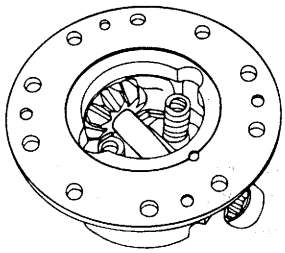
2. Install the clutch preload plate and side gear.

3. After assembling the pinion shaft, pinion gear and washer, fix the pinion shaft lock pin with a hammer.



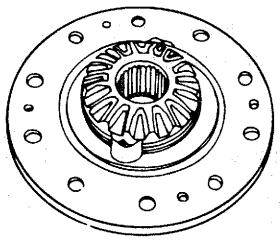
EIJA0310

4. Install the preload spring and spring plate in the opposite side .



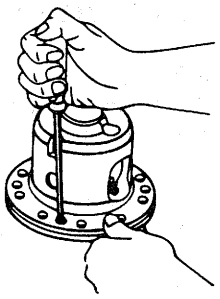
EIJA0311

5. After assembling the clutch disc and side gear in the opposite case, assemble the two cases.



EIJA0312

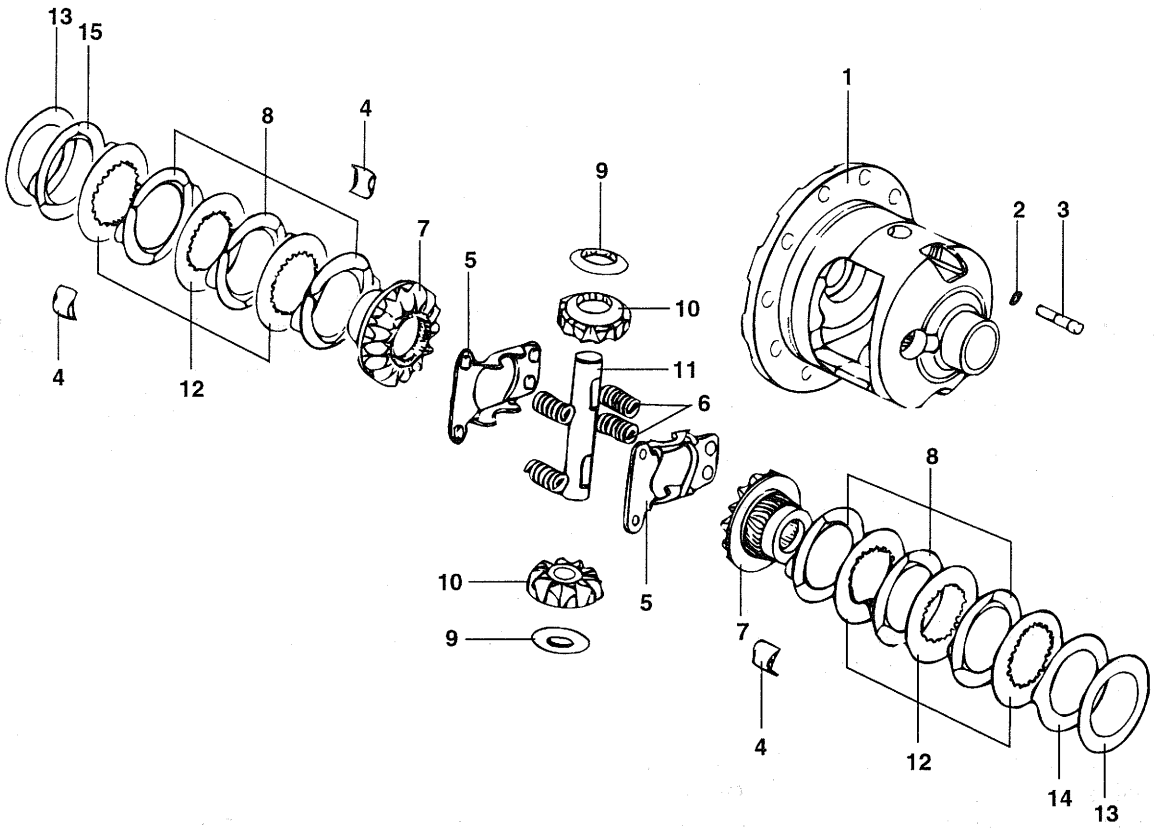
6. Assemble the case by tightening the torx screws driver.



EIJA0301

LIMITED SLIP DIFFERENTIAL (NO.7) EILB0380

COMPONENTS



1. Case
2. Washer-lock
3. Screw-lock
4. Guide-ear
5. Plate-preload
6. Spring-preload
7. Gear-side
8. Eared disc S/A (carbon on both sides)
9. Thrust washer-pinion
10. Pinion gear
11. Cross shaft-pinion
12. Disc-splined friction
13. Shim-side gear
14. Eared disc S/A (carbon on one side)

TORQUE : Nm (kg·cm, lb·ft)

EILB038A

DESCRIPTION EILB0390

This Carbon Disc Limited Slip Differential has a one piece case. Inside the case is a bevel gear set. The gear set has two side gears and two pinion gears. Each pinion gear is held in place by a spherical thrust washer and the cross shaft. The cross shaft fits into the holes in the case. The cross shaft is retained by a threaded lock pin with a lock washer. Behind each side gear is a friction disc pack. Between each disc pack and the internal pockets of the case is a shim. The thickness of these shims is selected to provide the correct backlash between the side gears and pinion gears. Between the side gears are a spring preload assembly and a thrust block. The preload plates are constructed so they straddle the cross shaft, hold the preload springs and position the thrust block.

DISASSEMBLY EILB0400

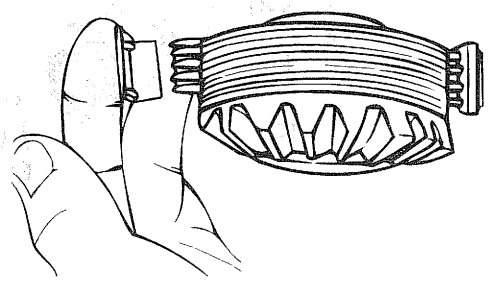
1. Remove the threaded lock screw and the cross shaft.
2. Remove the spring preload assembly. Use a hammer and punch to drive the spring plates out from the large window.
3. Without preload on the side gears, they can be turned by hand. Rotate the side gears until the pinions are in the window area. Remove the pinions and pinion thrust washers.
4. Remove the gear sub-assemblies (side gear, disc pack, ear guides and disc pack shims). Do not mix parts. Identify the parts so they can be reassembled to the original location.

INSPECTION EILB0410

1. Check the side gears, pinions, pinion thrust washers, thrust block and cross shaft for wear or damage. If there is excessive wear, cracks, nicks, grooves or galling, replace the parts.
2. Inspect the carbon surfaces. After cleaning with a solvent, the carbon surface should appear like a course weave fabric with flat spots on the peaks of the weave. If the surface is smooth, either from wear or from the weave filled with debris, replace the entire disc pack.
3. Measure the thickness of the carbon friction discs. If any of the double sided discs are less than 2.56 mm or the single sided disc is less than 2.15 mm, replace the entire disc pack.
4. Inspect the splined friction discs. If they have grooves or a mirror like finish, replace the entire disc pack. Small scratches on a buff like finish is okay.

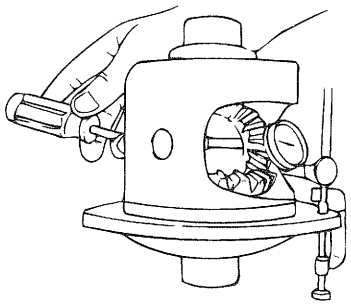
REASSEMBLY AND SHIM SELECTION EILB0420

1. Apply axle lubricant to all sliding surfaces. Be especially careful to coat the mating surfaces of the friction discs.
2. Starting with a double sided eared disc next to the side gear, stack four eared discs and three splined discs on to the spline of the side gear. A splined disc goes in between each eared disc with the last eared disc being single sided and the carbon surface facing the side gear. Use a heavy bearing grease in the ear guides to hold them in place during assembly.



H7RA1240

3. Select a shim 0.76 mm (030") thick and place on the hub side of the disc pack subassembly.
4. Lubricate and assemble the other side gears as above.
5. Install the flange end side gear subassembly and shim in the flange end of the differential case.
6. Position pinion gears and thrust washers on the side gears and install the cross shaft through the case and pinions.
7. Install a dial indicator on the case.
8. Compress the clutch pack with a large screw driver or pry bar as shown. Rotate the pinion gear back and forth to obtain backlash. Tooth backlash should be 0 to 0.10 mm (0 to .004"). If required, change the .76 mm shim to obtain the proper backlash.



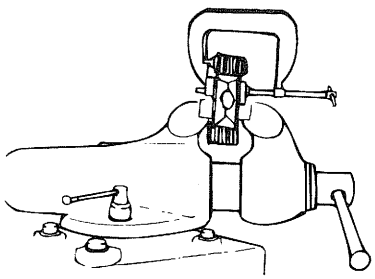
H7RA1250

9. Remove the side gear subassembly and repeat the tooth backlash procedure for the other gear pack on the opposite side of the case.

10. Remove the cross shaft, pinions and thrust washers and reinstall the first side gear subassembly and shim in the flange end of the case.

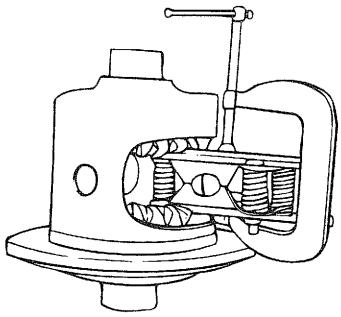
11. Install a pinion and thrust washer through each window so that the gear teeth mesh and so that the pinions are in line with each other. Rotate one side gear so the pinions and thrust washers rotate at a position where they line up with the cross shaft holes in the case.

12. Mount springs and load plates in a vise. With the thrust block between the spring plates, compress the assembly until the load plates touch. Install a "C" clamp on the plates and install 6 mm bolts through each front spring. Retain nuts on the screws as shown in the illustration.



H7RA1230

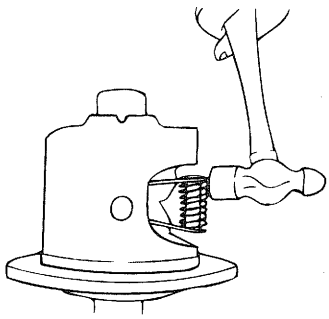
13. Position the spring pack between the side gears and remove the "C" clamp.



H7RA1190

14. Drive the spring pack into the side gears far enough to retain the springs. Then remove the 6 mm bolts and complete the pack installation by driving the spring pack in position so that the cross shaft can slide through the middle as shown. Turn the thrust block so that the hole in the middle lines up with the hole in the case.

15. Install the pinion shaft, lock screw and lock washer. Tighten the lock screw to 30-40 Nm (22-29 lb.ft) torque.



H7RA1170