
REAR AXLE

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120002222

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GENERAL INFORMATION

120002207

- The rear axle is a banjo-type semi-floating type. The axle shaft bearings are: Single-taper bearings for 2WD and 4WD (Panel van and window van). Double-taper bearings for vehicles with ABS and 4WD (Wagon) vehicles. ABS rotor is press-fitted to the axle shaft retainer ring.
- Differential gear has 5 different types. A torque-responsive mechanical-type limited slip differential has a high performance against driving on unstable surfaces such as muddy roads.

REAR AXLE

Item		2WD vehicles with 4G63 engine and standard wheel-base	2WD vehicles (other than those with 4G63 engine and standard wheel-base)	4WD – Panel van and window van	4WD – Wagon
Axle housing type		Banjo type	Banjo type	Banjo type	Banjo type
Axle shaft	Support method	Semi-floating type	Semi-floating type	Semi-floating type	Semi-floating type
	Axle diameter (bearing×centre×total length) mm	38.1 × 33.0 × 747.2 (44.0×33.0×744.5)	40.0 × 34.5 × 744.5	40.0 × 34.5 × 741.5 (44.0×34.5×744.5)	40.0 × 34.5 × 744.5
	Bearing type	Single-taper (double-taper)	Single-taper (double-taper)	Single-taper (double-taper)	Double-taper
	Bearing (outside dia.×inside dia.) mm	60.5 × 38.1 (80.0×40.0)	80.0 × 40.0	80.0 × 40.0	80.0 × 40.0

NOTE

() indicates vehicles with ABS.

DIFFERENTIAL

Item		2WD	2WD	2WD
		4G63 Standard wheelbase	4D56 Standard wheelbase	4G64
Drive gear type		Hypoid gear	Hypoid gear	Hypoid gear
Reduction ratio		4.875	4.222	4.636
Limited slip differential type		Torque-responsive mechanical type	Torque-responsive mechanical type	Torque-responsive mechanical type
Differential gear type (type × No. of teeth)	Side gear	Straight bevel gear × 2	Straight bevel gear × 2	Straight bevel gear × 2
	Pinion gear	Straight bevel gear × 2 (Straight bevel gear × 4)	Straight bevel gear × 2 (Straight bevel gear × 4)	Straight bevel gear × 2 (Straight bevel gear × 4)
Number of teeth	Drive gear	39	38	51
	Drive pinion	8	9	11
	Side gear	14	14	14
	Pinion gear	10	10	10
Bearing (O.D. × I.D.) mm	Side	73.4 × 41.3	80.0 × 45.2	80.0 × 45.2
	Front	64.3 × 30.2	68.3 × 30.2	68.3 × 30.2
	Rear	76.2 × 36.5	76.2 × 36.5	76.2 × 36.5

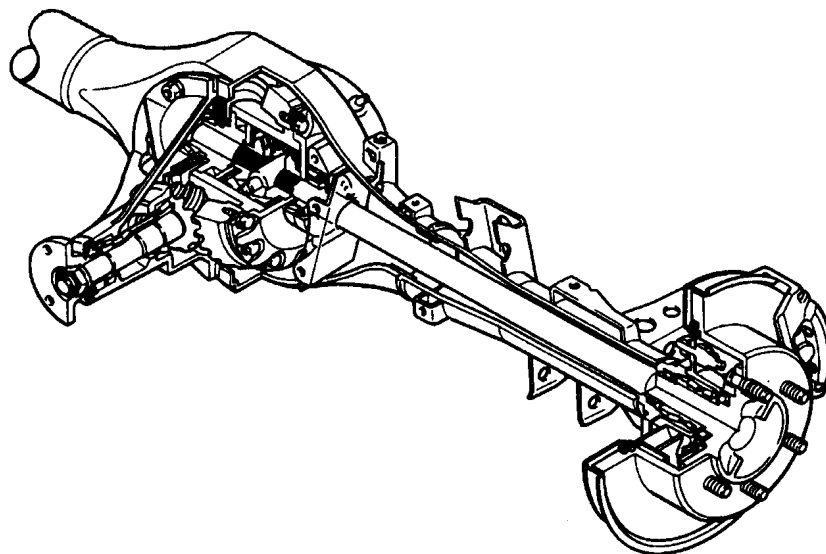
Item		2WD	2WD	4WD
		4D56 Long wheelbase	4G63 Long wheelbase	
Drive gear type		Hypoid gear	Hypoid gear	Hypoid gear
Reduction ratio		4.222	4.875	4.875
Limited slip differential type		Torque-responsive mechanical type	Torque-responsive mechanical type	Torque-responsive mechanical type
Differential gear type (type × No. of teeth)	Side gear	Straight bevel gear × 2	Straight bevel gear × 2	Straight bevel gear × 2
	Pinion gear	Straight bevel gear × 2 (Straight bevel gear × 4)	Straight bevel gear × 2 (Straight bevel gear × 4)	Straight bevel gear × 2 (Straight bevel gear × 4)
Number of teeth	Drive gear	38	39	39
	Drive pinion	9	8	8
	Side gear	19	14	14
	Pinion gear	10	10	10
Bearing (O.D. × I.D.) mm	Side	80.0 × 45.2	80.0 × 45.2	80.0 × 45.2
	Front	68.3 × 30.2	68.3 × 30.2	68.3 × 30.2
	Rear	79.4 × 36.5	76.2 × 36.5	76.2 × 36.5

NOTE

(): Vehicles with limited slip differential

CONSTRUCTION DIAGRAM

120000407



11W0052

SERVICE SPECIFICATIONS

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Item			Standard value	Limit
Axle shaft axial play mm		2WD (vehicles without ABS)	0.05–0.20	–
		2WD (vehicles with ABS) and 4WD	0–0.25	–
Rear axle total backlash mm			–	5
Limited slip differential preload Nm	2WD 4G63	Using special tool	17 or more	–
		Without using special tool	34 or more	–
	Except 2WD 4G63	Using special tool	13 or more	–
		Without using special tool	25 or more	–
Axle shaft retainer press-fitting force N	2WD 4G63 standard wheelbase (without ABS)		Initial press-fitting force 39,000 or more	–
			Final press-fitting force 59,000	–
	Except 2WD 4G63 standard wheelbase (without ABS)		Initial press-fitting force 49,000 or more	–
			Final press-fitting force 78,000	–
	4WD or 2WD (with ABS)		Initial press-fitting force 49,000 or more	–
			Final press-fitting force 98,000–108,000	–

Item			Standard value	Limit
Clearance between axle shaft retainer and snap ring mm			0–0.166	–
Drive gear runout mm			–	0.05
Drive gear backlash mm	4G63 Standard wheelbase		0.11–0.16	–
	4G63 Long wheelbase 4D56 Standard wheelbase 4G64		0.08–0.13	–
	4D56 Long wheelbase		0.13–0.18	–
Differential gear backlash mm	2WD 4G63 Standard wheelbase (without ABS)		0.01–0.076	0.2
	2WD 4G63 Standard wheelbase (with ABS) 4D56 Long wheelbase		0–0.076	0.2
	2WD 4G63 Long wheelbase 4D56 Standard wheelbase 4G64 4WD		0.01–0.25	0.2
Drive pinion turning torque Nm	Without oil seal	When replacing (with anti-rust agent)	0.6–0.9	–
		When replacing or reusing (with gear oil applied)	0.4–0.5	–
	With oil seal	When replacing (with anti-rust agent)	0.8–1.1	–
		When replacing or reusing (with gear oil applied)	0.6–0.7	–

Item			Standard value	Limit
Limited slip differential starting torque Nm	2WD 4G63	When a new clutch plate is used	49–78	–
		When re-installing current clutch plate	34–78	–
	Except 2WD vehicles with 4G63 engine	When a new clutch plate is used	39–74	–
		When re-installing current clutch plate	25–74	–
Friction plate and friction disc warping (flatness) mm			–	0.08
Friction plate and friction disc wear (difference in the thickness of the friction surface and the projections) mm			–	0.1
Horizontal difference between friction plate and friction disc thickness mm			0–0.05	–
Clearance between friction plate and friction disc mm	2WD 4G63		0.05–0.20	–
	Except 2WD vehicles with 4G63 engine		0.06–0.20	–
Difference between left and right dimensions from back thrust face of pressure ring to end of thrust washer mm		Except 2WD vehicles with 4G63 engine	0–0.05	–
Clearance in side gear axial direction mm		Except 2WD vehicles with 4G63 engine	0.05–0.20	–

LUBRICANTS

120002208

Item	Specified lubricants	Quantity		
Rear differential gear oil	<ul style="list-style-type: none"> Conventional differential: Hypoid gear oil API classification GL-5 or higher SAE viscosity No. 90, 80 W Limited slip differential: Hypoid gear oil MITSUBISHI Genuine Gear Oil Part No. 8149630 EX CASTROL HYPOY LS (GL-5, SAE 90), SHELL-LSD (GL-5, SAE 80W-90) or equivalent 	2WD	4G63 Standard wheelbase	1.2 dm ³
			4D56 Standard wheelbase	1.6 dm ³
			4G63 Long wheelbase	
			4G64	
		4WD	4D56 Long wheelbase	2.6 dm ³
			4G64	1.8 dm ³
			4D56 (Standard wheelbase)	

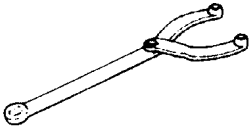
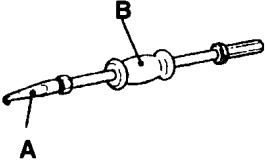
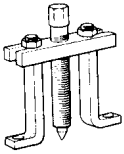
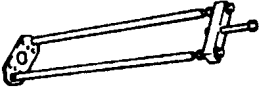
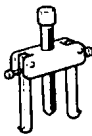

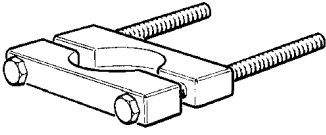
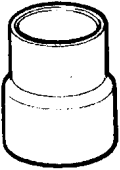
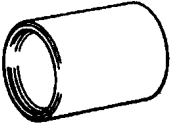
SEALANTS


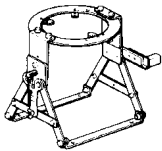




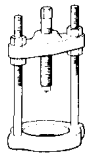

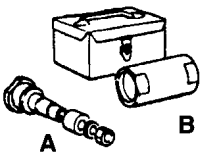
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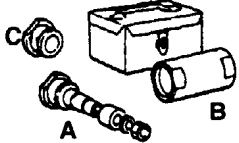



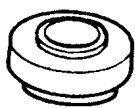


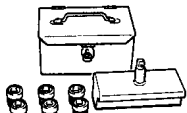
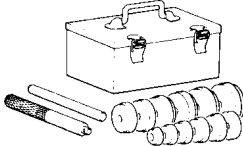
Items	Specified sealants	Remarks
Bearing case	3M ATD Part No. 8663 or equivalent	Semi-drying sealant
Dust cover		
Axle housing (differential carrier mounting part)		
Drive gear and differential case mounting part	3M Stud Locking 4170 or equivalent	Anaerobic sealant

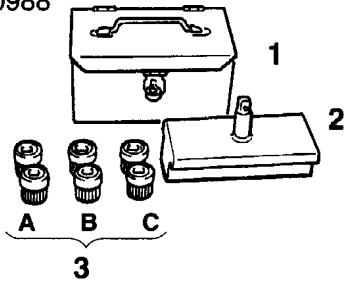
SPECIAL TOOLS

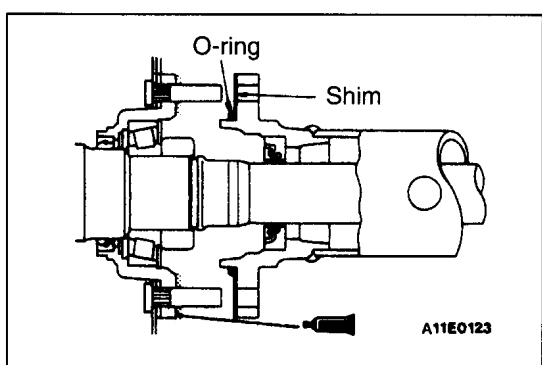
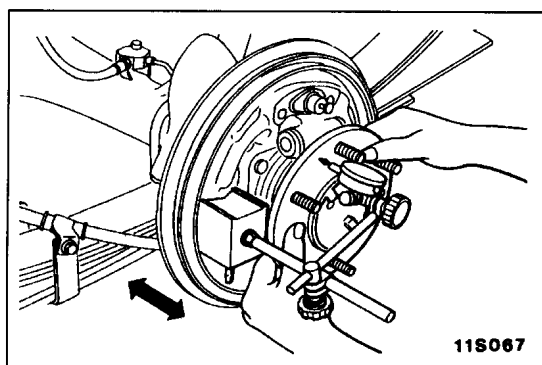
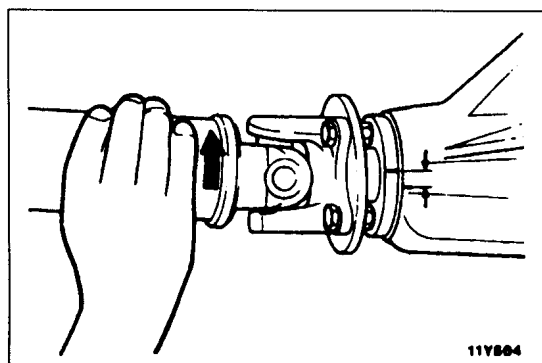
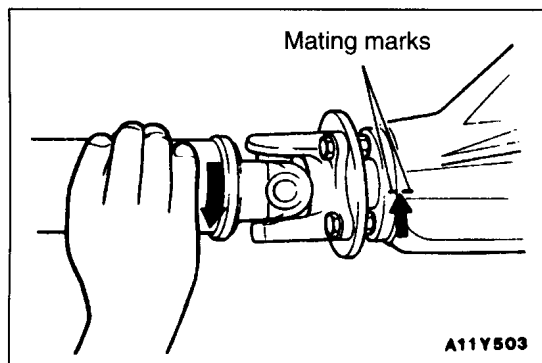
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Tool	Number	Name	Use
	MB990767	End yoke holder	Measurement of the limited slip differential preload
	MB990590 A: MB990212 B: MB990211	Rear axle shaft oil seal remover A: Adapter B: Sliding hammer	Removal of axle shaft (Use together with MB990241, MB990211) Removal of axle housing oil seal
	MB990241	Rear axle shaft puller	Removal of axle shaft (Use together with MB990211)
	MB991552	Axle shaft bearing and case remover	Removal of the axle shaft bearing and bearing case
	MB990801	Rear axle bearing outer race remover	Removal of bearing case, bearing outer race <2WD vehicles without ABS (except vehicles with 4G63 Standard wheelbase)>
	MB990786	Rear axle bearing outer race bridge	
	MB990560	Bearing remover	<ul style="list-style-type: none"> Removal of bearing inner race Press-fitting of the axle shaft bearing inner race Press-fitting of the axle shaft retainer <2WD vehicles with ABS and 4WD vehicles>
	MB990799	Bearing inner race installer	
	MB990890 or MB990891	Rear suspension bushing base	Installation of bearing outer race

Tool	Number	Name	Use
	MB990787	Axle shaft bearing remover	Installation of rotor
	MB990909	Working base	Supporting of the differential carrier
	MB990201 MB990722	Side bearing adjusting special spanner	Removal and adjustment of the side bearing nut 2WD 4G63 Standard wheelbase: MB990722 Except 2WD vehicles with 4G63 Standard wheelbase : MB990201
	MB990810	Side bearing puller	Removal of the side bearing inner race
	MB990811	Side bearing cup	
	MB990850	End yoke holder	Removal of the companion flange
	MB990339	Bearing puller	Removal of the drive pinion rear bearing inner race
	MB990648	Bearing remover	
	MB990856 A: MB990858 B: MB990720	Pinion height gauge set A: Drive pinion gauge B: Cylinder gauge	Measurement of the pinion height <2WD 4G63 Standard wheelbase>

Tool	Number	Name	Use
	MB991171 A: MB990819 B: MB991170 C: MB991169	Pinion height gauge set A: Drive pinion gauge B: Cylinder gauge C: Drive pinion gauge attachment	Measurement of the pinion height <Except 2WD vehicles with 4G63 Standard wheelbase>
	MB990685	Torque wrench	Measurement of the starting torque of drive pinion
	MB990326	Preload socket	
	MB990813	Tap	Removal of adhesive
	MB990728	Bearing installer	<ul style="list-style-type: none"> • Press-fitting of the drive pinion rear bearing inner race • Press-fitting of the side bearing inner race <2WD 4G63 Standard wheelbase>
	MB990727	Drive pinion oil seal installer	Press-fitting of the drive pinion oil seal
	MB990802	Bearing installer	Press-fitting of the side bearing inner race <Except 2WD vehicles with 4G63 Standard wheelbase>
	MB990988	Side gear holding tool set	Measurement of the clutch plate preload
	MB990925	Bearing and oil seal installer set	<ul style="list-style-type: none"> • Press-fitting of oil seal • Inspection of drive gear tooth contact • Removal of bearing outer race • For details of each installer, refer to GROUP 26 – Special Tools.

	Tool number		Name	O.D. mm
	1	MB990551	Box	—
	2	MB990989	Base	—
	3	(MB990990)	Tool A	25
		(MB990991)	Tool B	28
		(MB990992)	Tool C	31



SERVICE ADJUSTMENT PROCEDURES

120002209

REAR AXLE TOTAL BACKLASH CHECK

1. Park the vehicles on a flat, level surface.
2. Place the transmission control lever to the neutral position, and place the transfer control lever to the neutral position. Then pull the parking brake lever and raise the vehicle on a jack.

3. Turn the companion flange clockwise as far as it will go. Make the mating marks on the dust cover of the companion flange and on the differential carrier.
4. Turn the companion flange anti-clockwise as far as it will go, and measure the amount of distance through which the mating marks moved.

Limit: 5 mm

5. If the backlash exceeds the limit value, remove the differential carrier assembly and check the following.
 - Drive gear backlash (Refer to P.27-34.)
 - Differential gear backlash (Refer to P.27-35.)

AXLE SHAFT AXIAL PLAY CHECK

120000413

1. Measure the axle shaft axial play by using a dial indicator.

Standard value: 2WD (without ABS)

0.05–0.20 mm

2WD (with ABS), 4WD

0–0.25 mm

2. For vehicles with drum brakes (vehicles without ABS), if the play is not within the standard value, replace the shim.

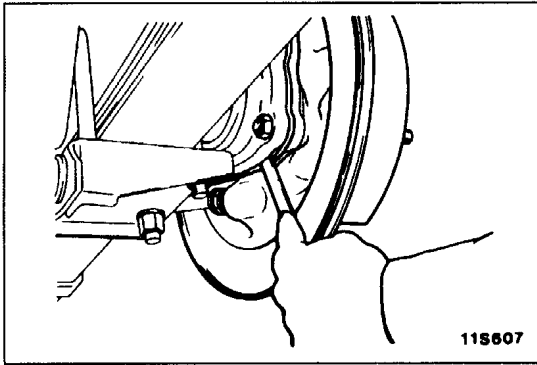
AXLE SHAFT AXIAL PLAY ADJUSTMENT

120000414

<2WD (without ABS)>

1. Insert a 1 mm thick shim and O-ring into the left side rear axle housing.
2. Apply the specified sealant to the mating surface of the bearing case, install the left axle shaft into rear axle housing and tighten the nuts to 49–59 Nm.

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



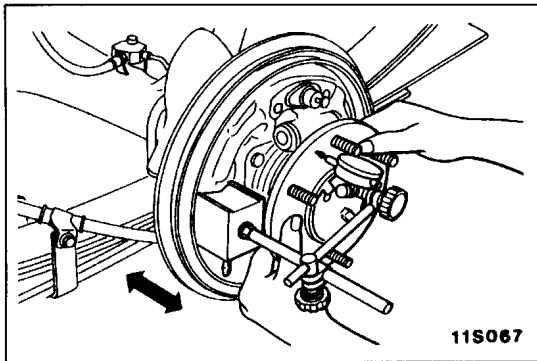
3. Temporarily install the right axle shaft assembly to the rear axle housing without installing the O-ring or shim.
4. Measure the clearance between the bearing case and rear axle housing end with a thickness gauge.

NOTE

Confirm that the measurement values do not differ in the horizontal and vertical positions.

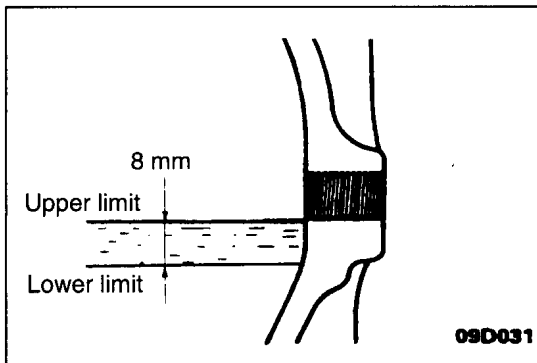
5. Select shims of the thickness which is equal to the sum of the measured clearance and 0.05–0.20 mm. Remove the right axle shaft, and install shim(s) and O-ring on the right side rear axle housing end.
6. Apply the specified sealant to the mating surface of bearing case, install the right axle shaft into rear axle housing and tighten the nut to 49–59 Nm.

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



7. Check to assure that the axle shaft axial play is within the standard value.

Standard value: 0.05–0.20 mm



GEAR OIL LEVEL CHECK

120002210

Check that gear oil level is not 8 mm below the bottom of filler plug hole.

Specified gear oil:

<Conventional differential>

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

<Limited slip differential>

Hypoid gear oil MITSUBISHI Genuine Gear Oil
Part No. 8149630 EX,

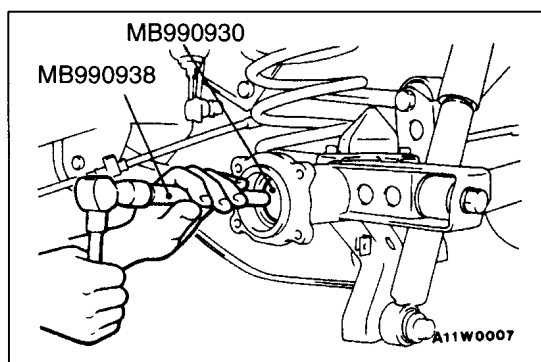
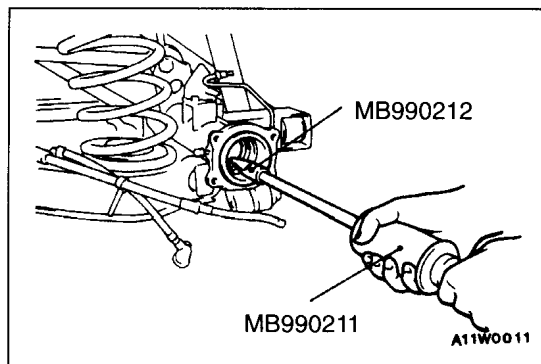
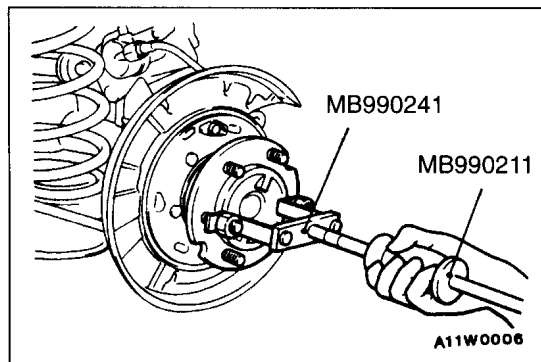
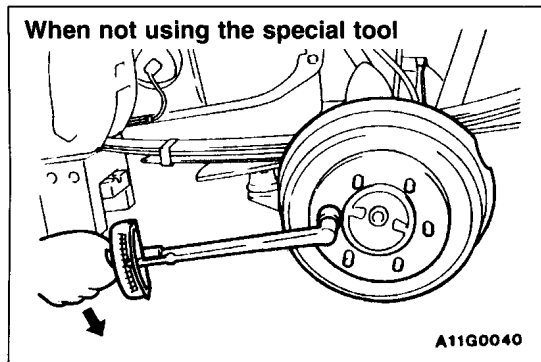
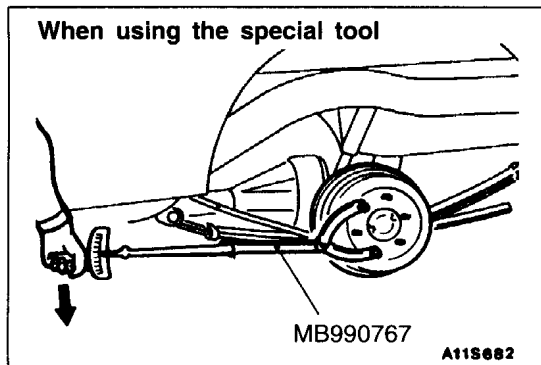
CASTROL HYPOY LS (GL-5, SAE 90),
SHELL-LSD (GL-5, SAE 80W-90) or equivalent

2WD 4G63 Standard wheelbase: 1.2 dm³

2WD 4G63 Long wheelbase, 4D56 Standard wheelbase, 4G64: 1.6 dm³

4WD: 1.8 dm³

4D56 Long wheelbase: 2.6 dm³



LIMITED SLIP DIFFERENTIAL PRELOAD MEASUREMENT

120000416

1. Place the shift lever in the neutral position and lock the front wheels.
2. Disconnect the propeller shaft from the differential.
3. With the parking brake fully released, jack up one rear wheel so that the other is still on the ground.
4. Measure the differential preload in the forward direction when using the special tool and when not using the special tool.

Standard value:

<2WD 4G63 Standard wheelbase>

Using the special tool 17 Nm or more

Without using the special tool 34 Nm or more

<Except 2WD vehicles with 4G63 Standard wheelbase>

Using the special tool 13 Nm or more

Without using the special tool 25 Nm or more

NOTE

If the differential preload is not within the standard value, disassemble the limited slip differential to check parts.

AXLE HOUSING OIL SEAL REPLACEMENT

120002437

1. Remove the axle shaft assembly (Refer to P.27-17, 25.)
2. Use special tools with hook attached to remove the oil seal.
3. Apply multipurpose grease to the oil seal fitting area of the rear axle housing.
4. Drive the new oil seal into the rear axle housing end by using the special tool.
5. Apply multipurpose grease to the oil seal lip.
6. Install the rear axle shaft.

AXLE ASSEMBLY

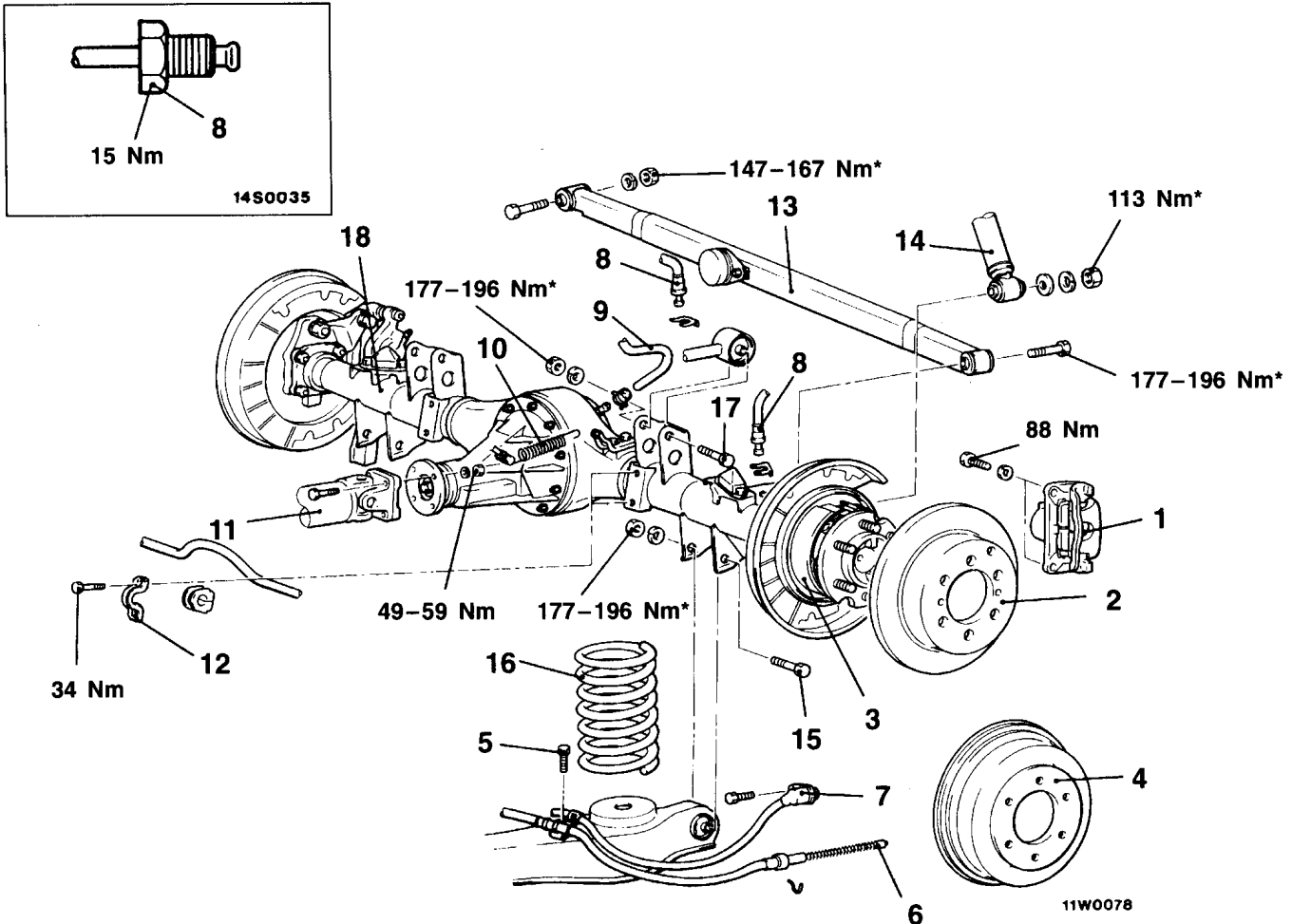
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REMOVAL AND INSTALLATION

Post-installation Operation

- Brake Fluid Filling and Air Bleeding (Refer to GROUP 35A – Service Adjustment Procedures.)
- Parking Brake Lever Stroke Adjustment (Refer to GROUP 36 – Service Adjustment Procedures.)

<Vehicles with coil springs>



00000988

Removal steps

1. Caliper assembly
<Vehicles with disc brake>
2. Brake disc
<Vehicles with disc brake>
3. Parking brake shoe assembly
<Vehicles with disc brake>
(Refer to GROUP 36 – Parking Brake Drum.)
4. Brake drum
<Vehicles with drum brake>
5. Parking brake cable, speed sensor
<Vehicles with ABS> attaching bolt
6. Parking brake cable connection
7. Speed sensor connection
<Vehicles with ABS>
8. Brake tube connection
9. Breather hose connection
10. Load sensing spring connection
11. Propeller shaft connection
12. Clamp
13. Lateral rod
14. Shock absorber connection
15. Lower arm mounting bolt
16. Rear spring
17. Upper control arm mounting bolt
18. Axle assembly

◀A▶ ▶B▶

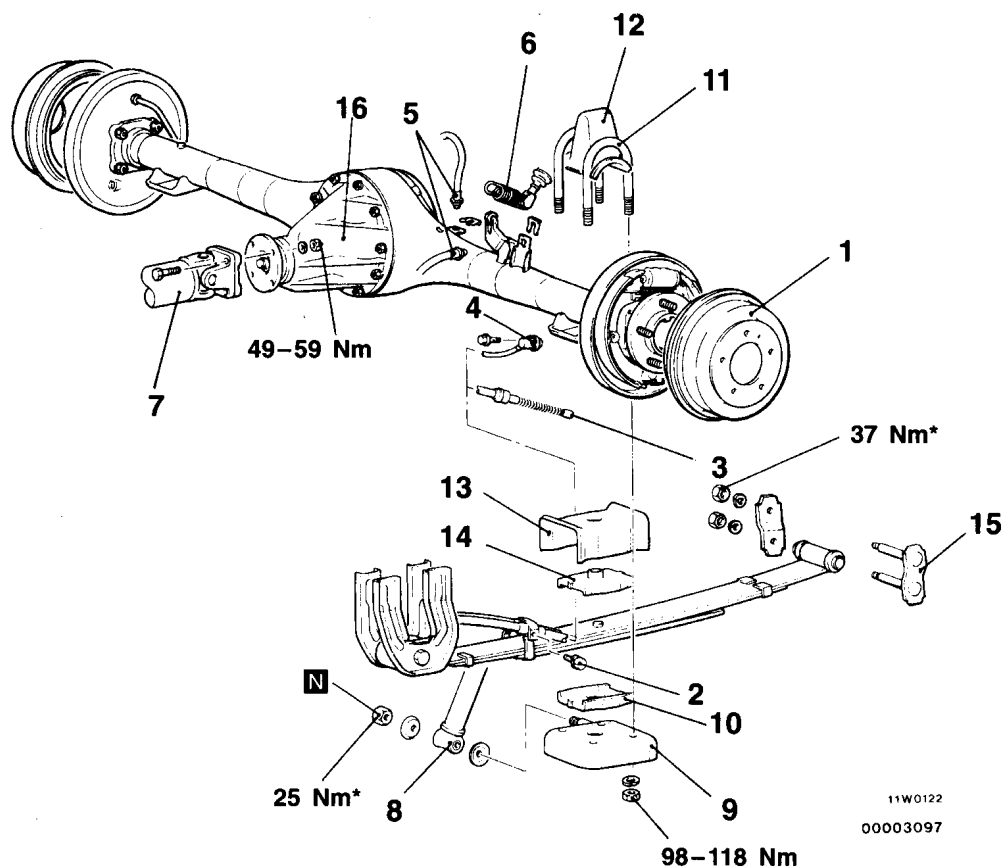
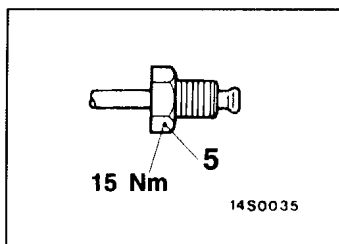
◀B▶

◀C▶

Caution

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

<2WD vehicles with leaf springs>



11W0122

00003097

Removal steps

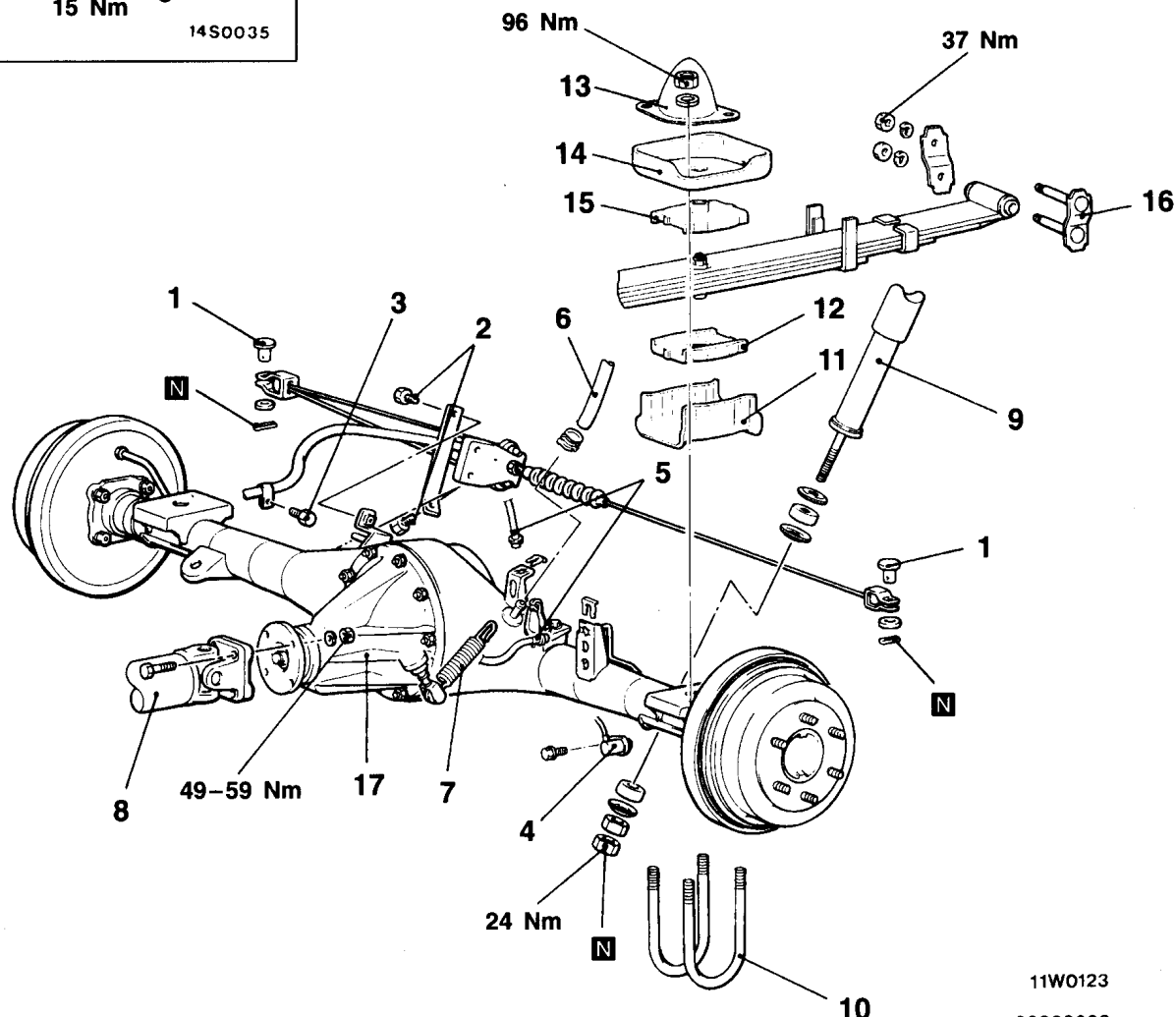
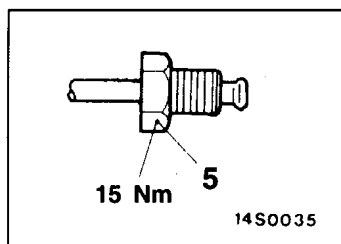
1. Brake drum
2. Parking brake cable, speed sensor
<Vehicles with ABS> attaching bolt
3. Parking brake cable connection
4. Speed sensor connection <Vehicles with ABS>
5. Brake tube connection
6. Load sensing proportioning valve connection
7. Propeller shaft connection
8. Shock absorber connection
9.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

**Caution**

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



<4WD vehicles with leaf springs>



11W0123

00003098

Removal steps

1. Pin
2. Parking brake cable mounting bolt (Axle housing side)
3. Parking brake cable mounting bolt (Leaf spring side)
4. Speed sensor connection <Vehicles with ABS>
5. Brake tube connection
6. Breather hose connection
7. Load sensing proportioning valve connection
8. Propeller shaft connection
9. Shock absorber connection
10. U-bolts

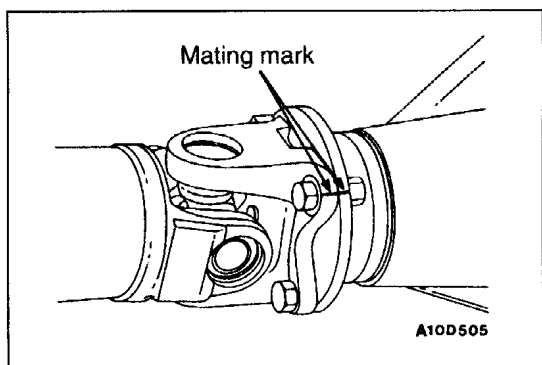
11. Clamp
12. Spring pad
13. Bump stopper
14. U-bolt seat
15. Spring pad
16. Shackle assembly
17. Axle assembly



Caution

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





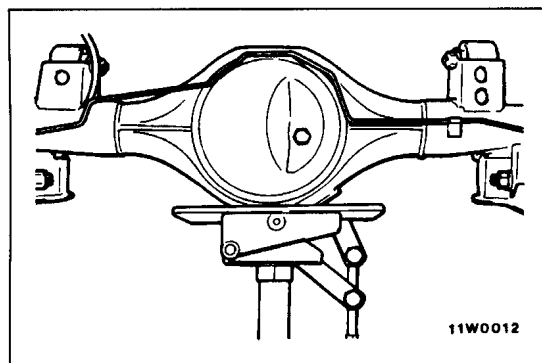
REMOVAL SERVICE POINTS

◀A▶ PROPELLER SHAFT REMOVAL

Make a mating marks on the companion flange and flange yoke, disconnect the propeller shaft from the companion flange.

Caution

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



◀B▶ SHOCK ABSORBER REMOVAL

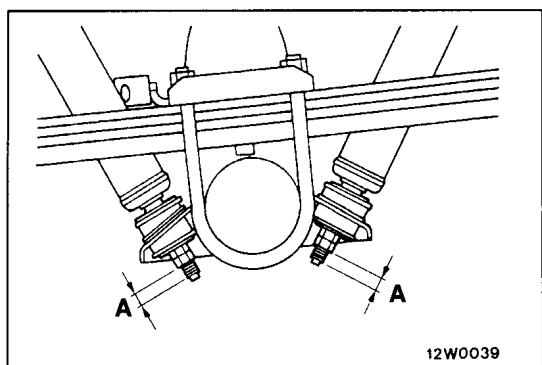
Support the axle housing with a jack before removing the shock absorber lower mounting nut.

◀C▶ AXLE ASSEMBLY REMOVAL

Take out the axle assembly from the rear of the vehicle.

Caution

Be careful not to drop the axle assembly, because it is unstable on the jack.



INSTALLATION SERVICE POINTS

▶A◀ SHOCK ABSORBER INSTALLATION

Standard value (A): 1–2 mm

▶B◀ PROPELLER SHAFT INSTALLATION

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

AXLE SHAFT <VEHICLES WITH DRUM BRAKE>

120002212

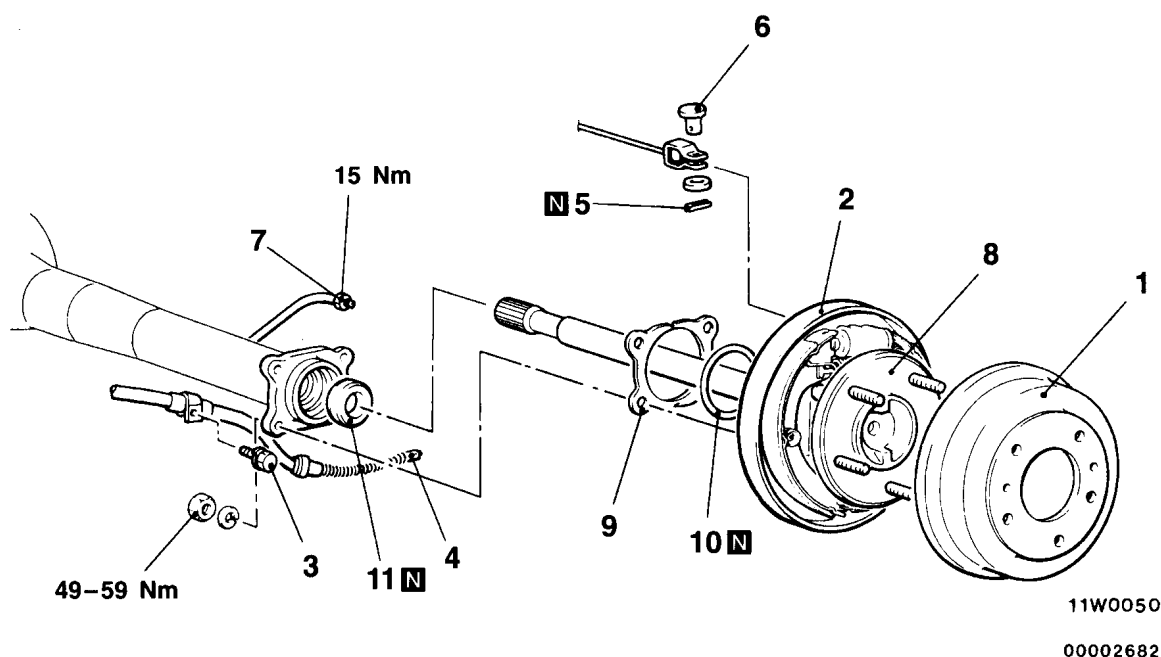
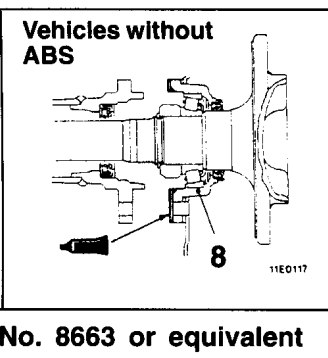
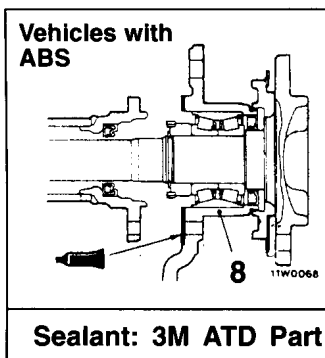
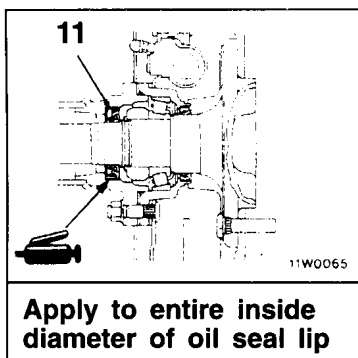
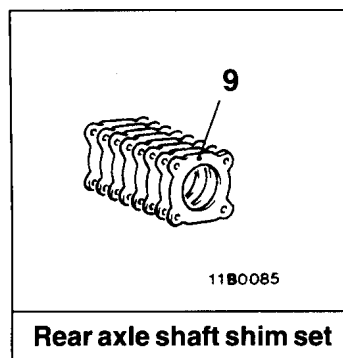
REMOVAL AND INSTALLATION

Pre-removal Operation

- Draining of Brake Fluid

Post-Installation Operation

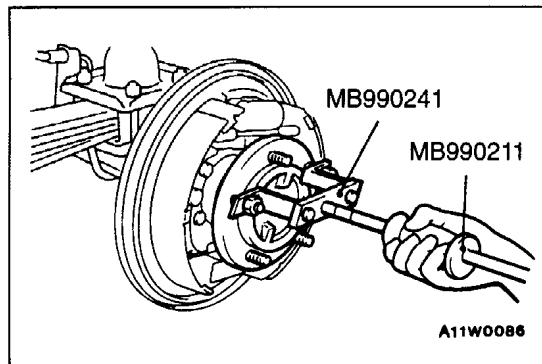
- Air bleeding of Brake Line (Refer to GROUP 35A – Service Adjustment Procedures.)
- Adjustment of parking Brake Pull Rod (Refer to GROUP 36 – Service Adjustment Procedures.)



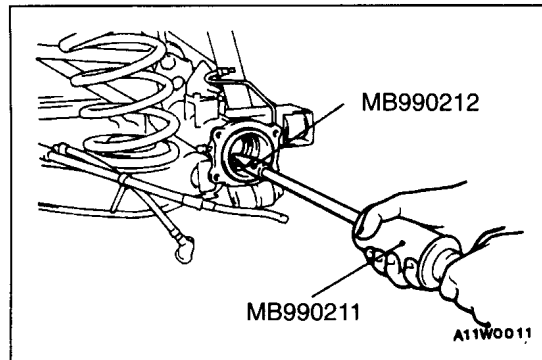
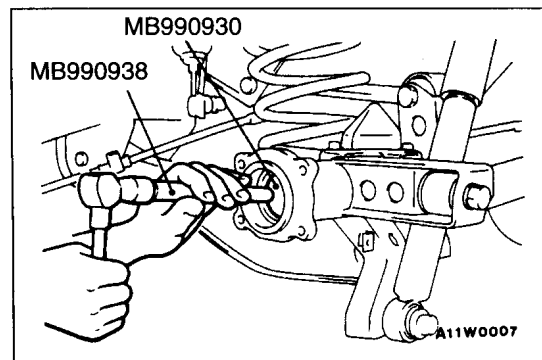
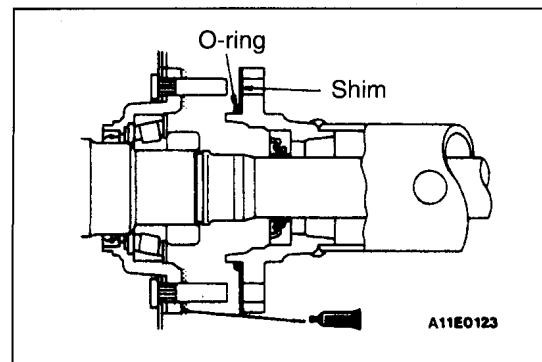
Removal steps

1. Brake drum
2. Shoe-lining assembly (Refer to GROUP 35A – Rear Drum Brake.)
3. Parking brake cable, speed sensor cable <Vehicles with ABS> attachment bolt
4. Parking brake cable connection

5. Split pin <4WD>
6. Pin <4WD>
7. Brake tube connection
 - Axle shaft axial play adjustment <Vehicles without ABS>
8. Axle shaft assembly
9. Shim <Vehicles without ABS>
10. O-ring
11. Oil seal

**REMOVAL SERVICE POINTS****◀A▶ AXLE SHAFT ASSEMBLY REMOVAL****Caution**

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

**◀B▶ OIL SEAL REMOVAL****INSTALLATION SERVICE POINTS****▶A◀ OIL SEAL INSTALLATION****▶B◀ AXLE SHAFT AXIAL PLAY ADJUSTMENT****<VEHICLES WITHOUT ABS>**

When replacing the axle shaft or the wheel bearings, the following adjustment is needed. When removing and reinstalling the axle shaft, it is not needed and the same thickness and number of shims as previously should be used.

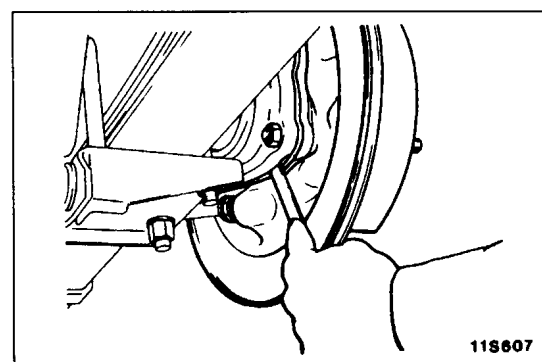
1. Insert a 1 mm thick shim and O-ring into the left side rear axle housing.
2. Apply the specified sealant to the mating surface of the bearing case, install the left axle shaft into rear axle housing and tighten the nuts to 49–59 Nm.

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

3. Temporarily install the right axle shaft assembly to the axle housing without installing the O-ring or shim.
4. Measure the clearance between the bearing case and rear axle housing end with a thickness gauge.

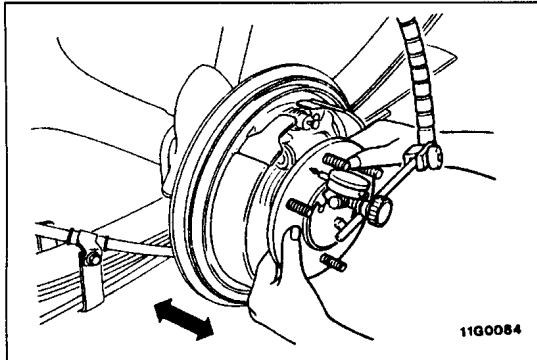
NOTE

Confirm that the measurement values do not differ in the horizontal and vertical positions.



5. Select shims of the thickness which is equal to the sum of the measured clearance and 0.05–0.20 mm.
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 to 49–59 Nm.

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



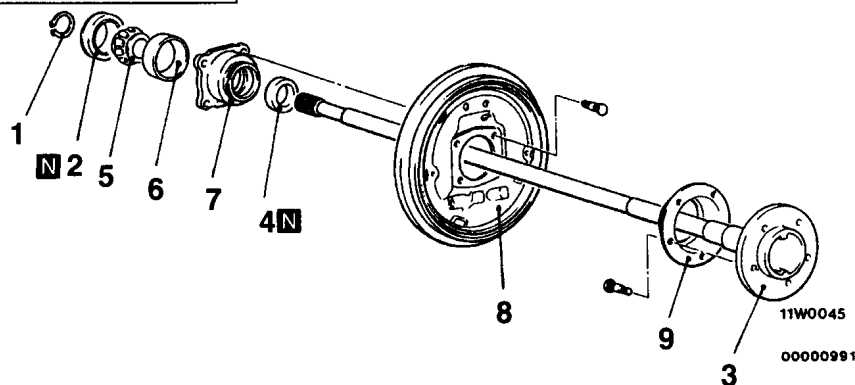
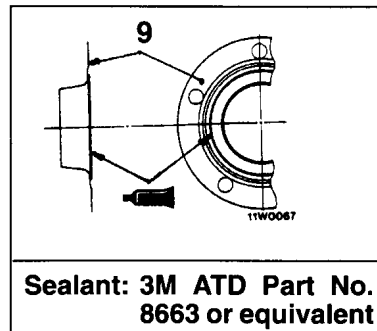
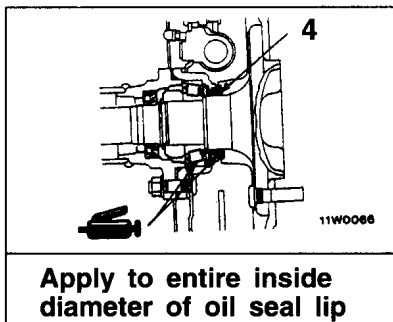
8. Check to ensure that the axle shaft axial play is within the standard value.

Standard value: 0.05–0.20 mm

DISASSEMBLY AND REASSEMBLY

120002213

<VEHICLES WITHOUT ABS>

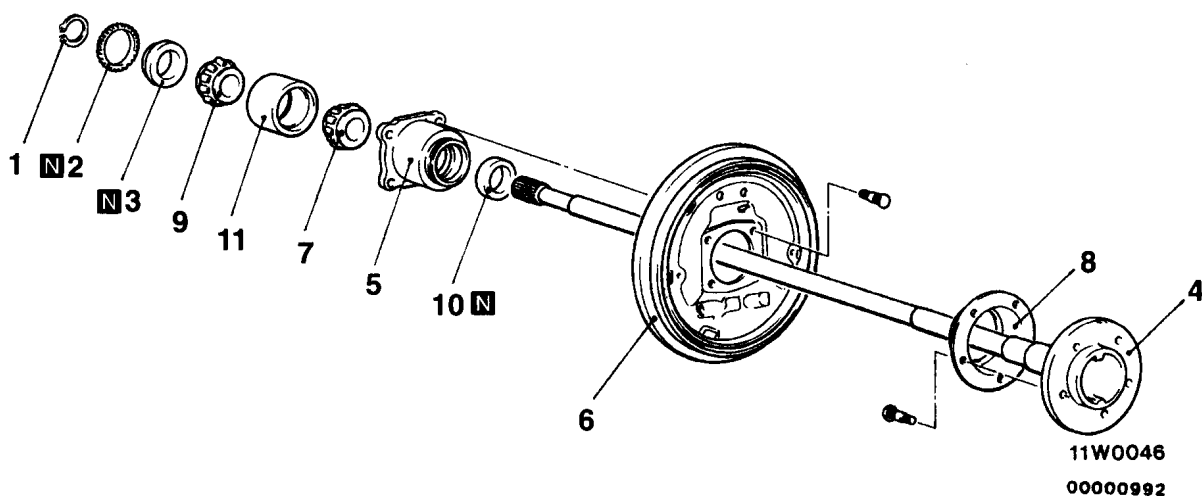
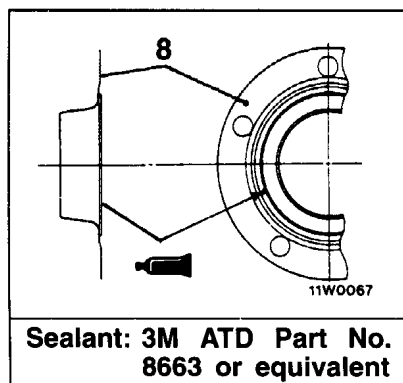
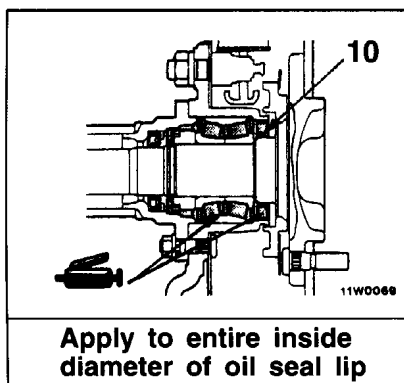


Disassembly steps

- | | |
|-----|-----------------------|
| ▶G◀ | 1. Snap ring |
| ▶E◀ | 2. Retainer |
| ▶D◀ | 3. Axle shaft |
| ▶C◀ | 4. Oil seal |
| | 5. Bearing inner race |

- | | | |
|-----|-----|-----------------------|
| ◀D▶ | ▶A◀ | 6. Bearing outer race |
| | | 7. Bearing case |
| | | 8. Backing plate |
| | | 9. Dust cover |

<VEHICLES WITH ABS>

**Disassembly steps**

◀A▶
◀B▶

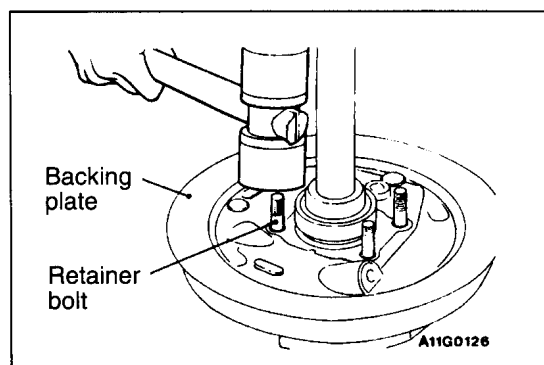
◀C▶

◀D▶

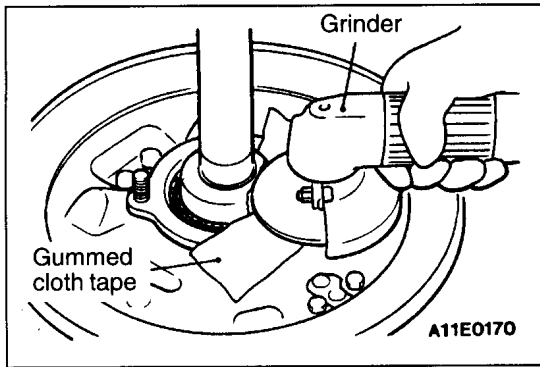
1. Snap ring
2. Rotor <Vehicles with ABS>
3. Retainer
4. Axle shaft
5. Bearing case
6. Backing plate
7. Outer bearing inner race
8. Dust cover
9. Inner bearing inner race
10. Oil seal
11. Bearing outer race

Reassembly steps

- ▶A▶ 11. Bearing outer race
- ▶B▶ 9. Inner bearing inner race
- ▶B▶ 7. Outer bearing inner race
- ▶D▶ 10. Oil seal
8. Dust cover
6. Backing plate
5. Bearing case
4. Axle shaft
- ▶E▶ 3. Retainer
- ▶F▶ 2. Rotor <Vehicles with ABS>
- ▶G▶ 1. Snap ring

**DISASSEMBLY SERVICE POINTS****◀A▶ RETAINER REMOVAL**

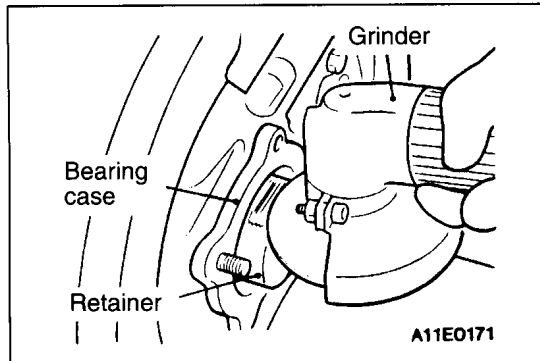
1. Remove one retainer bolt from the backing plate.



2. Apply gummed cloth tape around the edge of the bearing case for protection.
3. 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 and the side of bearing become approximately 1.0–1.5 mm and 2.0 mm respectively.

Caution

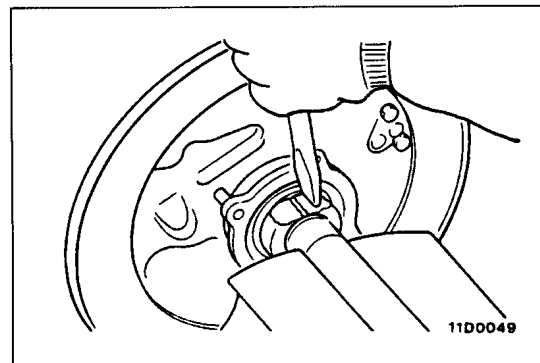
Be careful not to damage the bearing case and the axle shaft.



4. Fix the axle shaft and shave off the remaining 2.0 mm on the side of the bearing of the retainer.

Caution

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



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

Caution

Be careful not to damage the axle shaft.

◀B▶ AXLE SHAFT REMOVAL

<VEHICLES WITHOUT ABS>

1. Set the special tool by fixing its plate to the bearing case as shown in the figure.

<VEHICLES WITH ABS>

1. Secure the special tool to the bearing case bolts with the nuts and adjust the height of the hanger. Then install the washers, plate and nuts in that order.

NOTE

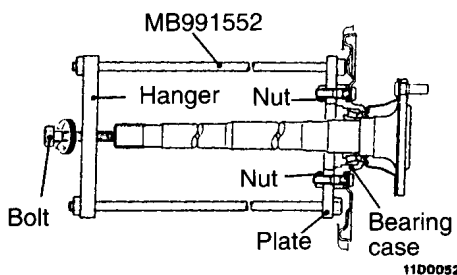
The washers are used to eliminate the difference in height of the bearing case so that the plate and the bearing case are parallel.

2. Place the end of the bolt against the centre of the axle shaft, and then tighten the nut to remove the axle shaft from the bearing case assembly.

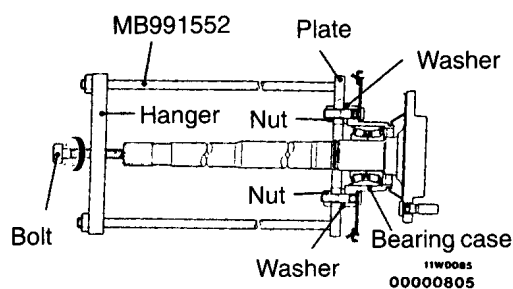
Caution

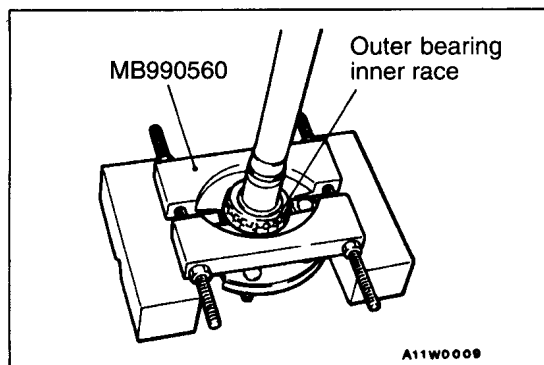
The hanger and plate should be placed so that they are parallel.

Vehicles without ABS

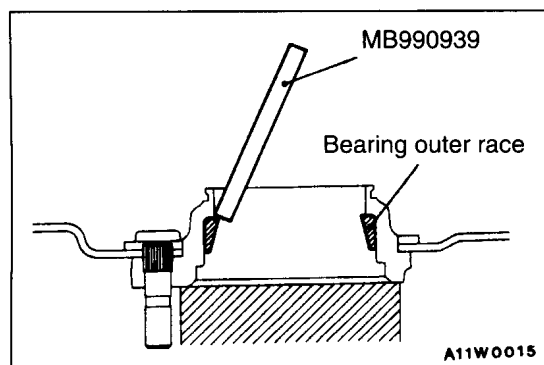


Vehicles with ABS

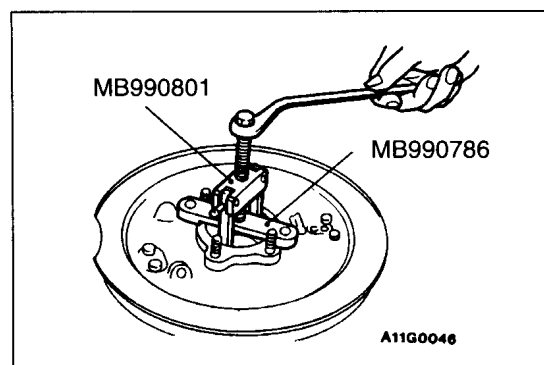


**◀C▶ OUTER BEARING INNER RACE REMOVAL**

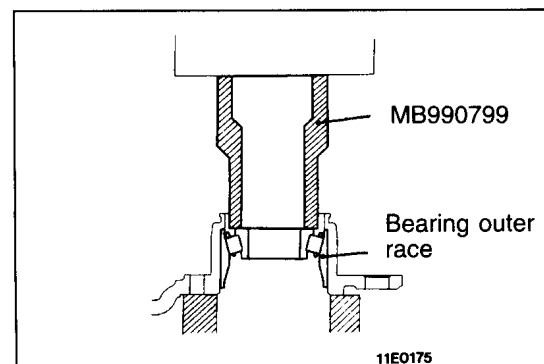
Install the special tool as shown in the illustration, and then use a press to remove the outer bearing inner race from the axle shaft.

**◀D▶ BEARING OUTER RACE REMOVAL**

<4G63 Standard wheelbase (without ABS)>



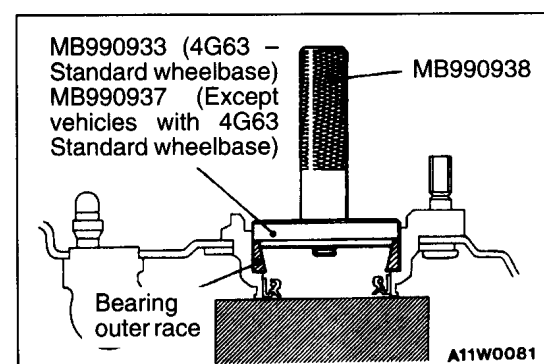
<Except vehicles with 4G63 engine and Standard wheelbase (without ABS)>

**<VEHICLES WITH ABS>**

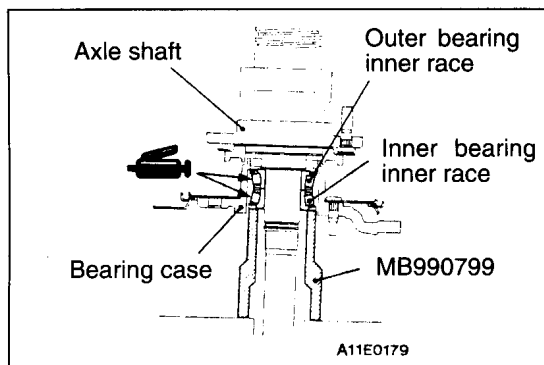
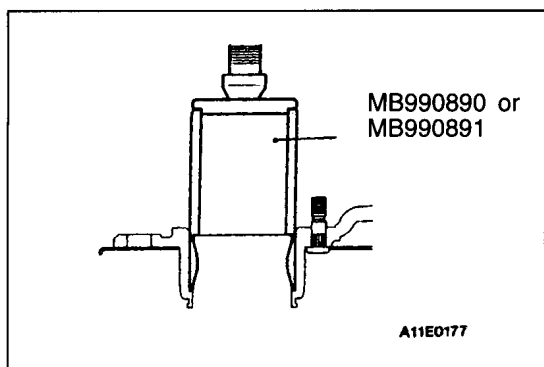
Reinstall the outer bearing inner race that was removed previously, and then use the special tool and a press to remove the bearing outer race.

INSPECTION

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

REASSEMBLY SERVICE POINTS**▶A▶ BEARING OUTER RACE INSTALLATION
<VEHICLES WITHOUT ABS>**

<VEHICLES WITH ABS>



►B◄ INNER BEARING INNER RACE / OUTER BEARING INNER RACE INSTALLATION

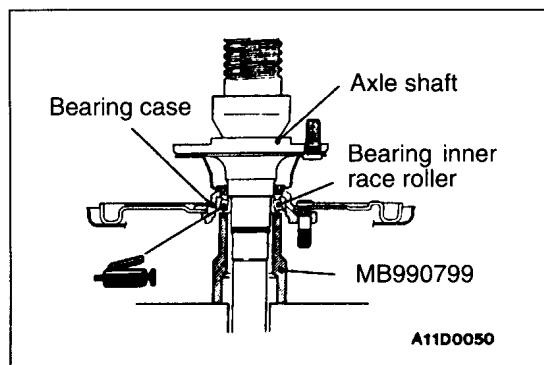
1. Apply multi-purpose grease to the roller surface and ends of the bearing.
2. Pass the axle shaft through the bearing case and the inner bearing inner race and outer bearing inner race.
3. Use the special tool to press-fit the inner bearing inner race and outer bearing inner race to the axle shaft.

Caution

Both bearing inner race, outer race sets should be press-fitted together.

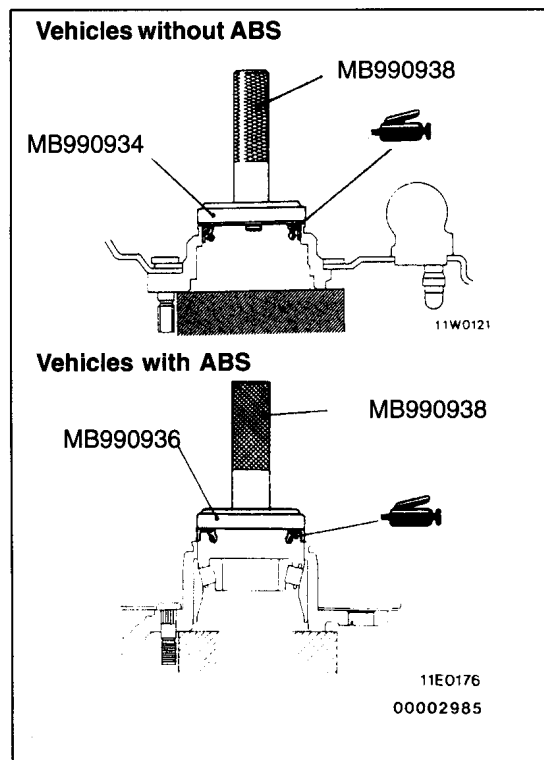
►C◄ BEARING INNER RACE INSTALLATION

1. Apply multi-purpose grease to the roller surface and ends of the bearing.
2. Place the bearing case and the bearing inner race onto the axle shaft in that order.
3. Use the special tool to press-fit the bearing inner race to the axle shaft.

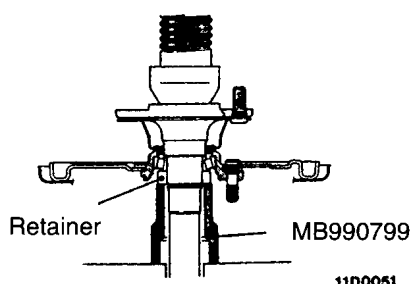


►D◄ OIL SEAL INSTALLATION

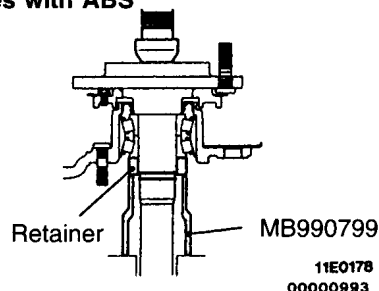
1. Apply the multi-purpose grease to the external periphery of the oil seal.
2. Press-fit the oil seal into the bearing case until it is flush with the face of the bearing case by using the special tools.
3. Apply the multi-purpose grease to the lips of the oil seal.



Vehicles without ABS



Vehicles with ABS



►E◄ RETAINER INSTALLATION

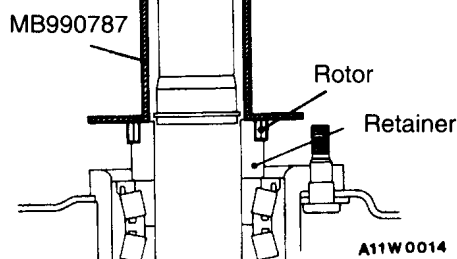
Use the special tool to press-fit the retainer to the axle shaft, while checking that the press-fitting force is at the standard value.

If the initial press-fitting force is less than the standard value, replace the axle shaft.

Standard value:

Item	Initial press-fitting force N	Final press-fitting force N
4G63 Standard wheelbase	39,000 or more	59,000
<Except vehicles with 4G63 Standard wheelbase>	49,000 or more	78,000
Vehicles with ABS	49,000 or more	98,000–108,000

►F◄ ROTOR INSTALLATION



►G◄ SNAP RING INSTALLATION

1. After installing the snap ring, measure the clearance (A) between the snap ring and the retainer with a thickness gauge, and check that it is within the standard values.

Standard value (A): 0–0.166 mm

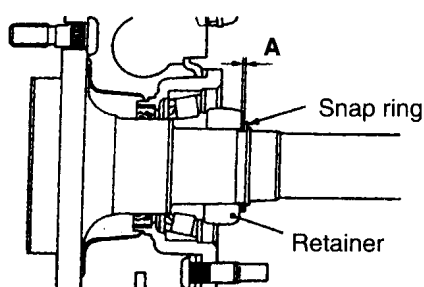
2. If the clearance exceeds the standard value, change the snap ring so that the clearance is at the standard value.

Thickness of snap ring mm	Identification colour
2.17	—
2.01	Yellow
1.85	Blue
1.69	Purple
1.53*	Red

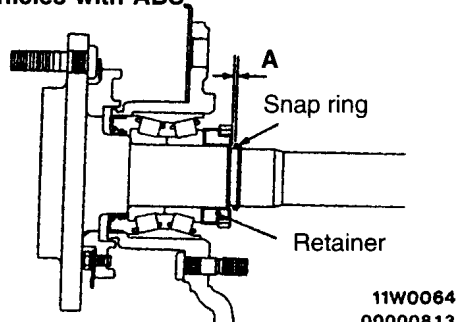
NOTE

* indicates vehicles other than with 4G63 standard wheelbase (without ABS).

Vehicles without ABS



Vehicles with ABS



AXLE SHAFT <VEHICLES WITH DISC BRAKE>

120002214

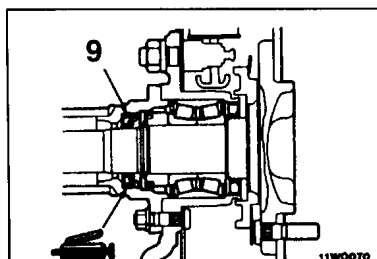
REMOVAL AND INSTALLATION

Pre-removal Operation

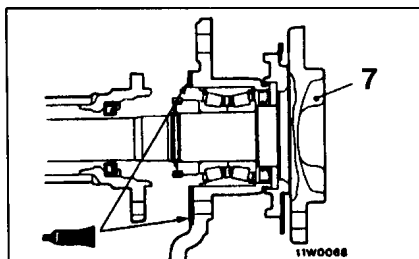
- Draining of Brake Fluid

Post-installation Operation

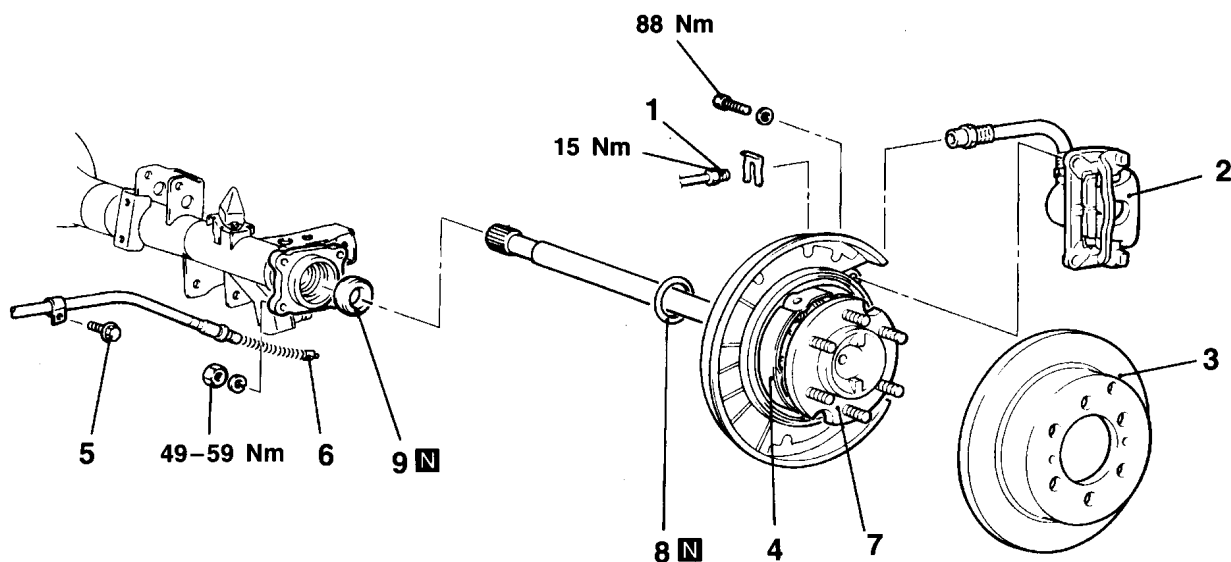
- Air Bleeding of Brake Line (Refer to GROUP 35A – Service Adjustment Procedures.)
- Adjustment of Parking Brake Pull Rod (Refer to GROUP 36 – Service Adjustment Procedures.)



Apply to entire inside diameter of oil seal lip



Sealant: 3M ATD Part No. 8663 or equivalent



11W0047

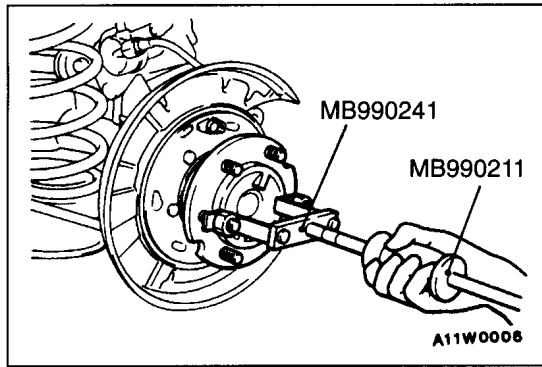
00000994

Removal steps

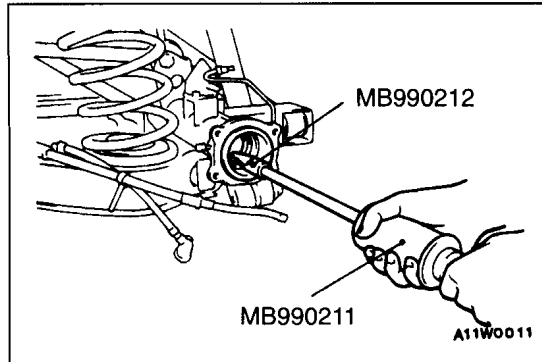
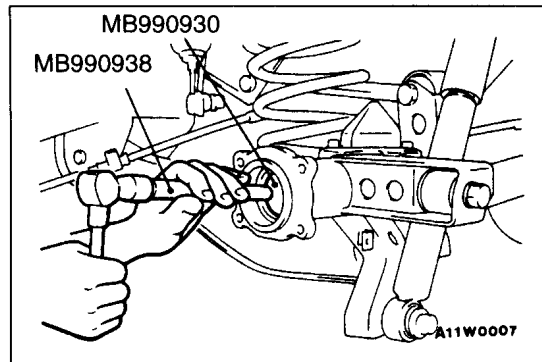
1. Brake tube connection
2. Caliper assembly
3. Brake disc
4. Parking brake shoe (Refer to GROUP 36 – Parking brake drum.)
5. Parking brake cable, speed sensor <Vehicles with ABS> attaching bolt
6. Parking brake cable connection
7. Axle shaft assembly
8. O-ring
9. Oil seal

◀A▶

◀B▶ ▶A◀

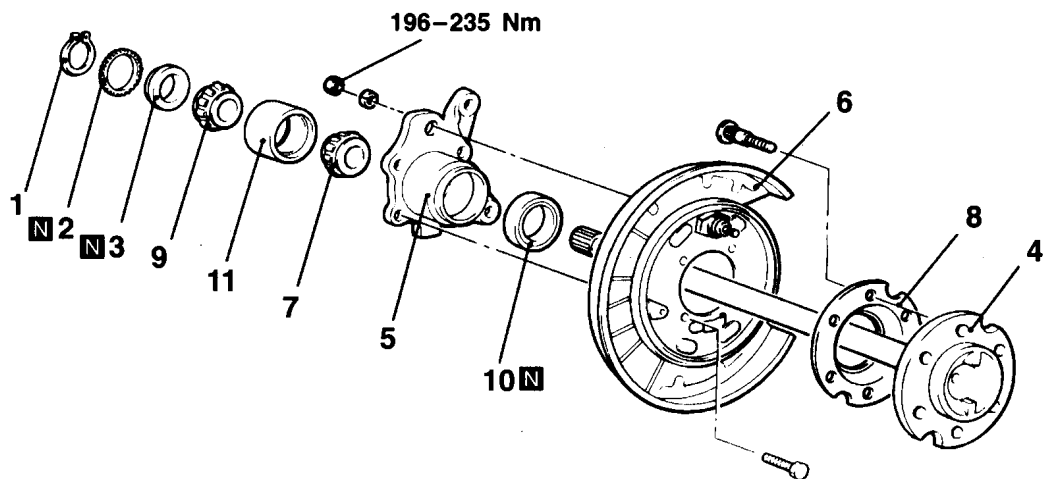
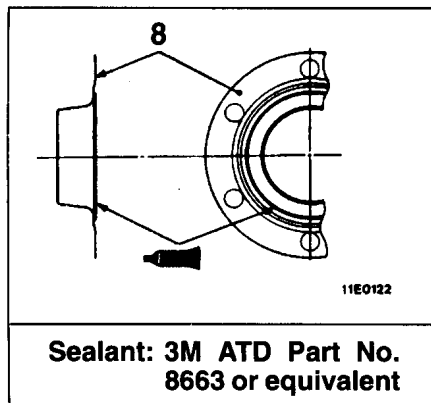
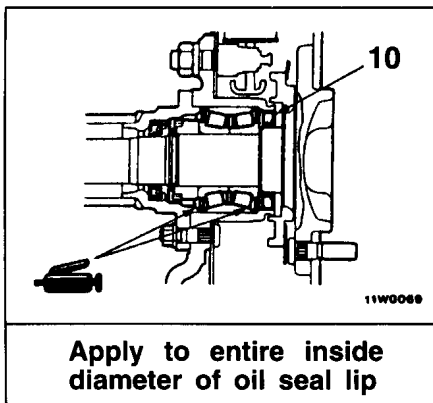
**REMOVAL SERVICE POINTS****◀A▶ AXLE SHAFT ASSEMBLY REMOVAL****Caution**

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

**◀B▶ OIL SEAL REMOVAL****INSTALLATION SERVICE POINT****▶A◀ OIL SEAL INSTALLATION**

DISASSEMBLY AND REASSEMBLY

120002215



11W0048

00000995

Disassembly steps

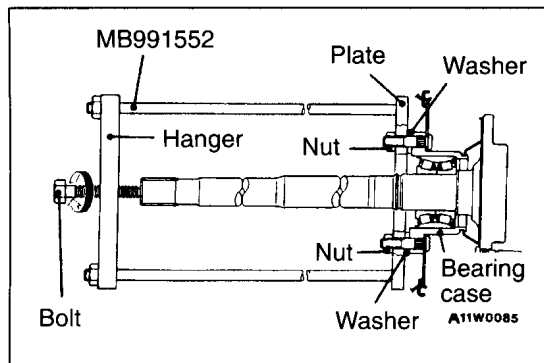
1. Snap ring
2. Rotor <Vehicles with ABS>
3. Retainer
4. Axle shaft
5. Bearing case
6. Backing plate
7. Outer bearing inner race
8. Dust cover
9. Inner bearing inner race
10. Oil seal
11. Bearing outer race

Reassembly steps

- ▶A◀ 11. Bearing outer race
- ▶B◀ 9. Inner bearing inner race
- ▶B◀ 7. Outer bearing inner race
- ▶C◀ 10. Oil seal
8. Dust cover
6. Backing plate
5. Bearing case
4. Axle shaft
- ▶D◀ 3. Retainer
- ▶E◀ 2. Rotor <Vehicles with ABS>
- ▶F◀ 1. Snap ring

DISASSEMBLY SERVICE POINTS**◀A▶ RETAINER REMOVAL**

Refer to P.27-20.

**◀B▶ AXLE SHAFT REMOVAL**

1. Secure the special tool to the bearing case bolts with the nuts and adjust the height of the hanger. Then install the washers, plate and nuts in that order.

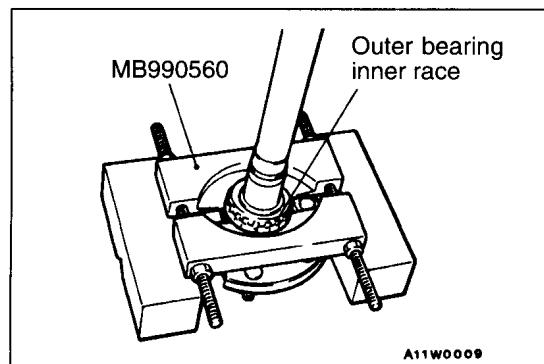
NOTE

The washers are used to eliminate the difference in height of the bearing case so that the plate and the bearing case are parallel.

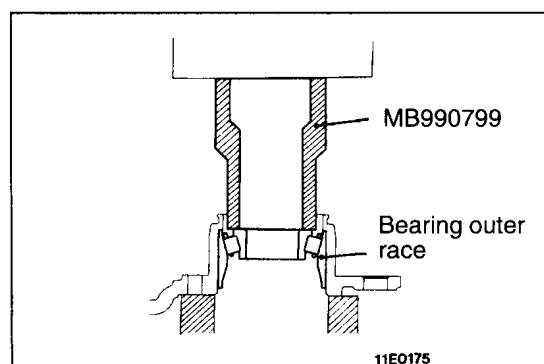
2. Place the end of the bolt against the centre of the axle shaft, and then tighten the nut to remove the axle shaft from the bearing case assembly.

Caution

The hanger and plate should be placed so that they are parallel.

**◀C▶ OUTER BEARING INNER RACE REMOVAL**

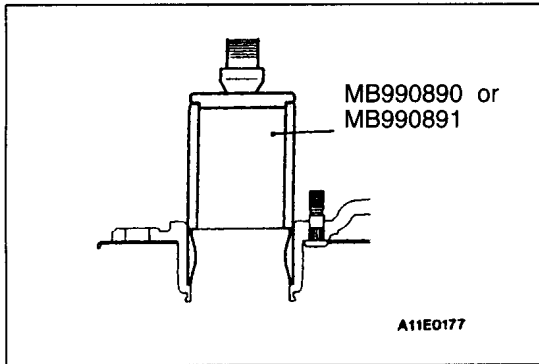
Install the special tool as shown in the illustration, and then use a press to remove the outer bearing inner race from the axle shaft.

**◀D▶ BEARING OUTER RACE REMOVAL**

Reinstall the outer bearing inner race that was removed previously, and then use the special tool and a press to remove the outer bearing outer race.

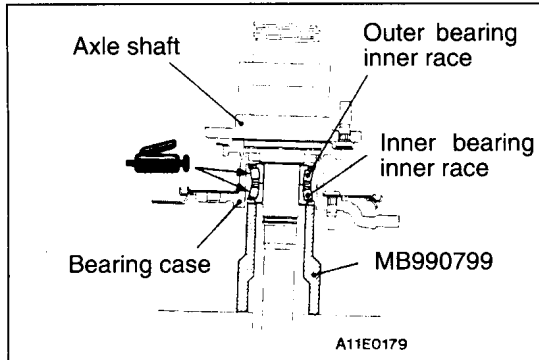
INSPECTION

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



REASSEMBLY SERVICE POINTS

►A◄ BEARING OUTER RACE INSTALLATION



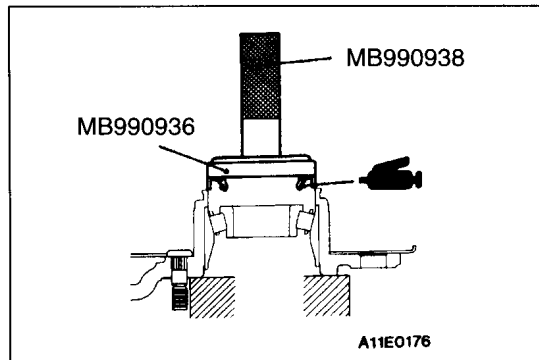
►B◄ INNER BEARING INNER RACE/OUTER BEARING INNER RACE INSTALLATION

1. Apply multi-purpose grease to the roller surface and ends of the bearing.
2. Pass the axle shaft through the bearing case and the inner bearing inner race and outer bearing inner race.
3. Use the special tool to press-fit the inner bearing inner race and outer bearing inner race to the axle shaft.

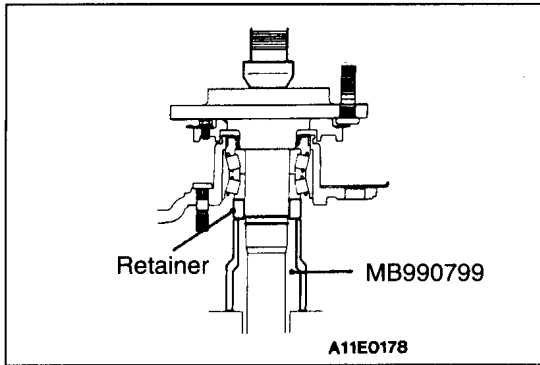
Caution

Both bearing inner race, outer race sets should be press-fitted together.

►C◄ OIL SEAL INSTALLATION



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



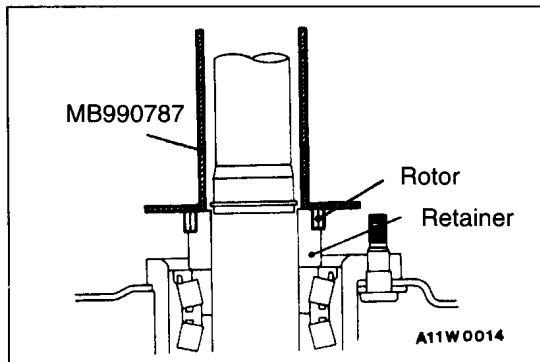
►D◄ RETAINER INSTALLATION

Use the special tool to press-fit the retainer to the axle shaft, while checking that the press-fitting force is at the standard value.

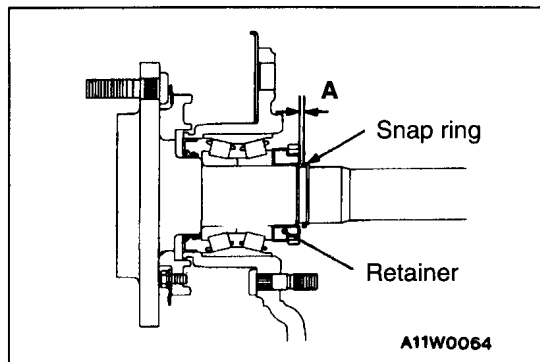
If the initial press-fitting force is less than the standard value, replace the axle shaft.

Standard value:

Initial press-fitting force	N	49,000 or more
Final press-fitting force	N	98,000–108,000



►E◄ ROTOR INSTALLATION



►F◄ SNAP RING INSTALLATION

1. After installing the snap ring, measure the clearance (A) between the snap ring and the retainer with a thickness gauge, and check that it is within the standard value.

Standard value (A): 0–0.166 mm

2. 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 colour
2.17		–
2.01		Yellow
1.85		Blue
1.69		Purple
1.53		Red

DIFFERENTIAL CARRIER

120002216

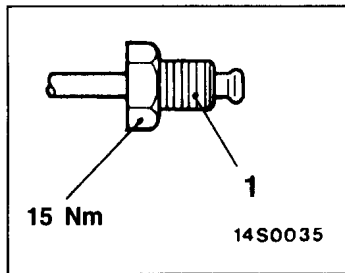
REMOVAL AND INSTALLATION

Pre-removal Operation

- Draining of Differential Gear Oil

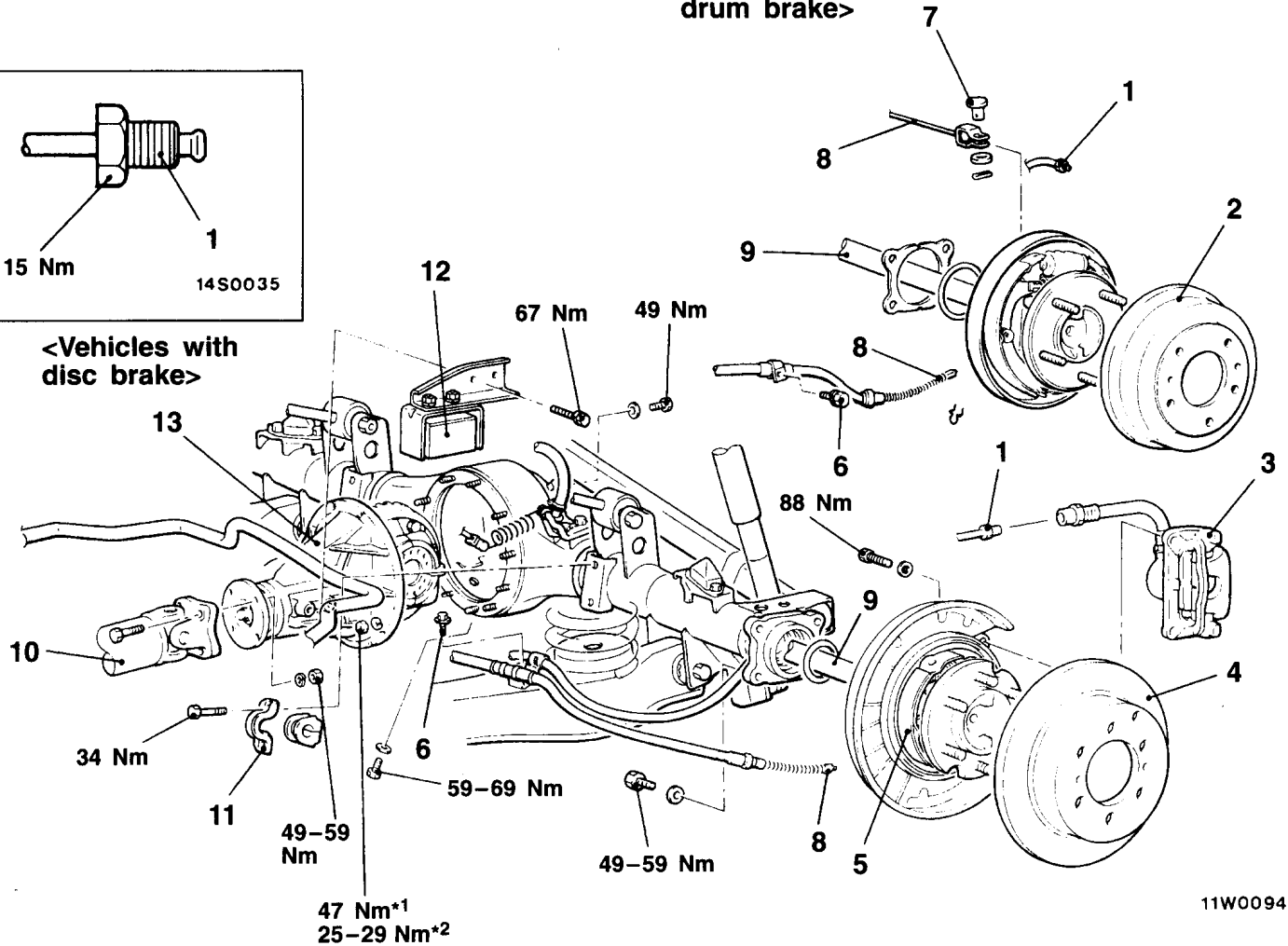
Post-installation Operation

- Air Bleeding from Brake Lines (Refer to GROUP 35A – Service Adjustment Procedures.)
- Adjustment of Parking Brake Lever Stroke (Refer to GROUP 36 – Service Adjustment Procedures.)
- Filling of Differential Gear Oil (Refer to P.27-11.)



<Vehicles with disc brake>

<Vehicles with drum brake>



11W0094

00002683

Removal steps

1. Brake tube connection
2. Brake drum
<Vehicles with drum brake>
3. Caliper assembly
<Vehicles with disc brake>
4. Brake disc <Vehicles with disc brake>
5. Parking brake shoe assembly
<Vehicles with disc brake> (Refer to GROUP 36 – Parking Brake Drum.)
6. Parking brake attaching bolt



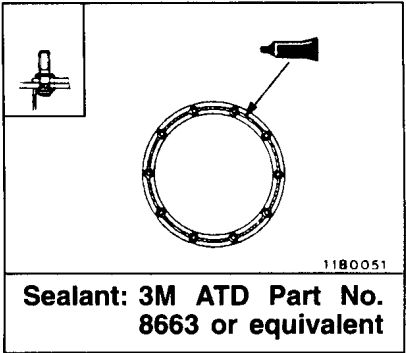
7. Pin <4WD>
8. Parking brake cable connection
9. Rear axle shaft assembly
10. Rear propeller shaft connection
11. Clamp <Vehicles with stabilizer>
12. Dynamic dumper
13. Differential carrier

NOTE

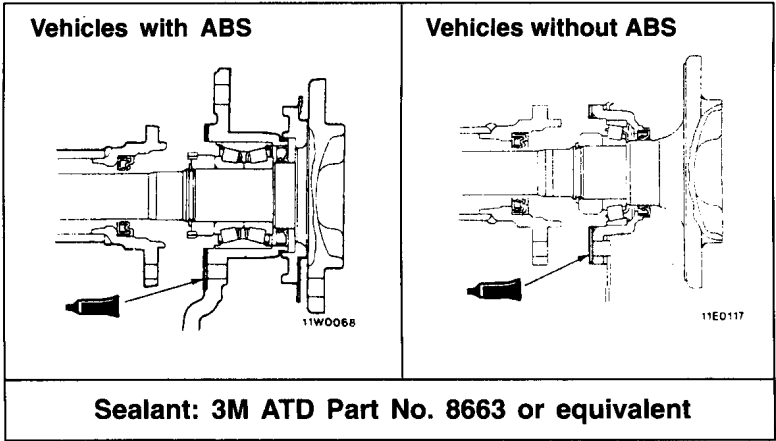
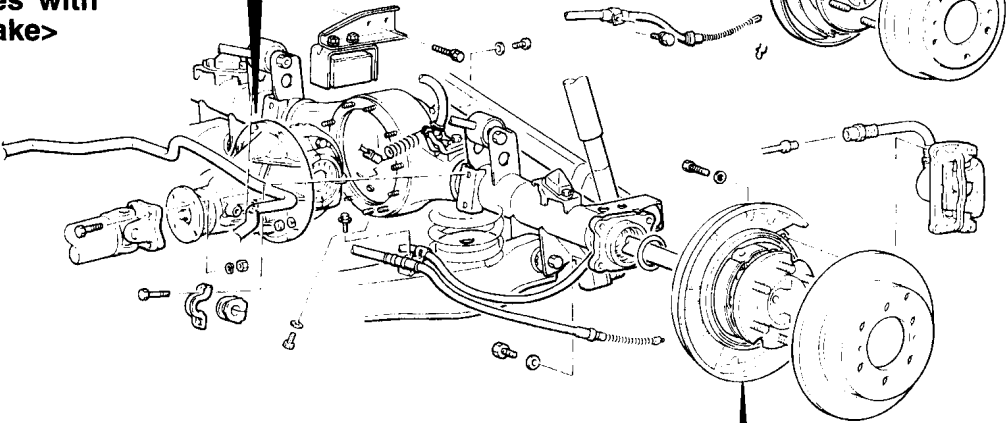
*1 4D56 Long wheelbase

*2 Except 4D56 Long wheelbase

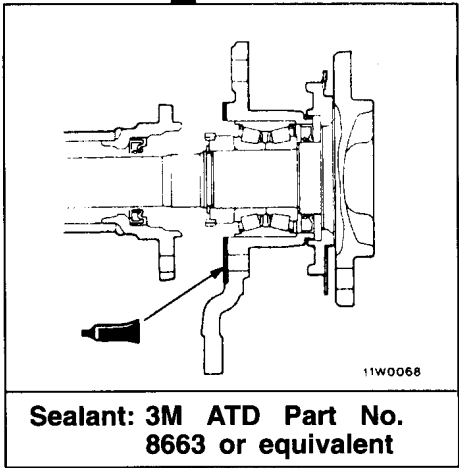
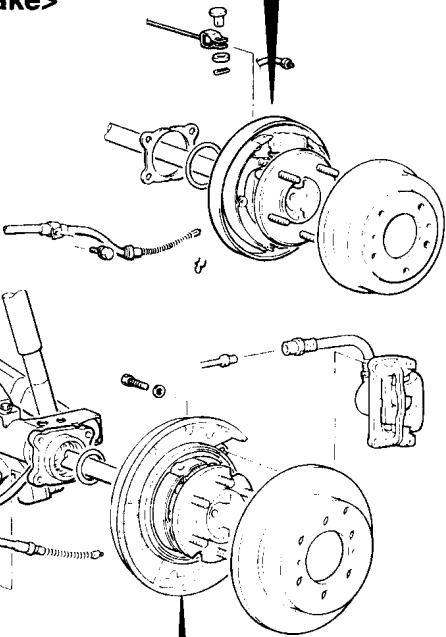
Sealing Points

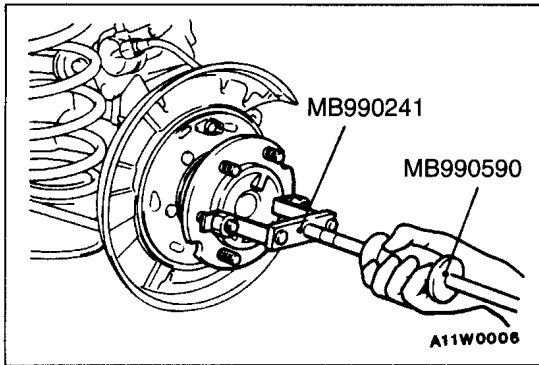


<Vehicles with disc brake>



<Vehicles with drum brake>





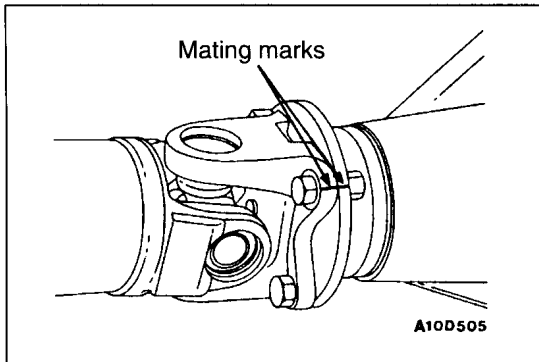
REMOVAL SERVICE POINTS

◀A▶ REAR AXLE SHAFT ASSEMBLY REMOVAL

Pull out the right and left axle shafts by about 70 mm. If it is difficult to pull out, use the special tools.

Caution

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

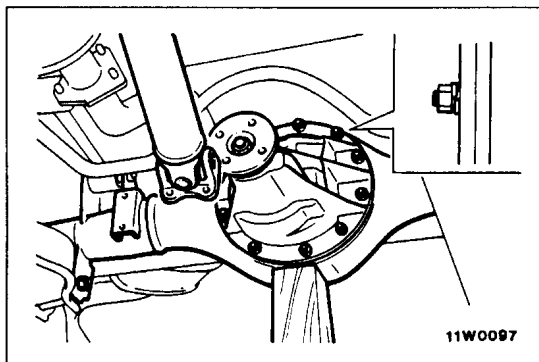


◀B▶ REAR PROPELLER SHAFT REMOVAL

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

Caution

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



◀C▶ DIFFERENTIAL CARRIER REMOVAL

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

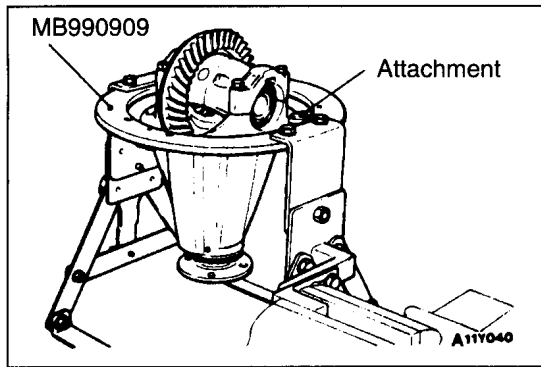
Caution

Use care not to strike the companion flange.

INSTALLATION SERVICE POINT

▶A▶ REAR PROPELLER SHAFT INSTALLATION

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

**INSPECTION BEFORE DISASSEMBLY**

120002217

Secure the special tool with a vice and install the differential carrier assembly with the attachment. Then carry out the following inspection.

DRIVE GEAR BACKLASH

1. Place a dial gauge against the end of a drive gear tooth and secure the drive pinion. Then turn the drive gear and take measurements at four places or more to check the backlash.

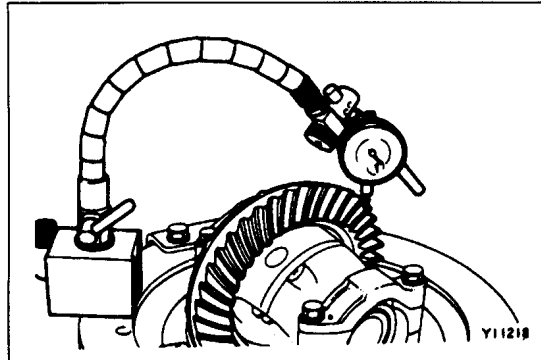
Standard value:

0.11–0.16 4G63 Standard wheelbase

0.08–0.13 4D56 Standard wheelbase, 4G64

0.13–0.18 4D56 Long wheelbase

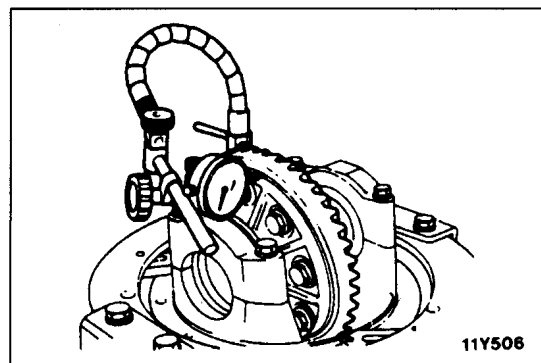
2. If the backlash is not within the standard value, replace the side bearing spacer, and then check the drive gear tooth contact.

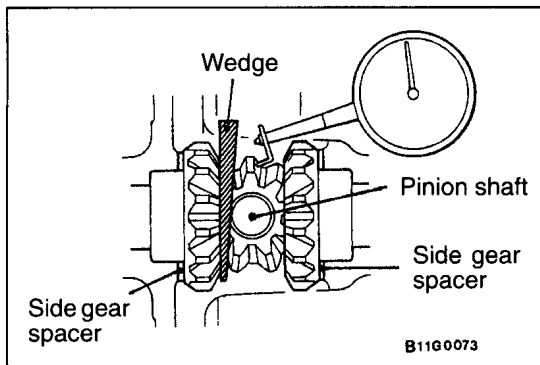
**DRIVE GEAR RUNOUT**

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

Limit: 0.05 mm

2. If the runout exceeds the limit value, check that there is no foreign material between the reverse side of the drive gear and the differential case, or that there is no looseness in the drive gear mounting bolt.
3. If step (2) is normal, change the assembly position of the drive gear and differential case, and then take another measurement.
4. If adjustment is impossible, replace the differential case or the drive gear and drive pinion as a set.





DIFFERENTIAL GEAR BACKLASH

1. Tap in a wooden wedge between the side gear and the pinion shaft and secure one side gear. Then place a dial gauge (with the measuring probe extended) against the pinion gear and measure the backlash.

Standard value:

0.01–0.076 2WD vehicles with 4G63 Standard wheelbase (without ABS)

0–0.076 2WD vehicles with 4G63 Standard wheelbase (with ABS), with 4D56 Long wheelbase

0.01–0.25 mm 2WD 4G63 Long wheelbase, 4D56 Standard wheelbase, 4G64 or 4WD

NOTE

Check the other pinion gear by the same procedure.

Limit: 0.2 mm

2. If the backlash exceeds the limit, replace the side gear spacers.
3. If adjustment is not possible, replace the side gears and pinion gears as a set.

DRIVE GEAR TOOTH CONTACT

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

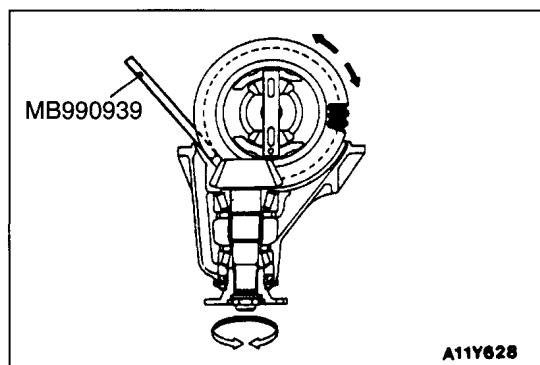
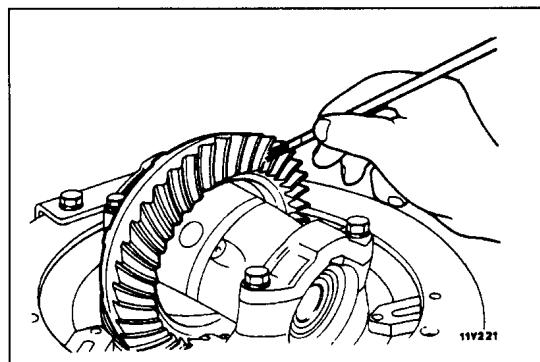
- (1) Apply a thin, uniform coat of machine blue to both surfaces of the drive gear teeth.

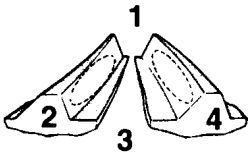
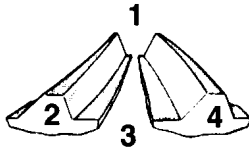
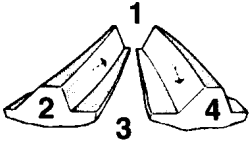
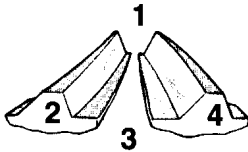
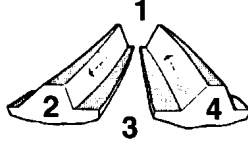
- (2) Insert a brass rod between the differential carrier and the differential case, and then rotate the companion flange by hand (once in the normal direction, and then once in the reverse direction) while applying a load to the drive gear, so that the revolution torque (approximately 2.5–3.0 Nm) is 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.



Standard tooth contact pattern	Problem	Solution
<p>1 Narrow tooth side 2 Drive-side tooth surface (the side applying power during forward movement) 3 Wide tooth side 4 Coast-side tooth surface (the side applying power during reverse movement)</p>  <p>11W0115</p>	<p>Tooth contact pattern resulting from excessive pinion height</p>  <p>11W0116</p> <p>The drive pinion is positioned too far from the centre of the drive gear.</p> <p>Tooth contact pattern resulting from insufficient pinion height</p>  <p>11W0117</p> <p>The drive pinion is positioned too close to the centre of the drive gear.</p>	 <p>11W0118</p> <p>Increase the thickness of the pinion height adjusting shim, and position the drive pinion closer to the centre of the drive gear. Also, for backlash adjustment, position the drive gear farther from the drive pinion.</p>  <p>11W0119</p> <p>Decrease the thickness of the pinion height adjusting shim, and position the drive pinion farther from the centre of the drive gear. Also, for backlash adjustment, position the drive gear closer to the drive pinion.</p>

NOTE

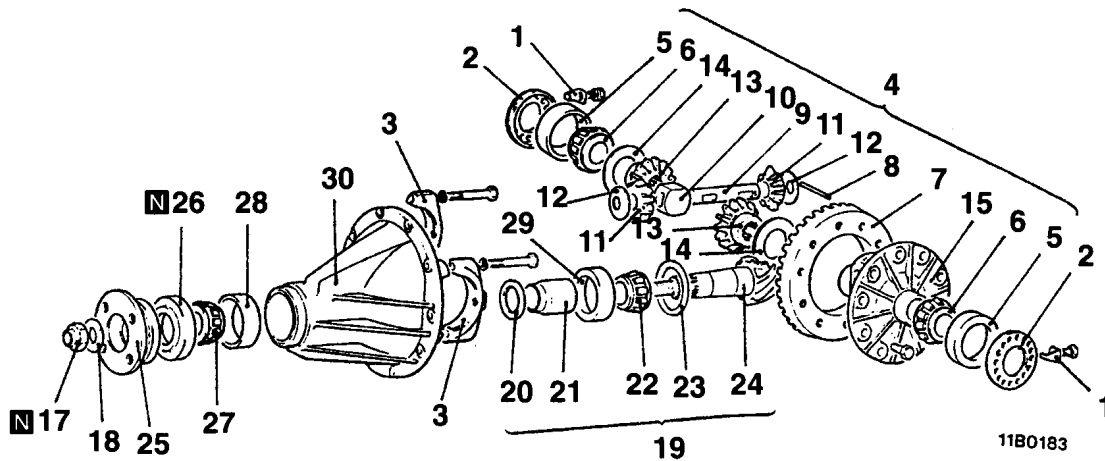
Checking the tooth contact pattern is the way to confirm that the adjustments of the pinion height and backlash have been done properly. Continue to adjust the pinion height and backlash until the tooth contact pattern resembles the standard pattern.

If, even 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.

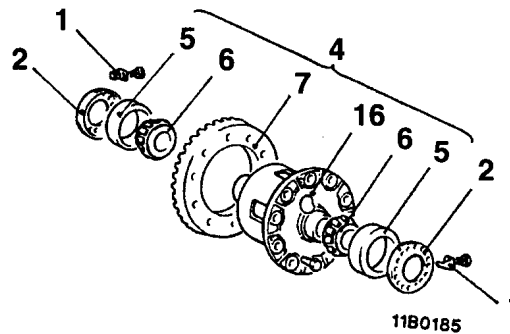
DISASSEMBLY

120002218

<Conventional differential>



<Limited slip differential>



Disassembly steps

- Inspection before disassembly (P. 27-34.)

◀A▶

1. Lock plate

◀B▶

2. Side bearing nut

◀C▶

3. Bearing cap

◀D▶

4. Differential case assembly

◀E▶

5. Side bearing outer race

6. Side bearing inner race

7. Drive gear

8. Lock pin

9. Pinion shaft

10. Thrust block
<2WD vehicles without ABS
(except 4G63 standard wheelbase)>
<2WD vehicles with ABS
(4G63 standard wheelbase)>

◀F▶

17. Self-locking nut

◀G▶

18. Washer

◀H▶

19. Drive pinion assembly

20. Drive pinion front shim

(For adjusting preload of drive pinion)

21. Drive pinion spacer

22. Drive pinion rear bearing inner race

23. Drive pinion rear shim

(For adjusting drive pinion height)

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

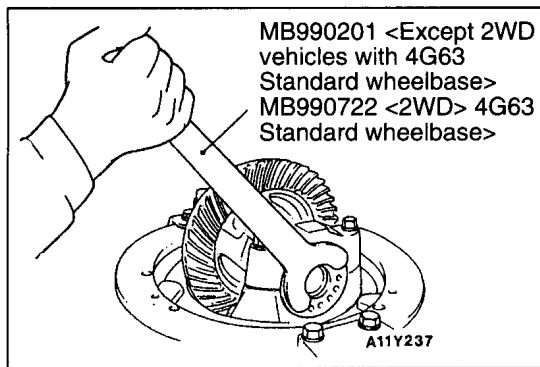
30. Differential carrier

◀I▶

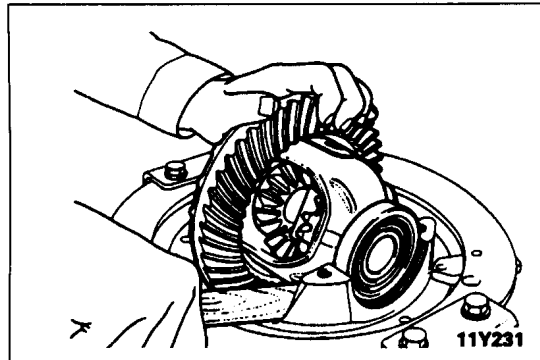
◀J▶

◀K▶

◀L▶

**DISASSEMBLY SERVICE POINTS****◀A▶ SIDE BEARING NUT REMOVAL****NOTE**

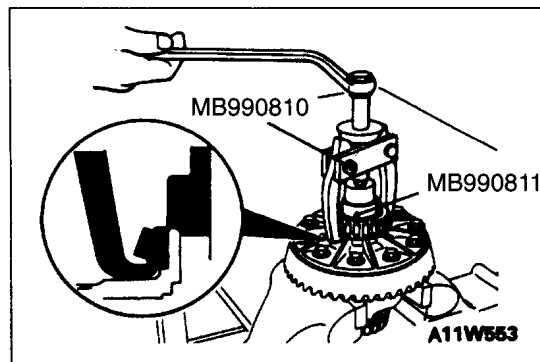
Keep the right and left side bearings and side bearing nuts separately, so that they do not become mixed at the time of reassembly.

**◀B▶ DIFFERENTIAL CASE ASSEMBLY REMOVAL**

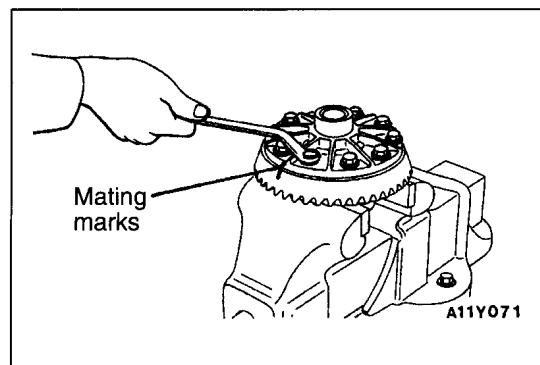
Use the handle of a hammer to remove the differential case assembly.

NOTE

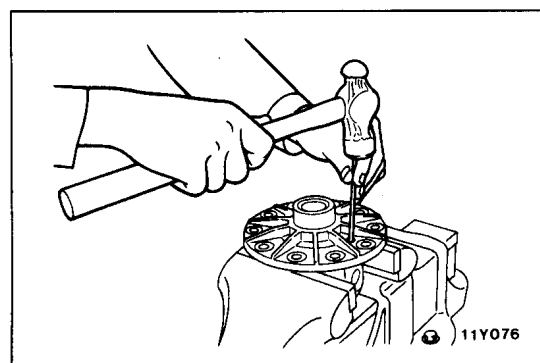
Keep the right and left side bearings and side bearing nuts separately, so that they do not become mixed at the time of reassembly.

**◀C▶ SIDE BEARING INNER RACE REMOVAL****NOTE**

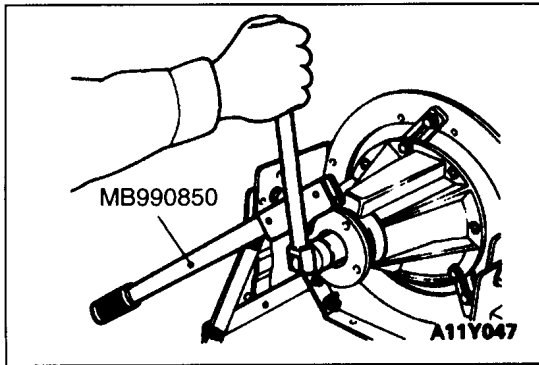
Attach the prongs of the special tool to the inner race of the side bearing through the openings in the differential case.

**◀D▶ DRIVE GEAR REMOVAL**

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.

**◀E▶ LOCK PIN REMOVAL**

◀F▶ SELF-LOCKING NUT REMOVAL



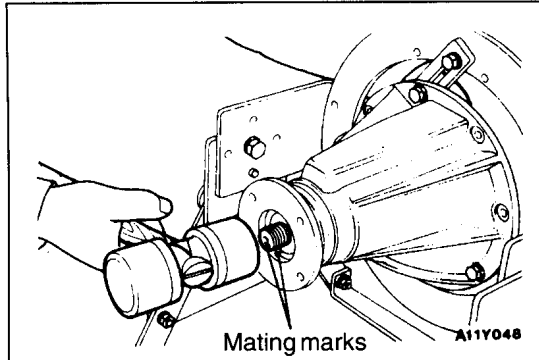
◀G▶ DRIVE PINION ASSEMBLY REMOVAL

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

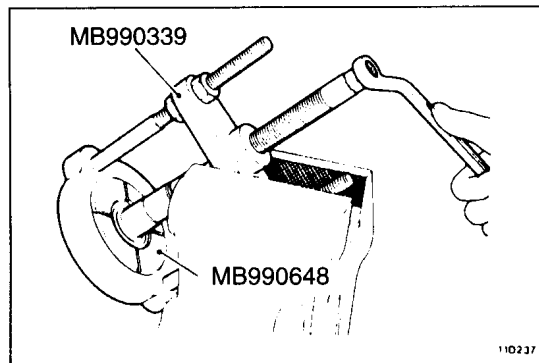
Caution

Do not make mating marks on the contact surfaces of the companion flange and propeller shaft.

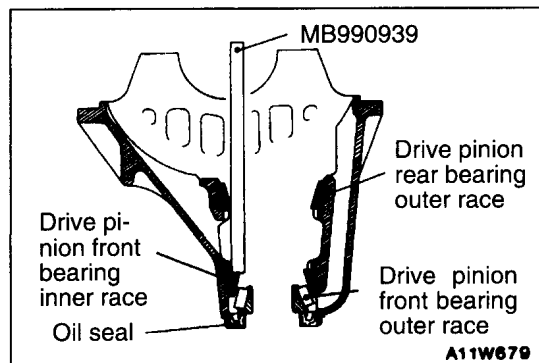
2. Drive out the drive pinion together with the drive pinion spacer and drive pinion front shims.



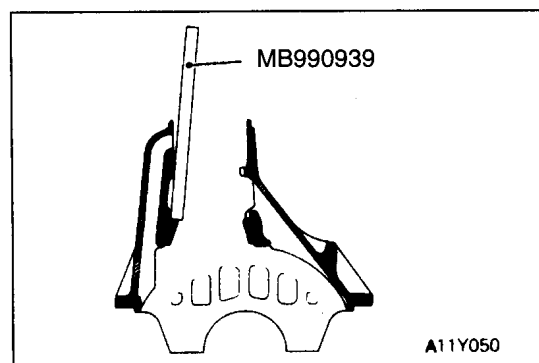
◀H▶ DRIVE PINION REAR BEARING INNER RACE REMOVAL

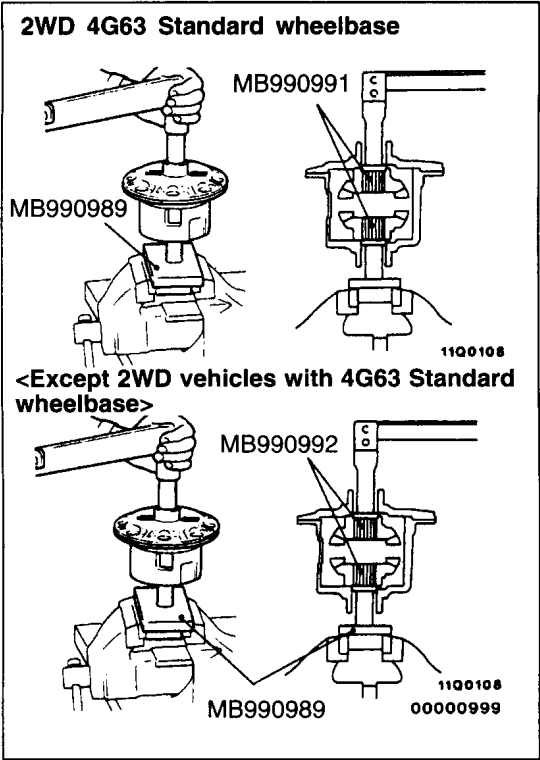


◀I▶ OIL SEAL/DRIVE PINION FRONT BEARING INNER RACE/DRIVE PINION FRONT BEARING OUTER RACE REMOVAL



◀J▶ DRIVE PINION REAR BEARING OUTER RACE REMOVAL





INSPECTION

DIFFERENTIAL PRELOAD INSPECTION

1. Use the special tool to measure the differential preload.

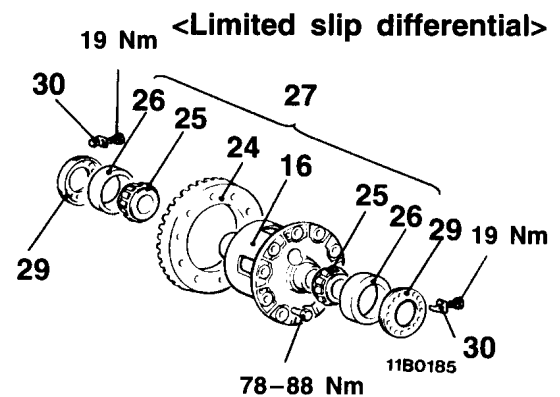
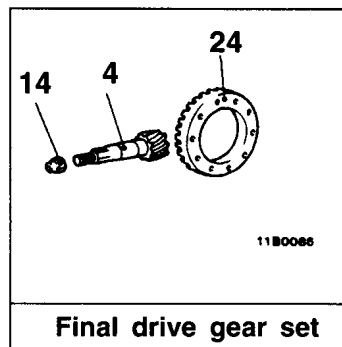
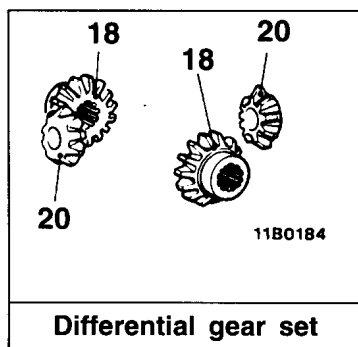
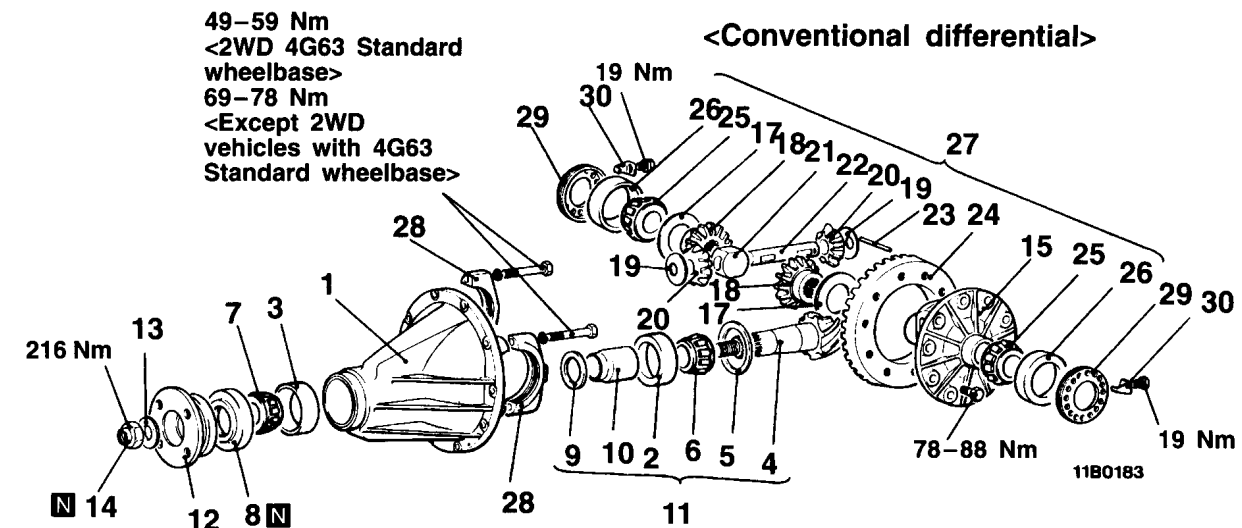
Standard value:

	When installing a new clutch plate Nm	When reinstalling the current clutch plate Nm
2WD 4G63 Standard wheelbase	49-78	34-78
<Except 2WD vehicles with 4G63 Standard wheelbase>	39-74	25-74

2. If the differential preload is not within the standard value, disassemble the differential case assembly and repair or replace the parts.

REASSEMBLY

120002219

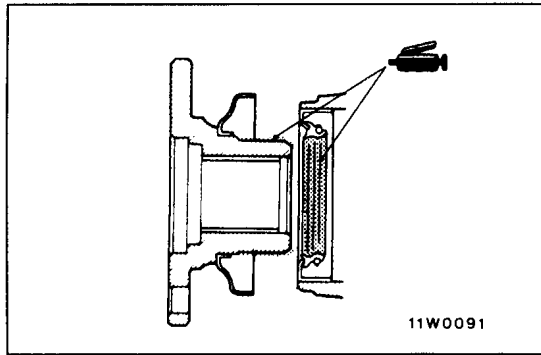


00001000

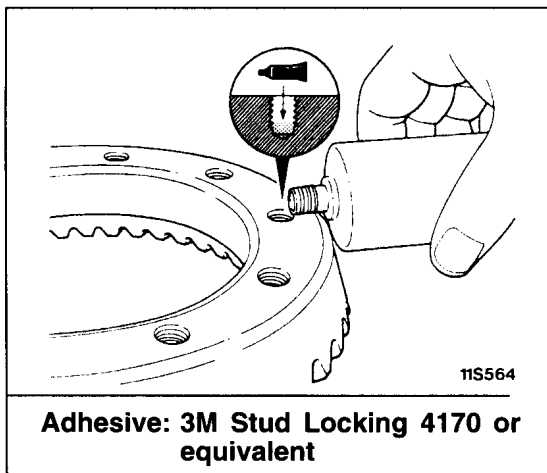
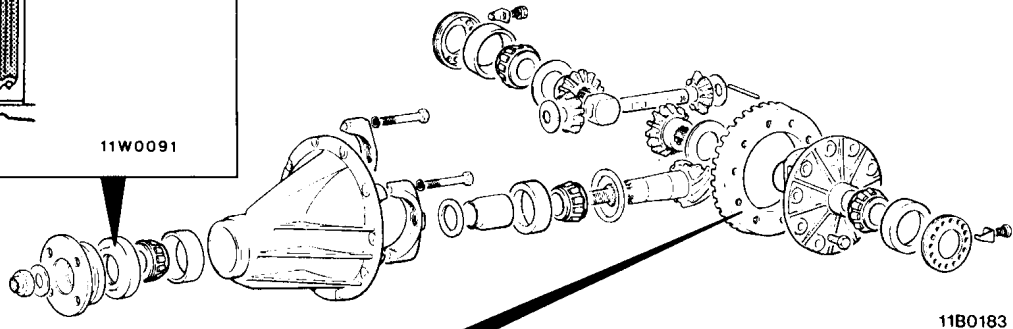
Reassembly steps

- 1. Differential carrier
- ▶A◀ 2. Drive pinion rear bearing outer race
- ▶B◀ 3. Drive pinion front bearing outer race
- ▶C◀ • Drive pinion height adjustment
- 4. Drive pinion
- 5. Drive pinion rear shim
(For adjusting drive pinion height)
- ▶D◀ 6. Drive pinion rear bearing inner race
- Drive pinion preload adjustment
- 7. Drive pinion front bearing inner race
- 8. Oil seal
- 9. Drive pinion front shim
(For adjusting drive pinion preload)
- 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
- 17. Side gear thrust spacer
- 18. Side gear
- 19. Pinion washer
- 20. Pinion gear
- ▶E◀ • Differential gear backlash adjustment
- 21. Thrust block
<2WD vehicles without ABS (except 4G63 standard wheelbase)>
<2WD vehicles with ABS (4G63 standard wheelbase)>
- 22. Pinion shaft
- ▶F◀ 23. Lock pin
- ▶G◀ 24. Drive gear
- ▶H◀ 25. Side bearing inner race
- 26. Side bearing outer race
- 27. Differential case assembly
- ▶I◀ 28. Bearing cap
- ▶J◀ • Drive gear backlash adjustment
- 29. Side bearing nut
- 30. Lock plate

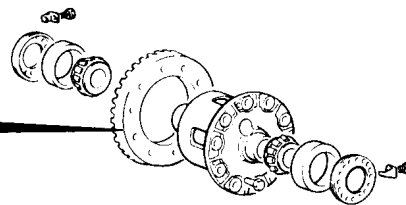
Lubrication and Adhesive Points



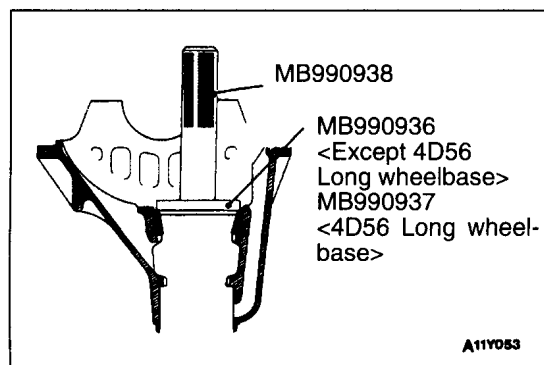
<Conventional differential>



<Limited slip differential>

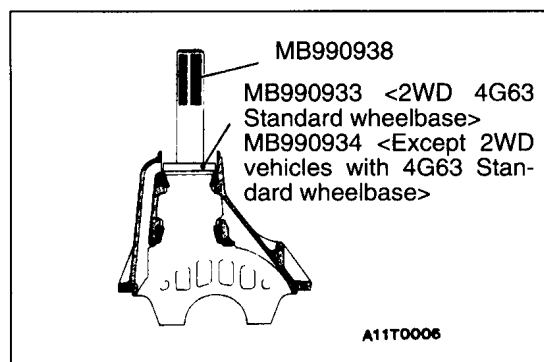


00001001



DISASSEMBLY SERVICE POINTS

►A◄ DRIVE PINION REAR BEARING OUTER RACE PRESS-FITTING



►B◄ DRIVE PINION FRONT BEARING OUTER RACE PRESS-FITTING

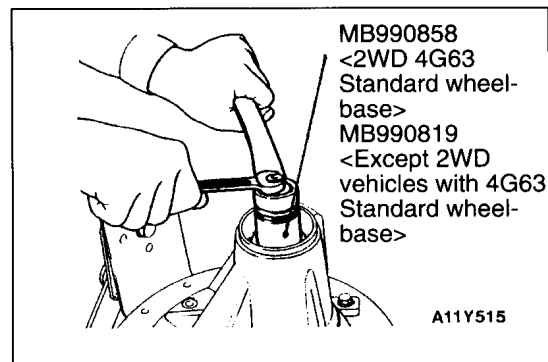
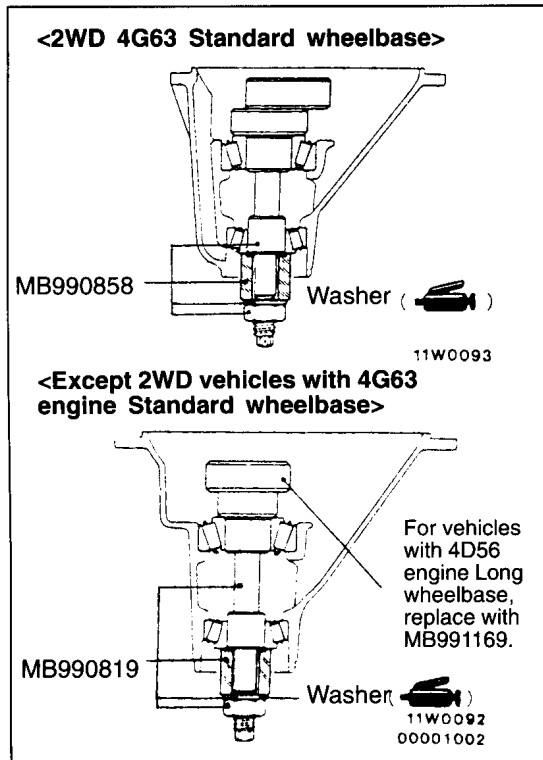
►C◄ DRIVE PINION HEIGHT ADJUSTMENT

Adjust the drive pinion height by the following procedures:

- (1) Apply multi-purpose grease to the washer of the special tool.
- (2) Install special tools and drive pinion front and rear bearing inner races to the gear carrier in the sequence shown in the illustration.

NOTE

For vehicles with 4D56 engine Long wheelbase, replace the drive pinion attachment only with MB991169.



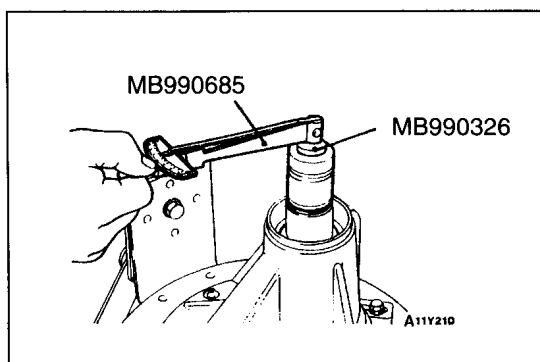
- (3) Tighten the nut of the special tool step by step while measuring the rotation torque of the drive pinion. Then check the rotation torque is at the standard value.

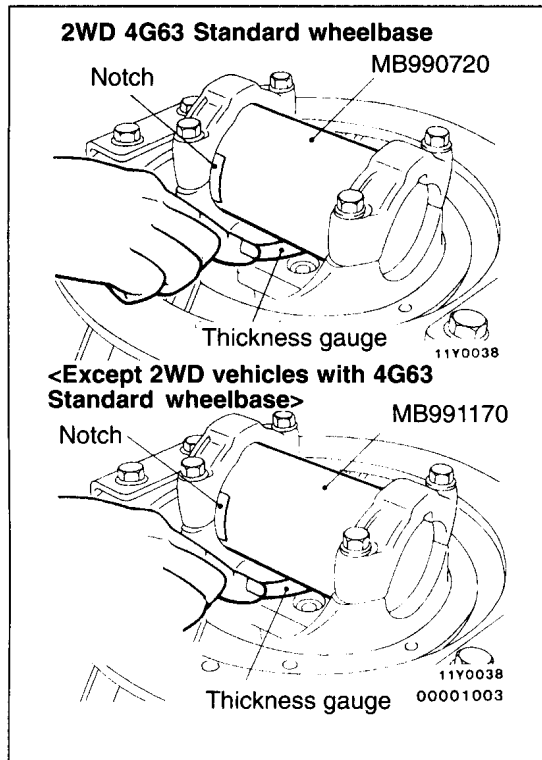
Standard value:

Bearing division	Bearing lubrication	Rotation torque
New	None (With anti-rust agent)	0.6–0.9 Nm
New or reusing	Gear oil applied	0.4–0.5 Nm

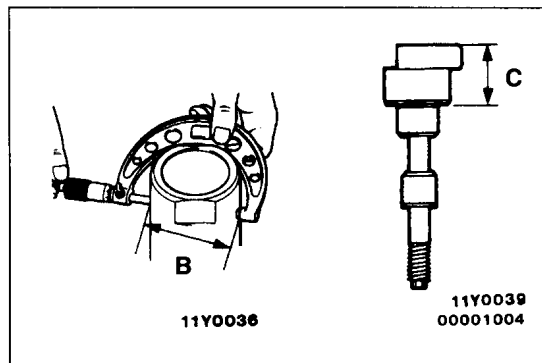
NOTE

With the differential for 2WD vehicles with 4G63 Standard wheelbase, the special tool cannot be turned a full revolution, so turn it several times within the range of movement to run in the bearing, and then measure the rotation torque.

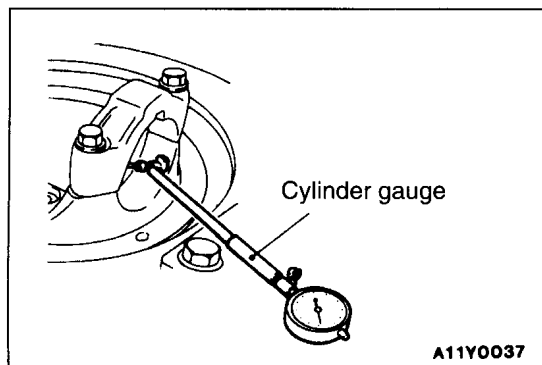




- (4) Clean the side bearing hub.
- (5) Place the special tools between the side bearing hub of the gear carrier, and position the notch as shown in the illustration. Then tighten side bearing mounting bolt.
- (6) Use a thickness gauge to measure the clearance (A) between the special tools.



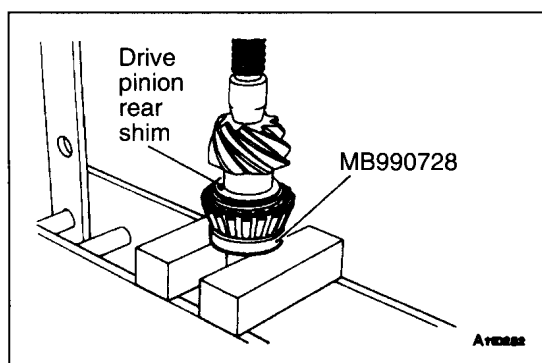
- (7) Remove the special tools (MB990858, MB990819, MB991169).
- (8) Use a micrometer to measure the dimensions (B, C) of the special tools.



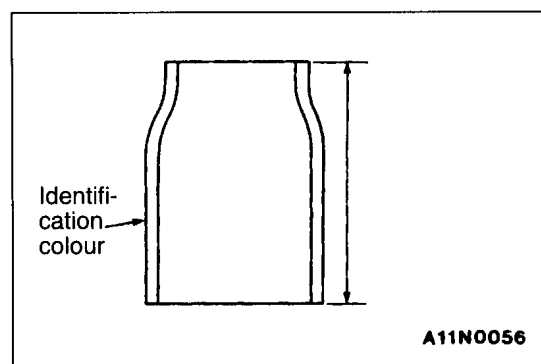
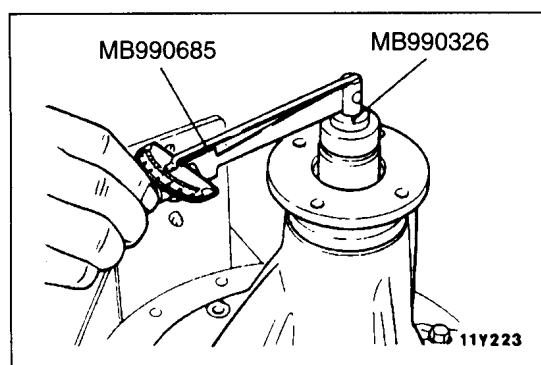
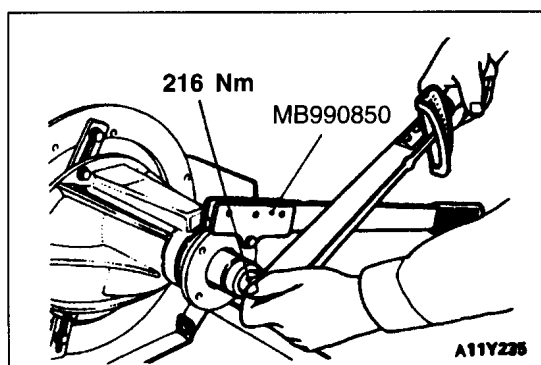
- (9) Install the bearing cap, and then use a cylinder gauge to measure the inside diameter (D) of the bearing cap.
- (10) Calculate the thickness (F) of the required drive pinion rear shim by the following formula, and then select a shim which most closely matches this thickness.

$$F = A + B + C - 1/2D - E$$

- E:** 91.00 – 2WD 4G63 Standard wheelbase
 100.00 – 2WD 4G63 Long wheelbase, 4D56 Standard wheelbase, 4G64 or 4WD
 115.00 – 4D56 Long wheelbase



- (11) 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.



►D◄ DRIVE PINION PRELOAD ADJUSTMENT

1. Insert the drive pinion into the gear carrier, and then install the following parts in that order from the carrier rear side. Drive pinion spacer, drive pinion front shim and drive pinion front bearing inner race, companion flange.

NOTE

Do not install the oil seal.

2. Tighten the companion flange to the specified torque by using the special tools.

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

Standard value:

Bearing division	Bearing lubrication	Rotation torque
New	None (With anti-rust agent)	0.6–0.9 Nm
New or reusing	Gear oil applied	0.4–0.5 Nm

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

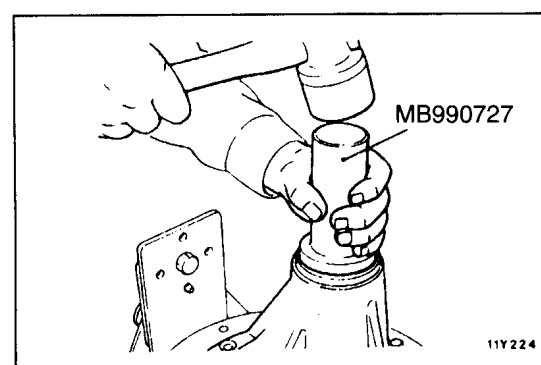
NOTE

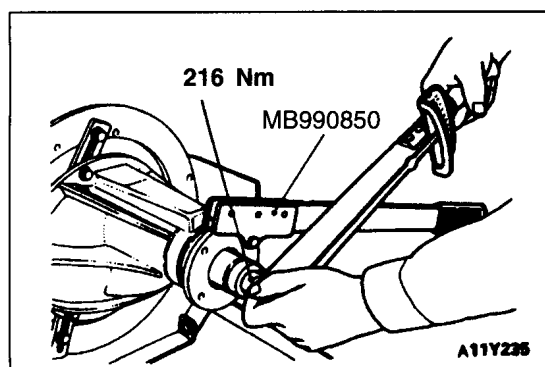
When selecting the drive pinion front shims, if the number of shims is large, reduce the number of shims to a minimum by selecting the drive pinion spacers.

Also, select the drive pinion spacer from the following two types.

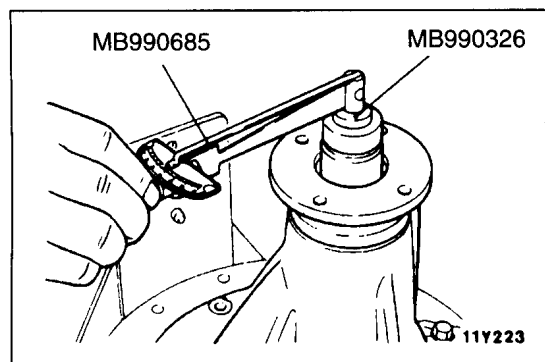
Item	Height of drive pinion spacer mm	Identification colour
2WD 4G63 Standard wheelbase	46.67	White
	47.01	—
<Except 2WD vehicles with 4G63 Standard wheelbase>	56.67	—
	57.01	White

5. Remove the companion flange and drive pinion again. Then insert the oil seal onto the drive pinion and use the special tool to press-fit the oil seal.





6. 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.

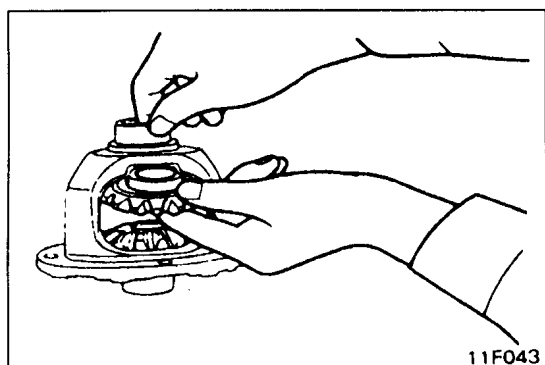


7. Measure the drive pinion turning torque (with oil seal) to verify that the drive pinion turning torque complies with the standard value.

Standard value:

Bearing division	Bearing lubrication	Rotation torque
New	None (With anti-rust agent)	0.8–1.1 Nm
New or reusing	Gear oil applied	0.6–0.7 Nm

8. If the rotation torque is not within the standard value, check the tightening torque of the companion flange self-locking nut and the installation of the oil seal.



►E◄ DIFFERENTIAL GEAR BACKLASH ADJUSTMENT

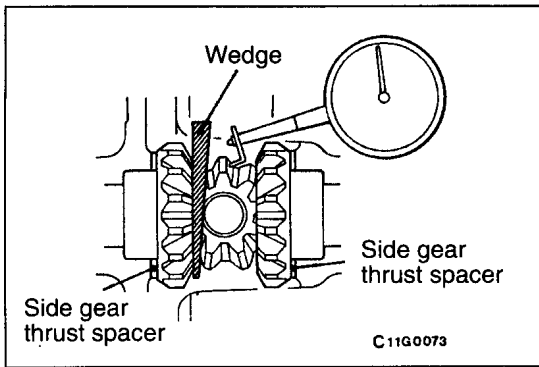
Adjust the differential gear backlash by the following procedure.

- (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 assemble the thrust block and 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:

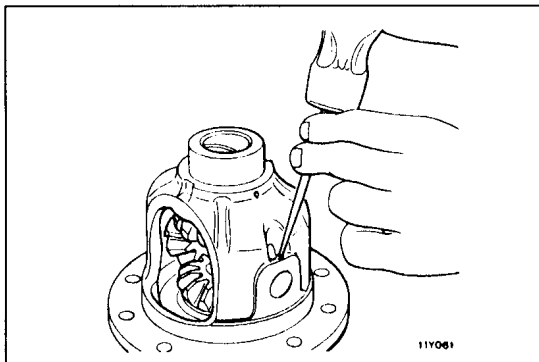
0.01–0.076 mm	2WD 4G63 Standard wheelbase (without ABS)
0–0.076 mm	2WD 4G63 Standard wheelbase (with ABS), 4D56 Long wheelbase
0.01–0.25 mm	2WD 4G63 Long wheelbase, 4D56 Standard wheelbase, 4G64 or 4WD

NOTE

Measure by the same procedure for the other pinion gear.

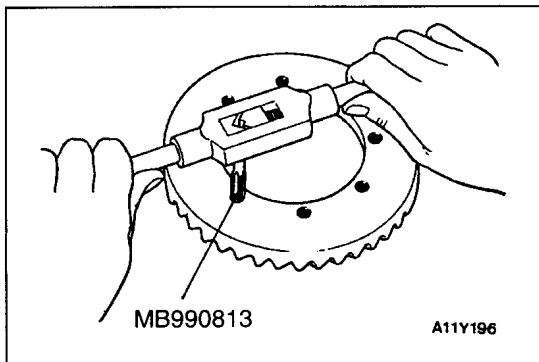
Limit: 0.2 mm

- (5) If the backlash exceeds the limit value, replace side bearing adjustment spacers.
- (6) If adjustment is not possible, replace the side gears and pinion gears as a set.
- (7) Check that the backlash is within the limit value and that the differential gear turns smoothly.



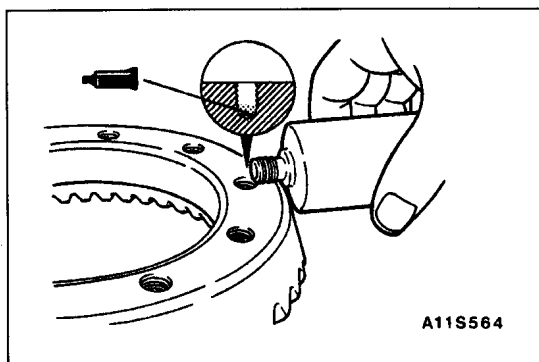
►F◀ LOCK PIN INSTALLATION

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.



►G◀ DRIVE GEAR INSTALLATION

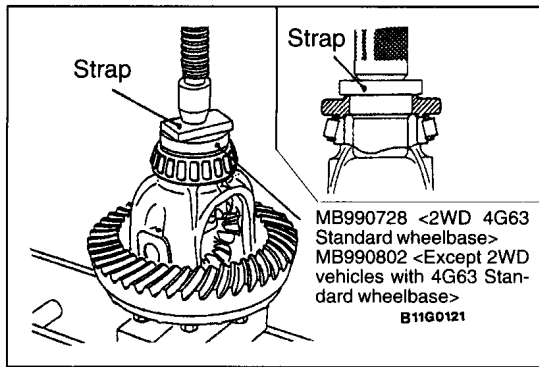
1. Clean the drive gear attaching bolts.
2. Remove the adhesive adhered to the threaded holes of the drive gear by turning the special tool (tap M10 × 1.25), and then clean the threaded holes by applying compressed air.



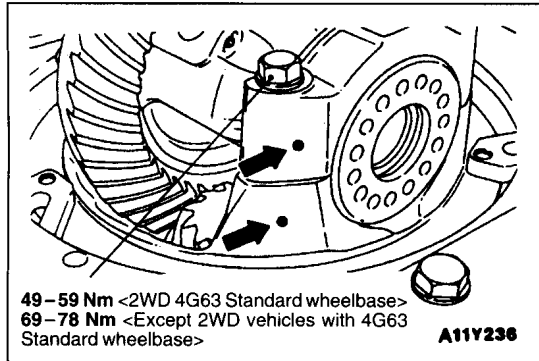
3. Apply the specified adhesive to the threaded holes of the drive gear.

Specified adhesive: 3M Stud Locking 4170 or equivalent

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

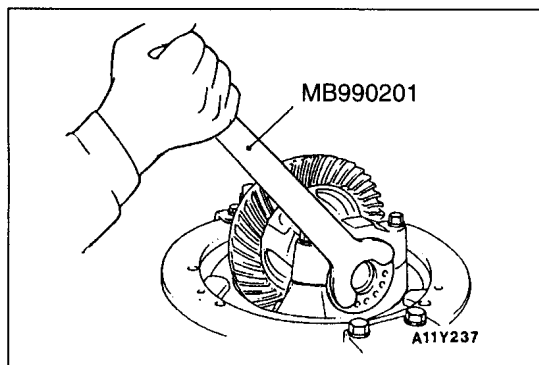


►H◄ SIDE BEARING INNER RACE INSTALLATION



►I◄ BEARING CAP INSTALLATION

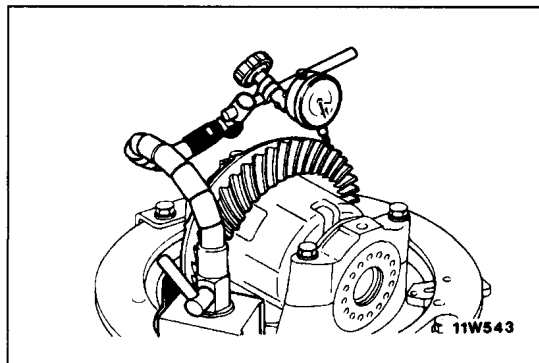
Align the mating marks on the gear carrier and the bearing cap, and then tighten the bearing cap.



►J◄ DRIVE GEAR BACKLASH ADJUSTMENT

Adjust drive gear backlash as follows:

- (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 drive gear backlash.

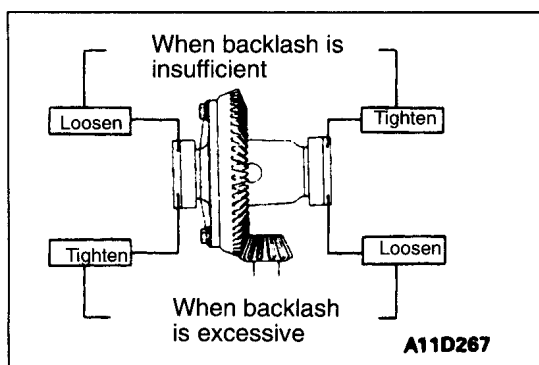
Standard value:

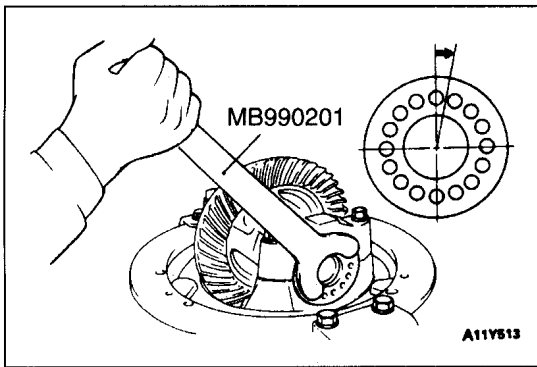
0.11–0.16 mm	4G63 Standard wheelbase
0.08–0.13 mm	4D56 Standard wheelbase, 4G64
0.13–0.18 mm	4D56 Long wheelbase

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

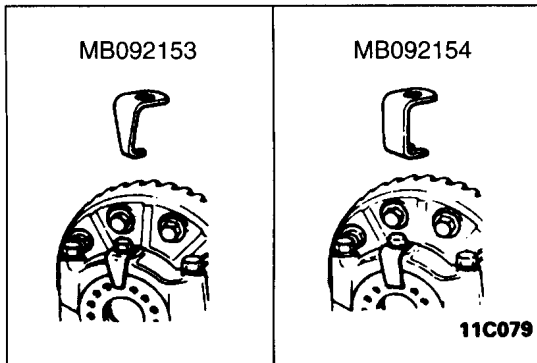
NOTE

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

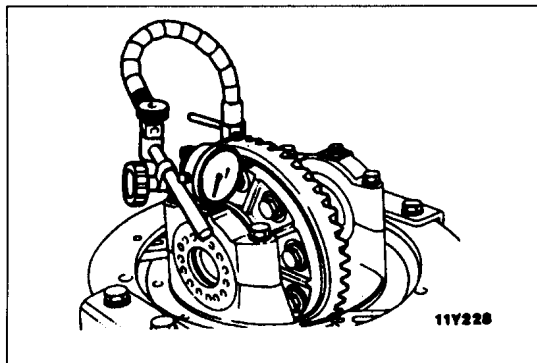




- (4) Using the special tool, to apply the preload, turn down both right and left side bearing nuts on half the distance between centres of two neighbouring holes.



- (5) Choose and install the lock plate (two kinds).
 (6) Check the drive gear tooth contact. If poor contact is evident, make adjustment. (Refer to P. 27-35.)



- (7) Measure the drive gear runout.

Limit: 0.05 mm

- (8) When drive gear runout exceeds the limit, remove the differential case and then the drive gears, moving them to different positions and reinstall them.
 (9) If adjustment is not possible, replace the differential case or drive gear and drive pinion as a set.

LIMITED SLIP DIFFERENTIAL CASE ASSEMBLY <2WD 4G63>

120000427

DISASSEMBLY AND REASSEMBLY

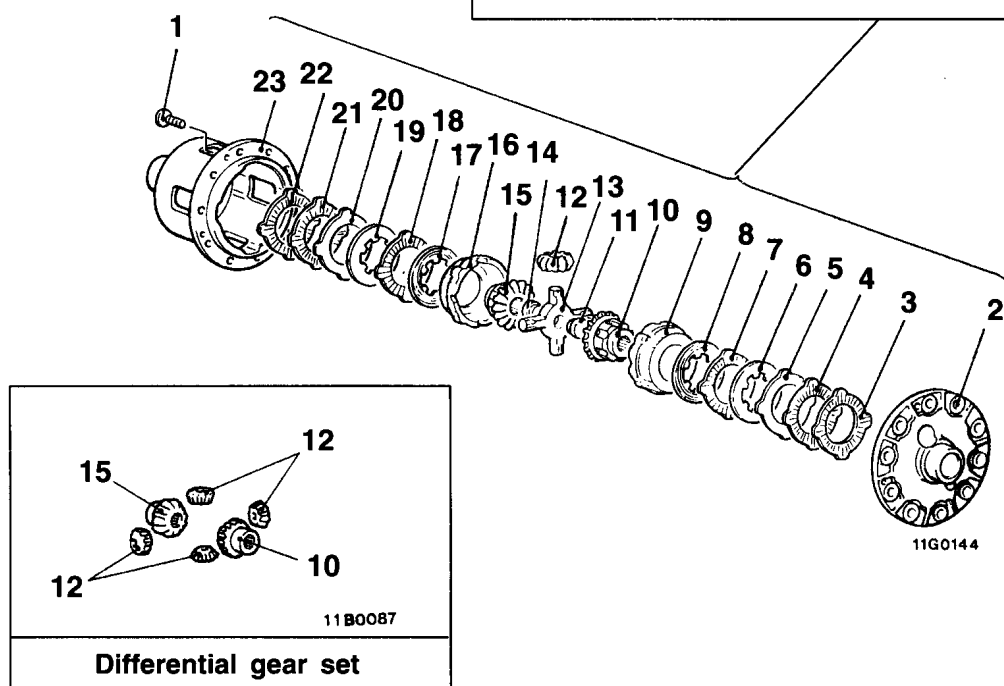


Gear oil:

MITSUBISHI Genuine Gear Oil Part No. 8149630EX,
CASTROL HYPOY LS (GL-5, SAE 90), SHELL-LSD
(GL-5, SAE 80W-90) or equivalent

Caution

Apply the specified gear oil to each component
especially careful to coat contact surfaces and sliding
surfaces.

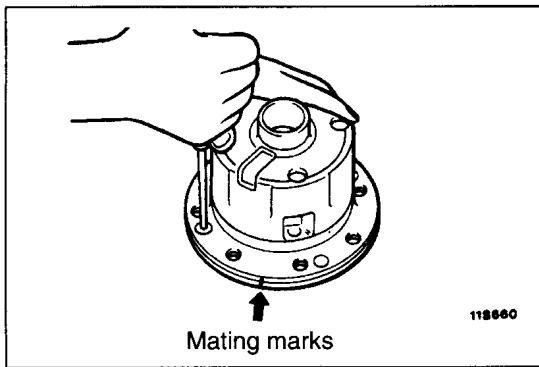


00001005

Disassembly steps

- ▶C◀ • Differential preload of limited slip differential
- ◀A▶ ▶B◀ 1. Screw
- 2. Differential case (A)
- 3. Friction plate
- 4. Friction plate
- 5. Spring plate
- 6. Spring disc
- 7. Friction plate
- 8. Friction disc
- 9. Pressure ring
- 10. Side gear
- 11. Thrust block
- 12. Differential pinion gear
- 13. Differential pinion shaft
- 14. Thrust block
- 15. Side gear
- 16. Pressure ring

- 17. Friction disc
- 18. Friction plate
- 19. Spring disc
- 20. Spring plate
- 21. Friction plate
- 22. Friction plate
- ▶A◀ 23. Differential case (B)



DISASSEMBLY SERVICE POINT

◀A▶ SCREW REMOVAL

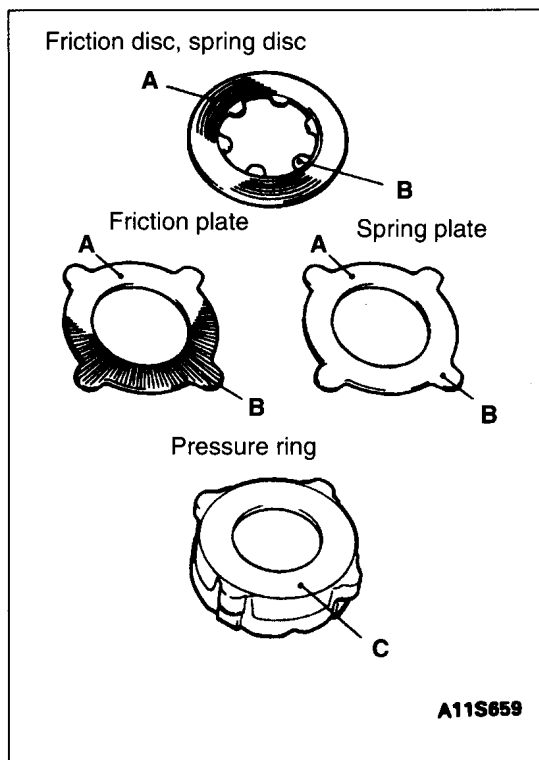
1. Check the mating marks.

NOTE

The mating marks are represented by one of the following methods.

- (1) Engraving by a punch or electric pen
- (2) Identical arabic numerals

2. Loosen the mounting screws for differential case (A) and (B) evenly, step by step.
3. Separate differential case (B) and differential case (A), and take out the parts inside. Do not confuse the left and right spring plates, spring discs, friction plates and friction discs for further reassembly.



INSPECTION

DIFFERENTIAL CASE COMPONENT CONTACT SLIDING SURFACE INSPECTION

1. Clean the disassembled parts with cleaning oil and dry them with compressed air.
2. Check the following items for each plate and disc and for the pressure ring.

- A. The friction surfaces of the friction plate, friction disc, spring plate.

If there are any signs of seizure, severe friction, or colour 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; this wear is not abnormal.

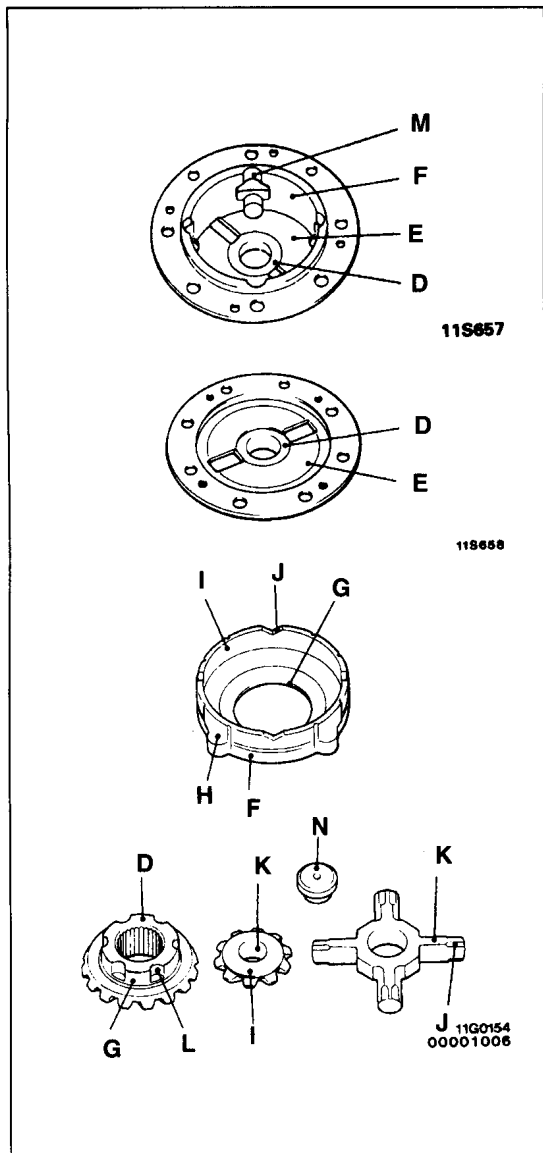
- B. Inside and outside projections of friction disc, friction plate and spring plate.

Replace any cracked or damaged parts.

- C. The friction surface of the friction disc and 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; this wear is not abnormal.



3. Inspect the contact and sliding surfaces listed below, and repair any nicks and burrs by using an oil stone.
 - D. The sliding surfaces between the side gears and the case
 - E. The spring contacting surface of the differential case and spring plate.
 - F. The contact surfaces of the outer circumference of the pressure ring and the inner circumference of the differential case.
 - G. The sliding surfaces of the hole in the pressure ring and the outer circumference of the side gear.
 - H. The projection on the outer circumference of the pressure ring.
 - I. The spherical surface of the differential pinion gear and the inner diameter of the pressure ring.
 - J. The V-shaped groove in the pressure ring, and the V-shaped part in the pinion shaft.
 - K. The outer diameter of the pinion shaft and the hole of the differential pinion gear.
 - L. The outer circumference groove of the side gear.
 - M. The inner circumference groove of the differential case.
 - N. The sliding surface of the thrust block.

WARPING OF THE 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.

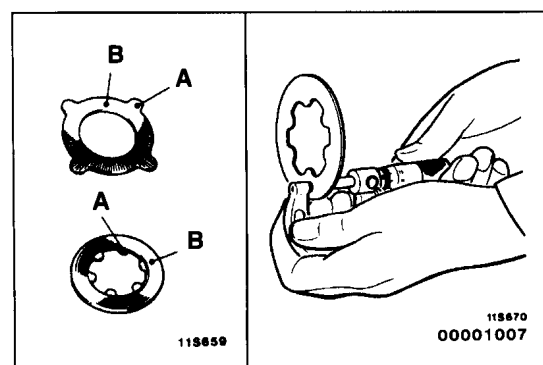
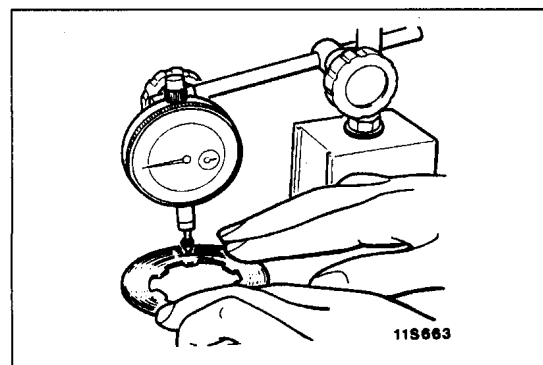
Limit: Max. 0.08 mm

WEAR OF THE FRICTION PLATE SPRING DISC AND FRICTION DISC

1. Measure the thickness of the friction surfaces (B) and projections (A) of the friction disc, spring disc and plate in several places. Then check that the differences between A and B are within the limit.

Limit: 0.1 mm

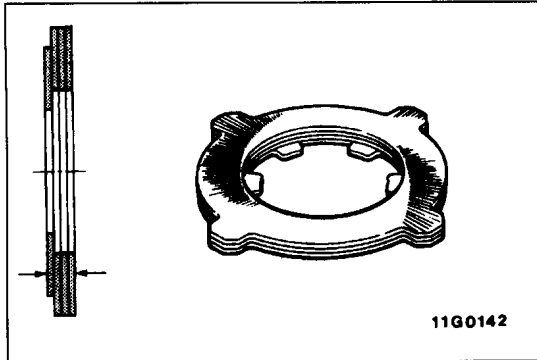
2. If the parts are worn beyond the allowable limit, replace them with new parts.



REASSEMBLY SERVICE POINTS

►A◄ DIFFERENTIAL CASE (B) INSTALLATION

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 end play of the side gear when installing the internal components into the differential case.



- (1) Arrange the 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.

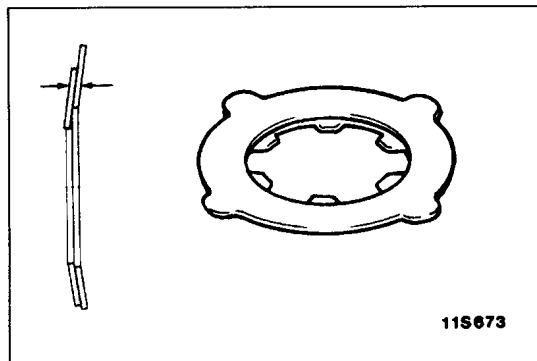
Standard value: 0–0.05 mm

NOTE

Two types of replacement parts are available:

Friction disc (with thicknesses of 1.6 mm and 1.7 mm)

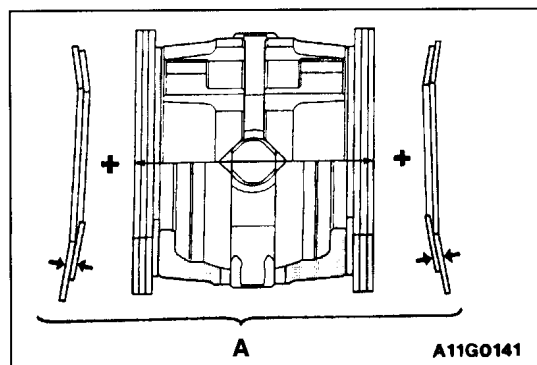
Friction plate (with thicknesses of 1.7 mm and 1.8 mm)



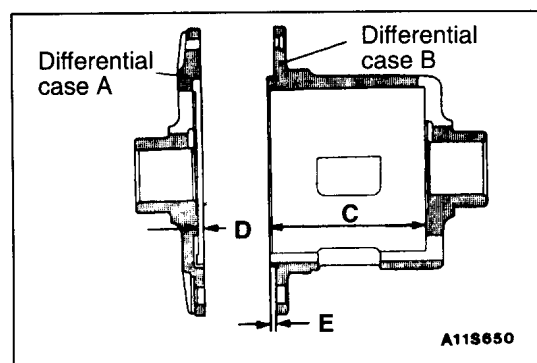
- (2) Place the spring plate and spring disc together as shown in the illustration, and use a micrometer to measure the thickness. Place the parts together in the combination that gives the least difference in thickness between the two sets.

NOTE

Replacement parts of the spring plate and spring disc are 1.7 mm.



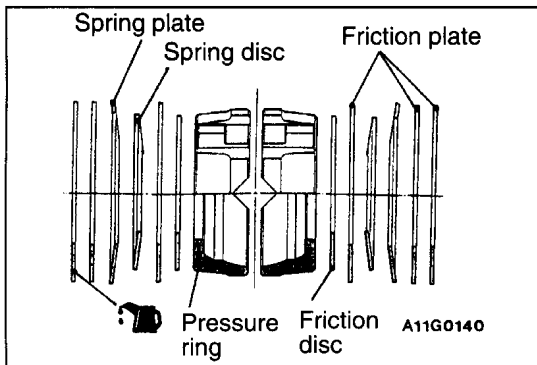
- (3) Assemble the pressure ring's internal components (differential pinion shaft and pressure ring) and the friction discs and friction plates, and then as shown in the figure, measure the overall width.
- (4) Calculate the total value (A) of the thickness of the spring disc and spring plate plus the value measured in (3) above.



- (5) Obtain the dimension (B) between the spring plate contact surfaces when differential cases (A) and (B) are combined. ($B = C + D - E$)
- (6) Change the thickness of the friction disc so that the clearance ($B - A$) between the differential case and the friction plate becomes the standard value.

Standard value: 0.05–0.20 mm

27-54 REAR AXLE – Limited Slip Differential Case Assembly <2WD 4G63>



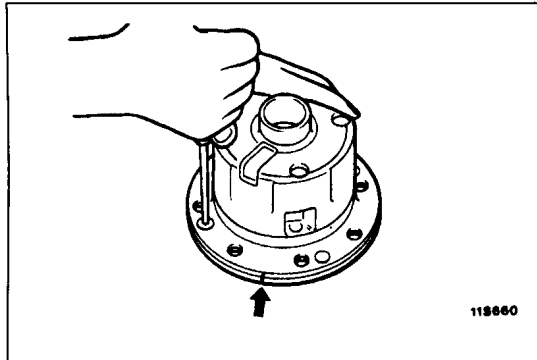
- (7) Apply specified gear oil to each part, and then insert each part into differential case (B) in the order shown in the illustration.

Gear oil:

MITSUBISHI Genuine Gear Oil Part No. 8149630 EX, CASTROL HYPOY LS (GL-5, SAE 90), SHELL-LSD (GL-5, SAE80W-90) or equivalent

NOTE

Be particularly sure to apply oil to the contact surfaces and sliding surfaces.

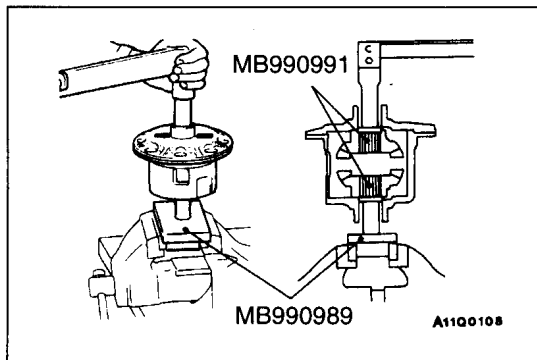


►B◀ SCREW INSTALLATION

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 friction plate are not fit correctly into the groove, so make the assembly again.



►C◀ DIFFERENTIAL PRELOAD INSPECTION FOR LIMITED SLIP DIFFERENTIAL

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

Standard value:

When a new clutch plate is used

49–78 Nm

When the current clutch plate is reused

34–78 Nm

NOTE

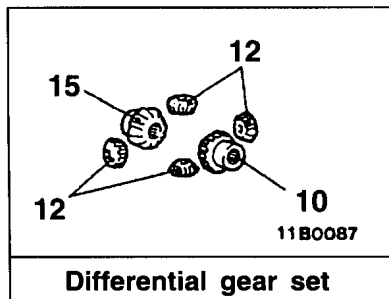
Measure the starting torque after rotating slightly. When measuring the torque, do so at the beginning of movement.

2. If the starting torque is not within the standard value, disassemble the differential case assembly and repair or replace the parts.

LIMITED SLIP DIFFERENTIAL CASE ASSEMBLY **<Except 2WD Vehicles with 4G63 Engine>**

120002220

DISASSEMBLY AND REASSEMBLY

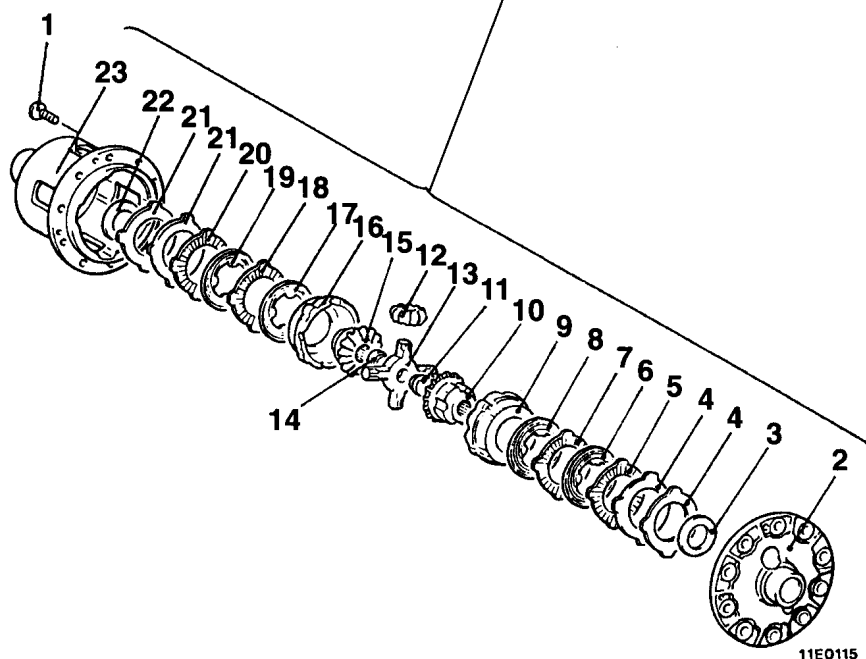


Gear oil:

**MITSUBISHI Genuine Gear Oil Part No. 8149630EX,
 CASTROL HYPOY LS (GL-5, SAE 90), SHELL-LSD
 (GL-5, SAE 80W-90) or equivalent**

Caution

**Apply the specified gear oil to each component
 especially careful to coat contact surfaces and sliding
 surfaces.**

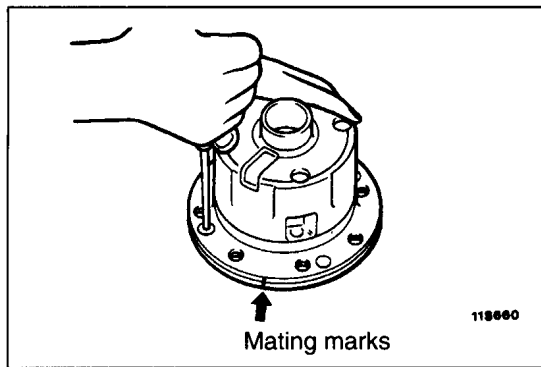


00001008

Disassembly steps

- ▶C◀ • Differential preload of limited slip differential
- ◀A▶ ▶B◀ 1. Screw
- 2. Differential case (A)
- 3. Thrust washer
- 4. Spring plate
- 5. Friction plate
- 6. Friction disc
- 7. Friction plate
- 8. Friction disc
- 9. Pressure ring
- 10. Side gear
- 11. Thrust block
- 12. Differential pinion gear
- 13. Differential pinion shaft
- 14. Thrust block
- 15. Side gear

- 16. Pressure ring
- 17. Friction disc
- 18. Friction plate
- 19. Friction disc
- 20. Friction plate
- 21. Spring plate
- 22. Thrust washer
- ▶A◀ 23. Differential case (B)

**DISASSEMBLY SERVICE POINT****◀A▶ SCREW REMOVAL**

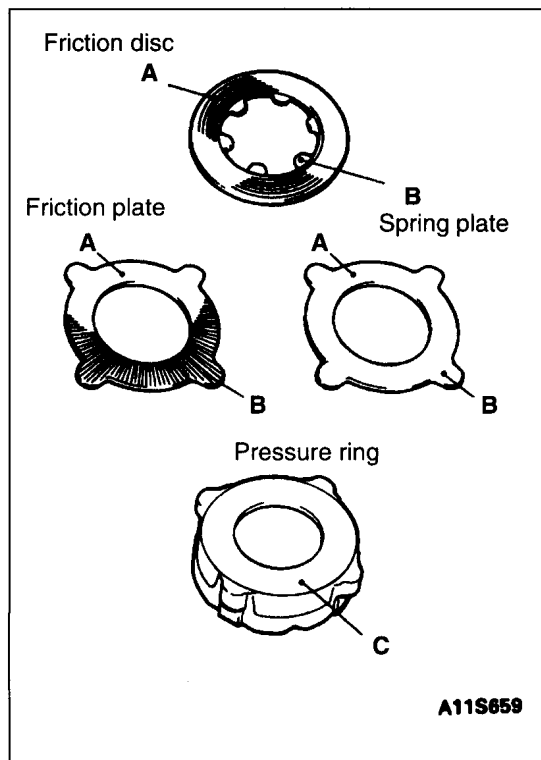
1. Check the mating marks.

NOTE

The mating marks are represented by one of the following methods.

- (1) Engraving by a punch or electric pen.
- (2) Identical arabic numerals.

2. Loosen the mounting screws for differential case (A) and (B) evenly, step by step.
3. Separate differential case (B) and differential case (A), and take out the parts inside. Do not confuse the left and right spring plates, spring discs, friction plates and friction discs for further reassembly.

**INSPECTION****DIFFERENTIAL CASE COMPONENT CONTACT SLIDING SURFACE INSPECTION**

1. Clean the disassembled parts with cleaning oil and dry them with compressed air.
2. Check the following items for each plate and disc and for the pressure ring.

- A. The friction surfaces of the friction plate, friction disc, spring plate.

If there are any signs of seizure, severe friction, or colour 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; this wear is not abnormal.

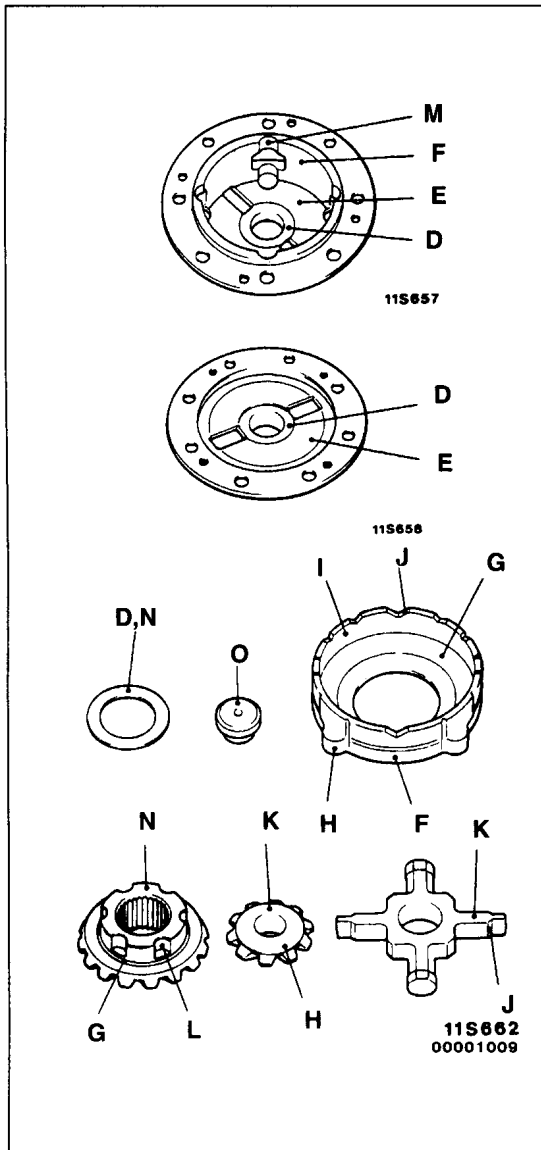
- B. Inside and outside projections of friction disc, friction plate and spring plate.

Replace any cracked or damaged parts.

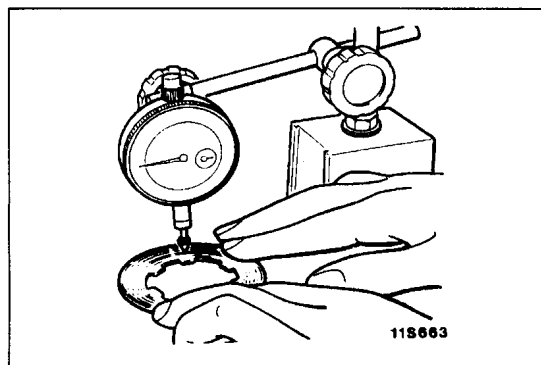
- C. The friction surface of the friction disc and pressure ring. If there are nicks or scratches, repair the part by first grinding with an oil stone and then polishing with rubbing compound on a surface plate.

NOTE

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



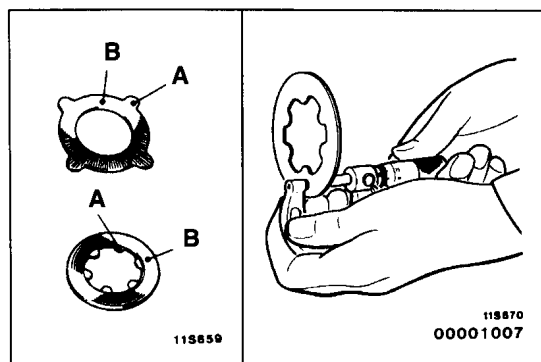
3. Inspect the contact and sliding surfaces listed below, and repair any nicks and burrs by using an oil stone.
 - D. The sliding surfaces of the thrust washer and the case.
 - E. The spring contacting surface of the differential case and spring plate.
 - F. The contact surfaces of the outer circumference of the pressure ring and the inner circumference of the differential case.
 - G. The sliding surfaces of the hole in the pressure ring and the outer circumference of the side gear.
 - H. The projection on the outer circumference of the pressure ring.
 - I. The spherical surface of the differential pinion gear and the inner diameter of the pressure ring.
 - J. The V-shaped groove in the pressure ring, and the V-shaped part in the pinion shaft.
 - K. The outer diameter of the pinion shaft and the hole of the differential pinion gear.
 - L. The outer circumference groove of the side gear.
 - M. The inner circumference groove of the differential case.
 - N. The sliding surface of the thrust block.
 - O. The sliding part of the thrust block.



WARPING OF THE 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: Max. 0.08 mm



WEAR OF THE FRICTION PLATE SPRING PLATE AND FRICTION DISC

1. Measure the thickness of the friction surfaces (B) and projections (A) of the friction disc, spring disc and plate in several places. Then check that the differences between A and B are within the limit.

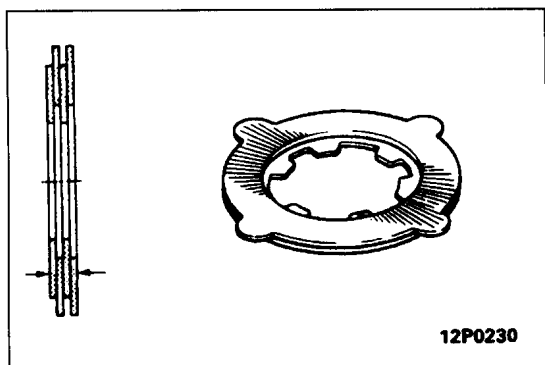
Limit: 0.1 mm

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

REASSEMBLY SERVICE POINTS

►A◄ DIFFERENTIAL CASE (B) INSTALLATION

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 end play 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.

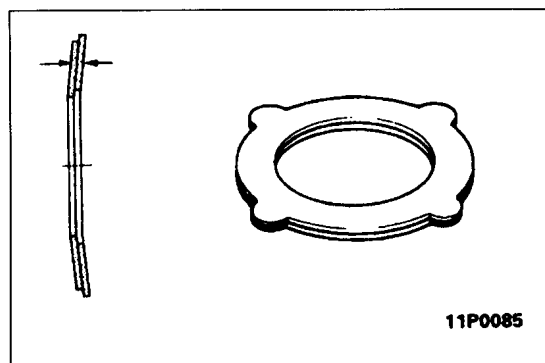
Standard value: 0–0.05 mm

NOTE

Two types of replacement parts are available:

Friction disc (with thicknesses of 1.6 mm and 1.7 mm)

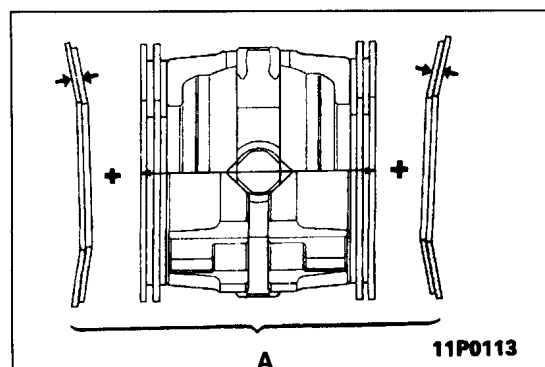
Friction plate (with thicknesses of 1.75 mm and 1.85 mm)



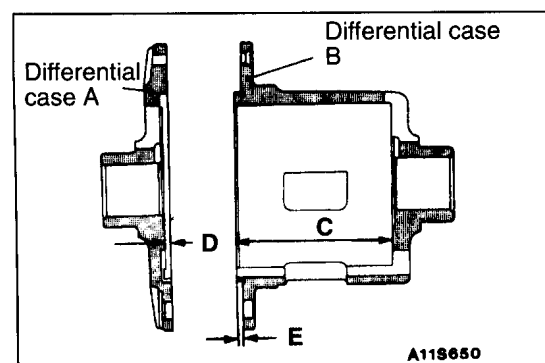
- (2) Place the spring plates together as shown in the illustration, and use a micrometer to measure the thickness. Place the parts together in the combination that gives the least difference in thickness between the two sets.

NOTE

If replacing with new parts, the thickness of the spring plates and spring discs should be 1.75 mm.

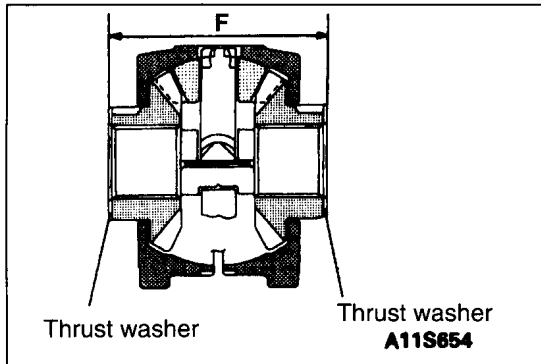


- (3) Assemble the pressure ring's internal components (differential pinion shaft and pressure ring) and the friction discs and friction plates, and then as shown in the figure, measure the overall width.
- (4) Calculate the total value (A) of the thickness of the spring disc and spring plate plus the value measured in (3) above.

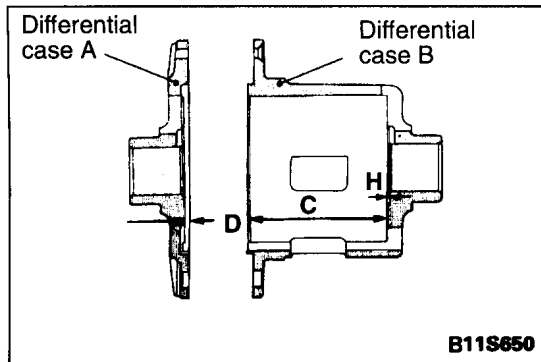


- (5) Obtain the dimension (B) between the spring plate contact surfaces when differential cases (A) and (B) are combined. ($B = C + D - E$)
- (6) Change the thickness of the friction disc so that the clearance ($B - A$) between the differential case and the spring plate becomes the standard value.

Standard value: 0.06–0.20 mm



- (7) Remove the spring plates, spring discs, friction plates and friction disc.
- (8) Measure the dimension (F) from the thrust washer end surface to end surface.



- (9) Obtain the dimension (G) between the thrust washer contact surfaces when differential cases (A) and (B) are combined.
 $(G = C + D + H)$

NOTE

Dimension (B) is the distance between the spring plate contact surfaces when differential cases (A) and (B) are combined. (Refer to P. 27-57.)

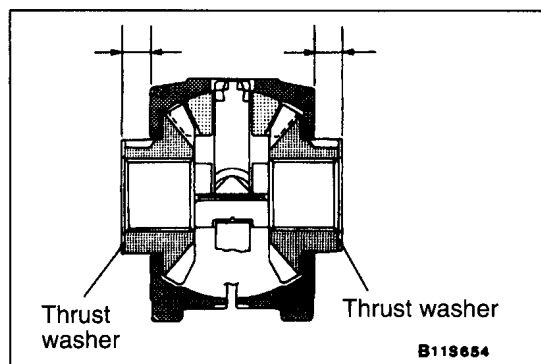
- (10) Check that the clearance $(G - F)$ in the side gear axial direction is within the standard value range.

Standard value: 0.05–0.20 mm

- (11) If the clearance is not within the standard value range, replace the thrust washers.

NOTE

1. Select washers in such a way that the clearances between the left and right pressure rings and the thrust washers remain the same as each other.
2. Three types of replacement parts are available:
 1.50 mm, 1.60 mm and 1.70 mm.



- (12) 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: 0–0.05 mm

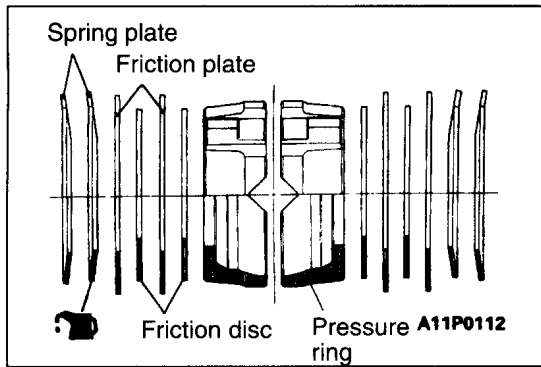
NOTE

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

- (13) If the distance is not within the standard value, replace the thrust washers.

NOTE

Three types of replacement parts are available:
 1.50 mm, 1.60 mm and 1.70 mm



(14) Apply specified gear oil to each part, and then insert each part into differential case (B) in the order shown in the illustration.

Gear oil: MITSUBISHI Genuine Gear Oil part No. 8149630EX, CASTROL HYPOY LS (GL-5, SAE 90), SHELL-LSD (GL-5, SAE 80W-90) or equivalent

NOTE

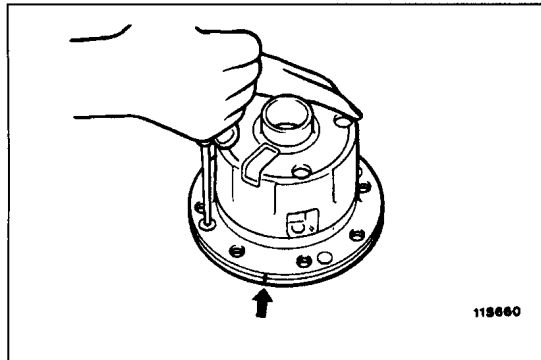
Be particularly sure to apply oil to the contact surfaces and sliding surfaces.

►B◀ SCREW INSTALLATION

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.



►C◀ DIFFERENTIAL PRELOAD INSPECTION FOR LIMITED SLIP DIFFERENTIAL

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

Standard value:

When a new clutch plate is used

39–74 Nm

When the current clutch plate is reused

25–74 Nm

NOTE

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

2. If the starting torque is not within the standard value, disassemble the differential case assembly and repair or replace the parts.

