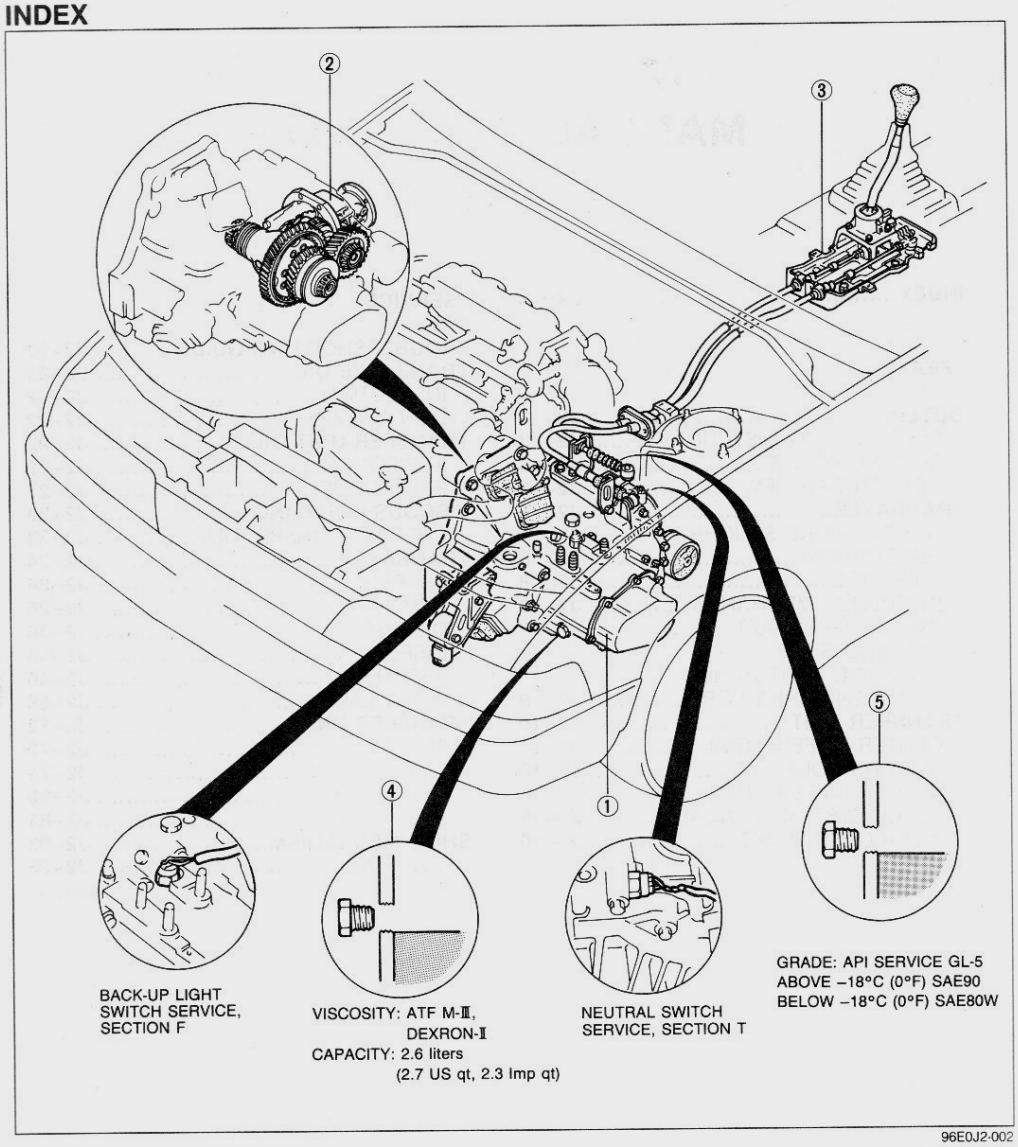
MANUAL TRANSAXLE (G5MX-R)

96E0J2-001

INDEX



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OUTLINE

OUTLINE OF CONSTRUCTION

- Full-time 4-wheel drive, incorporating a viscous coupling is used.
  With this system all driving conditions are easily contended with; from good roads to bad roads and inclement weather.
- The transaxle and transfer unit were developed based on the transaxle of the previous 626.
  The transaxle, center differential, viscous coupling, and front differential are a single, compact unit.
- The center differential employs a planetary carrier system and a viscous coupling, and functions to distribute the driving force to the front and rear differentials as needed.
  Through the use of this center differential, tire scuffing common to 4-wheel-drive vehicles during tight cornering, is eliminated.
- The speedometer driven gear (for detection of vehicle speed) is installed in the transfer carrier and detects the speed of the rear wheels.
- Lubrication oil of the transaxle and transfer unit and the carrier is contained separately.

96E0J2-003

SPECIFICATIONS
Transaxle and Transfer Unit

Item \ Engine model			New	Previous
			F2 12-valve (4WD)	FE 12-valve
Transaxle control			Floor shift	
Synchromesh system		Forward	Synchromesh	
		Reverse	Selective sliding and synchromesh	
Gear ratio		1st	3.307	3.307
		2nd	1.833	1.833
		3rd	1.233	1.310
		4th	0.914	1.030
		5th	0.717	0.837
		Reverse	3.166	3.166
Final gear ratio			4.388	3.850
Speedometer gear ratio			0.95	0.80, 0.84
Center differential	Type		Planetary carrier	—
	Number of ring gear teeth	Outer	79	—
		Inner	66	—
	Number of pinion gear teeth	Outer	14	—
		Inner	14	—
	Number of sun gear teeth	Pinion gear side	33	—
		Idler gear side	43	—
	Number of idler gear teeth		43	—
Oil		Type	ATF: DEXRON-II or M-III Above 0°F: API: GL-4 or GL-5 SAE: 80W-90 or SAE 90	ATF: DEXRON-II API: GL-4 or GL-5 SAE: 80W-90 or SAE 90
		Capacity	2.6 liters (2.7 US qt, 2.3 Imp qt)	3.35 liters (3.6 US qt, 3.9 Im

Transfer Carrier

Number of teeth	Ring gear	37
	Pinion gear	11
Oil	Type	API: GL-5 Above 0°F: SAE 90 Below 0°F: SAE 80W
	Capacity	0.5 liter (0.5 US qt, 0.4 Imp qt)

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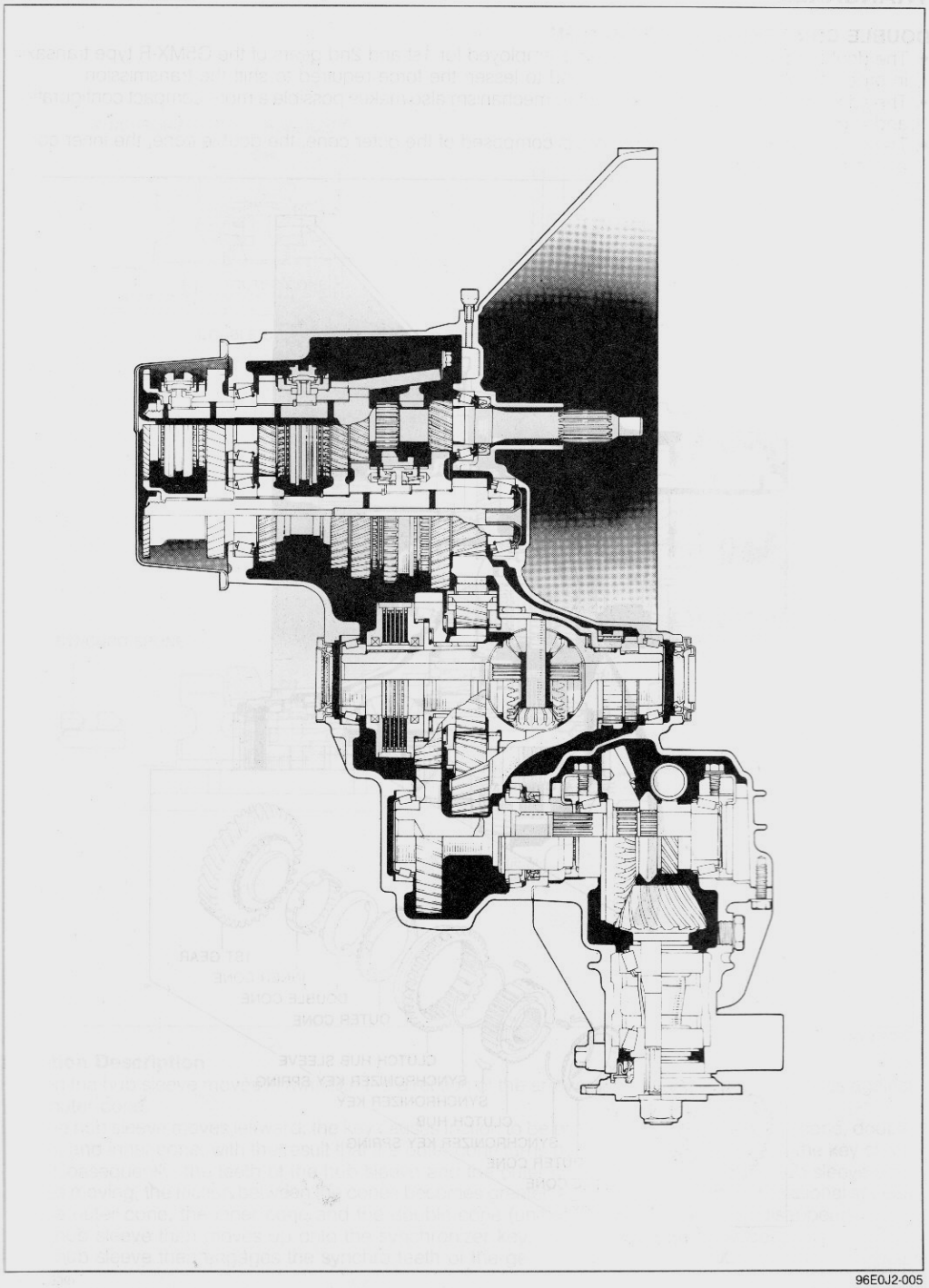
STRUCTURAL VIEW

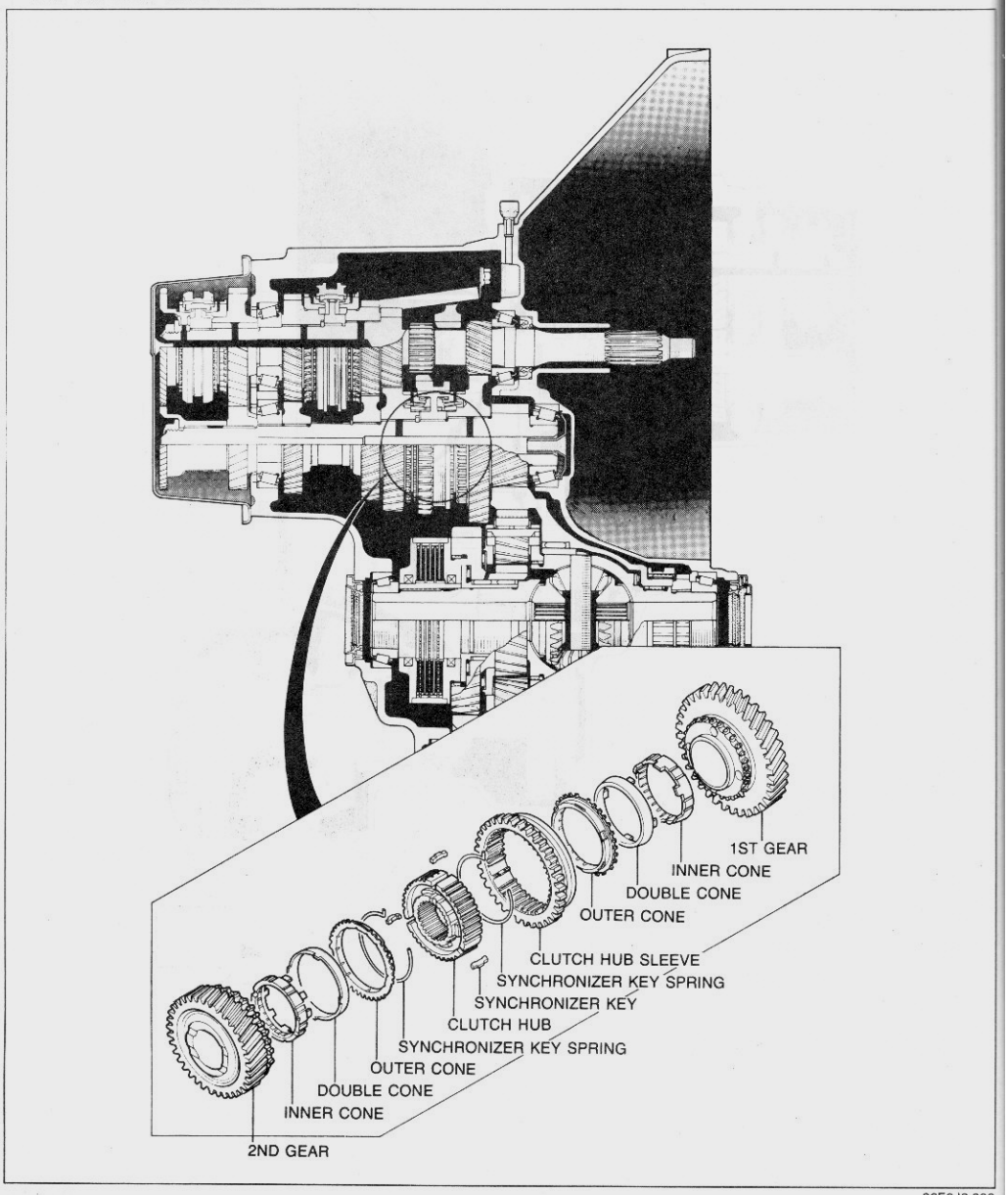


96E0J2-005

TRANSAXLE

DOUBLE CONE SYNCHRO MECHANISM

- The double cone synchro mechanism is employed for 1st and 2nd gears of the G5MX-R type transaxle in order to shorten the synchro time and to lessen the force required to shift the transmission.
- The adoption of the double cone synchro mechanism also makes possible a more compact configuration and a greater synchro capacity.
- The double cone synchro mechanism is composed of the outer cone, the double cone, the inner cone, and the inner cone hub.



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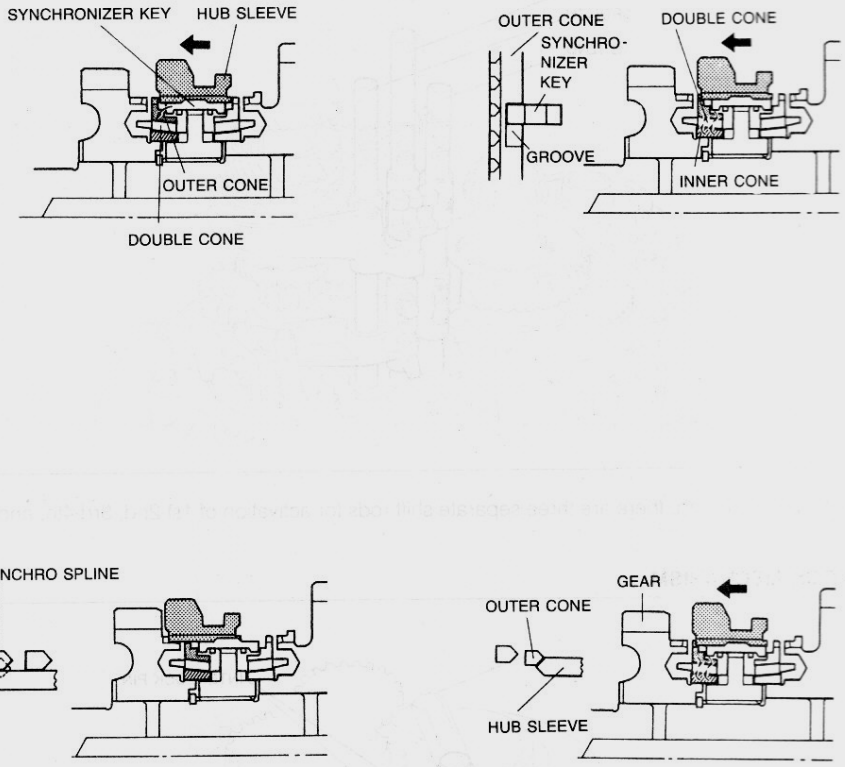

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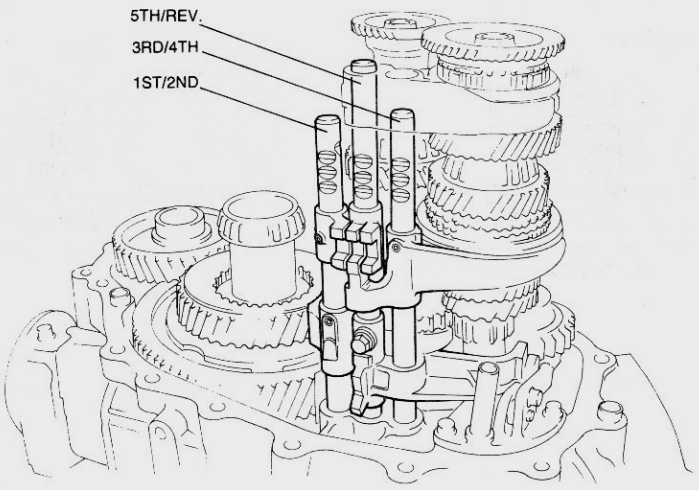
Operation Description

1. When the hub sleeve moves leftward (in the direction of the arrow), the synchronizer key presses against the outer cone.
2. As the hub sleeve moves leftward, the key causes friction to be produced between the outer cone, double cone, and inner cone, with the result that the outer cone turns by the amount of the gap of the key channel. Consequently, the teeth of the hub sleeve and the outer cone are aligned. As the hub sleeve continues moving, the friction between the cones becomes greater, and the difference of the rotational speeds of the outer cone, the inner cone and the double cone (unified with gear) gradually disappears.
3. The hub sleeve then moves up onto the synchronizer key, and engages the outer cone.
4. The hub sleeve then engages the synchro teeth of the gear to complete the shift.

SHIFT ROD



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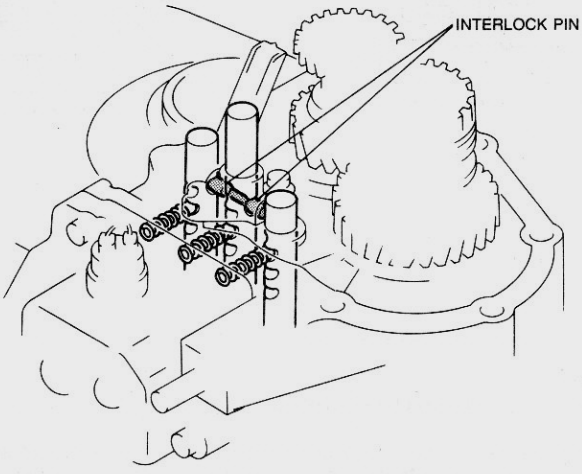
To assure smooth shifting, there are three separate shift rods for activation of 1st-2nd, 3rd-4th, and 5th-Rev shifts.

INTERLOCK MECHANISM



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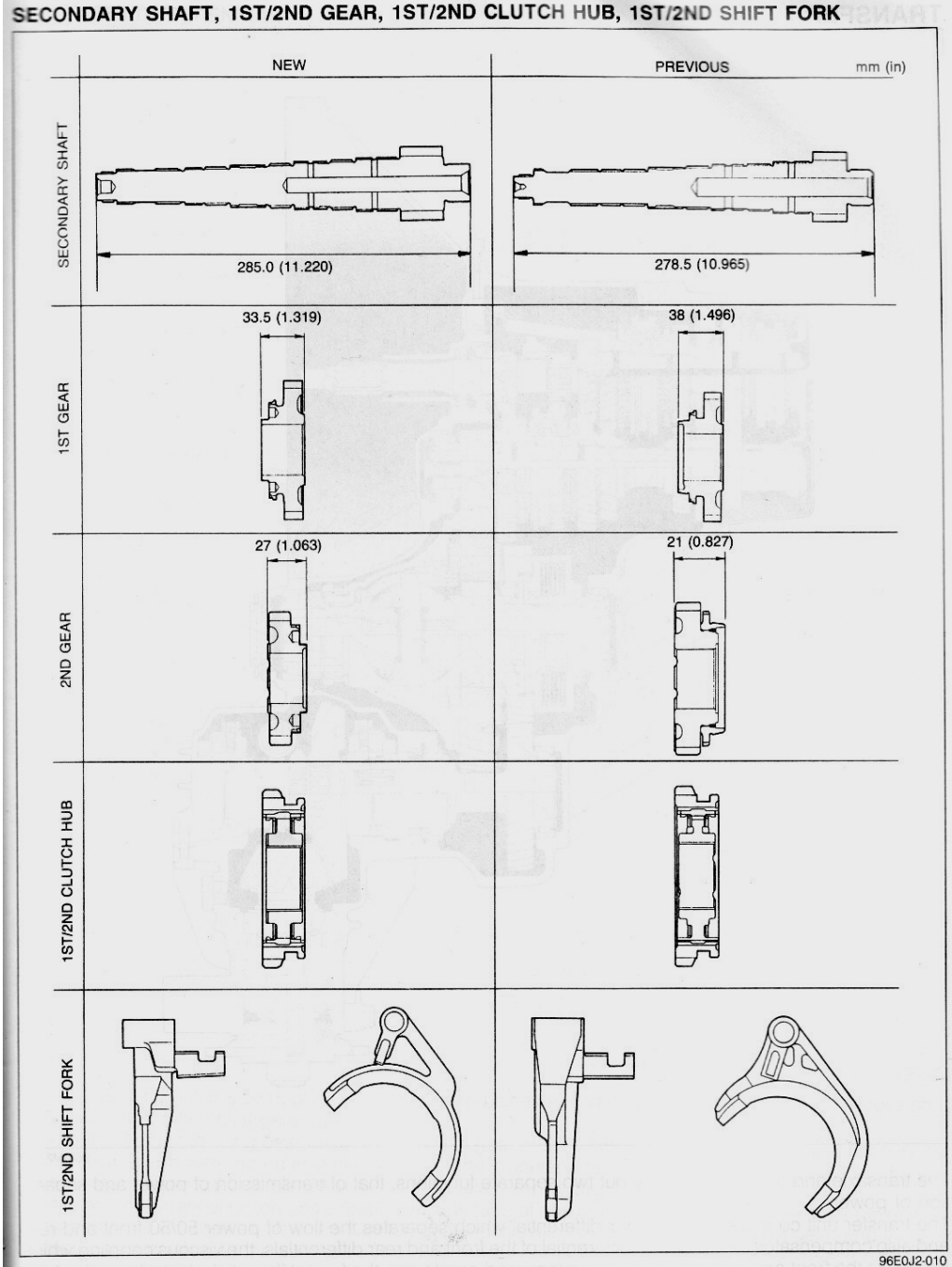
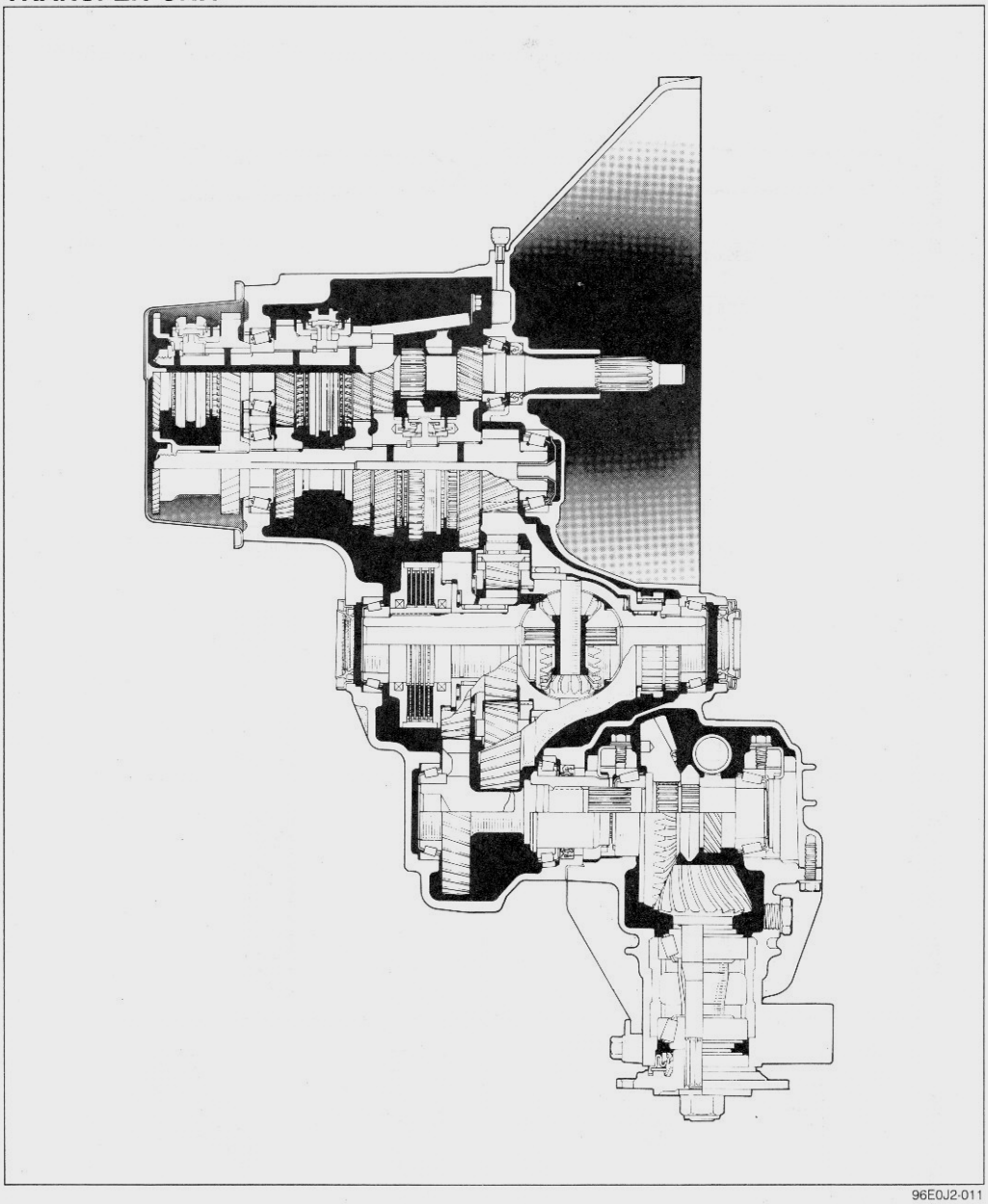
A pin type of interlock mechanism is used.
It is designed so that as one rod is moved, it pushes the interlock pins out and prevents the other rods from moving.

SECONDARY SHAFT, 1ST/2ND GEAR, 1ST/2ND CLUTCH HUB, 1ST/2ND SHIFT FORK



The gears in the transaxle are redesigned along with the change to the double cone synchro mechanism.

TRANSFER UNIT



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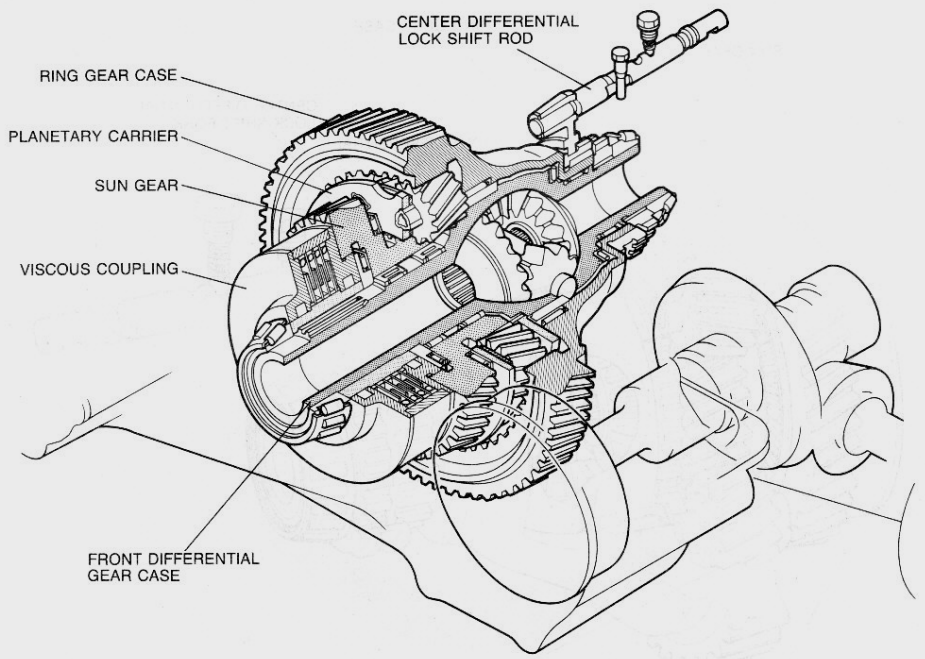
The transaxle and transfer unit carry out two separate functions, that of transmission of power and separation of power.
The transfer unit consists of; the center differential which separates the flow of power 50/50 front and rear and also compensates for the speed differential of the front and rear differentials, the viscous coupling which interlocks the front and rear axles under slippery road conditions, the front differential which drives the front wheels, and the transfer carrier to drive the rear wheels through the rear differential.

CENTER DIFFERENTIAL



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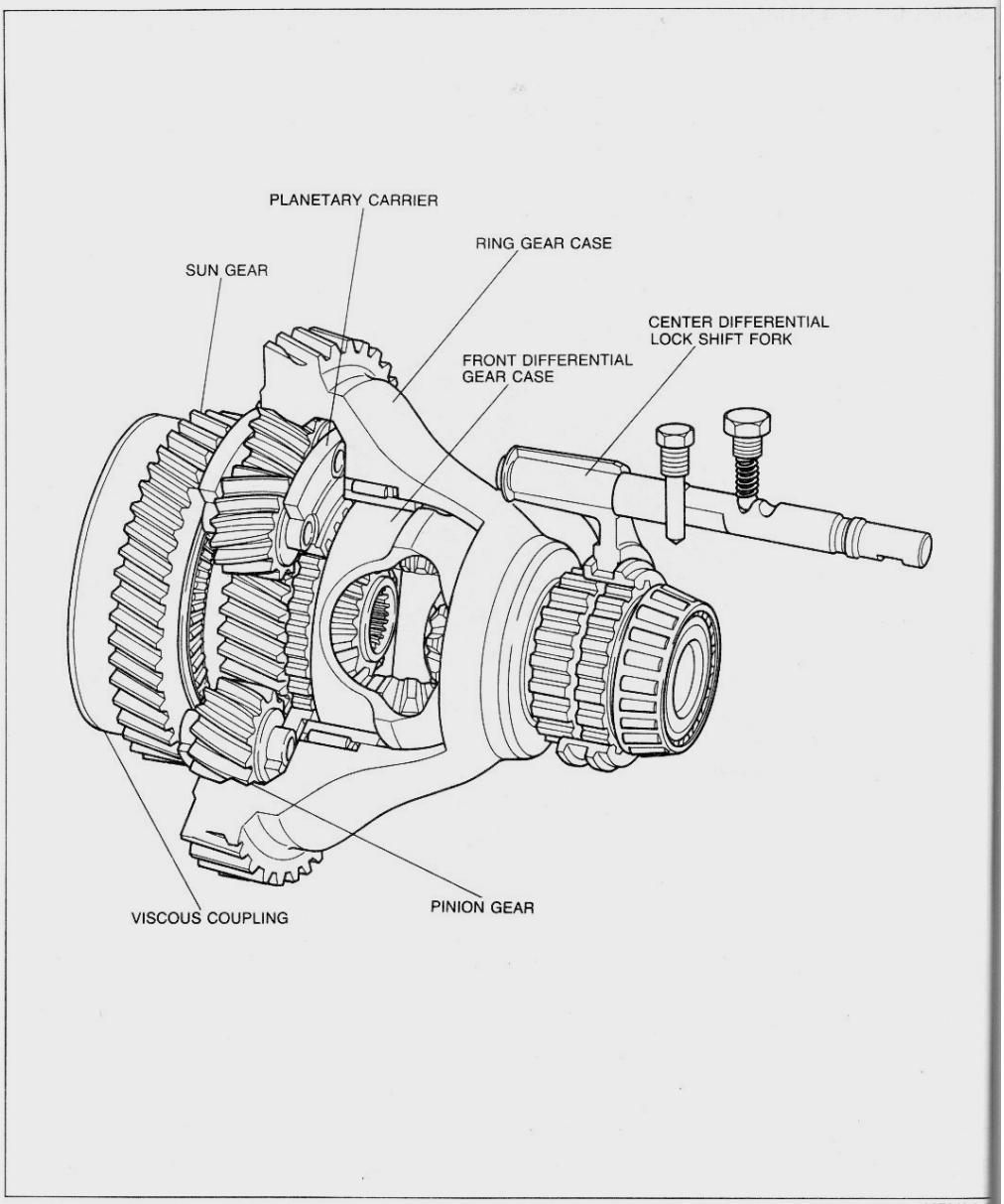
The center differential is composed of the ring gear, planetary carrier, pinion gears, sun gear, viscous coupling, and front differential gear case.
The outer teeth of the ring gear mesh with the final gear of the transaxle secondary shaft, and the ring gear inner teeth mesh with the outer pinion gears of the planetary carrier.
The center differential lock sleeve slides on the other end of the ring gear case.
There are three sets of pinion gears (each set consisting of one outer pinion gear and one inner pinion gear) spaced at regular intervals. The outer pinion gears mesh with the inner teeth of the ring gear, and the inner pinion gears mesh with the sun gear. The outer and inner pinion gears also mesh with each other.
The outer teeth of the viscous coupling mesh with the sun gear, and the inner teeth of the viscous coupling mesh with the front differential gear case.



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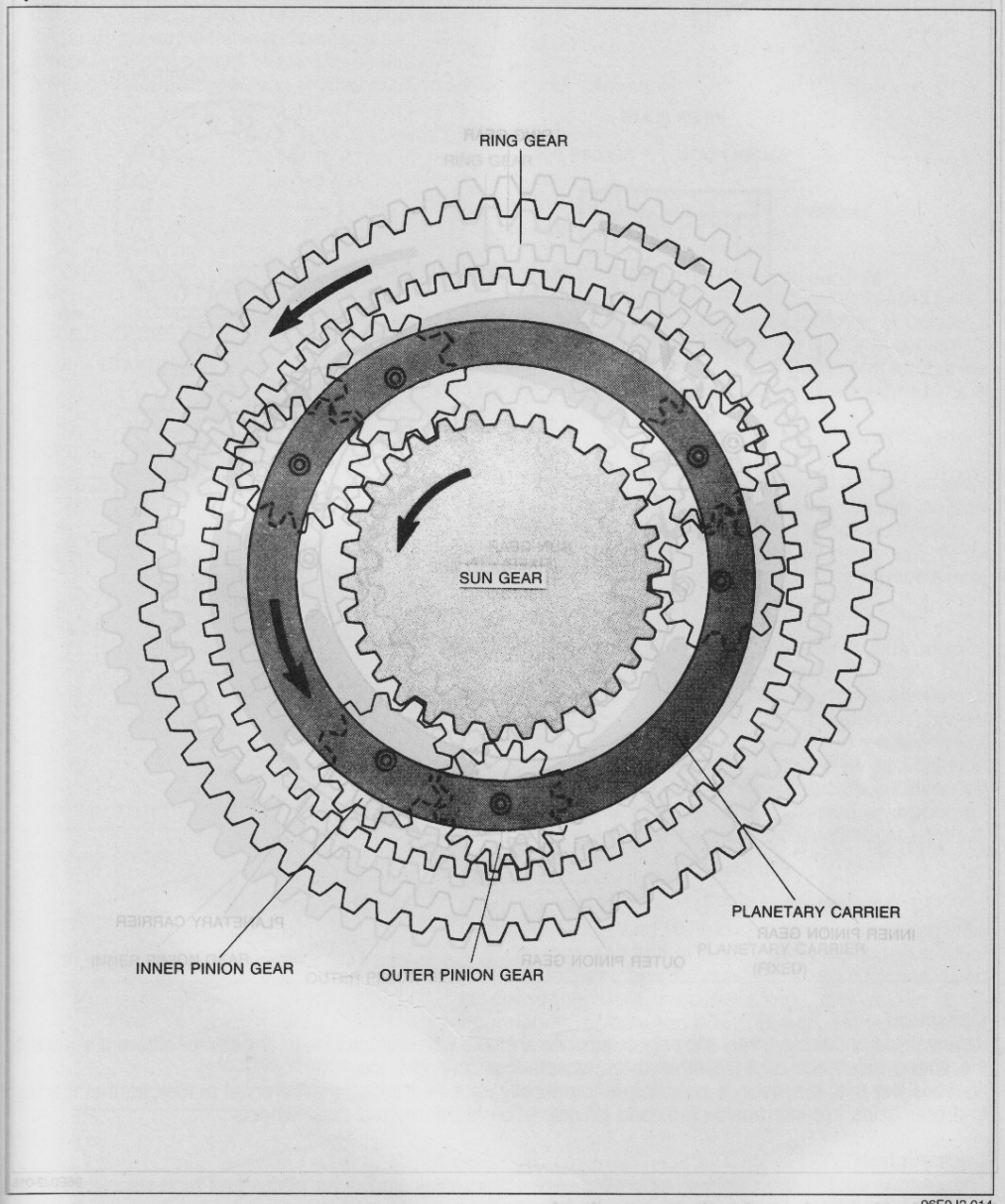
The center differential employs a planetary carrier system similar to that used in an automatic transaxle. In addition, the planetary carrier is coupled to the front differential gear case and can be manually coupled to the ring gear case by the center differential lock sleeve. (Refer to page J2–20.)
The sun gear is meshed with the inner pinion gears of the planetary carrier. The other side of the sun gear provides power to the rear differential through the idler gear, transfer carrier, and propeller shaft. The ring gear is the input driving force, and the output forces are the planetary carrier (front differential) and the sun gear (rear differential).

Operation



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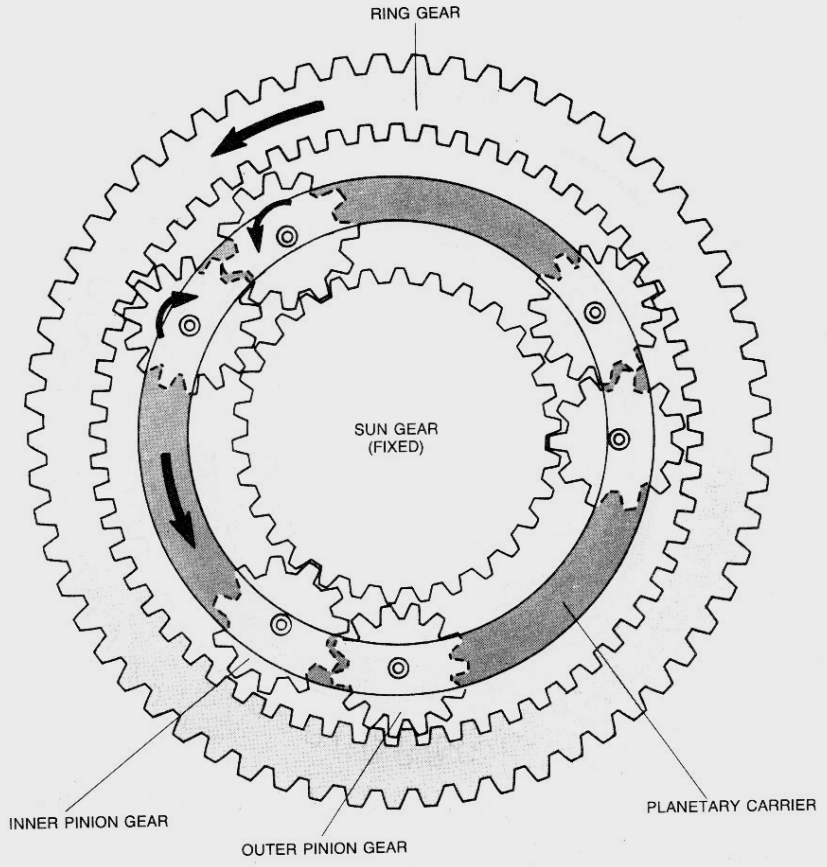
During straight-ahead travel

Driving force from the engine is transmitted from the final gear of the transaxle secondary shaft to the ring gear of the center differential, causing the ring gear to rotate.

Because the speed of the front wheels and of the rear wheels are the same during straight-ahead travel, the planetary carrier (output force to the front wheels) and the sun gear (output force to the rear wheels) act united (fixed condition) and rotate together with the ring gear.



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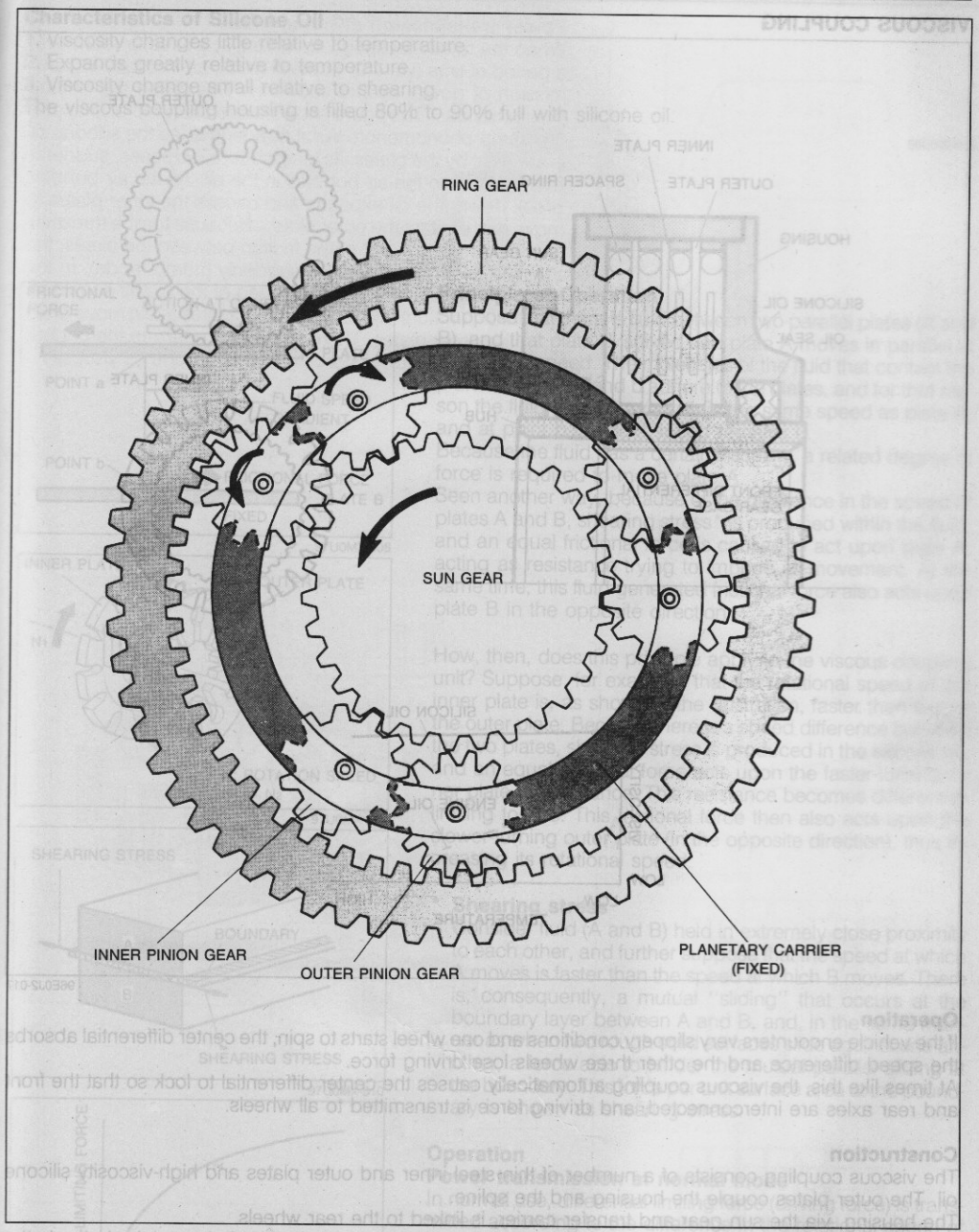
Front wheel speed greater than rear wheels

The speed of the sun gear (output force to the rear wheels) is less than that of the planetary carrier (out
force to the front wheels), thus effectively fixed.
As a result, the outer pinion gears rotate clockwise and the inner pinion gears rotate counterclockwise, t
rotating the planetary carrier counterclockwise.
In this way, the center differential absorbs the speed difference between the front and rear wheels and
driving force is distributed uniformly to the front and rear differentials.



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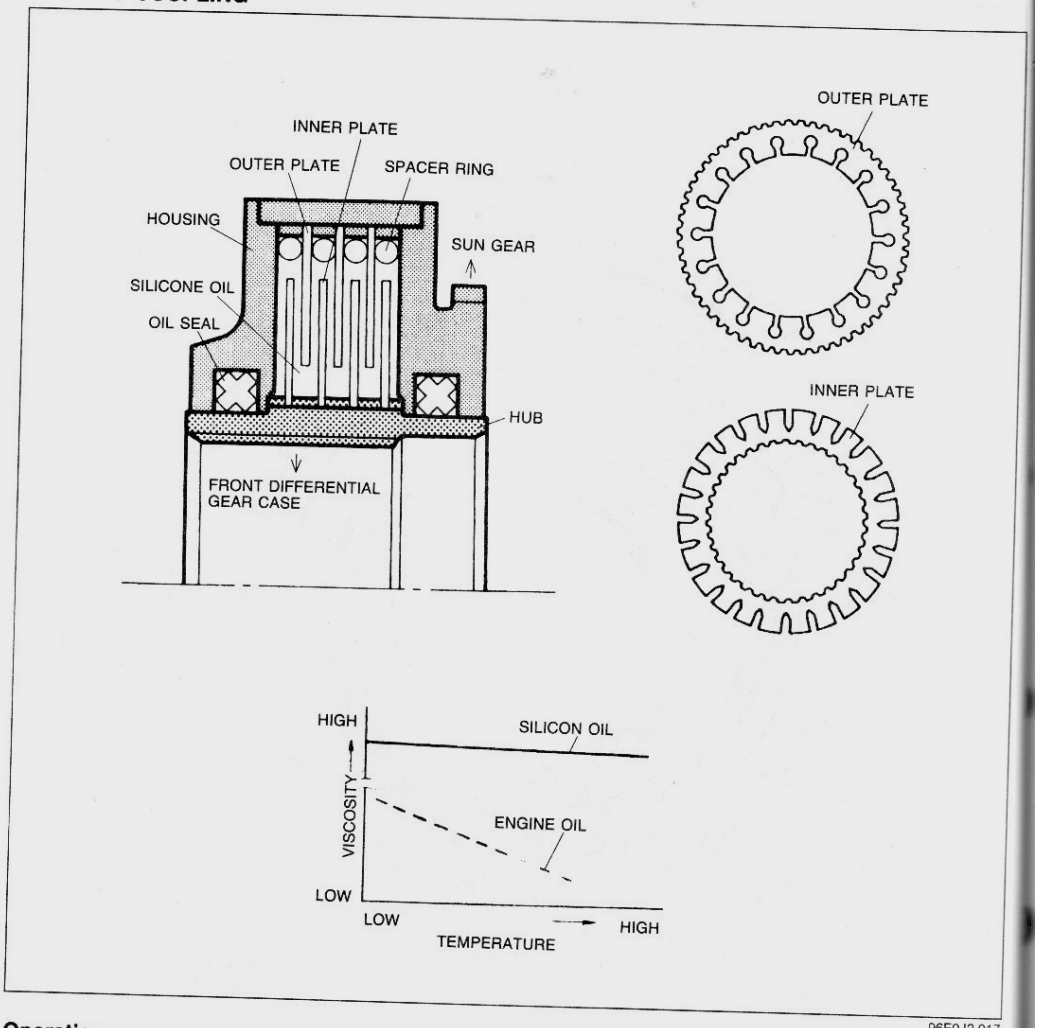
Rear wheel speed greater than front wheels

The speed of the planetary carrier (output force to front wheels) is less than that of the sun gear (output force to rear wheels), thus effectively becoming fixed. As a result, the outer pinion gears rotate counterclockwise and the inner pinion gears rotate clockwise, thus rotating the sun gear counterclockwise.

VISCOUS COUPLING



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Operation

If the vehicle encounters very slippery conditions and one wheel starts to spin, the center differential absorbs the speed difference and the other three wheels lose driving force.
At times like this, the viscous coupling automatically causes the center differential to lock so that the front and rear axles are interconnected, and driving force is transmitted to all wheels.

Construction

The viscous coupling consists of a number of thin steel inner and outer plates and high-viscosity silicone oil. The outer plates couple the housing and the spline.
The housing, via the sun gear and transfer carrier, is linked to the rear wheels.
Between the outer plates are spacer rings. The inner plates are coupled to the hub, and the hub, via the front differential gear case and the driveshafts, is linked to the front wheels.
The inner plates can move side to side on the hub.
The slots in the plates create the shearing of the silicone oil and cause the fluid coupling effect.
The viscous coupling unit is sealed by heat- and pressure-resistant oil seals, and is not rebuildable.

Characteristics of Silicone Oil

1. Viscosity changes little relative to temperature.
2. Expands greatly relative to temperature.
3. Viscosity change small relative to shearing.

The viscous coupling housing is filled 80% to 90% full with silicone oil.

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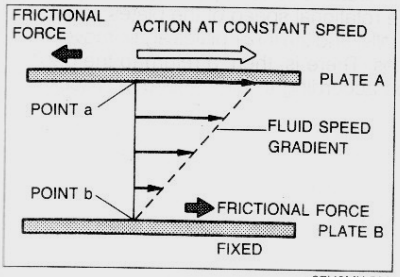

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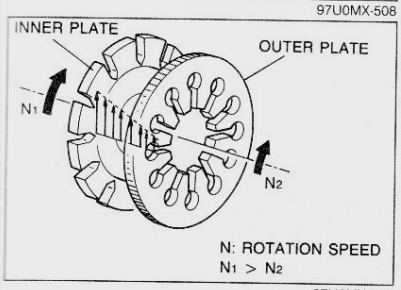

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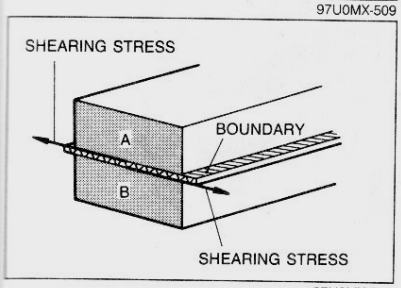

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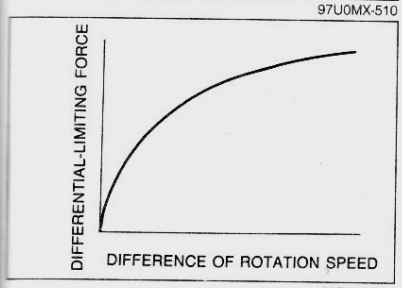

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Principle of Operation

Suppose that there is fluid between two parallel plates (A and B), and that plate B is fixed and plate A moves in parallel at a constant speed. The molecules of the fluid that contact the plates at points a and b adhere to the plates, and for that reason the fluid at point a moves at the same speed as plate A, and at point b the fluid speed remains 0.

Because the fluid has a certain viscosity, a related degree of force is required to move plate A.

Seen another way, because of the difference in the speed of plates A and B, shearing stress* is produced within the fluid, and an equal frictional force is caused to act upon plate A, acting as resistance trying to impede its movement. At the same time, this fluid-generated frictional force also acts upon plate B in the opposite direction.

How, then, does this principle apply to the viscous coupling unit? Suppose, for example, that the rotational speed of the inner plate is, as shown in the illustration, faster than that of the outer plate. Because there is a speed difference between the two plates, shearing stress is produced in the silicone oil, and an equal frictional force acts upon the faster-turning inner plate as resistance. This resistance becomes differential-limiting torque. This frictional force then also acts upon the slower-turning outer plate (in the opposite direction), thus increasing its rotational speed.

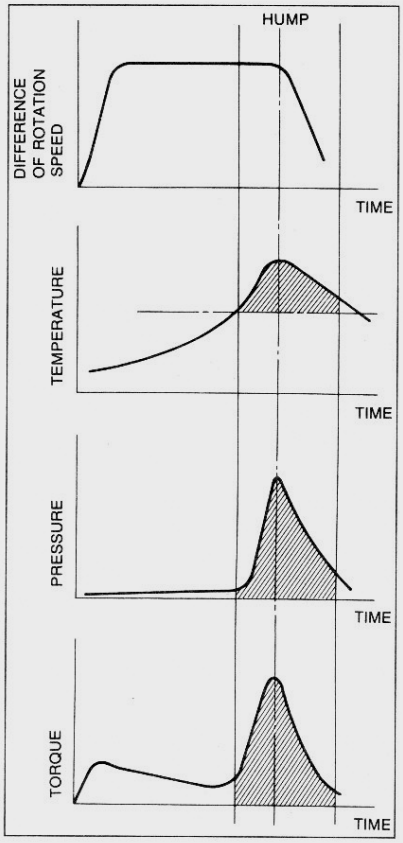
*** Shearing stress**

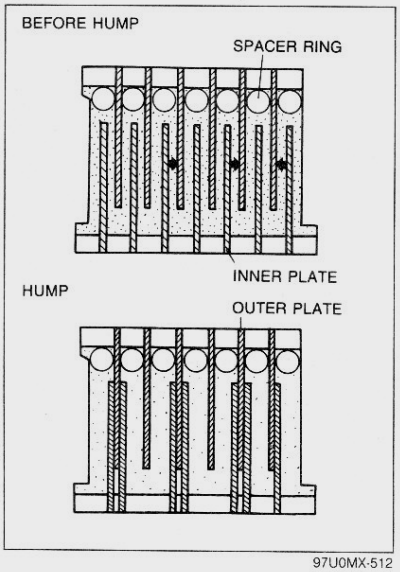
Consider fluid (A and B) held in extremely close proximity to each other, and further suppose that the speed at which A moves is faster than the speed at which B moves. There is, consequently, a mutual "sliding" that occurs at the boundary layer between A and B, and, in the same manner as when two rough solid surfaces slide against one another, a force acts to hinder the mutual parallel sliding at the boundary. This force per unit surface area at the boundary is known as shearing stress.

Operation

Power transmission at normal mode

In normal use, differential-limiting force (driving force) is transmitted according to the difference in the rotational speed of the front and rear wheels.





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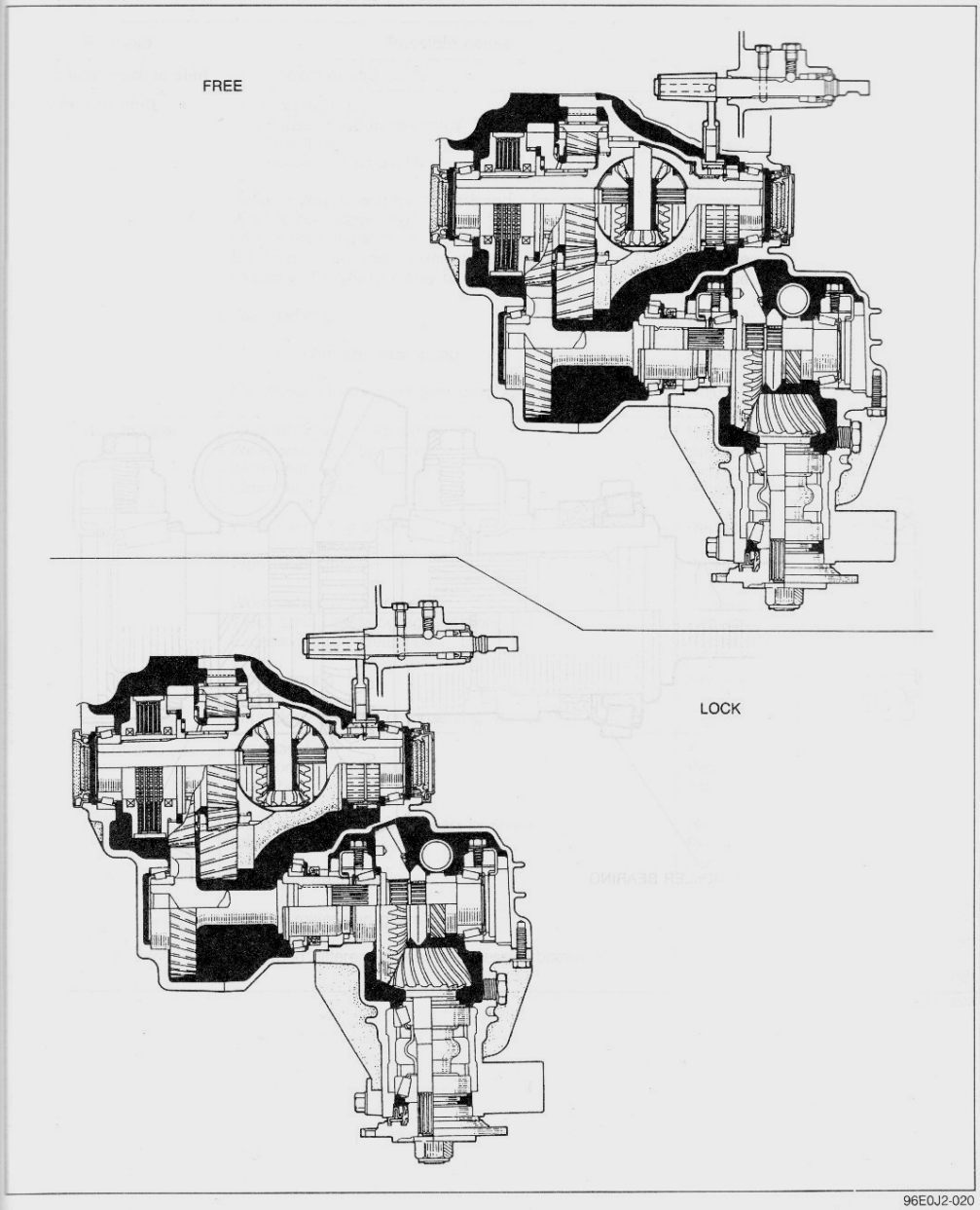
Power transmission at hump mode

When the rotational speed continues at a fixed amount over a period of time (i.e. one wheel in mud), an increase in transmission of power occurs suddenly. This called the "hump phenomenon." The figure shows the relationship of time and the hump phenomenon. What happens is, as the silicone oil is sheared by the plates, its temperature increases, suddenly breaking down the air bubbles in the oil. As the air bubbles break down, the oil expands and causes the inner plates to move and contact the outer plates. Because torque transmission occurs as a result of the friction between the plates, the transmitted torque increases suddenly (hump mode). In the hump mode, as the rotational speed of the plates equalizes, the oil temperature falls, and the inner plates again move away from the outer plates. There is, then, a return to the original torque transmission according to the silicone oil viscosity.

CENTER DIFFERENTIAL LOCK SYSTEM (MANUAL)



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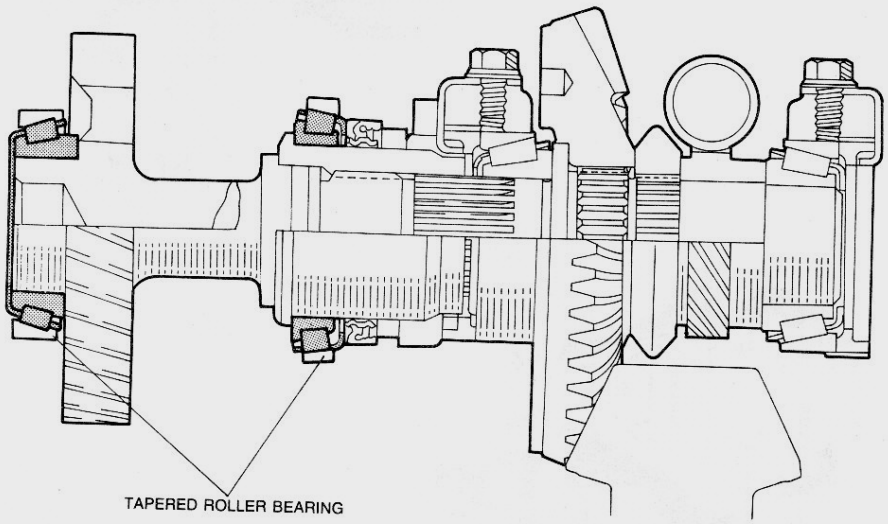
The center differential should not be locked for normal driving.
If the vehicle is to be tested on a speedometer tester or a chassis dynamometer, the propeller shaft must be removed to prevent the vehicle from jumping off the tester. And, because the propeller shaft is removed, the center differential must be manually locked to provide power to the front wheels.
The center differential is manually locked by pulling the differential lock rod outward.

IDLER GEAR SHAFT



96E0J2-021

For improved transaxle reliability, a tapered roller bearing is newly fitted at the ring gear end of the idler gear shaft for better support; in addition, the previously fitted bearing is changed from a ball bearing to a tapered roller bearing.

TROUBLESHOOTING GUIDE

Problem	Possible cause	Action	Page
Shift lever hard to shift	Worn select or shift cable	Replace	J2–93
Difficult to shift	Worn change rod	Replace	J2–93
	No grease in transaxle control	Lubricate	J2–93
	Insufficient oil	Add oil	J2–22
	Deterioration of oil quality	Replace with oil of specified quality	J2–22
	Wear or play of shift fork or shift rod	Replace	J2–45
	Worn synchronizer ring	Replace	J2–43
	Worn synchronizer cone of gear	Replace	J2–43
	Bad contact of synchronizer ring and cone of gear	Replace	J2–43
	Excessive longitudinal play of gears	Replace	J2–38, 40, 47, 50
	Worn bearing	Replace	J2–38, 40, 47, 50
	Worn synchronizer key spring	Replace	J2–38, 40, 47, 50
	Excessive primary shaft gear bearing preload	Adjust	J2–56
Won't stay in gear	Worn change control cable	Replace	J2–93
	Weak shift lever ball spring	Replace	J2–93
	Worn shift fork	Replace	J2–34, 64
	Worn clutch hub	Replace	J2–38, 40, 47, 50
	Worn clutch hub sleeve	Replace	J2–38, 40, 47, 50
	Worn shaft gear(s)	Replace	J2–38, 40, 47, 50
	Worn detent of control end	Replace	J2–30, 64
	Weak spring pressing against steel ball	Replace	J2–30, 64
	Excessive thrust clearance	Replace	J2–38, 40, 47, 50
	Worn bearing	Replace	J2–38, 40, 47, 50
	Improperly installed or loose engine mount	Tighten	J2–68
Abnormal noise	Insufficient oil	Add oil	J2–22
	Deterioration of oil quality	Replace	J2–22
	Worn bearing	Adjust or replace	J2–38, 40, 47, 50
	Worn sliding surfaces of gears or shafts	Replace	J2–38
	Excessive gear backlash	Replace	J2–38, 40, 47, 50
	Damaged gear teeth	Replace	J2–38, 40, 47, 50
	Foreign material in gears	Replace	J2–38, 40, 47, 50
	Damaged differential gear or excessive backlash	Adjust or replace	J2–74, 77, 81, 88

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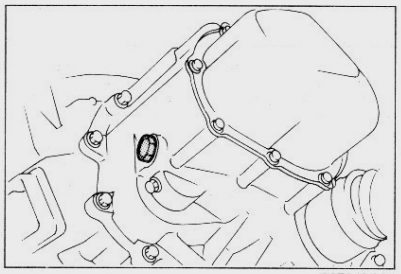
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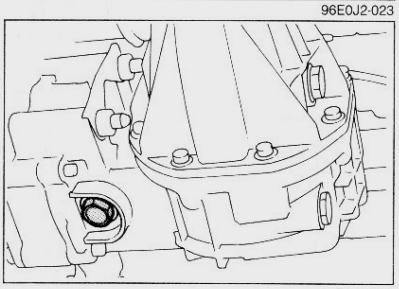
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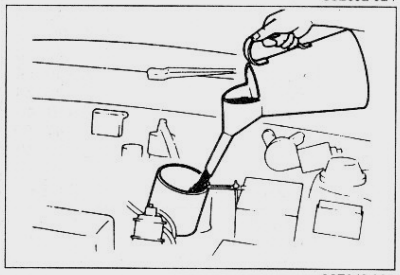
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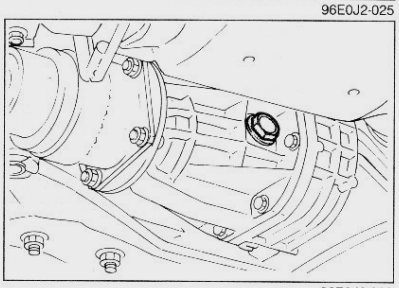
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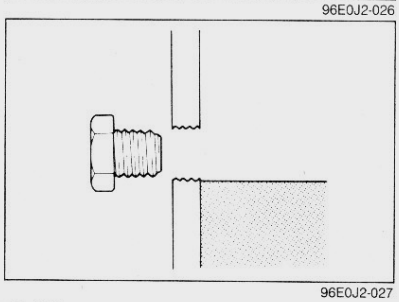
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TRANSAXLE OIL

INSPECTION

1. Remove the check plug.
2. Verify that the oil is at the bottom of the check plug port. If it is low, add the specified oil through the fill plug.
3. Wipe clean the plug threads and install the plugs.

Tightening torque:
Fill plug and check plug
39—59 N·m (4.0—6.0 m-kg, 29—43 ft-lb)

REPLACEMENT

Note
- **Replace the drain plug washer with a new one when ever the drain plug is removed.**

1. Remove the fill plug and check plug; then remove the drain plug and drain the oil.
2. Install the drain plug, and add the specified oil through the fill plug port.
3. Fill to the bottom of the check plug port.

Capacity: 2.6 liters (2.7 US qt, 2.3 Imp qt)

4. Install the fill and check plugs.

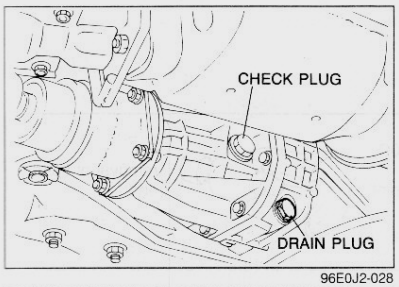
Tightening torque:
39—59 N·m (4.0—6.0 m-kg, 29—43 ft-lb)

TRANSFER UNIT OIL

INSPECTION

1. Remove the check plug.
2. Verify that the oil is at the bottom of the port. If it is low, add the specified oil through the check plug port.
3. Install the check plug and a new washer.

Tightening torque:
39—59 N·m (4.0—6.0 m-kg, 29—43 ft-lb)



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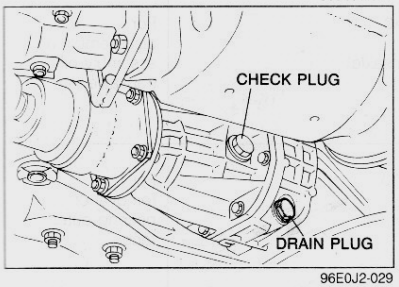

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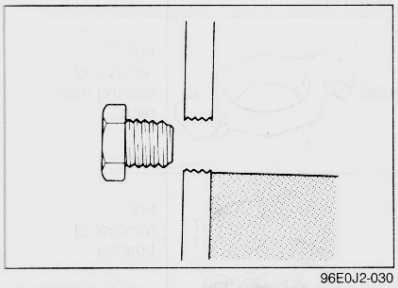
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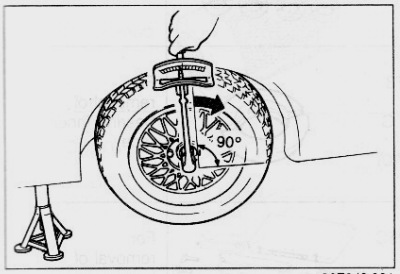


96E0J2-031

REPLACEMENT

Note
- **Replace drain plug washer with a new one whenever the drain plug is removed.**

1. Remove the check plug; then remove the drain plug and drain the oil.

2. Install the drain plug, and add the specified oil from the check plug port.

3. Fill to the bottom of the check plug port.

   Capacity: 0.5 liter (0.53 US qt, 0.44 Imp qt)

VISCOUS COUPLING

OPERATION INSPECTION

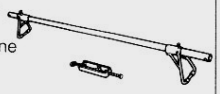
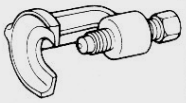
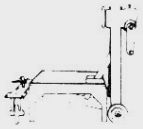
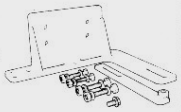
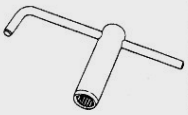
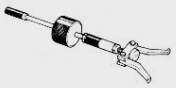
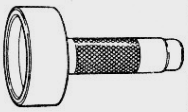
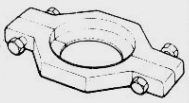
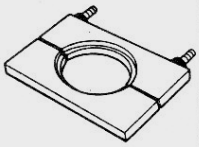
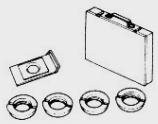
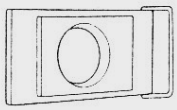
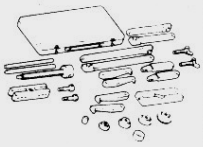
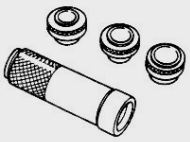
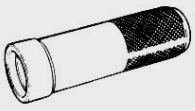
1. Turn off the engine and shift the transaxle into reverse.
2. Block the rear wheels with wheel chocks.
3. Jack up the front wheels and support the vehicle with jack stands.
4. Release the parking brake.
5. Measure the time it takes to turn the wheel 90° while applying the specified torque.

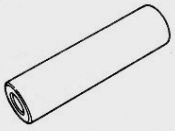
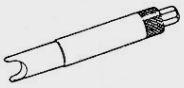
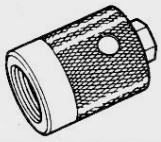
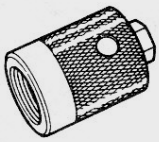
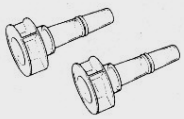
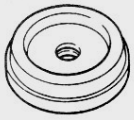
   Specified torque: 15 N·m (1.5 m-kg, 11 ft-lb)
   Specified time: 1.5 sec. min.

6. If not as specified, replace the viscous coupling. (Refer to pages J2–74, 89.)

TRANSAXLE

PREPARATION
SST

49 G017 5A0 Support, engine 	For support of engine	49 0118 850C Puller, ball joint 	For removal of tie-rod end
49 0107 680A Stand, engine 	For disassembly and assembly of transaxle	49 G019 0A0 Hanger, transaxle 	For disassembly and assembly of transaxle
49 G030 440 Holder, primary shaft 	For holding primary shaft	49 W032 2A0 Remover set, bearing 	For removal of bearing outer race
49 B001 795 Installer, oil seal 	For installation of oil seal	49 0636 145 Puller, fan pulley boss 	For removal of bearing inner race
49 G030 370 Plate, removing 	For removal of secondary 3rd gear and 2nd gear	49 G017 1A0 Remover set, bearing 	For removal of bearing
49 F401 366A Plate (Part of 49 G017 1A0) 	For removal of bearing inner race	49 B092 373 Attachment G (Part of 49 G017 1A0) 	For removal of bearing inner race
49 B092 374 Attachment H (Part of 49 G017 1A0) 	For removal of bearing inner race	49 0839 425C Puller set, bearing 	For removal of bearing inner race
49 F401 330B Installer set, bearing 	For installation of bearing	49 F401 331 Body (Part of 49 F401 330B) 	For installation of bearing inner race

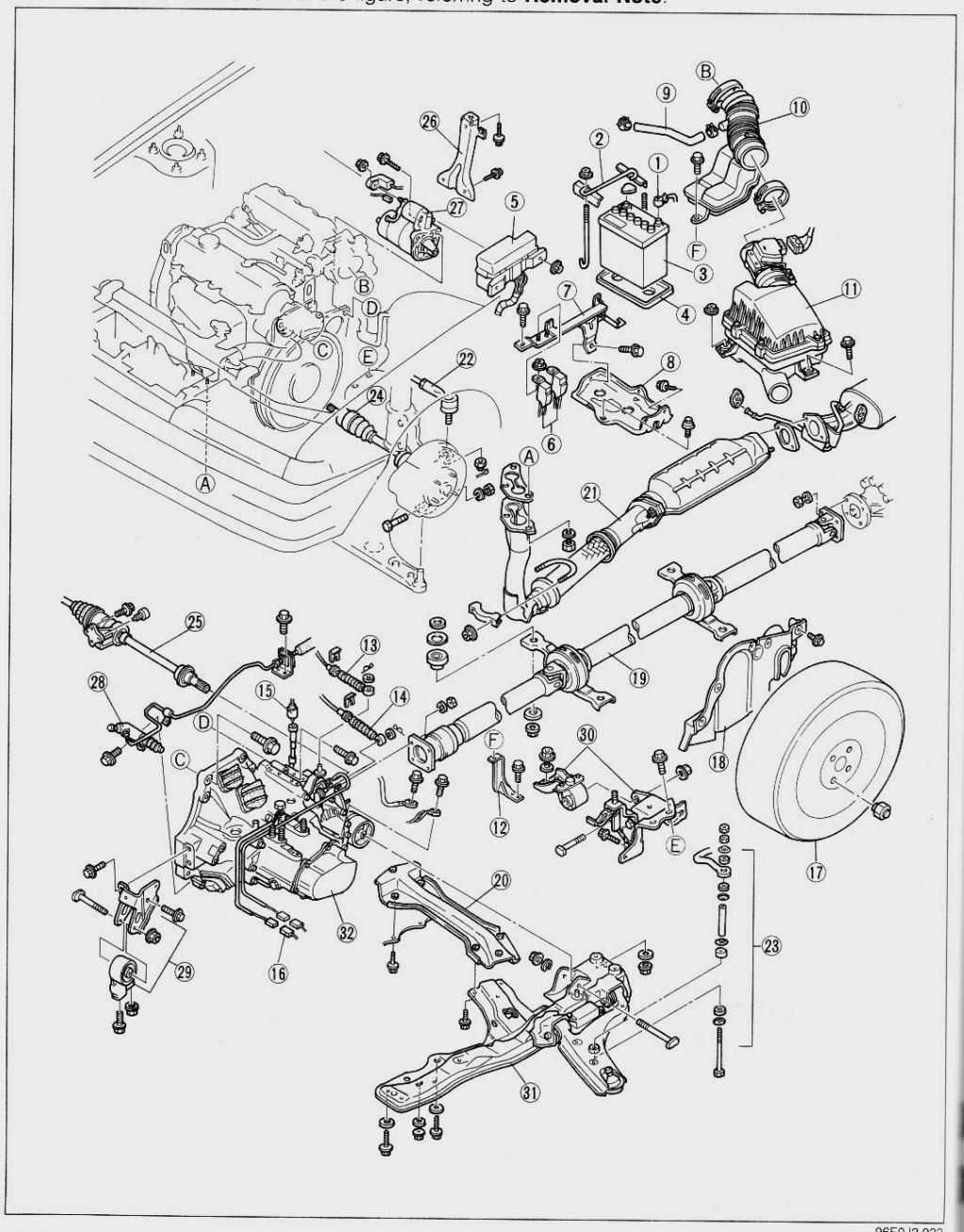
49 F401 335A Attachment A (Part of 49 F401 330B) 	For installation of bearing inner race	49 F401 337A Attachment B (Part of 49 F401 330B) 	For installation of bearing inner race
49 G030 380C Selector set, shim 	For adjustment of bearing preload	49 G030 381 Selector for ϕ68 (Part of 49 G030 380C) 	For adjustment of bearing preload
49 G030 382A Selector ϕ58 (Part of 49 G030 380C) 	For adjustment of bearing preload	49 F401 382A Selector ϕ52 (Part of 49 G030 380C) 	For adjustment of bearing preload
49 F401 384 Collar (Part of 49 G030 380C) 	For adjustment of bearing preload	49 G019 021 Set, bolt (Part of 49 G030 380C) 	For adjustment of bearing preload
49 FT01 515A Adapter, preload (Part of 49 G030 380C) 	For adjustment of bearing preload	49 F401 385 Bar (Part of 49 G030 380C) 	For adjustment of bearing preload
49 B017 102 Adapter, preload 	For adjustment of bearing preload	49 G017 202 Adapter, preload 	For adjustment of bearing preload
49 B027 001 Holder, differential side gear 	For holding side gear	49 F027 009 Attachment 68 & 77 	For installation of bearing

96E0J2-032

49 G030 029 Chain 	For support of engine

REMOVAL

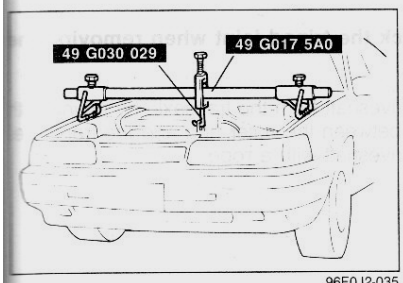
1. Disconnect the negative battery cable.
2. Raise the vehicle and support it with safety stands.
3. Drain the transaxle oil into a suitable container.
4. Remove in the order shown in the figure, referring to **Removal Note**.



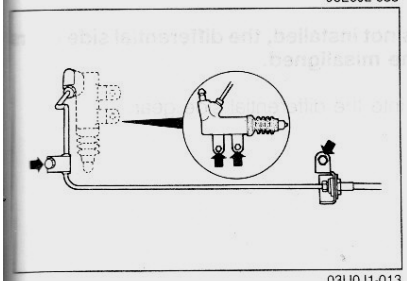
96E0J2-033

1. Negative battery cable
2. Battery clamp
3. Battery
4. Battery tray
5. Main fuse block
6. Relay
7. Bracket
8. Battery carrier
9. Hose
10. Air hose
11. Air cleaner
12. Bracket
13. Shift cable
14. Select cable
15. Speedometer cable
16. Connectors
17. Wheel and tire
18. Splash shield
19. Propeller shaft
    Removal Note ..... page J2–28
20. Rear member
21. Exhaust pipe
22. Tie-rod end
    Removal Note ..... page J2–28
23. Stabilizer
24. Driveshaft
    Removal Note ..... page J2–28
25. Jointshaft
26. Bracket
27. Starter
28. Clutch release cylinder
    Removal Note ..... below
29. Engine mount No.2
    Removal Note ..... below
30. Engine mount No.4
    Removal Note ..... below
31. Frame
    Removal Note ..... below
32. Transaxle
    Removal Note ..... page J2–29

96E0J2-034



96E0J2-035



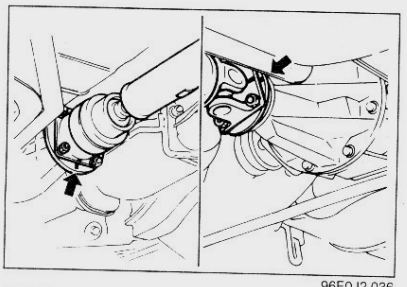
03U0J1-013

Removal Note
Frame
1. Suspend the engine with the **SST** and remove the engine mounts.

Clutch release cylinder

Caution
- **Do not damage the clutch pipe.**

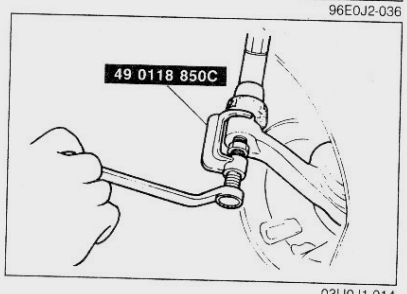
1. Remove the bolts shown.
2. Lay aside the clutch release cylinder and the clutch pipe when removing the transaxle.



96E0J2-036

Propeller shaft

1. Before removing the propeller shaft, mark the flanges for correct reassembly.

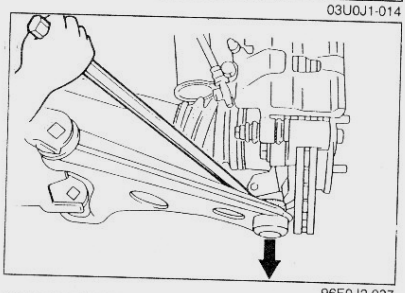


03U0J1-014

Tie-rod end

Caution
- **Do not damage the dust boot.**

1. Remove the cotter pin and loosen the nut.
2. Disconnect the tie-rod end with the **SST**.



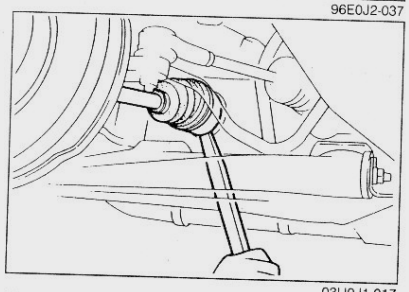
96E0J2-037

Driveshaft

1. Remove the clinch bolt.

Caution
- **Wrap a rag around the ball joint dust boot to protect it from damage.**

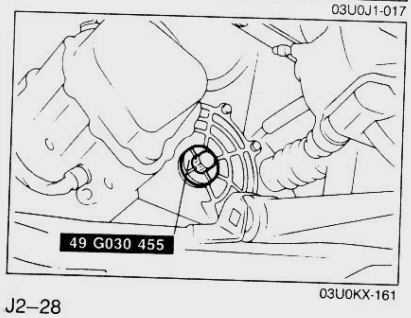
2. Disconnect the lower arm from the knuckle with a pry bar.



03U0J1-017

Caution
- **Do not shock the tripod joint when removing the driveshaft.**

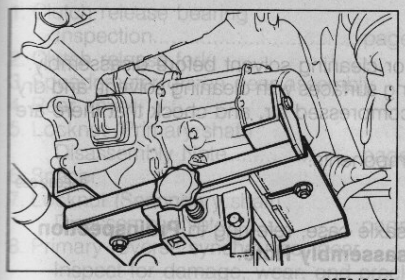
3. Separate the driveshaft from the transaxle by prying with a bar inserted between the outer ring and the transaxle.
4. Suspend the driveshaft with a rope.



03U0KX-161

Caution
- **If the SST is not installed, the differential side gears may become misaligned.**

4. Slide the **SST** into the differential side gear.


96E0J2-038

Transaxle

1. Loosen the **SST** (engine support) and lean the engine toward the transaxle.
2. Support the transaxle with a jack.
3. Remove the transaxle mounting bolts.
4. Remove the transaxle.

DISASSEMBLY

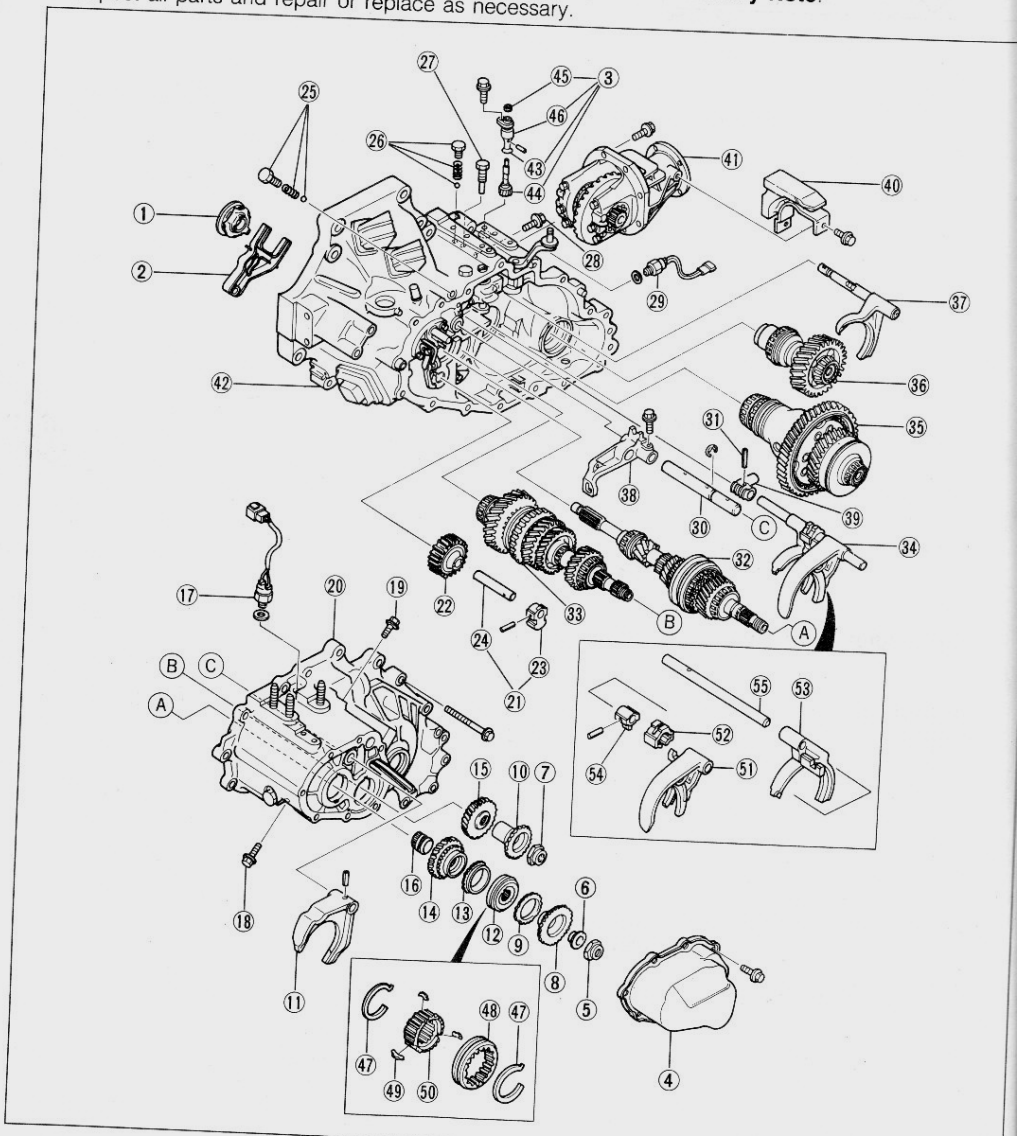
Precaution

1. Clean the transaxle exterior thoroughly with a steam cleaner or cleaning solvent before disassemb
2. Clean the removed parts (except sealed bearings) and all sealing surfaces with cleaning solvent, and with compressed air. Clean out all holes and passages with compressed air, and check that there no obstructions.
3. Wear eye protection when using compressed air to clean components.

5th/Reverse Gear and Housing Parts

96E0J

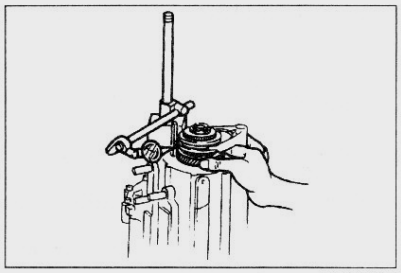
1. Measure the thrust clearance between 5th gear and the transaxle case, referring to **Preinspectior**
2. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
3. Inspect all parts and repair or replace as necessary.



96E0J2-040

1. Clutch release bearing
   Inspection..... page J2–44
2. Clutch release fork
3. Speedometer driven gear assembly
4. Rear cover
5. Locknut (Primary shaft)
   Disassembly Note..... page J2–32
6. Spacer
7. Locknut (Secondary shaft)
   Disassembly Note..... page J2–32
8. Primary reverse synchronizer gear
   Inspect for damage, wear, and cracks
9. Synchronizer ring (Reverse)
   Inspection..... page J2–43
10. Secondary reverse synchronizer gear
    Inspect for damage, wear, and cracks
11. 5th/Reverse shift fork
    Inspection..... page J2–45
12. Clutch hub assembly (5th/Reverse)
    Inspection..... page J2–45
13. Synchronizer ring (5th)
    Inspection..... page J2–43
14. 5th gear
    Inspection..... page J2–44
15. Secondary 5th gear
    Inspect for damage, wear, and cracks
16. Gear sleeve
    Inspection..... page J2–44
17. Back-up light switch
18. Lock bolt
19. Interlock bolt
20. Transaxle case assembly
21. Reverse idler gear shaft assembly
22. Reverse idler gear
    Inspection..... page J2–43
23. Reverse idler gear support
24. Reverse idler gear shaft
25. Bolt, spring, and steel ball
26. Bolt, spring, and steel ball
27. Bolt
28. Bolt
29. Neutral switch
30. 5th/Reverse shift rod
31. Roll pin
    Disassembly Note..... page J2–32
32. Primary shaft assembly
    Disassembly Note..... page J2–38
33. Secondary shaft assembly
    Disassembly Note..... page J2–40
34. Shift fork and shift rod assembly
35. Front and center differential assembly
    Disassembly Note..... page J2–74
36. Idler gear assembly
37. Center differential lock shift fork assembly
38. Shift gate
39. Control end
40. Dynamic damper assembly
41. Transfer carrier assembly
42. Clutch housing assembly
43. O-ring
44. Driven gear
45. Oil seal
    Disassembly Note..... page J2–33
46. Gear case
47. Synchronizer key spring
48. Clutch hub sleeve
49. Synchronizer key
50. Clutch hub
51. 3rd/4th shift fork
    Inspection..... page J2–45
52. Interlock sleeve
53. 1st/2nd shift fork
    Inspection..... page J2–45
54. Control lever
55. Control rod

96E0J2-041

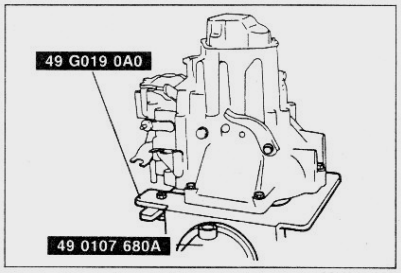


96E0J2-042

Preinspection
5th gear thrust clearance
1. Measure the 5th gear thrust clearance with a dial indicator.

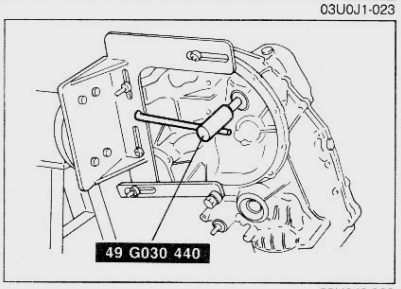
Clearance: 0.10—0.22mm (0.004—0.009 in)
Maximum : 0.27mm (0.011 in)

2. If the clearance exceeds the maximum, check the contact surfaces of 5th gear and the clutch hub. Replace worn or damaged parts.



03U0J1-023

Disassembly note
Locknut
1. Mount the transaxle on the **SST**.

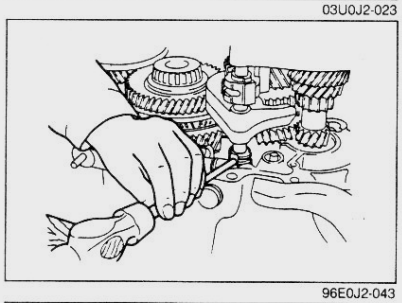


03U0J2-023

2. Lock the primary shaft with the **SST**.
3. Shift to 1st or 2nd gear to lock the rotation of the primary shaft.

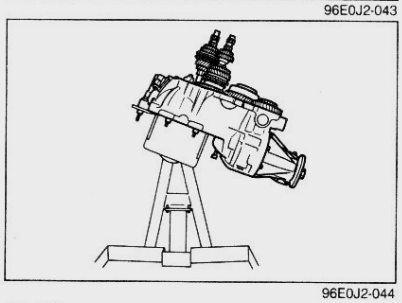
Caution
- **Do not reuse the removed locknut.**

4. Uncrimp the tabs of the locknuts.
5. Remove the locknuts from the primary and secondary shafts.



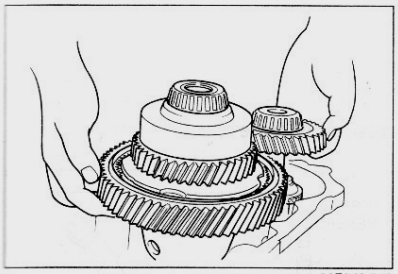
96E0J2-043

Roll pin
1. Remove the roll pin with a pin punch.



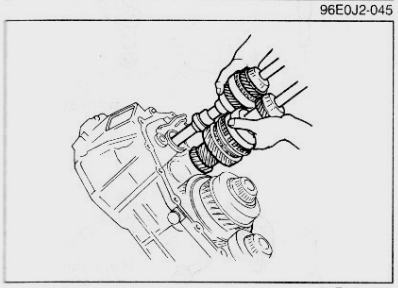
96E0J2-044

Primary shaft assembly, secondary shaft assembly, front and center differential assembly and idler gear assembly
1. Tilt the transaxle toward the transfer carrier side.



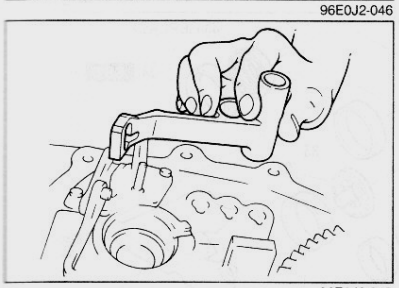
96E0J2-045

2. Lift the center differential and idler gear a few centimeters (inches).



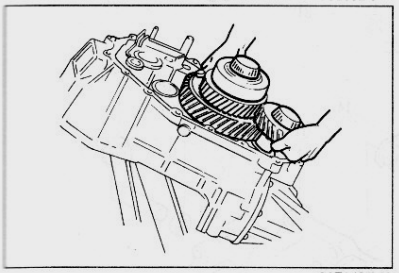
96E0J2-046

3. Remove the primary shaft assembly, secondary shaft assembly, and shift fork and shift rod assembly together.



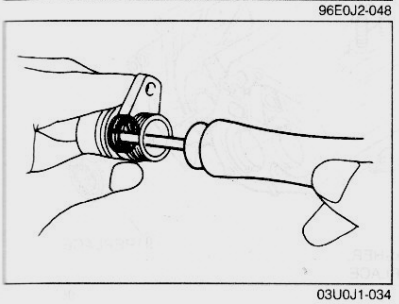
96E0J2-047

4. Remove the shift gate.



96E0J2-048

5. Remove the center differential assembly, center differential lock shift fork assembly, and idler gear together.



03U0J1-034

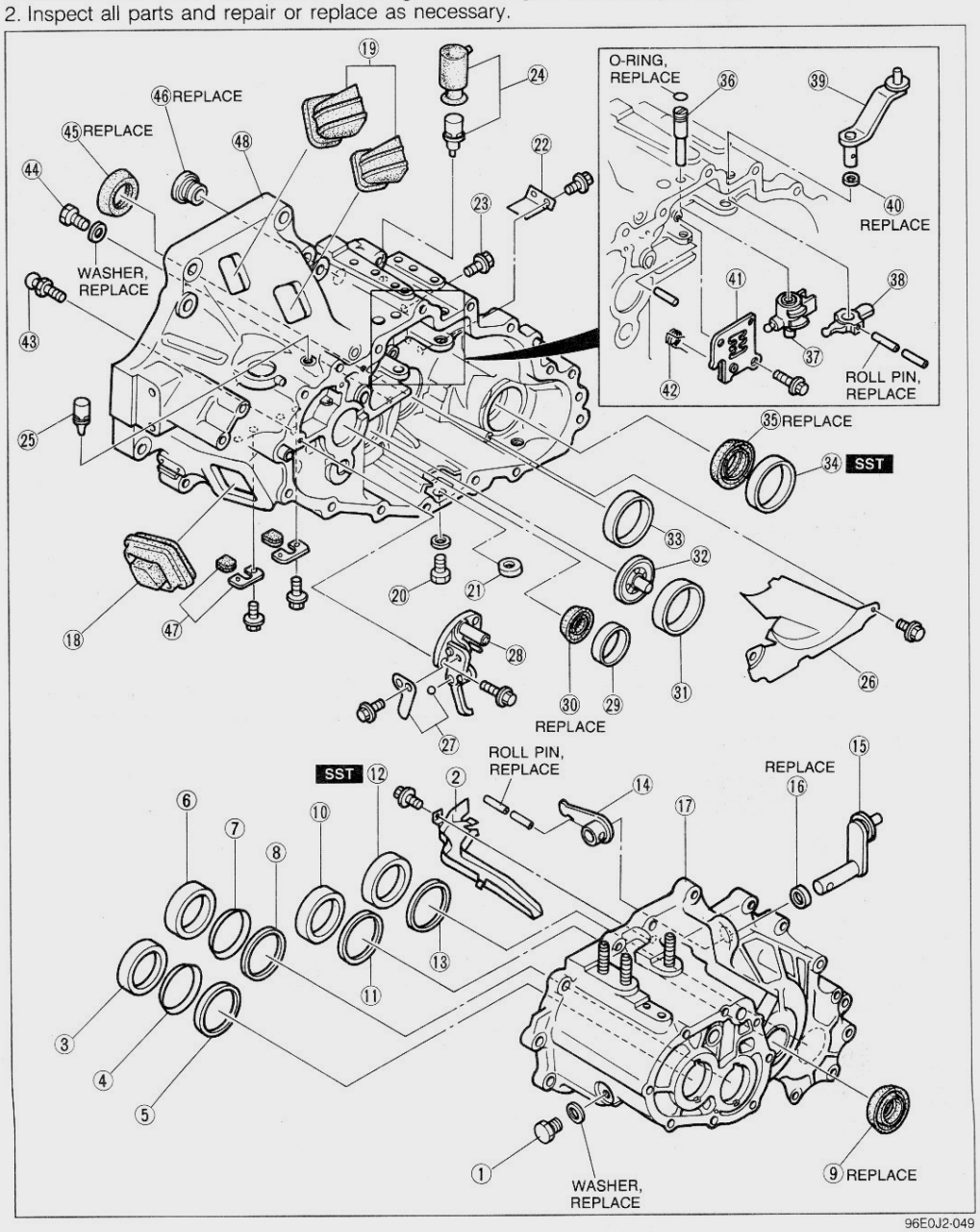
Oil seal (Speedometer gear case)

1. Remove the oil seal as shown in the figure.

Clutch Housing and Transaxle Case Components

Caution
- **Do not remove an oil seal if not necessary.**

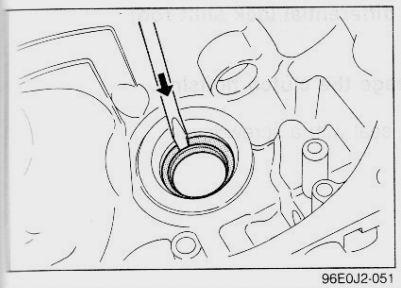
1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
2. Inspect all parts and repair or replace as necessary.



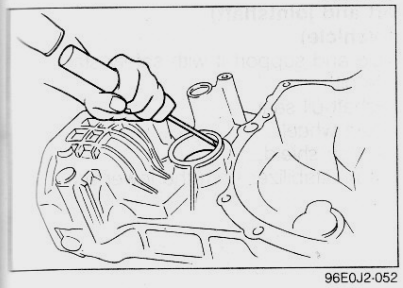
96E0J2-049

1. Plug
2. Oil passage
3. Bearing outer race
4. Diaphragm spring
5. Adjustment shim
6. Bearing outer race
7. Diaphragm spring
8. Adjustment shim
9. Oil seal
   Disassembly Note ..... page J2–35
10. Bearing outer race
    Disassembly Note ..... page J2–35
11. Adjustment shim
12. Bearing outer race
    Disassembly Note ..... page J2–36
13. Adjustment shim
14. Selection lever
15. Select lever
16. Oil seal
17. Transaxle case
18. Dust cover
19. Ventilator cover
20. Plug
21. Magnet
22. Baffle
23. Bolt
24. Bleeder dust boot and bleeder
25. Bleeder
26. Baffle
27. Lever set spring and steel ball
28. Reverse lever support
29. Bearing outer race
30. Oil seal
31. Bearing outer race
    Disassembly Note ..... page J2–36
32. Funnel
    Disassembly Note ..... page J2–36
33. Bearing outer race
    Disassembly Note ..... page J2–35
34. Bearing outer race
35. Oil seal
    Replacement (On-vehicle) ..... page J2–36
36. Crank lever shaft
    Disassembly Note ..... page J2–36
37. Crank lever
38. Inner shift lever
39. Select lever
40. Oil seal
41. Base plate assembly
42. Spring
43. Pivot
44. Plug
45. Oil seal
    Disassembly Note ..... page J2–35
46. Oil seal
    Disassembly Note ..... page J2–36
47. Seal plate and seal rubber
48. Clutch housing

96E0J2-050



96E0J2-051



96E0J2-052

Disassembly note
Oil seal (Front and center differential)

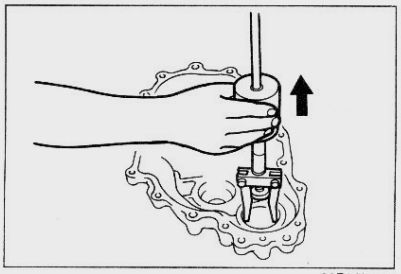
Caution
- **Do not damage the clutch housing and transaxle case.**

1. Remove the oil seal with a screwdriver.

Bearing outer race (Front and center differential)

Caution
- **Do not damage the clutch housing and transaxle case.**

1. Remove the bearing outer race with a screwdriver.

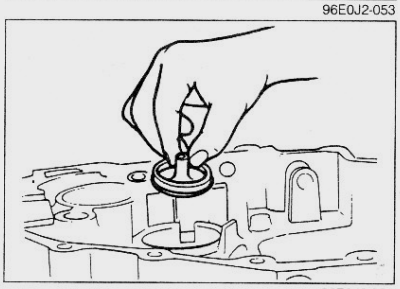


96E0J2-053

Bearing outer race (Idler gear)

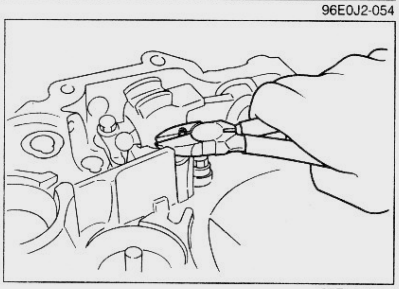
Caution
- **Do not damage the clutch housing and transaxle case.**

1. Remove the bearing outer race with the **SST**.



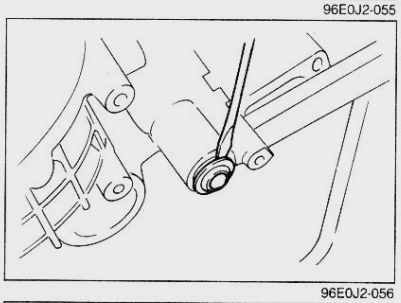
96E0J2-054

Bearing outer race and funnel (Secondary shaft)
1. Remove the bearing outer race by lifting out the funnel and race together.



96E0J2-055

Crank lever shaft
1. Remove the roll pin with side cutters.
2. Remove the crank lever shaft.

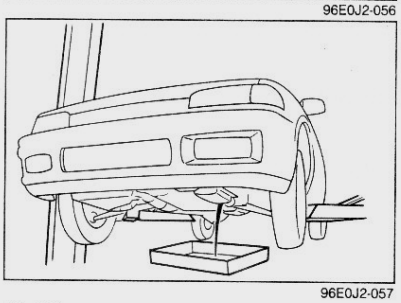


96E0J2-056

Oil seal (Center differential lock shift rod)

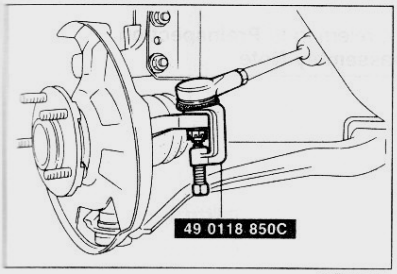
Caution
- **Do not damage the clutch housing.**

1. Remove the oil seal with a screwdriver.



96E0J2-057

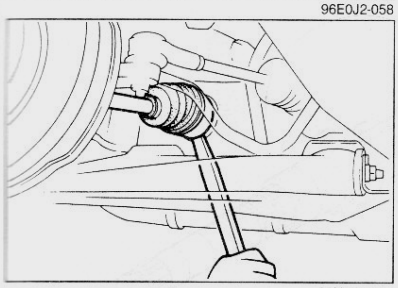
Oil seal (Driveshaft and jointshaft)
Replacement (On-vehicle)
1. Jack up the vehicle and support it with safety stands.
2. Drain the transaxle oil.
3. Replace the driveshaft oil seal.
   (1) Remove the front wheel.
   (2) Remove the splash shield.
   (3) Separate the front stabilizer from the lower arm.



96E0J2-058

Caution
- **Do not damage the dust boots.**

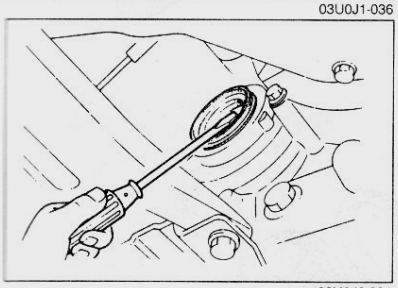
(4) Remove the clinch bolt and pull the lower arm downward to separate the knuckle from the lower arm ball joint.
(5) Loosen the nut and disconnect the tie-rod end with the **SST**.



03U0J1-036

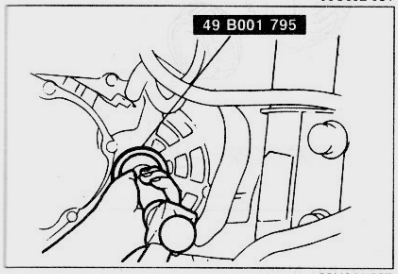
Caution
- **Do not subject the tripod joint to shock when removing the driveshaft.**

(6) Disconnect the driveshaft from the transaxle by prying with a bar inserted between the outer ring and the transaxle.
(7) Suspend the driveshaft with a rope.



03U0J2-031

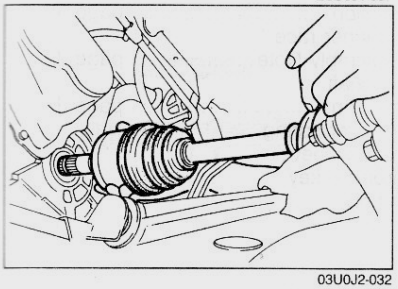
(8) Remove the oil seal with a screwdriver.



03U0J1-037

Note
- **Tap in until the oil seal installer contacts the case.**
- **Coat the oil seal lip with transaxle oil.**

(9) Tap the new oil seal into the transaxle case with the **SST**.

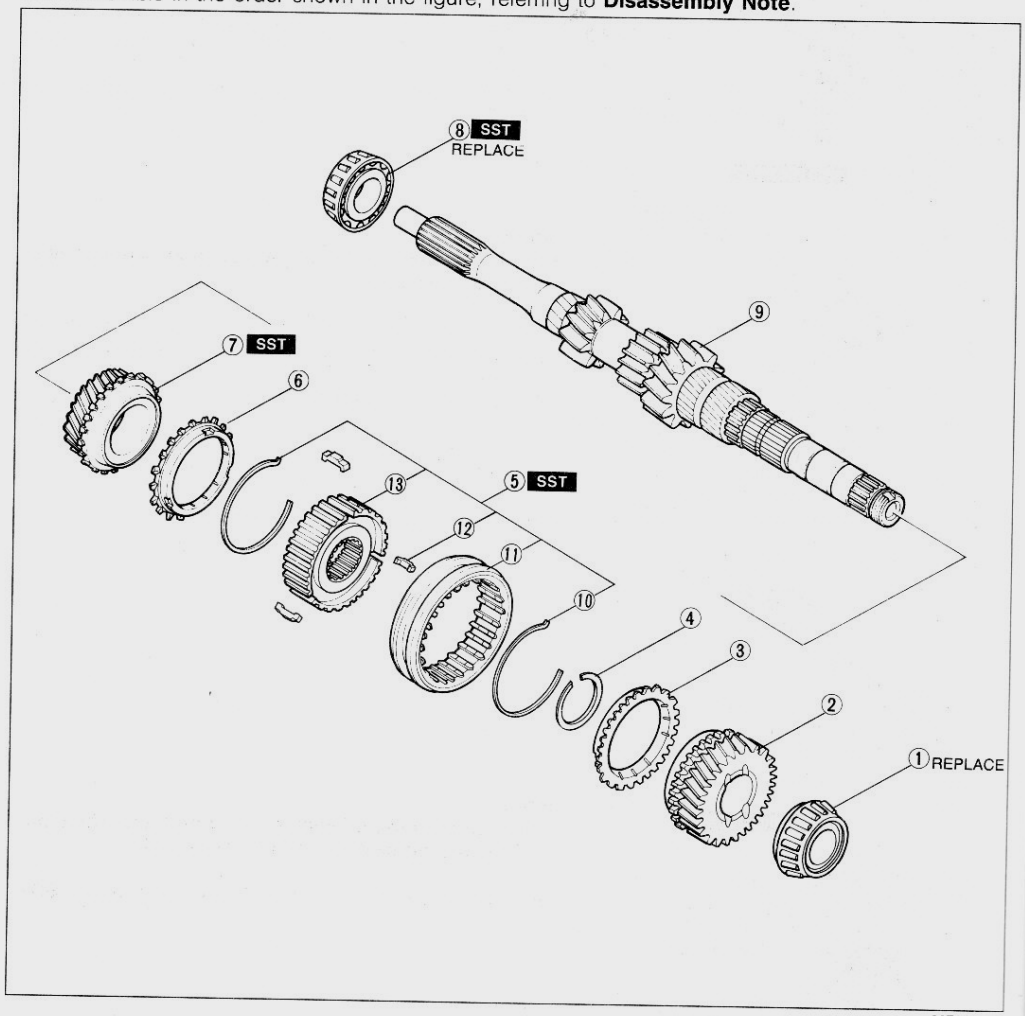


03U0J2-032

(10) Replace the driveshaft end clip with a new one. Insert the driveshaft with the end-gap of the clip facing upward.

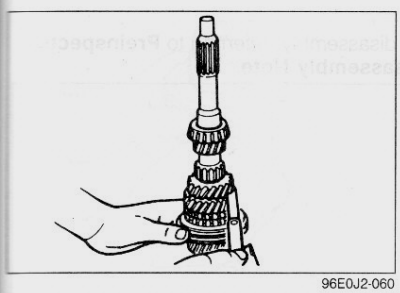
Primary Shaft Assembly

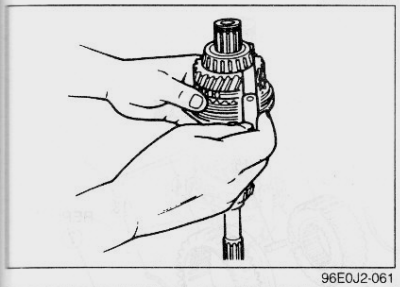
1. Measure the thrust clearances of all gears before disassembly, referring to **Preinspection**.
2. Disassemble in the order shown in the figure, referring to **Disassembly Note**.



96E0J2-059

1. Bearing inner race
   Disassembly Note ..... page J2–39
2. 4th gear
   Disassembly Note ..... page J2–39
3. Synchronizer ring (4th)
   Inspection ..... page J2–43
4. Retaining ring
5. Clutch hub assembly (3rd/4th)
   Disassembly Note ..... page J2–39
   Inspection ..... page J2–45
6. Synchronizer ring (3rd)
   Disassembly Note ..... page J2–39
   Inspection ..... page J2–43
7. 3rd gear
   Disassembly Note ..... page J2–39
   Inspection ..... page J2–44
8. Bearing inner race
   Disassembly Note ..... page J2–39
9. Primary shaft
   Inspection ..... page J2–43
10. Synchronizer spring
11. Clutch hub sleeve
12. Synchronizer key
13. Clutch hub


96E0J2-060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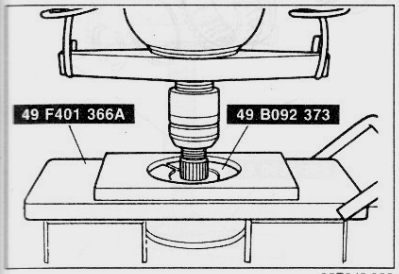
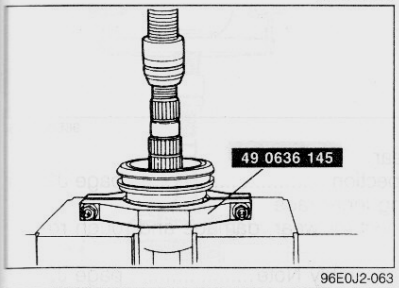


96E0J2-062



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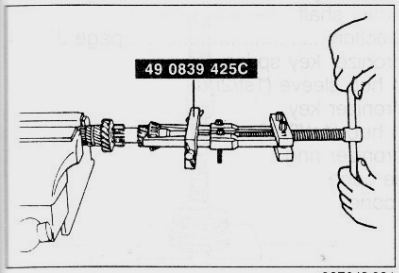


96E0J2-064

Preinspection
3rd gear thrust clearance
1. Measure the clearance between 3rd gear and 2nd gear.

   Clearance: 0.05—0.20mm (0.002—0.008 in)
   Maximum : 0.25mm (0.010 in)

2. If the clearance exceeds the maximum, check the contact surfaces of the 3rd gear, 2nd gear and clutch hub (3rd/4th). Replace worn or damaged parts.

4th gear thrust clearance
1. Measure the clearance between 4th gear and the bearing inner race.

   Clearance: 0.165—0.365mm (0.006—0.014 in)
   Maximum : 0.415mm (0.016 in)

2. If the clearance exceeds the maximum, check the contact surfaces of the 4th gear, bearing inner race, and clutch hub (3rd/4th). Replace worn or damaged parts.

Disassembly note
Bearing inner race (4th gear)

Caution
- **Hold the shaft with one hand so that it does not fall.**

1. Remove the bearing inner race with the **SST**.

Clutch hub assembly (3rd/4th), synchronizer ring (3rd) and 3rd gear

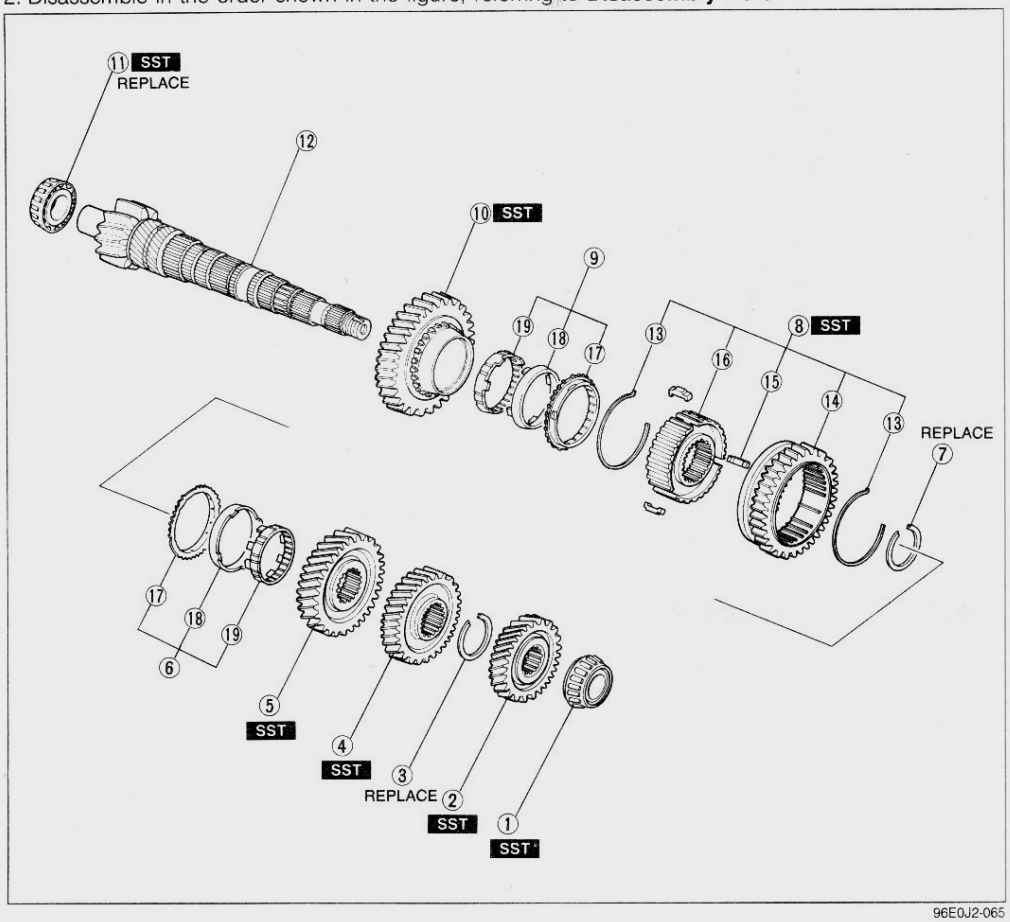
Caution
- **Hold the shaft with one hand so that it does not fall.**

1. Remove the retaining ring.
2. Remove the clutch hub assembly (3rd/4th), synchronizer ring (3rd) and 3rd gear with the **SST**.

Bearing inner race (1st gear)
1. Remove the bearing inner race with the **SST**.

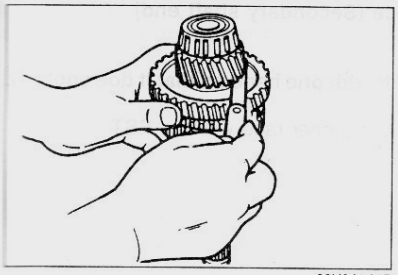
Secondary Shaft Assembly

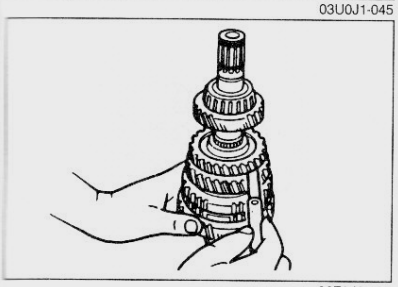
1. Measure the thrust clearance of 1st gear and 2nd gear before disassembly, referring to **Preinspection**.
2. Disassemble in the order shown in the figure, referring to **Disassembly Note**.

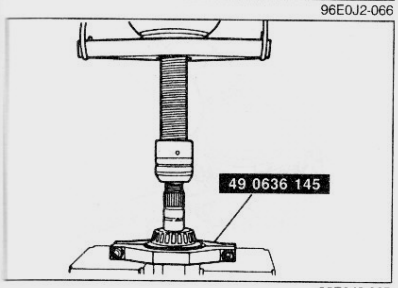


96E0J2-065

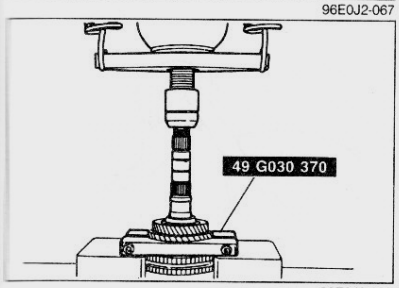
1. Bearing inner race
   Disassembly Note ..... page J2–41
2. 4th gear
   Disassembly Note ..... page J2–41
3. Retaining ring
4. 3rd gear
   Disassembly Note ..... page J2–41
5. 2nd gear
   Disassembly Note ..... page J2–41
   Inspection ..... page J2–45
6. Double cone assembly
7. Retaining ring
8. Clutch hub assembly (1st/2nd)
   Disassembly Note ..... page J2–41
   Inspection ..... page J2–45
9. Double cone assembly
   Disassembly Note ..... page J2–41
10. 1st gear
    Inspection ..... page J2–45
11. Bearing inner race
    Inspect for wear, damage and rough rotation
    Disassembly Note ..... page J2–42
12. Secondary shaft
    Inspection ..... page J2–44
13. Synchronizer key spring
14. Clutch hub sleeve (1st/2nd)
15. Synchronizer key
16. Clutch hub (1st/2nd)
17. Synchronizer ring
18. Double cone
19. Inner cone


03U0J1-045


96E0J2-066



96E0J2-067



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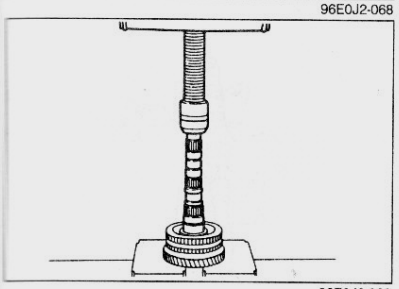

96E0J2-069

Preinspection
1st gear thrust clearance
1. Measure the clearance between 1st gear and the differential drive gear.

Clearance: 0.05—0.28mm (0.002—0.011 in)
Maximum: 0.33mm (0.013 in)

2. If the clearance exceeds the maximum, check the contact surfaces of the 1st gear, differential drive gear of the secondary shaft gear, and clutch hub assembly (1st/2nd). Replace worn or damaged parts.

2nd gear thrust clearance
1. Measure the clearance between 2nd gear and 3rd gear.

Clearance: 0.18—0.46mm (0.007—0.018 in)
Maximum: 0.51mm (0.020 in)

2. If the clearance exceeds the maximum, check the contact surfaces of the 2nd gear, 3rd gear, and clutch hub assembly (1st/2nd). Replace worn or damaged parts.

Disassembly note
Bearing inner race and 4th gear

Caution
- **Hold the shaft with one hand so that it does not fall.**

1. Remove the bearing inner race and 4th gear with the **SST**.

3rd gear and 2nd gear

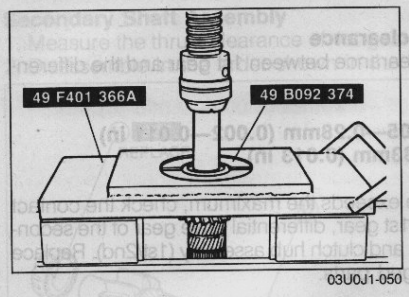
Caution
- **Hold the shaft with one hand so that it does not fall.**

1. Remove the retaining ring.
2. Remove the 3rd gear and 2nd gear with the **SST**.

Clutch hub assembly (1st/2nd), double cone assembly and 1st gear

Caution
- **Hold the shaft with one hand so that it does not fall.**

1. Remove the retaining ring.
2. Remove the clutch hub assembly (1st/2nd), double cone assembly and 1st gear with the **SST**.

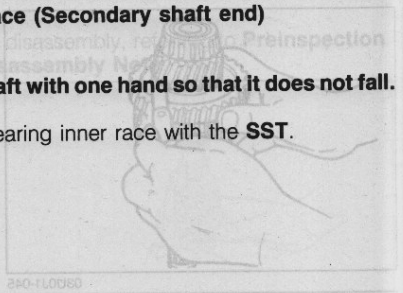
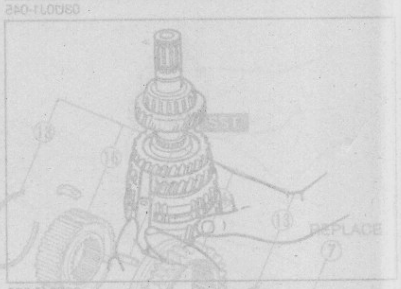
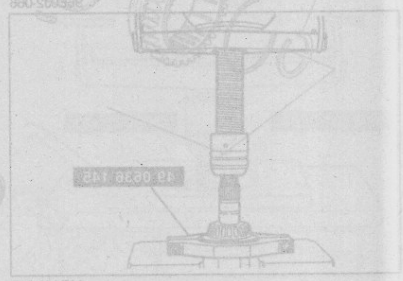
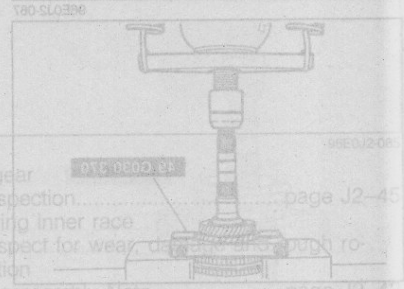
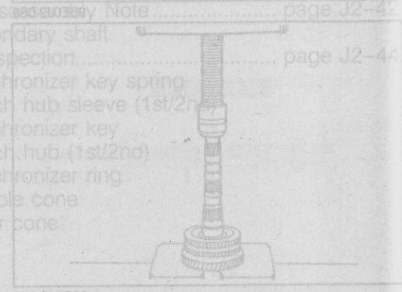


03U0J1-050

Bearing inner race (Secondary shaft end)

Caution
- **Hold the shaft with one hand so that it does not fall.**

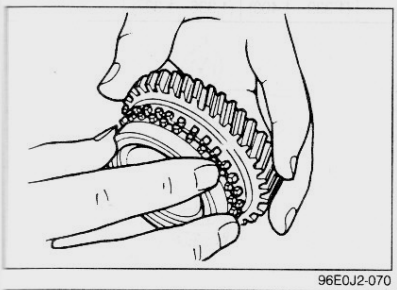
1. Remove the bearing inner race with the **SST**.

INSPECTION

Inspect all parts and repair or replace as necessary.

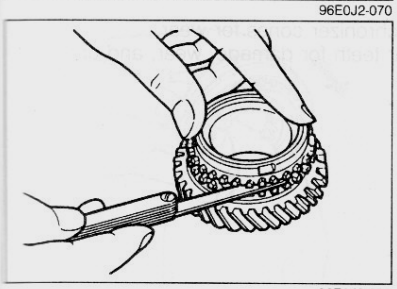
03U0J1-051



96E0J2-070

Synchronizer Ring

1. Inspect the synchronizer ring teeth for damage, wear, and cracks.
2. Inspect the taper surface for wear and cracks.



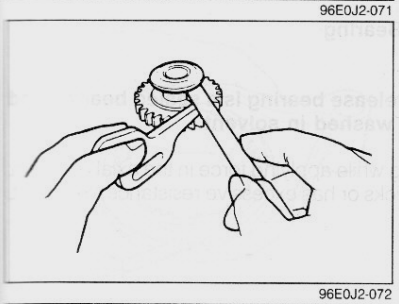
96E0J2-071

Note

- **Set the synchronizer ring squarely in the gear; then measure around the circumference.**

3. Measure the clearance between the synchronizer ring and flank surface of the gear.

Standard clearance: 1.02—1.98mm (0.040—0.078 in)
Minimum: 2.48mm (0.098 in)

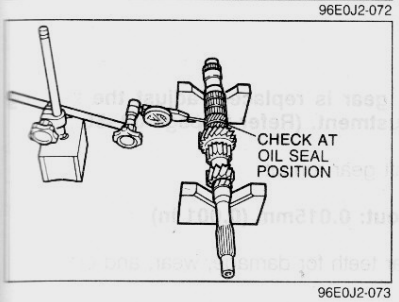


96E0J2-072

Reverse Idler Gear and Reverse Lever

1. Inspect the gear teeth for damage, wear, and cracks.
2. Measure the clearance between the reverse idler gear bushing and the reverse lever.

Standard clearance: 0.10—0.35mm (0.004—0.014 in)
Maximum: 0.85mm (0.033 in)



96E0J2-073

Primary Shaft

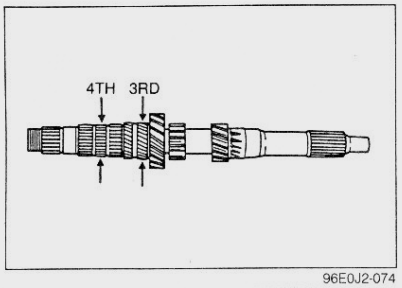
Note

- **If the shaft gear is replaced, adjust the bearing preload. (Refer to page J2–56.)**

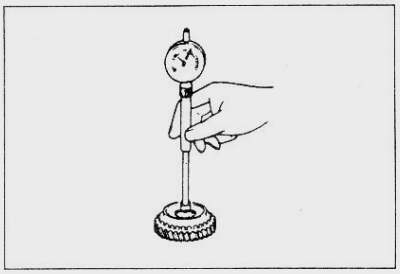
1. Inspect the shaft gear runout.

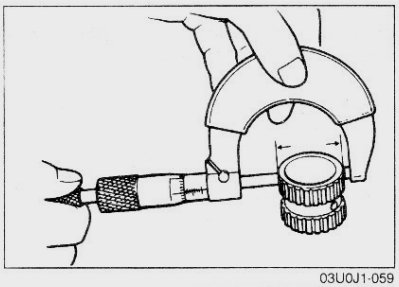
Maximum runout: 0.05mm (0.002 in)

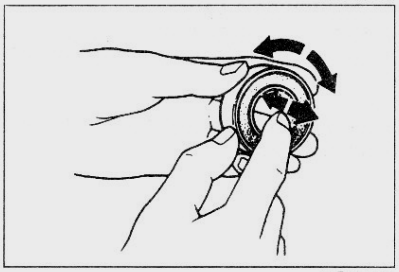
2. Inspect the splines for damage and wear.
3. Inspect the gear teeth for damage, wear, and cracks.

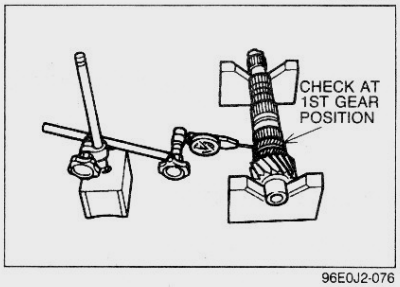


96E0J2-074




03U0J1-059


96E0J2-075



96E0J2-076

3rd Gear, 4th Gear, 5th Gear, and Gear Sleeve (5th Gear)

1. Measure the clearance between the shaft gear and the gear.

Oil Clearance

mm (in)

	Shaft (Outer dia.)	Gear (Inner dia.)	Sleeve (Outer dia.)	Oil clearance
3rd	35.945—35.970 (1.415—1.416)	36.000—36.025 (1.417—1.418)	—	0.03—0.08 (0.001—0.003)
4th	30.945—30.970 (1.218—1.219)	31.000—31.025 (1.220—1.221)	—	
5th	—	34.000—34.025 (1.339—1.400)	33.945—33.970 (1.336—1.337)	

2. Inspect the synchronizer cones for wear.
3. Inspect the gear teeth for damage, wear, and cracks.

Clutch Release Bearing

Caution
- **The clutch release bearing is a sealed bearing and must no be washed in solvent.**

1. Turn the bearing while applying force in the axial direction. If the bearing sticks or has excessive resistance, replace it.

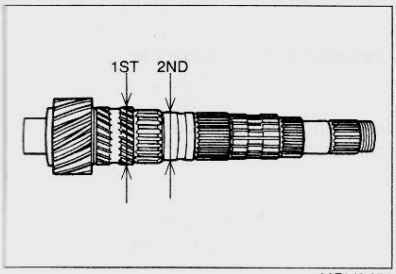
Secondary Shaft

Note
- **If the shaft gear is replaced, adjust the bearing preload adjustment. (Refer to page J2–56.)**

1. Inspect the shaft gear runout.

Maximum runout: 0.015mm (0.001 in)

2. Inspect the gear teeth for damage, wear, and cracks.



96E0J2-077

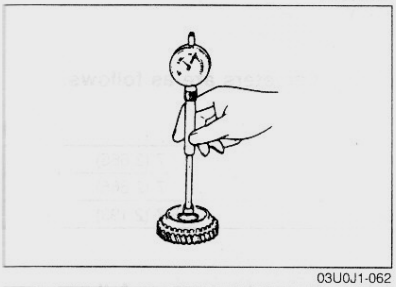
1st Gear and 2nd Gear

1. Measure the clearance between the shaft gear and the gear.

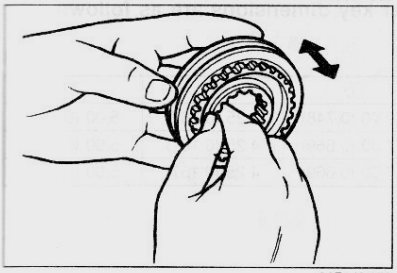
Oil Clearance

mm (in)

	Shaft (Outer dia.)	Gear (Inner dia.)	Oil clearance
1st	39.445—39.470 (1.553—1.554)	39.500—39.525 (1.555—1.556)	0.03—0.08 (0.001—0.003)
2nd	34.945—34.970 (1.376—1.377)	35.000—35.025 (1.378—1.379)	

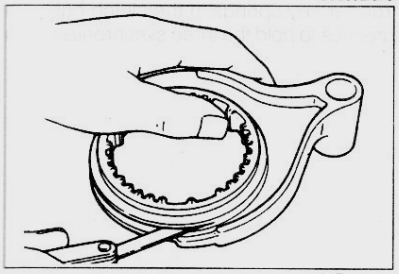

03U0J1-062

2. Inspect the synchronizer cones for wear.
3. Inspect the gear teeth for damage, wear, and cracks.


96E0J2-078

Clutch Hub Assembly

1. Inspect the clutch hub sleeve and hub operation.
2. Inspect the gear teeth for damage, wear, and cracks.
3. Inspect the synchronizer keys for damage, wear, and cracks.


96E0J2-079

4. Measure the clearance between the hub sleeve and the shift fork.

Clearance

mm (in)

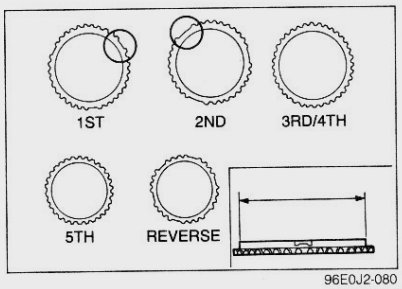
	Standard	Maximum
1st/2nd	0.10—0.40 (0.004—0.016)	0.9 (0.035)
3rd/4th	0.10—0.40 (0.004—0.016)	0.9 (0.035)
5th/Rev.	0.10—0.40 (0.004—0.016)	0.9 (0.035)

ASSEMBLY

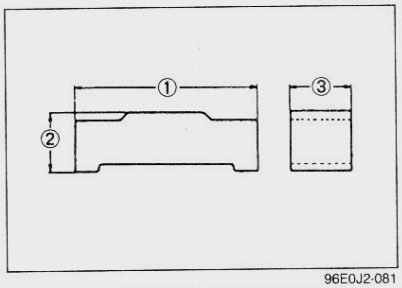
Precaution

1. All O-rings and gaskets must be replaced with the new ones included in the overhaul kit.
2. Verify that all parts are completely clean before assembly.
3. Assemble parts within 10 minutes after applying sealant.
   Allow all sealant to cure at least 30 minutes after assembly before filling the transaxle with transaxle oil.
4. The bearing outer race and bearing inner race must be replaced as a unit.

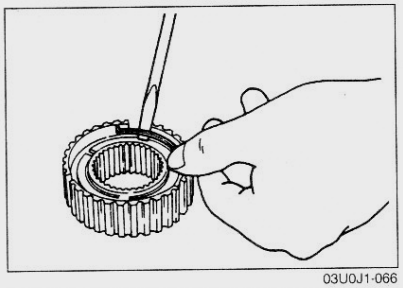
03U0J1-063



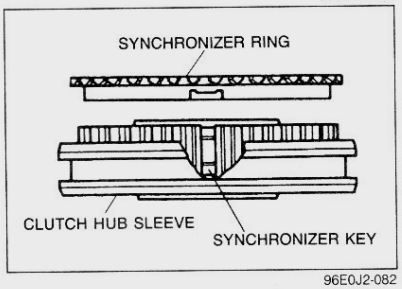
96E0J2-080



96E0J2-081



03U0J1-066



96E0J2-082

Clutch hub assembly

Note

- **Synchronizer ring diameters are as follows.**

mm (in)

1st and 2nd	67.7 (2.665)
3rd and 4th	67.7 (2.665)
5th/Reverse	55.7 (2.193)

- **Synchronizer key dimensions are as follows.**

mm (in)

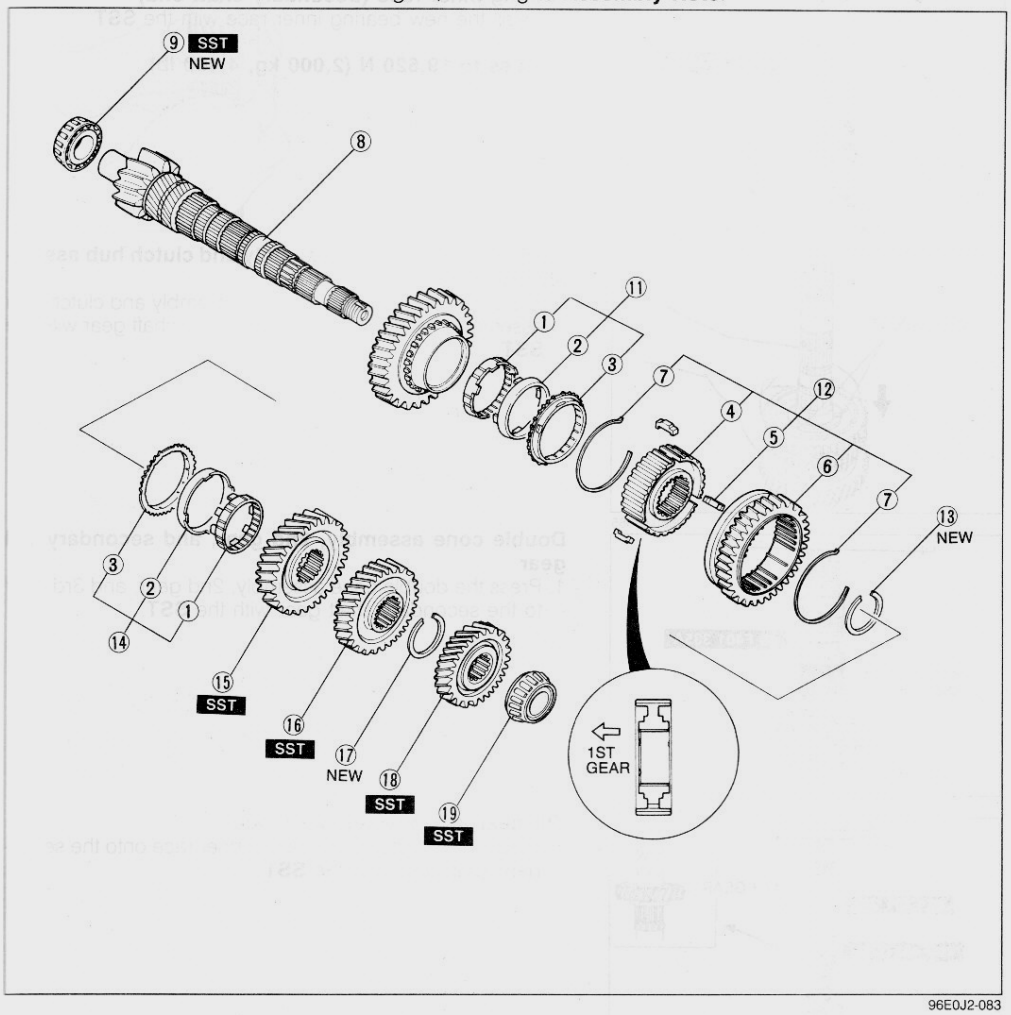
	①	②	③
1st/2nd	19.00 (0.748)	4.25 (0.167)	5.00 (0.197)
3rd/4th	17.00 (0.669)	4.25 (0.167)	5.00 (0.197)
5th/Reverse	17.00 (0.669)	4.25 (0.167)	5.00 (0.197)

1. Install the synchronizer key springs in the clutch hub with the hooks in the grooves to hold the three synchronizer keys in place.

2. Align the synchronizer ring grooves with the synchronizer keys during assembly.

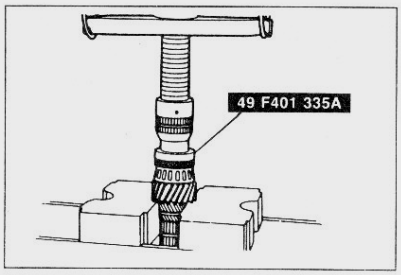
Secondary Shaft Assembly

1. Assemble in the order shown in the figure, referring to **Assembly Note**.



96E0J2-083

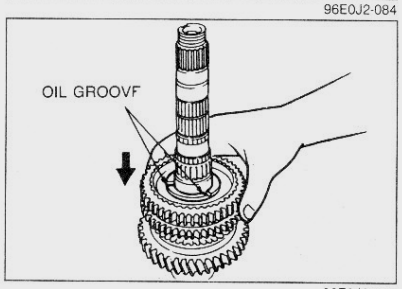
1. Inner cone
2. Double cone
3. Synchronizer ring
4. Clutch hub (1st/2nd)
5. Synchronizer key
6. Clutch hub sleeve (1st/2nd)
7. Synchronizer key spring
8. Secondary shaft
9. Bearing inner race
   Assembly Note..... page J2–48
10. 1st gear
11. Double cone assembly
    Assembly Note..... page J2–48
12. Clutch hub assembly (1st/2nd)
    Assembly Note..... page J2–48
13. Retaining ring
14. Double cone assembly
    Assembly Note..... page J2–48
15. 2nd gear
    Assembly Note..... page J2–48
16. 3rd gear
    Assembly Note..... page J2–48
17. Retaining ring
18. 4th gear
    Assembly Note..... page J2–48
19. Bearing inner race
    Assembly Note..... page J2–48



96E0J2-084

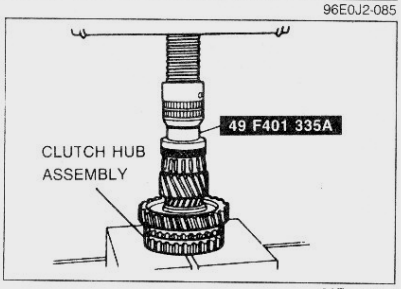
Assembly note
Bearing inner race (Secondary shaft end)
1. Install the new bearing inner race with the **SST**.

Press to 19,620 N (2,000 kg, 4,400 lb)



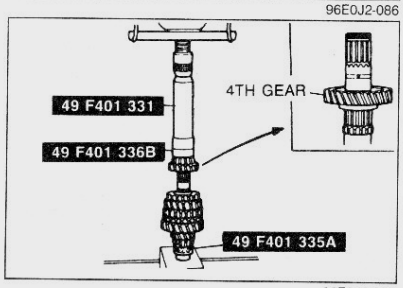
96E0J2-085

1st gear, double cone assembly and clutch hub assembly (1st/2nd)
1. Press the 1st gear, double cone assembly and clutch hub assembly (1st/2nd) onto the secondary shaft gear with the **SST**.



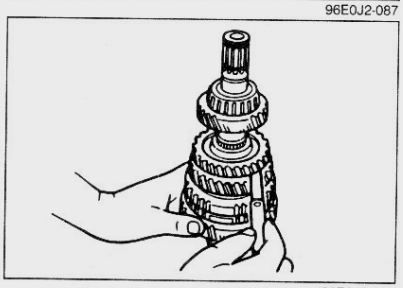
96E0J2-086

Double cone assembly, 2nd gear, and secondary 3rd gear
1. Press the double cone assembly, 2nd gear, and 3rd gear to the secondary shaft gear with the **SST**.



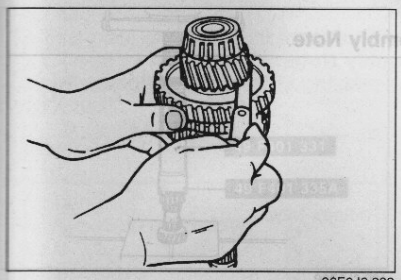
96E0J2-087

4th gear and bearing inner race
1. Press the 4th gear and bearing inner race onto the secondary shaft gear with the **SST**.


96E0J2-088

2. Measure the clearance between the 2nd gear and 3rd gear.

Clearance: 0.175—0.455mm (0.0069—0.0179 in)
Maximum : 0.505mm (0.0199 in)



96E0J2-089

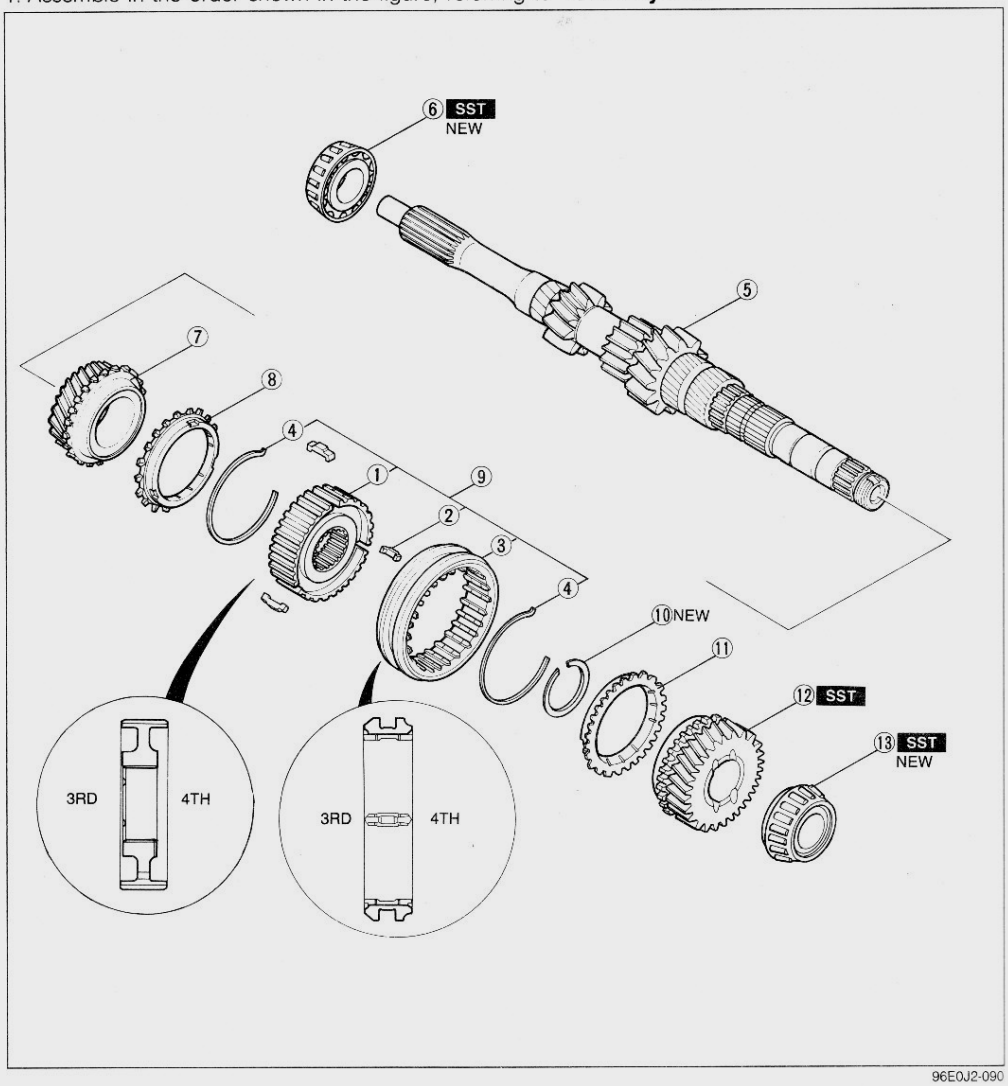
3. Measure the clearance between the 1st gear and differential drive gear.

Clearance: 0.05—0.28mm (0.002—0.011 in)
Maximum : 0.33mm (0.0130 in)

4. If not as specified, reassemble the secondary shaft assembly.

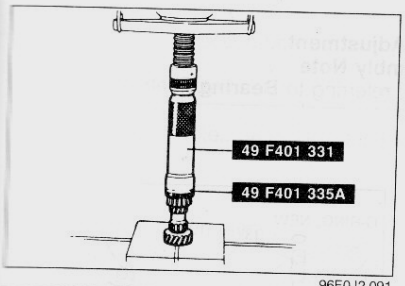
Primary Shaft Assembly

1. Assemble in the order shown in the figure, referring to **Assembly Note**.



96E0J2-090

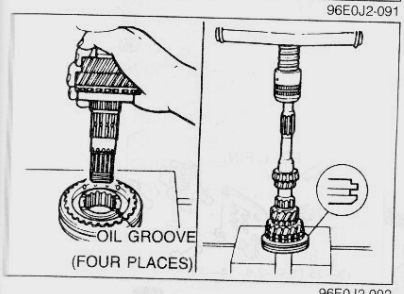
1. Clutch hub (3rd/4th)
2. Synchronizer key
3. Clutch hub sleeve (3rd/4th)
4. Synchronizer key spring
5. Primary shaft
6. Bearing inner race (1st gear)
   Assembly Note..... page J2–51
7. 3rd gear
   Assembly Note..... page J2–51
8. Synchronizer ring
   Assembly Note..... page J2–51
9. Clutch hub assembly (3rd/4th)
   Assembly Note..... page J2–51
10. Retaining ring
11. Synchronizer ring
    Assembly Note..... page J2–51
12. 4th gear
    Assembly Note..... page J2–51
13. Bearing inner race (4th gear)
    Assembly Note..... page J2–51



96E0J2-091

Assembly note
Bearing inner race (1st gear)
1. Press on the new bearing inner race with the **SST**.

Press to 19,620 N (2,000 kg, 4,400 lb)



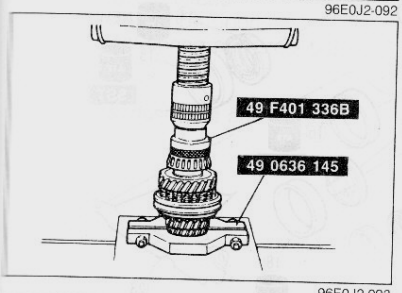
96E0J2-092

3rd gear, synchronizer ring (3rd), and clutch hub assembly (3rd/4th)

Caution
- **Apply transaxle oil to the bore of 3rd gear.**

1. Turn the primary shaft over and press on the 3rd gear, synchronizer ring (3rd), and clutch hub assembly (3rd/4th).

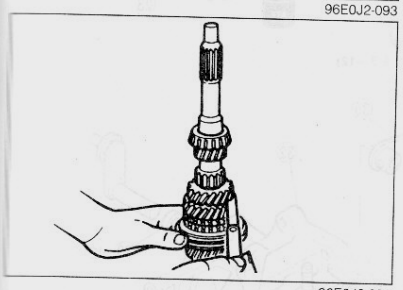
Press to 19,620 N (2,000 kg, 4,400 lb)



96E0J2-093

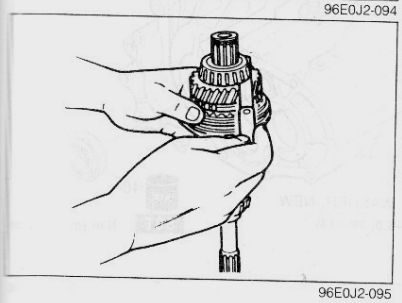
Synchronizer ring (4th), 4th gear, and bearing
1. Install the retaining ring.
2. Press on the synchronizer ring (4th), 4th gear, and ball bearing.

Press to 19,620 N (2,000 kg, 4,400 lb)


96E0J2-094

3. Measure the clearance between the 3rd gear and 2nd gear.

Clearance: 0.05—0.20mm (0.002—0.008 in)
Maximum : 0.25mm (0.010 in)


96E0J2-095

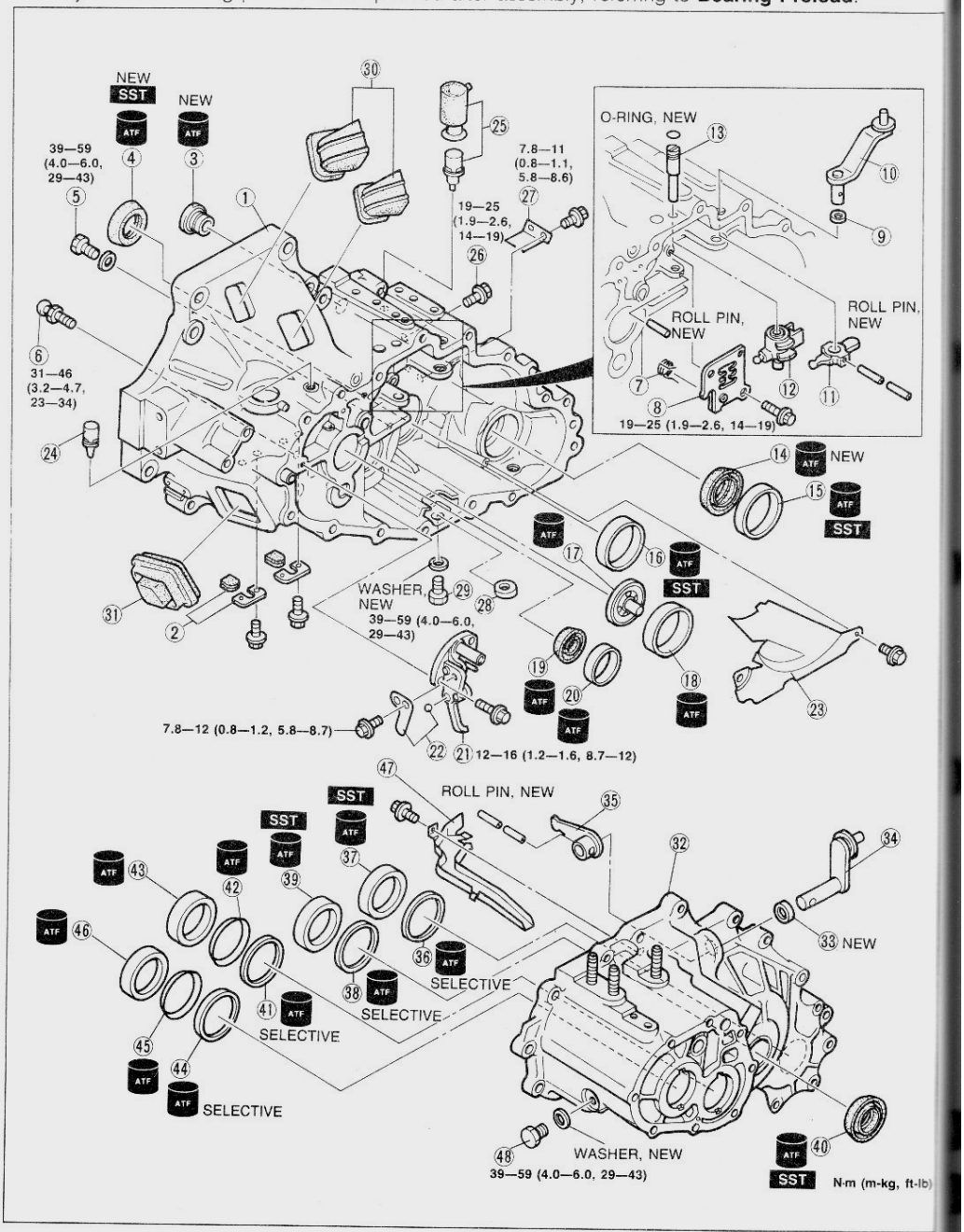
4. Measure the clearance between the 4th gear and bearing inner race.

Clearance: 0.17—0.37mm (0.007—0.015 in)
Maximum : 0.42mm (0.017 in)

5. If not as specified, reassemble the primary shaft assembly.

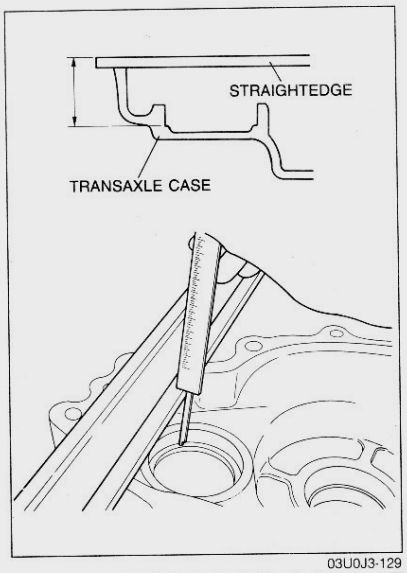
Clutch Housing and Transaxle Case Components

1. Select the adjustment shim(s), referring to **Bearing Preload Adjustment**.
2. Assemble in the order shown in the figure, referring to **Assembly Note**.
3. Verify that the bearing preload is as specified after assembly, referring to **Bearing Preload**.

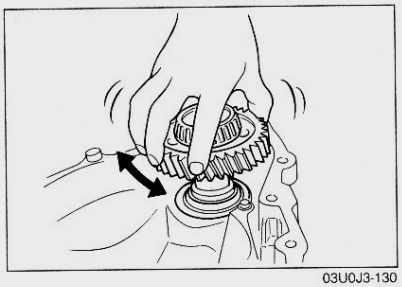


1. Clutch housing
2. Seal plate and seal rubber
3. Oil seal
   Assembly Note..... page J2–62
4. Oil seal
   Assembly Note..... page J2–62
5. Plug
6. Pivot
7. Spring
8. Base plate assembly
9. Oil seal
10. Select lever
11. Inner shift lever
12. Crank lever
13. Crank lever shaft
14. Oil seal
15. Bearing outer race
    Assembly Note..... page J2–62
16. Bearing outer race
    Assembly Note..... page J2–62
17. Funnel
18. Bearing outer race
19. Oil seal
20. Bearing outer race
21. Reverse lever support
22. Lever set spring and steel ball
23. Baffle
24. Bleeder
25. Bleeder dust boot and bleeder
26. Bolt
27. Baffle
28. Magnet
29. Plug
30. Ventilator cover
31. Dust cover
32. Transaxle case
33. Oil seal
34. Select lever
35. Inner select lever
36. Adjustment shim
37. Bearing outer race
    Assembly Note..... page J2–62
38. Adjustment shim
39. Bearing outer race
    Assembly Note..... page J2–62
40. Oil seal
    Assembly Note..... page J2–62
41. Adjustment shim
42. Diaphragm spring
    Assembly Note..... page J2–62
43. Bearing outer race
44. Adjustment shim
45. Diaphragm spring
    Assembly Note..... page J2–62
46. Bearing outer race
47. Oil passage
48. Plug

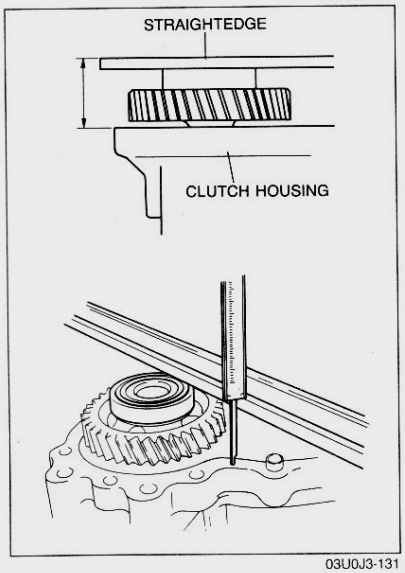
96E0J2-097



03U0J3-129



03U0J3-130



03U0J3-131

Idler gear adjustment shim selection

Note
- **Measure at three locations and average the reading.**

1. Place a straightedge on the transaxle case.
2. Measure the depth on the bearing outer race bore.

3. Set the idler gear assembly into the clutch housing.
4. Turn the idler gear assembly to seat the bearing.
5. Install the bearing outer race to the idler gear assembly.

6. Measure from the top of the bearing outer race to the clutch housing.

Adjust shim thickness	mm (in)
0.10 (0.003)	0.20 (0.008)
0.25 (0.010)	0.30 (0.012)
0.35 (0.014)	0.40 (0.016)
0.45 (0.018)	0.50 (0.020)
0.55 (0.022)	0.60 (0.024)
0.65 (0.026)	0.70 (0.028)
0.75 (0.030)	0.80 (0.032)
0.85 (0.034)	0.90 (0.035)
0.95 (0.037)	1.00 (0.039)
1.05 (0.041)	1.10 (0.043)
1.15 (0.045)	1.20 (0.047)

03U0J3-132

Caution
- **The number of shims used must not exceed two.**

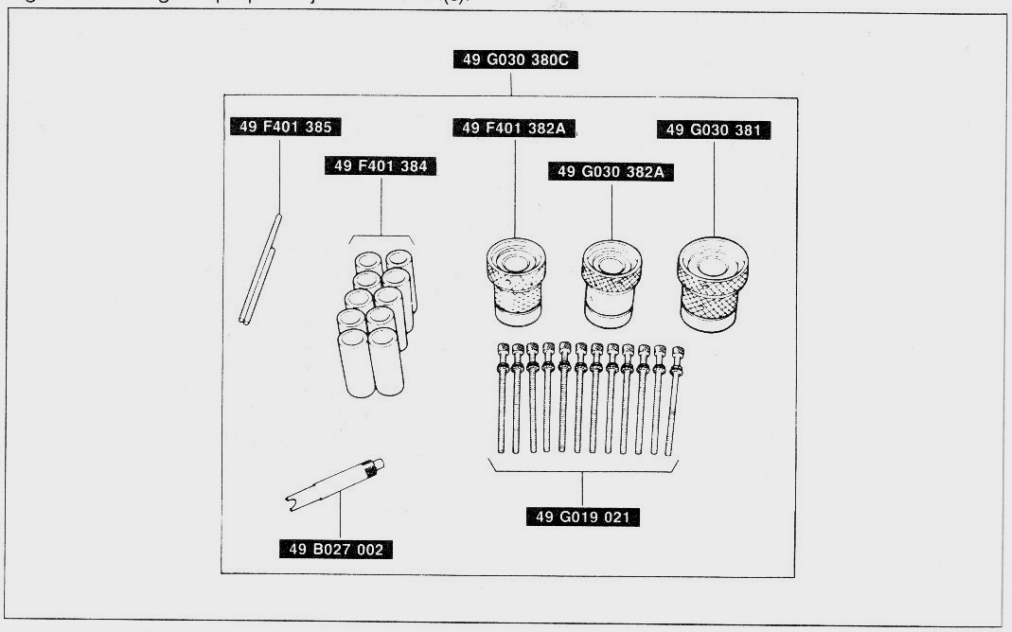
7. Select the shim as follows.
   (a) Subtract the bearing height (Step 6) from the depth of the bearing bore (Step 2).
   (b) Add 0.17mm (0.0067 in) to (a).
   (c) Add 0.22mm (0.0087 in) to (a).
   (d) Select the shim in the range between (b) and (c) from the table.

Example:
Depth of bearing bore: 52.00mm (2.0472 in)
Bearing height: 51.50mm (2.0276 in)
(a) 52.00mm (2.0472 in) – 51.50mm (2.0276 in) = 0.50mm (0.0196 in)
(b) 0.50mm (0.0196 in) + 0.17mm (0.0067 in) = 0.67mm (0.0263 in)
(c) 0.50mm (0.0196 in) + 0.22mm (0.0087 in) = 0.72mm (0.0283 in)
(d) Select the 0.70mm (0.0276 in) shim.

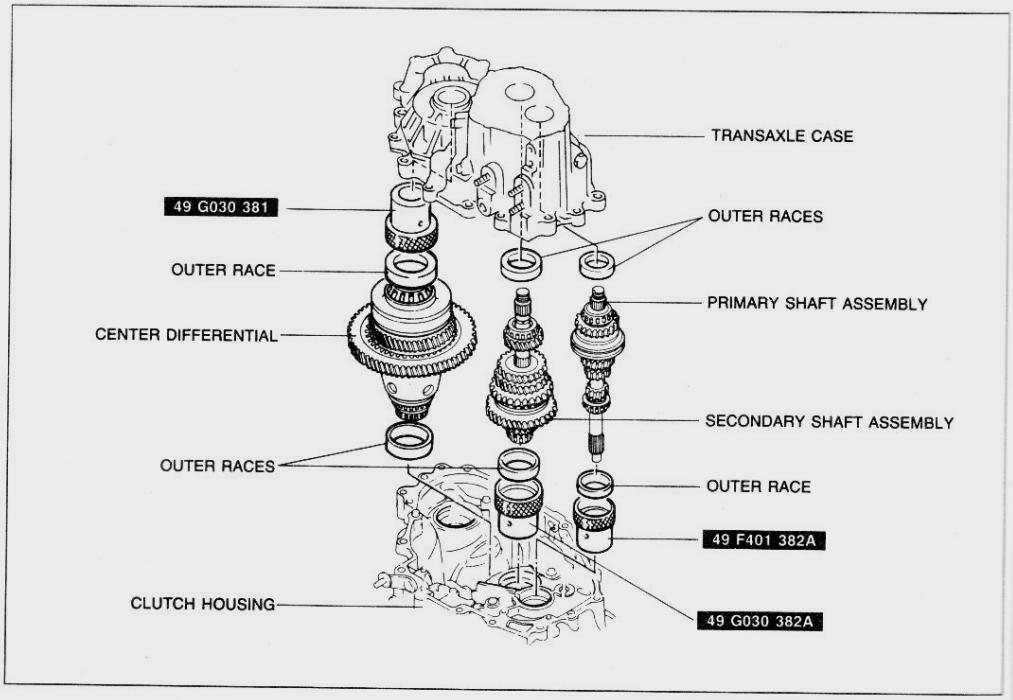
96E0J2-098

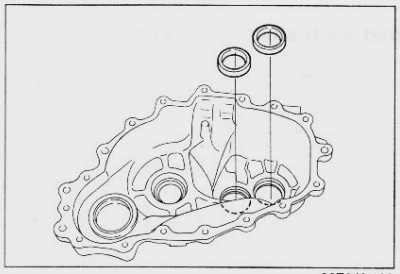
Bearing preload adjustment

Adjust the bearing preload of the primary shaft, secondary shaft, and front and center differential by selecting and installing the proper adjustment shim(s).



96E0J2-099

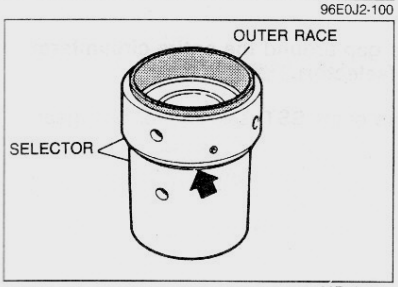




96E0J2-100

Primary and secondary shaft gear

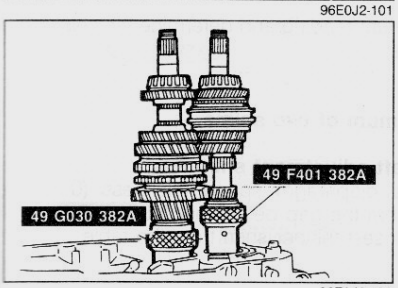
1. Install the primary and secondary shaft bearing outer races into the transaxle case (shims and diaphragm spring removed).
2. Mount the clutch housing onto the transaxle hanger.



96E0J2-101

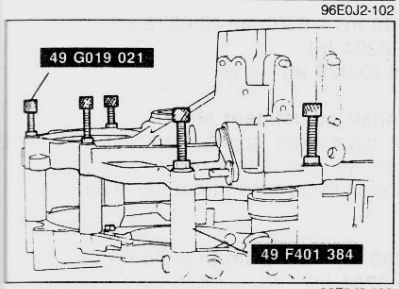
3. Set the outer races into the **SST**.

Note
- **Turn the selector to eliminate the gap indicated by the arrow in the figure.**



96E0J2-102

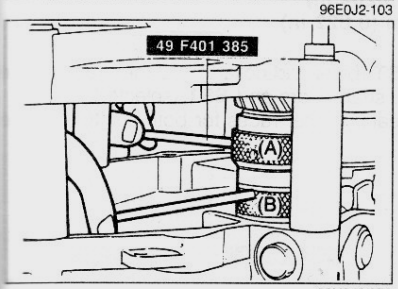
4. Set the **SST** (selector) in place.
5. Set the primary and secondary shaft gear assemblies onto the **SST** (selector).



96E0J2-103

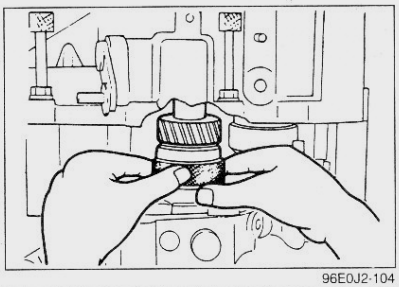
6. Set the **SST** (collars) between the transaxle case and the clutch housing, and install the **SST** (bolts), and tighten to the specified torque.

Tightening torque:
37—52 N·m (3.8—5.3 m-kg, 27—38 ft-lb)



03U0J2-072

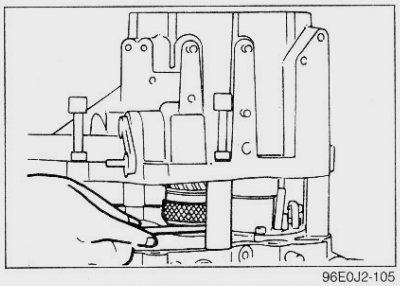
7. To seat the bearings, mount the **SST** (bars) on parts Ⓐ and Ⓑ of the selector, and turn the selector so the gaps are widened.
   Then turn the **SST** in the reverse direction until the gaps are eliminated.



96E0J2-104

Note
- **Make sure that each shaft turns smoothly.**

8. Manually expand the **SST** (selector) for both shafts until the **SST** (selector) no longer turns.



96E0J2-105

Note
- **Measure the gap around the entire circumference of the SST (selector).**

9. Measure the gap of the **SST** (selector) for both gears.

Thickness mm (in)
0.20 (0.008)
0.25 (0.010)
0.30 (0.012)
0.35 (0.014)
0.40 (0.016)
0.45 (0.018)
0.50 (0.020)
0.55 (0.022)
0.60 (0.024)
0.65 (0.026)
0.70 (0.028)

96E0J2-106

10. Take the maximum reading and determine the shim to be used as follows:

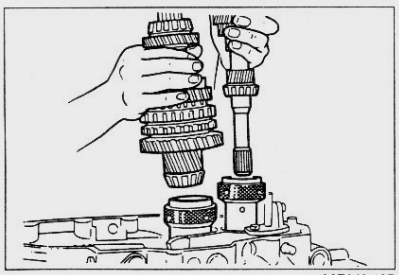
Note
- **Use a maximum of two shims.**

<Primary shaft adjustment shim>
- Subtract the diaphragm spring thickness (0.70mm, 0.0276 in) from the gap determined in Step 9.
- Select the closest thinner shim from the table.

Example
1.22mm (0.0480 in) – 0.70mm (0.0276 in)
= 0.52mm (0.0204 in)
Shim: 0.50mm (0.020 in)

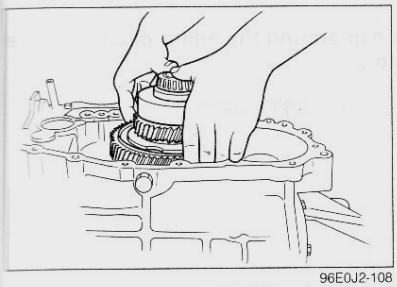
<Secondary shaft adjustment shim>
- Subtract the diaphragm spring thickness (0.70mm, 0.0276 in) from the gap determined in Step 9.
- Select the closest thicker shim from the table.

Example
1.22mm (0.0480 in) – 0.70mm (0.0276 in)
= 0.52mm (0.0204 in)
Shim: 0.55mm (0.022 in)



96E0J2-107

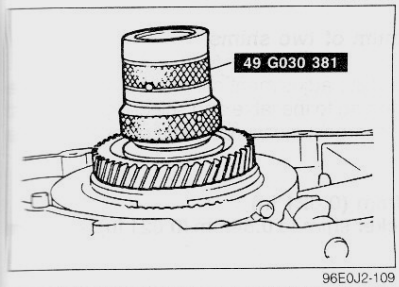
11. Remove the **SST** (bolts and collars) and then remove the transaxle case, shaft gears and **SST** (selector).
12. Remove the bearing outer races for both shafts from the transaxle case.



96E0J2-108

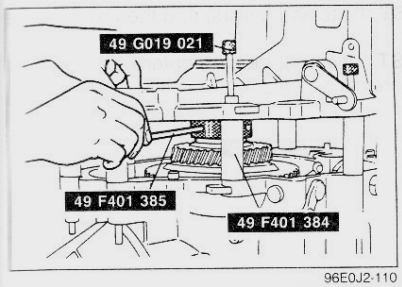
Front and center differential

1. Install the bearing outer race with the **SST**.



96E0J2-109

1. Install the front and center differential and bearing outer race *into the clutch housing.*
2. Set the **SST** (selector) in place.

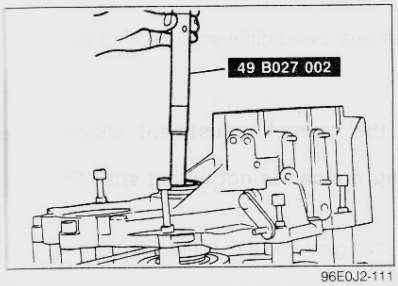


96E0J2-110

3. Set the **SST** (collars) between the transaxle case and the clutch housing, and install the **SST** (bolts), and tighten to the specified torque.

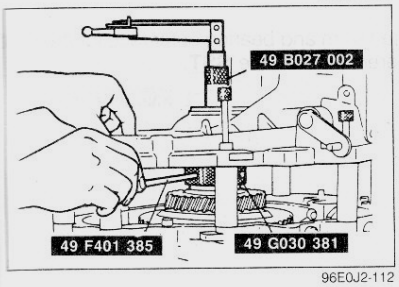
   Tightening torque:
   37—52 N·m (3.8—5.3 m-kg, 27—38 ft-lb)

4. To seat the bearings turn the **SST** (bar) so the gap is widened.



96E0J2-111

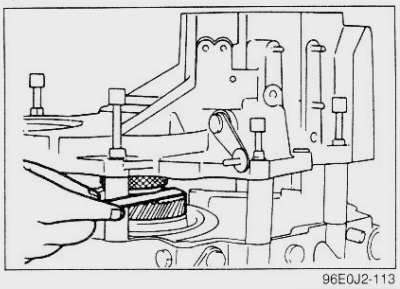
5. Insert the **SST** (preload adaptor).



96E0J2-112

6. Expand the **SST** (selector) until the specified preload is obtained.

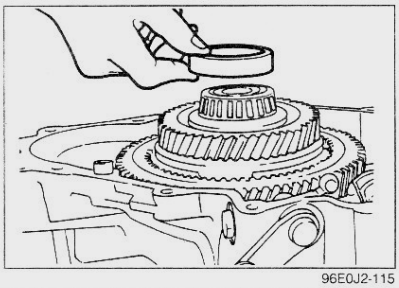
   Preload:
   2.9—3.9 N·m (30—40 cm-kg, 26—35 in-lb)



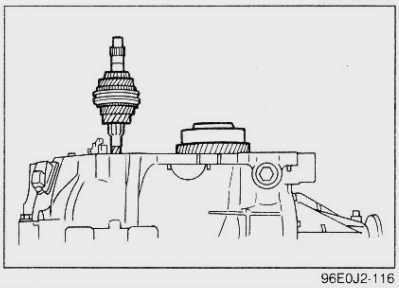
96E0J2-113

Thickness	mm (in)
0.10 (0.004)	0.70 (0.028)
0.20 (0.008)	0.75 (0.030)
0.25 (0.010)	0.80 (0.031)
0.30 (0.012)	0.85 (0.033)
0.35 (0.014)	0.90 (0.035)
0.40 (0.016)	0.95 (0.037)
0.45 (0.018)	1.00 (0.039)
0.50 (0.020)	1.05 (0.041)
0.55 (0.022)	1.10 (0.043)
0.60 (0.024)	1.15 (0.045)
0.65 (0.026)	1.20 (0.047)

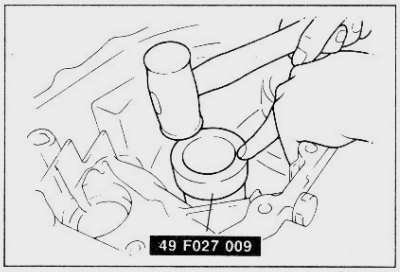
96E0J2-114



96E0J2-115



96E0J2-116



96E0J2-117

Note
- **Measure the gap around the entire circumference of the selector.**

7. Measure the gap in the **SST** (selector).

Note
- **Use a maximum of two shims.**

8. Select an appropriate adjustment shim to be used for the differential by referring to the table and selecting the closest thicker shim to the largest measured value of the gap in the **SST** (selector).

Example: 0.54mm (0.021 in)
The closest thicker shim to 0.54mm (0.021 in) is 0.6mm (0.014 in).

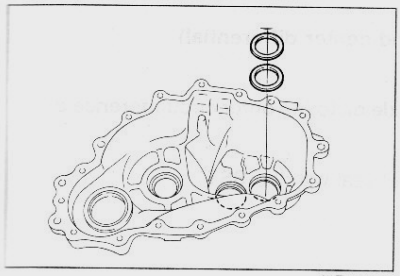
9. Remove the **SST** (bolts and collars) and then remove the transaxle case.
10. Remove the **SST** (selector), bearing outer race and front and center differential.

Bearing preload
Verify that the shaft gears and differential bearing preload is correct.

Note
- **Verify that the correct adjustment shims were selected.**
- **If the bearing preload is not within specification, readjust.**

1. Set the primary shaft gear and the differential into the clutch housing.

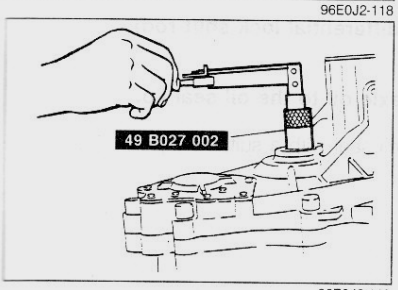
2. Install the selected shim and bearing outer race for the front and center differentials with the **SST**.



96E0J2-118

3. Install the selected shim, diaphragm spring and bearing outer race for the primary shaft.
4. Install the transaxle case, and tighten to the specified torque.

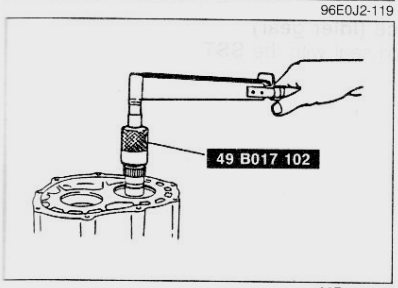
Tightening torque:
37—52 N·m (3.8—5.5 m-kg, 27—38 ft-lb)



96E0J2-119

5. Install the **SST** through the driveshaft opening.
6. Hook a spring scale to the attachment and measure the preload.

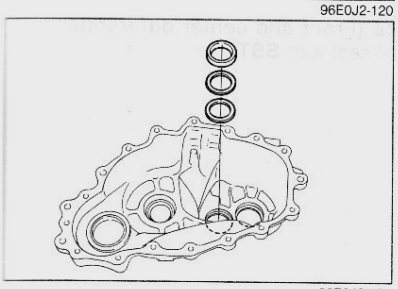
Preload: 2.9—3.9 N·m (30—40 cm-kg, 26—35 in-lb)



96E0J2-120

7. Remove the **SST**.
8. With the transaxle facing in the direction shown in the figure, install the **SST** to the primary shaft gear.
9. Measure the preload.

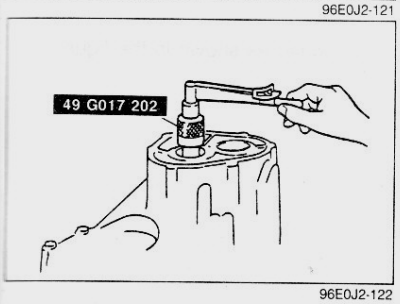
Preload:
0.1—0.25 N·m (1.0—2.5 cm-kg, 0.87—2.18 in-lb)



96E0J2-121

10. Remove the **SST**, transaxle case, primary shaft gear and differential.
11. Install the secondary shaft gear and transaxle case, then tighten to the specified torque.

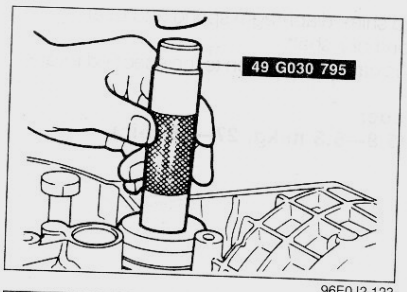
Tightening torque:
37—52 N·m (3.8—5.5 m-kg, 27—38 ft-lb)



96E0J2-122

12. Measure the secondary shaft preload with the **SST**.

Preload:
0.29—0.42 N·m (3.0—4.3 cm-kg, 2.6—3.7 in-lb)

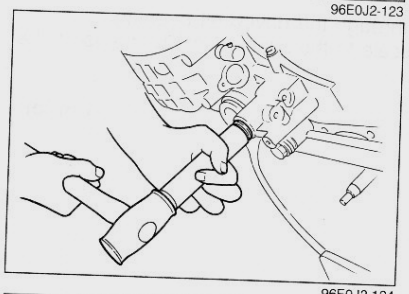


96E0J2-123

Assembly note
Oil seal (Front and center differential)

Caution
- **Apply transaxle oil to the outer circumference of the oil seal.**

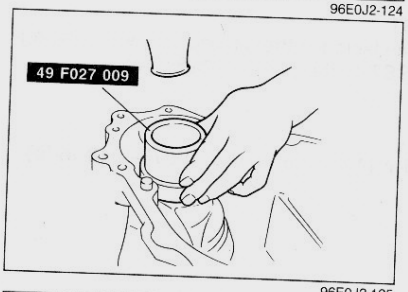
1. Install the new oil seal with the **SST**.


96E0J2-124

Oil seal (Center differential lock shift rod)

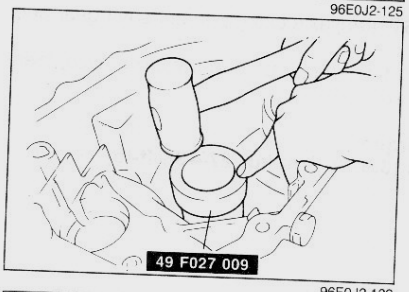
Caution
- **Apply transaxle oil to the oil seal lip.**

1. Install the new oil seal with a suitable pipe.



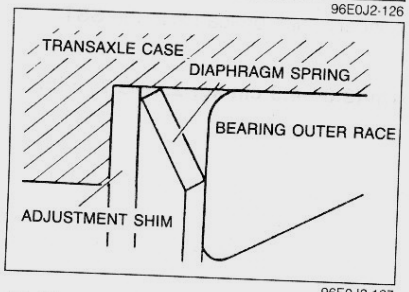
96E0J2-125

Bearing outer race (Idler gear)
1. Install the new oil seal with the **SST**.



96E0J2-126

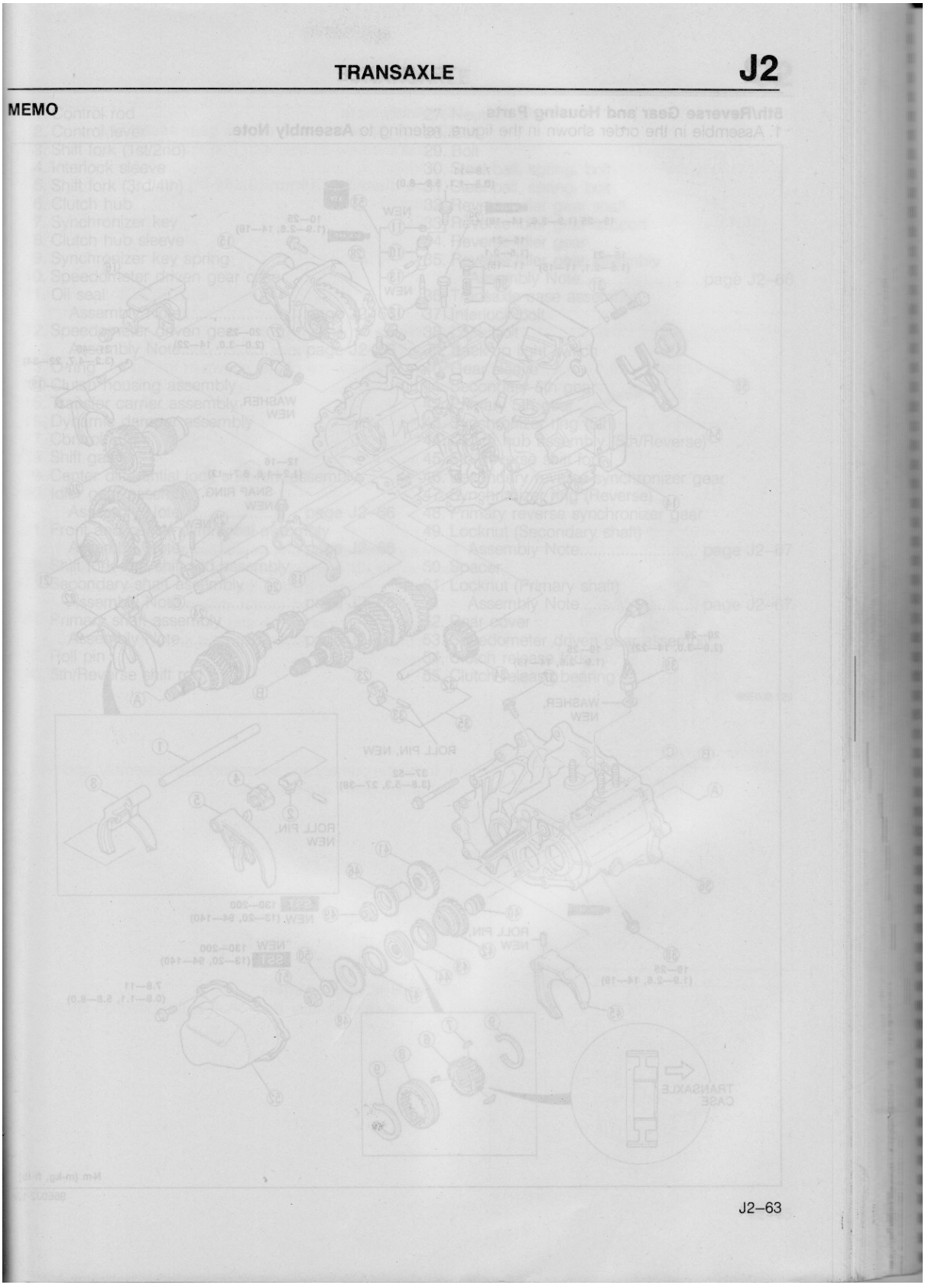
Bearing outer race (Front and center differential)
1. Install the new oil seal with **SST**.



96E0J2-127

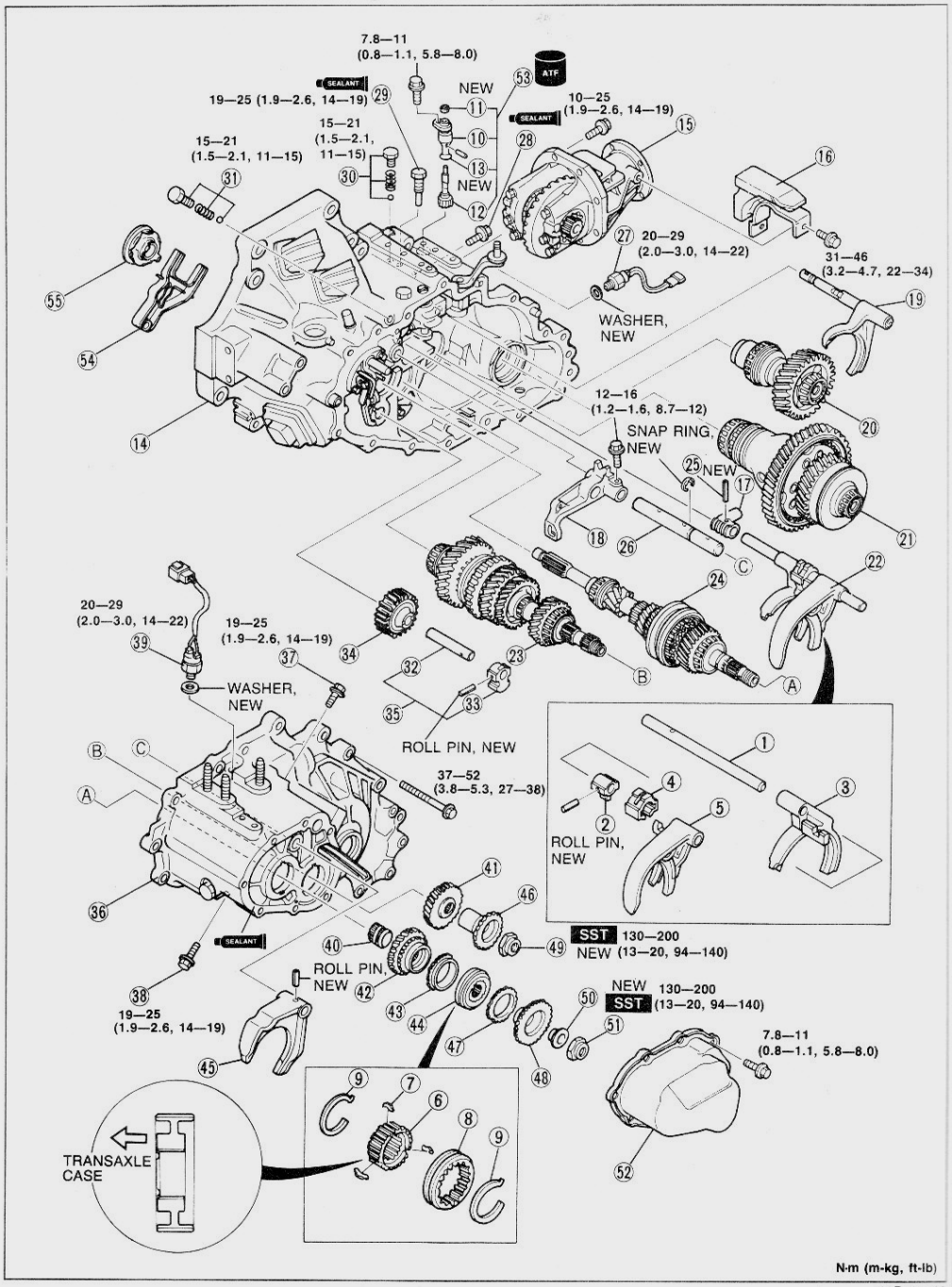
Diaphragm spring
1. Install the diaphragm spring as shown in the figure.

MEMO



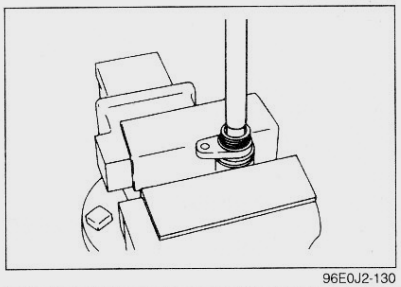
5th/Reverse Gear and Housing Parts

1. Assemble in the order shown in the figure, referring to **Assembly Note**.



1. Control rod
2. Control lever
3. Shift fork (1st/2nd)
4. Interlock sleeve
5. Shift fork (3rd/4th)
6. Clutch hub
7. Synchronizer key
8. Clutch hub sleeve
9. Synchronizer key spring
10. Speedometer driven gear case
11. Oil seal
    Assembly Note..... page J2–66
12. Speedometer driven gear
    Assembly Note..... page J2–66
13. O-ring
14. Clutch housing assembly
15. Transfer carrier assembly
16. Dynamic damper assembly
17. Control end
18. Shift gate
19. Center differential lock shift fork assembly
20. Idler gear assembly
    Assembly Note..... page J2–66
21. Front and center differential assembly
    Assembly Note..... page J2–66
22. Shift fork and shift rod assembly
23. Secondary shaft assembly
    Assembly Note..... page J2–66
24. Primary shaft assembly
    Assembly Note..... page J2–66
25. Roll pin
26. 5th/Reverse shift rod
27. Neutral switch
28. Bolt
29. Bolt
30. Steel ball, spring, bolt
31. Steel ball, spring, bolt
32. Reverse idler gear shaft
33. Reverse idler gear support
34. Reverse idler gear
35. Reverse idler gear assembly
    Assembly Note..... page J2–66
36. Transaxle case assembly
37. Interlock bolt
38. Lock bolt
39. Back-up light switch
40. Gear sleeve
41. Secondary 5th gear
42. Primary 5th gear
43. Synchronizer ring (5th)
44. Clutch hub assembly (5th/Reverse)
45. 5th/Reverse shift fork
46. Secondary reverse synchronizer gear
47. Synchronizer ring (Reverse)
48. Primary reverse synchronizer gear
49. Locknut (Secondary shaft)
    Assembly Note..... page J2–67
50. Spacer
51. Locknut (Primary shaft)
    Assembly Note..... page J2–67
52. Rear cover
53. Speedometer driven gear assembly
54. Clutch release fork
55. Clutch release bearing

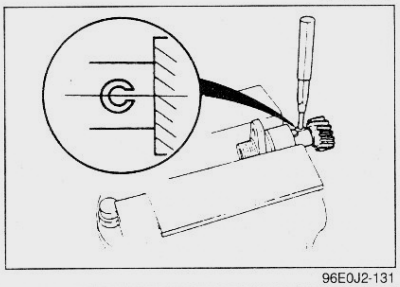
96E0J2-129



96E0J2-130

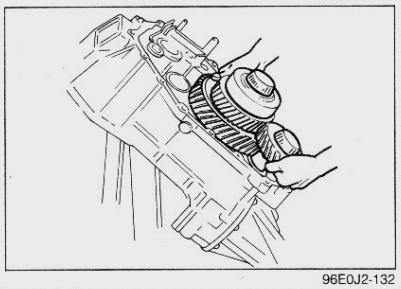
Assembly note
Oil seal (Speedometer driven gear assembly)
1. Install the new oil seal with a suitable pipe.

Pipe diameter: 16mm (0.630 in)



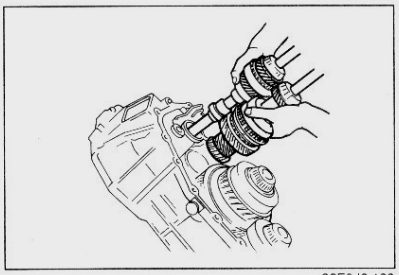
96E0J2-131

Speedometer driven gear
1. Install the speedometer driven gear.
2. Install the new roll pin as shown in the figure.



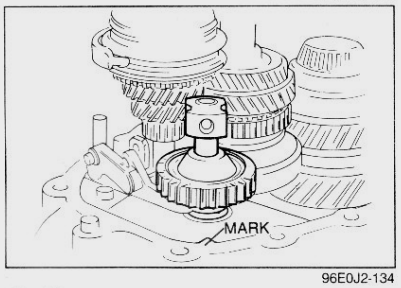
96E0J2-132

Primary shaft assembly, secondary shaft assembly, front and center differential assembly and idler gear assembly
1. Tilt the transaxle toward the transfer carrier side.
2. Install the front and center differential assembly, center differential lock shift fork and idler gear.
3. Lift the front and center differential and idle gear a few centimeters (inches).



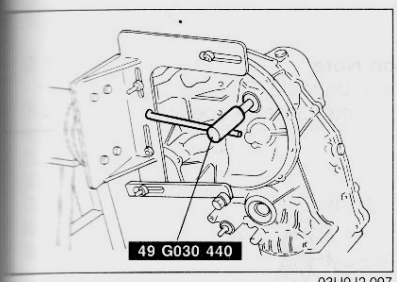
96E0J2-133

4. Install the primary and secondary shaft assembly, and verify that the gears are meshed.

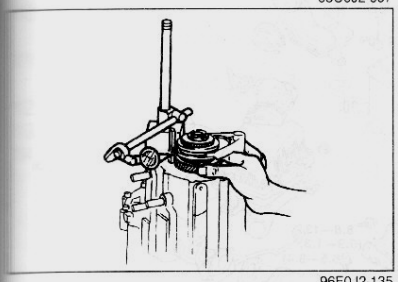


96E0J2-134

Reverse idler gear shaft
1. Set the reverse idler gear shaft in the direction shown.



03U0J2-097



96E0J2-135

Locknut

1. Shift to 1st gear.
2. Lock the primary shaft with the **SST**.
3. Tighten new locknuts on the primary and secondary shafts.

   Tightening torque:
   128—196 N·m (13.0—20.0 m-kg, 94—145 ft-lb)

4. Stake the locknuts.

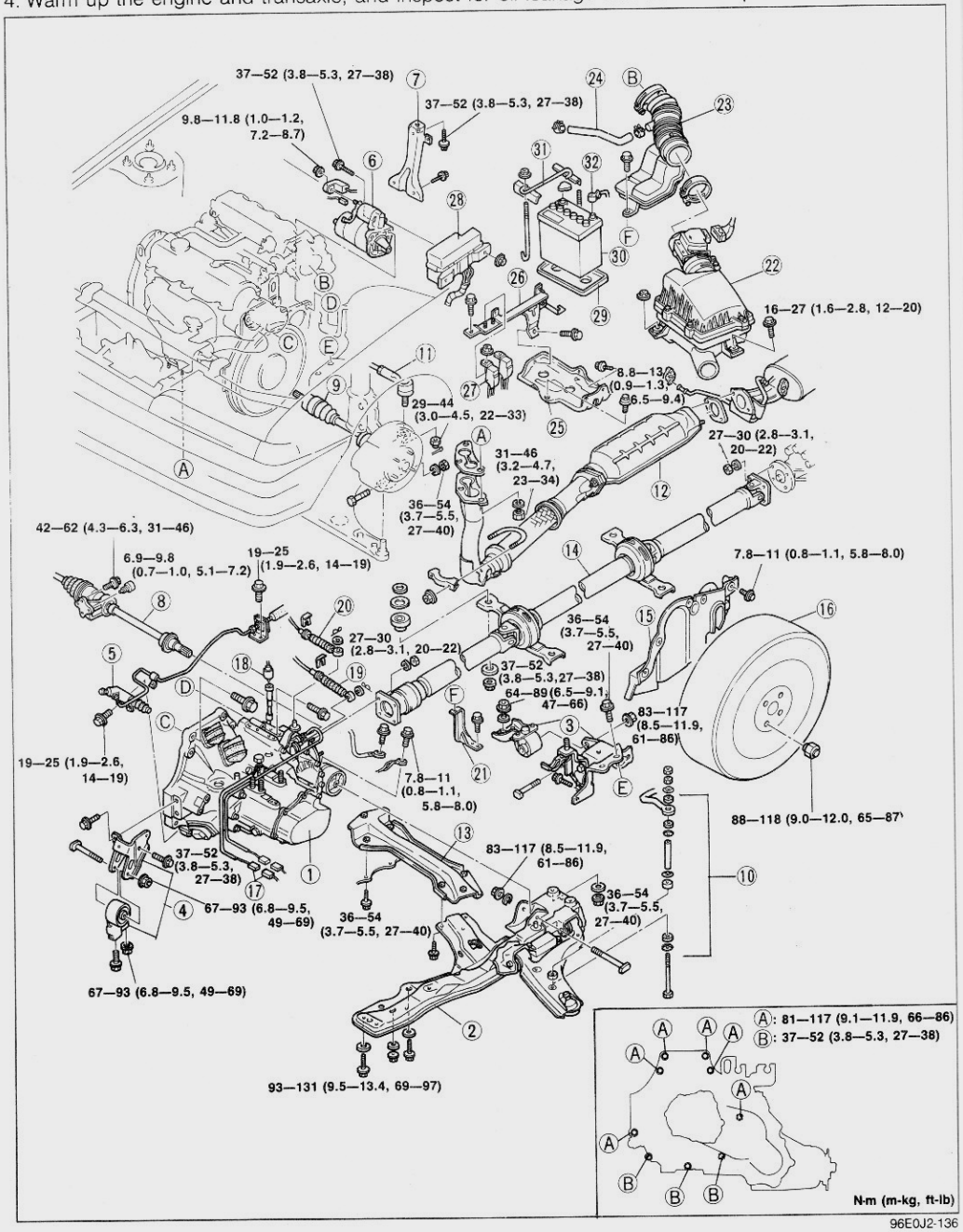
5. Measure the 5th gear thrust clearance with a dial indicator.

   Clearance: 0.10—0.22mm (0.004—0.009 in)
   Maximum : 0.27mm (0.011 in)

6. If not as specified, reassemble the transaxle.

INSTALLATION

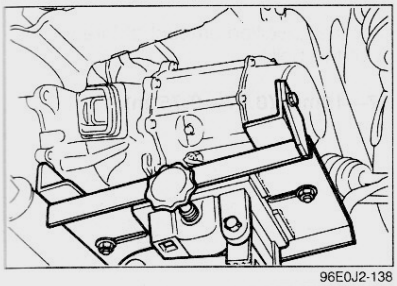
1. Raise the vehicle and support it with safety stands.
2. Install in the order shown in the figure, referring to **Installation Note**.
3. Add the specified amount of the specified transaxle oil. (Refer to page J2–22.)
4. Warm up the engine and transaxle, and inspect for oil leakage and transaxle operation.



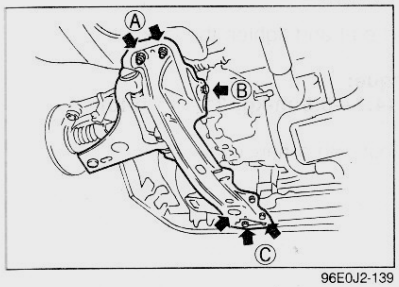
96E0J2-136

1. Transaxle
   Installation Note ..... below
2. Frame
   Installation Note ..... below
3. Engine mount No.4
4. Engine mount No.2
5. Clutch release cylinder
6. Starter
7. Bracket
8. Jointshaft
9. Driveshaft
   Installation Note ..... page J2–70
10. Stabilizer
    Installation Note ..... page J2–70
11. Tie-rod end
    Installation Note ..... page J2–70
12. Exhaust pipe
13. Rear member
14. Propeller shaft
    Installation Note ..... page J2–71
15. Splash shield
16. Wheel and tire
17. Connectors
18. Speedometer cable
19. Select cable
20. Shift cable
21. Bracket
22. Air cleaner
23. Air hose
24. Hose
25. Battery carrier
26. Bracket
27. Relay
28. Main fuse block
29. Battery tray
30. Battery
31. Battery clamp
32. Negative battery cable

96E0J2-137



96E0J2-138

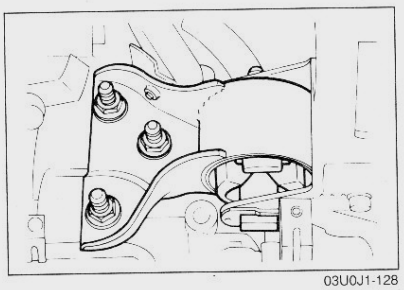


96E0J2-139

Installation Note
Transaxle
1. Set the transaxle on a jack and lift it into place.
2. Install the transaxle.

Frame
1. Install the bolts and nuts as shown.

Tightening torque:
Ⓐ 36—54 N·m (3.7—5.5 m-kg, 27—40 ft-lb)
Ⓑ 83—117 N·m (8.5—11.9 m-kg, 61—86 ft-lb)
Ⓒ 93—131 N·m (9.5—13.4 m-kg, 69—97 ft-lb)

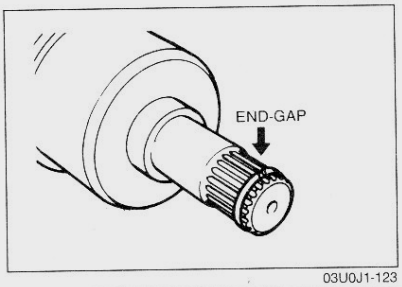


03U0J1-128

2. Tighten engine mount No.4 nuts.

Tightening torque:
64—89 N·m (6.5—9.1 m-kg, 47—66 ft-lb)

3. Remove the **SST** (Engine support).

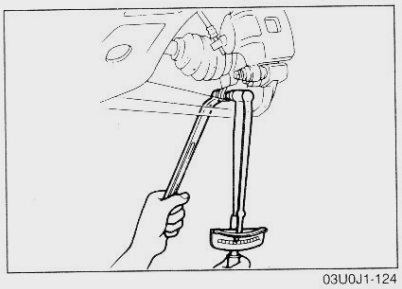


03U0J1-123

Driveshaft

Caution
- **Verify that the oil seal is not damaged.**
- **Do not damage the oil seal**

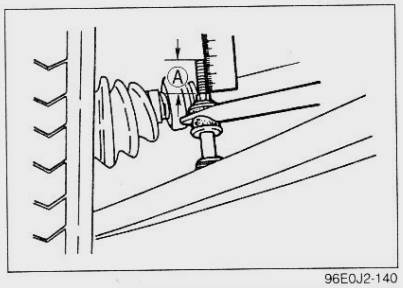
1. Insert the clip with the end-gap at the top of the groove.
2. Apply transaxle oil around the oil seal lip. Install the driveshaft.
3. Verify that the driveshaft is correctly seated by pulling on the shaft.



03U0J1-124

4. Connect the lower arm to the knuckle and tighten the clinch bolt.

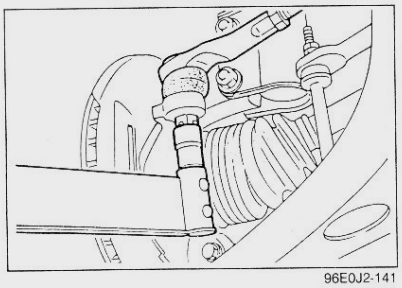
Tightening torque:
43—59 N·m (4.4—6.0 m-kg, 32—43 ft-lb)



96E0J2-140

Stabilizer
1. Tighten the nut until the specified amount of thread is exposed at the end of the bolt.

Dimension A: 17—19mm (0.67—0.75 in)

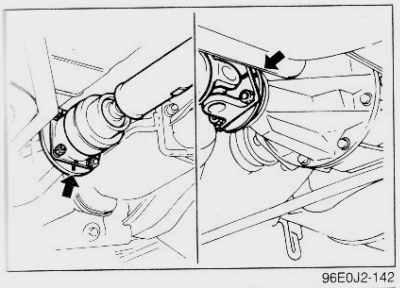


96E0J2-141

Tie-rod end
1. Install the tie-rod end and tighten the locknut.

Tightening torque:
42—57 N·m (4.3—5.8 m-kg, 31—42 ft-lb)

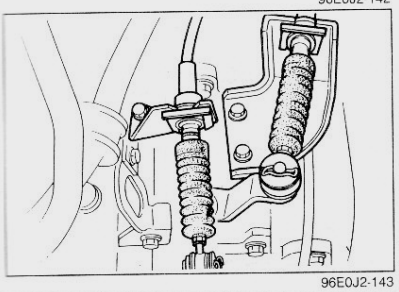
2. Secure the locknut with a new cotter pin.



96E0J2-142

Propeller shaft

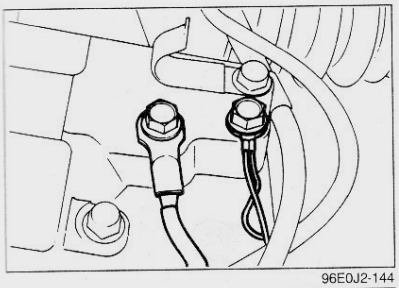
1. Align the marks, and install the front and rear propeller shaft.



96E0J2-143

Shift cable

1. Install the shift cables to the brackets, and secure them by the clips.
2. Connect the shift cables to the transaxle control lever, and install the washers and pins.

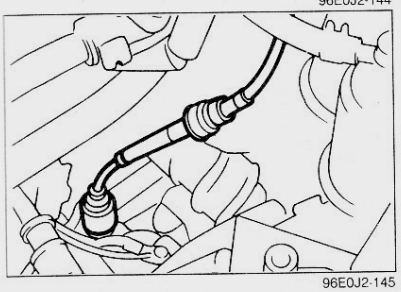


96E0J2-144

Ground

1. Install the ground to the transaxle.

Tightening torque:
7.8—11 N·m (80—110 cm-kg, 69—95 in-lb)



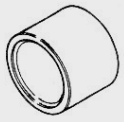
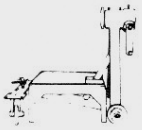
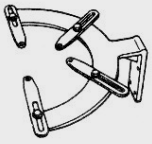
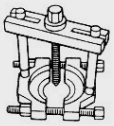
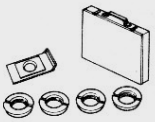
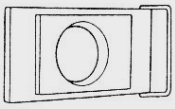
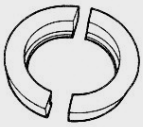
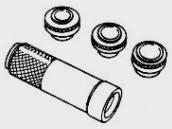
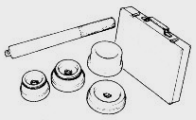
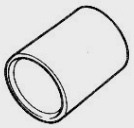
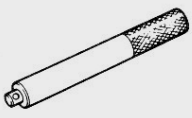
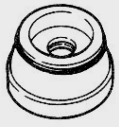
96E0J2-145

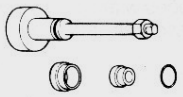
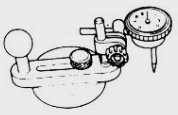
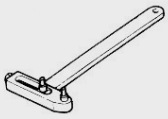
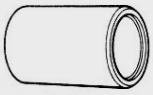
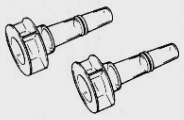
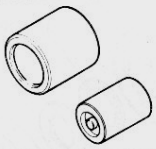
Speedometer cable

1. Connect the speedometer cable to the speedometer driven gear.

TRANSFER UNIT

PREPARATION
SST

49 G026 103 Support block 	For disassembly of idler gear	49 0107 680A Stand, engine 	For disassembly and assembly of differential
49 M005 561 Hanger, differential carrier 	For disassembly and assembly of differential	49 S120 710 Holder, coupling flange 	For removal and installation of companion flange
49 0710 520 Puller, bearing 	For removal of bearing	49 G017 1A0 Remover set, bearing 	For removal of bearing
49 F401 366A Plate (Part of 49 G017 1A0) 	For removal of bearing	49 B027 003 Attachment M 	For removal of bearing
49 F401 330B Installer set, bearing 	For installation of bearing	49 F401 331 Body (Part of 49 F401 330B) 	For installation of bearing inner race
49 F401 337A Attachment C (Part of 49 F401 330B) 	For installation of bearing inner race	49 F027 0A1 Installer set, bearing 	For removal of bearing
49 H028 2A0 Rubber bush replacer 	For installation of bearing	49 H028 202 Block L (Part of 49 H028 2A0) 	For installation of bearing
49 F027 003 Handle (Part of 49 F027 0A1) 	For installation of bearing	49 F027 005 Attachment for ϕ62 bearing (Part of 49 F027 0A1) 	For installation of bearing

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 F027 0A0 Gauge set, pinion height adjustment 	For adjustment of pinion height	49 0660 555 Block, gauge (Part of 49 F027 0A0) 	For adjustment of pinion height
49 0727 570 Gauge body, pinion height (Part of 49 F027 0A0) 	For adjustment of pinion height	49 F401 336B Attachment B (Part of 49 F401 330B) 	For installation of bearing inner race
49 0259 720 Wrench, differential side bearing adjusting nut 	For adjustment of drive pinion and ring gear backlash	49 W023 785 Installer, boot 	For installation of bearing
49 G030 338 Attachment E 	For installation of bearing	49 B027 001 Holder, diff. side gear 	For holding side gear
49 G028 2A0 Replacer, lower arm bushing 	For installation of thrust washer	49 G028 201 Block, support (Part of 49 G028 2A0) 	For installation of thrust washer
49 U027 003 Installer, oil seal 	For installation of oil seal	49 0839 425C Puller set, bearing 	For removal of companion flange

96E0J2-146

DISASSEMBLY

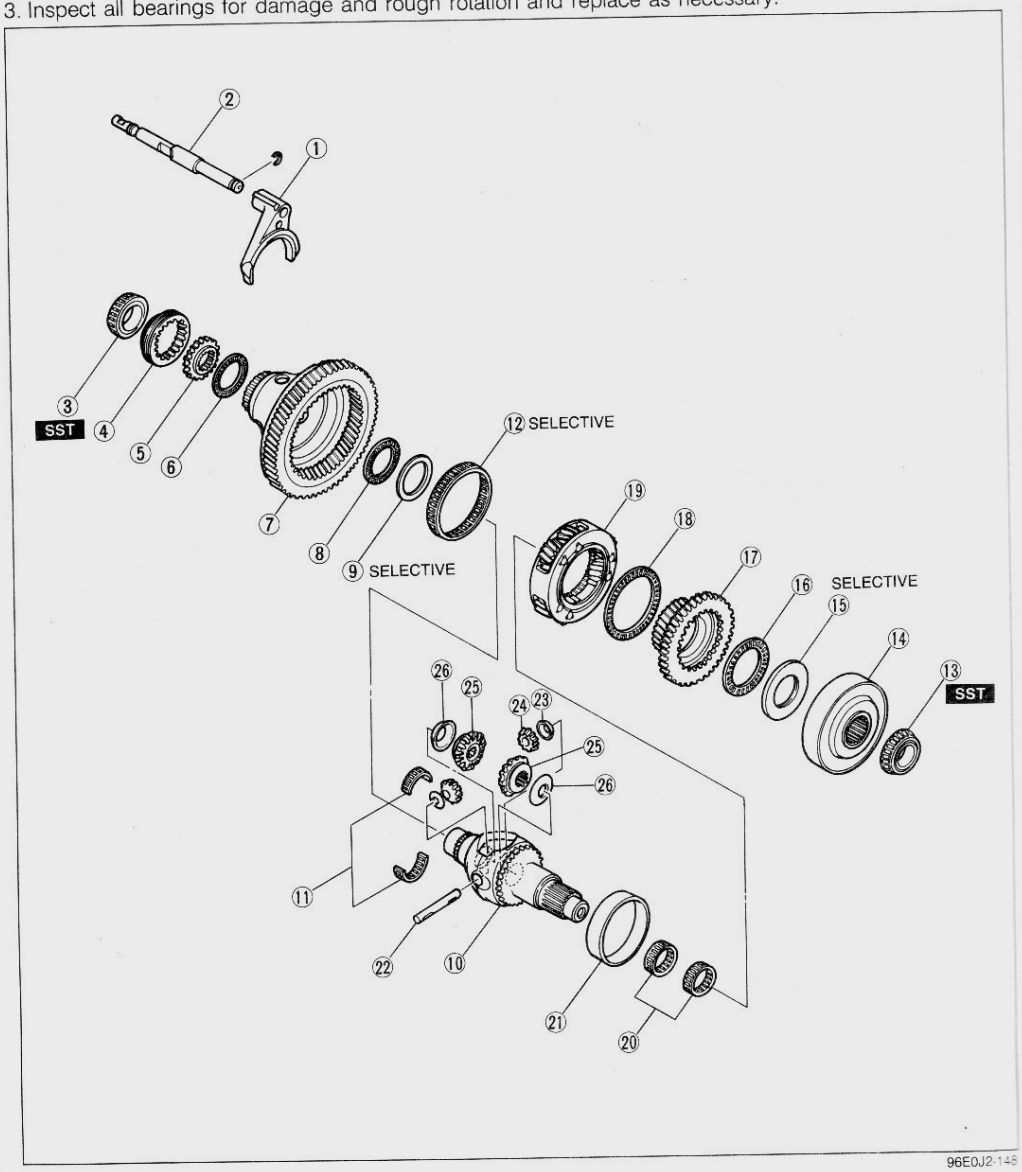
Precaution

1. Clean the removed parts (except sealed bearings) and all sealing surfaces with cleaning solvent, and dry with compressed air. Clean out all holes and passages with compressed air, and check that there are no obstructions.
2. Wear eye protection when using compressed air to clean components.

96E0J2-147

Front and Center Differential Assembly

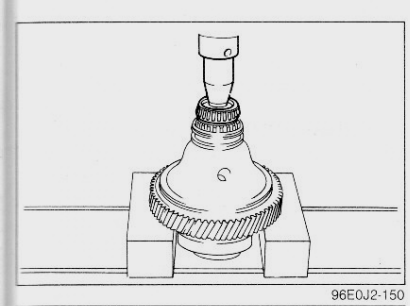
1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
2. Inspect all parts and repair or replace as necessary.
3. Inspect all bearings for damage and rough rotation and replace as necessary.



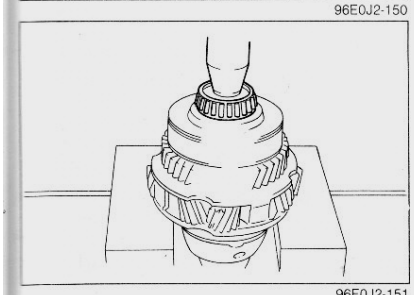
96E0J2-148

1. Center differential lock shift fork
2. Center differential lock shift rod
3. Bearing inner race (Differential lock gear sleeve)
   Removal Note ..... below
4. Differential lock gear sleeve
5. Differential lock hub
   Inspect for damage and wear
6. Gear case needle bearing
7. Ring gear case
   Inspect gear teeth for wear and cracks
8. Gear case needle bearing
9. Differential lock thrust washer
10. Front differential gear case
11. Gear case needle bearing
12. Gear case needle bearing
13. Bearing inner race (Viscous coupling)
    Removal Note ..... below
14. Viscous coupling
15. Thrust washer
16. Gear case needle bearing
17. Sun gear
    Inspect gear teeth for wear and cracks
18. Gear case needle bearing
19. Planetary carrier
    Inspect gear for wear, cracks and rough rotation
20. Gear case needle bearing
21. Differential gear case sleeve
    Removal Note ..... page J2–76
22. Pinion shaft
23. Washer
24. Pinion gear
    Inspect gear for wear and cracks
25. Side gear
    Inspect gear for wear and cracks
26. Washer

96E0J2-149



96E0J2-150



96E0J2-151

Disassembly note
Bearing inner race (Differential lock gear sleeve side)

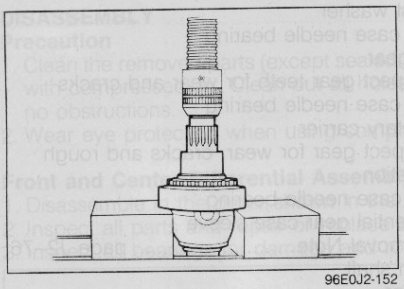
Caution
- **Hold the front differential gear case with one hand so that it does not fall.**

1. Remove the bearing inner race.

Bearing inner race (Viscous coupling)

Caution
- **Hold the front differential gear case with one hand so that it does not fall.**

1. Remove the bearing inner race.


96E0J2-152

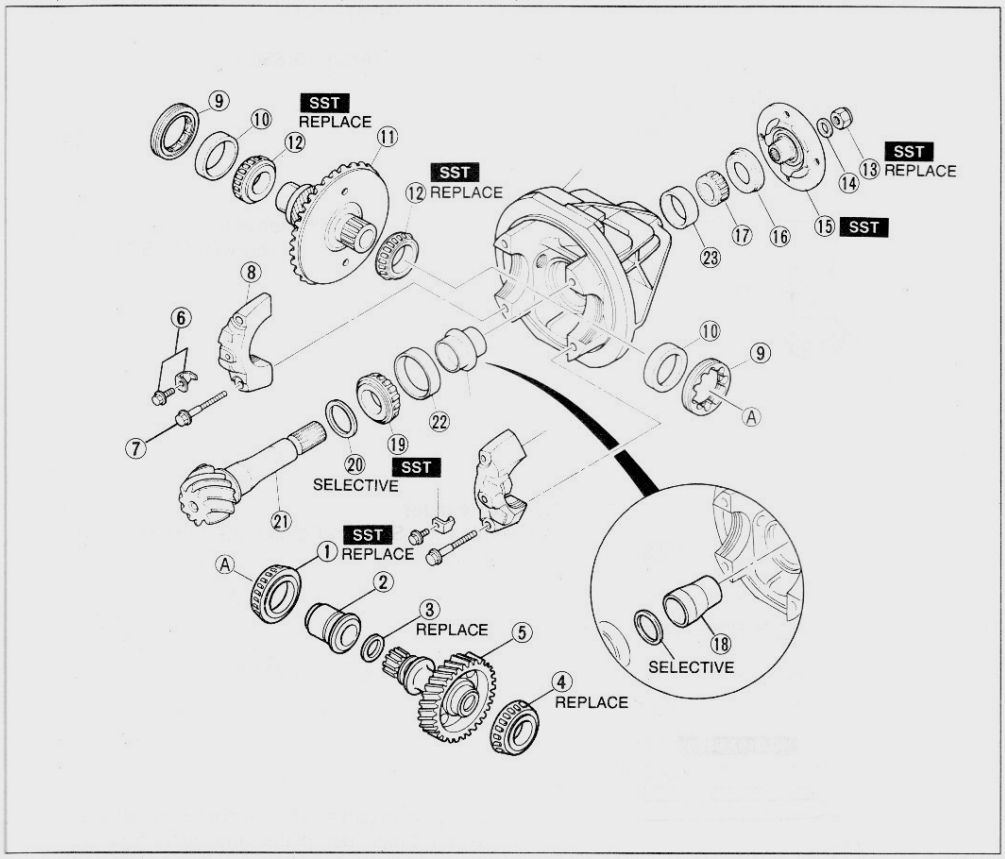
Differential gear case sleeve

Caution
- **Hold the front differential gear case with one hand so that it does not fall.**

1. Remove the differential gear case sleeve.

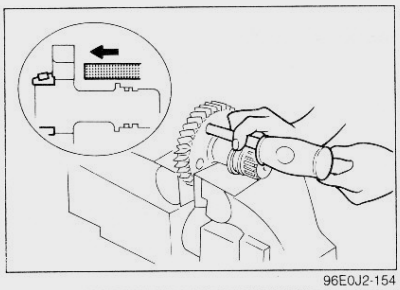
Transfer Carrier Assembly

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



96E0J2-153

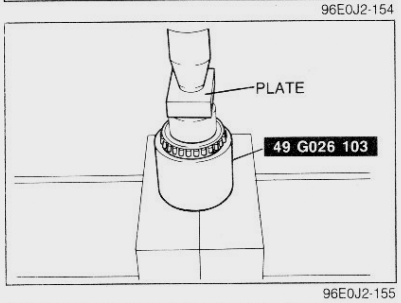
1. Bearing inner race (Joint sleeve)
   Removal Note ..... page J2–78
2. Joint sleeve
3. O-ring
4. Bearing inner race (Idler gear)
5. Idler gear shaft
6. Lock plate and bolt
7. Bolt
8. Bearing cap
9. Adjusting screw
10. Bearing outer race
    Removal Note ..... page J2–78
11. Differential gear
    Inspect gear for wear and cracks
12. Bearing inner race
    Inspect for damage and rough rotation
    Removal Note ..... page J2–79
13. Locknut
    Removal Note ..... page J2–79
14. Washer
15. Companion flange
    Removal Note ..... page J2–79
    Inspect splines for damage and wear
16. Oil seal
17. Bearing inner race (Companion flange)
    Inspect for damage and rough rotation
18. Collapsible spacer
19. Bearing inner race (Drive pinion)
    Removal Note ..... page J2–79
    Inspect for damage and rough rotation
20. Spacer
21. Drive pinion
    Removal Note ..... page J2–79
    Inspect gear for damage and cracks
    Inspect splines for damage and wear
22. Bearing outer race (Drive pinion)
23. Bearing outer race (Companion flange)



96E0J2-154

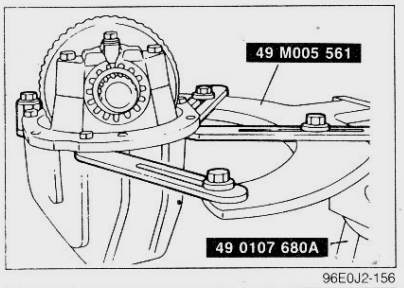
Disassembly note
Bearing inner race (Idler gear)
1. Clamp the idler gear in a vise.
2. Remove the bearing inner race.

Pipe diameter: 16mm (0.630 in)



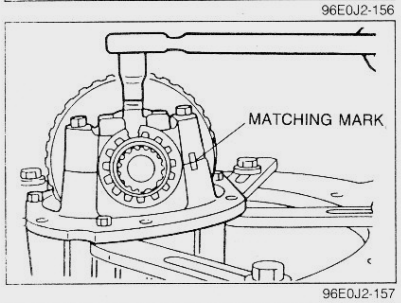
96E0J2-155

Bearing inner race (Joint sleeve)
1. Remove the bearing inner race with the **SST**.



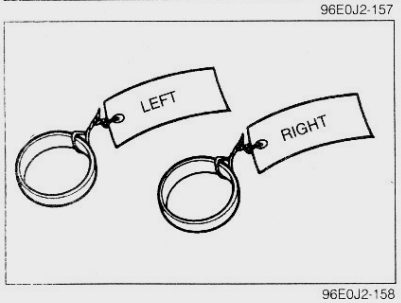
96E0J2-156

Transfer carrier
1. Assemble the **SST** and mount the transfer carrier.



96E0J2-157

Cap
1. Mark one bearing cap and the carrier for proper reassembly.
2. Remove the bolts, lock plates and bearing caps.

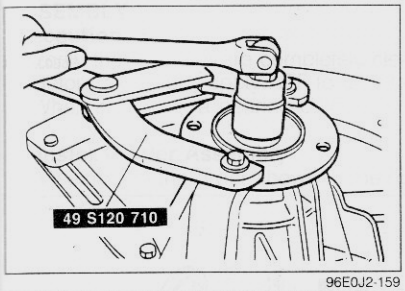


96E0J2-158

Bearing outer race (Side bearing)

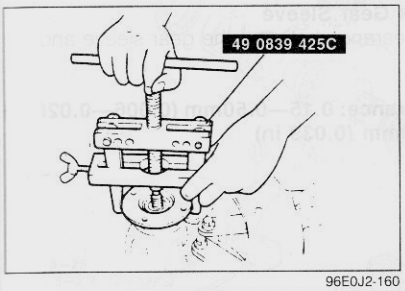
Note
- **For proper reassembly, identify the bearing outer races.**

1. Remove the bearing outer races.



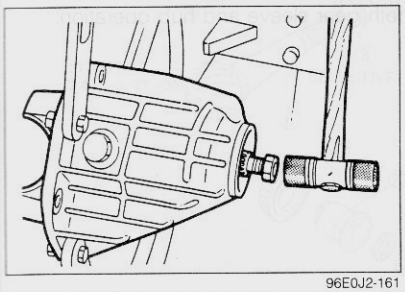
96E0J2-159

Locknut
1. Remove the locknut with the **SST**.

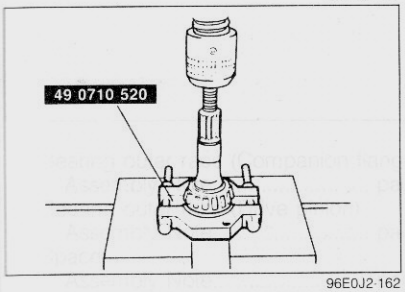


96E0J2-160

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


96E0J2-161

Drive pinion
1. Push the drive pinion out by attaching a miscellaneous locknut to the drive pinion, then tapping it with a brass hammer.

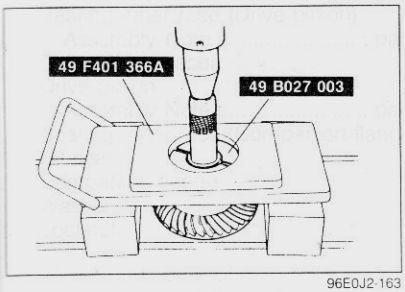


96E0J2-162

Bearing inner race (Drive pinion)

Caution
- **Support the drive pinion by hand so that it does not fall.**

1. Remove the bearing with the **SST**.
2. Remove the spacer.



96E0J2-163

Bearing inner race (Side bearing)

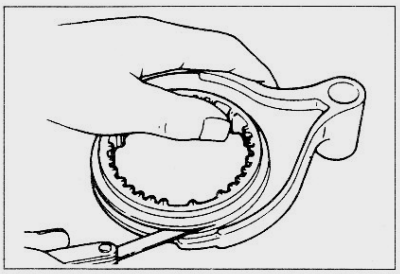
Note
- **Do not disassemble the bearing inner race if not necessary.**
- **For proper reassembly, identify the bearing inner race.**

1. Remove the bearing inner race with the **SST**.

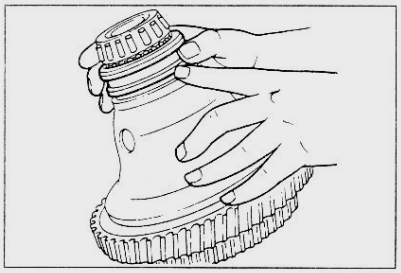
INSPECTION

Inspect all parts and repair or replace as necessary.

96E0J2-164



96E0J2-165



96E0J2-166

Differential Lock Gear Sleeve

1. Measure the clearance between the gear sleeve and the shift fork.

   Standard clearance: 0.15—0.50mm (0.006—0.020 in)
   Maximum: 1.0mm (0.039 in)

2. Inspect for smooth gear sleeve and hub operation.

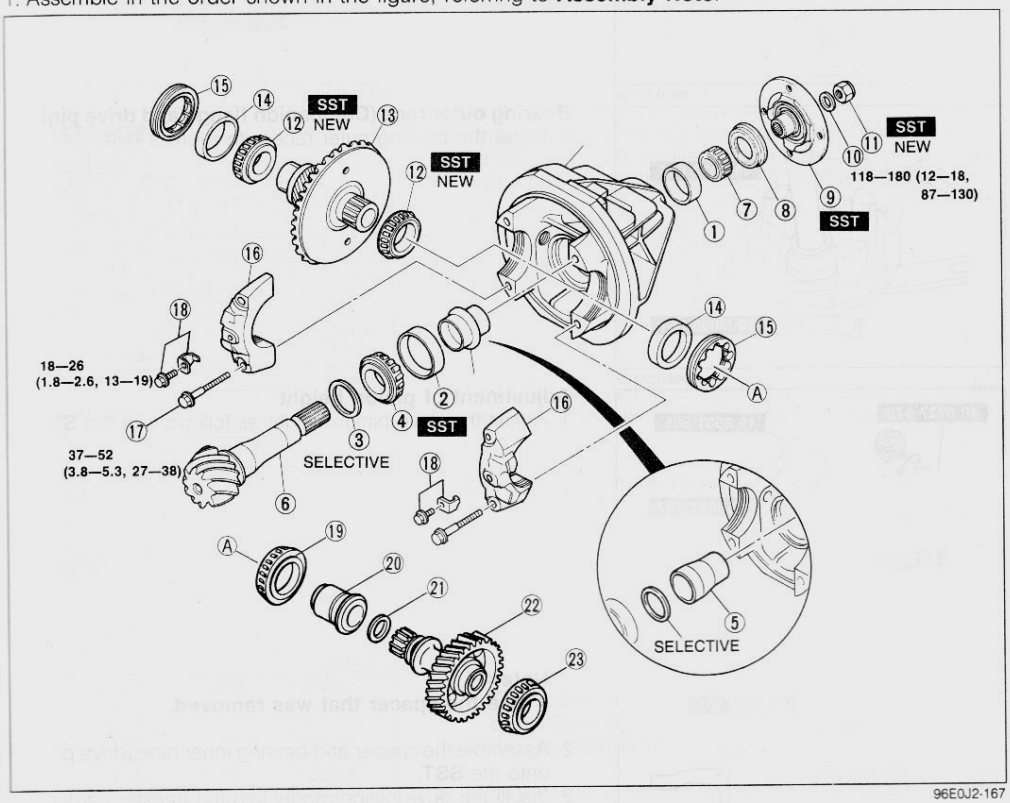
ASSEMBLY

Precaution

1. Verify that all parts are completely clean before assembly.
2. Before assembly, apply ATF to all rotating parts and sliding parts.
3. When replacing, a bearing outer race and bearing inner race must be replaced as a unit.

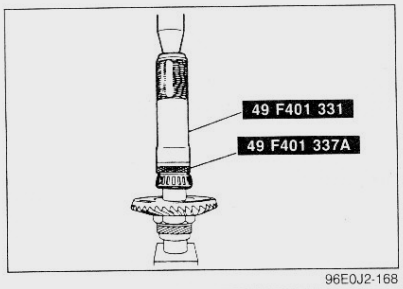
Transfer Carrier Assembly

1. Assemble in the order shown in the figure, referring to **Assembly Note**.



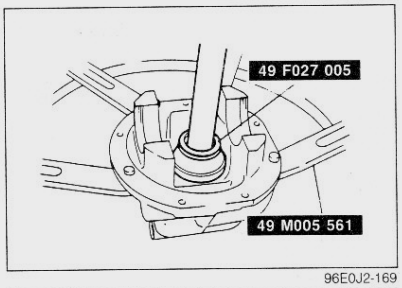
96E0J2-167

1. Bearing outer race (Companion flange)
   Assembly Note..... page J2–82
2. Bearing outer race (Drive pinion)
   Assembly Note..... page J2–82
3. Spacer
   Assembly Note..... page J2–82
4. Bearing inner race (Drive pinion)
   Assembly Note..... page J2–83
5. Collapsible spacer
6. Drive pinion
   Assembly Note..... page J2–84
7. Bearing inner race (Companion flange)
8. Oil seal
9. Companion flange
10. Washer
11. Locknut
12. Bearing inner race (Differential gear)
    Assembly Note..... page J2–82
13. Differential gear
14. Bearing outer race
15. Adjusting screw
    Assembly Note..... page J2–85
16. Bearing cap
    Assembly Note..... page J2–86
17. Bolt
18. Lock plate and bolt
19. Bearing inner race (Joint sleeve)
    Assembly Note..... page J2–87
20. Joint sleeve
21. O-ring
22. Idler gear
23. Bearing inner race (Idler gear)
    Assembly Note..... page J2–87



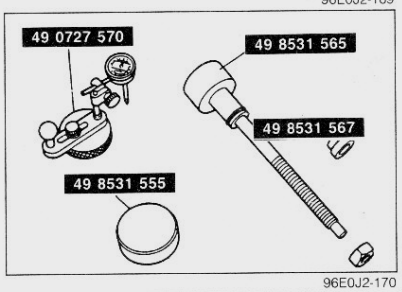
96E0J2-168

Assembly note
Bearing inner race (Differential gear)
1. Install the bearing inner race with the **SST**.



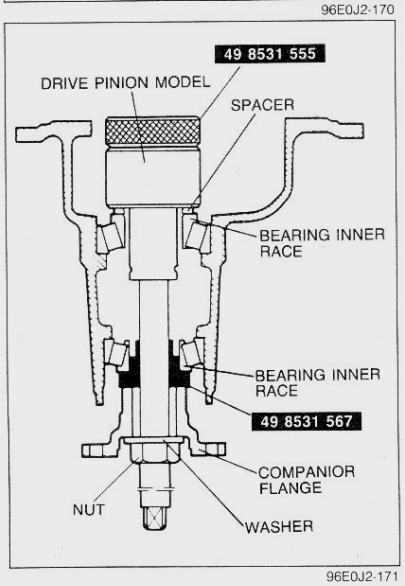
96E0J2-169

Bearing outer race (Companion flange and drive pinion)
1. Install the bearing outer race with a brass drift.



96E0J2-170

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



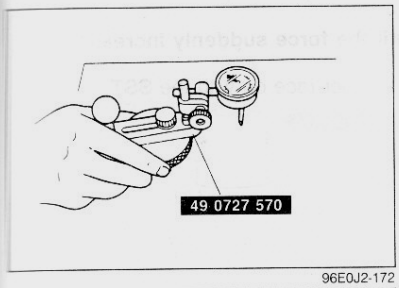
96E0J2-171

Note
- **Use the spacer that was removed.**

2. Assemble the spacer and bearing inner race (drive pinion) onto the **SST**.
3. Install the drive pinion model into the transfer carrier.

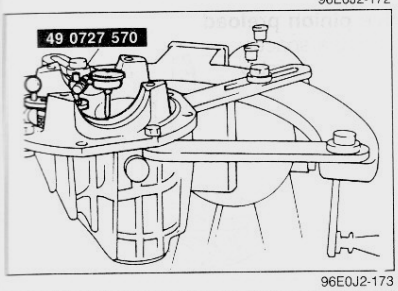
Note
- **Use the nut which was removed.**

4. Install the bearing inner race (companion flange), **SST**, companion flange, washer, and nut.
5. Tighten the nut to the extent that the companion flange can still be turned by hand.



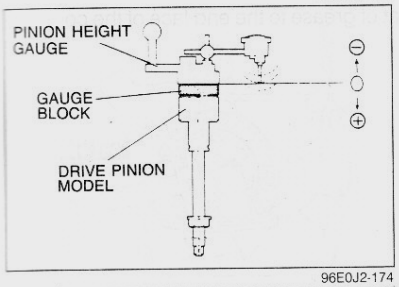
96E0J2-172

6. Place the **SST** on the surface plate and set the dial indicator to "Zero".



96E0J2-173

7. Set the **SST** atop the gauge block.
8. Place the feeler of the dial indicator so that it contacts where the side bearing is installed in the carrier, and measure the lowest position on the left and right sides.



96E0J2-174

9. Add the two (left and right) values obtained by the measurements taken in Step 7, and then divide the total by 2.

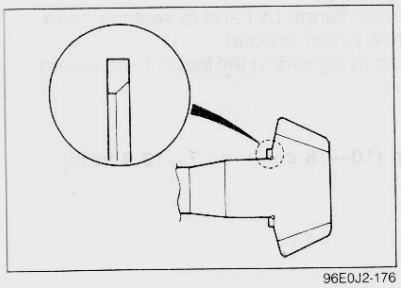
Specification: 0mm (0 in)

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)

96E0J2-175

Note
- **The spacer thicknesses are available in increments of 0.03mm (0.001 in). Select the spacer thickness that is closest to that necessary.**

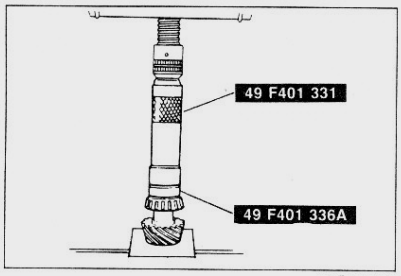
10. If not within specification, adjust the pinion height by selection of a spacer.


96E0J2-176

Bearing inner race (Drive pinion)

Note
- **Install the spacer selected for the pinion height adjustment, being careful the direction of installation is correct.**

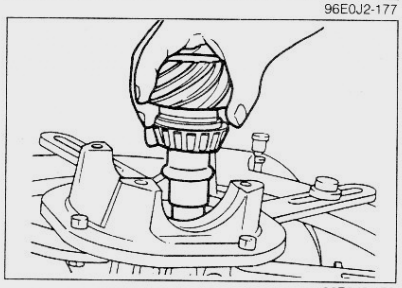
1. Install the spacer onto the drive pinion.



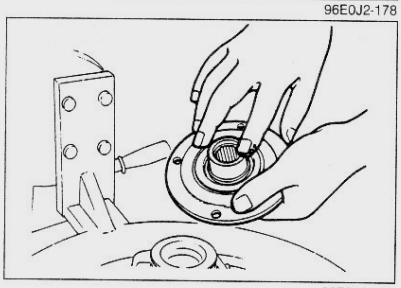
96E0J2-177

Note
- **Press on until the force suddenly increases.**

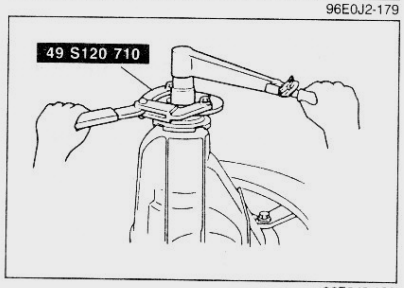
2. Press the bearing inner race on with the **SST**.


96E0J2-178

Adjustment of drive pinion preload
1. Install a new collapsible spacer.
2. Install the drive pinion assembly


96E0J2-179

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

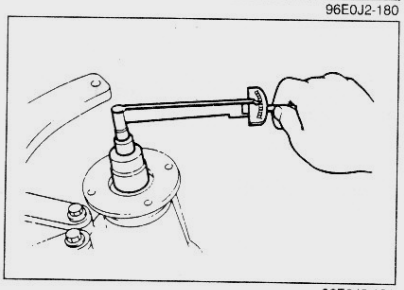


96E0J2-180

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

4. Install the bearing inner race, companion flange and washer, and tighten the locknut.

Tightening torque:
118—180 N·m (12—18 m-kg, 87—130 ft-lb)

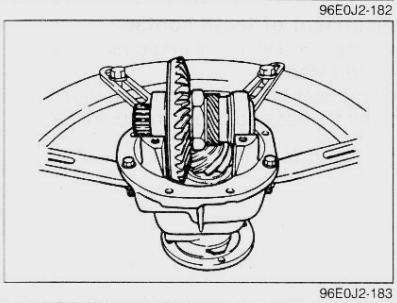

96E0J2-181

5. Turn the companion flange by hand to seat the bearings.
6. Measure the drive pinion preload.
   Adjust the preload by tightening the locknut and record the tightening torque.

Preload:
1.0—1.6 N·m (10—16 cm-kg, 8.7—13.9 in-lb)

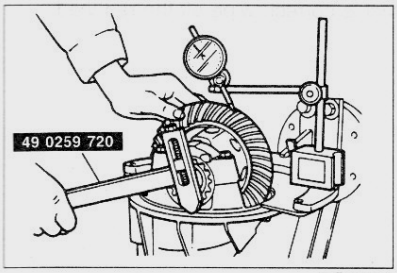
96E0J2-182

7. Remove the nut, washer, and companion flange.
8. Tap a new oil seal into the differential carrier with the **SST**.
9. Install the washer and companion flange, and tighten the locknut to the tightening torque record in Step 6.


96E0J2-183

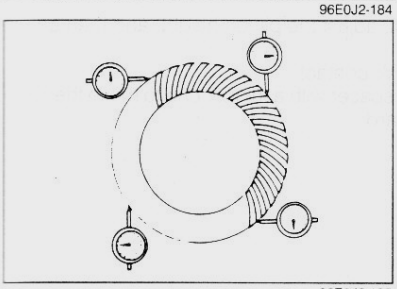
Adjustment of backlash

1. Mount the differential gear assembly in the carrier.



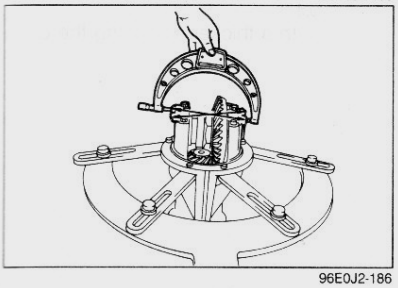
96E0J2-184

2. Install the differential bearing caps making sure that the mark on the cap corresponds with the one on the carrier.
3. Loosely tighten the bearing cap bolts.
4. Mark the ring gear at four points at approx. **90°** intervals. Mount a dial indicator to the carrier so that the feeler comes into contact at a right angle with one of the ring gear teeth.


96E0J2-185

5. Turn both bearing adjusting screws equally with the **SST** until the backlash is within specifications.

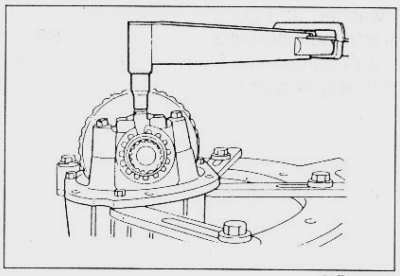
Standard backlash:
0.09—0.11mm (0.0035—0.0043 in)


96E0J2-186

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

6. After adjusting the backlash, tighten the adjusting screws equally until the distance between the pilot sections on the bearing caps is as specified.

Specification:
142.137—142.200mm (5.596—5.599 in)



96E0J2-187

7. Tighten the bearing cap bolts to the specified torque.

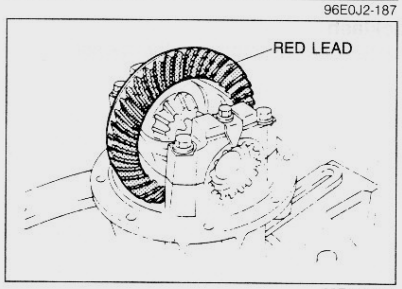
Tightening torque:
37—52 N·m (3.8—5.3 m-kg, 27—38 ft-lb)

8. Install and tighten the lock plates onto the bearing caps.

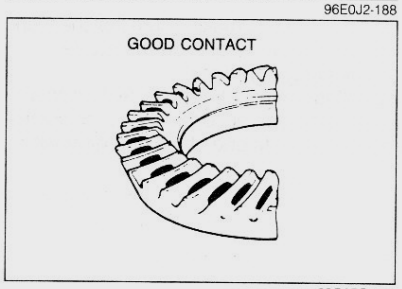
Tightening torque:
18—26 N·m (1.8—2.6 m-kg, 13—19 ft-lb)

Inspection and adjustment of tooth 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.

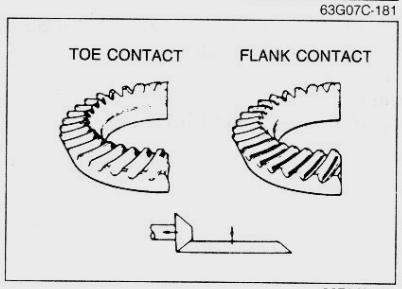


96E0J2-188



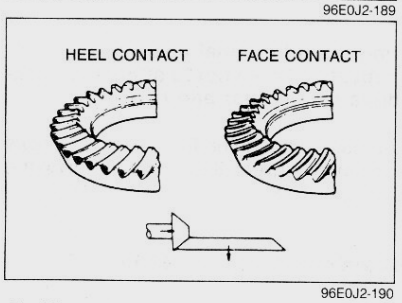
63G07C-181

3. If the tooth contact is correct, wipe off the red lead.



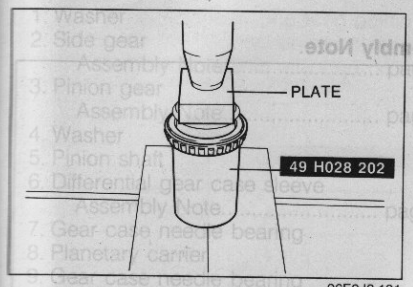
96E0J2-189

4. If it is not correct, adjust the pinion height, and then adjust the backlash.
   (1) Toe and flank contact
   Replace the spacer with a thinner one to move the drive pinion outward.



96E0J2-190

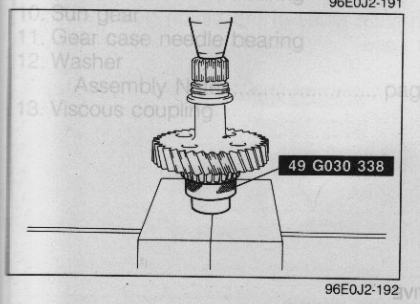
(2) Heel and face contact
Replace the spacer with a thicker one bring the drive pinion inward.



96E0J2-191

Bearing inner race (Joint sleeve)

1. Install the bearing inner race with the **SST**.



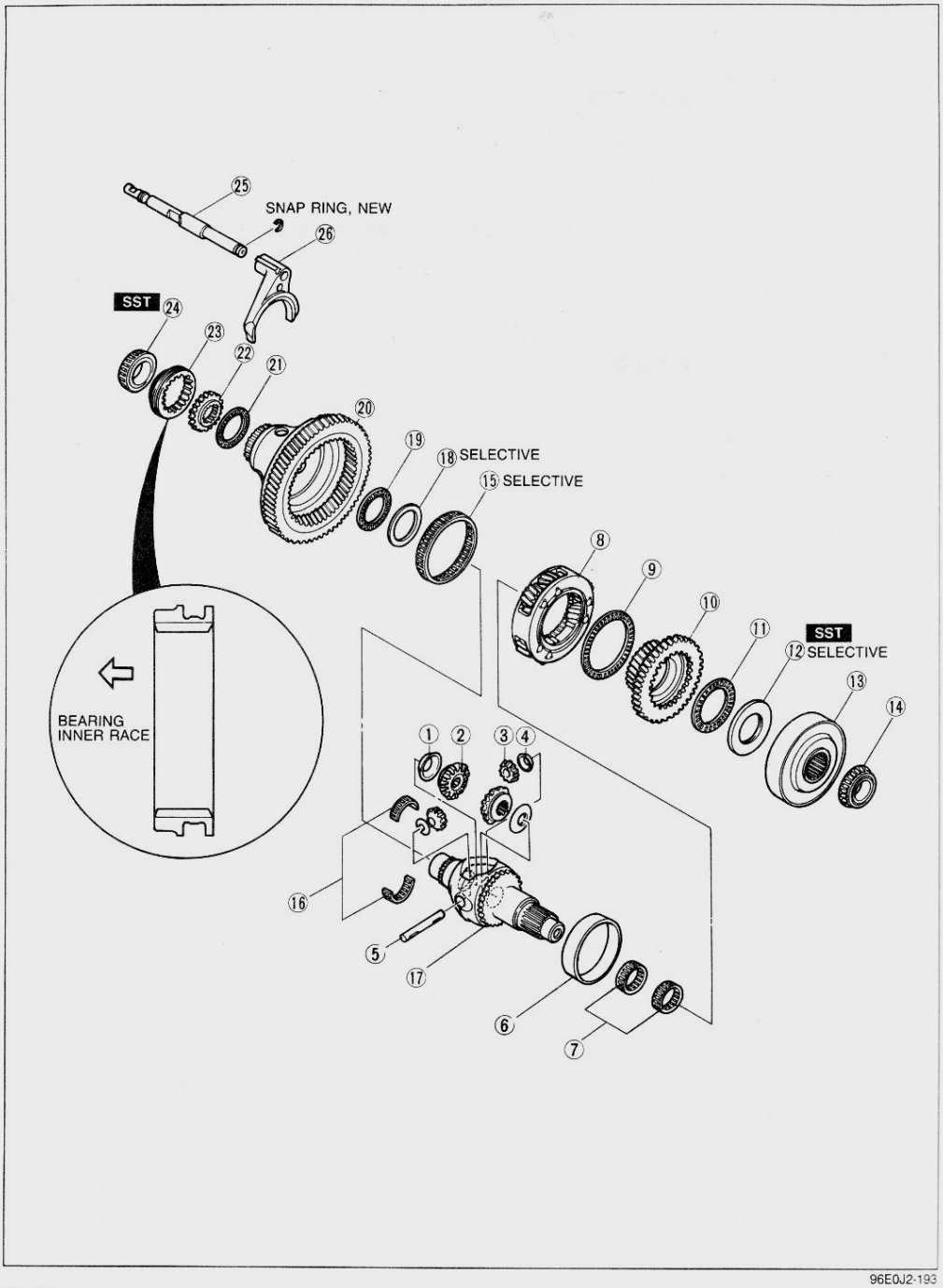
96E0J2-192

Bearing inner race (Idler gear)

1. Install the bearing inner race with the **SST**.

Front and Center Differential Assembly

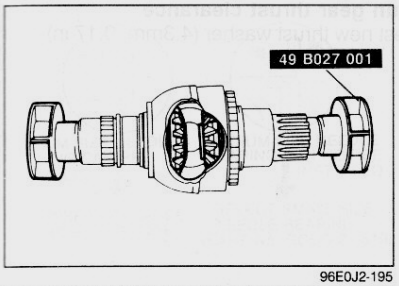
1. Assemble in the order shown in the figure, referring to **Assembly Note**.



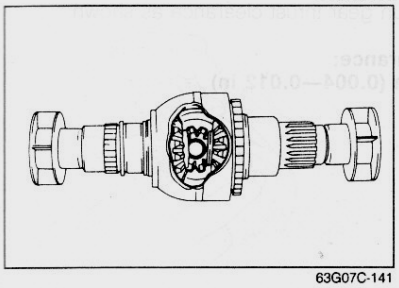
96E0J2-193

1. Washer
2. Side gear
   Assembly Note..... page J2–89
3. Pinion gear
   Assembly Note..... page J2–89
4. Washer
5. Pinion shaft
6. Differential gear case sleeve
   Assembly Note..... page J2–90
7. Gear case needle bearing
8. Planetary carrier
9. Gear case needle bearing
10. Sun gear
11. Gear case needle bearing
12. Washer
    Assembly Note..... page J2–90
13. Viscous coupling
14. Bearing inner race (Viscous coupling)
    Assembly Note..... page J2–91
15. Gear case needle bearing
    Assembly Note..... page J2–91
16. Gear case needle bearing
17. Front differential gear case
18. Differential lock thrust washer
    Assembly Note..... page J2–92
19. Gear case needle bearing
20. Ring gear case
21. Gear case needle bearing
22. Differential lock hub
23. Differential lock gear sleeve
24. Bearing inner race
    (Differential lock gear sleeve)
    Assembly Note..... page J2–92
25. Center differential lock shift rod
26. Center differential lock shift fork

96E0J2-194



96E0J2-195



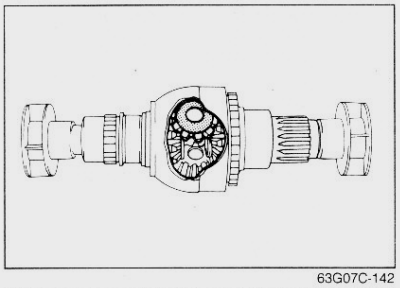
63G07C-141

Assembly note
Side gear and pinion gear

1. Install the side gears and washers, and fix them with the **SST**.

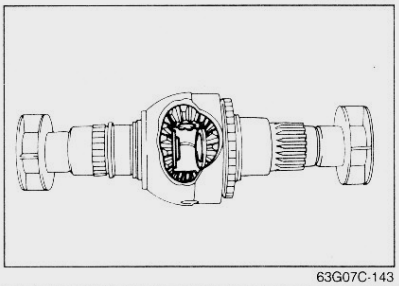
Note
- **Do not install the washer at this time.**

2. Install a pinion gear and turn it 180°.



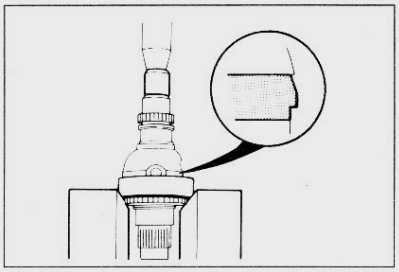
63G07C-142

3. Install the other pinion gear and washer.
4. Turn the pinion gear and washer 150°.
5. Install the washer on opposite pinion gear.



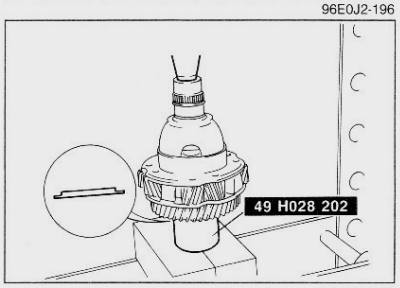
63G07C-143

6. Align the pinion shaft holes of the pinion gears with the differential gear case.



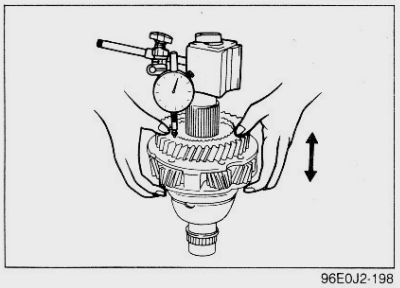
96E0J2-196

Differential gear case sleeve
1. Insert the pinion shaft
2. Install the differential gear case sleeve.



96E0J2-197

Adjustment of sun gear thrust clearance
1. Install the thickest new thrust washer (4.3mm, 0.17 in) with the **SST**.



96E0J2-198

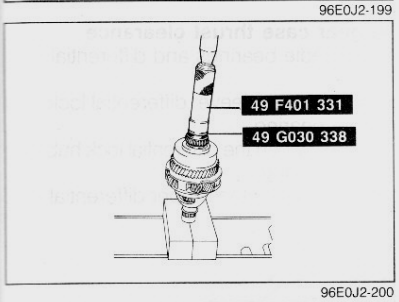
2. Measure the sun gear thrust clearance as shown.

Standard clearance:
0.1—0.3mm (0.004—0.012 in)

Measured clearance mm (in)	Thrust washer mm (in)
0.9—1.1 (0.035—0.043)	3.5 (0.138)
0.7—0.9 (0.028—0.035)	3.7 (0.146)
0.5—0.7 (0.020—0.028)	3.9 (0.154)
0.3—0.5 (0.012—0.020)	4.1 (0.161)
0.1—0.3 (0.004—0.012)	4.3 (0.169)

96E0J2-199

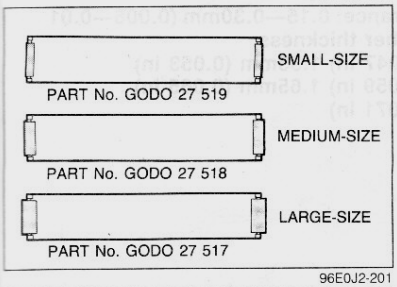
3. If the clearance is not within specification, select the thrust washer from the table.



96E0J2-200

Bearing inner race (Viscous coupling)

1. Install the bearing inner race with the **SST**.



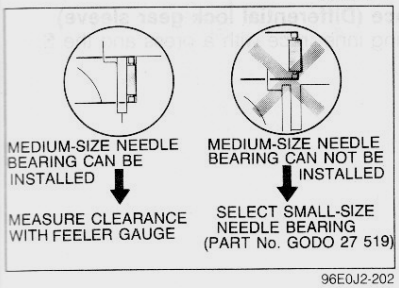
96E0J2-201

Adjustment of front differential gear case radial clearance

1. Install the front differential gear case into the ring gear case.

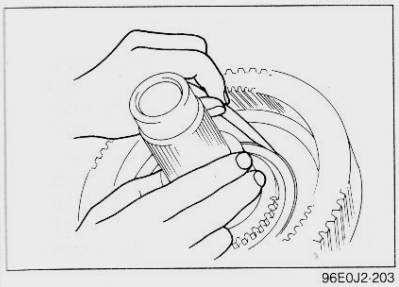
Note

- **Available gear case needle bearing part numbers.**
  Small G0D0 27 519
  Medium..... G0D0 27 518
  Large G0D0 27 517



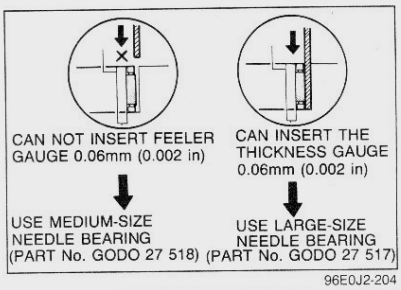
96E0J2-202

2. Verify that the medium size gear case needle bearing can be installed.
3. If not, install the small size gear case needle bearing.



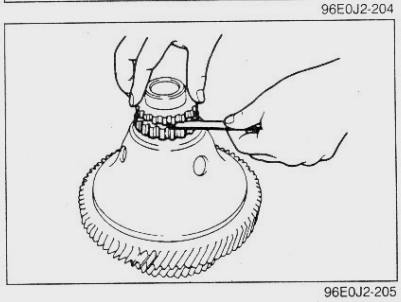
96E0J2-203

4. If the medium size gear case needle bearing can be installed, measure the clearance between the ring gear case and the needle bearing.



96E0J2-204

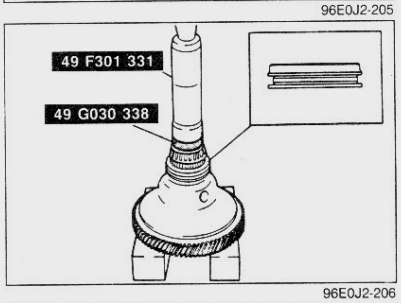
5. If the clearance exceeds **0.06mm (0.002 in)**, install the large size gear case needle bearing.



96E0J2-205

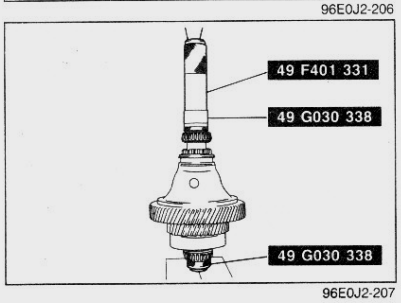
Adjustment of ring gear case thrust clearance

1. Install the gear case needle bearings and differential lock thrust washer.
2. Install the differential lock gear sleeve, differential lock hub and gear case needle bearing.
3. Measure the clearance between the differential lock hub and the gear case needle bearing.
   If not within specification, select the proper differential lock thrust washer.



96E0J2-206

Standard clearance: 0.15—0.30mm (0.006—0.011 in)
Available washer thickness:
1.20mm (0.047 in) 1.35mm (0.053 in)
1.50mm (0.059 in) 1.65mm (0.065 in)
1.80mm (0.071 in)



96E0J2-207

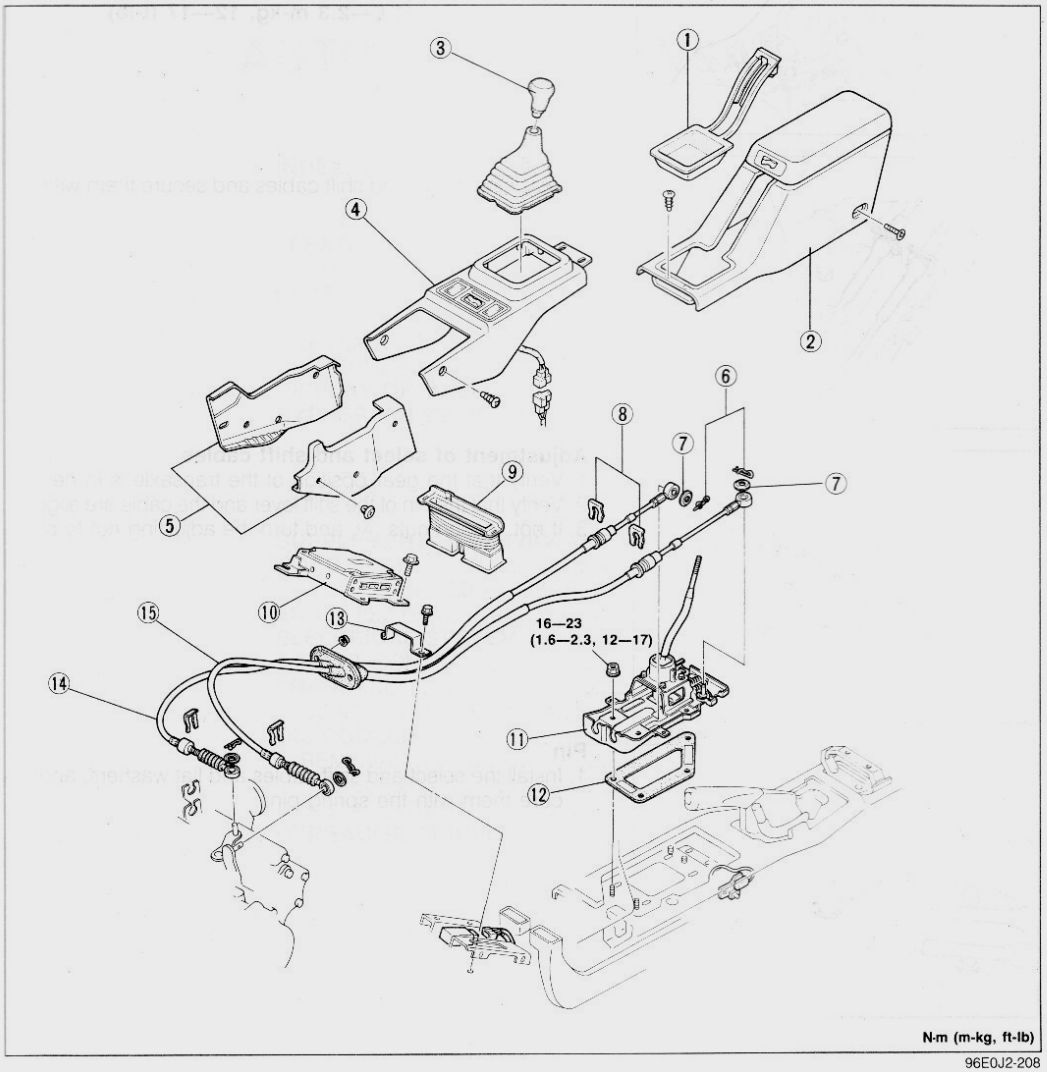
Bearing inner race (Differential lock gear sleeve)

1. Install the bearing inner race with a press and the **SST**.

SHIFT MECHANISM

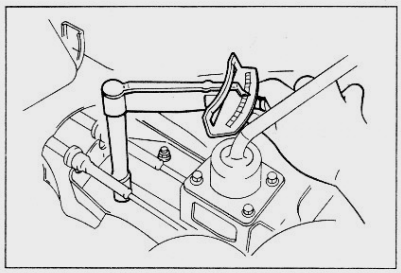
OVERHAUL

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



96E0J2-208

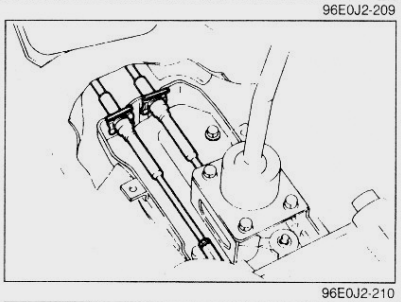
1. Upper plate
2. Rear console
3. Shift lever knob
4. Front console
5. Side cover
6. Spring pin
7. Flat washer
8. Clip
9. Front duct
10. Engine control unit
11. Shift lever assembly
    Installation Note ..... page J2–94
12. Rubber seat
13. Retainer
14. Select cable
    Installation Note ..... page J2–94
15. Shift cable



96E0J2-209

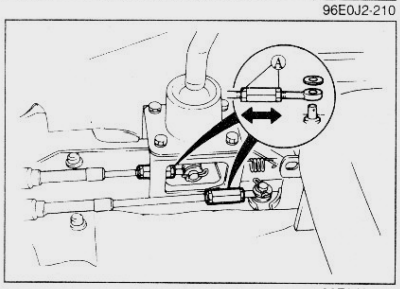
Assembly Note
Shift lever assembly
1. Install the rubber seat
2. Install the shift lever assembly.

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



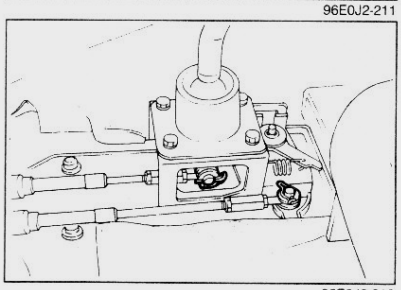
96E0J2-210

Clip
1. Install the select and shift cables and secure them with the clips.



96E0J2-211

Adjustment of select and shift cables
1. Verify that the gear position of the transaxle is in neutral.
2. Verify that the pin of the shift lever and the cable are aligned.
3. If not, loosen nuts Ⓐ, and turn the adjusting nut to align.



96E0J2-212

Pin
1. Install the select and shift cables and flat washers, and secure them with the spring pins.