

REAR AXLE

CONTENTS

N03AA-

AXLE ASSEMBLY <2.6L ENGINE>	14	TROUBLESHOOTING	8
AXLE ASSEMBLY <3.0L ENGINE>	16	AXLE SHAFT, AXLE HOUSING	8
AXLE SHAFT	18	Grease Leakage	
DIFFERENTIAL CARRIER	23	Noise While Wheels are Rotating	
SERVICE ADJUSTMENT PROCEDURES	11	DIFFERENTIAL (CONVENTIONAL	
Axle Housing Oil Seal Replacement	12	DIFFERENTIAL)	8
Axle Shaft Check for End Play	11	Bearing Noise While Driving or Coasting	
Gear Oil Level Check	11	Constant Noise	
Limited Slip Differential Preload Measurement	12	Gear Noise While Coasting	
Rear Axle Total Backlash Check	11	Gear Noise While Driving	
SPECIAL TOOLS	5	Heat	
SPECIFICATIONS	2	Noise While Turning	
General Specifications	2	Oil Leakage	
Lubricants	4	DIFFERENTIAL (LIMITED SLIP	
Sealant and Adhesive	5	DIFFERENTIAL)	9
Service Specifications	3	Abnormal Noise during Driving or Gear	
Torque Specifications	4	Changing	
		Abnormal Noise When Cornering	
		Breakdown	
		Gear Noise	
		Gear Oil Leakage	
		Limited Slip Differential Does	
		not Function	
		Seizure	

SPECIFICATIONS

GENERAL SPECIFICATIONS

N03CA-

Items	Vehicles with conventional differential	Vehicles with limited slip differential
Axle housing type	Banjo type	Banjo type
Axle shaft		
Supporting type	Semi-floating type	Semi-floating type
Shaft dimensions		
Bearing portion dia. mm (in.)	40 (1.57)	40 (1.57)
Center portion dia. mm (in.)	34.5 (1.358)	34.5 (1.358)
Overall length mm (in.)		
<2.6L Engine>	703.5 (27.700)	703.5 (27.700)
<3.0L Engine>	723.5 (28.484)	723.5 (28.484)
Bearing		
O.D. x I.D. x width mm (in.)	80 x 40 x 19.75 (3.15 x 1.57 x .7776)	80 x 40 x 19.75 (3.15 x 1.57 x .7776)
Differential		
Reduction gear type	Hypoid gear	Hypoid gear
Reduction ratio	4.625	4.625
Differential lock type	-	Disc type
Differential gear type and configuration		
Side gear	Straight bevel gear x 2	Straight bevel gear x 2
Pinion gear	Straight bevel gear x 2	Straight bevel gear x 4
Number of teeth		
Drive gear	37	37
Drive pinion	8	8
Side gear		
<2.6L Engine>	14	16
<3.0L Engine>	19	16
Pinion gear	10	10

SERVICE SPECIFICATIONS

N03CB--

Items	Vehicles with conventional differential	Vehicles with limited slip differential
<p>Standard value</p> <p>Axle shaft end play mm (in.)</p> <p>Limited slip differential preload (on Vehicle) Nm (ft.lbs.)</p> <p>Parking brake lever stroke</p> <p>Stabilizer attaching bolt end attaching dimension mm (in.)</p> <p>Final drive gear backlash mm (in.)</p> <p><2.6L Engine></p> <p><3.0L Engine></p> <p>Differential gear backlash mm (in.)</p> <p><2.6L Engine></p> <p><3.0L Engine></p> <p>Drive pinion turning torque</p> <p>Without oil seal Nm (in. lbs.)</p> <p>With oil seal Nm (in. lbs.)</p> <p>Difference in total thickness between left and right clutch plates mm (in.)</p> <p>Clearance between the clutch plates and the differential case mm (in.)</p> <p>Difference in distances from backs of left and right pressure rings to end of thrust washer mm (in.)</p> <p>Clearance of the side gear in the axial direction mm (in.)</p> <p>Limited slip differential preload</p> <p>When equipped with new clutch plates Nm (ft. lbs.)</p> <p>When equipped with old clutch plates Nm (ft. lbs.)</p>	<p>0.05–0.20 (.0020–.0079)</p> <p>–</p> <p>4–6 clicks</p> <p>15–17 (.59–.67)</p> <p>0.11–0.16 (.0043–.0063)</p> <p>0.13–0.18 (.0051–.0071)</p> <p>0.010–0.076 (.0004–.0030)</p> <p>0–0.076 (0–.0030)</p> <p>0.4–0.5 (3.5–4.3)</p> <p>0.65–0.75 (5.6–6.5)</p> <p>–</p> <p>–</p> <p>–</p> <p>–</p> <p>–</p> <p>–</p> <p>–</p> <p>–</p>	<p>0.05–0.20 (.0020–.0079)</p> <p>35 (25) or more</p> <p>4–6 clicks</p> <p>15–17 (.59–.67)</p> <p>0.11–0.16 (.0043–.0063)</p> <p>0.13–0.18 (.0051–.0071)</p> <p>–</p> <p>–</p> <p>0.4–0.5 (3.5–4.3)</p> <p>0.65–0.75 (5.6–6.5)</p> <p>0.05 (.0020) or less</p> <p>0.06–0.20 (.0024–.0079)</p> <p>0.05 (.0020) or less</p> <p>0.05–0.20 (.0020–.0079)</p> <p>65–100 (47–72)</p> <p>35–100 (25–72)</p>
<p>Limit</p> <p>Rear axle total backlash mm (in.)</p> <p>Drive gear runout mm (in.)</p> <p>Differential gear backlash mm (in.)</p> <p>Friction plates and friction discs warping (flatness) mm (in.)</p> <p>Friction plates and friction discs wear (difference in thicknesses of friction surfaces and projections) mm (in.)</p>	<p>5 (.20)</p> <p>0.05 (.0020)</p> <p>0.2 (.008)</p> <p>–</p> <p>–</p>	<p>5 (.20)</p> <p>0.05 (.0020)</p> <p>–</p> <p>0.08 (.0031)</p> <p>0.1 (.004)</p>

TORQUE SPECIFICATIONS

N03CC--

Items	Nm	ft. lbs.
<2.6L Engine>		
Shackle assembly attaching nut	45-60	33-43
Shock absorber attaching nut	18-25	13-18
U-bolt attaching nut	85-110	61-80
Differential carrier to rear axle housing	25-30	18-22
<3.0L Engine>		
Lower arm to frame side bracket	130-150	94-108
Lower arm to axle housing side bracket	190-220	137-159
Shock absorber attaching nut	110-130	80-94
Lateral rod attaching nut	110-130	80-94
Stabilizer bar to axle housing side bracket	30-40	22-29
Differential carrier to rear axle housing	40-55	29-40
Brake tube flare nut	13-17	9-12
Propeller shaft attaching nut	50-60	36-43
Bearing case to rear axle housing	50-60	36-43
Rear axle bearing lock nut	180-220	130-159
Filler plug	40-60	29-43
Drain plug	60-70	43-51
Companion flange	190-250	137-181
Differential case to drive gear	80-90	58-65
Bearing cap	55-65	40-47
Lock plate	15-22	11-16

LUBRICANTS

N03CD--

Items	Specified lubricants	Quantity
Rear axle gear oil		
Conventional differential	Hypoid gear oil API classification GL-5 or higher/SAE viscosity No. 90, 80W	2.6L Engine: 1.80 lit. (3.80 pints) 3.0L Engine: 2.60 lit. (5.49 pints)
Limited slip differential	MITSUBISHI Genuine Gear Oil Part No. 8149630 EX or equivalent	2.6L Engine: 1.80 lit. (3.80 pints) 3.0L Engine: 2.60 lit. (5.49 pints)

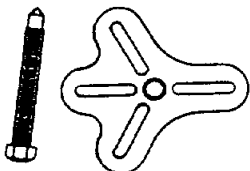
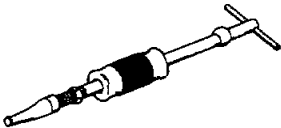
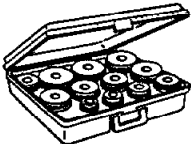

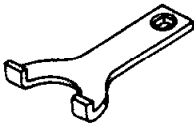
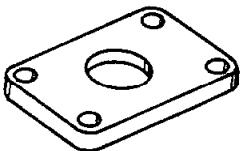
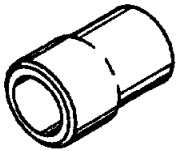
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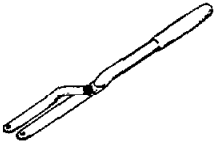
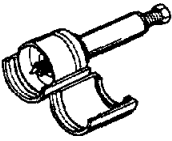



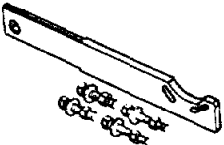
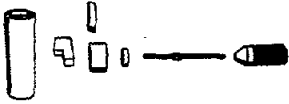

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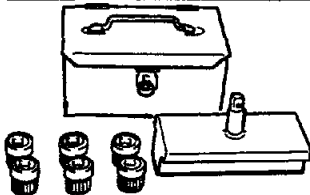
Items	Specified lubricants	Quantity
Axle shaft shim	3M ART Part No. 8663 or equivalent	As required
Differential carrier to axle housing	3M ART Part No. 8663 or equivalent	As required
Drive gear threaded hole	3M Adhesive stud locking 4170 or equivalent	As required

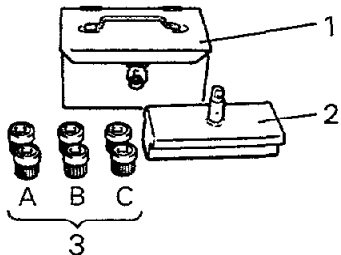
SPECIAL TOOLS

N03DA-

Tool	Number	Name	Use
	MB990241-01	Axle puller	Measurement of limited slip differential preload Removal of axle shaft
	MB990211-01	Sliding hammer with adapter	Removal of axle shaft Removal of axle housing oil seal
	MB990925-01	Bearing and oil seal installer disc set	Pressing of axle housing oil seal MB990930-01 Pressing of axle shaft bearing outer race MB990937-01 Pressing of axle shaft oil seal MB990937-01 Pressing of drive pinion rear bearing outer race MB990936-01, MB990937-01 Pressing of drive pinion front bearing outer race MB990934-01 (Refer to GROUP 2)
	MB990938-01	Handle	Pressing of axle housing oil seal Pressing of axle shaft bearing outer race Pressing of axle shaft oil seal Pressing of drive pinion rear bearing outer race Pressing of drive pinion front bearing outer race
	MB990785-01	Lock nut spanner wrench	Removal and installation of lock nut
	MB990787-01	Rear axle bearing case remover	Removal of axle shaft bearing and bearing case
	MB990799-01	Axle bearing remover and installer	Pressing of axle shaft bearing inner race

Tool	Number	Name	Use
	MB990201-01	Adjustable wrench	Removal and adjustment of side bearing nut
	MB990339-01	Pinion carrier bearing puller	Removal of side bearing inner race Removal of drive pinion rear bearing inner race
	MIT303173	Insert	Removal of side bearing inner race Removal of drive pinion rear bearing inner race
	MIT44801	Collet set	Removal of side bearing inner race Removal of drive pinion rear bearing inner race
	MB990811-01	Side bearing cup remover step plate	Removal of side bearing inner race
	MB990767-01	End yoke holder	Holding of companion flange
	MB990901-01	Pinion height gauge set	Measurement of pinion height
	MB990802-01	Bearing installer	Pressing of drive pinion rear bearing inner race Pressing of side bearing inner race

Tool	Number	Name	Use
	MIT304180	Handle	Pressing of drive pinion oil seal
	MB990031-01	Drive pinion oil seal installer	Pressing of drive pinion oil seal
	MB990988	Side gear holding tool set	Measurement of limited slip differential preload Tool C, MB990989

MB990988 	Tool number		Name	O.D. mm (in.)
	1	MB990551	Box	–
	2	MB990989	Base	–
	3	(MB990990)	Tool A	25 (.98)
(MB990991)		Tool B	28 (1.10)	
(MB990992)		Tool C	31 (1.22)	

TROUBLESHOOTING

N03EAAAa

Symptom	Probable cause	Remedy
AXLE SHAFT, AXLE HOUSING Noise while wheels are rotating	Brake drag Bent axle shaft Worn or scarred axle shaft bearing	Replace
Grease leakage	Worn or damaged oil seal Malfunction of bearing seal	Replace
DIFFERENTIAL (CONVENTIONAL DIFFERENTIAL) Constant noise	Improper final drive gear tooth contact adjustment Loose, worn or damaged side bearing Loose, worn or damaged drive pinion bearing	Correct or replace
	Worn drive gear, drive pinion Worn side gear thrust washer or pinion shaft Deformed drive gear or differential case Damaged gear	Replace
	Foreign material	Eliminate the foreign material and check; replace if necessary
	No oil	Fill or change
Gear noise while driving	Poor gear engagement Improper gear adjustment Improper drive pinion preload adjustment	Correct or replace
	Damaged gear	Replace
	Foreign material	Eliminate the foreign material and check; replace the parts if necessary
	Insufficient oil	Fill or change
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	Adjust
	Insufficient oil	Fill or change

Symptom	Probable cause	Remedy
Oil leakage	Clogged breather hose	Clean or replace
	Cover tightened not Seal malfunction	Retighten, apply sealant, or replace the gasket
	Worn or damaged oil seal	Replace
	Excessive oil	Adjust the oil level
DIFFERENTIAL (LIMITED SLIP DIFFERENTIAL) Abnormal noise during driving or gear changing	Excessive final drive gear backlash Insufficient drive pinion preload	Adjust
	Excessive differential gear backlash	Adjust or replace
	Worn spline of a side gear	Replace
	Loose spline coupling self-locking nut	Retighten or replace

NOTE

In addition to a malfunction of the differential carrier components, abnormal noise can also be caused by the universal joint of the propeller shaft, the axle shafts, the wheel bearings, etc. Before disassembling any parts, take all possibilities into consideration and confirm the source of the noise.

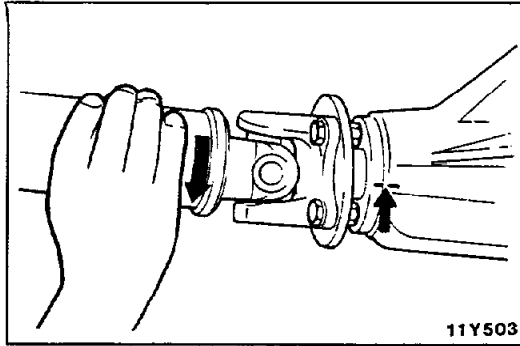
Abnormal noise when cornering	Damaged differential gears Damaged pinion shaft Nicked and/or abnormal wear of inner and outer clutch plates Poor gear oil Abnormally worn or damaged thrust washer	Replace
	Improper gear oil quantity	Refill or replace
Gear noise	Improper final drive gear tooth contact adjustment	Adjust or replace
	Incorrect final drive gear backlash Improper drive pinion preload adjustment	Adjust
	Damaged, broken, and/or seized tooth surfaces of the drive gear and drive pinion Damaged, broken, and/or seized drive pinion bearings Damaged broken, and/or seized side bearings Damaged differential case Poor gear oil	Replace
	Improper gear oil quantity	Refill or replace

NOTE

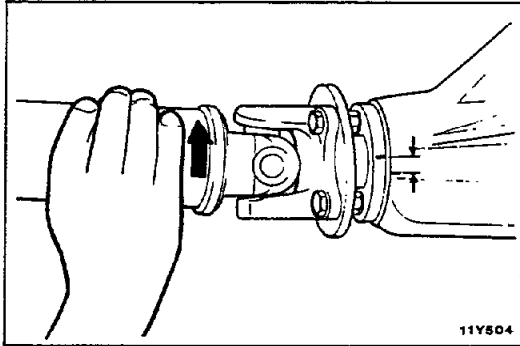
Noise from the engine, muffler vibration, transmission, propeller shaft, wheel bearings, tires, body, etc., is easily mistaken as being caused by malfunction in the differential carrier components. Be extremely careful and attentive when performing the driving test, etc.

Test methods to confirm the source of the abnormal noise include: coasting, acceleration, constant speed driving, raising the rear wheels on a jack, etc. Use the method most appropriate to the circumstances.

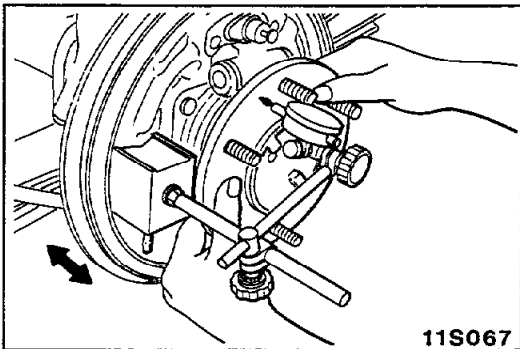
Symptom	Probable cause	Remedy
Gear oil leakage	Worn or damaged front oil seal, or an improperly installed oil seal Damaged gasket	Replace
	Loose spline coupling self-locking nut	Retighten or replace
	Loose filler or drain plug	Retighten or apply adhesive
	Clogged or damaged breather hose	Clean or replace
Seizure	Improper final drive gear backlash Excessive drive pinion preload Excessive side bearing preload Improper differential gear backlash Excessive clutch plate preload	Adjust
	Improper gear oil	Replace
	Improper gear oil quantity	Refill or replace
<p>NOTE In the event of seizure, disassemble and replace the parts involved, and also be sure to check all components for any irregularities and repair or replace as necessary.</p>		
Breakdown	Incorrect final drive gear backlash Incorrect drive pinion preload Incorrect side bearing preload Excessive differential gear backlash Incorrect clutch plate preload	Adjust
	Loose drive gear clamping bolts	Retighten
	Operational malfunction due to overloaded clutch	Avoid excessively rough operation
<p>NOTE In addition to disassembling and replacing the failed parts, be sure to check all components for irregularities and repair or replace as necessary.</p>		
Limited slip differential does not function (on snow, mud, ice, etc.).	The limited slip device is damaged	Disassemble, check the functioning, and replace the damaged parts



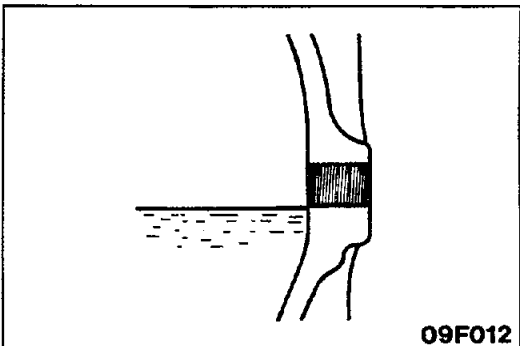
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SERVICE ADJUSTMENT PROCEDURES

N03FAAB

REAR AXLE TOTAL BACKLASH CHECK

If the vehicle vibrates and produces a booming sound due to the unbalance of the drivetrain, use the following procedure to measure the rear axle total backlash to see if it is necessary to remove the differential carrier assembly.

- (1) Park the vehicle on a flat, level surface.
- (2) Set both the transmission shift lever and the transfer shift lever to neutral.
- (3) Chock the wheels.

NOTE

If the vehicle is to be raised on a lift, engage the parking brake to lock the wheels.

- (4) Manually turn the propeller shaft clockwise as far as it will go and make mating marks on the companion flange dust cover and the gear carrier.
- (5) Manually turn the propeller shaft counterclockwise as far as it will go and measure the movement of the mating marks.

Limit : 5 mm (.20 in.)

- (6) If the backlash exceeds the limit, remove the differential carrier assembly and adjust it.

AXLE SHAFT CHECK FOR END PLAY

N03FBAB

1. Jack up the vehicle and remove the rear wheels.
2. Remove the brake drums.
3. Measure the axle shaft end play with a dial indicator.
4. Pull the axle shaft all the way out and note the end play indication on the dial indicator.

Standard value : 0.05–0.20 mm (.0020–.0079 in.)

5. If the axle shaft end play exceeds the standard value, withdraw the axle shaft, and then adjust to the standard value by changing the shim thickness. (Refer to P.3-18.)

GEAR OIL LEVEL CHECK

N03FCAC

1. Remove the filler plug, and check the oil level.
2. The oil level is sufficient if it reaches the level plug hole.

Specified gear oil:

Conventional differential

Hypoid gear oil API classification GL-5 or higher/SAE viscosity No. 90, 80W

<2.6L Engine> [1.80 lit. (3.80 pints)]

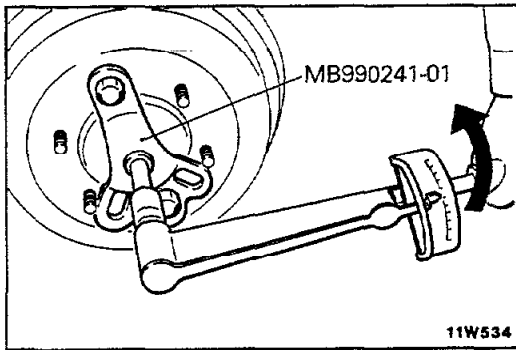
<3.0L Engine> [2.60 lit. (5.49 pints)]

Limited slip differential

MITSUBISHI Genuine Gear Oil Part No. 8149630 EX or equivalent

<2.6L Engine> [1.80 lit. (3.80 pints)]

<3.0L Engine> [2.60 lit. (5.49 pints)]



LIMITED SLIP DIFFERENTIAL PRELOAD MEASUREMENT

N03FDAD

1. To measure the preload of the limited slip differential, set the shift lever of the transmission to the neutral position, lock the front wheels, and fully release the parking brake. One of the rear wheels should be maintained in contact with the ground surface, and the other should be raised up.
2. Measure the axle shaft turning torque at the side on which the wheel is raised position by using the following procedure:
 - (1) Remove the wheel.
 - (2) Mount the special tool to the hub bolts with the hub nuts.
 - (3) Find the limited slip differential preload by measuring the axle shaft turning torque in the forward direction with a torque wrench.

NOTE

Before measuring the turning torque, turn the axle shaft to remove any initial resistance.

Standard value : 35 Nm (25 ft.lbs.) or more

- (4) If the turning torque is less than the standard value, remove the limited slip differential from the vehicle and repair it. (Refer to P.3-37.)

AXLE HOUSING OIL SEAL REPLACEMENT

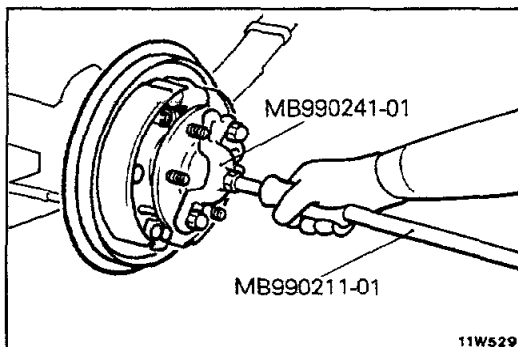
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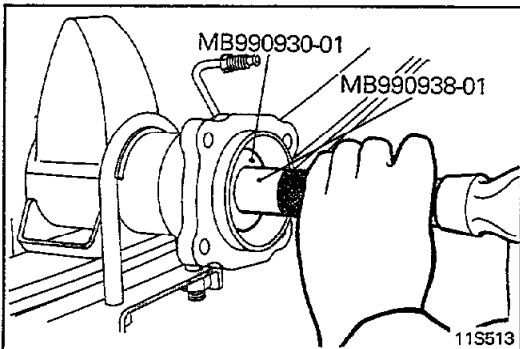
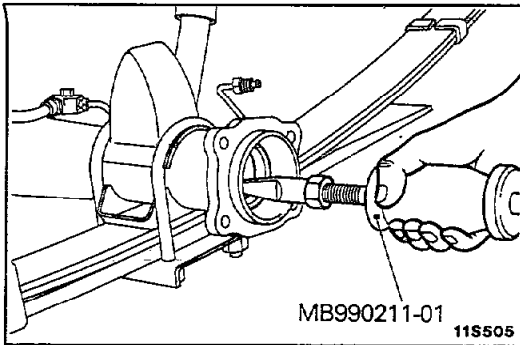
1. Disconnect the parking brake cables from the equalizer and then remove the clamps from the parking brake cables. (Refer to GROUP 5 – Parking Brake Cable.)

NOTE

Do not disconnect the parking brake cable and rear brake connection.

2. Before disconnecting the brake tube, drain the brake fluid from the bleeder screw at the left side of the rear brake.
3. Pull the rear axle shaft with rear brake assembly attached. If the rear axle shaft is hard to remove, use the special tools.





4. Use special tool with hook attached to remove the oil seal.
5. Apply the multipurpose grease to the oil seal fitting area of the rear axle housing.
6. Drive the new oil seal into the rear axle housing end by using the special tools.
7. Apply the multipurpose grease to the oil seal lip.
8. Adjust the clearance between the bearing case and rear axle housing end. (Refer to P.3-23.)
9. Install the rear axle shaft assembly to the rear axle housing.
10. Connect the brake tube and bleed out the air. (Refer to GROUP 5 – Service Adjustment Procedures.)
11. Connect the parking brake cable, and adjust the stroke of the parking brake lever.

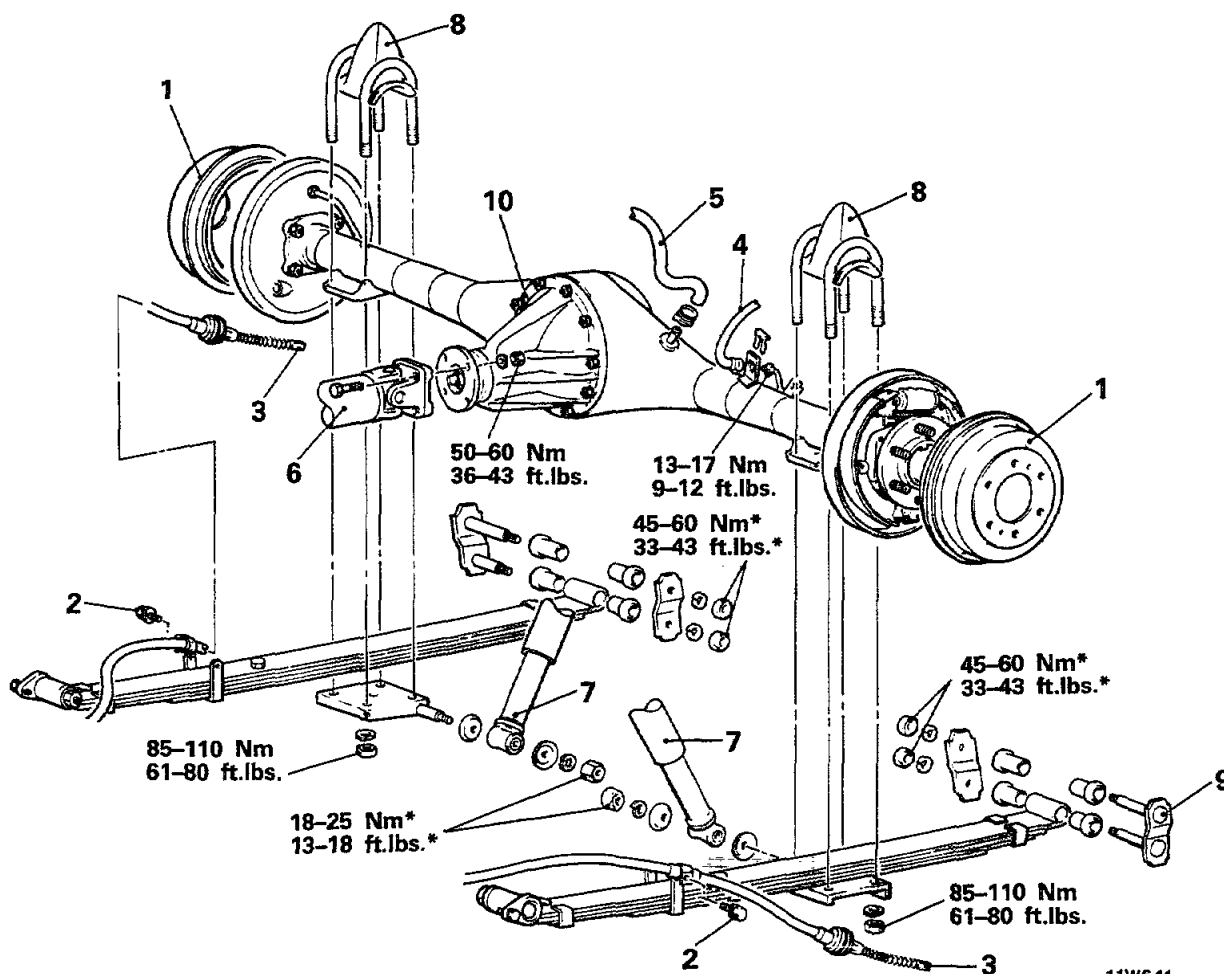
Standard value : 4-6 clicks

(Refer to GROUP 5 – Service Adjustment Procedures.)

AXLE ASSEMBLY <2.6L ENGINE>

N03GA--

REMOVAL AND INSTALLATION

**Post-installation Operation**

- Air Bleeding from Brake Lines (Refer to GROUP 5 - Service Adjustment Procedures)
- Adjustment of Parking Brake Lever Stroke (Refer to GROUP 5 - Service Adjustment Procedures)

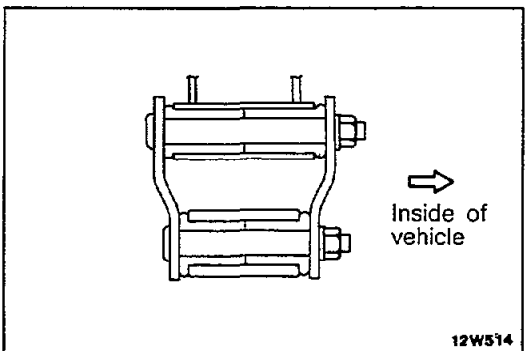
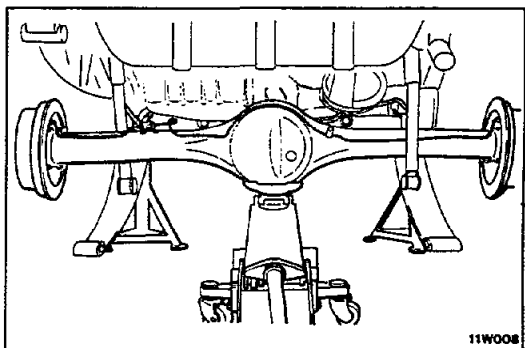
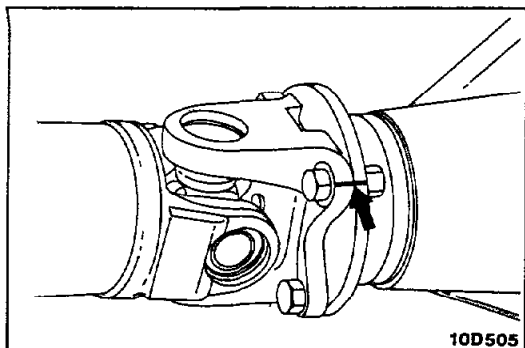
Removal steps

1. Brake drums
2. Parking brake cable attaching bolts
- ◆◆◆ 3. Connection of parking brake cable end and brake shoe assembly
- ◆◆ 4. Connection of brake hose
5. Connection of breather hose
- ◆◆◆◆ 6. Rear propeller shaft
7. Connection of shock absorbers (lower part only)

- ◆◆ 8. U-bolts and bump stopper
- ◆◆◆ 9. Shackle assembly
- ◆◆ 10. Axle assembly

NOTE

- (1) Reverse the removal procedures to reinstall.
- (2) ◆◆ : Refer to "Service Points of Removal".
- (3) ◆◆◆ : Refer to "Service Points of Installation".
- (4) The part with * must be tightened with the vehicles lowered to the ground.



SERVICE POINTS OF REMOVAL

N03GBAF

3. DISCONNECTION OF PARKING BRAKE CABLE END AND BRAKE SHOE ASSEMBLY

Refer to GROUP 5 – Parking Brake Cable.

4. DISCONNECTION OF BRAKE HOSE

Before disconnecting the brake tube, drain the brake fluid from the bleeder screw at the right side of the rear brake.

6. REMOVAL OF REAR PROPELLER SHAFT

Make the mating marks on the flange yoke of the rear propeller shaft and the companion flange of the differential case.

8. REMOVAL OF U-BOLT AND BUMP STOPPER

Before removing the U-bolt and the bumper stopper, place the jack underneath the center of the axle assembly to hold it slightly upward.

10. REMOVAL OF AXLE ASSEMBLY

Draw out the axle assembly toward the rear of the vehicle.

Caution

The axle assembly is unstable on the jack; be careful not to allow it to fall.

SERVICE POINTS OF INSTALLATION

N03GDAF

9. INSTALLATION OF SHACKLE ASSEMBLY

Install the shackle assembly from the outside toward the inside of vehicle.

6. INSTALLATION OF REAR PROPELLER SHAFT

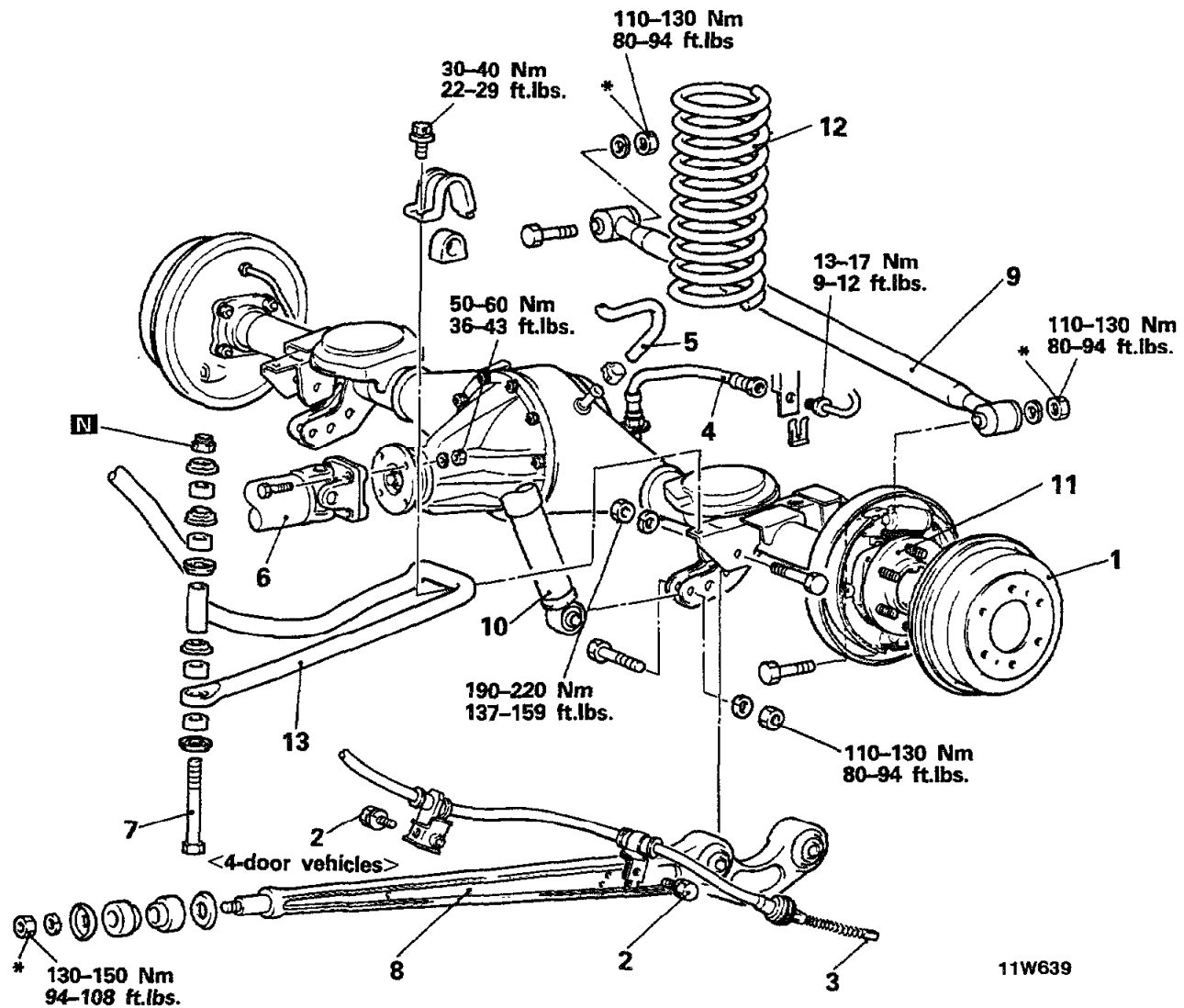
Align the mating marks on the flange yoke and the companion flange to install the rear propeller shaft.

3. CONNECTION OF PARKING BRAKE CABLE END AND BRAKE SHOE ASSEMBLY

Refer to GROUP 5 – Parking Brake Cable.

AXLE ASSEMBLY <3.0L ENGINE>

REMOVAL AND INSTALLATION



Removal steps

1. Brake drum
2. Parking brake cable attaching bolts
- ◄◄ ►► 3. Connection of parking brake cable end and brake shoe assembly
- ◄◄ 4. Connection of brake hose
- ◄◄ ►► 5. Connection of breather hose
- ◄◄ ►► 6. Rear propeller shaft
- 7. Stabilizer bar installation bolt
- ◄◄ ►► 8. Lower arm
- 9. Lateral rod
- ◄◄ ►► 10. Connection of shock absorbers (lower part only)

Post-installation Operation

- Air Bleeding from Brake Lines (Refer to GROUP 5 - Service Adjustment Procedures)
- Adjustment of Parking Brake Lever Stroke (Refer to GROUP 5 - Service Adjustment Procedures)

- ◄◄ 11. Axle assembly
- ◄◄ 12. Coil spring
- ◄◄ 13. Stabilizer bar

NOTE

- (1) Reverse the removal procedures to reinstall.
- (2) ◄◄ : Refer to "Service Points of Removal".
- (3) ►► : Refer to "Service Points of Installation".
- (4) The part with * must be tightened with the vehicles lowered to the ground.
- (5) N : Non-reusable parts.

SERVICE POINTS OF REMOVAL

N03GBAD

3. DISCONNECTION OF PARKING BRAKE CABLE END AND BRAKE SHOE ASSEMBLY

Refer to GROUP 5 – Parking Brake Cable.

4. DISCONNECTION OF BRAKE HOSE

Refer to P.3-15

6. REMOVAL OF REAR PROPELLER SHAFT

Refer to P.3-15

8. REMOVAL OF LOWER ARM

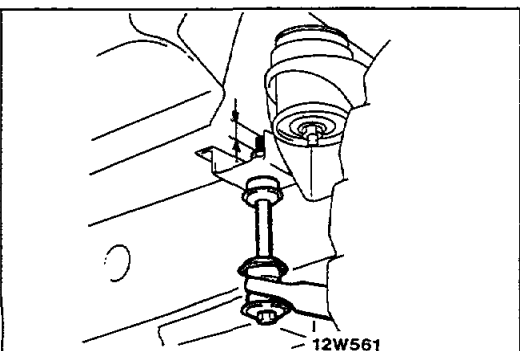
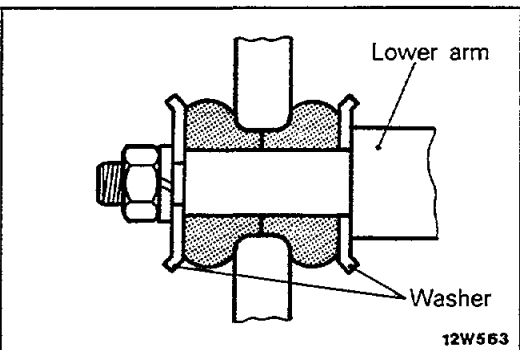
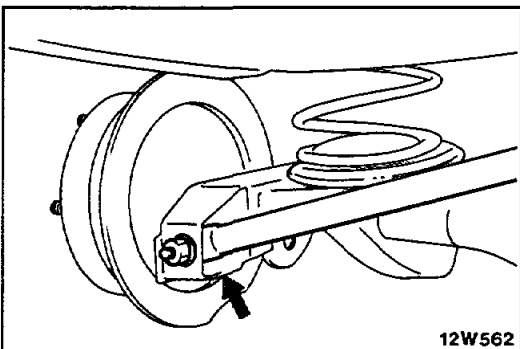
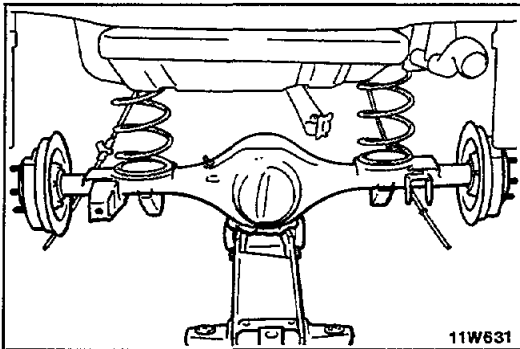
After supporting the axle assembly by floor jacks, remove the lower arm.

11. REMOVAL OF AXLE ASSEMBLY

Draw out the axle assembly toward the rear of the vehicle.

Caution

The axle assembly is unstable on the jack; be careful not to allow it to fall.



SERVICE POINTS OF INSTALLATION

N03GDAD

9. INSTALLATION OF LATERAL ROD

Install the lateral rod from the axle housing side.

8. INSTALLATION OF LOWER ARM

Install the washers (facing as shown in the figure) to the lower arm.

7. INSTALLATION OF STABILIZER BAR INSTALLATION BOLT

When installing the stabilizer bar to the stabilizer bar bracket, check to be sure that the amount of projection of the stabilizer bar installation bolt is within the standard value range.

Standard value : 15–17 mm (.59–.67 in.)

NOTE

The dimension shown in figure is the value when a new bushing is used.

6. INSTALLATION OF REAR PROPELLER SHAFT

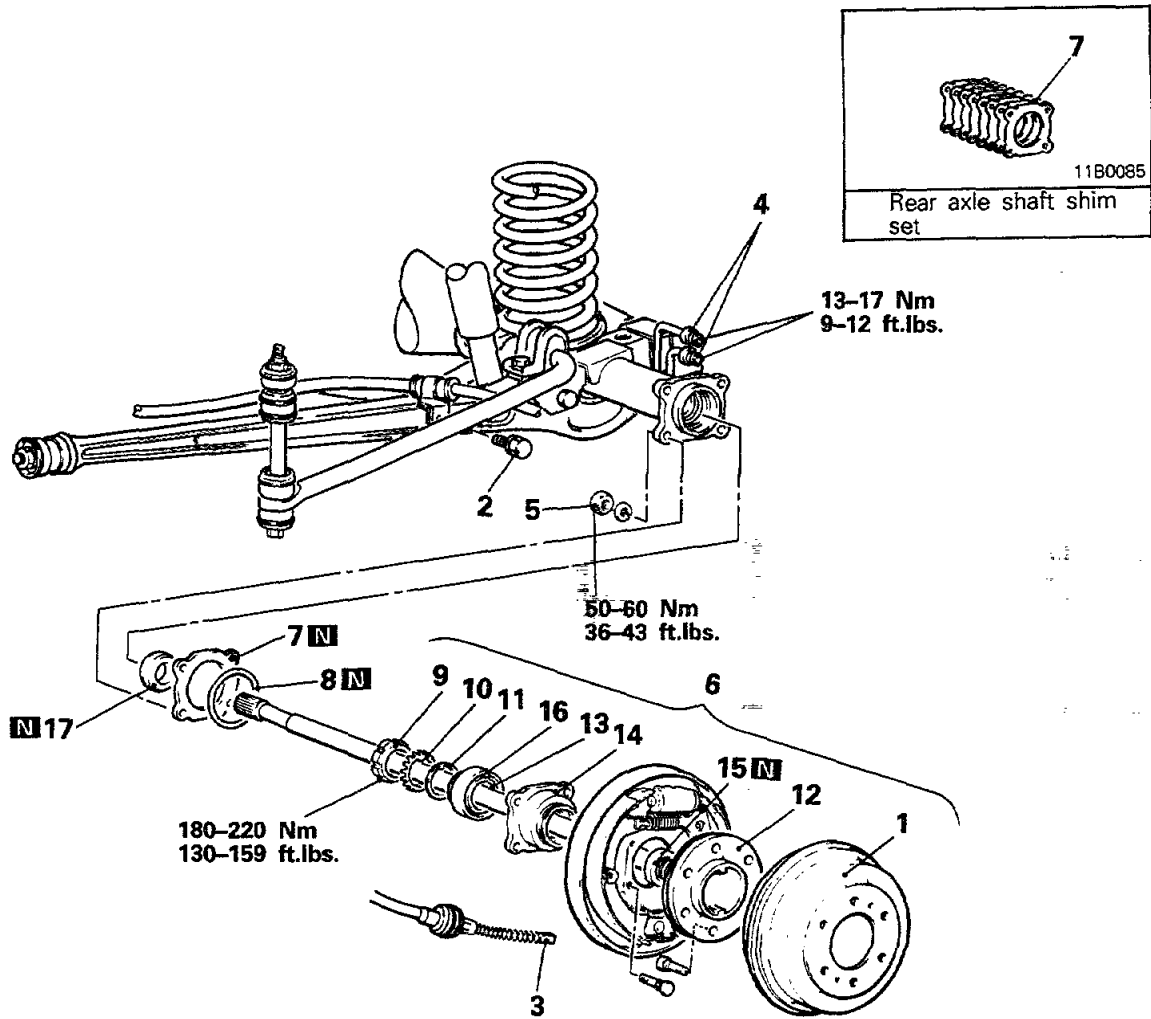
Refer to P.3-15.

3. CONNECTION OF PARKING BRAKE CABLE END AND BRAKE SHOE ASSEMBLY

Refer to GROUP 5 – Parking Brake Cable.

AXLE SHAFT REMOVAL AND INSTALLATION

N03HA--



11W640

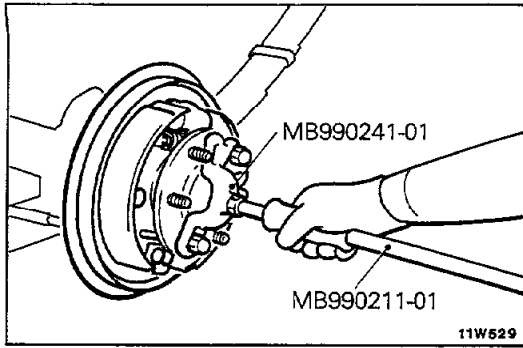
Post-installation Operation

- Air Bleeding from Brake Lines (Refer to GROUP 5 - Service Adjustment Procedures)
- Adjustment of Parking Brake Lever Stroke (Refer to GROUP 5 - Service Adjustment Procedures)

Removal steps

- | | | | |
|-------|--|-------|---|
| | 1. Brake drum | ◆◆ | 10. Lock washer |
| | 2. Parking brake cable attaching bolts | ◆◆ | 11. Washer |
| ◆◆ ◆◆ | 3. Connection of parking brake cable end and brake shoe assembly | ◆◆ ◆◆ | 12. Rear axle shaft |
| ◆◆ | 4. Connection of brake tubes | ◆◆ | 13. Bearing inner race |
| | 5. Nuts | ◆◆ | 14. Bearing case |
| ◆◆ | 6. Rear axle shaft assembly (with parking brake cable) | ◆◆ | 15. Oil seal |
| | 7. Shims | ◆◆ ◆◆ | 16. Bearing outer race |
| | 8. O-ring | ◆◆ ◆◆ | 17. Oil seal |
| ◆◆ | Adjustment of axle shaft end play | (1) | Reverse the removal procedures to reinstall. |
| ◆◆ ◆◆ | 9. Lock nut | (2) | ◆◆ : Refer to "Service Points of Removal". |
| | | (3) | ◆◆ : Refer to "Service Points of Installation". |
| | | (4) | ◆ : Non-reusable parts |

N03HBAF



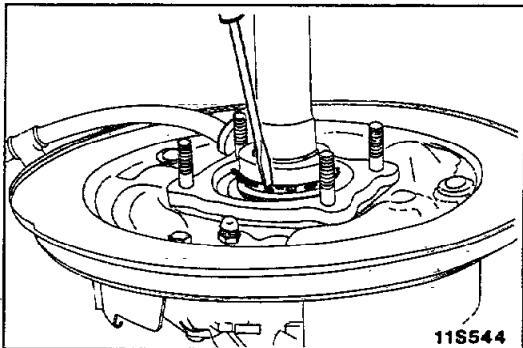
SERVICE POINTS OF REMOVAL

3. DISCONNECTION OF PARKING BRAKE CABLE END AND BRAKE SHOE ASSEMBLY

Refer to GROUP 5 – Parking Brake Cable.

4. DISCONNECTION OF BRAKE TUBES

Refer to P.3-15.



6. REMOVAL OF REAR AXLE SHAFT ASSEMBLY

Pull the rear axle shaft with rear brake assembly attached. If the rear axle shaft is hard to remove, use the special tools.

NOTE

Do not damage the oil seal during its removal.

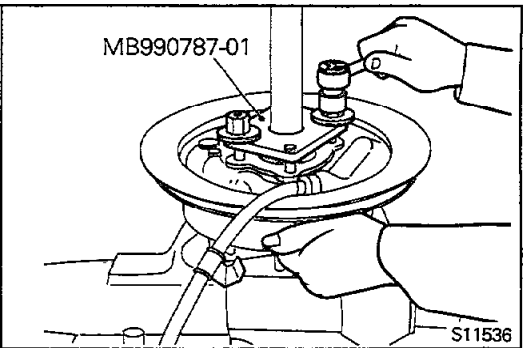
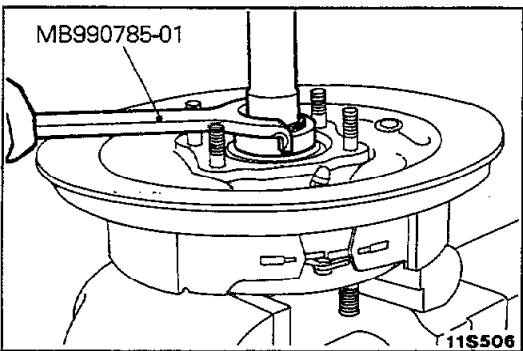
9. REMOVAL OF LOCK NUT

Remove the lock nut by following the steps below.

(1) Straighten the bent tab of the lock washer with the screwdriver.

(2) Remove the lock nut by using the special tool.

(3) Remove the lock washer and the washer.



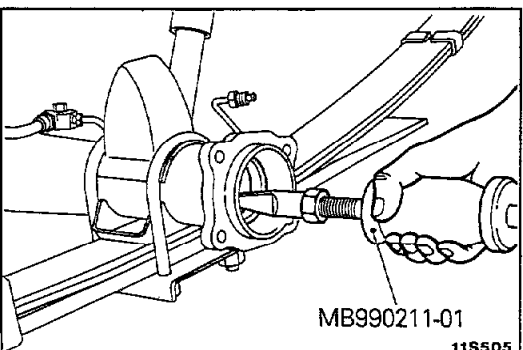
12. REMOVAL OF REAR AXLE SHAFT

(1) Reinsert the lock nut on the axle shaft approximately three turns.

(2) Install the special tool as figure to remove the rear axle shaft from the bearing case.

Be sure to install nuts and washers diagonally.

(3) Turn nuts with equal pressure to ensure smooth removal of the wheel bearing.



16. REMOVAL OF BEARING OUTER RACE

Using a hammer and drift, remove bearing outer race from bearing case.

17. REMOVAL OF OIL SEAL

Remove the oil seal from the end of rear axle housing with the special tool, if necessary.

INSPECTION

N03HCAA

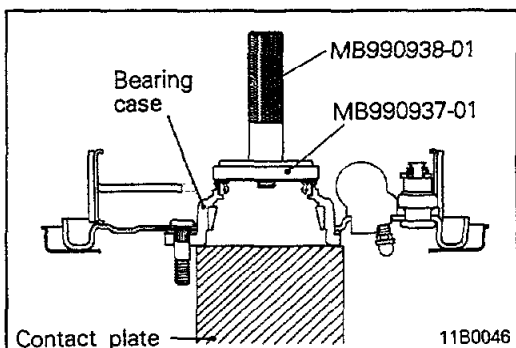
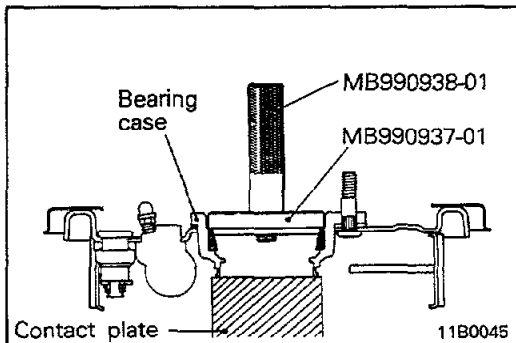
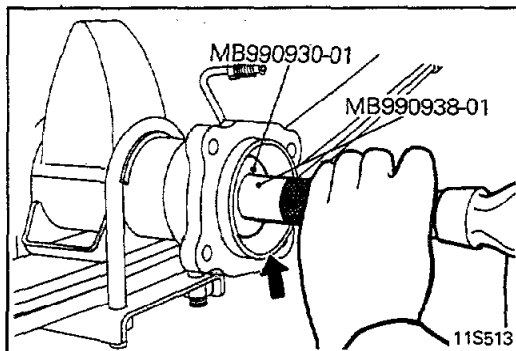
- Check the dust cover for deformation and damage.
- Check the oil seal for damage.
- Check the inner and outer bearings for seizure, discoloration and rough raceway surface.
- Check the axle shaft for cracks, wear and damage.

SERVICE POINTS OF INSTALLATION

N03HDAH

17. INSTALLATION OF OIL SEAL

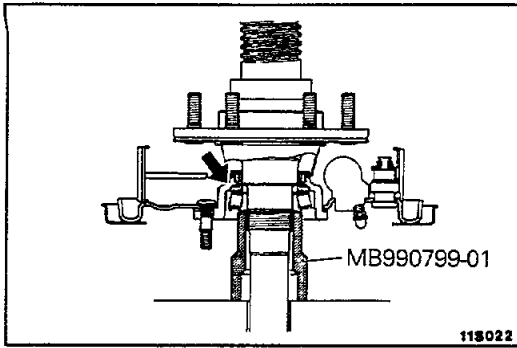
- (1) Apply the multipurpose grease to the oil seal fitting area of the rear axle housing.
- (2) Drive the new oil seal into the rear axle housing end by using the special tools.
- (3) Apply the multipurpose grease to the oil seal lip.

**16. INSTALLATION OF BEARING OUTER RACE**

- (1) Apply the multipurpose grease to the external surface of the bearing outer race.
- (2) Press-fit the bearing outer race into the bearing case by using special tools.

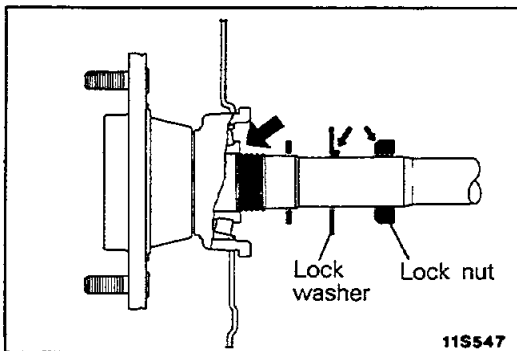
15. INSTALLATION OF OIL SEAL

- (1) Apply the multipurpose grease to the external surface of the new oil seal.
- (2) Press-fit the new oil seal into the bearing case until it is flush with the face of the bearing case by using special tools.
- (3) Apply the multipurpose grease to the lips of the oil seal.



13. INSTALLATION OF BEARING INNER RACE/12. REAR AXLE SHAFT

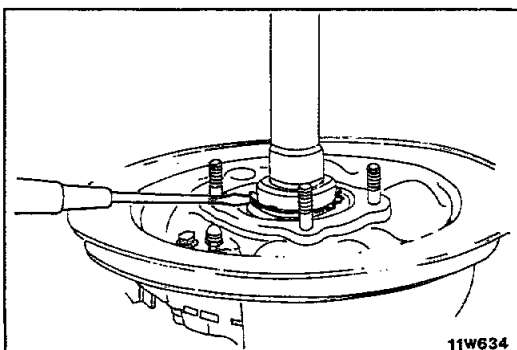
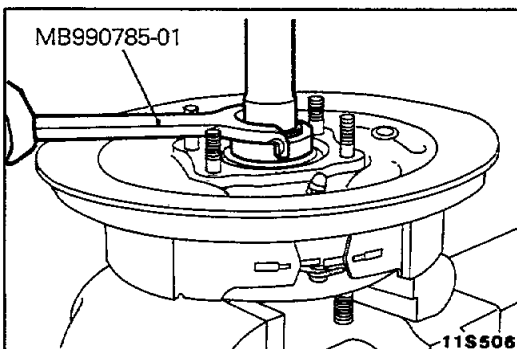
- (1) Apply the multipurpose grease to the roller surfaces of the bearing inner race.
- (2) Install the rear brake assembly attached with bearing case and the bearing inner race in that order to the axle shaft.
- (3) Press-fit the bearing inner race into the axle shaft by using special tool.
- (4) Pack the bearing case with the multipurpose grease.



11. INSTALLATION OF WASHER/10. LOCK WASHER/9. LOCK NUT

Install these parts with cares described below.

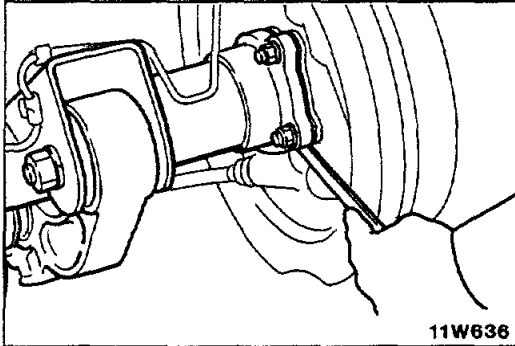
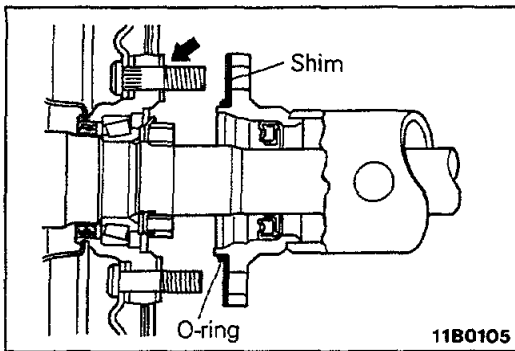
- (1) Apply the multipurpose grease to the thread portion of the axle shaft, to which the locking nut is installed.
- (2) Align the washer tab with the slot of the axle shaft to install the washer.
- (3) Align the lock washer tab with the slot of the axle shaft to install the lock washer as figure.
- (4) Install the lock nut with its chamfering in the directions shown in the illustration.
- (5) Tighten the lock nut to the specified torque by using the special tool.



- (6) Bend the tab of the lock washer into the slot of the lock nut.

NOTE

If the slot in the lock nut and the tab of the lock washer are out of alignment, turn the lock nut in until they are in alignment.



● ADJUSTMENT OF AXLE SHAFT END PLAY

Adjust the clearance between the bearing case and rear axle housing end by the following procedure.

- (1) Insert a 1 mm (.04 in.) thick shim and O-ring into the left side rear axle housing.
- (2) Apply the specified sealant to the mating surface of bearing case, install the left axle shaft into rear axle housing and tighten the nuts.

NOTE

Tighten the nuts in diagonal sequence.

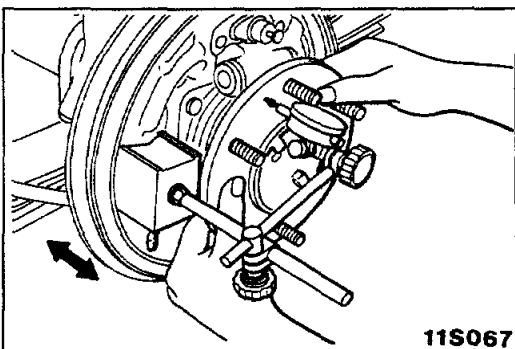
**Specified sealant: 3M ART Part No. 8663
or equivalent**

- (3) Install the right axle shaft without a shim (s) and O-ring and temporarily tighten to about 6 Nm (4.3 ft.lbs.).
- (4) Measure the clearance between the bearing case and rear axle housing end with a feeler gage.
- (5) Select shims of the thickness which is equal to the sum of the measured clearance and 0.05–0.20 mm (.0020–.0079 in.)
- (6) Remove the right axle shaft, and install shim (s) and O-ring on the right side rear axle housing end.
- (7) Apply the specified sealant to the mating surface of bearing case, install the right axle shaft into rear axle housing and tighten the nut.

**Specified sealant: 3M ART Part No. 8663
or equivalent**

NOTE

Tighten the nuts in diagonal sequence.



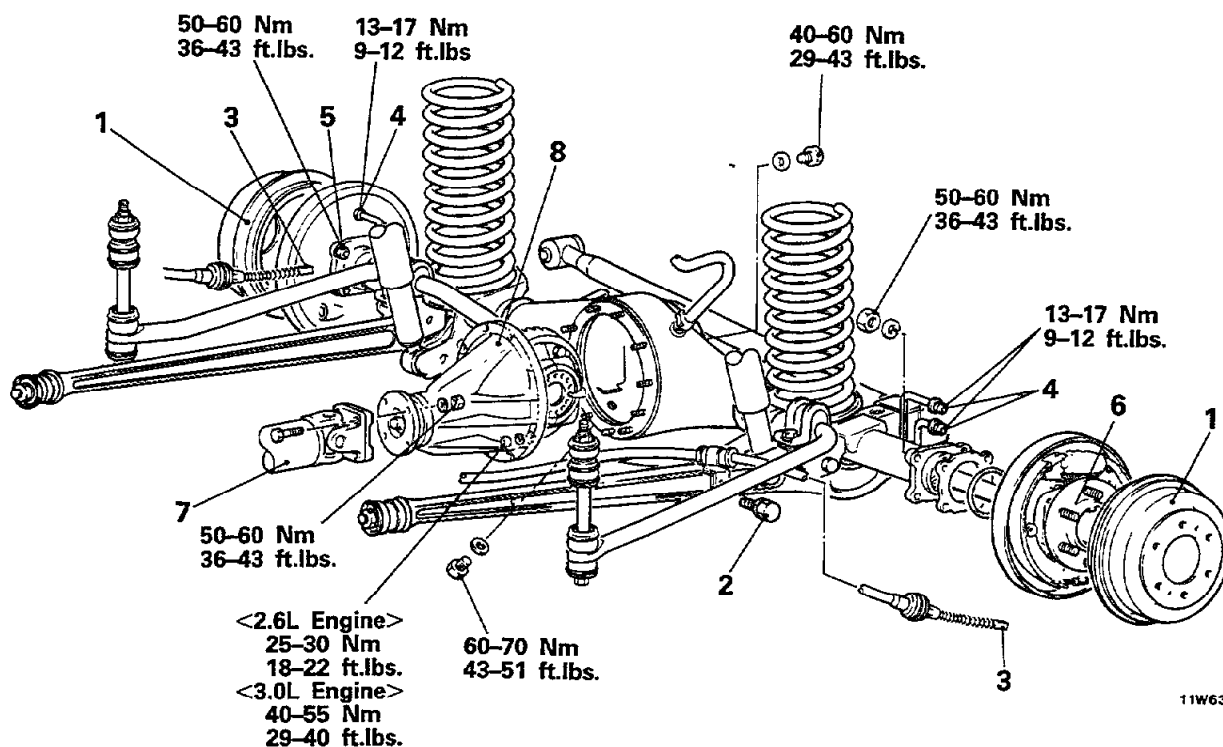
- (8) Check to assure that the axle shaft axial play is within the standard value.

Standard value : 0.05–0.20 mm (.0020–.0079 in.)

3. CONNECTION OF PARKING BRAKE CABLE END AND BRAKE SHOE ASSEMBLY

Refer to GROUP 5 – Parking Brake Cable.

DIFFERENTIAL CARRIER REMOVAL AND INSTALLATION



Pre-removal Operation

- Drain of Differential Gear Oil

Post-installation Operation

- Air Bleeding from Brake Lines (Refer to GROUP 5 - Service Adjustment Procedures)
- Adjustment of Parking Brake Lever Stroke (Refer to GROUP 5 - Service Adjustment Procedures)
- Filling of Differential Gear Oil (Refer to P.3-11.)

Removal steps

1. Brake drums
2. Parking brake cable attaching bolts
3. Connection of parking brake cable end and brake shoe assembly
4. Connection of brake tubes
5. Nuts
6. Rear axle shaft assembly
7. Rear propeller shaft
8. Differential carrier

NOTE

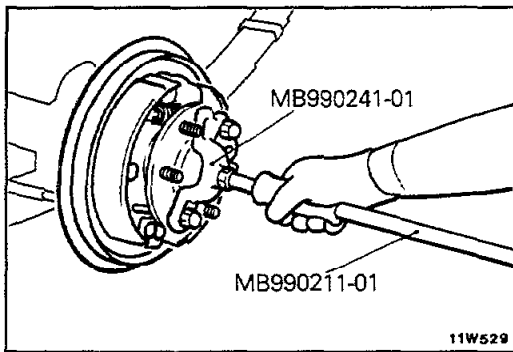
- (1) Reverse the removal procedures to reinstall.
- (2) ◀▶ : Refer to "Service Points of Removal".
- (3) ▶▶ : Refer to "Service Points of Installation".

SERVICE POINTS OF REMOVAL

N031BAF

3. DISCONNECTION OF PARKING BRAKE CABLE END AND BRAKE SHOE ASSEMBLY

Refer to GROUP 5 - Parking Brake Cable.



4. DISCONNECTION OF BRAKE TUBES

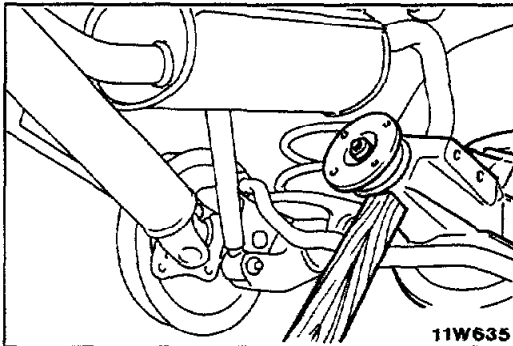
Refer to P.3-15.

6. REMOVAL OF REAR AXLE SHAFT ASSEMBLY

Pull out the right and left axle shafts by about 70 mm (2.8 in.). If it is hard to pull out, use the special tools.

7. REMOVAL OF REAR PROPELLER SHAFT

Refer to P.3-15.

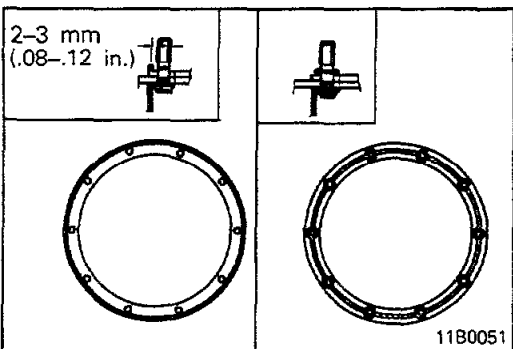


8. REMOVAL OF DIFFERENTIAL CARRIER

Remove the attaching nuts and strike the lower part of differential carrier assembly with a square lumber several times, to remove the assembly.

Caution

- (1) Do not remove the uppermost nut but keep it loosened all the way to the stud bolt end.
- (2) Use care not to strike the companion flange.



SERVICE POINTS OF INSTALLATION

N03IDAF

8. APPLICATION OF SEALANT TO DIFFERENTIAL CARRIER

When the differential carrier is installed, apply specified sealant to the differential carrier mounting surface of the axle housing as illustrated in either of the illustrations.

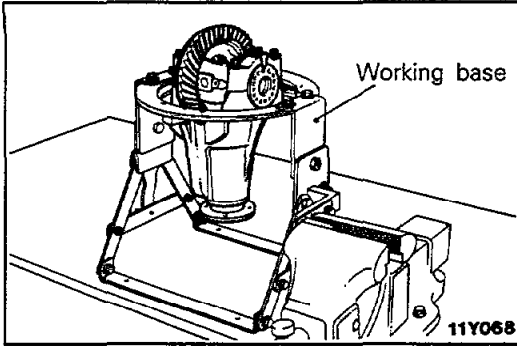
Specified sealant: 3M ART Part No. 8663 or equivalent

7. INSTALLATION OF REAR PROPELLER SHAFT

Refer to P.3-15.

3. CONNECTION OF PARKING BRAKE CABLE END AND BRAKE SHOE ASSEMBLY

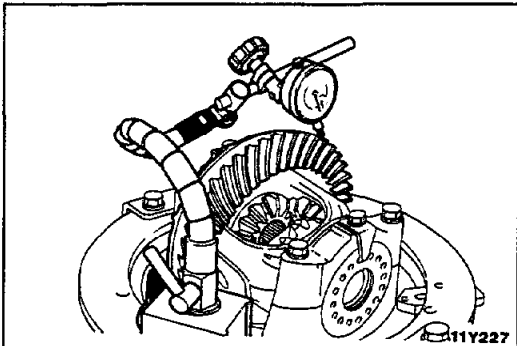
Refer to GROUP 5 – Parking Brake Cable.



INSPECTION BEFORE DISASSEMBLY

N031EAA

Secure the working base in a vice and then install the removed differential carrier assembly.



FINAL DRIVE GEAR BACKLASH

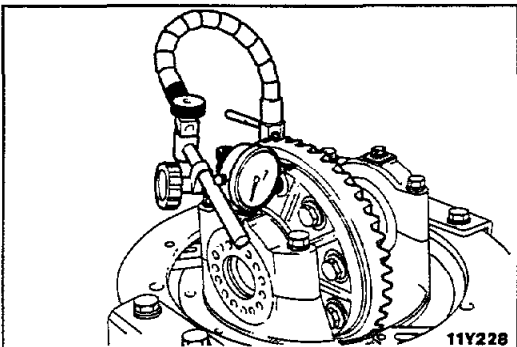
With the drive pinion locked in place, measure the final drive gear backlash with a dial indicator on the drive gear.

NOTE

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

Standard value :

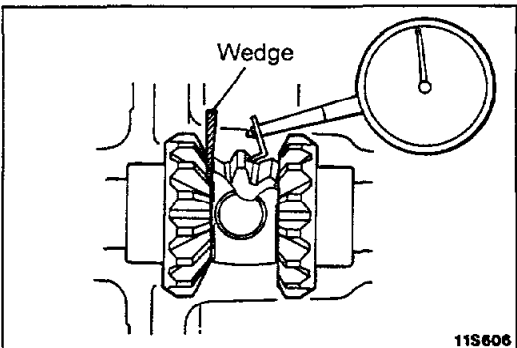
- <2.6L Engine>
0.11–0.16 mm (.0043–.0063 in.)
- <3.0L Engine>
0.13–0.18 mm (.0051–.0071 in.)



DRIVE GEAR RUNOUT

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

Limit : 0.05 mm (.0020 in.)



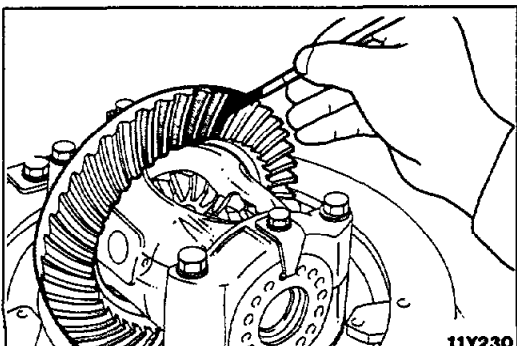
DIFFERENTIAL GEAR BACKLASH (CONVENTIONAL DIFFERENTIAL)

While locking the side gear with the wedge, measure the differential gear backlash with a dial indicator on the pinion gear.

Standard value :

- <2.6L Engine>
0.010–0.076 mm (.0004–.0030 in.)
- <3.0L Engine>
0–0.076 mm (0–.0030 in.)

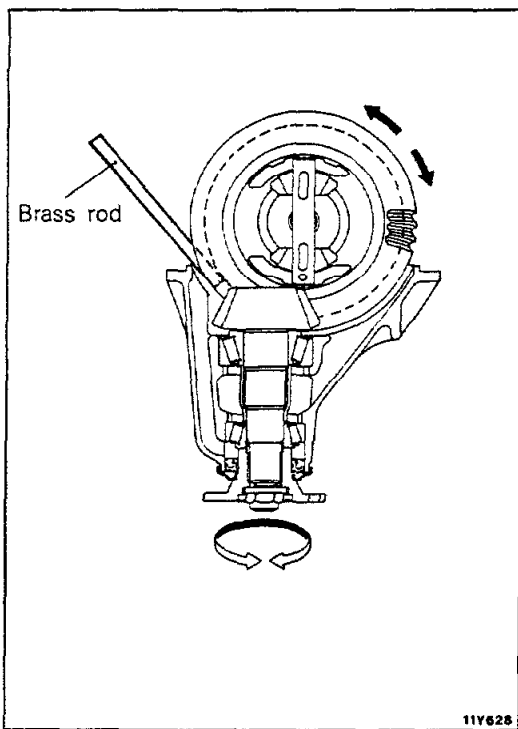
Limit : 0.2 mm (.008 in.)



FINAL DRIVE GEAR TOOTH CONTACT

Check the final drive gear tooth contact by following the steps below.

- (1) Apply a thin, uniform coat of machine blue to both surfaces of the drive gear teeth.



- (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 the revolution torque [approximately 2.5–3.0 Nm (1.8–2.2 ft.lbs.)] 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 condition of the drive gear and drive pinion.

NOTE

Checking the tooth contact pattern is the way to confirm that the adjustments of the pinion height and backlash have been done properly. Continue to adjust the pinion height and backlash until the tooth contact pattern resembles the standard pattern.

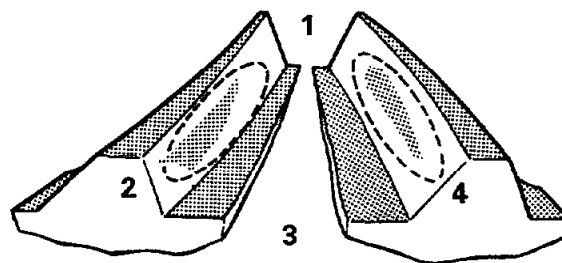
If, after adjustments have been made, the correct tooth contact pattern cannot be obtained, it means that the drive gear and the drive pinion have become worn beyond the allowable limit. Replace the gear set.

Caution

If either the drive gear or the drive pinion is to be replaced, be sure to replace both gears as a set.

Standard tooth contact pattern

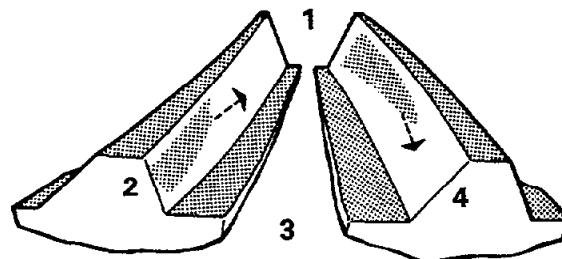
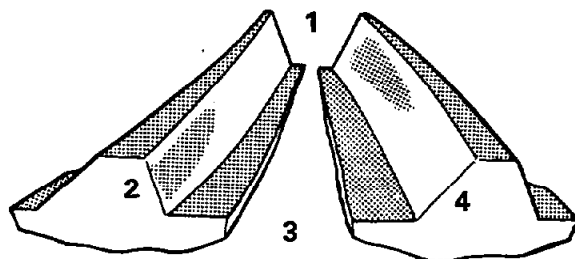
- 1 Toe
- 2 Drive-side
- 3 Heel
- 4 Coast-side



Problem

Solution

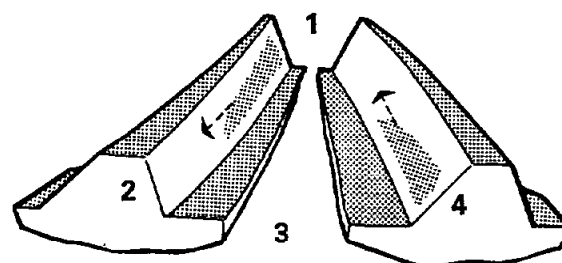
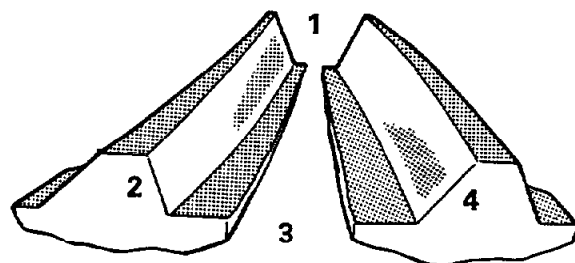
Tooth contact pattern resulting from excessive pinion height



The drive pinion is positioned too far from the center of the drive gear.

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, position the drive gear farther from the drive pinion.

Tooth contact pattern resulting from insufficient pinion height



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 farther from the center of the drive gear. Also, for backlash adjustment, position the drive gear closer to the drive pinion.

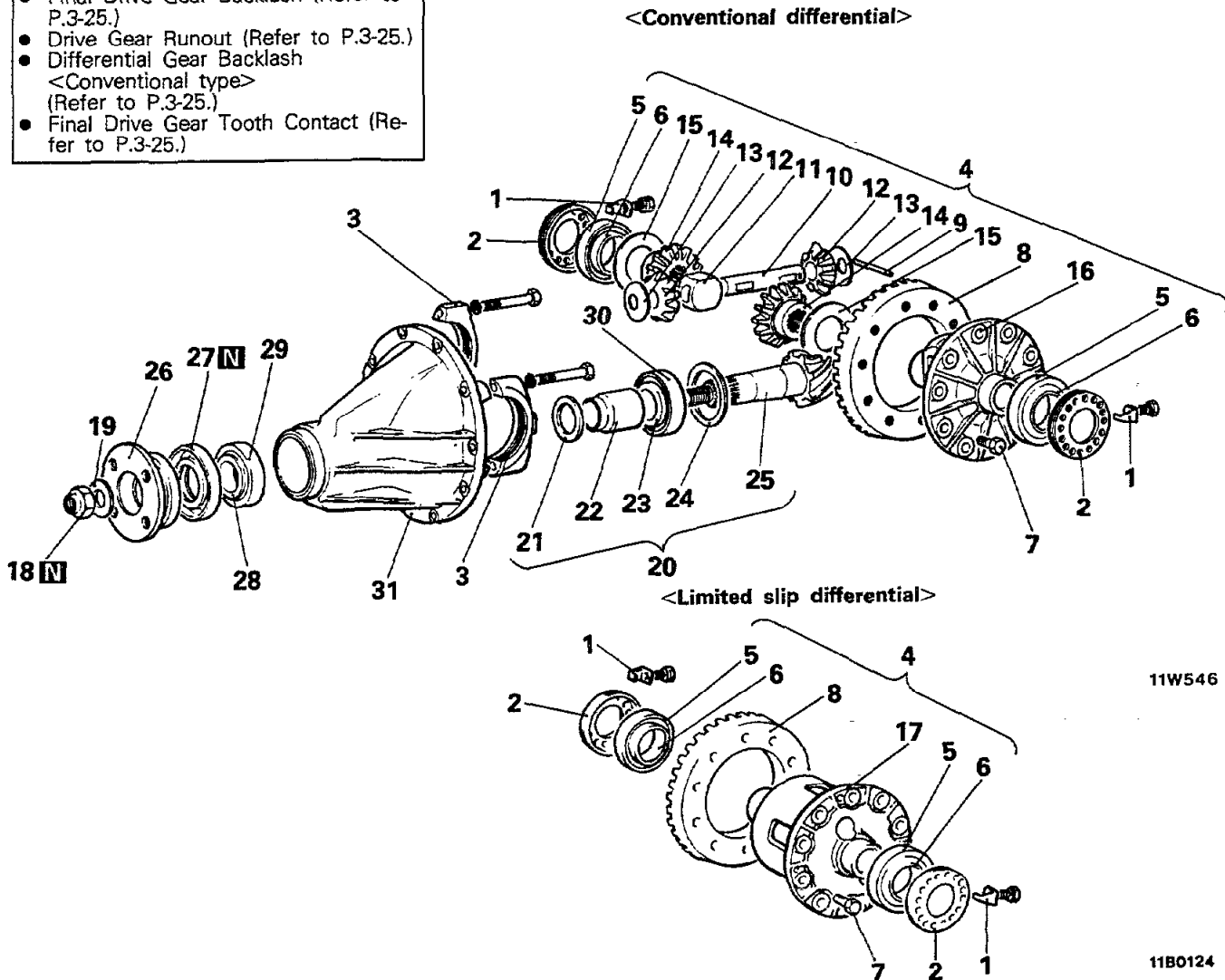
11S642

N03IF-

DISASSEMBLY

Inspection Before Disassembly

- Final Drive Gear Backlash (Refer to P.3-25.)
- Drive Gear Runout (Refer to P.3-25.)
- Differential Gear Backlash <Conventional type> (Refer to P.3-25.)
- Final Drive Gear Tooth Contact (Refer to P.3-25.)



11W546

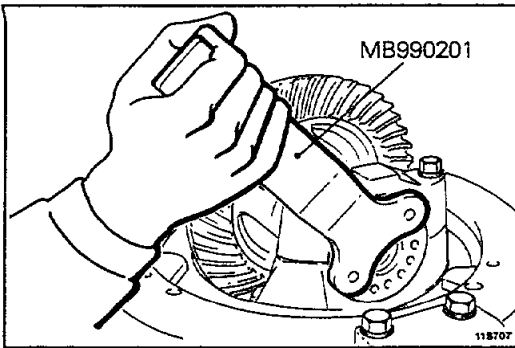
11B0124

Disassembly steps

- | | |
|---|---|
| 1. Lock plates | |
| ↔ 2. Side bearing nuts | |
| ↔ 3. Bearing caps | |
| ↔ 4. Differential case assembly | |
| ↔ 5. Side bearing outer races | |
| ↔ 6. Side bearing inner races | |
| ↔ 7. Bolts (10) | |
| ↔ 8. Drive gear | |
| ↔ 9. Lock pin | |
| 10. Pinion shaft | |
| 11. Thrust block | |
| 12. Pinion gears | |
| 13. Pinion washers | |
| 14. Side gears | |
| 15. Side gear thrust spacers | |
| 16. Differential case | |
| 17. Limited slip differential case assembly | |
| ↔ 18. Self-locking nut | |
| 19. Washer | |
| | ↔ 20. Drive pinion assembly |
| | 21. Drive pinion front shim (for preload adjustment) |
| | 22. Drive pinion spacer |
| | ↔ 23. Drive pinion rear bearing inner race |
| | ↔ 24. Drive pinion rear shim (for pinion height adjustment) |
| | 25. Drive pinion |
| | 26. Companion flange |
| | 27. Oil seal |
| | 28. Drive pinion front bearing inner race |
| | ↔ 29. Drive pinion front bearing outer race |
| | ↔ 30. Drive pinion rear bearing outer race |
| | 31. Differential carrier |

NOTE

- (1) ↔ : Refer to "Service Points of Disassembly".
- (2) [N] : Non-reusable parts

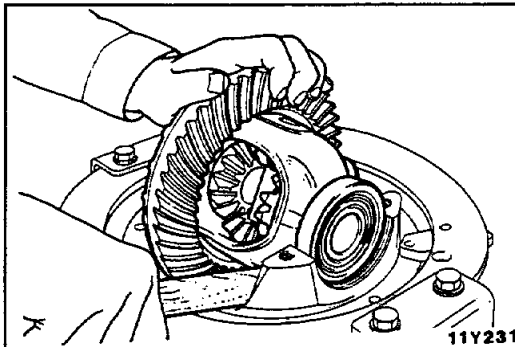


SERVICE POINTS OF DISASSEMBLY

N03IGAA

2. REMOVAL OF SIDE BEARING NUT

Using the special tool, remove the side bearing nut.

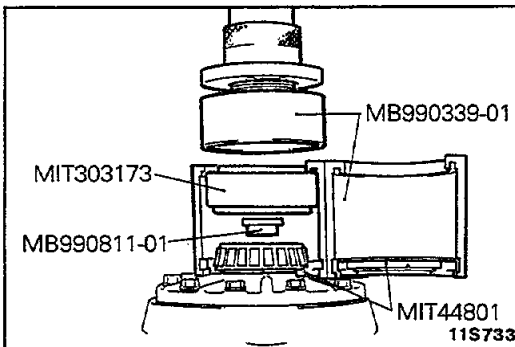


4. REMOVAL OF DIFFERENTIAL CASE ASSEMBLY

Take out the differential case assembly with hammer handles.

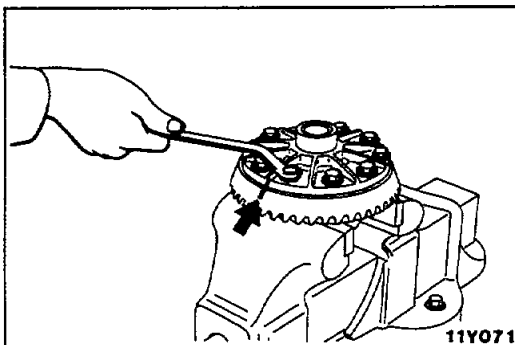
NOTE

Keep the right and left side bearings and side bearing nuts separate, so that they do not become mixed at the time of reassembly.



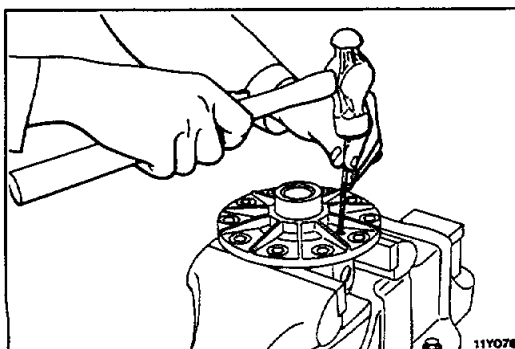
6. REMOVAL OF SIDE BEARING INNER RACE

Pull out the side bearing inner races by using the special tools.



8. REMOVAL OF DRIVE GEAR

- (1) Make the mating marks to the differential case and the drive gear.
- (2) Loosen the drive gear attaching bolts in diagonal sequence to remove the drive gear.

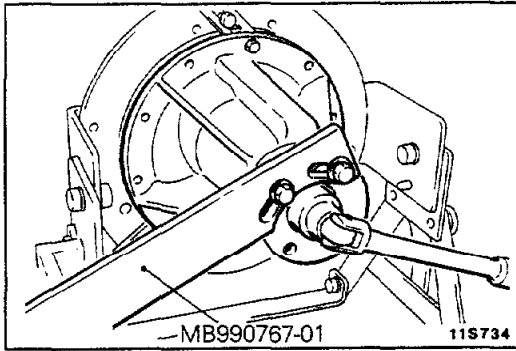


9. DRIVE-OUT OF LOCK PIN

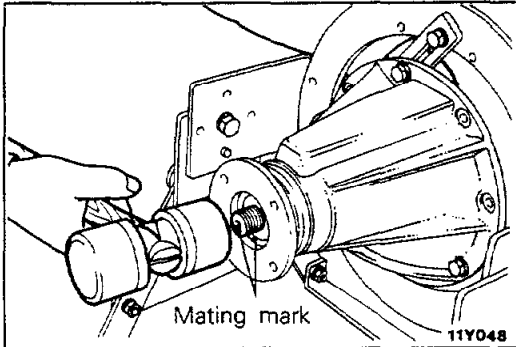
Drive out the lock pin with a punch.

NOTE

The removed side gears and side gear thrust spacers, left and right, should be retained for reassembly.

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

Use the special tool to hold the companion flange and remove the companion flange self-locking nut.

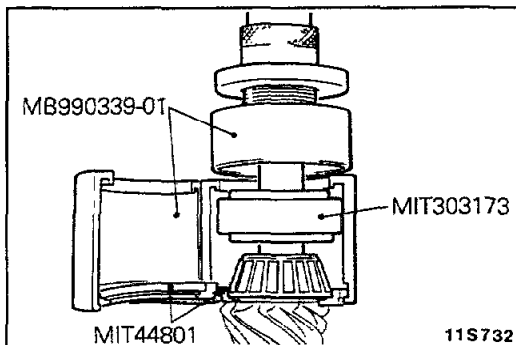
**20. REMOVAL OF DRIVE PINION ASSEMBLY**

- (1) Make the mating marks to the drive pinion and companion flange.

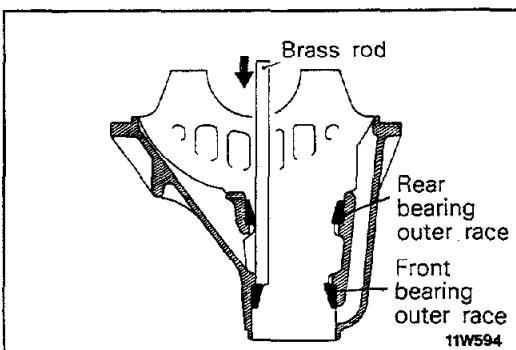
Caution

The mating mark made on the companion flange must not be on the coupling surface of the flange yoke and the rear propeller shaft.

- (2) Drive out the drive pinion together with the drive pinion spacer and drive pinion front shims.

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

Pull out the drive pinion rear bearing inner race by using the special tools.

**29. REMOVAL OF DRIVE PINION FRONT BEARING OUTER RACE/30. DRIVE PINION REAR BEARING OUTER RACE**

Drive out the drive pinion front bearing outer race from the gear carrier.

INSPECTION

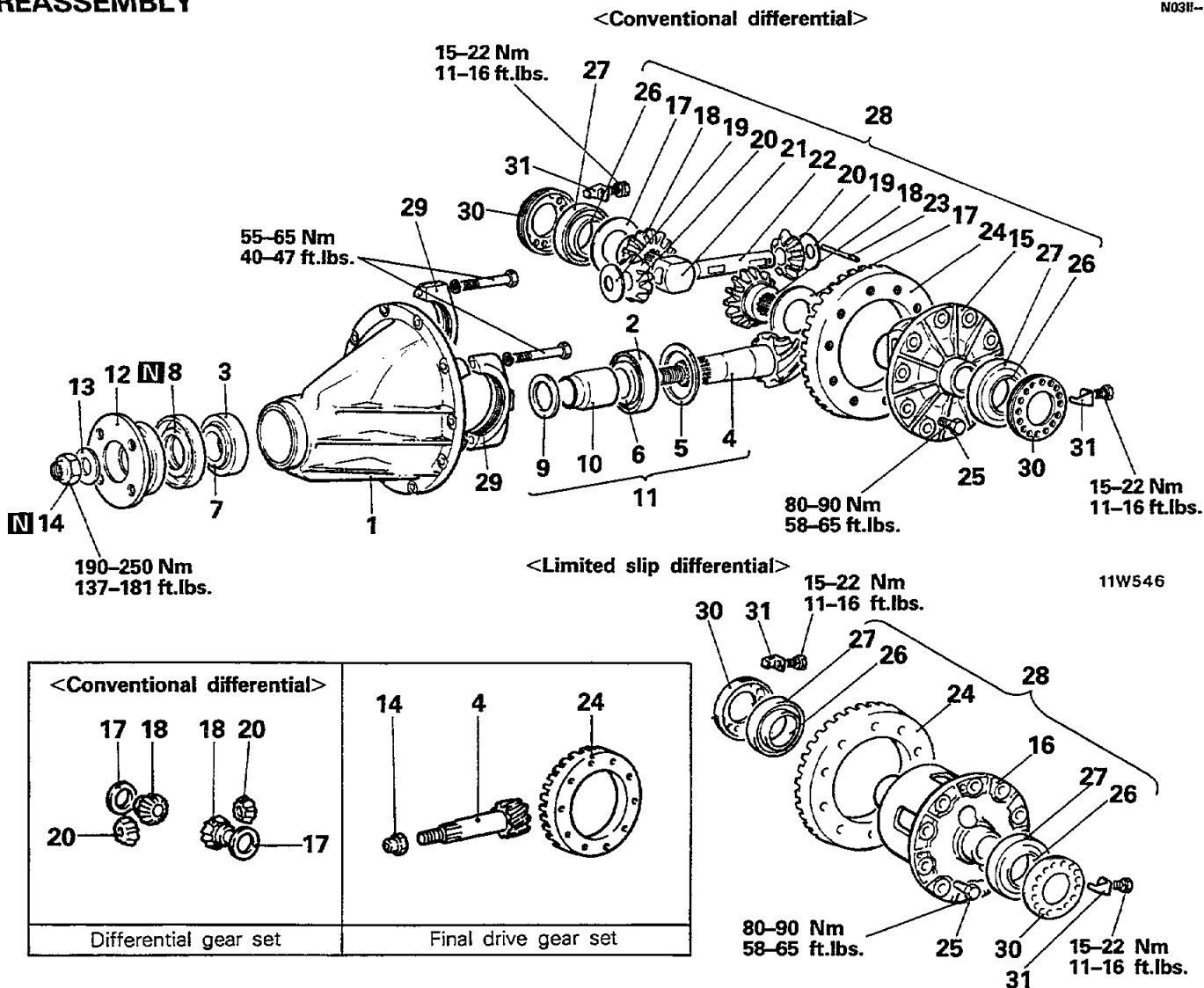
N03IHAC

Wash the disassembled parts in cleaning solvent, dry them using compressed air, and then check the following areas:

- Check the companion flange for wear or damage.
 - Check the oil seal for wear or deterioration.
 - Check the bearings for wear or discoloration.
 - Check the gear carrier for cracks.
 - Check the drive pinion and ring gear for wear or cracks.
 - Check the side gears, pinion gears and pinion shaft for wear or damage.
- <conventional type>
- Check the side gear spline for wear or damage. <conventional type>

REASSEMBLY

N0311-



11W546

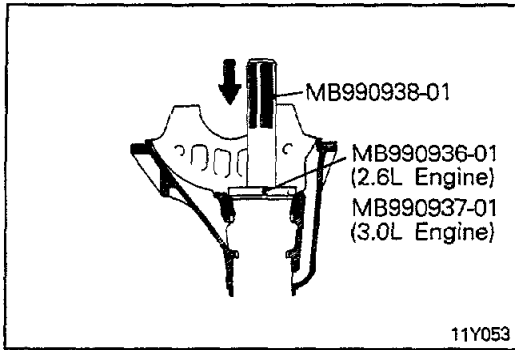
11B0124

Reassembly steps

- | | |
|--|---|
| <ul style="list-style-type: none"> 1. Differential carrier ▶▶ 2. Drive pinion rear bearing outer race ▶▶ 3. Drive pinion front bearing outer race ▶▶ Adjustment of pinion height 4. Drive pinion 5. Drive pinion rear shim (for pinion height adjustment) ▶▶ 6. Drive pinion rear bearing inner race ▶▶ Adjustment of drive pinion preload 7. Drive pinion front bearing inner race 8. Oil seal 9. Drive pinion front shim (for preload adjustment) 10. Drive pinion spacer 11. Drive pinion assembly 12. Companion flange 13. Washer 14. Self-locking nut 15. Differential case 16. Limited slip differential case assembly | <ul style="list-style-type: none"> 17. Side gear thrust spacers 18. Side gears 19. Pinion washers 20. Pinion gears ▶▶ Adjustment of differential gear backlash 21. Thrust block 22. Pinion shaft ▶▶ 23. Lock pin ▶▶ 24. Drive gear 25. Bolts (10) ▶▶ 26. Side bearing inner races 27. Side bearing outer races 28. Differential case assembly ▶▶ 29. Bearing caps ▶▶ Adjustment of final drive gear backlash 30. Side bearing nuts 31. Lock plates |
|--|---|

NOTE

- (1) ▶▶ : Refer to "Service Points of Reassembly".
- (2) N : Non-reusable parts

**SERVICE POINTS OF REASSEMBLY**

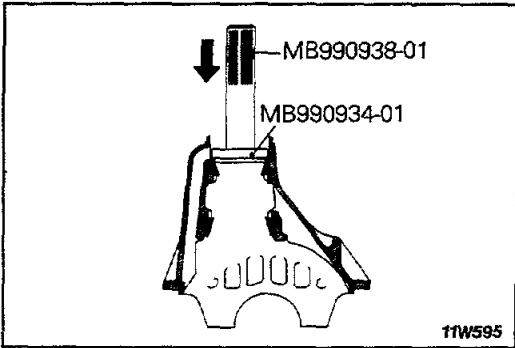
N03LJAE

2. INSTALLATION OF DRIVE PINION REAR BEARING OUTER RACE

Press-fit the drive pinion rear bearing outer race into the gear carrier by using special tools.

NOTE

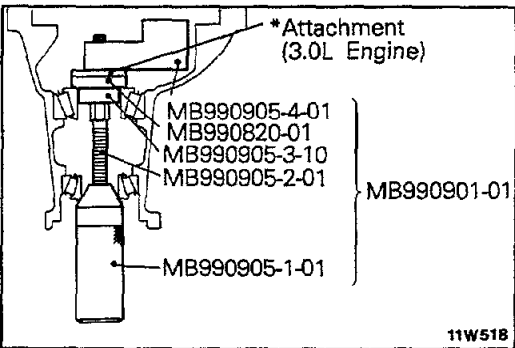
Perform press-fitting carefully so as not to tilt the outer race.

**3. INSTALLATION OF DRIVE PINION FRONT BEARING OUTER RACE**

Press-fit the drive pinion front bearing outer race into gear carrier by using special tools.

NOTE

Perform press-fitting carefully so as not to tilt the outer race.



- ADJUSTMENT OF PINION HEIGHT**

Adjust the drive pinion height by the following procedures:

- (1) Install special tools and drive pinion front and rear bearing inner races to the gear carrier in the sequence shown in the illustration.

For vehicles with 3.0L Engine, fit in an attachment with a thickness of 15 mm (.59 in.) above MB990820-01.

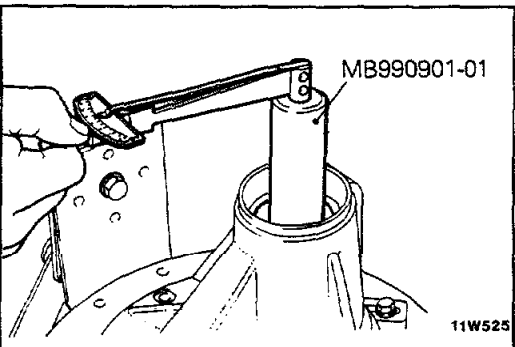
- (2) Tighten the nut of the special tool until the standard value of drive pinion turning torque is obtained.

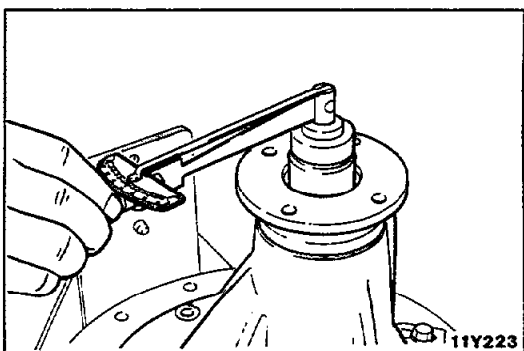
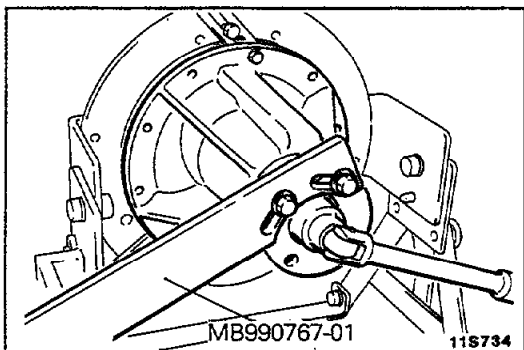
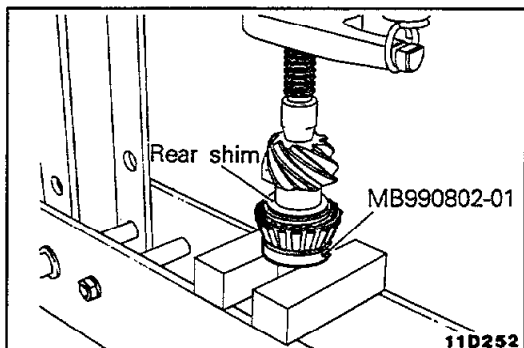
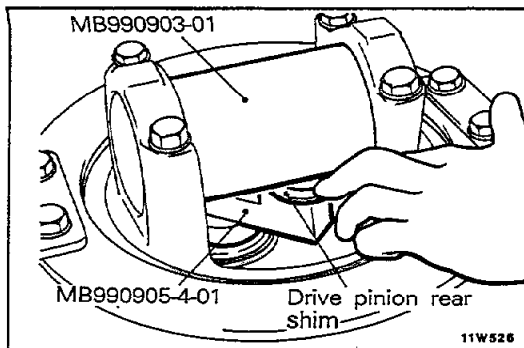
- (3) Measure the drive pinion turning torque (without the oil seal).

Standard value : 0.4–0.5 Nm (3.5–4.3 in.lbs.)

NOTE

1. Gradually tighten the nut of the special tool while checking the drive pinion turning torque.
2. Because one rotation cannot be made when the special tool is in contact with the gear carrier, move it a few times and, after seating the bearing, measure the rotation torque.





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

NOTE

Be sure to clean the side bearing seat thoroughly. When positioning the special tool, be sure that the cut-out sections of the special tool are in the position shown in the illustration, and also confirm that the special tool is in close contact with the side bearing seat.

When selecting the drive pinion rear shims, keep the number of shims to a minimum.

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

● **ADJUSTMENT OF DRIVE PINION PRELOAD**

Adjust the drive pinion turning torque by using the following procedure:

Without Oil Seal

- (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 by using the special tools.

NOTE

Do not install the oil seal.

- (3) Measure the drive pinion turning torque (without the oil seal)

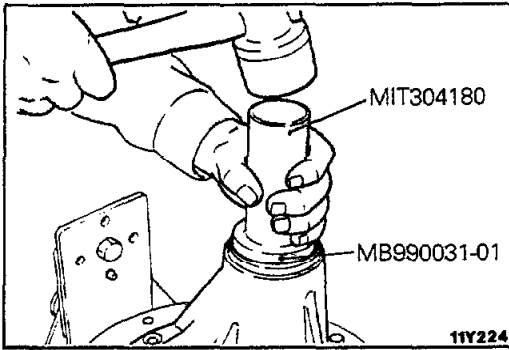
Standard value : 0.4–0.5 Nm (3.5–4.3 in.lbs.)

- (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.

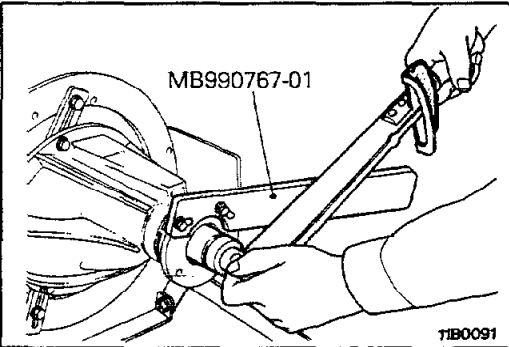
NOTE

When selecting the drive pinion front shims, if the number of shims is large, reduce the number of shims to a minimum by selecting the drive pinion spacers.

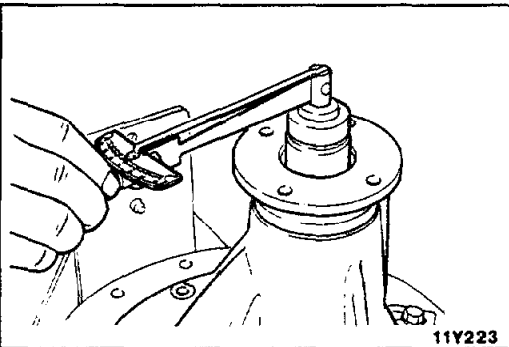
- (5) Remove the companion flange and drive pinion once again.

**With Oil Seal**

- (1) After setting the drive pinion front bearing inner race, drive the oil seal into the gear carrier front lip by using the special tool.
- (2) Apply multipurpose grease to the oil seal lip.

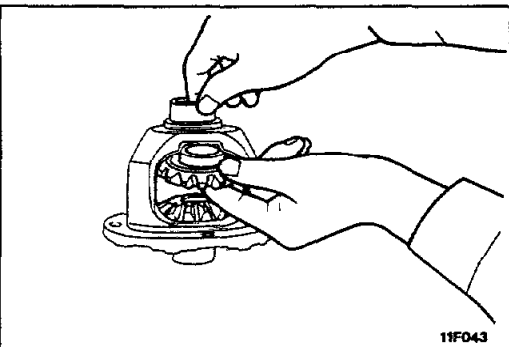


- (3) Install the drive pinion assembly and companion flange with mating marks properly aligned, and tighten the companion flange self-locking nut to the specified torque by using the special tools.



- (4) Measure the drive pinion turning torque (with oil seal) to verify that the drive pinion turning torque complies with the standard value.

Standard value : 0.65–0.75 Nm (5.6–6.5 in.lbs.)

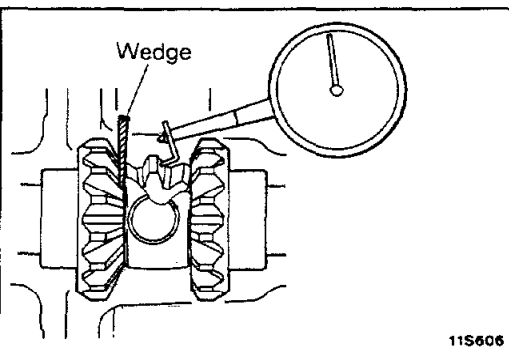


● **ADJUSTMENT OF DIFFERENTIAL GEAR BACKLASH**

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

NOTE

Do not drive in the lock pin yet.



- (3) Insert a wedge between the side gear and the pinion shaft to lock the side gear.
- (4) While locking the side gear with the wedge, measure the differential gear backlash with a dial indicator on the pinion gear.

Standard value :

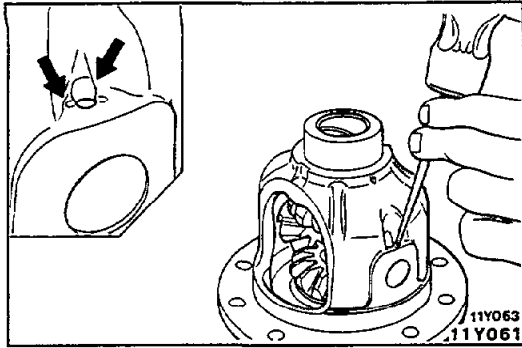
<2.6L Engine>

0.010–0.076 mm (.0004–.0030 in.)

<3.0L Engine>

0–0.076 mm (0–.0030 in.)

Limit : 0.2 mm (.008 in.)



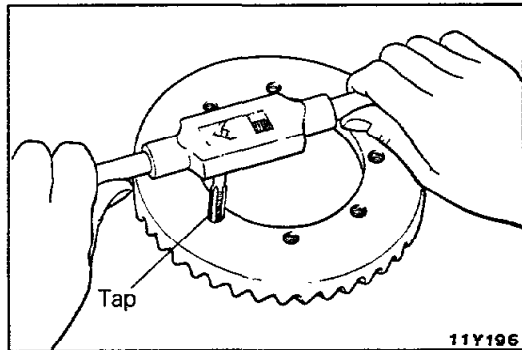
- (5) If the differential gear backlash exceeds the limit, adjust the backlash by installing thicker side gear thrust spacers.
- (6) Measure the differential gear backlash once again, and confirm that it is within the limit.
If adjustment is not possible, replace the side gears and pinion gears as a set.

23. INSTALLATION OF LOCK PIN

- (1) Align the pinion shaft lock pin hole with the differential case lock pin hole, and drive in the lock pin.
- (2) Stake the lock pin with a punch at two points.

24. INSTALLATION OF DRIVE GEAR

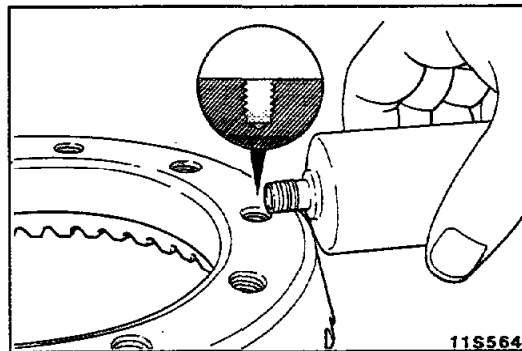
- (1) Clean the drive gear attaching bolts.
- (2) Remove the adhesive adhered to the threaded holes of the drive gear by turning the tap tool (M10 x 1.25), and then clean the threaded holes by applying compressed air.



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

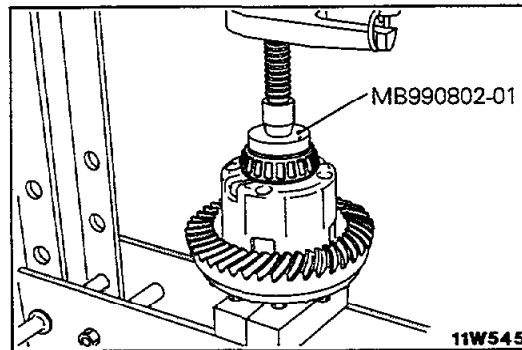
Specified adhesive : 3M adhesive stud locking 4170 or equivalent

- (4) Install the drive gear onto the differential case with the mating marks properly aligned. Be sure to tighten the bolts to the specified torque in a diagonal sequence.



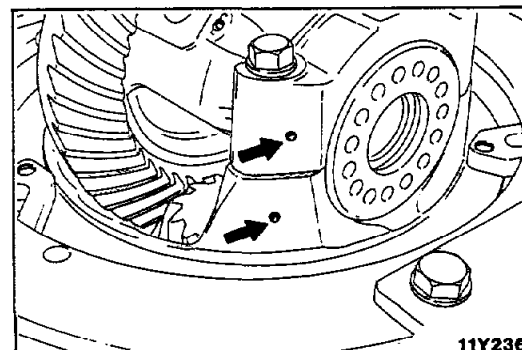
26. PRESS-FIT OF SIDE BEARING INNER RACE

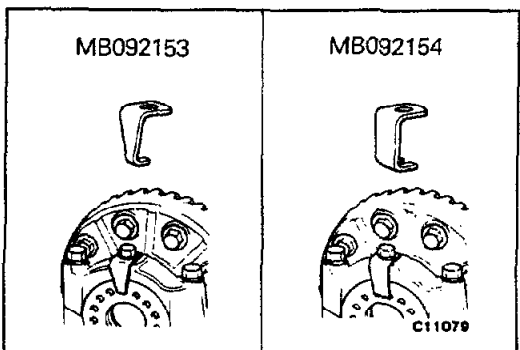
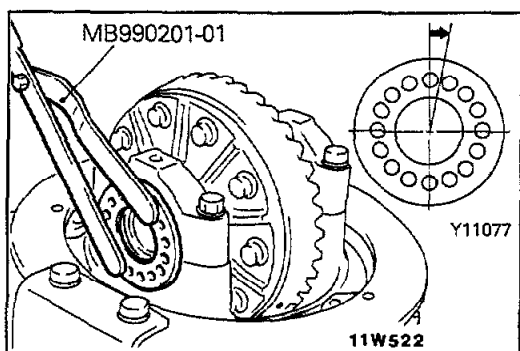
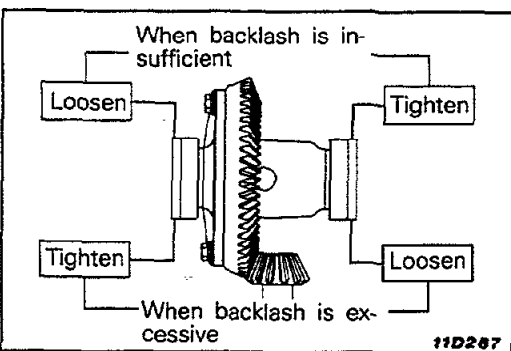
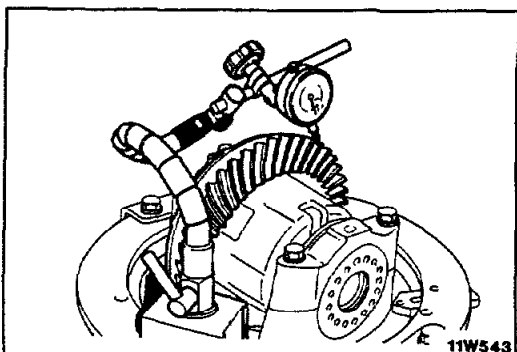
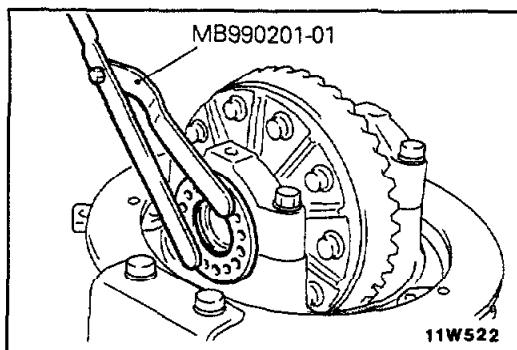
Press-fit the side bearing inner races to the differential case by using the special tool.



29. INSTALLATION OF BEARING CAP

Align the mating marks on the gear carrier and the bearing cap, and then tighten the bearing cap.





• ADJUSTMENT OF FINAL DRIVE GEAR BACKLASH

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

(2) Measure the final drive gear backlash.

Standard value :

<2.6L Engine>

0.11–0.16 mm (.0043–.0063 in.)

<3.0L Engine>

0.13–0.18 mm (.0051–.0071 in.)

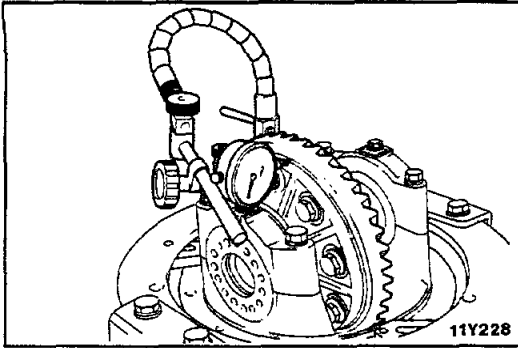
(3) Using the special tool (MB990201), adjust the backlash to standard value by moving the side bearing nut as shown.

NOTE

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

(4) Using the special tool, to apply the preload, turn down both right and left side bearing nuts on half the distance between centres of two neighbouring holes.

(5) Choose and install the lock plates (two kinds).



(6) Check the final tooth contact. If poor contact is evident, make adjustment. (Refer to P.3-25.)

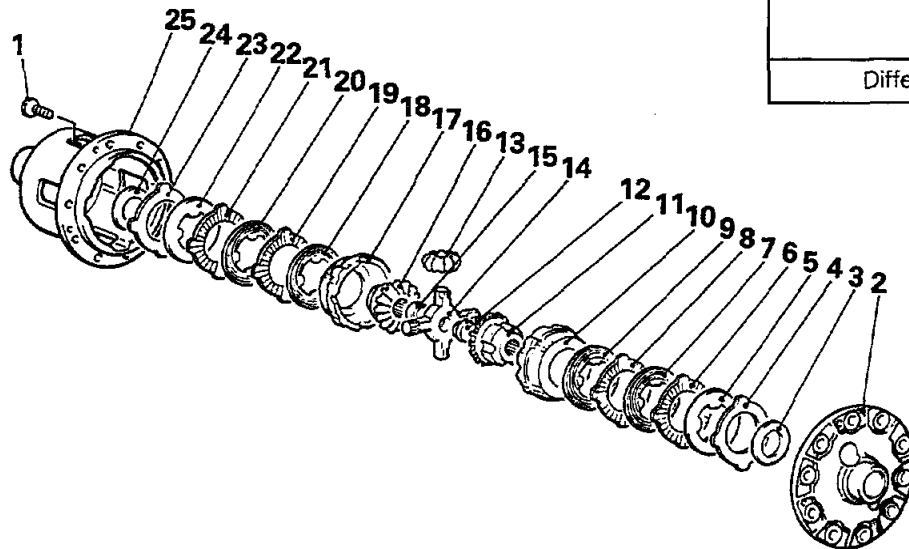
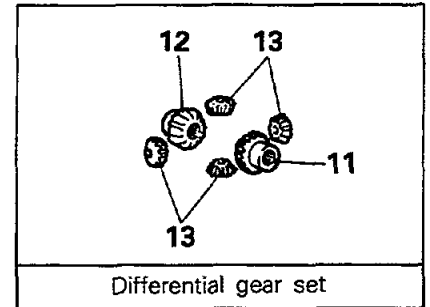
(7) Measure the drive gear runout.

Limit : 0.05 mm (.0020 in.)

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

OVERHAUL <Limited Slip Differential>

N0310-



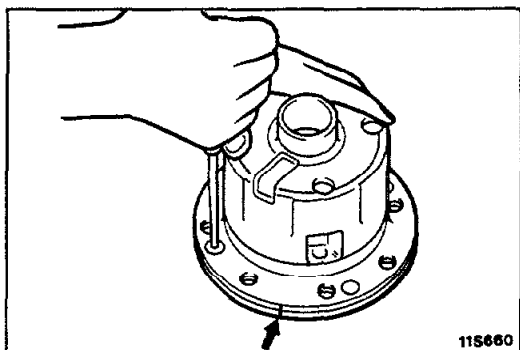
1180098

Disassembly steps

- ◄◄ 1. Screw
- 2. Differential case (A)
- 3. Thrust washer
- 4. Spring plate
- 5. Spring disc
- 6. Friction plate
- 7. Friction disc
- 8. Friction plate
- 9. Friction disc
- 10. Pressure ring
- 11. Side gear
- 12. Thrust block
- 13. Differential pinion gear
- 14. Differential pinion shaft
- 15. Thrust block
- 16. Side gear
- 17. Pressure ring
- 18. Friction disc
- 19. Friction plate
- 20. Friction disc
- 21. Friction plate
- 22. Spring disc
- 23. Spring plate
- 24. Thrust washer
- ◄◄ 25. Differential case (B)

NOTE

- (1) Reverse the disassembly procedures to reassemble.
- (2) ◄◄ : Refer to "Service Points of Disassembly".
- (3) ◄◄ : Refer to "Service Points of Reassembly".



11S660

SERVICE POINTS OF DISASSEMBLY

N031PAA

1. REMOVAL OF SCREW

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

NOTE

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

- (3) Remove the components from 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

N031QAA

- Check the side gears, pinion gears and pinion shaft for wear or damage.
- Check the side gear spline for wear or damage.

INSPECTION OF CONTACT AND SLIDING SURFACES OF PARTS

- (1) 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 by 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.

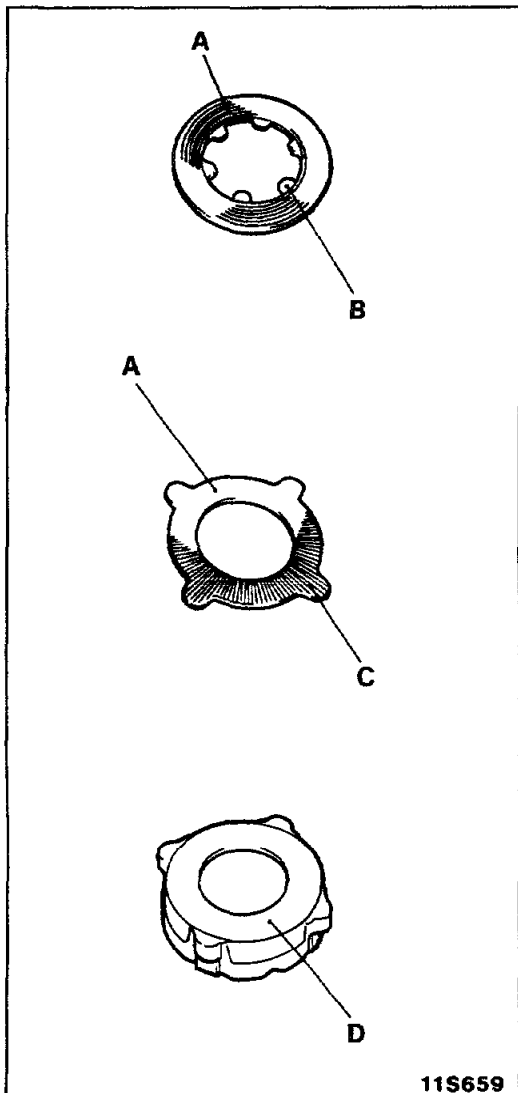
Repair the parts by using an oil stone; if the parts cannot be repaired, replace them.

D The friction surface of the friction disc of the pressure ring.

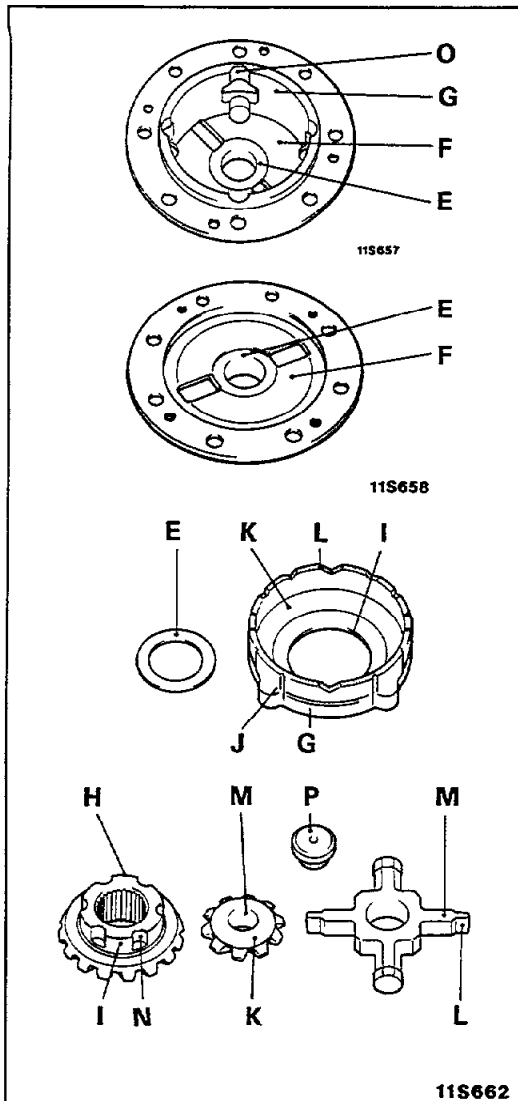
If there are nicks or scratches, repair the part by first grinding with an oil stone and then polishing with rubbing compound on a surface plate.

NOTE

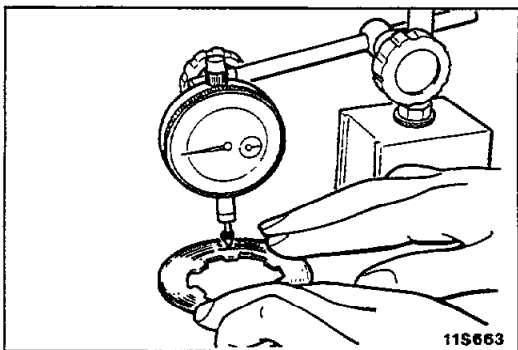
The strong contact on the inner circumference of the friction surface is because of the spring plate and the spring disc; this wear is not abnormal.



11S659



- (2) Inspect the contact and sliding surfaces listed below, and repair any nicks and burrs by 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.
 - P** The sliding surface of the thrust block.



INSPECTION FOR WARPING OF FRICTION PLATE 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 : 0.08 mm (.0031 in.)

INSPECTION FOR WEAR OF FRICTION PLATE AND FRICTION DISC

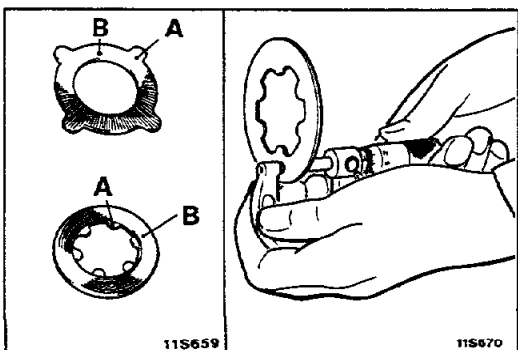
- (1) In order to measure the wear, measure the thickness of the friction surfaces and projections of the friction disc and plate, and then find the difference. (The same procedure is used for the spring discs and the spring plates.)

Limit : 0.1 mm (.004 in.)

NOTE

Make the measurement at several different points.

- (2) If the parts are worn beyond the allowable limit, replace them with new parts.

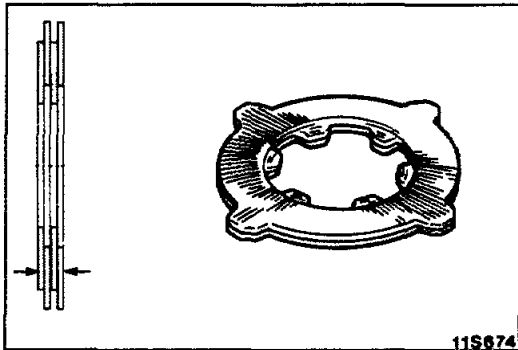


SERVICE POINTS OF REASSEMBLY

N031RAC

25. INSTALLATION OF DIFFERENTIAL CASE (B)

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.



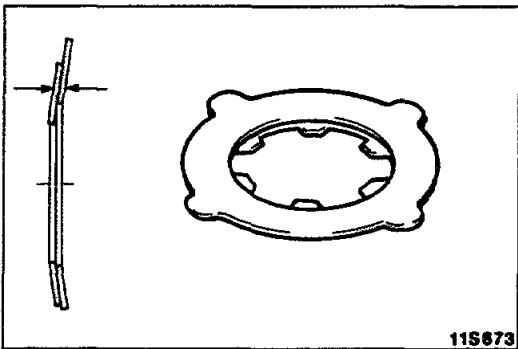
11S674

- (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 : 0.05 mm (.0020 in.) or less

NOTE

For new ones, there is one type of friction plate: 1.75 mm (.0689 in.); there are two types of friction disc: 1.75 mm (.0689 in.) and 1.85 mm (.0728 in.).

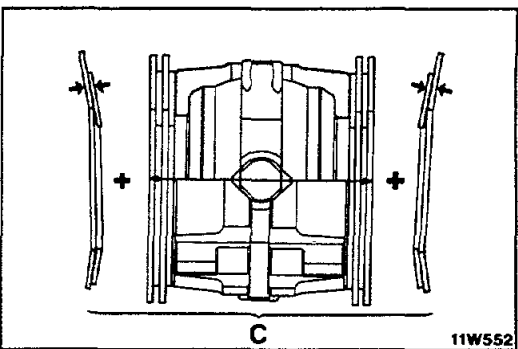


11S673

- (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.

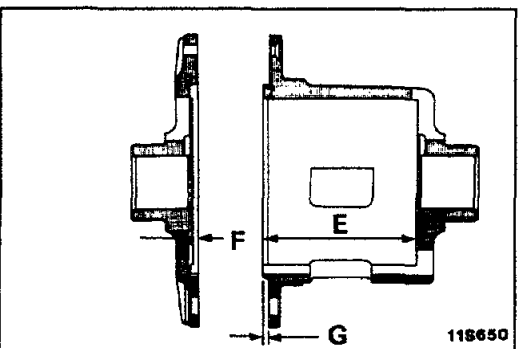
NOTE

For new ones, there is one type of spring disc and spring plate: 1.75 mm (.0689 in.).



11W552

- (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.



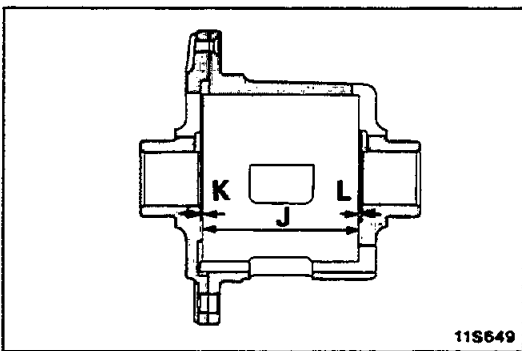
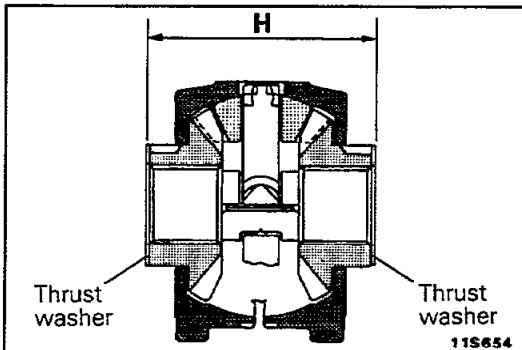
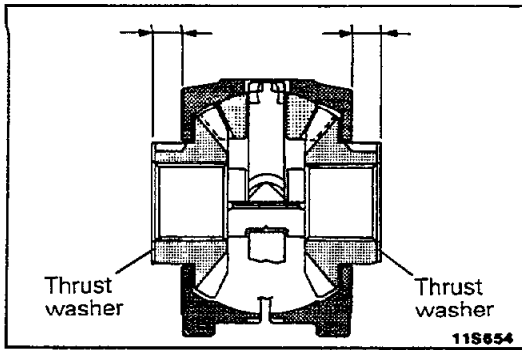
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- (5) Obtain the dimension (D) between the spring plate contact surfaces when differential cases (A) and (B) are combined.

$$D = E + F - G$$

- (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 : 0.06–0.20 mm (.0024–.0079 in.)



- (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 : 0.05 mm (.0020 in.) or less

NOTE

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

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

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

NOTE

Dimension J is the distance between the spring plate contact surfaces when differential cases (A) and (B) are combined. (Refer to P.3-40.)

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

Standard value : 0.05–0.20 mm (.0020–.0079 in.)

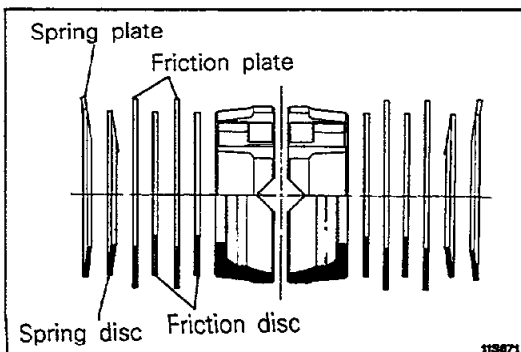
NOTE

1. 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.
2. There are three sizes of new thrust washers: 1.50 mm (.0591 in.), 1.60 mm (.0630 in.), and 1.70 mm (.0670 in.)

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

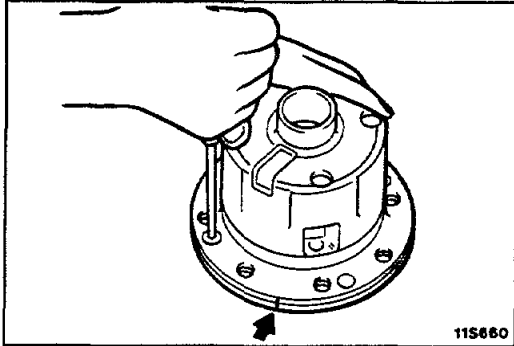
NOTE

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



Specified gear oil:
MOPAR Hypoid Gear Lubricant Part No. 4318058
plus MOPAR Hypoid Gear Oil Additive-Friction Modifier,
Part No. 4318060 or equivalent

2. 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.

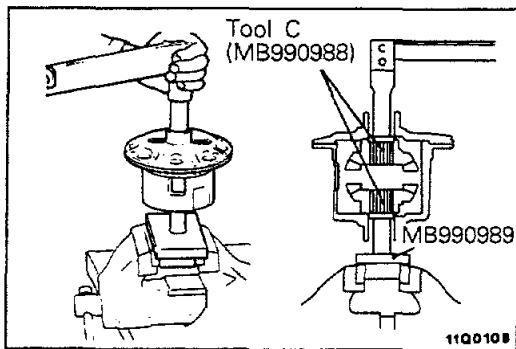


1. INSTALLATION OF SCREW

- (1) Align the mating marks (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.



- (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
65–100 Nm (47–72 ft.lbs.)

When an old clutch plate is used
35–100 Nm (25–72 ft.lbs.)

NOTE

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