Driveshaft and Axle

GENERAL

SPECFICATIONS EIMB0100

PROPELLER SHAFT

ITEMS	SPECIFICATION	
	2.5 DIESEL	3.5 GASOLINE
Joint type Front Rear	 U.J. + U.J. U.J. + U.J.	 U.J. + C.V.J. U.J. + U.J.
Length x O.D mm (in.) Front Rear (4WD) Rear (2WD)	 749.5 x 50.8 (M/T) 817.5 x 50.8 (A/T) 1089 x 76.2 (M/T) 1022 x 76.2 (A/T) 1497 x 76.2 (M/T) 1420 x 76.2 (A/T)	 775.5 x 63.5 (M/T) 753.5 x 63.5 (A/T) 1064 x 76.2 (M/T) 1084 x 76.2 (A/T) ← ←
Runout	0.5mm (0.020 in.) or less	0.5mm (0.020 in.) or less

U.J. : Universal Joint
C.V.J. : Constant Velocity Joint

2 WD : 2 Wheel Drive
4 WD : 4 Wheel Drive

M/T : Manual Transmission
A/T : Automatic Transmission

FRONT AXLE AND DRIVESHAFT

ITEMS	SPECIFICATION	
	2.5 DIESEL	3.5 GASOLINE
Front axle hub bearing type	Taper roller bearing	←
Driveshaft joint type (4WD) Outer Inner	 B.J. D.O.J.	 B.J., B.J. T.J., D.O.J.
Differential (4WD) Reduction gear type Reduction ratio	 Hypoid gear 4,875 (NO.6) : 2.5 Diesel Engine	 Hypoid gear 4,625 (NO.6) : 3.5 Gasoline Engine

B.J. : Birfield Joint D.O.J. : Double Offset Joint T.J. : Tripod Joint

REAR AXLE AND AXLE SHAFT

ITEMS	SPECIFICATION
Axle housing type	Banjo Type
Axle shaft supporting type	Semi-floating type
DIFFERANTIAL Reduction gear type Reduction gear ratio	 Hypoid gear 4.875 (NO.7) : 2.5 Diesel Engine 4.625 (NO.7.5) : 3.5 Gasoline Engine

LUBRICANTS EIMB0200

Items	Specified lubricants	Quantity
B.J. - D.O.J. Driveshaft type (2.5 Diesel, 3.5 Gasoline)		
B.J. Boot grease	Repair kit grease	130(+10/-0) gr. (2.5 Diesel) 145 ± 10 gr. (3.5 Gasoline)
D.O.J. Boot grease	Repair kit grease	130(+10/-0) gr. (2.5 Diesel) 135 ± 10 gr. (3.5 Gasoline)
B.J. - T.J. Driveshaft type(GKN) (3.5 Gasoline)		
B.J. Boot grease	Repair kit grease	115 ± 5 gr.
D.O.J. Boot grease	Repair kit grease	230 ± 10 gr.
Differential		
	Hypoid gear oil	Fill the reservoir to the plug hole
Front	GH90W (Warmer than -30°C)	1.8L
	GH80W (Colder than -30°C)	1.8L
Rear		
Conventional differential	GH90W (Warmer than -30°C)	2.8L (2.5 Diesel)
	GH80W (Colder than -30°C)	2.8L (3.5 Gasoline)
With LSD (Limited Slip Differential)	Multi gear LS90 (MMC CO.LTD), SAE 90	2.8L (2.5 Diesel)
	INFILREX33 (MOBIL CO.LTD)	2.8L (3.5 Gasoline)

SEALANTS AND ADHESIVES EIMB0300

Items	Specified sealants and adhesives
Contact surface of the drive flange and front axle hub	HERM SEAL NO.201
Threaded holes for mounting of the drive flange and front axle hub	PRETONR #316 or equivalent
Differential cover installation surface (to gear carrier)	THREEBOND #1215 or equivalent
Contact surface of the rear axle housing and the bearing case	THREEBOND #1104 or equivalent

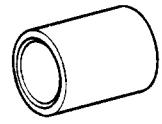
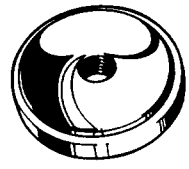
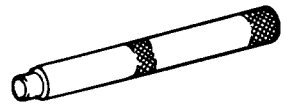
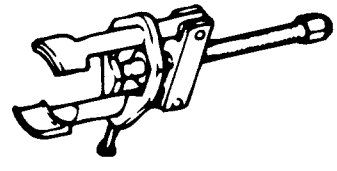
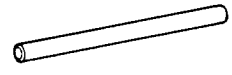
TORQUE SPECIFICATIONS EIMB0400

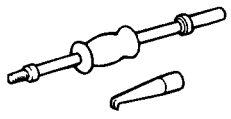
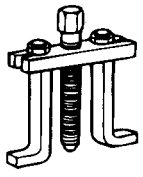
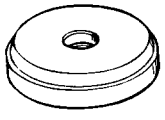
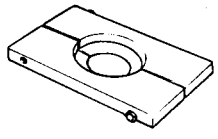
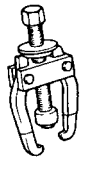
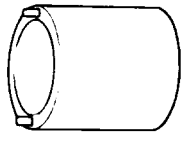
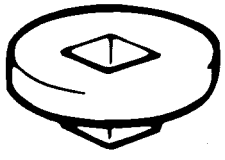
Items	Nm	Kg·cm	lb·ft
Propeller shaft			
Yoke flange mounting nut(Front, Rear)	50-60	500-600	37-44
LJ assembly to transfer flange mounting nut	35-40	350-400	26-29
Center bearing mounting self locking flange nut	40-50	400-500	29-37
Center bearing mounting bracket	40-50	400-500	29-37
Self locking nut to center yoke mounting lock nut(2WD)	230-250	2300-2500	168-183
Wheel nut	100-120	1000-1200	73-88
Front hub to brake disc mounting	50-60	500-600	37-44
Upper arm ball joint to knuckle mounting	60-90	600-900	44-66
Lower arm ball joint to knuckle mounting	120-180	1200-1800	88-132
Knuckle to tie rod end mounting	40-50	400-500	26-29
Front hub to drive flange mounting bolt	50-60	500-600	37-44
Driveshaft to inner shaft mounting	50-60	500-600	37-44
Rear axle housing to bearing case	120-140	1200-1400	88.8-103.6
Oil filler plug	40-60	400-600	29-44
Oil drain plug	60-70	600-700	44-51
Differential self-locking nut	160-220	1600-2200	117-161

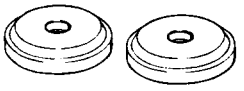
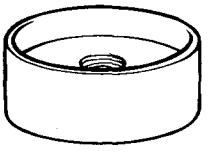
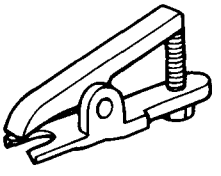
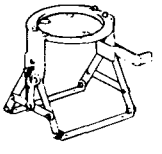
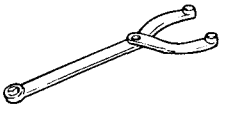
⚠ ***CAUTION***

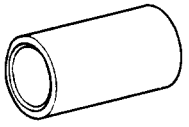
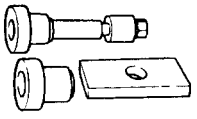
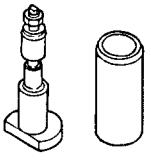
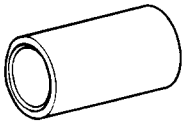
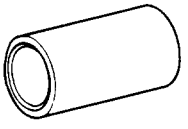
Replace self-locking nuts with new ones after removal.

SPECIAL TOOL EIMB0500

Tool (Number and Name)	Illustration	Use
Bushing remover and installer 09216-21100	 B1621100	Press-fitting of the inner shaft housing dust seal
Bearing outer race installer 09432-33700	 D3233700	Installation of the front hub bearing (Use with 09500-21000)
Bar 09500-21000	 E0021000	Installation of the front hub bearing (Use with 09432-33700)
Bearing and gear puller 09455-21000	 HFR49-7	Removal of the inner race from the front hub (Use with 09545-34100)
Draft 09517-21400	 E1721400	Removal of the knuckle needle bearing from the knuckle
Universal joint remover 09493-43000	 D9343000	Removal and installation of the journal bearing

Tool (Number and Name)	Illustration	Use
Sliding hammer 09526-11100	 E2611100	• Removal of the front hub and the inner shaft (Use with 09500-11001) • Removal of the rear axle housing oil seal
Axle puller 09526-11001	 E2611001	Removal of the front hub and the inner shaft (Use with 09500-11001)
Oil seal installer 09517-21000	 E1721000	Press-fitting of the differential drive pinion oil seal (Use with 09500-21000)
Remove plate 09527-4A000	 E274A000	Removal of the differential drive pinion rear bearing
Bearing puller 09517-43001	 D9-8	• Removal of the front lower arm ball joint • Removal of the differential side bearing
Lock nut remover 09518-4A000	 E184A000	Removal and installation of the front hub lock nut
Preload socket 09532-11600	 HFR49-10	Measurement of the drive pinion starting torque (Use with torque wrench)

Tool (Number and Name)	Illustration	Use
Oil seal installer 09532-32000	 E3232000	Installation of the differential drive pinion front bearing outer race
Oil seal installer 09542-4A000	 E424A000	Press-fitting of the oil seal into knuckle (Use with 09500-11000)
Ball joint puller 09568-34000	 HFR49-1	Disconnection of the tie rod ball joint and the upper arm ball joint
Oil seal installer 09532-32100B	 E3231200	Installation of the differential drive pinion rear bearing outer race (Use with 09500-11000)
Working base 09517-43401	 E1743401	Supporting for the differential carrier
End yoke holder 09517-21700	 E1721700	Removal and installation of the differential self-locking nut

Tool (Number and Name)	Illustration	Use
Pinion height gauge base 09500-H1000	 E00H1000	Measurement of the front differential drive pinion height (No.6)
Pinion height gauge 09500-43131 (6호)	 E0043131	
Pinion height gauge 09500-4A000	 E004A000	Measurement of the rear differential drive pinion height (No.7)
Pinion height gauge tube 09500-4A100	 E004A100	
Pinion height gauge base 09500-H1100	 E00H1100	Measurement of the rear differential drive pinion height (No.7.5) (Use with 09500-4A000)

TROUBLESHOOTING EIMB0600

Symptom		Probable cause	Remedy
Propeller shaft	Noise at start	Worn journal bearing Worn sleeve yoke spline or flange yoke Loose propeller shaft installation	Replace Replace Retighten
	Noise and vibration at high speed	Unbalanced propeller shaft Improper snap ring selection Worn journal bearing	Replace Adjust the clearance Replace
Drive shaft, Inner shaft	Noise during wheel rotation	Housing tube bent Inner shaft bent Inner shaft bearing worn, pounding Drive shaft assembly worn damaged, bent	Replace Replace Check or replace
	Noise due to excessive play of wheel in turning direction	Inner shaft and side gear serration play Drive shaft and side gear serration play	Replace
Center Axle Disconnect System (CADS)	Does not lock	Negative pressure leakage Vacuum tank damaged Check valve damaged Actuator assembly damaged Shift fork damaged CADS clutch damaged Differential shaft damaged Actuator assembly attaching bolt loose	Correct or replace vacuum hose Replace Retighten attaching bolts
	Locks but does not become free	Foreign substances on tooth surfaces of differential shaft and clutch sleeve Foreign substances on tooth surfaces of CADS sleeve and CADS clutch	Clean tooth surfaces or replace
Axle shaft, axle housing	Noise while wheels are rotating	Bent axle shaft Worn or scarred axle shaft bearing	Replace Replace
	Grease leakage	Worn or damaged oil seal Malfunction of bearing seal	Replace Replace
Differential	Constant noise	Improper drive gear and drive pinion gear tooth contact 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 Insufficient oil	Correct or replace Eliminate the foreign (Replace the parts if necessary) Replenish

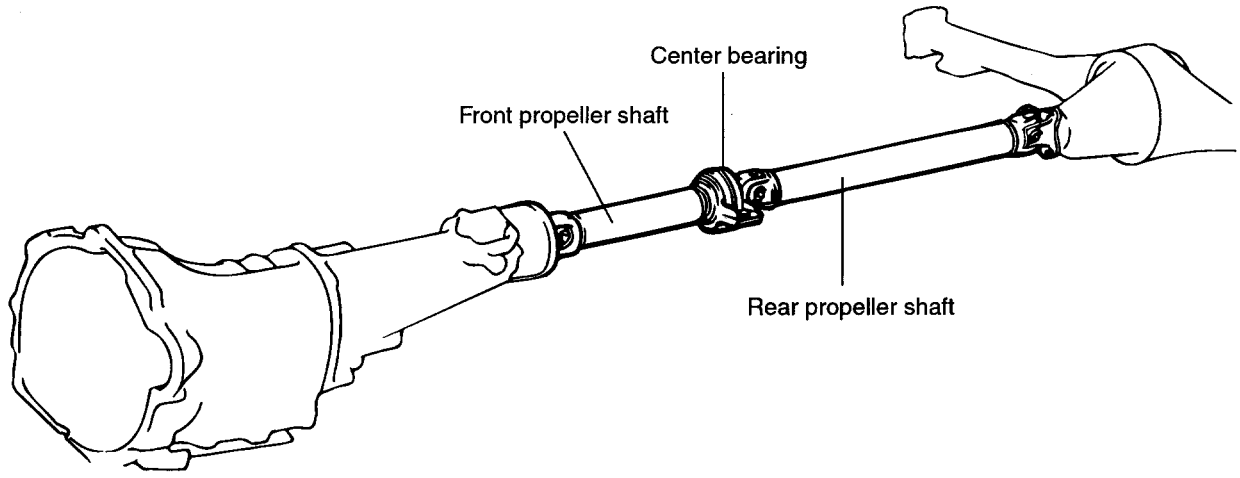
Symptom		Probable cause	Remedy
Differential	Gear noise while driving	Poor gear engagement Improper gear adjustment Improper drive pinion preload adjustment Damaged gear Foreign material Insufficient oil	Correct or replace Replace Eliminate the foreign material and check (Replace the parts if necessary) Replenish
	Gear noise while coasting	Improper drive pinion preload adjustment Damaged gear	Correct or replace 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 Insufficient oil	Adjust Replenish
	Oil leakage	Differential carrier not tightened Seal malfunction Worn or damaged oil seal Excessive oil	Retighten, apply sealant, or replace the gasket Replace Adjust the oil level

PROPELLER SHAFT ASSEMBLY

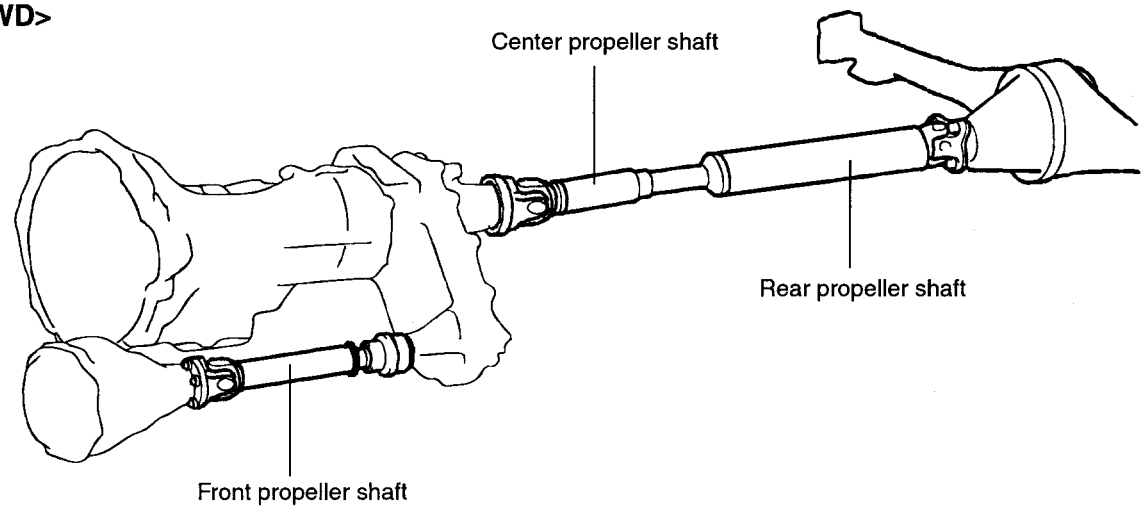
PROPELLER SHAFT

COMPONENTS EIMB0700

<2WD>



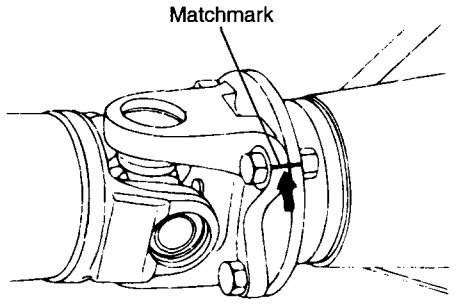
<4WD>



EHPDS01A

REMOVAL EIMB0800

1. Make a matchmark on the flange yoke and the differential companion flange.



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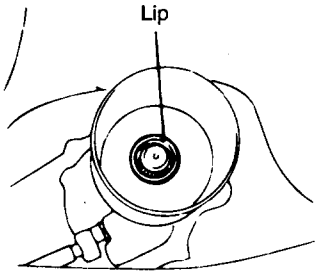
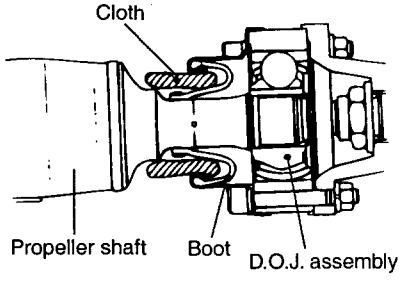
2. Use with the plug as a cover so that no foreign material gets into the transmission(2WD).



AU49-05A

NOTE

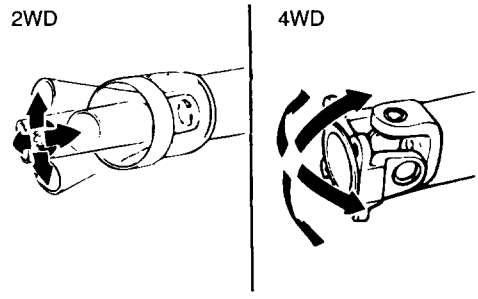
- *When removing the propeller shaft, be careful not to damage the boot.*
- *Insert a piece of cloth into the boot to prevent it from being damaged.*



A7PS0280

INSPECTION EIMB0900

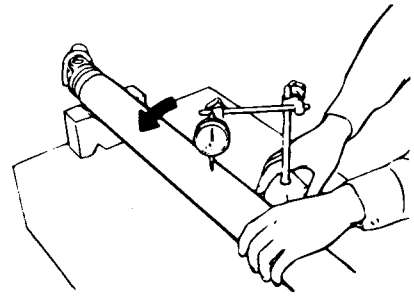
1. Check the sleeve yoke, center yoke and flange yoke for wear, damage or cracks.
2. Check the propeller shaft yokes for wear, damage or cracks.
3. Check the propeller shaft for bends, twisting or damage.
4. Check the universal joints for smooth operation in all directions.



KIMB090A

5. Check the center bearing for smooth movement(2WD).
6. Check the center bearing mounting rubber for damage or deterioration(4WD).
7. Measure the propeller shaft runout with a dial indicator.

Limit	Front	0.5 mm (0.02 in.) or less
	Rear	0.5 mm (0.02 in.) or less



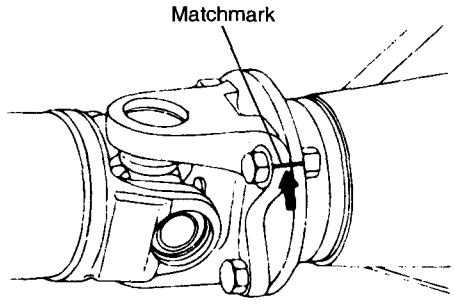
AU49-05C

INSTALLATION EIMB1000

Align the matchmark on the flange yoke and the differential companion flange. Install the propeller shaft.

⚠ ***CAUTION***

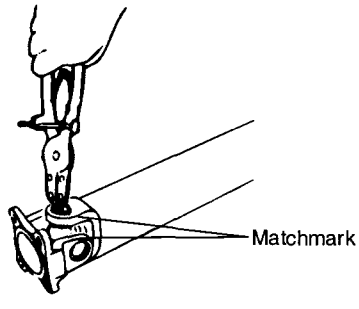
- ***Clean the thread of the mounting bolts and nuts before tightening these parts. Otherwise, they can become loose.***
- ***Be careful not to damage the lip section of the transmission oil seal when installing the propeller shaft. (2WD)***



KSRPS02A

DISASSEMBLY EIMB1100

1. **REMOVAL OF SNAP RINGS**
   a. Make matchmarks on the yoke and universal joint that are to be disassembled.
   b. Remove the snap ring from the yoke with a snap ring pliers.

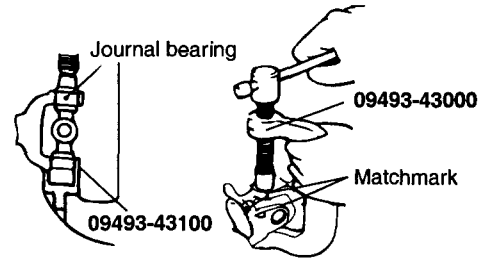


A7PS0320

2. **REMOVAL OF JOURNAL BEARINGS**
   Remove the journal bearings from the yoke with a special tool.

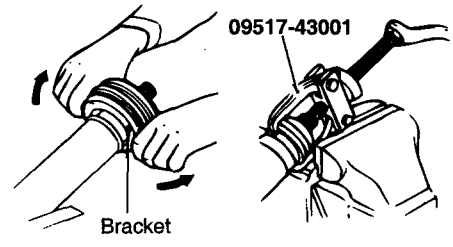
⚠ ***CAUTION***

Do not tap the journal bearings to remove them, because this will cause inbalance of the propeller shaft.



TU49-06C

3. **REMOVAL OF CENTER BEARING ASSEMBLY**
   a. Remove the center bearing bracket.
   b. Pull out the center bearing with a puller.



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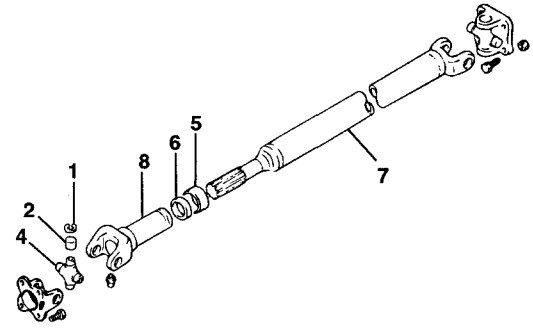
4. **REMOVAL OF REAR PROPELLER SHAFT (4WD)**



Removal steps

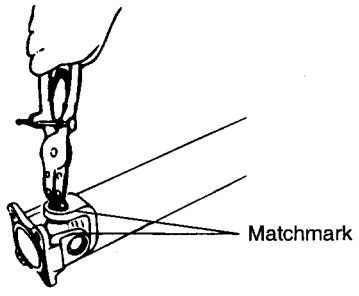
1. Snap ring
2. Journal bearing
3. Flange yoke
4. Universal joint spider
5. Packing retainer
6. Shield packing
7. Rear propeller shaft
8. Sleeve yoke

EHPDS02A

REASSEMBLY EIMB1200

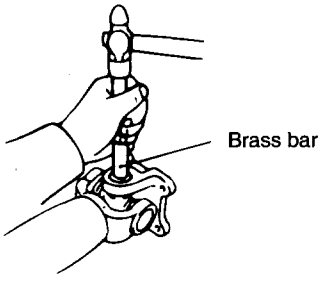
SNAP RING

1. Install snap rings of the same thickness onto both sides of each yoke.



ESRPS77A

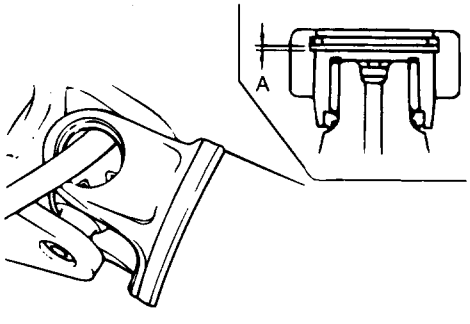
2. Press the bearing and journal into one side using a brass bar.



ESRPS05A

3. Measure the clearance between the snap ring and the groove wall of the yoke with a feeler gauge.

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

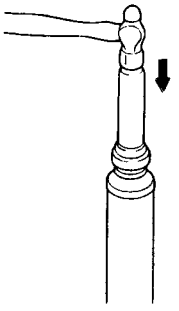


EIJA3360

4. If the clearance exceeds the standard value, replace the snap rings.

CENTER BEARING ASSEMBLY/CENTER YOKE

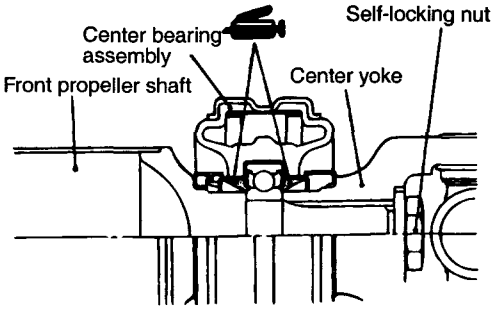
1. Install the center bearing assembly to the front propeller shaft as shown in the illustration.



H7PS0260

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

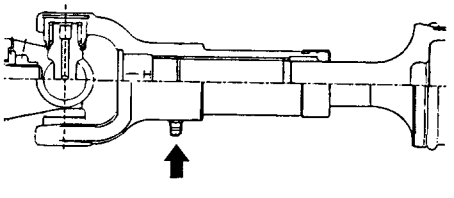
3. Press-fit the center bearing with the center yoke while tightening the self-locking nut.



ESRPS10B

4. Install the propeller shaft so that the flange face of center mounting bracket spacer upward.

5. After installing the propeller shaft, fill the grease into the neeple until it comes out from the sleeve yoke plug hole

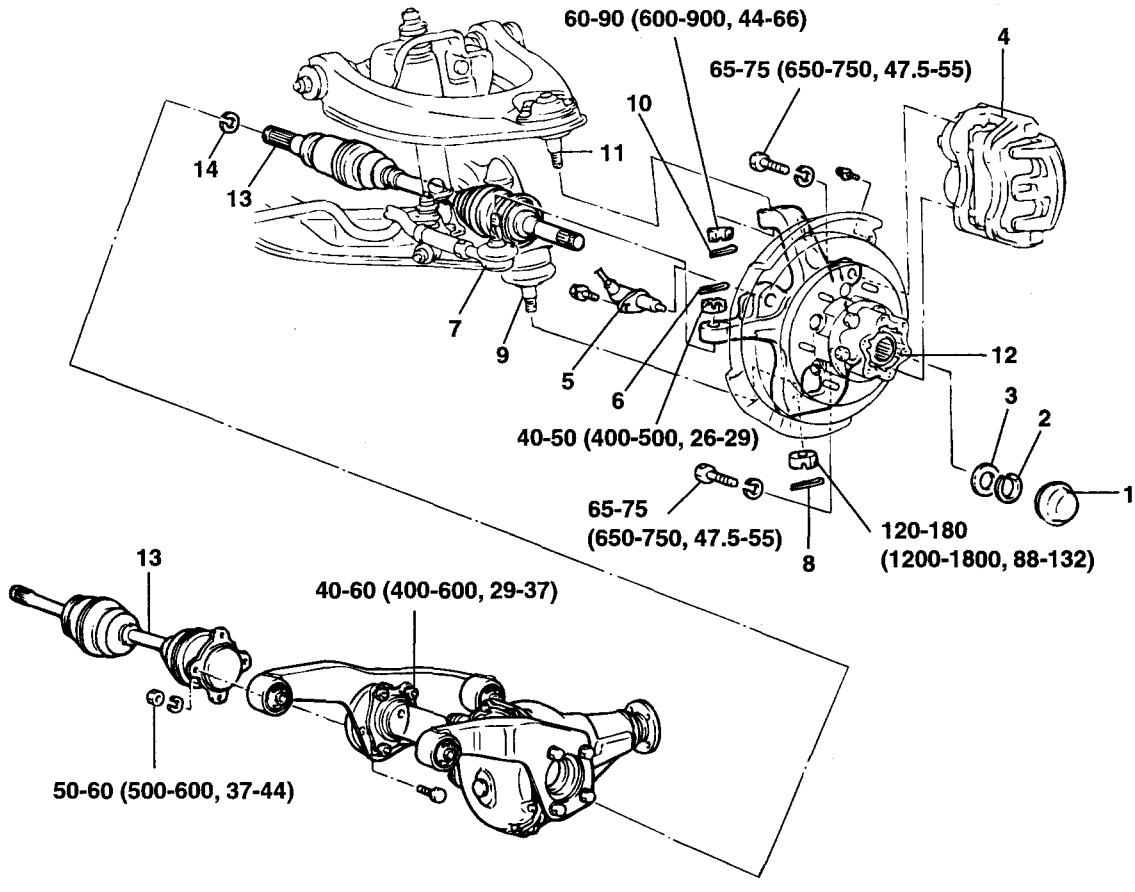


KSRPS03A

DRIVESHAFT

FRONT DRIVESHAFT ASSEMBLY

COMPONENTS EIMB1300



Removal steps

1. Hub cap
2. Snap ring
3. Shim
4. Front brake assembly
5. Speed sensor (ABS)
6. Split pin
7. Tie rod end
8. Split pin
9. Lower ball joint
10. Split pin
11. Upper ball joint
12. Front hub and knuckle assembly
13. Driveshaft
14. Circlip

TORQUE : Nm (kg·cm, ft·lb)

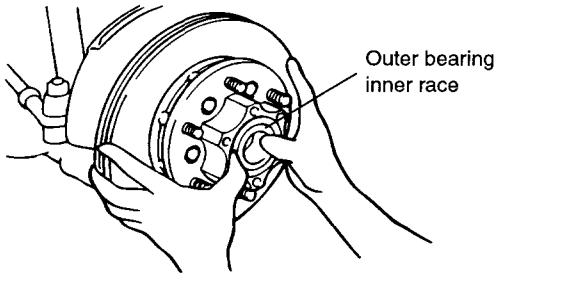
EHPDS90A

REMOVAL EIMB1400

1. Remove the front hub and knuckle assembly. (Refer to front hub/knuckle for detail)

⚠ ***CAUTION***

Do not drop the outer bearing inner race.

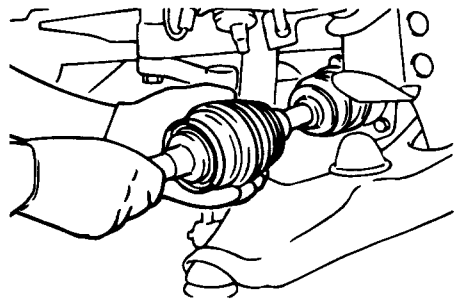


H7FA030A

2. Remove the driveshaft.

⚠ ***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.***
- ***Wrap cloth around the boot of the driveshaft so that the boot is not damaged when it is removed.***



KHPDS13A

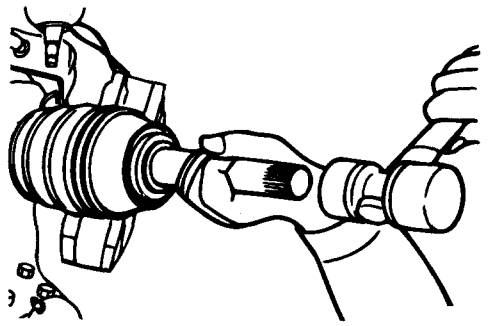
INSPECTION EIMB1500

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 EIMB1600

1. Installation is the reverse of removal.
2. If the driveshaft is not installed into the differential carrier easily, use a plastic hamer (LH).



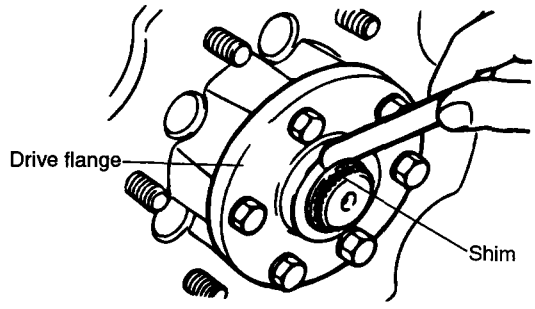
KHPDS14A

⚠ ***CAUTION***

- ***Be careful not to damage the lip of the oil seal.***
- ***Replace the circlip which is attached to the B.J side spline part with a new one.***

3. Driveshaft end play adjustment.
   a. Install the shim and snap ring to the driveshaft.
   b. Push the driveshaft in by hand toward the knuckle until they touch.
   c. Measure the clearance between the drive flange and the shim with a feeier gage.

Standard value : 0.2-0.5mm (0.008-0.2 in.)

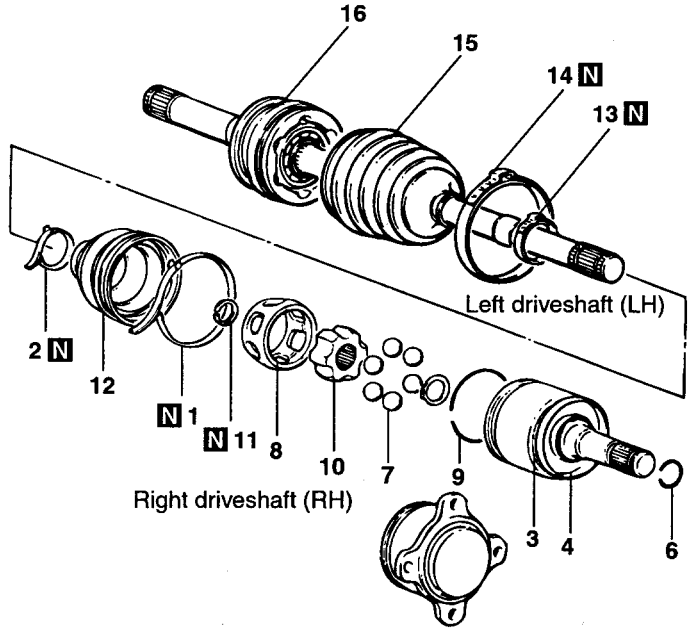


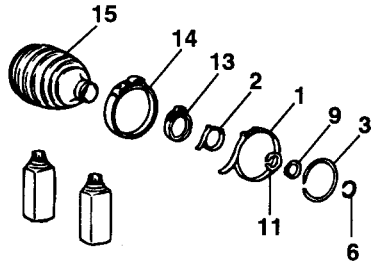
EHPDS11A

d. If the amount of play is outside the standard value, adjust by selecting a shim that will bring the play to the standard value.

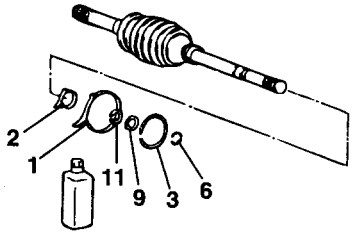
FRONT DRIVESHAFT (DOJ-BJ TYPE)

COMPONENTS EIMB1700

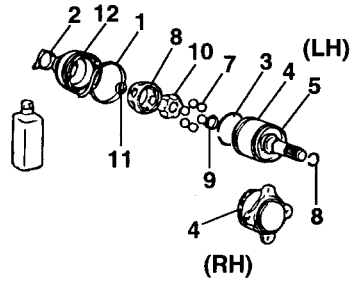




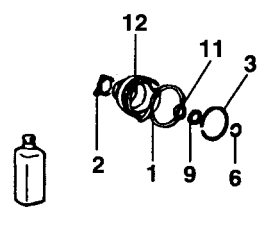
Boot repair kit (B.J.)



B.J. Repair kit



D.O.J. Repair kit



Boot repair kit (D.O.J.)

1. Boot band A
2. Boot band B
3. Circlip
4. D.O.J. outer race
5. Dust cover
6. Circlip
7. Ball
8. D.O.J. cage
9. Snap ring
10. D.O.J. inner race
11. Circlip
12. D.O.J. boot
13. B.J. boot band (large)
14. B.J. boot band (small)
15. B.J. boot
16. B.J. assembly

CAUTION : N Replace the parts with new one after removal.

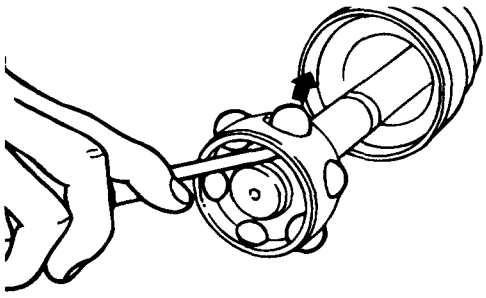
EHPDS09A

DISASSEMBLY EIMB1800

NOTE

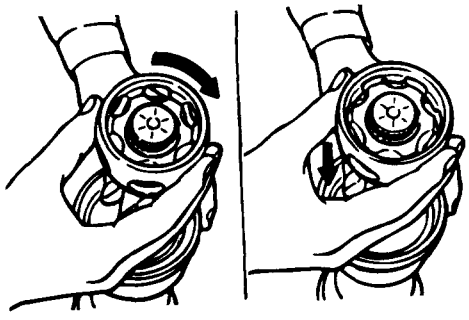
1. *Do not disassemble the B.J. assembly.*
2. *Special grease must be applied to the driveshaft joint. Do not substitute with another type of grease.*
3. *The boot band should be replaced with a new one.*

1. REMOVAL OF BALLS
Remove the balls from the D.O.J cage.



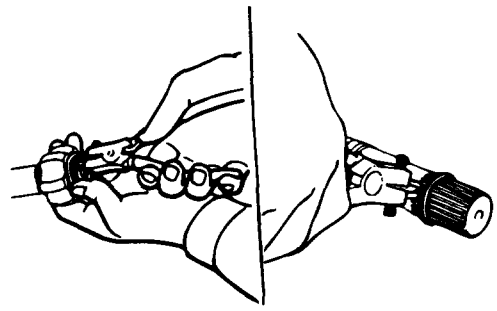
KHPDS15A

2. REMOVAL OF D.O.J CAGE
Remove the D.O.J cage from the D.O.J inner race in the direction of the B.J



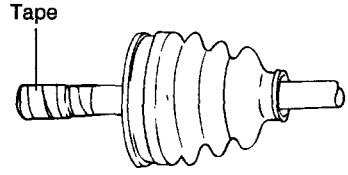
KHPDS16A

3. REMOVAL OF SNAP RING/CIRCLIP
   a. Remove the snap ring from the driveshaft using a snap ring pliers, and then withdraw the D.O.J inner race and D.O.J cage from the driveshaft.
   b. Remove the circlip from the driveshaft using a pliers.



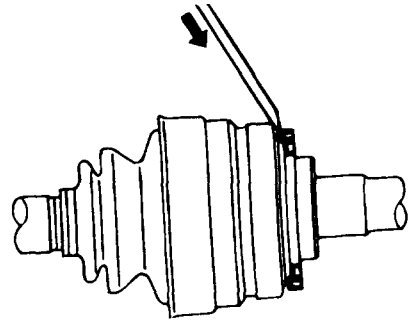
KHPDS17A

4. REMOVAL OF D.O.J BOOT
   a. Wrap vinyl tape around the spline part on the D.O.J side of the driveshaft so that the D.O.J boot is not damaged when they are removed.
   b. Remove the D.O.J boot from the driveshaft.



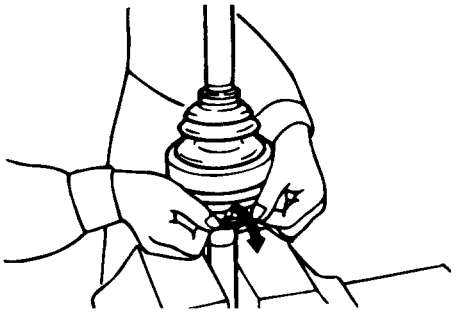
EIDA251D

5. REMOVAL OF DUST COVER



KHPDS18A

6. REMOVAL OF BOOT PROTECTOR
After extending the folded over part of the boot protector and removing the boot protector band, push the boot protector to the B.J side and then remove it.

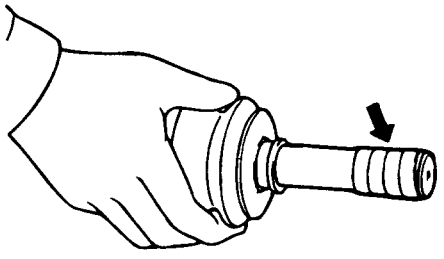


KHPDS19A

7. REMOVAL OF B.J BOOT
   a. Wrap vinyl tape around the spline part on the D.O.J side of the driveshaft so that the D.O.J boot is not damaged when they are removed.
   b. Withdraw the B.J boot from the driveshaft.

⚠ ***CAUTION***

Do not disassembly the B.J.



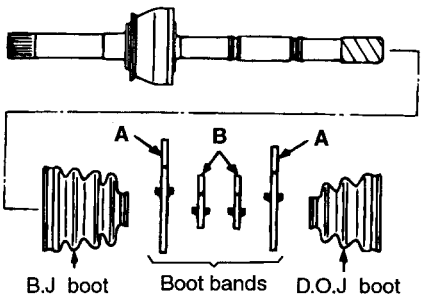
KHPDS99A

INSPECTION EIMB1900

1. Check the driveshaft for bending or wear.
2. Check for water, foreign matter or rust in the boot.
3. Check the ball joint for wear or damage.
4. Check the boot for wear or damage.

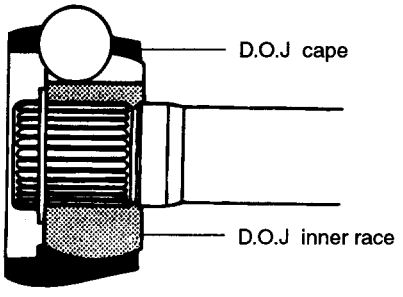
REASSEMBLY EIMB2000

1. INSTALLATION OF BOOTS AND BOOT BANDS.
   a. Wrap vinly tape around the spline part on the D.O.J side of the driveshaft.
   b. Install the B.J boot, boot bands(new ones), and D.O.J boot on the driveshaft.



EHPDS20A

2. INSTALLATION OF D.O.J CAGE/D.O.J INNER RACE
Install the D.O.J cage onto the driveshaft so that the smaller diameter side of the cage is installed first.



EHPDS21A

3. Apply the specified grease to the driveshaft and boot.

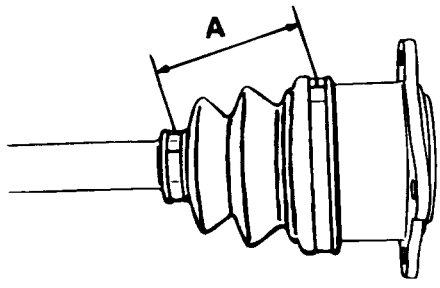
Items	Quantity (gr.)	
	2.5 Diesel	3.5 Gasoline
B.J	130 (+10/-0)	145±10
D.O.J	130 (+10/-0)	135±10

4. INSTALLATION OF D.O.J OUTER RACE
   a. Install the circlip onto the D.O.J outer race. Place the D.O.J boot over the D.O.J outer race, and then use boot band B to secure the boot.

⚠ ***CAUTION***

Do not secure the boot band A.

b. Secure the driveshaft, and then move the D.O.J outer race until it is at the position where the D.O.J boot assembly dimension is the standard value.



KHPDS22A

c. Remove a part of the D.O.J boot from the D.O.J outer race and release the air within the boot.
d. Secure the boot band A on D.O.J boot.

⚠ ***CAUTION***

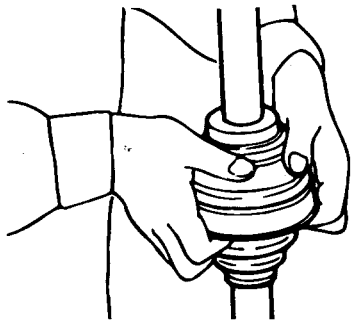
Be sure that the installation direction of the boot bands is correct.

5. INSTALLATION OF BOOT PROTECTOR/BOOT PROTECTOR BAND
   a. Push in the boot protector with the hands and tighten it with the boot band.

⚠ ***CAUTION***

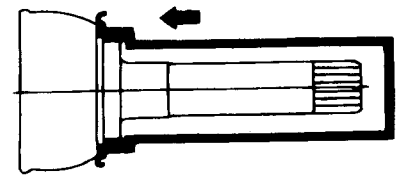
Be sure that the installation direction of the boot bands is correct.

   b. Put the edge of the boot protector back into the original state.



KHPDS23A

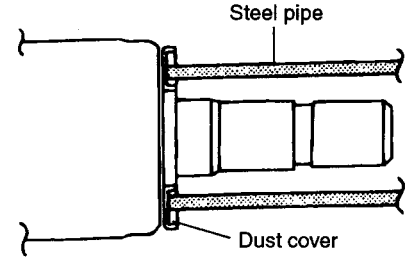
6. INSTALLATION OF DUST COVER
   Using a suitable tool, install the dust cover to B.J assembly.



KHPDS24A

7. INSTALLATION OF DUST COVER
   Using the steel pipe as specified below, force the dust cover to the D.O.J outer race.

Steel pipe	mm (in.)
Outside diameter	77 (3.03)

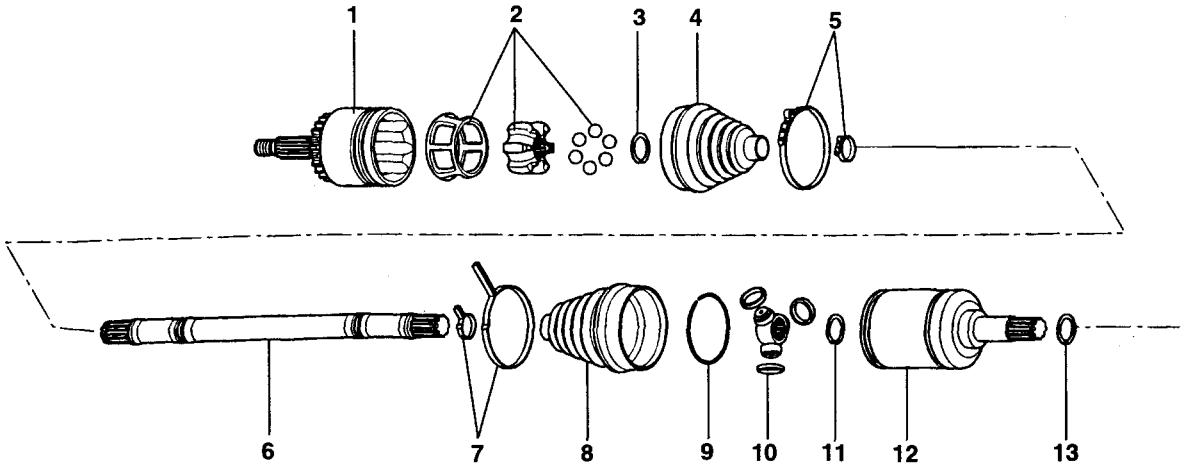


EHPDS25A

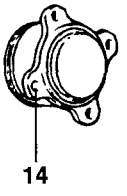
FRONT DRIVESHAFT (T.J-BJ TYPE)

COMPONENTS EIMB2100

Left driveshaft (LH)



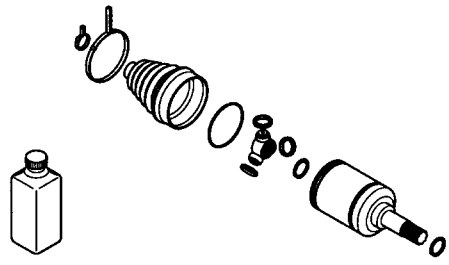
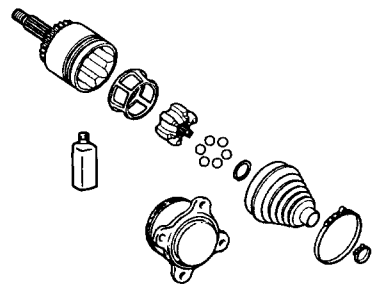
Right driveshaft (RH)



1. B.J assembly
2. B.J inner race and ball
3. Snap ring
4. B.J boot
5. B.J boot band
6. Driveshaft
7. T.J boot band
8. T.J boot
9. Circlip
10. Spider assembly
11. Snap ring
12. T.J assembly
13. Circlip
14. T.J outer race

EHPDS26A

REPAIR KIT

Kit name	Illustration	Components
T.J boot kit	 KIMB290A	• T.J boot band • T.J boot • Snap ring • Spider assembly • Snap ring • T.J assembly • Circlip • Grease
G.J boot kit	 KHPDS27A	• B.J assembly • B.J inner race and ball • Snap ring • B.J boot • B.J boot band • Grease

DISASSEMBLY EIMB2200

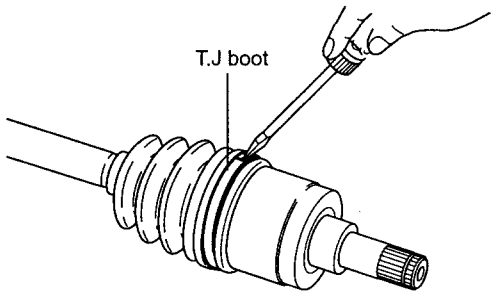
NOTE

1. *Do not disassemble the B.J assembly.*
2. *The Driveshaft joint uses special grease. Do not substitute with another type of grease.*
3. *The Boot band should be replaced with a new one.*

1. Remove the T.J boot band and pull the boot from T.J outer race.

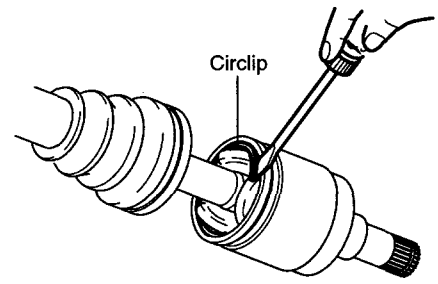
NOTE

Be careful not to damage it.



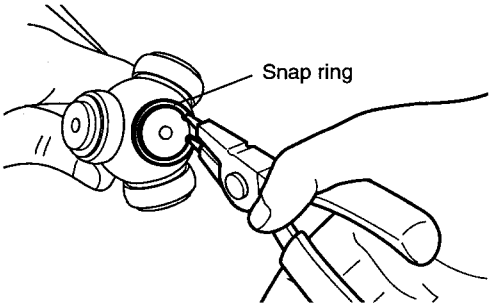
EIMB300A

2. Remove the circlip using a screwdriver.



EIMB300B

3. Remove the driveshaft from the T.J outer race.
4. Remove the snap ring and disassemble the spider assembly from the shaft.
5. Clean the spider assembly.

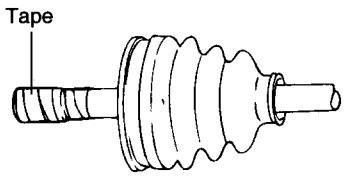


EIMB300C

6. Remove the B.J boot band and pull out the T.J boot and the B.J boot.

⚠ ***CAUTION***

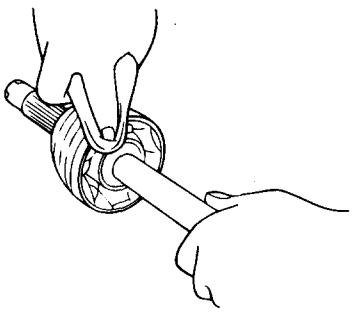
If the boot is reused, wrap a tape around the driveshaft splines to protect the boot.



EIDA251D

INSPECTION EIMB2300

1. Check the driveshaft spline for wear.
2. Check for water, foreign matter, or rust in the boot.
3. Check the spider ring for revolution and wear.
4. Check the T.J case inside for wear and rust.

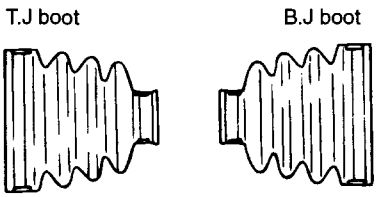


EIDA252A

REASSEMBLY EIMB2400

1. Wrap a tape around the driveshaft spline (T.J side) to avoid boot damage.
2. Apply specified grease to the driveshaft and install the boots.

Items	Recommended grease	Quantity (gr.)
B.J	CENTURY	115 ± 5
T.J	ONE LUBER GKN	230 ± 10

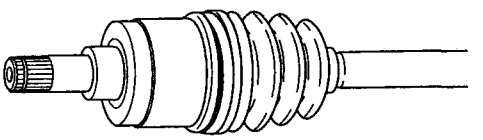


EIMB320A

3. Add specified grease as much as was wiped away at the time of inspection.
4. Tighten the boot bands.

⚠ ***CAUTION***

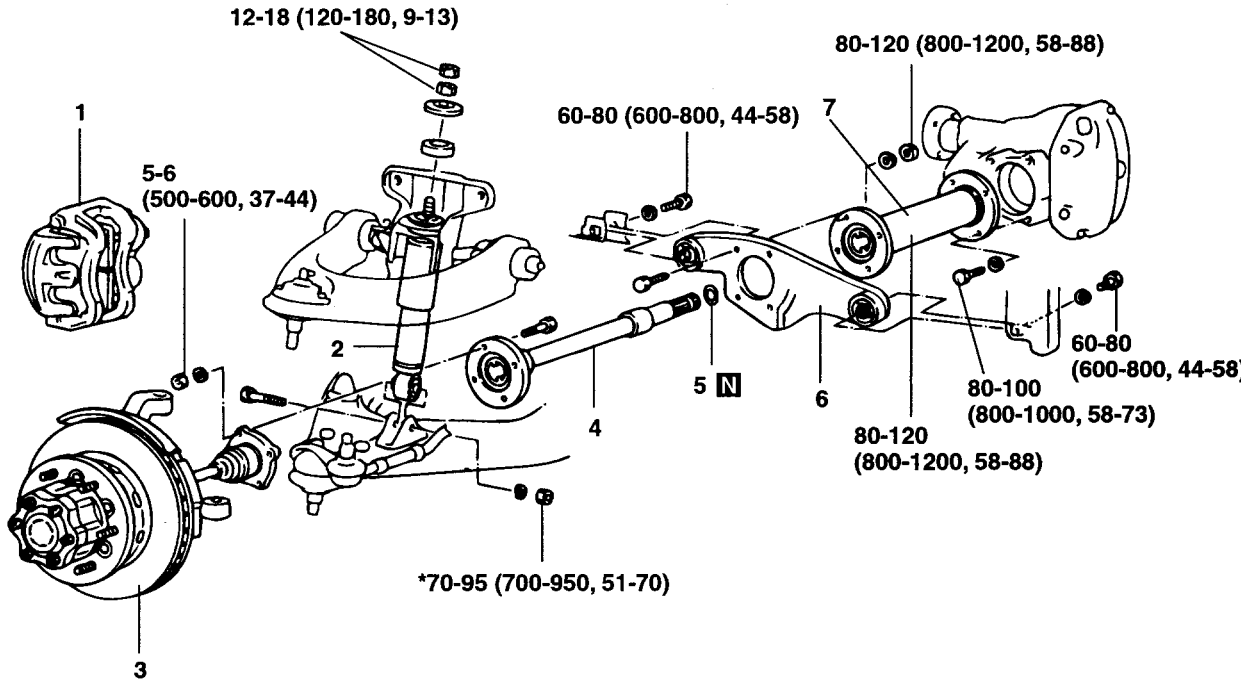
Keep the specified distance between the boot bands to control the air when they are tightened.



KGX7012A

CENTER BEARING AND INNER SHAFT

COMPONENTS EIMB2500



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

CAUTION

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

N : Replace the parts with new one after removal.

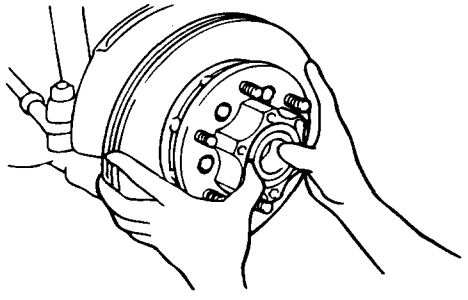
TORQUE : Nm (kg·m, lb·ft)

EHPDS28A

REMOVAL EIMB2600

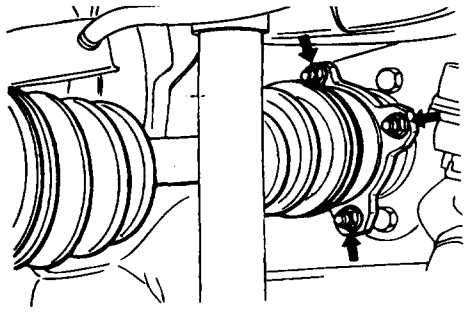
1. Remove the front hub and knuckle.

> **NOTE**
> *If the hub assembly is not removed from the knuckle easily, use the special tools(09526-11001, 09526-11100).*



H7FA0300

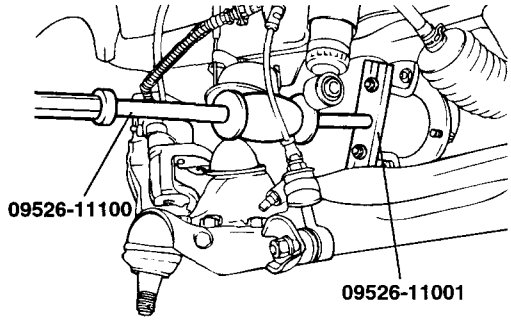
2. Remove the right driveshaft (RH).



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.

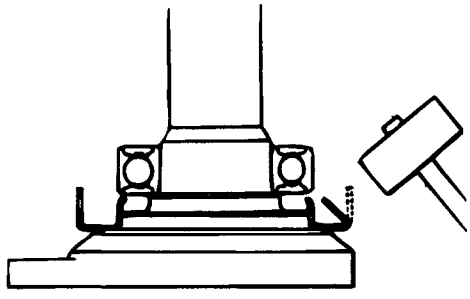
INSTALLATION EIMB2750

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.***

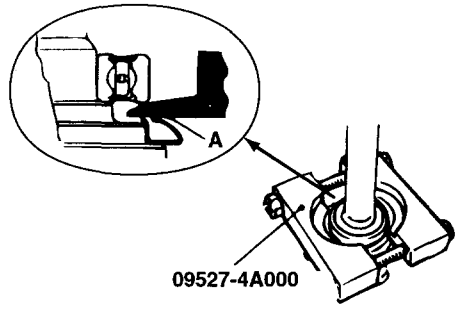
DISASSEMBLY EIMB2800

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.

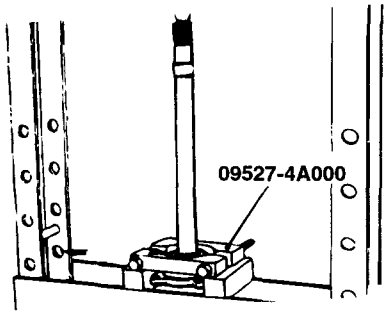


EIMB275A

3) Press out the inner shaft from the bearing.

⚠ ***CAUTION***

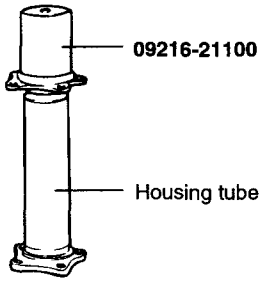
Do not allow the inner shaft to drop.



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.



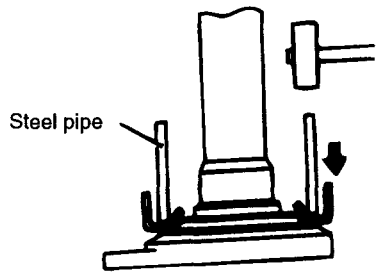
EIMB380A

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)

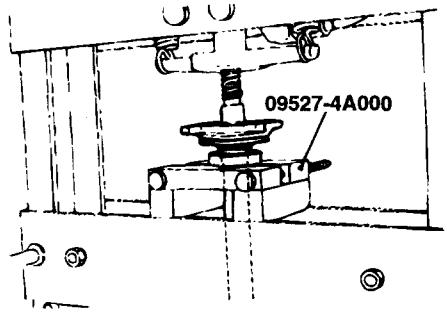
⚠ ***CAUTION***

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.

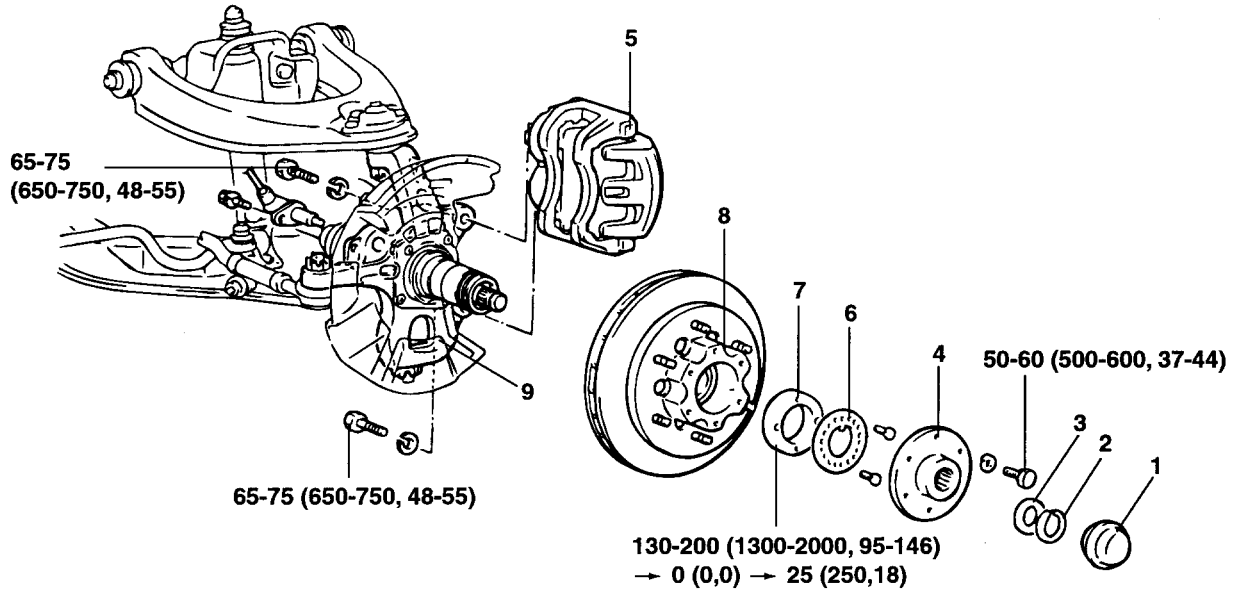


H7FA0660

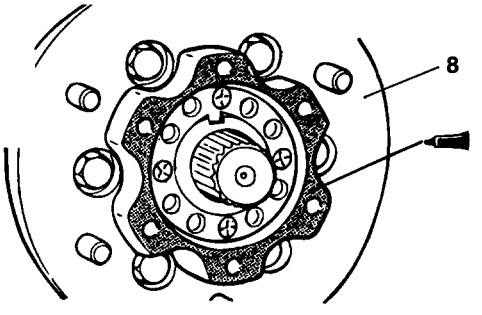
FRONT AXLE

FRONT HUB/KNUCKLE

COMPONENTS EIMB3000



Front hub shim set



Sealant : HERM SEAL NO.201 or equivalent

CAUTION :
Make sure that is no excess specified sealant on the hub outside surface.

Removal steps

1. Hub cap
2. Snap ring
3. Shim
4. Drive flange
5. Front brake assembly
6. Lock washer
7. Lock nut
8. Front hub assembly
9. Knuckle

TORQUE : Nm (kg·m, lb·ft)

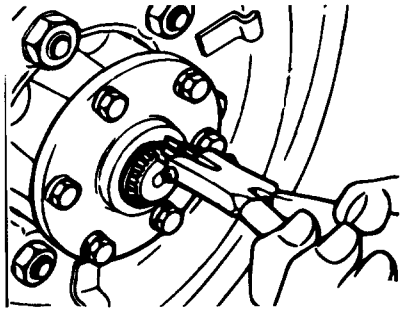
EHPDS03A

REMOVAL EIMB3100

1. Remove the hub cap.
2. Use a snap ring pliers to remove the snap ring from the driveshaft. (4WD)

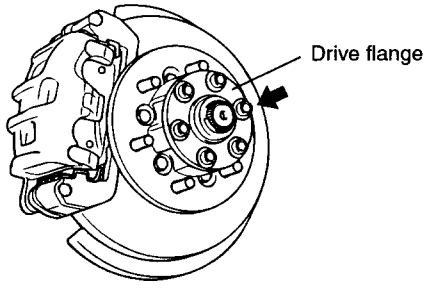
⚠ ***CAUTION***

The proper tool for removing and installing the snap ring is a pair of snap ring pliers. Screwdriver or other tool can deform or spread the snap ring beyond its yield point. Be sure to use only snap ring pliers for removing and installing the snap ring.



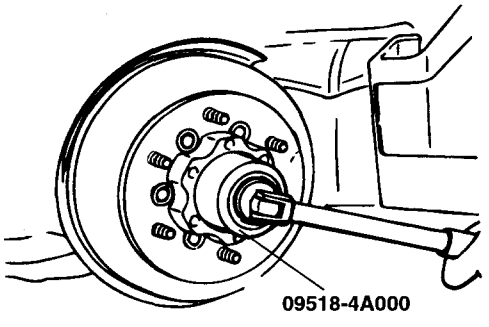
KHPDS04A

3. Remove the drive flange from the hub.



EHPDS05A

4. After removing the lock washer, remove the lock nut with special tool (09518-4A000).



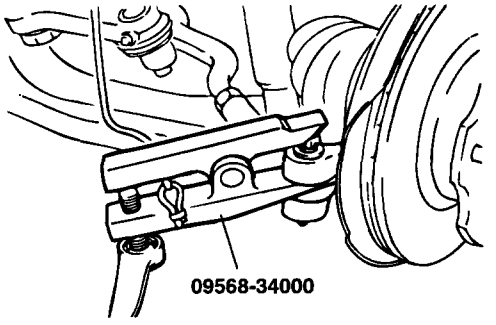
KHPDS06A

5. Remove the front brake assembly.

⚠ ***CAUTION***

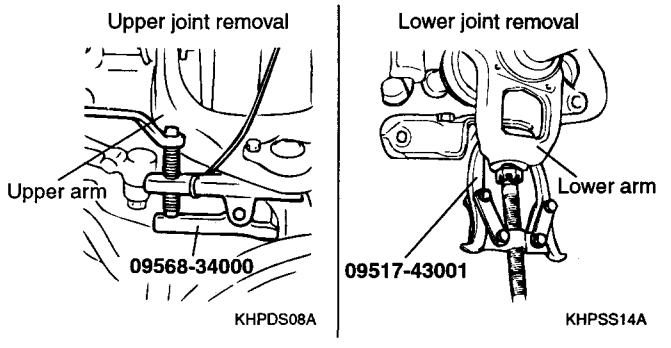
- ***Use wire to suspend the front brake assembly to the upper arm so that the front brake assembly won't fall.***
- ***Do not twist the brake hose.***

6. Using the special tool(09568-34000), disconnect the tie rod from the knuckle.



KHPDS07A

7. Using the special tools(09517-43001, 09568-34000), disconnect the upper joint and lower joint from the knuckle.



KHPDS08A KHPSS14A

EIMB140A

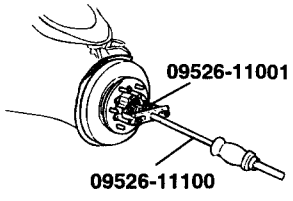
⚠ ***CAUTION***

- ***Use a cord to bind the special tool closely so that it will not become separated.***
- ***The nut should only be loosened, not removed.***

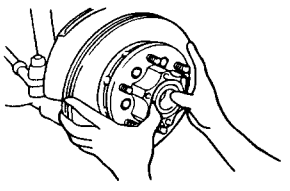
8. Remove the hub from the knuckle.

NOTE

If the hub assembly is not removed from the knuckle easily, use the special tools(09526-11001, 09526-11100).



KHPDS10A



H7FA0300

KIMB140B

INSPECTION EIMB3200

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 EIMB3300

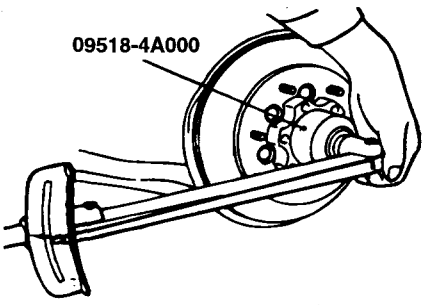
1. Installation is the reverse of removal.
2. Wheel bearing preload adjustment.
   a. Use the special tool(09518-4A000) to tighten the lock nut by the following procedure.

NOTE

While the wheel bearing preload adjust, remove the brake assembly.

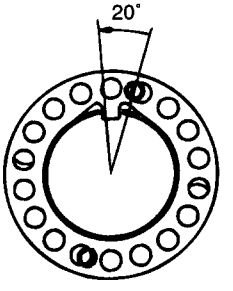
Tighten to 130-200Nm
(1300-2000kg·m, 95-146lb.ft)
↓
Loosen to 0Nm (0kg·m, 0lb.ft)
↓
Re-tighten to 25Nm
(250kg·m, 18lb.ft)
and then loosen 30-40°

EIMB330A



H7FA0310

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



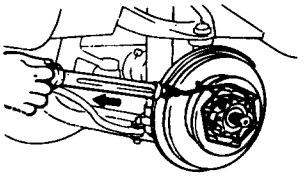
KHPD673A

   c. Loosen the lock nut approximately 30 to 40 degrees to adjust the front hub starting torque and the end play so that they are at the standard values.

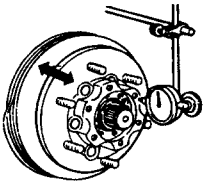
Standard value :
Starting torque : 0.3-13Nm (3-13kg·cm, 0.22-0.95lb·ft)
end play : 0.05m (0.0in.) or less

NOTE

If adjustment is not possible, the bearing may be incorrectly installed; check and repair if necessary. The lubrication condition should also be checked.



H7FA0330



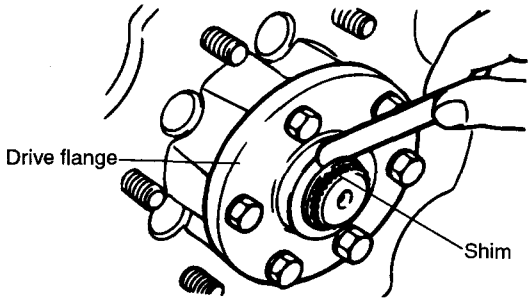
H7FA0340

KIMB150B

d. Install the lock washer.
If the lock washer holes are not aligned with the lock nut holes, loosen the lock nut to align them.

3. Driveshaft end play adjustment.
   a. Install the shim and snap ring to the driveshaft.
   b. Push the driveshaft in by hand toward the knuckle until they touch.
   c. Measure the clearance between the drive flange and the shim with a feeler gage as shown in the illustration.

Standard value : 0.2-0.5 mm (0.008-0.02 in.)



EHPDS11A

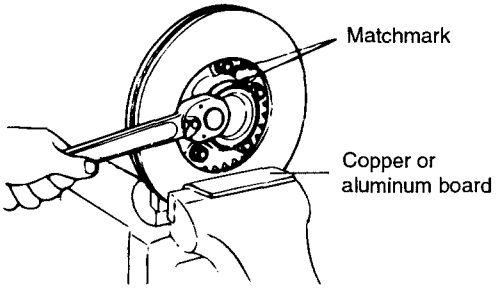
d. If the amount of play is outside the standard value, adjust by selecting a shim that will bring the play to the standard value.

DISASSEMBLY FRONT HUB EIMB3400

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

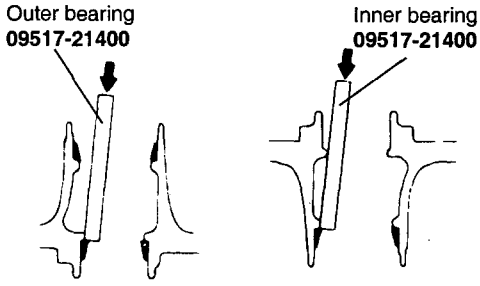
⚠ CAUTION

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



EIMB160A

2. Using the special tool, drive out the inner and outer bearing outer races by tapping them equally.



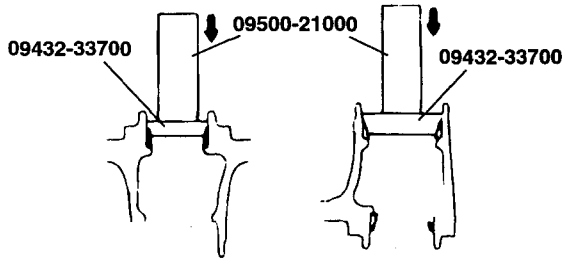
ESRDS71A

REASSEMBLY FRONT HUB EIMB3500

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

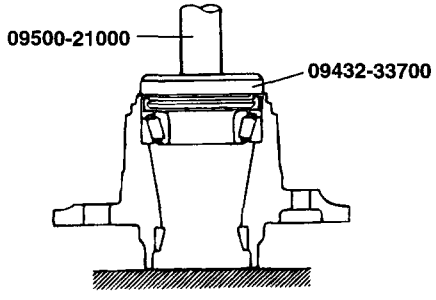
NOTE

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



KIMB170A

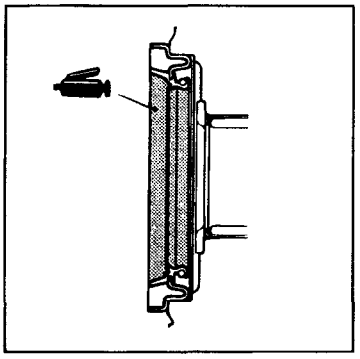
2. Using the special tools(09432-33700, 09500-21000), press-fit new oil seal into the front hub.

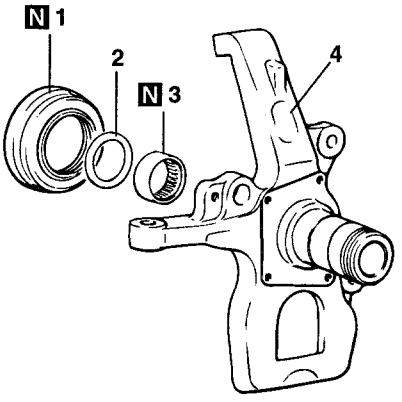


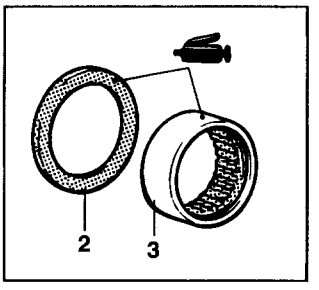
KHPDS12A

KNUCKLE (4WD) EIMB3600

COMPONENTS







Disassembly steps

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

N : Replace the parts with new one after removal.

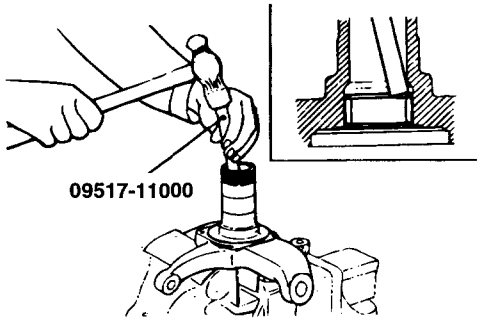
EHPDS12B

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.



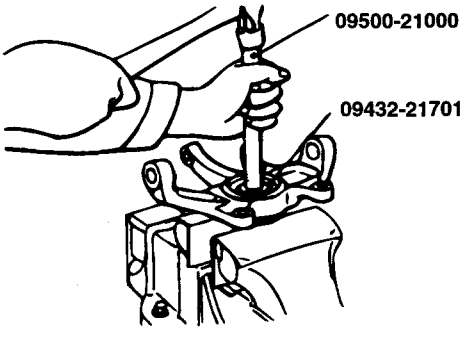
H7FA0460

REASSEMBLY EIMB3800

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

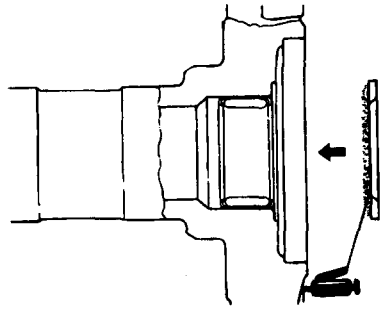
CAUTION

Care to prevent driving the needle bearing too far in.



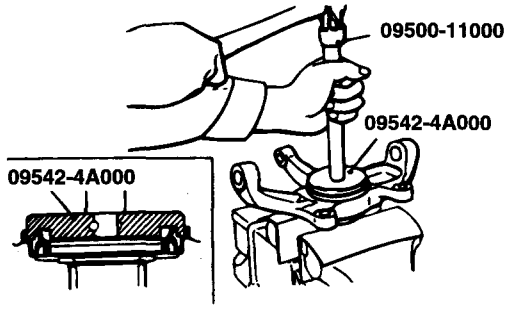
KIMB200A

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.



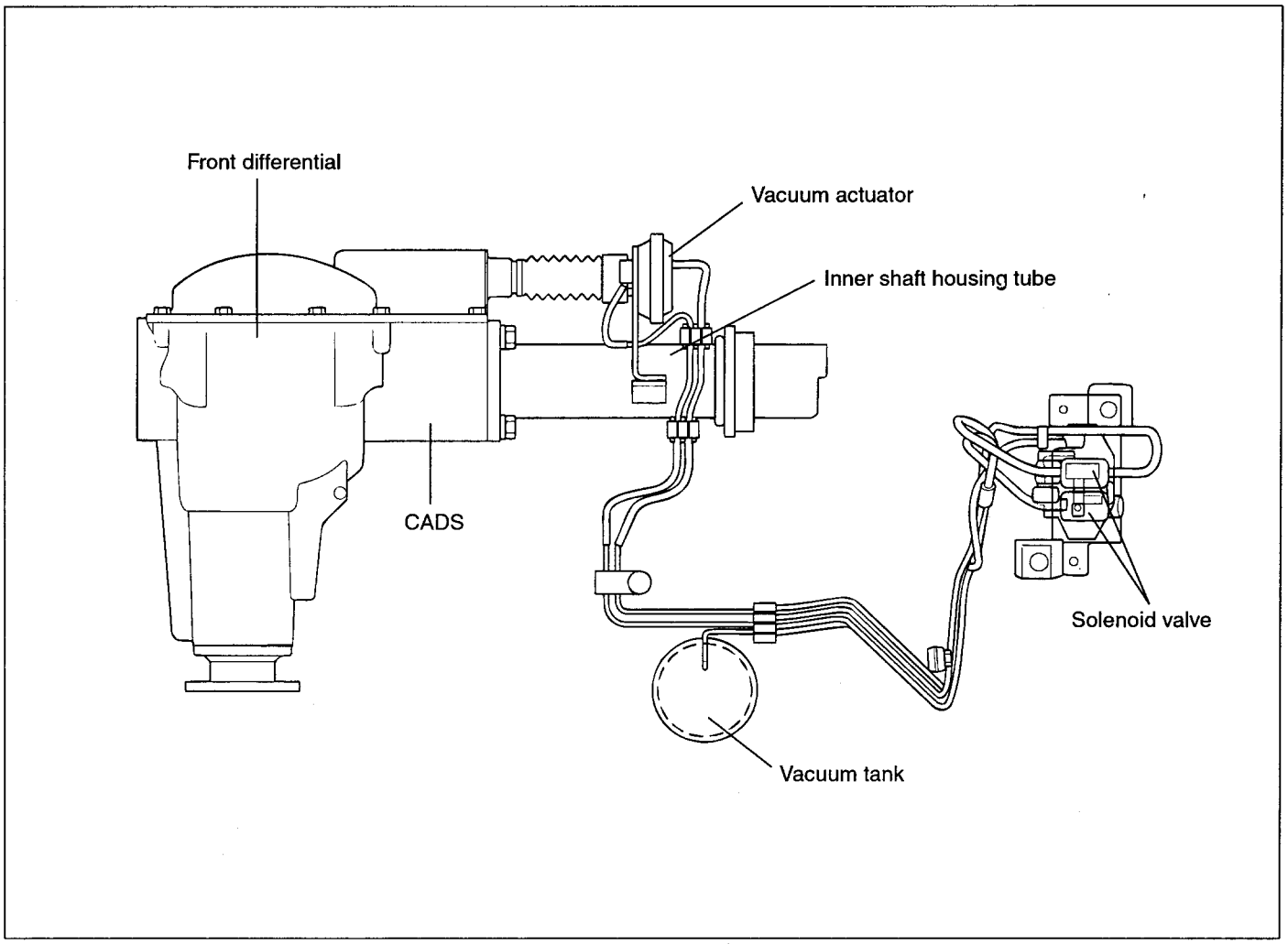
H7FA0490

CENTER AXLE DISCONNECT SYSTEM

DESCRIPTION EIMB3900

When transferring 2 wheel drive to 4 wheel drive and vice versa of the vehicle, as final controlling system of driving force, CADS (Center Axle Disconnect System) helps the transfer of 2 wheel or 4 wheel when driving. While 2 wheel driving, front axle is rotating at idle by the speed of vehicle. As a result of this, noise and vibration generated from incomplete driving decreases the optimal driving. To prevent it, this system helps the complete 2 wheel drive by applying CADS to axle.

COMPONENTS EIMB4000

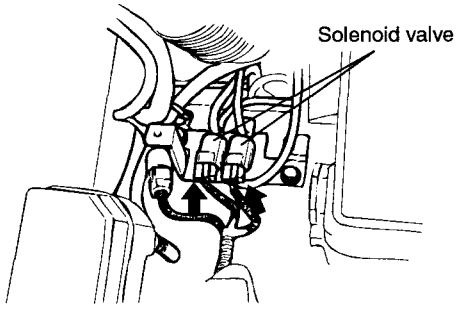


EHPDS29A

REMOVAL EIMB4100

1. Solenoid valve and vacuum hose removal.

   1) After removing the battery(-) cable, disconnect each harness connector from the solenoid valves.

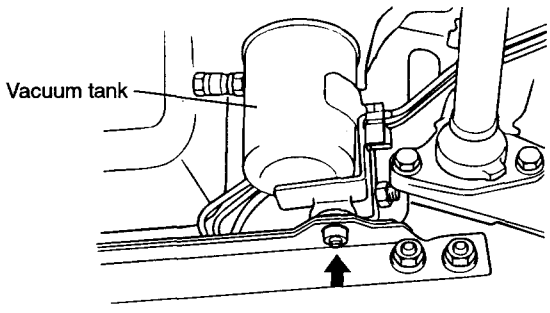


EHPDS30A

   2) Disconnect the solenoid valve and the vacuum hose, remove the solenoid valve.

   3) Remove the vacuum pipe bracket, and disconnect the vacuum pipe and hose.

   4) Remove the vacuum tank assembly.

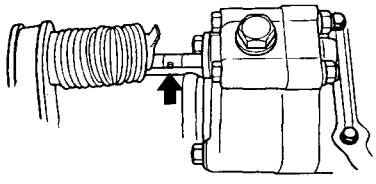


EHPDS31A

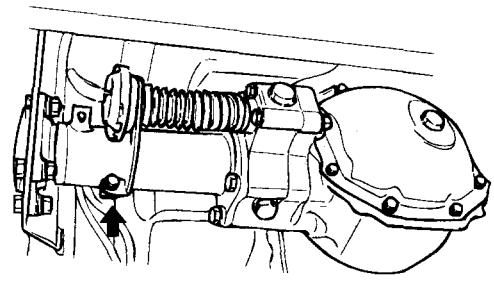
2. CADS REMOVAL

   1) Disconnect the vacuum hose from the actuator.

   2) Remove the pin from the actuator shift rod.



   3) Remove the actuator from the inner shaft housing tube.



KHPDS33A

   4) Remove the inner shaft and housing tube.

   5) Remove the CADS from the front differential carrier.

INSPECTION EIMB4200

SOLENOID VALVE AND HOSE CHECK

1. Check the vacuum hose and pipe for damage.
2. Check the vacuum tank for damage.

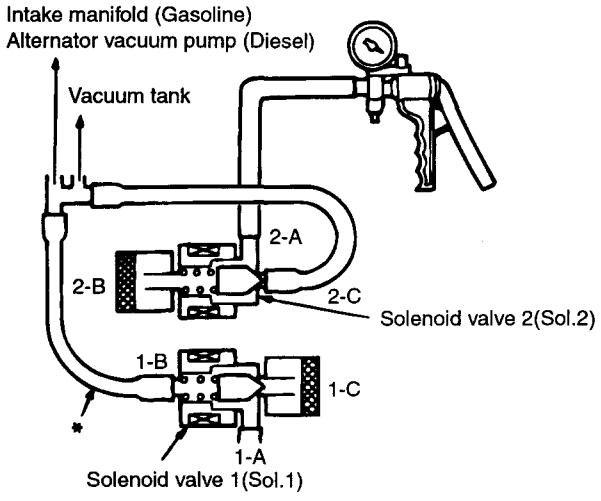
SOLENOID VALVE OPERATION CHECK

1. Remove the vacuum hoses from the solenoid valves.
2. Disconnect the harness connectors
3. Connect a hand vacuum pump to solenoid valve 2(Sol.2). Apply negative pressure and carry out the following inspections.

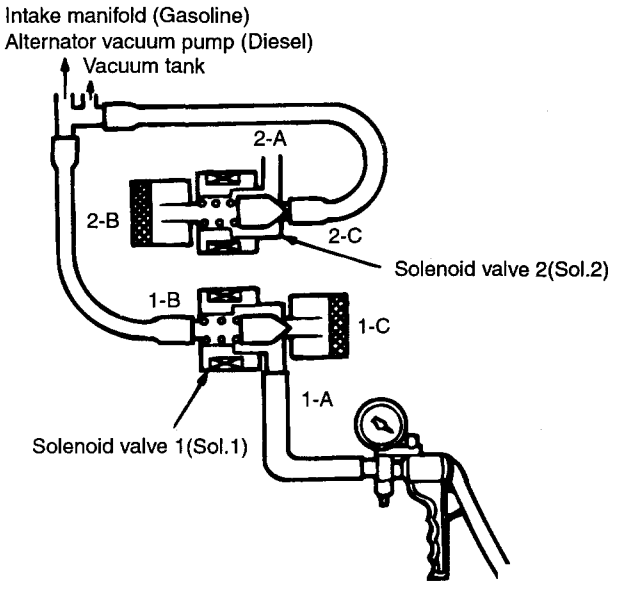
   1) Even if the hand pump is operated with no other operation, no negative pressure develops.

   2) Even when battery positive voltage is applied to solenoid 2(Sol.2), the condition is the same as in "1)". But when the vacuum hose of solenoid 1(Sol.1) is blocked by bending at the *mark, negative pressure is maintained.

   3) When battery positive voltage is applied to solenoids 2(Sol.2) and 1(Sol.1) negative pressure is maintained.



EHPDS34A



EHPDS35A

4. Connect the hand vacuum pump to solenoid valve 1(Sol.1).
   Apply negative pressure and carry out the following inspections.

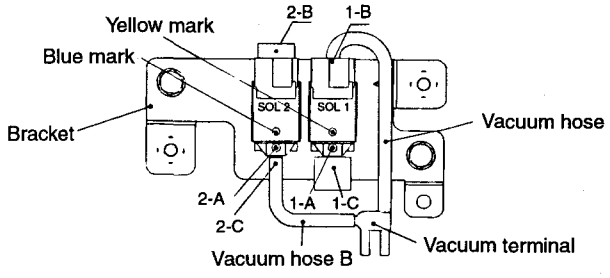
   1) With no other operation, negative pressure is maintained.

   2) When battery positive voltage is applied to solenoid 1(Sol.1), the negative pressure equalizes.

   3) When battery positive voltage is applied to solenoid 2(Sol.2), the negative pressure equalizes.

NOTE

SOLENOID VALVE OPERATING



EHPD131A

	OFF	ON
SOL VLV 1	1-B ←→ 1-A ←/→ 1-C	1-B ←/→ 1-A ←→ 1-C
SOL VLV 2	2-B ←→ 2-A ←/→ 2-C	2-B ←/→ 2-A ←→ 2-C
Actuator operating	2WD (NORMAL)	4WD

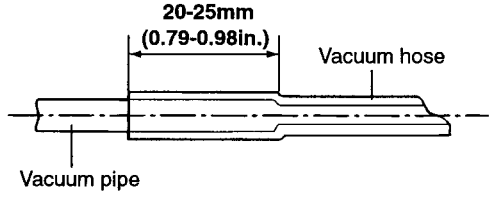
←→ : Valve ON

←/→ : Valve OFF

EIMB420A

INSTALLATION EIMB4300

1. Installation is the reverse of removal.
2. Connect the vacuum hose and the pipe as follows. If the straight line of the hose is short, fully push the hose to install.

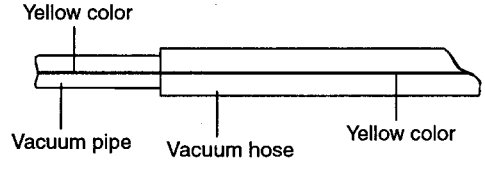


EHPDS36A

3. Install the vacuum hoses and pipes so that the identification colors matched.

⚠ ***CAUTION***

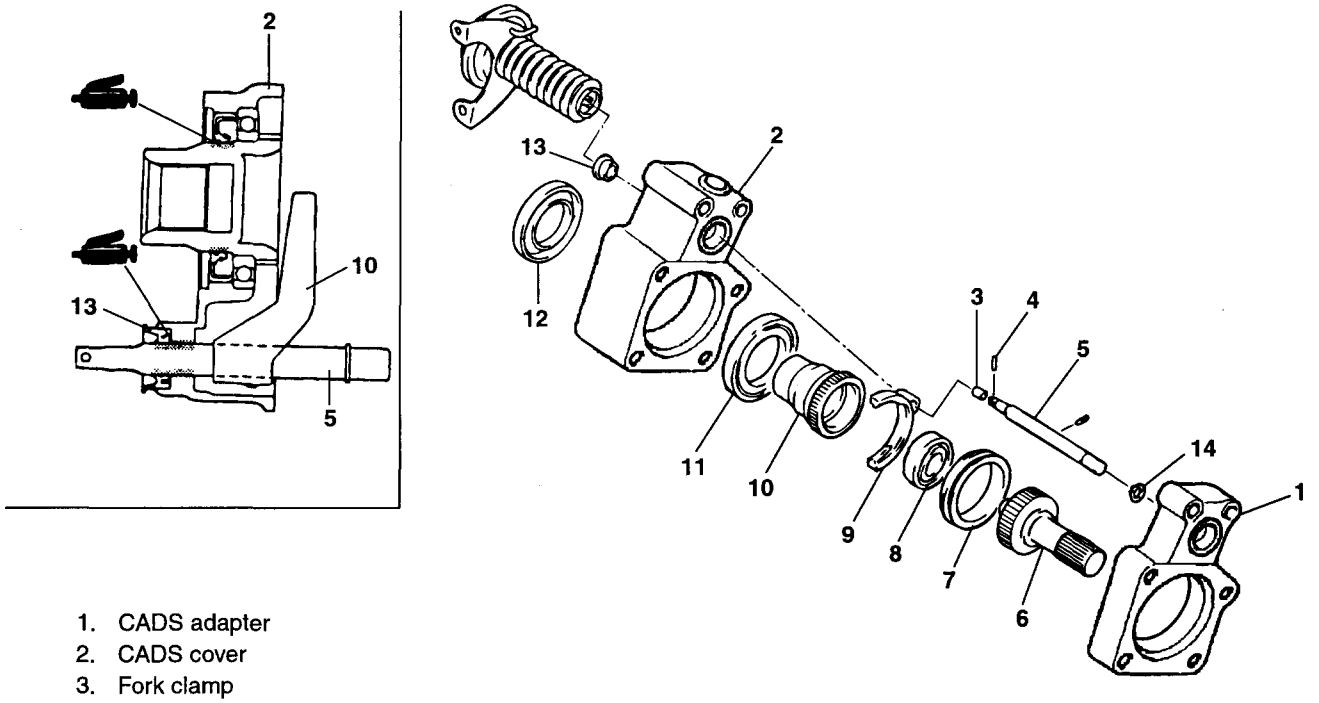
Be careful not to be punched and twisted when installing the vacuum hoses and pipes.



EHPDS37A

DISASSEMBLY EIMB4400

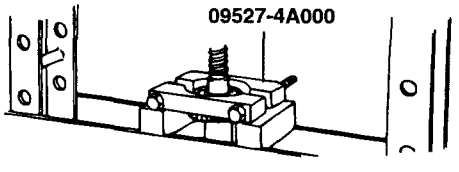
COMPONENTS



1. CADS adapter
2. CADS cover
3. Fork clamp
4. Clamp pin
5. Shift rod
6. Differential shaft
7. CADS sleeve
8. Ball bearing
9. Shift fork
10. CADS clutch
11. Ball bearing
12. CADS oil seal
13. Fork oil seal
14. Stopper ring

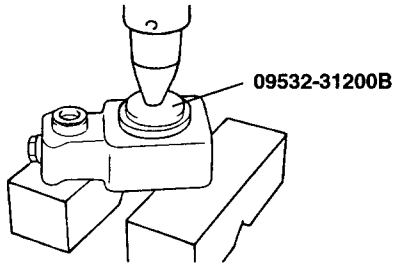
EHPDS32B

1. Using the special tool(09527-4A000), remove the ball bearing from the differential shaft.



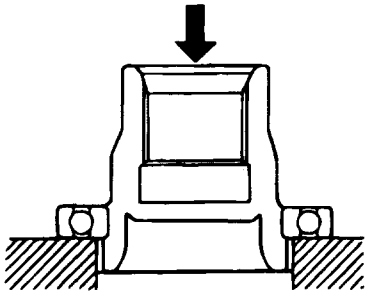
KHPDS38A

2. Using the special tool(09532-31200B), remove the clutch and the bearing from the CADS cover.



KHPDS39A

3. Separate the bearing from the CADS clutch.



KHPDS40A

INSPECTION EIMB4500

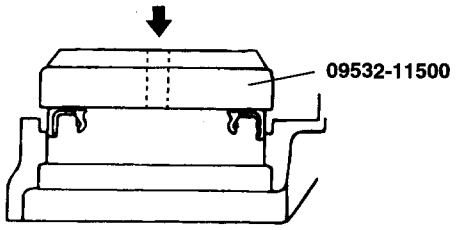
1. Check the oil seal for damage or wear.
2. Check the bearing for wear or discoloration.
3. Check the gear and the clutch for wear or damage.
4. Check the CADS cover and the adapter for crack.

REASSEMBLY EIMB4600

1. Using the special tool(09532-11500), install the oil seal until it is flush with the CADS cover.

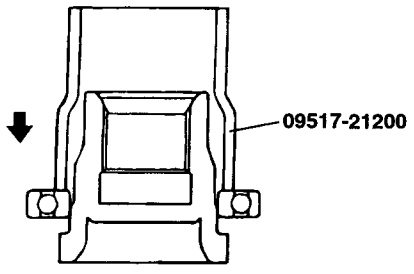
   NOTE

   Apply gear oil to the oil seal slightly.



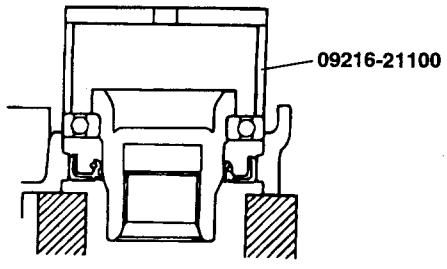
KHPDS41A

2. Using the special tool(09517-21200), press-fit the bearing into the CADS clutch.



KHPDS42A

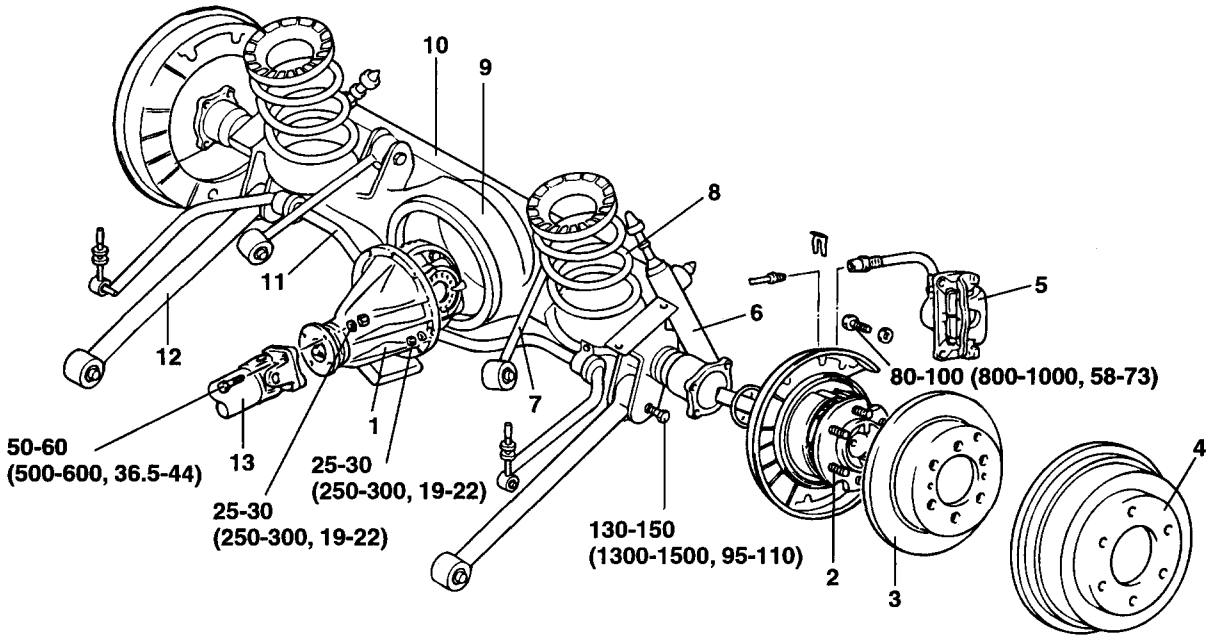
3. Using the special tool(09216-21100), press-fit the bearing into the CADS cover.



KHPDS43A

REAR AXLE

COMPONENTS EIMB4700



1. Differential carrier
2. Rear axle shaft
3. Brake disc (ABS)
4. Rear drum (CBS)
5. Rear caliper assembly (ABS)
6. Rear shock absorber
7. Upper link
8. Rear coil spring
9. Rear axle housing
10. Lateral rod
11. Stabilizer bar
12. Lower link

TORQUE : Nm (kg·m, lb·ft)

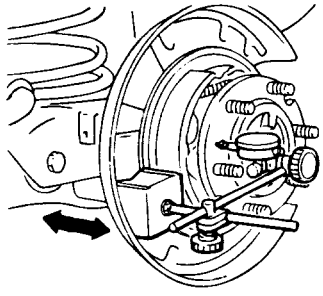
EHPDS45A

SERVICE INSPECTION PROCEDURE EIMB4800

AXLE SHAFT END PLAY CHECK

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

Standard value : 0-0.25mm (0-0.0098 in.)



KHPDS47A

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

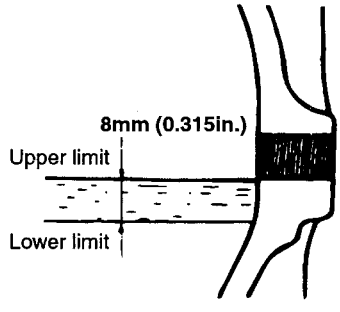
GEAR OIL LEVEL CHECK

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
GH90W (Warmer than -30°C)
GH80W (Colder than -30°C)
With Limited Slip Differential
Multi gear LS90 MMC CO.LTD, SAE 90:2.5 Diesel
INFILREX 33 (MOBIL CO.LTD):3.5 Gasolie

SPECIFIED GEAR OIL QUANTITY

Items	Oil quantity
No. 7 (2.5 Diesel)	2.8 Liter
No.7.5 (3.5 Gasoline)	2.8 Liter



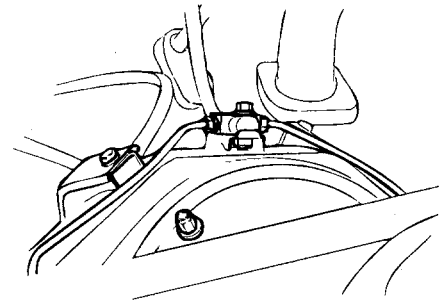
EIMB560A

REMOVAL EIMB4900

1. Remove the brake drum.
2. Remove the parking brake cable and speed sensor.
3. Disconnect the brake tube connection.

NOTE

Hold the brake hose in a vise or equivalent to prevent overflowing brake fluid.

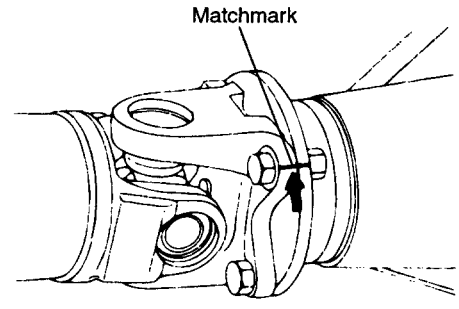


KHPDS50A

4. Make a matchmark on the companion flange and flange yoke, disconnect the propeller shaft from the differential assembly.

CAUTION

Suspend the propeller shaft from the body with wire, etc, to prevent it from falling.

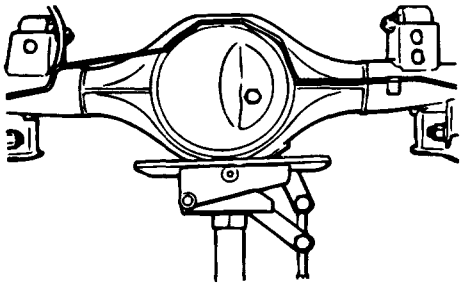


EIMB080A

5. Remove the stabilizer bar.

CAUTION

Support the rear axle housing with rigid jack before removing the stabilizer bar.



H7RA0600

6. Remove the lateral rod.
7. Remove the rear shock absorber assembly.
8. Remove the lower link and the upper link.

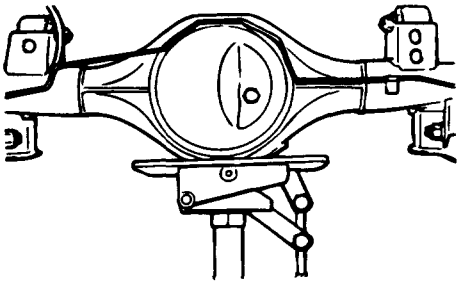
⚠ ***CAUTION***

Be careful not to drop the rear coil spring when removing it.

9. Remove the rear axle assembly from the vehicle.

⚠ ***CAUTION***

Be careful not to drop the axle assembly.



H7RA0600

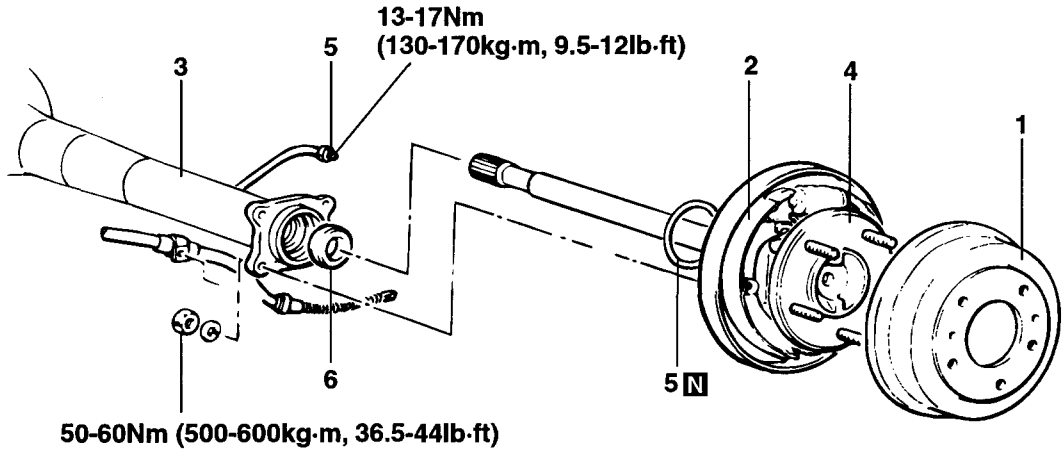
INSTALLATION EIMB5000

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	100-120 (1000-1200, 73-88)
Brake caliper mounting bolt	80-100 (800-1000, 58-73)
Rear shock absorber lower mounting nut	90- 20 (900-1200, 66-88)
Rear upper link mounting	150-180 (1500-1800, 110-131)
Rear lower link mounting	150-180 (1500-1800, 110-131)
Lateral rod mounting nut (Rear axle side)	180-240 (1800-2400, 131-175)
Lateral rod mounting (Frame side)	150-180 (1500-1800, 110-131)
Rear stabilizer link bush mounting nut	19-28 (190-280, 14-20)
Rear stabilizer link bracket mounting	30-40 (300-400, 22-29)

REAR AXLE SHAFT ASSEMBLY

COMPONENTS EIMB5100



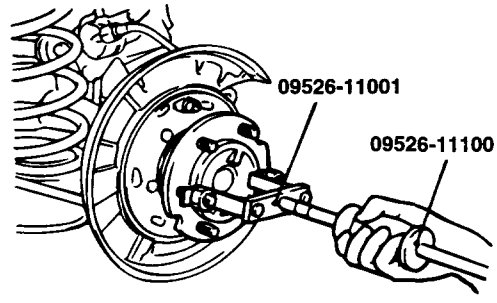
1. Brake drum/Disc
2. Shoe-lining assembly
3. Rear axle housing
4. Axle shaft assembly
5. O-ring
6. Oil seal

N : Replace the parts with new one after removal.

EHPDS46A

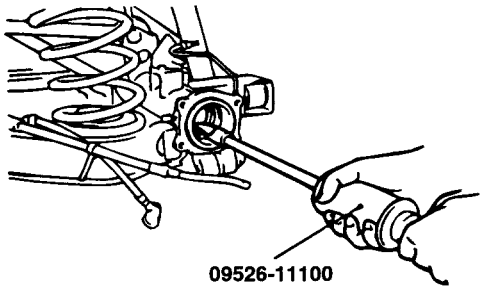
REMOVAL EIMB5200

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

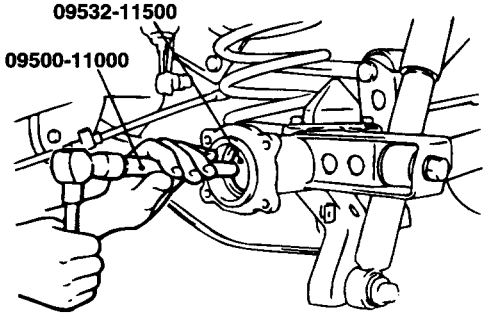
7. Using the special tool(09526-11100), remove the oil seal.



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.

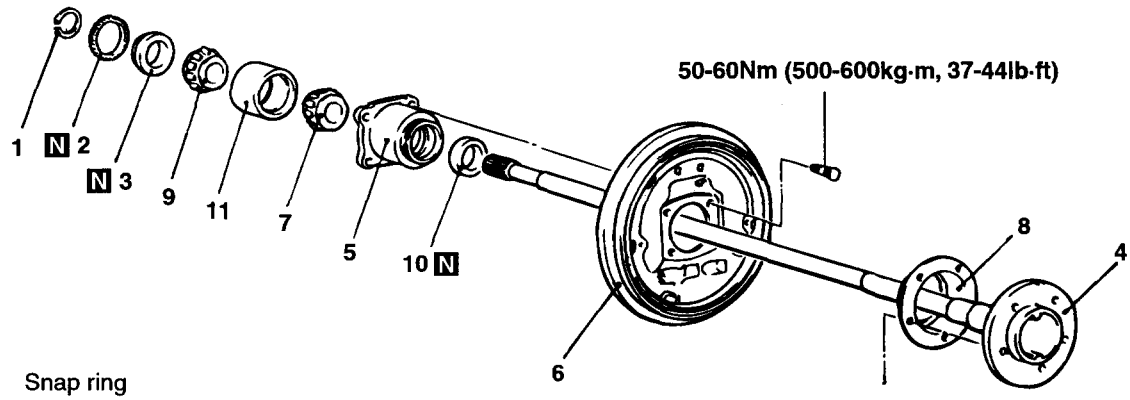


H7RA0560

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

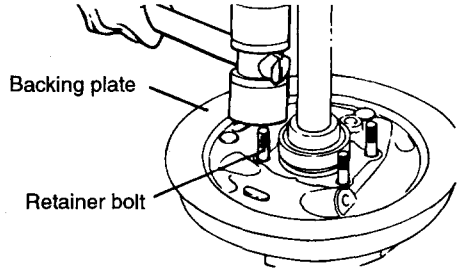
N : Replace the parts with new one after removal.

TORQUE : Nm (kg·m, lb·ft)

EIMB620A

DISASSEMBLY EIMB5500

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

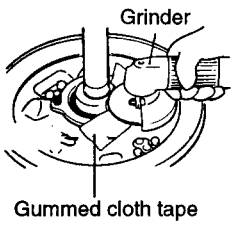


EHPDS33B

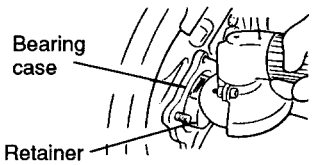
3. Apply gummed cloth tape around the edge of the bearing case for protection.
4. As shown in the figure, fix the axle shaft and shave off with grinder a point of its circumference locally until the wall thickness on the side of axle shaft of retainer becomes approximately 1.0-1.5mm (0.039-0.059in.).

⚠ ***CAUTION***

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



H7RA1120



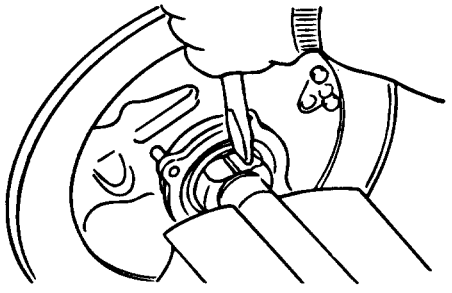
H7RA1130

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.

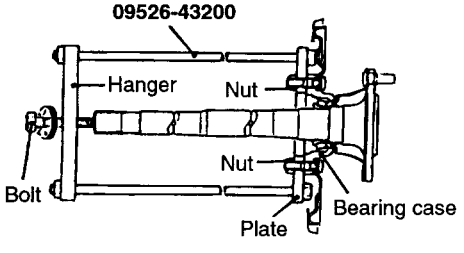


H7RA1140

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

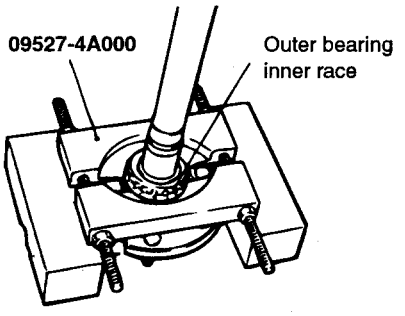
NOTE

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.



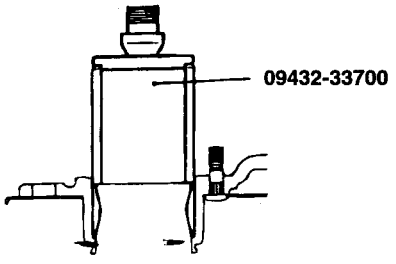
EIMB550B

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.

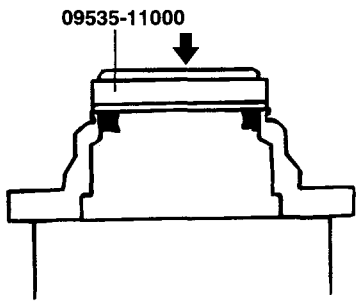
Specified grease : CENTOPLEX 278 (MS511-7)

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.

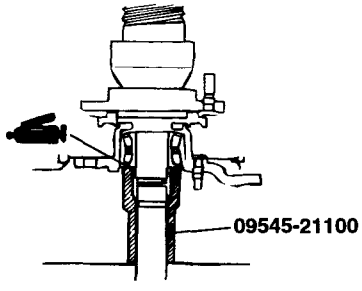
Specified grease : CENTOPLEX 278 (MS511-7)



H7RA1260

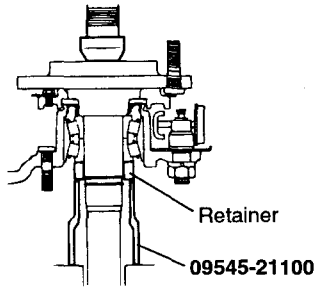
4. Install the backing plate.

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

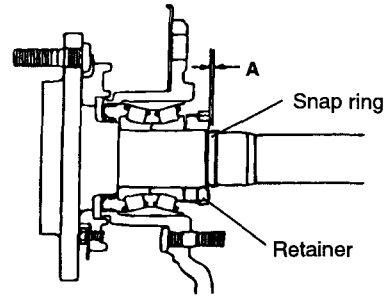
7. After installing the snap ring, measure the clearance(A) between the snap ring and the retainer.

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	-

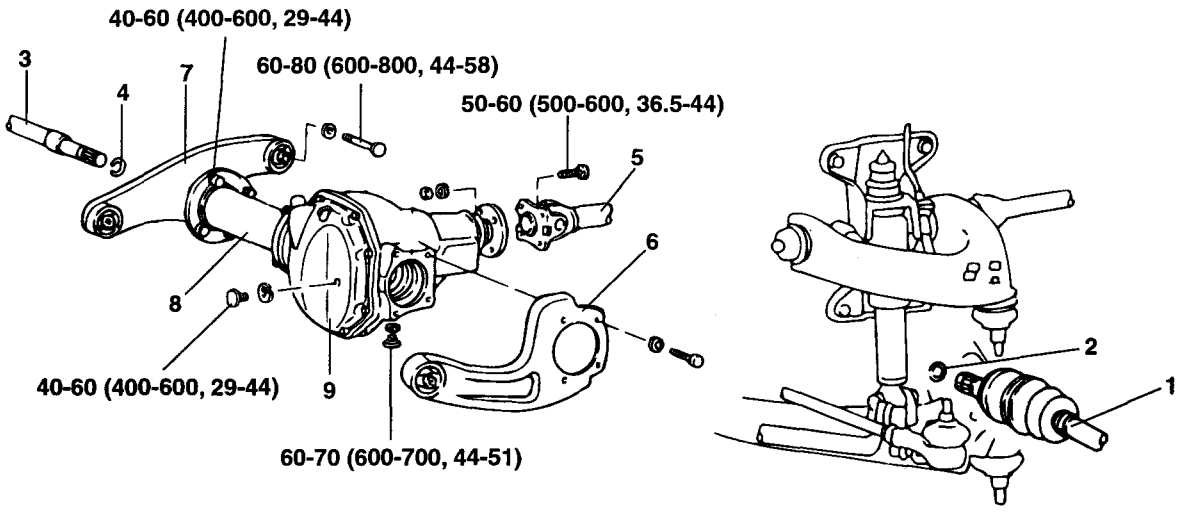


EHPDS48A

DIFFERENTIAL CARRIER ASSEMBLY

FRONT DIFFERENTIAL CARRIER

COMPONENTS EIMB5800



Removal steps

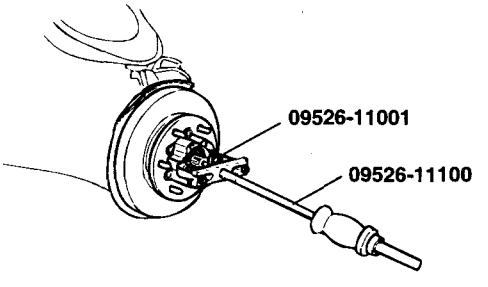
1. Driveshaft
2. Circlip
3. Inner shaft
4. Circlip
5. Propeller shaft
6. Differential mounting bracket (LH)
7. Differential mounting bracket (RH)
8. Housing tube
9. Differential carrier assembly

TORQUE : Nm (kg·m, lb·ft)

EHPDS44A

REMOVAL EIMB5900

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



KHPDS10A

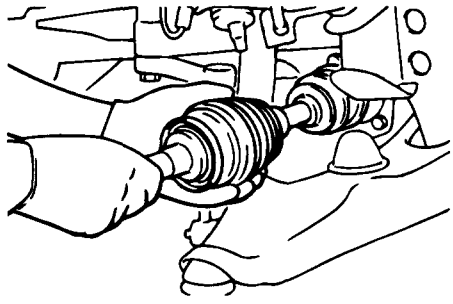
NOTE

Use the special tools(09526-11001, 09526-11100) so as to remove the hub remove the hub and knuckle easily.

2. Remove the driveshaft.

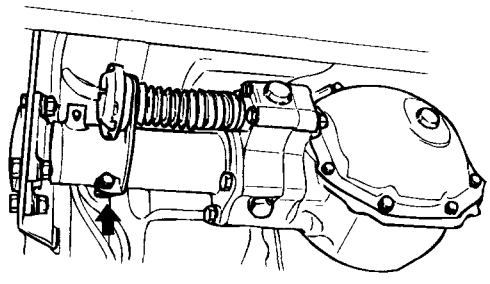
⚠ CAUTION

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



KHPDS13A

3. Remove the actuator from the inner shaft housing (Vehicle with CADS)



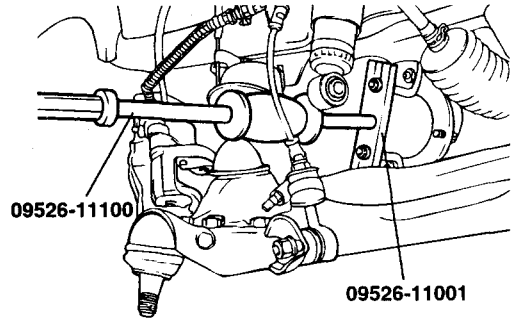
KHPDS33A

4. Drain oil.

5. 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.***

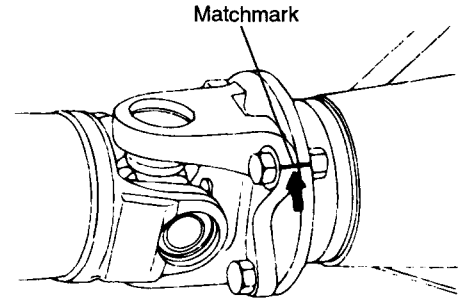


H7FA1226

6. Remove the front propeller shaft.

NOTE

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

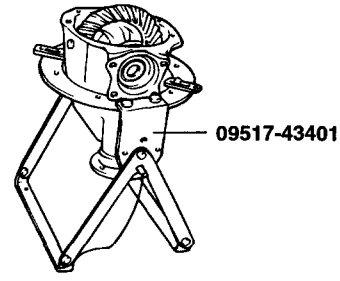


EIMB080A

7. Remove the differential carrier.

INSPECTION BEFORE DISASSEMBLY EIMB6000

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



H7FS0600

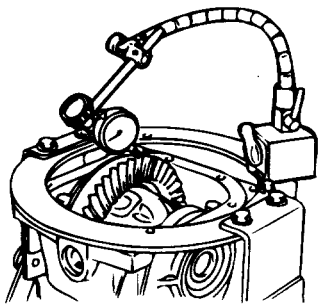
FINAL DRIVE GEAR BACKLASH

1. Fix the drive gear so it cannot move and measure the final 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 spacer.

NOTE

After adjustment, inspect the contact of the final 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.

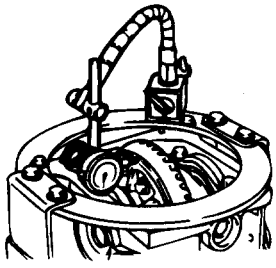
Limit : 0.05 mm (0.0020 in.)

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

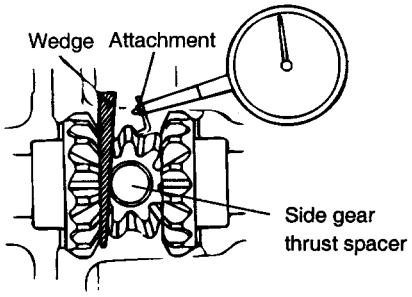
DIFFERENTIAL GEAR BACKLASH

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.)



A7FA0710

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

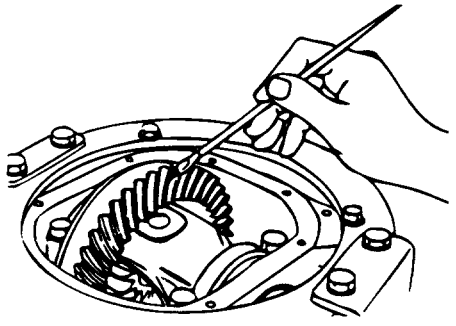
NOTE

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

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.



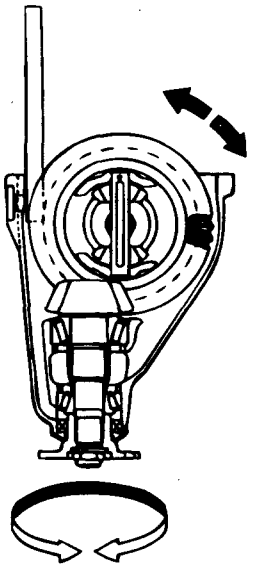
H7FA0720

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.

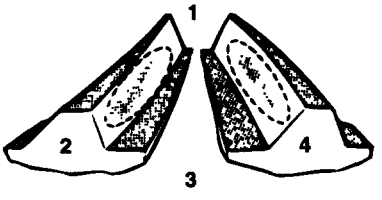
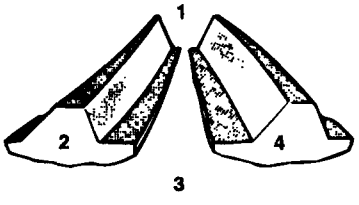
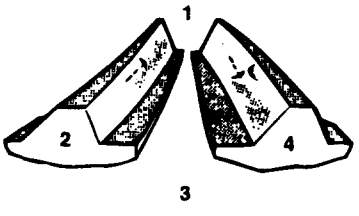
   ⚠ ***CAUTION***

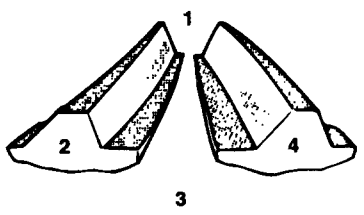
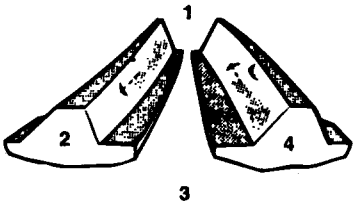
   If the drive gear is rotated too much, the tooth contact pattern will become unclear and difficult to check.

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.

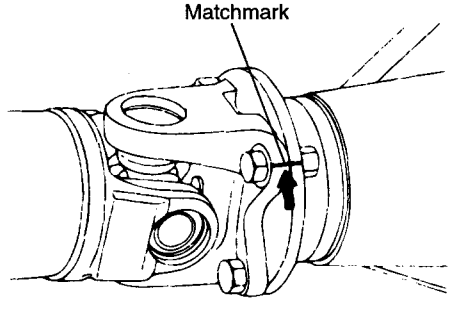
Tooth contact pattern resulting from insufficient pinion height	
 EIJA0014	 EIJA0015
The drive pinion is positioned too close to the center of the drive gear.	Decrease the thickness of the pinion height adjusting shim, and position the drive pinion further from the center of the drive gear. Also, for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

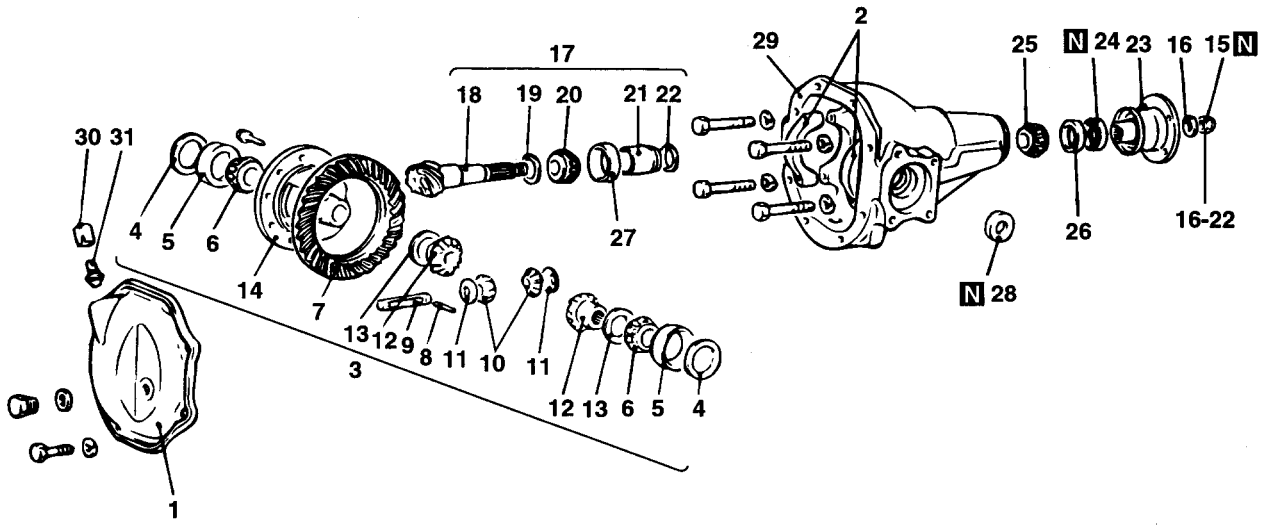
1. Installation is the reverse of removal.
2. Align the matchmark on the flange yoke and the companion flange.
   Tighten the propeller shaft and the front differential carrier.



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

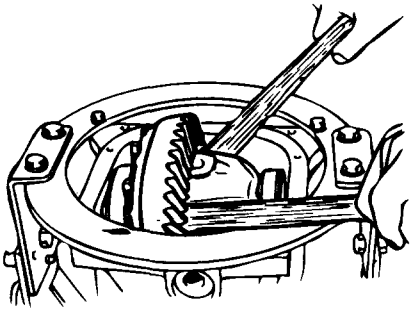
1. **REMOVAL OF THE DIFFERENTIAL CASE ASSEMBLY**

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.

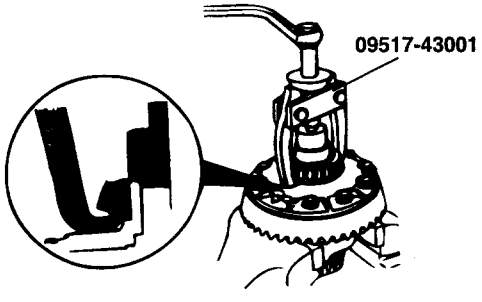


H7FA0740

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.

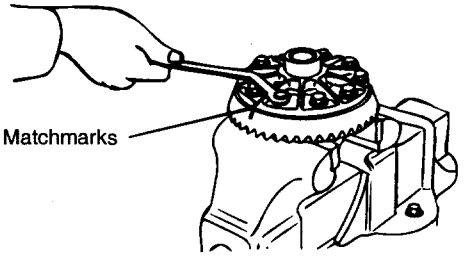
NOTE

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



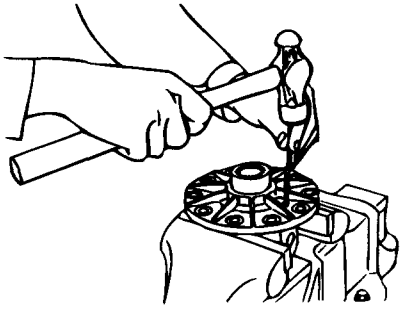
H7FA0750

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.



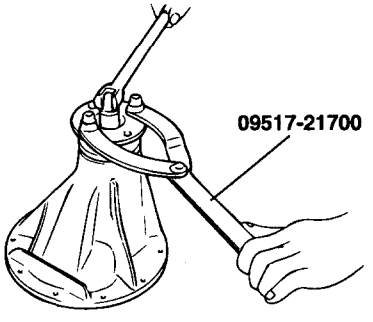
A7FA0760

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



H7FA0770

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

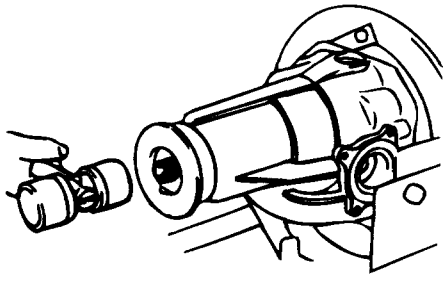


H7RA1100

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

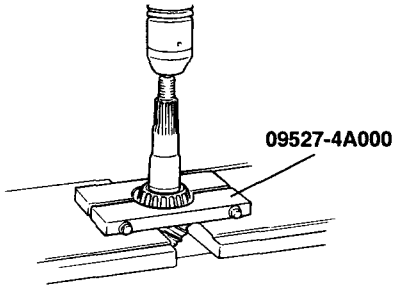
> ⚠ ***CAUTION***
>
> ***Matchmarks should not be made to the contact surfaces of the companion flange and the propeller shaft.***

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



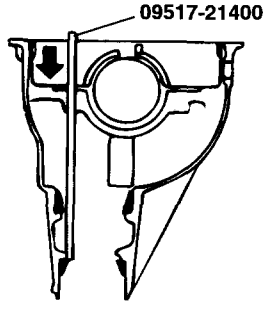
H7FA0790

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



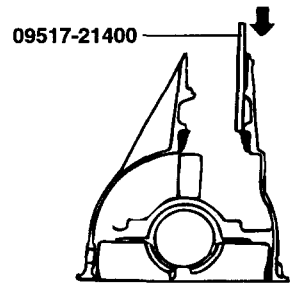
H7RA1090

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**



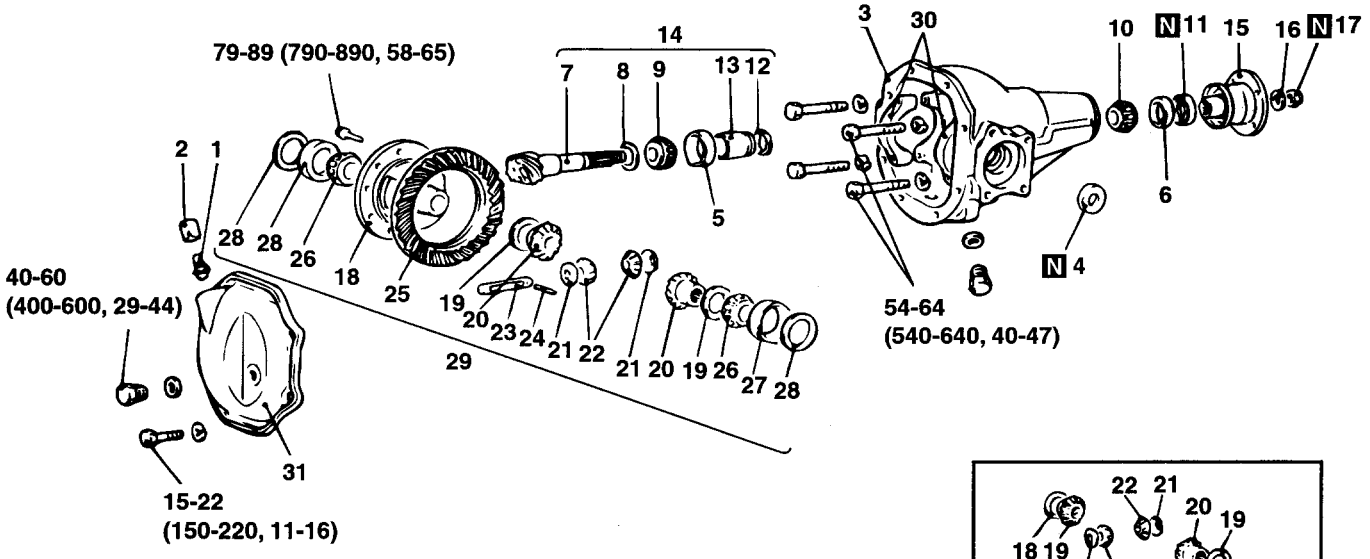
KIMB520E

INSPECTION EIJB0490

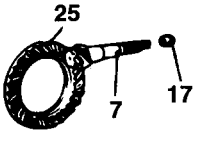
1. Check the companion flange for wear or damage.
2. Check the bearings for wear or discoloration.
3. Check the gear carrier for cracks.
4. Check the drive pinion and drive gear for wear or cracks.
5. Check the side gears, pinion gears and pinion shaft for wear or damage.
6. Check the side gear spline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

REASSEMBLY EIMB6500

COMPONENTS



Differential gear set



Final drive gear set

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

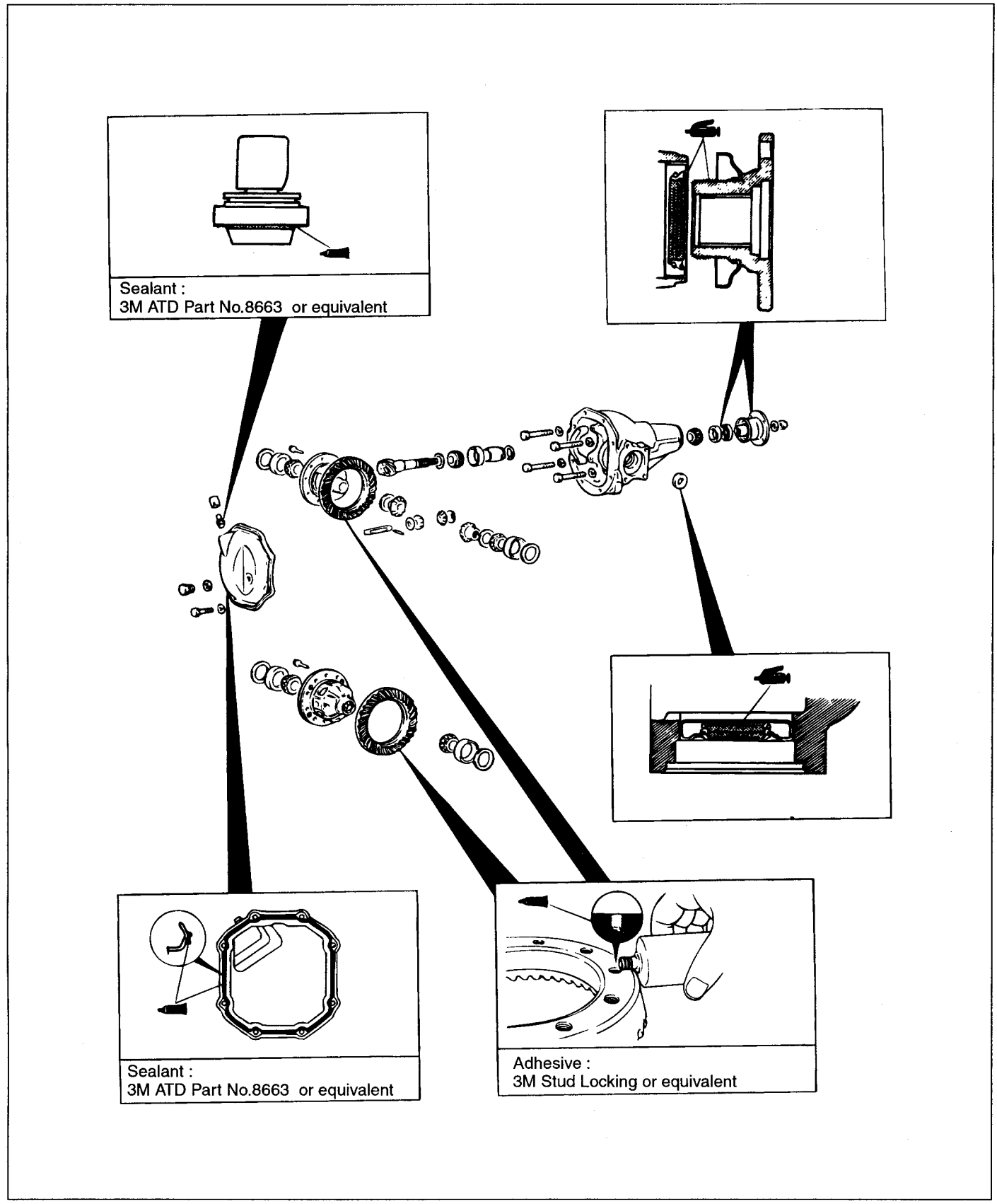
N : Replace the parts with new one after removal.

TORQUE : Nm (kg·cm, lb·ft)

EIMB525A

LUBRICATION, SEALING AND ADHESIVE POINTS EIMB6600

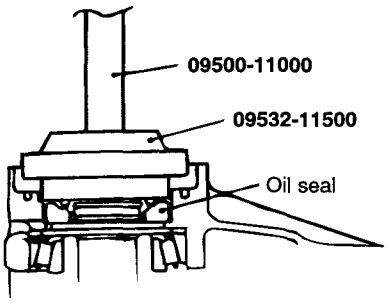
COMPONENTS



EIMB530A

REASSEMBLY EIMB6700

1. PRESS-FITTING OF IL SEAL

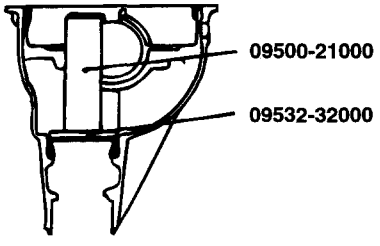


EIMB670A

2. DRIVE PINION FRONT BEARING OUTER RACE INSTALLATION

⚠ ***CAUTION***

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

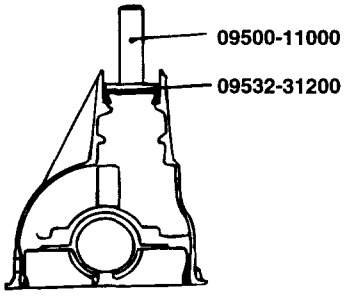


H7FA0860

3. DRIVE PINION REAR BEARING OUTER RACE INSTALLATION

⚠ ***CAUTION***

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



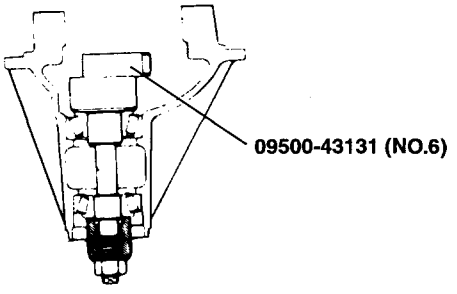
H7FA0870

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.

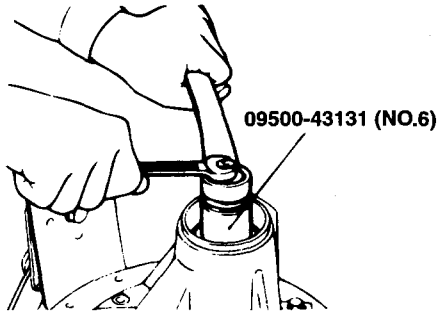
⚠ ***CAUTION***

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.

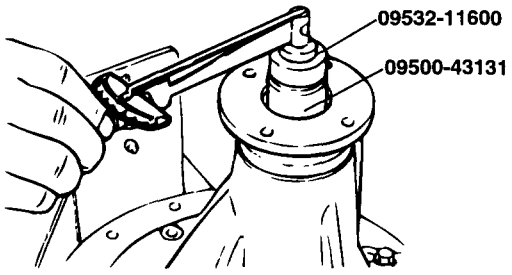


EIMB670C

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.*

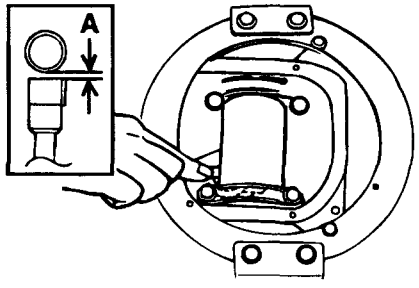


KIMB540A

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.

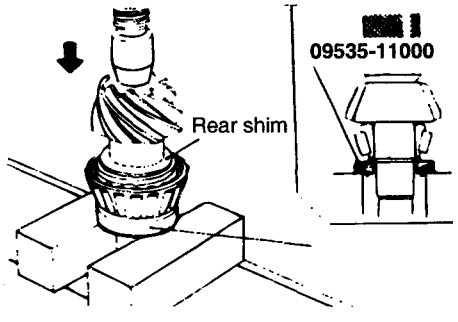
NOTE

- *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

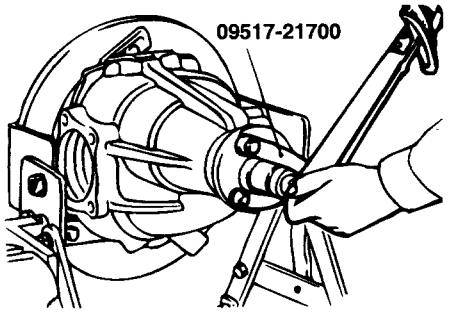
7. ADJUSTMENT OF DRIVE PINION PRELOAD
Adjust the drive pinion turning torque according to the following procedures :

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.

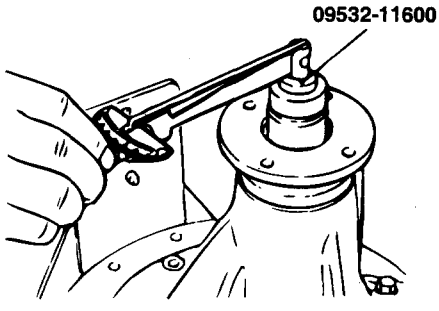
2) Tighten the companion flange self-locking nut to the specified torque using the special tool.



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)



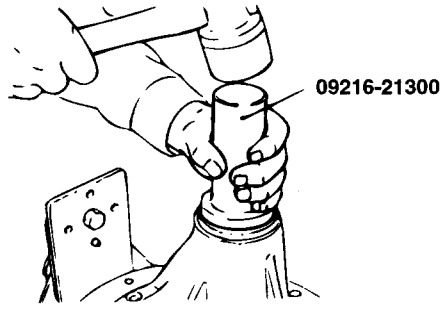
H7FA0940

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

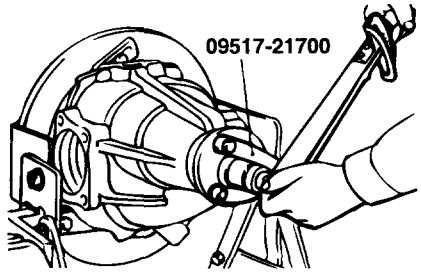
When selecting the drive pinion front shim pack use the minimum number of shims.

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

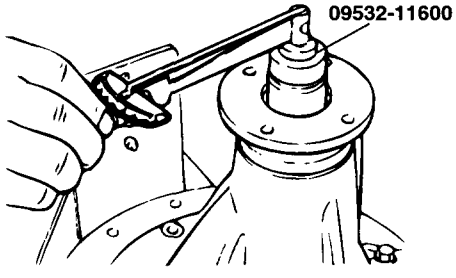
6) Install the drive pinion assembly, shim packs and companion flange with matchmarks properly aligned, and tighten the companion flange self-locking nut to the specified torque using the special tool(09517-21700).



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

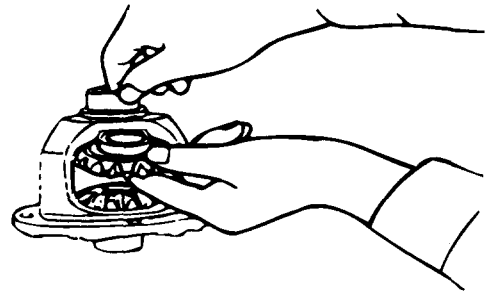
8) If it is beyond the standard value, verify the torque of the companion flange self-locking nut or the fit of the oil seal.

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.

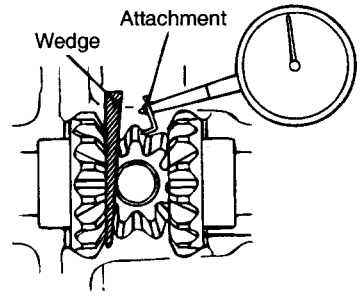


H7FA0990

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.

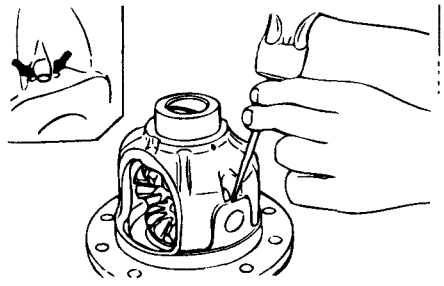
NOTE
- *After adjustment, check that the backlash is within the limit and the differential gear rotates smoothly.*

- *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.

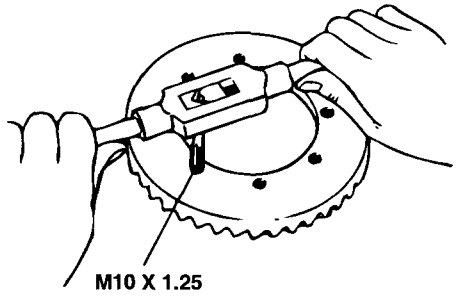


H7FA1010

10. INSTALLATION OF THE DRIVE GEAR

1) Clean the drive gear attaching bolts.

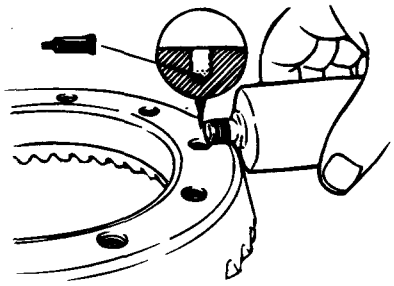
2) Remove the adhesive on the threaded holes of the drive gear use a tap (M10 x 1.25), and then clean the threaded holes with compressed air.



H7FA1020

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

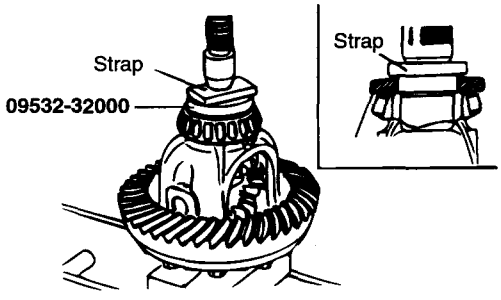
Specified adhesive : LOCTITE #262 or equivalent



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



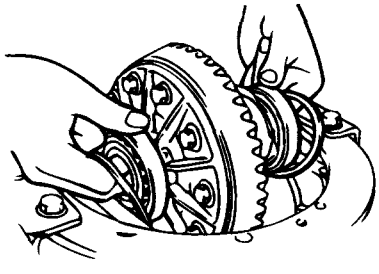
EIMB670D

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.

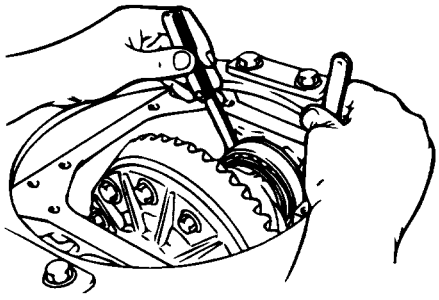
NOTE

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



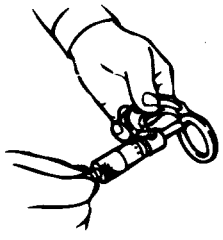
H7FA1050

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.

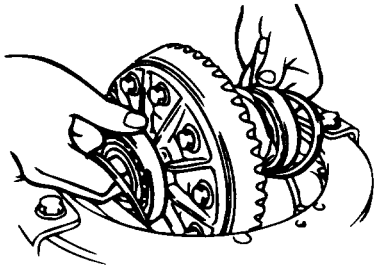


$$+\frac{\text{Clearance}}{2}+0.05\text{ mm}$$

= Thickness of the spacer on one side

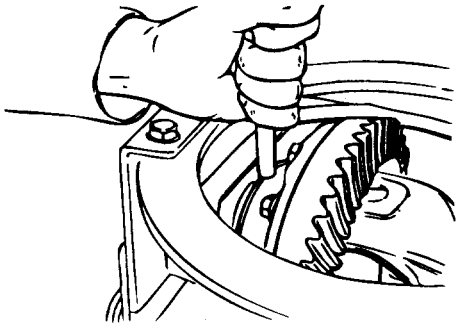
A7FA1070

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



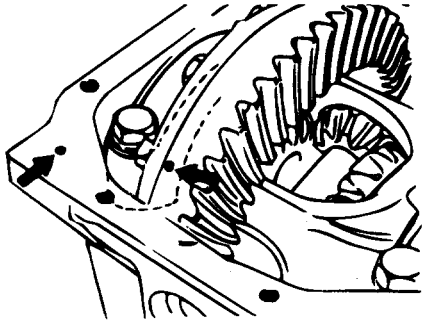
H7FA1080

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.



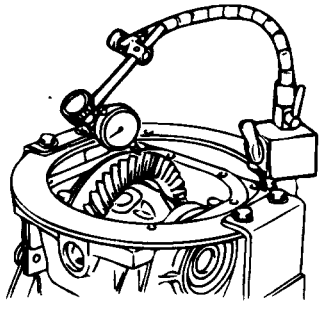
H7FA1100

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.)

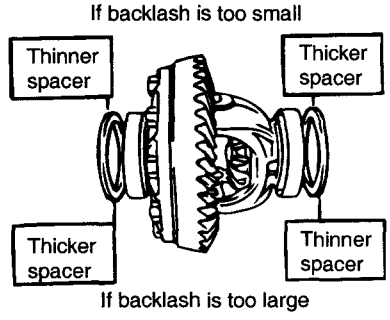


H7FA1110

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.

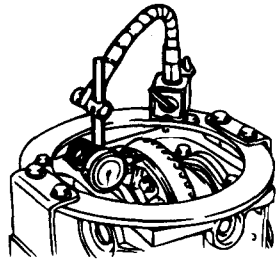


A7FA1120

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.)

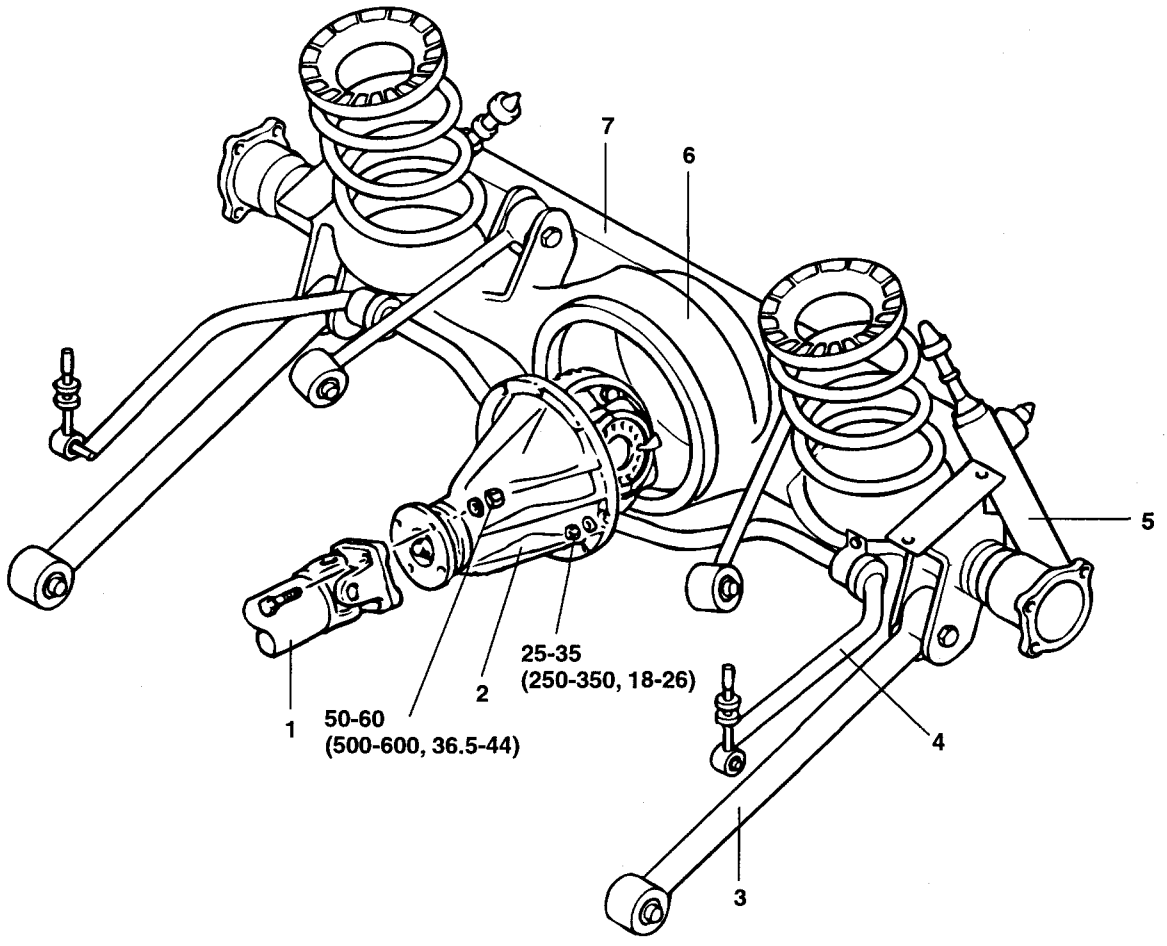


H7FA1130

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 EIMB6800



1. Rear propeller shaft
2. Differential carrier assembly
3. Lower link
4. Stabilizer bar
5. Rear shock absorber
6. Rear axle housing
7. Lateral rod

TORQUE : Nm (kg·cm, lb·ft)

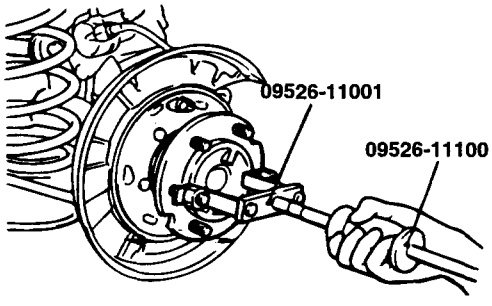
EHPDS49A

REMOVAL EIMB6900

1. Drain the differential gear oil.
2. Remove the rear brake drum.
3. Remove the parking brake cable attaching bolt.
4. Remove the stabilizer bar.
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.

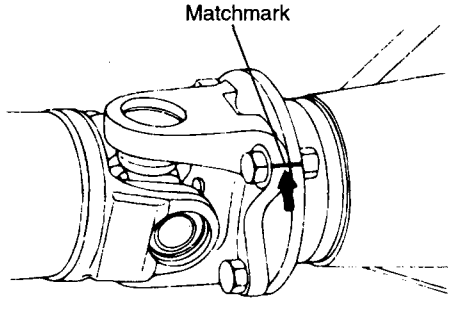


H7RA0870

6. After marking the matchmark on the flange yoke of the rear propeller shaft and the companion flange of the differential case, remove the rear propeller shaft assembly.

⚠ CAUTION

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

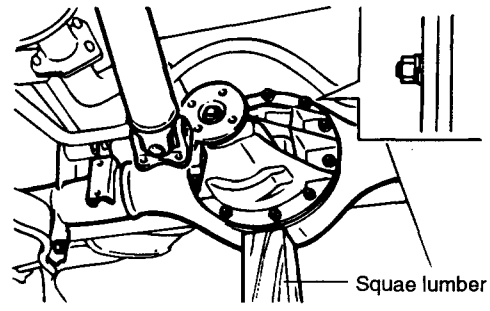


EIMB080A

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

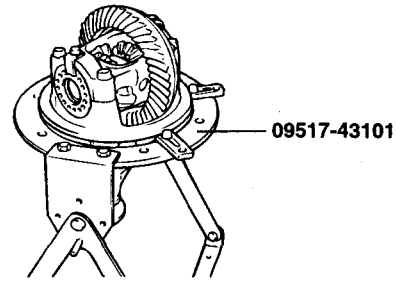
Use care not to strike the companion flange.



EIMB660A

INSPECTION BEFORE DISASSEMBLY EIMB7000

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



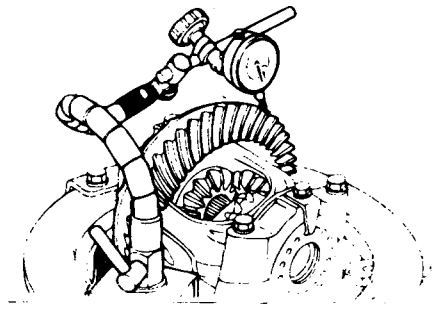
H7RA1070

1. FINAL DRIVE GEAR BACKLASH
   Check the final drive gear backiash 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.

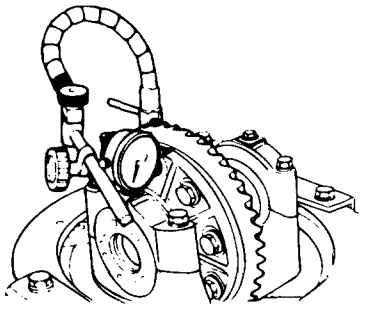
NOTE

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

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.

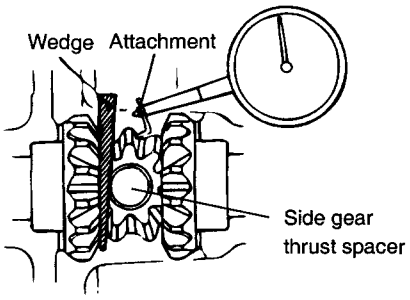
3. DIFFERENTIAL GEAR BACKLASH

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 : 0.01-0.25mm (0.0004-0.0098in.)



A7FA0710

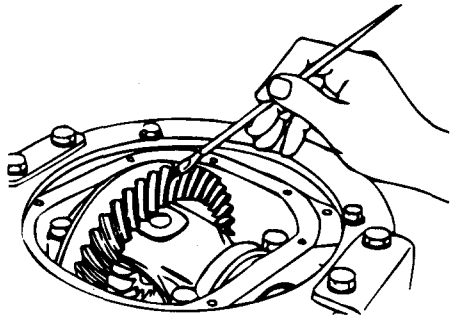
2) If the backlash exceeds the limit, adjust using side bearing spacers.

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.



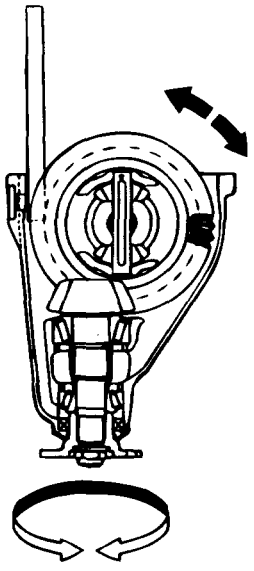
H7FA0720

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 25-30kg·cm) is applied to the drive pinion.

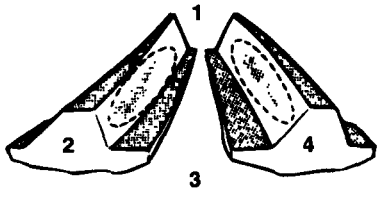
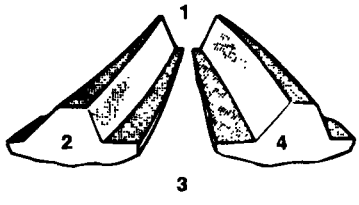
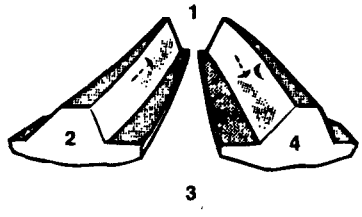
CAUTION

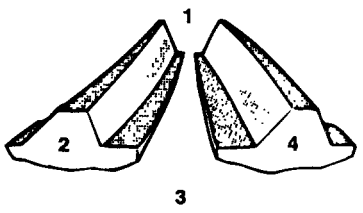
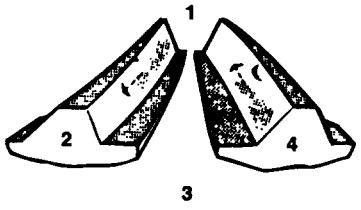
If the drive gear is rotated too much, the tooth contact pattern will become unclear and difficult to check.

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 EIMB7100

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**
   Align the matchmarks on the flange yoke and companion flange, and install the propeller shaft.

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

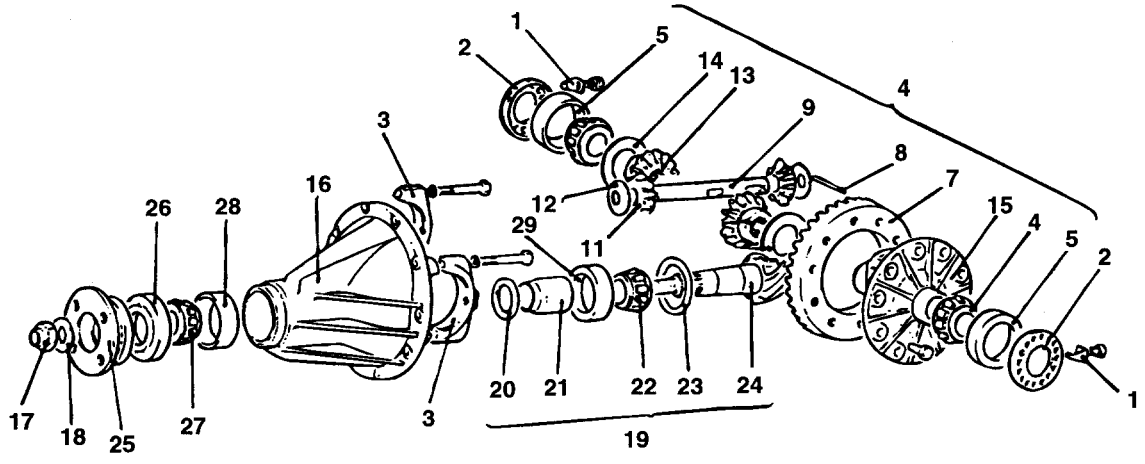
3. **AXLE SHAFT ASSEMBLY**

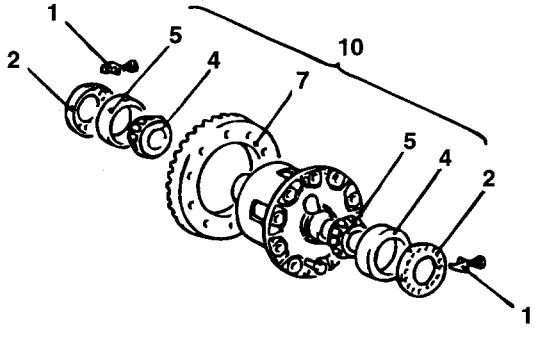
   1) Apply specified sealant to the axle housing and bearing case end faces.

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

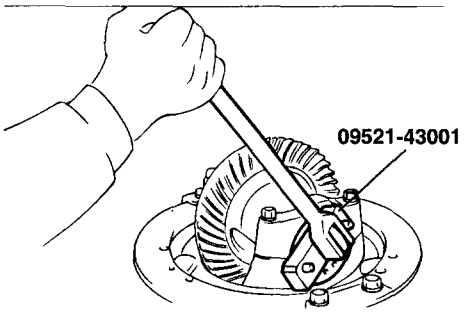
DISASSEMBLY EIMB7300

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.

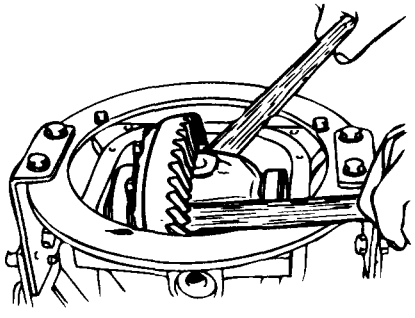


AU52-25B

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.***



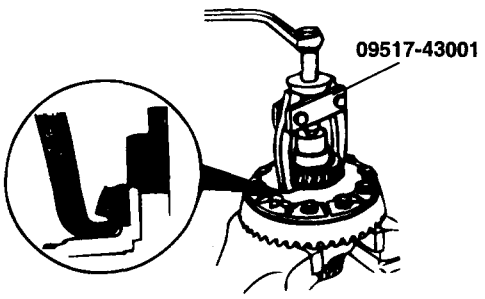
H7FA0740

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.

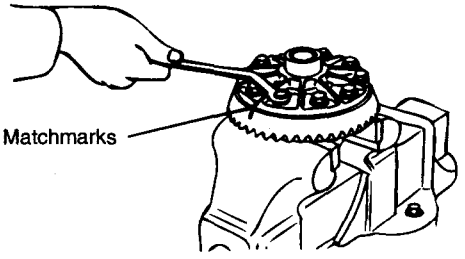
NOTE

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.



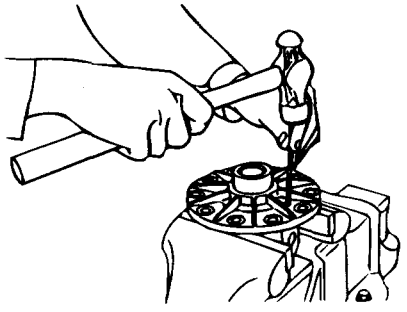
H7FA0750

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.



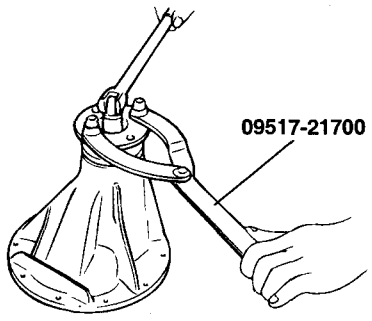
A7FA0760

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



H7FA0770

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



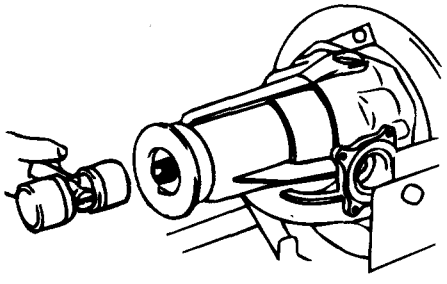
H7RA1100

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

   ⚠ ***CAUTION***

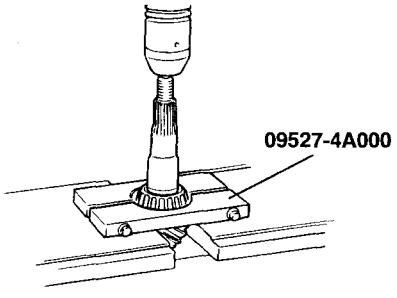
   Matchmarks should not be made on the contact surfaces of the companion flange and the propeller shaft.

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



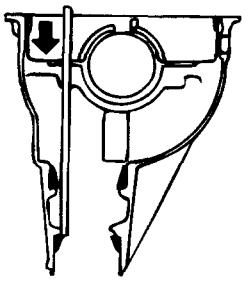
H7FA0790

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



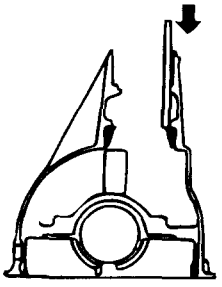
H7RA1090

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

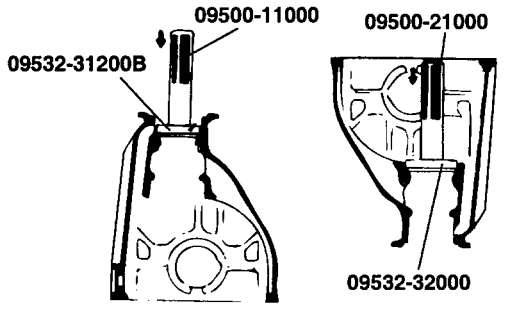
1. Check the companion flange for wear or damage.
2. Check the bearings for wear or discoloration.
3. Check the gear carrier for cracks.
4. Check the drive pinion and drive gear for wear or cracks.
5. Check the side gears, pinion gears and pinion shaft for wear or damage.
6. Check the side gear spline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

REASSEMBLY EIMB7500

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

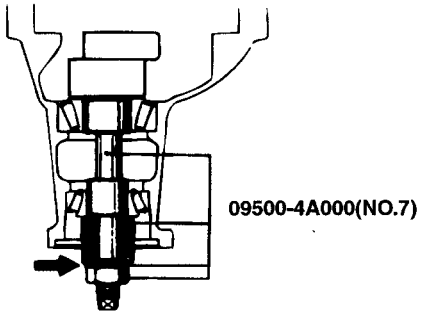
ADJUSTMENT OF PINION HEIGHT

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.

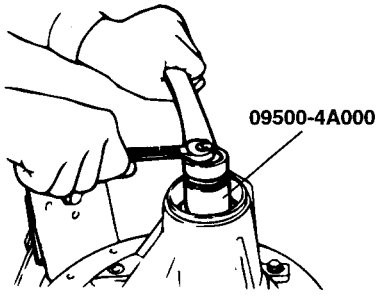
NOTE

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



EIMB750A

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



EIMB750B

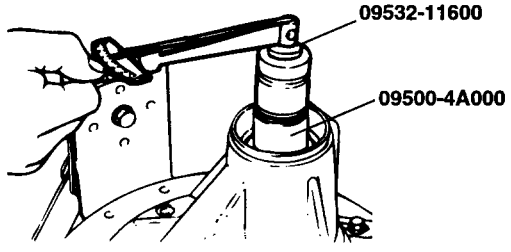
3. Measure the drive pinion turning torque (without the oil seal) using the special tool (09532-11600).

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) 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.*

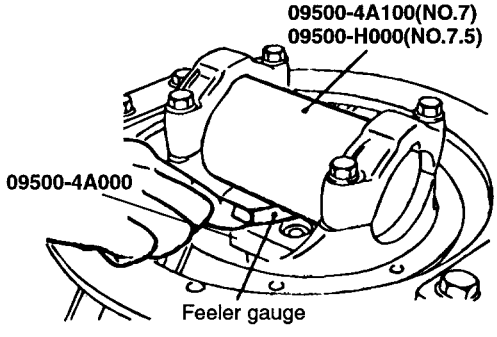


KIMB720C

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.

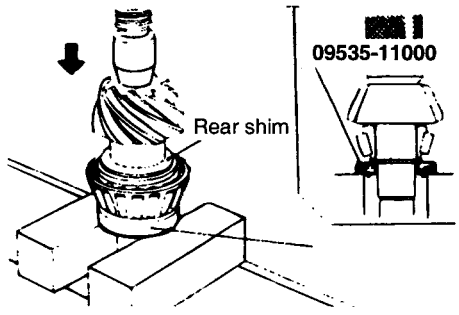
NOTE

- *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.*



EIMB750C

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

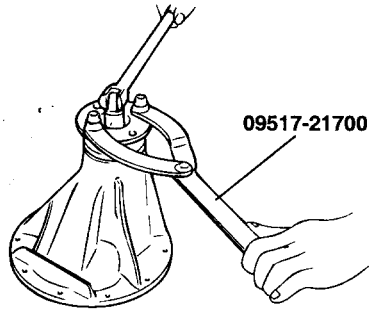
ADJUSTMENT OF DRIVE PINION PRELOAD

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.

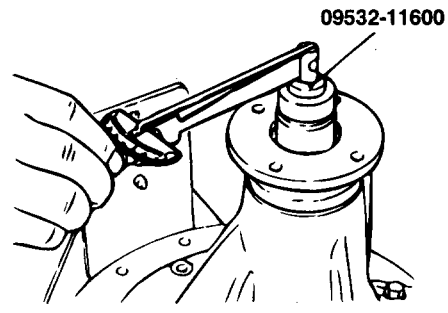


H7RA1100

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

STANDARD VALUE :

Bearing use	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)



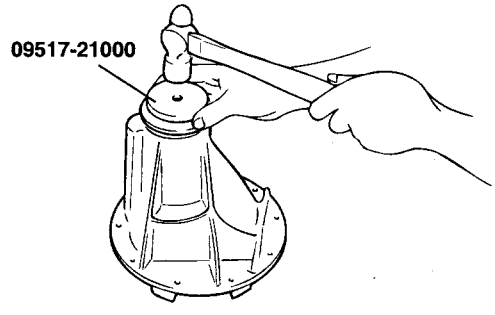
H7FA0940

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

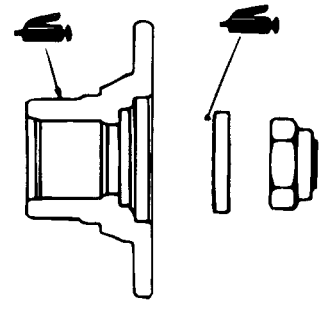
When selecting the drive pinion front shim pack, use the minimum number of shims.

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.



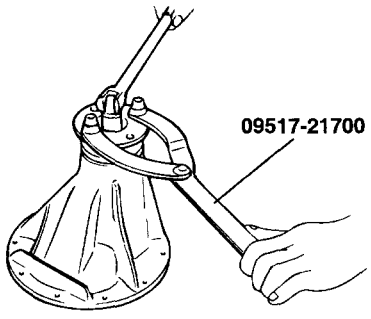
H7RA1080

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).



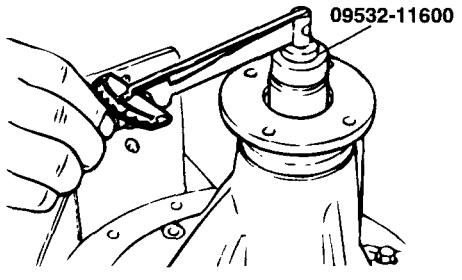
H7RA1100

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)	0.8-1.15 (8-11.5)
New or reused	Oil application	0.65-0.75 (6.5-7.5)

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

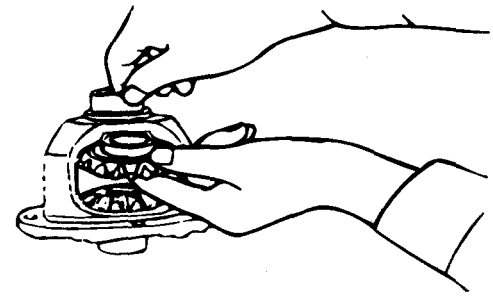
ADJUSTMENT OF DIFFERENTIAL GEAR BACKLASH

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.



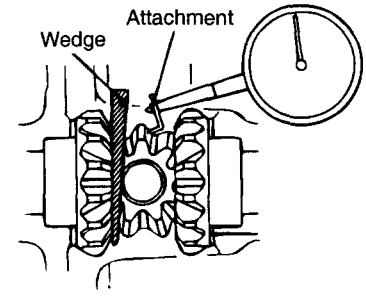
H7FA0990

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.)
Limit : 0.2mm (0.008in.)



A7FA1000

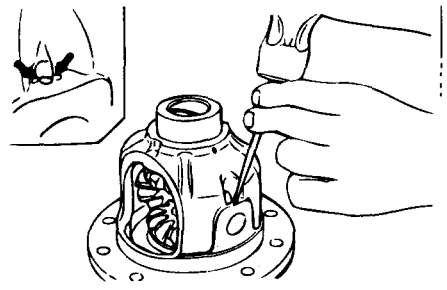
4. If the differential gear backlash exceeds the limit, adjust the backlash by installing thicker side gear thrust spacers.
5. Measure the differential gear backlash once again, and confirm that it is within the limit.

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.*

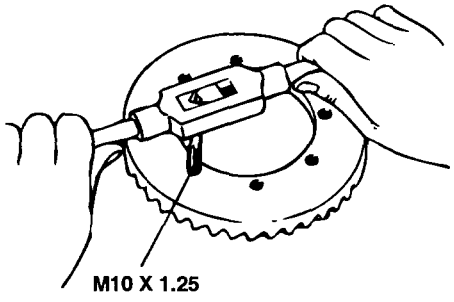
6. Installation of the lock pin
   a. Align the pinion shaft lock pin hole with the differential case lock pin hole, and drive in the lock pin.

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.

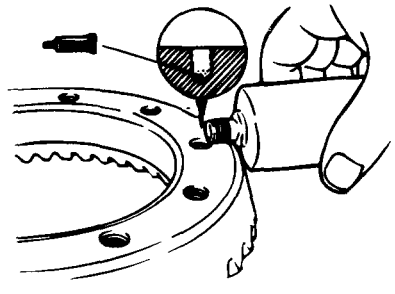


H7FA1020

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

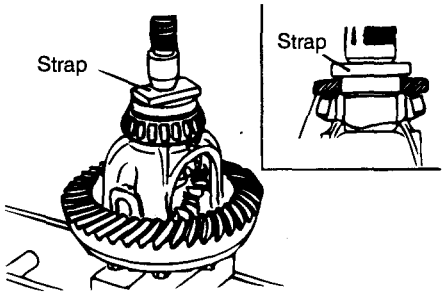
Specified adhesive : LOCTITE #262 or equivalent

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



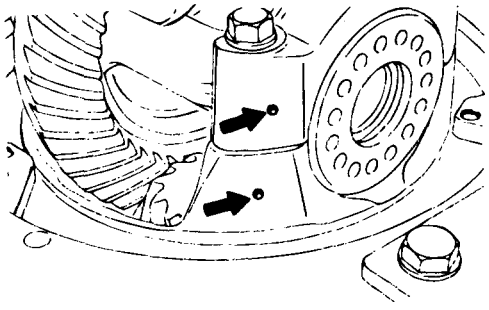
H7FA1030

8. Press-fit the side bearing inner race



A7FA1040

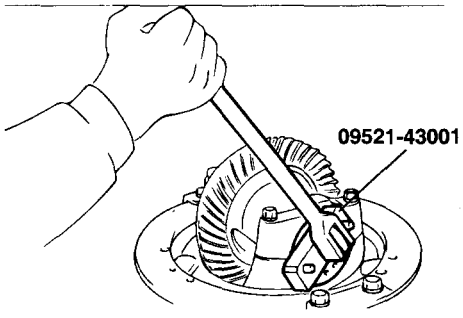
9. Align the matchmark on the gear carrier and the bearing cap, and then tighten the bearing cap.



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.



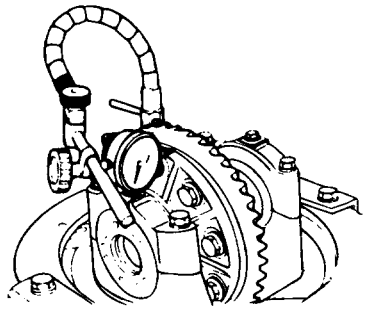
AU52-25B

   2) Measure the final drive gear backlash.

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

NOTE

Measure at lease 4 point on the drive gear periphery.

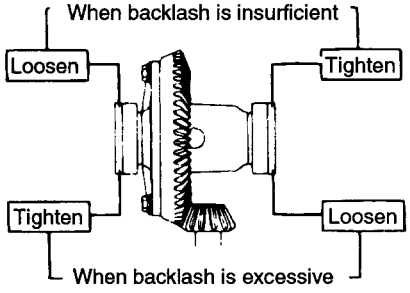


AU52-32A

3) Using the special tool(09521-43000), adjust the backlash to standard value by moving the side bearing nut as shown.

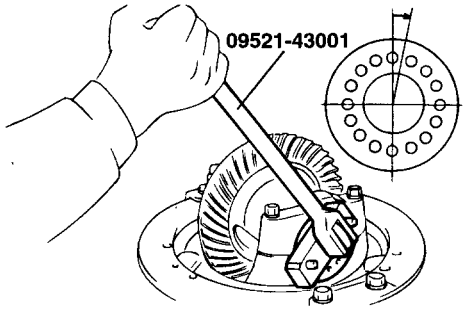
NOTE

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



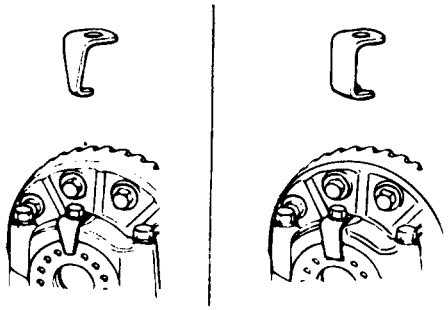
EIMB750D

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.



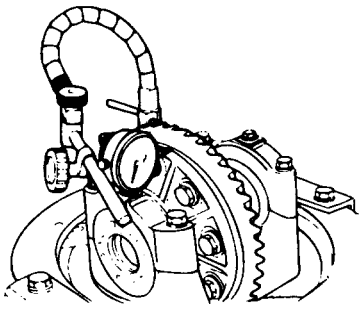
AU52-32D

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.)

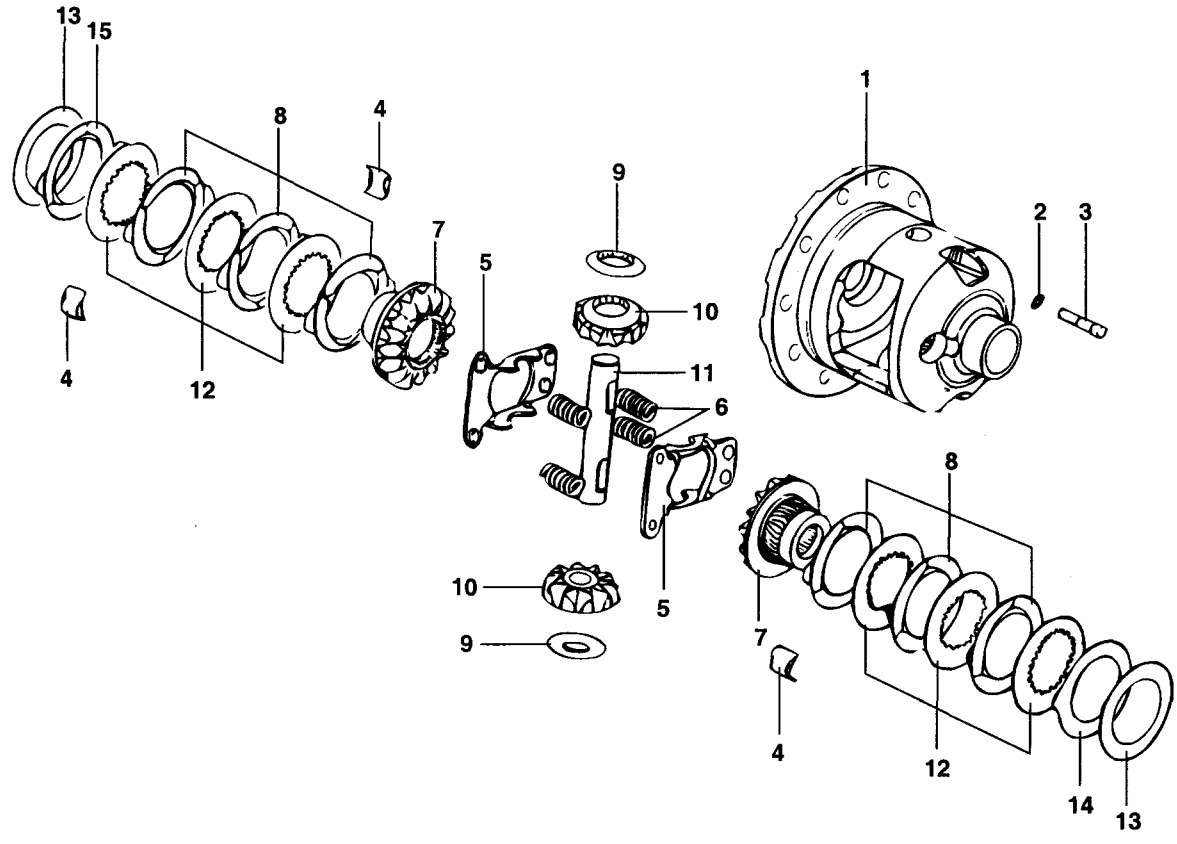
8) When drive gear runout exceeds the limit, remove the differential case and then the drive gears, moving them to different positions and reinstalling them.



AU52-32A

LIMITED SLIP DIFFERENTIAL (LSD)

COMPONENTS EIMB7600



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

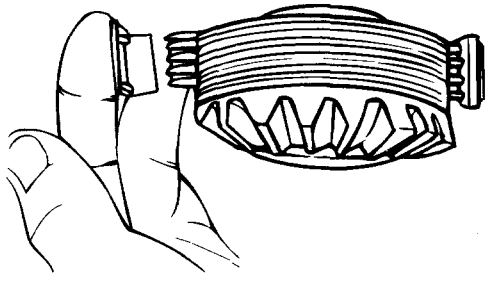
1. Remove the threaded lock screw and the cross shaft.
2. Remove the spring preload assembly. Use a hammer and punch to drive the spring plates out from the large window.
3. Without preload on the side gears, they can be turned by hand. Rotate the side gears until the pinions are in the window area. 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 EIMB7900

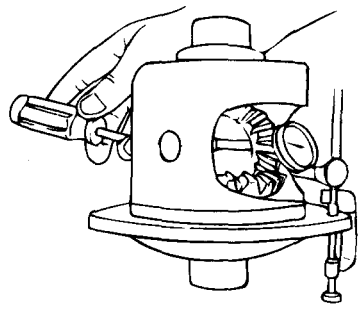
1. Check the side gears, pinions, pinion thrust washers, thrust block and cross shaft for wear or damage. If there is excessive wear, cracks, nicks, grooves or galling, replace the parts.
2. Inspect the carbon surfaces. After cleaning with a solvent, the carbon surface should appear like a course weave 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 2.56mm (0.101in.) or the single sided disc is less than 2.15mm (0.085in.), 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 EIMB8000

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.
3. Select a shim 0.76mm (0.023in.) 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 0.10mm (0 to 0.004in.). If required, change the .76mm (0.023in.) shim to obtain the proper backlash.



H7RA1240



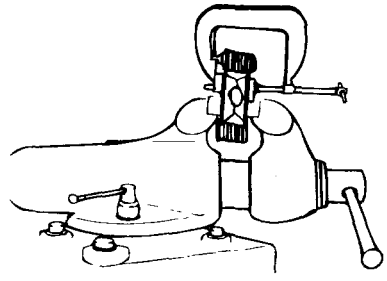
H7RA1250

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.

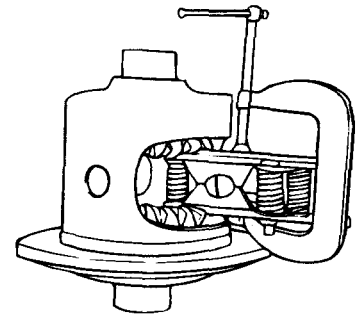
11. Install a pinion and thrust washer through each window so that the gear teeth mesh and so that the pinions are in line with each other. Rotate one side gear so the pinions and thrust washers rotate at a position where they line up with the cross shaft holes in the case.

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

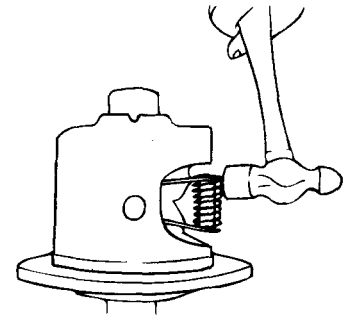
13. Position the spring pack between the side gears and remove the "C" clamp.



H7RA1190

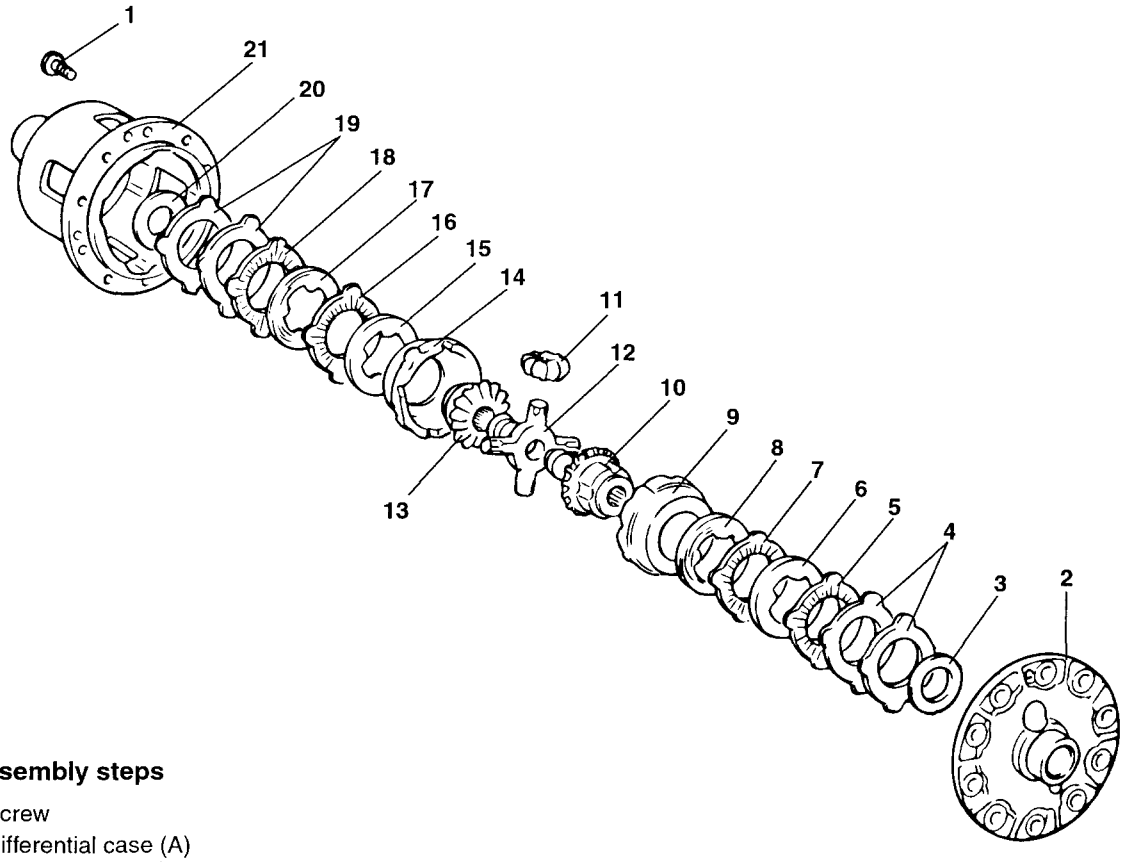
14. Drive the spring pack into the side gears far enough to retain the springs. Then remove the 6 mm bolts and complete the pack installation by driving the spring pack in position so that the cross shaft can slide through the middle as shown. Turn the thrust block so that the hole in the middle lines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

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



H7RA1170

COMPONENTS EIMB8100



Diassembly steps

1. Screw
2. Differential case (A)
3. Thrut washer
4. Spring plate
5. Friction plate
6. Friction disc
7. Friction plate
8. Friction disc
9. Pressure ring
10. Side gear
11. Differential pinion gear
12. Differential pinion shaft
13. Side gear
14. Pressure ring
15. Friction disc
16. Friction plate
17. Friction disc
18. Friction plate
19. Spring plate
20. Thrust washer
    (Adjustment of clutch plate friction force)
21. Differential case (B)

EHPDS60A

DISASSEMBLY EIMB8200

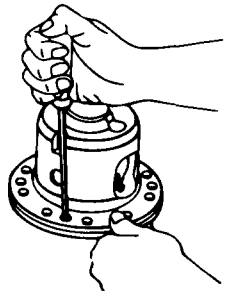
SERVICE POINTS OF DISASSEMBLY

REMOVAL OF SCREW

1. Loosen screws of the differential cases (A) and (B) uniformly a little at a time.
2. Separate differential cases (A) from differential case (B).

NOTE

Before disassembling the differential cases, confirm that the matchmark (numbers) on case A and case B are the same.



EIJA0301

3. Remove the components from the differential case (B).

NOTE

Keep the right and left thrust washers, spring plates, spring discs, friction plates, and friction discs separate in order to be able to distinguish them for reassembly.

INSPECTION EIMB8300

1. Check the side gears, pinion gears and pinion shaft for wear or damage.
2. Check the side gears spline for wear or damage.
3. Inspection of contact and sliding surfaces of parts.

Inspect the friction plate, friction disc, spring plate, spring disc and pressure ring.

A. The friction surfaces of the friction plate, friction disc, spring plate, and spring disc. If there are any signs of seizure, severe friction, or color change from the heat, it will adversely affect the locking performance ; replace the part with a new one.

NOTE

The strong contact on the inner circumference of the friction surfaces is because of the spring plate and the spring disc : this wear is not abnormal.

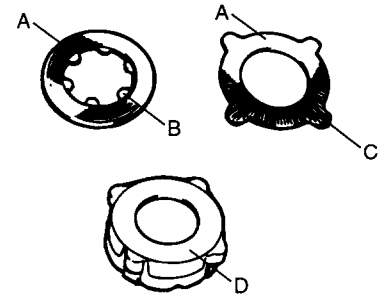
B. The six projections on the inner circumference of the friction disc.
If there are nicks and dents, it will cause abnormalities in the clutch pressure.
Repair the parts using an oil stone ; if the parts cannot be repaired, replace them.

C. The four projections on the outer circumference of the friction disc.
If there are nicks and dents, it will cause abnormalities in the clutch pressure.
Repair the parts using an oil stone ; If the parts cannot be repaired, replace them.

D. The friction surface of the friction disc of the pressure ring.
If there are nicks or scratches, repair the part by first grinding with an oil stone and them polishing with rubbing compound on a surface plate.

NOTE

The strong contact on the inner circumference of the friction surface is because of the spring plate and the spring disc ; this wear is not abnormal.

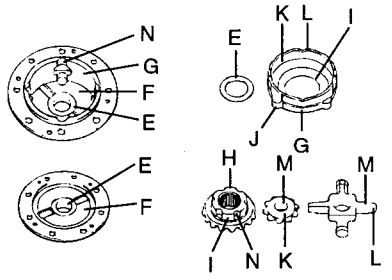


EHP1001A

Inspect the contact and sliding surfaces listed below, and repair any nicks and burrs using an oil stone.

E. The sliding surfaces of the thrust washer and the case.
F. The spring contacting surface of the differential case.
G. The contact surfaces of the outer circumference of the pressure ring and the inner circumference of the differential case.
H. The sliding surface of the thrust washer.
I. The sliding surfaces of the hole in the pressure ring and the outer circumference of the side gear.

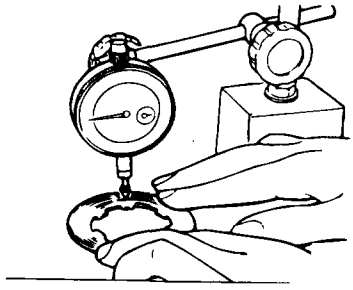
J. The projection on the outer circumference of the pressure ring.
K. The spherical surface of the differential pinion gear and the inner diameter of the pressure ring.
L. The V-shaped groove in the pressure ring, and the V-shaped part in the pinion shaft.
M. The outer diameter of the pinion shaft and the hole of the differential pinion gear.
N. The outer circumference groove of the side gear.
O. The inner circumference groove of the differential case.



EHPDS63A

4. INSPECTION FOR WARPING OF FRICTION PLATED AND FRICTION DISC
Using a dial indicator, measure the amount of warping(the flatness) of the friction plate and the friction disc on a surface plate by turning the friction plate or disc.

Limit : 0.08mm (0.0031in.)



KHPDS64A

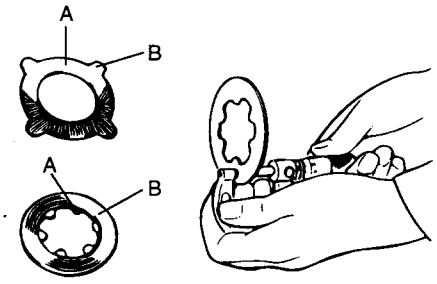
5. INSPECTION FOR WEAR OF FRICTION PLATE AND FRICTION DISC

1) In order to measure the wear, measure the thickness of the friction surfaces and projections of the friction disc and plate, and then find the difference.
(The same procedure is used for the spring discs and the spring plates.)

Limit : 0.1mm (0.0041in.)

NOTE

Make the measurement at several different points.



KHPDS65A

2) If the parts are worn beyond the limit value, replace them with new parts.

SERVICE POINT OF REASSEMBLY EIMB8400

ADJUSTMENT OF CLUTCH PLATE FRICTION FORCE

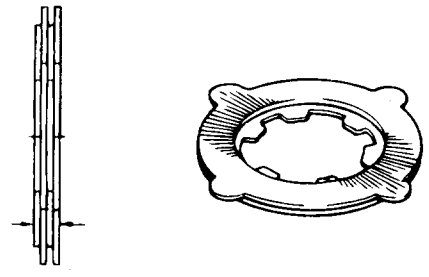
Before assembly, use the following method to adjust the clearance between the spring plates and differential cases (for adjustment of the clutch plate friction force), and to adjust the axial clearance of the side gear when installing the internal components into the differential case.

1. Arrange the two(each) friction discs and friction plates for each side, one on top of another, as shown in the figure, combining them so that the difference in thickness between the left and the right is the standard value.

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

NOTE

For new ones, there is one type of friction plate : 1.75mm (0.0689in.) ; there are two types of friction disc : 1.75mm (0.0689in.) and 1.85mm (0.0728in.).

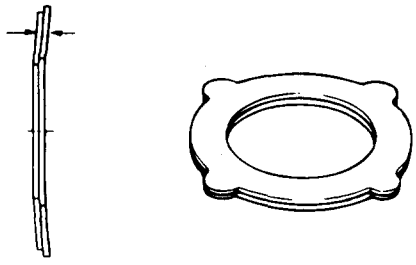


KHPDS66A

2. Arrange one spring disc and one spring plate for each side, one on top of the other, so that the difference between the left and the right thickness is minimized.

NOTE

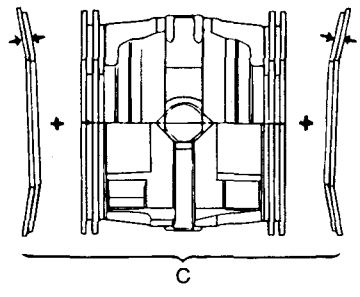
For new ones, there is one type of spring disc and spring plate : 1.75mm (0.0689in.).



KHPDS67A

3. Assemble the pressure ring's internal components (differential pinion shaft and pressure ring) and the friction discs and friction plates, and then, as shown in the figure, measure the overall width.

4. Calculate the total value (C) of the thickness of the spring discs and spring plates plus the value measured in (3) above.

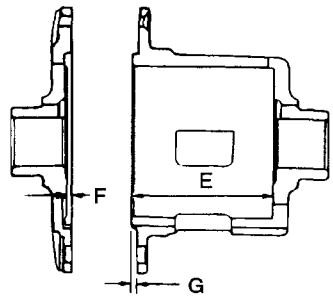


EHPDS68A

5. Obtain the dimension (D) between the spring plate contact surfaces when differential cases (A) and (B) are combined.
No 6. Diff : D + F - G
No 7. Diff : E - F + H - G

6. Change the thickness of the friction disc so that the clearance (D - C) between the differential case and the spring plate becomes the standard value.

Standard value : 0.06-0.20mm (0.0024-0.0079in.)



EHPDS69A

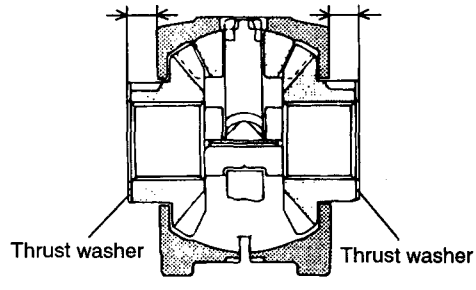
7. Remove the spring plates, spring discs, friction plates and friction disc.

8. Install the thrust washer as shown in the figure, and then select a thrust washer so that the difference between the left and right dimensions from the pressure ring rear face to the thrust washer end face is the standard value.

Standard value : 0.05mm (0.0020in.) or less

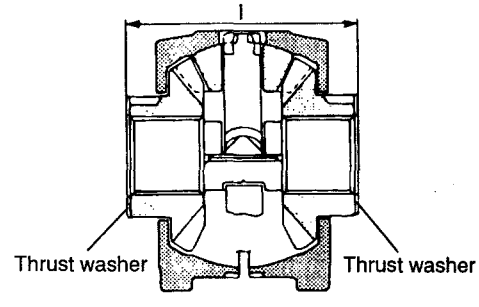
NOTE

Measure the distance while squeezing the V-shaped groove manually.



EIMB840A

9. Measure the dimension (I) from the thrust washer end surface to end surface.

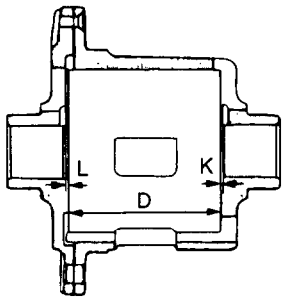


EHPDS70A

10. Obtain the dimension (J) between the thrust washer contact surfaces when differential cases (A) and (B) are combined.
J = K + L + D

NOTE

Dimension (D) is the distance between the spring plate contact surfaces when differential cases (A) and (B) are combined.



EHPDS71A

11. Change the thickness of the thrust washer so that the clearance (J-I) between the thrust washer and the differential case is the standard value.

Standard value : 0.05-0.20mm (0.0020-0.0079in.)

NOTE

- *Select the thrust washer so that the difference between the left and right dimensions from the pressure ring rear face and the thrust washer end surface are the standard value even when the thrust washer is changed.*
- *The are three sizes of new thrust washers : 1.50mm (0.0591in.), 1.60mm (0.0630in.), and 1.70mm(0.0670in.).*

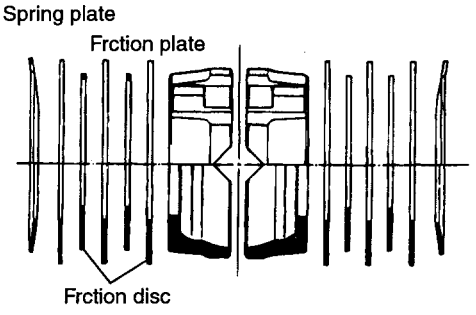
12. Place the each part in the differential case (B) as directions shown in the figure.

NOTE

- *Before assembly, apply the specified gear oil to each component especially careful to coat contact surfaces and sliding surfaces.*

Specified gear oil :
MITSUBISHI Genuine gear oil Paft No.
8149630EX or equivalent

- *Be careful not to insert the friction plates and friction discs in the incorrect order and to install the spring plates and spring disc in incorrect direction.*



EHPP102A

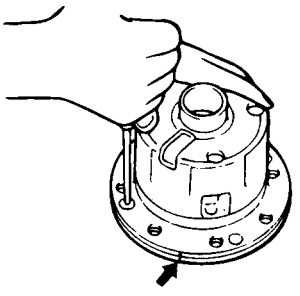
INSTALLATION OF SCREW

1. Align the matchmark (the same numeral on each case) of differential case (A) and differential case (B).

2. Turning the screwdriver slowly several times, tighten the screw so that the cases are in close contact.

NOTE

If even though the screw is tightened, the end surfaces of case (A) and case (B) do not come into close contact, probably the thrust washer and spring plate are not fit correctly into the groove, so make the assembly again.



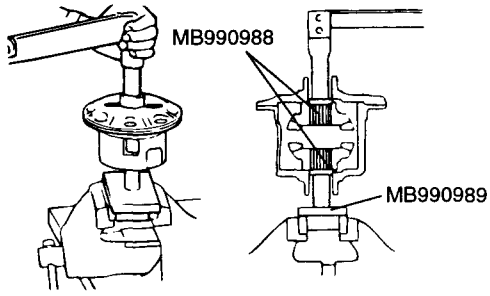
KHPDS73A

3. After assembly, in order to check the frictional force of the clutch plate, use the special tools to measure the turning torque.

Standard value :
When a new clutch plate is used
40-75Nm (400-750kg·cm)
When an old clutch plate is used
25-75Nm (250-750kg·cm)

NOTE

Measure the turning torque after rotating slightly. When measuring the torque, do so at the beginning of movement.

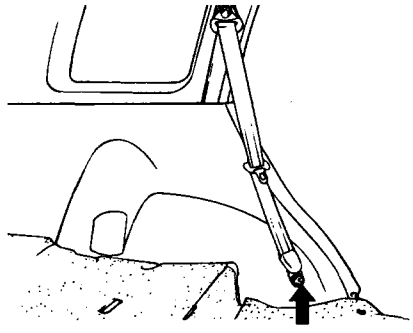


EHPDS74A

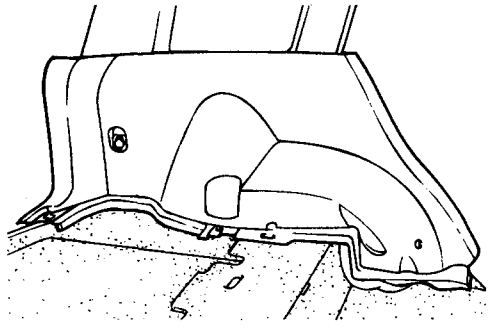
REAR SEAT BELT

REMOVAL AND INSTALLATION ESMB1900

1. Loosen the seat belt lower anchor bolt and remove the quarter trim.

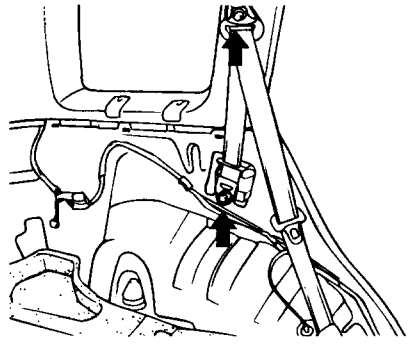


KSMB210A



KSMB210B

2. Loosen the seat belt upper anchor bolt and retractor mounting bolt, then remove the rear seat belt.



KSMB210C

Tightening torque

35 - 55 Nm (350 - 550 kg·cm, 25.8 - 40.6 lb·ft)

3. Installation is the reverse of removal.