

REAR AXLE

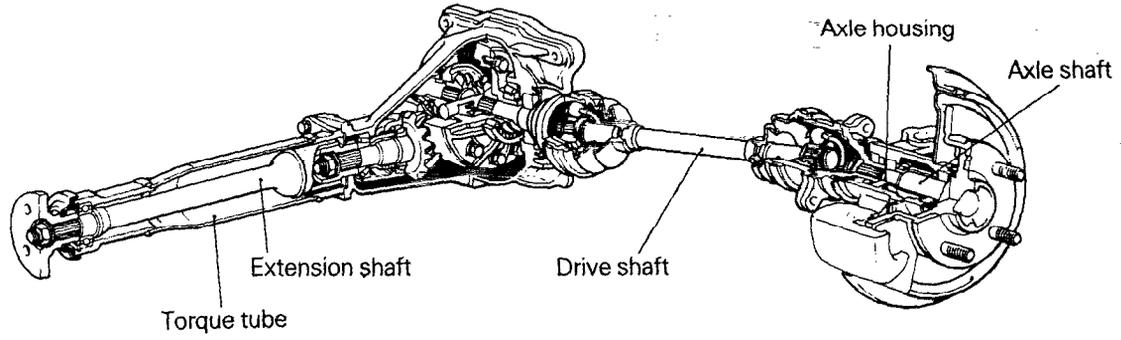
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GENERAL INFORMATION

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The rear axle consists of torque tube, differential, drive shaft, axle housing and axle shaft. The differential is of a limited slip type.



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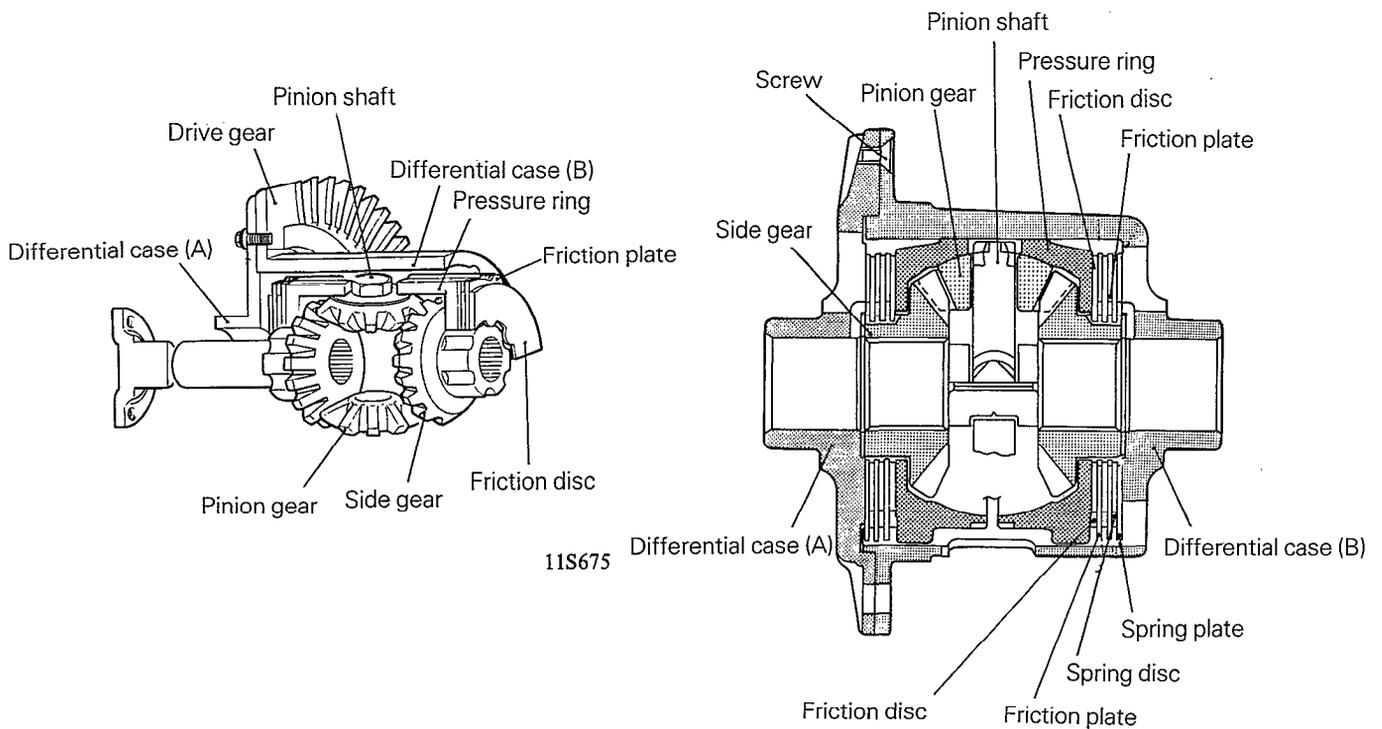
LIMITED SLIP DIFFERENTIAL

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A limited slip differential is an anti-slipping device which functions as a differential during cornering to allow the outer wheel to turn at a faster speed than the inner wheel. In the event that one wheel begins spinning (driving on slippery road surfaces, one wheel leaves the road surface. etc.), it automatically functions to prevent such spinning.

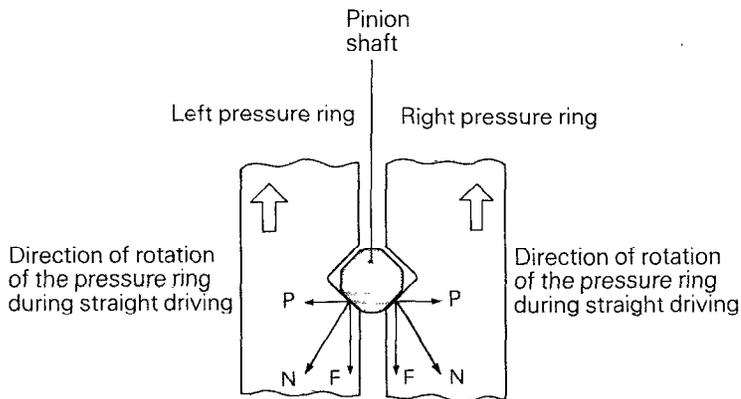
CONSTRUCTION AND FUNCTION

With a conventional differential, in the event that one wheel of the vehicle is on ice, mud, or some other slippery surface, the wheel will spin and the drive force of the vehicle will be greatly reduced. If this happens, the speeds of the differential case and of the side gear (axle shaft) are different because of differential operation. The limited slip function acts to limit this differential operation. The construction is shown in the illustration. The multi-plate clutches engage with the differential case and with each of the side gears. If spinning causes a difference in component speeds, the frictional force between the clutch plates will cause the speed of the side gear to become closer to that of the differential case, and thus the limited slip function will control the spinning. In addition, the purpose of the pressure rings inside the differential case is to the driving force to the pinion gear, and the reason for the separation is to provide an increase in the clutch plate pressing force through the leverage of the pinion shaft.

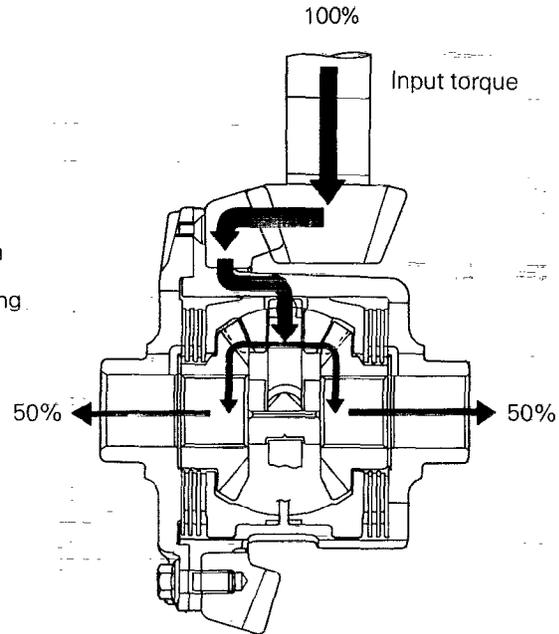


OPERATION (TORQUE TRANSMISSION) DURING STRAIGHT DRIVING

When the differential case is turned the drive pinion via the drive gear, the pressure rings which are interlocked with the differential case will also turn at the same speed. [The projections located on the outside of the pressure rings engage (with some play) the grooves located on the inside of the differential case]. When the pressure rings move in the direction or rotation, they contact the tapered portion of the pinion shaft, and thereby receive reaction force in both the lateral direction and the direction of rotation. The reaction force in the lateral direction presses the clutch plates together, and maintains straight driving. During such driving, because the road surface gives equal resistance to both the left and right wheels, equal resistance is applied to the left and right side gears. Therefore, the pinion gear does not revolve, and the drive gear, the differential case, the pinion shaft, the pinion gear, and the left and right side gears all turn as one unit.



Reaction force symbol code
 P = Pressing force of the pressure rings on the clutch plates
 F = Pressing force of the pressure rings on the pinion shaft
 N = Resultant, force of P + F

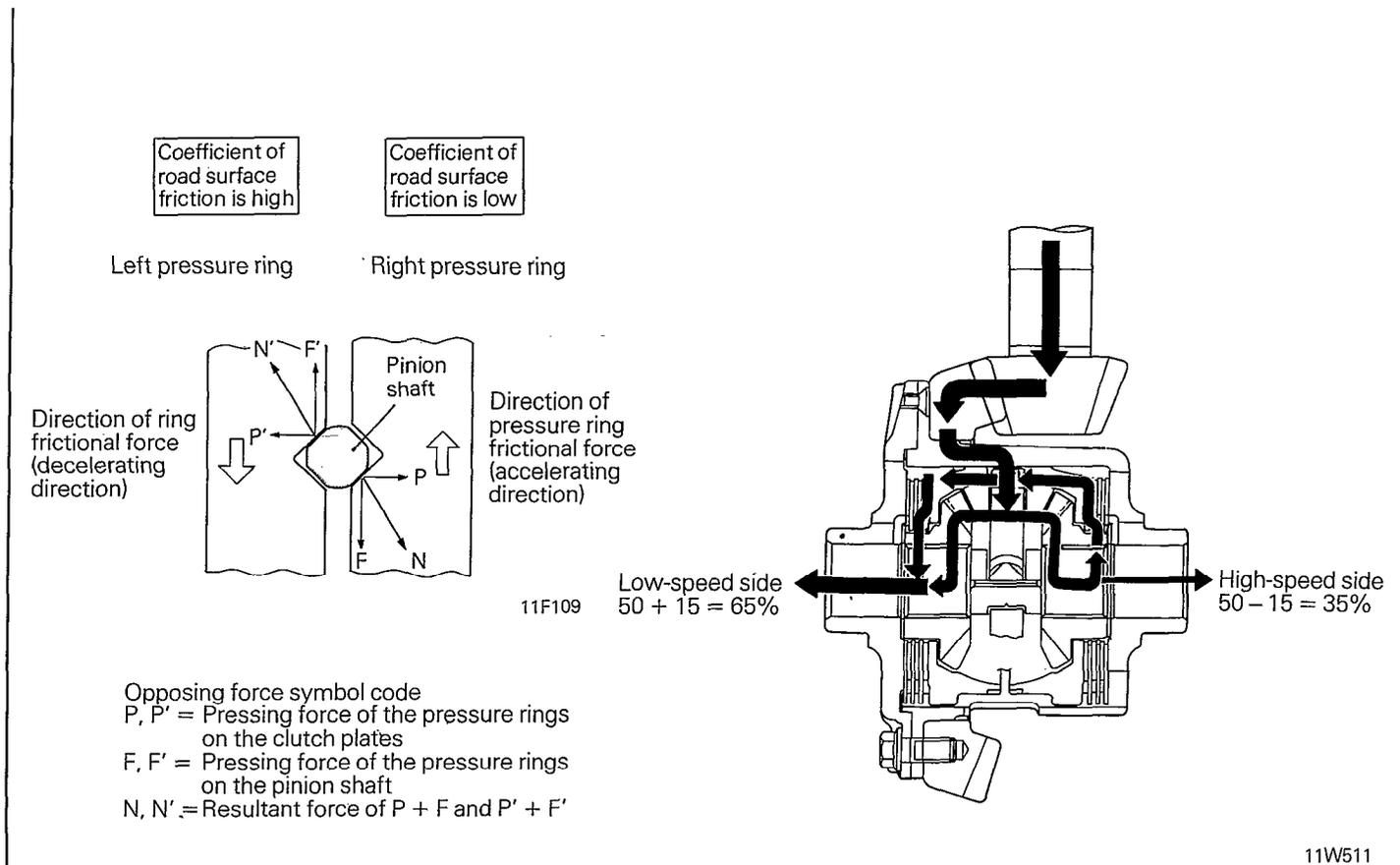


OPERATION (TORQUE TRANSMISSION) WHEN THE SPEEDS OF THE LEFT AND RIGHT WHEELS ARE DIFFERENT

When one wheel is in contact with a concrete road surface (which has high coefficient of friction) and the other wheel is in contact with a muddy or other slippery road surface (which has low coefficient of friction), the differential operation will cause the speed of the wheel in contact with the slippery surface to be faster than the speed of the drive gear, lowering the maximum drive force. If this occurs, the limited slip function will control the differential operation and increase the driving force.

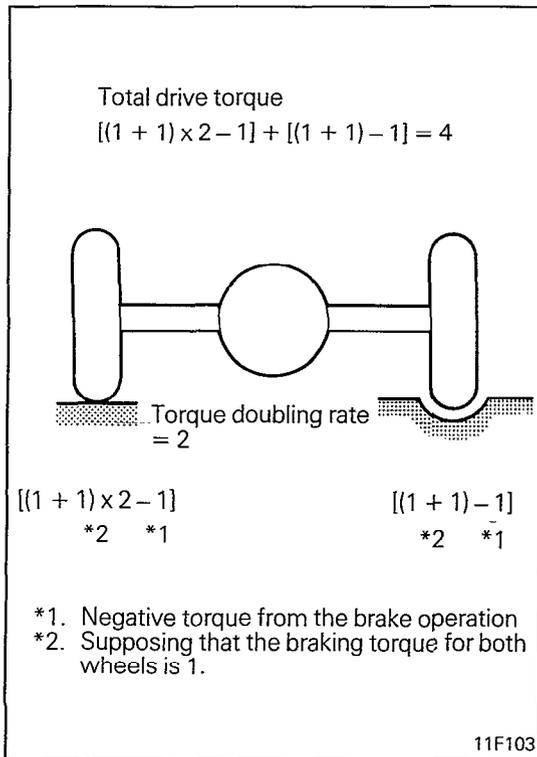
The transmission of torque through the limited slip device in this event is as follows:

When the differential case is turned by the drive gear and the drive pinion, the pressure rings which are interlocked with the differential case will turn at the same speed. Also, the difference in the road surface resistances will cause differential operation and the left and right side gears will revolve at speeds different from that of the differential case. Because of the friction produced between the clutch plates in mesh with both the side gear and differential case, one of the pressure rings increases its rotating speed, whereas the other reduces its rotating speed. The pressure rings press the tapered portion of the pinion shaft with which they are in contact, and thereby receive reaction force in both the lateral direction and the direction of rotation. The reaction force in the lateral direction causes the clutch plates to mesh, increasing the frictional and the drive force.



FEATURES OF THE LIMITED SLIP DIFFERENTIAL

- (1) When one wheel of the vehicle is in contact with a road surface which has poor traction, the limited slip differential, in comparison to a conventional differential, supplies additional torque to the wheel which has the better traction conditions by utilizing clutch plates, thus improving the traction capacity. Moreover, the effect of the limited slip differential is to prevent the vehicle from becoming stuck, even if the traction of one of the wheels becomes radically reduced.
- (2) When one wheel moves from a road surface which has poor traction onto one which has good traction, or when the wheels are constantly leaving the road surface while driving on a rough, bumpy road, the clutch plates of the limited slip differential allow the torque to absorb the differences between the revolution speeds of the right and left wheels. In addition, the sudden changes (jolting) in the drive force are also absorbed, thus preventing skidding.
- (3) Because in the limited slip differential, the differential operation is slightly restricted during normal cornering, the understeer tendency (the tendency for the cornering of the vehicle to exceed the turning of the steering wheel) becomes greater, however, this does not have any detrimental effect on the driving of the vehicle. Moreover, in the event that the inside wheel lifts up (the tire leaves the road surface) during high speed cornering, the clutch plates function to limit differential operation which would simultaneously decrease the drive force of the outside wheel; therefore, the limited slip differential moderates sudden speed reductions during vehicle cornering, and thereby provides greater cornering capability than a conventional differential.



MAKING EFFECTIVE USE OF A LIMITED SLIP DIFFERENTIAL

Effective Use in Combination with the Brakes

If a wheel is in contact with a slippery road surface and has begun to spin, using the brakes in combination with the limited slip differential will provide even greater traction capability. The resistance caused by the brakes will further increase the drive torque of the engine, and this increased torque will increase the clutch plate pressing force of the pressure ring, thus increasing the traction. Also, the drive force transmitted to the brakes will not function as real drive force. This is shown in the illustration at right. The application rate is $R_t = 2$, and, supposing the torque from the brake operation is 1, a drive torque of $1 + 1 = 2$ will be applied to the spinning wheel (the right wheel), and a drive torque of twice that which is applied to the spinning wheel, or $(1 + 1) \times 2 = 4$, will be applied to the wheel which is not spinning (the left wheel). However, because the brake force of 1 is a negative value with regard to the propulsion torque of each wheel, the propulsion torque actually obtained by the right wheel is $(1 + 1) - 1 = 1$, and that obtained by the left wheel is $[(1 + 1) \times 2 - 1] = 3$.

Therefore, the total drive torque is $1 + 3 = 4$. In the same circumstances, the total drive torque of a conventional differential is $1 + 1 = 2$, and that of a limited slip differential when the brakes are not used in combination is $1 + 2 = 3$. This represents an increase in the traction by a factor of 2 over that of a conventional differential, and by a factor of 1.3 over that of a limited slip differential when the brakes are not used.

NOTES REGARDING SERVICE PROCEDURES FOR THE LIMITED SLIP DIFFERENTIAL

- (1) The engine must never be operated while only a single wheel is jacked up. Doing so is extremely dangerous; if the differential functions while the engine is operated at high speed, the oil film between the clutch plates will decrease, thus causing the friction coefficient to increase, the prescribed torque ratio will be exceeded, an excessive amount of torque will be applied to the stationary wheel, and the vehicle will move forward. Also, resistance must never be applied to the spinning wheel.
- (2) In the event that one of the wheels comes in contact with a slippery road surface and begins to spin, if the engine continues to be operated at high speed for too long, the clutch plates might become abnormally worn; such action must be avoided.
- (3) As gear oil, use MOPAR Hypoid Gear Lubricant (part number 4318058) to which MOPAR Hypoid Gear Oil Additive/Friction Modifier (part number 4318060) has been added. When changing the oil, the oil which is removed will appear considerably blacker than ordinary oil. This, however, is not a change in color due to the deterioration of the oil, but rather the oil has become mixed with worn particles of the special treatment on the clutch plates.

SPECIFICATIONS

GENERAL SPECIFICATIONS

Items	Specifications
Axle shaft Type Shaft dimension Outer bearing portion dia. mm (in.) Inner bearing portion dia. mm (in.) Center portion dia. mm (in.) Overall length mm (in.) Bearing O.D. x I.D. Outer mm (in.) Inner mm (in.)	Semi-floating type 35 (1.38) 30 (1.18) 33 (1.30) 204 (8.03) 72 x 35 (2.83 x 1.38) 62 x 30 (2.44 x 1.18)
Drive shaft Joint type Inner Outer Length x diameter mm (in.)	Double offset joint Birfield joint 333 x 30 (13.1 x 1.2)
Differential Reduction gear type Reduction ratio Differential lock type Differential gear type and configuration Side gear Pinion gear Number of teeth Drive gear Drive pinion Side gear Pinion gear	Hypoid gear 3.545 Disc type Straight bevel gear x 2 Straight bevel gear x 4 39 11 16 10

SERVICE SPECIFICATIONS

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Items	Specifications
Standard value	
Limited slip differential axle shaft turning torque Nm (ft.lbs.)	39 (28) or more
Setting of D.O.J. boot length mm (in.)	83 ± 3 (3.3 ± .12)
Final drive gear backlash mm (in.)	0.13 – 0.18 (.005 – .007)
Drive pinion rotating torque	
with oil seal Ncm (in.lbs.)	40 – 50 (3.5 – 4.3)
without oil seal Ncm (in.lbs.)	15 – 25 (1.3 – 2.2)
Difference in total thickness between left and right clutch plate mm (in.)	0.05 (.002)
Clearance between the clutch plates and the differential case mm (in.)	0.06 – 0.20 (.002 – .008)
Clutch plate preload	
when equipped with new clutch plates Nm (ft.lbs.)	50 – 80 (36 – 58)
when equipped with old clutch plates Nm (ft.lbs.)	35 – 80 (25 – 58)
Limit	
Rear axle total backlash mm (in.)	5 (.2)
Drive gear runout mm (in.)	0.05 (.002)
Axle shaft end play mm (in.)	0.8 (.031)
Torque tube companion flange runout mm (in.)	0.1 (.004)
Spline coupling runout mm (in.)	0.1 (.004)
Clutch plate wear	
Difference in the thicknesses of the friction surface and the projection mm (in.)	0.1 (.004)
Flatness of the friction plates and friction discs mm (in.)	0.08 (.003)

TORQUE SPECIFICATIONS

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Items	Nm	ft.lbs.
Axle shaft companion flange	260 – 300	188 – 217
Drive shaft to axle shaft companion flange	55 – 65	40 – 70
Rear axle housing to caliper support	40 – 50	29 – 36
Torque tube companion flange	160 – 220	116 – 159
Propeller shaft to torque tube	50 – 60	36 – 43
Torque tube to front support	35 – 45	25 – 33
Torque tube to differential carrier	70 – 85	51 – 61
Lower control arm shaft	70 – 80	51 – 58
Axle housing to lower control arm	15 – 20	11 – 14
Strut assembly to axle housing	50 – 70	36 – 51
Axle housing mounting nut	50 – 70	36 – 51
Rear support protector to insulator	30 – 35	22 – 25
Rear insulator to crossmember	25 – 30	18 – 22
Differential carrier to spline coupling	190 – 250	137 – 181

Items	Nm	ft.lbs.
Filler plug	40 – 60	29 – 43
Drain plug	60 – 70	43 – 51
Bearing cap	55 – 65	40 – 47
Differential case to drive gear	80 – 90	58 – 65
Cover	15 – 22	11 – 16
Rear supports	50 – 70	36 – 51

LUBRICANTS

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Items	Specified lubricants	Quantity
Rear axle gear oil	MOPAR Hypoid Gear Lubricant Part No. 4318058 plus MOPAR Hypoid Gear Oil Additive-Friction Modifier Part No. 4318060 or equivalent	1.30 lit. (1.37 qts.)
Axle housing grease	MOPAR Multi-Mileage Lubricant Part No. 2525035 or equivalent	85 g (3.0 oz)
Axle shaft oil seal lip	MOPAR Multi-Mileage Lubricant Part No. 2525035 or equivalent	As required
Differential case oil seal lip	MOPAR Multi-Mileage Lubricant Part No. 2525035 or equivalent	As required
Differential side spline and pocket of extension shaft	MOPAR Multi-Mileage Lubricant Part No. 2525035 or equivalent	As required
Contact surfaces of spline coupling and washer	MOPAR Multi-Mileage Lubricant Part No. 2525035 or equivalent	As required
Washer of special tools for pinion height adjustment	MOPAR Multi-Mileage Lubricant Part No. 2525035 or equivalent	As required
D.O.J. boot grease	Repair kit grease	
Overall capacity		110 – 130 g (3.9 – 4.5 oz)
Within D.O.J.		65 – 75 g (2.3 – 2.6 oz)
Within D.O.J. boot		45 – 55 g (1.6 – 1.9 oz)
B.J. boot grease	Repair kit grease	
Overall capacity		95 – 115 g (3.4 – 4.1 oz)
Within B.J.		55 – 65 g (2.0 – 2.3 oz)
Within B.J. boot		40 – 50 g (1.4 – 1.8 oz)

NOTE

D.O.J.: Double offset joint

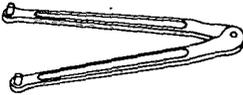
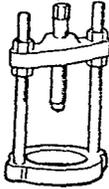
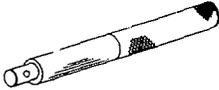
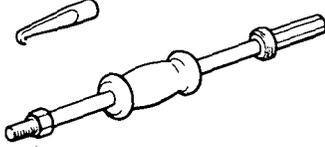
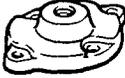
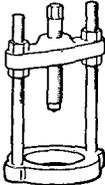
B.J.: Birfield joint

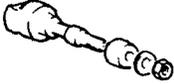
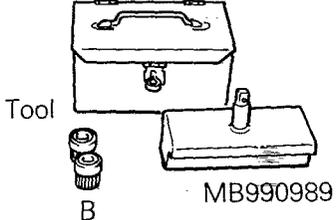
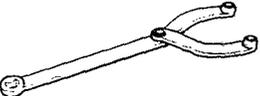
SEALANTS AND ADHESIVES

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Items	Specified sealants and adhesives	Quantity
Differential cover	MOPAR Part No. 4318034 or equivalent	As required
Drive gear threaded hole	MOPAR LOCTITE 271 or equivalent	As required

SPECIAL TOOLS

Tool (Number and name)	Use	Tool (Number and name)	Use
C-4381 Spanner wrench 	Removal of the axle shaft outer bearing	DT-1007-B Axle shaft oil seal installer 	Insertion of the axle shaft oil seal Press-fitting of the oil seal of the drive pinion Press-fitting of the oil seal onto the side of the differential carrier
C-293-PA Bearing puller 	Removal of the axle shaft outer bearing	C-4171 Drive handle 	Press-fitting of the oil seal onto the side of the differential carrier Press-fitting of the axle shaft inner bearing Press-fitting of the drive pinion bearing
C-637 Sliding hammer set 	Removal of extension shaft bearing	MB990906 Drive shaft, torque tube remover and installer attachment 	Removal and insertion of the drive shaft assembly
C-4637-1 Torque tube bearing installer 	Press-fitting of the extension shaft bearing	MB990907 Coupling holder 	Removal and installation of the spline coupling
MB990810 Side bearing puller 	Removal of the side bearing inner race	MB990648 Bearing remover 	Removal of the drive pinion rear bearing inner race
MB990811 Side bearing cup 	Removal of the side bearing inner race	C-293-PA Bearing puller 	Removal of the drive pinion rear bearing inner race

Tool (Number and name)	Use	Tool (Number and name)	Use
<p>MB990802 Bearing installer</p> 	<p>Press-fitting of the drive pinion rear bearing inner race Press-fitting of the side bearing inner race</p>	<p>C-4626 Pinion height gauge unit</p> 	<p>Measurement of the drive pinion height</p>
<p>MB990552 Cylinder gauge</p> 	<p>Measurement of the drive pinion height</p>	<p>MB990988 Side gear holding tool set</p> 	<p>Measurement of the clutch plate preload</p>
<p>MB990767 End yoke holder</p> 	<p>Measurement of the limited slip differential preload</p>		

TROUBLESHOOTING

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Symptom	Probable cause	Remedy
AXLE SHAFT, AXLE HOUSING Noise while wheels are rotating	Brake drag Bent axle shaft Worn or scarred axle shaft bearing	Replace
Grease leakage	Worn or damaged oil seal Malfunction of bearing seal	Replace
DRIVE SHAFT Noise	Wear, play or seizure of ball joint Excessive drive shaft spline looseness	Replace
TORQUE TUBE Noise	Wear, play or seizure of bearing	Replace
DIFFERENTIAL Abnormal noise during driving or gear changing	Excessive final drive gear backlash Insufficient drive pinion preload	Adjust
	Excessive differential gear backlash	Adjust or replace
	Worn spline of a side gear	Replace
	Loose spline coupling self-locking nut	Retighten or replace

NOTE

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

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

NOTE

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

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

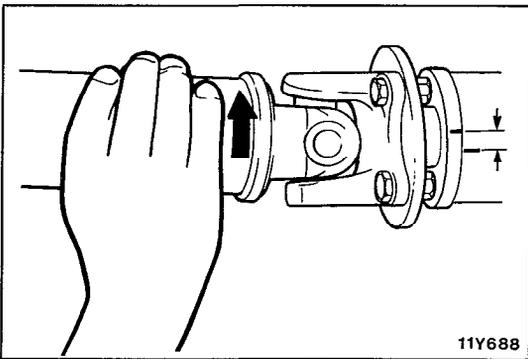
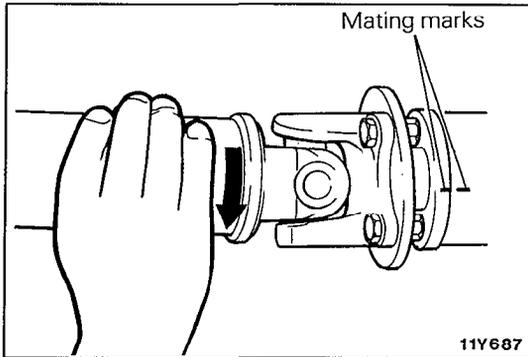
Symptom	Probable cause	Remedy
Gear oil leakage	Worn or damaged front oil seal, or an improperly installed oil seal Damaged gasket	Replace
	Loose spline coupling self-locking nut	Retighten or replace
	Loose filler or drain plug	Retighten or apply adhesive
	Clogged or damaged vent plug	Clean or replace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

SERVICE ADJUSTMENT PROCEDURES

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CHECKING REAR AXLE TOTAL BACKLASH

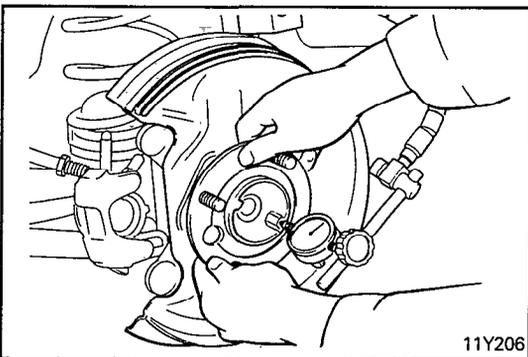
1. If the vehicle vibrates and produces a booming sound due to the imbalance of the driving system, measure the rear axle total backlash by the following procedures to see if the differential carrier assembly requires removal.
 - (1) Place the gearshift lever in the neutral position, apply the parking brake and jack up the vehicle.
 - (2) Turn the companion flange fully clockwise. Make the mating mark on the dust cover of the companion flange and on the torque tube.



- (3) Turn the companion flange fully counter-clockwise, and measure the amount of distance through which the mating marks moved.

Limit: 5 mm (.2 in.)

2. If the backlash exceeds the limit, remove the differential carrier assembly and adjust the backlash.



CHECKING AXLE SHAFT FOR AXIAL PLAY

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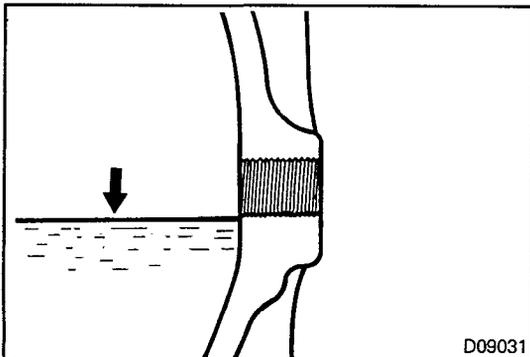
1. Measure the axle shaft for axial play by using a dial indicator.

Limit: 0.8 mm (.031 in.)
2. If the axle shaft axial play exceeds the limit, replace the bearing.

CHECKING GEAR OIL LEVEL

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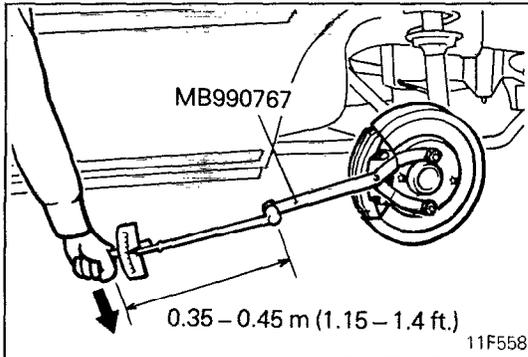
1. Remove the level plug, and check the oil level.
2. The oil level is sufficient if it reaches the level plug hole.



LIMITED SLIP DIFFERENTIAL PRELOAD MEASUREMENT

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- To measure the preload of the limited slip differential, set the shift lever of the transmission to the neutral position, lock the front wheels, and fully release the parking brake. One of the rear wheels should be maintained in contact with the ground surface, and the other should be raised up.



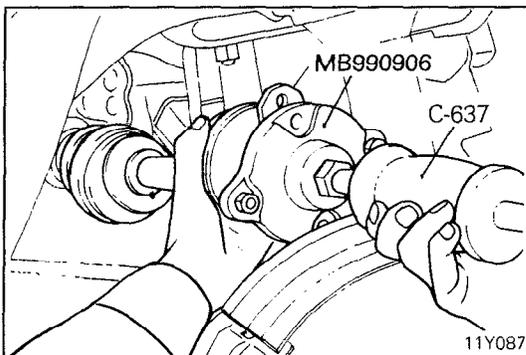
- Measure the starting torque at the side on which the wheel is in the raised position by using the following procedures:
 - Remove the wheel.
 - Mount the special tool to the hub bolts by using the hub nuts.
 - Find the limited slip differential preload by measuring the axle shaft starting torque in the forward direction with a torque wrench.

Standard value: 39 Nm (28 ft.lbs.) or more

NOTE

This value includes the dragging torque 4 Nm (3 ft.lbs.) of the disc brake.

- If the torque is less than the standard value, remove the limited slip differential from the vehicle and disassemble it.



DIFFERENTIAL CARRIER OIL SEAL REPLACEMENT

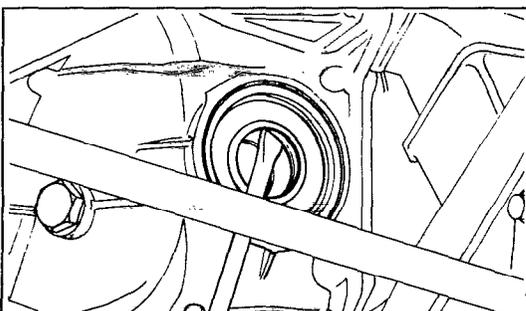
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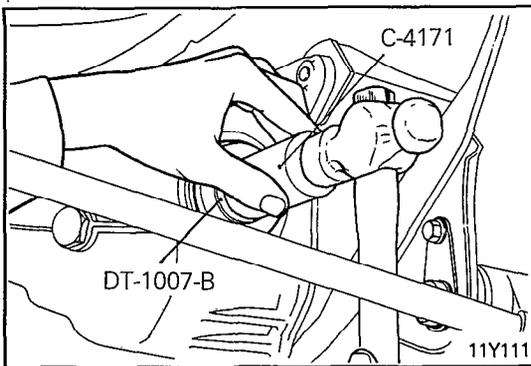
- Detach the drive shaft and the companion flange.
- Pull the drive shaft out from the differential carrier by using the special tools.

Caution

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

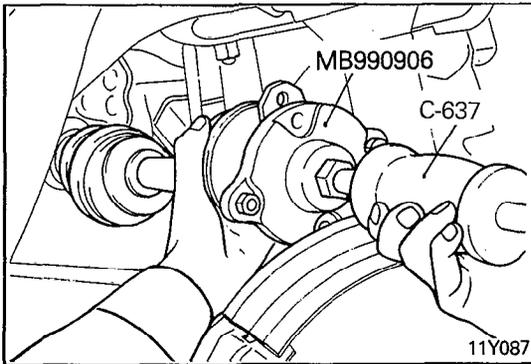
- Remove the oil seal from the differential carrier.





4. Press-fit the oil seal positively with the special tool and apply the specified grease to the oil seal lip.

Specified grease: MOPAR Multi-Mileage Lubricant Part No. 2525035 or equivalent



5. Drive the drive shaft into the differential carrier by using the special tools.

Caution

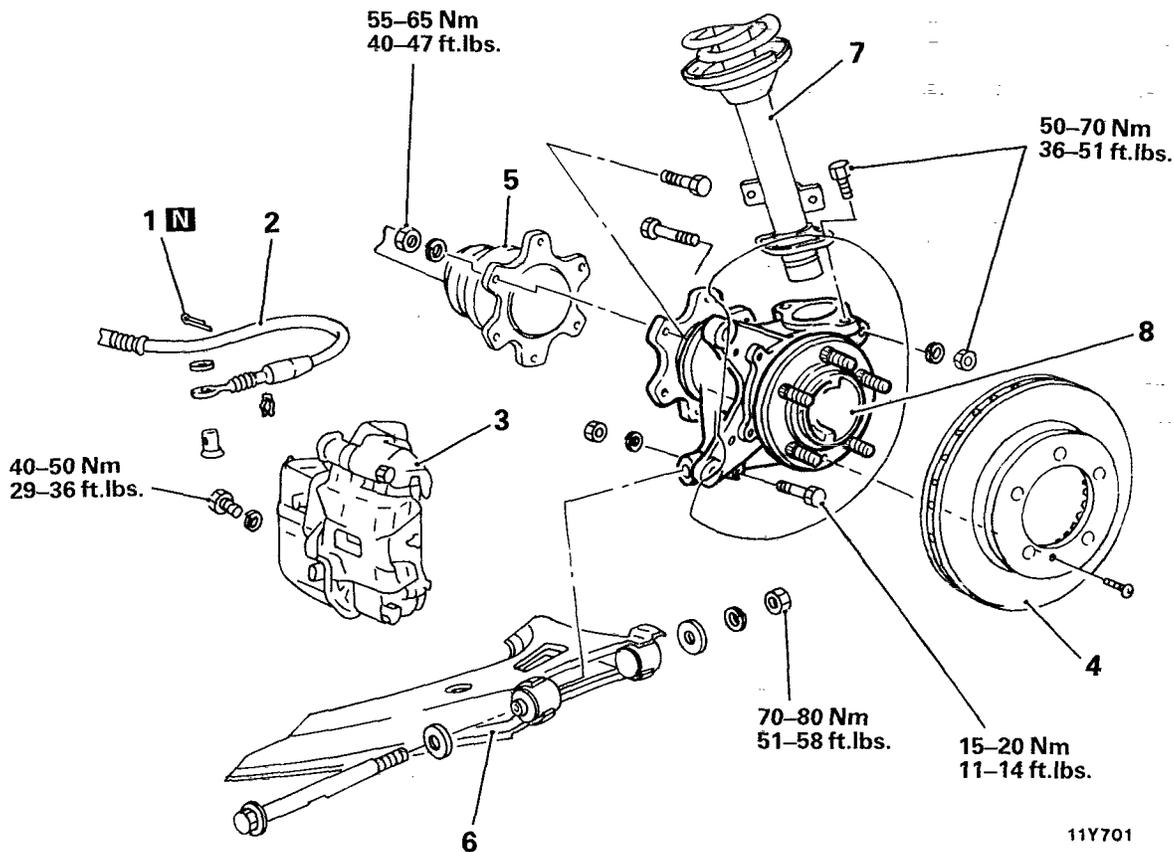
1. Be careful not to damage the lip of the oil seal.
2. Replace the circlip which is attached to the B.J. side spline with a new one.

6. Install the drive shaft to the companion flange.

AXLE SHAFT

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REMOVAL AND INSTALLATION



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Removal steps

1. Cotter pin
2. Parking brake cable connection
- ↔ 3. Rear brake assembly connection
4. Brake disc
5. Drive shaft connection
6. Lower control arm connection
7. Strut assembly connection
8. Axle housing assembly

NOTE

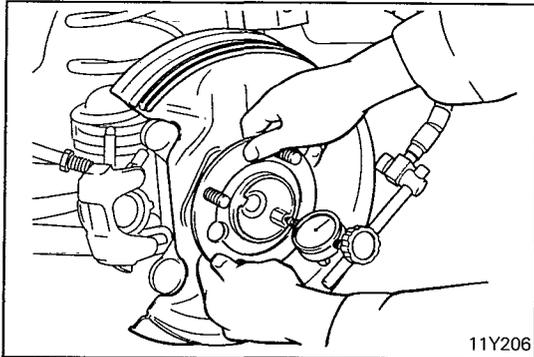
- (1) Reverse the removal procedures to reinstall.
- (2) ↔: Refer to "Service Points of Removal".
- (3) **N**: Non-reusable parts

SERVICE POINT OF REMOVAL

N03HBAC

3. DISCONNECTION OF REAR BRAKE ASSEMBLY

Hold the caliper body by suspending it with wires or other suitable method so that the brake hoses are not twisted.

**INSPECTION**

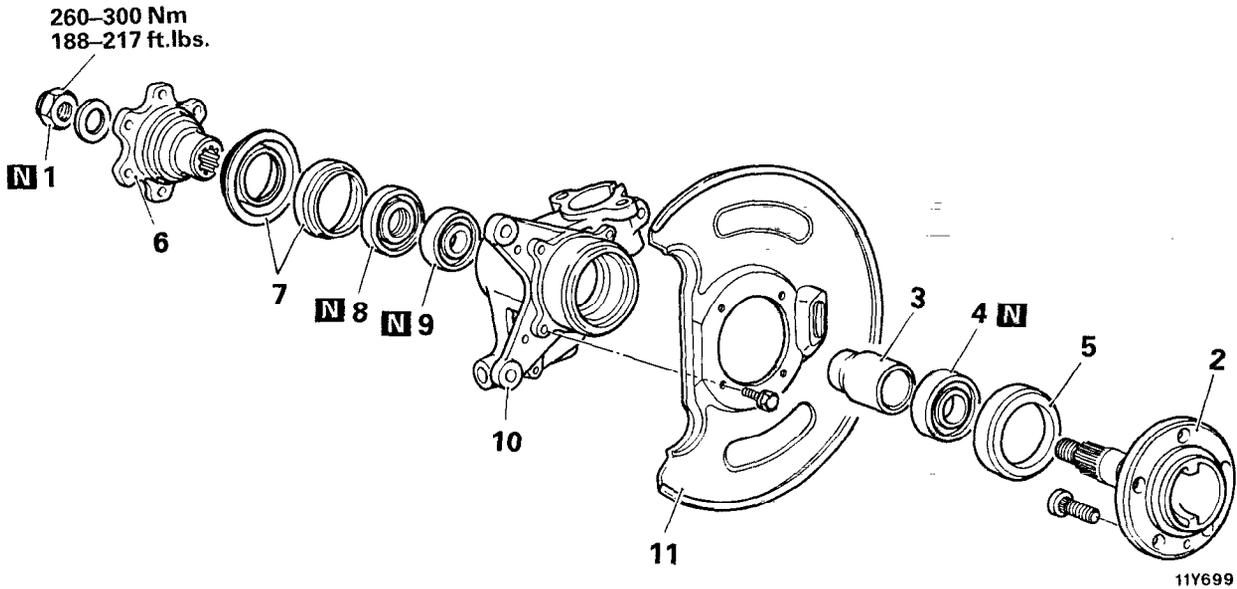
N03HCAB

- Check to assure that the axle shaft end play is within the limit.

Limit: 0.8 mm (.031 in.)

AXLE SHAFT

DISASSEMBLY AND REASSEMBLY



Disassembly steps

- 1. Companion flange mounting nut (self-locking nut)
- ◄► 2. Axle shaft
- 3. Spacer
- 4. Outer bearing
- 5. Dust cover
- 6. Companion flange
- 7. Dust cover
- 8. Oil seal
- 9. Inner bearing
- 10. Axle housing
- 11. Dust cover

NOTE

- (1) Reverse the disassembly procedures to reassemble.
- (2) ◄►: Refer to "Service Points of Disassembly".
- (3) ►►: Refer to "Service Points of Reassembly".
- (4) N: Non-reusable parts

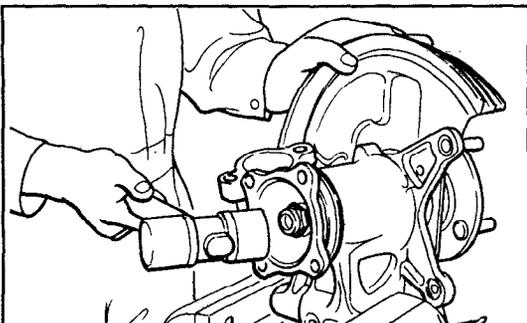
SERVICE POINT OF DISASSEMBLY

2. REMOVAL OF AXLE SHAFT

Loosen the companion flange mounting nut, and then tap the axle shaft out of the axle housing by using a plastic hammer.

Caution

Be careful not to scratch the oil seal.



INSPECTION

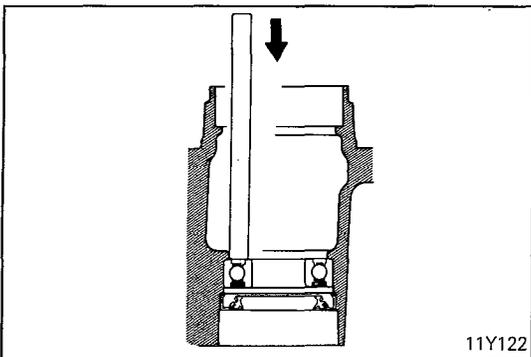
N03HGAA

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

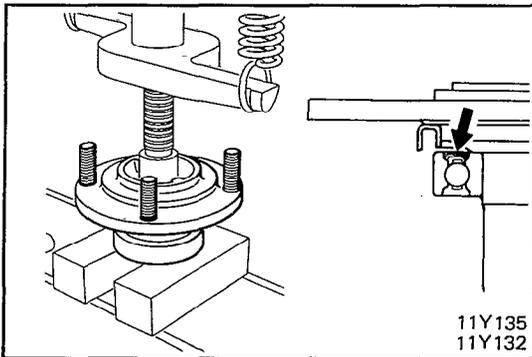
INNER AND OUTER BEARING REPLACEMENT

N03HHAB

- (1) Remove the rear axle bearing with the special tool and Bearing Puller.



- (2) Drive out the inner bearing from the axle housing and oil seal by using a bar.



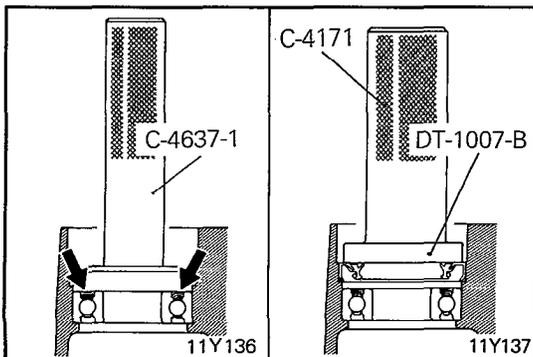
- (3) Press-fit the new outer bearing to the axle shaft.

NOTE

The seal side of the outer bearing should face the flange side of the axle shaft.

- (4) Apply specified grease to the inside surface of the axle housing.

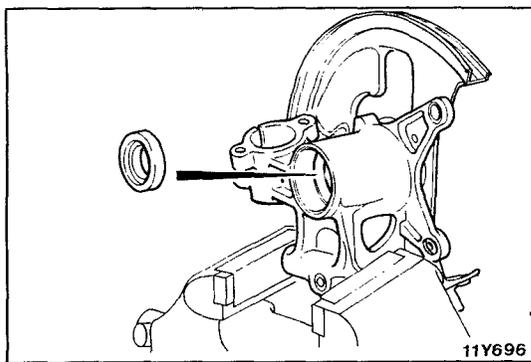
Specified grease: MOPAR Multi-Mileage Lubricant Part No. 2525035 or equivalent



- (5) Position the new inner bearing so that the seal side faces the companion flange, and then press-fit the bearing.

- (6) Apply the specified grease to the area of the axle housing where the oil seal is to be press-fitted, and then use the special tool to drive the oil seal in until it comes into contact with the edge of the axle housing.

Specified grease: MOPAR Multi-Mileage Lubricant Part No. 2525035 or equivalent

**SERVICE POINT OF REASSEMBLY**

N03H1AA

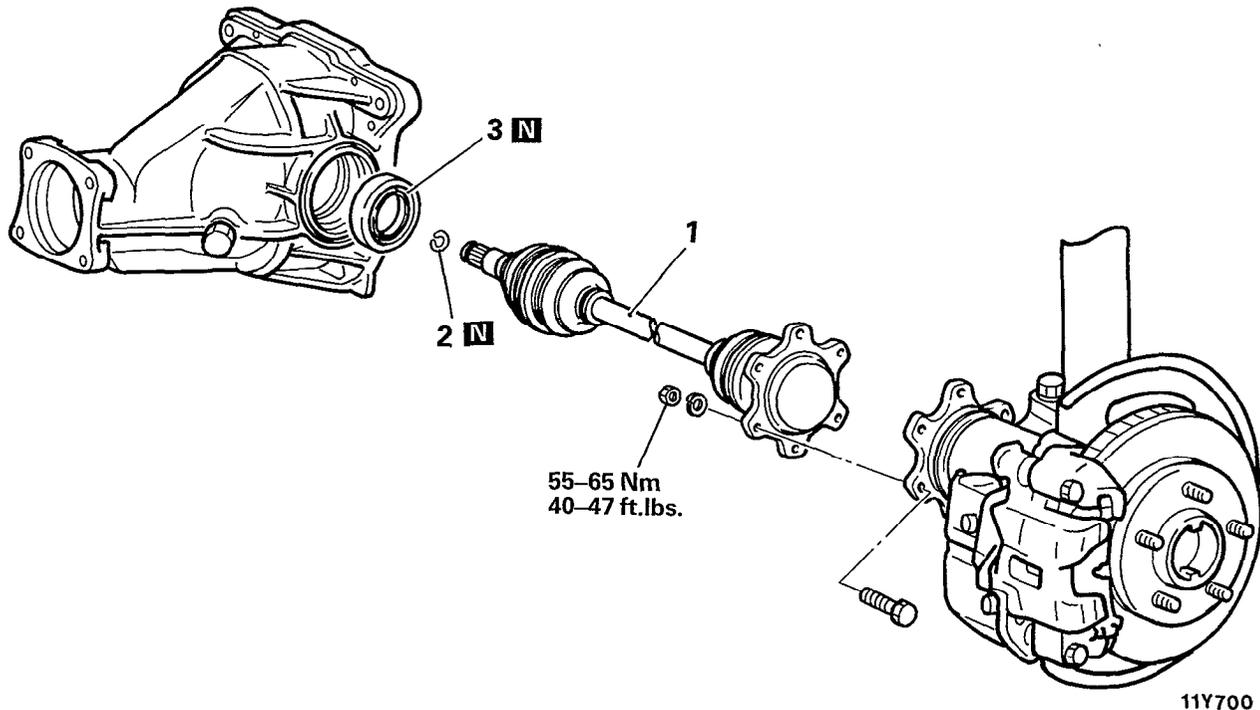
8. APPLICATION OF GREASE TO OIL SEAL

Apply specified grease to the oil seal lip.

**Specified grease: MOPAR Multi-Mileage Lubricant Part
No. 2525035 or equivalent**

DRIVE SHAFT

REMOVAL AND INSTALLATION

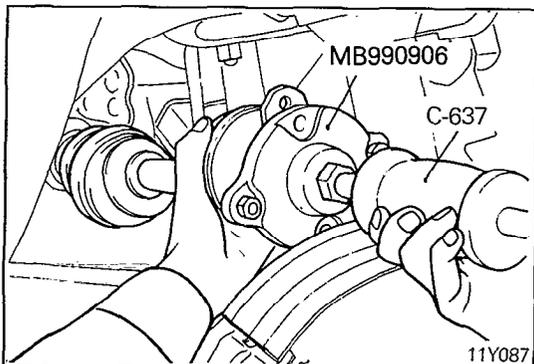


Removal steps

- ◄◄ ▶▶ 1. Drive shaft assembly
- ▶▶ 2. Circlip
- ▶▶ 3. Oil seal

NOTE

- (1) Reverse the removal procedures to reinstall.
- (2) ◄◄: Refer to "Service Points of Removal".
- (3) ▶▶: Refer to "Service Points of Installation".
- (4) **N**: Non-reusable parts



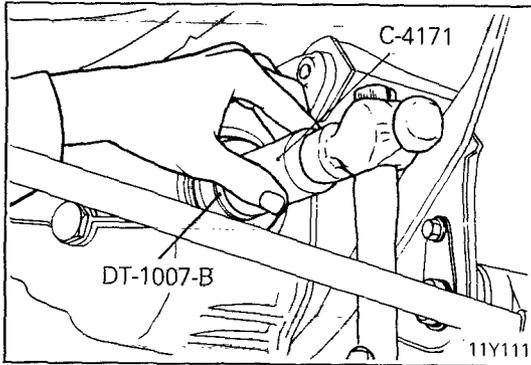
SERVICE POINT OF REMOVAL

1. REMOVAL OF DRIVE SHAFT ASSEMBLY

Pull the drive shaft out from the differential carrier by using the special tools.

Caution

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



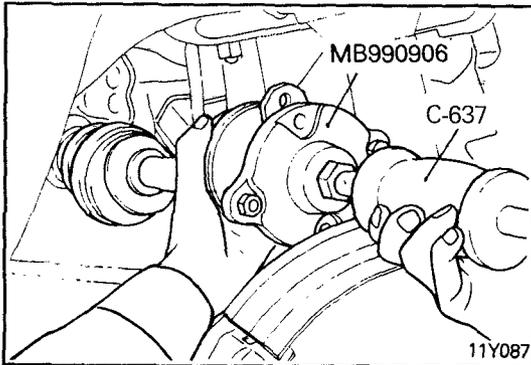
SERVICE POINTS OF INSTALLATION

N03JCAA

3. INSTALLATION OF OIL SEAL

- (1) If the oil seal is to be replaced because of damage, drive it in by using the special tool.
- (2) Apply the specified grease to the oil seal lip.

**Specified grease: MOPAR Multi-Mileage Lubricant
Part No. 2525035 or equivalent**



1. INSTALLATION OF DRIVE SHAFT ASSEMBLY

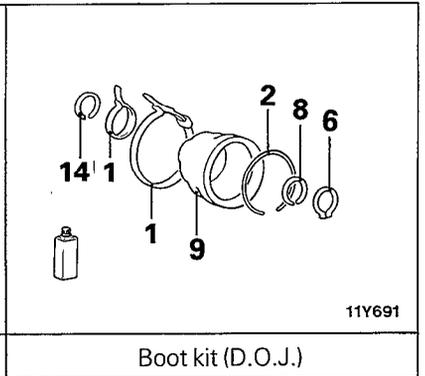
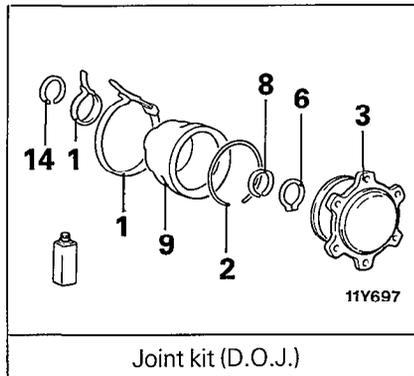
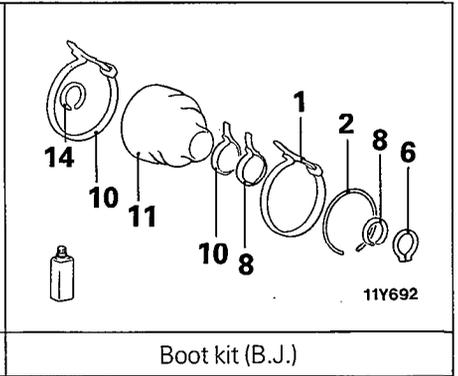
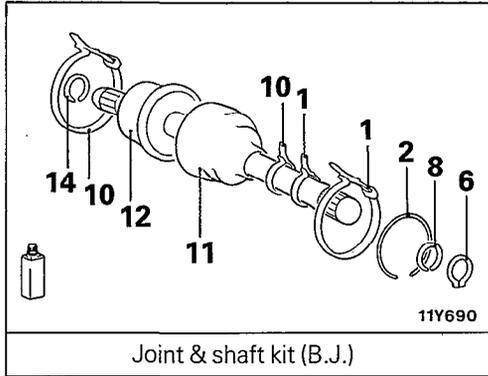
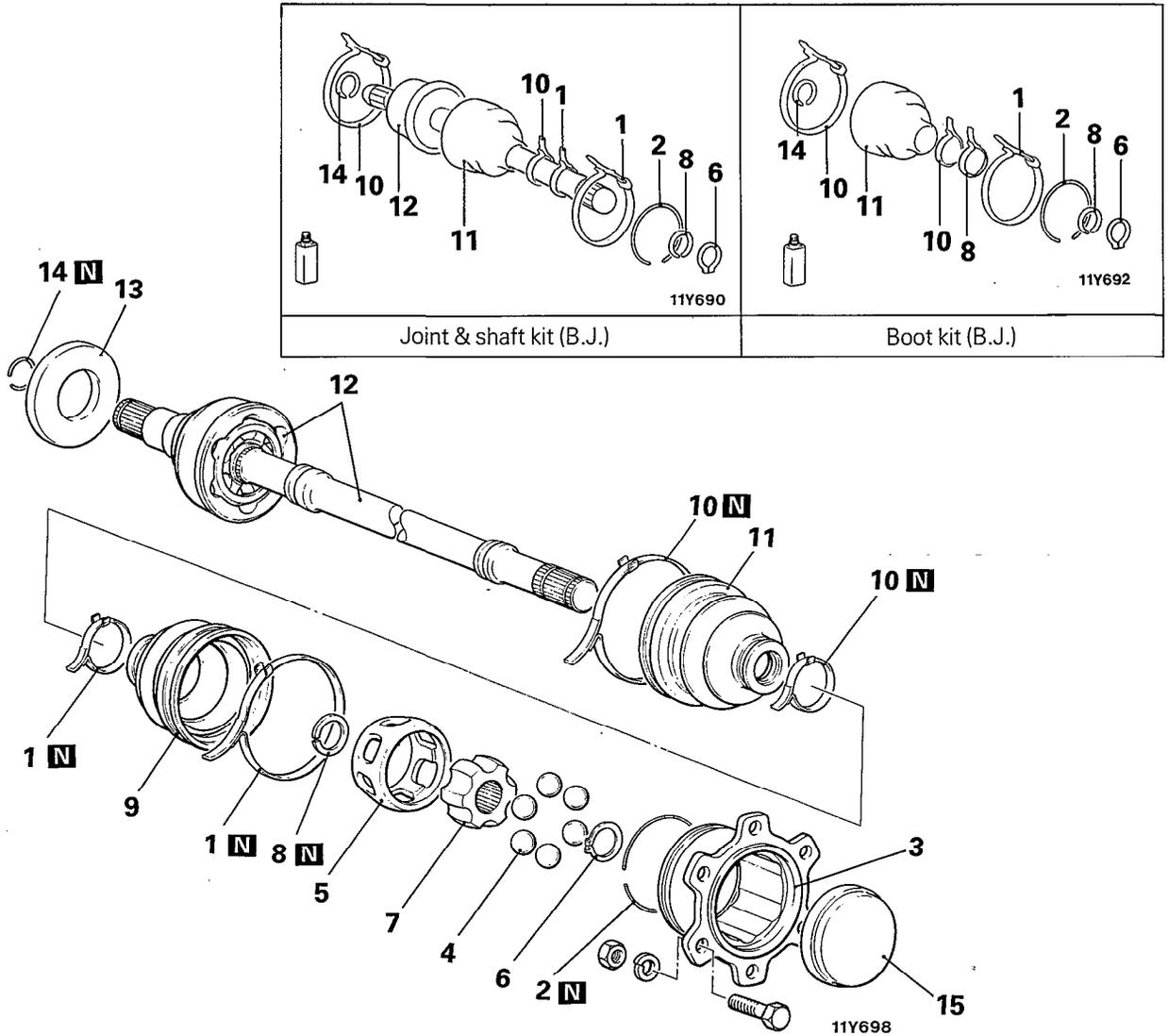
Drive the drive shaft into the differential carrier by using the special tools.

Caution

1. Be careful not to damage the lip of the oil seal.
2. Before and after connecting the drive shaft with the companion flange, slide the drive shaft axially to check that it does not come off the differential carrier.

DRIVE SHAFT

DISASSEMBLY AND REASSEMBLY

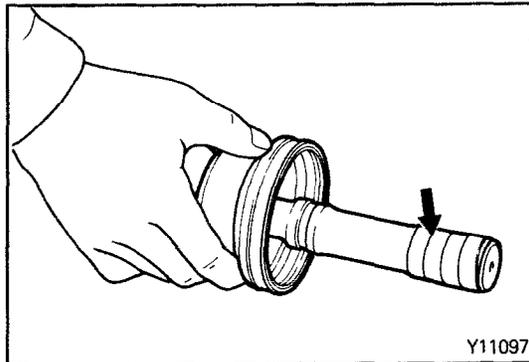
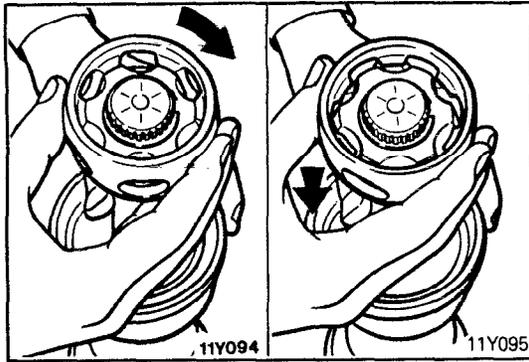


Disassembly steps

- ◆◆ 1. Boot bands (for D.O.J. boot)
- ◆◆ 2. Circlip
- ◆◆ 3. D.O.J. outer race
- ◆◆ 4. Balls
- ◆◆◆◆ 5. D.O.J. cage
- ◆◆ 6. Snap ring
- ◆◆ 7. D.O.J. inner race
- ◆◆ 8. Circlip
- ◆◆ 9. D.O.J. boot
- ◆◆ 10. Boot bands (for B.J. boot)
- ◆◆◆◆ 11. B.J. boot
- ◆◆◆◆ 12. B.J. and shaft assembly
- ◆◆ 13. Dust cover
- ◆◆ 14. Circlip
- ◆◆ 15. End plate

NOTE

- (1) Reverse the disassembly procedures to reassemble.
- (2) ◆◆◆: Refer to "Service Points of Disassembly".
- (3) ◆◆◆: Refer to "Service Points of Reassembly".
- (4) The drive shaft joint requires special grease. Do not use any other type.
- (5) **N**: Non-reusable parts

**SERVICE POINTS OF DISASSEMBLY**

N03JEA

5. REMOVAL OF D.O.J. CAGE

Remove the D.O.J. cage from the D.O.J. inner race in the direction of the B.J.

9. REMOVAL OF D.O.J. BOOT / 11. B.J. BOOT

Wrap vinyl tape around the spline part on the D.O.J. side of the drive shaft so that the D.O.J. and B.J. boots are not damaged when they are removed.

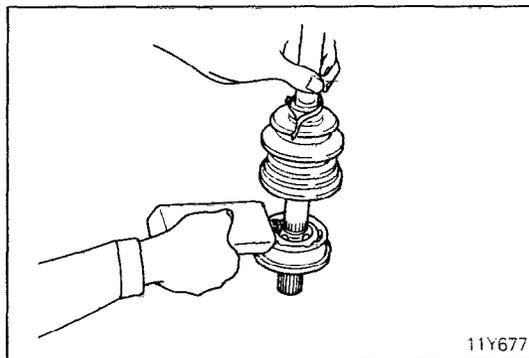
Caution

B.J. and shaft assembly cannot be disassembled. Do not attempt to disassemble.

INSPECTION

N03JFAA

- Check drive shaft for bend and wear.
- Check B.J. for entry of water, foreign matter and rust.
- Check B.J. ball for damage.
- Check D.O.J. cage, D.O.J. inner race and ball for rust, wear and damage.
- Check D.O.J. outer race for wear and damage.

**SERVICE POINTS OF REASSEMBLY**

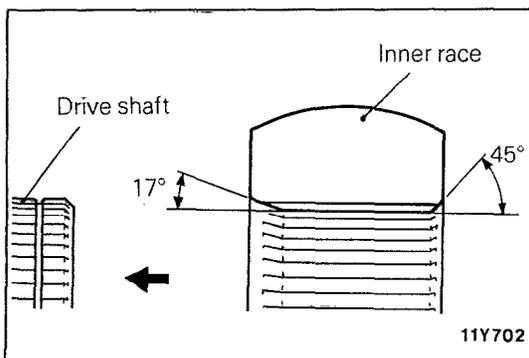
N03JGAC

12. APPLICATION OF GREASE TO B.J. AND SHAFT ASSEMBLY / 11. B.J. BOOT

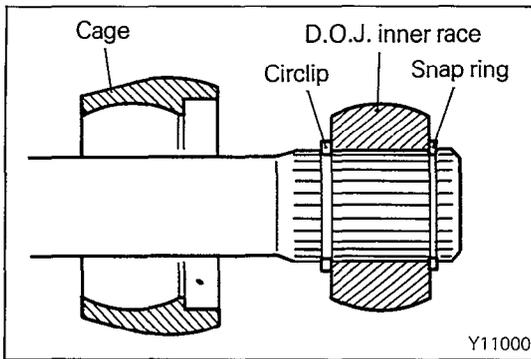
If the B.J. is to be reused, pack the specified grease into the B.J. boot.

Specified grease: Repair kit grease

Overall capacity	95 – 115 g (3.4 – 4.1 oz)
Within B.J.	55 – 65 g (2.0 – 2.3 oz)
Within B.J. boot	40 – 50 g (1.4 – 1.8 oz)

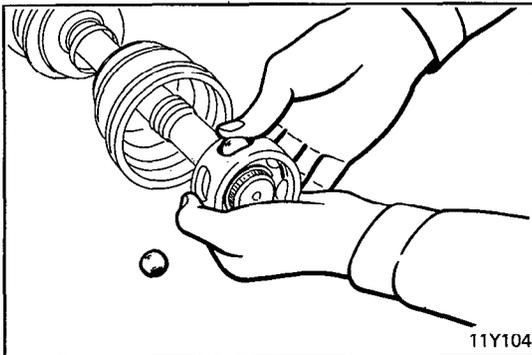
**7. INSTALLATION OF D.O.J. INNER RACE / 5. D.O.J. CAGE**

- (1) Install the D.O.J. cage onto the drive shaft so that the smaller diameter side of the cage is installed first.
- (2) Install the circlip on the drive shaft.
- (3) Install the D.O.J. inner race on the drive shaft with its smaller chamfering angle (17°) side on the B.J. side, and then secure with the snap ring.



- (4) Apply specified grease to the D.O.J. inner race and the D.O.J. cage, and then fit them together.

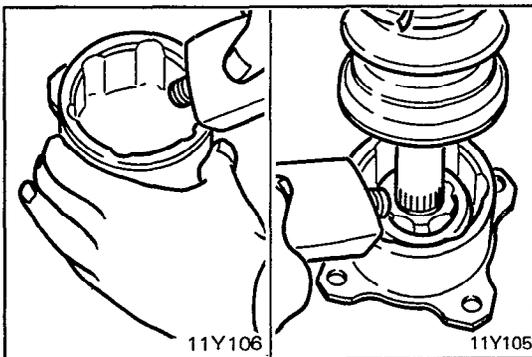
Specified grease: Repair kit grease



4. APPLICATION OF GREASE TO BALLS

- Apply specified grease to the ball insertion parts of the D.O.J. inner race and D.O.J. cage, and insert the balls.

Specified grease: Repair kit grease

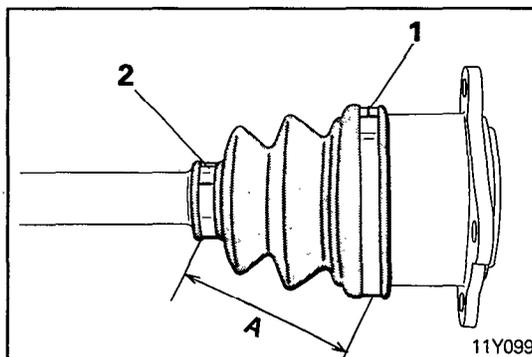


3. INSTALLATION OF D.O.J. OUTER RACE

- (1) Apply 65 to 75 g (2.3 to 2.6 oz) of specified grease to the D.O.J. outer race.
- (2) Fit the drive shaft into the D.O.J. outer race.
- (3) Apply 45 to 55 g (1.6 to 1.9 oz) of specified grease to the D.O.J. outer race.

Specified grease: Repair kit grease

Overall capacity	110 – 130 g (3.9 – 4.5 oz)
Within D.O.J.	65 – 75 g (2.3 – 2.6 oz)
Within D.O.J. boot	45 – 55 g (1.6 – 1.9 oz)



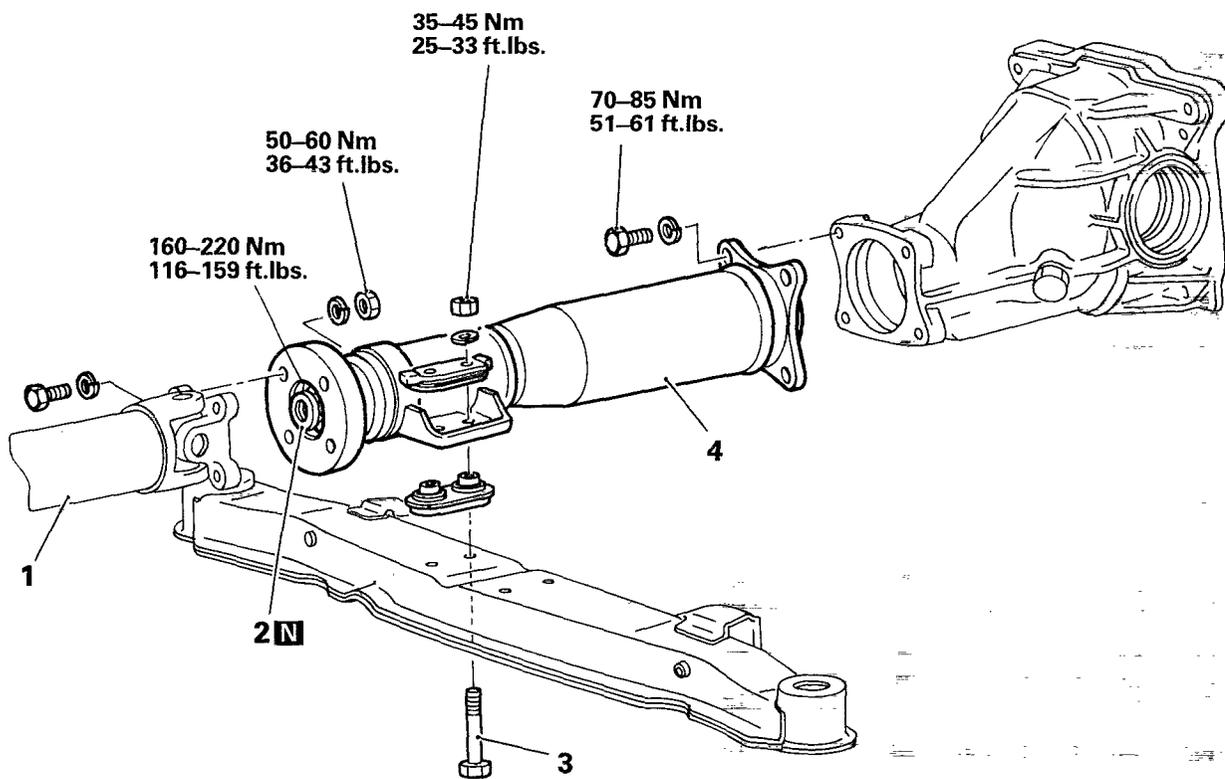
1. INSTALLATION OF BOOT BANDS (FOR D.O.J. BOOT)

- (1) Install the circlip onto the D.O.J. outer race.
- (2) Place the D.O.J. boot over the D.O.J. outer race, and then use boot band (1) to secure the boot.
- (3) Place boot band (2) at the specified distance in order to adjust the amount of air inside the D.O.J. boot, and then tighten the boot band (2).

Standard value (A): 83 ± 3 mm (3.3 ± .12 in.)

TORQUE TUBE REMOVAL AND INSTALLATION

N03KA

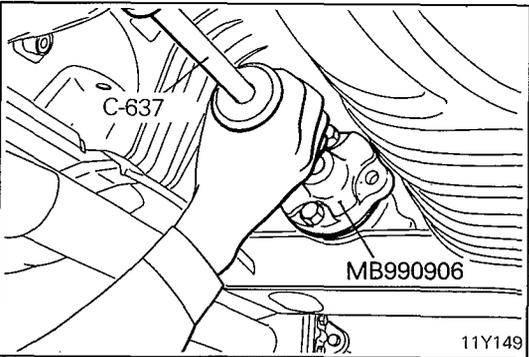
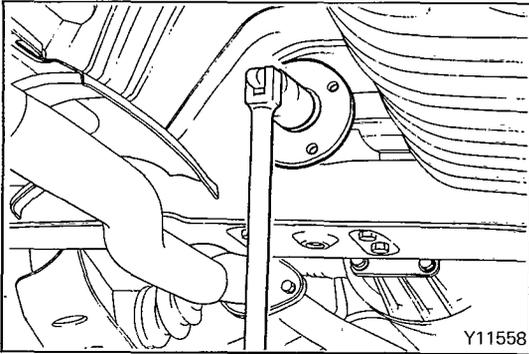


Removal steps

1. Propeller shaft
- ◆◆ ◆◆ 2. Measurement of companion flange runout
- ◆◆ 2. Companion flange mounting nut (Self-locking nut)
- ◆◆ 3. Torque tube assembly to front support bolt
- ◆◆ ◆◆ 4. Torque tube assembly

NOTE

- (1) Reverse the removal procedures to reinstall.
- (2) ◆◆: Refer to "Service Points of Removal".
- (3) ◆◆: Refer to "Service Points of Installation".
- (4) **N**: Non-reusable parts



SERVICE POINTS OF REMOVAL

N03KBAA

2. REMOVAL OF COMPANION FLANGE MOUNTING NUT

Hold the extension shaft by applying the parking brake, and loosen the companion flange mounting nut.

NOTE

The nut should only be loosened, not removed.

4. REMOVAL OF TORQUE TUBE ASSEMBLY

- (1) Disconnect the extension shaft spline from the spline coupling by using the special tools.
- (2) Disconnect the special tools from the torque tube, and pull the torque tube assembly out toward the rear.

Caution

Whenever the torque tube assembly is removed, be sure to disassemble and install them in accordance with the specified procedure. Otherwise the damaged bearing will result.

SERVICE POINTS OF INSTALLATION

N03KCAA

4. INSTALLATION OF TORQUE TUBE ASSEMBLY

Drive the extension shaft in the differential spline coupling by using the special tools until the surface of the torque tube flange comes fully in contact with the surface of the differential carrier flange.

Caution

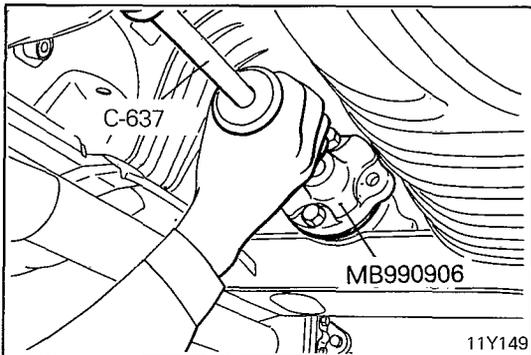
- 1. Do not hit the torque tube flange and the bracket when driving in the torque tube.**
- 2. If a clearance between the torque tube flange and the differential carrier flange exists, and the torque tube and the differential carrier are connected to each other, the ball bearing may be pre-loaded and seized.**

If there is clearance between the torque tube and differential carrier flange, proceed as follows:

- (1) Remove the torque tube assembly.
- (2) Disassemble the torque tube assembly. (Refer to P.3-31.)
- (3) Apply the specified grease to the pocket and the spline part of the differential side of the extension shaft. (Refer to P.3-32.)

Specified grease: MOPAR Multi-Mileage Lubricant Part No. 2525035 or equivalent

- (4) Insert the extension shaft into the torque tube.
- (5) Drive the extension shaft into the differential spline coupling.
- (6) Install the torque tube onto the differential carrier and front support.

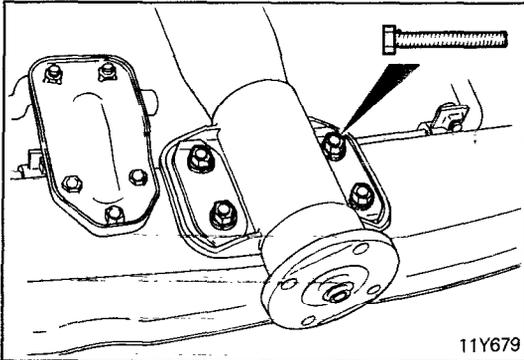


- (7) Drive the bearing into the extension shaft by using the special tool. (Refer to P.3-32.)

NOTE

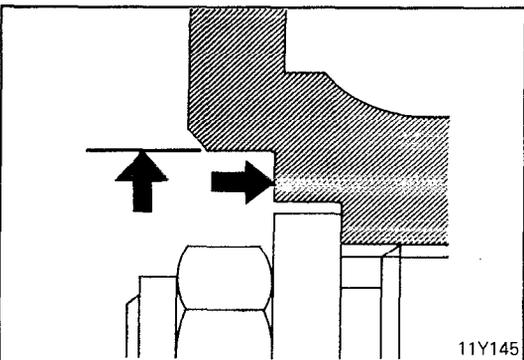
Continue driving the bearing in until the flange surface of the special tool comes in contact with the edge of the torque tube.

- (8) Install the snap ring by using snap ring pliers to secure the bearing in place.
 (9) Install the companion flange by properly aligning the mating marks.



3. APPLICATION OF OIL TO TORQUE TUBE ASSEMBLY TO FRONT SUPPORT BOLT

Apply oil to the bolt on its entire surface before it is installed.

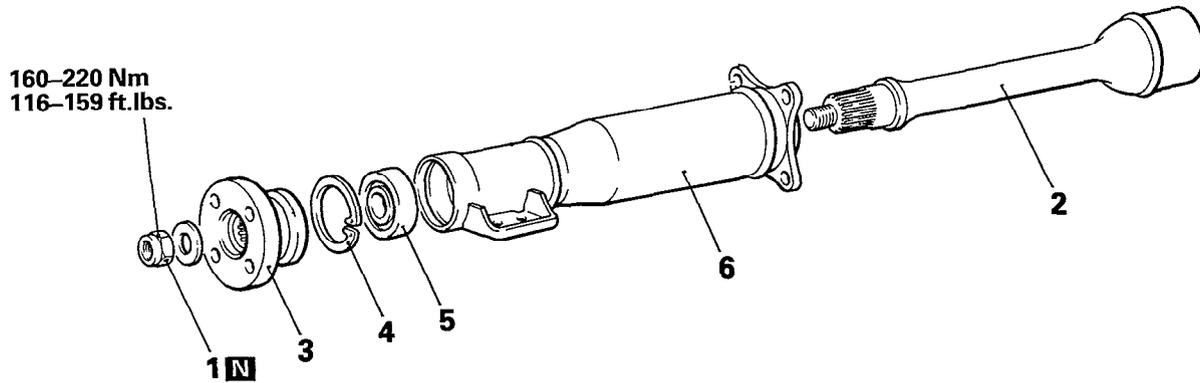


• MEASUREMENT OF COMPANION FLANGE RUNOUT

- (1) Hold the extension shaft by applying the parking brake, and tighten the companion flange mounting nut.
- (2) Measure companion flange runout with a dial indicator.
- (3) If the companion flange runout exceeds the standard value, change the phase of the companion flange and extension shaft and measure the runout once again.

Standard value: 0.1 mm (.004 in.)

**TORQUE TUBE
DISASSEMBLY AND REASSEMBLY**



Disassembly steps

- 1. Companion flange mounting nut (Self-locking nut)
- ↔ 2. Extension shaft
- ↔ 3. Companion flange
- ↔ 4. Snap ring
- ↔ 5. Bearing
- 6. Torque tube

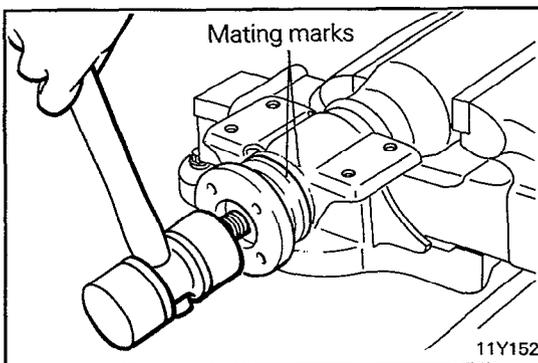
Reassembly steps

- ↔ 6. Torque tube
- ↔ 5. Bearing
- ↔ 2. Extension shaft
- ↔ 4. Snap ring
- ↔ 3. Companion flange
- ↔ 1. Companion flange mounting nut (Self-locking nut)

NOTE

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

11Y154

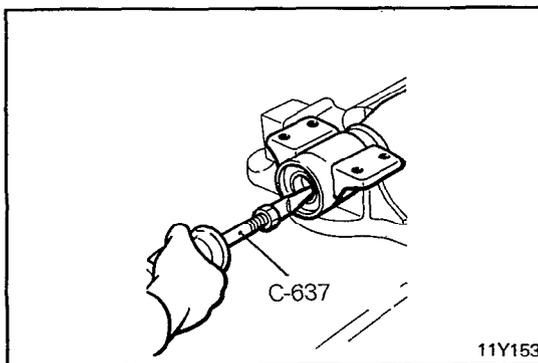


SERVICE POINTS OF DISASSEMBLY

N03KEAA

2. REMOVAL OF EXTENSION SHAFT / 3. COMPANION FLANGE

- (1) Make the mating marks to the extension shaft and companion flange.
- (2) Drive out the extension shaft from the torque tube with a plastic hammer.



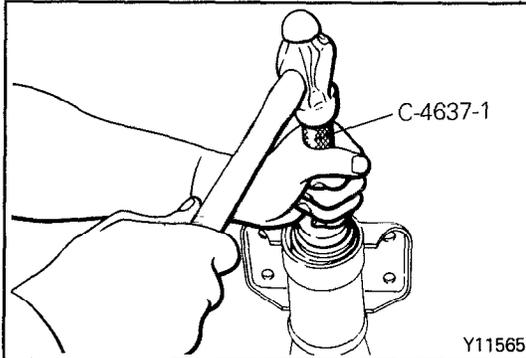
5. REMOVAL OF BEARING

- Pull out the bearing from the torque tube by using the special tool.

INSPECTION

N03KFAA

- Check bearing for looseness and rotation.
- Check torque tube for cracks.
- Check extension shaft for bend, wear and damage.

**SERVICE POINTS OF REASSEMBLY**

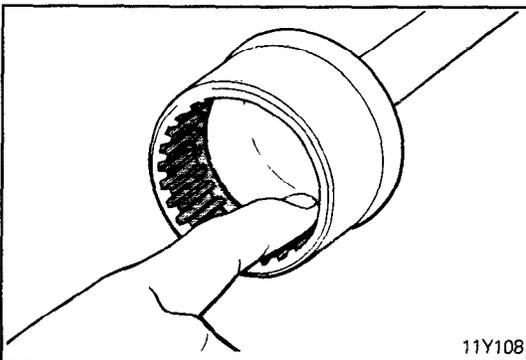
N03KGAA

5. INSTALLATION OF BEARING

Drive the bearing into the extension shaft by using the special tool.

NOTE

Continue driving the bearing in until the flange surface of the special tool comes in contact with the edge of the torque tube.

**2. APPLICATION OF GREASE TO EXTENSION SHAFT**

Apply the specified grease to the pocket and the spline part of the differential side of the extension shaft.

Specified grease: MOPAR Multi-Mileage Lubricant Part No. 2525035 or equivalent

3. INSTALLATION OF COMPANION FLANGE

Install the companion flange with mating marks properly aligned.

1. INSTALLATION OF COMPANION FLANGE MOUNTING NUT

Temporarily tighten the companion flange by using the companion flange mounting nuts.

NOTE

After mounted to the vehicle, tighten the companion flange mounting nut.

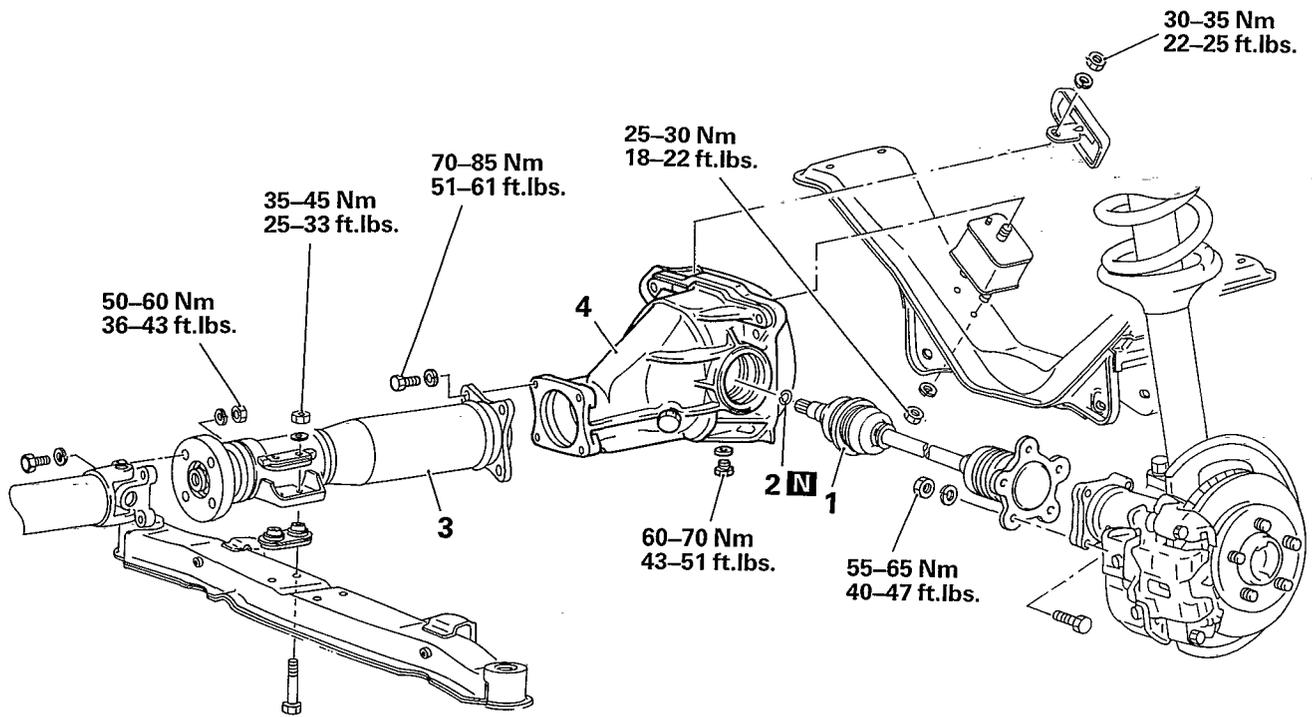
DIFFERENTIAL CARRIER REMOVAL AND INSTALLATION

Pre-removal Operation

- Draining Gear Oil

Post-installation Operation

- Filling Gear Oil



11Y705

Removal steps

1. Drive shaft
 2. Circlip
 3. Torque tube
 4. Differential carrier assembly
- ↔

NOTE

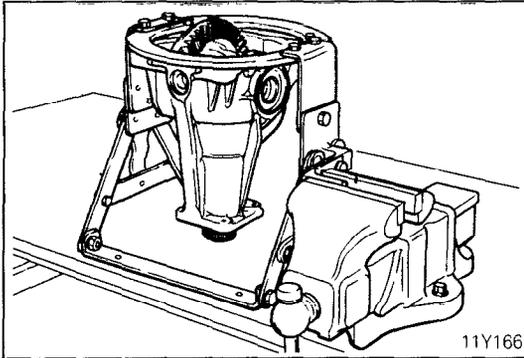
- (1) Reverse the removal procedures to reinstall.
- (2) ↔: Refer to "Service Points of Removal".
- (3) N: Non-reusable parts

SERVICE POINT OF REMOVAL

N03IBAC

4. DIFFERENTIAL CARRIER ASSEMBLY

Dismount the differential carrier from the rear support insulators by raising the differential carrier with a jack.

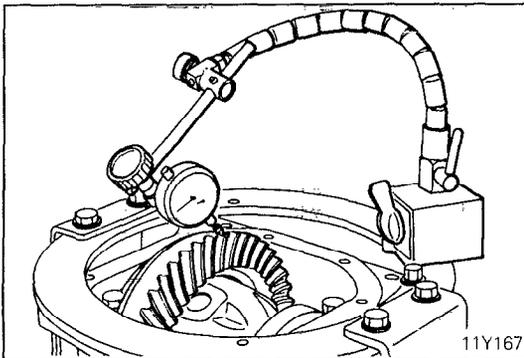


11Y166

INSPECTION BEFORE DISASSEMBLY

N03IEAE

Remove the rear supports and cover. Secure the working base in a vice and then install the removed differential carrier assembly.



11Y167

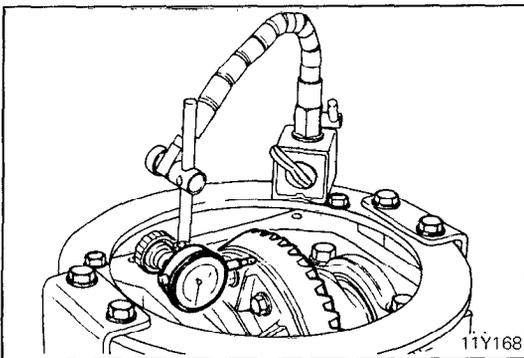
FINAL DRIVE GEAR BACKLASH

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

NOTE

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

Standard value: 0.13 – 0.18 mm (.005 – .007 in.)

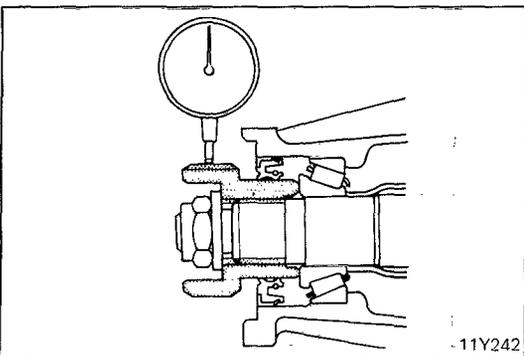


11Y168

DRIVE GEAR RUNOUT

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

Limit: 0.05 mm (.002 in.)

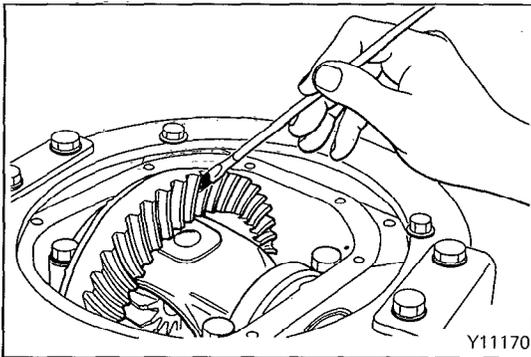


11Y242

SPLINE COUPLING RUNOUT

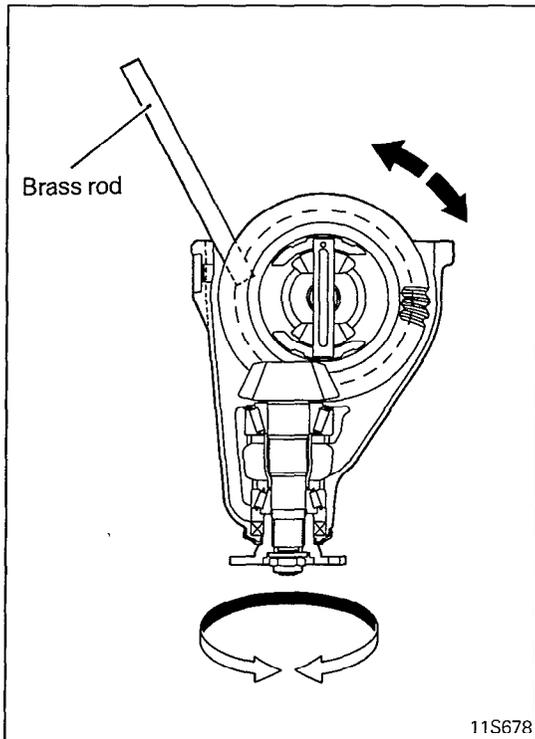
Measure the spline coupling runout with a dial indicator.

Standard value: 0.1 mm (.004 in.)

**FINAL DRIVE GEAR TOOTH CONTACT**

Check the final drive gear tooth contact as follows:

- (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 spline coupling 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 rotating torque [approximately 2.5 to 3.0 Nm (1.8 to 2.2 ft.lbs.)] is applied to the drive pinion.

Caution

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

- (3) Check the tooth contact condition of the drive gear and drive pinion.

NOTE

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

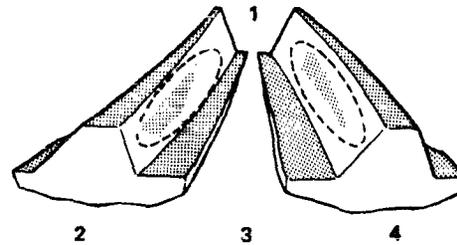
If, after adjustments have been made, the correct tooth contact pattern cannot be obtained, it means that the drive gear and the drive pinion have become worn beyond the allowable limit; replace the gear set.

Caution

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

Standard tooth contact pattern

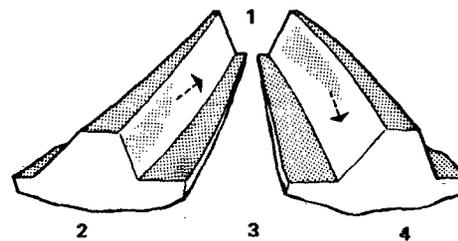
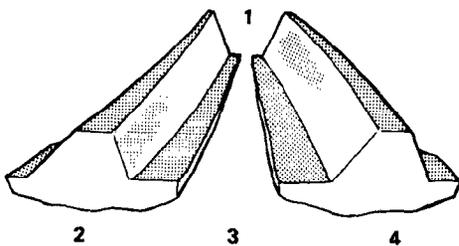
- 1 Toe
- 2 Drive-side
- 3 Heel
- 4 Coast-side



Problem

Solution

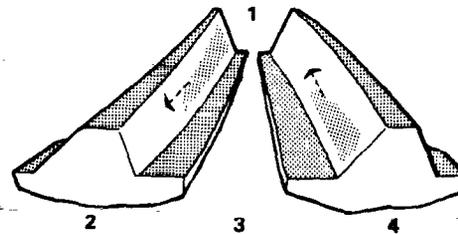
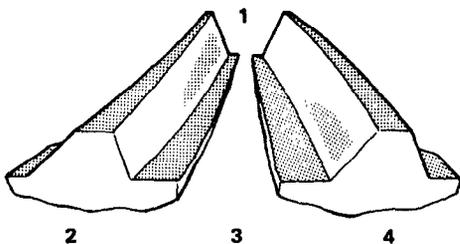
Tooth contact pattern resulting from excessive pinion height



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

Increase the thickness of the pinion height adjusting shim, and position the drive pinion closer to the center of the drive gear. Also, for backlash adjustment, position the drive gear farther from the drive pinion.

Tooth contact pattern resulting from insufficient pinion height



The drive pinion is positioned too close to the center of the drive gear.

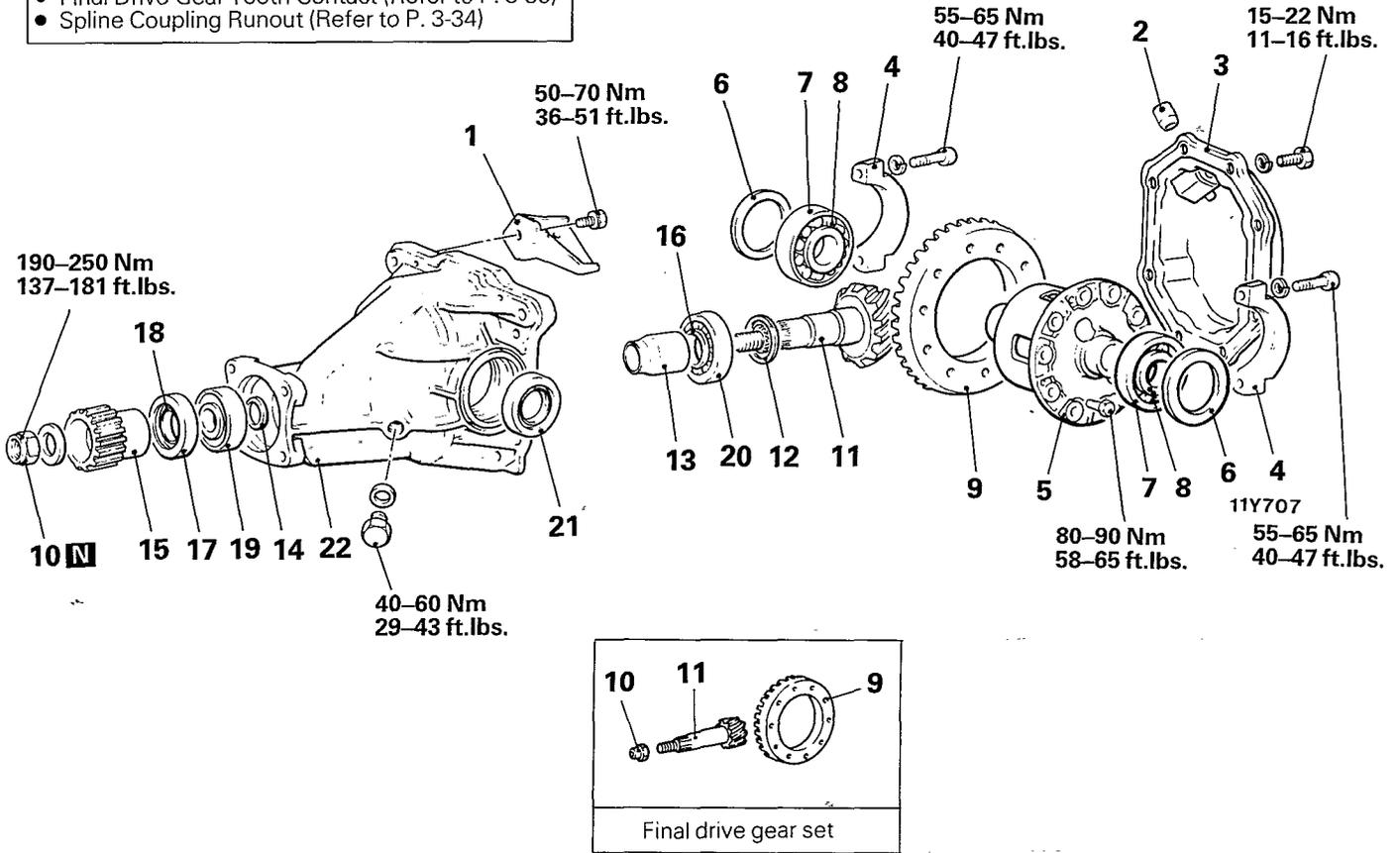
Decrease the thickness of the pinion height adjusting shim, and position the drive pinion farther from the center of the drive gear. Also, for backlash adjustment, position the drive gear closer to the drive pinion.

DIFFERENTIAL CARRIER

DISASSEMBLY AND REASSEMBLY

Inspection Before Disassembly

- Final Drive Gear Backlash (Refer to P.3-34)
- Drive Gear Runout (Refer to P. 3-34)
- Final Drive Gear Tooth Contact (Refer to P. 3-35)
- Spline Coupling Runout (Refer to P. 3-34)



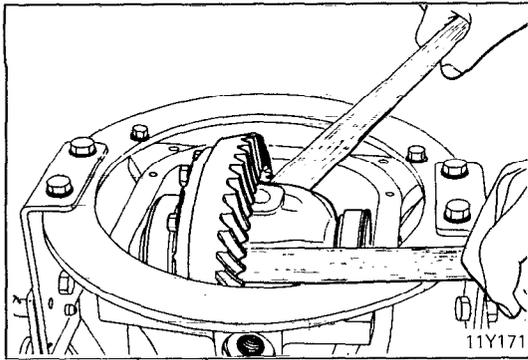
Disassembly steps

- 1. Rear supports
- ◀▶ 2. Vent plug
- ◀▶ 3. Cover
- ◀▶ 4. Bearing cap
- ◀▶ 5. Differential case assembly
- ◀▶ 6. Final drive gear backlash adjustment
- ◀▶ 7. Side bearing adjusting spacer
- ◀▶ 8. Side bearing outer race
- ◀▶ 9. Side bearing inner race
- ◀▶ 10. Drive gear
- ◀▶ 11. Spline coupling mounting nut (Self-locking nut)
- ◀▶ 12. Drive pinion
- ◀▶ 13. Drive pinion rear shim (for pinion height adjustment)
- ◀▶ 14. Drive pinion preload adjustment
- ◀▶ 15. Pinion height adjustment
- ◀▶ 16. Drive pinion spacer
- ◀▶ 17. Drive pinion front shim (for preload adjustment)
- ◀▶ 18. Spline coupling
- ◀▶ 19. Drive pinion rear bearing inner race
- ◀▶ 20. Drive pinion rear bearing outer race
- ◀▶ 21. Oil seal
- ◀▶ 22. Gear carrier

- ◀▶ 18. Drive pinion front bearing inner race
- ◀▶ 19. Drive pinion front bearing outer race
- ◀▶ 20. Drive pinion rear bearing outer race
- 21. Oil seal
- 22. Gear carrier

NOTE

- (1) Reverse the disassembly procedures to reassemble.
- (2) ◀▶: Refer to "Service Points of Disassembly".
- (3) ▶▶: Refer to "Service Points of Reassembly".
- (4) **N**: Non-reusable parts

**SERVICE POINTS OF DISASSEMBLY**

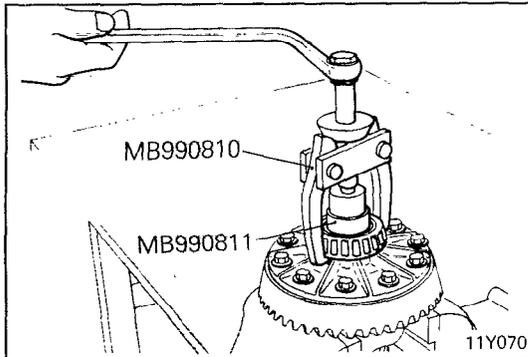
N03JLBA

5. REMOVAL OF DIFFERENTIAL CASE ASSEMBLY

Take out the differential case assembly with a hammer handle.

NOTE

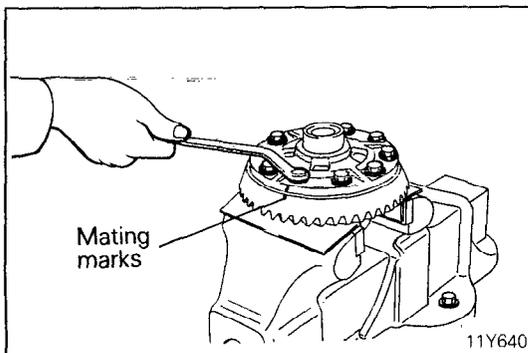
Keep the right and left side bearings and side bearing adjusting spacers separate, so that they do not become mixed at the time of reassembly.

**8. REMOVAL OF SIDE BEARING INNER RACE**

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

NOTE

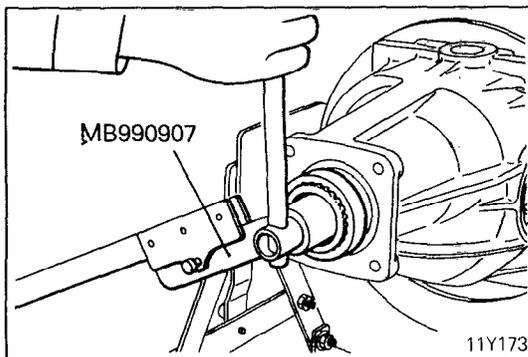
Attach the prongs of the special tool to the inner race of the side bearing through the openings in the differential case.

**9. REMOVAL OF DRIVE GEAR**

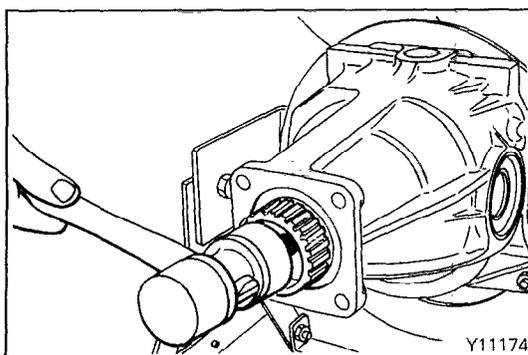
- (1) Make the mating marks to the differential case and the drive gear.
- (2) Loosen the drive gear attaching bolts in diagonal sequence to remove the drive gear.

NOTE

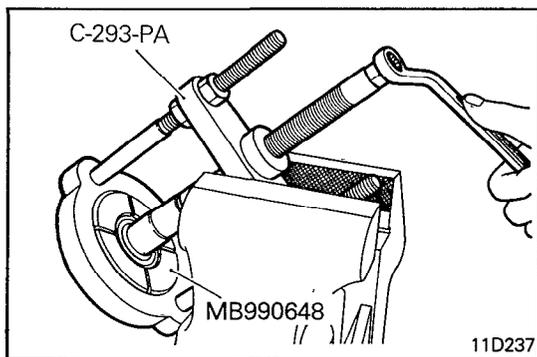
An anti-looseness agent has been used on the bolts. If they cannot be loosened, heat the area to approximately 150°C (302°F) with a propane torch, and then loosen them.

**10. REMOVAL OF SPLINE COUPLING MOUNTING NUT**

Use the special tools to hold the spline coupling and remove the spline coupling mounting nut.

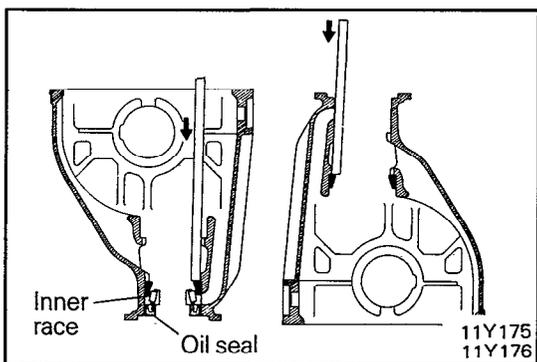
**11. REMOVAL OF DRIVE PINION**

- (1) Make the mating marks to the drive pinion and spline coupling.
- (2) Drive out the drive pinion together with the drive pinion spacer and drive pinion front shims.



16. REMOVAL OF DRIVE PINION REAR BEARING INNER RACE

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



17. REMOVAL OF OIL SEAL / 19. DRIVE PINION FRONT BEARING OUTER RACE / 20. DRIVE PINION REAR BEARING OUTER RACE

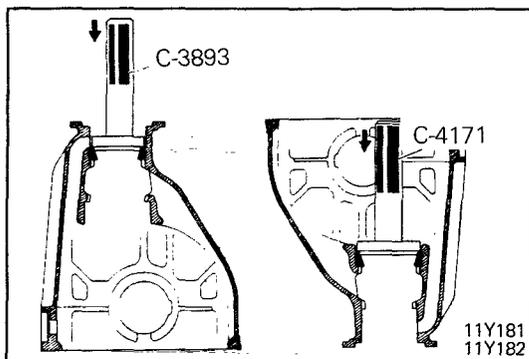
Drive out the oil seal, drive pinion front and rear bearing outer races from the gear carrier by using a bar.

INSPECTION

N03IMBA

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

- Check companion flange for wear or damage.
- Check oil seal for wear or deterioration.
- Check bearings for wear or discoloration.
- Check gear carrier for cracks.
- Check drive pinion and ring gear for wear or cracks.



SERVICE POINTS OF REASSEMBLY

N031NBD

20. INSTALLATION OF DRIVE PINION REAR BEARING OUTER RACE / 19. DRIVE PINION FRONT BEARING OUTER RACE

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

Caution

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

• PINION HEIGHT ADJUSTMENT

Adjust the drive pinion height by the following procedure:

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

NOTE

Apply a thin coat of the specified grease to the mating face of the washer of the special tool.

Specified grease: MOPAR Multi-Mileage Lubricant Part No. 2525035 or equivalent

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

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

Standard value: 15 – 25 Ncm (1.3 – 2.2 in.lbs.)

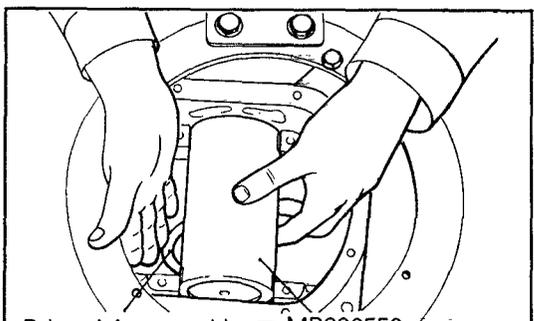
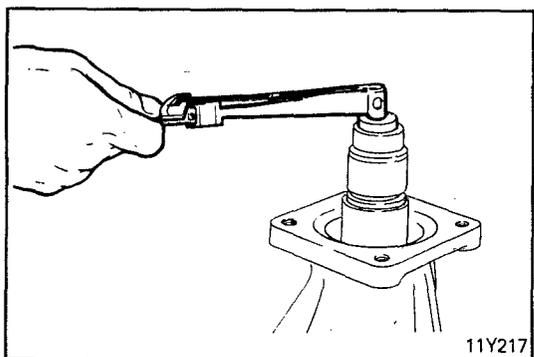
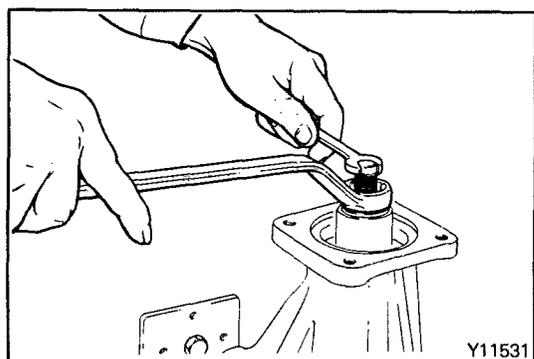
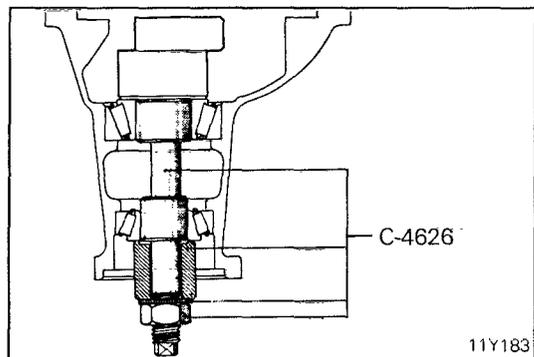
NOTE

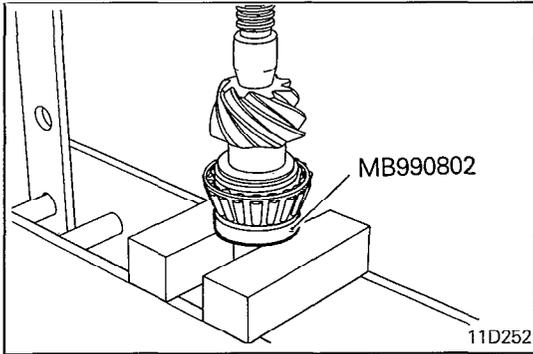
Gradually tighten the nut of the special tool while checking the drive pinion rotating torque.

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

NOTE

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





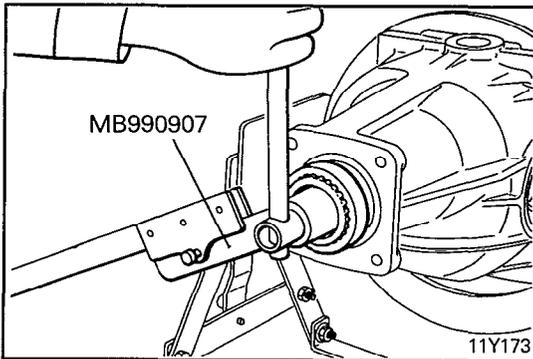
- (5) Fit the selected drive pinion rear shim(s) to the drive pinion, and press-fit the drive pinion rear bearing inner race by using the special tool.

● **DRIVE PINION PRELOAD ADJUSTMENT**

Without Oil Seal

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

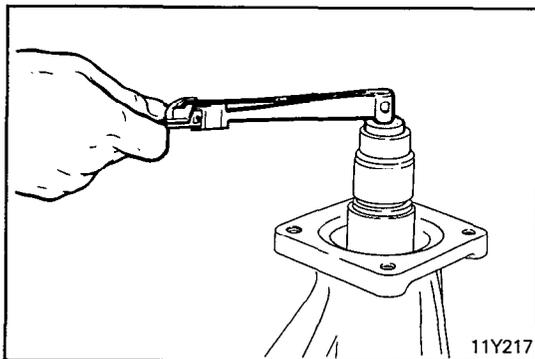
- (1) Fit the drive pinion front shim(s) between the drive pinion spacer and the drive pinion front bearing inner race.



- (2) Tighten the spline coupling by using the special tools.

NOTE

Do not install oil seal.



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

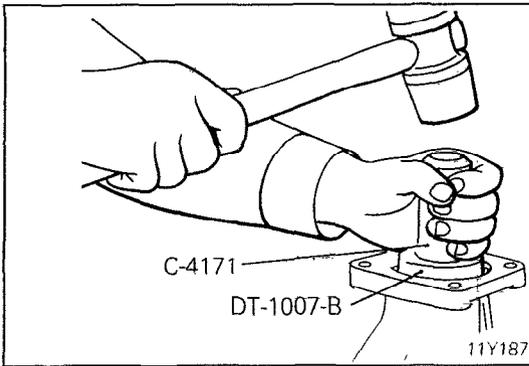
Standard value: 15 – 25 Ncm (1.3 – 2.2 in.lbs.)

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

NOTE

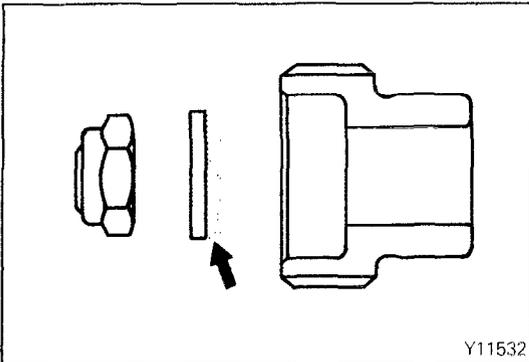
When selecting the drive pinion front shims, if the number of shims is large, reduce the number of shims to a minimum by selecting the drive pinion spacers.

- (5) Remove the spline coupling and drive pinion once again.



- (6) Place the front bearing inner race in the gear carrier.
- (7) Drive the oil seal into the gear carrier front lip by using the special tool.
- (8) Apply specified grease to the oil seal lip.

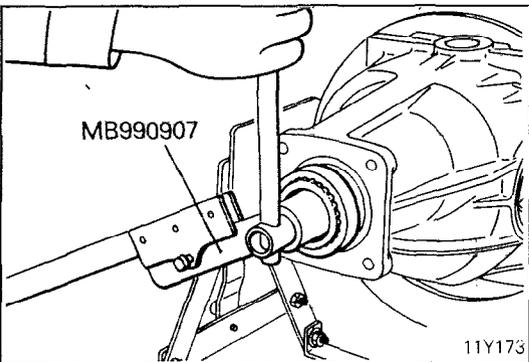
Specified grease: Multipurpose grease SAE J310, NLGI No. 2



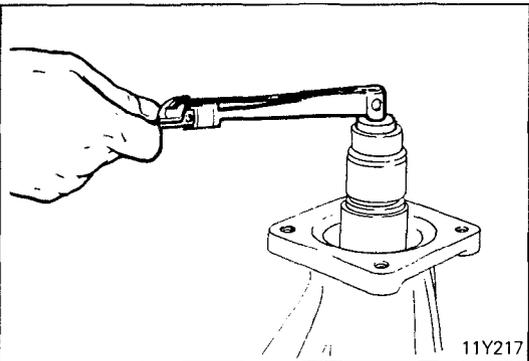
With Oil Seal

- (1) Apply a thin coat of specified grease to the spline coupling contacting surface of the washer before installing drive pinion assembly.

Specified grease: MOPAR Multi-Mileage Lubricant Part No. 2525035 or equivalent

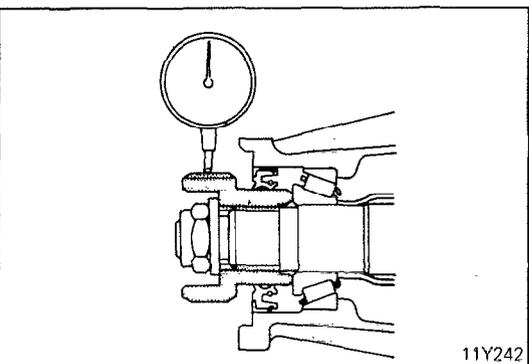


- (2) Install the drive pinion assembly and spline coupling with mating marks properly aligned, and tighten the spline coupling mounting nut by using the special tools.



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

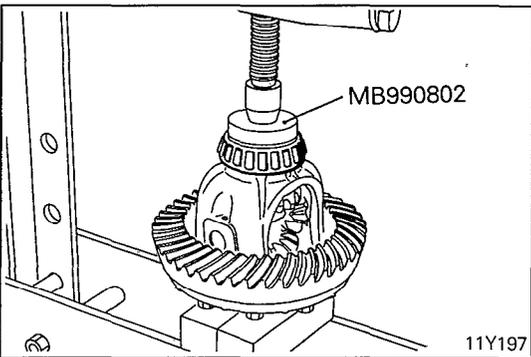
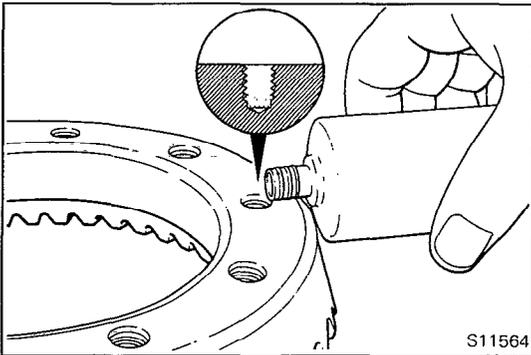
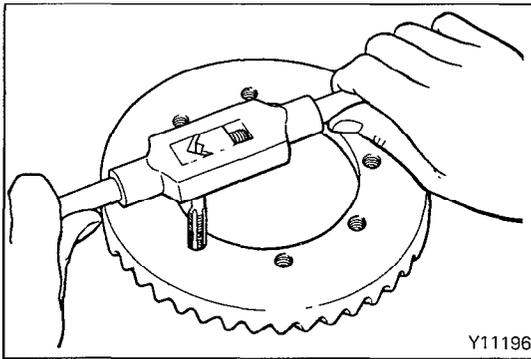
Standard value: 40 – 50 Ncm (3.5 – 4.3 in.lbs.)



- (4) Measure the spline coupling runout.

Standard value: 0.1 mm (.004 in.)

If the spline coupling runout exceeds the standard value, change the phase of the spline coupling and drive pinion after disassembling the differential carrier and measure the runout once again.



9. INSTALLATION OF DRIVE GEAR

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

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

Specified adhesive: MOPAR LOCTITE 271 or equivalent

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

8. PRESS-FIT OF SIDE BEARING INNER RACE

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

FINAL DRIVE GEAR BACKLASH ADJUSTMENT

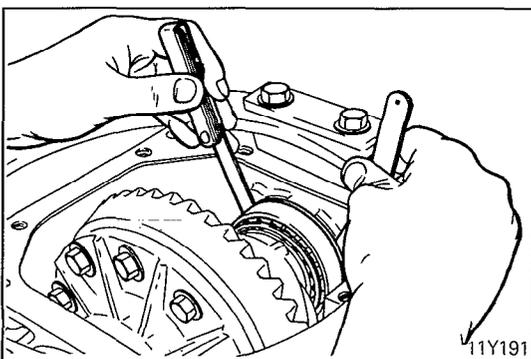
Adjust the final drive gear backlash by the following procedure:

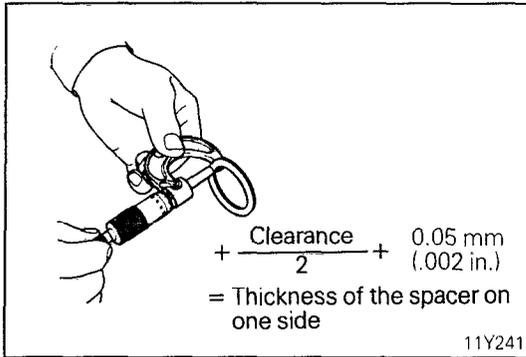
- (1) Install the side bearing adjusting spacers, which are thinner than those removed, to both the pinion gear and the drive gear sides of the differential case assembly, and then mount the differential case assembly into the gear carrier.

NOTE

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

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

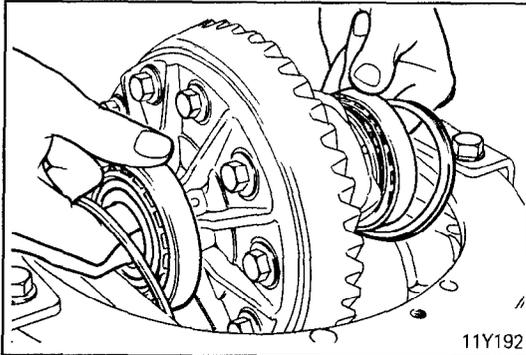




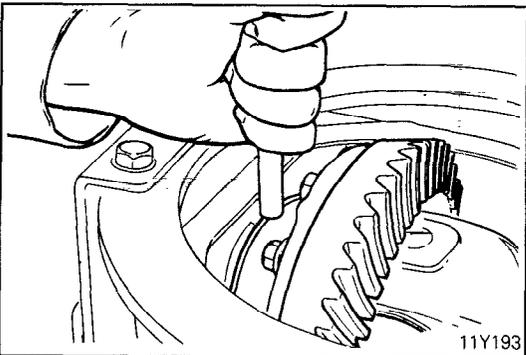
- (3) Measure the thickness of the side bearing adjusting spacers on one side, select two pairs of spacers which correspond to that thickness plus one half of the clearance plus 0.05 mm (.002 in.), and then install one pair each to the drive pinion side and the drive gear side.

NOTE

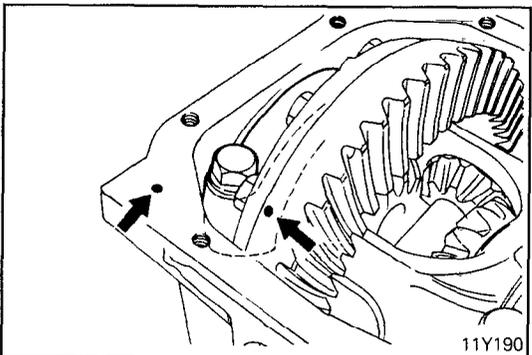
Be sure that there is no clearance between the gear carrier and the side bearing adjusting spacer.



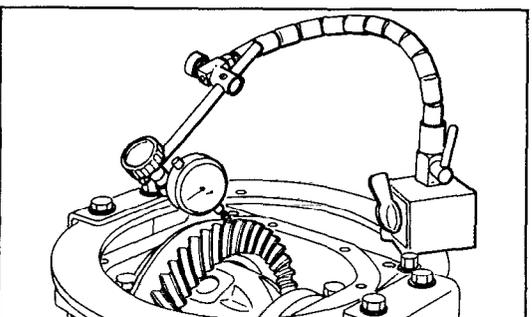
- (4) Install the side bearing adjusting spacers and differential case assembly, as shown in the illustration, to the gear carrier.



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

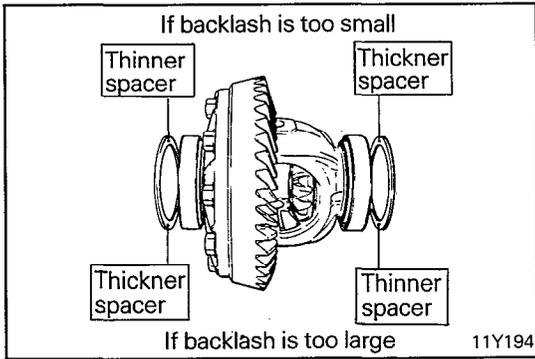


- (6) Align the mating marks on the gear carrier and the bearing cap, and then tighten the bearing cap.



- (7) Measure the final drive gear backlash.

Standard value: 0.13 – 0.18 mm (.005 – .007 in.)



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

NOTE

Be sure to change the side bearing adjusting spacers on the drive pinion side and on the drive gear side so that the total thickness is equal to that obtained from the calculation in item (3).

When selecting the side bearing adjusting spacers, keep the number of spacers to a minimum.

- (9) Check the drive gear and drive pinion for tooth contact. If poor contact is evident, make adjustment. (Refer to P.3-36.)

- (10) Re-measure the backlash to verify that the backlash complies with the standard value.

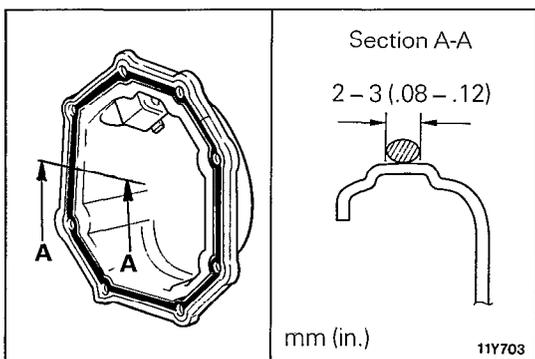
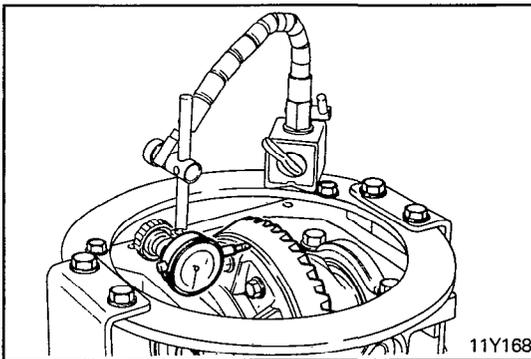
NOTE

There is a correlation between the backlash and tooth contact of the final drive gear. Coordinate their adjustment, while checking both, until a point of compromise is found. If correct adjustment cannot be made by only moving the drive gear sideways, adjustment of the drive pinion height is required.

- (11) Measure the drive gear runout.

Limit: 0.05 mm (.002 in.)

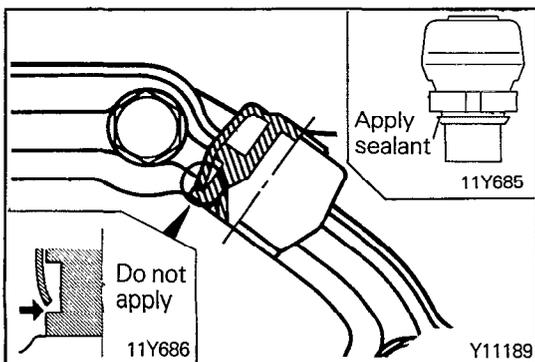
If the drive gear runout exceeds the limit, reinstall by changing the phase of the drive gear and differential case, and re-measure.



3. INSTALLATION OF COVER

Apply specified sealant to the cover flange surface (surface which contacts the carrier) as illustrated and attach it on the carrier.

Specified sealant: MOPAR Part No. 4318034 or equivalent



2. INSTALLATION OF VENT PLUG

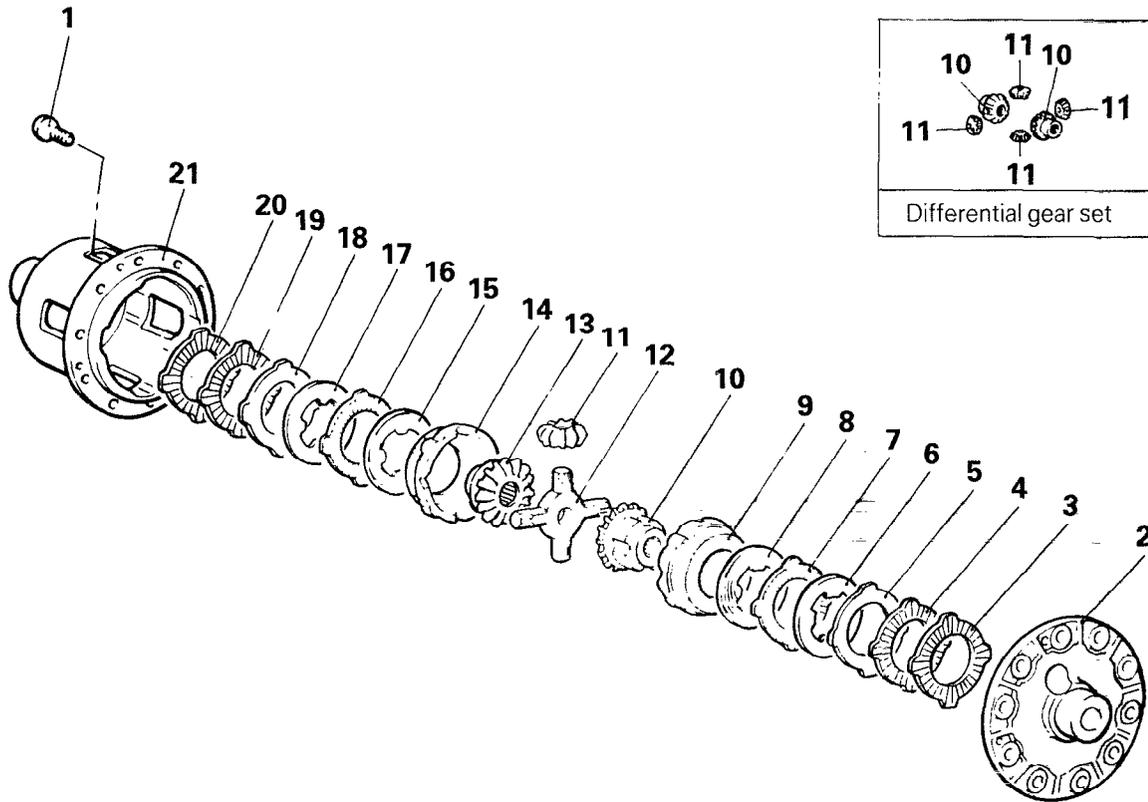
When installing vent plug, apply semi-drying sealant to the mating surfaces of the vent plug and the cover.

Caution

Do not apply sealant to the part shown in the illustration.

**DIFFERENTIAL CARRIER
OVERHAUL**

N031W-



11Y694

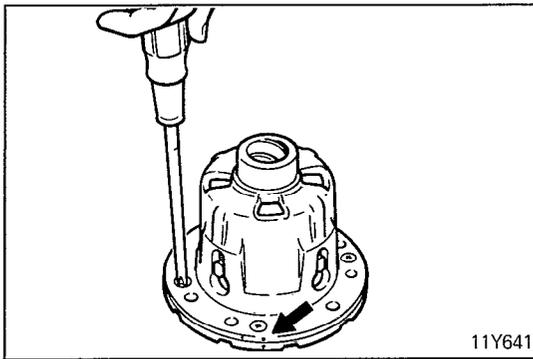
Disassembly steps

- ◆◆ Adjustment of clutch plate preload
- ◆◆ 1. Screw
- 2. Differential case (A)
- 3. Spring plate
- 4. Spring disc
- 5. Friction plate
- 6. Friction disc
- 7. Friction plate
- 8. Friction disc
- 9. Pressure ring
- 10. Side gear
- 11. Differential pinion gear
- 12. Differential pinion shaft
- 13. Side gear
- 14. Pressure ring
- 15. Friction disc

- 16. Friction plate
- 17. Friction disc
- 18. Friction plate
- 19. Spring disc
- 20. Spring plate
- ◆◆ Adjustment of clutch plate friction force
- 21. Differential case (B)

NOTE

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



SERVICE POINT OF DISASSEMBLY

N031PBA

1. REMOVAL OF SCREW

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

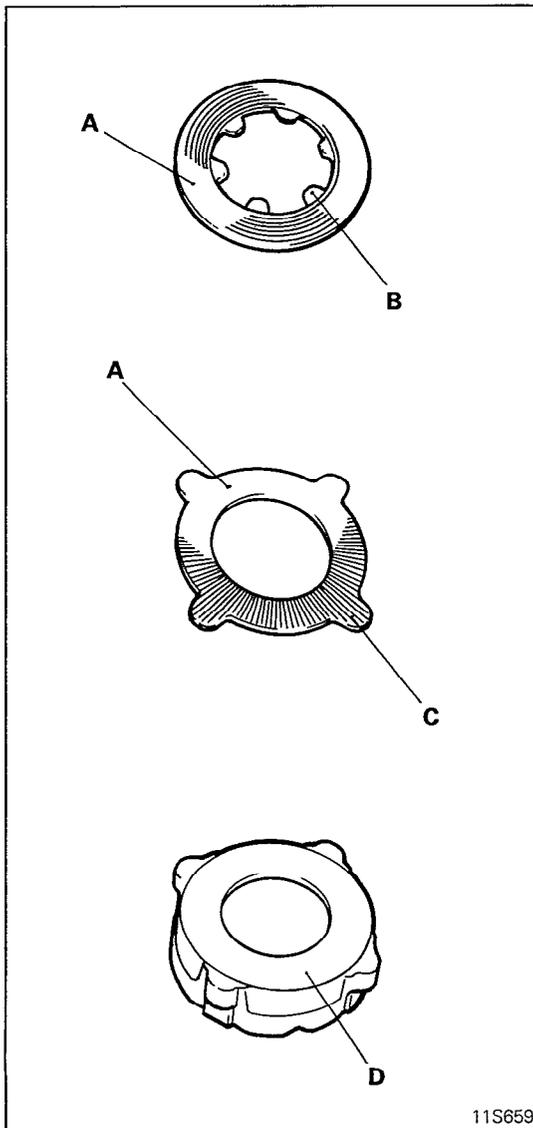
NOTE

Keep the right and left parts separate in order to be able to distinguish them for reassembly.

INSPECTION

N031QBA

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



INSPECTION OF THE CONTACT AND SLIDING SURFACES OF PARTS

- (1) Inspect the friction plate, friction disc, spring plate, spring disc and pressure ring.

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

If there are any signs of seizure, severe friction, or 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 and the spring disc; this wear is not abnormal.

- B. The six projections on the inner circumference of the friction disc.

If there are nicks and dents, it will cause abnormalities in the clutch pressure.

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

- C. The four projections on the outer circumference of the friction disc.

If there are nicks and dents, it will cause abnormalities in the clutch pressure.

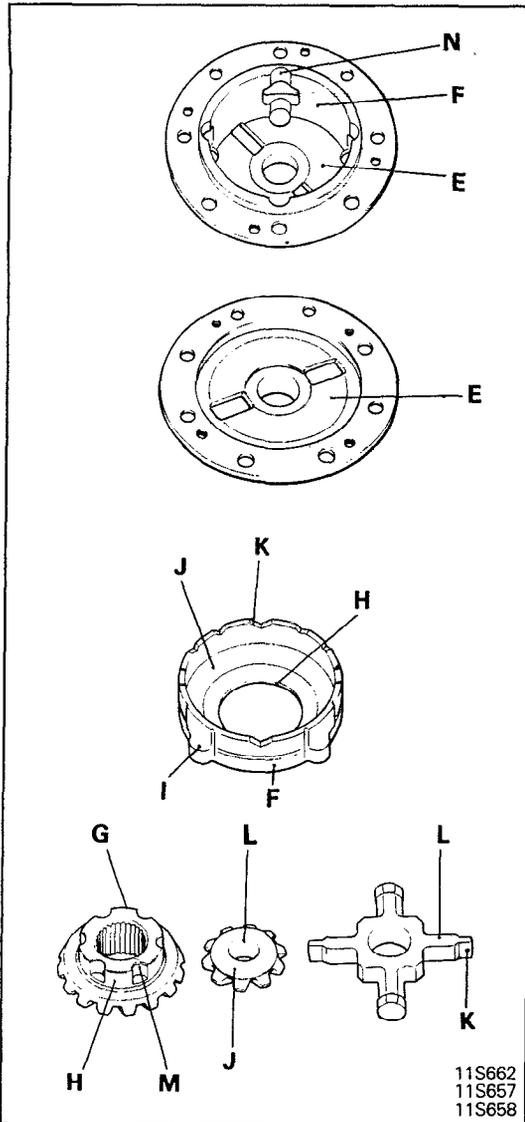
Repair the parts by using an oil stone; if the parts cannot be repaired, replace them.

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

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

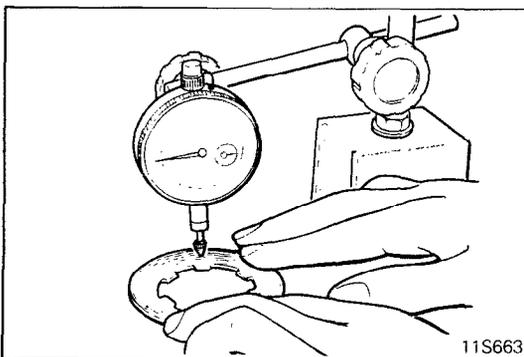
NOTE

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



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

- E. The spring contacting surface of the differential case.
- F. The contact surfaces of the outer circumference of the pressure ring and the inner circumference of the differential case.
- G. The sliding surface of the thrust washer.
- H. The sliding surfaces of the hole in the pressure ring and the outer circumference of the side gear.
- I. The projection on the outer circumference of the pressure ring.
- J. The spherical surface of the differential pinion gear and the inner diameter of the pressure ring.
- K. The V-shaped groove in the pressure ring, and the V-shaped part in the pinion shaft.
- L. The outer diameter of the pinion shaft and the hole in the differential pinion gear.
- M. The outer circumference groove of the side gear.
- N. The inner circumference groove of the differential case,



INSPECTION FOR 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: 0.08 mm (.0031 in.)

INSPECTION FOR WEAR OF THE FRICTION PLATE AND FRICTION DISC

(1) In order to measure the wear, measure the thickness of the friction surfaces and projections of the friction disc and plate, and then find the difference.

Limit: 0.1 mm (.0039 in.)

NOTE

Make the measurement at several different points.

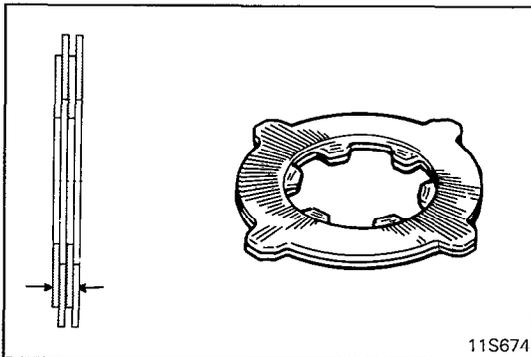
(2) If the parts are worn beyond the allowable limit, replace

SERVICE POINTS OF REASSEMBLY

N03IRBA

● **CLUTCH PLATE FRICTION FORCE ADJUSTMENT**

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

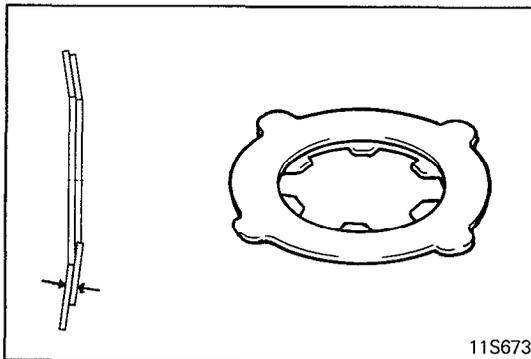


- (1) Stack up the friction discs and friction plates two each on each side as illustrated. Find combination that gives standard difference in thickness between the two sides.

Standard value: 0.05 mm (.0020 in.)

NOTE

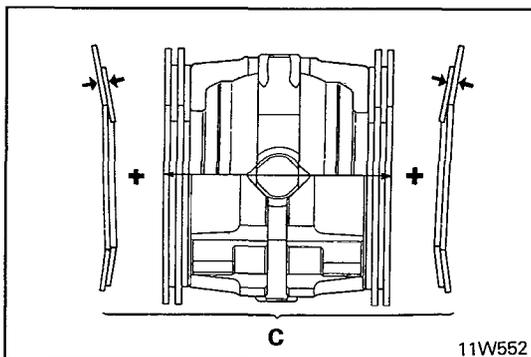
The thickness of new friction plate and friction disc is 1.70 mm (.0669 in.).



- (2) Stack up spring disc and spring plate one each on each side as illustrated. Find combination that gives smallest difference in thickness between the two sides.

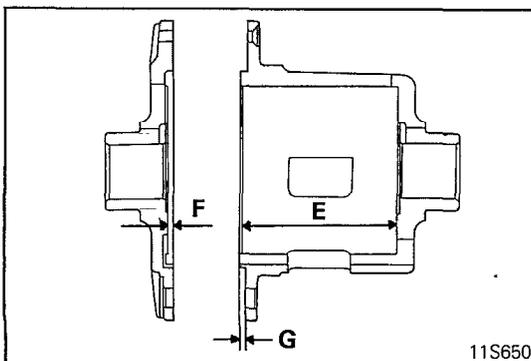
NOTE

The thickness of new spring disc and spring plate is 1.70 mm (.0669 in.).



- (3) Assemble the pressure ring internal parts (differential pinion shaft, differential pinion gear and side gear), friction discs and friction plates and measure the overall width as illustrated.

- (4) Determine the sum (C) of thickness of spring discs and spring plates and measurement taken in step (3) above.



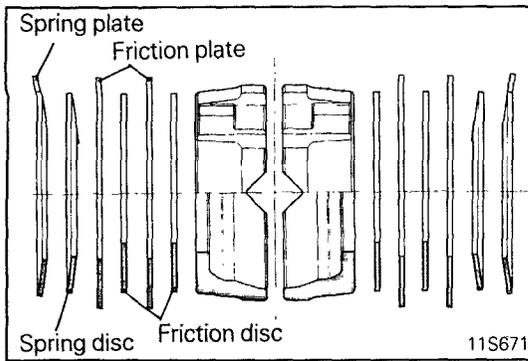
- (5) Determine the dimension (D) between contact surfaces of spring plates when differential cases (A) and (B) are combined.

$$D = E + F - G$$

- (6) Adjust the spring disc thickness so that the spring plate to differential case clearance (D – E) becomes the standard value.

Standard value:

0.06 – 0.20 mm (.0024 – .0079 in.)



- (7) Place parts in the differential case (B) in the illustrated direction.

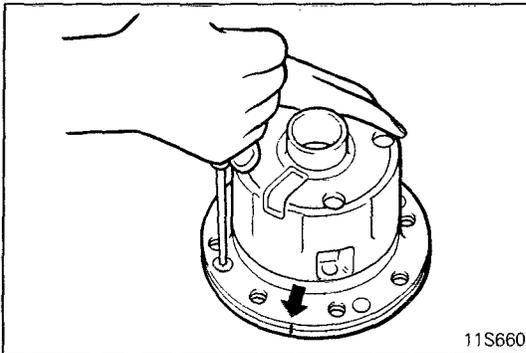
NOTE

- (a) Before assembly, apply the specified gear oil to each component being especially careful to coat all contact surfaces and sliding surfaces.

Specified gear oil:

MOPAR Hypoid Gear Lubricant Part No. 4318058 plus MOPAR Hypoid Gear Oil Additive – Friction Modifier, Part No. 4318060 or equivalent

- (b) Be careful not to insert the friction plates and friction discs in the incorrect order and to install the spring plates and spring discs in incorrect direction.

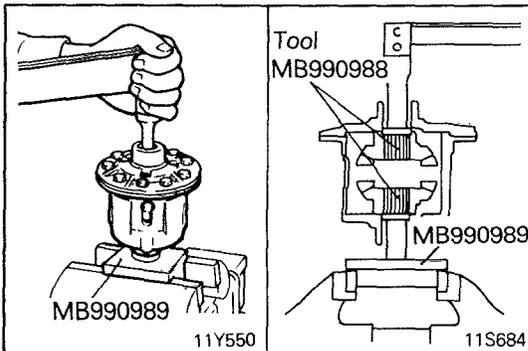


• **CLUTCH PLATE PRELOAD ADJUSTMENT**

- (1) Align mating marks (same numeral on each case) on differential case (A) and differential case (B).
 (2) Tighten screws with a screwdriver in several steps until the cases are brought into close contact.

NOTE

If end faces of cases (A) and (B) do not come into close contact when screws are tightened, incorrect engagement of preload spring and outer clutch plate or spring plate with groove is suspected. Assemble again.



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

NOTE

Slightly rotate the unit before measuring the torque.

Standard value:

When a new clutch plate is used
 50 – 80 Nm (36 – 58 ft.lbs.)

When an old clutch plate is used
 35 – 80 Nm (25 – 58 ft.lbs.)