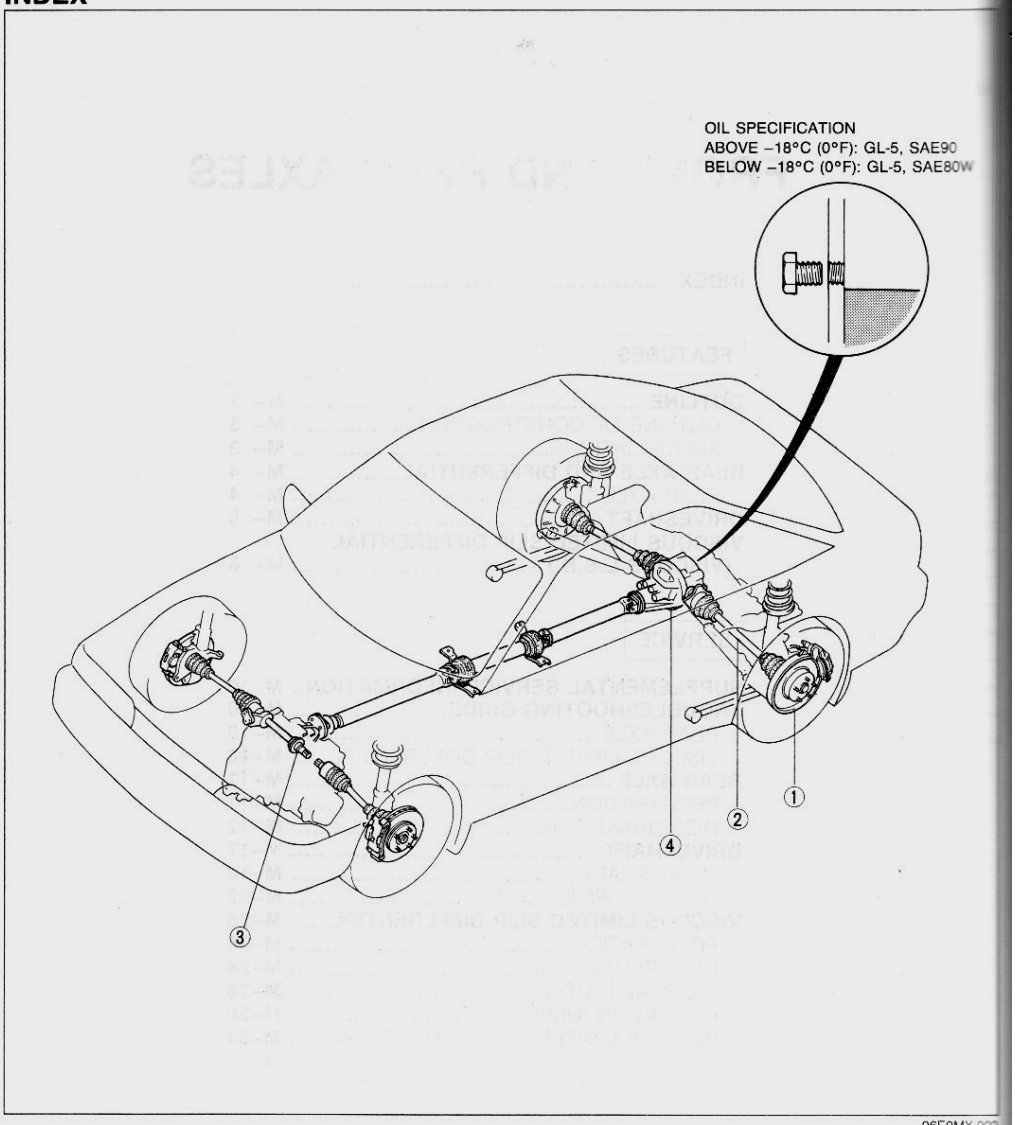
FRONT AND REAR AXLES

96E0MX-001

INDEX



96E0MX-002

OUTLINE

OUTLINE OF CONSTRUCTION

(4WD model)

- Double-offset joints, which feature low rotational fluctuation noise and excellent vibration resistance, are used for the differential side of front and rear driveshafts.
- The viscous limited slip differential (L.S.D.) is used to improve handling and performance.
- Angular type ball bearings are employed for the rear wheel bearings for improved durability and serviceability.

(2WD model)

- The construction of front and rear axle is the same as the previous model.
- The construction of driveshaft is the same as the previous model.
- Dust seal for joint shaft is redesigned to improve reliability.

96E0MX-003

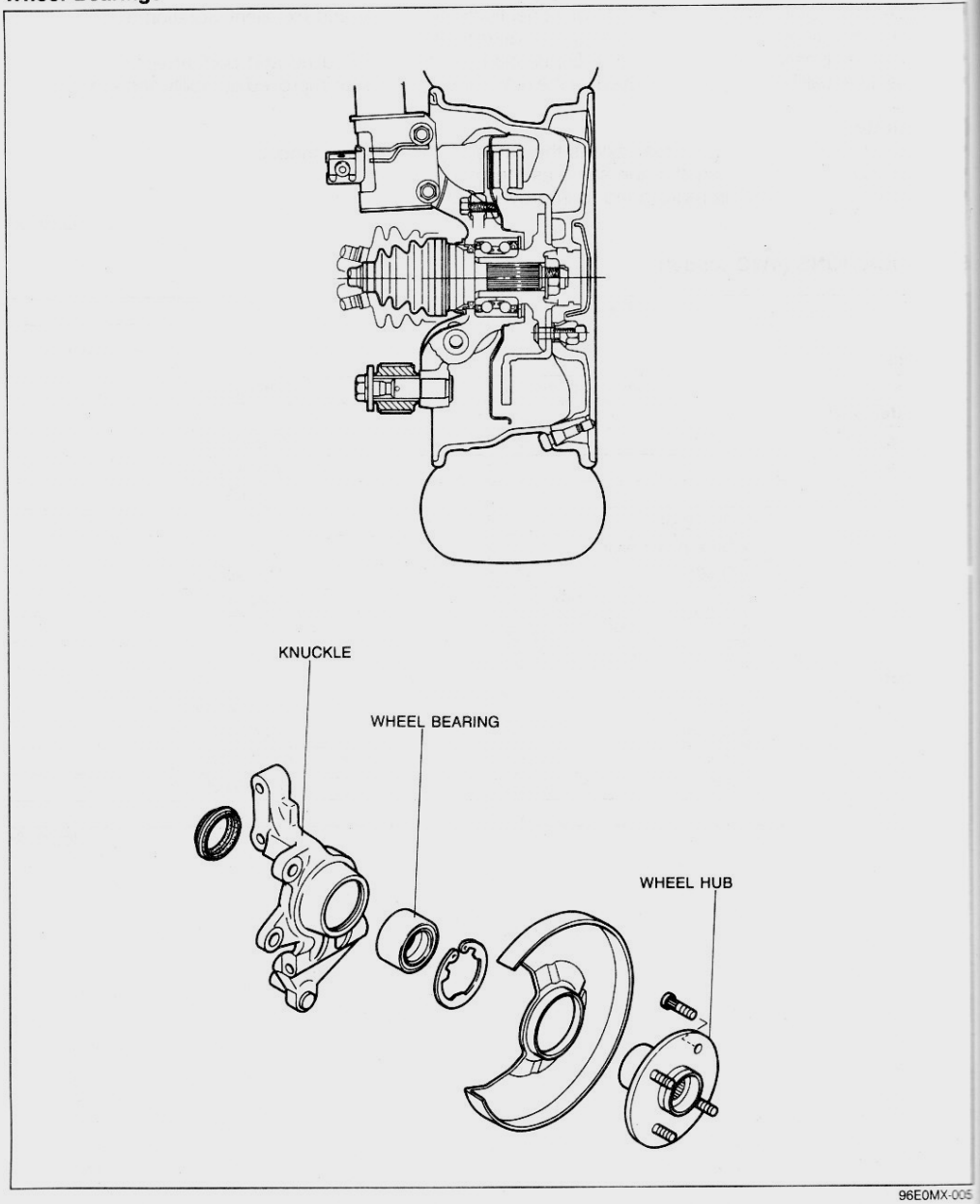
SPECIFICATIONS (4WD model)

Item \ Engine/Transaxle Model			F2
			G5MX-R
Rear axle			
Wheel bearing axial play		Maximum mm (in)	0.05 (0.002)
Rear differential			
Reduction gear			Hypoid gear
Differential gear			Straight bevel gear
Reduction ratio			3.909
Number of teeth	Ring gear		43
	Drive pinion gear		11
Differential oil	Grade		API: GL-5
	Viscosity	Above −18°C (0°F)	SAE 90
		Below −18°C (0°F)	SAE 80W
	Amount	liter (US qt, Imp qt)	0.65 (0.69, 0.57)
Driveshaft			
Joint type	Inside		Double-offset joint
	Outside		Bell joint
Length of shaft	Right	mm (in)	691 (27.20)
	Left	mm (in)	661 (26.02)
Shaft diameter		mm (in)	22 (0.86)

96E0MX-004

REAR AXLE AND DIFFERENTIAL

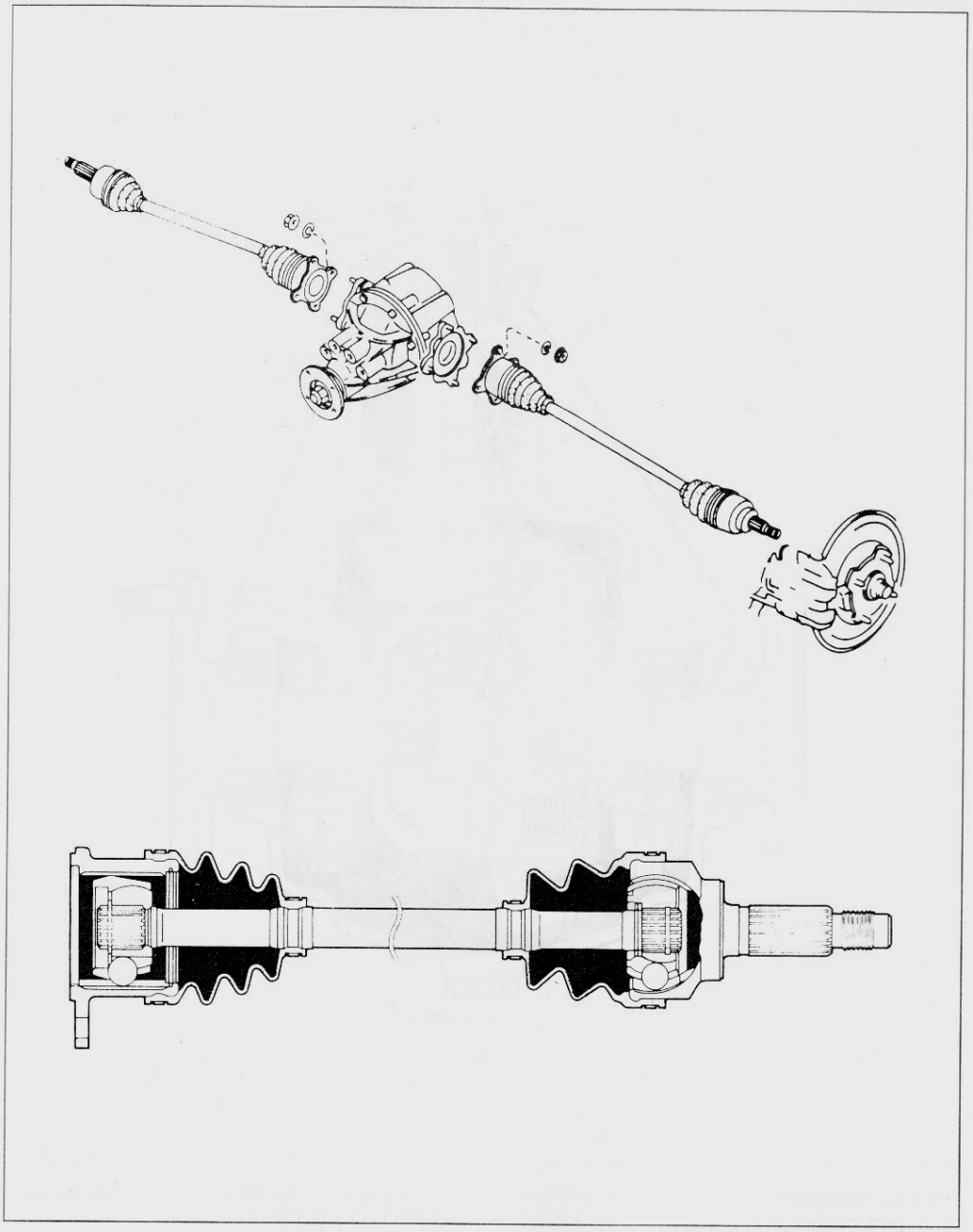
REAR AXLE
Wheel Bearings



96E0MX-005

The use of angular type wheel bearings allows setting of bearing preload by simply tightening the driveshaft nut to the specified torque, thus improving bearing durability and serviceability.

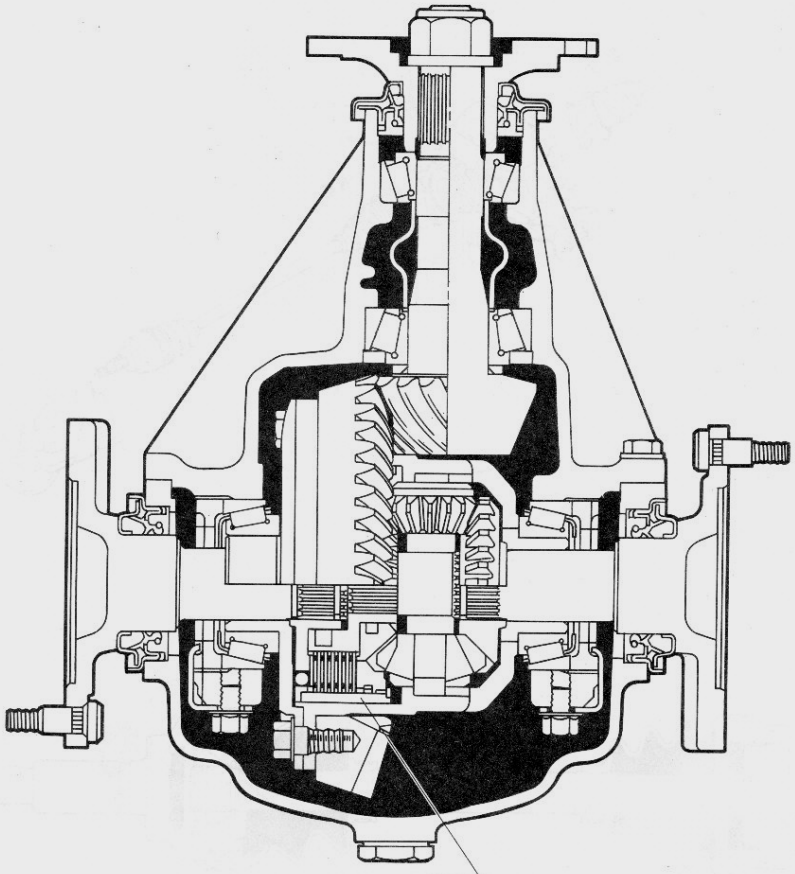
DRIVESHAFT



96E0MX-006

To transmit the power from the rear differential to the wheels, driveshafts, similar in design to the front driveshafts, are employed. As with the front driveshafts, bell joint is used at the wheel side and double-offset joint is used at the differential side.

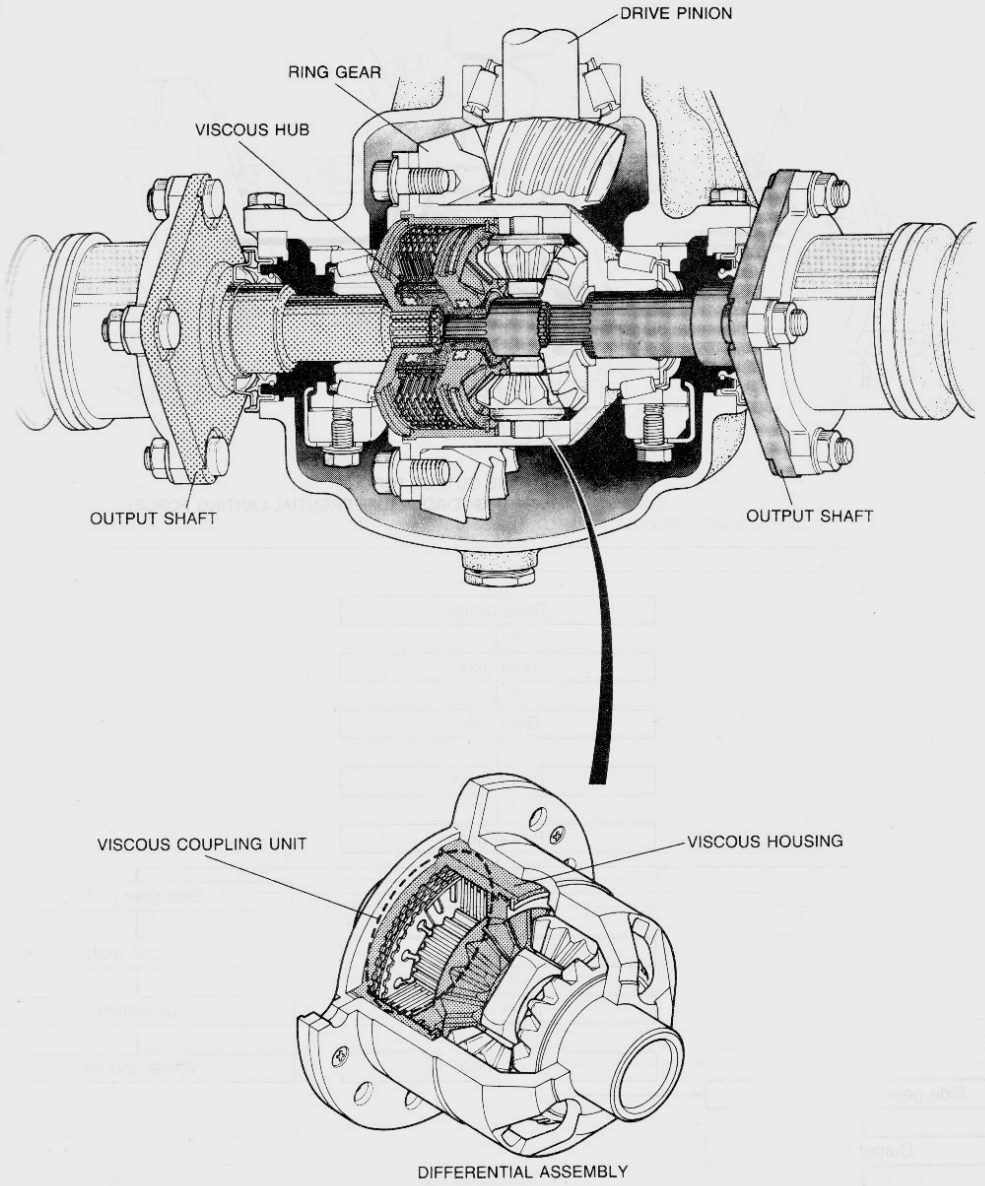
VISCOUS LIMITED SLIP DIFFERENTIAL (VISCOUS L.S.D.)



96E0MX-007

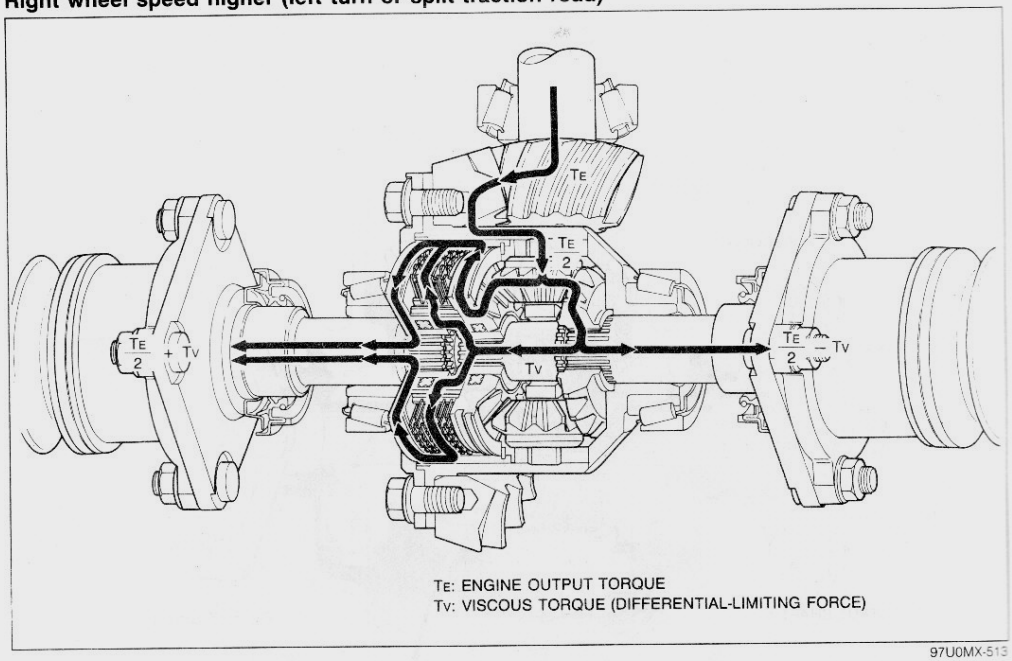
The newly designed viscous limited slip differential is made available for the 4WD model to improve handling, performance and serviceability, and to achieve reductions of vibration and noise.
The viscous limited slip differential is a viscous coupling that takes advantage of resistance of a fluid to control operation of the differential.
The viscous limited slip differential is composed of the self-contained viscous coupling unit and the differential mechanism (side gears and pinion gears), common to other differentials.

CROSS-SECTIONAL VIEW



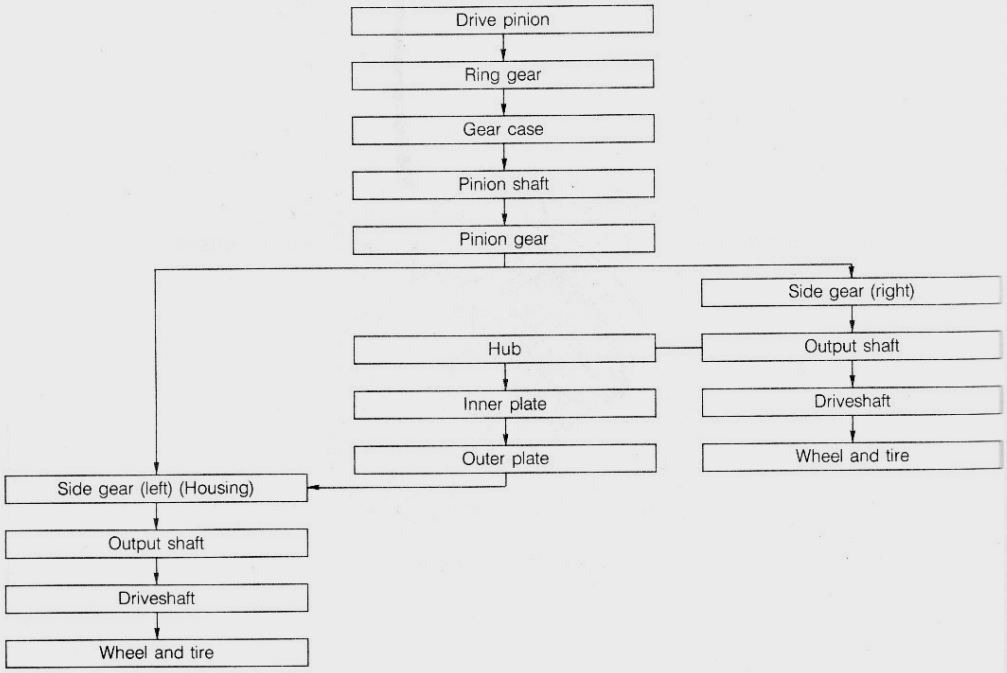
97U0MX-505

POWER FLOW
Right wheel speed higher (left turn or split-traction road)

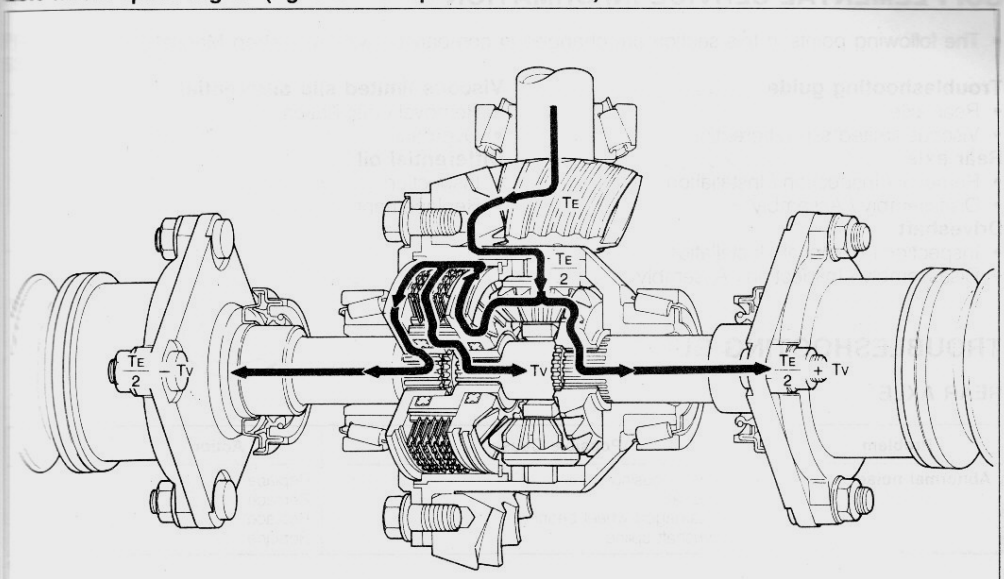


TE: ENGINE OUTPUT TORQUE
TV: VISCOUS TORQUE (DIFFERENTIAL-LIMITING FORCE)

97U0MX-513

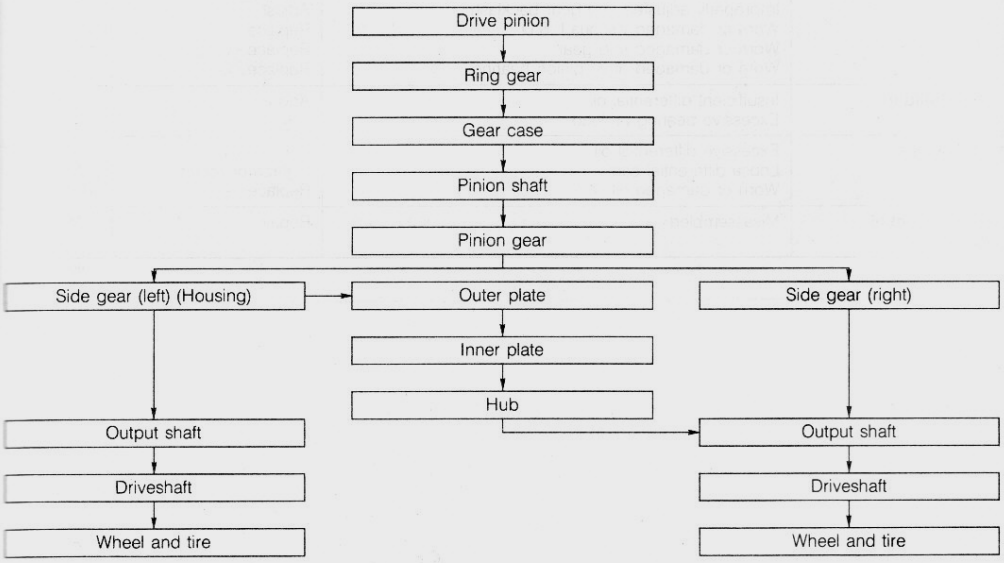


Left wheel speed higher (right turn or split-traction road)



TE: ENGINE OUTPUT TORQUE
Tv: VISCOUS TORQUE (DIFFERENTIAL-LIMITING FORCE)

97U0MX-514



M SUPPLEMENTAL SERVICE INFORMATION, TROUBLESHOOTING GUIDE

SUPPLEMENTAL SERVICE INFORMATION

- The following points in this section are changed in comparison with Workshop Manual (1163-10-87G).

Troubleshooting guide
- Rear axle
- Viscous limited slip differential

Rear axle
- Removal / Inspection / Installation
- Disassembly / Assembly

Driveshaft
- Inspection / Removal / Installation
- Disassembly / Inspection / Assembly

Viscous limited slip differential
- Removal / Installation
- Overhaul

Differential oil
- Inspection
- Replacement

96E0MX-008

TROUBLESHOOTING GUIDE

REAR AXLE

Problem	Possible Cause	Action	Page
Abnormal noise	Bent bearing housing	Replace	—
	Bent driveshaft	Replace	M–22
	Worn or damaged wheel bearing	Replace	M–13
	Worn driveshaft spline	Replace	M–23

96E0MX-009

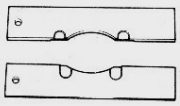
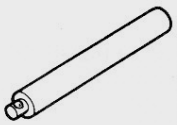
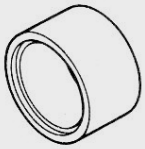
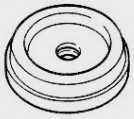
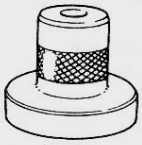
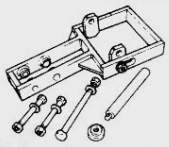
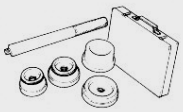
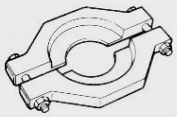
VISCOUS LIMITED SLIP DIFFERENTIAL

Problem	Possible Cause	Action	Page
Abnormal noise	Insufficient differential oil	Add oil	M–28
	Incorrect differential oil	Replace	M–28
	Improperly adjusted ring gear backlash	Adjust	M–40
	Worn or damaged viscous L.S.D.	Replace	M–28, 33
	Worn or damaged ring gear	Replace	M–33
	Worn or damaged drive pinion bearing	Replace	M–33
Heat buildup	Insufficient differential oil	Add oil	M–28
	Excessive bearing preload	Adjust	M–38
Oil leakage	Excessive differential oil	Remove oil	M–28
	Loose differential carrier	Tighten or repair	M–41
	Worn or damaged oil seal	Replace	M–28, 33
No differential operation	Misassembled	Repair	M–33

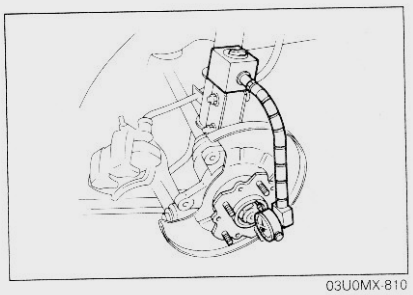
96E0MX-010

REAR AXLE

PREPARATION
SST

49 F026 103 Puller, wheel hub 	For removal of wheel hub and wheel bearing	49 G033 105 Attachment A (Part of 49 G033 1A1) 	For removal of wheel hub
49 G033 106 Attachment B (Part of 49 G033 1A1) 	For removal of wheel bearing	49 G033 102 Handle (Part of 49 B026 1A0) 	For removal of wheel hub
49 G033 107 Installer, dust cover 	For installation of dust cover	49 H026 103 Block, support 	For installation of dust cover, wheel bearing hub flange
49 B001 797 Handle (Part of 49 S231 505) 	For installation of wheel bearing	49 F027 004 Attachment for bearing ϕ80 	For installation of wheel bearing
49 V001 795 Installer, oil seal 	For installation of oil seal	49 B026 1A0 Puller, wheel hub 	For removal of wheel hub
49 F027 0A1 Installer set, bearing 	For installation of wheel bearing	49 H027 002 Remover, bearing 	For removal of wheel bearing

96E0MX-011


03U0MX-810

DISC BRAKE TYPE

Preinspection

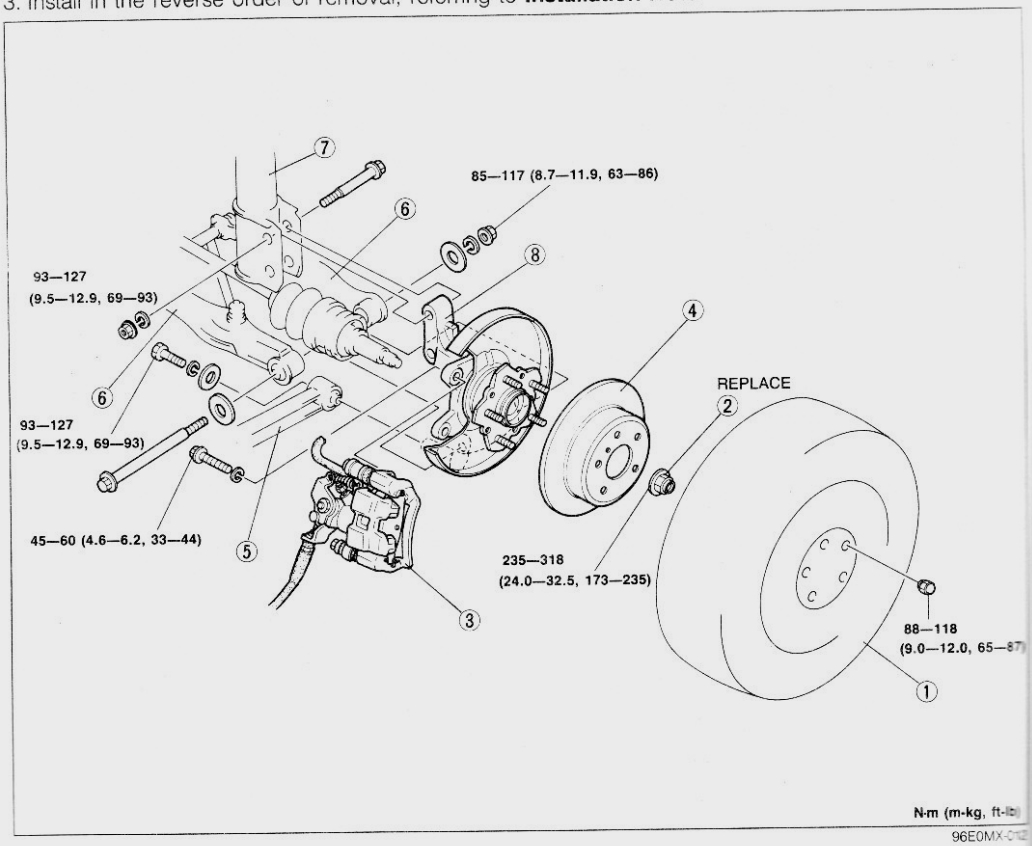
Wheel bearing play

1. Remove the wheel and tire.
2. Remove the brake caliper assembly.
3. Position a dial indicator against the wheel hub. Push and pull the wheel hub by hand in the axial direction and measure the wheel bearing play.
4. If the bearing play exceeds specification, check and adjust the wheel hub nut torque or replace the wheel bearing if necessary.

Maximum wheel bearing play: 0.05mm (0.002 in)

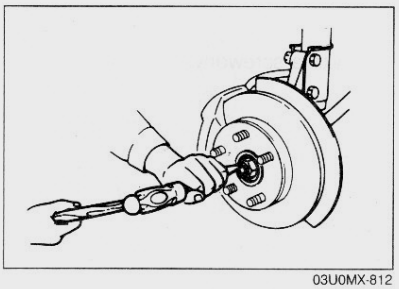
Removal / Inspection / Installation

1. Remove in the order shown in the figure, referring to **Removal Note**.
2. Inspect all parts, and repair or replace as necessary.
3. Install in the reverse order of removal, referring to **Installation Note**.



96E0MX-012

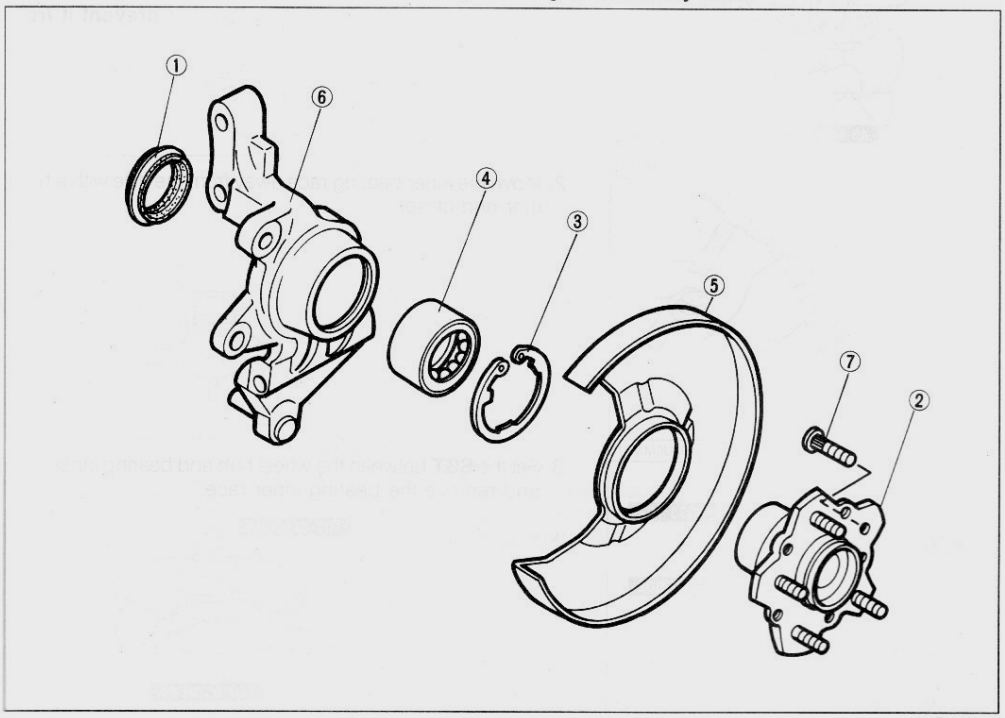
1. Wheel and tire
2. Locknut
   Installation Note ..... page M–13
3. Brake caliper assembly
   Service ..... Section P
4. Disc plate
5. Trailing link
6. Lateral link
7. Shock absorber
8. Wheel hub, knuckle
   Disassembly / Inspection / Assembly ..... page M–13


03U0MX-812

Installation Note
Wheel hub nut
1. Install a new nut, and stake it as shown.

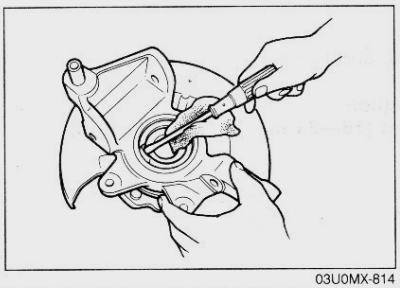
Tightening torque:
177—235 N·m (18—24 m-kg, 130—174 ft-lb)

Disassembly / Inspection / Assembly
1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
2. Inspect all parts, and repair or replace as necessary.
3. Assemble in the reverse order of disassembly, referring to **Assembly Note**.



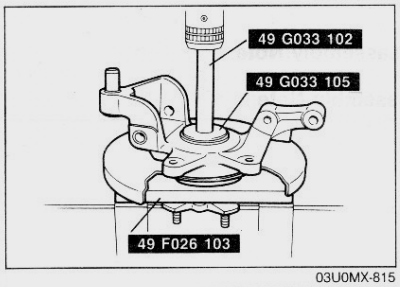
96E0MX-013

1. Oil seal
   - Disassembly Note..... page M–14
   - Assembly Note ..... page M–16
2. Wheel hub
   - Disassembly Note..... page M–14
   - Inspect for cracks and other damage
   - Assembly Note ..... page M–16
3. Retaining ring
4. Wheel bearing
   - Disassembly Note..... page M–14
   - Assembly Note ..... page M–15
5. Dust cover
   - Disassembly Note..... page M–15
   - Inspect for damage and distortion
   - Assembly Note ..... page M–15
6. Knuckle
   - Inspect for cracks and other damage
7. Wheel stud
   - Disassembly Note..... page M–15
   - Assembly Note ..... page M–15



03U0MX-814

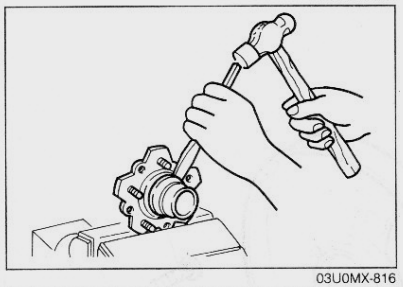
Disassembly Note
Oil seal
1. Remove the oil seal with a screwdriver.



03U0MX-815

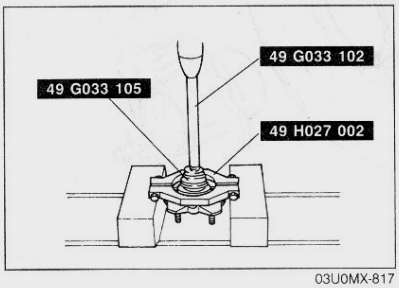
Wheel hub
1. Remove the wheel hub from the knuckle with the **SST** and a press.

Caution
- **Support the wheel hub by hand to prevent it from falling.**



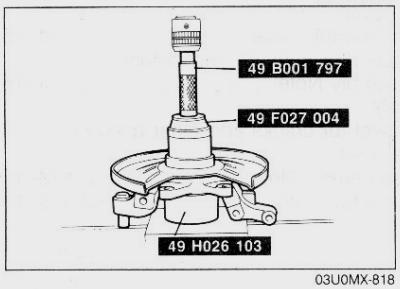
03U0MX-816

2. Move the inner bearing race away from the axle with a hammer and chisel.



03U0MX-817

3. Set the **SST** between the wheel hub and bearing inner race, and remove the bearing inner race.

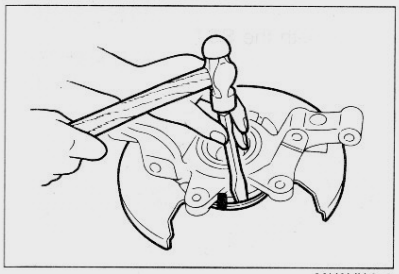


03U0MX-818

Wheel bearing

Caution
- **Do not reuse the removed wheel bearing.**

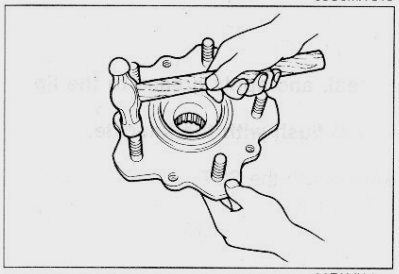
1. Remove the wheel bearing from the knuckle with the **SST** and a press.


03U0MX-819

Dust cover

Caution
- **Do not remove the dust cover if not necessary.**
- **Do not reuse the removed dust cover.**

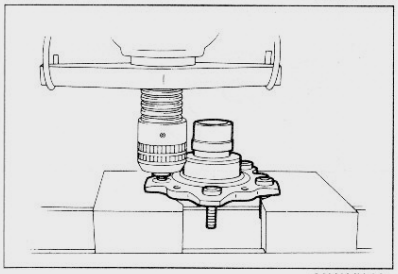
1. Mark the dust cover and knuckle for proper reassembly.
2. Remove the dust cover with a chisel.


96E0MX-014

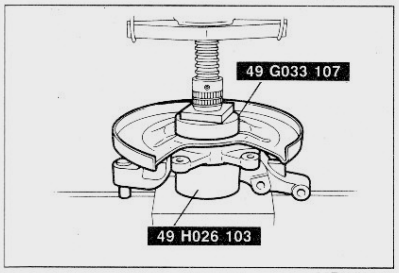
Wheel studs

Caution
- **Do not remove the wheel studs if not necessary.**
- **Do not reuse the removed wheel.**

1. Remove the wheel studs with a hammer.

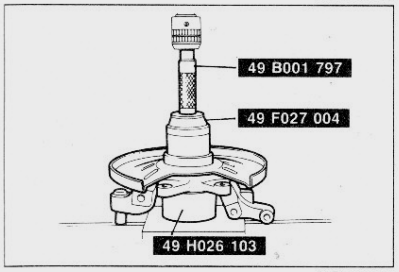

03U0MX-821

Assembly Note
Wheel stud
1. Install the new wheel studs with a press.



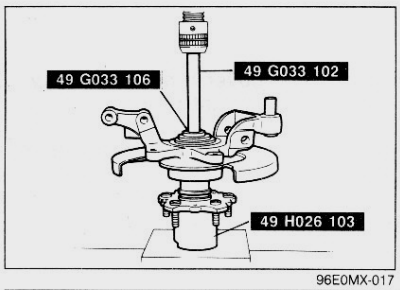
96E0MX-015

Dust cover
1. Mark the new dust cover the same as the one removed.
2. Align the marks of the new dust cover and the knuckle.
3. Press on the new dust cover with the **SST**.

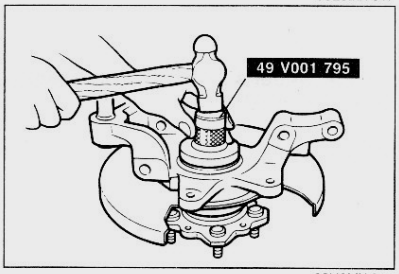


96E0MX-016

Wheel bearing
1. Press in the new wheel bearing with the **SST**.



96E0MX-017



03U0MX-014

Wheel hub

1. Press in the wheel hub with the **SST**.

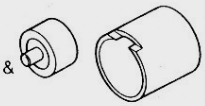
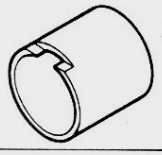
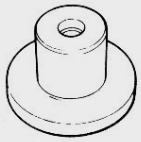
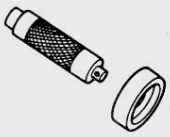
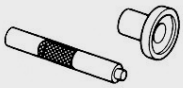
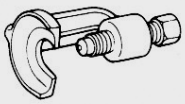
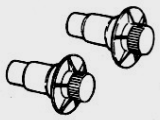
Oil seal

Caution
- **Use a new oil seal, and apply grease to the lip of the seal.**
- **Install the oil seal flush with the knuckle.**

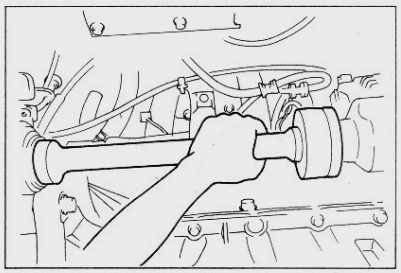
1. Install the new oil seal with the **SST**.

DRIVESHAFT

PREPARATION
SST

49 H034 2A0 Lower arm bushing puller & installer 	For support of bracket	49 H034 201 Support block (Part of 49 H034 2A0) 	For support of bracket
49 F026 102 Installer, bearing 	For removal of bearing and rear oil seal	49 G030 795 Installer, oil seal 	For installation of front oil seal and bearing
49 M005 795 Installer set, oil seal 	For installation of rear oil seal	49 M005 796 Body (Part of 49 M005 795) 	For installation of rear oil seal
49 0118 850C Puller, ball joint 	For removal of tie-rod end	49 G030 455 Holder, diff. side gear 	For support of side gears

96E0MX-018



96E0MX-019

JOINT SHAFT

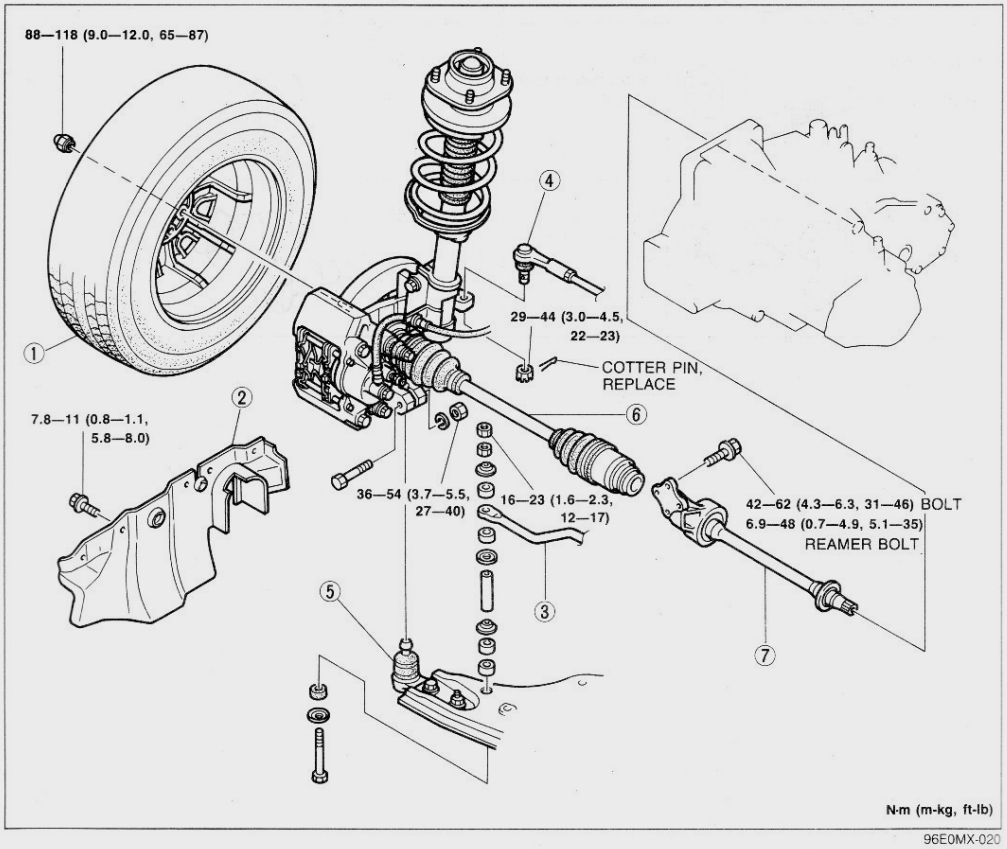
Preinspection

Joint shaft

1. Verify that the joint shaft is not twisted or cracked. Replace it if necessary.
2. Turn the joint shaft by hand and verify that the bearing rotates smoothly and freely. Replace it if necessary.

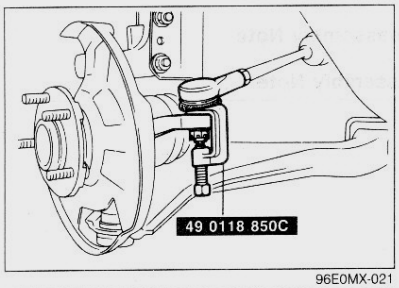
Removal / Installation

1. Drain the transaxle oil before removal.
2. Remove in the order shown in the figure, referring to **Removal Note**.
3. Install in the reverse order of removal, referring to **Installation Note**.

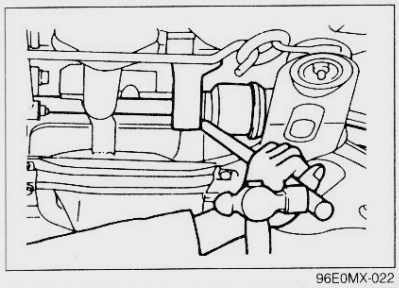


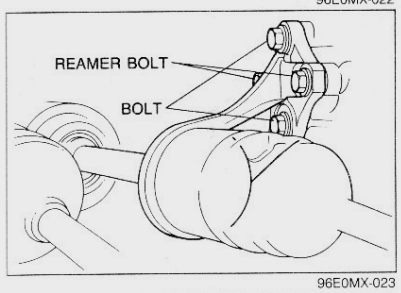
96E0MX-020

1. Wheel and tire
2. Splash shield
3. Stabilizer
   Installation Note ..... page M–19
4. Ball joint
   Removal Note ..... page M–19
5. Lower arm ball joint
6. Driveshaft
7. Joint shaft
   Removal Note ..... page M–19
   Installation Note ..... page M–19
   Overhaul ..... page M–20

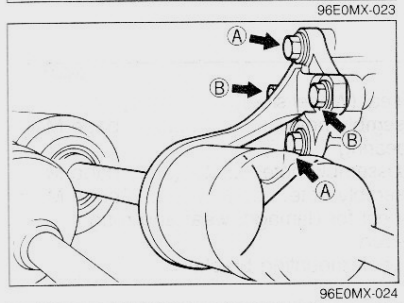


96E0MX-021

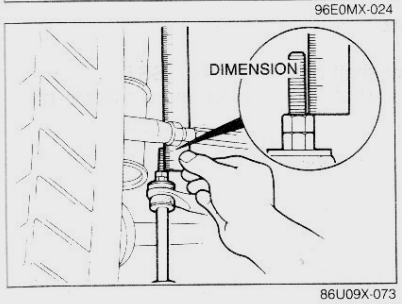

96E0MX-022



96E0MX-023



96E0MX-024



86U09X-073

Removal Note
Ball joint

Caution
- **Do not damage the dust boot.**
- **Do not reuse the cotter pin.**

1. Remove the cotter pin and loosen the nut until it is flush with the end of ball stud.
2. Disconnect the ball joint from knuckle arm with the **SST**.

Joint shaft
1. Separate the joint shaft and driveshaft with pry bar.

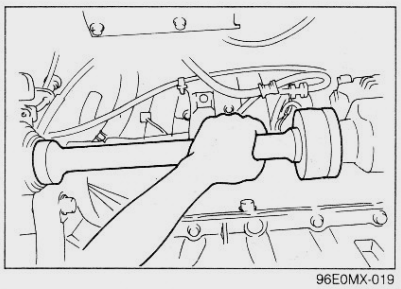
2. Remove the two bolts and two reamer bolts, and disconnect the joint shaft from the cylinder block.

Installation Note
Joint shaft
1. Connect the joint shaft mount to the cylinder block with the two bolts and two reamer bolts.

Tightening torque
Ⓐ : 42—62 N·m (4.3—6.3 m-kg, 31—46 ft-lb)
Ⓑ : 6.9—48 N·m (0.7—4.9 m-kg, 5.1—35 ft-lb)

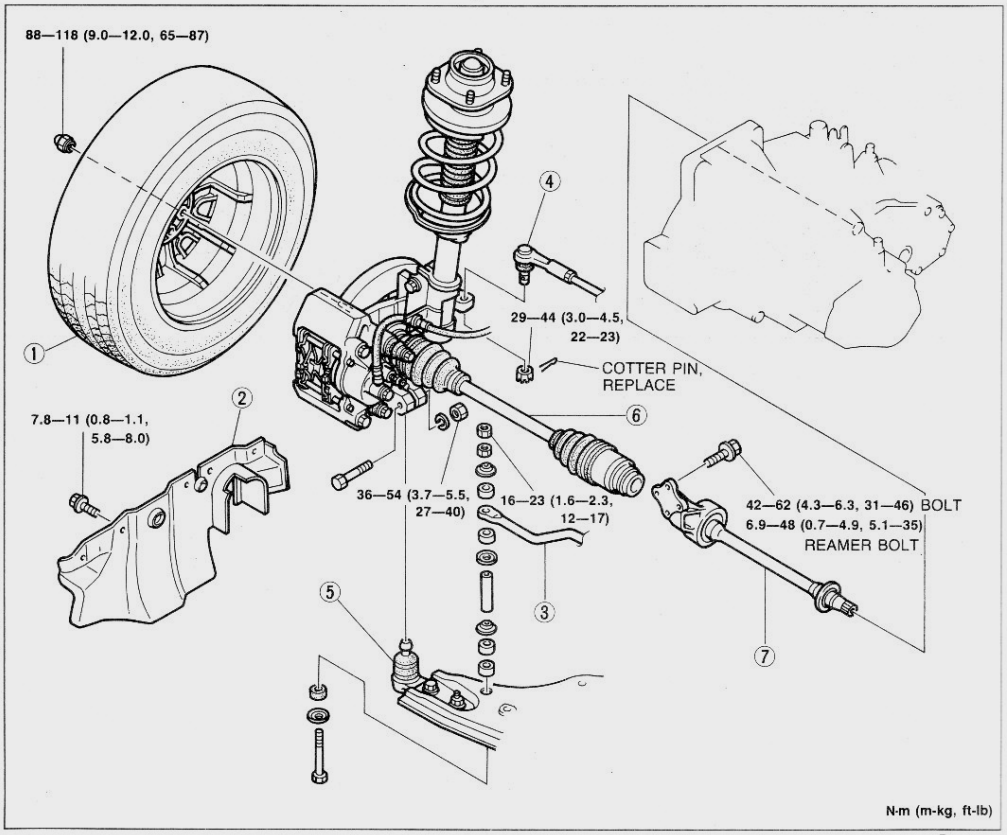
Stabilizer
Lock the nut with **20.1mm (0.79 in)** of the threads exposed.

Tightening torque:
16—23 N·m (1.6—2.3 m-kg, 12—17 ft-lb)


96E0MX-019

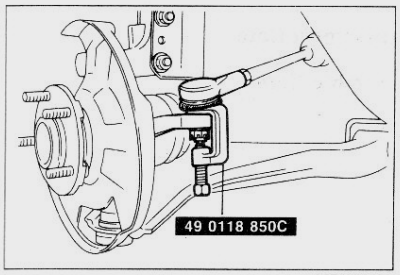
JOINT SHAFT
Preinspection
Joint shaft
1. Verify that the joint shaft is not twisted or cracked. Replace it if necessary.
2. Turn the joint shaft by hand and verify that the bearing rotates smoothly and freely. Replace it if necessary.

Removal / Installation
1. Drain the transaxle oil before removal.
2. Remove in the order shown in the figure, referring to **Removal Note**.
3. Install in the reverse order of removal, referring to **Installation Note**.

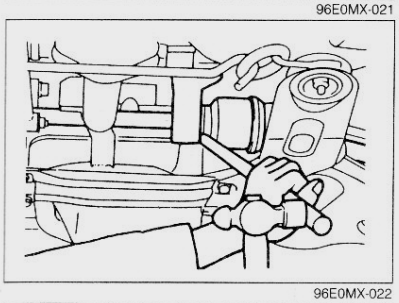


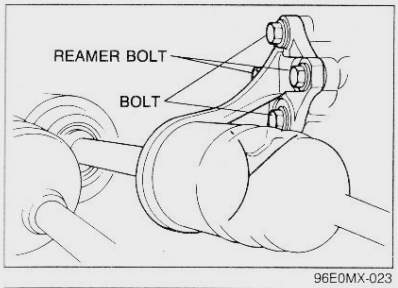
96E0MX-020

1. Wheel and tire
2. Splash shield
3. Stabilizer
   Installation Note ..... page M–19
4. Ball joint
   Removal Note ..... page M–19
5. Lower arm ball joint
6. Driveshaft
7. Joint shaft
   Removal Note ..... page M–19
   Installation Note ..... page M–19
   Overhaul ..... page M–20

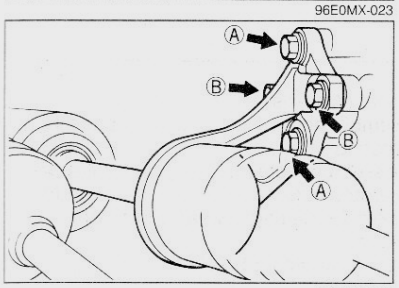


96E0MX-021

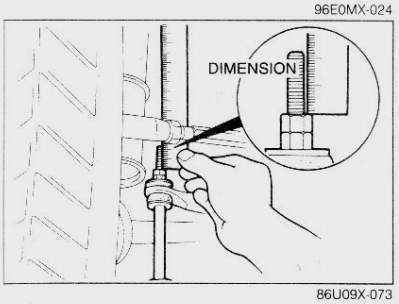

96E0MX-022



96E0MX-023



96E0MX-024



86U09X-073

Removal Note
Ball joint

Caution
- **Do not damage the dust boot.**
- **Do not reuse the cotter pin.**

1. Remove the cotter pin and loosen the nut until it is flush with the end of ball stud.
2. Disconnect the ball joint from knuckle arm with the **SST**.

Joint shaft
1. Separate the joint shaft and driveshaft with pry bar.

2. Remove the two bolts and two reamer bolts, and disconnect the joint shaft from the cylinder block.

Installation Note
Joint shaft
1. Connect the joint shaft mount to the cylinder block with the two bolts and two reamer bolts.

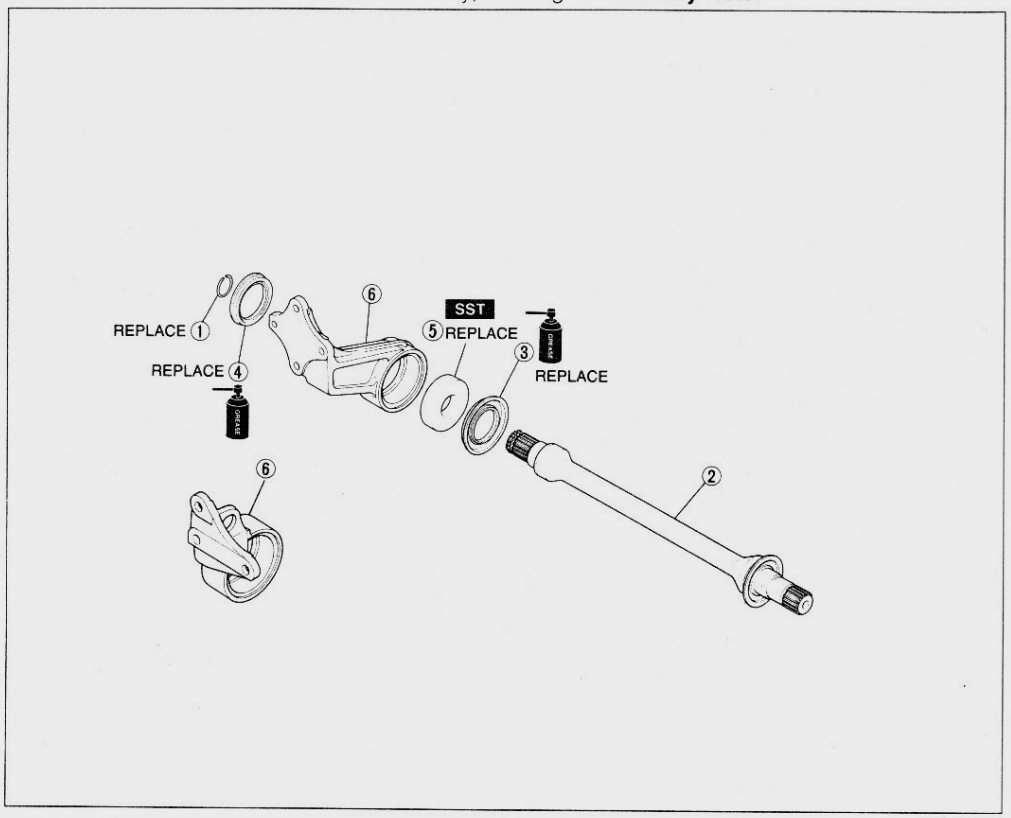
Tightening torque
Ⓐ : 42—62 N·m (4.3—6.3 m-kg, 31—46 ft-lb)
Ⓑ : 6.9—48 N·m (0.7—4.9 m-kg, 5.1—35 ft-lb)

Stabilizer
Lock the nut with **20.1mm (0.79 in)** of the threads exposed.

Tightening torque:
16—23 N·m (1.6—2.3 m-kg, 12—17 ft-lb)

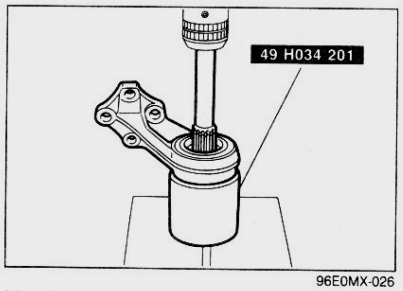
Overhaul

1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
2. Inspect all parts, and repair or replace as necessary.
3. Assemble in the reverse order of disassembly, referring to **Assembly Note**.



96E0MX-025

1. Clip
2. Joint shaft
   - Disassembly note ..... page M–20
   - Assembly note ..... page M–21
   - Inspect splines for damage and wear
3. Dust seal (Differential-side)
   - Assembly note ..... page M–21
4. Dust seal (Wheel-side)
   - Assembly note ..... page M–21
5. Ball bearing
   - Disassembly note ..... page M–21
   - Assembly note ..... page M–21
   - Inspect for damage, wear and rough rotation
6. Joint shaft mounting bracket

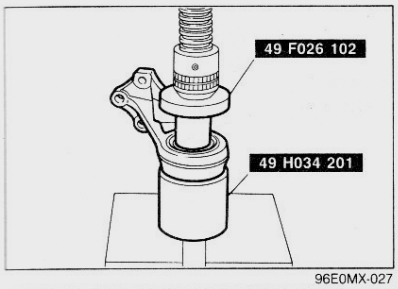


96E0MX-026

Disassembly Note

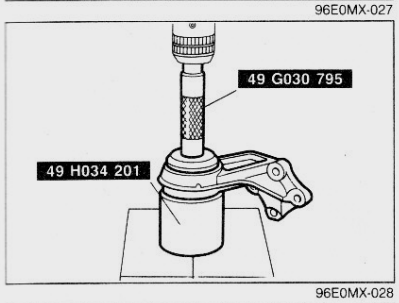
Joint shaft

1. Support the joint shaft bracket with the **SST**.
2. Remove the joint shaft with a press and a suitable pipe.



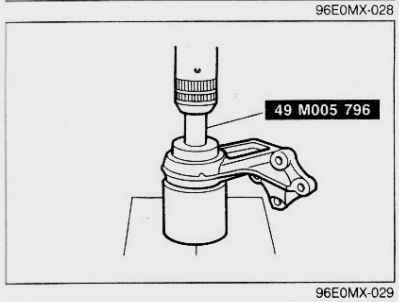
96E0MX-027

Ball bearing
1. Remove the ball bearing from joint shaft bracket with the **SST**.



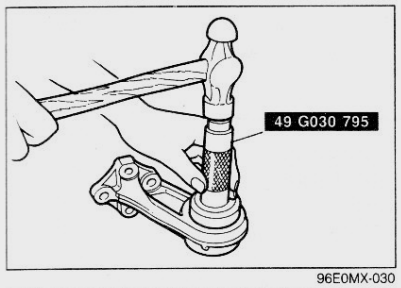
96E0MX-028

Assembly Note
Ball bearing
1. Install the ball bearing with the **SST**.



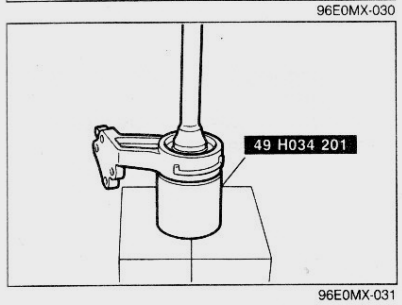
96E0MX-029

Dust seal (Differential-side)
1. Install the new dust seal with the **SST**.



96E0MX-030

Dust seal (Wheel-side)
1. Install the new dust seal with the **SST**.



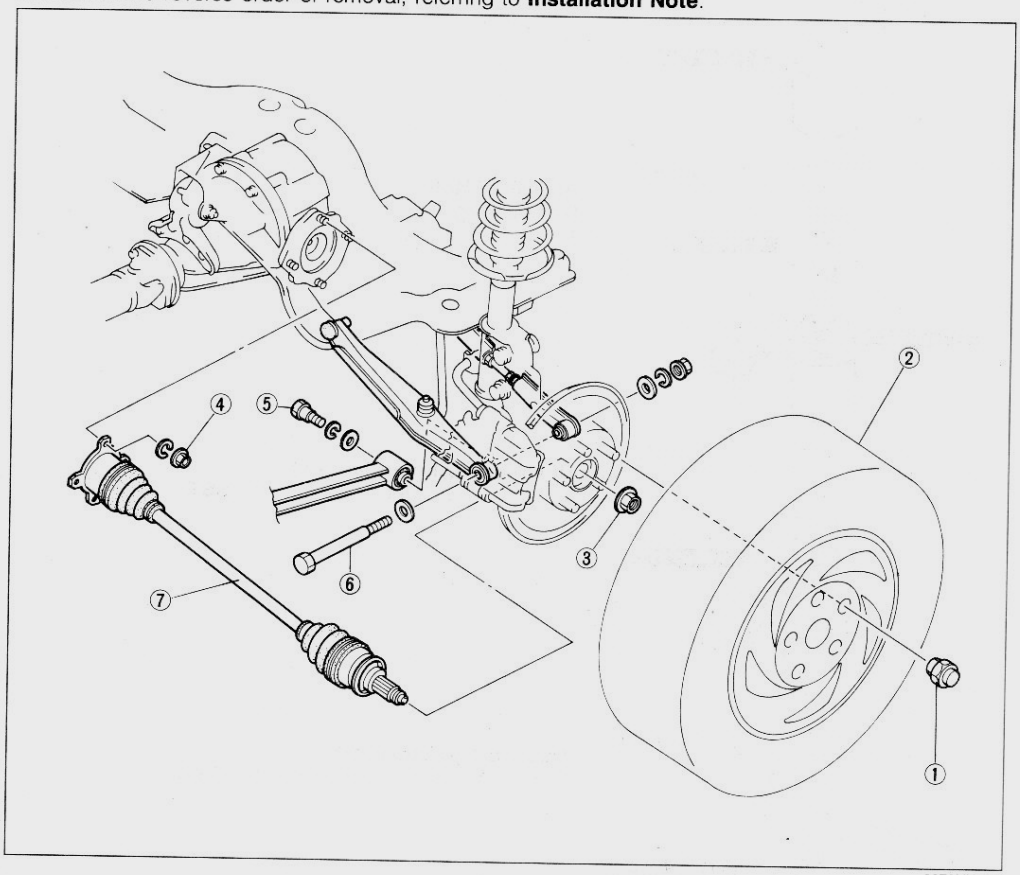
96E0MX-031

Joint shaft
1. Support the joint shaft bracket with the **SST**.
2. Install the joint shaft with a press.

DOUBLE-OFFSET JOINT

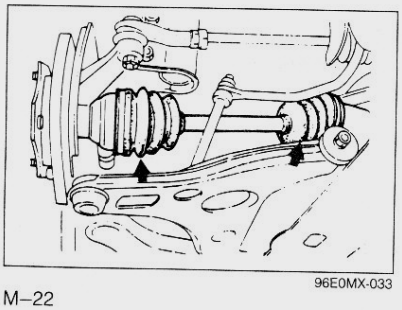
Inspection / Removal / Installation

1. Inspect the rear driveshaft, referring to **Inspection**.
2. Remove in the order shown in the figure, referring to **Removal Note**.
3. Install in the reverse order of removal, referring to **Installation Note**.



96E0MX-032

1. Wheel nut
2. Wheel and tire
3. Wheel hub nut
4. Nut (Driveshaft)
   Removal Note..... page M–23
5. Bolt (Trailing link)
6. Bolt (Lateral link)
7. Driveshaft
   Inspection..... below

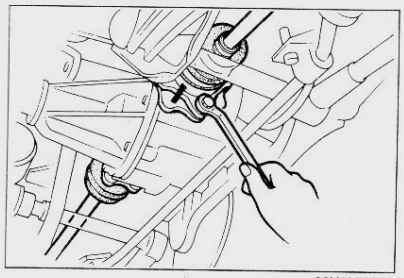


96E0MX-033

Inspection

Driveshaft

1. Turn the driveshaft by hand and verify that the splines and joints are not excessively loose.
2. Verify that the driveshaft is not twisted or cracked.
3. Replace the driveshaft if necessary.

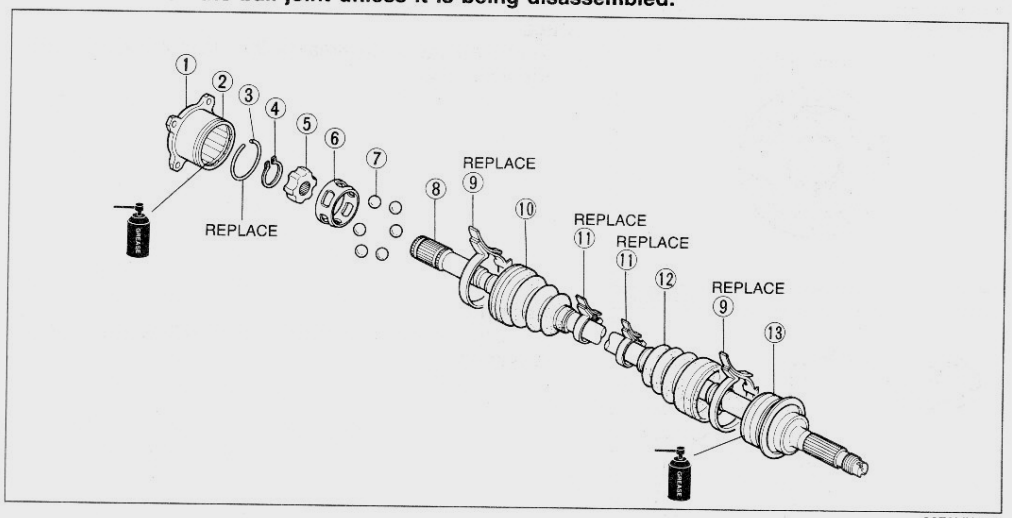


03U0MX-828

Removal Note
Nuts (Driveshaft)
1. Before removing the driveshaft, mark the driveshaft and output shaft for proper reassembly.

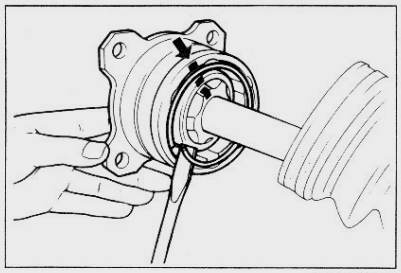
Disassembly / Inspection / Assembly
1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
2. Inspect all parts, and repair or replace as necessary.
3 Assemble in the reverse order of removal, referring to **Assembly Note**.

Caution
- **Secure the driveshaft in a vise with protective material (such as copper plates) on the vise jaws.**
- **Be careful that dust or other foreign material does not enter the ball joint while the work is being performed.**
- **Do not disassemble the wheel-side ball joint.**
- **Do not wash the ball joint unless it is being disassembled.**



96E0MX-034

1. Boot band (Large)
2. Boot band (Small)
3. Clip
   Disassembly Note..... page M–24
4. Outer ring
5. Ball
6. Snap ring
   Disassembly Note..... page M–24
7. Cage
   Disassembly Note..... page M–24
   Assembly Note ..... page M–25
8. Inner ring
   Disassembly Note..... page M–24
9. Boot
   Disassembly Note..... page M–24
   Assembly Note ..... page M–25
10. Boot band (Small)
11. Boot band (Large)
12. Boot
   Disassembly Note..... page M–24
   Assembly Note ..... page M–25
13. Driveshaft
   Inspect for bending, twisting and other damage

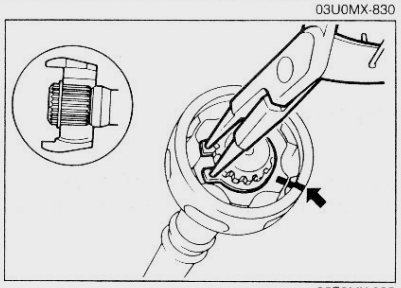


03U0MX-830

Disassembly Note
Clip

Caution
- **Mark with paint, do not use a punch.**

1. Mark the outer ring and the cage for proper reassembly.
2. Remove the clip with a screwdriver.

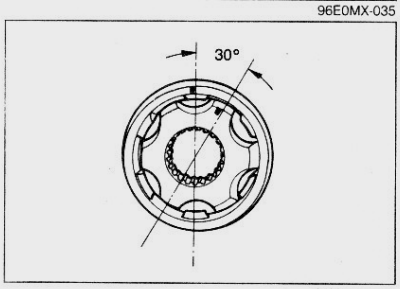


96E0MX-035

Snap ring

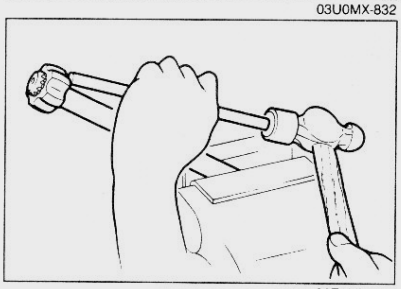
Caution
- **Mark with paint, do not use a punch.**

1. Mark the driveshaft, the cage and the inner ring for proper reassembly.
2. Remove the snap ring with snap-ring pliers.



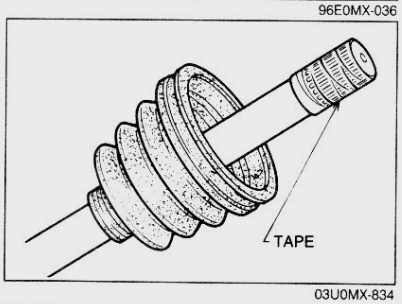
03U0MX-832

Cage
1. Turn the cage approximately 30°, then pull it away from the inner ring.



96E0MX-036

Inner ring
1. Drive the inner ring off the driveshaft with a brass bar and a hammer.

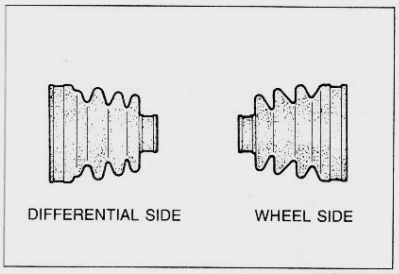


03U0MX-834

Boot

Caution
- **Do not remove the boot (wheel-side) if not necessary.**

1. Wrap the splines of the driveshaft with tape to prevent damaging the boot.
2. Remove the boot.

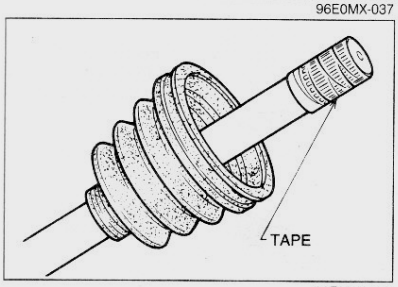


96E0MX-037

Assembly Note
Boot

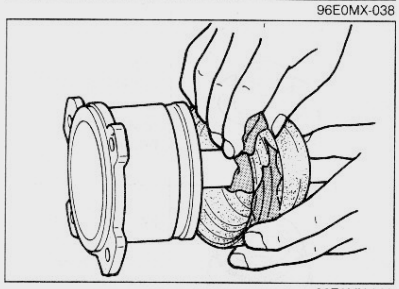
Caution
- **The wheel-side and differential-side boots are different.**

A: 79.2mm (3.13 in)
B: 80.2mm (3.15 in)



96E0MX-038

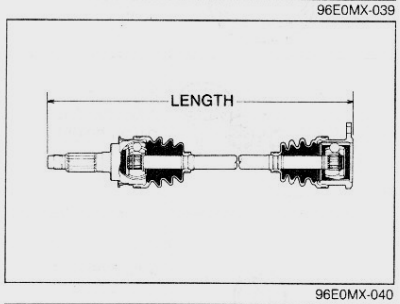
1. Wrap the wheel-side splines of the shaft with tape and install the boot and a new boot band.


96E0MX-039

Caution
- **Do not use other than the specified grease.**

2. Apply molybdenum disulfide grease to the joint.

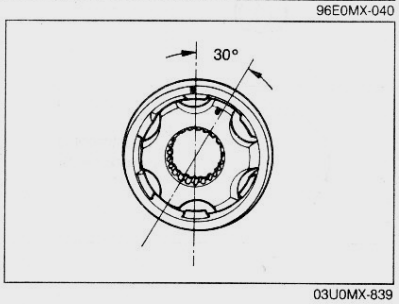
Quantity:
Differential side: 55 ± 10 g (1.94 ± 0.35 oz)
Wheel side : 55 ± 10 g (1.94 ± 0.35 oz)



96E0MX-040

3. Measure the length of the driveshaft.

Standard length:
Right side: 691mm (27.20 in)
Left side : 661mm (26.02 in)

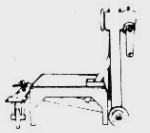
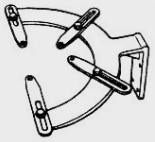
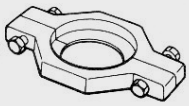
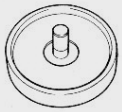
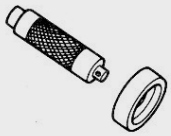
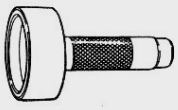
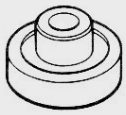
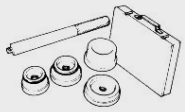
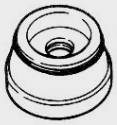
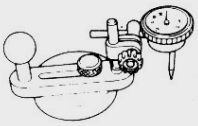
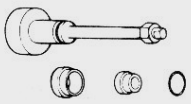
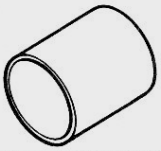
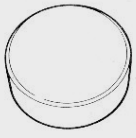


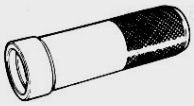
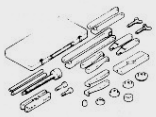
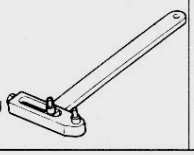
03U0MX-839

Cage
1. Install the cage at approximately 30° from the mark, then align the marks.

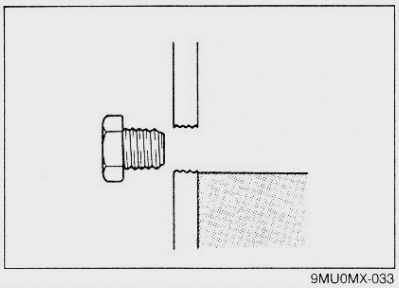
VISCOUS LIMITED SLIP DIFFERENTIAL

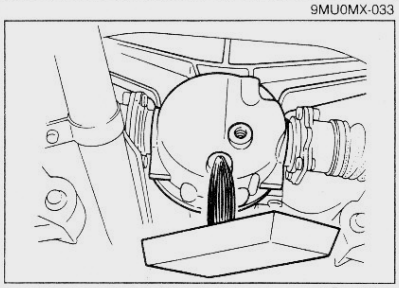
PREPARATION
SST

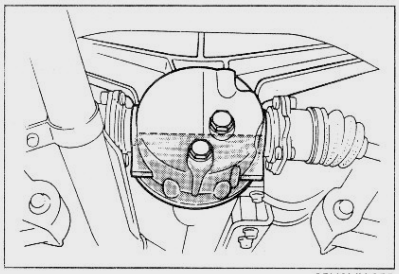
49 0107 680A Engine stand 	For disassembly and assembly of differential	49 M005 561 Hanger, differential carrier 	For disassembly and assembly of differential
49 0636 145 Puller, fan pulley boss 	For removal of bearing inner race (side bearing)	49 N034 213 Installer, rubber bushing 	For installation of differential mounting rubber
49 G030 795 Installer, oil seal 	For installation of oil seal	49 G030 797 Handle (Part of 49 G030 795) 	For installation of bearing outer race
49 B001 795 Installer, oil seal 	For installation of oil seal (output shaft)	49 H033 101 Remover, bearing 	For installation of bearing outer race (front bearing)
49 F027 0A1 Installer set, bearing 	For installation of bearing	49 F027 005 Attachment ϕ62 (Part of 49 F027 0A1) 	For installation of bearing outer race (rear bearing)
49 F027 0A0 Gauge set, pinion height adjustment 	For adjustment of pinion height	49 0727 570 Gauge body, pinion height (Part of 49 F027 0A0) 	For adjustment of pinion height
49 8531 565 Model, pinion 	For adjustment of pinion height	49 8531 567 Collar A (Part of 49 8531 565) 	For adjustment of pinion height
49 H027 001 Collar 	For adjustment of pinion height	49 N027 001 Gauge block 	For adjustment of pinion height

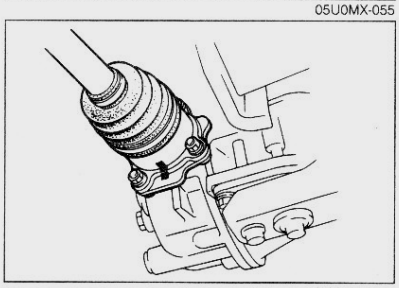
49 D017 2A1 Installer set, bearing 	For installation of bearing	49 F401 336B Attachment B (Part of 49 D017 2A1) 	For installation of bearing inner race (rear bearing)
49 F401 331 Body (Part of 49 D017 2A1) 	For installation of bearing inner race (rear bearing)	49 F401 337A Attachment C (Part of 49 D017 2A1) 	For installation of bearing inner race (side bearing)
49 S120 710 Holder, coupling flange 	For removal and installation of companion flange	49 0839 425C Puller set, bearing 	For removal and installation of companion flange
49 U027 003 Installer, oil seal 	For installation of oil seal (companion flange)	49 0259 720 Wrench, differential side bearing adjusting nut 	For adjustment of drive pinion and ring gear backlash

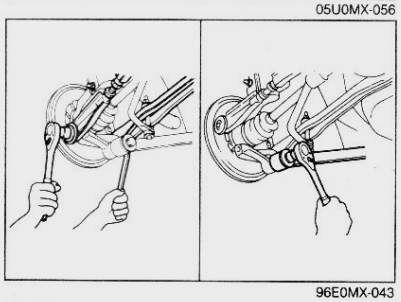
96E0MX-041


9MU0MX-033


96E0MX-042


05U0MX-055


05U0MX-056


96E0MX-043

DIFFERENTIAL OIL

Inspection

1. Remove the filler plug.
2. Verify that the oil is at the bottom of the filler plug hole. If it is low, add the specified oil.
3. Install the filler plug.

Tightening torque:
39—54 N·m (4.0—5.5 m-kg, 29—40 ft-lb)

Replacement

1. Remove the filler and drain plugs.
2. Drain the differential oil into a suitable container.
3. Wipe the plugs clean.
4. Install the drain plug and new washer.

Tightening torque:
39—54 N·m (4.0—5.5 m-kg, 29—40 ft-lb)

5. Add the specified oil from the filler plug until the level reaches the bottom of the plug hole.

Specified oil
Type:
Above −18°C (0°F): API GL-5, SAE 90
Below −18°C (0°F): API GL-5, SAE 80W
Capacity: 0.65 liter (0.69 US qt, 0.57 Imp qt)

6. Install the filler plug.

Tightening torque:
39—54 N·m (4.0—5.5 m-kg, 29—40 ft-lb)

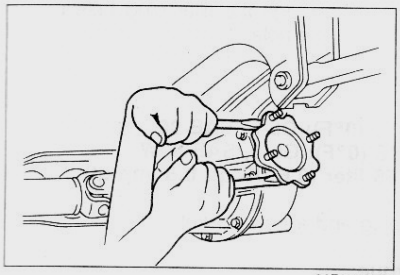
OIL SEAL (OUTPUT SHAFT)

Replacement

1. Jack up the vehicle and support it with safety stands.
2. Drain the differential gear oil.

Note
- **Mark the driveshaft and output shaft flanges for proper reassembly.**

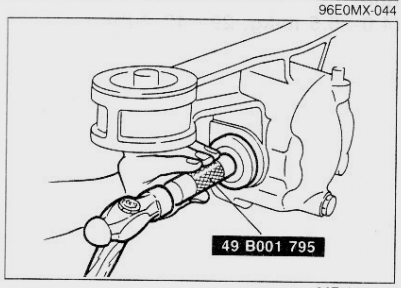
3. Remove the lateral link.
4. Remove the trailing link.
5. Pull the wheel hub out to separate the driveshaft from the output shaft.


96E0MX-044

6. Suspend the driveshaft.

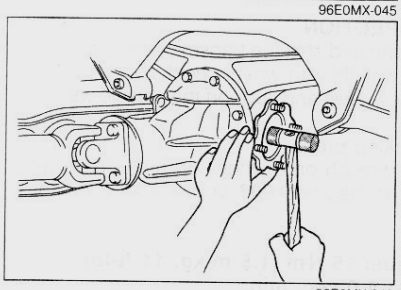
Note
- **Use caution during the removal operation, because the shaft may suddenly drop.**

7. Remove the output shaft with two pry bars as shown in the figure, then remove the clips.
8. Remove the oil seal.



96E0MX-045

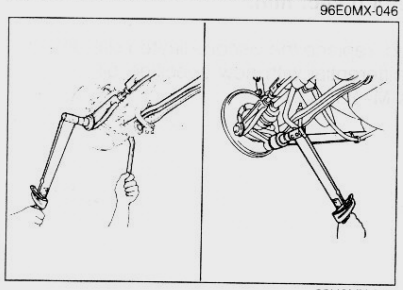
9. Apply lithium-based grease to the new oil seal lip and install it with the **SST**.


96E0MX-046

10. Install a new clip at the end of the output shaft.

Caution
- **The right output shaft is longer than the left shaft.**

11. Install the output shaft into the side gear by lightly tapping with a plastic hammer.
12. Verify that the output shaft is hooked into the side gear by pulling it by hand.

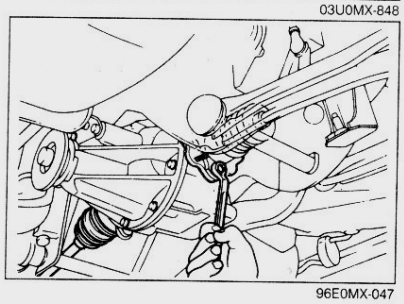

03U0MX-848

13. Install the lateral link.

Tightening torque:
63—75 N·m (6.4—7.6 m-kg, 46—55 ft-lb)

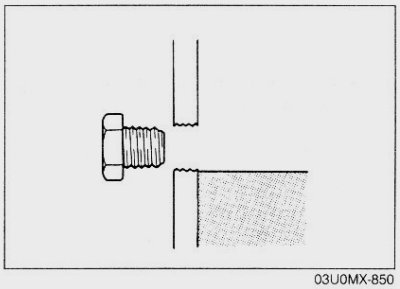
14. Install the trailing link.

Tightening torque:
49—59 N·m (5.0—6.0 m-kg, 36—43 ft-lb)


96E0MX-047

15. Align the marks and install the driveshaft.

Tightening torque:
54—64 N·m (5.5—6.5 m-kg, 40—47 ft-lb)

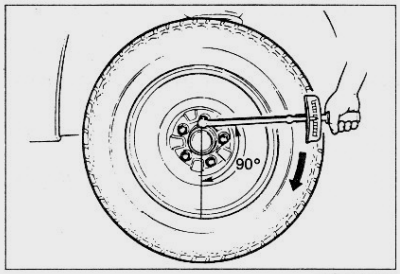

03U0MX-850

16. Add the specified oil through the filler plug hole until it reaches the bottom of the hole.

Specified oil
Type:
Above −18°C (0°F): GL-5, SAE 90
Below −18°C (0°F): GL-5, SAE 80W
Capacity: 0.65 liter (0.6 US qt, 0.5 Imp qt)

17. Install the filler plug and a new gasket.

Tightening torque:
39—54 N·m (4.0—5.5 m-kg, 29—40 ft-lb)



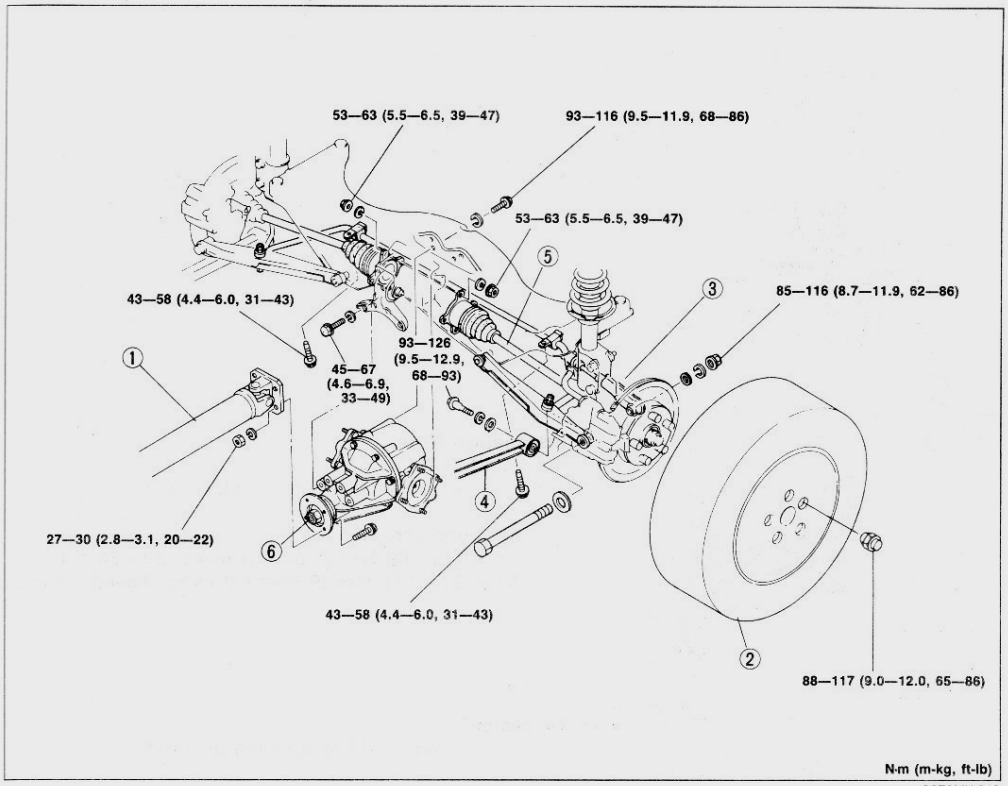
96E0MX-048

OPERATION INSPECTION
1. Turn off the engine and shift the transmission into reverse.
2. Block the front wheels with wheel chocks.
3. Jack up the rear wheels and support the vehicle with safety stands.
4. Release the parking brake.
5. Using a torque wrench on a wheel lug nut, measure the time it takes to turn the wheel **90°** while applying the specified torque.

Specified torque: 15 N·m (1.5 m-kg, 11 ft-lb)
Specified time: 4.0 sec. min.

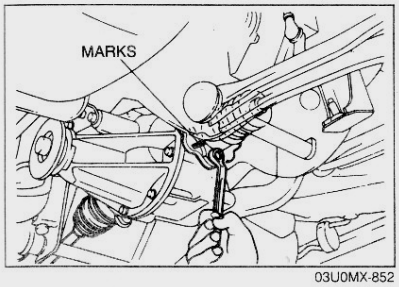
6. If not as specified, replace the viscous limited slip differential and fill the differential with new specified oil.
(Refer to pages M–28, 33.)

VISCOUS LIMITED SLIP DIFFERENTIAL
Removal / Installation
1. Drain the differential oil.
2. Remove in the order shown in the figure, referring to **Removal Note**.
3. Install in the reverse order of removal, referring to **Installation Note**.
4. Add the specified oil to the specified level.



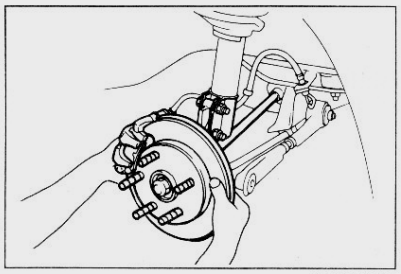
96E0MX-049

1. Propeller shaft
   Service ..... Section L
2. Wheel and tire
3. Lateral link
4. Trailing link
5. Driveshaft
   Removal Note ..... below
   Installation Note ..... page M–32
6. Viscous L.S.D.
   Removal Note ..... page M–32
   Installation Note ..... page M–32
   Overhaul ..... page M–33



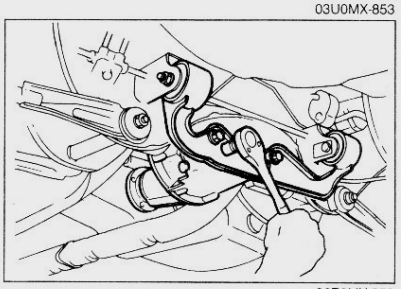
03U0MX-852

Removal Note
Driveshaft
1. Before removing the driveshaft, mark the driveshaft and output shaft for proper reassembly.



03U0MX-853

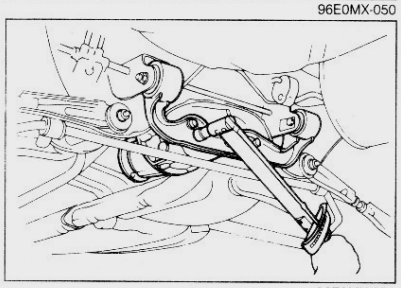
2. Pull the wheel hub out to separate the driveshaft from the output shaft.



96E0MX-050

Viscous L.S.D.

1. Support the differential with a jack while removing it.



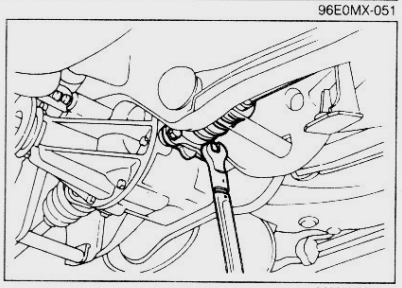
96E0MX-051

Installation Note

Viscous L.S.D.

1. Support the differential with a jack while installing it.

Tightening torque:
Front 45—68 N·m (4.6—6.9 m-kg, 33—50 ft-lb)
Rear 93—116 N·m (9.5—11.9 m-kg, 68—86 ft-lb)



03U0MX-856

Driveshaft

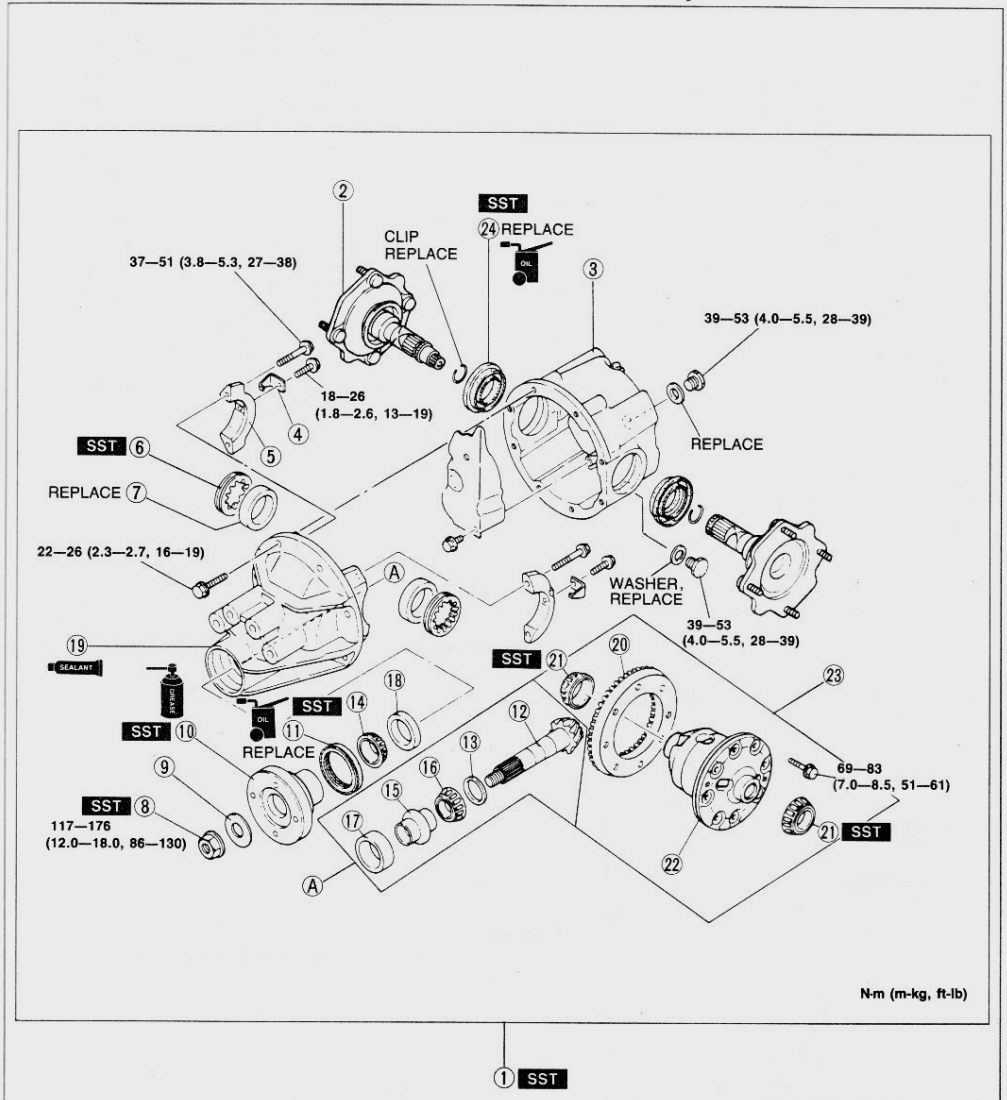
1. Align the marks and reinstall the driveshaft.

Tightening torque:
53—63 N·m (5.5—6.5 m-kg, 39—47 ft-lb)

Overhaul

Caution
- **Install the differential carrier within 10 minutes after applying sealant. Allow the sealant to set at least 30 minutes after installation before filling the differential with the specified oil.**

1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
2. Inspect all parts, and repair or replace as necessary.
3. Assemble in the reverse order of disassembly, referring to **Assembly Note**.

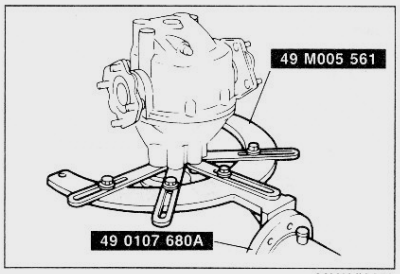


96E0MX-052

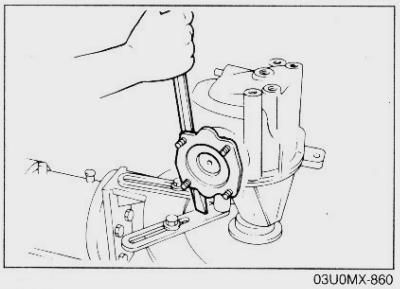
VISCOUS LIMITED SLIP DIFFERENTIAL

1. Differential gear assembly
   Disassembly Note..... page M–34
2. Output shaft
   Disassembly Note..... page M–34
   Assembly Note ..... page M–41
3. Differential case
   Assembly Note ..... page M–41
4. Lock plate
5. Bearing cap
   Disassembly Note..... page M–35
6. Adjusting screw
   Disassembly Note..... page M–39
7. Bearing outer race (Side bearing)
8. Nut (Companion flange)
   Disassembly Note..... page M–35
   Assembly Note ..... page M–39
9. Washer
10. Companion flange
    Disassembly Note..... page M–35
    Inspect splines for cracks and other damage
    Assembly Note ..... page M–39
11. Oil seal (Companion flange)
    Assembly Note ..... page M–39
12. Drive pinion
    Assembly Note ..... page M–36
    Inspect splines for cracks and other damage
13. Spacer
14. Bearing inner race (Front bearing)
    Inspect for rough rotation
15. Collapsible spacer
16. Bearing inner race (Rear bearing)
    Disassembly Note..... page M–36
    Inspect for rough rotation
17. Bearing outer race (Rear bearing)
    Disassembly Note..... page M–36
    Assembly Note ..... page M–37
18. Bearing outer race (Front bearing)
    Disassembly Note..... page M–36
    Assembly Note ..... page M–37
19. Differential carrier
20. Ring gear
    Inspect for cracks and other damage
21. Bearing inner race (Side bearing)
    Disassembly Note..... page M–36
22. Gear case
23. Viscous L.S.D.
24. Oil seal (Output shaft)
    Assembly Note ..... page M–41

96E0MX-053



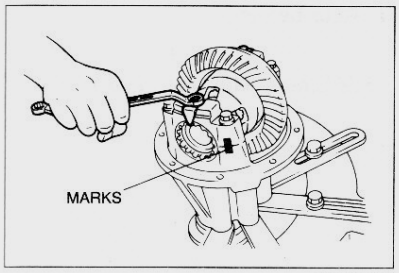
03U0MX-859



03U0MX-860

Disassembly Note
Differential gear assembly
1. Mount the differential carrier on the **SST**.

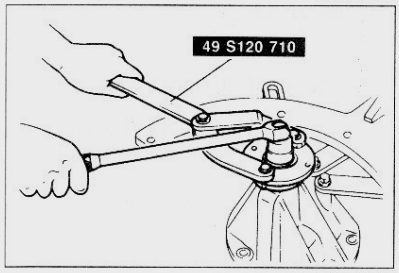
Output shaft
1. Remove the output shaft with a pry bar as shown in the figure.



03U0MX-861

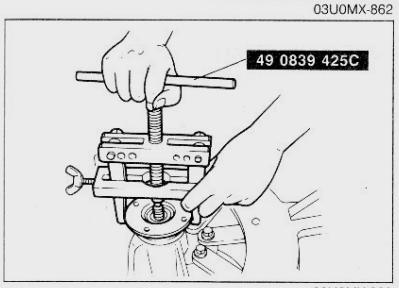
Bearing cap
1. Mark one bearing cap and the carrier.

Adjusting screw
1. Mark one adjusting screw and the carrier.



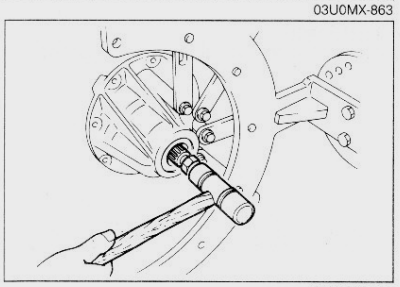
03U0MX-862

Nut (Companion flange)
1. Hold the companion flange with the **SST** and remove the nut.

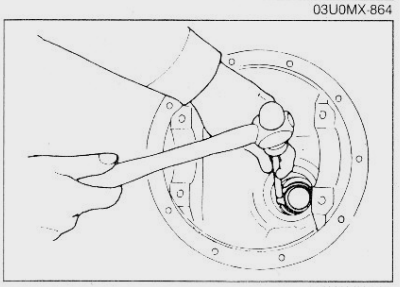


03U0MX-863

Companion flange
1. Remove the companion flange with the **SST**.


03U0MX-864

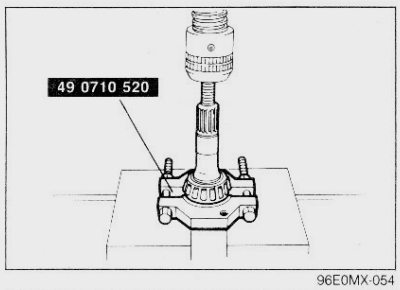
Drive pinion
1. Push out the drive pinion by attaching a miscellaneous nut to the drive pinion and tapping it with a copper hammer.


03U0MX-865

Bearing outer race (Front), (Rear)

Note
- **Identify the bearing outer races for proper reassembly.**

1. Remove the bearing outer races by alternately tapping the races at the two grooves in the carrier.

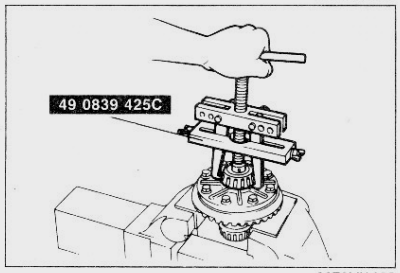


96E0MX-054

Bearing inner race (Rear bearing)

Note
- **Support the drive pinion with one hand so that it does not fall.**

1. Remove the rear bearing with the **SST**.

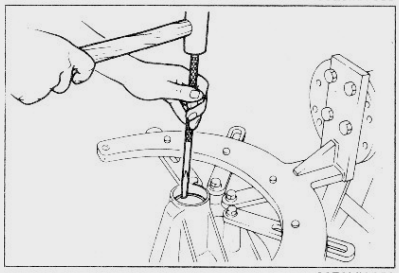


96E0MX-055

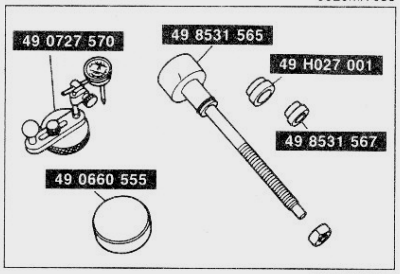
Bearing inner race (Side bearing)

Note
- **Do not remove the bearing inner races if not necessary.**
- **Replace the bearing inner races with new bearings if removed.**

1. Remove the side bearings from the gear case with the **SST**.

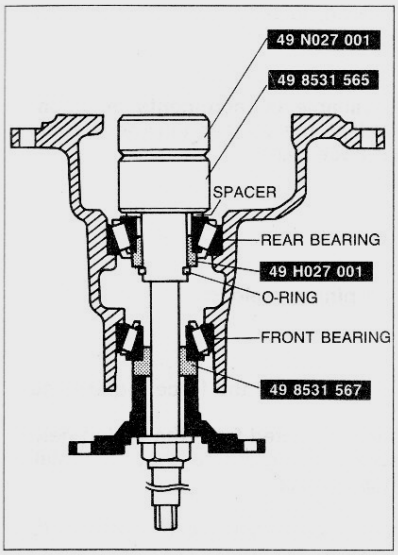

96E0MX-056

Assembly Note
Bearing outer race (Front), (Rear)
1. Install the front and rear bearing outer races with a brass drift and a hammer.



03U0MX-869

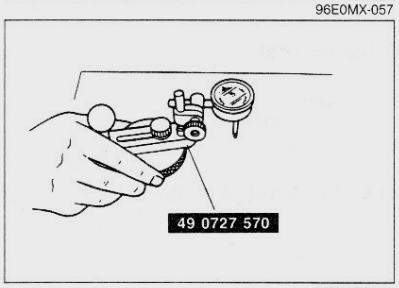
Adjustment of pinion height
1. Adjust the drive pinion height as follows with the **SST**.



96E0MX-057

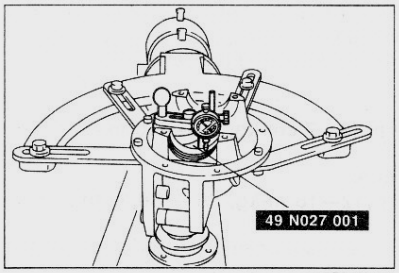
Note
- **Use the spacer that was removed.**
- **Do not install the collapsible spacer.**

a) Install the bearing inner race (rear), spacer, O-ring and **SST**.
b) Install the bearing inner race (front), companion flange, washer, and nut.
c) Tighten the nut just enough so that the **SST** can still be turned by hand.



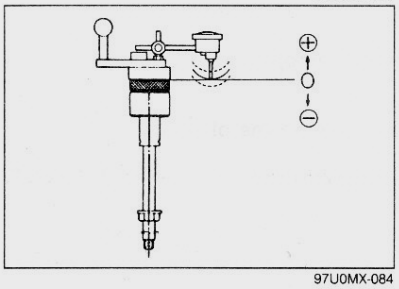
97U0MX-082

d) Place the **SST** on a surface plate and set the dial indicator to "Zero".



96E0MX-058

e) Place the **SST** atop the drive pinion model. Set the gauge body atop the gauge block.
f) Place the feeler of the dial indicator so that it contacts where the bearing inner race (side bearing) sets in the carrier. Measure the lowest position on the left and right sides of the carrier.



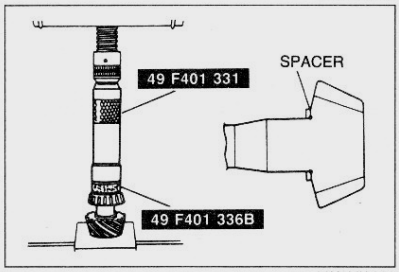
97U0MX-084

g) Add the two (left and right) values obtained in Step f, and divide the total by 2.

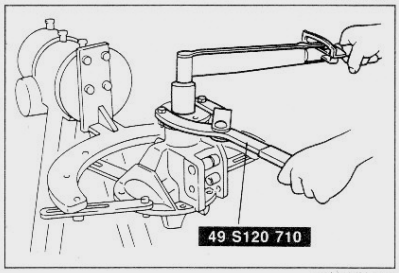
Specification: 0mm (0 in)

Mark	Thickness	Mark	Thickness
08	3.08mm (0.1213 in)	29	3.29mm (0.1295 in)
11	3.11mm (0.1224 in)	32	3.32mm (0.1307 in)
14	3.14mm (0.1236 in)	35	3.35mm (0.1319 in)
17	3.17mm (0.1248 in)	38	3.38mm (0.1331 in)
20	3.20mm (0.1260 in)	41	3.41mm (0.1343 in)
23	3.23mm (0.1271 in)	44	3.44mm (0.1354 in)
26	3.26mm (0.1283 in)	47	3.47mm (0.1366 in)

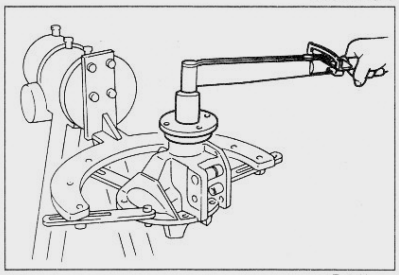
96E0MX-059



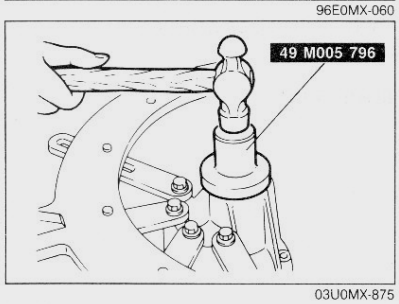
03U0MX-872



03U0MX-873



96E0MX-060



03U0MX-875

h) If not within specification, adjust the pinion height by selection of a spacer.

Note
- **Spacers are available in increments of 0.03mm (0.0012 in). Select the spacer thickness that is closest to that necessary.**

Adjustment of drive pinion preload

1. Install the spacer.

Note
- **Press the bearing on until the force required suddenly increases.**
- **Install the spacer selected from the pinion height adjustment above, being careful that the installation direction is correct.**

2. Press the bearing inner race (rear bearing) on with the **SST**.

Caution
- **Do not install the oil seal.**

3. Install the collapsible spacer.
4. Install the drive pinion assembly.
5. Install the companion flange, and tighten the flange nut.

Tightening torque: 117 N·m (12 m-kg, 86 ft-lb)

6. Turn the companion flange by hand to seat the bearing.
7. Measure the drive pinion preload.
   Adjust the preload by tightening the flange nut.

Preload:
0.29—0.68 N·m (3—7 cm-kg, 2.6—6.0 in-lb)

Tightening torque:
117—176 N·m (12—18 m-kg, 86—130 ft-lb)

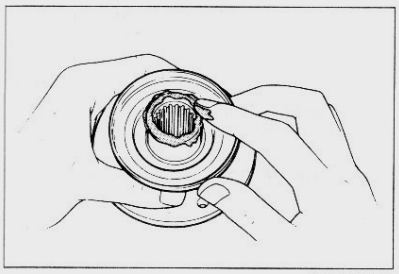
If the specified preload cannot be obtained, replace the collapsible spacer with a new one and recheck.

8. Remove the nut, washer, and companion flange.

Oil seal (Companion flange)

Caution
- **Apply differential oil to the oil seal lip.**

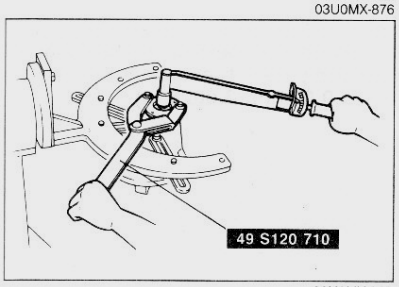
1. Tap a new oil seal into the differential carrier with the **SST**.



03U0MX-876

Companion flange

1. Apply a light coat of grease to the end face of the companion flange.



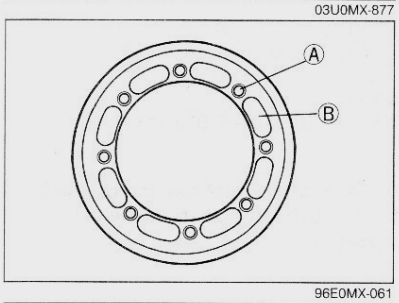
03U0MX-877

Nut (Companion flange)

1. Adjust the preload by tightening the flange nut.

Preload:
0.29—0.68 N·m (3—7 cm-kg, 2.6—6.0 in-lb)

Tightening torque:
117—176 N·m (12—18 cm-kg, 86—130 in-lb)

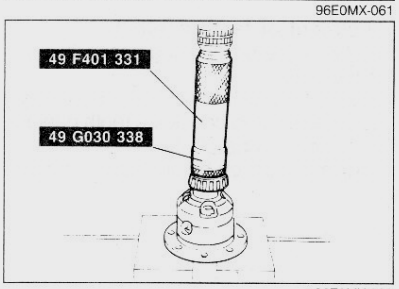


96E0MX-061

Adjustment of drive pinion and ring gear backlash

Note
- **Apply approx. 0.04 cc (0.0024 cu in) of compound at each point.**

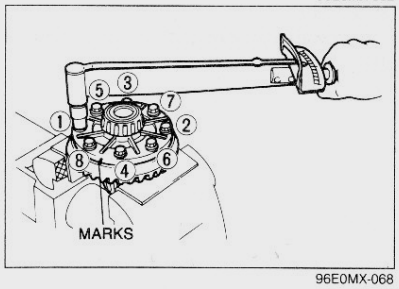
1. Apply thread-locking compound to points Ⓐ and Ⓑ around the back face of the ring gear.



96E0MX-062

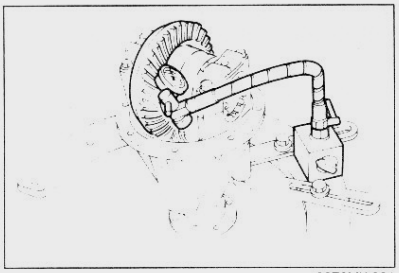
2. Mount the ring gear onto the gear case.

Tightening torque:
69—83 N·m (7.0—8.5 m-kg, 51—61 ft-lb)



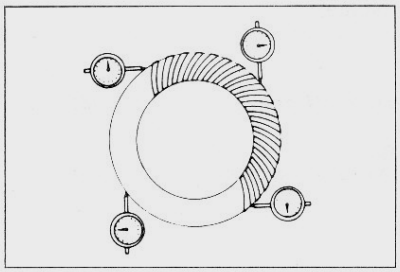
96E0MX-068

3. Press the new bearing inner race (side gear) on with the **SST**.
4. Install the differential gear assembly in the carrier.
5. Note the identification mark on the adjusting screw, and install the screws to their respective sides.
6. Install the differential bearing caps, making sure that the identification mark on the cap corresponds with the one on the carrier.

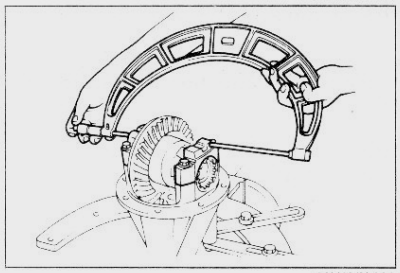

96E0MX-064

7. Mark the ring gear at four points at approx. **90°** intervals. Mount a dial indicator onto the carrier so that the feeler comes into contact at a right angle with one of the ring gear teeth.
8. Turn both bearing adjusting screws, equally with the **SST** until the backlash is as specified.

Backlash: 0.09—0.11mm (0.0035—0.0043 in)


97U0MX-104

9. Check the backlash at the three other marked points, and make sure the minimum backlash is above **0.05mm (0.0020 in)** and the difference between the maximum and minimum is less than **0.07mm (0.0028 in)**.


03U0MX-882

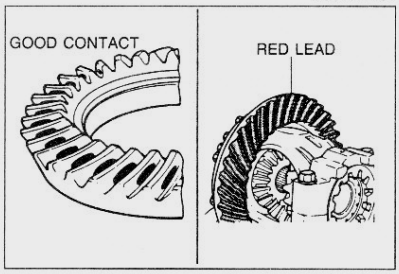
10. Tighten the adjusting screws equally until the distance between the pilot sections on the bearing caps is as specified.

Specified distance:
150.13—150.20mm (5.910—5.913 in)

Note
- **When adjusting the differential bearing preload, be careful not to affect the backlash of the drive pinion and ring gear.**

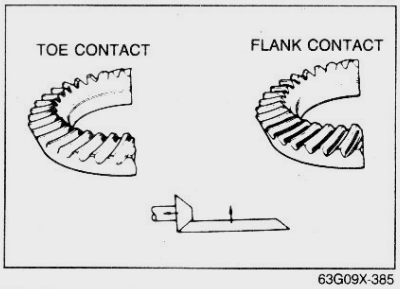
Inspection and adjustment of teeth contact

1. Coat both surfaces of 6—8 teeth of the ring gear with a uniformly thin coat of red lead.
2. While moving the ring gear back and forth by hand, rotate the drive pinion several times and check the tooth contact.
3. If the tooth contact is good, wipe off the red lead.
4. If it is not good, readjust the pinion height, and then readjust the backlash.



03U0MX-883

(1) Toe and flank contact
Replace the spacer with a thinner one to move the drive pinion outward.



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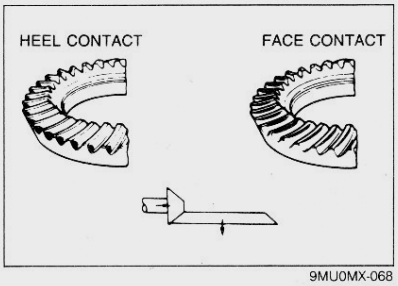
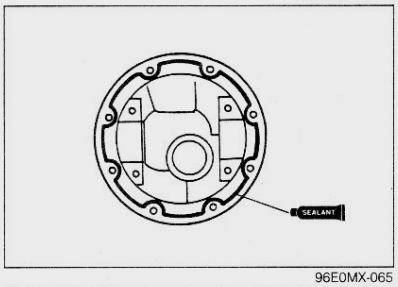


9MU0MX-068

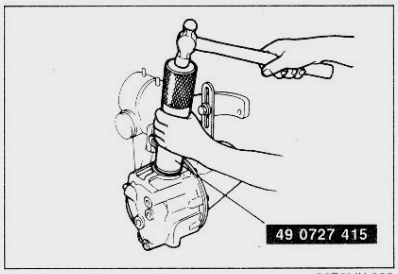
(2) Heel and face contact
Replace the spacer with a thicker one to bring the drive pinion inward.



96E0MX-065

Differential case
1. Apply sealant to the case mounting surface.
2. Tighten the bolts.

Tightening torque:
23—26 N·m (2.3—2.7 m-kg, 10—20 ft-lb)

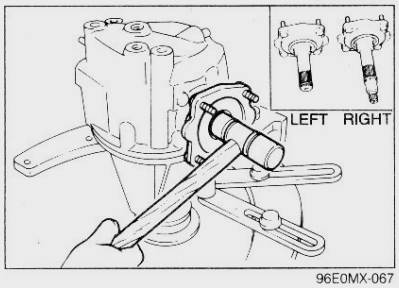


96E0MX-066

Oil seal (Output shaft)

Caution
- **Apply lithium-base grease to the oil seal lip.**

1. Install the new oil seal with the **SST**.



96E0MX-067

Output shaft
1. Install new clips.

Caution
- **The right output shaft is longer than the left shaft.**

2. Install the output shaft into the side gears by lightly tapping with a plastic hammer.
3. Verify that the output shaft is secured in the side gears by pulling them by hand.