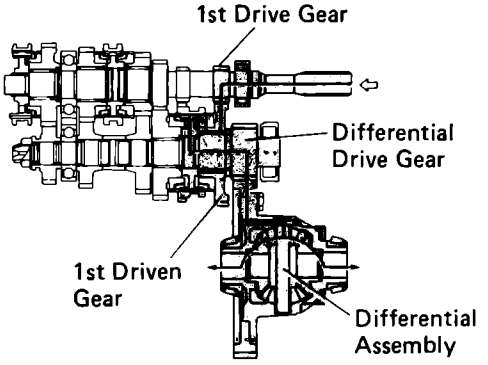
MANUAL TRANSAXLE

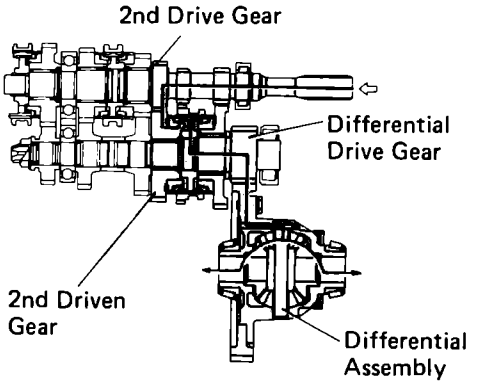
(S53 TRANSAXLE/2WD)

DESCRIPTION

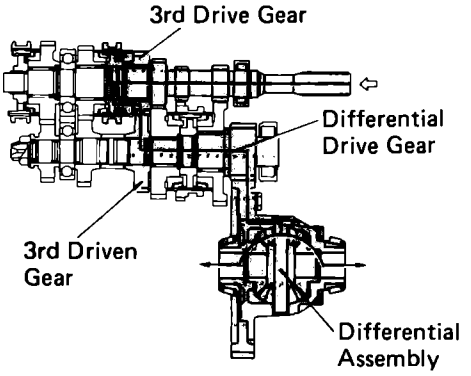
- **Transaxle types S53 are constant mesh synchronizers for forward gears, and a sliding mesh reverse gear.**
- **The input shaft is composed of the 1st and 2nd speed gears and the reverse drive gear, and the output shaft is composed of the drive gear (for use with the ring gear).**
- **The oil used in transaxle is as follows:**
  S53 .....ATF type DEXRON® II
- **The illustrations below show the engagements of transaxle gears.**



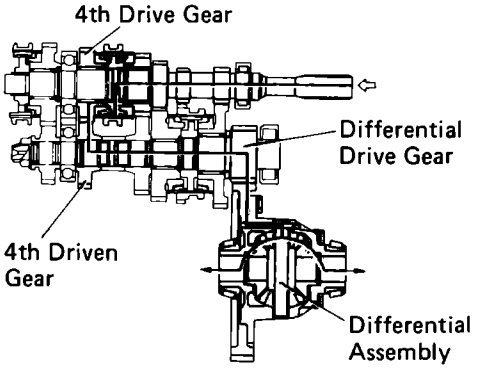
1st



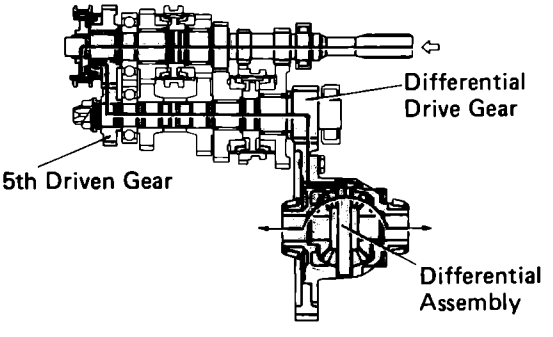
2nd



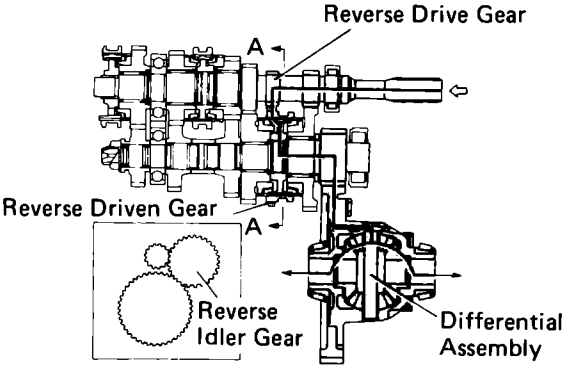
3rd



4th



5th



Rev.

Z9913

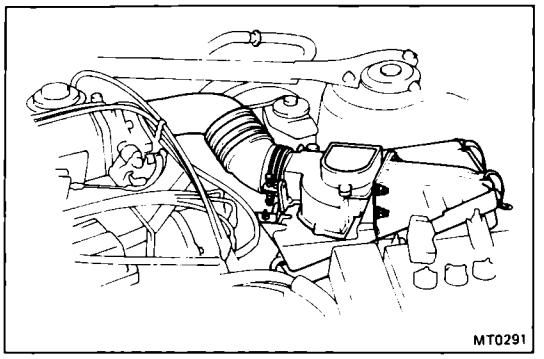
PRECAUTIONS

When working with FIPG material, you must be observe the following.

- Using a razor blade and gasket scraper, remove all the old packing (FIPG) material from the gasket surfaces.
- Thoroughly clean all components to remove all the loose material.
- Clean both sealing surfaces with a non-residue solvent.
- Apply the seal packing in approx. 1 mm (0.04 in.) bead along the sealing surface.
- Parts must be assembled within 10 minutes of application. Otherwise, the packing (FIPG) material must be removed and reapplied.

TROUBLESHOOTING

Problem	Possible cause	Remedy	Page
Noise	Transmission or differential faulty	Disassemble and inspect transmission or differential	MT-7, 42
	Wrong oil grade	Replace oil	
	Oil level low	Add oil	
Oil leakage	Oil level too high	Drain oil	
	Oil seal, O-ring or gasket worn or damaged	Replace oil seal, O-ring or gasket	MT-7 FA-18
Hard to shift or will not shift	Control cable faulty	Replace control cable	
	Transmission faulty	Disassemble and inspect transmission	MT-7
Jumps out of gear	Transmission faulty	Disassemble and inspect transmission	MT-7

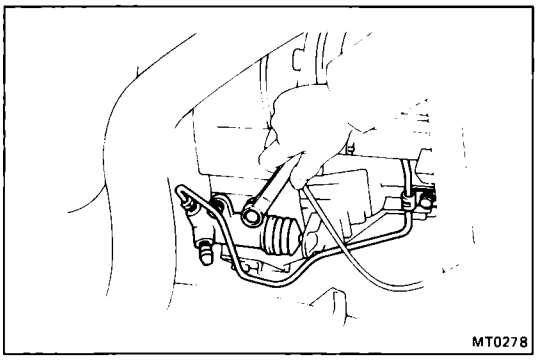


S53 TRANSMISSION

REMOVAL OF TRANSAXLE

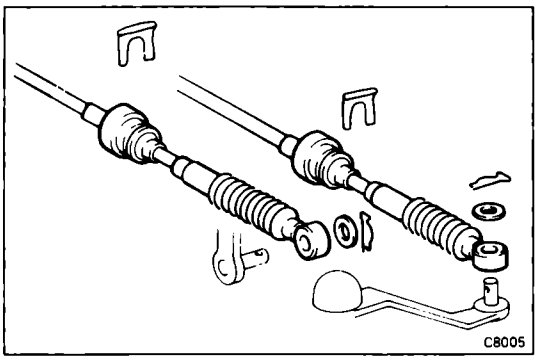
1. **REMOVE NEGATIVE BATTERY CABLE**

2. **REMOVE AIR CLEANER WITH AIR HOSE**

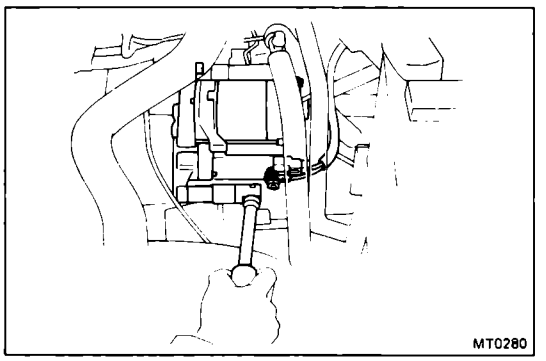


3. **REMOVE CLUTCH TUBE BRACKET**
   (a) Remove the retainer from the bracket.
   (b) Remove the bolt and bracket.

4. **REMOVE CLUTCH RELEASE CYLINDER AND TUBE CLAMP**

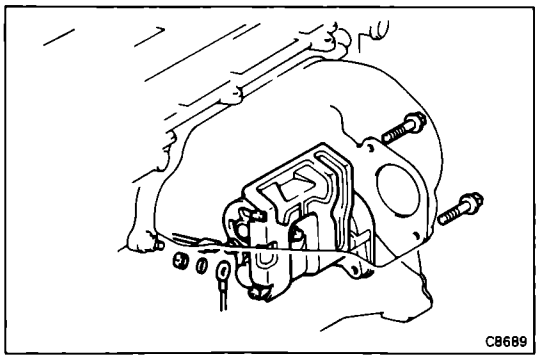


5. **DISCONNECT CONTROL CABLES**
   (a) Remove the clips and washers.
   (b) Remove the retainer from the cables.



6.-1 (3S-FE)

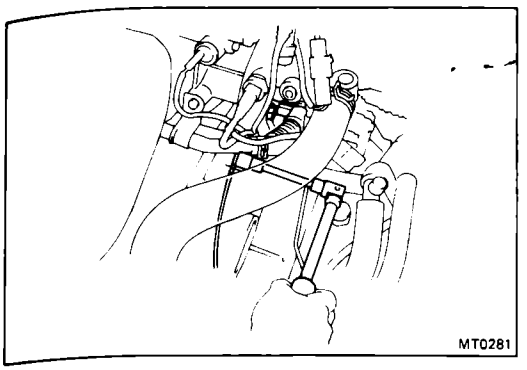
REMOVE BATTERY AND STARTER
   (a) Remove the battery.
   (b) Disconnect the cable and connector.
   (c) Remove the starter with the two bolts.



6.-2 (3S-GE)

REMOVE STARTER
   (a) Disconnect the cable and connector.
   (b) Remove the starter with the two bolts.

7. **DISCONNECT BACK-UP LIGHT SWITCH CONNECTOR AND GROUND STRAP**



8. REMOVE TRANSAXLE MOUNTING BOLTS OF TRANSAXLE UPPER

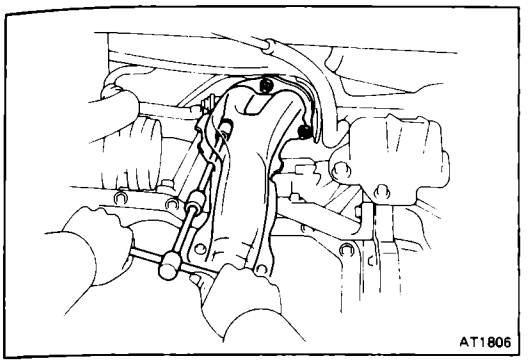
9. RAISE VEHICLE

CAUTION: Be sure the vehicle is securely supported.

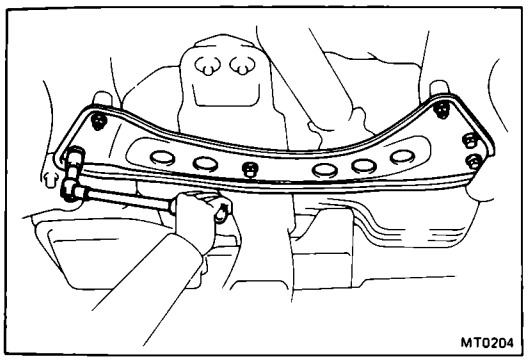
10. REMOVE UNDER COVERS

11. DRAIN OUT FLUID

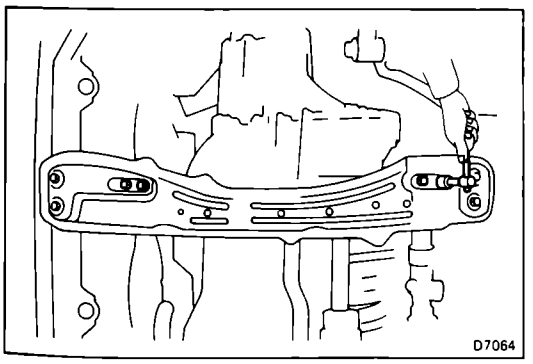
12. DISCONNECT SPEEDOMETER CABLE



13. DISCONNECT EXHAUST PIPE FROM MANIFOLD



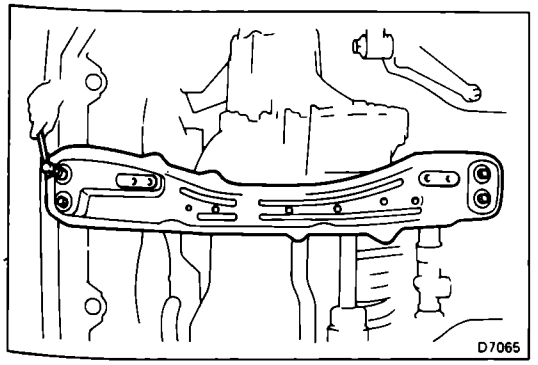
14. REMOVE SUSPENSION LOWER CROSSMEMBER



15. DISCONNECT FRONT AND REAR MOUNTINGS

(a) Remove the two covers from the member.

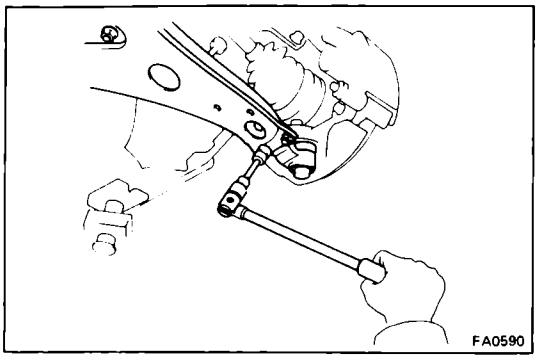
(b) Remove the four bolts.



16. REMOVE ENGINE MOUNTING CENTER MEMBER

17. DISCONNECT BOTH DRIVE SHAFTS FROM TRANSAXLE

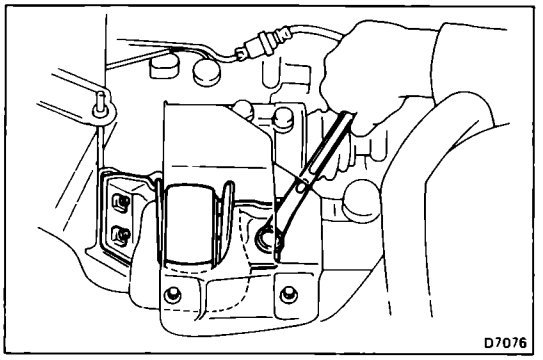
(See page FA-16)



18. DISCONNECT LEFT STEERING KNUCKLE FROM LOWER ARM

(a) Disconnect the steering knuckle from the lower arm.

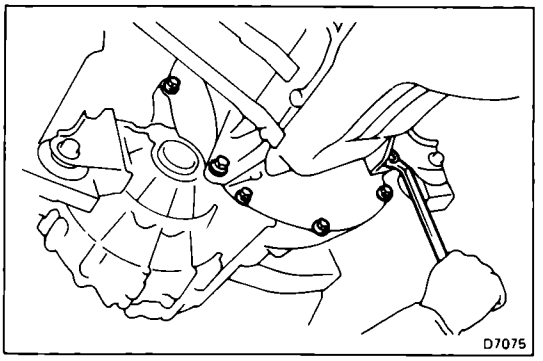
(b) Pull the steering knuckle toward the outside and remove the drive shaft.



19. DISCONNECT LEFT ENGINE MOUNTING

(a) Raise the transaxle and engine slightly with a jack and wooden block in between.

(b) Disconnect the left engine mounting.

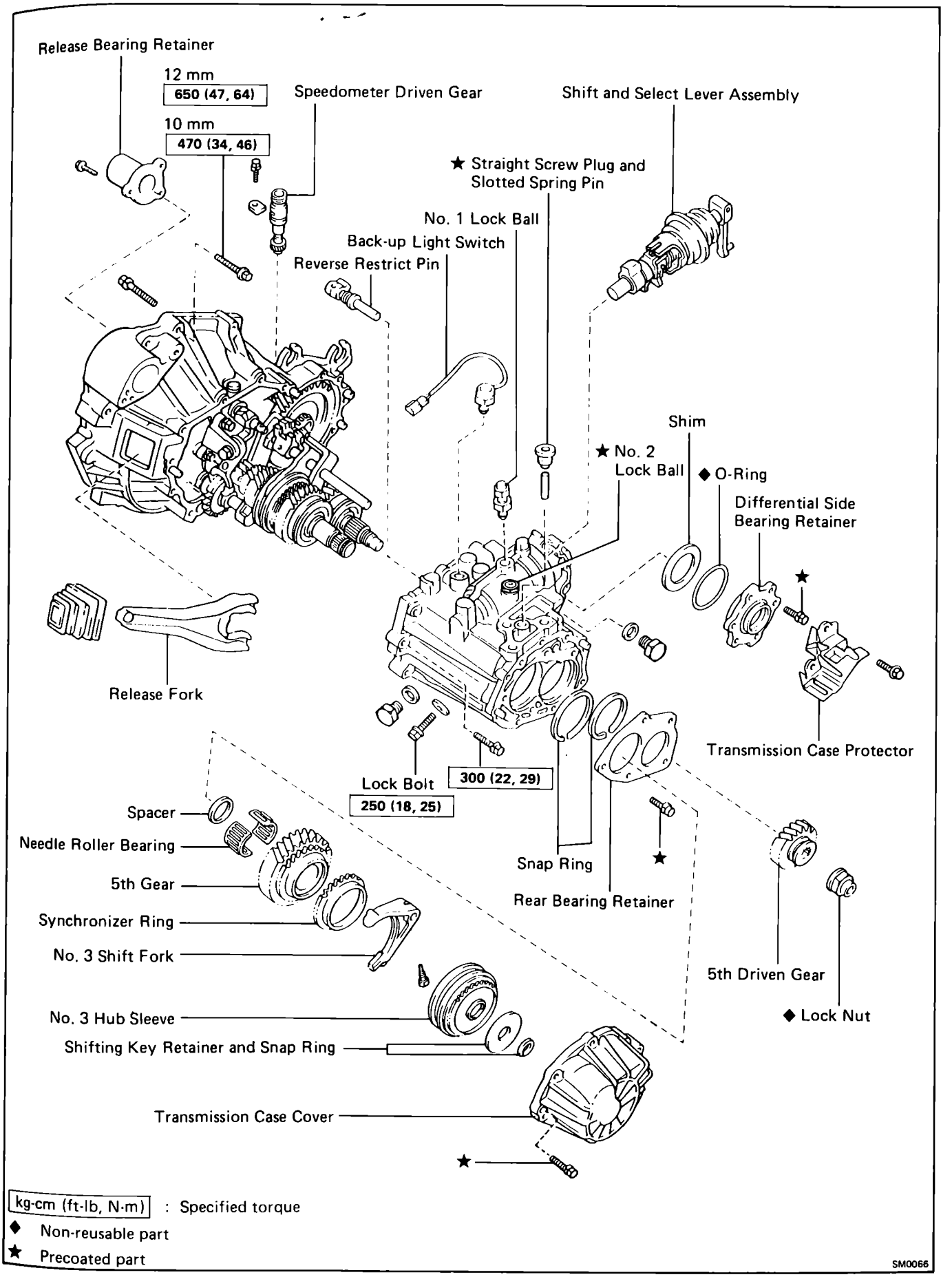


20. REMOVE TRANSAXLE

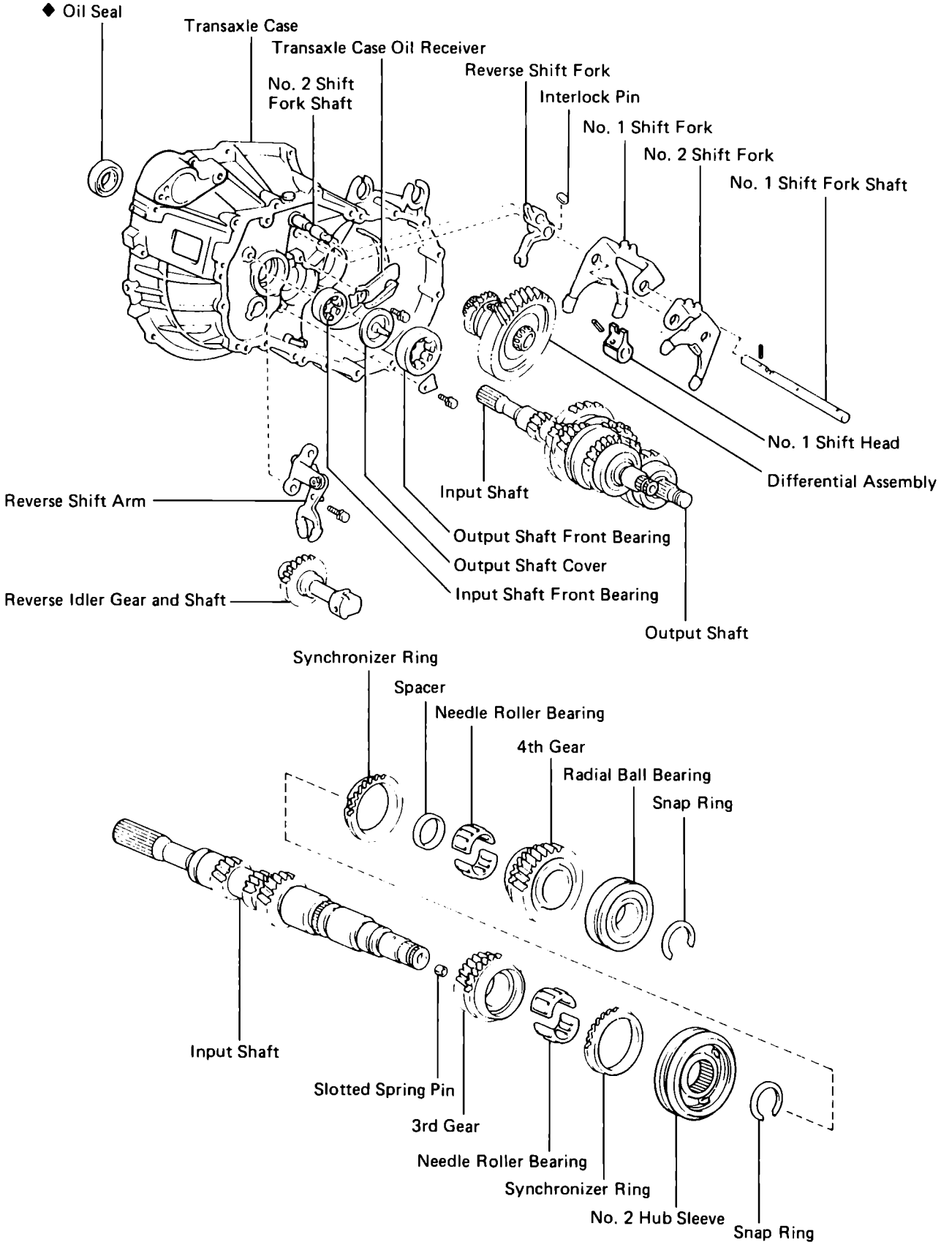
(a) Remove the transaxle mounting bolts from the engine.

(b) Lower the engine left side and remove the transaxle from the engine.

COMPONENTS


Release Bearing Retainer
12 mm
650 (47, 64)
10 mm
470 (34, 46)
Speedometer Driven Gear
Shift and Select Lever Assembly
★ Straight Screw Plug and Slotted Spring Pin
No. 1 Lock Ball
Back-up Light Switch
Reverse Restrict Pin
Shim
★ No. 2 Lock Ball
◆ O-Ring
Differential Side Bearing Retainer
★
Transmission Case Protector
Release Fork
Lock Bolt
250 (18, 25)
300 (22, 29)
Spacer
Needle Roller Bearing
5th Gear
Synchronizer Ring
No. 3 Shift Fork
Snap Ring
★
Rear Bearing Retainer
5th Driven Gear
◆ Lock Nut
No. 3 Hub Sleeve
Shifting Key Retainer and Snap Ring
Transmission Case Cover
★
kg-cm (ft-lb, N·m) : Specified torque
◆ Non-reusable part
★ Precoated part
SM0066

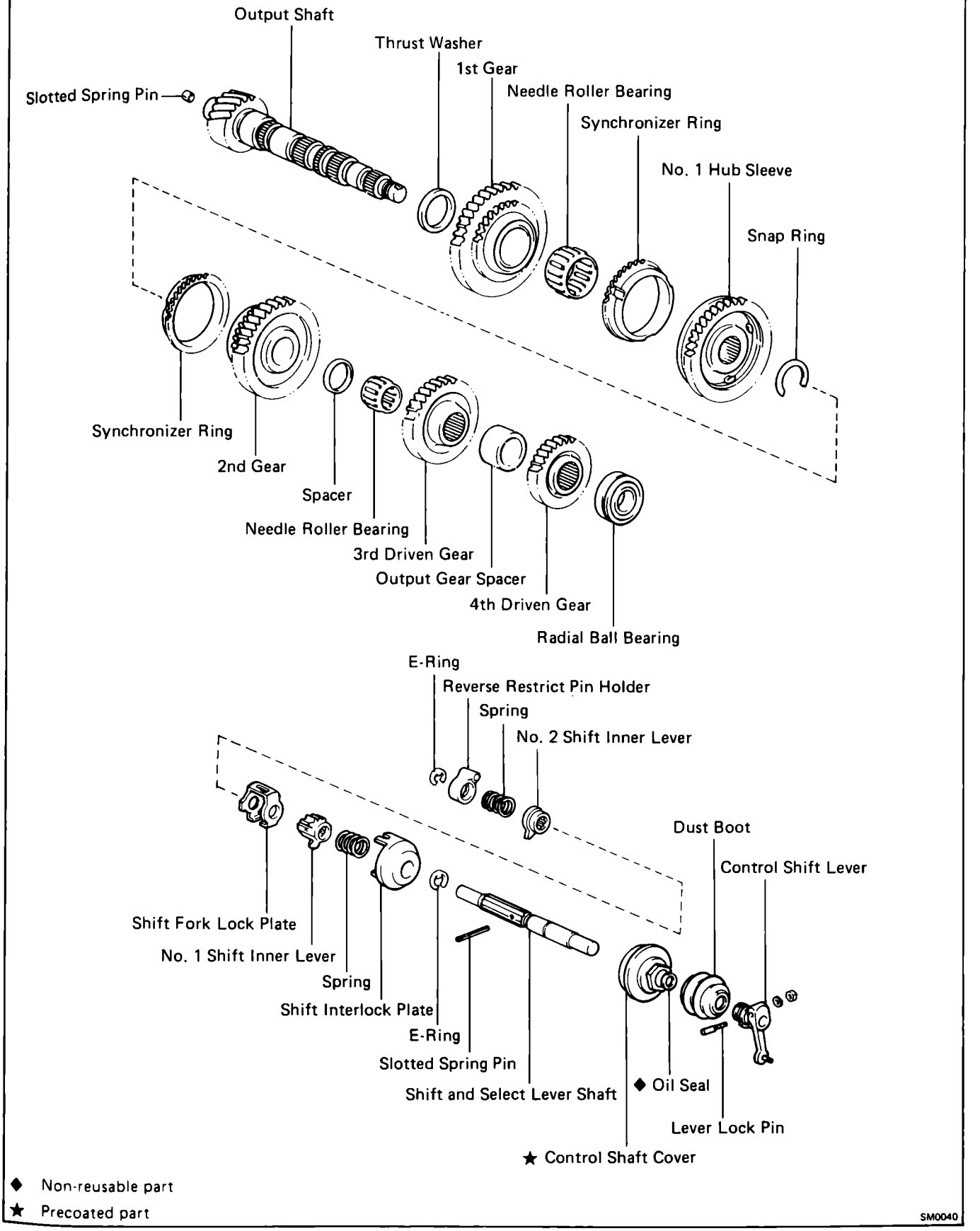
COMPONENTS (Cont'd)



◆ Non-reusable part

SM0067

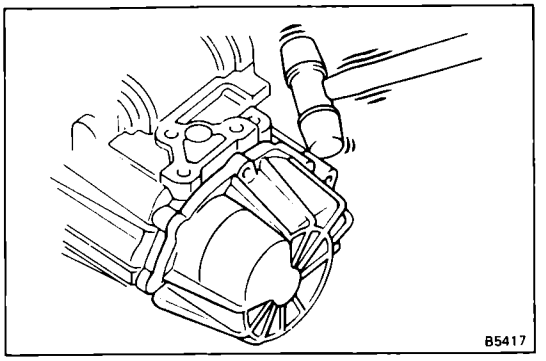
COMPONENTS (Cont'd)



◆ Non-reusable part

★ Precoated part

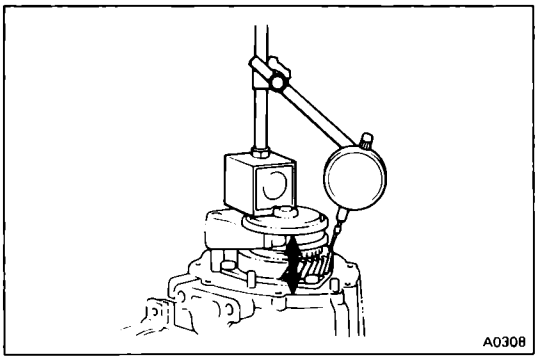
SM0040



DISASSEMBLY OF TRANSMISSION

(See pages MT-7 to 9)

1. **REMOVE RELEASE FORK, BEARING, BACK-UP LIGHT SWITCH AND SPEEDOMETER DRIVEN GEAR**
2. **REMOVE RELEASE BEARING RETAINER**
3. **REMOVE TRANSMISSION CASE COVER**
4. **REMOVE NO. 3 SHIFT FORK SECURING BOLT**

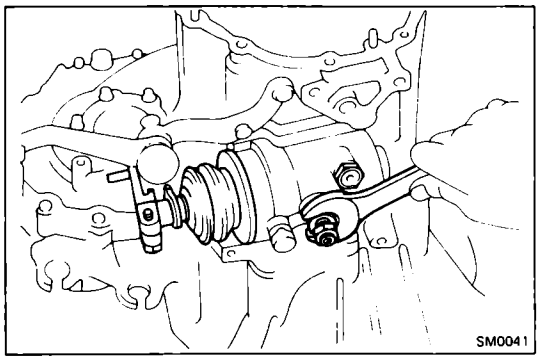


5. **MEASURE FIFTH GEAR THRUST CLEARANCE**

   Using a dial indicator, measure the thrust clearance.

   Standard clearance: 0.20 — 0.40 mm (0.0079 — 0.0157 in.)

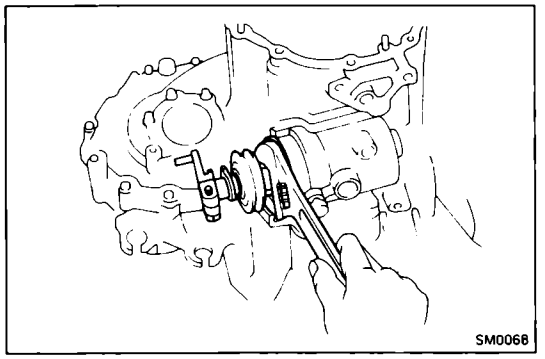
   Maximum clearance: 0.45 mm (0.0177 in.)



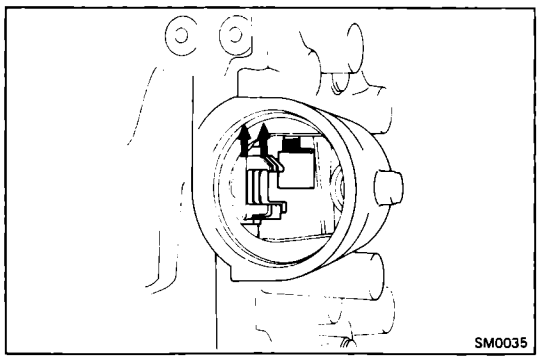
6. **REMOVE NO. 1 AND NO. 2 LOCK BALL ASSEMBLIES**

   Loosen the lock nut and remove the lock balls.

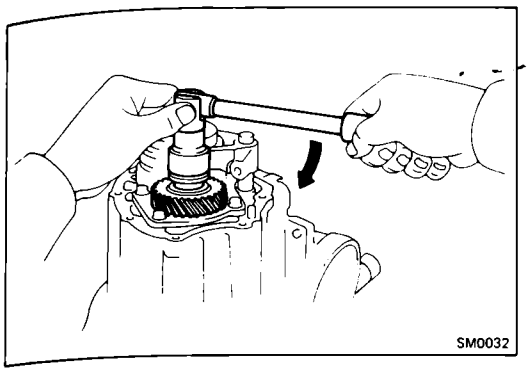
7. **REMOVE SELECTING BELLCRANK**



8. **REMOVE SHIFT AND SELECT LEVER ASSEMBLY**



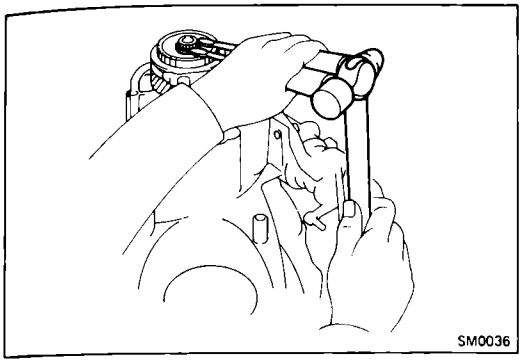
9. **REMOVE OUTPUT SHAFT LOCK NUT**
   (a) Unstake the nut.
   (b) Engage the gear double meshing.



(c) Remove the lock nut.

NOTE: The lock nut has LH threads.

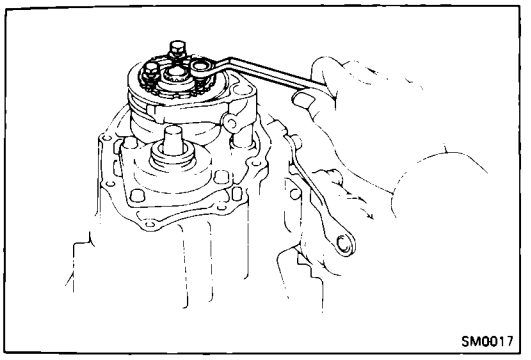
(d) Disengage the gear double meshing.



10. REMOVE NO. 3 HUB SLEEVE ASSEMBLY AND NO. 3 SHIFT FORK

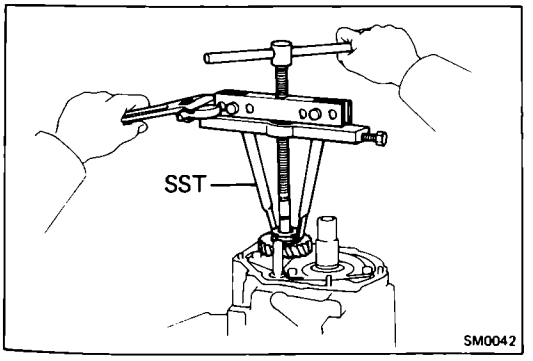
(a) Using two screwdrivers and a hammer, tap out the snap ring.

(b) Remove the shifting key retainer.



(c) Using three case cover set bolts, tighten the three bolts a little at a time and remove No. 3 hub sleeve assembly and shift fork.

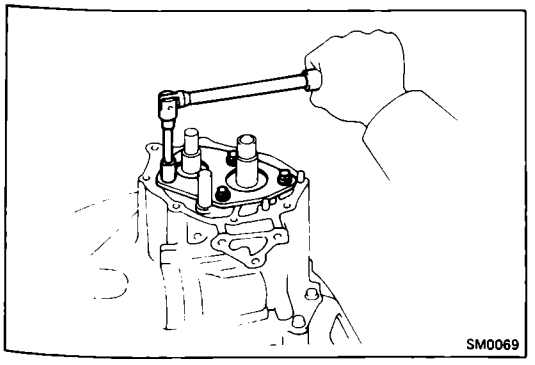
11. REMOVE FIFTH GEAR, SYNCHRONIZER RING, NEEDLE ROLLER BEARINGS AND SPACER



12. REMOVE FIFTH DRIVEN GEAR

Using SST, remove the 5th driven gear.

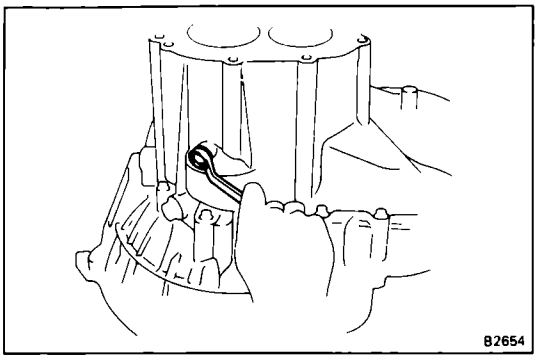
SST 09950-20017



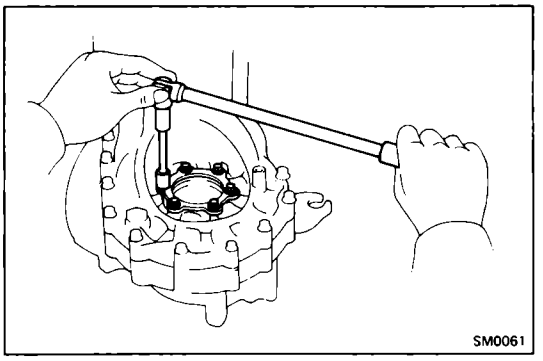
13. REMOVE REAR BEARING RETAINER

14. REMOVE BEARING SNAP RINGS

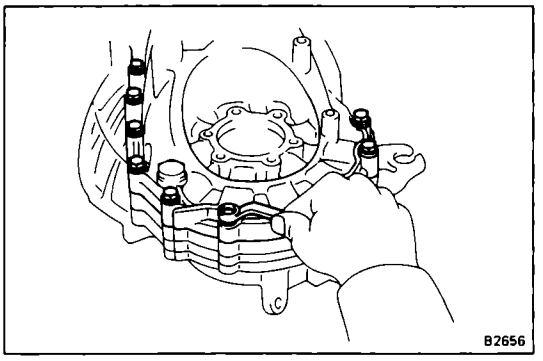
Using snap ring pliers, remove the two snap rings.



15. REMOVE REVERSE IDLER GEAR SHAFT LOCK BOLT

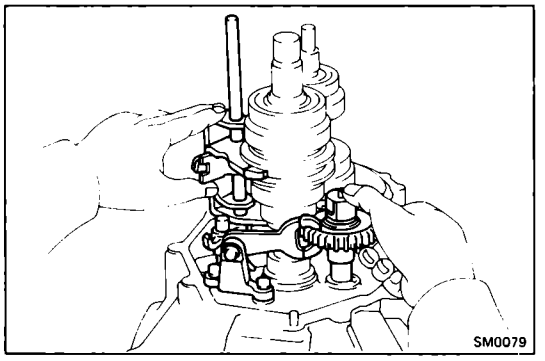


16. REMOVE DIFFERENTIAL SIDE BEARING RETAINER AND SHIM



17. REMOVE TRANSMISSION CASE

Remove the seventeen bolts and tap off the case with a plastic hammer.



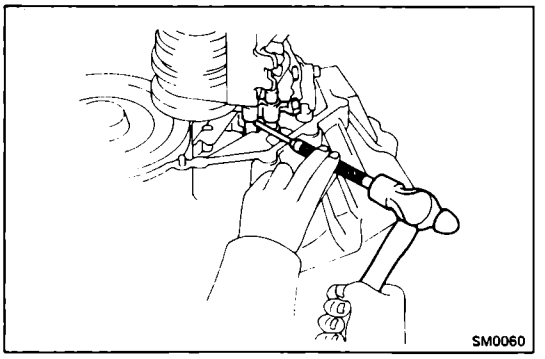
18. REMOVE REVERSE SHIFT ARM

(a) Shift the fork shaft into reverse.

(b) Remove the two bolts and pull off the reverse shift arm.

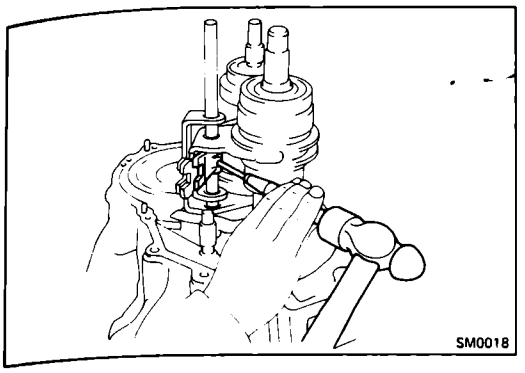
19. REMOVE REVERSE IDLER GEAR AND SHAFT

Pull out the shaft.

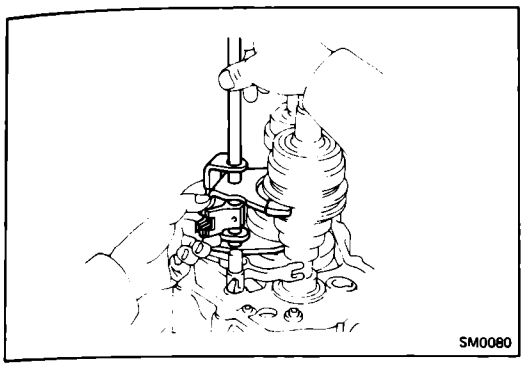


20. REMOVE NO. 1 SHIFT FORK SHAFT, NO. 1 SHIFT HEAD, NO. 1 AND NO. 2 SHIFT FORKS

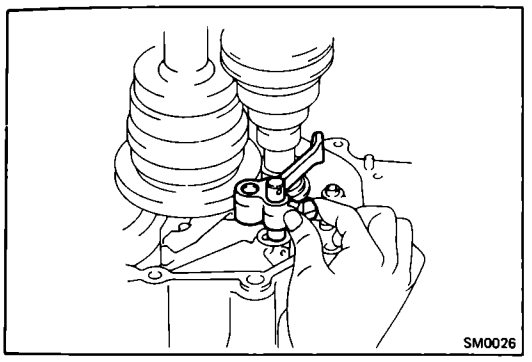
(a) Drive out the slotted spring pin from No. 1 fork shaft.



(b) Drive out the slotted spring pin from the shift head.



(c) Pull out No. 1 fork shaft and remove the shift head and shift forks.

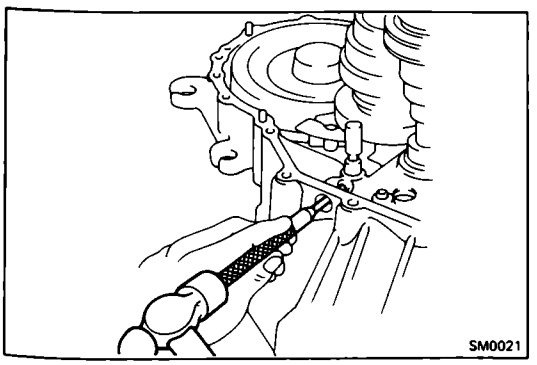


21. REMOVE REVERSE SHIFT FORK AND INTERLOCK PIN

22. REMOVE NO. 2 FORK SHAFT

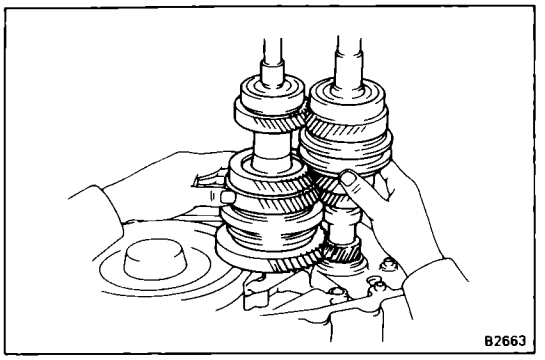
(a) Using SST, remove the straight screw plug.

SST 09313-30021



(b) Using a pin punch and hammer, drive out the slotted spring pin.

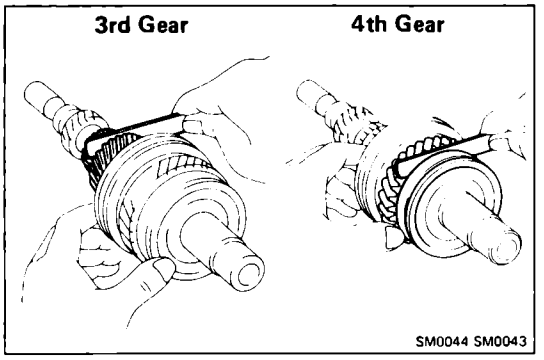
(c) Pull out the shaft.



23. **REMOVE INPUT AND OUTPUT SHAFTS TOGETHER FROM TRANSAXLE CASE**

24. **REMOVE DIFFERENTIAL ASSEMBLY**

25. **REMOVE MAGNET**



26. **MEASURE THIRD AND FOURTH GEAR THRUST CLEARANCE**

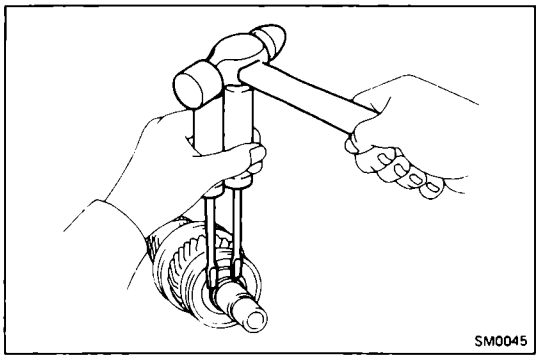
Using a feeler gauge, measure the thrust clearance.

Standard clearance:

3rd gear	**0.10 – 0.25 mm (0.0039 – 0.0098 in.)**
4th gear	**0.20 – 0.45 mm (0.0079 – 0.0177 in.)**

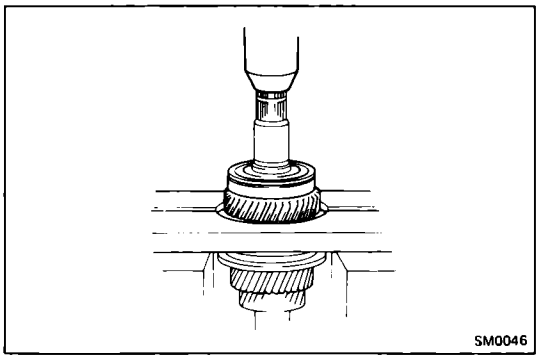
Maximum clearance:

3rd gear	**0.30 mm (0.0118 in.)**
4th gear	**0.50 mm (0.0197 in.)**



27. **REMOVE SNAP RING FROM INPUT SHAFT**

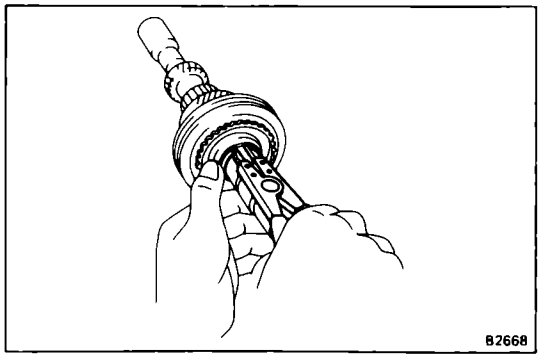
Using two screwdrivers and a hammer, tap out the snap ring.



28. **REMOVE RADIAL BALL BEARING, FOURTH GEAR, NEEDLE ROLLER BEARINGS, SYNCHRONIZER RING AND SPACER FROM INPUT SHAFT**

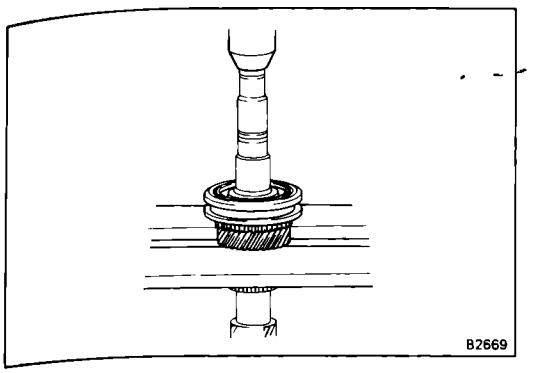
(a) Using a press, remove the radial ball bearing and 4th gear.

(b) Remove the needle roller bearings, synchronizer ring and spacer.



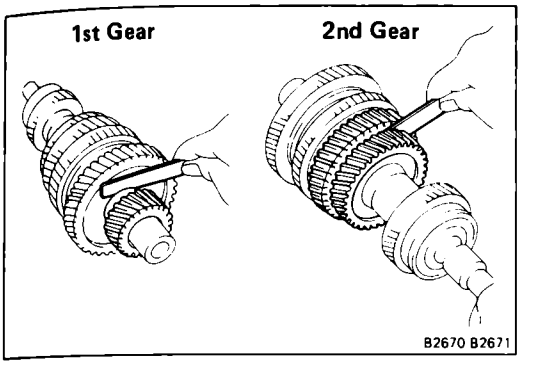
29. **REMOVE SNAP RING**

Using snap ring pliers, remove the snap ring.



30. REMOVE NO. 2 HUB SLEEVE ASSEMBLY, THIRD GEAR, SYNCHRONIZER RING AND NEEDLE ROLLER BEARINGS

Using a press, remove No. 2 hub sleeve, 3rd gear, synchronizer ring and needle roller bearings.



31. MEASURE FIRST AND SECOND GEAR THRUST CLEARANCE

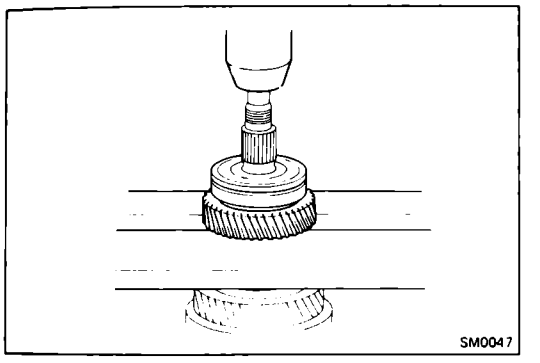
Using a feeler gauge, measure the thrust clearance.

Standard clearance:

1st gear	**0.10 — 0.29 mm (0.0039 — 0.0114 in.)**
2nd gear	**0.20 — 0.44 mm (0.0079 — 0.0173 in.)**

Maximum clearance:

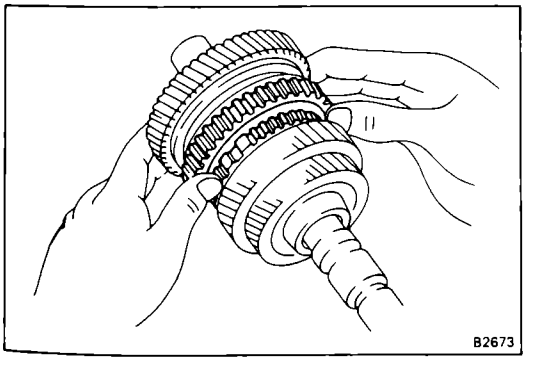
1st gear	**0.35 mm (0.0138 in.)**
2nd gear	**0.50 mm (0.0197 in.)**



32. REMOVE RADIAL BALL BEARING, FOURTH DRIVEN GEAR AND OUTPUT GEAR SPACER FROM OUTPUT SHAFT

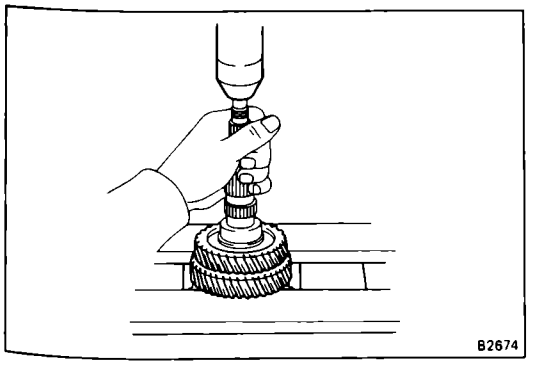
(a) Using a press, remove the radial ball bearing and 4th driven gear.

(b) Remove the spacer.



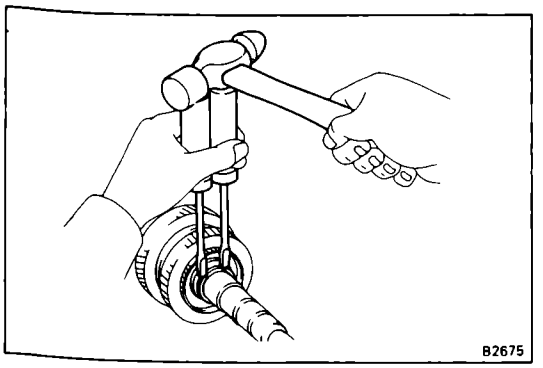
33. REMOVE THIRD DRIVEN GEAR, SECOND GEAR, NEEDLE ROLLER BEARING, SPACER AND SYNCHRONIZER RING

(a) Shift No. 1 hub sleeve into the 1st gear.



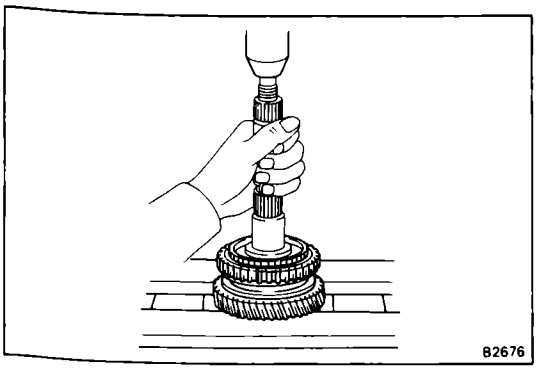
(b) Using a press, remove the 3rd driven gear and 2nd gear.

(c) Remove the needle roller bearing, spacer and synchronizer ring.



34. REMOVE SNAP RING

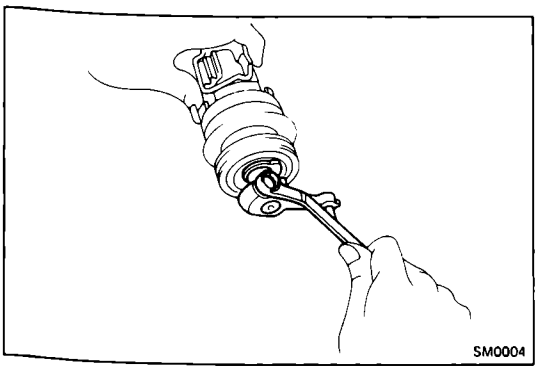
Using two screwdrivers and a hammer, tap out the snap ring.



35. REMOVE NO. 1 HUB SLEEVE ASSEMBLY, FIRST GEAR, SYNCHRONIZER RING, NEEDLE ROLLER BEARING AND THRUST WASHER

(a) Using a press, remove No. 1 hub sleeve, 1st gear and synchronizer ring.

(b) Remove the needle roller bearing and thrust washer.



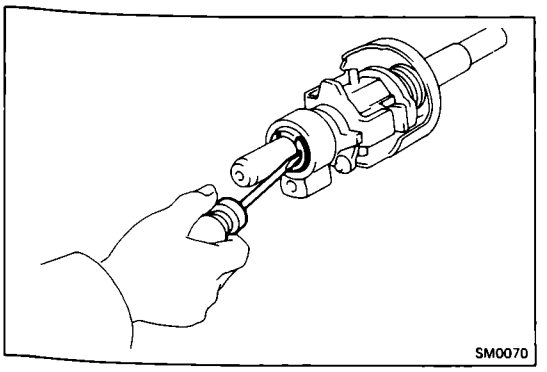
36. DISASSEMBLE SHIFT AND SELECT LEVER ASSEMBLY

(a) Remove the lever lock pin and nut.

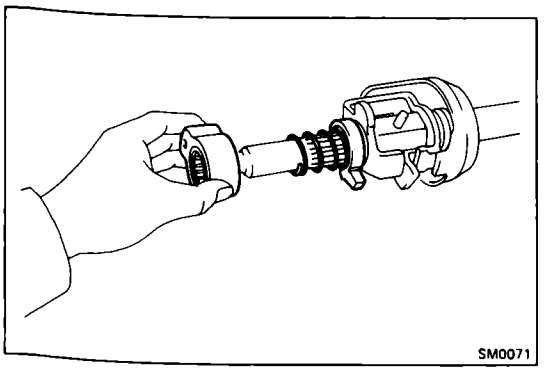
(b) Remove the control shift lever.

(c) Remove the dust boot.

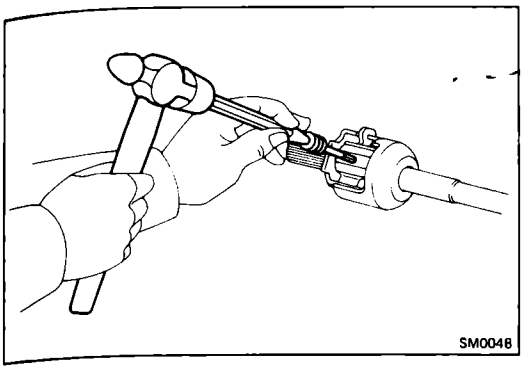
(d) Remove the control shaft cover.



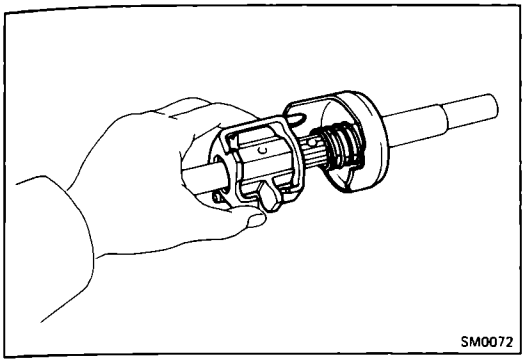
(e) Remove the E-ring.



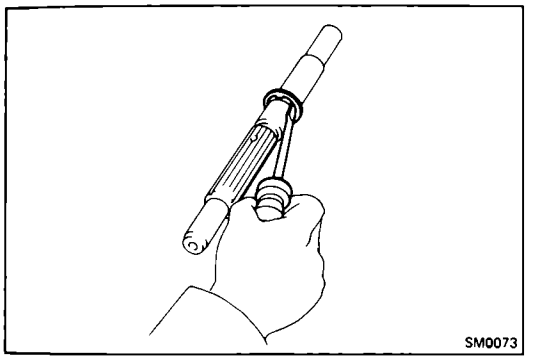
(f) Remove the reverse restrict pin holder, spring and No. 2 shift inner lever.



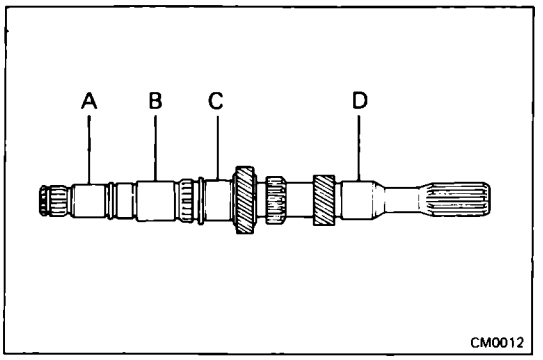
(g) Using a pin punch and hammer, drive out the slotted spring pin.



(h) Remove the shift fork lock plate, No. 1 shift inner lever, spring and shift interlock plate.



(i) Remove the E-ring from the shaft.



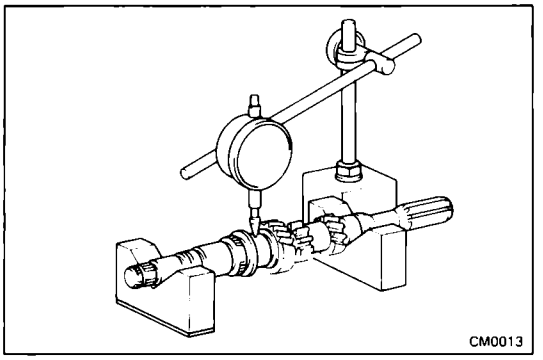
INSPECTION OF TRANSMISSION COMPONENTS

1. INSPECT INPUT SHAFT

(a) Using a micrometer, measure the outer diameter of the input shaft journal surface.

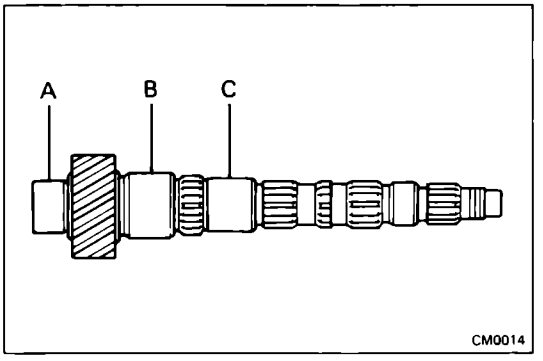
Minimum outer diameter:

Part A 26.970 mm (1.0618 in.)
B 32.470 mm (1.2783 in.)
C 33.090 mm (1.3028 in.)
D 29.970 mm (1.1799 in.)



(b) Using a dial indicator, check the shaft runout.

Maximum runout: 0.05 mm (0.0020 in.)

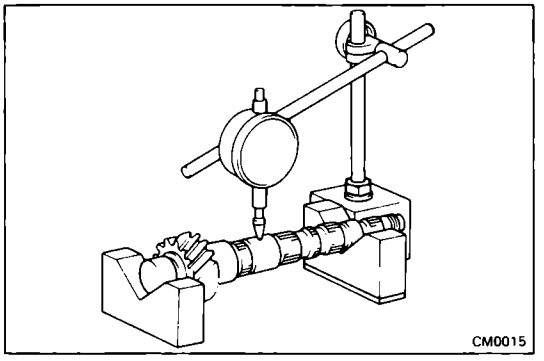


2. INSPECT OUTPUT SHAFT

(a) Using a micrometer, measure the outer diameter of the output shaft journal surface.

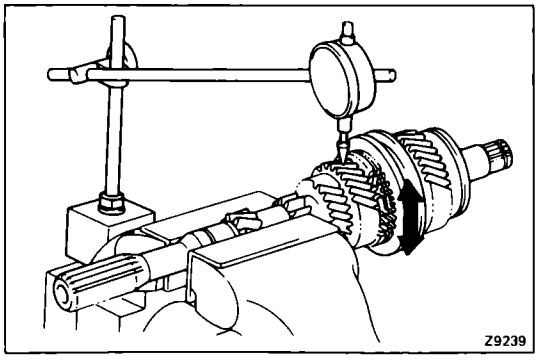
Minimum outer diameter:

Part A 31.970 mm (1.2587 in.)
B 37.970 mm (1.4949 in.)
C 31.970 mm (1.2587 in.)



(b) Using a dial indicator, check the shaft runout.

Maximum runout: 0.05 mm (0.0020 in.)



3. CHECK OIL CLEARANCE OF EACH GEAR

Using a dial indicator, measure the oil clearance between the gear and input or output shaft with the needle roller bearing installed.

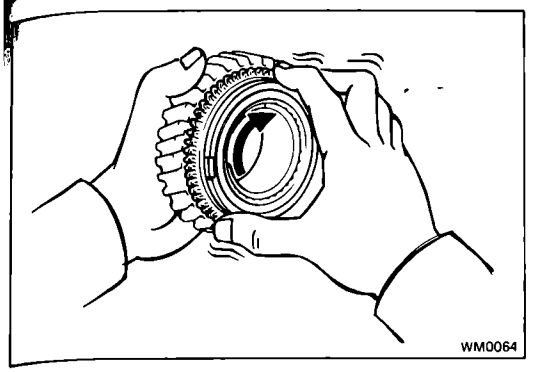
Standard clearance:

1st, 2nd, 3rd and 4th gears
0.009 — 0.053 mm
(0.0004 — 0.0021 in.)

5th gear 0.009 — 0.050 mm
(0.0004 — 0.0020 in.)

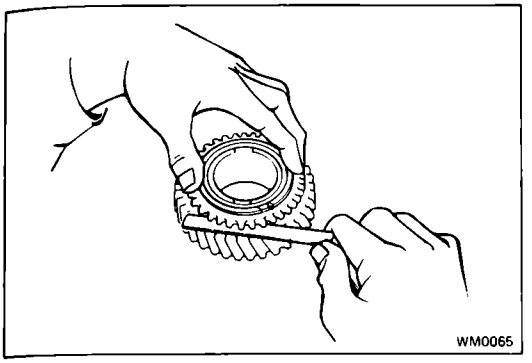
Maximum clearance: 0.070 mm (0.0028 in.)

If the clearance exceeds the limit, replace the gear, needle roller bearing or shaft.



4. INSPECT SYNCHRONIZER RINGS

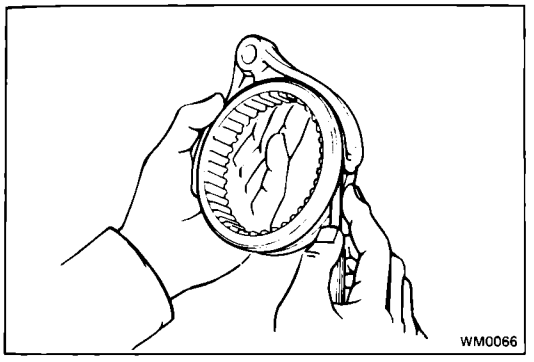
(a) Turn the ring and push it in to check the braking action.



(b) Measure the clearance between the synchronizer ring back and the gear spline end.

Minimum clearance: 0.6 mm (0.024 in.)

If the clearance is less than the limit, replace the synchronizer ring.

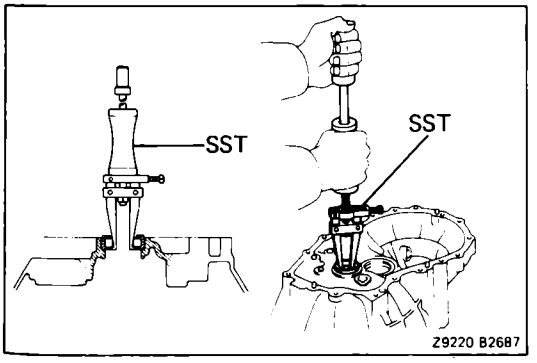


5. MEASURE CLEARANCE OF SHIFT FORKS AND HUB SLEEVES

Using a feeler gauge, measure the clearance between the hub sleeve and shift fork.

Maximum clearance: 1.0 mm (0.039 in.)

If the clearance exceeds the limit, replace the shift fork or hub sleeve.

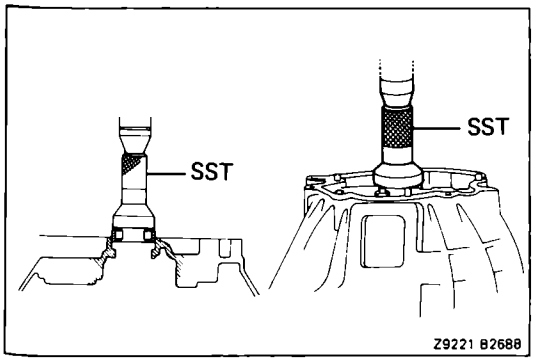


6. IF NECESSARY, REPLACE INPUT SHAFT FRONT BEARING

(a) Remove the bolt and transaxle case oil receiver.

(b) Using SST, pull out the bearing.

SST 09308-00010

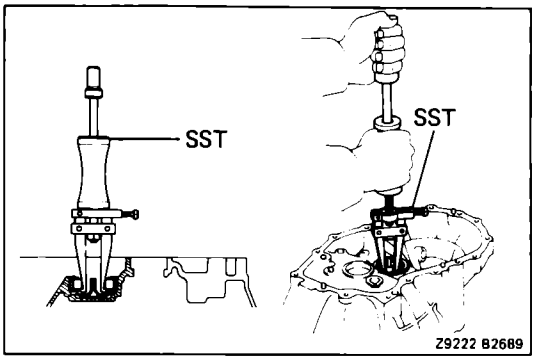


(c) Using SST, press in a new bearing.

SST 09310-35010

(d) Install the transaxle case oil receiver and torque the bolt.

Torque: 75 kg-cm (65 in.-lb, 7.4 N·m)

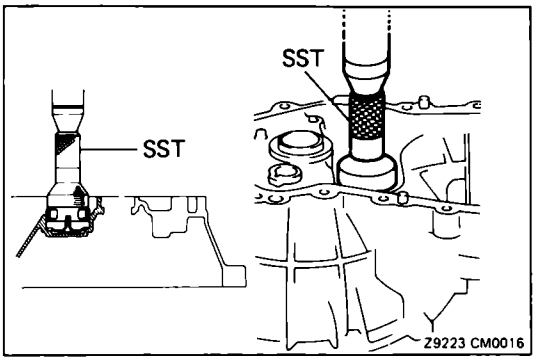


7. **IF NECESSARY, REPLACE OUTPUT SHAFT FRONT BEARING**

(a) Remove the bolt and bearing lock plate.

(b) Using SST, pull out the bearing.

SST 09308-00010

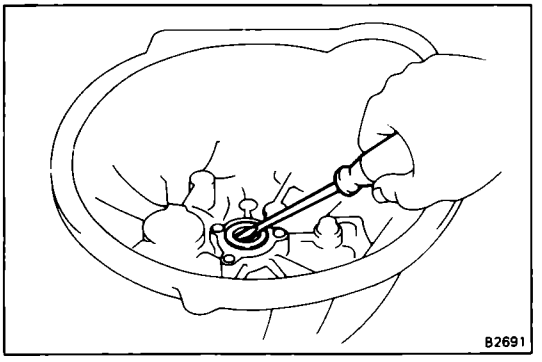


(c) Using SST, press in a new bearing.

SST 09310-35010

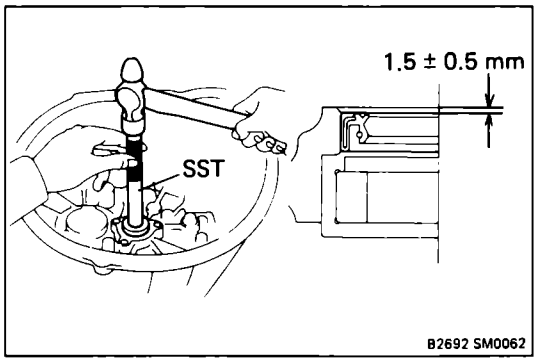
(d) Install the bearing lock plate and torque the bolt.

Torque: 185 kg-cm (13 ft-lb, 18 N·m)



8. **IF NECESSARY, REPLACE INPUT SHAFT FRONT OIL SEAL**

(a) Using a screwdriver, pry out the oil seal.

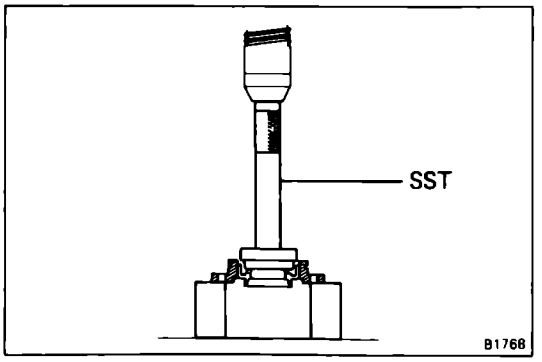


(b) Using SST, drive in a new oil seal.

SST 09608-20012 (09608-00080, 09608-03020)

Drive in depth: 1.0 – 2.0 mm (0.039 – 0.079 in.)

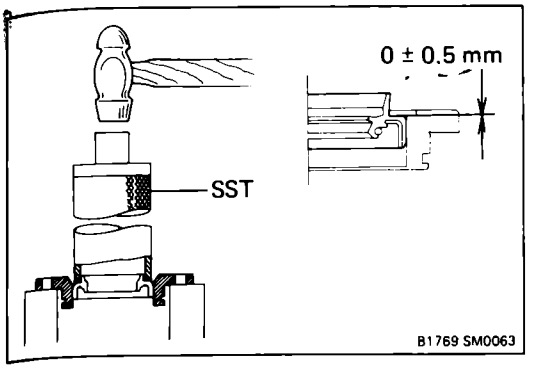
(c) Coat the lip of the oil seal with MP grease.



9. **IF NECESSARY, REPLACE LH SIDE OIL SEAL**

(a) Using SST, press out the oil seal from the retainer.

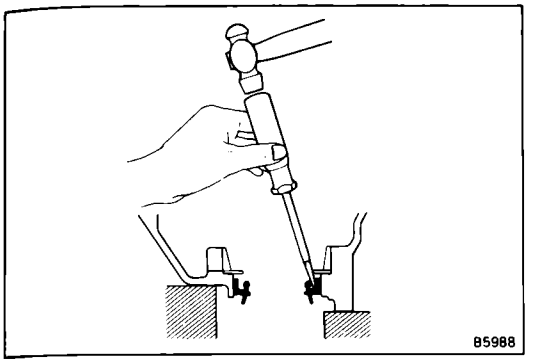
SST 09608-20012 (09608-00030, 09608-03020)



(b) Using SST, press in a new oil seal until its surface is flush with the case surface.

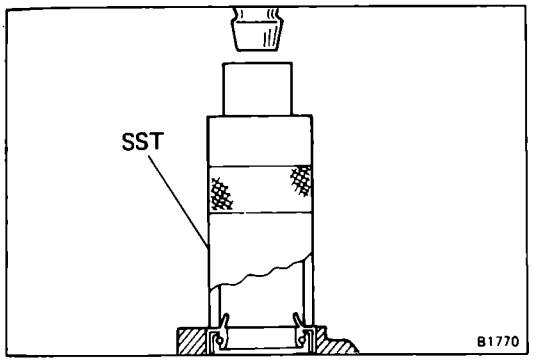
SST 09316-60010 (09316-00010)

(c) Coat the lip of the oil seal with MP grease.



10. IF NECESSARY, REPLACE RH SIDE OIL SEAL

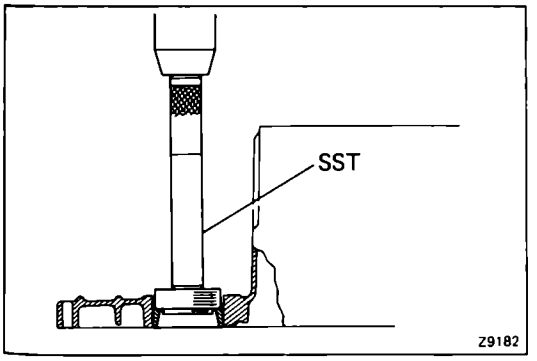
(a) Drive out the oil seal with a screwdriver.



(b) Using SST, drive in a new oil seal until its surface is flush with the case surface.

SST 09316-60010 (09316-00010)

(c) Coat the lip of the oil seal with MP grease.



11. IF NECESSARY, REPLACE LH OUTER RACE OF SIDE BEARING

(a) Using SST, press out the outer race.

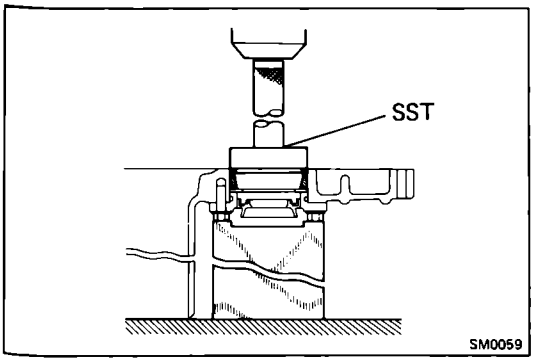
SST 09608-20012 (09608-00060, 09608-03020)

(b) Install the bearing retainer without an O-ring.

(c) Install and torque the retainer bolts.

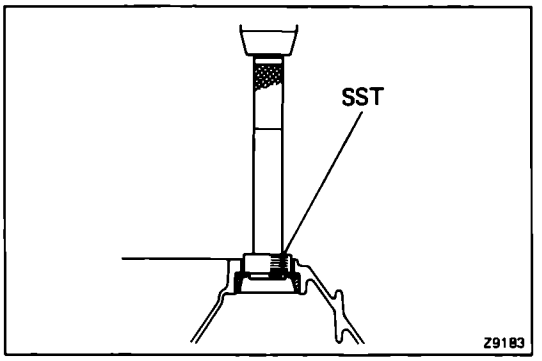
Torque: 185 kg-cm (13 ft-lb, 18 N·m)

(d) Place the thinnest shim into the case.
(See table on page MT-28)



(e) Using SST, press in a new outer race.

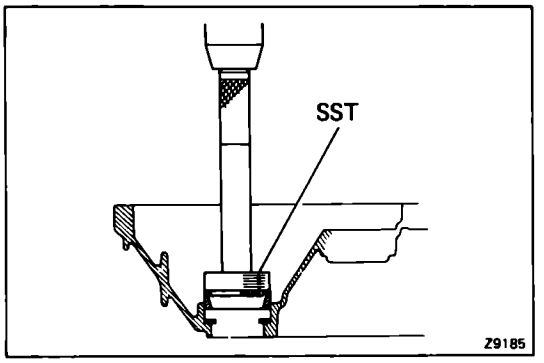
SST 09608-20012 (09608-03020, 09608-03060)



12. IF NECESSARY, REPLACE RH OUTER RACE OF SIDE BEARING

(a) Using SST, press out the outer race and shim.

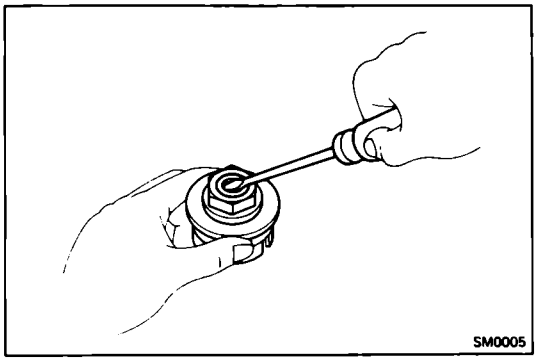
SST 09608-20012 (09608-00030, 09608-03020)



(b) Place the shim into the case.

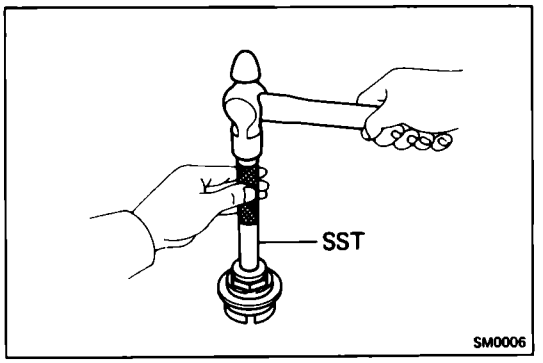
(c) Using SST, press in a new outer race.

SST 09608-20012 (09608-03020, 09608-03060)



13. IF NECESSARY, REPLACE CONTROL SHAFT COVER OIL SEAL

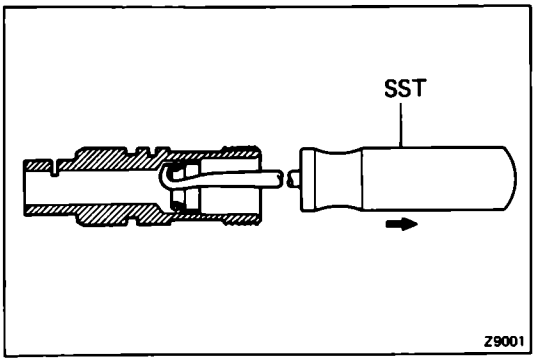
(a) Using a screwdriver, pry out the oil seal.



(b) Using SST, drive in a new oil seal until its surface is flush with the cover surface.

SST 09608-20012 (09608-00080, 09608-03020)

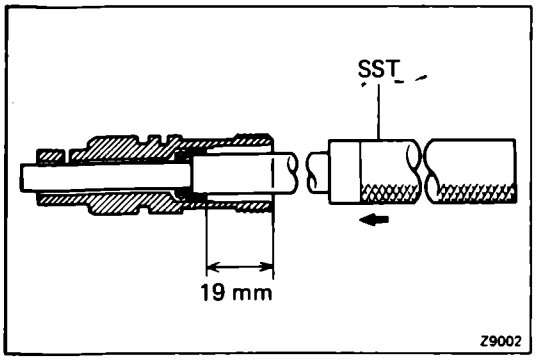
(c) Coat the lip of the oil seal with MP grease.



14. IF NECESSARY, REPLACE SPEEDOMETER DRIVEN GEAR OIL SEAL

(a) Using SST, pull out the oil seal.

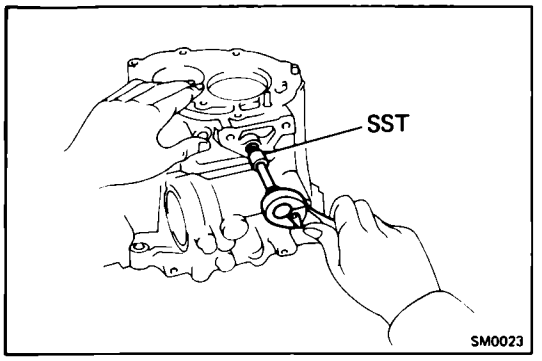
SST 09921-00010



(b) Using SST, drive in a new oil seal.

SST 09201-60011

Drive in depth: 19 mm (0.75 in.)

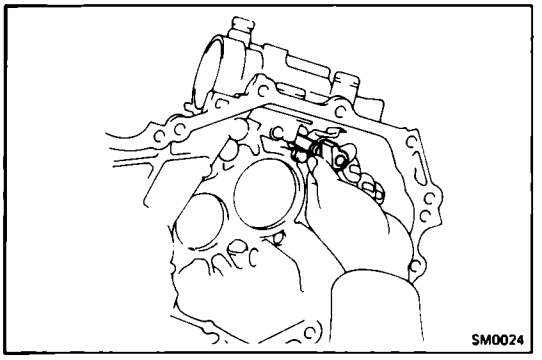


15. IF NECESSARY, REPLACE REVERSE RESTRICT PIN

(a) Using SST, remove the straight screw plug.

SST 09313-30021

(b) Using a pin punch and hammer, drive out the slotted spring pin.



(c) Replace the reverse restrict pin.

(d) Drive in the slotted spring pin.

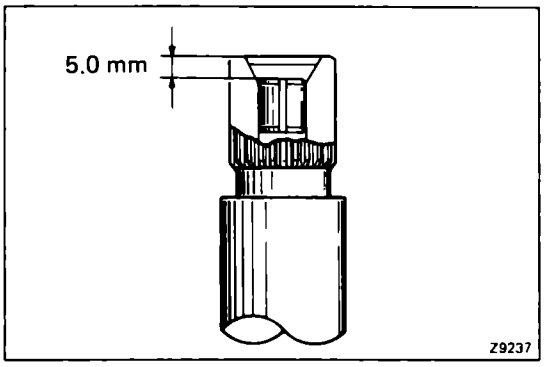
(e) Apply sealant to the plug threads.

Sealant: Part No. 08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent

(f) Using SST, install the straight screw plug.

SST 09313-30021

Torque: 130 kg-cm (9 ft-lb, 13 N·m)

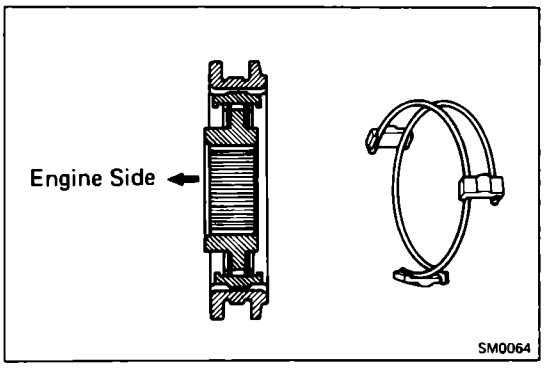


ASSEMBLY OF TRANSMISSION

(See pages MT-7 to 9)

1. IF INPUT SHAFT WAS REPLACED, DRIVE IN SLOTTED SPRING PIN

If the input shaft was replaced, drive the slotted spring pin in the input shaft to a depth of 5.0 mm (0.197 in.).

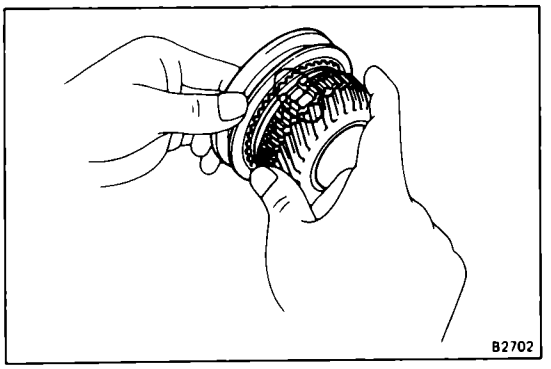


2. INSERT NO. 2 CLUTCH HUB INTO HUB SLEEVE

(a) Install the clutch hub and shifting keys to the hub sleeve.

(b) Install the shifting key springs under the shifting keys.

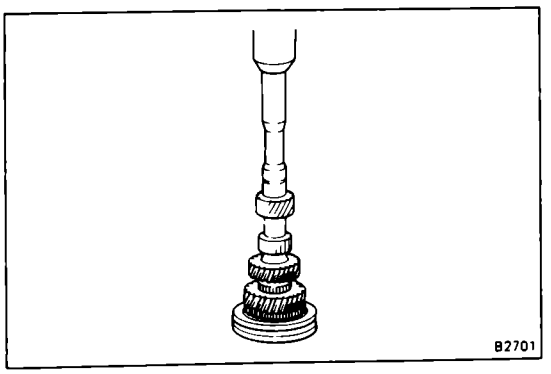
CAUTION: Install the key springs positioned so that their end gaps are not in line.



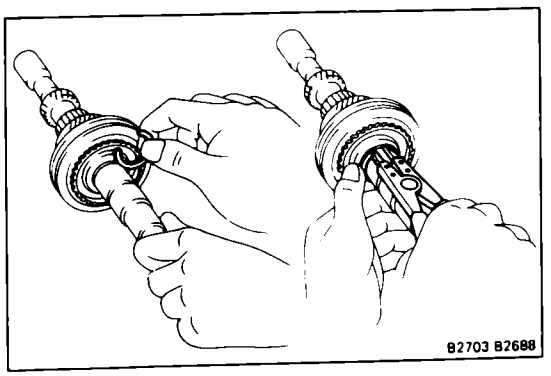
3. INSTALL THIRD GEAR, NEEDLE ROLLER BEARINGS, SYNCHRONIZER RING AND NO. 2 HUB SLEEVE ASSEMBLY TO INPUT SHAFT

(a) Apply ATF to the needle roller bearings.

(b) Place the synchronizer ring on the gear and align the ring slots with the shifting keys.



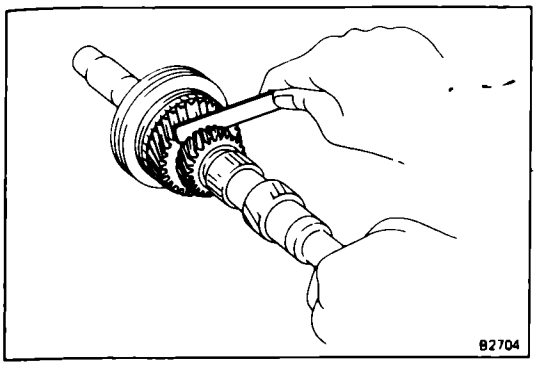
(c) Using a press, install the 3rd gear and No. 2 hub sleeve.



4. INSTALL SNAP RING

Select a snap ring that will allow minimum axial play and install it on the shaft.

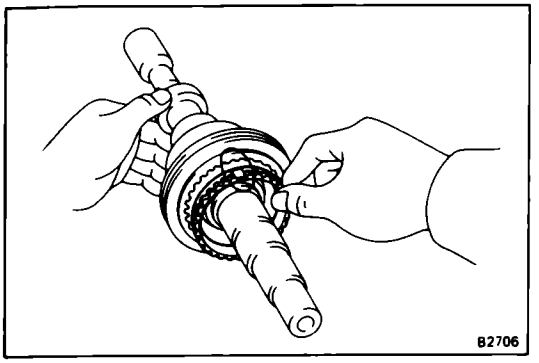
Mark	Thickness	mm (in.)
1	1.95 – 2.00	(0.0768 – 0.0787)
2	2.00 – 2.05	(0.0787 – 0.0807)
3	2.05 – 2.10	(0.0807 – 0.0827)
4	2.10 – 2.15	(0.0827 – 0.0846)
5	2.15 – 2.20	(0.0846 – 0.0866)
6	2.20 – 2.25	(0.0866 – 0.0886)



5. MEASURE THIRD GEAR THRUST CLEARANCE

Using a feeler gauge, measure the 3rd gear thrust clearance.

Standard clearance: 0.10 – 0.25 mm (0.0039 – 0.0098 in.)

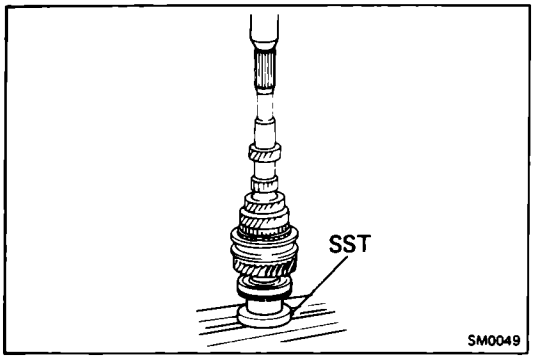


6. INSTALL SYNCHRONIZER RING, SPACER, NEEDLE ROLLER BEARINGS, FOURTH GEAR AND RADIAL BALL BEARING

(a) Install the spacer.

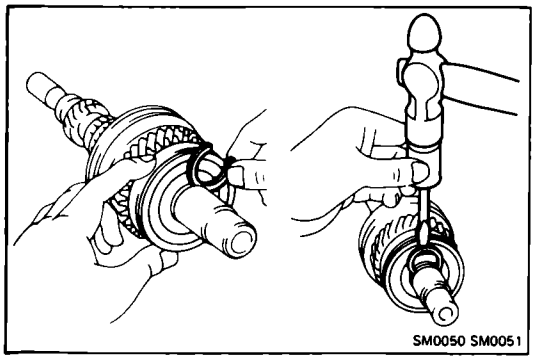
(b) Apply ATF to the needle roller bearings.

(c) Place the synchronizer ring on the gear and align the ring slots with the shifting keys.



(d) Using SST, press in the 4th gear and radial ball bearing.

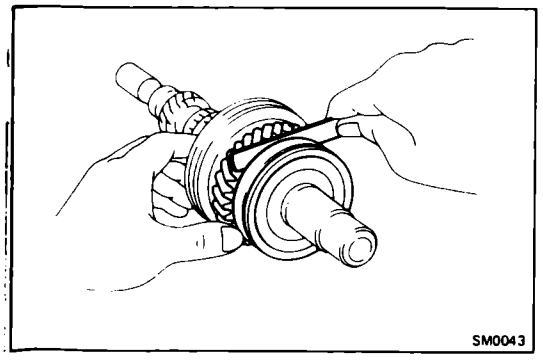
SST 09608-20012 (09608-03070)



7. INSTALL SNAP RING

Select a snap ring that will allow minimum axial play and install it on the shaft.

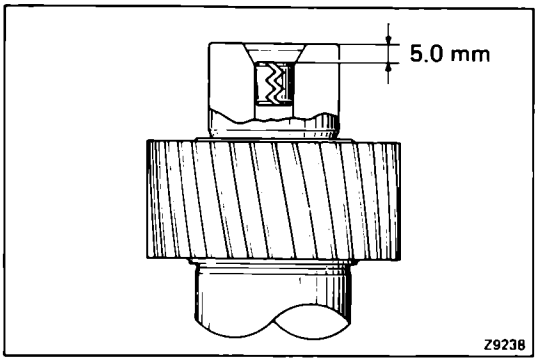
Mark	Thickness	mm (in.)
A	2.15 – 2.20	(0.0846 – 0.0866)
B	2.20 – 2.25	(0.0866 – 0.0886)
C	2.25 – 2.30	(0.0886 – 0.0906)
D	2.30 – 2.35	(0.0906 – 0.0925)
E	2.35 – 2.40	(0.0925 – 0.0945)



8. MEASURE FOURTH GEAR THRUST CLEARANCE

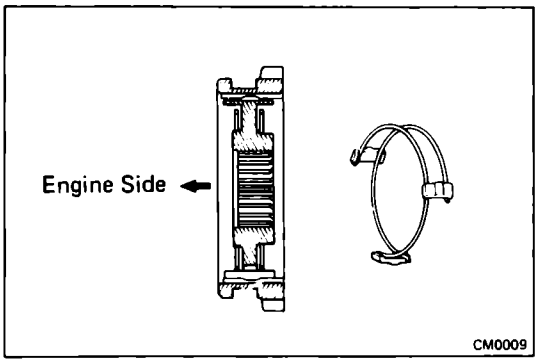
Using a feeler gauge, measure the 4th gear thrust clearance.

Standard clearance: 0.20 – 0.45 mm (0.0079 – 0.0177 in.)



9. IF OUTPUT SHAFT WAS REPLACED, DRIVE IN SLOTTED SPRING PIN

If the output shaft was replaced, drive the slotted spring pin in the output shaft to a depth of 5.0 mm (0.197 in.).

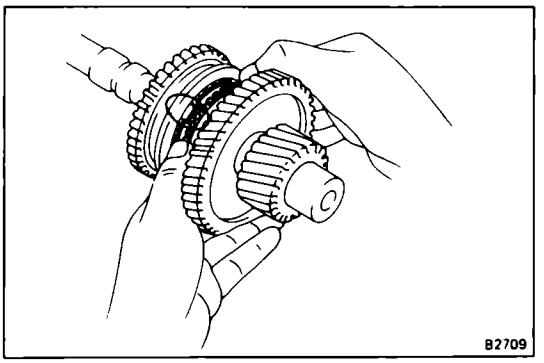


10. INSERT NO. 1 CLUTCH HUB INTO HUB SLEEVE

(a) Install the clutch hub and shifting keys to the hub sleeve.

(b) Install the shifting key springs under the shifting keys.

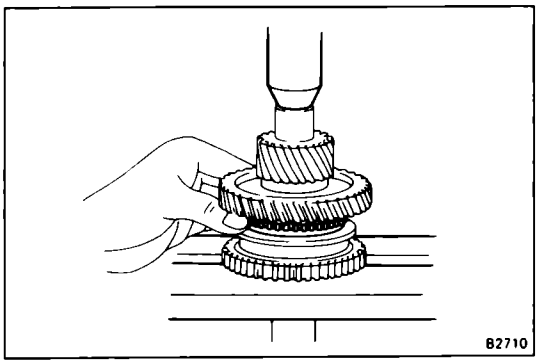
CAUTION: Install the key springs positioned so that their end gaps are not in line.



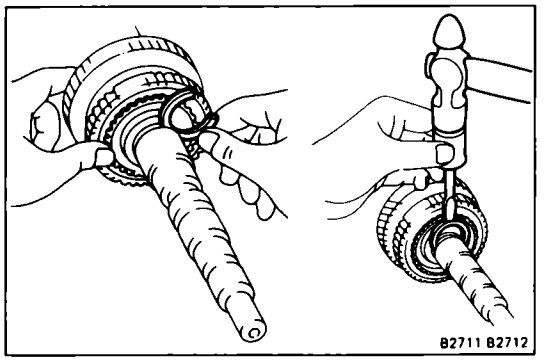
11. INSTALL THRUST WASHER, FIRST GEAR, NEEDLE ROLLER BEARING, SYNCHRONIZER RING AND NO. 1 HUB SLEEVE ASSEMBLY TO OUTPUT SHAFT

(a) Apply ATF to the needle roller bearing.

(b) Place the synchronizer ring on the gear and align the ring slots with the shifting keys.



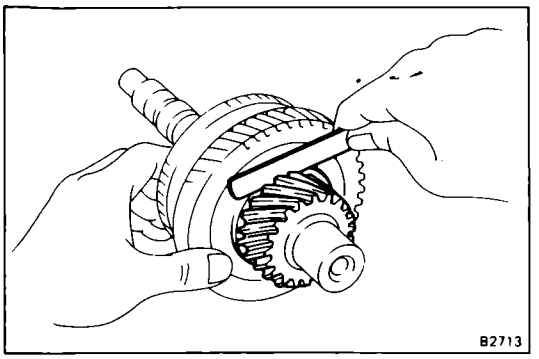
(c) Using a press, install the 1st gear and No. 1 hub sleeve.



12. INSTALL SNAP RING

Select a snap ring that will allow minimum axial play and install it on the shaft.

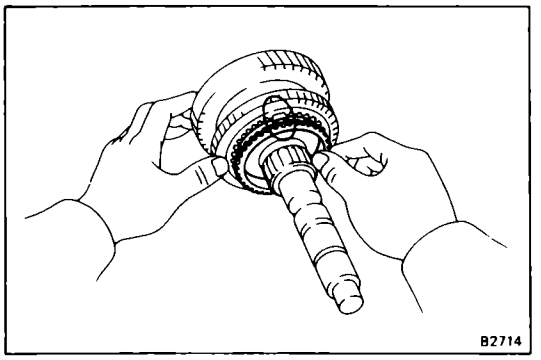
Mark	Thickness	mm (in.)
1	2.50 – 2.55	(0.0984 – 0.1004)
2	2.55 – 2.60	(0.1004 – 0.1024)
3	2.60 – 2.65	(0.1024 – 0.1043)
4	2.65 – 2.70	(0.1043 – 0.1063)
5	2.70 – 2.75	(0.1063 – 0.1083)
6	2.75 – 2.80	(0.1083 – 0.1102)



13. MEASURE FIRST GEAR THRUST CLEARANCE

Using a feeler gauge, measure the 1st gear thrust clearance.

Standard clearance: 0.10 – 0.29 mm (0.0039 – 0.0114 in.)



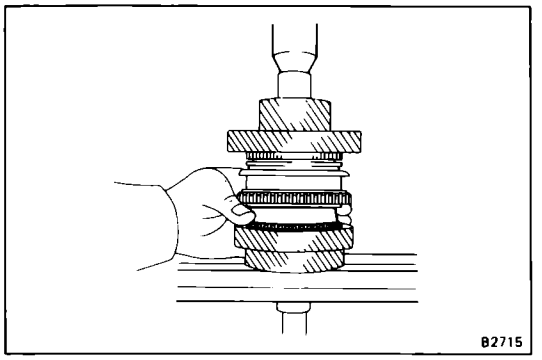
14. INSTALL SPACER, SYNCHRONIZER RING, SECOND GEAR, NEEDLE ROLLER BEARING AND THIRD DRIVEN GEAR

(a) Install the spacer.

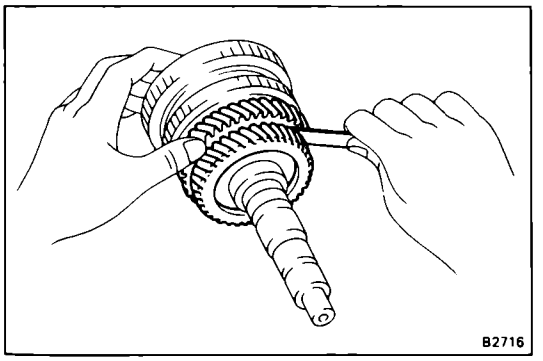
(b) Place the synchronizer ring on the gear and align the ring slots with the shifting keys.

(c) Apply ATF to the needle roller bearing.

(d) Install the 2nd gear.



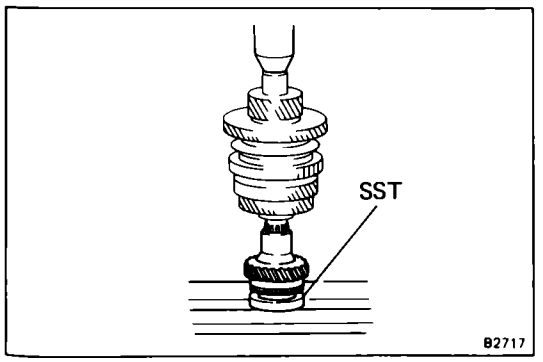
(e) Using a press, install the 3rd driven gear.



15. MEASURE SECOND GEAR THRUST CLEARANCE

Using a feeler gauge, measure the 2nd gear thrust clearance.

Standard clearance: 0.20 – 0.44 mm (0.0079 – 0.0173 in.)

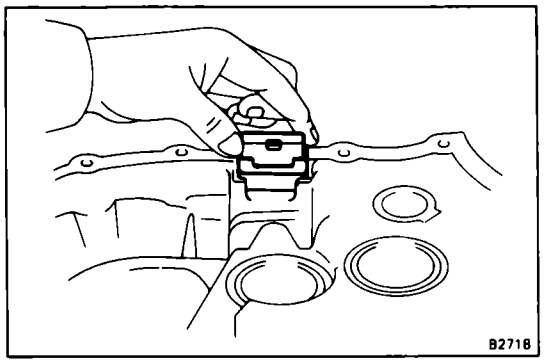


16. INSTALL OUTPUT GEAR SPACER, FOURTH DRIVEN GEAR AND RADIAL BALL BEARING

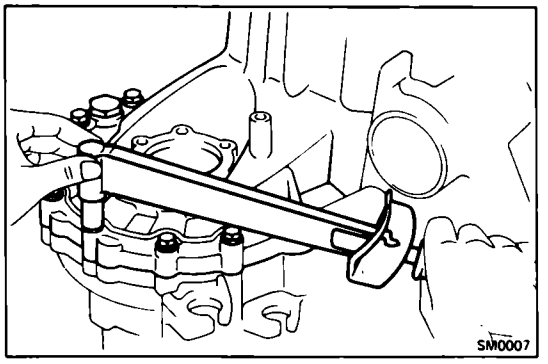
(a) Install the spacer.

(b) Using SST, press in the 4th driven gear and bearing

SST 09608-12010 (09608-00070)



17. INSTALL MAGNET



18. MEASURE DIFFERENTIAL SIDE BEARING PRELOAD

NOTE: If the transmission case, transaxle case, differential side bearing, differential case, transaxle case side shim or side bearing retainer was replaced, install the thinnest shim into the transmission case.
(Follow the step 11 on page MT-21)

(a) Install the differential to the transaxle case.

(b) Install the transmission case.

(c) Install and torque the case bolts.

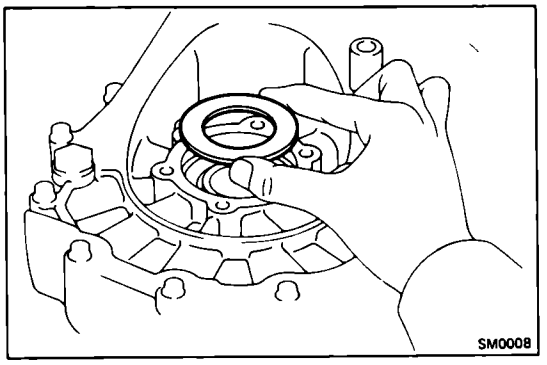
Torque: 300 kg-cm (22 ft-lb, 29 N·m)

(d) Install the shim into the transmission case.

(e) Install the bearing retainer without an O-ring.

(f) Install and torque the retainer bolts.

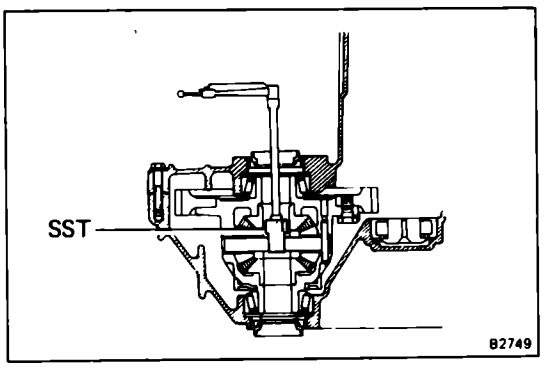
Torque: 185 kg-cm (13 ft-lb, 18 N·m)



(g) Using SST and torque meter, measure the preload.

SST 09564-32011

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

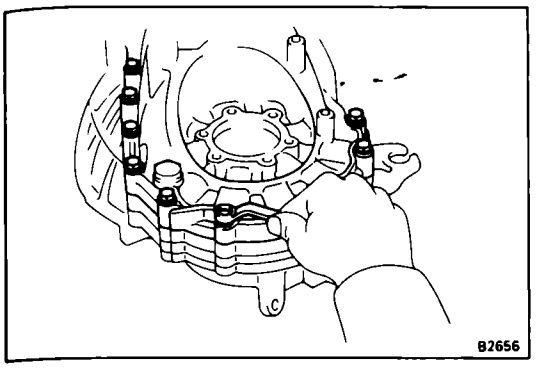


If the preload is not within specification, remove the bearing retainer.

Select another shim.

CAUTION: When selecting the shim begin with one of the thinner shims in the table below and work toward thicker one.

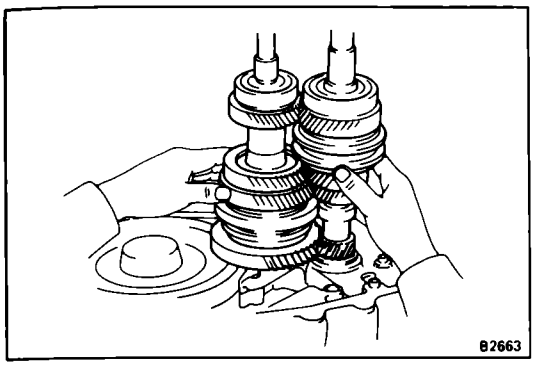
NOTE: The preload will change about 3 — 4 kg-cm (2.6 — 3.5 in.-lb, 0.3 — 0.4 N·m) with each shim thickness.



19. REMOVE BEARING RETAINER, SHIM AND TRANSMISSION CASE

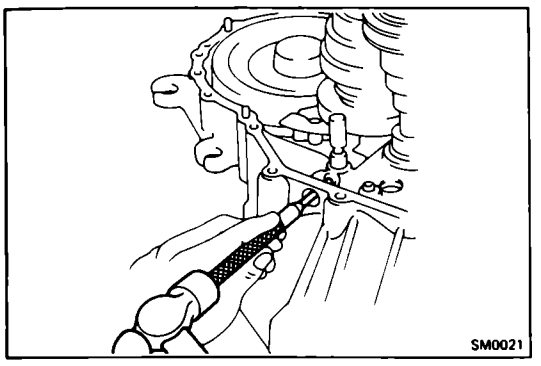
If the preload is adjusted within specification, remove the bearing retainer, shim and transmission case.

Be careful not to lose the adjusted shim.



20. INSTALL INPUT AND OUTPUT SHAFTS

Install the input shaft and output shaft together.



21. INSTALL NO. 2 FORK SHAFT

(a) Insert No. 2 fork shaft to the transaxle case and align the slotted spring pin hole.

(b) Using a pin punch and hammer, drive in the slotted spring pin.

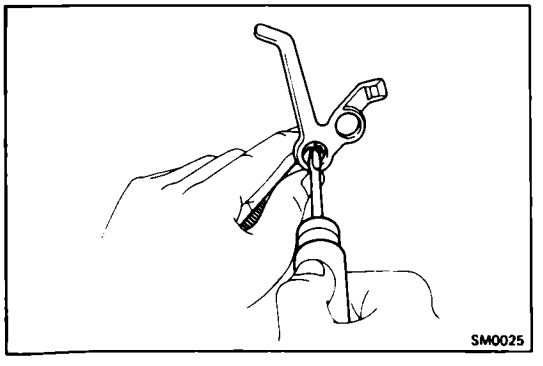
(c) Apply sealant to the plug threads.

Sealant: Part No. 08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent

(d) Using SST, install the straight screw plug.

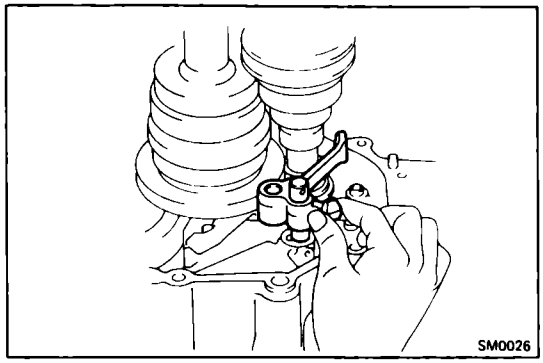
SST 09313-30021

Torque: 130 kg-cm (9 ft-lb, 13 N·m)

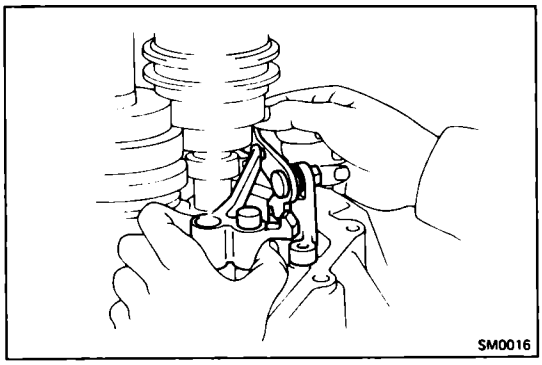


22. INSTALL REVERSE SHIFT FORK AND INTERLOCK PIN

(a) Insert interlock pin into the reverse shift fork hole.



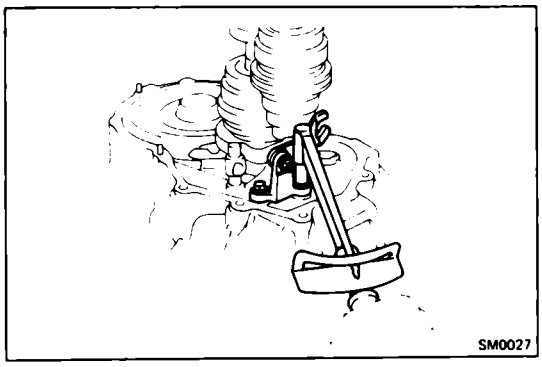
(b) Install the reverse shift fork onto No. 2 fork shaft.



23. INSTALL REVERSE SHIFT ARM

(a) Put the reverse shift arm pivot into the reverse shift fork and install the reverse shift arm to the transaxle case.

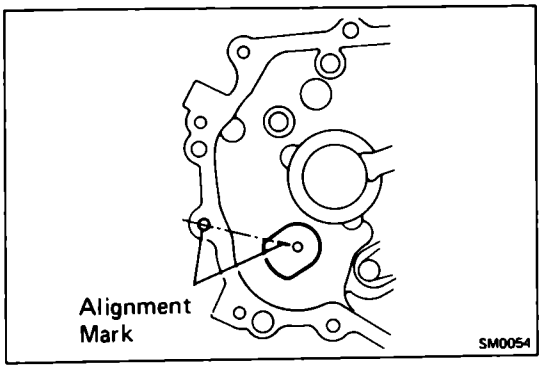
(b) Shift the reverse shift arm into reverse.



(c) Install and torque the bolts.

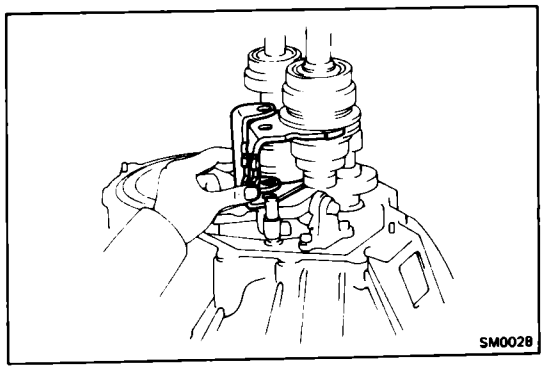
Torque: 185 kg-cm (13 ft-lb, 18 N·m)

(d) Shift the reverse shift arm to neutral position.



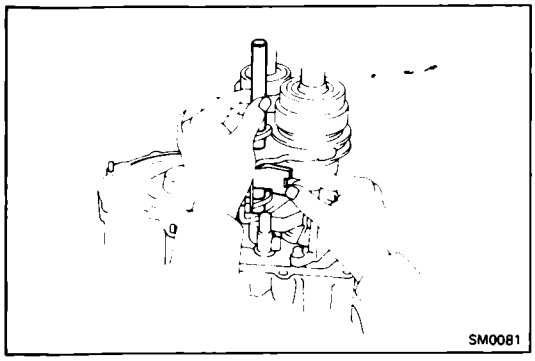
24. INSTALL REVERSE IDLER GEAR AND SHAFT

Install the reverse idler gear and shaft as shown.

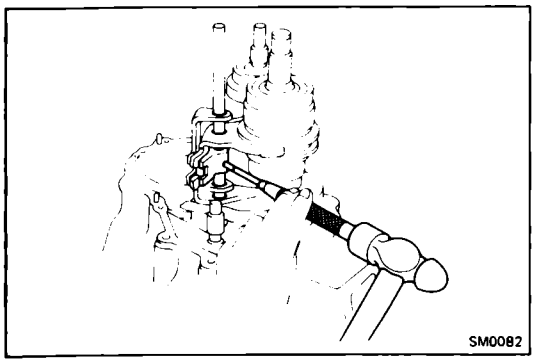


25. INSTALL NO. 1 AND NO. 2 SHIFT FORKS, NO. 1 SHIFT HEAD AND NO. 1 FORK SHAFT

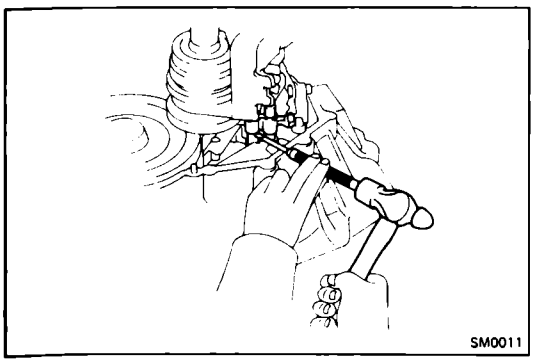
(a) Place No. 1 and No. 2 shift forks into the groove of No. 1 and No. 2 hub sleeves.



(b) Hold No. 1 shift head and insert No. 1 fork shaft into the transaxle case through No. 1 and No. 2 shift forks, No. 1 shift head and reverse shift fork.

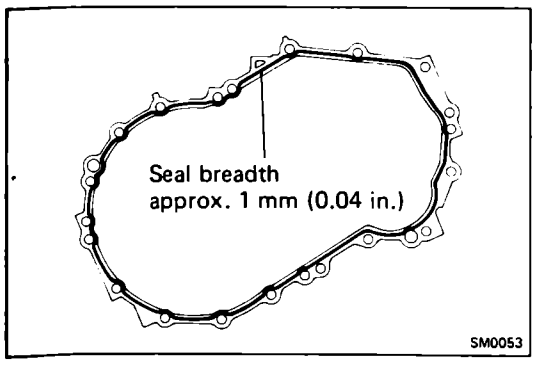


(c) Using a pin punch and hammer, drive the slotted spring pin into No. 1 shift head.



(d) Shift the fork shaft into reverse.

(e) Using a pin punch and hammer, drive the slotted spring pin into No. 1 fork shaft.



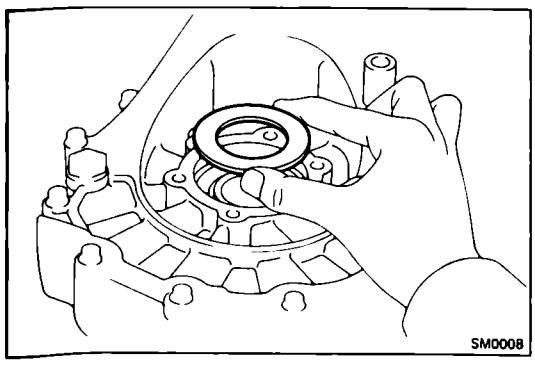
26. INSTALL TRANSMISSION CASE

(a) Apply seal packing to the transmission case as shown in the figure.

Seal packing: Part No. 08826-00090, THREE BOND 1281 or equivalent

(b) Install and torque the seventeen bolts.

Torque: 300 kg-cm (22 ft-lb, 29 N·m)



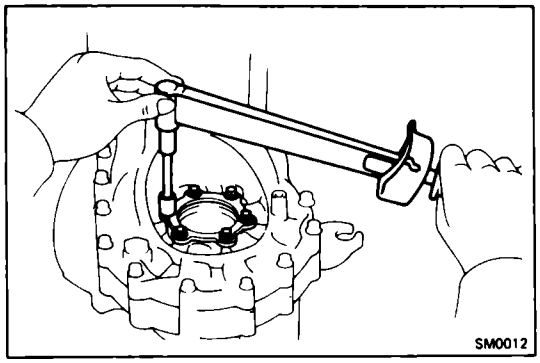
27. INSTALL SHIM AND SIDE BEARING RETAINER WITH O-RING

(a) Install a new O-ring on the retainer.

(b) Install the shim and retainer.

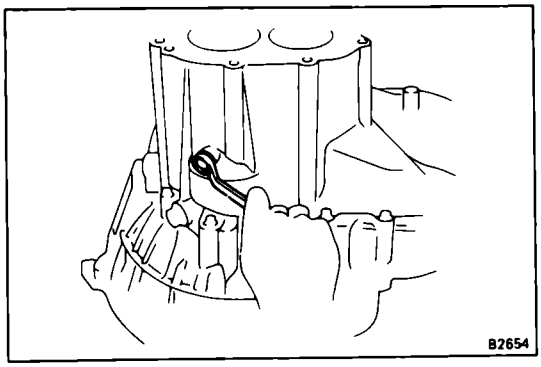
(c) Apply sealant to the bolt threads.

Sealant: Part No. 08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent



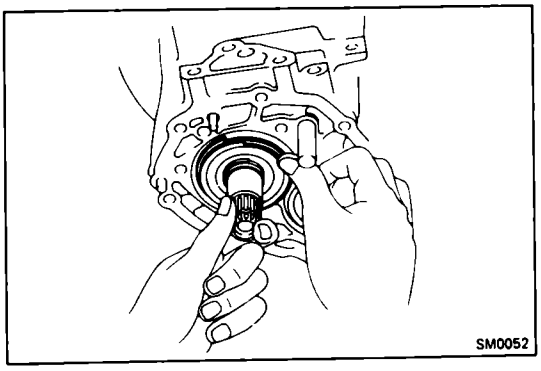
(d) Install and torque the six bolts.

Torque: 185 kg-cm (13 ft-lb, 18 N·m)

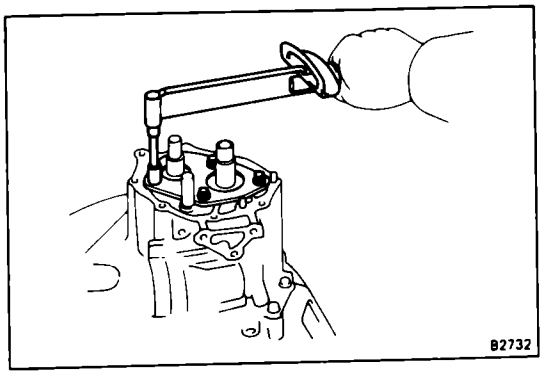


28. INSTALL AND TORQUE REVERSE IDLER GEAR SHAFT LOCK BOLT

Torque: 250 kg-cm (18 ft-lb, 25 N·m)



29. INSTALL BEARING SNAP RINGS



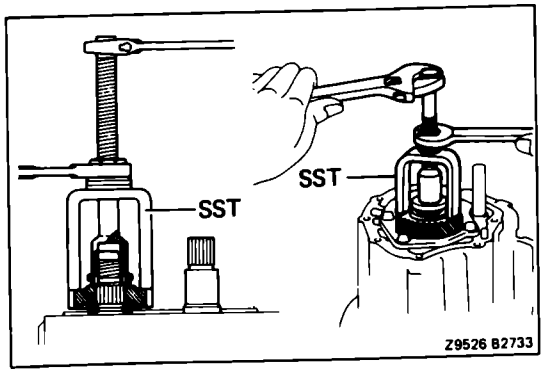
30. INSTALL REAR BEARING RETAINER

(a) Apply sealant to the bolt threads.

Sealant: Part No. 08833-00070, THREE BOND 1324 or equivalent

(b) Install and torque the five bolts.

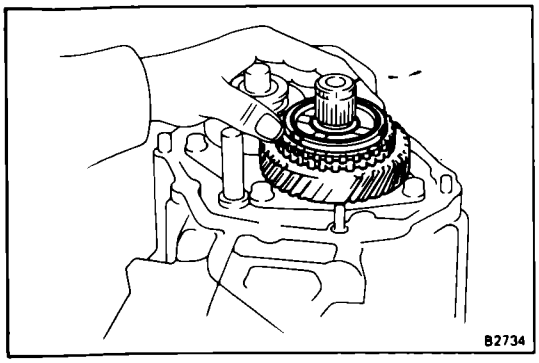
Torque: 210 kg-cm (15 ft-lb, 21 N·m)



31. INSTALL FIFTH DRIVEN GEAR

Using SST, install the 5th driven gear.

SST 09309-32050

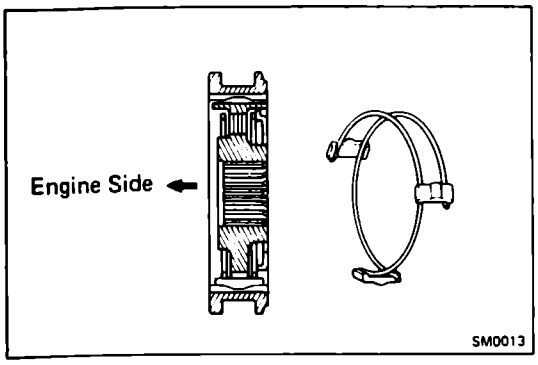


32. INSTALL SPACER, NEEDLE ROLLER BEARINGS, FIFTH GEAR AND SYNCHRONIZER RING

(a) Install the spacer.

(b) Apply ATF to the needle roller bearings.

(c) Install the 5th gear with the needle roller bearings and synchronizer ring.

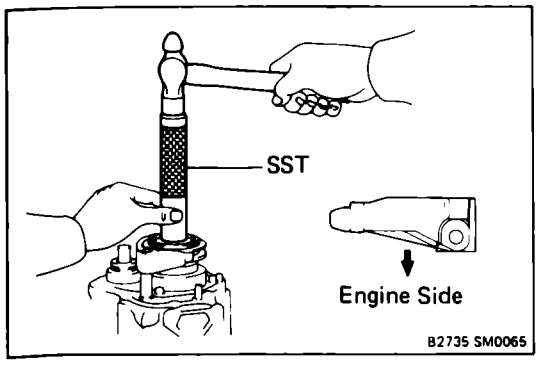


33. INSERT NO. 3 CLUTCH HUB INTO HUB SLEEVE

(a) Install the clutch hub and shifting keys to the hub sleeve.

(b) Install the shifting key springs under the shifting keys

CAUTION: Install the key springs positioned so that their end gaps are not in line.



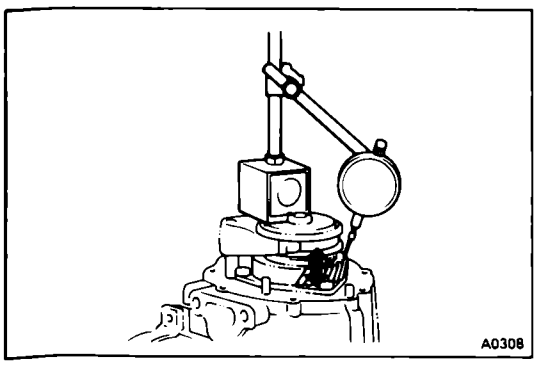
34. INSTALL NO. 3 HUB SLEEVE ASSEMBLY WITH NO. 3 SHIFT FORK

(a) Support the tip of the input shaft with a spacer or such to raise the transaxle assembly.

(b) Using SST, drive in No. 3 hub sleeve with No. 3 shift fork.

SST 09612-22011

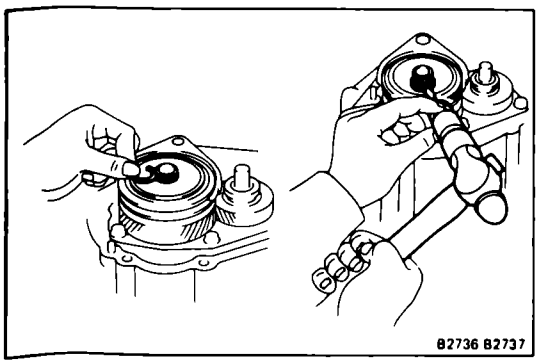
CAUTION: Align the synchronizer ring slots with the shifting keys.



35. MEASURE FIFTH GEAR THRUST CLEARANCE

Using a dial indicator, measure the thrust clearance.

Standard clearance: 0.20 – 0.40 mm (0.0079 – 0.0157 in.)

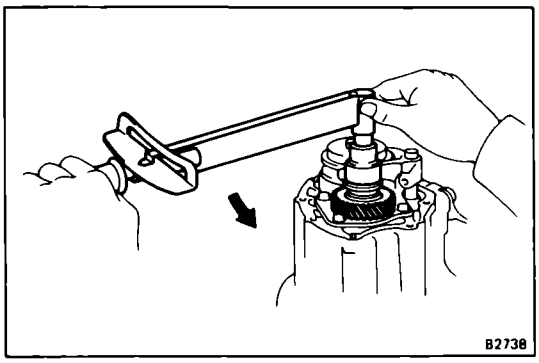


36. INSTALL SHIFTING KEY RETAINER AND SNAP RING

(a) Install the retainer.

(b) Select a snap ring that will allow minimum axial play and install it on the shaft.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
1	1.60 – 1.65 (0.0630 – 0.0650)	9	2.00 – 2.05 (0.0787 – 0.0807)
2	1.65 – 1.70 (0.0650 – 0.0669)	10	2.05 – 2.10 (0.0807 – 0.0827)
3	1.70 – 1.75 (0.0669 – 0.0689)	11	2.10 – 2.15 (0.0827 – 0.0846)
4	1.75 – 1.80 (0.0689 – 0.0709)	12	2.15 – 2.20 (0.0846 – 0.0866)
5	1.80 – 1.85 (0.0709 – 0.0728)	13	2.20 – 2.25 (0.0866 – 0.0886)
6	1.85 – 1.90 (0.0728 – 0.0748)	14	2.25 – 2.30 (0.0886 – 0.0906)
7	1.90 – 1.95 (0.0748 – 0.0768)	15	2.30 – 2.35 (0.0906 – 0.0925)
8	1.95 – 2.00 (0.0768 – 0.0787)		



37. INSTALL LOCK NUT

(a) Engage the gear double meshing.

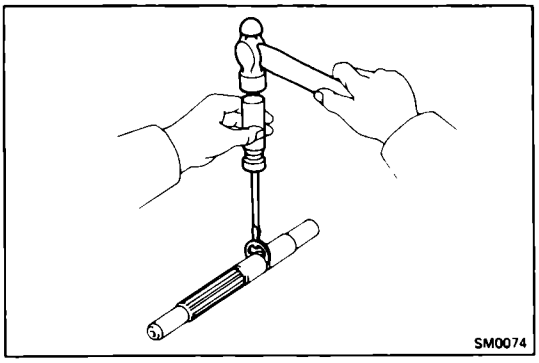
(b) Install and torque the nut.

Torque: 1,250 kg-cm (90 ft-lb, 123 N·m)

NOTE: The lock nut has LH threads.

(c) Disengage the gear double meshing.

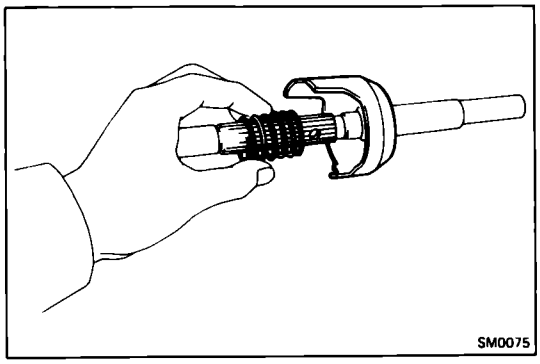
(d) Stake the lock nut.



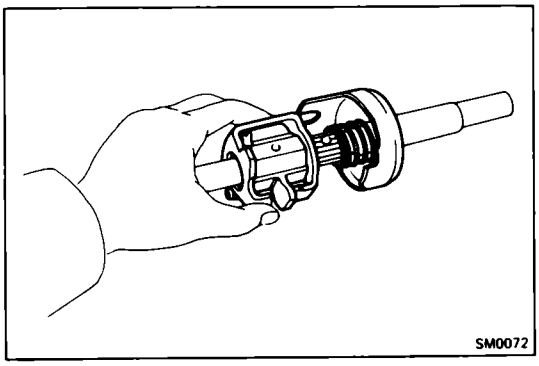
38. ASSEMBLE SHIFT AND SELECT LEVER ASSEMBLY

(a) Apply ATF to the shaft.

(b) Install the E-ring.

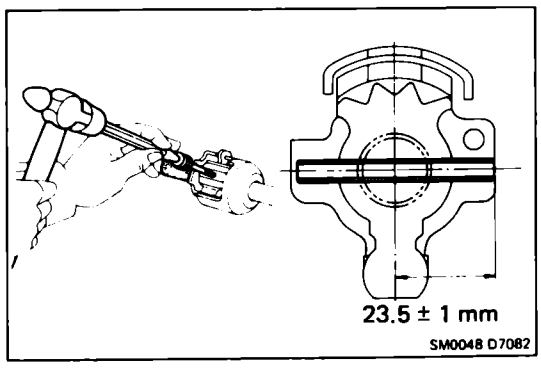


(c) Install shift interlock plate and spring.

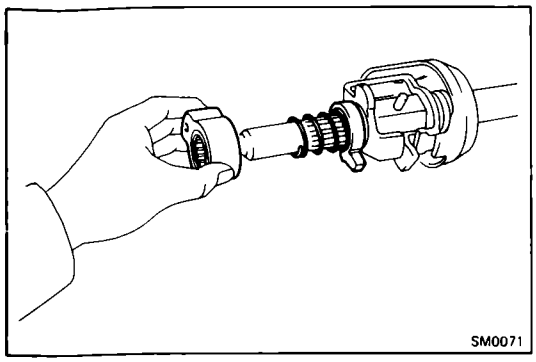


(d) Install No. 1 shift inner lever with the shift fork lock plate.

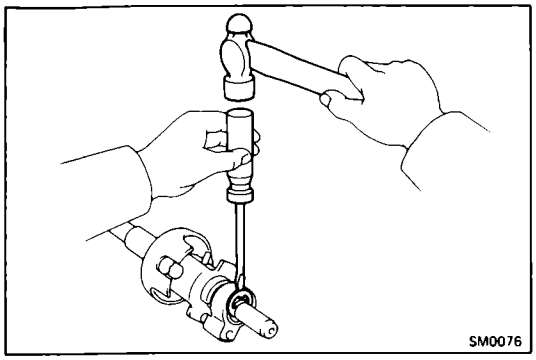
NOTE: One of the spline teeth of the shift and select lever shaft has been eliminated. Therefore, be certain to correctly align this portion to the matching portions on the parts during assembly.



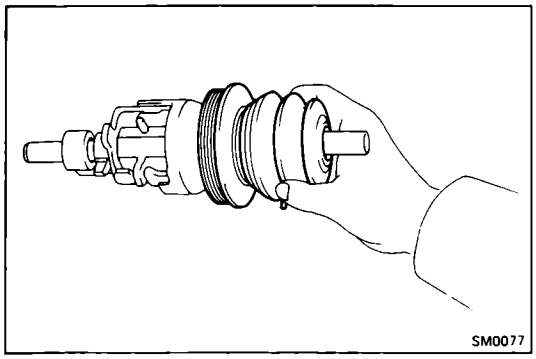
(e) Using a pin punch and hammer, drive in the slotted spring pin.


SM0071

(f) Install No. 2 shift inner lever, spring and reverse restrict pin holder.

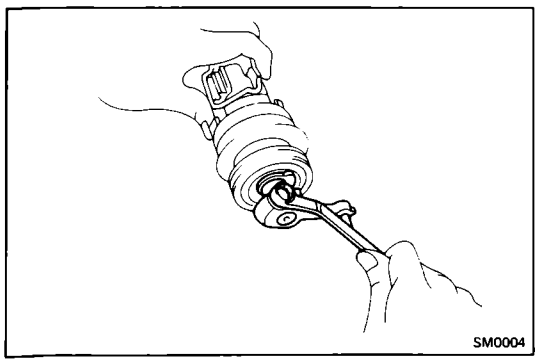

SM0076

(g) Install the E-ring.

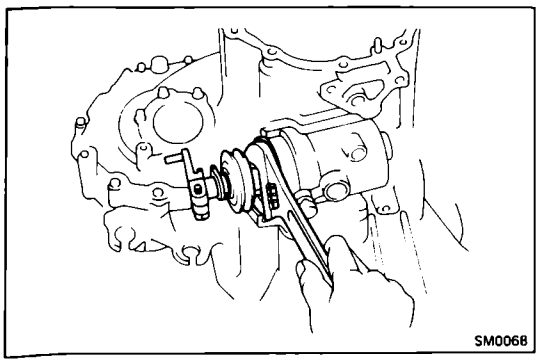

SM0077

(h) Install the control shaft cover and dust boot.

NOTE: Make sure to install the boot in correct direction. Position the air bleed of the boot downward.


SM0004

(i) Install the control shift lever and insert the lever lock pin to the lever. Install the washer and lock nut.


SM0068

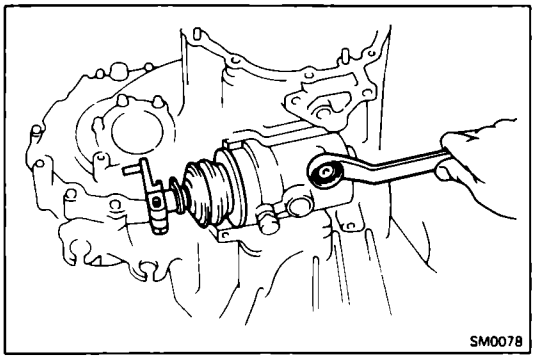
39. INSTALL SHIFT AND SELECT LEVER ASSEMBLY

(a) Apply seal packing to the underside of the flanged portion of the control shaft cover.

Seal packing: Part No. 08826-00090, THREE BOND 1281 or equivalent

(b) Install the shift and select lever assembly and torque the control shaft cover.

Torque: 375 kg-cm (27 ft-lb, 37 N·m)



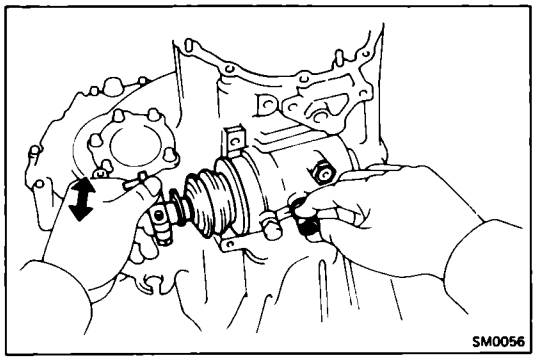
40. INSTALL NO. 2 LOCK BALL ASSEMBLY

(a) Apply sealant to the lock ball assembly threads.

Sealant: Part No. 08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent

(b) Install and torque the lock ball assembly.

Torque: 230 kg-cm (17 ft-lb, 23 N·m)

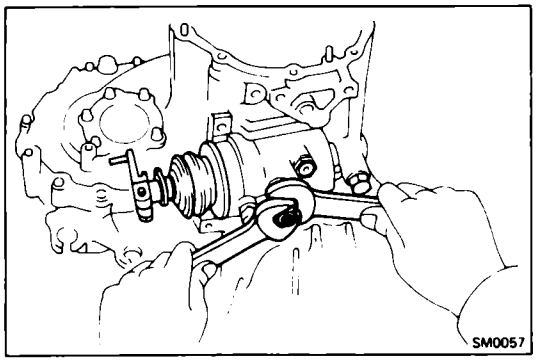


41. INSTALL AND ADJUST NO. 1 LOCK BALL ASSEMBLY

(a) Fully loosen the lock nut.

(b) Fully screw in the lock ball.

(c) Loosen the lock ball to where the play at the shift outer lever tip is 0.1 – 0.5 mm (0.004 – 0.020 in.).



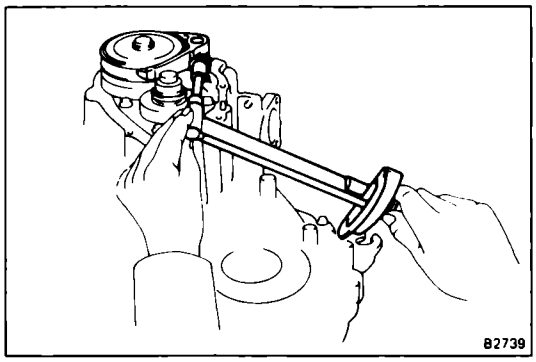
(d) Hold the lock ball and tighten the lock nut.

Torque: 375 kg-cm (27 ft-lb, 37 N·m)

(e) Check the shift outer lever tip play.

Lever tip play: 0.1 – 0.5 mm (0.004 – 0.020 in.)

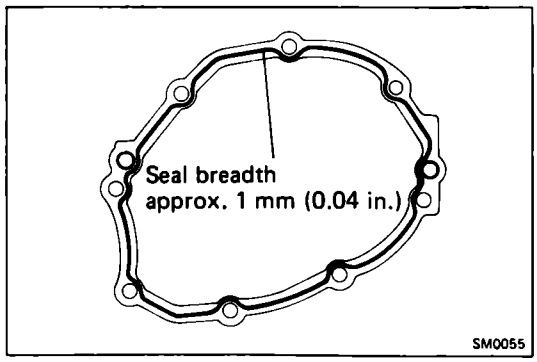
42. INSTALL SELECTING BELLCRANK



43. INSTALL NO. 3 SHIFT FORK SECURING BOLT

Install and torque the bolt.

Torque: 185 kg-cm (13 ft-lb, 18 N·m)



44. INSTALL TRANSMISSION CASE COVER

(a) Apply seal packing to the transmission case as shown in the figure.

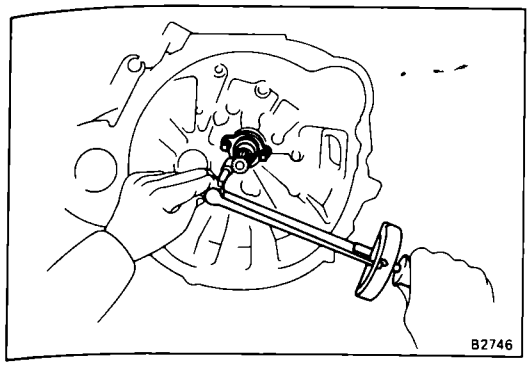
Seal packing: Part No. 08826-00090, THREE BOND 1281 or equivalent

(b) Apply sealant to the bolt threads.

Sealant: Part No. 08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent

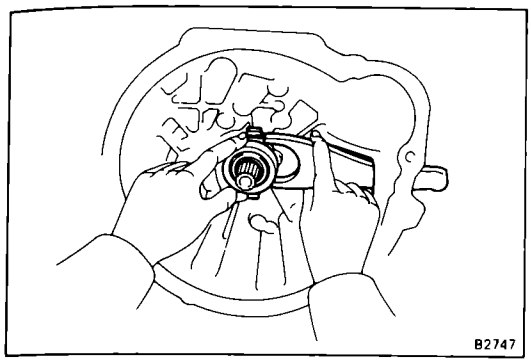
(c) Install and torque the eight bolts.

Torque: 300 kg-cm (22 ft-lb, 29 N·m)



45. INSTALL RELEASE BEARING RETAINER

Torque: 75 kg-cm (65 in.-lb, 7.4 N·m)



46. INSTALL RELEASE FORK AND BEARING

(a) Apply molybdenum disulphide lithium base grease to the following parts:

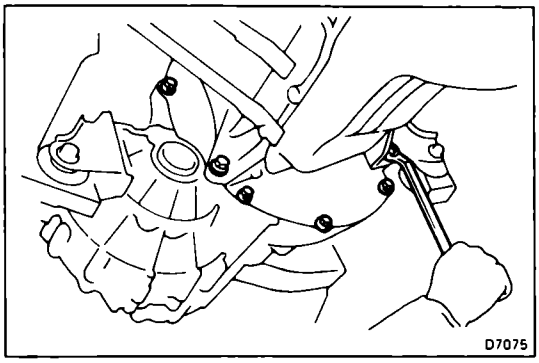
- Release bearing hub inside groove
- Input shaft spline
- Release fork contact surface

(b) Apply MP grease to the front surface of the release bearing.

47. INSTALL BACK-UP LIGHT SWITCH

Torque: 450 kg-cm (33 ft-lb, 44 N·m)

48. INSTALL SPEEDOMETER DRIVEN GEAR



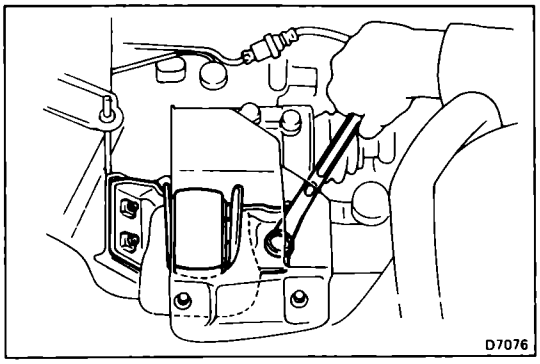
INSTALLATION OF TRANSAXLE

1. INSTALL TRANSAXLE TO ENGINE

Align the input shaft spline with the clutch disc, and install the transaxle to the engine. Torque the bolts.

Torque:

12 mm bolt 650 kg-cm (47 ft-lb, 64 N·m)
10 mm bolt 470 kg-cm (34 ft-lb, 46 N·m)



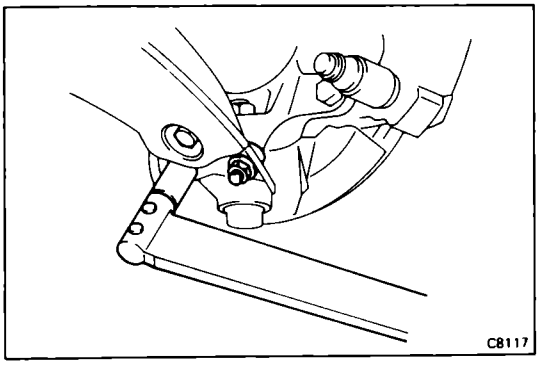
2. CONNECT LEFT ENGINE MOUNTING

Connect the left engine mounting with the bolts. Torque the bolts.

Torque: 530 kg-cm (38 ft-lb, 52 N·m)

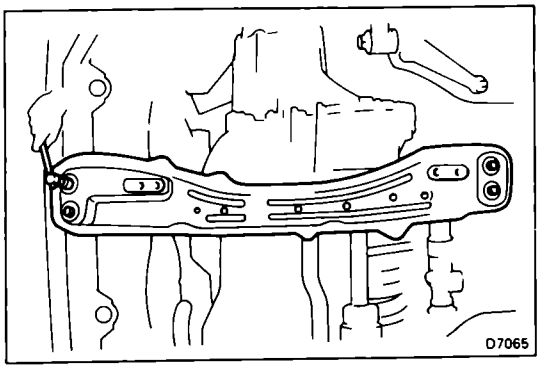
3. CONNECT BOTH DRIVE SHAFTS

(See page FA-29)



4. CONNECT LEFT STEERING KNUCKLE TO LOWER ARM

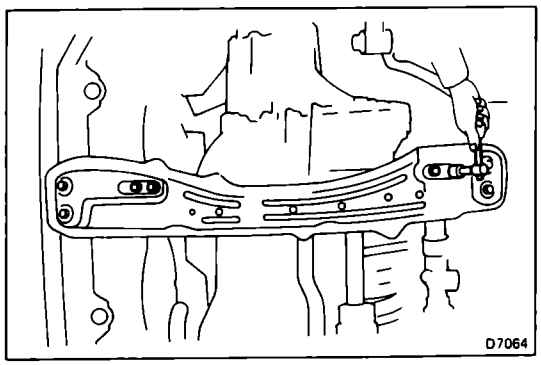
Torque: 1,300 kg-cm (94 ft-lb, 127 N·m)



5. INSTALL ENGINE MOUNTING CENTER MEMBER

Install the engine mounting center member with the four bolts. Torque the bolts.

Torque: 400 kg-cm (29 ft-lb, 39 N·m)

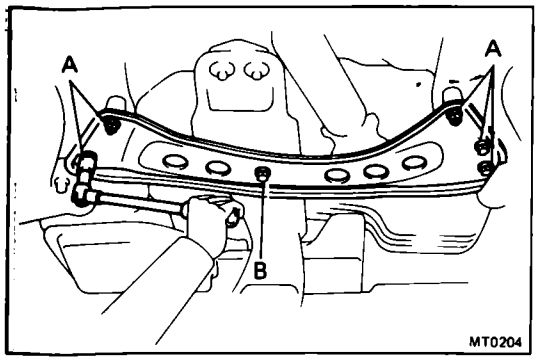


6. CONNECT FRONT AND REAR MOUNTINGS

(a) Install the front and rear engine mounting bolts. Torque the bolts.

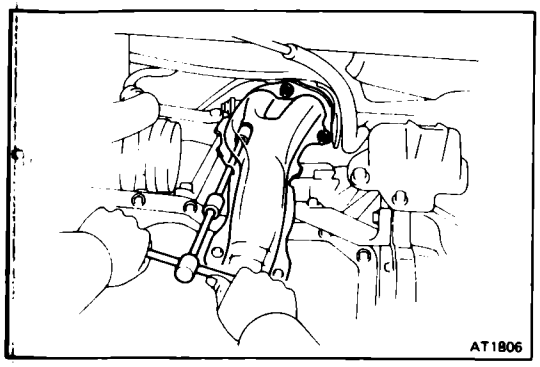
Torque: 400 kg-cm (29 ft-lb, 39 N·m)

(b) Install the two covers to the member.



7. **INSTALL SUSPENSION LOWER CROSSMEMBER**

   Torque: A 2,125 kg-cm (154 ft-lb, 208 N·m)
   B 400 kg-cm (29 ft-lb, 39 N·m)



8. **CONNECT EXHAUST PIPE TO MANIFOLD**

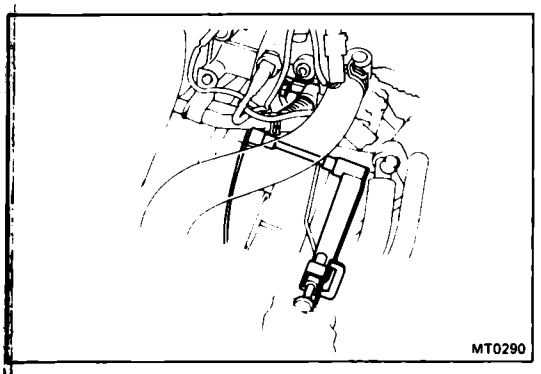
   Torque: 630 kg-cm (46 ft-lb, 62 N·m)

9. **CONNECT SPEEDOMETER CABLE**

10. **FILL TRANSAXLE WITH ATF DEXRON® II**

    Capacity: 2.6 liters (2.7 US qts, 2.3 Imp. qts)

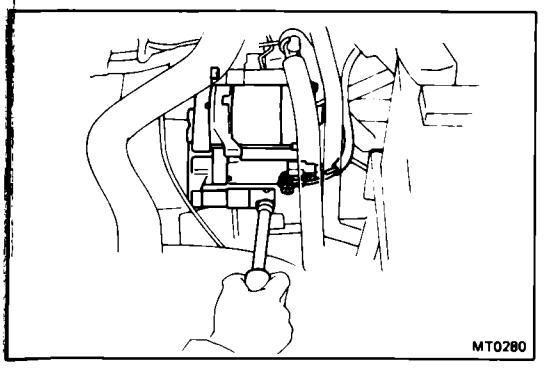
11. **INSTALL UNDER COVERS**



12. **INSTALL TRANSAXLE MOUNTING BOLTS OF TRANSAXLE UPPER**

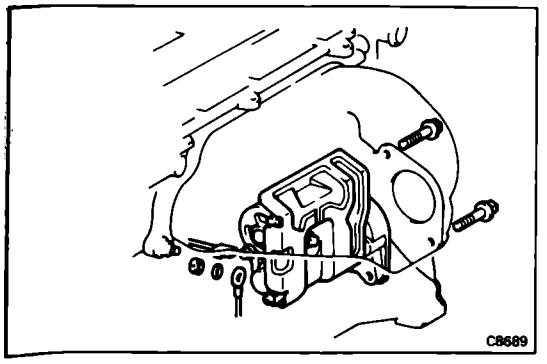
    Torque: 650 kg-cm (47 ft-lb, 64 N·m)

13. **CONNECT BACK-UP LIGHT SWITCH CONNECTOR AND GROUND STRAP**



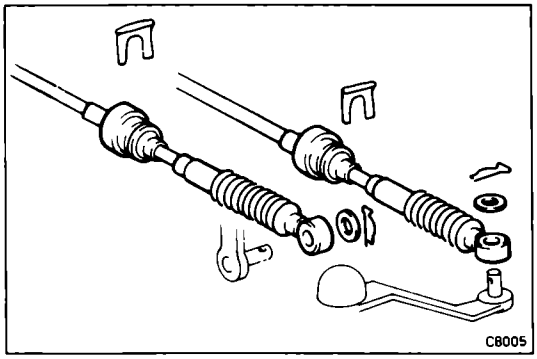
14.-1 (3S-FE)
INSTALL STARTER AND BATTERY

(a) Install the starter with the two bolts.
(b) Connect the connector and cable.
(c) Install the battery.



14.-2 (3S-GE)
INSTALL STARTER

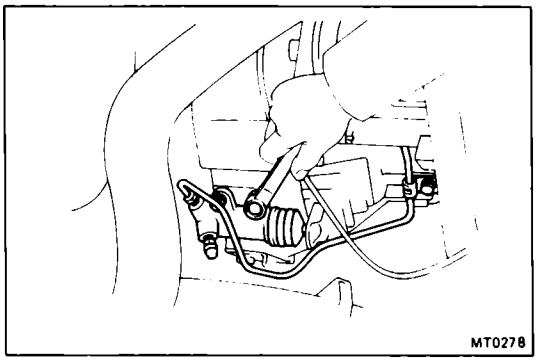
(a) Install the starter with the two bolts.
(b) Connect the connector and cable.



15. CONNECT CONTROL CABLES

(a) Install the retainers.

(b) Connect the cables to the linkage with the washer and clip.

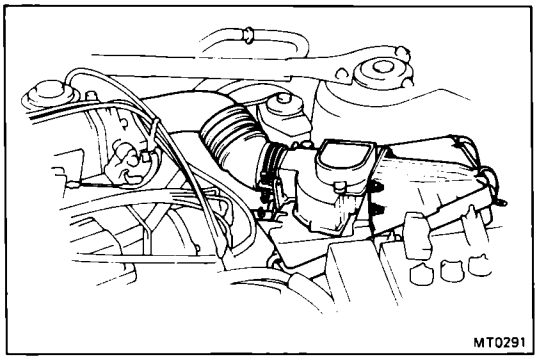


16. INSTALL CLUTCH TUBE BRACKET

(a) Install the bracket with a bolt.

(b) Install the retainer to the bracket.

17. INSTALL CLUTCH RELEASE CYLINDER AND TUBE CLAMP



18. INSTALL AIR CLEANER WITH AIR HOSE

19. INSTALL NEGATIVE BATTERY CABLE

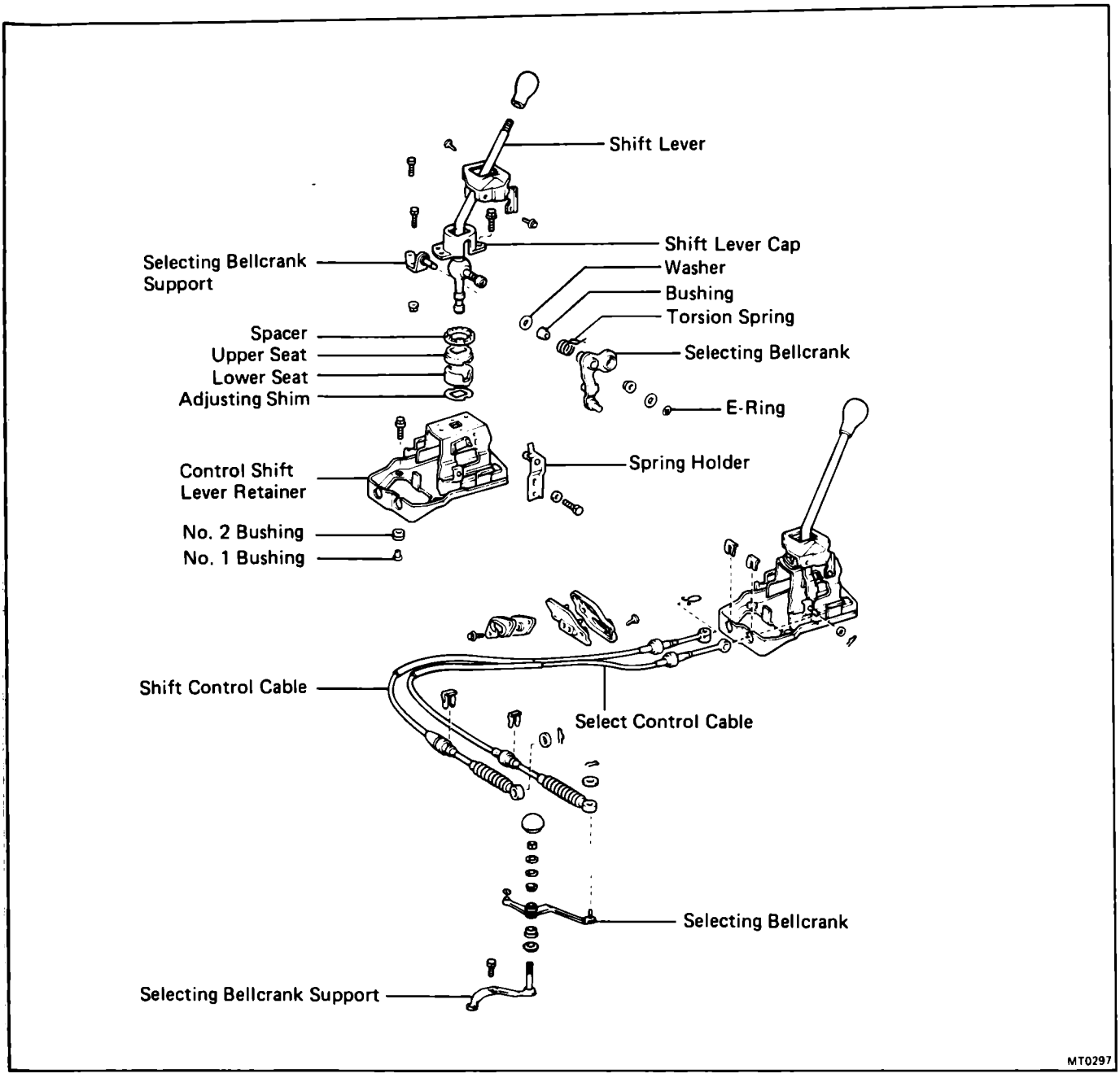
20. CHECK FRONT WHEEL ALIGNMENT
(See page FA-3)

21. PERFORM ROAD TEST

Check for any abnormal noise or operation.

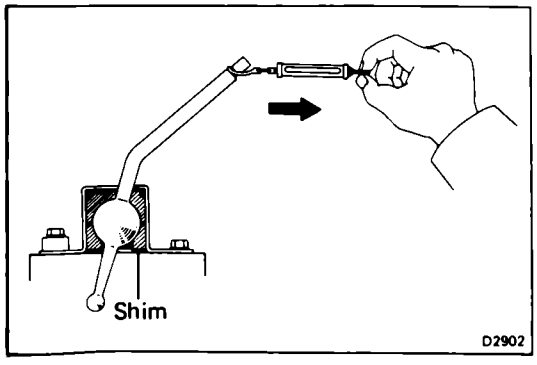
SHIFT LEVER AND CONTROL CABLE

COMPONENTS



ADJUSTMENT OF SHIFT LEVER FREEPLAY

ADJUST SHIFT LEVER SEAT CLEARANCE



Select a shim of a thickness that allow a preload of 50 — 100 g (0.1 — 0.2 lb, 0.5 — 1.0 N) at the top of lever and install it in the shift lever seat.

Shim thickness

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
C or 5	0.5 (0.020)	G or 9	0.9 (0.035)
D or 6	0.6 (0.024)	H or 10	1.0 (0.039)
E or 7	0.7 (0.028)	K or 11	1.1 (0.043)
F or 8	0.8 (0.031)	L or 12	1.2 (0.047)

DIFFERENTIAL

REMOVAL OF DIFFERENTIAL

1. REMOVE TRANSAXLE
   (See pages MT-4 to 6)

2. REMOVE DIFFERENTIAL ASSEMBLY
   (See steps 1 to 24 on pages MT-10 to 14)

REPLACEMENT OF DIFFERENTIAL

(See pages AT-150 to 152)

ADJUSTMENT OF DIFFERENTIAL CASE

(See pages AT-153, 154)

INSTALLATION OF DIFFERENTIAL

1. INSTALL DIFFERENTIAL ASSEMBLY TO TRANSAXLE
   (See steps 18 to 37 and 39 to 48 on pages MT-28 to 37)

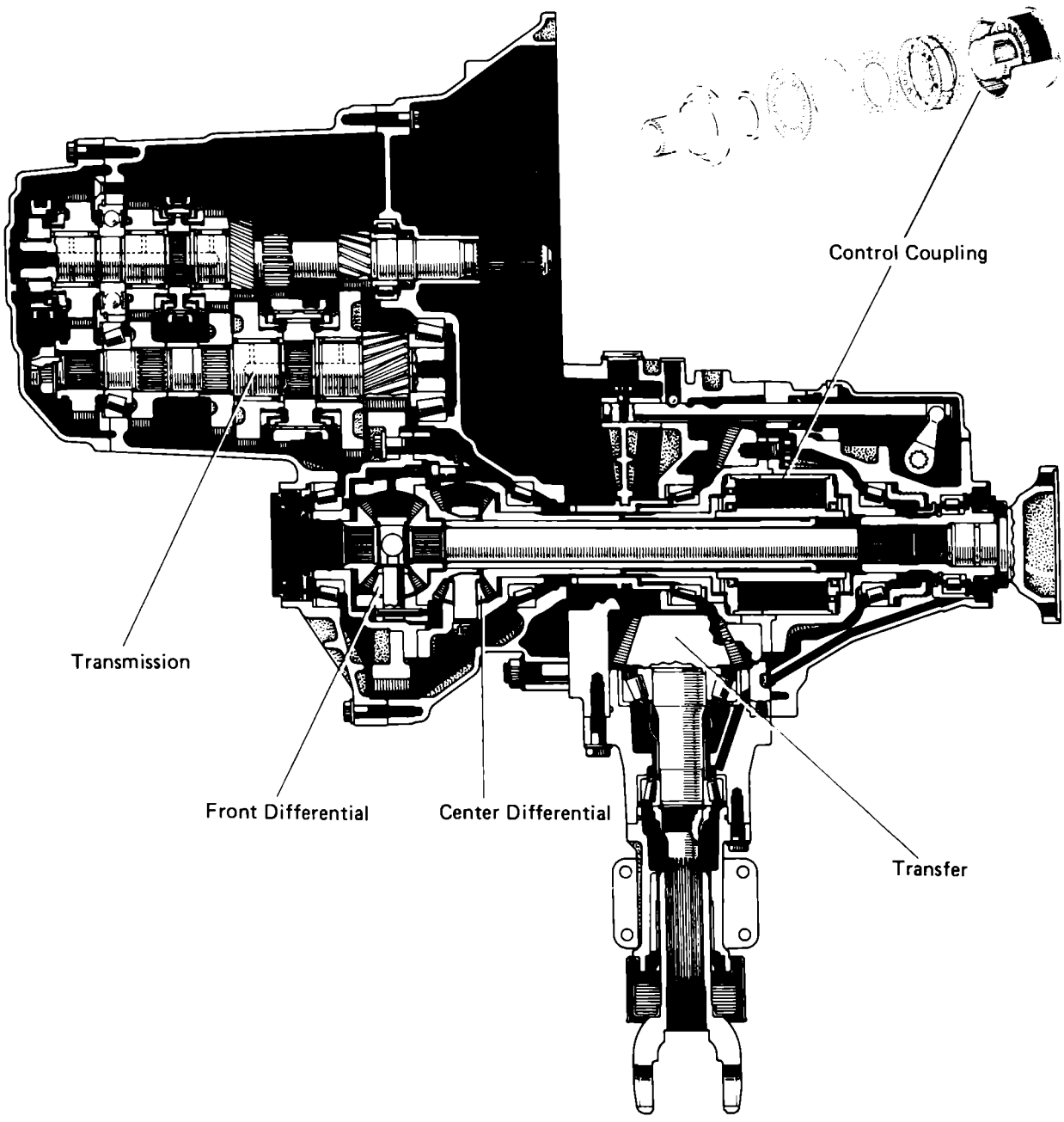
2. INSTALL TRANSAXLE
   (See pages MT-38 to 40)

(E50F2 TRANSAXLE/4WD)

DESCRIPTION

GENERAL

- The E50F2 transaxle has been compactly designed by arranging the transmission, the center differential, the front differential and the transfer on the same quadruple case axle.
- The center differential, which compensates the difference in rotation speed between the front and rear wheels, utilizes bevel gear to provide durability and reliability by distributing the engine power from the transmission 50/50 to both front and rear propeller shafts. This center differential has been equipped with a control coupling which functions as a LSD.



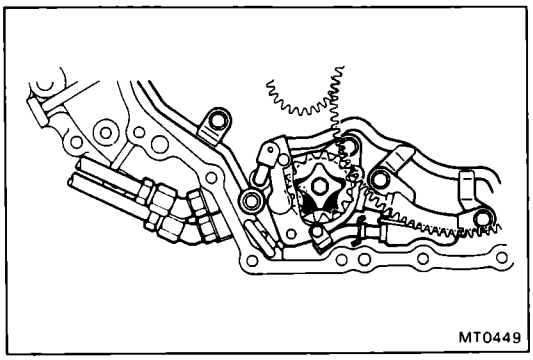
Transaxle type	E50F2	
Transmission	Operation method	Floor shift vehicles are provided with push-pull type remote control
	Transmission type	Forward : Constant mesh Reverse : Sliding mesh
Center differential	Reduction side (Gear type)	Helical gear
	Differential side (Gear type)	Bevel gear
	Type of differential center mechanism	Viscous coupling
Transfer	Gear type	Hypoid gear

- The oil used in each transaxle is as follow:

  Transaxle oil E50 (08885-80206) or equivalent

  (Recommended oil
  Oil grade: API GL-5
  Viscosity: SAE 75W-90 or 80W-90
  Above −18°C (0°F) SAE90
  Below −18°C (0°F) SAE80W)

- The oil capacity: 4.8 Liters (5.1 US qts, 4.2 Imp. qts)

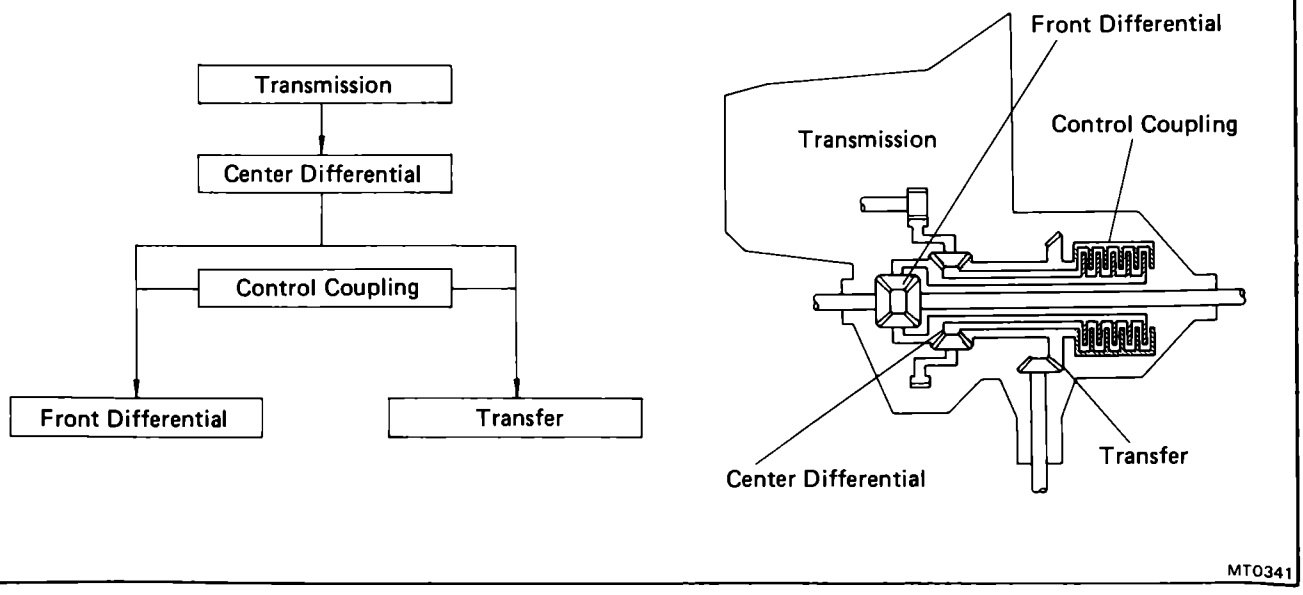


OIL PUMP

- The oil pump is of the trochoid type, and is driven by the differential ring gear and the pump drive gear. It is located at the bottom of the transaxle case.

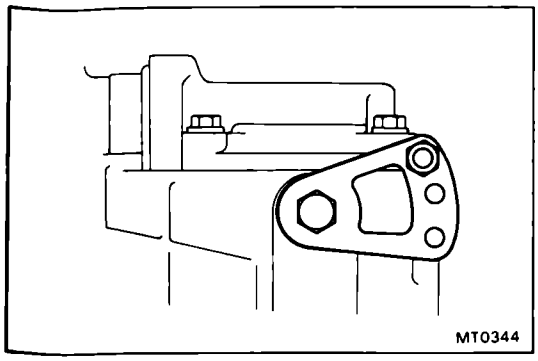
POWER TRANSMISSION

- Power from the transmission is transmitted along the route shown below:



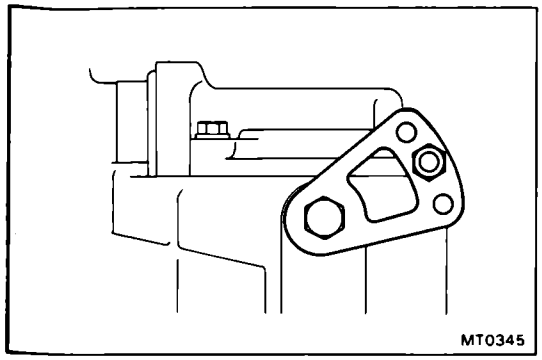
SELECT LEVER FOR SERVICING

- Ordinarily, there is no need for the ordinary customer to operate anything.
- However, to operate 2 wheels out of the four, the following switches have been installed.



VISCOUS MODE

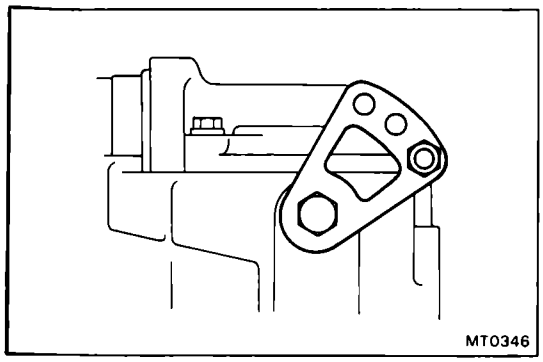
This is the mode for use during normal driving. After finishing inspection, be sure to return the lever to this mode and attach the lock bolt.



VISCOUS FREE MODE

This mode cuts off the driving force transmitted from the center differential to the control coupling, and makes the center differential free.

CAUTION: Never use this during normal driving.



FF MODE

This mode cuts off the driving force transmitted from the center differential to the transfer, and locks the center differential.

However, when the lever is shifted to this mode, the driving force is transmitted only to the front wheels.

CAUTION: Never use this during normal driving. It will have a bad effect on the transaxle.

PRECAUTIONS

When working with FIPG material, you must be observe the following.

- **Using a razor blade and gasket scraper, remove all the old packing (FIPG) material from the gasket surfaces.**
- **Thoroughly clean all components to remove all the loose material.**
- **Clean both sealing surfaces with a non-residue solvent.**
- **Apply the seal packing in approx. 1 mm (0.04 in.) bead along the sealing surface.**
- **Parts must be assembled within 10 minutes of application. Otherwise, the packing (FIPG) material must be removed and reapplied.**

TROUBLESHOOTING

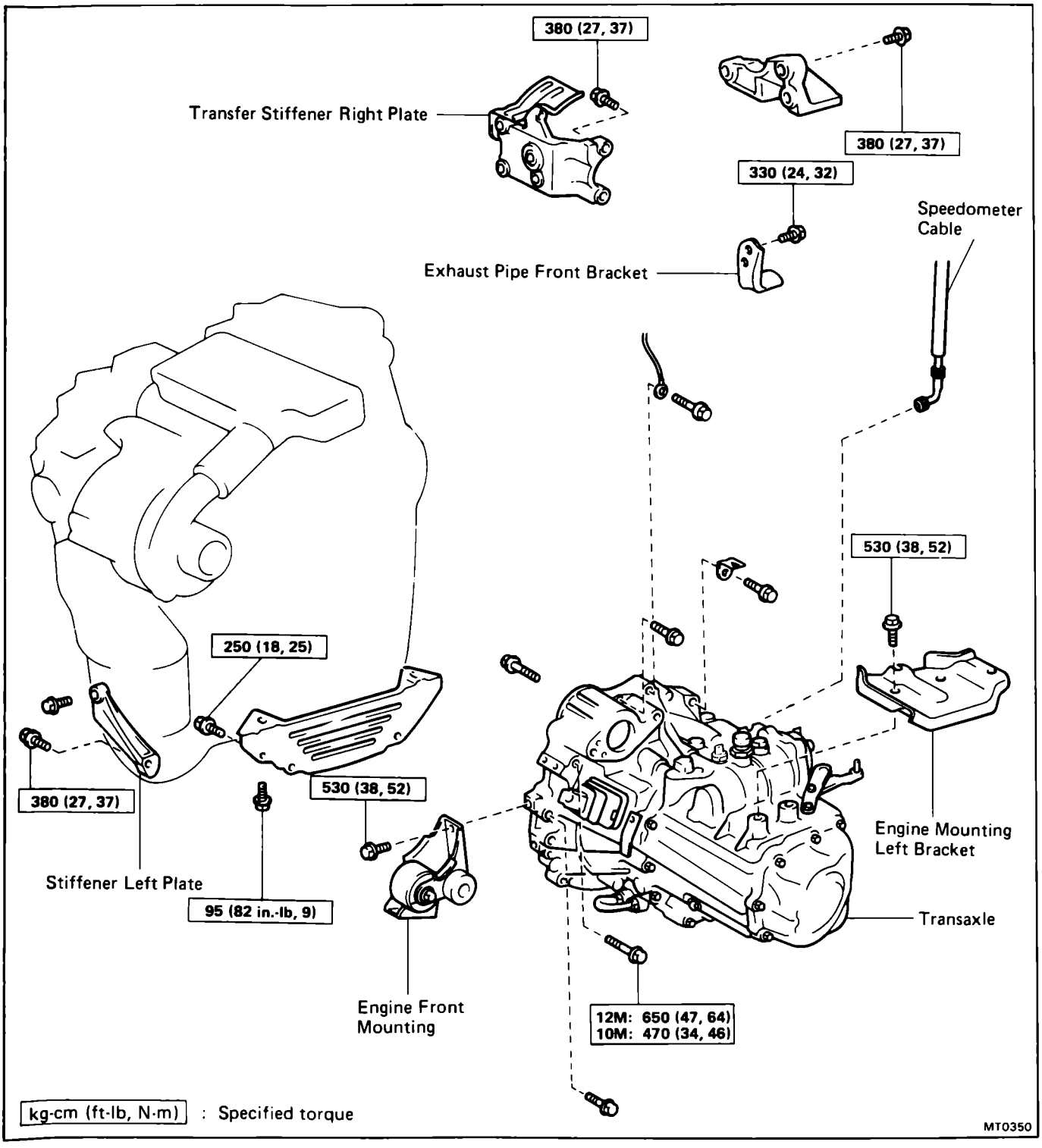
Problem	Possible cause	Remedy	Page
Noise	Transmission, differential or transfer faulty	Disassemble and inspect transmission, differential or transfer	MT-49
	Wrong oil grade	Replace oil	
	Oil level low	Add oil	MT-48
Oil leakage	Oil level too high	Drain oil	FA-10
	Oil seal, O-ring or gasket worn or damaged	Replace oil seal, O-ring or gasket	MT-49
Hard to shift or will not shift	Control cable faulty	Replace control cable	MT-138
	Transmission faulty	Disassemble and inspect transmission	MT-49
Tight corner braking phenomenon	Differential, center differential or transfer faulty	Replace differential, center differential or transfer	MT-84 MT-100

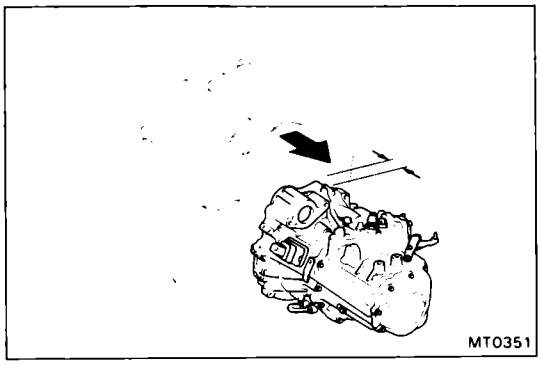
REMOVAL AND INSTALLATION OF TRANSAXLE

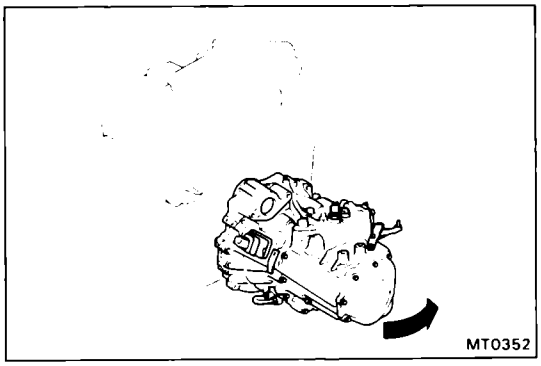
1. **REMOVE ENGINE WITH TRANSAXLE**
   (See page EM-43)

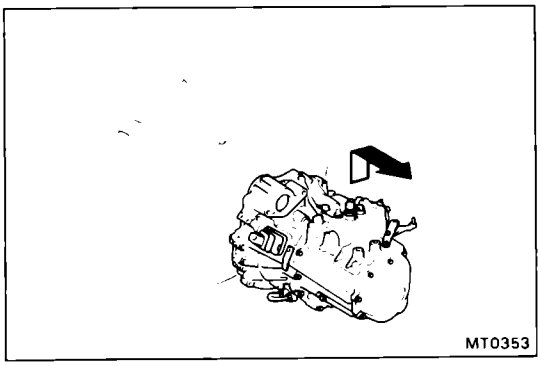
   INSTALL ENGINE WITH TRANSAXLE
   (See page EM-49)

2. **REMOVE AND INSTALL TRANSAXLE AS SHOWN**




MT0351


MT0352


MT0353

(MAIN POINT OF REMOVAL AND INSTALLATION)

1. REMOVE TRANSAXLE ASSEMBLY

NOTE: When removing transaxle from engine, remove as the following procedure since cylinder block rib contacts transfer case.

(a) Pull straight until there are space of 60 — 80 mm (2 — 3 in.) between engine and transaxle case.

(b) Move the transmission case cover to the arrow in the illustration.

(c) While holding transfer output slightly, pull out whole transaxle.

2. INSTALL TRANSAXLE ASSEMBLY FOLLOWING REMOVAL SEQUENCE IN REVERSE

REPLACEMENT OF TRANSAXLE GEAR OIL

1. DRAIN TRANSAXLE OIL

2. FILL TRANSAXLE OIL WITH GEAR OIL

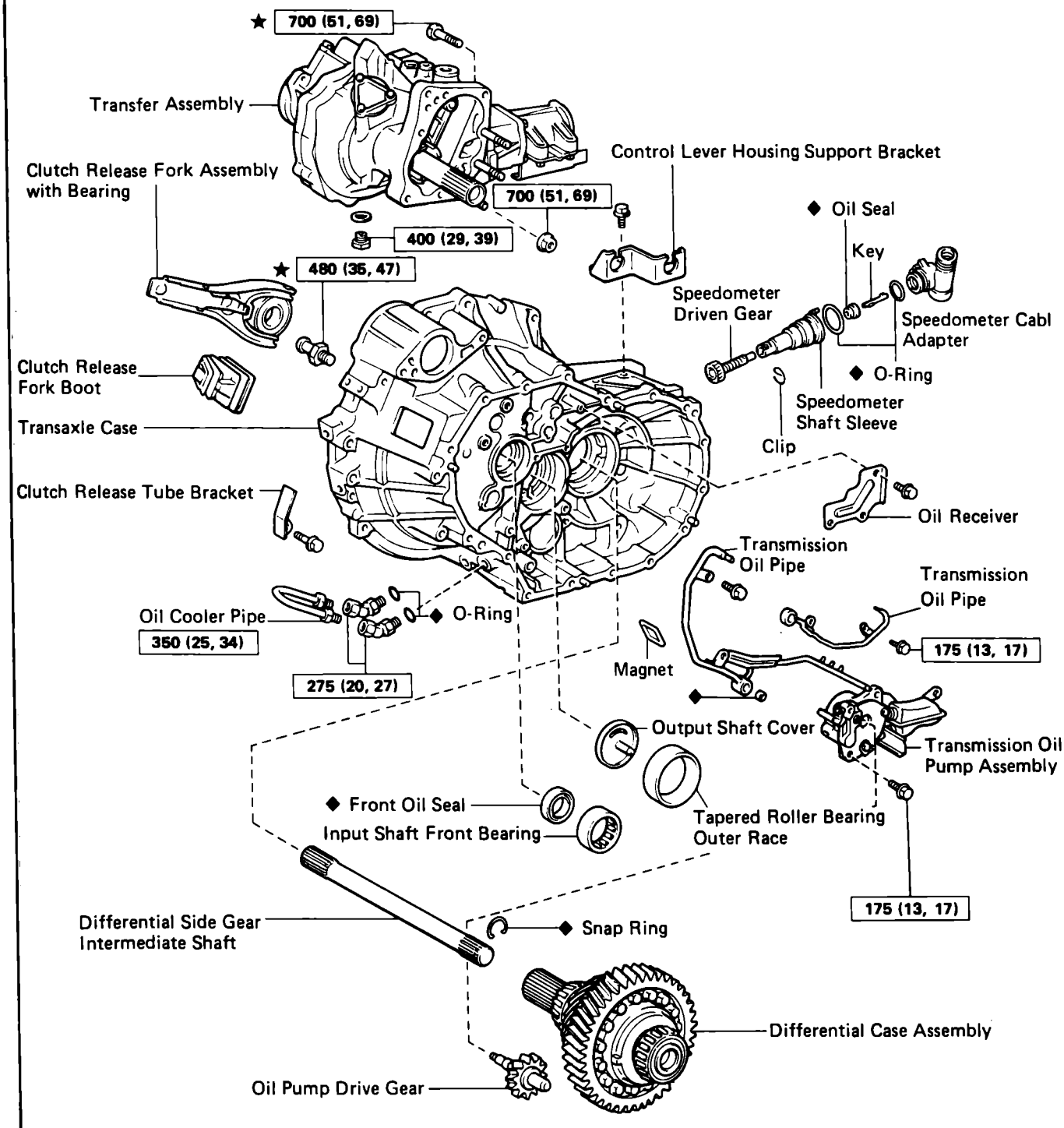
Oil: Transaxle oil E50 (08885-80206) or equivalent

Recommened oil
Oil grade: API GL-5
Viscosity: SAE 75W-90 or 80W-90
Above −18°C (0°C) SAE 90
Below −18°C (0°C) SAE 80W

Capacity: 4.8 Liters (5.1 US qts, 4.2 Imp qts)

REMOVAL OF COMPONENT PARTS

COMPONENTS



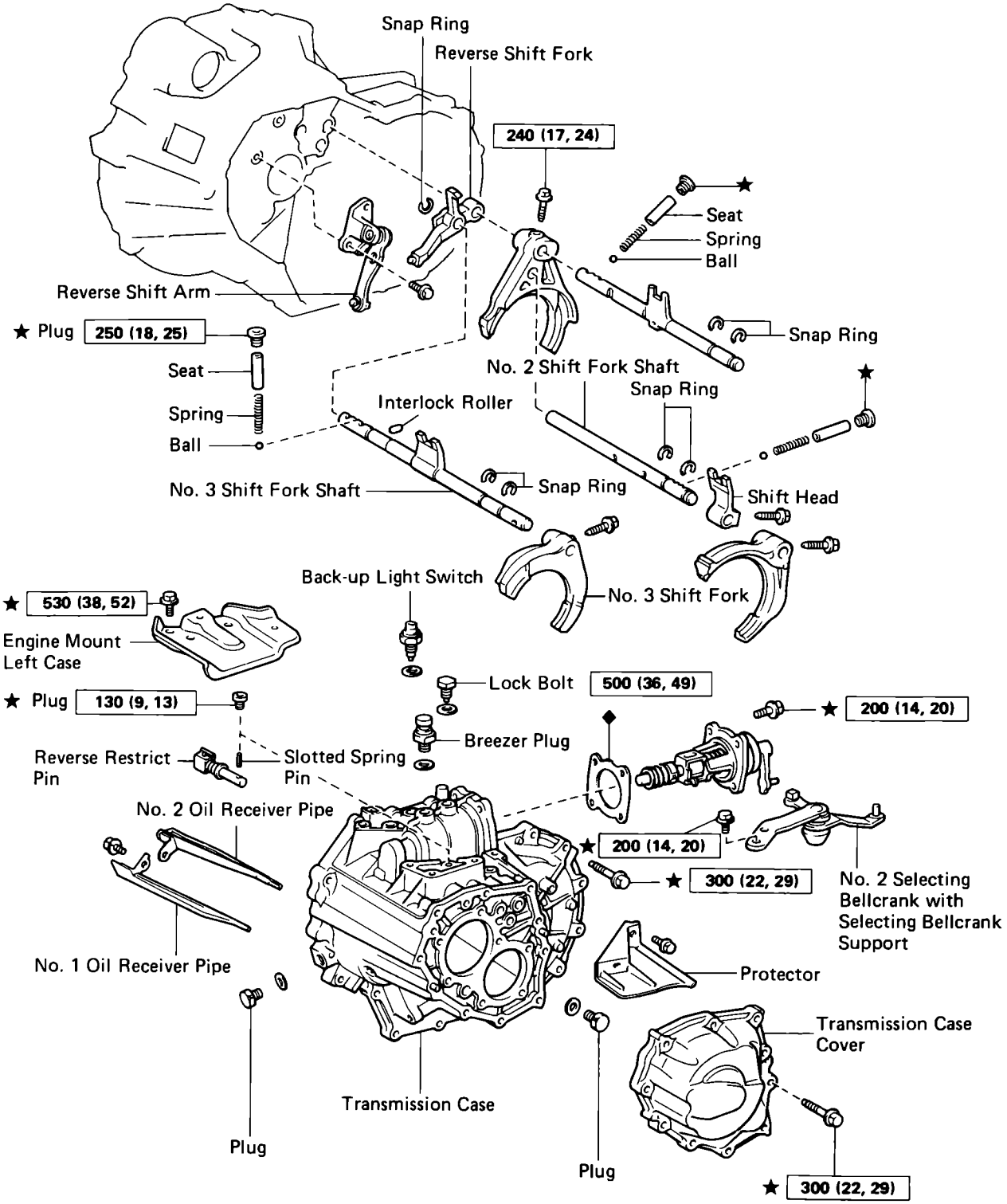
kg-cm (ft-lb, N·m) : Specified torque

◆ : Non-reusable part

★ : Precoated part

MT0374

COMPONENTS (Cont'd)



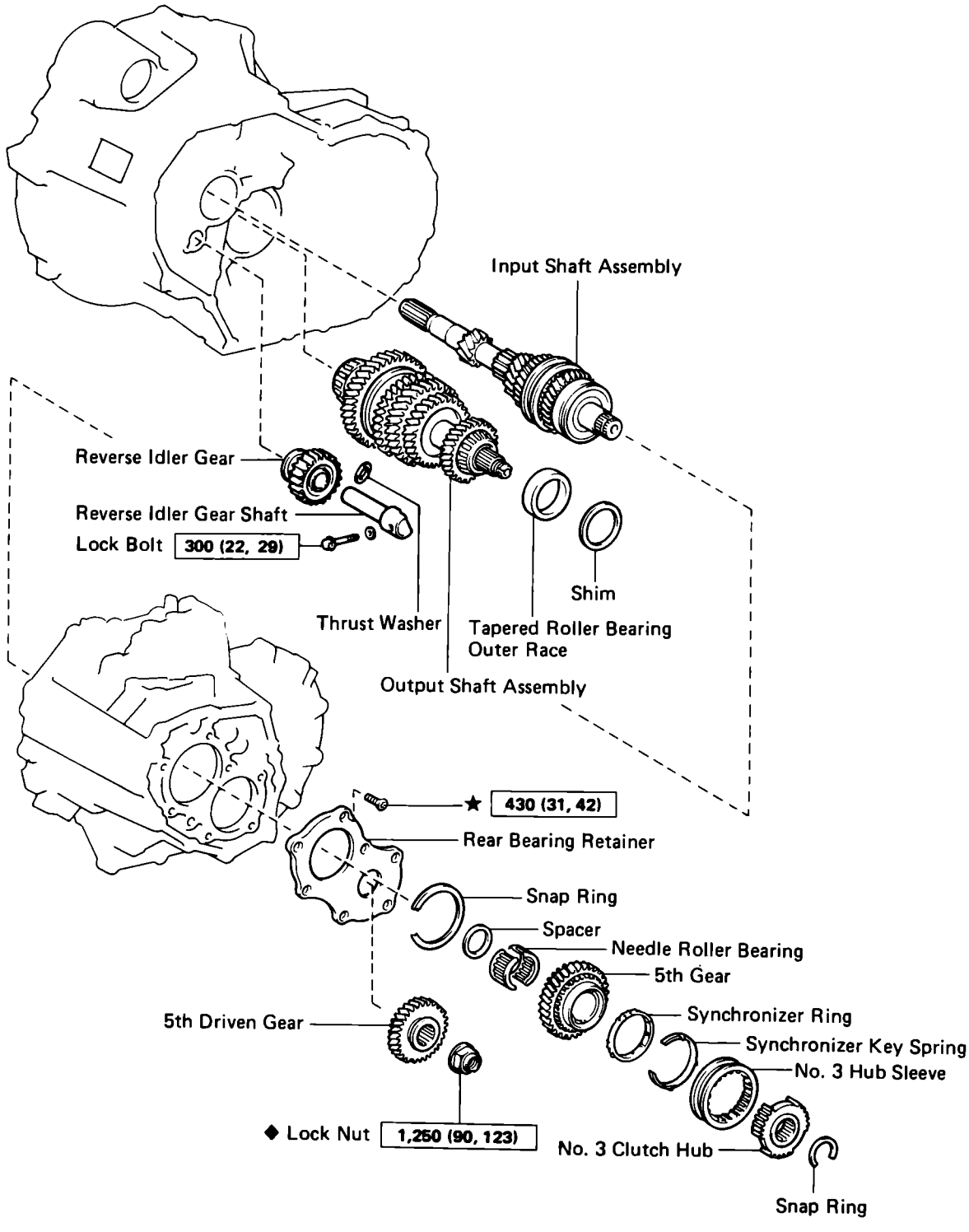
kg-cm (ft-lb, N·m) : Specified torque

◆ Non-reusable part

★ Precoated part

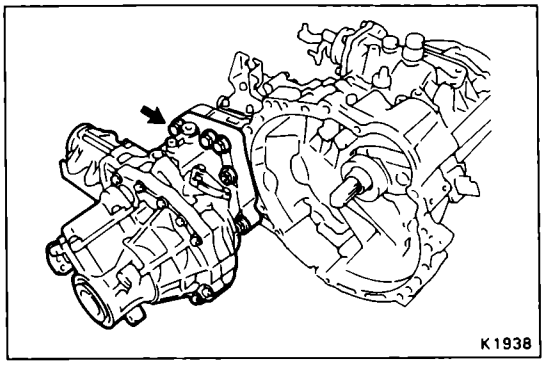
K2047

COMPONENTS (Cont'd)

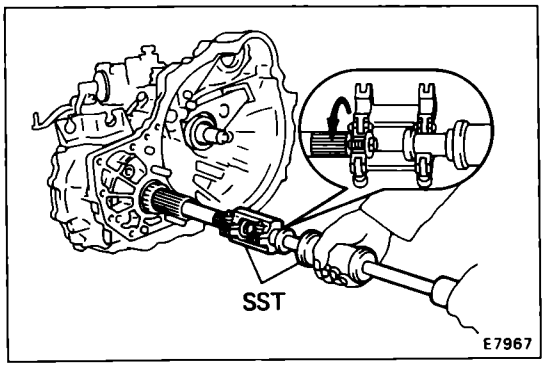


kg-cm (ft-lb, N·m) : Specified torque
◆ : Non-reusable part
★ : Precoated part

E8601

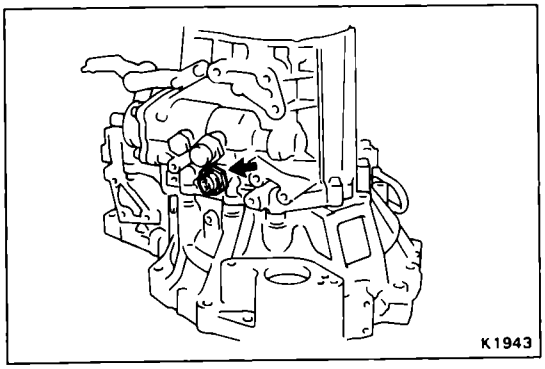


1. **REMOVE TRANSFER ASSEMBLY**
   (a) Remove the three bolts and five nuts.
   (b) Using a plastic hammer, remove the transfer assembly from the transaxle.

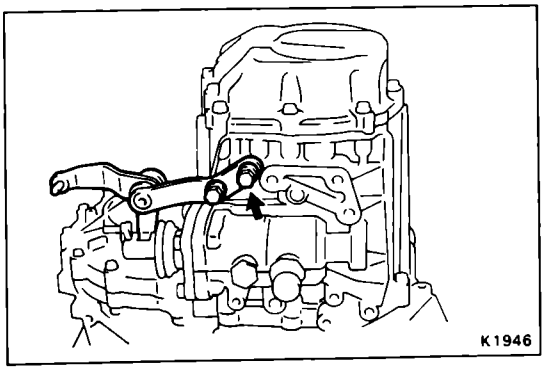


2. **REMOVE DIFFERENTIAL SIDE GEAR INTERMEDIATE SHAFT**
   (a) Screw in a suitable bolt with washer into the side gear intermediate shaft.
   (b) Using SST, remove the side gear intermediate shaft.

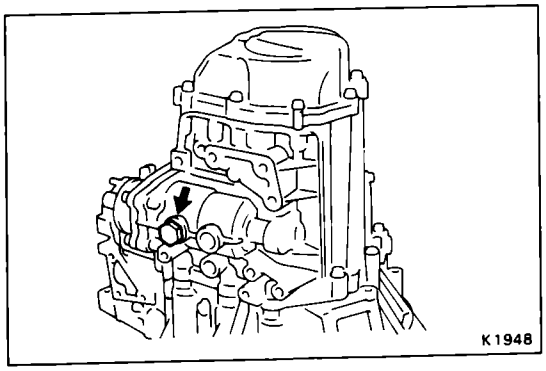
   SST 09910-00015 (09911-00011, 09912-00010)



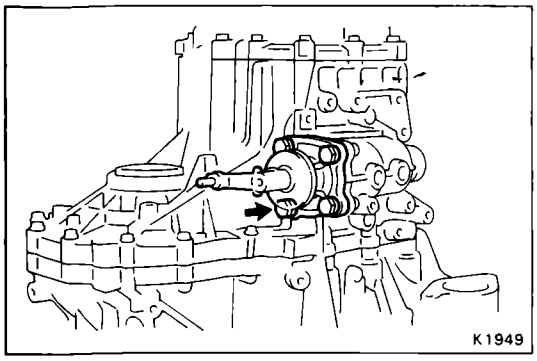
3. **REMOVE RELEASE FORK AND BEARING**
4. **REMOVE BACK-UP LIGHT SWITCH**



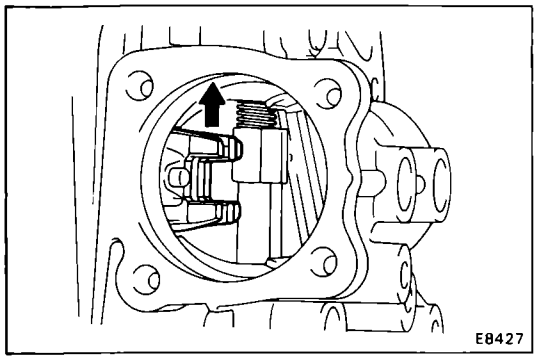
5. **REMOVE SPEEDOMETER DRIVEN GEAR**
6. **REMOVE NO.2 SELECTING BELLCRANK WITH SELECTING BELLCRANK SUPPORT**



7. **REMOVE SHIFT AND SELECT LEVER SHAFT LOCK BOLT**



8. REMOVE SHIFT AND SELECTING LEVER ASSEMBLY

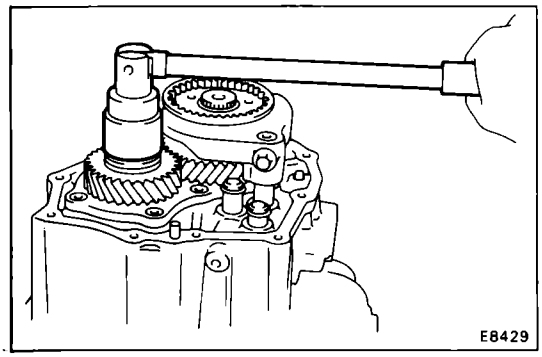


9. REMOVE TRANSMISSION CASE COVER

10. REMOVE OUTPUT SHAFT LOCK NUT

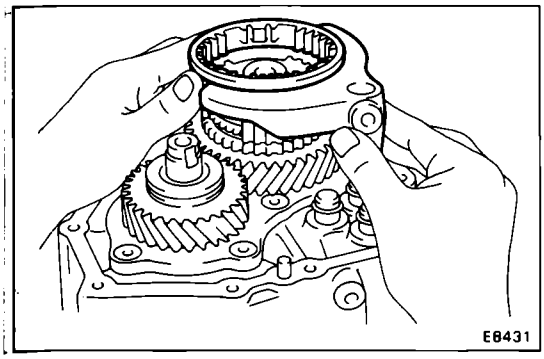
(a) Unstake the lock nut.

(b) Engage the gear double meshing.



(c) Remove the lock nut.

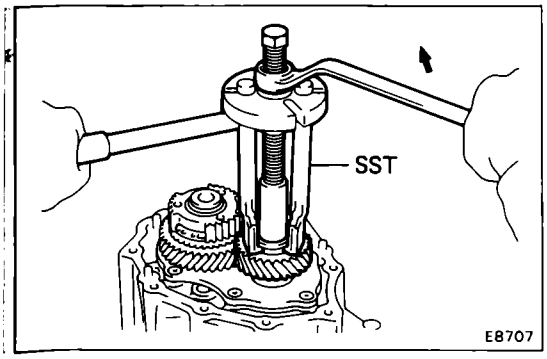
(d) Disengage the gear double meshing.



11. REMOVE NO.3 HUB SLEEVE AND FIFTH SHIFT FORK

(a) Remove the No.3 shift fork set bolt.

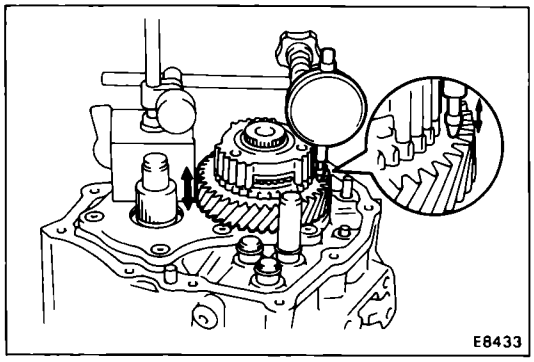
(b) Remove the No.3 hub sleeve and No.3 shift fork.



12. REMOVE FIFTH DRIVEN GEAR

Using SST, remove the 5th driven gear.

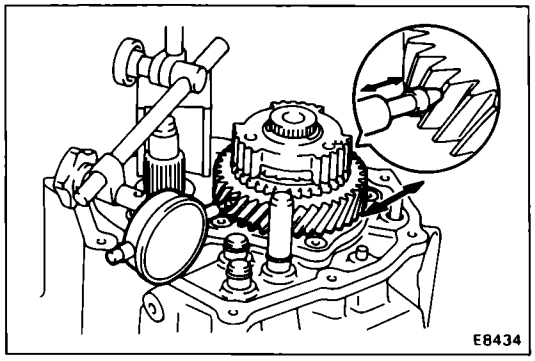
SST 09310-17010 (09310-07010, 09310-07020
09310-07040, 09310-07050)



13. MEASURE FIFTH GEAR THRUST CLEARANCE

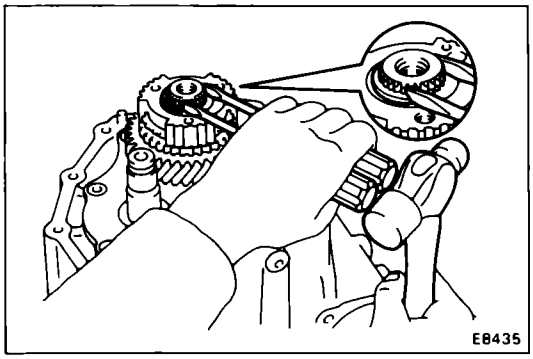
(a) Using a dial indicator, measure the thrust clearance.

Standard clearance: 0.10 – 0.57 mm (0.0039 – 0.0224 in.)
Maximum clearance: 0.65 mm (0.0256 in.)



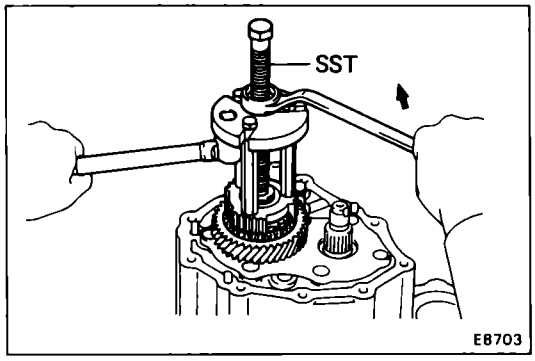
(b) Using a dial indicator, measure the oil clearance.

Standard clearance: 0.009 – 0.050 mm (0.0004 – 0.0020 in.)
Maximum clearance: 0.070 mm (0.0028 in.)



14. REMOVE NO.3 CLUTCH HUB AND FIFTH GEAR

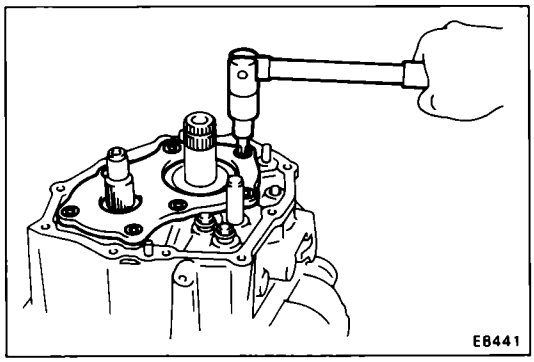
(a) Using two screwdrivers and a hammer, tap out the snap ring.



(b) Using SST, remove the No.3 clutch hub with synchronizer ring and 5th gear.

SST 09310-17010 (09310-07010, 09310-07020 09310-07040, 09310-07050)

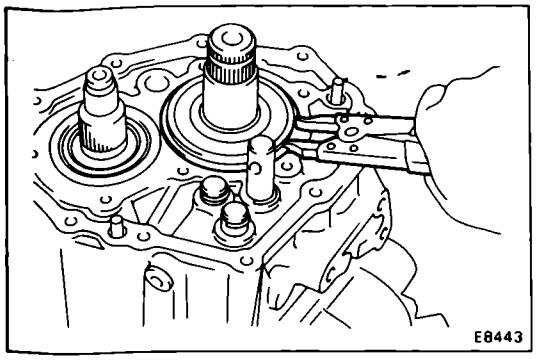
15. REMOVE NEEDLE ROLLER BEARING AND SPACER



16. REMOVE REAR BEARING RETAINER

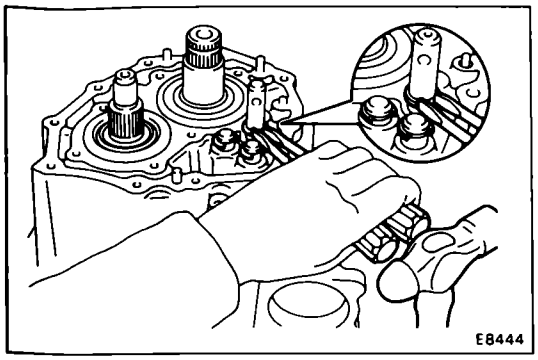
(a) Using a torx wrench, remove the seven torx screws and bearing retainer.

(b) Remove the adjust shim.

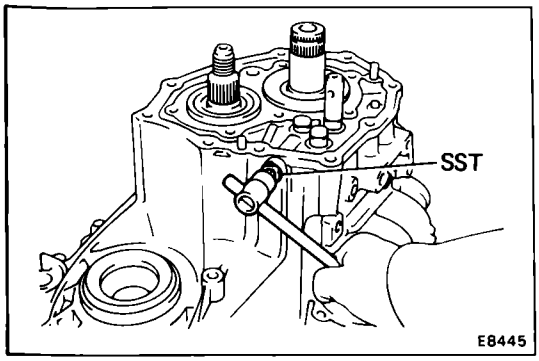


17. REMOVE SNAP RING

(a) Using snap ring pliers, remove the snap ring.



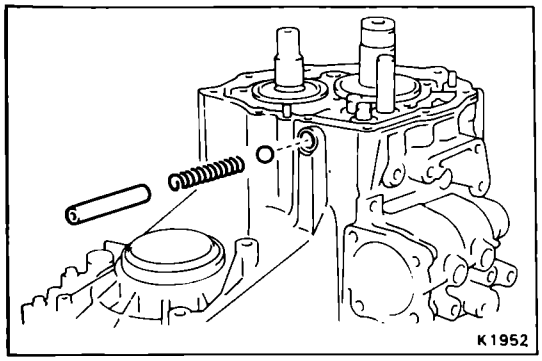
(b) Using two screwdrivers and a hammer, remove the three snap rings.



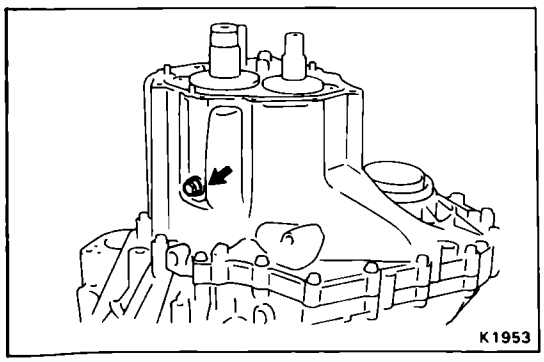
18. REMOVE PLUG, SEAT, SPRING AND LOCKING BALL

(a) Using SST, remove the plug.

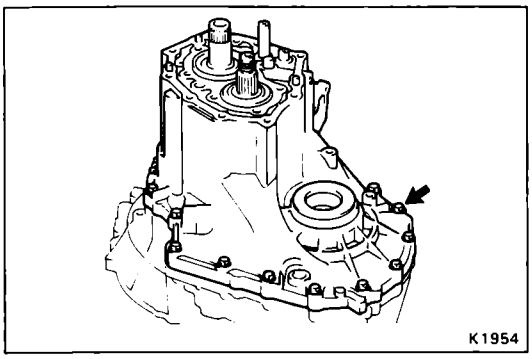
SST 09313-30021



(b) Using a magnetic finger, remove the seat, spring and ball.

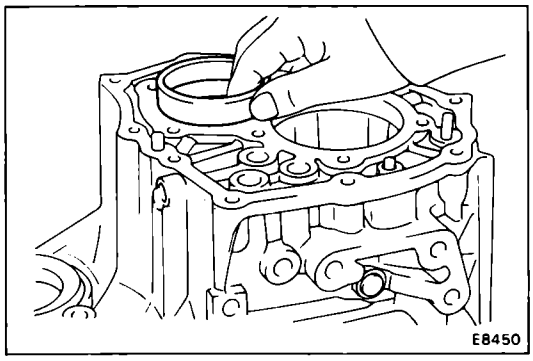


19. REMOVE REVERSE IDLER GEAR SHAFT RETAINING BOLT

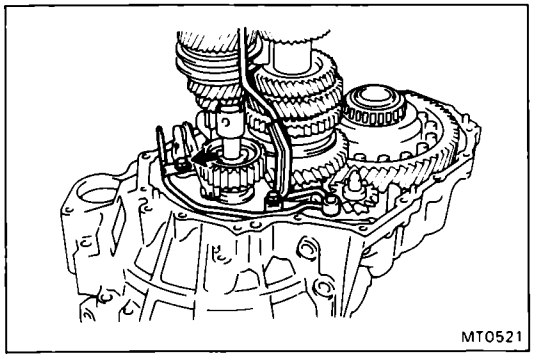


20. REMOVE TRANSMISSION CASE

Remove the seventeen bolts and tap off the case with a plastic hammer.



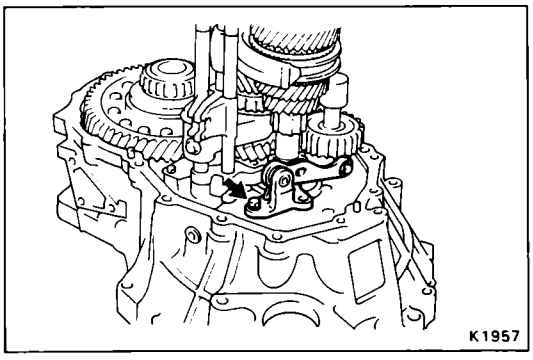
21. REMOVE OUTPUT SHAFT REAR TAPERED ROLLER BEARING OUTER RACE



22. REMOVE NO.2 OIL PIPE

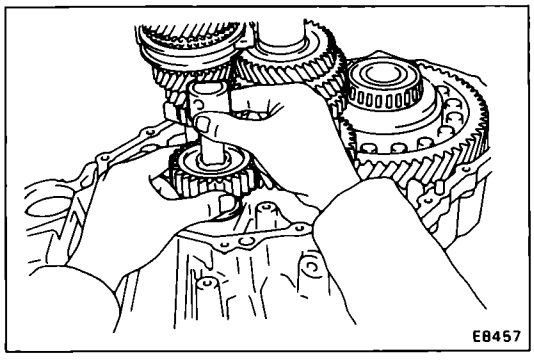
(a) Remove the gasket.

(b) Remove the two bolts and oil pipe.



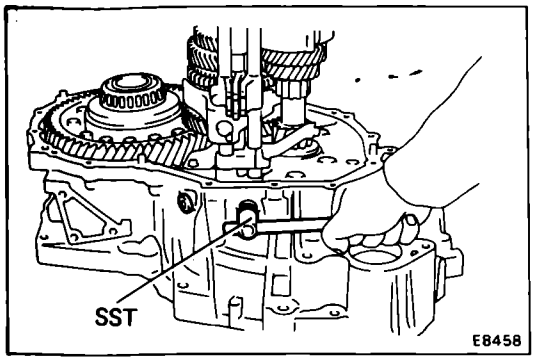
23. REMOVE REVERSE SHIFT ARM

Remove the bolt and pull off the bracket.



24. REMOVE REVERSE IDLER GEAR AND SHAFT

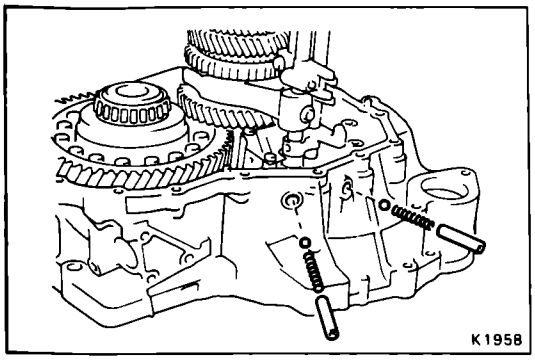
Pull out the shaft, remove the reverse idler gear.



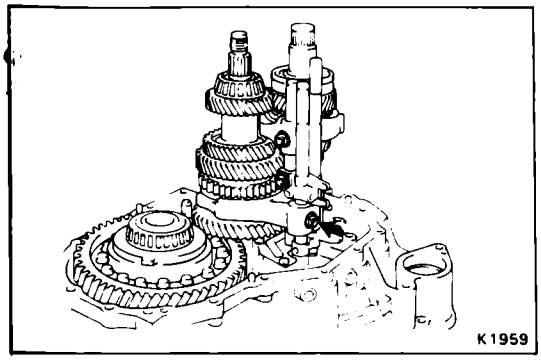
25. REMOVE PLUGS, SEATS, SPRINGS AND BALLS

(a) Using SST, remove the two plugs.

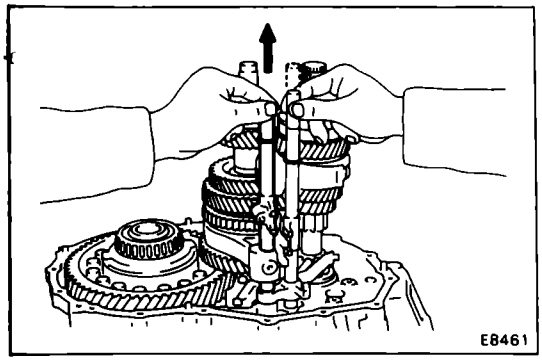
SST 09313-30021



(b) Using a magnetic finger, remove the two seats, springs and balls.

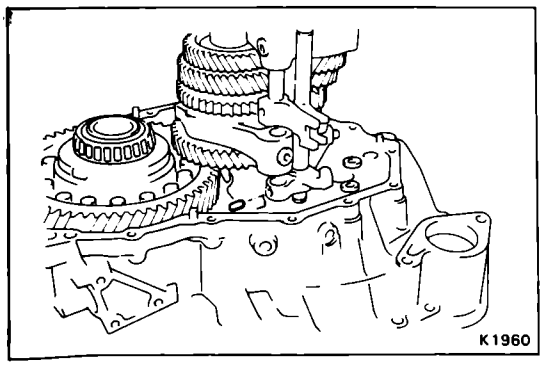


26. REMOVE SET BOLTS



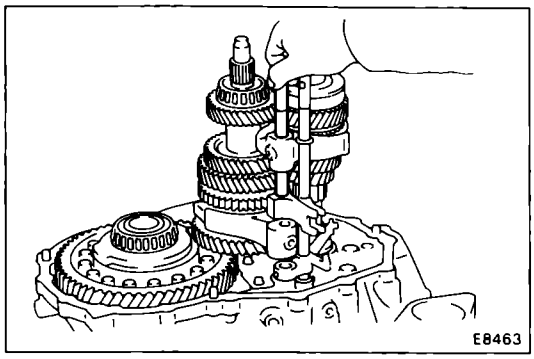
27. REMOVE NO.1 SHIFT FORK SHAFT

Pull up No.3 shift fork shaft, remove the No.1 shift fork shaft.



28. REMOVE INTERLOCK ROLLER

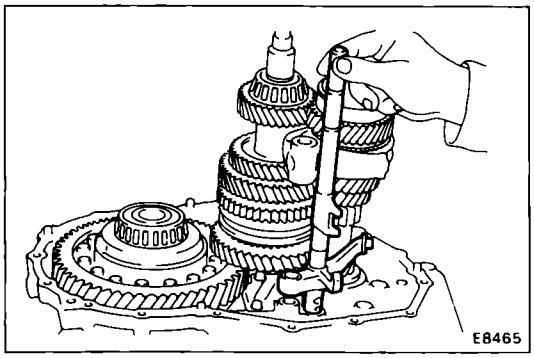
Using a magnetic finger, remove the interlock roller from the reverse shift fork.



29. REMOVE NO.2 SHIFT FORK SHAFT, SHIFT HEAD AND NO.1 SHIFT FORK

(a) Pull out the No.2 shift fork shaft.

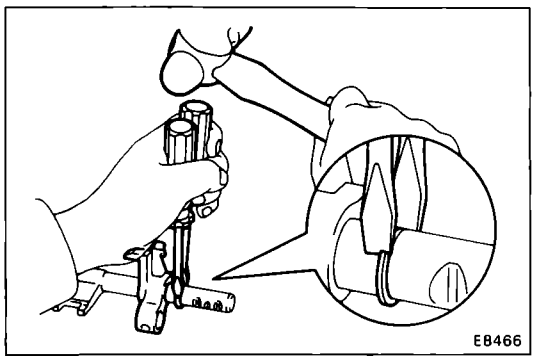
(b) Remove the shift head and No.1 shift fork.



30. REMOVE NO.3 SHIFT FORK SHAFT WITH REVERSE SHIFT FORK AND NO.2 SHIFT FORK

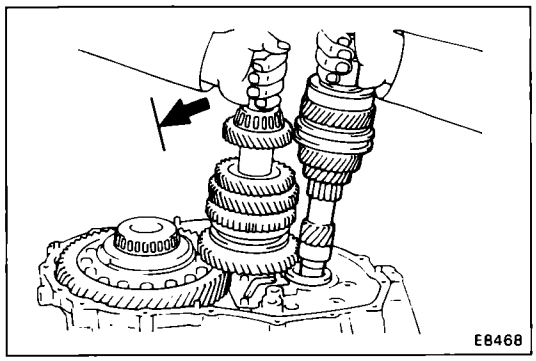
(a) Pull out the No.3 shift fork shaft with reverse shift fork.

(b) Remove the No.2 shift fork.



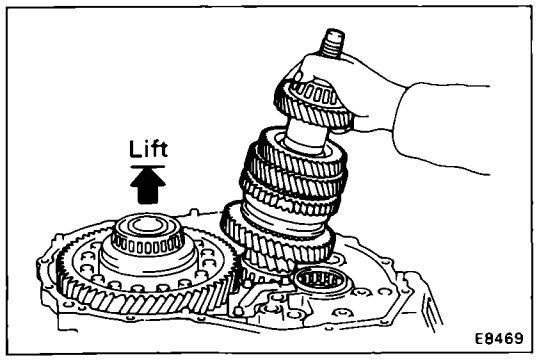
31. REMOVE SNAP RINGS

Using two screwdrivers and a hammer, remove the snap ring and reverse shift fork from the No.3 shift fork shaft.

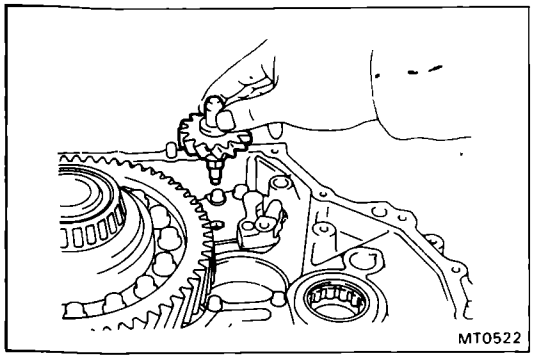


32. REMOVE INPUT AND OUTPUT SHAFT ASSEMBLY

(a) Leaning the output shaft to the differential side, remove the input shaft assembly.

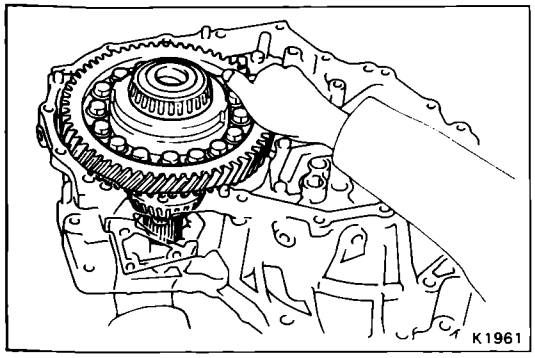


(b) Lift up the differential case assembly, remove the output shaft assembly.

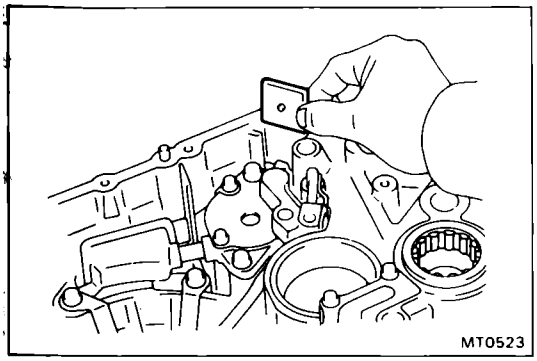


33. REMOVE DIFFERENTIAL ASSEMBLY

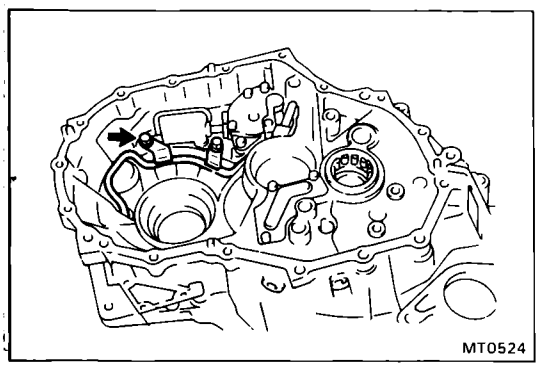
(a) Remove the oil pump drive gear.



(b) Remove the differential case assembly.

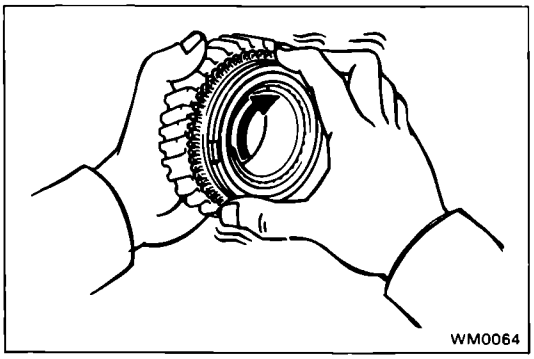


34. REMOVE MAGNET FROM TRANSAXLE CASE



35. REMOVE OIL PUMP ASSEMBLY

Remove the four bolts, oil pipe and oil pump.

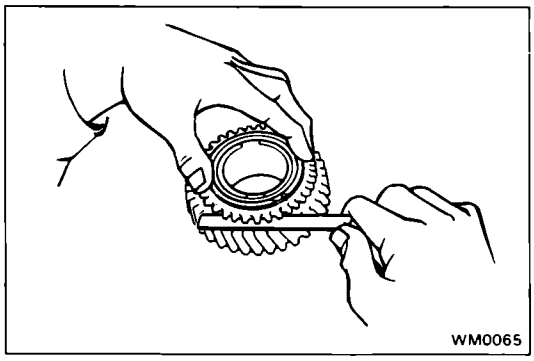


INSPECTION OF COMPONENT PARTS

1. INSPECT SYNCHRONIZER RING OF FIFTH GEAR

(a) Check for wear or damage.

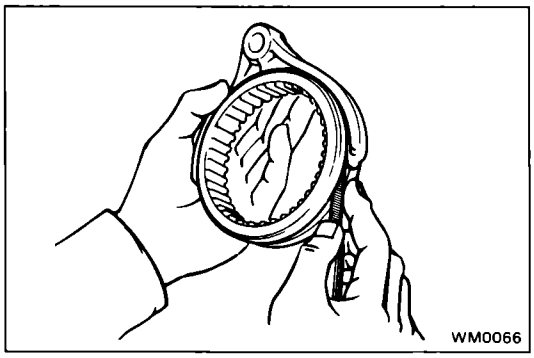
(b) Turn the ring and push it in to check the braking action.



(c) Measure the clearance between the synchronizer ring back and the gear spline end.

Minimum clearance: 0.6 mm (0.024 in.)

If the clearance is less than the limit, replace the synchronizer ring.

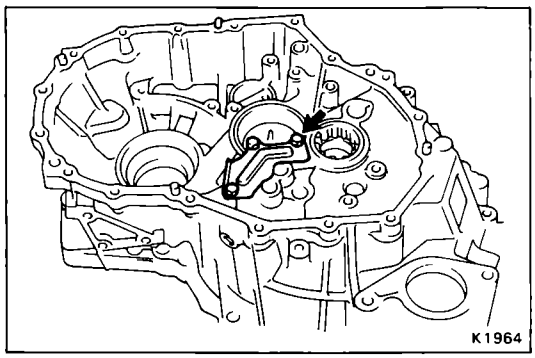


2. MEASURE CLEARANCE OF SHIFT FORK AND HUB SLEEVE

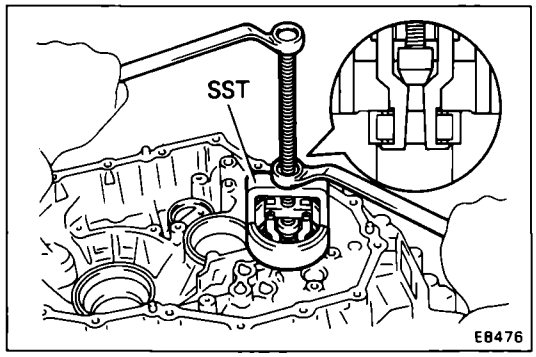
Using a feeler gauge, measure the clearance between the hub sleeve and shift fork.

Maximum clearance: 1.0 mm (0.039 in.)

If the clearance exceeds the limit, replace the shift fork or hub sleeve.



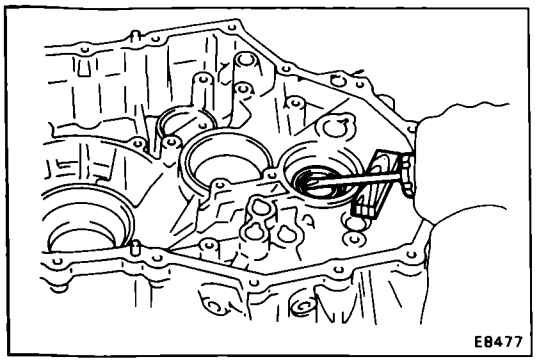
3. REMOVE TRANSAXLE CASE RECEIVER



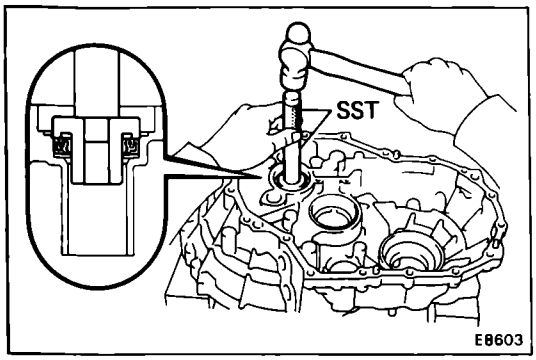
4. IF NECESSARY, REPLACE INPUT SHAFT BEARING AND OIL SEAL

(a) Using SST, pull out the bearing.

SST 09612-65014



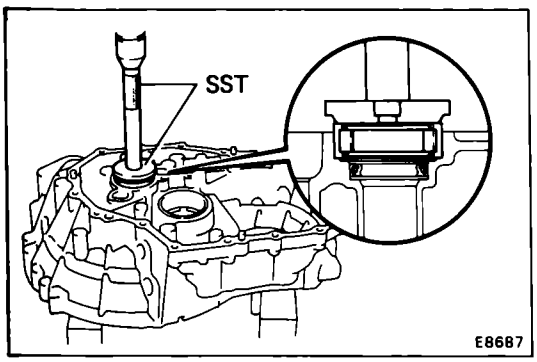
(b) Using a screwdriver, remove the oil seal.



(c) Using SST, drive in a new oil seal.

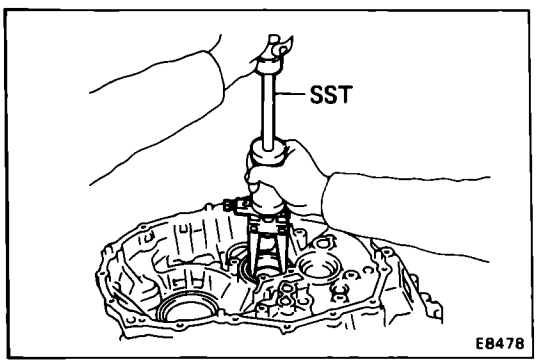
SST 09608-12010 (09608-00020, 09608-00080)

(d) Coat the lip of oil seal with MP grease.



(e) Using SST, drive in a new bearing.

SST 09608-12010 (09608-00020, 09608-00060)

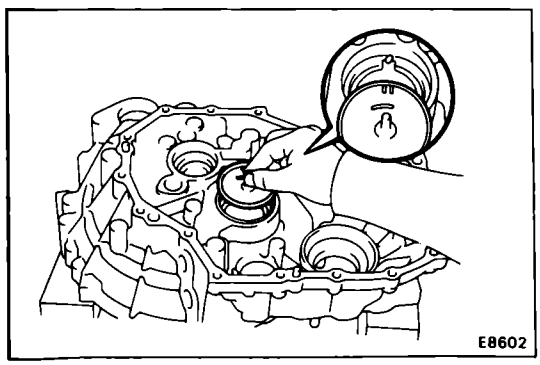


5. IF NECESSARY, REPLACE OUTPUT SHAFT FRONT OUTER RACE AND OUTPUT SHAFT COVER

(a) Using SST, pull out the outer race.

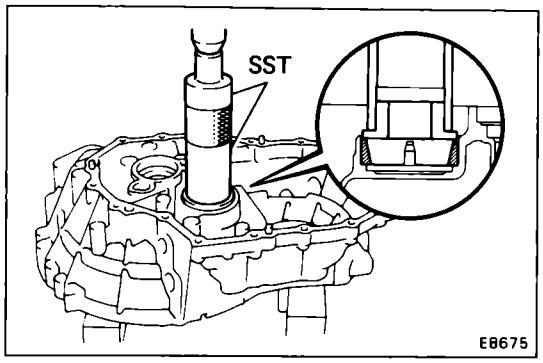
SST 09308-00010

(b) Remove the output shaft front cover.

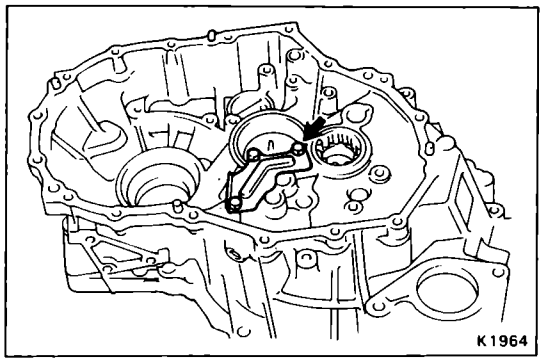


(c) Install the output shaft front cover.

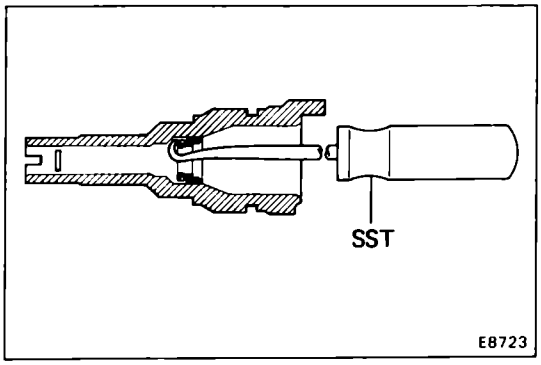
NOTE: Install the output shaft cover projection into case side groove.



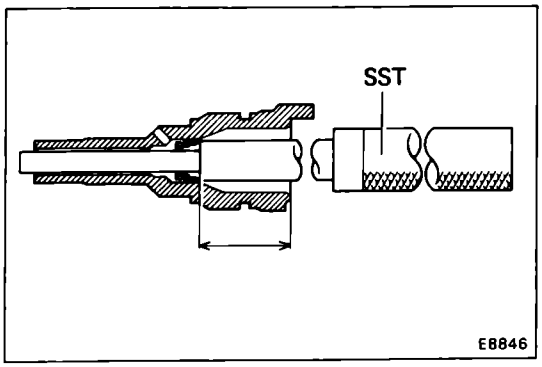
(d) Using SST, press in a new outer race.
SST 09316-60010 (09316-00010, 09316-00020)



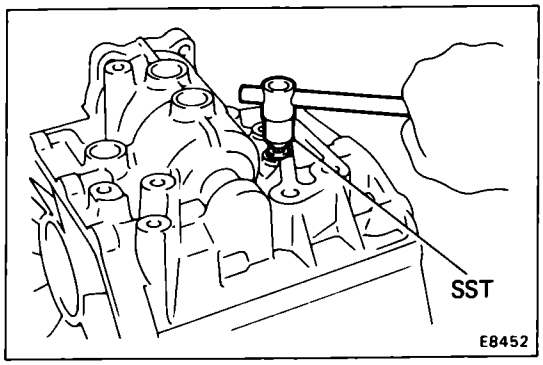
6. INSTALL AND TORQUE TRANSAXLE CASE RECEIVER
Torque: 75 kg-cm (65 in.-lb, 7.4 N·m)



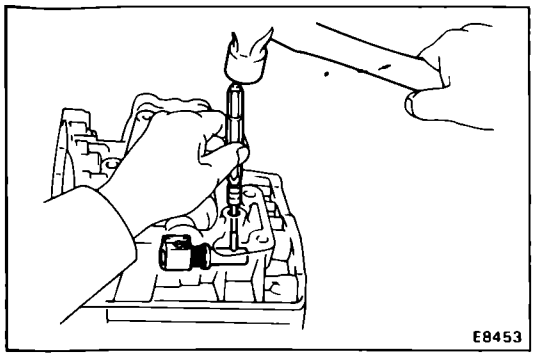
7. IF NECESSARY, REPLACE SPEEDOMETER DRIVEN GEAR OIL SEAL
(a) Using SST, pull out the oil seal.
SST 09921-00010



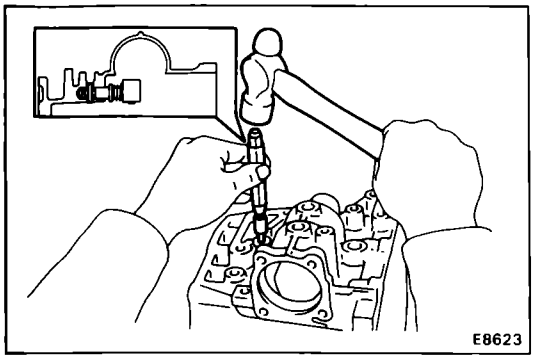
(b) Using SST, drive in a new oil seal.
SST 09201-60011
Drive in depth: 33 mm (1.30 in.)
(c) Coat the lip of oil seal with MP grease.



8. IF NECESSARY, REPLACE REVERSE RESTRICT PIN
(a) Using SST, remove the screw plug.
SST 09313-30021

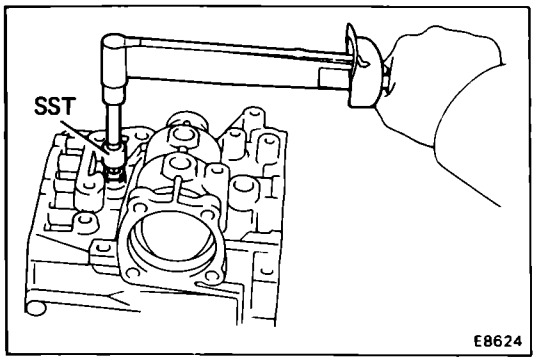


(b) Using a pin punch and hammer, drive out the slott spring pin.



(c) Replace the reverse restrict pin.

(d) Using a pin punch, drive in the slotted spring pin



(e) Apply liquid sealant to the plug threads.

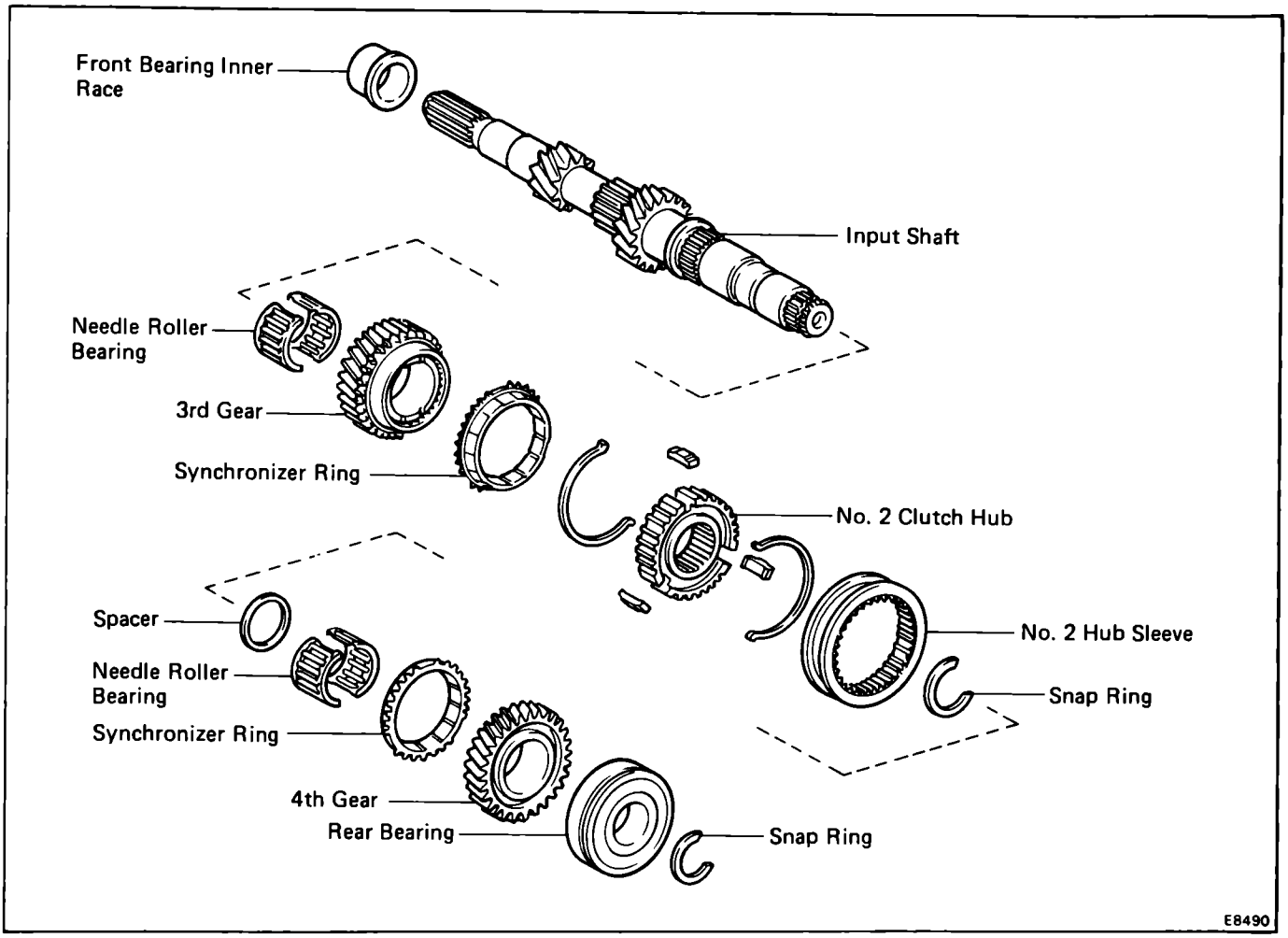
Sealant: Part No.08833-00080, THREE BOND 1344 LOCTITE 242 or equivalent

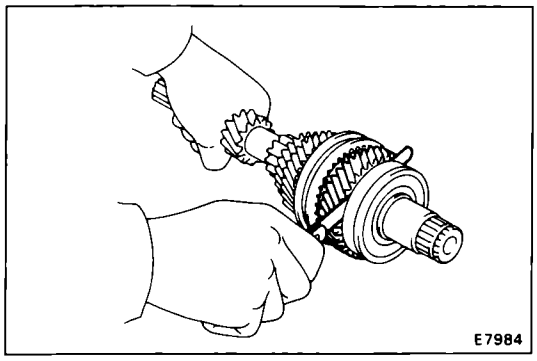
(f) Using SST, install the screw plug.

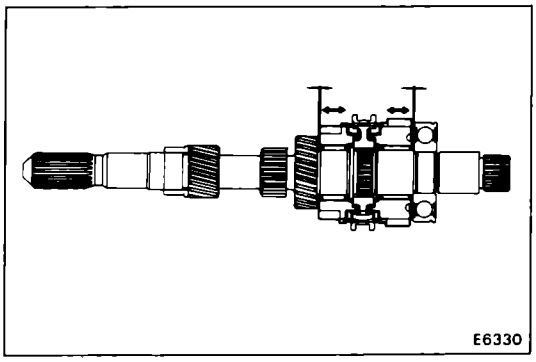
SST 09313-30021

COMPONENT PARTS

Input Shaft Assembly







DISASSEMBLY OF INPUT SHAFT ASSEMBLY

1. **MEASURE THIRD AND FOURTH GEAR THRUST CLEARANCE**

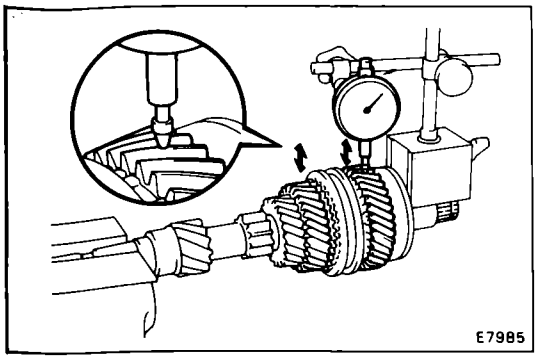
   Using a feeler gauge, measure the thrust clearance.

   Standard clearance:

   3rd gear 0.10 – 0.35 mm (0.0039 – 0.0138 in.)
   4th gear 0.10 – 0.55 mm (0.0039 – 0.0217 in.)

   Maximum clearance:

   3rd gear 0.40 mm (0.0157 in.)
   4th gear 0.60 mm (0.0236 in.)



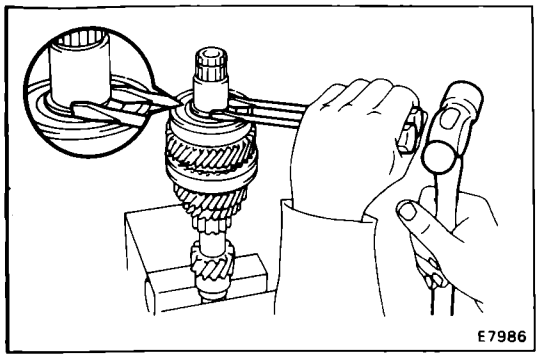
2. CHECK OIL CLEARANCE OF THIRD AND FOURTH GEA

Using dial indicator, measure the oil clearance between t gear and shaft.

Standard clearance:
3rd gear 0.009 — 0.053 mm (0.0004 — 0.0020 i
4th gear 0.009 — 0.051 mm (0.0004 — 0.0020 i

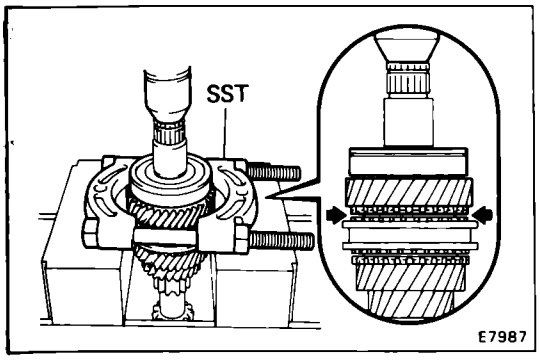
Maximum clearance: 0.080 mm (0.003 in.)

If clearance exceeds the limit, replace the gear, needle rol bearing or shaft.



3. REMOVE SNAP RING

Using two screwdrivers and a hammer, tap out the sn ring.

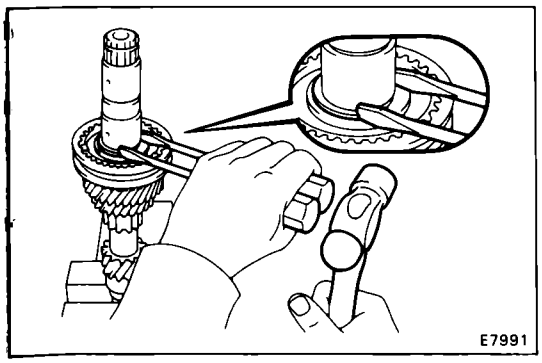


4. REMOVE INPUT SHAFT REAR BEARING AND FOUR GEAR

Using SST and a press, remove the input shaft rear bearin

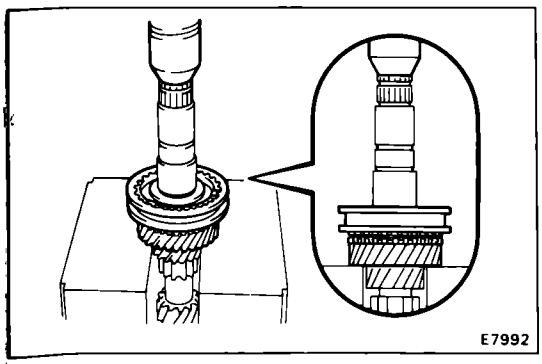
SST 09950-00020

5. REMOVE NEEDLE ROLLER BEARINGS, SPACER AND SYNCHRONIZER RING



6. REMOVE SNAP RING

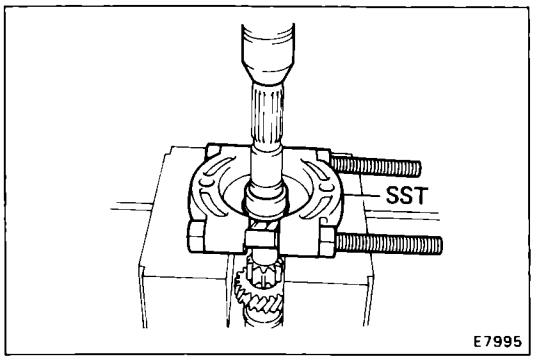
Using two screwdrivers and a hammer, tap out the sn ring.



7. REMOVE NO.2 CLUTCH HUB ASSEMBLY, SYNCHRONI ER RING AND THIRD GEAR

Using a press, remove No.2 hub sleeve, 3rd gear, sy chronizer ring and needle roller bearings.

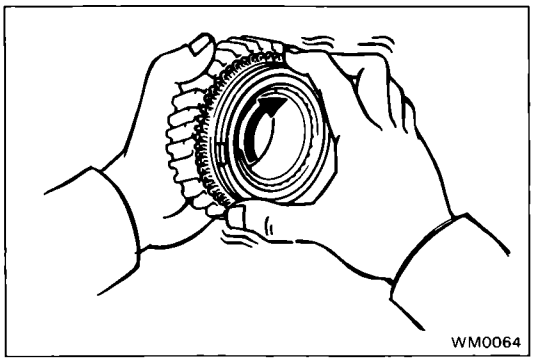
8. REMOVE NEEDLE ROLLER BEARING



9. **REMOVE INPUT SHAFT FRONT BEARING INNER RACE**

Using SST and a press, remove the inner race.

SST 09950-00020

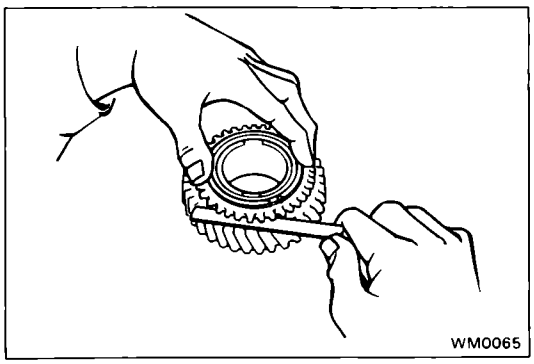


INSPECTION OF INPUT SHAFT COMPONENT PARTS

1. **INSPECT SYNCHRONIZER RINGS**

(a) Check for wear or damage.

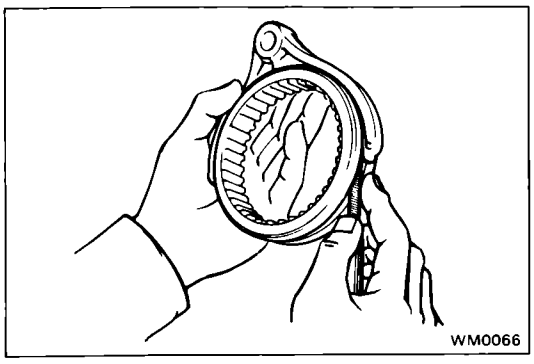
(b) Turn the ring and push it in to check the breaking action.



(c) Measure the clearance between the synchronizer ring back and gear spline end.

Minimum clearance: 0.6 mm (0.024 in.)

If the clearance is less than the limit, replace the synchronizer ring.

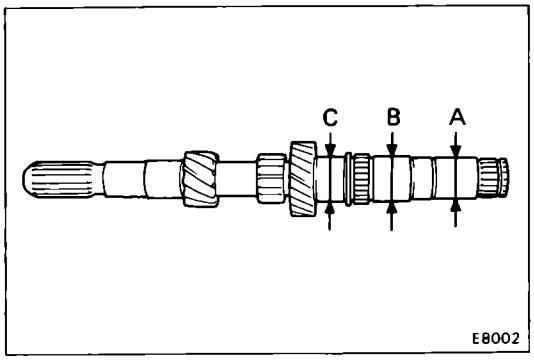


2. **MEASURE CLEARANCE OF NO.2 SHIFT FORK AND HUB SLEEVE**

Using a feeler gauge, measure the clearance between the hub sleeve and shift fork.

Maximum clearance: 1.0 mm (0.039 in.)

If the clearance exceeds the limit, replace the shift fork or hub sleeve.



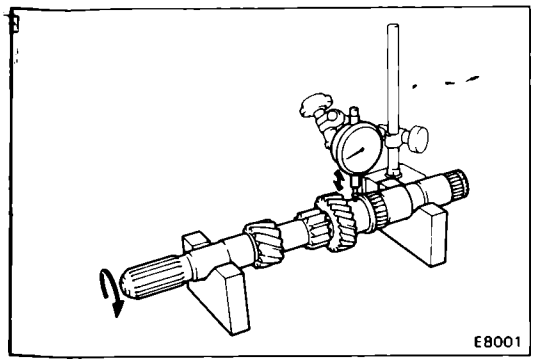
3. **INSPECT INPUT SHAFT**

(a) Check the input shaft for wear or damage.

(b) Using a micrometer, measure the outer diameter of the input shaft journal surface.

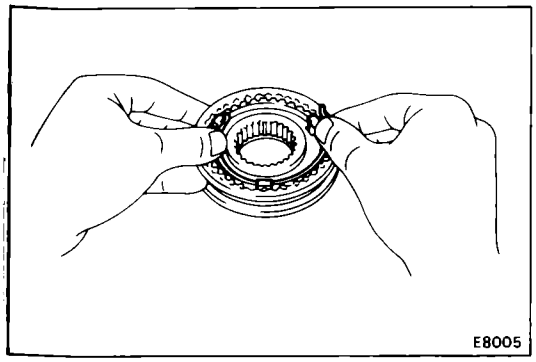
Minimum outer diameter:

Part	**A**	**32.930 mm (1.2964 in.)**
	B and C	**35.950 mm (1.4154 in.)**


E8001

(c) Using a dial indicator, check the shaft runout.

Maximum runout: 0.060 mm (0.0024 in.)


E8005

ASSEMBLY OF INPUT SHAFT ASSEMBLY

(See page MT-64)

NOTE: Coat all of the sliding and rotating surface with gear oil before assembly.

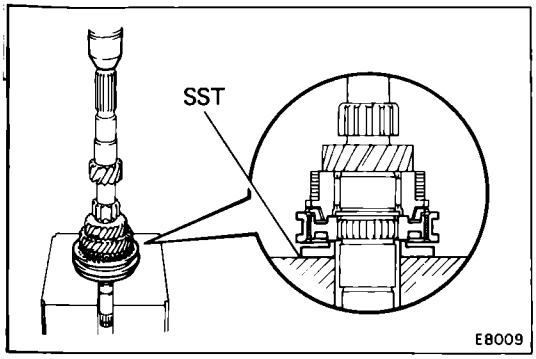
1. INSERT NO.2 CLUTCH HUB SLEEVE

(a) Install the clutch hub and shifting keys to the hub sleeve.

NOTE: When istalling the No.2 clutch hub to the input shaft either end maybe inserted.

(b) Install the shifting key springs under the shifting keys.

CAUTION: Install the key springs positioned so that their end gaps are not in line.



E8009

2. INSTALL NEEDLE ROLLER BEARING, THIRD GEAR, SYNCHRONIZER RING AND NO.2 HUB SLEEVE ASSEMBLY TO INPUT SHAFT

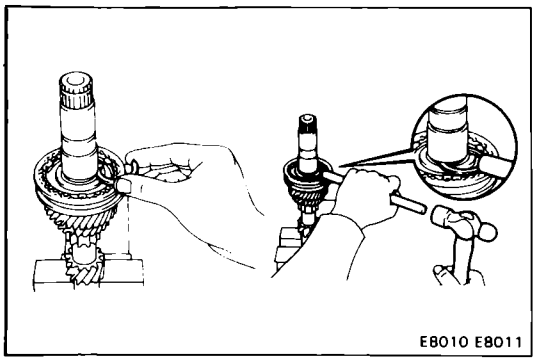
(a) Apply MP grease to the needle roller bearings.

(b) Install the 3rd gear.

(c) Place the synchronizer ring on the gear and align the ring slots with the shifting keys.

(d) Using SST and a press, install the 3rd gear and No.2 hub sleeve.

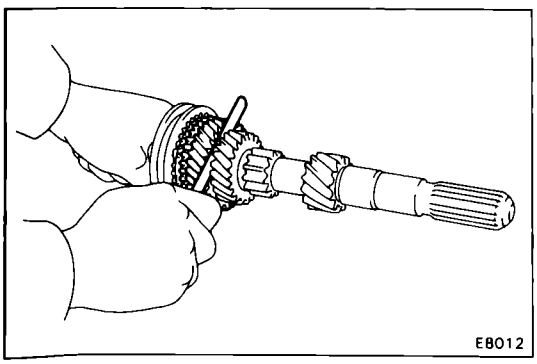
SST 09506-35010


E8010 E8011

3. INSTALL SNAP RING

Select a snap ring that will allow minimum axial play and install it on the shaft.

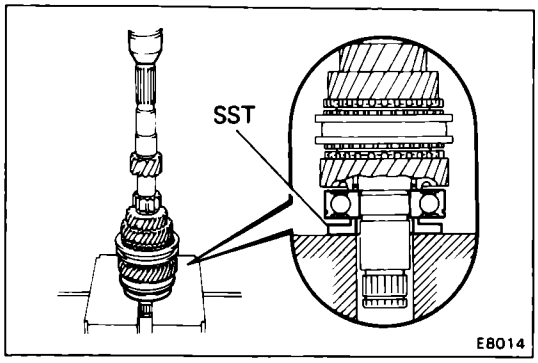
Mark	Thickness	mm (in.)
H	2.30 — 2.35	(0.0906 — 0.0925)
J	2.35 — 2.40	(0.0925 — 0.0945)
K	2.40 — 2.45	(0.0945 — 0.0965)
L	2.45 — 2.50	(0.0965 — 0.0984)
M	2.50 — 2.55	(0.0984 — 0.1004)
N	2.55 — 2.60	(0.1004 — 0.1024)
P	2.60 — 2.65	(0.1024 — 0.1043)

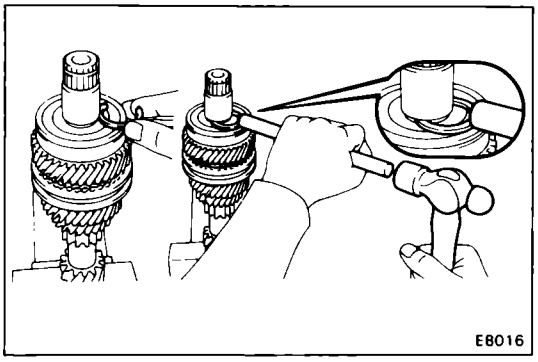

E8012

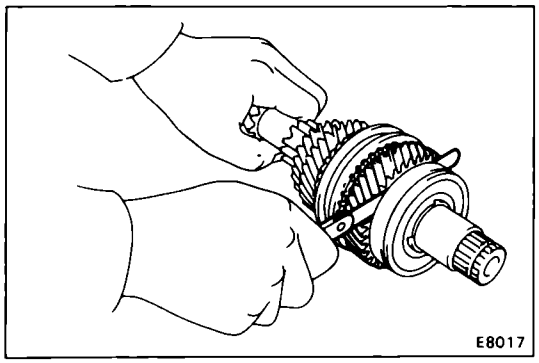
4. MEASURE THIRD GEAR THRUST CLEARANCE

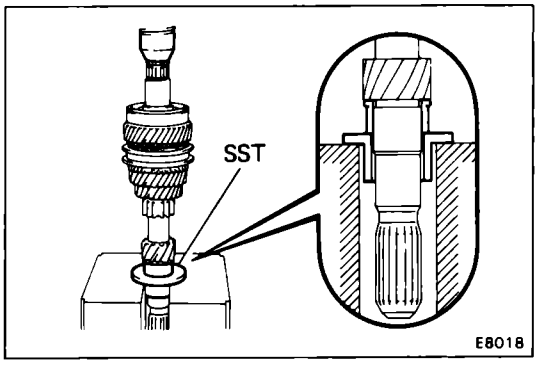
Using a feeler gauge, measure the 3rd gear thrust clearance.

Standard clearance: 0.10 — 0.35 mm (0.0039 — 0.0138 in.)









5. INSTALL SPACER, SYNCHRONIZER RING, NEEDLE ROLLER BEARINGS, FOURTH GEAR AND RADIAL BALL BEARING

(a) Install the spacer.

(b) Apply MP grease to the needle roller bearings.

(c) Place the synchronizer ring on the gear and align the ring slots with the shifting keys.

(d) Install the 4th gear.

(e) Using SST and a press, install the radial ball bearing.

SST 09506-35010

6. INSTALL SNAP RING

Select a snap ring that will allow minimum axial play and install it on the shaft.

Mark	Thickness	mm (in.)
1	2.35 — 2.40	(0.0925 — 0.0945)
2	2.40 — 2.45	(0.0945 — 0.0965)
3	2.45 — 2.50	(0.0965 — 0.0984)
4	2.50 — 2.55	(0.0984 — 0.1004)
5	2.55 — 2.60	(0.1004 — 0.1024)
6	2.60 — 2.65	(0.1024 — 0.1043)
7	2.65 — 2.70	(0.1043 — 0.1063)
8	2.70 — 2.75	(0.1063 — 0.1083)

7. MEASURE FOURTH GEAR THRUST CLEARANCE

Using a feeler gauge, measure the 4th gear thrust clearance.

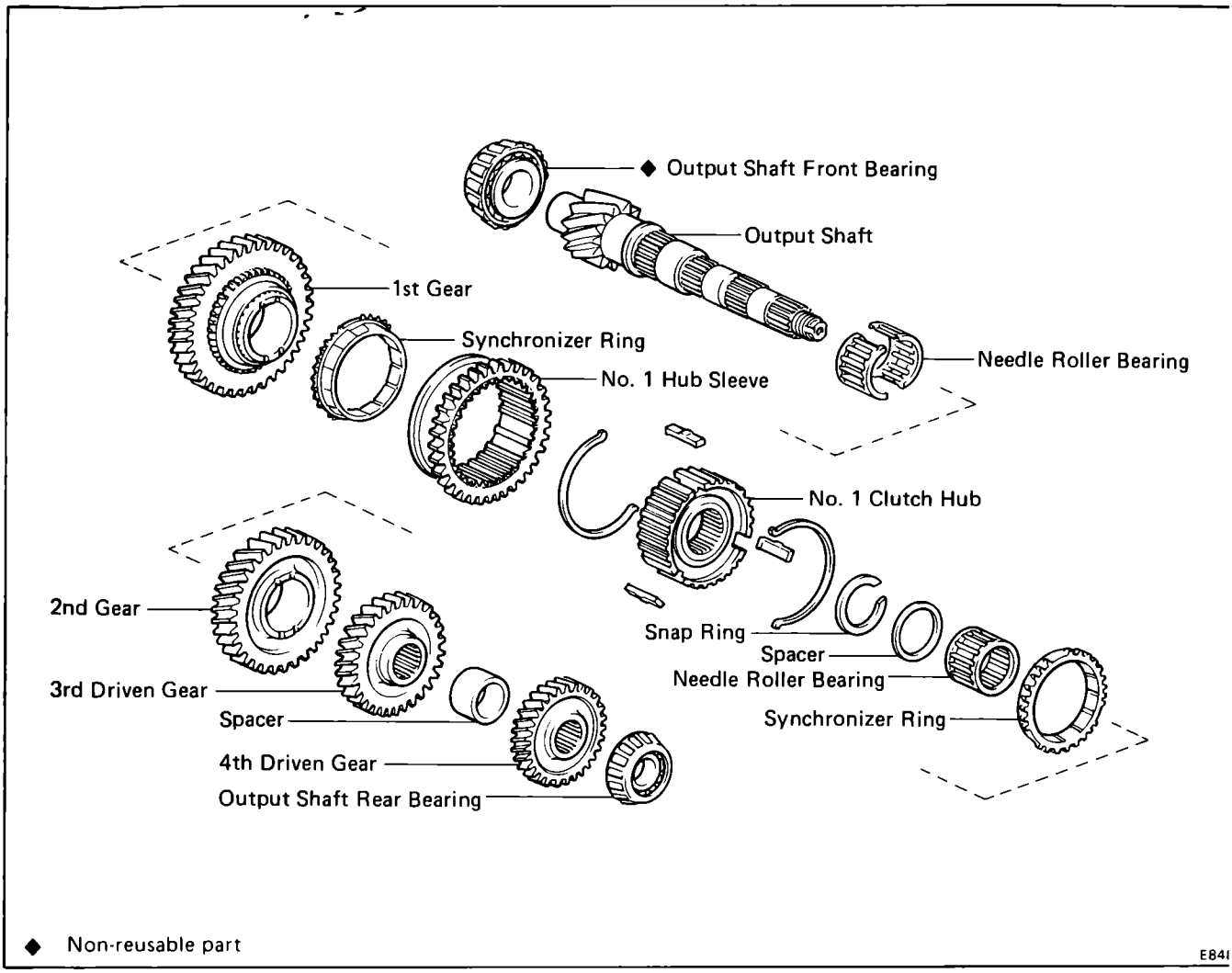
Standard clearance: 0.10 — 0.55 mm (0.0039 — 0.0217 in.)

8. INSTALL INPUT SHAFT FRONT BEARING INNER RACE

Using SST and a press, install the input shaft front bearing inner race.

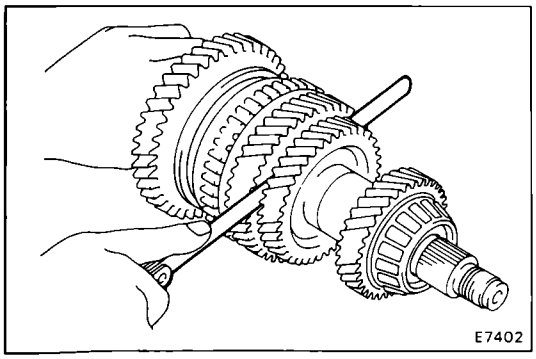
SST 09316-60010 (09316-00020)

Output Shaft Assembly

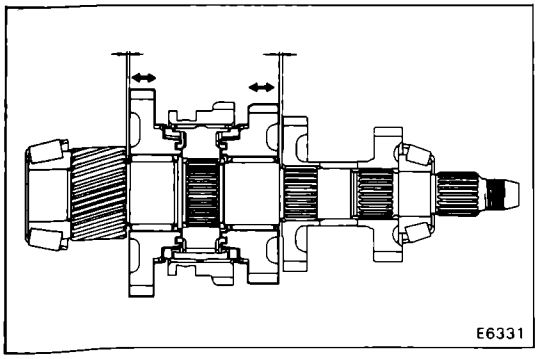


◆ Non-reusable part

E841



E7402



E6331

DISASSEMBLY OF OUTPUT SHAFT ASSEMBLY

1. MEASURE FIRST AND SECOND GEAR THRUST CLEARANCE

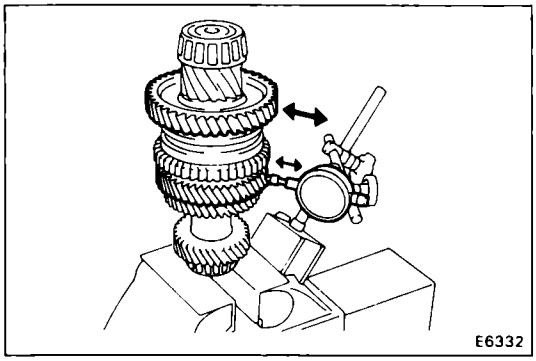
Using a feeler gauge, measure the thrust clearance.

Standard clearance:

1st gear 0.10 — 0.35 mm (0.0039 — 0.0138 ir
2nd gear 0.10 — 0.45 mm (0.0039 — 0.0177 ir

Maximum clearance:

1st gear 0.40 mm (0.0157 in.)
2nd gear 0.50 mm (0.0197 in.)



2. **CHECK OIL CLEARANCE OF FIRST AND SECOND GEAR**

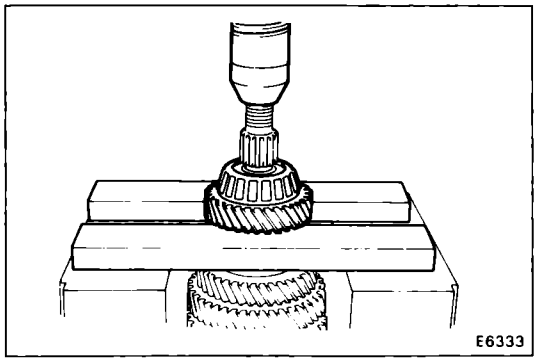
Using dial indicator, measure the oil clearance between the gear and shaft.

Standard clearance:

1st gear	**0.009 — 0.051 mm (0.0004 — 0.0020 in.)**
2nd gear	**0.009 — 0.053 mm (0.0004 — 0.0020 in.)**

Maximum clearance: 0.080 mm (0.003 in.)

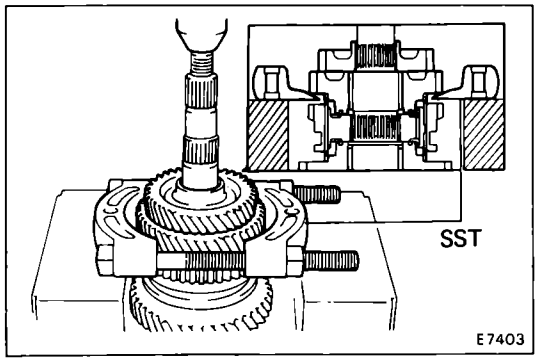
If the clearance exceeds the limit, replace the gear, needle roller bearing or shaft.



3. **REMOVE OUTPUT SHAFT REAR BEARING, FOURTH DRIVEN GEAR AND SPACER**

(a) Using a press, remove the bearing and 4th driven gear.

(b) Remove the spacer.

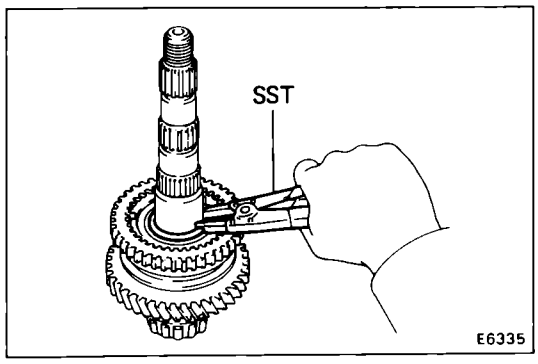


4. **REMOVE THIRD DRIVEN GEAR AND SECOND GEAR**

Using SST and a press, remove the 3rd driven gear and 2nd gear.

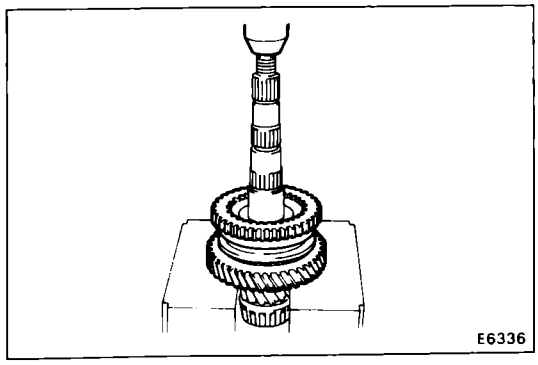
SST 09950-00020

5. **REMOVE NEEDLE ROLLER BEARINGS, SPACER AND SYNCHRONIZER RING**



6. **REMOVE SNAP RING**

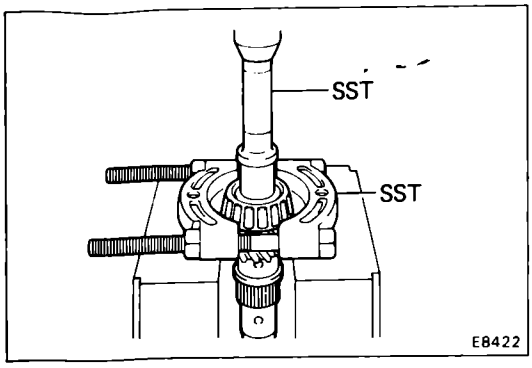
Using snap ring pliers, remove the snap ring.



7. **REMOVE NO.1 HUB SLEEVE ASSEMBLY AND FIRST GEAR**

Using a press, remove No.1 hub sleeve and 1st gear.

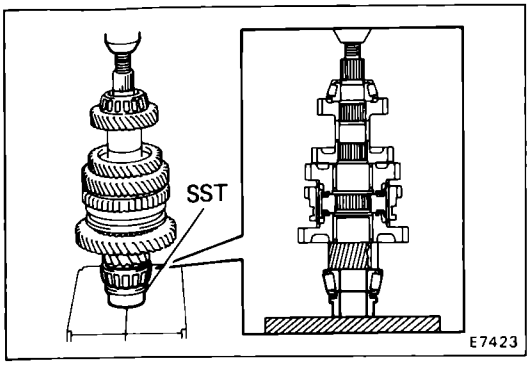
8. **REMOVE SYNCHRONIZER RING AND NEEDLE ROLLER BEARING**



9. **IF NECESSARY, REPLACE OUTPUT SHAFT FRONT BEARING**

(a) Using SST and a press, remove the bearing.

SST 09307-12010, 09950-00020



(b) Using SST and a press, install the new bearing.

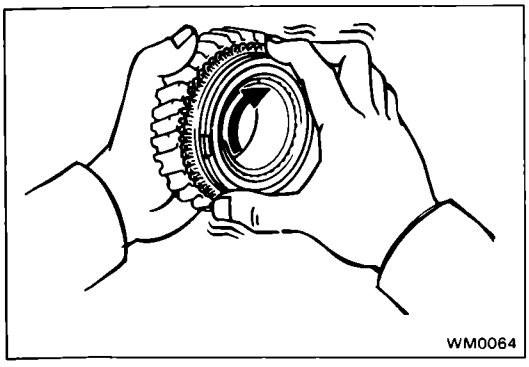
SST 09316-60010 (09316-00070)

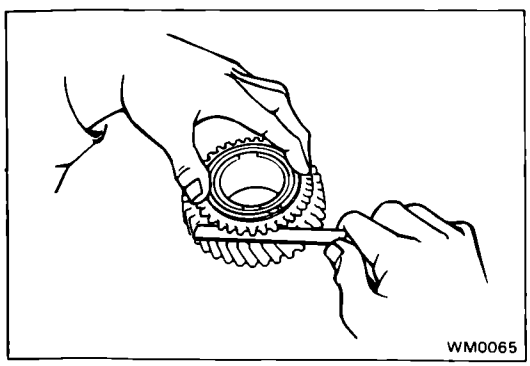
INSPECTION OF OUTPUT SHAFT COMPONENT PARTS

1. **INSPECT SYNCHRONIZER RINGS**

(a) Check for wear or damage.

(b) Turn the ring and push it in to check the braking action.

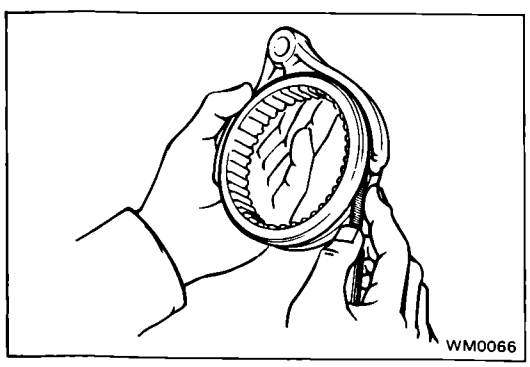




(c) Measure the clearance between the synchronizer ring back and the gear spline end.

Minimum clearance: 0.6 mm (0.024 in.)

If the clearance is less than the limit, replace the synchronizer ring.

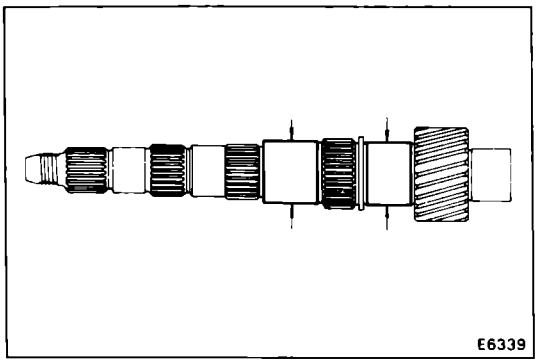


2. **MEASURE CLEARANCE OF NO.1 SHIFT FORK AND HUB SLEEVE**

Using a feeler gauge, measure the clearance between the hub sleeve and shift fork.

Maximum clearance: 1.0 mm (0.039 in.)

If the clearance exceeds the limit, replace the shift fork or hub sleeve.

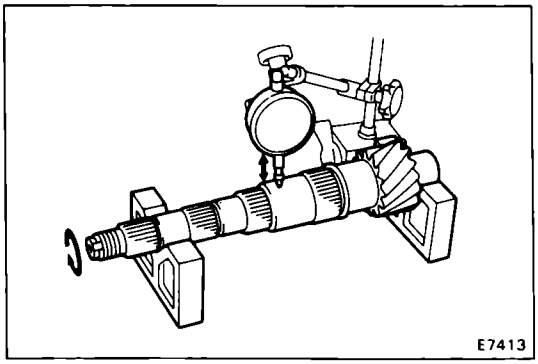

E6339

3. INSPECT OUTPUT SHAFT

(a) Check the output shaft for wear or damage.

(b) Using a micrometer, measure the outer diameter of the output shaft journal surface.

Minimum outer diameter: 38.950 mm (1.5335 in.)


E7413

(c) Using a dial indicator, check the shaft runout.

Maximum clearance: 0.060 mm (0.0024 in.)

ASSEMBLY OF OUTPUT SHAFT ASSEMBLY

(See page MT-69)

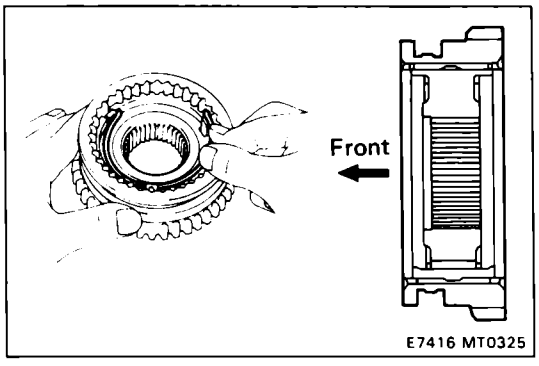
NOTE: Coat all of the sliding and rotating surface with gear oil before assembly.

1. INSERT NO.1 CLUTCH HUB INTO HUB SLEEVE

(a) Install the clutch hub and shifting keys to the hub sleeve.

(b) Install the shifting key springs under the shifting keys.

CAUTION: Install the key springs positioned so that their end gaps are not in line.



E7416 MT0325

2. INSTALL NEEDLE ROLLER BEARINGS, FIRST GEAR, SYNCHRONIZER RING AND NO.1 HUB SLEEVE TO OUTPUT SHAFT

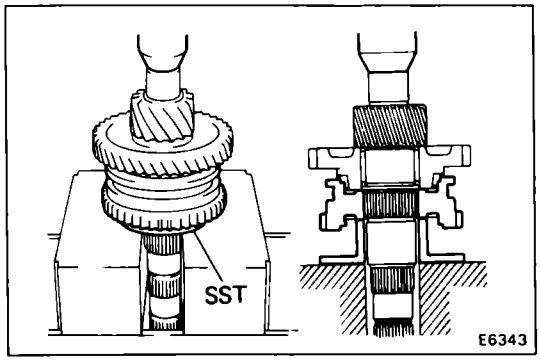
(a) Apply MP grease to the needle roller bearings.

(b) Install the 1st gear.

(c) Place the synchronizer ring (for 1st gear) on the gear and align the ring slots with the shifting keys.

(d) Using SST and a press, install the 1st gear and No.1 hub sleeve.

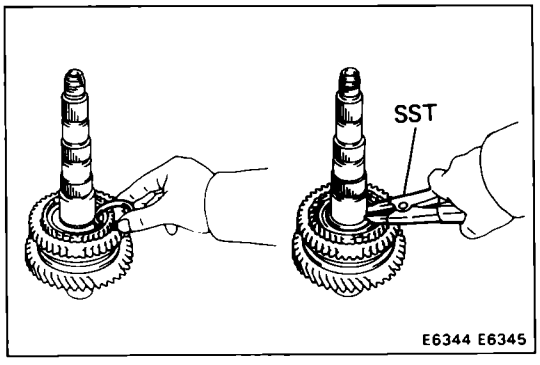
SST 09316-60010 (09316-00040)



E6343

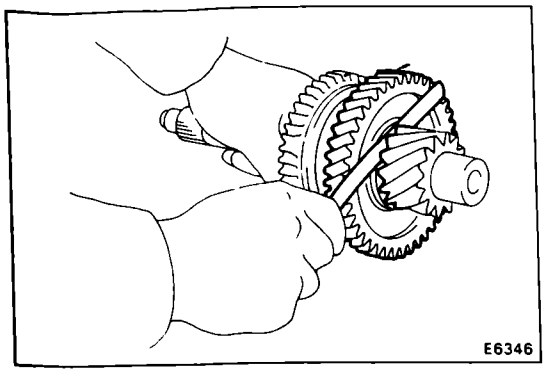
3. INSTALL SNAP RING

Select a snap ring that will allow minimum axial play and install it on the shaft.



E6344 E6345

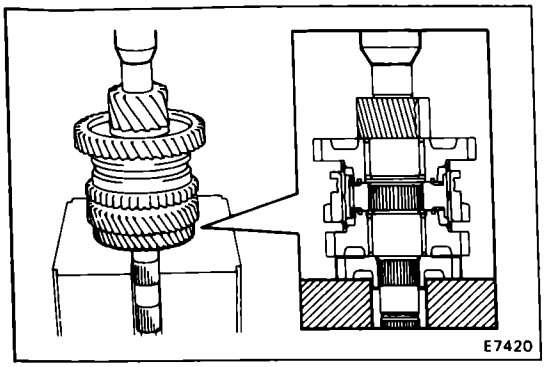
Mark	Thickness	mm (in.)
A	2.80 – 2.85	(0.1102 – 0.1122)
B	2.85 – 2.90	(0.1122 – 0.1142)
C	2.90 – 2.95	(0.1142 – 0.1161)
D	2.95 – 3.00	(0.1161 – 0.1181)
E	3.00 – 3.05	(0.1181 – 0.1201)
F	3.05 – 3.10	(0.1201 – 0.1220)
G	3.10 – 3.15	(0.1220 – 0.1240)



4. MEASURE FIRST GEAR THRUST CLEARANCE

Using a feeler gauge, measure the 1st gear thrust clearance

Standard clearance: 0.10 — 0.35 mm (0.0039 — 0.0138 in.)



5. INSTALL SPACER, NEEDLE ROLLER BEARING, SYNCHRONIZER RING, SECOND GEAR AND THIRD DRIVEN GEAR

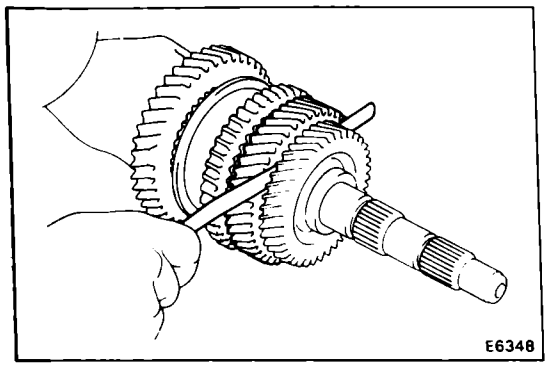
(a) Install the spacer.

(b) Apply MP grease to the needle roller bearing.

(c) Place the synchronizer ring (for 2nd gear) on the gear and align the ring slots with the shifting keys.

(d) Install the 2nd gear.

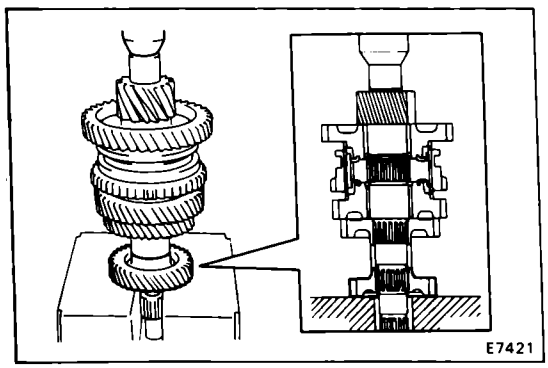
(e) Using a press, install the 3rd driven gear.



6. MEASURE SECOND GEAR THRUST CLEARANCE

Using a feeler gauge, measure the 2nd gear thrust clearance.

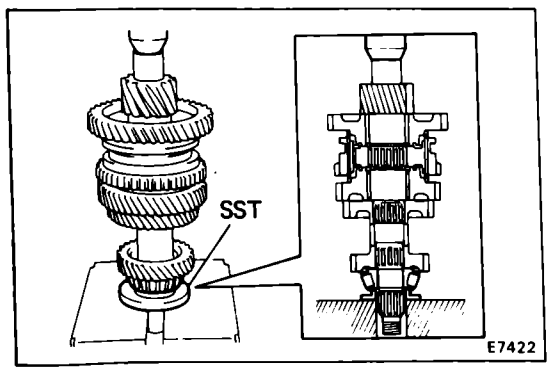
Standard clearance: 0.10 — 0.45 mm (0.0039 — 0.0177 in.)



7. INSTALL SPACER AND FOURTH DRIVEN GEAR

(a) Install the spacer.

(b) Using a press, install the 4th driven gear.

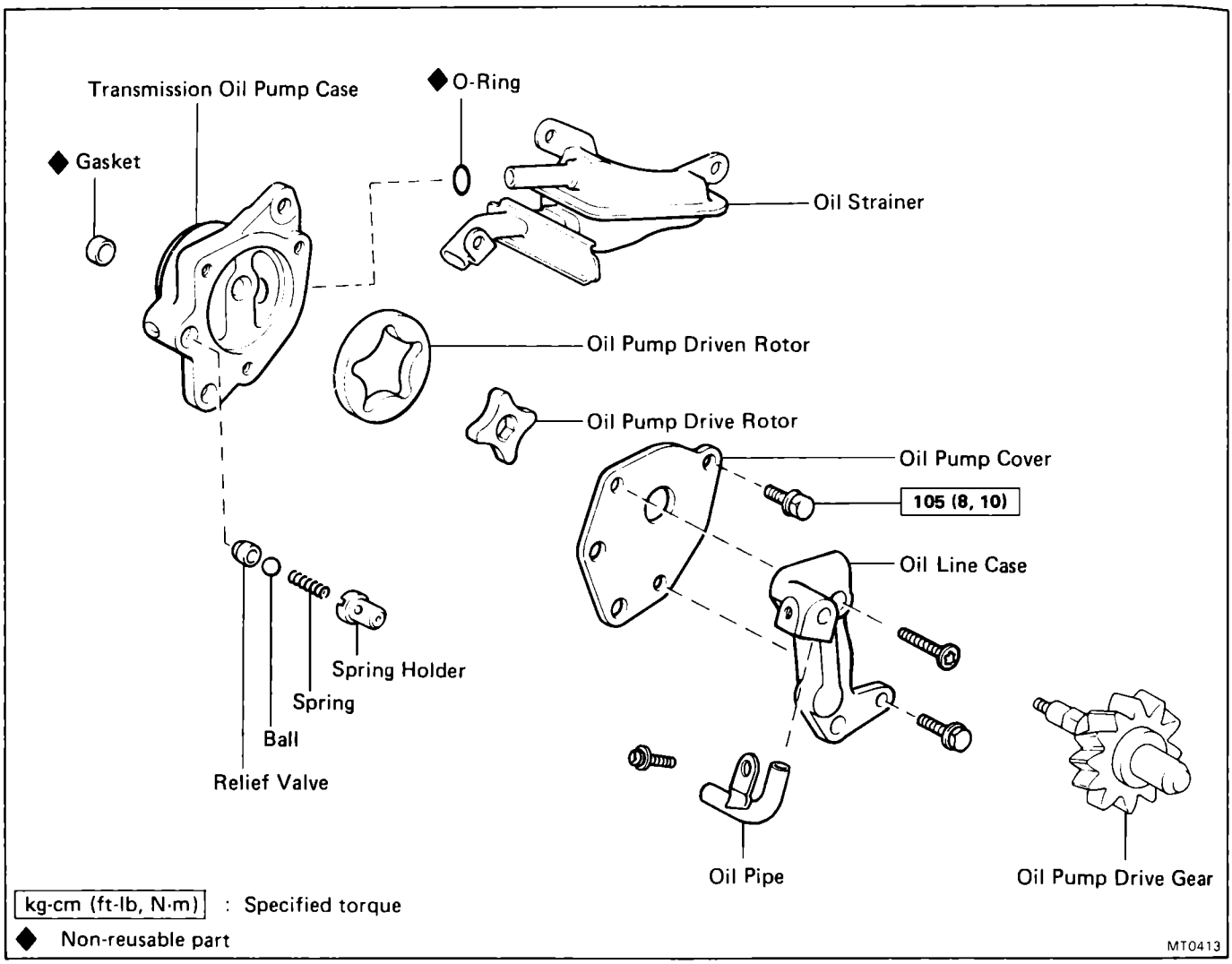


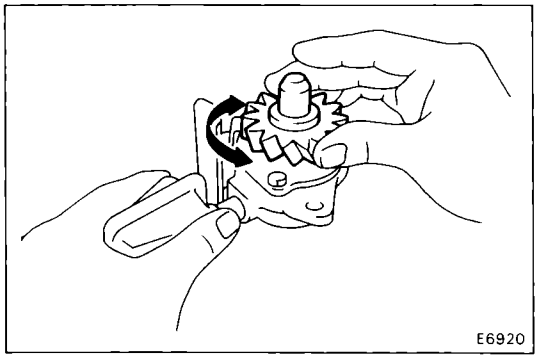
8. INSTALL OUTPUT SHAFT REAR BEARING

Using SST and a press, install the output shaft rear taper roller bearing.

SST 09506-30012

Oil Pump

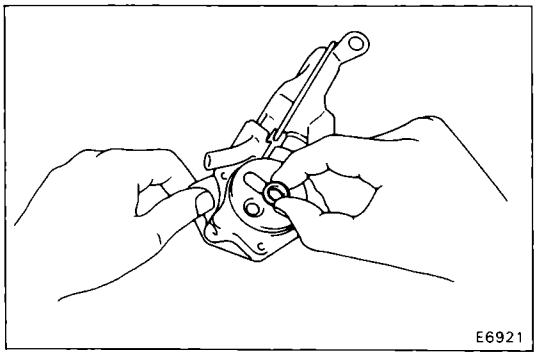




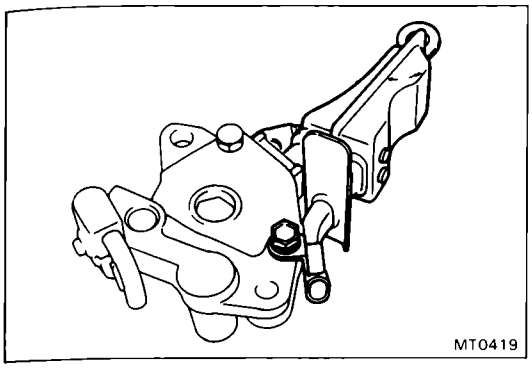
DISASSEMBLY OF OIL PUMP

1. CHECK OPERATION OF OIL PUMP

Install the oil pump drive gear to the drive rotor, check that the drive rotor turns smoothly.

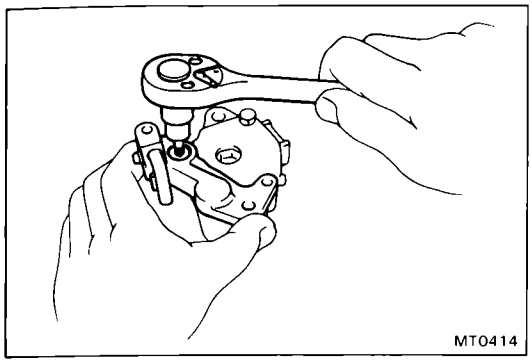


2. REMOVE GASKET FROM OIL PUMP CASE



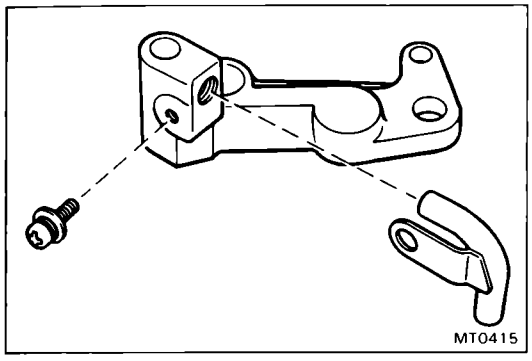
3. REMOVE OIL STRAINER

Remove the bolt and pull out the oil strainer.

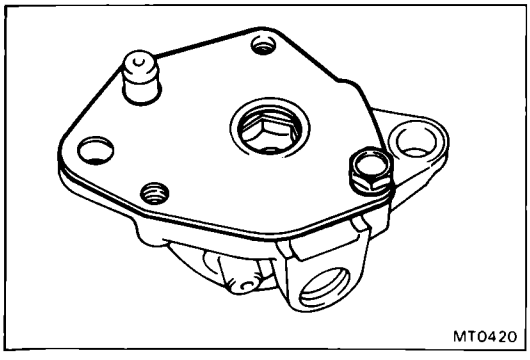


4. REMOVE OIL LINE CASE AND OIL PIPE

(a) Using a torx wrench, remove the torx screw and oil line case.

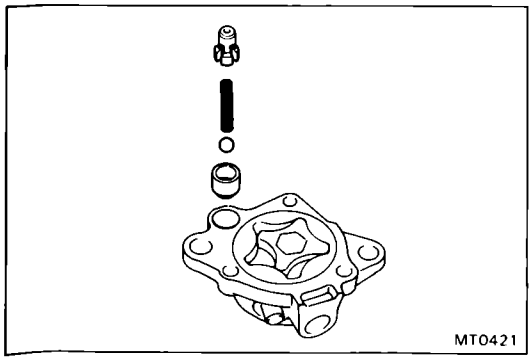


(b) Remove the No.3 oil pipe from the oil line case.

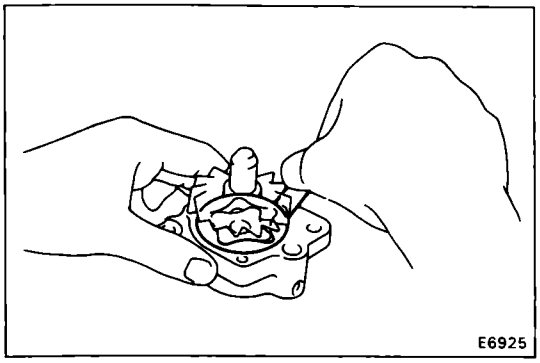


5. REMOVE OIL PUMP COVER

Remove the bolt and the oil pump cover.



6. REMOVE NO.1 RELIEF VALVE ASSEMBLY



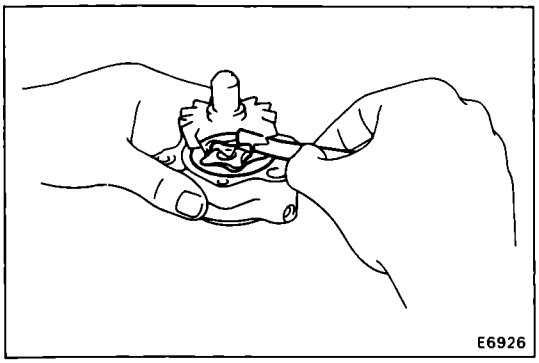
7. CHECK ROTOR BODY CLEARANCE

(a) Install the oil pump drive gear to the drive rotor.

(b) Using a feeler gauge, measure the body clearance between the driven rotor and oil pump case.

Standard clearance: 0.10 – 0.16 mm (0.0039 – 0.0063 in.)

Maximum clearance: 0.30 mm (0.0118 in.)



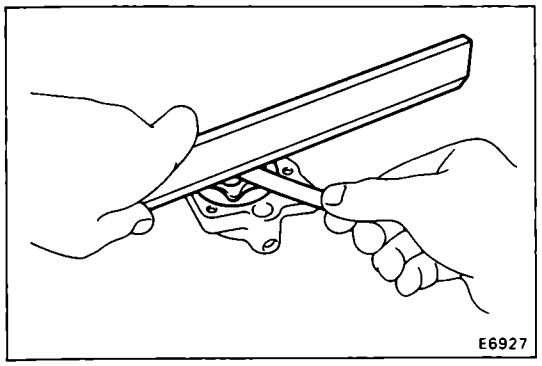
8. CHECK ROTOR TIP CLEARANCE

(a) Install the oil pump drive gear to the drive rotor.

(b) Using a feeler gauge, measure the tip clearance between the drive and driven rotors.

Standard clearance: 0.08 – 0.15 mm (0.0031 – 0.0059 in.)

Maximum clearance: 0.30 mm (0.0118 in.)

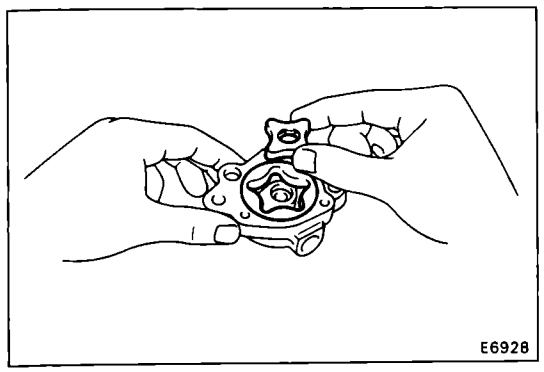


9. CHECK SIDE CLEARANCE

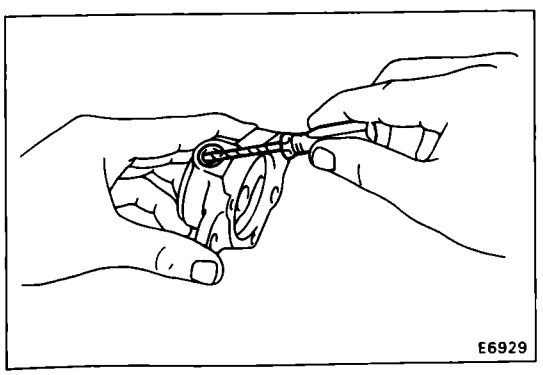
Using a precision straight edge and feeler gauge, measure the side clearance of both rotors.

Standard clearance: 0.03 – 0.08 mm (0.0012 – 0.0031 in.)

Maximum clearance: 0.15 mm (0.0059 in.)

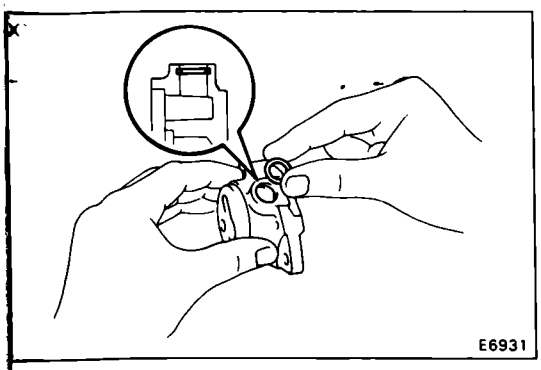


10. REMOVE OIL PUMP DRIVE ROTOR AND DRIVEN ROTOR



11. REMOVE O-RING

Using a screwdriver, remove the O-ring from the oil pump case.



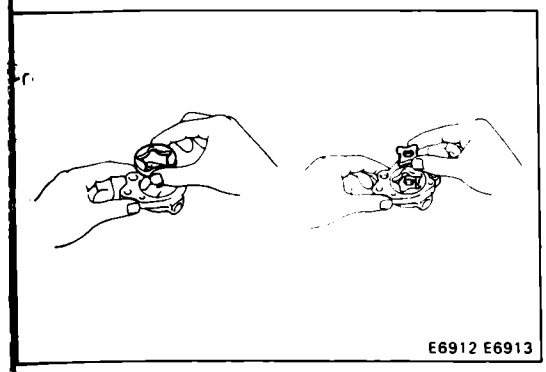
ASSEMBLY OF OIL PUMP

(See page MT-40)

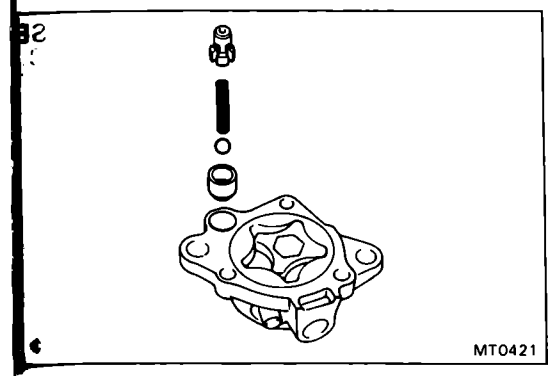
1. INSTALL NEW O-RING

(a) Apply the gear oil to a new O-ring.

(b) Install a new O-ring to the oil pump case.

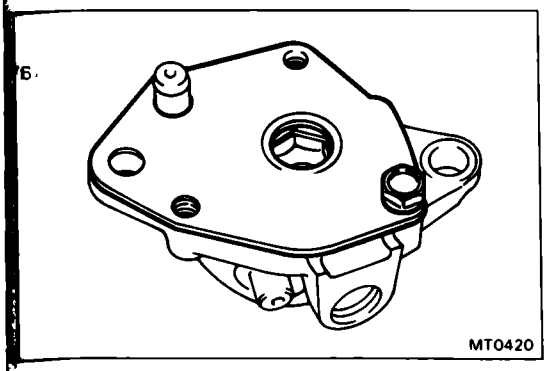


2. INSTALL DRIVEN ROTOR AND DRIVE ROTOR



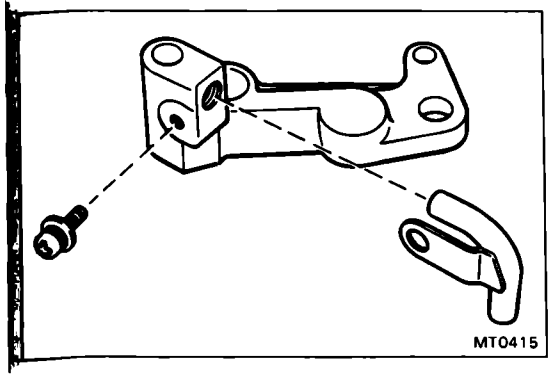
3. INSTALL NO.1 RELIEF VALVE ASSEMBLY

Install the relief valve seat, ball, spring and spring holde to the oil pump case.



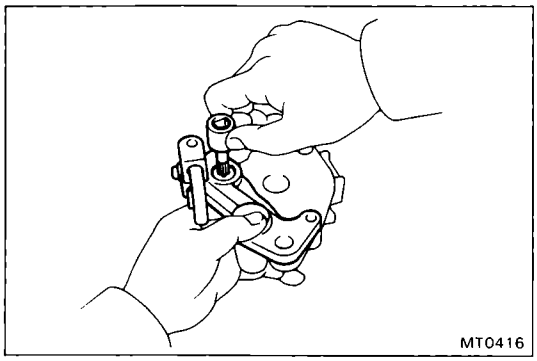
4. INSTALL OIL PUMP COVER

Temporarily install the bolt.

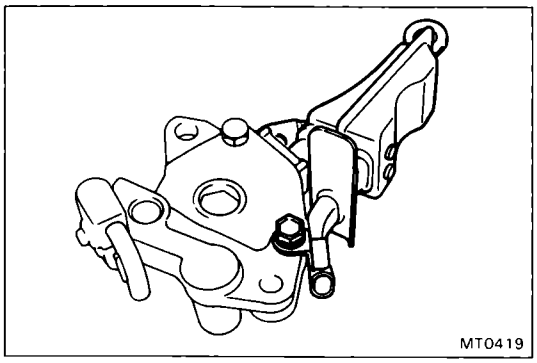


5. INSTALL OIL LINE CASE

(a) Install the No.3 oil pipe to the oil line case.

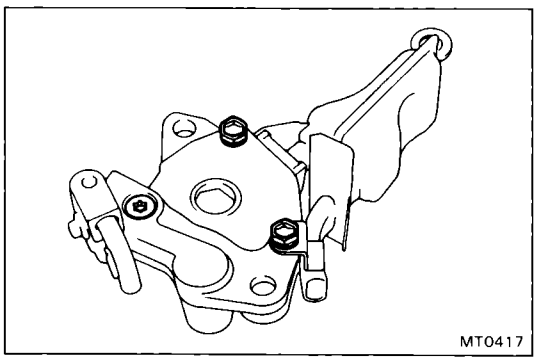


(b) Using a torx wrench, temporarily install the torx screw.



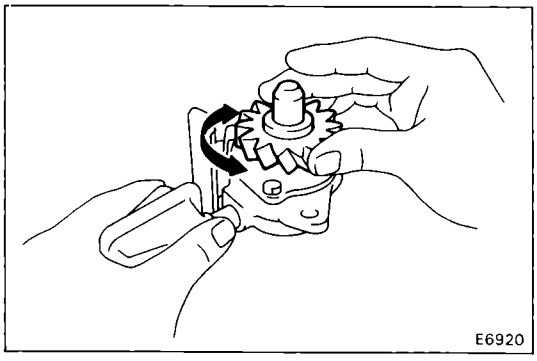
6. INSTALL OIL STRAINER

Install the oil strainer to the oil pump case, temporarily install the bolt.



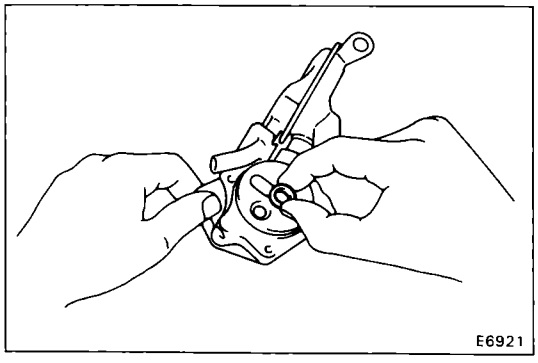
7. TORQUE OIL PUMP COVER BOLTS AND OIL LINE CASE TORX SCREW

Torque: 105 kg-cm (8 ft-lb, 10 N·m)



8. CHECK OPERATION OF OIL PUMP

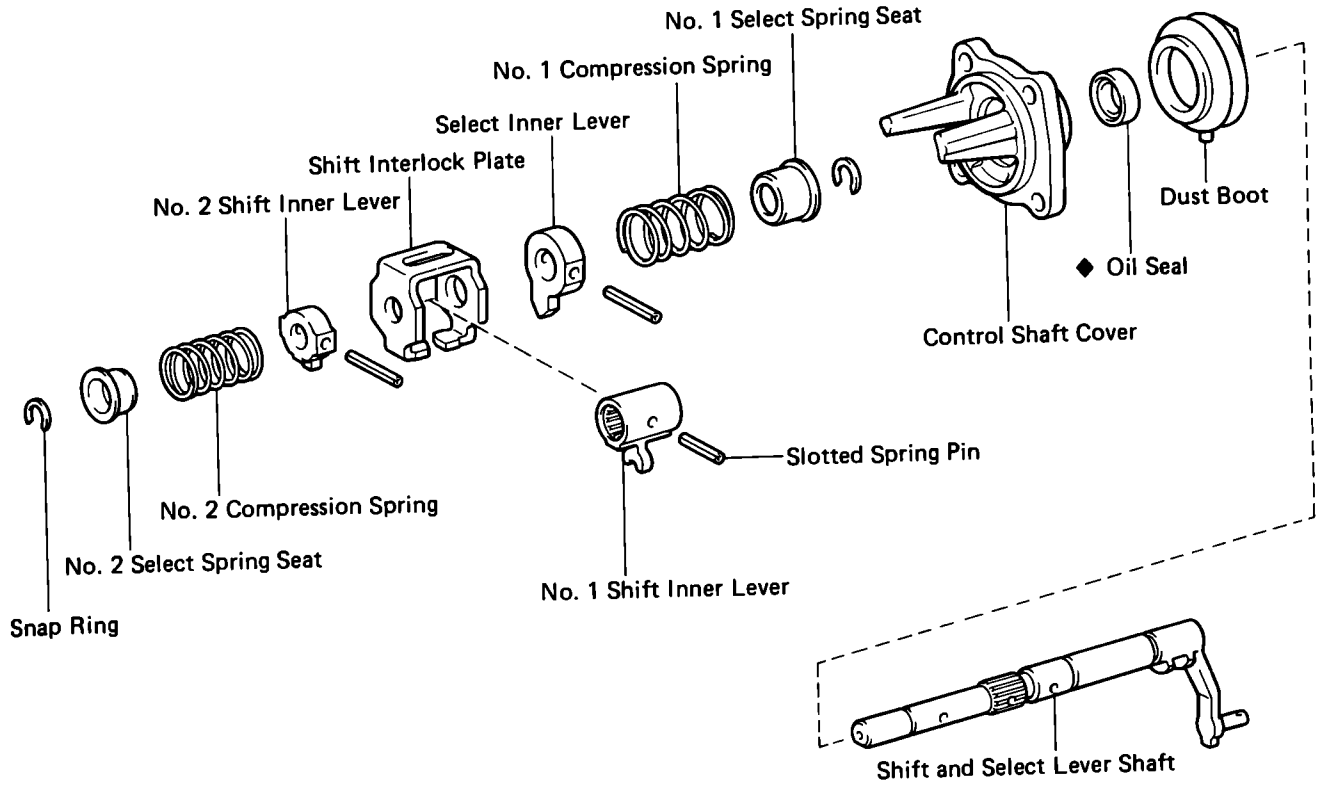
Insert the oil pump drive gear to the drive rotor, check that the drive rotor turns smoothly.



9. INSTALL GASKET

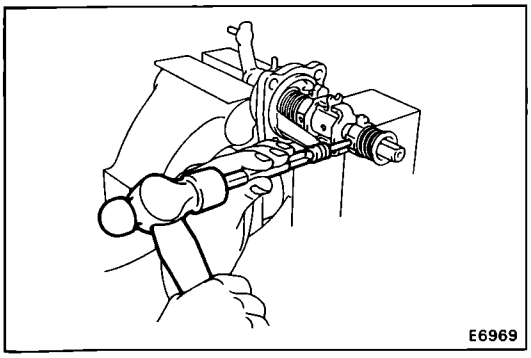
Install the new gasket to the oil pump case.

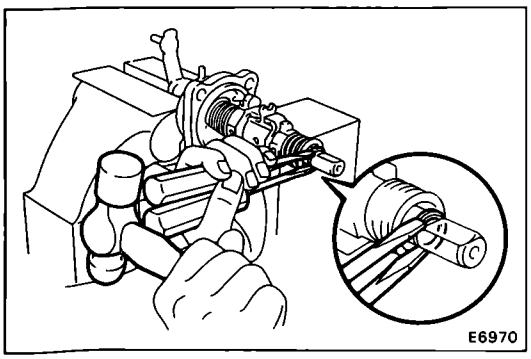
Shift and Select Lever Shaft



◆ Non-reusable part

E696E





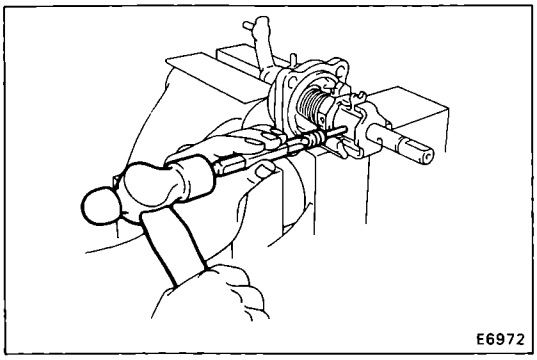
DISASSEMBLY OF SHIFT AND SELECT LEVER SHAFT

1. REMOVE NO.2 SHIFT INNER LEVER

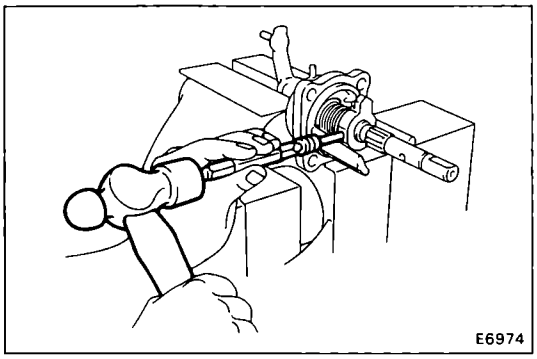
(a) Using a pin punch and a hammer, drive out the slot ted spring pin from No.2 shift inner lever.

(b) Using two screwdrivers and a hammer, remove th snap ring.

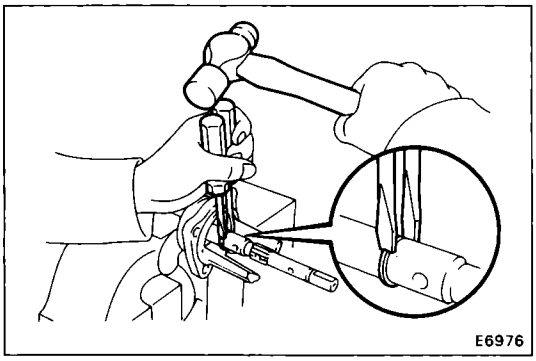
(c) Remove No.2 select spring seat, No.2 compressio spring and No.2 shift inner lever.



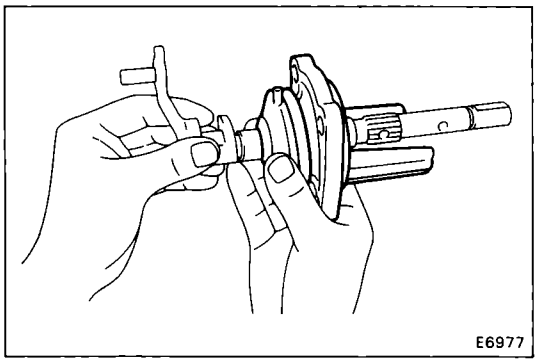
2. **REMOVE SHIFT INTERLOCK PLATE AND NO.1 SHAFT INNER LEVER**
   (a) Using a pin punch and hammer, drive out the slotted spring pin.
   (b) Remove the shift interlock plate and No.1 shift inner lever.



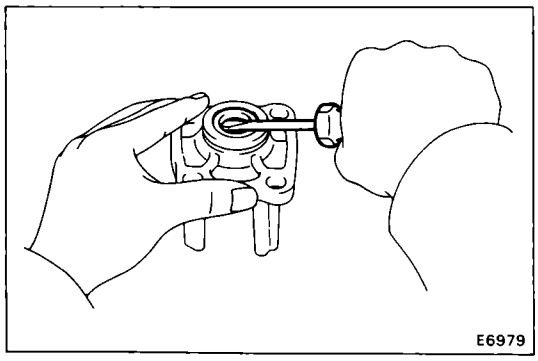
3. **REMOVE SELECT INNER LEVER**
   (a) Using a pin punch and hammer, drive out the slotted spring pin.
   (b) Remove the select inner lever, No.1 compression spring and No.1 select spring seat.



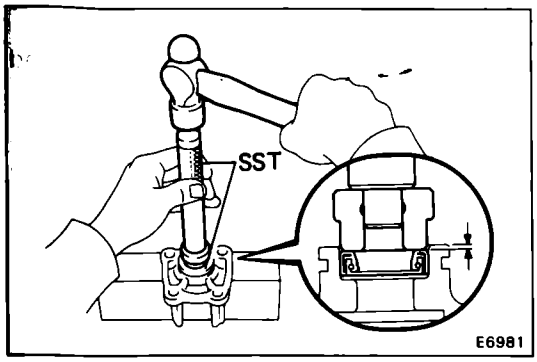
4. **REMOVE SNAP RING**
   Using two screwdrivers and a hammer, remove the snap ring.



5. **REMOVE CONTROL SHAFT COVER AND DUST BOOT**



6. **IF NECESSARY, REPLACE CONTROL SHAFT COVER OIL SEAL**
   (a) Using a screwdriver, remove oil seal.

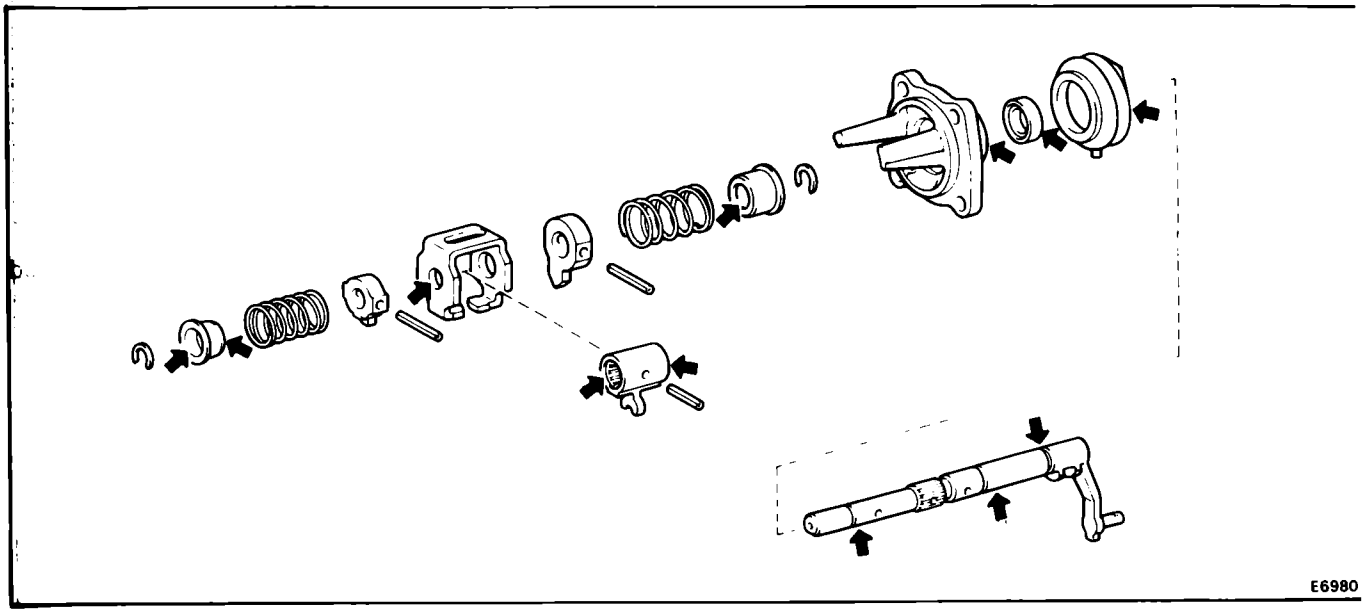


(b) Using SST and a hammer, drive in the new oil seal
SST 09620-30010 (09627-30010 and 09631-00020)
Oil seal depth: 0 — 1.0 mm (0 — 0.039 in.)

(c) Apply MP grease to the oil seal.

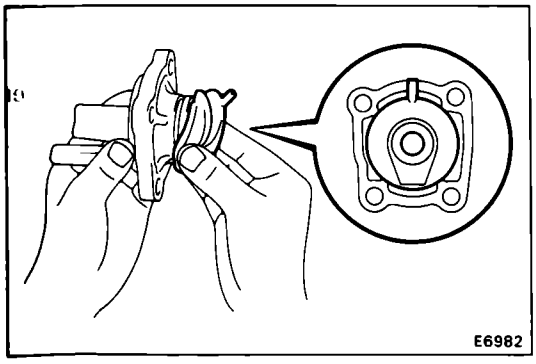
ASSEMBLY OF SHIFT AND SELECT LEVER SHAFT

1. APPLY MP GREASE TO PARTS, AS SHOWN

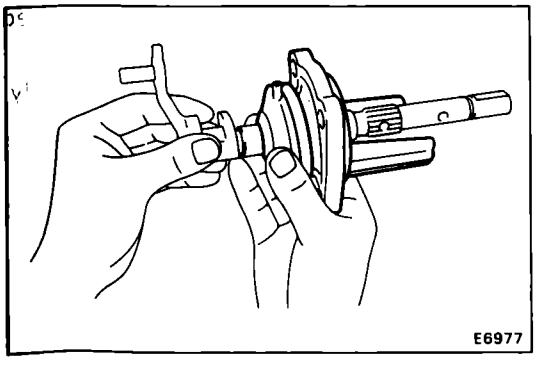


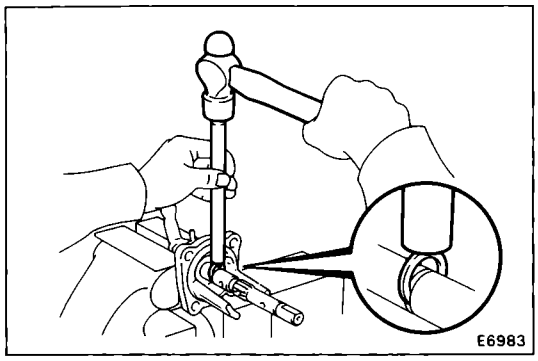
2. INSTALL SHIFT AND SELECT LEVER SHAFT

(a) Install the boot to the control shaft cover, as shown.



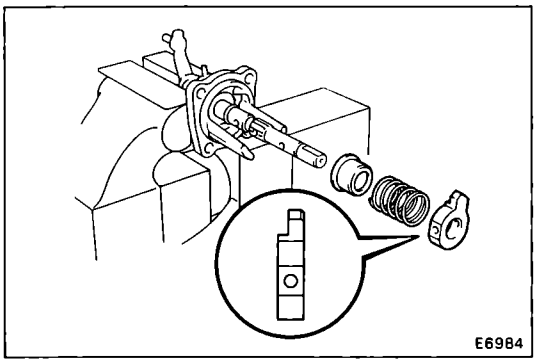
(b) Install the shift and select lever shaft to the control shaft cover.





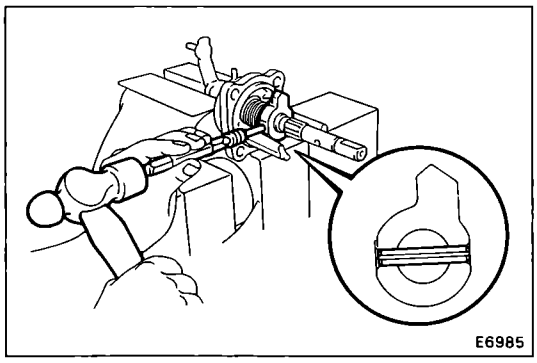
3. INSTALL SNAP RING

Using a brass bar and hammer, install the snap ring and spring seat.

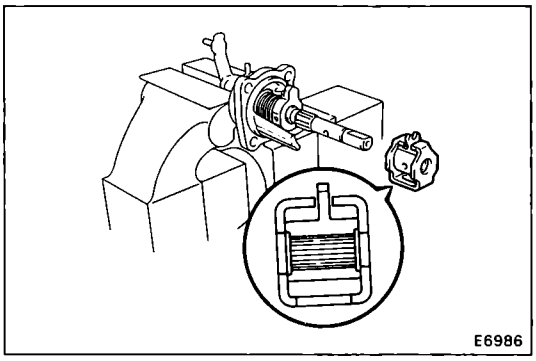


4. INSTALL SELECT INNER LEVER

(a) Install the No.1 spring seat, No.1 select spring and select inner lever, as shown.

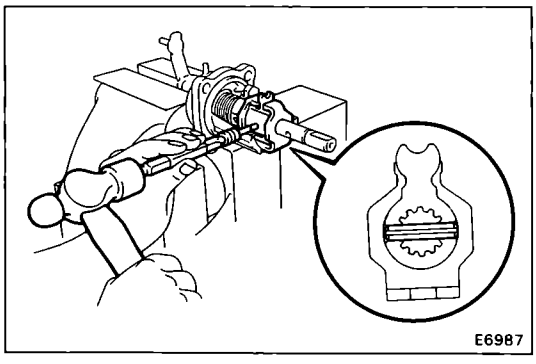


(b) Using a pin punch and hammer, drive in the slotted spring pin.



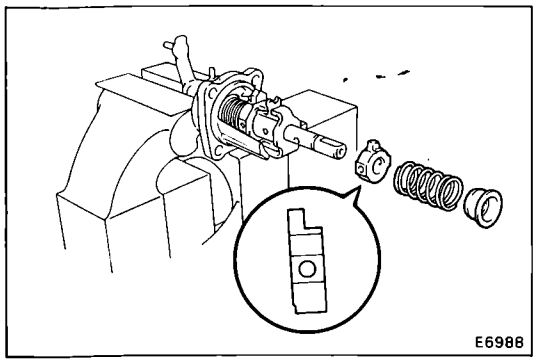
5. INSTALL SHIFT INTERLOCK PLATE AND NO.1 SHIFT INNER LEVER

(a) Install the shift interlock plate and No.1 shift inner lever.



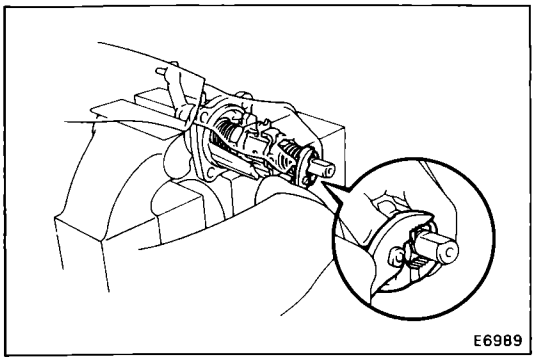
(b) Using a pin punch and hammer, drive in the slotted spring pin.

(c) Check that the shift interlock plate turns smoothly.

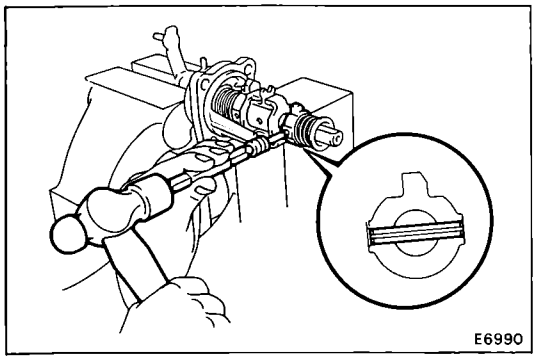


6. INSTALL NO.2 SHIFT INNER LEVER

(a) Install the No.2 shift inner lever, No.2 compressio spring and No.2 select spring seat, as shown.

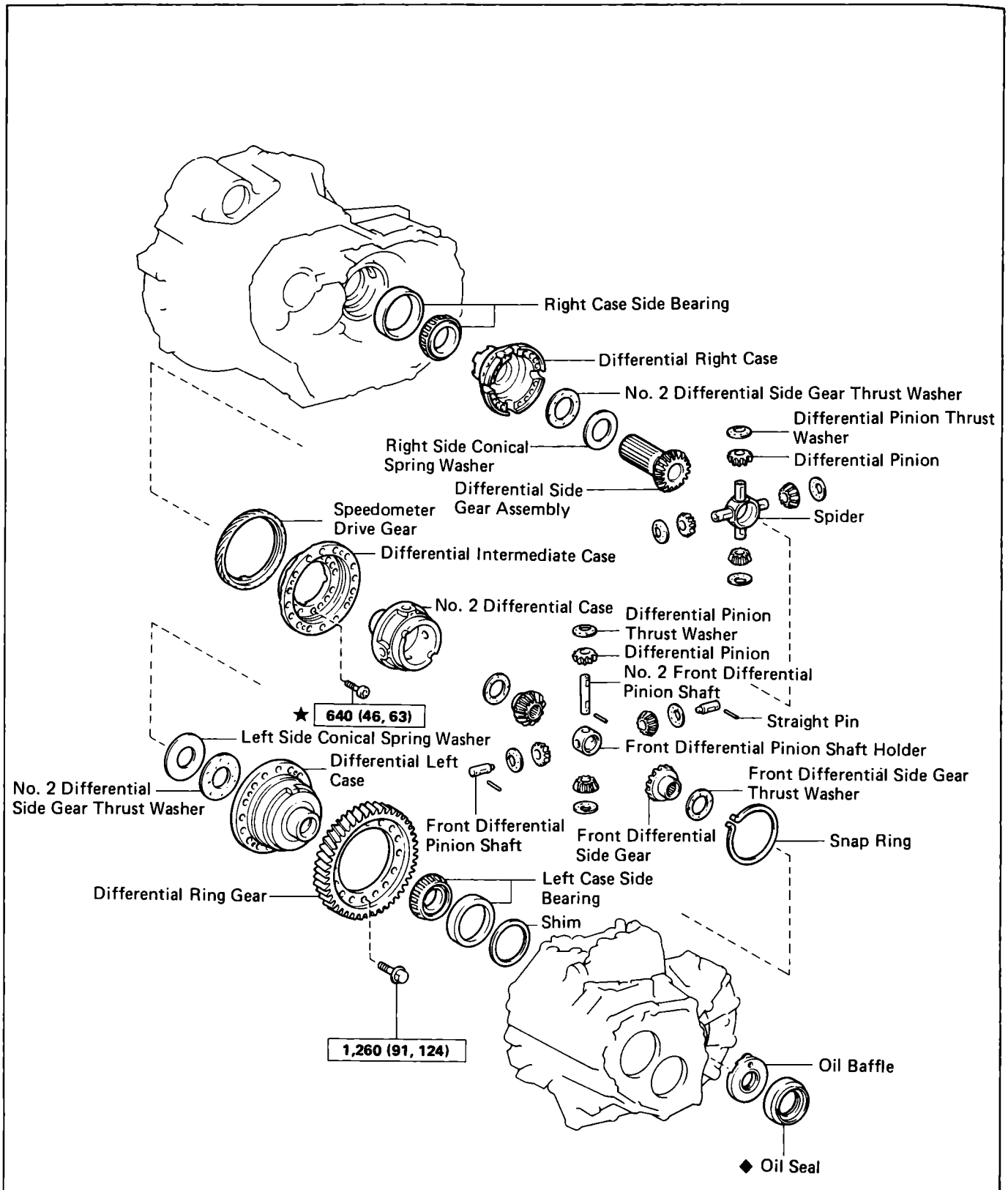


(b) Install the snap ring.



(c) Using a pin punch and hammer, drive in the slotte spring pin.

Differential Case

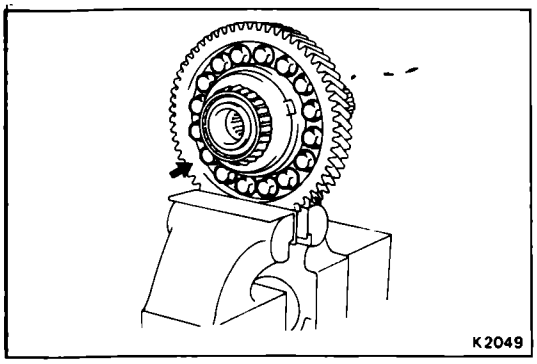


kg-cm (ft-lb, N·m) : Specified torque

◆ : Non-reusable part

★ : Precoated part

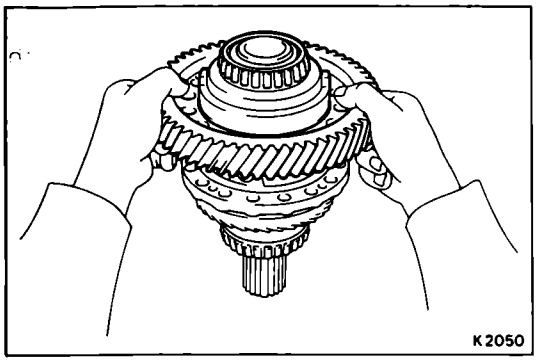
K2048



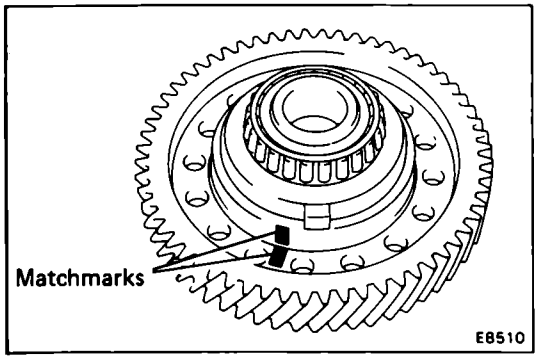
DISASSEMBLY OF DIFFERENTIAL CASE

1. REMOVE DIFFERENTIAL LEFT CASE

(a) Remove the sixteen bolts.

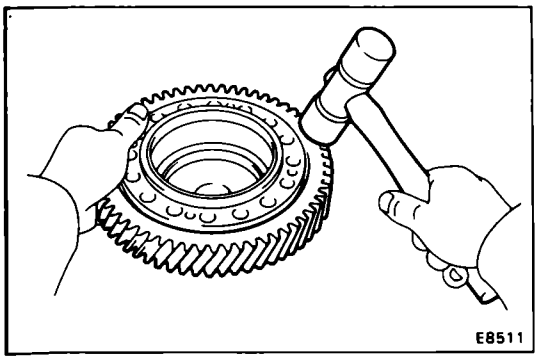


(b) Remove the differential left case up ward.

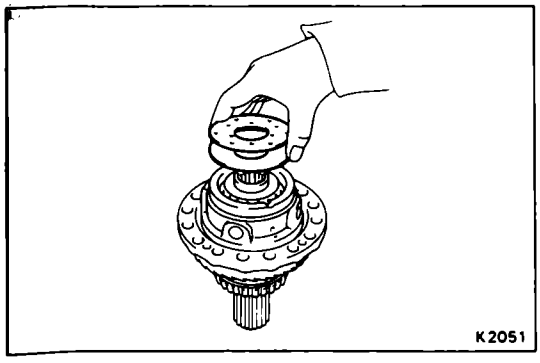


2. REMOVE RING GEAR

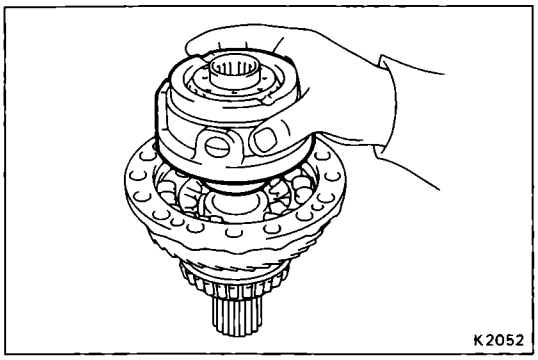
(a) Place the matchmarks on both the differential left case and ring gear.



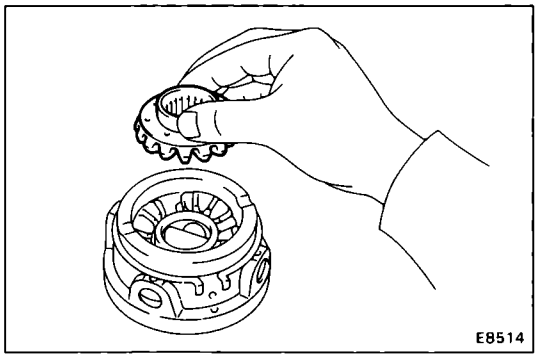
(b) Using a plastic hammer, tap out the ring gear.



3. REMOVE NO.2 DIFFERENTIAL SIDE GEAR THRUST WASHER AND CONICAL SPRING WASHER



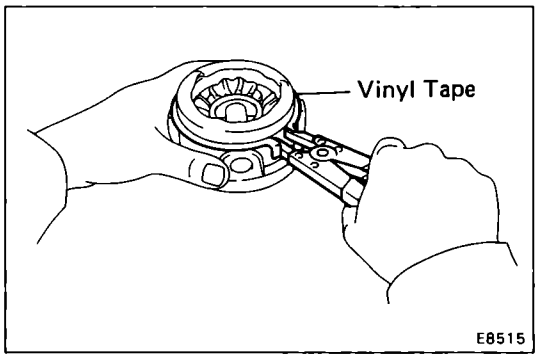
4. REMOVE DIFFERENTIAL NO.2 CASE ASSEMBLY



5. DISASSEMBLE DIFFERENTIAL NO.2 CASE

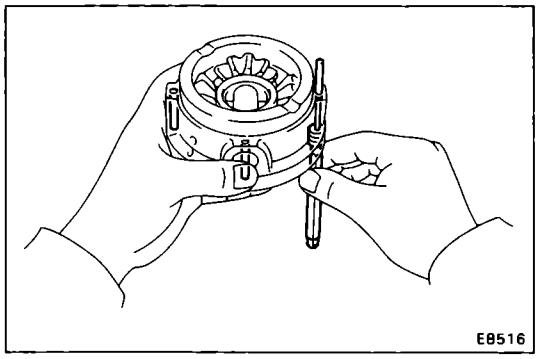
(a) Remove the front differential side gear together with thrust washer.

(b) Remove the front differential side gear thrust washer from the side gear.

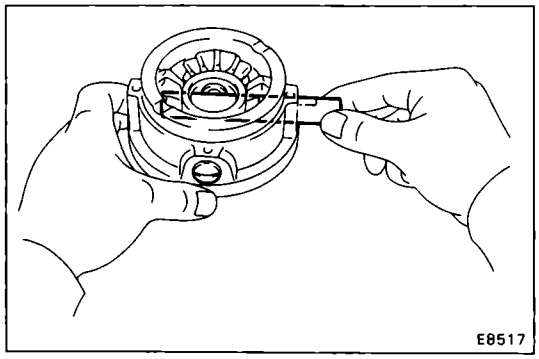


(c) Using snap ring pliers, remove the snap ring.

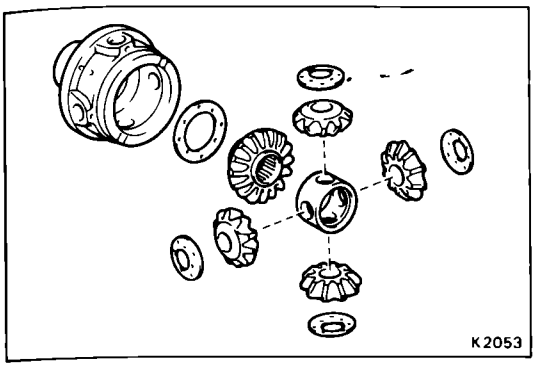
NOTE: Before removing the shaft snap ring, wrap vinyl tape around the case prevent from damege.



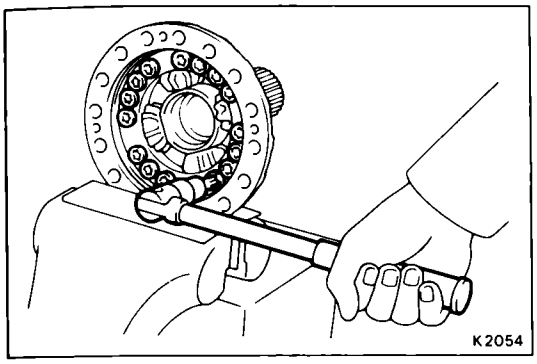
(d) Using a pin punch, push out the three straight pins.



(e) Remove the two front differential pinion shafts and No.2 front differential pinion shaft.

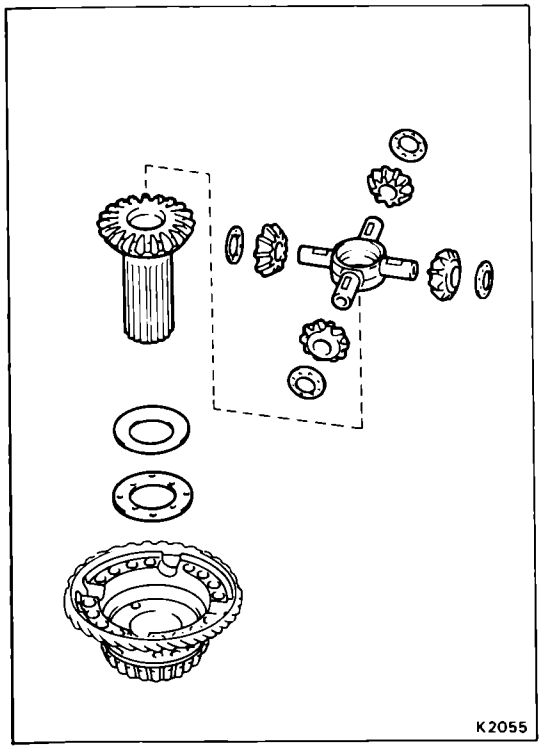


(f) Remove the pinion shaft holder, four differential pinions, pinion thrust washers, front side gear and thrust washer from the differential No.2 case.



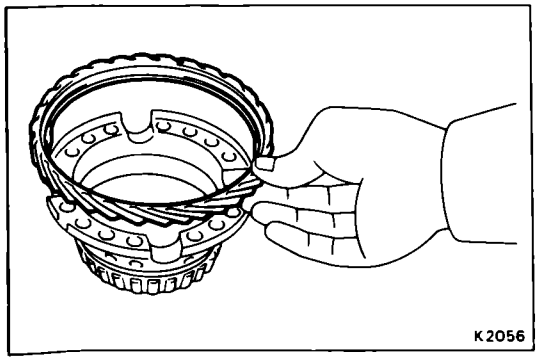
6. REMOVE DIFFERENTIAL INTERMEDIATE CASE

Using a torx wrench, remove the sixteen torx screws and differential intermediate case.

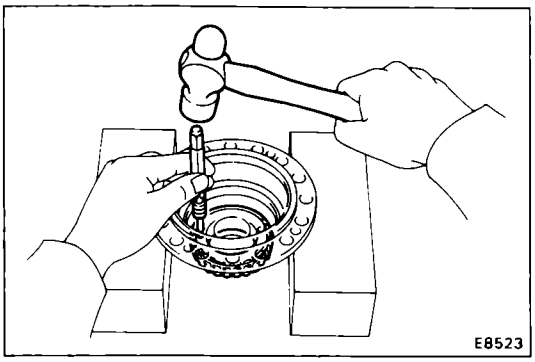


7. DISASSEMBLY DIFFERENTIAL RIGHT CASE

(a) Remove the differential spider, four pinions, pinion thrust washers, side gear subassembly, conical spring washer and No.2 side gear thrust washer.

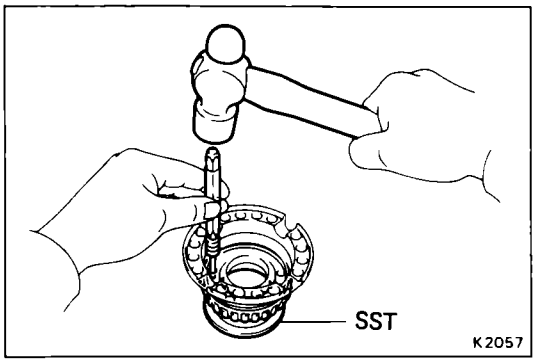


8. REMOVE SPEEDOMETER DRIVE GEAR



9. **REMOVE SIDE BEARING**

(a) Using a pin punch and hammer, drive out the side bearing evenly through two holes in the differential left case.



(b) Using a pin punch and hammer, drive out the side bearing evenly through four holes in the differential right case.

SST 09316-60010 (09316-00020)

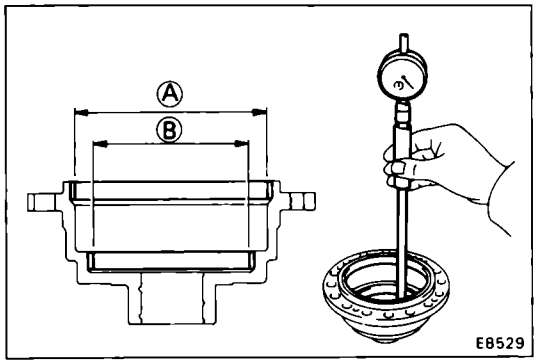
INSPECTION OF DIFFERENTIAL CASE

1. **MEASURE DIFFERENTIAL LEFT CASE**

Using a cylinder gauge, measure the inner diameter of the differential left case bushing.

Standard diameter:
A 111.000 – 111.035 mm (4.3701 – 4.3714 in.)
B 90.500 – 90.535 mm (3.5630 – 3.5644 in.)

Maximum diameter:
A 110.060 mm (4.3331 in.)
B 90.560 mm (3.5653 in.)

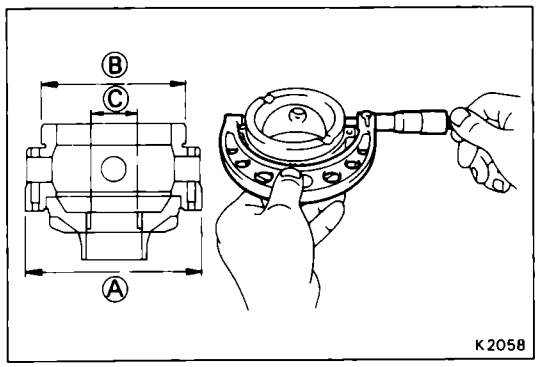


2. **MEASURE DIFFERENTIAL NO.2 CASE**

Using a micrometer, measure the outer diameter of differential No.2 case.

Standard diameter:
A 110.929 – 110.964 mm (4.3673 – 4.3686 in.)
B 90.429 – 90.464 mm (3.5606 – 3.5615 in.)
C 35.000 – 35.025 mm (1.3778 – 1.3789 in.)

Minimum diameter:
A 110.850 mm (4.3642 in.)
Minimum diameter:
B 90.350 mm (3.5571 in.)
Maximum diameter:
C 35.030 mm (1.3791 in.)

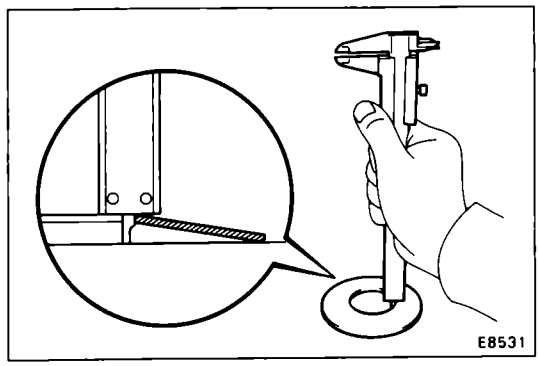


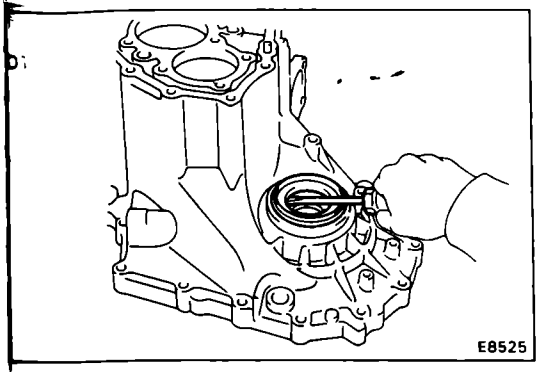
3. **MEASURE CONICAL SPRING WASHER**

Using a caliper, measure the height of the conical spring washer.

Standard height:
Left conical spring washer
2.60 – 2.80 mm (0.102 – 0.110 in.)
Right conical spring washer
1.70 – 1.90 mm (0.067 – 0.075 in.)

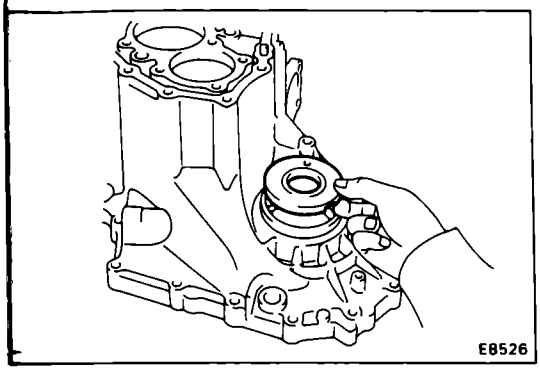
Minimum height:
Left conical spring washer
2.50 mm (0.098 in.)
Right conical spring washer
1.60 mm (0.063 in.)



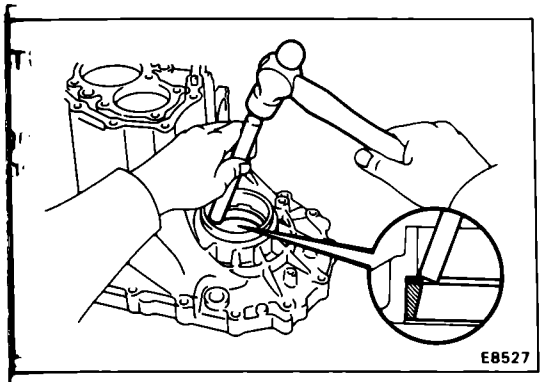


4. **(Transmission Case Side)**
IF NECESSARY, REPLACE OIL SEAL AND TAPERE ROLLER BEARING OUTER RACE

(a) Using a screwdriver, remove the oil seal.

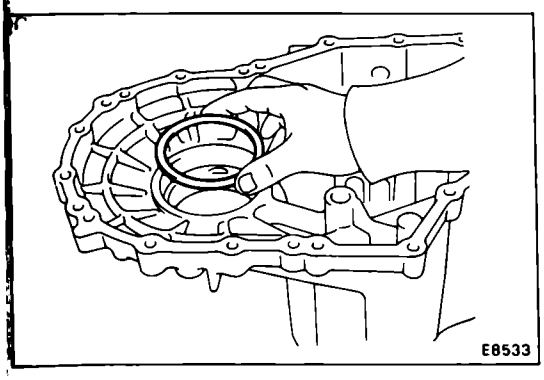


(b) Remove the transmission oil baffle.



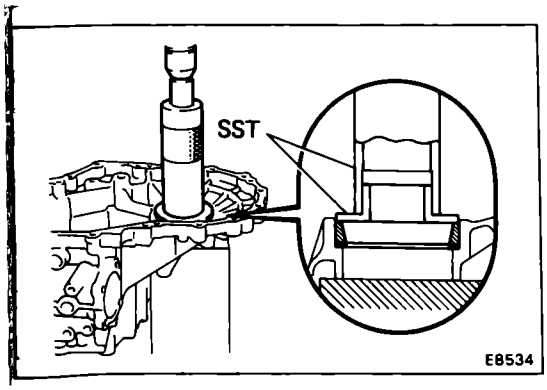
(c) Using a brass bar and hammer, drive out the bearing outer race lightly and evenly.

(d) Remove the adjust shim.



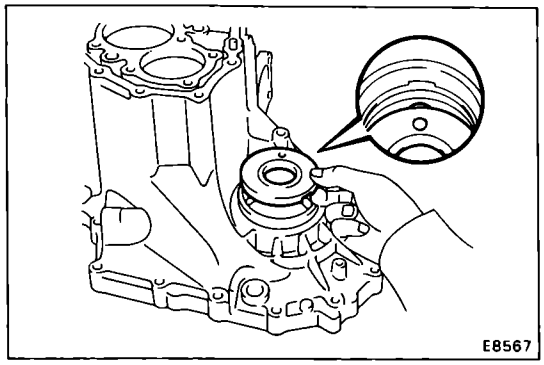
(e) Install the adjust shim.
(See page MT-124)

NOTE: First select and install a shim of lesser thickness than before.



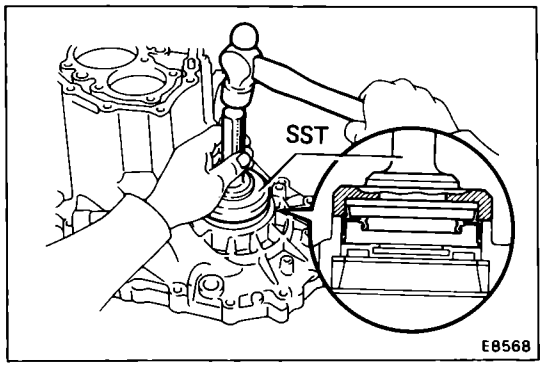
(f) Using SST and a press, install the taper roller bearing outer race.

SST 09316-60010 (09316-00010, 09316-00040)



(g) Install the transmission oil baffle.

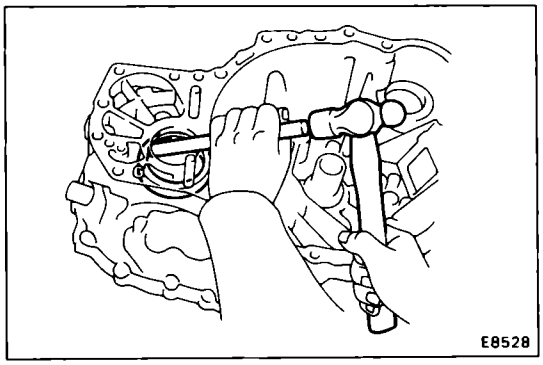
NOTE: Install the transmission oil baffle projection into the case side cutout.



(h) Using SST, drive in a new oil seal.

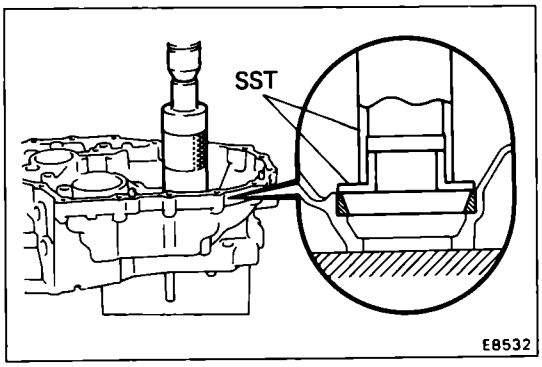
SST 09223-15010

(i) Coat the lip of the oil seal with MP grease.



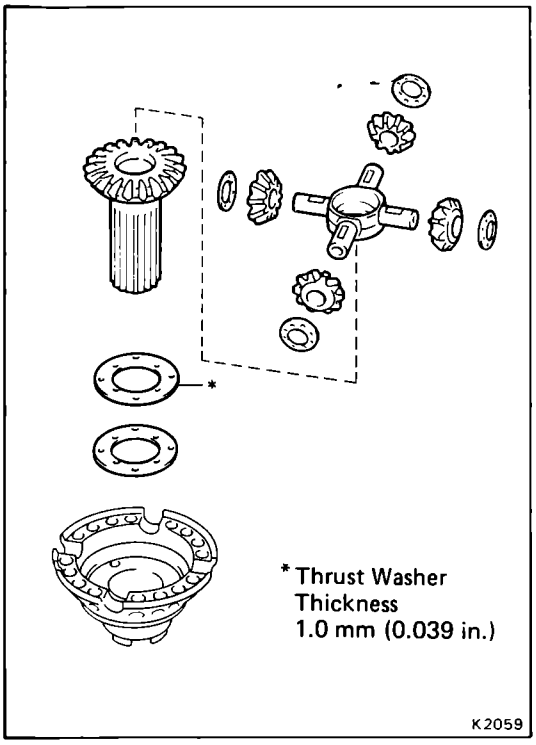
5. **(Transaxle Case Side)**
IF NECESSARY, REPLACE TAPER ROLLER BEARING OUTER RACE

(a) Using a brass bar and hammer, drive out the bearing outer race lightly and evenly through the cut-out portion on the transaxle case.



(b) Using SST and a press, install the taper roller bearing outer race.

SST 09316-60010 (09316-00010, 09316-00040)



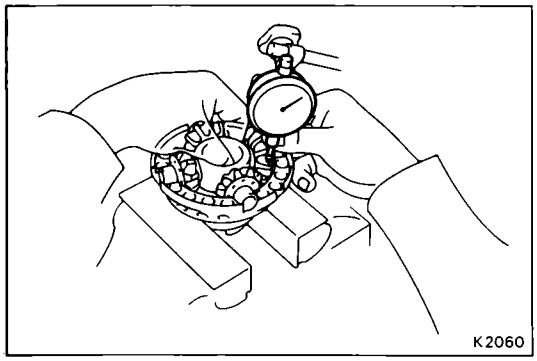
ASSEMBLY OF DIFFERENTIAL CASE

NOTE: Coat all of of the sliding surface with gear oil b
fore assembly.

1. **CHECK AND ADJUST CENTER DIFFERENTIAL SIDE GEA BACKLASH**
(Differential Side Gear Sub Assembly)

(a) Install the No.2 side gear thrust washer, (Tempora ly install) 1.0 mm (0.039 in.) size thrust washe differential side gear subassembly, spider, four pi ions and pinion thrust washers to the differential rig case.

NOTE: Thrust washer 1.0 mm (0.039 in.) size is for chec of backlash.



(b) Using a dial indicator, measure the backlash of or pinion gear while holding the differential side gear su assembly toward the case.

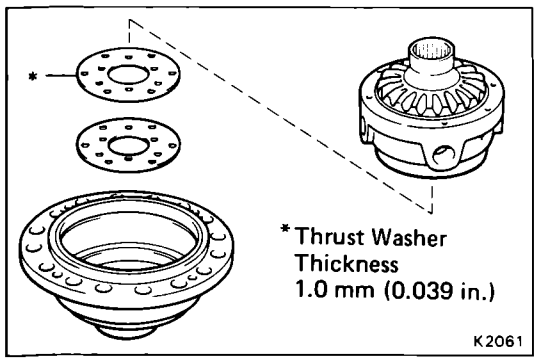
Standard clearance: 0.05 — 0.20 mm (0.0020 — 0.0079 in.)

NOTE: Push the pinion gear of the right side of th differential case.

Referring to the table below, select the No.2 thrust wash er which will ensure that the backlash is within specific tion. Try to select a washer of the same size.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
—	0.80 (0.0315)	—	1.15 (0.0453)
—	0.85 (0.0335)	—	1.20 (0.0472)
—	0.90 (0.0354)	—	1.25(0.0492)
—	0.95 (0.0374)	—	1.30(0.0512)
—	1.00 (0.0394)	—	1.35(0.0531)
—	1.05 (0.0413)	—	1.40(0.0551)
—	1.10 (0.0433)		

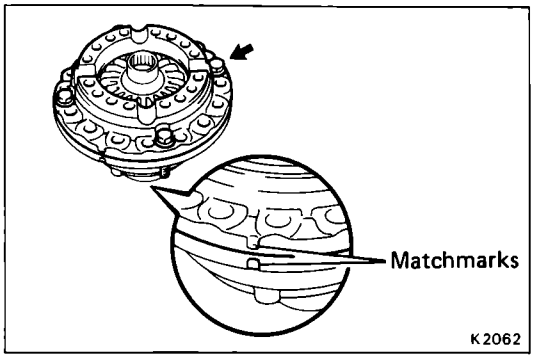
(c) Remove the differential right case.



(No.2 Differential Case)

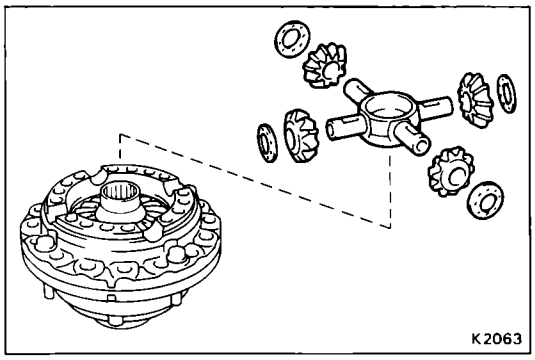
(a) Install the No.2 side gear thrust washer, (Tempora ly install) 1.0 mm (0.039 in.) size thrust washer ar differential No.2 case to the differential left case.

NOTE: Thrust washer 1.0 mm (0.039 in.) size is for chec of backlash.

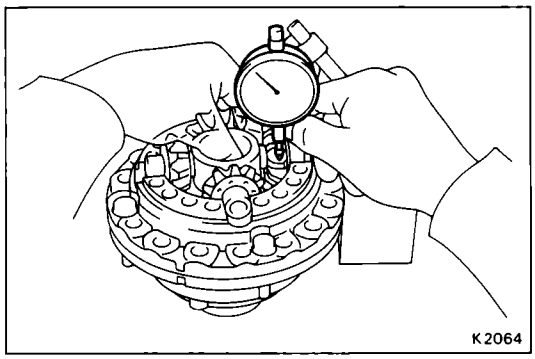


(b) Using four transmission case cover bolts, install the differential intermediate case to the left case.

NOTE: Align the matchmarks on the differential left case and connect the intermediate case.



(c) Install the differential spider, four pinions and pinion thrust washers to the differential intermediate case.



(d) Using a dial indicator, measure the backlash of one pinion gear while holding the No.2 differential case.

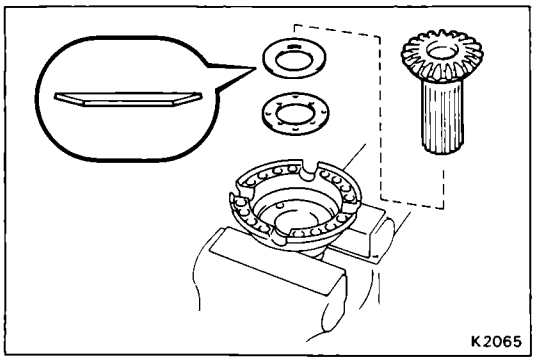
Standard backlash: 0.05 — 0.20 mm (0.0020 — 0.0079 in.)

NOTE: Push the pinion gear of the differential intermediate case.

Referring to the table below, select the thrust washer which will ensure that the backlash is within specification. Try to select a washer of the same size.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
—	0.80 (0.0315)	—	1.15 (0.0453)
—	0.85 (0.0335)	—	1.20 (0.0472)
—	0.90 (0.0354)	—	1.25 (0.0492)
—	0.95 (0.0374)	—	1.30 (0.0512)
—	1.00 (0.0394)	—	1.35 (0.0531)
—	1.05 (0.0413)	—	1.40 (0.0551)
—	1.10 (0.0433)		

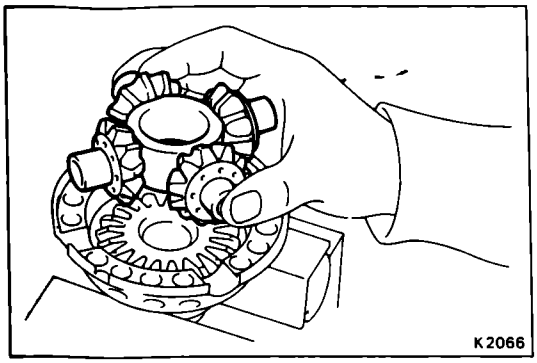
(e) Remove the differential left case.



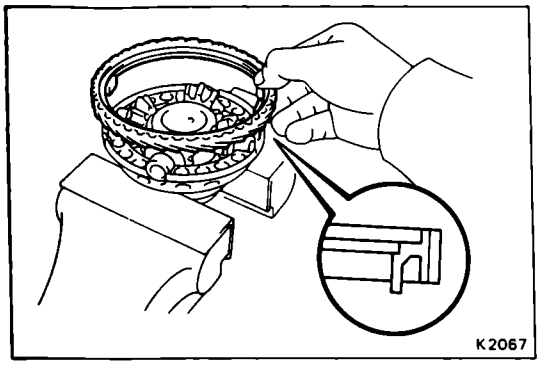
5. ASSEMBLY DIFFERENTIAL RIGHT CASE

(a) Install the No.2 side gear thrust washer (previously selected), conical spring washer and differential side gear subassembly to the right case.

NOTE: Be careful not to mistake the direction of conical spring washer.

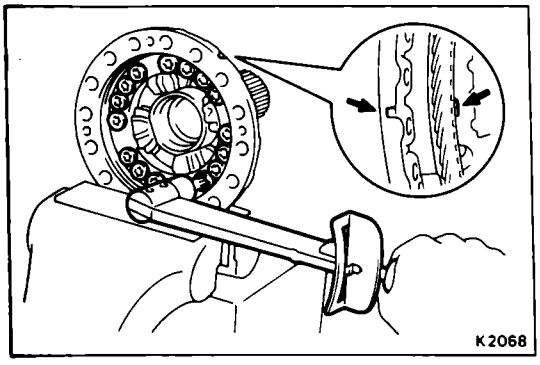


(b) Install the differential spider, four pinion and pinion thrust washers to the differential right case.



6. INSTALL SPEEDOMETER DRIVE GEAR

Install the speedometer drive gear to the differential right case.

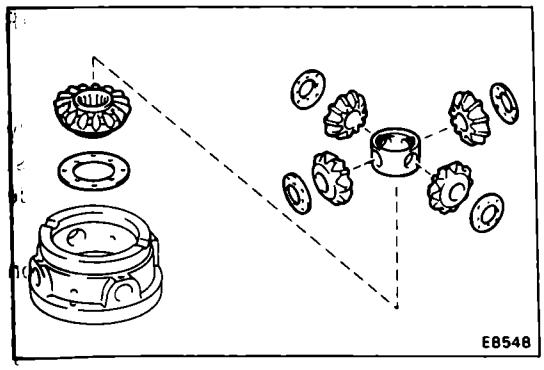


7. INSTALL DIFFERENTIAL INTERMEDIATE CASE

(a) Align the matchmarks on the right case and connect the intermediate case.

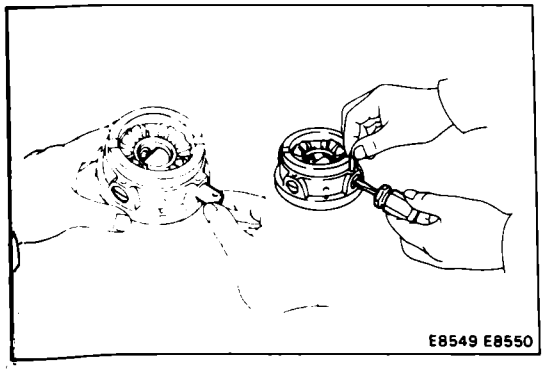
(b) Install the sixteen torx screws. Using a torx wrench, tighten the screws uniformly and a little at a time in succession. Torque the screws.

Torque: 640 kg-cm (46 ft-lb, 63 N·m)



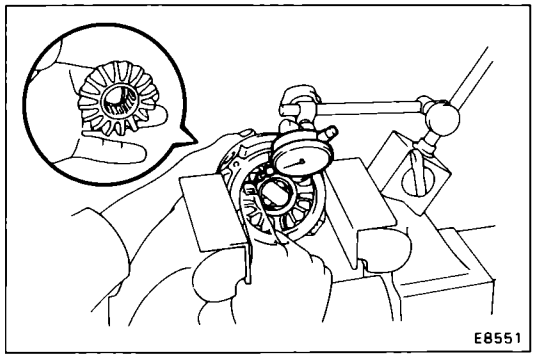
8. CHECK AND ADJUST FRONT SIDE GEAR BACKLASH (Differential No.2 Case)

(a) Install the front differential side gear thrust washer, side gear, pinion shaft holder, four pinions and thrust washers.



(b) Fit No.2 case pin hole and pinion shaft pin hole, install the No.2 pinion shaft and two pinion shafts to the No.2 case.

(c) Install the three straight pins.



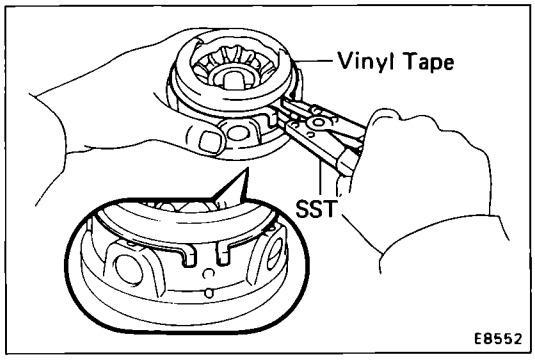
(d) Using a dial indicator, measure the backlash of one pinion gear while holding the front differential side gear toward the case.

Standard backlash: 0.05 — 0.20 mm (0.0020 — 0.0079 in.)

NOTE: Do not mount the surface of No.2 differential case which contacts with bushing in a vise.

Referring to the table below, select the thrust washer which will ensure that the backlash is within specification. Try to select a washer of the same size.

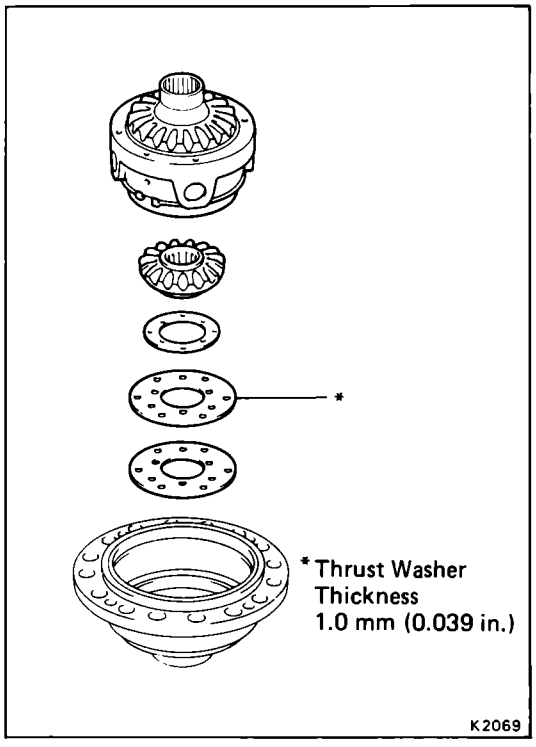
Mark	Thickness	mm (in.)
B	1.00	(0.0394)
C	1.05	(0.0413)
D	1.10	(0.0433)
E	1.15	(0.0453)
F	1.20	(0.0472)
G	1.25	(0.0492)



9. INSTALL SNAP RING

Using snap ring pliers, install the shaft snap ring toward as shown.

NOTE: Before installing the shaft snap ring, wrap vinyl tape around the case prevent from damege.

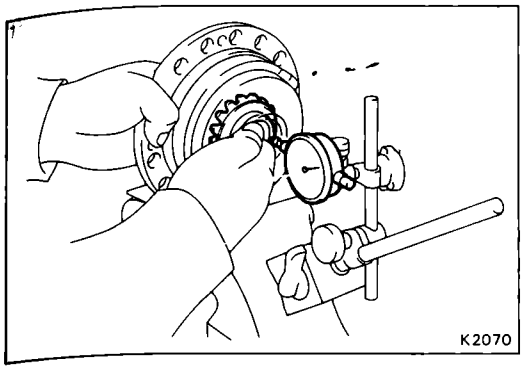


10. CHECK AND ADJUST FRONT DIFFERENTIAL SIDE GEAR THRUST CLEARANCE

(Differential Left Case)

(a) Install the No.2 side gear thrust washer, (temporarily install) 1.0 mm (0.039 in.) size No.2 side gear thrust washer, front differential side gear thrust washer, side gear and No.2 case assembly.

NOTE: Engage the front differential side gear and pinion gear of No.2 case.


K2070

(b) Using a dial indicator, measure the thrust clearan of front differential side gear while holding the Nc case on the left side.

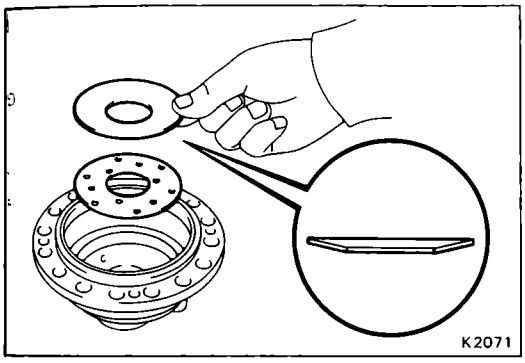
Standard clearance: 0.14 — 0.21 mm (0.006 — 0.008 in.)

NOTE: Turning the side gear a bit, check the maximu value of thrust clearance.

Referring to the table below, select the thrust washer whi will ensure that the thrust clearance within specificatio Try to select a washer of the same size.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
A	0.95 (0.0374)	F	1.20 (0.0472)
B	1.00 (0.0394)	G	1.25 (0.0492)
C	1.05 (0.0413)	H	1.30 (0.0512)
D	1.10 (0.0433)	J	1.35 (0.0531)
E	1.15 (0.0453)	K	1.40 (0.0551)

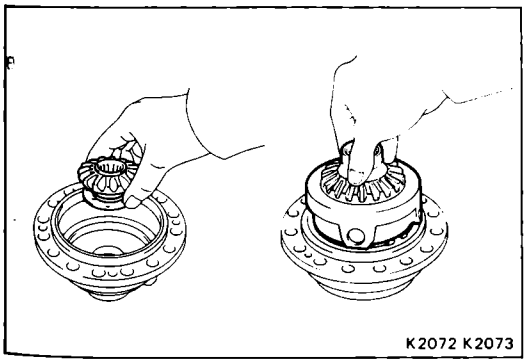
(c) Remove the differential left case.


K2071

11. ASSEMBLY DIFFERENTIAL LEFT CASE

(a) Install the No.2 side gear thrust washer (previousl selected) and conical spring washer to the left case

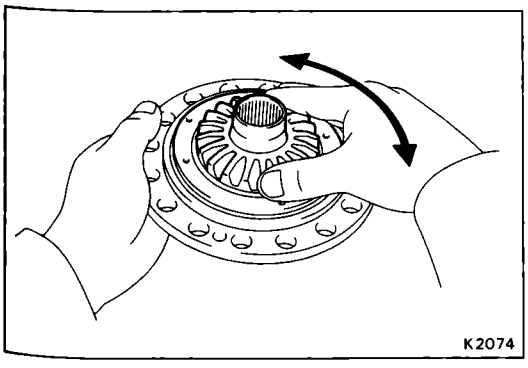
NOTE: Be careful not to mistake the direction of conic spring washer.


K2072 K2073

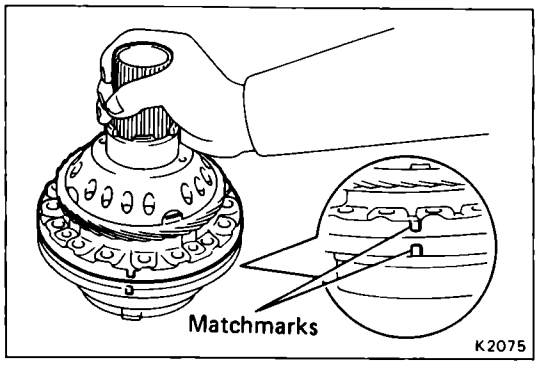
(b) Install the front differential side gear thrust washe and side gear to the left case.

(c) Install the differential No.2 case assembly.

NOTE: Engage the front differential side gear and pinior gear of No.2 case.

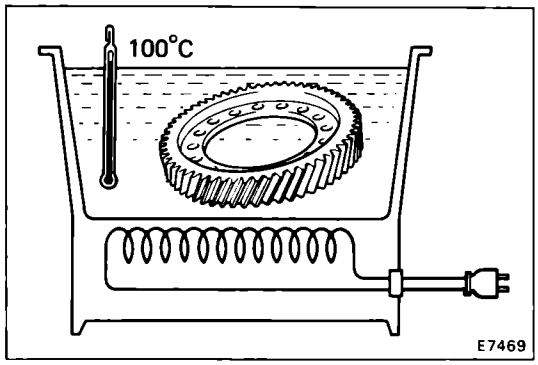

K2074

(d) Turning the differential No.2 case, check the turns smoothly.



(e) Install the intermediate case to the differential left case.

NOTE: Align the matchmarks on the differential left case and connect the intermediate case.



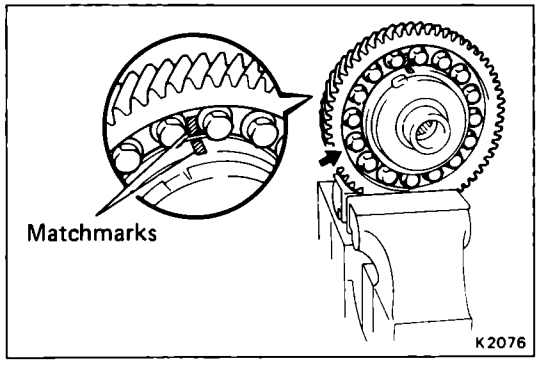
12. INSTALL RING GEAR

(a) Clean the contact surface of the differential left case.

(b) Heat the ring gear to about 100°C (212°F) in an oil bath.

CAUTION: Do not heat the ring gear above 110°C (230°F)

(c) Clean the contact surface of the ring gear with cleaning solvent.

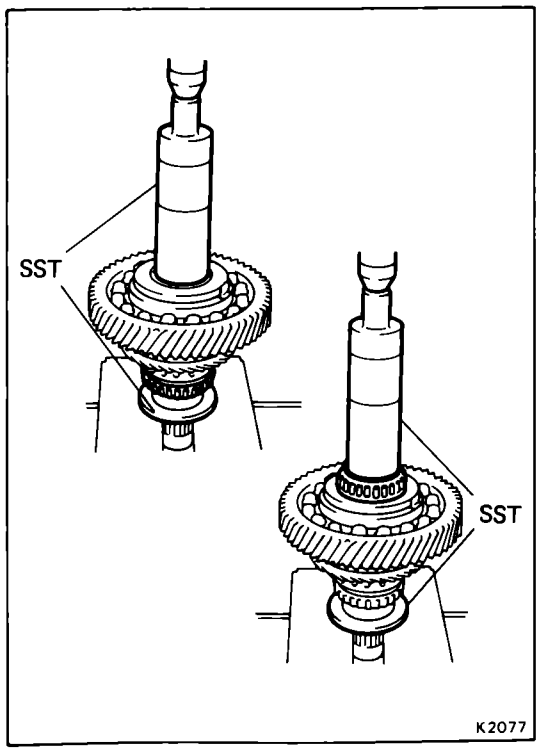


(d) Then quickly install the ring gear on the differential case.

NOTE: Align the matchmarks on the differential left case and connect the ring gear.

(e) Install the sixteen set bolts. Tighten the set bolts uniformly and a little at a time in succession. Torque the bolts.

Torque: 1260 kg-cm (91 ft-lb, 124 N·m)

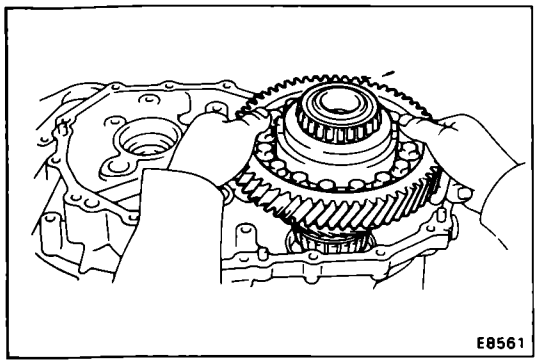


13. INSTALL SIDE BEARING

Using SST and a press, install the side bearing to the differential case.

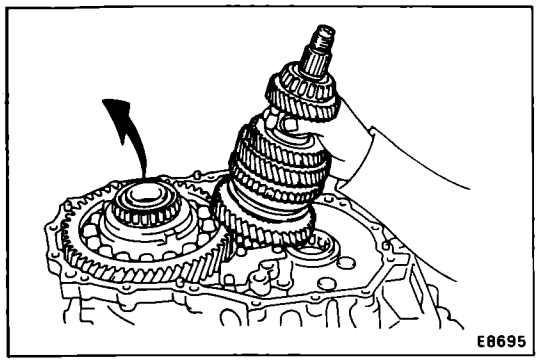
SST 09316-20011 and 09316-60010 (09316-00010)

14. ADJUST OUTPUT SHAFT PRELOAD
(See page MT-124)



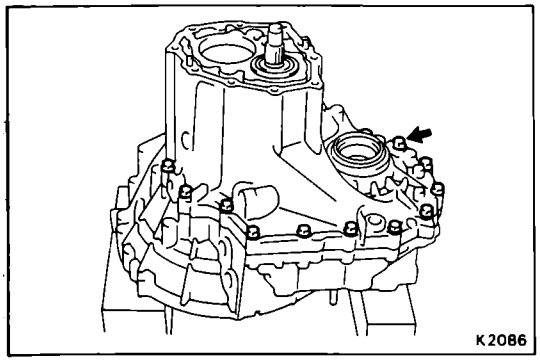
15. INSTALL DIFFERENTIAL CASE ASSEMBLY

Install the differential case assembly to the transaxle cas



16. INSTALL OUTPUT SHAFT ASSEMBLY

Lift up the differential case, install the output shaft a sembly.



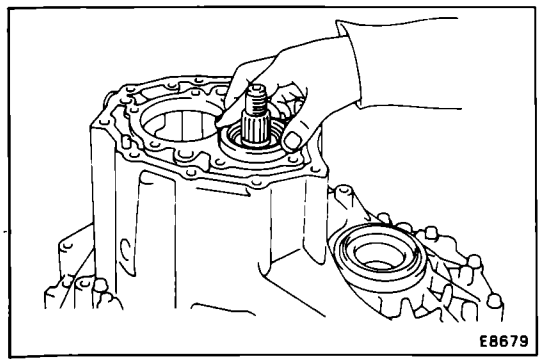
17. INSTALL TRANSMISSION CASE

(a) Install the transmission case.

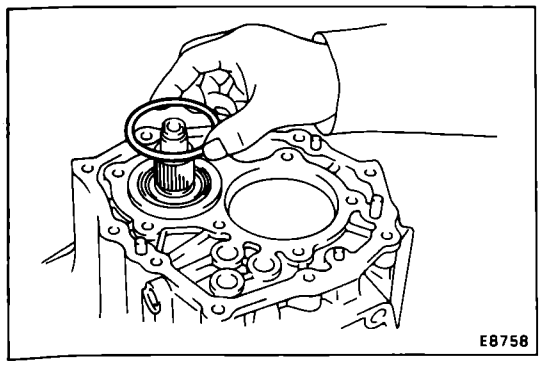
NOTE: If necessary, tap on the case with a plas hammer.

(b) Install and torque the seventeen bolts.

Torque: 300 kg-cm (22 ft-lb, 29 N·m)

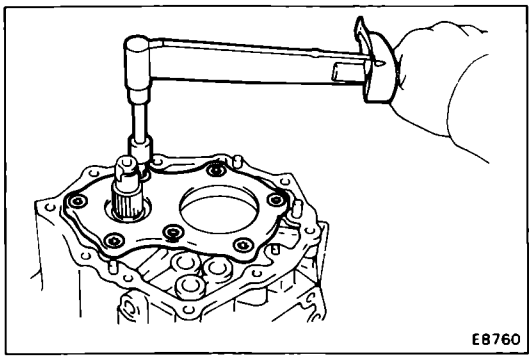


18. INSTALL OUTPUT SHAFT REAR TAPERED ROLLER BEA ING OUTER RACE



19. INSTALL ADJUST SHIM
(See page MT-124)

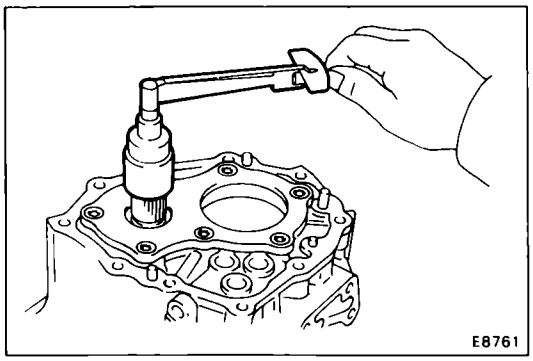
NOTE: Install the previously selected shim.


E8760

20. INSTALL REAR BEARING RETAINER

Using a torx wrench, install and torque the seven torx screws.

Torque: 430 kg-cm (31ft-lb, 42 N·m)


E8761

21. ADJUST DIFFERENTIAL CASE PRELOAD

(a) Install the new lock nut to the output shaft.

(b) Turn the output shaft right and left two or three times to allow the bearings to settle.

(c) Using a torque wrench, measure the preload.

Preload (at starting):

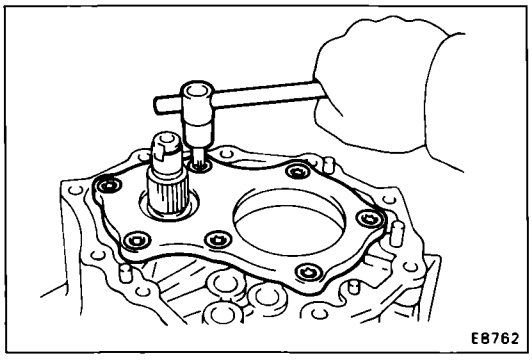
New bearing
Add output shaft preload
1.9 — 3.7 kg-cm
(1.6 — 3.2 in.-lb, 0.2 — 0.4 N·m)

Reused bearing
Add output shaft preload
1.2 — 2.3 kg-cm
(1.0 — 2.0 in.-lb, 0.1 — 0.2 N·m)

If the preload is not within specification, select the thrust washers.

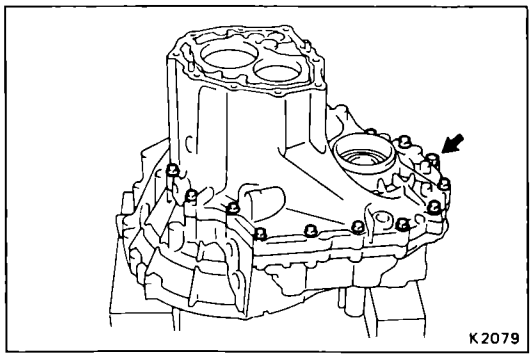
NOTE: The preload will change about 1.3 kg-cm (1.13 in.-lb, 0.13 N·m) with each shim thickness.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
0	2.00 (0.0787)	9	2.45 (0.0965)
1	2.05 (0.0807)	A	2.50 (0.0984)
2	2.10 (0.0827)	B	2.55 (0.1004)
3	2.15 (0.0846)	C	2.60 (0.1024)
4	2.20 (0.0866)	D	2.65 (0.1043)
5	2.25 (0.0886)	E	2.70 (0.1063)
6	2.30 (0.0906)	F	2.75 (0.1083)
7	2.35 (0.0925)	G	2.80 (0.1102)
8	2.40 (0.0945)	H	2.85 (0.1122)


E8762

22. REMOVE REAR BEARING RETAINER

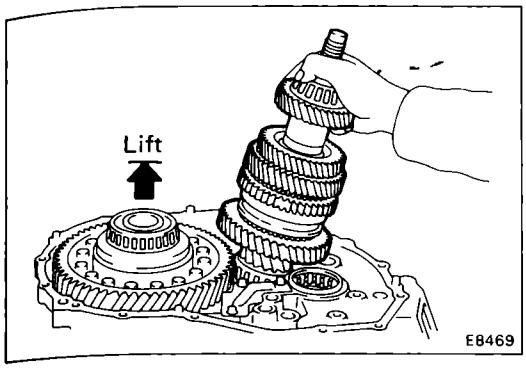
Using torx wrench, remove the seven torx screws and rear bearing retainer.


K2079

23. REMOVE ADJUST SHIM

24. REMOVE TRANSMISSION CASE

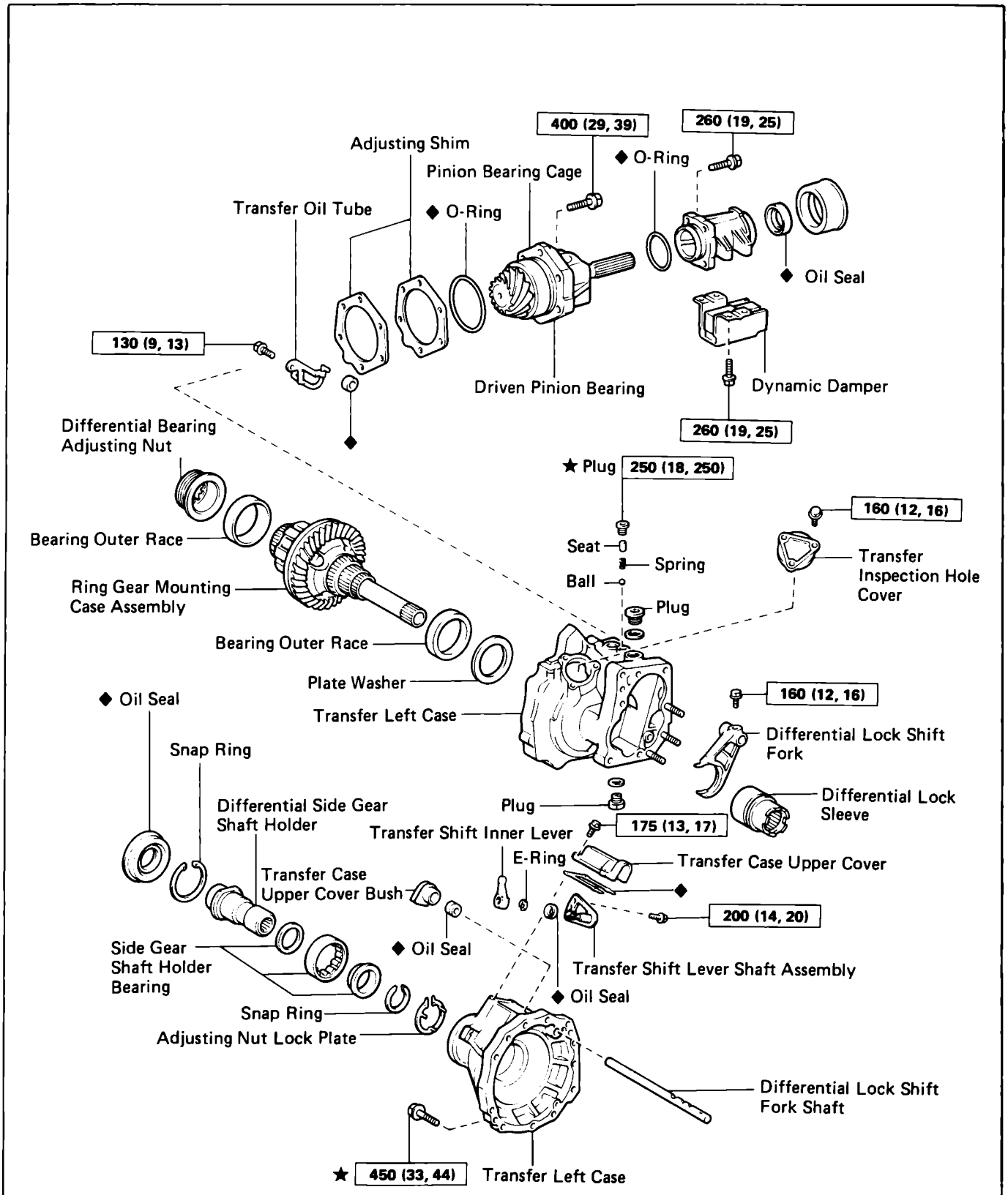
Remove the seventeen bolts and tap off the case with a plastic hammer.



25. **REMOVE OUTPUT SHAFT ASSEMBLY**

26. **REMOVE DIFFERENTIAL CASE ASSEMBLY**

Transfer

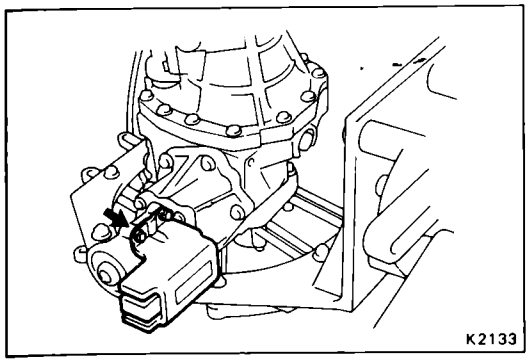


kg-cm (ft-lb, N·m) : Specified torque

◆ Non-reusable part

★ Precoated part

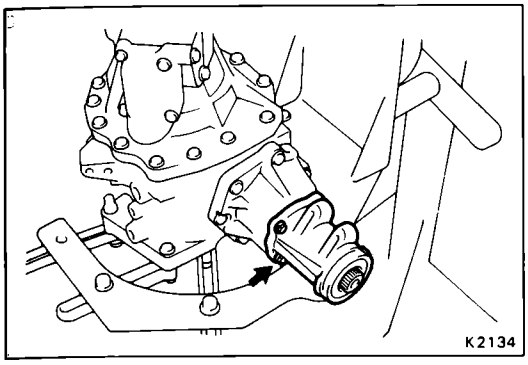
K2111



DISASSEMBLY OF TRANSFER COMPONENT PARTS

1. REMOVE DYNAMIC DAMPER

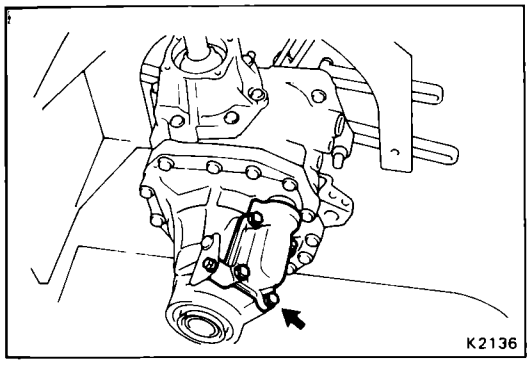
Remove the four bolts and dynamic damper.



2. REMOVE EXTENSION HOUSING

(a) Remove the four bolts and tap off the housing with a plastic hammer.

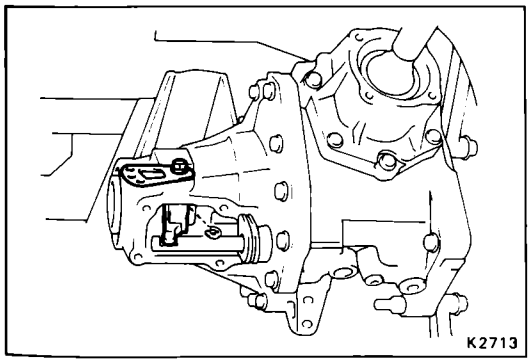
(b) Remove the O-ring from the extension housing.



3. REMOVE TRANSFER CASE COVER

(a) Remove the five bolts.

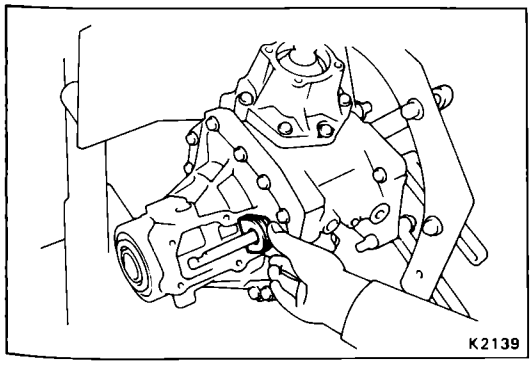
(b) Remove the case cover and gasket.



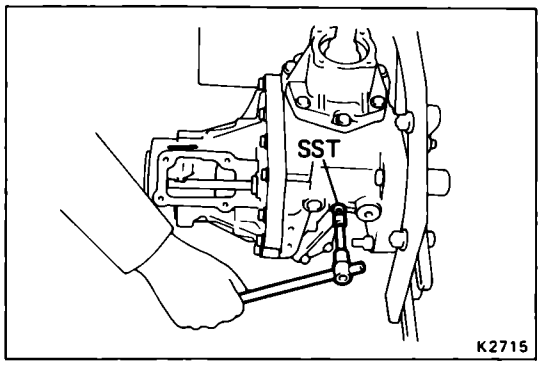
4. REMOVE SHIFT LEVER SHAFT AND INNER LEVER

(a) Remove the E-ring.

(b) Remove the shift lever shaft and inner lever.



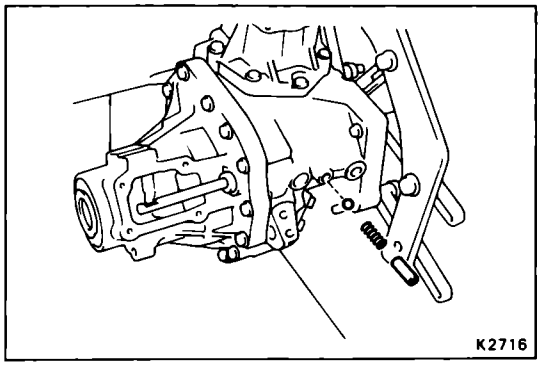
5. REMOVE TRANSFER CASE UPPER BUSHING



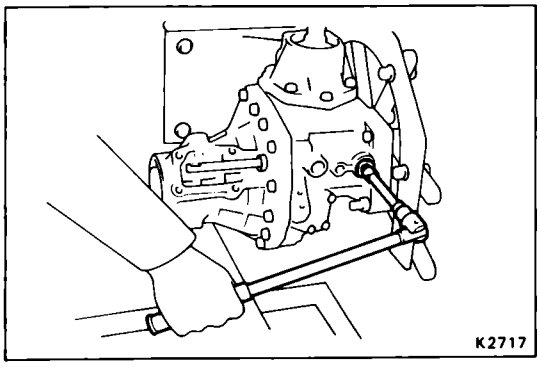
6. REMOVE PLUG, SEAT, SPRING AND LOCKING BALL

(a) Using SST, remove the plug.

SST 09313-30021



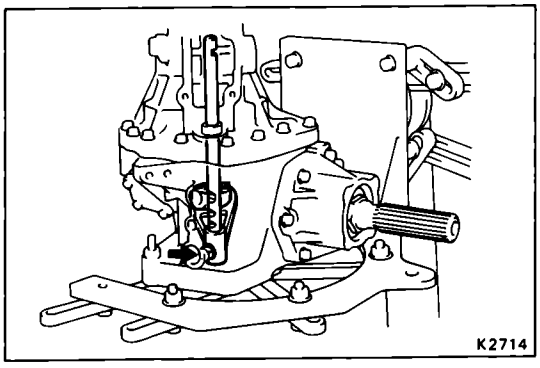
(b) Using a magnetic finger, remove the seat, spring and ball.



7. REMOVE DIFFERENTIAL LOCK SHIFT FORK AND SHIFT FORK SHAFT

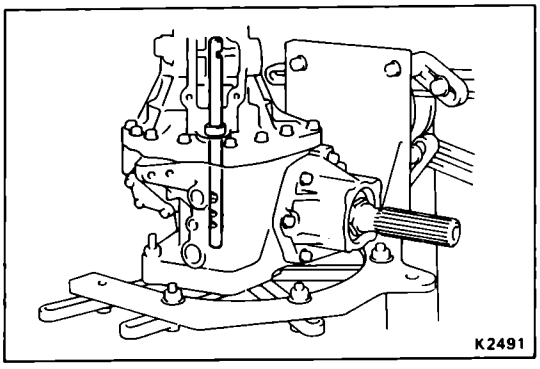
(a) Using SST, remove the plug.

SST 09043-38100

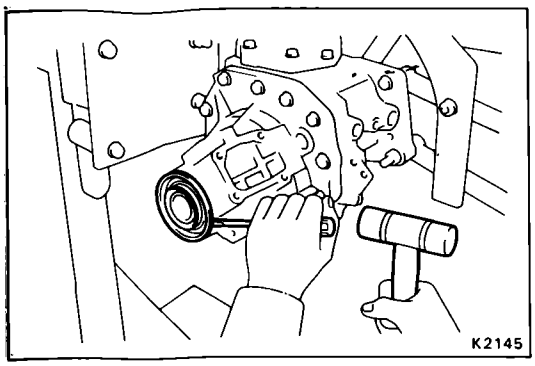


(b) Remove the set bolt.

(c) Remove the differential lock sleeve and shift fork.

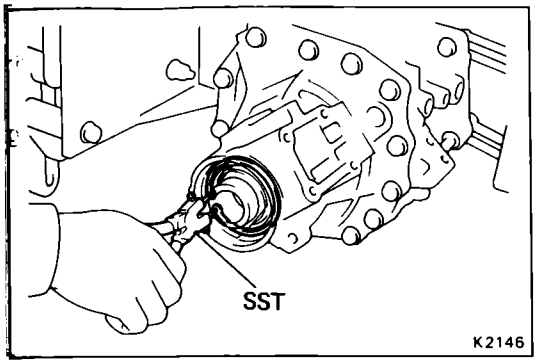


(d) Pull out the shift fork shaft.

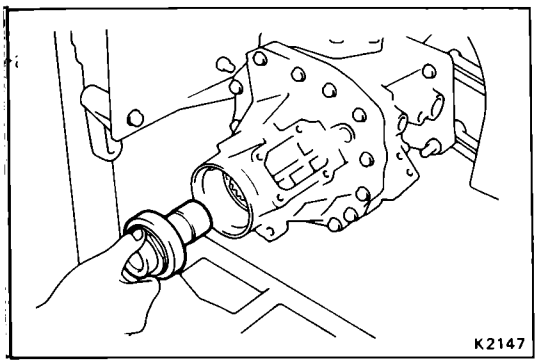


8. REMOVE SIDE GEAR SHAFT HOLDER

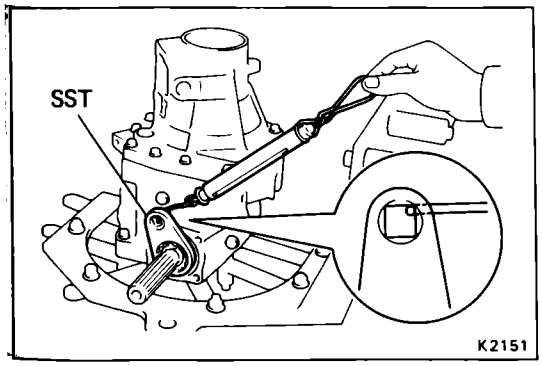
(a) Using a screwdriver and hammer, remove the oil seal.



(b) Using snap ring pliers, remove the snap ring.



(c) Remove the shaft holder.



9. CHECK PRELOAD

(a) Using SST and a spring tension gauge, measure the driven pinion preload of the backlash between the driven pinion and ring gear.

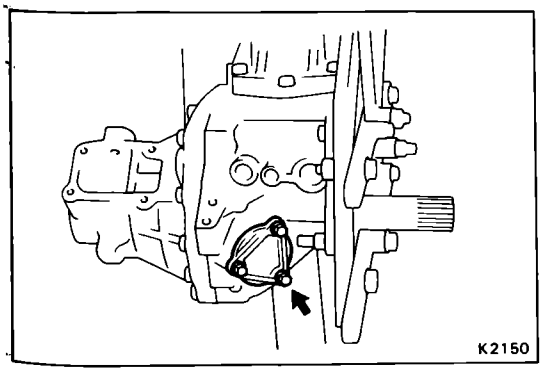
SST 09326-20011

Preload (at starting): 0.9 — 1.4 kg (2 — 3 lb, 9 — 14 N)

(b) Using SST and a spring tension gauge, measure the total preload.

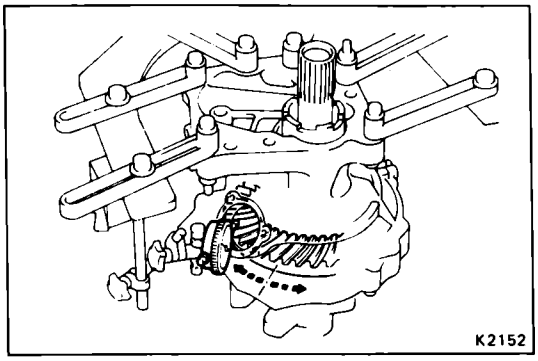
SST 09326-20011

Total preload (at starting):
Add driven pinion preload
0.5 — 0.9 kg (1 — 2 lb, 5 — 9 N)



10. REMOVE TRANSFER INSPECTION HOLE COVER

Remove the three bolts and a cover.

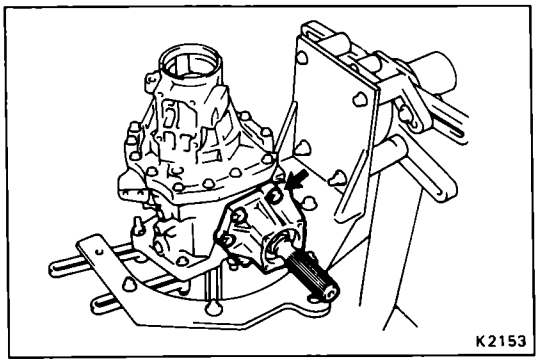


11. CHECK RING GEAR BACKLASH

Using a dial indicator, measure the ring gear backlash.

Backlash: 0.13 — 0.18 mm (0.0051 — 0.0071 in.)

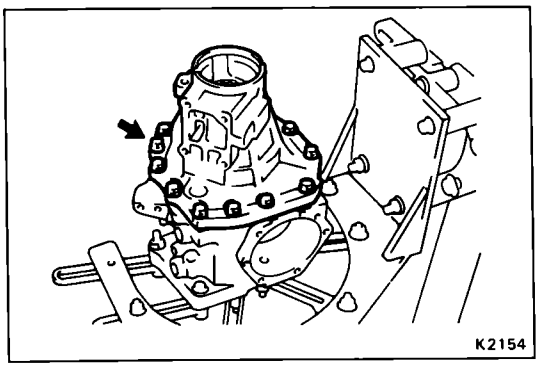
12. CHECK TOOTH CONTACT (See page MT-00)



13. REMOVE DRIVEN PINION BEARING CAGE ASSEMBLY

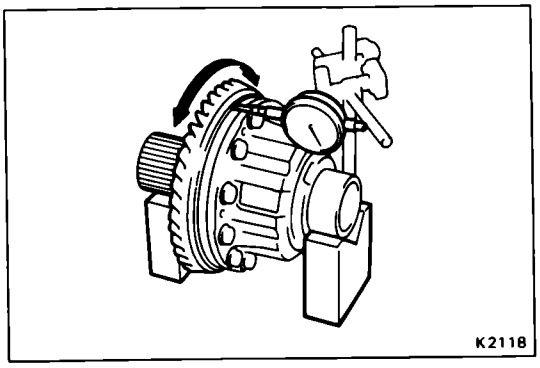
(a) Remove the six bolts and tap off the bearing cage assembly with a plastic hammer.

(b) Remove the O-ring from the driven pinion bearing cage.

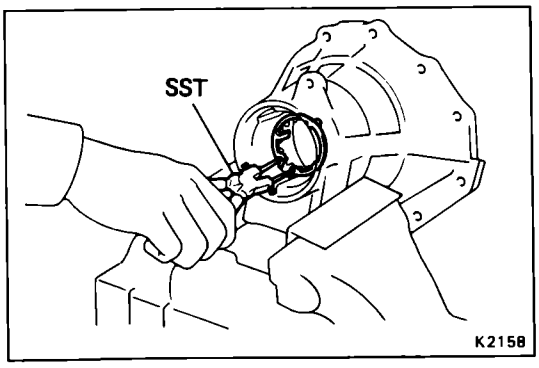


14. REMOVE TRANSFER RIGHT CASE

Remove the twelve bolts and tap off the case with a plastic hammer.

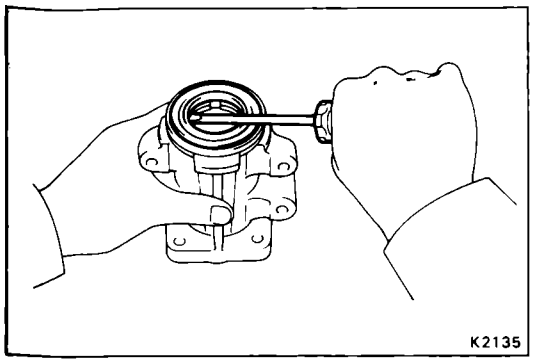


15. REMOVE RING GEAR MOUNTING CASE ASSEMBLY



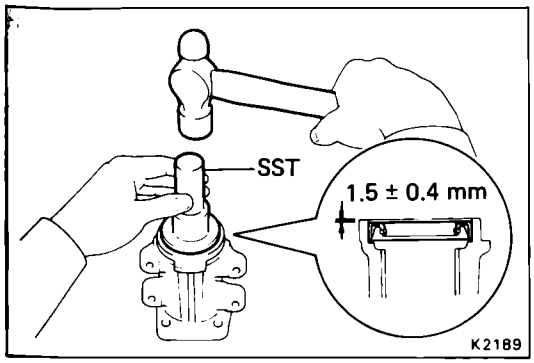
16. REMOVE ADJUSTING NUT LOCK PLATE

Using snap ring pliers, remove the lock plate from the transfer right case.



17. IF NECESSARY, REPLACE EXTENSION HOUSING OIL SEAL

(a) Using a screwdriver, remove the oil seal.

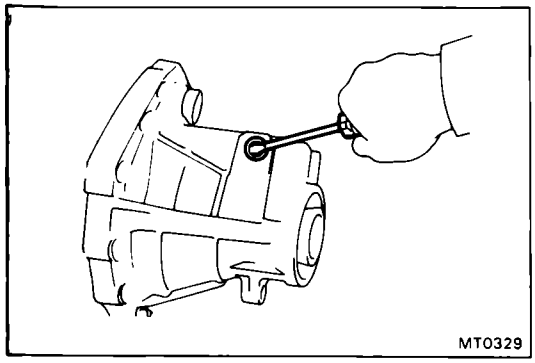


(b) Using SST and a hammer, drive in a new oil seal.

SST 09325-20010

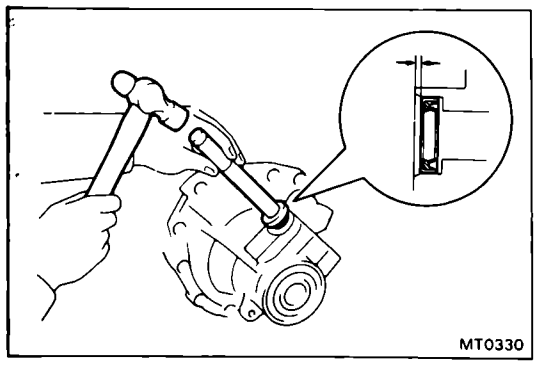
Oil seal depth: 1.1 – 1.9 mm (0.043 – 0.075 in.)

(c) Coat the lip of oil seal with MP grease.



18. IF NECESSARY, REPLACE DIFFERENTIAL LOCK SHIFT LEVER SHAFT OIL SEAL

(a) Using a screwdriver, remove the oil seal.

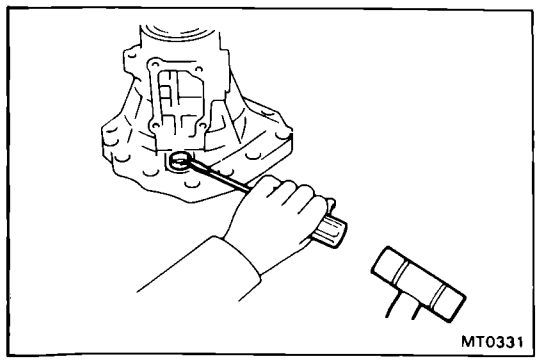


(b) Coat the lip seal with MP grease.

(c) Using SST and a hammer, drive in a new oil seal.

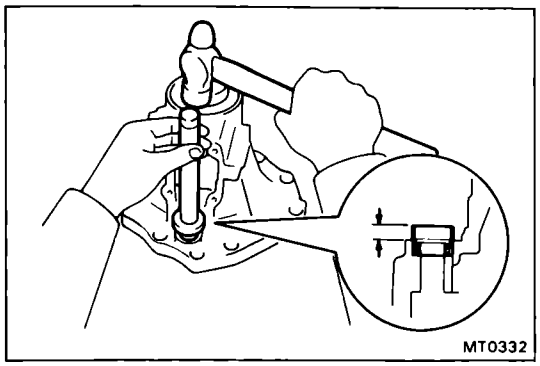
SST 09620-30010 (09625-30010, 09631-00020)

Oil seal depth: 1.0 – 2.0 mm (0.039 – 0.079 in.)



19. IF NECESSARY, REPLACE SHIFT FORK SHAFT OIL SEAL

(a) Using a screwdriver and hammer, remove the oil seal.

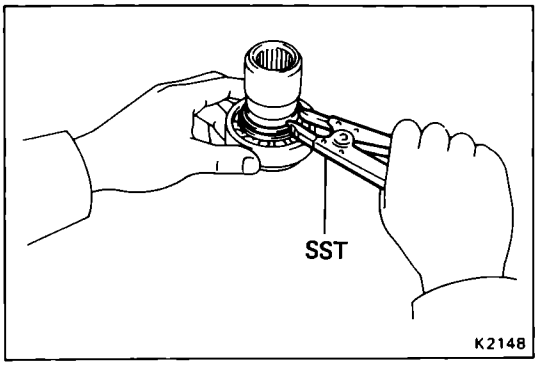


(b) Coat the lip of the oil seal with MP grease.

(c) Using SST and a hammer, drive in a new oil seal as shown.

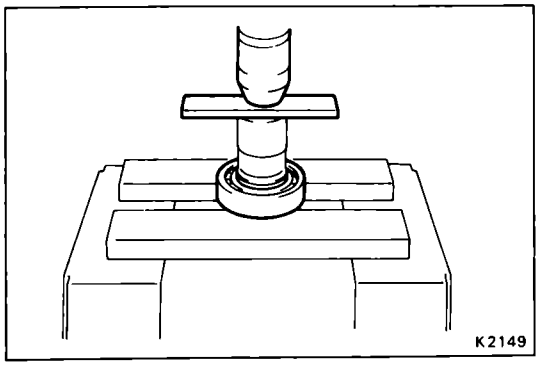
SST 09620-30010 (09625-30010, 09631-00020)

Oil seal height: 8.5 – 9.5 mm (0.335 – 0.374 in.)

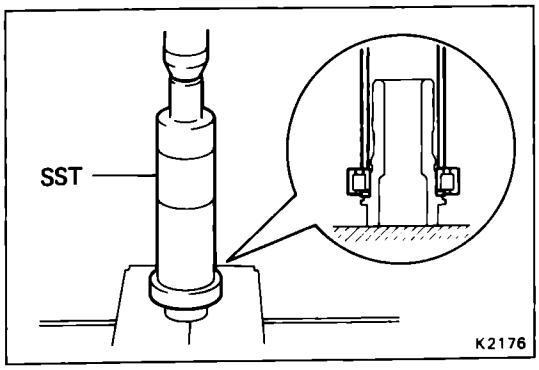


20. IF NECESSARY, REPLACE SIDE GEAR SHAFT HOLDER BEARING

(a) Using snap ring pliers, remove the snap ring.

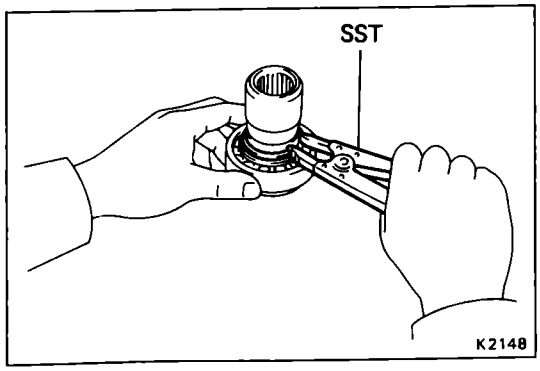


(b) Using a press, remove the bearing from the side gear shaft holder.

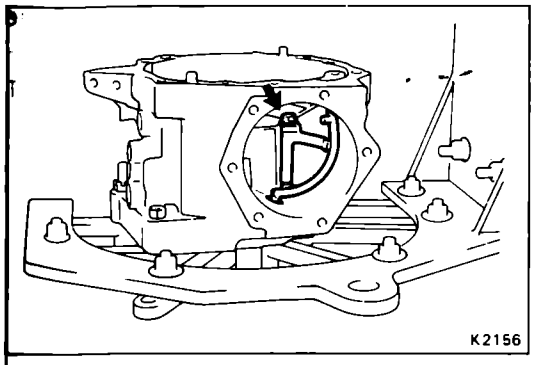


(c) Using SST and a press, install the new bearing as shown.

SST 09316-60010 (09316-00010)

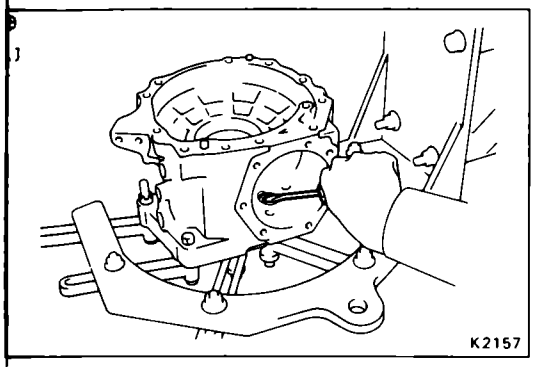


(d) Using snap ring pliers, install the snap ring.

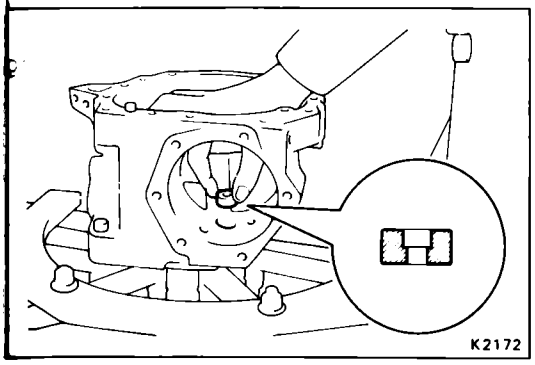


21. IF NECESSARY, REPLACE TRANSFER OIL TUBE

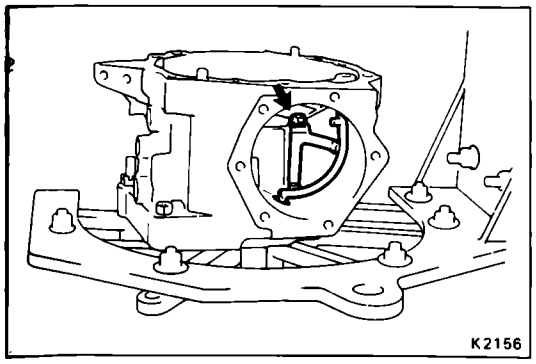
(a) Remove the bolt and oil tube.



(b) Using a screwdriver, remove the cushion.



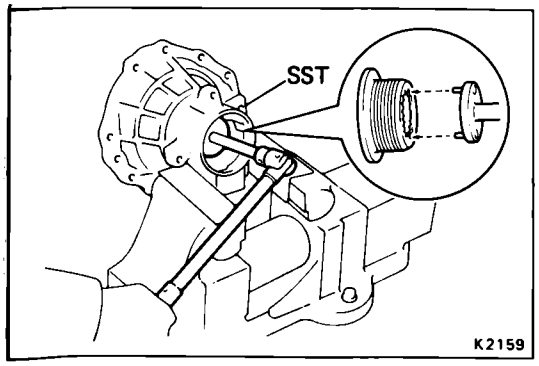
(c) Install the new cushion.



(d) Install the oil tube.

(e) Install and torque the bolt.

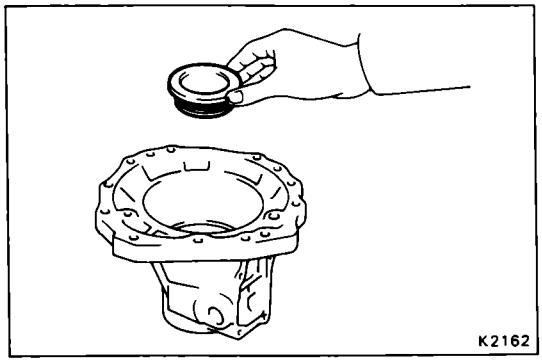
Torque: 130 kg-cm (9 ft-lb, 13 N·m)



22. IF NECESSARY, REPLACE RING GEAR MOUNTING CASE SIDE BEARING OUTER RACE (Transfer Right Case)

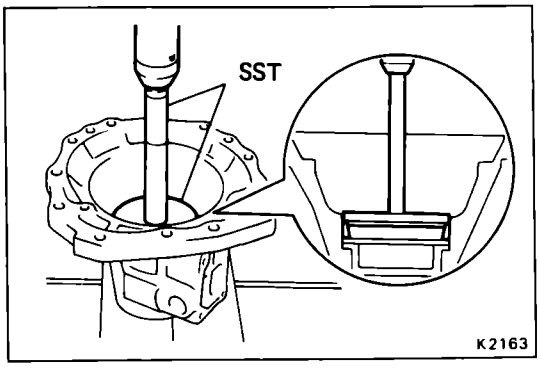
(a) Using SST, turn the bearing adjusting nut, remove the outer race and bearing adjusting nut.

SST 09318-20010



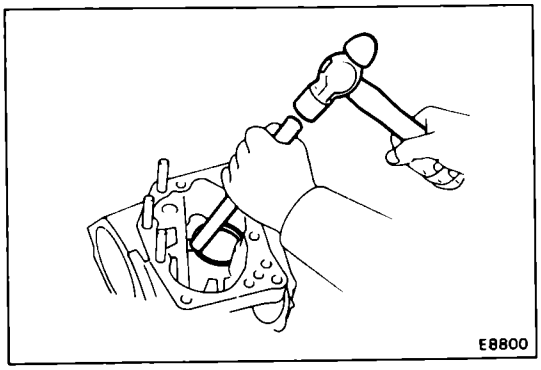
(b) Install the bearing adjusting nut until it touches the lip of the case.

NOTE: If the nut is difficult to turn, use SST (09318-20010).



(c) Using SST and a press, install the bearing outer race until it is almost touching the bearing adjusting nut.

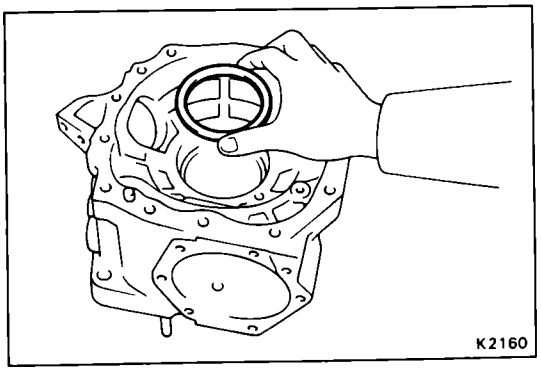
SST 09608-35014 (09608-06020, 09608-06180)



(Transfer Left Case)

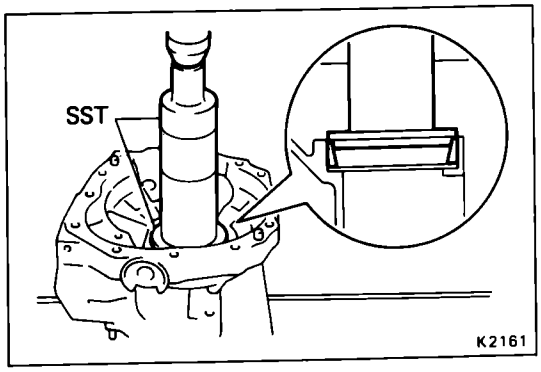
(a) Using a brass bar and hammer, drive out the bearing outer race lightly and evenly.

(b) Remove the plate washer.



(c) Install the plate washer.

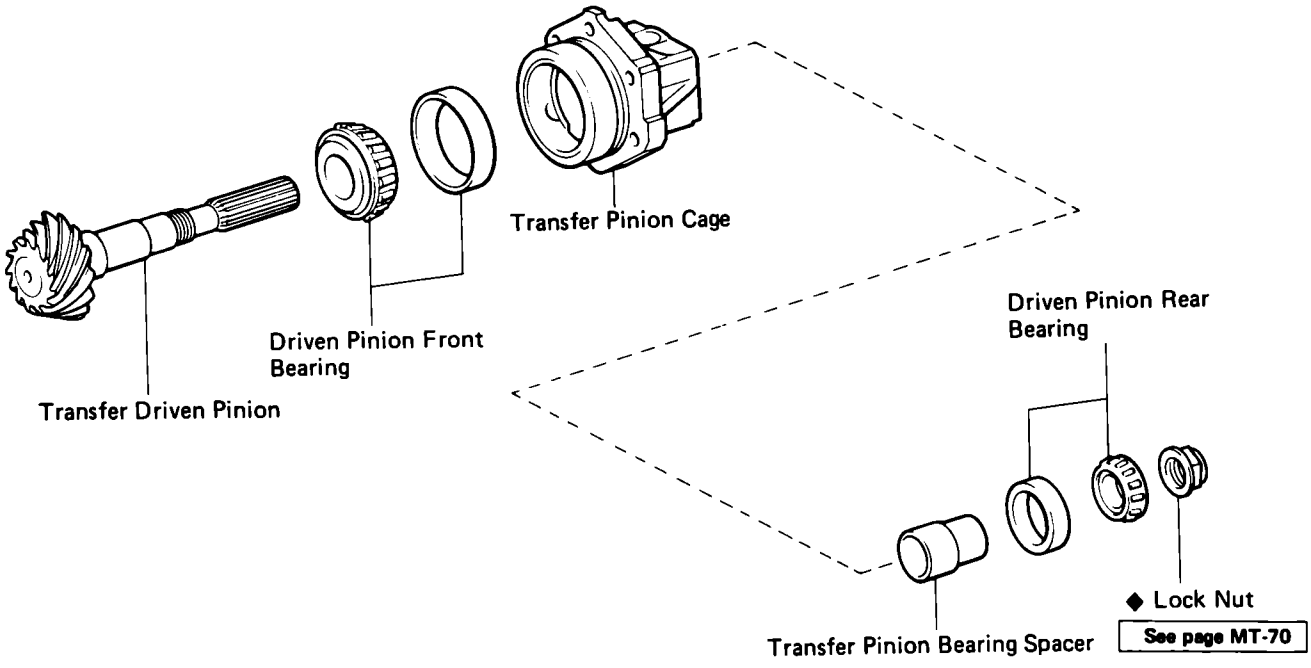
NOTE: First install a washer of the same thickness as before.



(d) Using SST and a press, install the outer race.

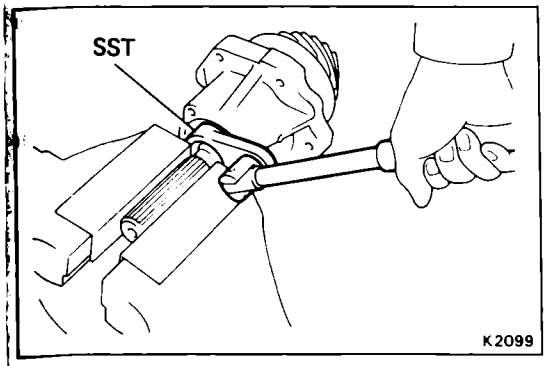
SST 09316-60010 (09316-00010, 09316-00060)

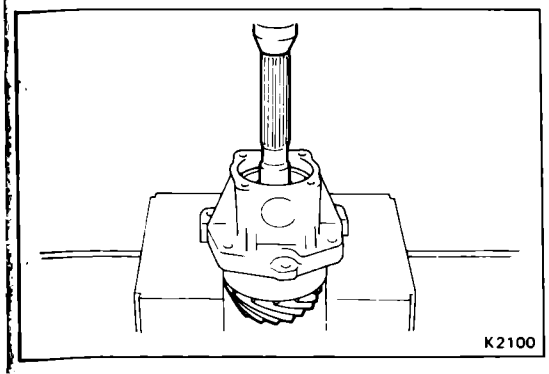
DRIVEN PINION BEARING CAGE ASSEMBLY



◆ Non-reusable part

K2110





DISASSEMBLY OF DRIVEN PINION BEARING CAGE

1. REMOVE LOCK NUT

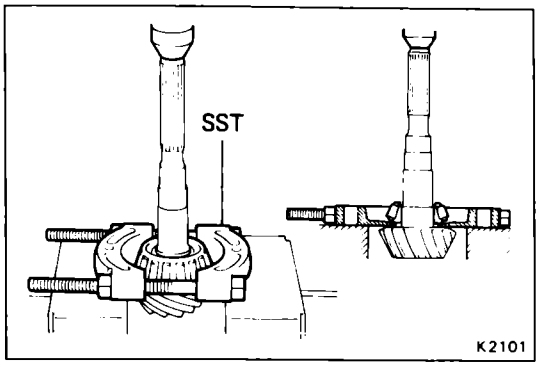
(a) Unstake the lock nut.

(b) Using SST, remove the lock nut.

SST 09326-20011

2. REMOVE DRIVEN PINION

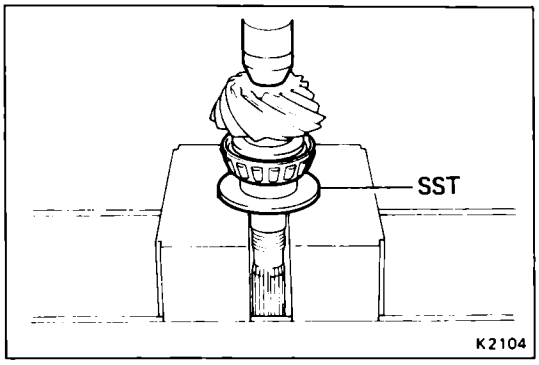
Using a press, remove the driven pinion, rear bearing and spacer.



3. IF NECESSARY, REPLACE DRIVEN PINION FRONT BEARING

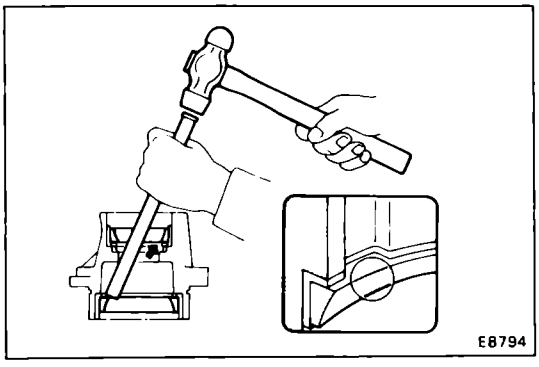
(a) Using SST and a press, remove the front bearing.

SST 09950-00020



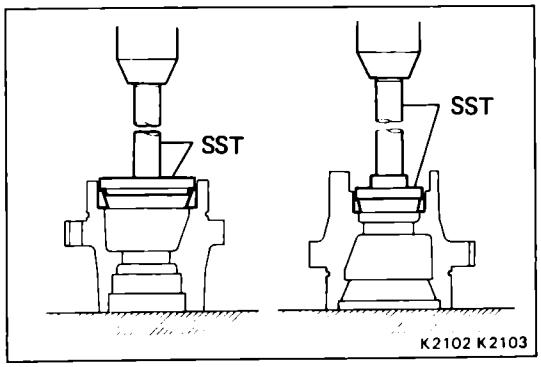
(b) Using SST and a press, install the front bearing.

SST 09316-60010 (09316-00050)



4. IF NECESSARY, REPLACE FRONT AND REAR BEARING OUTER RACE

(a) Using a brass bar and hammer, drive out the bearing outer race lightly and evenly.

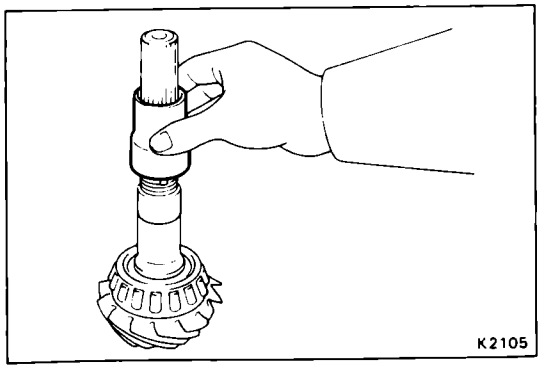


(b) Using SST and a press, install the front bearing outer race.

SST 09608-35014 (09608-06020, 09608-06210)

(c) Using SST and a press, install the rear bearing outer race.

SST 09550-10012 (09252-10010, 09555-10010)



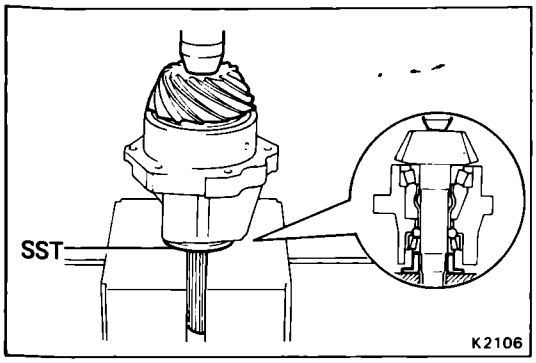
ASSEMBLY OF DRIVEN PINION BEARING CAGE

NOTE: Coat all of the sliding and rotating surface with gear oil before assembly.

1. INSTALL DRIVEN PINION BEARING CAGE

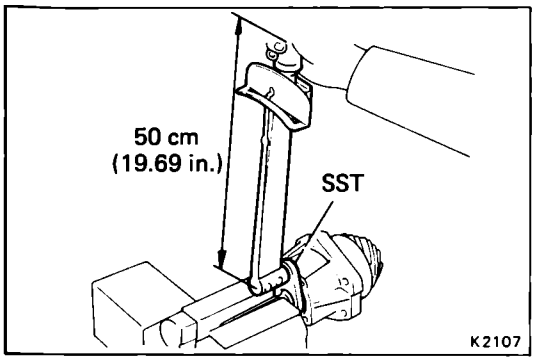
(a) Install the new bearing spacer.

NOTE: Insert the spacer with the smaller facing upwards.



(b) Using SST and a press, install the rear bearing.

NOTE: Press down until the pinion can just move slightly up and down.



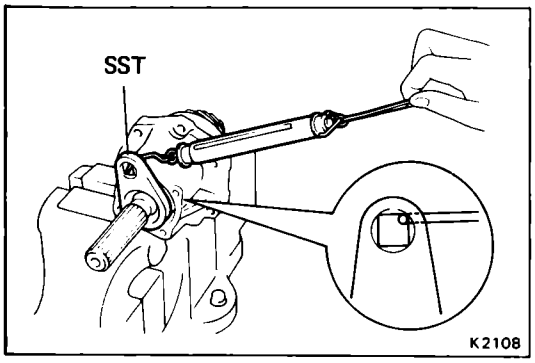
2. ADJUST DRIVEN PINION PRELOAD

(a) Using SST, install and torque the new lock nut.

SST 09326-20011

Torque: 1,000 kg-cm (72 ft-lb, 98 N·m)

NOTE: Use a torque wrench with a fulcrum length of 50 cm (19.69 in.).



(b) Using SST and a spring tension gauge, measure the driven pinion preload.

NOTE: Turn the driven pinion right and left two or three times to allow the bearings to settle.

Preload (at starting):

New bearing	**1.8 — 2.9 kg (4.0 — 6.4 lb, 17.7 — 28.4 N)**
Reused bearing	**0.9 — 1.4 kg (1.1 — 2.0 lb, 4.9 — 8.8 N)**

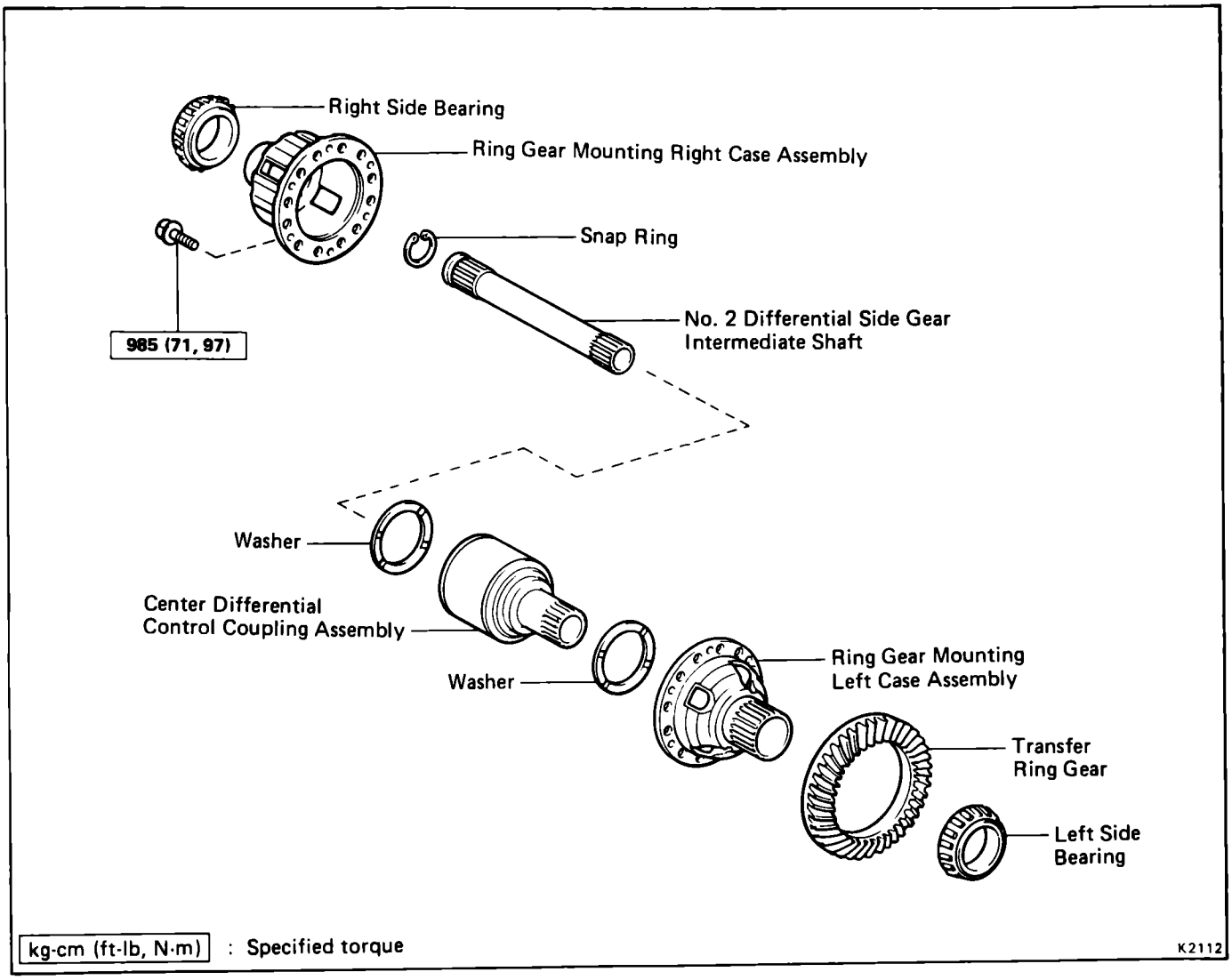
- If preload is greater than specification, replace the bearing spacer.
- If preload is less than specification, retighten the nut 5 — 10° at a time until the specified preload is reached.

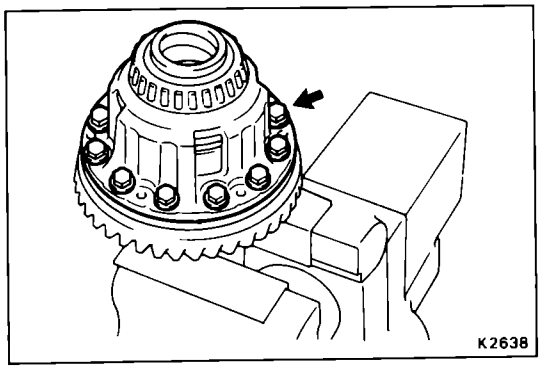
If the maximum torque is exceed while retightening the nut, replace the bearing spacer and repeat the preload procedure. Do not back off the pinion nut to reduce the preload.

Maximum torque: 2,200 kg-cm (159 ft-lb, 216 N·m)

3. STAKE LOCK NUT

RING GEAR MOUNTING CASE ASSEMBLY

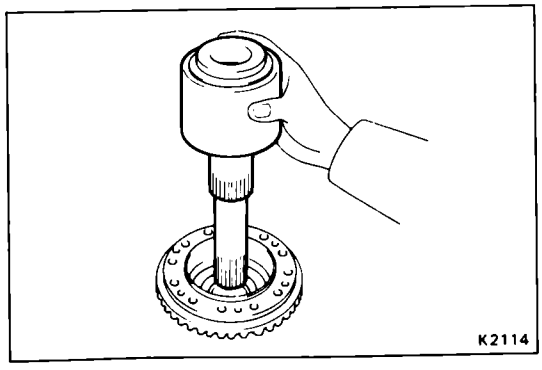




DISASSEMBLY OF RING GEAR MOUNTING CASE

1. REMOVE RING GEAR MOUNTING RIGHT CASE

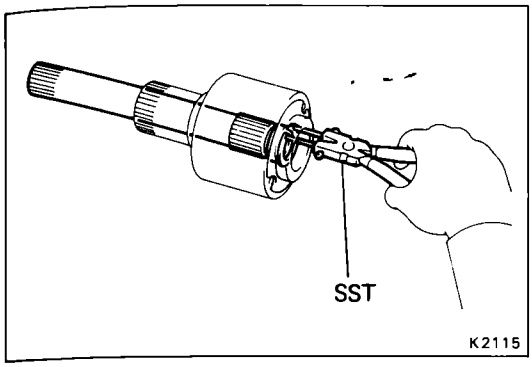
Remove twelve bolts and right case.



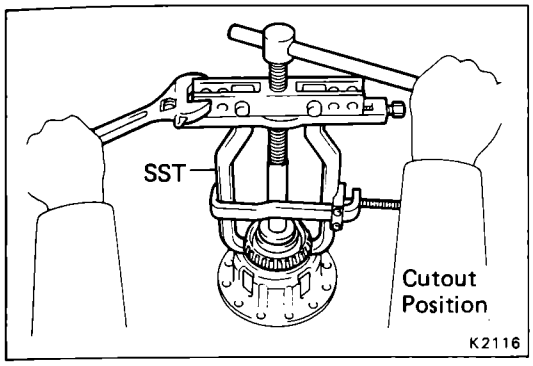
2. REMOVE CENTER DIFFERENTIAL CONTROL COUPLING

(a) Remove the control coupling from the left case.

(b) Remove the two washers from the control coupling.



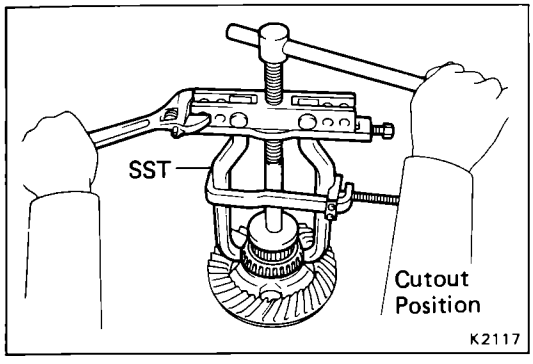
(c) Using a snap ring pliers , remove the snap ring and No.2 intermediate shaft.



3. REMOVE MOUNTING CASE SIDE BEARING (Right Case Side)

Using SST, remove the side bearing.

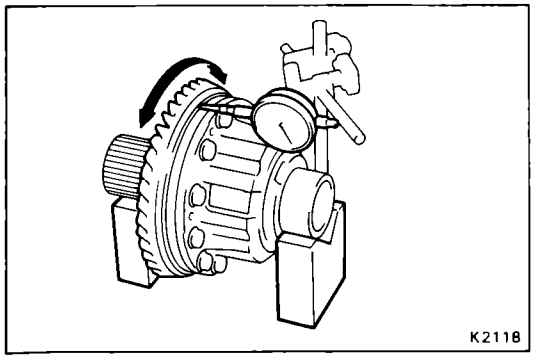
SST 09950-20017



(Left Case Side)

Using SST, remove the side bearing.

SST 09950-20017



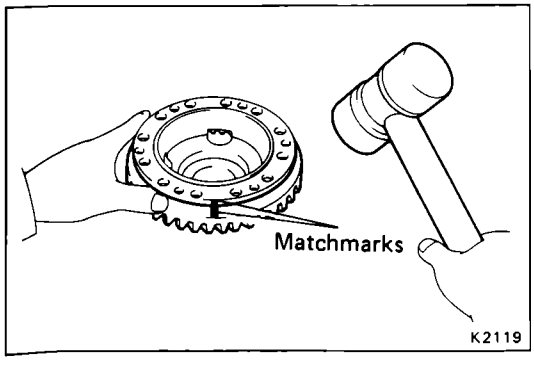
4. CHECK RING GEAR RUNOUT

(a) Install the mounting right case to the left case.

(b) Using a dial indicator, check the ring gear runout.

Maximum runout: 0.1 mm (0.004 in.)

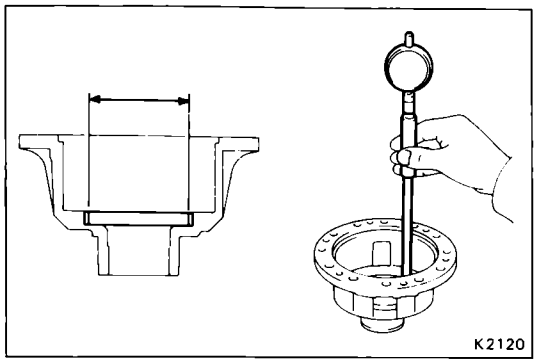
(c) Remove the mounting right case from the left case.



5. REMOVE RING GEAR

(a) Place the matchmarks on both the mounting left case and ring gear.

(b) Using a plastic hammer, tap out the ring gear.



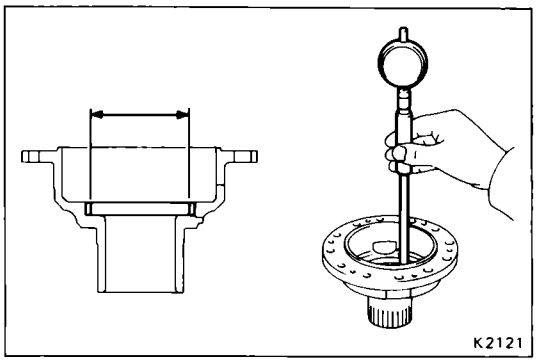
INSPECTION OF RING GEAR MOUNTING CASE

1. MEASURE RING GEAR MOUNTING CASE

(a) Using a cylinder gauge, measure the inner diameter of the mounting right case bushing.

Standard diameter: **69.000 — 69.035 mm (2.7165 — 2.7179 in.)**

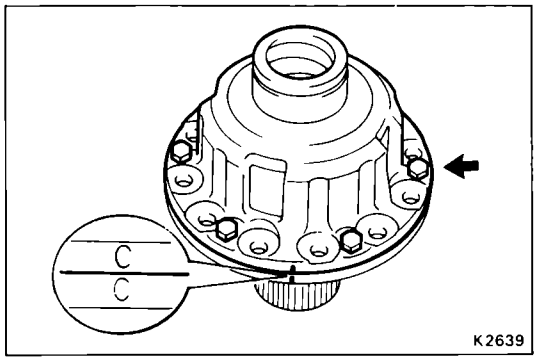
Maximum diameter: **69.060 mm (2.7189 in.)**



(b) Using a cylinder gauge, measure the inner diameter of the mounting left case bushing.

Standard diameter: **69.000 — 69.035 mm (2.7165 — 2.7179 mm)**

Maximum diameter: **69.060 mm (2.7189 in.)**

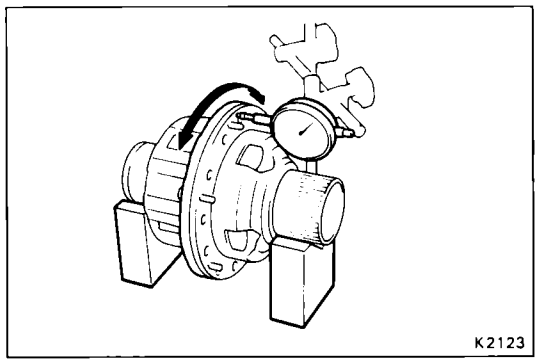


2. CHECK RING GEAR MOUNTING CASE RUNOUT

NOTE: Perform only when the limit is exceeded in the ring gear runout inspection.

(a) Using six bolts (Diameter 8 mm, Pitch 1.25 mm), install the mounting right case to the left case.

NOTE: Align the matchmarks on the right case and connect the left case.

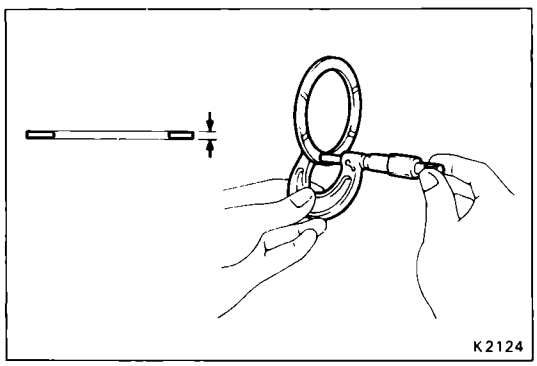


(b) Using a dial indicator, check the mounting case runout.

Maximum runout: 0.1 mm (0.004 in.)

(c) Remove the six bolts.

(d) Remove the mounting right case from the left case.

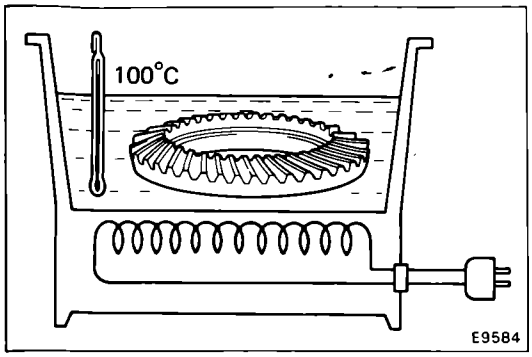


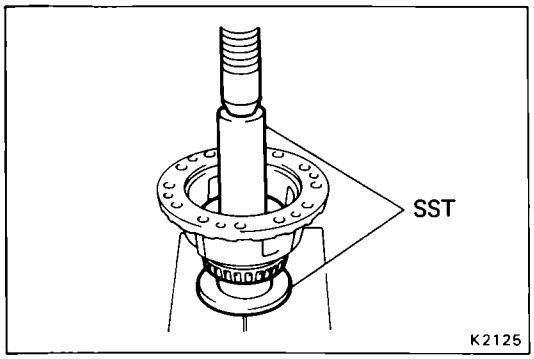
3. MEASURE WASHER

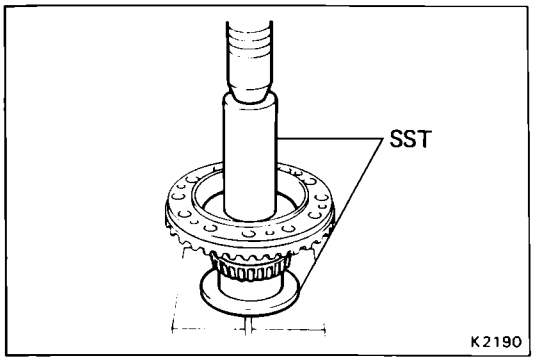
Using a micrometer, measure the two washers thickness.

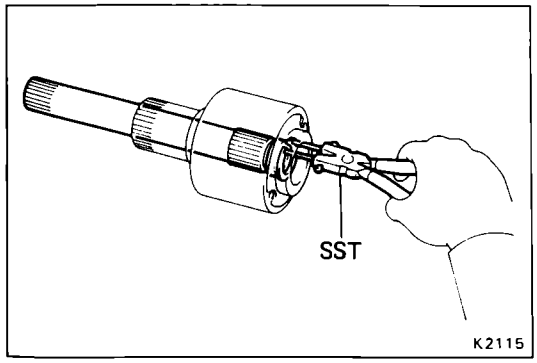
Standard thickness: **1.49 — 1.51 mm (0.0587 — 0.0594 in.)**

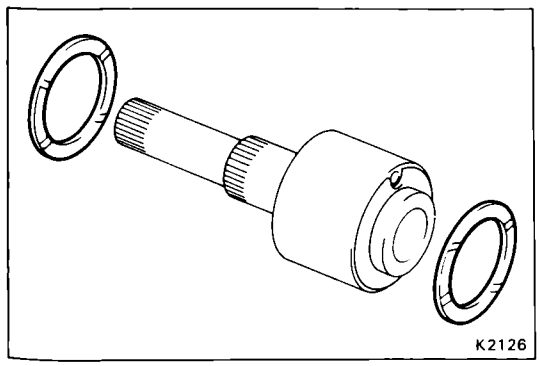
Minimum thickness: **1.45 mm (0.0571 in.)**











ASSEMBLY OF RING GEAR MOUNTING CASE

1. INSTALL RING GEAR

(a) Clean the contact surface of the mounting left cas

(b) Heat the ring gear to about 100°C (212°F) in an (bath.

CAUTION: Do not heat the ring gear above 110° (230°F).

(c) Clean the contact surface of the ring gear with clea ing solvent.

(d) Turn quickly install the ring gear on the mounting le case.

NOTE: Align the matchmarks on the mounting left ca and connect the ring gear.

2. CHECK RING GEAR RUNOUT
(See page MT-113)

3. INSTALL MOUNTING CASE SIDE BEARING
(Right Case Side)

Using SST and a press, install the side bearing.

SST 09309-36010, 09316-20011

(Left Case Side)

Using SST and a press, install the side bearing.

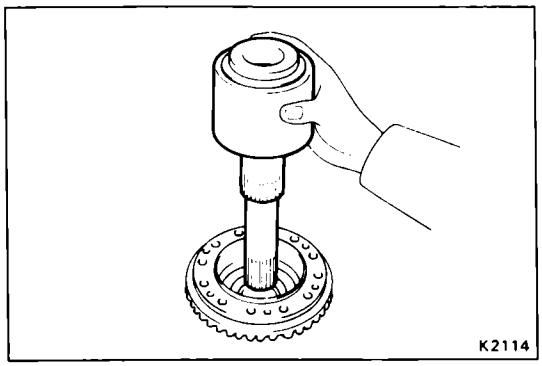
SST 09309-36010, 09316-20011

4. INSTALL CENTER DIFFERENTIAL CONTROL COUPLIN

(a) Insert the No.2 intermediate shaft to the cent differential control coupling.

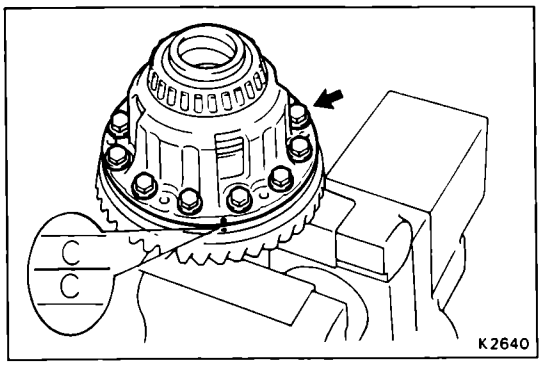
(b) Using snap ring pliers, install the snap ring.

(c) Install the two washers to the center differential co trol coupling.



(d) Install the center differential control coupling to the left case.

NOTE: Do not drop the washer.



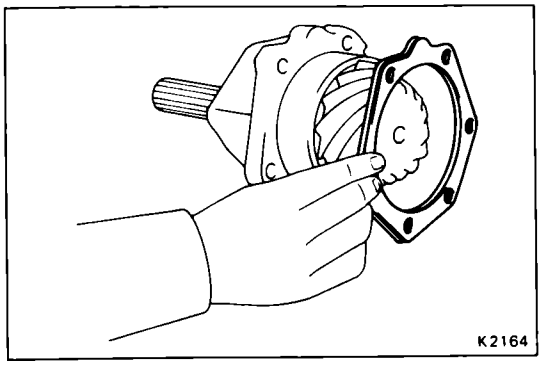
4. INSTALL RING GEAR MOUNTING RIGHT CASE

(a) Install the right case to the left case.

(b) Install and torque the twelve bolts.

Torque: 985 kg-cm (71 ft-lb, 97 N·m)

NOTE: Align the matchmarks on the left case and connect the right case.



ASSEMBLY OF TRANSFER COMPONENT PARTS

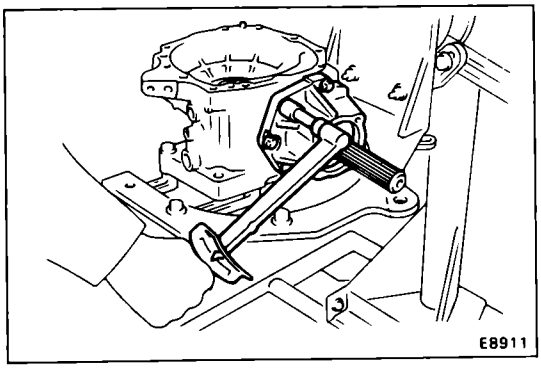
(See page MT-100)

NOTE: Coat all of the sliding and rotating surface with gear oil before assembly.

1. ADJUST RING GEAR BACKLASH

(a) Install the adjusting shim to the driven pinion bearing cage assembly.

NOTE: First install a shim of the same thickness as before.

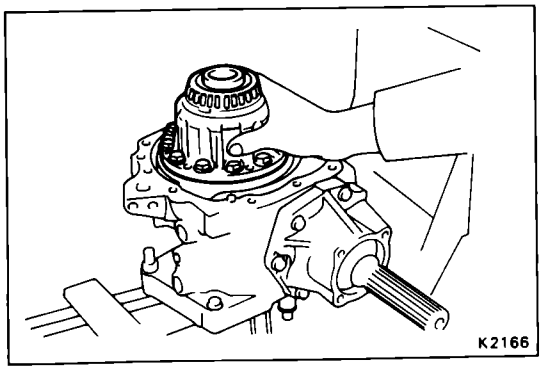


(b) Install the driven pinion bearing cage assembly to the transfer left case.

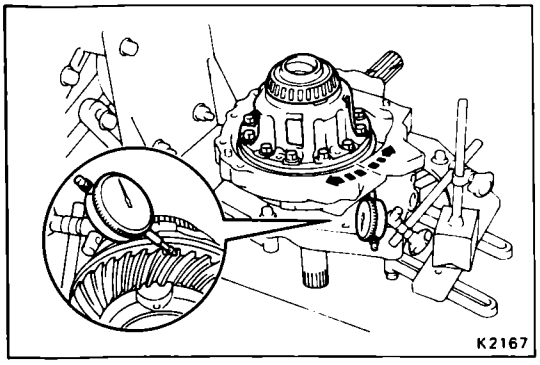
(c) Install and torque the six bolts.

Torque: 400 kg-cm (29 ft-lb, 39 N·m)

NOTE: Do not install the O-ring.



(d) Install the ring gear mounting case assembly to the transfer left case.



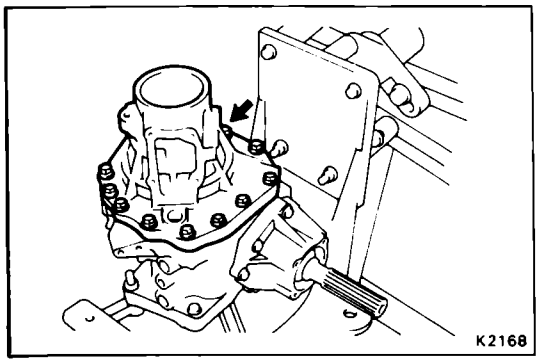
(e) Using a dial indicator, measure the ring gear backlas

Backlash: 0.13 — 0.18 mm (0.0051 — 0.0071 in.)

(f) Referring to the table below, select the plate wash which will ensure that the backlash is within speci cation. Try to select a washer of the same size.

NOTE: The backlash will change about 0.02 mm (0.00(in.) with each shim thickness.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
1	2.13 (0.0839)	13	2.49 (0.0980)
2	2.16 (0.0850)	14	2.52 (0.0992)
3	2.19 (0.0862)	15	2.55 (0.1004)
4	2.22 (0.0874)	16	2.58 (0.1016)
5	2.25 (0.0886)	17	2.61 (0.1028)
6	2.28 (0.0898)	18	2.64 (0.1039)
7	2.31 (0.0909)	19	2.67 (0.1051)
8	2.34 (0.0921)	20	2.70 (0.1063)
9	2.37 (0.0933)	21	2.73 (0.1075)
10	2.40 (0.0945)	22	2.76 (0.1087)
11	2.43 (0.0957)	23	2.79 (0.1098)
12	2.46 (0.0968)	24	2.82 (0.1110)

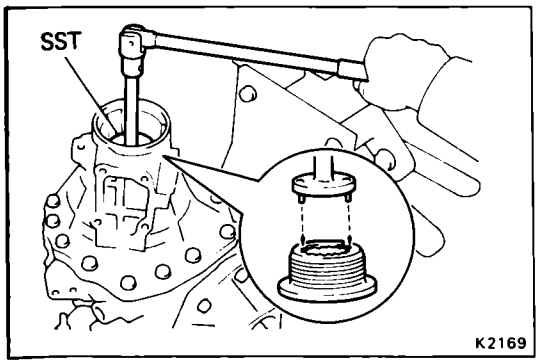


2. ADJUST TOTAL PRELOAD

(a) Install the transfer right case.

(b) Install and torque the twelve bolts.

Torque: 450 kg-cm (33 ft-lb, 44 N·m)



(c) Adjust the total preload by tightening the bearing a(justing nut.

Using SST, tightening the adjusting nut.

SST 09318-20010

NOTE: Measure the preload while tightening the adjus ing nut a little at a time.

(d) Using SST and a spring tension gauge, measure th total preload.

SST 09326-20011

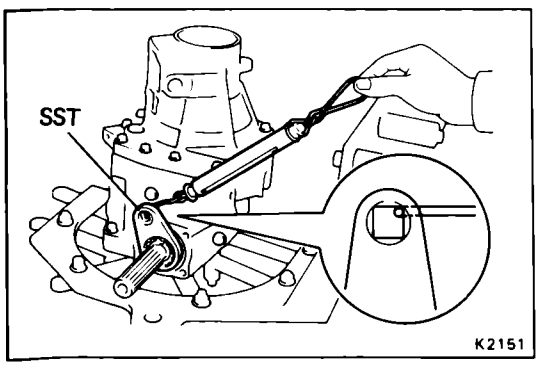
Preload (at starting):

New bearing

Add driven pinion preload 1.3 — 1.4 kg (2.9 — 3.1 lb, 13 — 14 N)

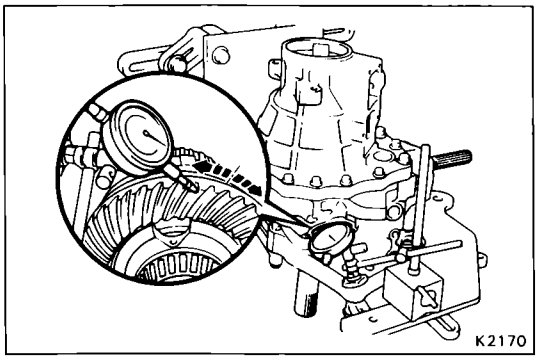
Reused bearing

Add driven pinion preload 0.5 — 0.9 kg (1 — 2 lb, 5 — 9 N)



NOTE: Turn the output shaft counterclockwise and cloc wise several times.

(e) When the standard value for total preload is exceed ed, remove the transfer right case, push in the adjus ing nut and outer race. Again adjust the total preloa

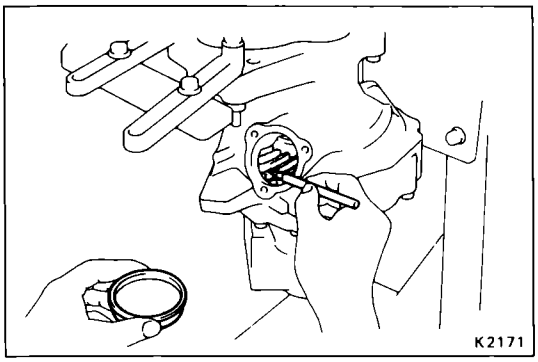


3. CHECK RING GEAR BACKLASH

(a) Using a dial indicator, measure the ring gear backlash.

Backlash: 0.13 — 0.18 mm (0.0051 — 0.0071 in.)

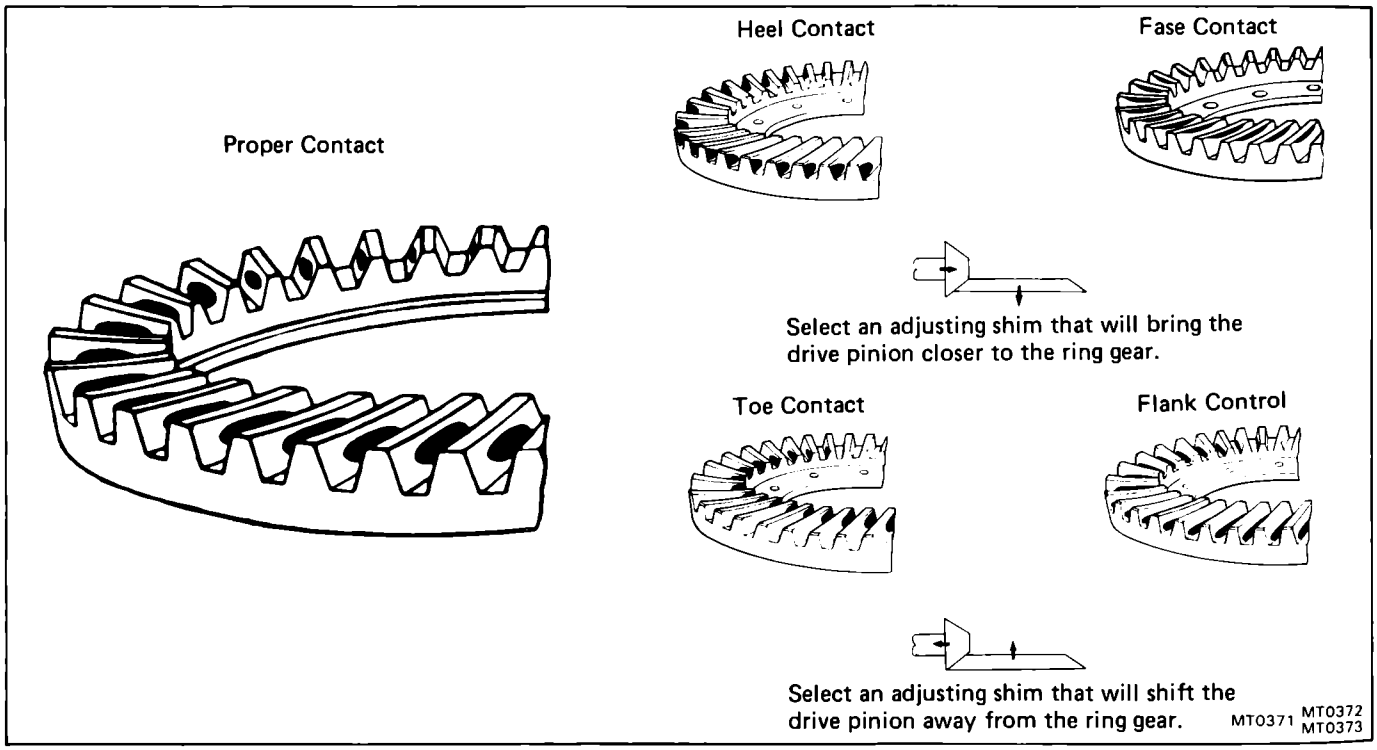
(b) When the backlash is outside the standard value, select a different plate washer to the one selected step 2. Again adjust the backlash and total preload.



4. CHECK TOOTH CONTACT

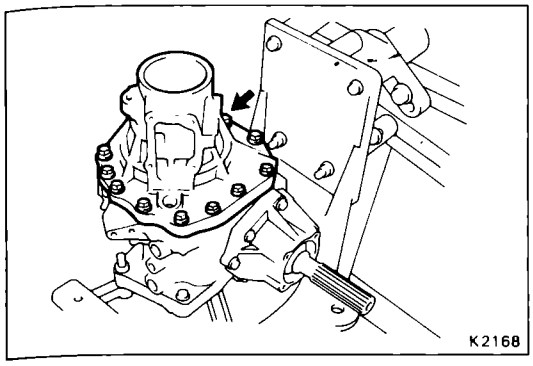
(a) Coat 3 or 4 teeth at four different position on the ring gear with red lead.

(b) Rotate the ring gear, inspect the teeth pattern.



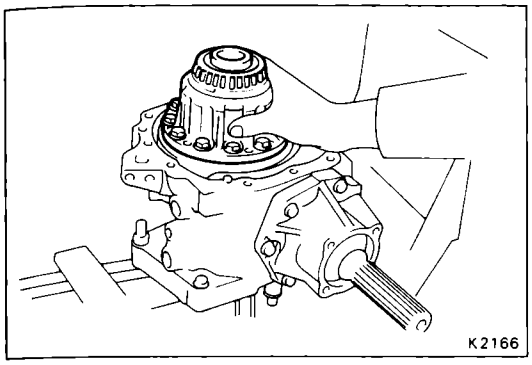
(e) If the teeth are not contacting properly, again select the proper shim and plate.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
A	0.30 (0.0118)	F	0.45 (0.0177)
B	0.33 (0.0130)	G	0.48 (0.0189)
C	0.36 (0.0142)	H	0.51 (0.0201)
D	0.39 (0.0154)	J	0.54 (0.0213)
E	0.42 (0.0165)	K	0.57 (0.0224)

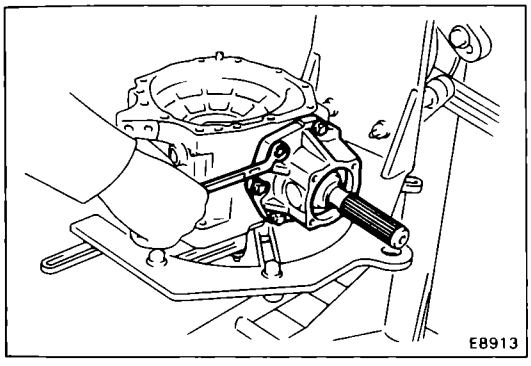


5. REMOVE RING GEAR MOUNTING CASE ASSEMBLY

(a) Remove the twelve bolts and transfer right case.

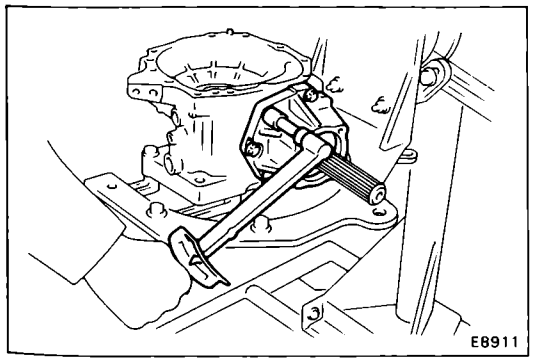


(b) Remove the ring gear mounting case assembly.



6. REMOVE DRIVEN PINION BEARING CAGE ASSEMBLY

Remove the six bolts and bearing cage assembly.



7. INSTALL DRIVEN PINION BEARING CAGE ASSEMBLY

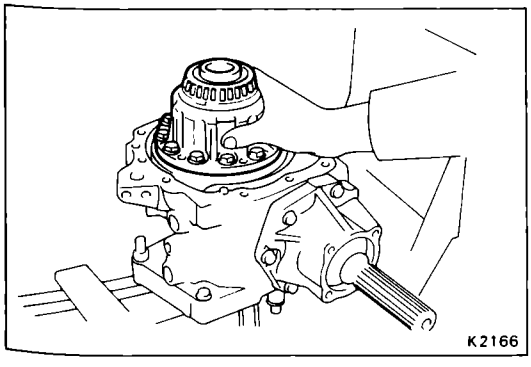
(a) Coat the O-ring with gear oil.

(b) Install the O-ring to the driven pinion bearing cage.

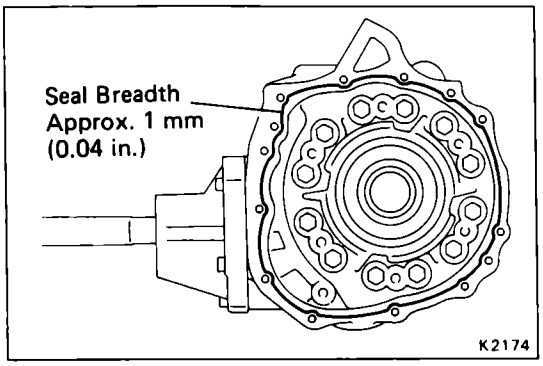
(c) Install the driven pinion bearing cage with the adjusting shim (previously selected) to the transfer left case.

(d) Install and torque the six bolts.

Torque: 400 kg-cm (29 ft-lb, 39 N·m)



8. INSTALL RING GEAR MOUNTING CASE ASSEMBLY



9. INSTALL TRANSFER RIGHT CASE

(a) Remove any packing material and be careful not to drop oil on the contacting surfaces of the transfer left case or right case.

(b) Apply seal packing to the transfer left case as shown in the figure.

Seal packing: Part No.08826-00090, THREE BOND 1281 or equivalent

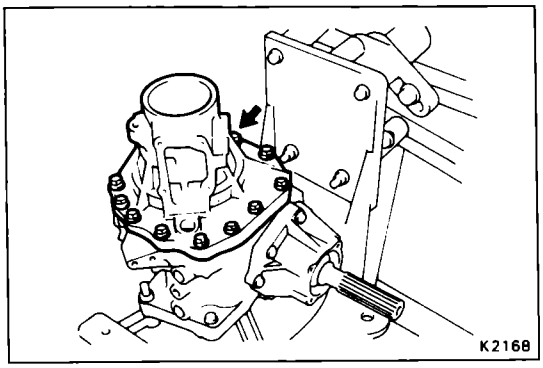
NOTE: Install the transfer right case as soon as the seal packing is applied.

(c) Apply sealant to the bolt threads.

Sealant: Part No.08833-00080, THREE BOND 1344, LOCTITE 242 OR EQUIVALENT

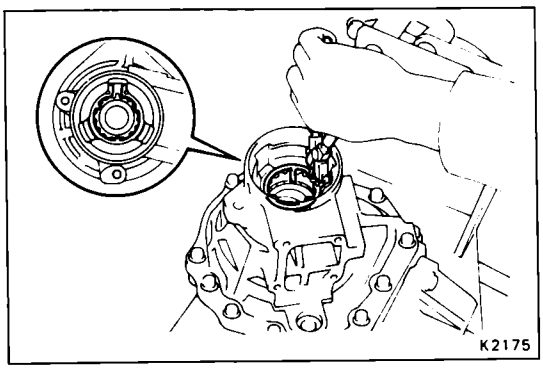
(d) Install and torque the twelve bolts.

Torque: 450 kg-cm (33 ft-lb, 44 N·m)



10. CHECK TOTAL PRELOAD

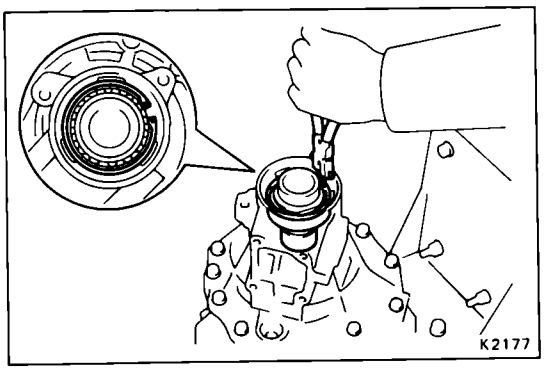
(See page MT-117)



11. INSTALL ADJUSTING NUT LOCK PLATE

Using snap ring pliers, install the lock plate so that the projection from the lock plate fits properly into the groove of the adjusting nut.

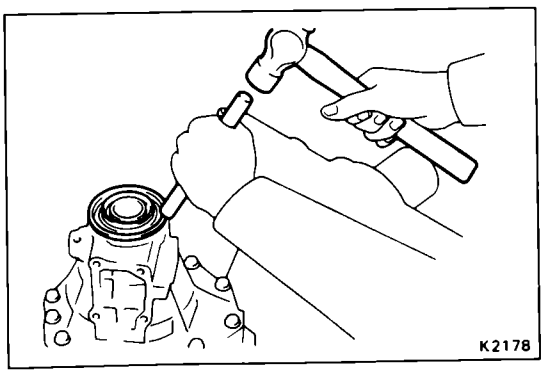
NOTE: Choose one of the two types of lock plate can be installed, tighten the adjusting nut to the minimum limit.



12. INSTALL SIDE GEAR SHAFT HOLDER

(a) Install the side gear shaft holder to the transfer right case.

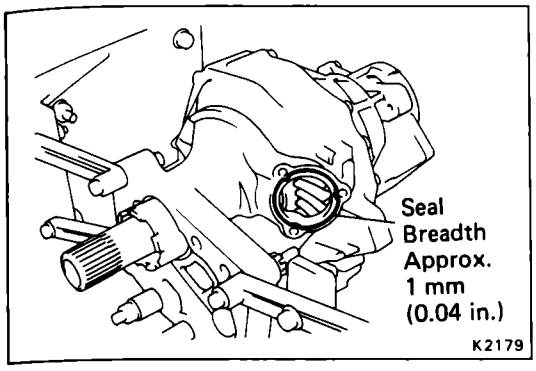
(b) Using snap ring pliers, install the snap ring.



13. INSTALL OIL SEAL

(a) Coat the lip of the oil seal with MP grease.

(b) Using a brass bar and hammer, drive in a new oil seal.



14. INSTALL TRANSFER INSPECTION HOLE COVER

(a) Remove any packing material and be careful not t drop oil on the contacting surfaces of transfer left cas or transfer inspection hole cover.

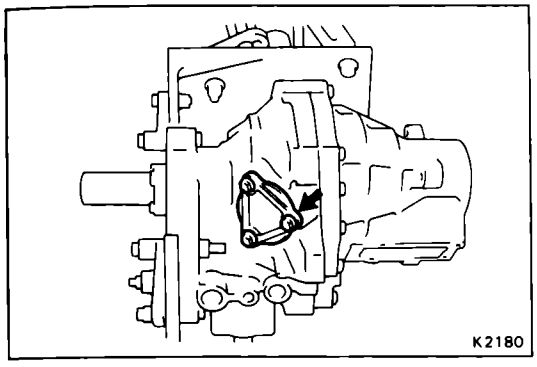
(b) Apply seal packing to the transfer left case as show in the figure.

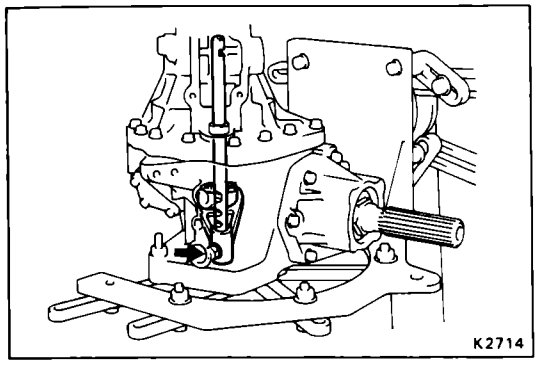
Seal packing: Part No.08826-00090, THREE BON 1281 or equivalent

NOTE: Install the transfer inspection hole cover as soo as the seal packing is applied.

(c) Install and torque the three bolts.

Torque: 160 kg-cm (12 ft-lb, 16 N·m)





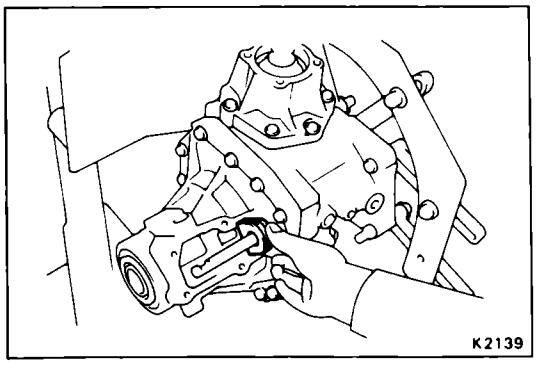
15. INSTALL DIFFERENTIAL LOCK SHIFT FORK SHAFT

(a) Install the differential lock sleeve with shift fork.

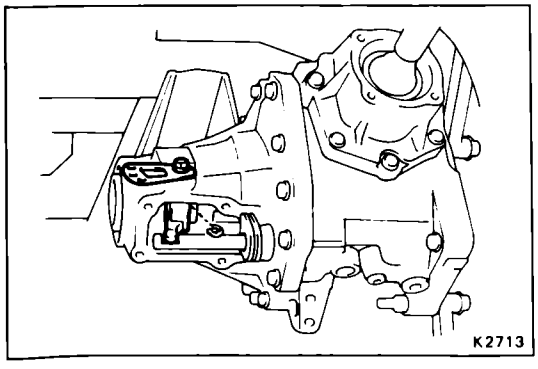
(b) Install the shift fork shaft to the transfer case.

(c) Install and torque the bolt.

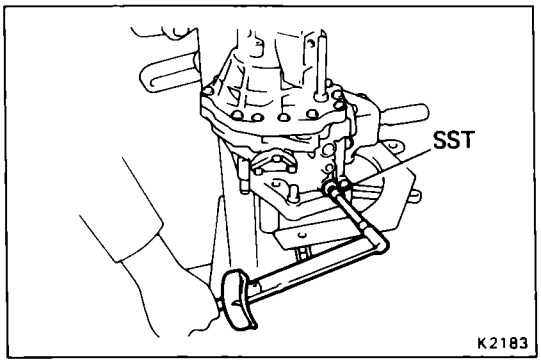
Torque: 160 kg-cm (12 ft-lb, 16 N·m)



(b) Install the transfer case upper cover bushing.



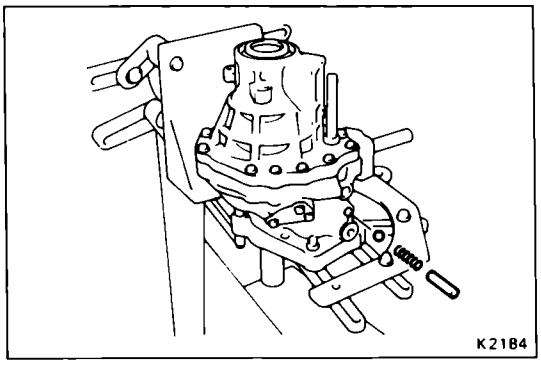
(c) Install the inner lever in the shift fork shaft groove Insert the shift lever shaft and install the E-ring.



(d) Using SST, install and torque the plug.

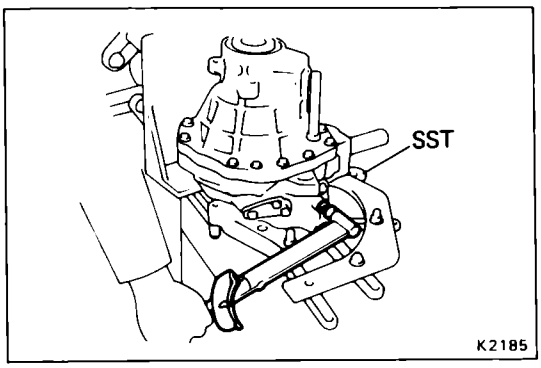
SST 09043-38100

Torque: 400 kg-cm (29 ft-lb, 39 N·m)



16. INSTALL LOCKING BALL, SPRING, SEAT AND PLUG

(a) Using magnetic finger, install the locking ball, spring and seat.



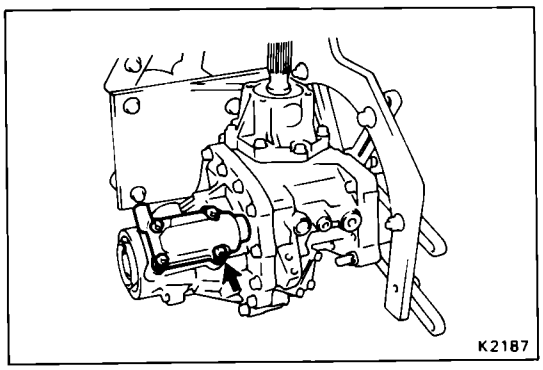
(b) Apply sealant to the plug threads.

Sealant: Part No.08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent

(c) Using SST, install and torque the plug.

SST 09313-30021

Torque: 250 kg-cm (18 ft-lb, 25 N·m)

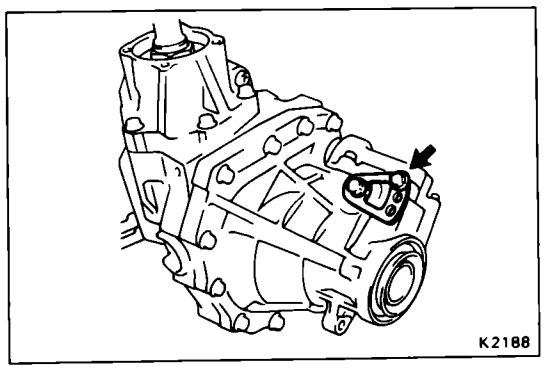


17. INSTALL TRANSFER CASE COVER

(a) Install the new gasket and case cover.

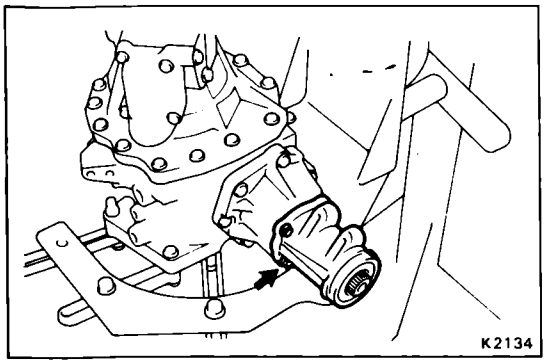
(b) Install and torque the four bolts.

Torque: 175 kg-cm (13 ft-lb, 17 N·m)



(c) Install the bolt to the shift lever shaft as shown.

Torque: 200 kg-cm (14 ft-lb, 20 N·m)



18. INSTALL EXTENSION HOUSING

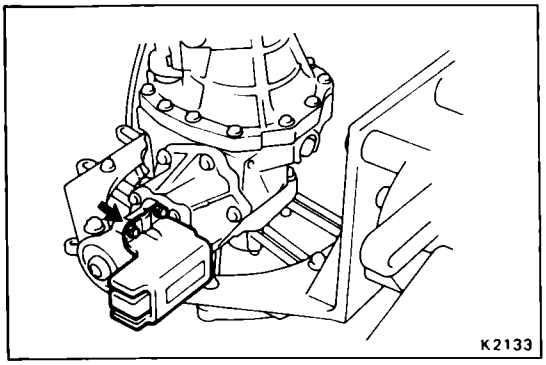
(a) Coat the O-ring with gear oil.

(b) Install the O-ring to the extension housing.

(c) Install the extension housing to the driven pinion be ing cage.

(d) Install and torque the four bolts.

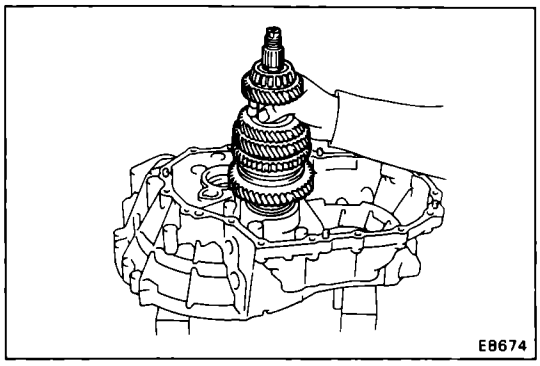
Torque: 260 kg-cm (19 ft-lb, 25 N·m)



19. INSTALL DYNAMIC DAMPER

Install and torque the four bolts.

Torque: 260 kg-cm (19 ft-lb, 25 N·m)


E8674

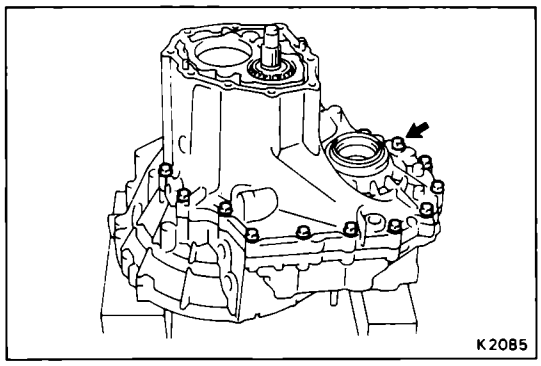
INSTALLATION OF COMPONENT PARTS

(See page MT-49 to MT-51)

NOTE: Coat all of the sliding and rotating surface with gear oil before assembly.

1. ADJUST OUTPUT SHAFT PRELOAD

(a) Install the output shaft assembly to the transaxle case.

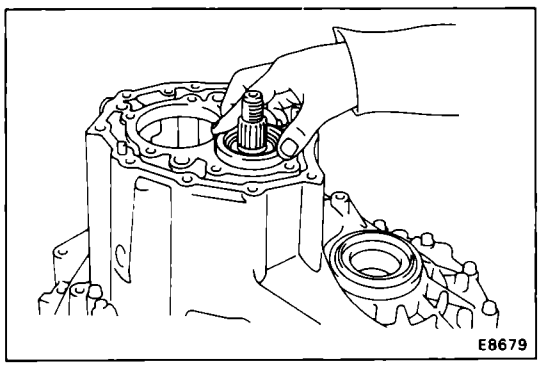

K2085

(b) Install the transmission case to the transaxle case.

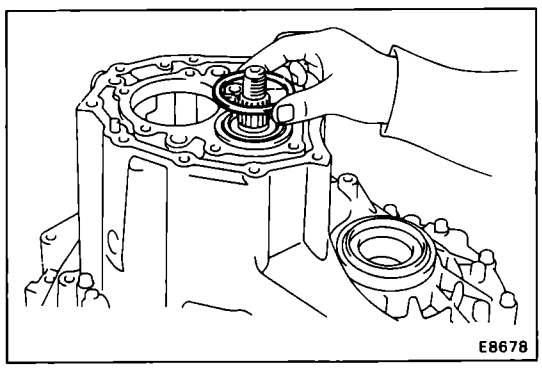
If necessary, tap on the case with a plastic hammer.

(c) Install and torque the seventeen bolts.

Torque: 300 kg-cm (22 ft-lb, 29 N·m)

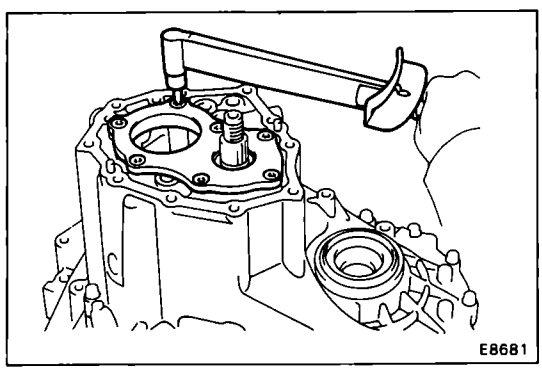

E8679

(d) Install the output shaft rear bearing outer race.


E8678

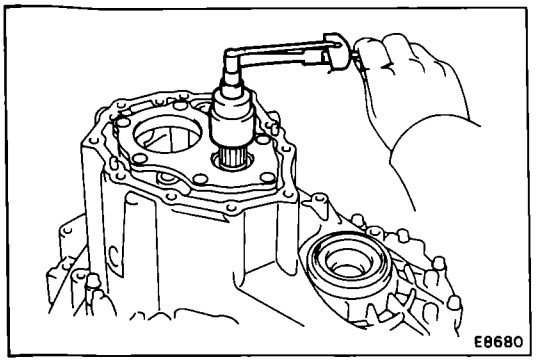
(e) Install the adjust shim.

NOTE: When reusing the output shaft bearing, first install a shim of the same thickness as before. If installing a new tapered roller bearing, first select and install a shim of lesser thickness than before.


E8681

(f) Using a torx wrench, install and torque the seven torx screws.

Torque: 430 kg-cm (31 ft-lb, 42 N·m)


E8680

(g) Install the new lock nut to the output shaft.

(h) Turn the output shaft counterclockwise and clockwi several times.

(i) Using a torque meter, measure the preload of the ou put shaft.

Preload (at starting)

New bearing

8.0 — 16.0 kg-cm

(6.9 — 13.9 in.-lb, 0.78 — 1.57 N·m)

Reused bearing

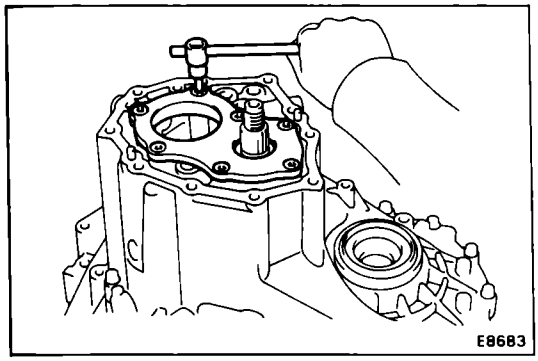
5.0 — 10.0 kg-cm

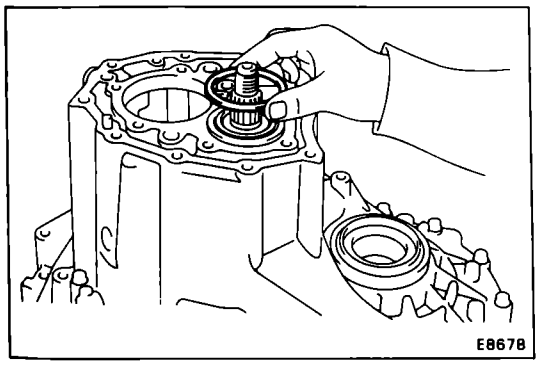
(4.3 — 8.7 in.-lb, 0.49 — 0.98 N·m)

If the preload is not within specification, select the thru washers.

NOTE: The preload will change about 4 — 5 kg-cm (3 — 4.3 in.-lb, 0.4 — 0.5 N·m) with each shim thicknes

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
—	0.80 (0.0315)	—	1.15 (0.0453)
0	1.30 (0.0512)	D	1.95 (0.0768)
1	1.35 (0.0531)	E	2.00 (0.0787)
2	1.40 (0.0551)	F	2.05 (0.0807)
3	1.45 (0.0571)	G	2.10 (0.0827)
4	1.50 (0.0591)	H	2.15 (0.0846)
5	1.55 (0.0610)	J	2.20 (0.0866)
6	1.60 (0.0630)	K	2.25 (0.0886)
7	1.65 (0.0650)	L	2.30 (0.0906)
8	1.70 (0.0669)	M	2.35 (0.0925)
9	1.75 (0.0689)	N	2.40 (0.0945)
A	1.80 (0.0709)	P	2.45 (0.0965)
B	1.85 (0.0728)	Q	2.50 (0.0984)
C	1.90 (0.0748)		

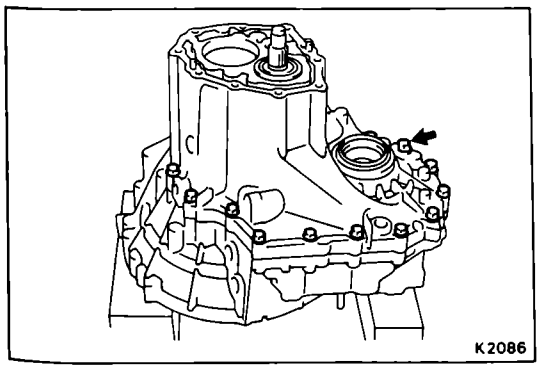

E8683


E8678

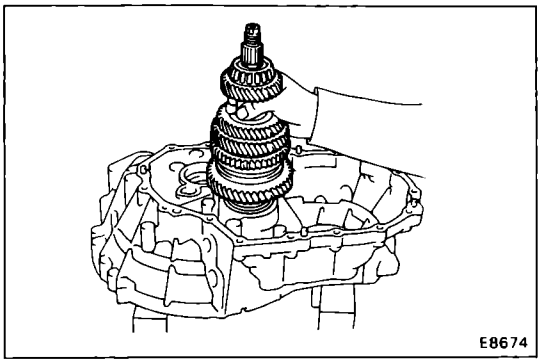
(j) Remove the lock nut.

(k) Using a torx wrench, remove the seven torx screw

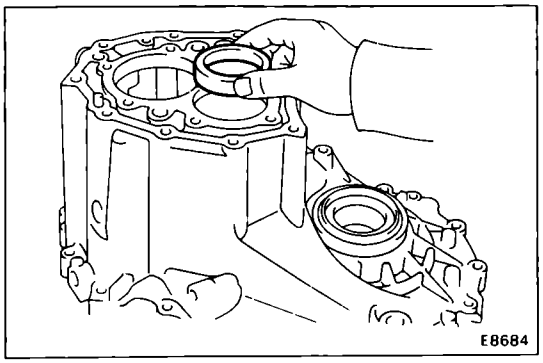
(l) Remove the adjusting shim.


K2086

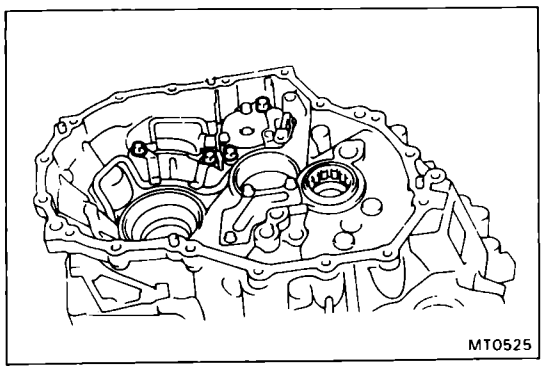
(m) Remove the seventeen bolts and tap off the case wi a plastic hammer.



(n) Remove the output shaft rear bearing outer race.



(o) Remove the output shaft assembly.



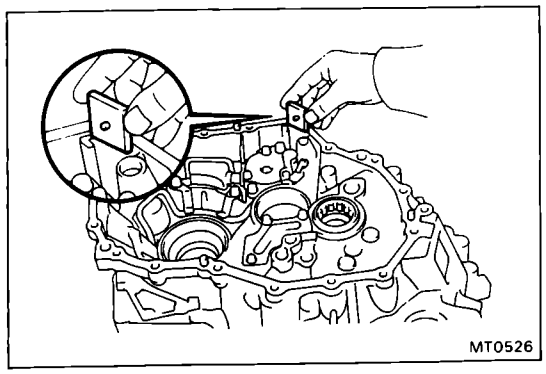
2. INSTALL OIL PUMP ASSEMBLY WITH OIL PIPE

(a) Install the oil pump assembly with oil pipe.

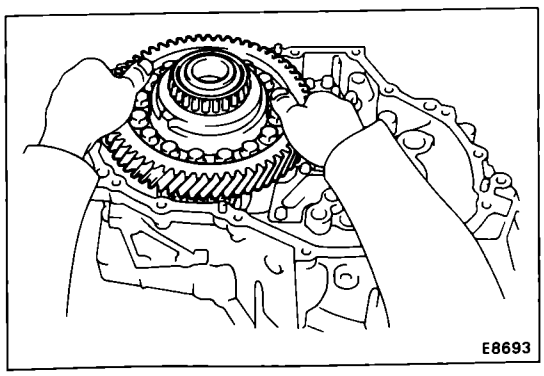
NOTE: Do not drop the oil pump gasket.

(b) Install and torque the four bolts.

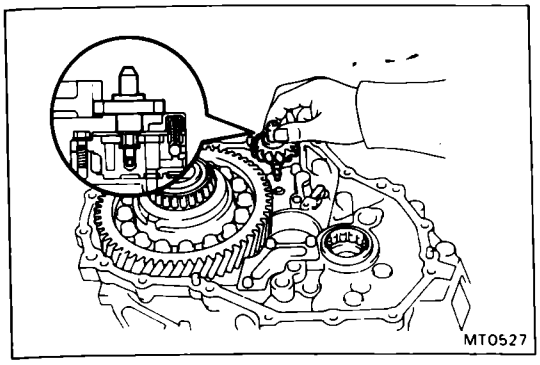
Torque: 175 kg-cm (13 ft-lb, 17 N·m)



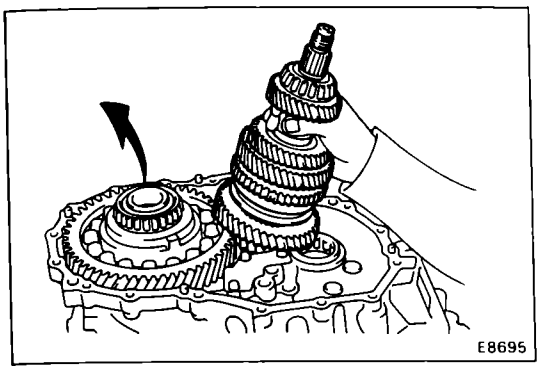
3. INSTALL MAGNET TO TRANSAXLE CASE



4. INSTALL DIFFERENTIAL CASE ASSEMBLY

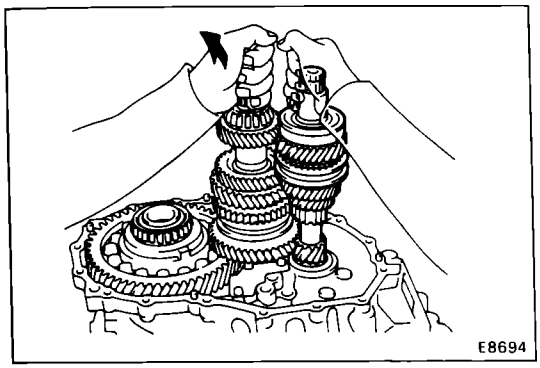


5. INSTALL OIL PUMP DRIVE GEAR



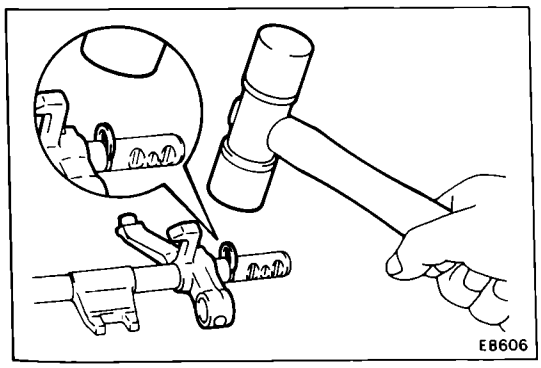
6. INSTALL OUTPUT SHAFT ASSEMBLY

Left the differential case assembly, install the output shaft assembly.



7. INSTALL INPUT SHAFT ASSEMBLY

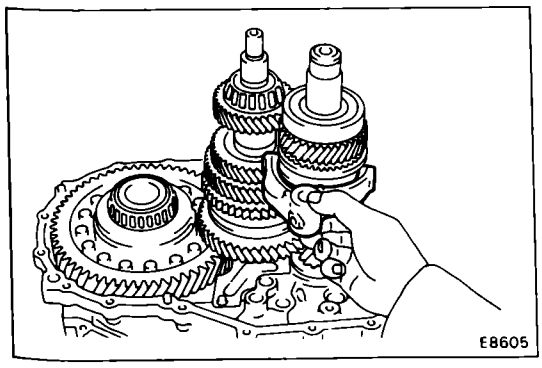
Leaning the output shaft to the differential side, install the input shaft assembly.



8. INSTALL SNAP RING

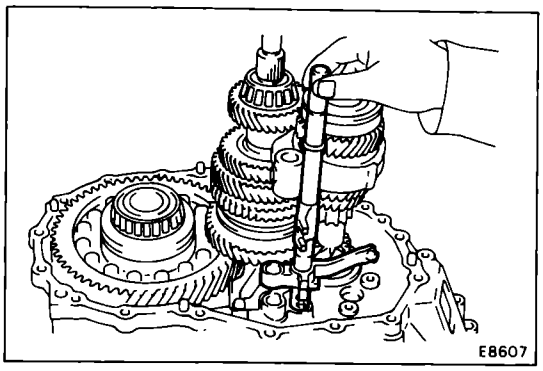
(a) Install the reverse shift fork to the No.3 shift fork.

(b) Using a hammer, install the snap ring.

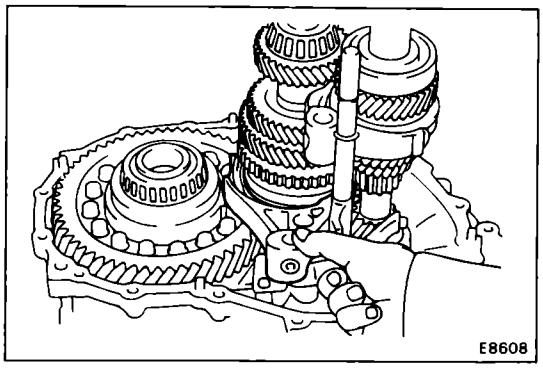


9. INSTALL NO.2 SHIFT FORK AND NO.3 SHIFT FORK SHAFT WITH REVERSE SHIFT FORK

(a) Place No.2 shift fork into the groove of No.2 hub sleeve.

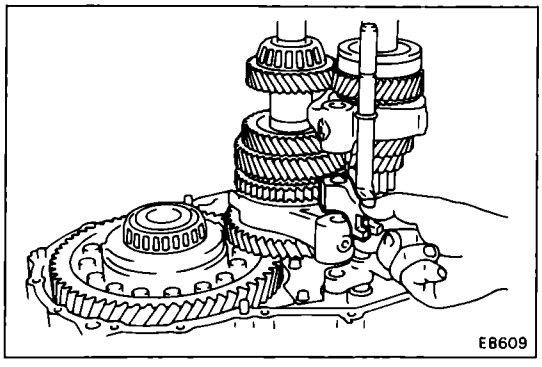


(b) Install the No.3 shift fork shaft with reverse shift fork to the case.

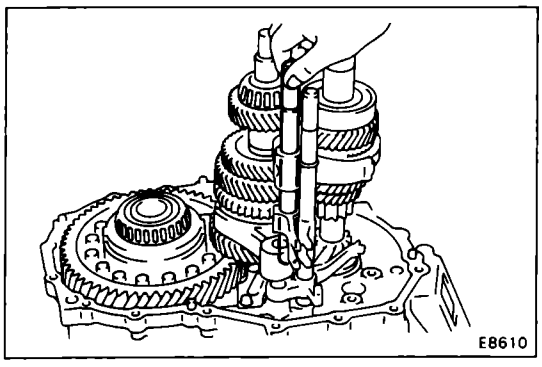


10. INSTALL NO.1 SHIFT FORK, SHIFT HEAD AND NO.2 SHIFT FORK SHAFT

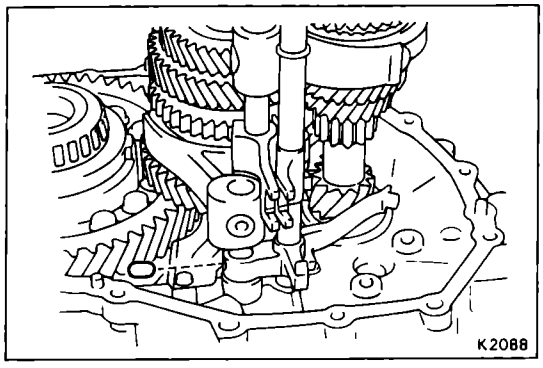
(a) Place No.1 shift fork into the groove of No.1 hub sleeve.



(b) Put shift head onto the No.1 shift fork.

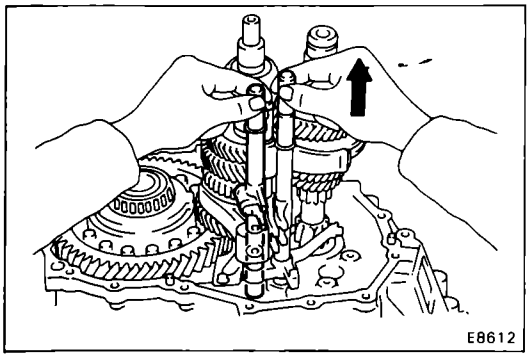


(c) Install the No.2 shift fork shaft to the case, through the No.2 shift fork, the shift head and the No.1 shift fork.



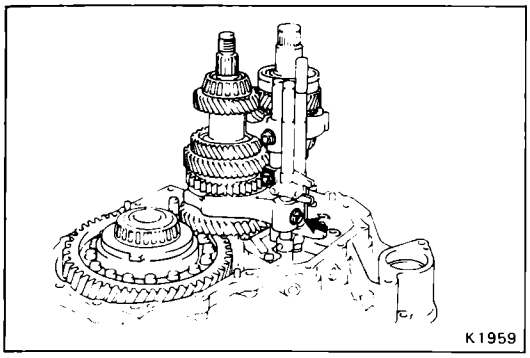
11. INSTALL NO.1 SHIFT FORK SHAFT

(a) Using a magnetic finger, install the interlock roller into the reverse shift fork.



(b) Install the No.1 shift fork shaft to the case, through the No.1 shift fork and reverse shift fork.

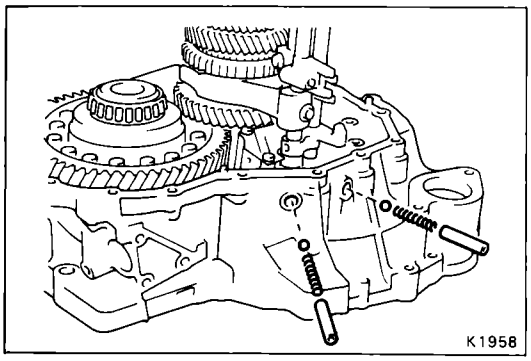
NOTE: If it is difficult to put the fork shaft through the reverse shift fork, pull up the No.3 shift fork shaft.



12. INSTALL SET BOLTS

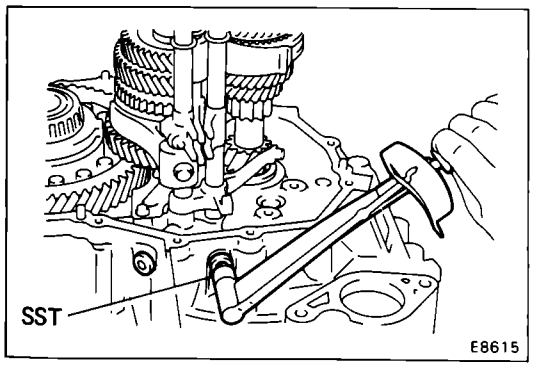
Install and torque the three bolts.

Torque: 240 kg-cm (17 ft-lb, 24 N·m)



13. INSTALL LOCKING BALLS, SPRINGS, SPRING SEATS AND SCREW PLUGS

(a) Install the two locking balls, spring and spring seats.



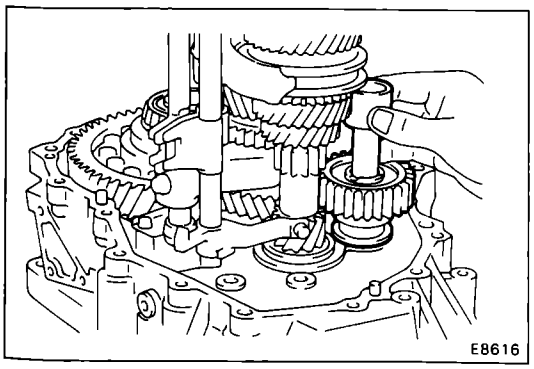
(b) Apply sealant to the screw plugs.

Sealant: Part No.08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent

(c) Using SST, torque the screw plugs.

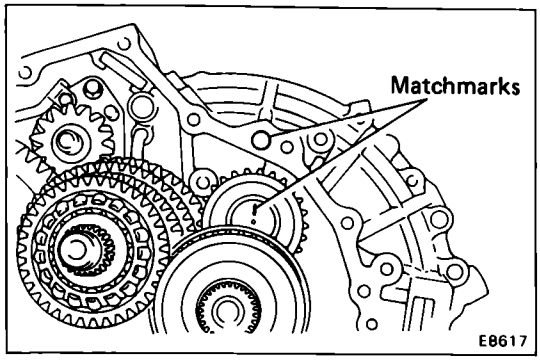
SST 09313-30021

Torque: 250 kg-cm (18 ft-lb, 25 N·m)

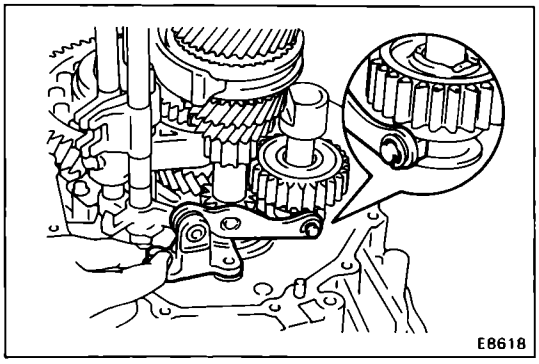


14. INSTALL REVERSE IDLER GEAR SHAFT AND GEAR

(a) Install the reverse idler gear shaft with gear to the case.



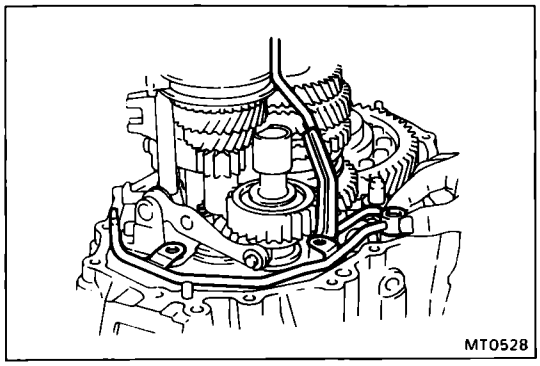
(c) Align the matchmarks, as shown.



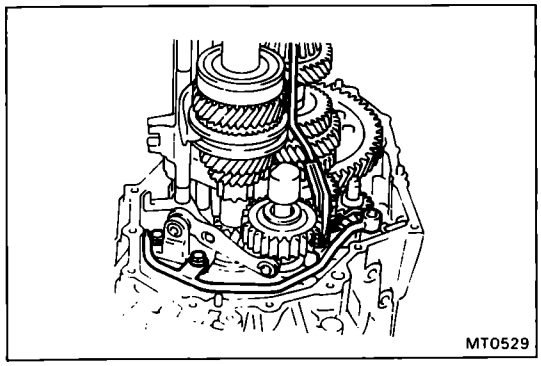
15. INSTALL REVERSE SHIFT ARM BRACKET ASSEMBLY AND NO.2 OIL PIPE

(a) Put the reverse shift fork pivot into the reverse shift arm and install the reverse shift arm bracket to the transaxle case.

(b) Install the bolt.

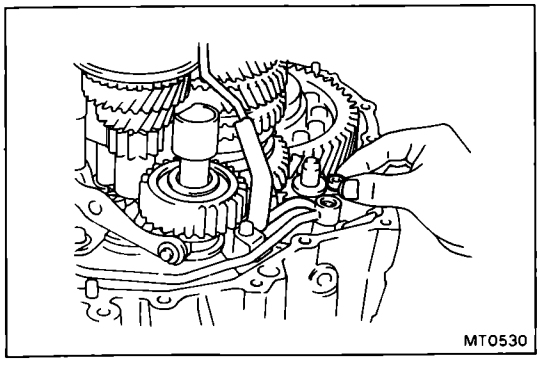


(c) Install the No.2 oil pipe.

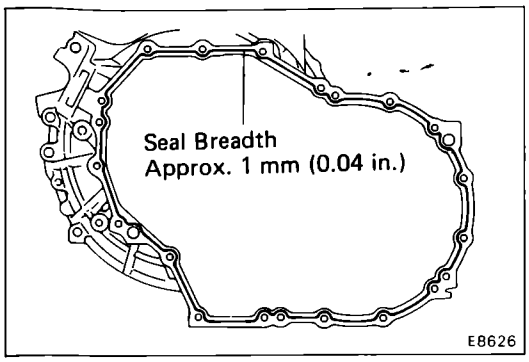


(d) Torque the two oil pipe bolts and shift arm bracket bolt.

Torque: 175 kg-cm (13 ft-lb, 17 N·m)



(e) Install the new gasket to the oil pipe.



16. INSTALL TRANSMISSION CASE

(a) Remove any packing material and be careful not to drop oil on the contacting surfaces of the transaxle case.

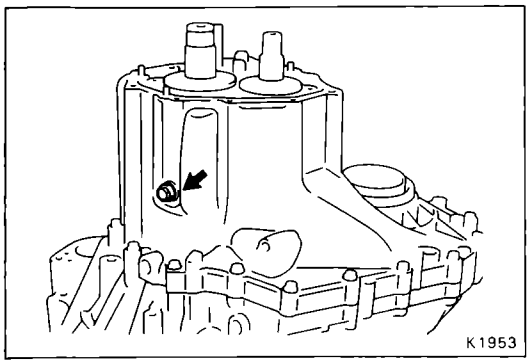
(b) Apply seal packing to the transmission case as shown in the figure.

Seal packing: Part No.08826-00090, THREE BOND 1281 or equivalent

NOTE: Install the transmission case as soon as the seal packing is applied.

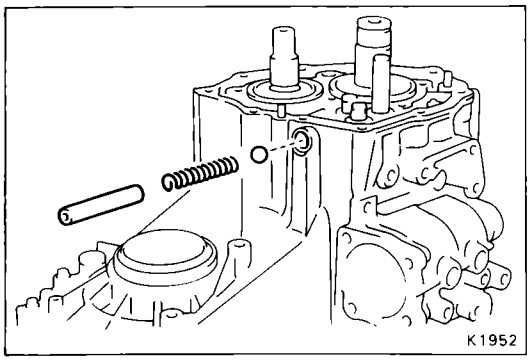
(c) Install and torque the seventeen bolts.

Torque: 300 kg-cm (22 ft-lb, 29 N·m)



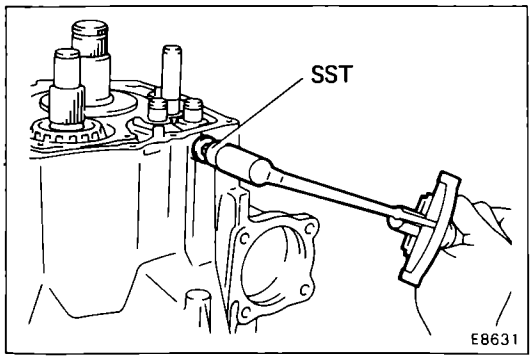
17. INSTALL AND TORQUE REVERSE IDLER GEAR SHAFT BOLT WITH GASKET

Torque: 300 kg-cm (22 ft-lb, 29 N·m)



18. INSTALL LOCKING BALL, SPRING, SPRING SEAT AND SCREW PLUG

(a) Install the locking ball, spring and spring seat.



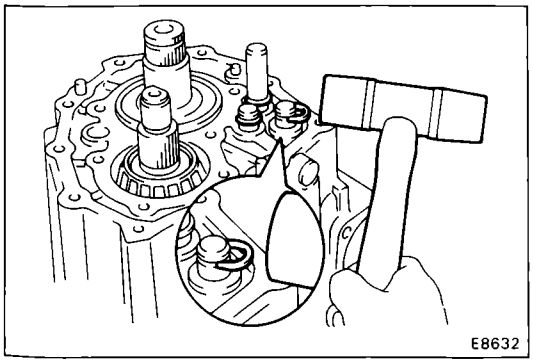
(b) Apply sealant to the screw plug.

Sealant: Part No.08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent

(c) Using SST, torque the screw plug.

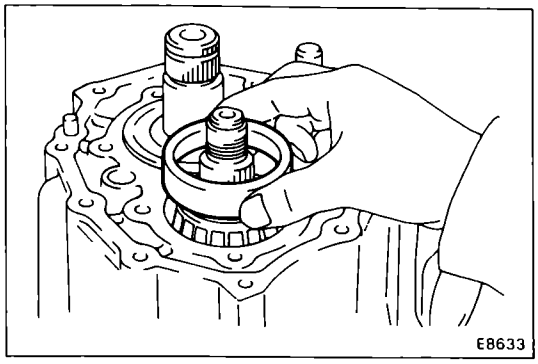
SST 09313-30021

Torque: 250 kg-cm (18 ft-lb, 25 N·m)



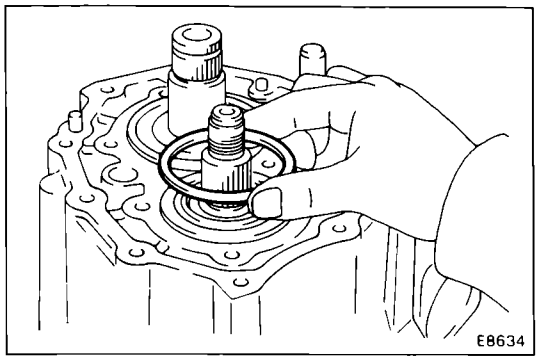
19. INSTALL SNAP RINGS

Using a plastic hammer, install the three snap rings.

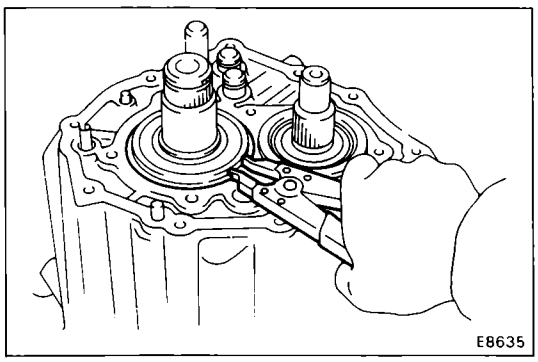


20. INSTALL REAR BEARING RETAINER

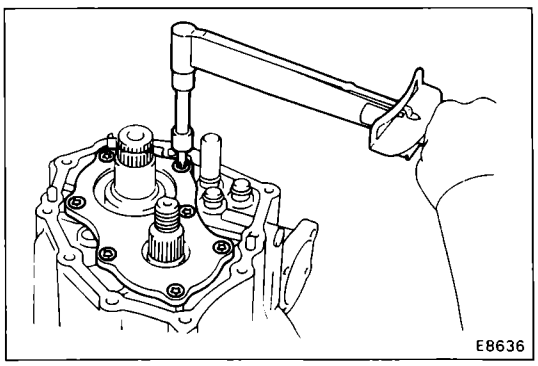
(a) Install the output shaft rear bearing outer race.



(b) Install the adjusting shim.



(c) Using snap ring pliers, install the snap ring to the input shaft rear bearing.

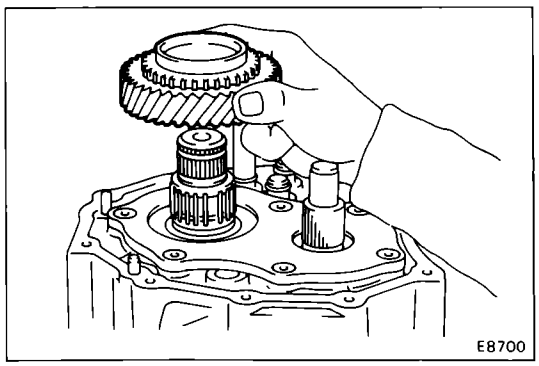


(d) Apply sealant to the screw plugs.

Sealant: Part No.08833-00070, THREE BOND 1324, LOCTITE 242 or equivalent

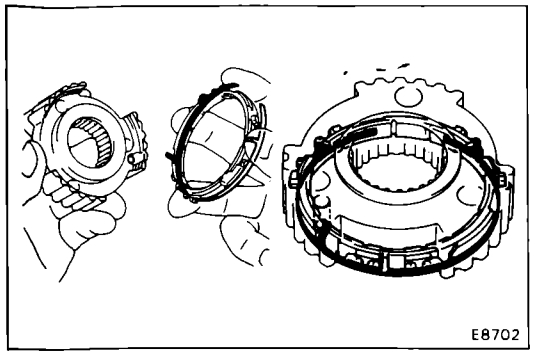
(e) Using a torx wrench, torque the screw plug.

Torque: 430 kg-cm (31 ft-lb, 42 N·m)

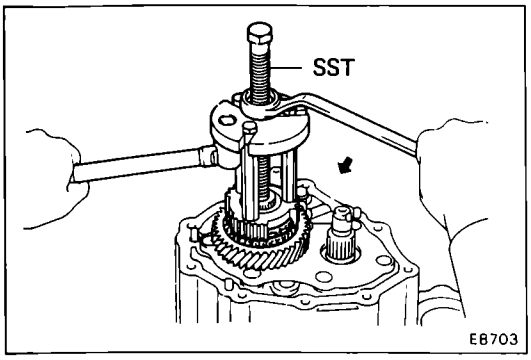


21. INSTALL FIFTH GEAR AND NO.3 CLUTCH HUB

(a) Install the spacer, needle roller bearings and 5th gear.


E8702

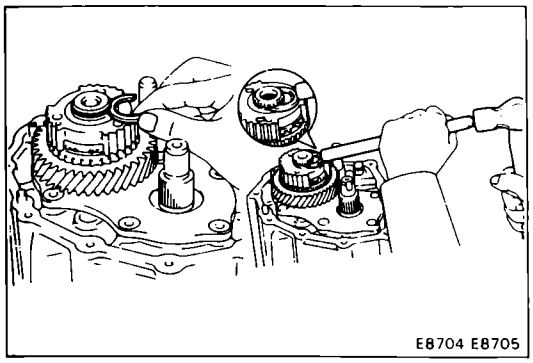
(b) Install the synchronizer ring and key spring to the No.3 clutch hub.



E8703

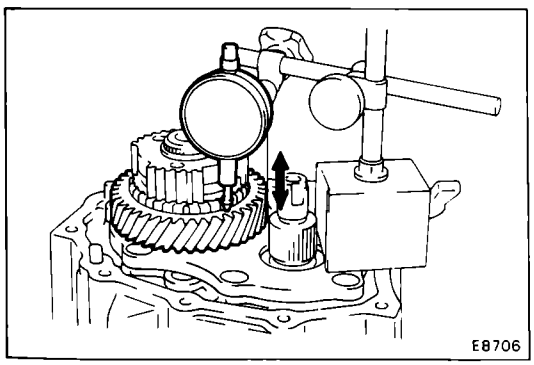
(c) Using SST, install the No.3 clutch hub with synchronizer ring and key spring.

SST 09310-17010 (09310-07010, 09310-07020, 09310-07030)


E8704 E8705

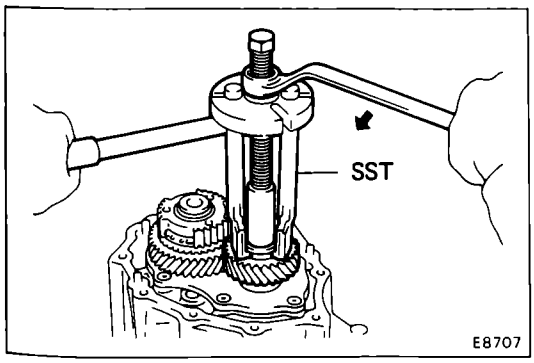
(d) Select a snap ring that will allow minimum axial play and install it on the shaft.

Mark	Thickness	mm (in.)
Q	2.25 — 2.30	(0.0886 — 0.0906)
R	2.30 — 2.35	(0.0906 — 0.0925)
S	2.35 — 2.40	(0.0925 — 0.0945)
T	2.40 — 2.45	(0.0945 — 0.0965)
U	2.45 — 2.50	(0.0965 — 0.0984)
V	2.50 — 2.55	(0.0984 — 0.1004)
W	2.55 — 2.60	(0.1004 — 0.1024)
X	2.60 — 2.65	(0.1024 — 0.1043)
Y	2.65 — 2.70	(0.1043 — 0.1063)


E8706

(e) Using a dial indicator, measure the 5th gear thrust clearance.

Standard clearance: 0.10 — 0.57 mm (0.004 — 0.022 in.)

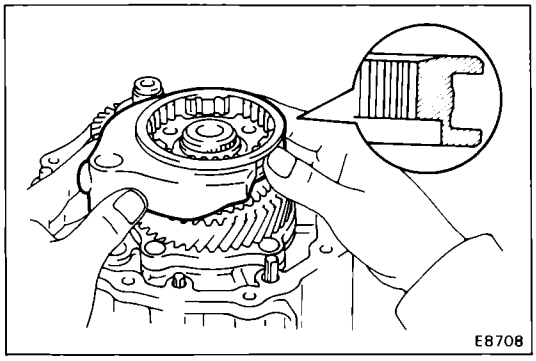


E8707

22. INSTALL FIFTH DRIVEN GEAR

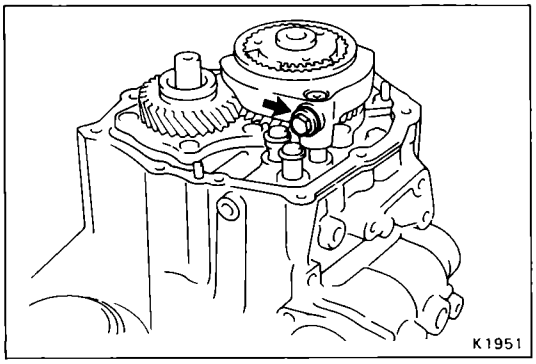
Using SST, install the 5th driven gear.

SST 09310-17010 (09310-07010, 09310-07020 09310-07040, 09310-07050)



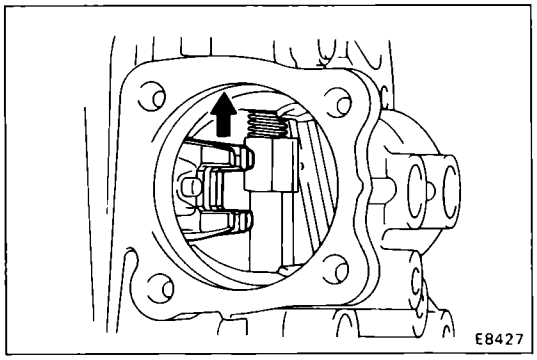
23. INSTALL NO.3 HUB SLEEVE AND FIFTH SHIFT FORK

(a) Install the No.3 hub sleeve and 5th shift fork.



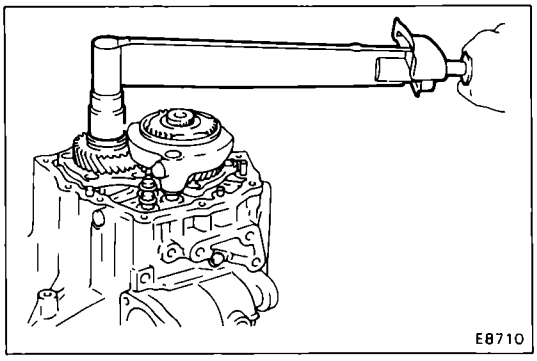
(b) Install and torque the set bolt.

Torque: 240 kg-cm (17 ft-lb, 24 N·m)



24. INSTALL LOCK NUT

(a) Engage the gear double meshing.

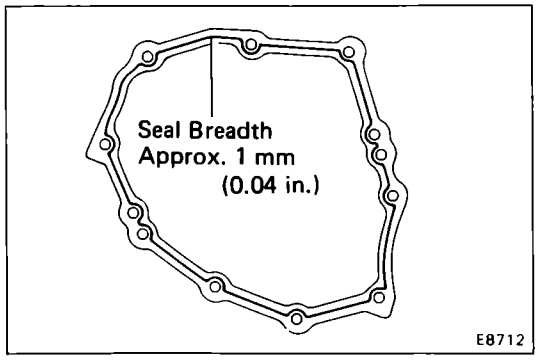


(b) Install and torque the nut.

Torque: 1,250 kg-cm (90 ft-lb, 123 N·m)

(c) Disengage the gear double meshing.

(d) Stake the lock nut.



25. INSTALL TRANSMISSION CASE COVER

(a) Remove any packing material and be careful not to drop oil on the contacting surfaces of the transmission case cover.

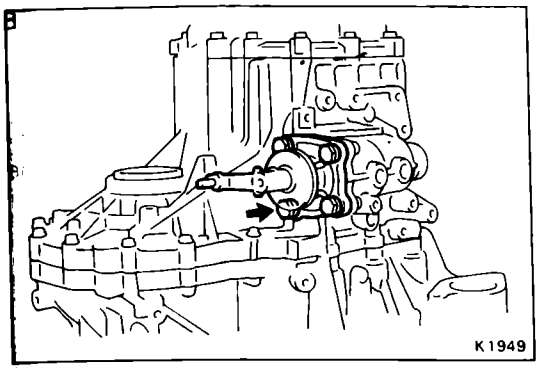
(b) Apply seal packing to the transmission case as shown in the figure.

Seal packing: Part No.08826-00090, THREE BOND 1281 or equivalent

NOTE: Install the transmission case cover as soon as the seal packing is applied.

(c) Install and torque the ten bolts.

Torque: 300 kg-cm (22 ft-lb, 29 N·m)



26. INSTALL SHIFT AND SELECT LEVER SHAFT ASSEM

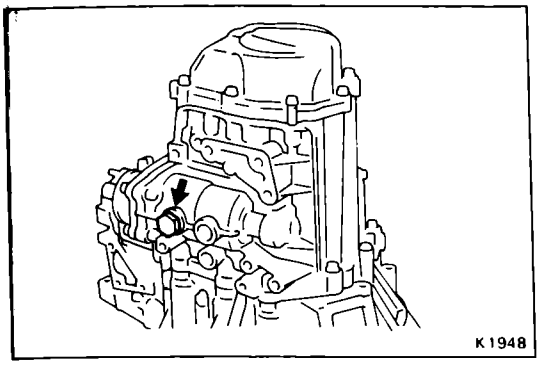
(a) Install the shift and select lever shaft assembly new gasket.

(b) Apply sealant to the bolt threads.

Sealant: Part No.08833-00080, THREE BOND 134 LOCTITE 242 or equivalent

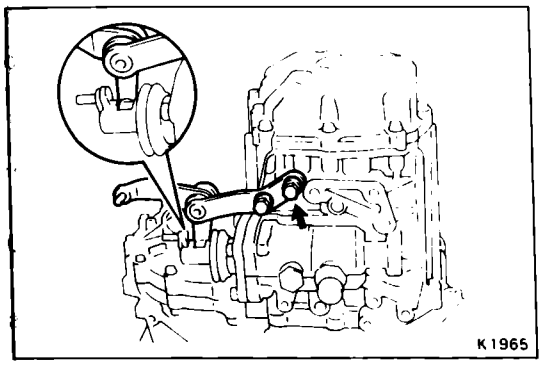
(c) Install and torque the four bolts.

Torque: 200 kg-cm (14 ft-lb, 20 N·m)



(d) Install and torque the lock bolt with gasket.

Torque: 500 kg-cm (36 ft-lb, 49 N·m)



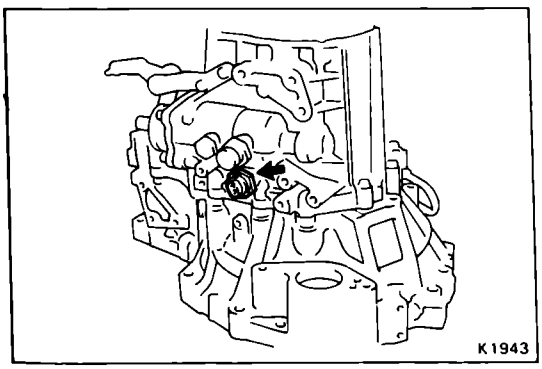
27. INSTALL NO.2 SELECTING BELLCRANK WITH SELECTI BELLCRANK SUPPORT

(a) Apply sealant to the bolt threads.

Sealant: Part No.08833-00080, THREE BOND 134· LOCTITE 242 or equivalent

(b) Install and torque the two bolts.

Torque: 200 kg-cm (14 ft-lb, 20 N·m)

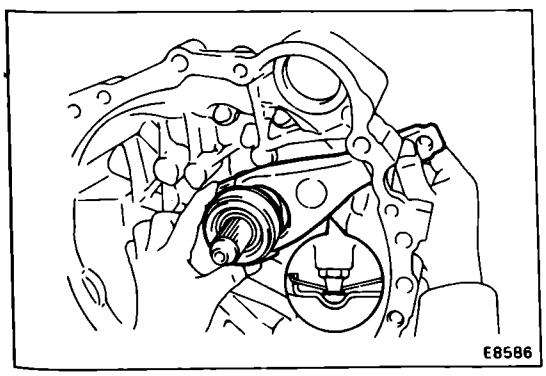


28. INSTALL BACK-UP LIGHT SWITCH

Using SST, install and torque the back-up light switc

Torque: 410 kg-cm (30 ft-lb, 40 N·m)

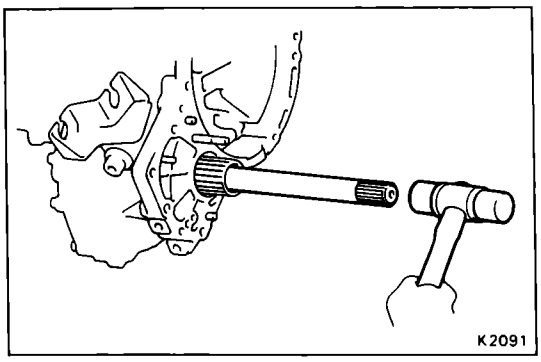
29. INSTALL SPEEDOMETER DRIVEN GEAR



30. INSTALL RELEASE FORK AND BEARING

Apply molybdenum disulphide lithium base grease to t following part:

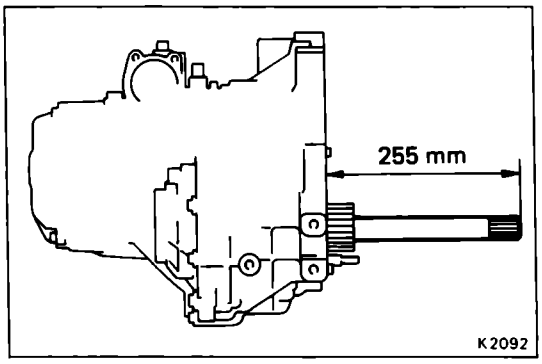
- Release bearing hub inside groove
- Input shaft spline
- Release fork contact surface



31. INSTALL DIFFERENTIAL SIDE GEAR INTERMEDIATE SHAFT

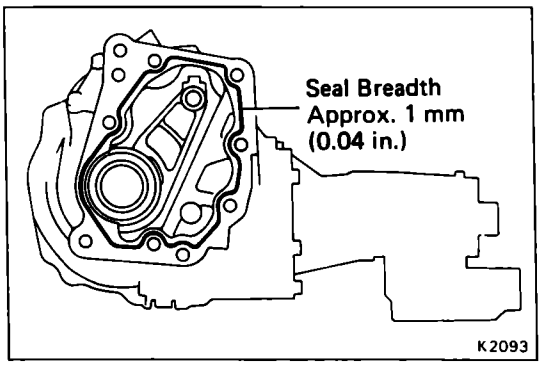
(a) Coat the MP grease to the intermediate shaft.

(b) Using a plastic hammer, correctly drive the intermediate shaft straight until the top of it touches the differential pinion shaft.



NOTE: Keeping the intermediate shaft on the pinion shaft of differential, measure the point in the illustration.

Protrusion length: 255 mm (10.04 in.)



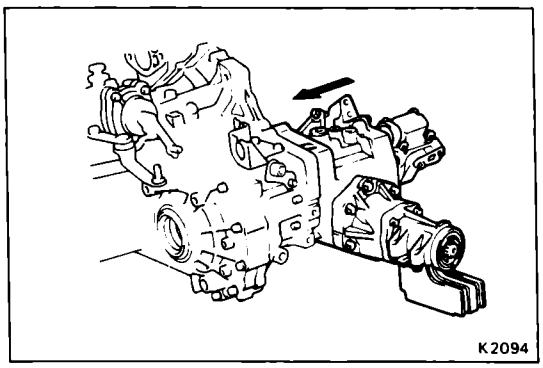
32. INSTALL TRANSFER ASSEMBLY

(a) Remove any packing material and be careful not to drop oil on the contacting surfaces of the transfer or transaxle.

(b) Apply seal packing to the transfer as shown in the figure.

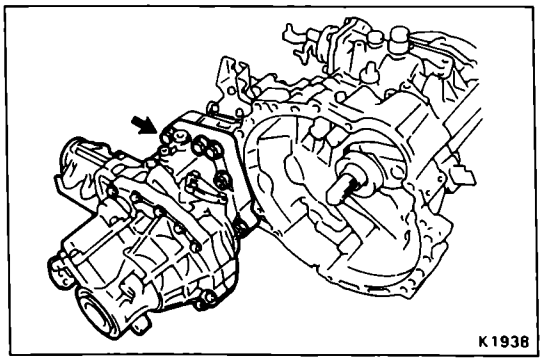
Seal packing: Part No.08826-00090, THREE BOND 1281 or equivalent

NOTE: Install the transfer as soon as the seal packing is applied.



(c) Install the transfer assembly to the transaxle assembly.

NOTE: Shift into 4th gear, install the transfer assembly while turning the input shaft of the transaxle.



(d) Apply sealant to the bolt threads.

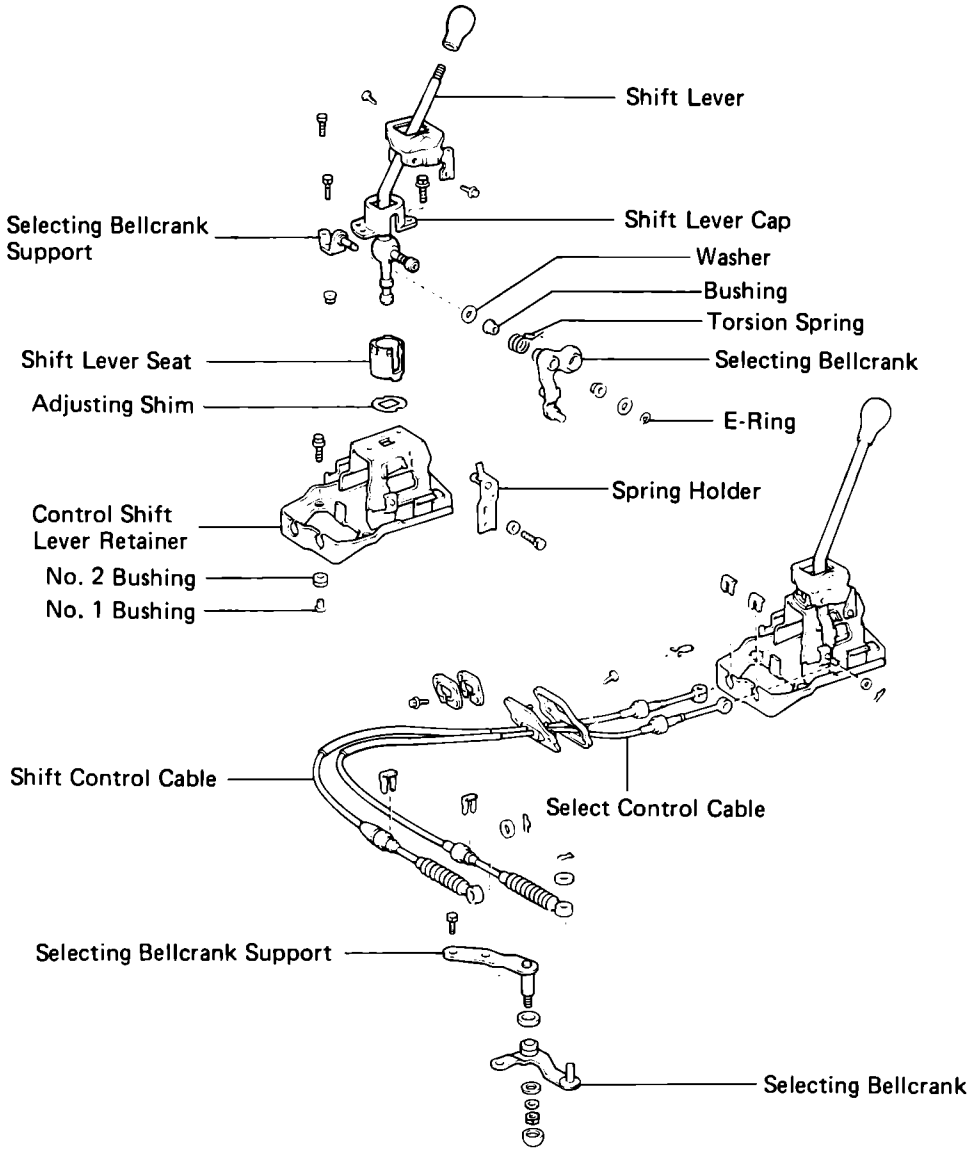
Sealant: Part No.08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent

(e) Install and torque the three bolts and five nuts.

Torque: 700 kg-cm (51 ft-lb, 69 N·m)

SHIFT LEVER AND CONTROL CABL

COMPONENTS

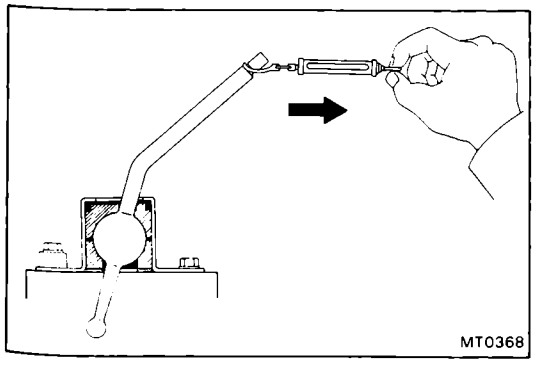


MT033

ADJUSTMENT OF SHIFT LEVER FREEPLAY

ADJUST SHIFT LEVER SEAT CLEARANCE

Select a shim of a thickness that allow a preload of 50 – 100 g (0.1 — 0.2 lb, 0.5 1.0 N) at the top of lever an install it in the shift lever seat.



MT0368

Shim thickness

Mark	Thickness	mm (in.)	Mark	Thickness	mm (in.)
C or 5	0.5	(0.020)	G or 9	0.9	(0.035)
D or 6	0.6	(0.024)	H or 10	1.0	(0.039)
E or 7	0.7	(0.028)	K or 11	1.1	(0.043)
F or 8	0.8	(0.031)	L or 12	1.2	(0.047)