SECTION MT
MANUAL TRANSAXLE

CONTENTS

RS5F30A

RS5F70A

RS6F51A

PRECAUTIONS

PFP:00001

Caution

ECS005GI

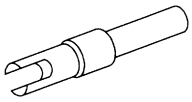
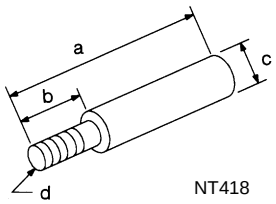
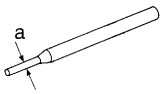
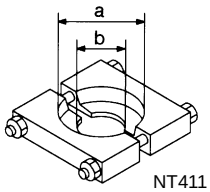
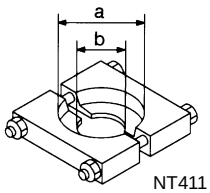
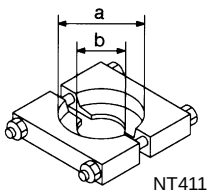
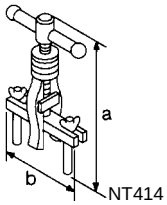
- Do not reuse transaxle oil, once it has been drained.
- Check oil level or replace oil with vehicle on level ground.
- During removal or installation, keep inside of transaxle clear of dust or dirt.
- Check for the correct installation status prior to removal or disassembly. If mating marks are required, be certain they do not interfere with the function of the parts they are applied to.
- In principle, tighten bolts or nuts gradually in several steps working diagonally from inside to outside. If tightening sequence is specified, observe it.
- Be careful not to damage sliding surfaces and mating surfaces.

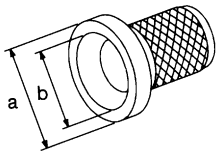
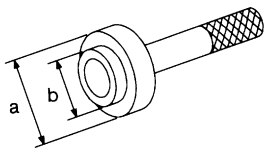
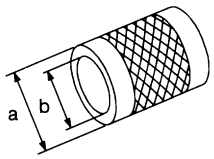
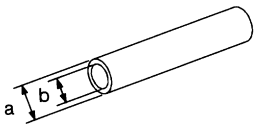
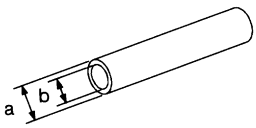
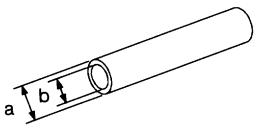
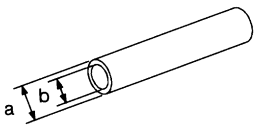
PREPARATION

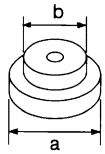
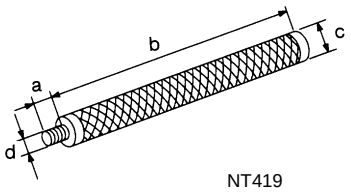
PFP:00002

Special Service Tools

ECS006BN

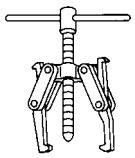
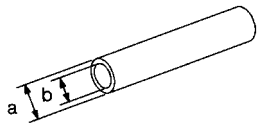
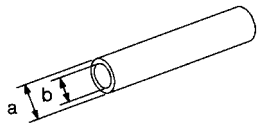
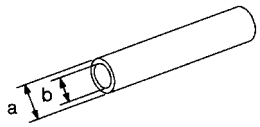
Tool number Tool name	Description
KV38105900 Preload adapter  NT087	● Measuring turning torque of final drive assembly ● Measuring total turning torque ● Measuring clearance between side gear and differential case with washer ● Selecting differential side bearing adjusting shim (Use with KV38106000.)
KV38106000 Height gauge adapter (differential side bearing) a: 140 mm (5.51 in) b: 40 mm (1.57 in) c: 16 mm (0.63 in) dia. d: M8 x 1.25P  NT418	● Selecting differential side bearing adjusting shim (Use with KV38105900.)
KV32101000 Pin punch a: 4 mm (0.16 in) dia.  NT410	● Removing and installing retaining pin
ST22730000 Puller a: 82 mm (3.23 in) dia. b: 30 mm (1.18 in) dia.  NT411	● Removing mainshaft front and rear bearing inner race Removing 5th main gear
ST30031000 Puller a: 90 mm (3.54 in) dia. b: 50 mm (1.97 in) dia.  NT411	● Removing differential side bearing inner race
ST30021000 Puller a: 110 mm (4.33 in) dia. b: 68 mm (2.68 in) dia.  NT411	● Removing 5th synchronizer
ST33290001 Puller a: 250 mm (9.84 in) b: 160 mm (6.30 in)  NT414	● Removing differential oil seal ● Removing mainshaft front bearing outer race ● Removing differential side bearing outer race

Tool number Tool name	Description
ST33400001 Drift a: 60 mm (2.36 in) dia. b: 47 mm (1.85 in) dia.  NT086	● Installing differential oil seal
KV38102100 Drift a: 44 mm (1.73 in) dia. b: 24.5 mm (0.965 in) dia.  NT427	● Installing input shaft rear bearing
ST33200000 Drift a: 60 mm (2.36 in) dia. b: 44.5 mm (1.752 in) dia.  NT091	● Installing mainshaft front bearing outer race
ST22350000 Drift a: 34 mm (1.34 in) dia. b: 28 mm (1.10 in) dia.  NT065	● Installing input shaft front bearing
ST22452000 Drift a: 45 mm (1.77 in) dia. b: 36 mm (1.42 in) dia.  NT065	● Installing 1st & 2nd synchronizer
ST37750000 Drift a: 40 mm (1.57 in) dia. b: 31 mm (1.22 in) dia.  NT065	● Installing 5th main gear ● Installing 3rd & 4th synchronizer ● Installing input shaft oil seal ● Installing 5th synchronizer
ST22360002 Drift a: 29 mm (1.14 in) dia. b: 23 mm (0.91 in) dia.  NT065	● Installing mainshaft rear bearing inner race

Tool number Tool name	Description
ST30621000 Drift a: 79 mm (3.11 in) dia. b: 59 mm (2.32 in) dia.  NT073	● Installing differential side bearing outer race (Use with ST30611000.)
ST30611000 Drift handle a: 15 mm (0.59 in) b: 335 mm (13.19 in) c: 25 mm (0.98 in) dia. d: M12 x 1.5P  NT419	● Installing differential side bearing outer race (Use with ST30621000.)

Commercial Service Tools

ECS006BO

Tool name	Description
Puller  NT077	● Removing input shaft front bearing
Drift a: 26 mm (1.02 in) dia. b: 21 mm (0.83 in) dia.  NT065	● Installing mainshaft front bearing inner race
Drift a: 56 mm (2.20 in) dia. b: 50.5 mm (1.988 in) dia.  NT065	● Installing differential side bearing inner race
Drift a: 38 mm (1.50 in) dia. b: 32 mm (1.26 in) dia.  NT065	● Installing striking rod oil seal

NOISE, VIBRATION, AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

ECS005GL

Use the chart below to help you find the cause of the symptom. The numbers indicate the order of the inspection. If necessary, repair or replace these parts.

MANUAL TRANSAXLE

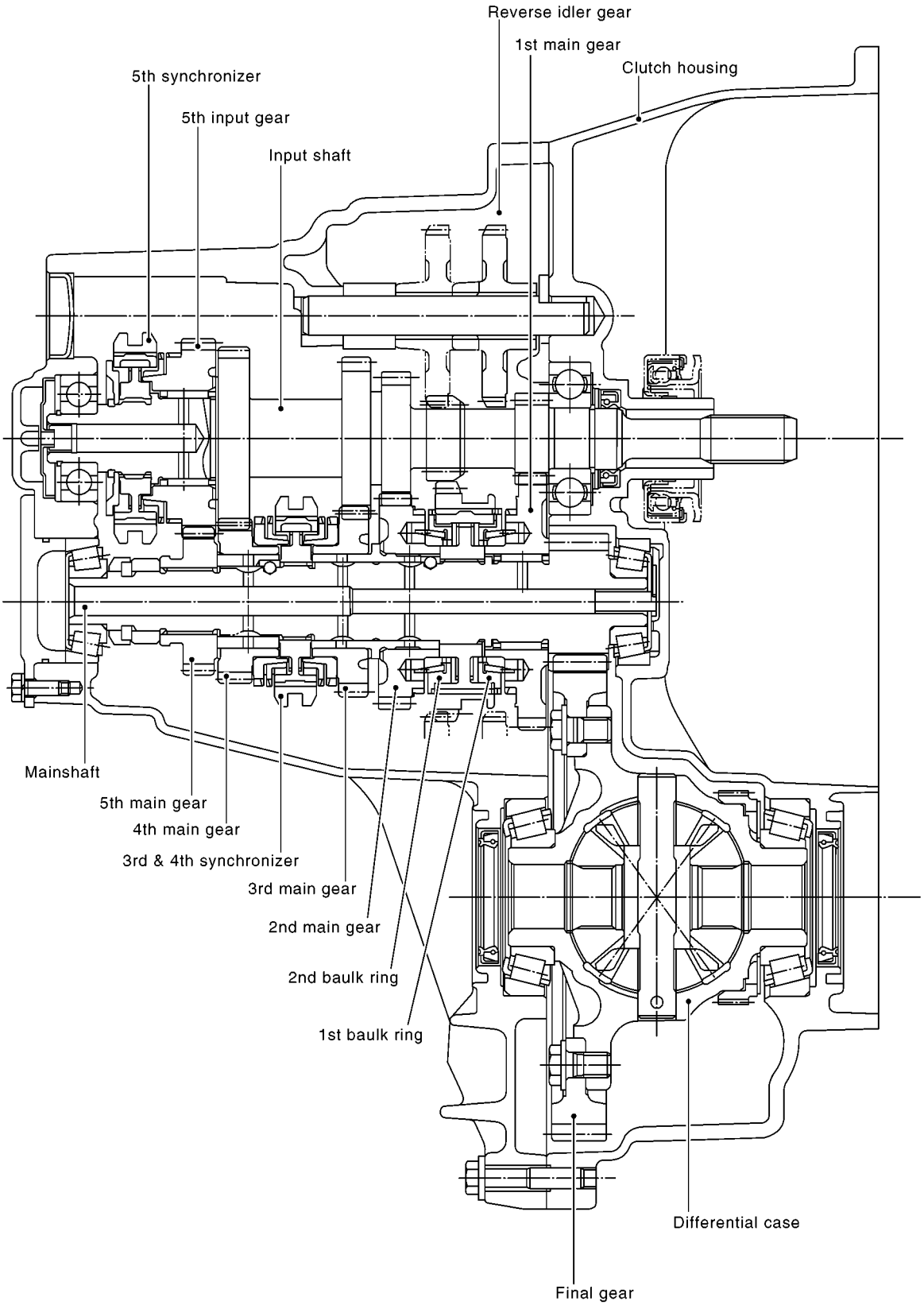
Reference page		MT-11	MT-11	MT-11	MT-19	MT-19	MT-19	MT-15	MT-21	MT-21	MT-20	MT-20	MT-20	MT-20
SUSPECTED PARTS (Possible cause)		(Oil level is low.)	(Wrong oil)	(Oil level is high.)	GASKET (Damaged)	OIL SEAL (Worn or damaged)	O-RING (Worn or damaged)	SHIFT CONTROL ROD (Worn)	CHECK PLUG RETURN SPRING AND CHECK BALL (Worn or damaged)	SHIFT FORK (Worn)	GEAR (Worn or damaged)	BEARING (Worn or damaged)	BAULK RING (Worn or damaged)	INSERT SPRING (Damaged)
Symptoms	Noise	1	2									3	3	
	Oil leakage		3	1	2	2	2							
	Hard to shift or will not shift		1	1				2					3	3
	Jumps out of gear							1	2	3	3			

DESCRIPTION

PFP:00000

Cross-Sectional View

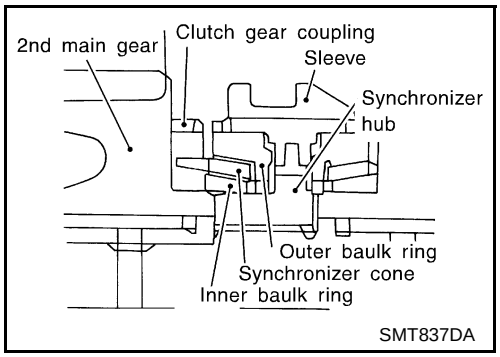
ECS005GM



MCIA0001E

DOUBLE-CONE SYNCHRONIZER

Double-cone synchronizer is adopted for 1st and 2nd gears to reduce operating force of the shift lever.



M/T OIL

PFP:KLD20

Changing M/T Oil

ECS005GN

DRAINING

1. Start the engine and let it run to warm up the transaxle.
2. Stop the engine. Remove drain plug and drain oil.
3. Set a gasket on the drain plug and install it to the transaxle.

Drain plug:

: 25 - 34 N·m (2.5 - 3.5 kg-m, 18 - 25 ft-lb)

CAUTION:
Do not reuse gasket.

FILLING

1. Remove filler plug. Fill with new oil until oil level reaches the specified limit near filler plug mounting hole.

Oil grade : API GL-4
Capacity (reference) : Approx. 2.8 - 3.0 ℓ (4-7/8 - 5-1/4 Imp pt)

2. After refilling oil, check oil level. Assemble gasket to filler plug, then install it to transaxle body.

Filler plug:

: 10 - 19 N·m (1.0 - 2.0 kg-m, 87 - 173 in-lb)

CAUTION:
Do not reuse gasket.

Checking M/T Oil

ECS005GO

OIL LEAKAGE AND OIL LEVEL

- Check that oil is not leaking from transaxle or around it.
- Check oil level from filler plug mounting hole as shown in the figure.

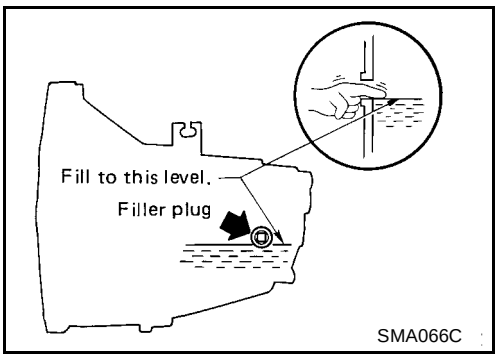
CAUTION:
Never start engine while checking oil level.

- Set a new gasket on the filler plug and install it on the transaxle.

Filler plug:

: 10 - 19 N·m (1.0 - 2.0 kg-m, 87 - 173 in-lb)

CAUTION:
Do not reuse gasket.



SIDE OIL SEAL

PFP:32113

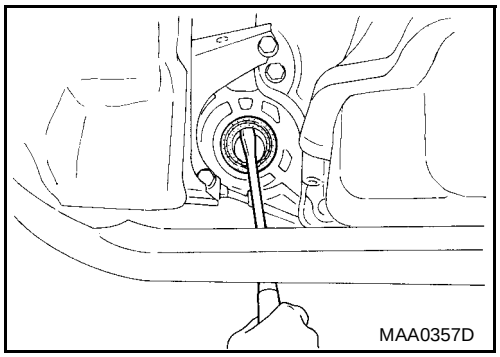
Removal and Installation

ECS005GP

REMOVAL

1. Remove the drive shaft from the transaxle. Refer to FAX-11, "FRONT DRIVE SHAFT" .
2. Remove oil seal with a slotted screwdriver.

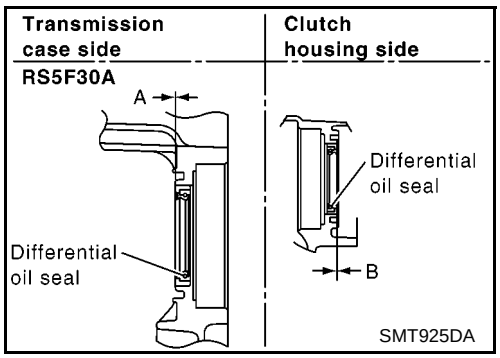
CAUTION:
Be careful not to damage the case surface when removing the oil seal.



INSTALLATION

1. Using a drift (special service tool), drive the oil seal straight until it protrudes from the case end equal to dimension A shown in the figure.

Dimension A : Within 0.5 mm of flush with the case.



Drift to be used:

Transaxle case side	ST3340 0001
Clutch housing side	

CAUTION:
- **When installing oil seals, apply multi-purpose grease to oil seal lips.**
- **Do not reuse oil seal.**

2. Install all parts in reverse order of removal and check oil level after installation.

STRIKING ROD OIL SEAL

PFP:32858

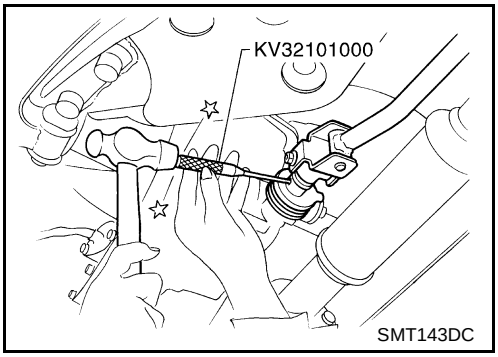
Removal and Installation

ECS005GQ

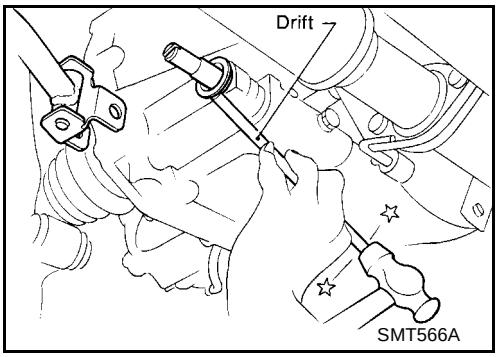
REMOVAL

1. Remove transaxle control rod from yoke.
2. Remove retaining pin of yoke.

- **Be careful not to damage boot.**



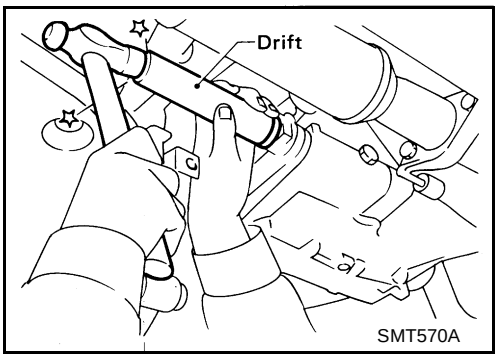
3. Remove striking rod oil seal.



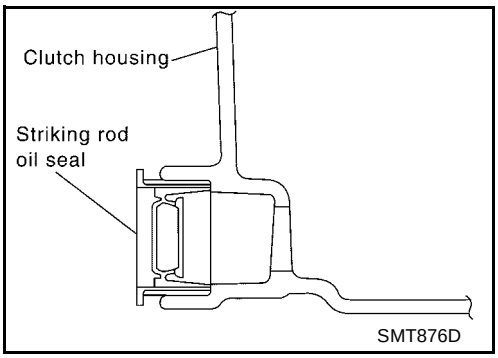
INSTALLATION

1. Install striking rod oil seal.

- **Apply multi-purpose grease to seal lip of oil seal before installing.**



- **Drive it in as far as it will go.**



POSITION SWITCH

PFP:32005

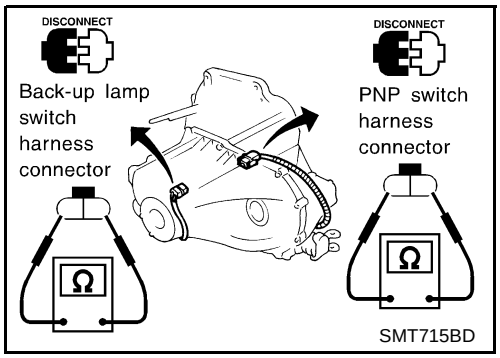
Checking

ECS005GR

BACK-UP LAMP SWITCH

- Check continuity.

Gear position	Continuity
Reverse	Yes
Except reverse	No



PNP SWITCH

- Check continuity.

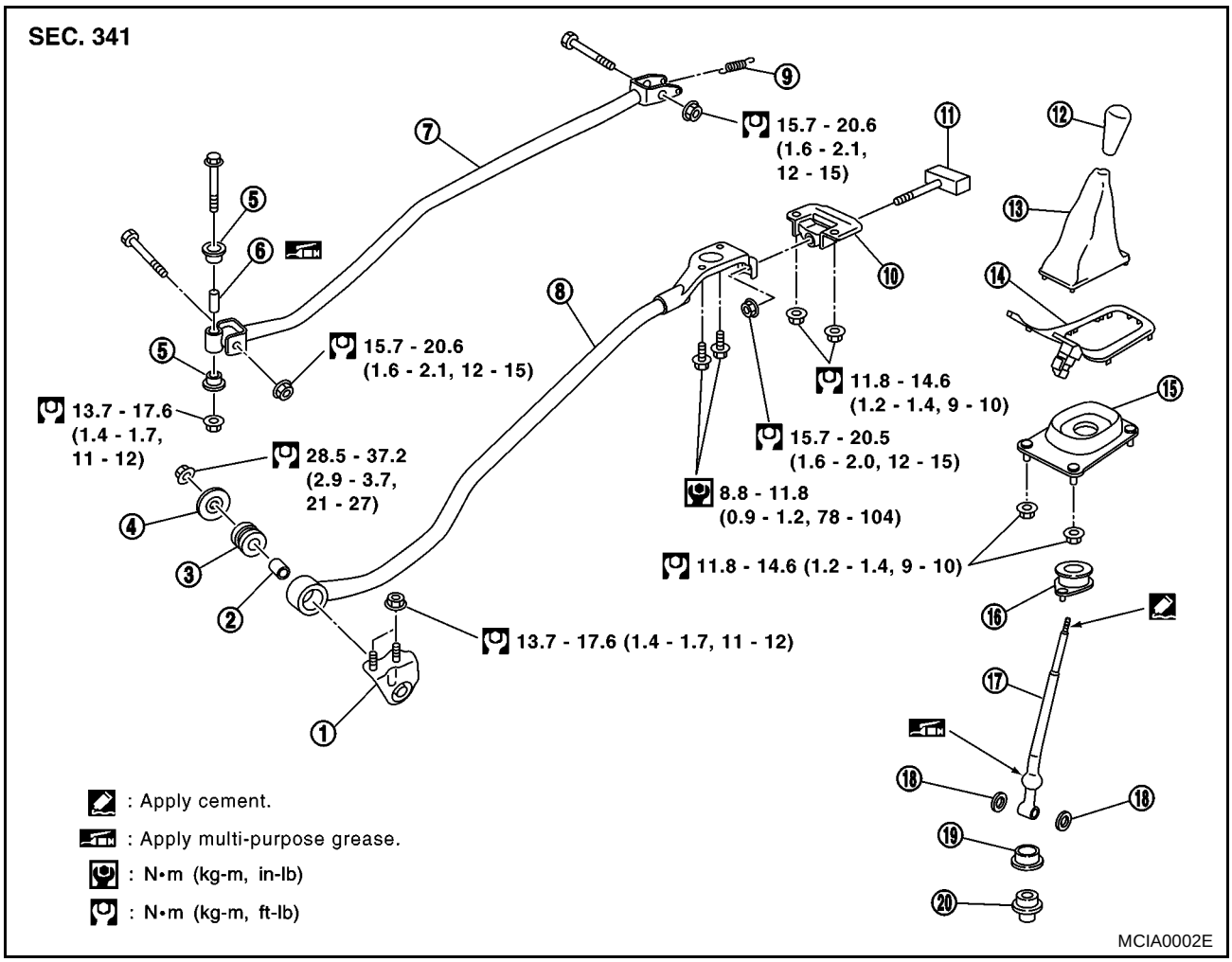
Gear position	Continuity
Neutral	Yes
Except neutral	No

CONTROL LINKAGE

PFP:34103

Removal and Installation

ECS005GS



1. Support rod bracket
2. Collar
3. Bushing
4. Washer
5. Bushing
6. Collar
7. Control rod
8. Support rod
9. Return spring
10. Holder bracket
11. Mass damper
12. Control lever knob
13. Boot
14. Finisher
15. Transaxle hole cover
16. Control lever socket
17. Control lever
18. Bushing
19. Ball socket
20. Dust boot

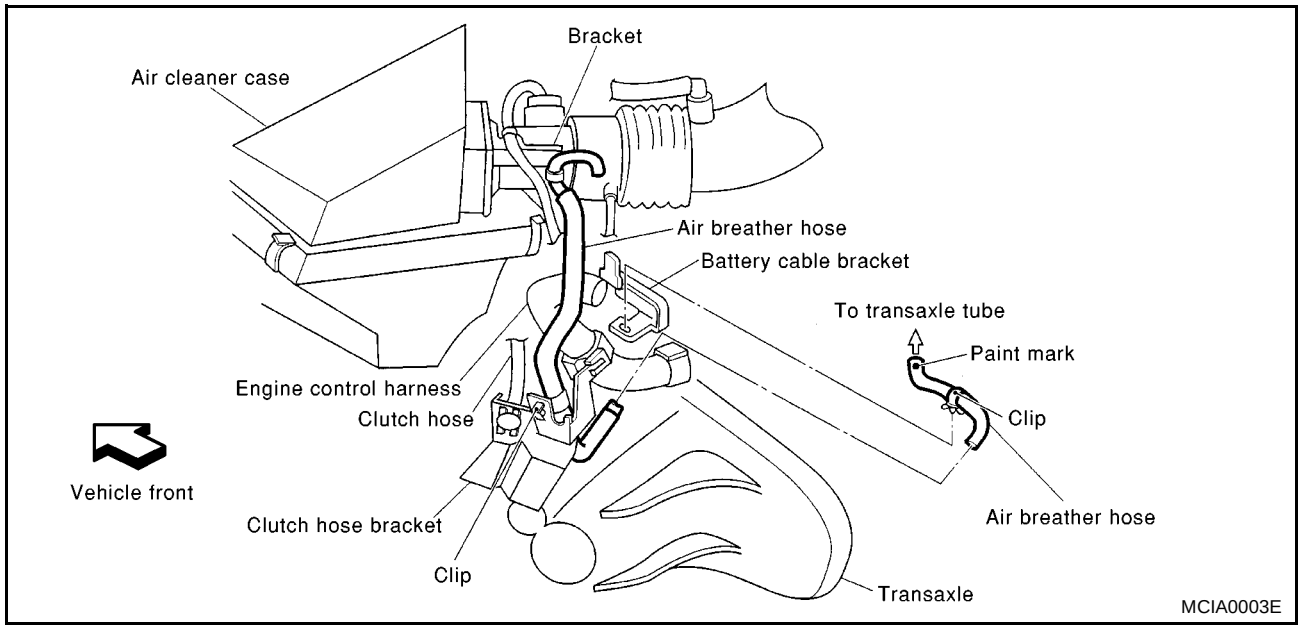
AIR BREATHER HOSE

PFP:31098

Removal and Installation

ECS005GT

Refer to the figure for air breather hose removal and installation information.



CAUTION:

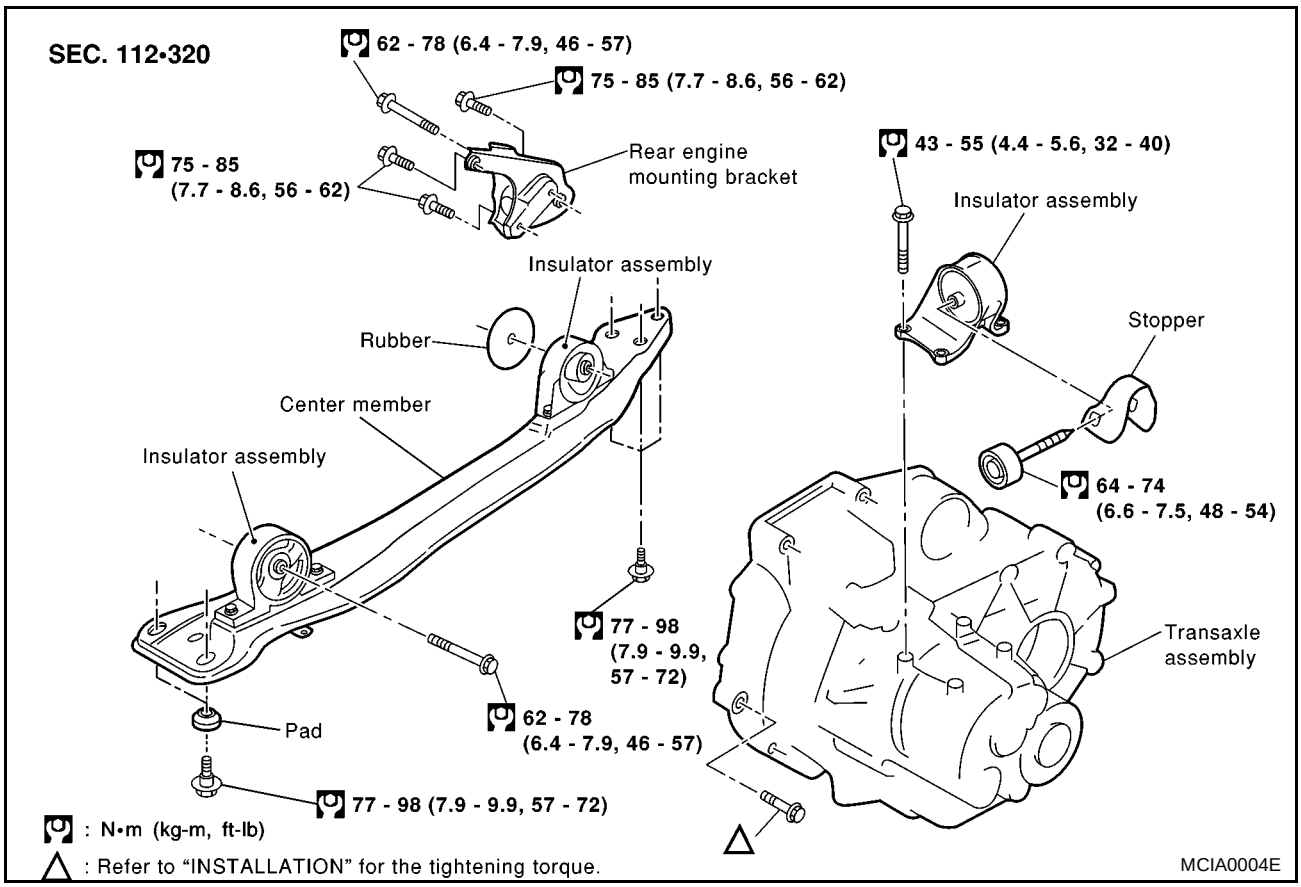
- **Make sure there are no pinched or restricted areas on the air breather hose caused by bending or winding when installing it.**
- **Be sure to insert hose into the transaxle tube until overlap area reaches the spool.**

TRANSAXLE ASSEMBLY

PFP:32010

Removal and Installation

ECS005PI



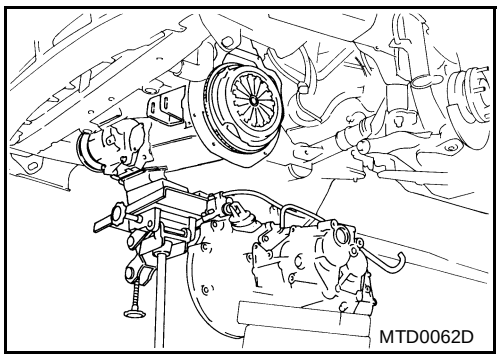
REMOVAL

1. Remove air cleaner, air duct, and battery.
2. Remove the air breather hose.
3. Remove clutch operating cylinder.

   CAUTION:
   Do not depress clutch pedal during removal procedure.
4. Disconnect control linkage from transaxle.
5. Disconnect PNP switch, back-up lamp switch, vehicle speed sensor and ground harness connectors.
6. Remove starter motor.
7. Drain gear oil from transaxle.
8. Remove suspension cross bar.
9. Remove exhaust front tube and the drive shaft.
10. Place a jack onto the transaxle.

    CAUTION:
    When setting jack, be careful not to bring it into contact with the switch.
11. Remove center member, engine insulator and engine mount bracket.
12. Support engine by placing a jack under oil pan.
13. Remove bolts securing transaxle to engine.

14. Remove transaxle from vehicle.

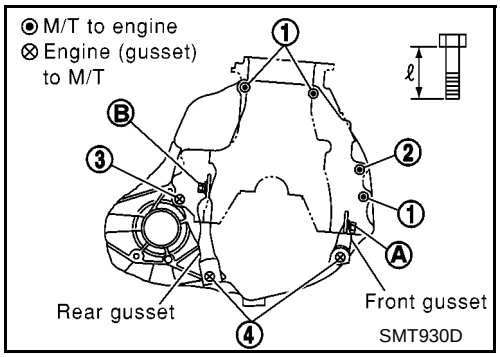


INSTALLATION

Paying attention to the following items, install in the reverse order of removal.

- When installing the transaxle to the engine, tighten to the specified torque.

  CAUTION:
  When installing transaxle, be careful not to bring transaxle input shaft into contact with the clutch cover.



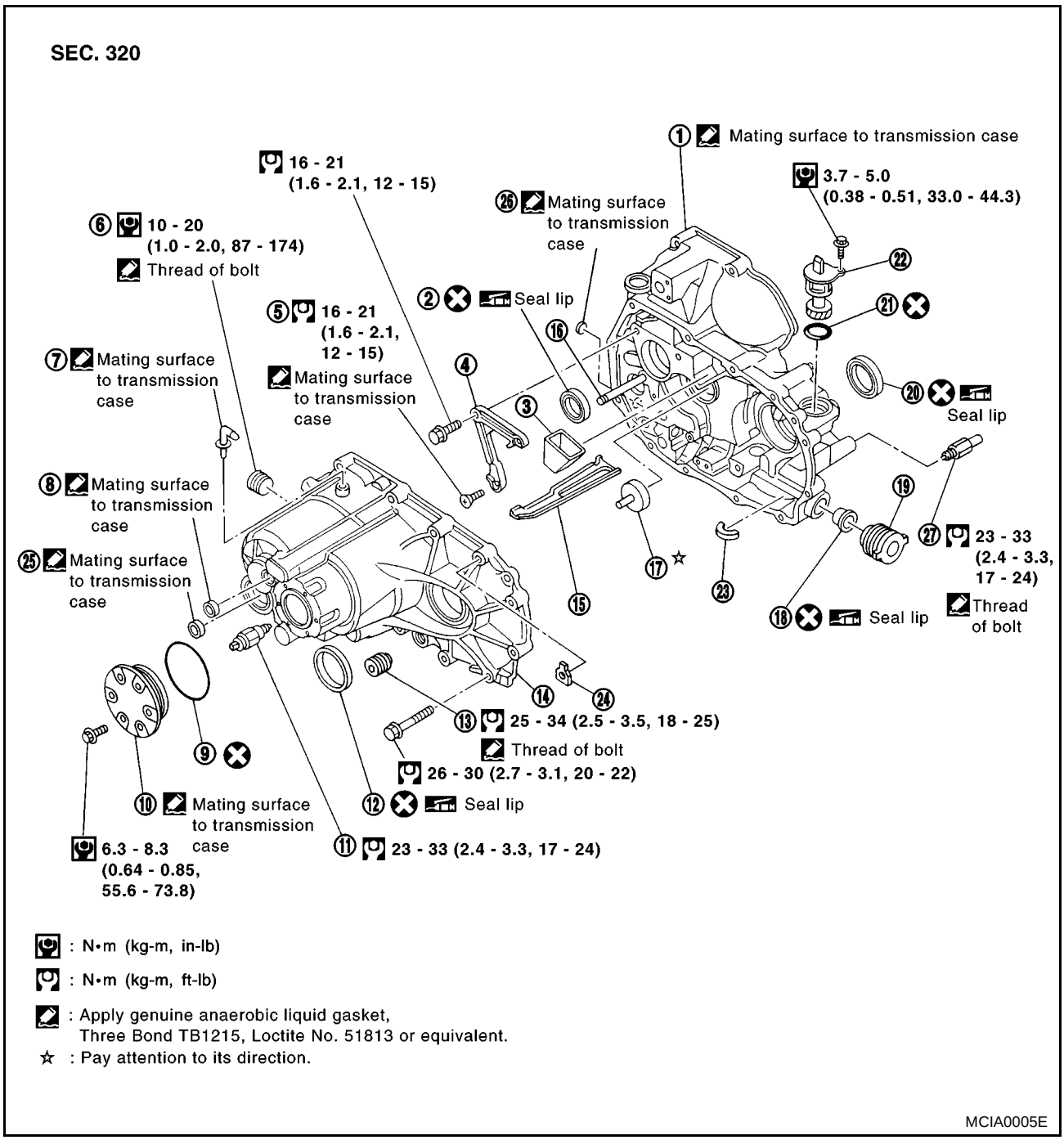
Bolt No.	Tightening torque N·m (kg-m, ft-lb)	" ℓ " mm (in)
1	30 - 40 (3.1 - 4.1, 22 - 30)	70 (2.76)
2	30 - 40 (3.1 - 4.1, 22 - 30)	80 (3.15)
3	30 - 40 (3.1 - 4.1, 22 - 30)	30 (1.18)
4*1	15 - 20 (1.6 - 2.1, 12 - 15)	25 (0.98)
Front gusset A to engine	30 - 40 (3.1 - 4.1, 22 - 30)	20 (0.79)
Rear gusset B to engine	15 - 20 (1.6 - 2.1, 12 - 15)	16 (0.63)

*1: With gussets

Component Parts

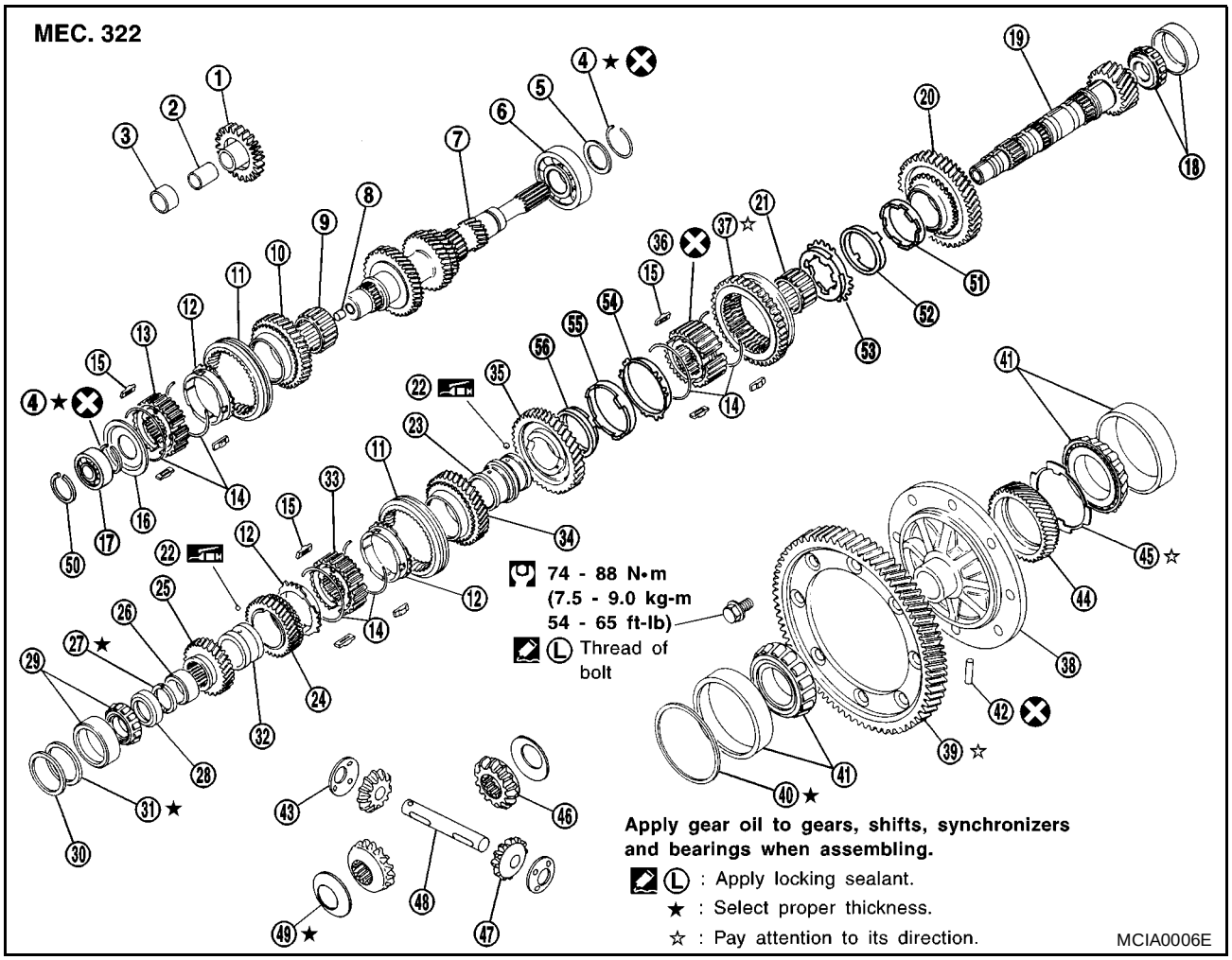
ECS005PJ

CASE AND HOUSING COMPONENTS



1. Clutch housing
2. Input shaft oil seal
3. Oil pocket
4. Bearing retainer
5. Torx screw
6. Filler plug
7. Air breather tube
8. Welch plug
9. O-ring
10. Case cover
11. Back-up lamp switch
12. Differential oil seal
13. Drain plug
14. Transaxle case
15. Oil gutter
16. Reverse idler shaft
17. Oil channel
18. Striking rod oil seal
19. Boot
20. Differential oil seal
21. O-ring
22. Speedometer pinion assembly
23. Magnet
24. Earth term
25. Welch plug
26. Welch plug
27. PNP switch

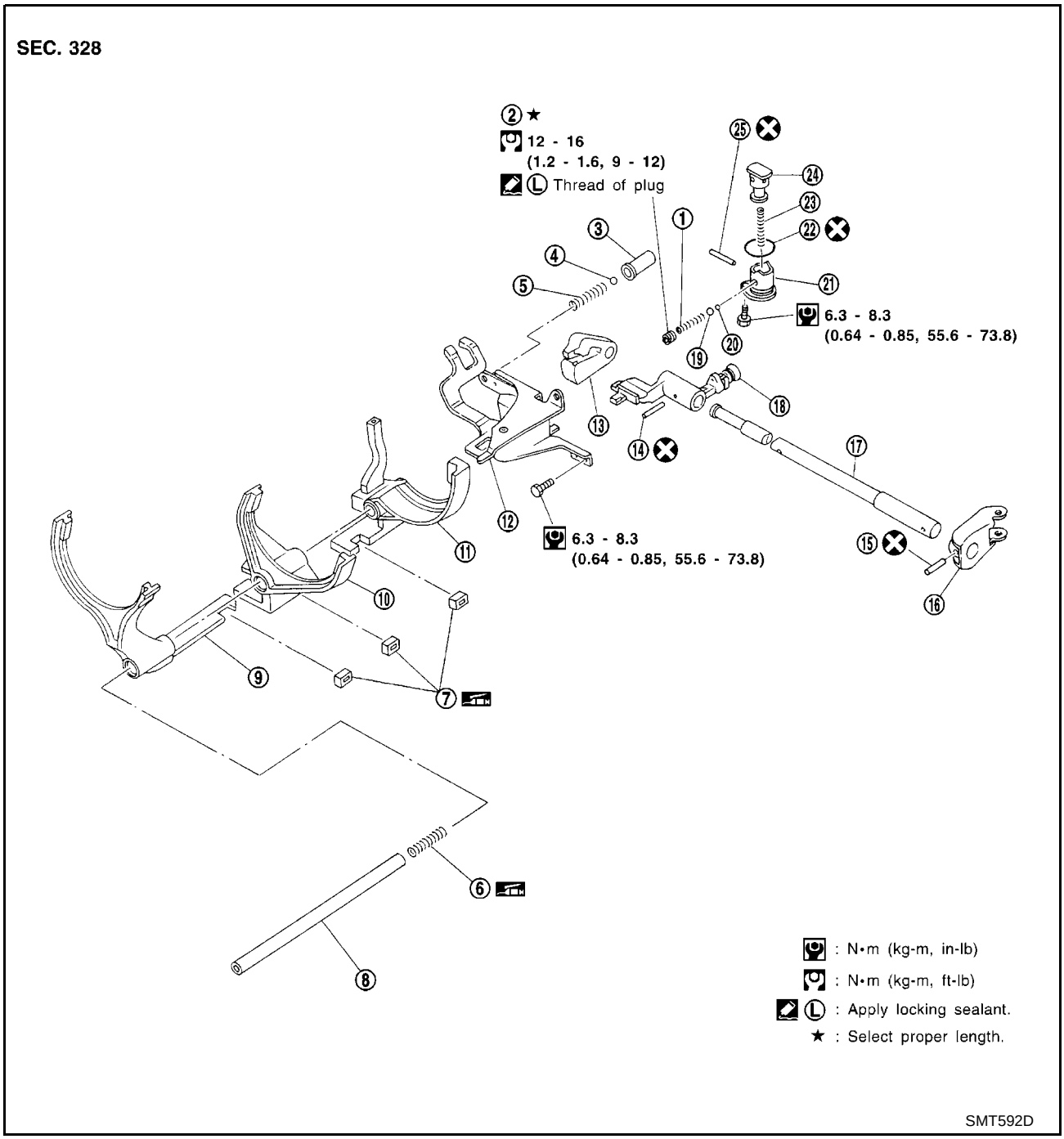
GEAR COMPONENTS



1. Reverse idler gear
2. Reverse idler bushing
3. Reverse idler spacer
4. Snap ring
5. Spacer
6. Input shaft front bearing
7. Input shaft
8. Oil plug
9. 5th gear needle bearing
10. 5th input gear
11. Coupling sleeve
12. Baulk ring
13. 5th synchronizer hub
14. Spread spring
15. Shifting insert
16. 5th stopper
17. Input shaft rear bearing
18. Mainshaft front bearing
19. Mainshaft
20. 1st main gear
21. 1st gear needle bearing
22. Steel ball
23. 2nd & 3rd bushing
24. 4th main gear
25. 5th main gear
26. Thrust washer
27. Mainshaft C-ring
28. C-ring holder
29. Mainshaft rear bearing
30. Spacer
31. Mainshaft rear bearing adjusting shim
32. 4th bushing
33. 3rd & 4th synchronizer hub
34. 3rd main gear
35. 2nd main gear
36. 1st & 2nd synchronizer hub
37. Reverse main gear (Coupling sleeve)
38. Differential case
39. Final gear
40. Differential side bearing adjusting shim
41. Differential side bearing
42. Retaining pin
43. Pinion mate thrust washer
44. Speedometer drive gear
45. Speedometer stopper
46. Side gear
47. Pinion mate gear
48. Pinion mate shaft
49. Side gear thrust washer
50. Snap ring
51. 1st inner baulk ring
52. 1st synchronizer cone
53. 1st outer baulk ring
54. 2nd outer baulk ring
55. 2nd synchronizer cone
56. 2nd inner baulk ring

SHIFT CONTROL COMPONENTS

SEC. 328



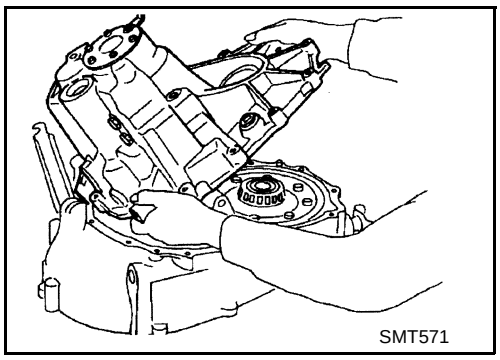
1. Reverse check spring
2. Reverse check plug
3. Check ball plug
4. Shift check ball
5. Shift check spring
6. Fork shaft support spring
7. Shifter cap
8. Fork shaft
9. 5th shift fork
10. 3rd & 4th shift fork
11. 1st & 2nd shift fork
12. Control bracket
13. Striking interlock
14. Retaining pin
15. Retaining pin
16. Yoke
17. Striking rod
18. Striking lever
19. Check ball (Large)
20. Check ball (Small)
21. Check sleeve
22. O-ring
23. Select return spring
24. Check plunger
25. Stopper pin

Disassembly and Assembly

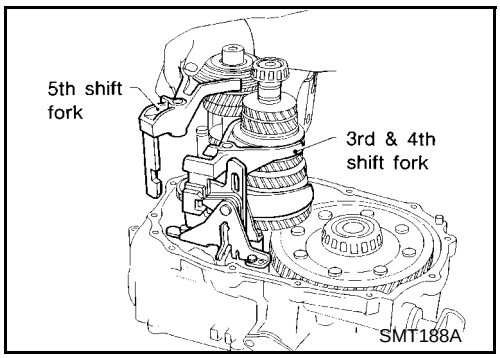
ECS005PK

DISASSEMBLY

1. Remove transaxle case while slightly tilting it to prevent 5th shift fork from interfering with case.

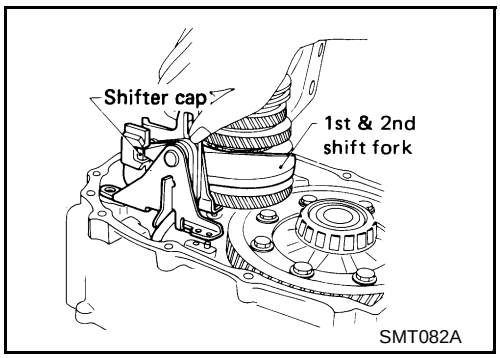

SMT571

2. Draw out reverse idler spacer and fork shaft, then remove 5th and 3rd & 4th shift forks.
   - **Be careful not to lose shifter cap.**



SMT188A

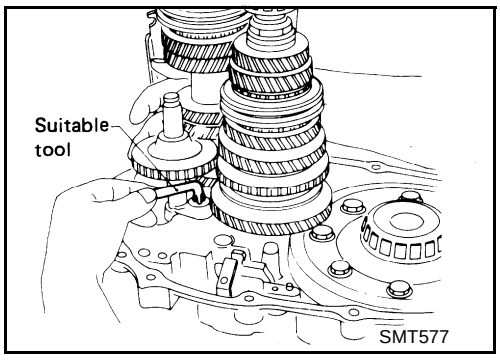
3. Remove control bracket with 1st & 2nd shift fork.
   - **Be careful not to lose shifter cap.**



SMT082A

4. Remove gear components from clutch housing.

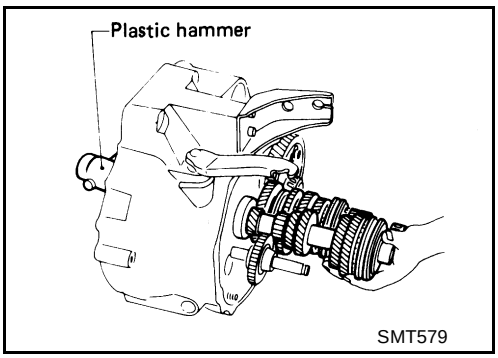
a. Remove three screws and detach bearing retainer.
   - **One of these three screws is torx type and should be removed with a suitable tool, as shown.**



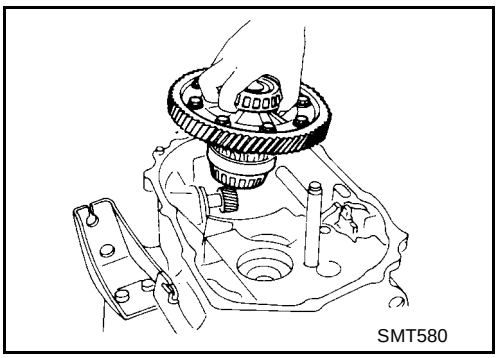
SMT577

b. Remove input shaft together with mainshaft by tapping lightly.

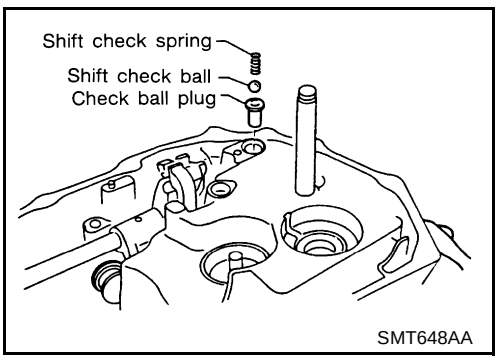
- **Always withdraw mainshaft straight out. Failure to do so can damage resin oil channel on clutch housing side.**
- **Do not draw out reverse idler shaft from clutch housing because these fittings will be loose.**
- **When removing input shaft, be careful not to scratch oil seal lip with shaft spline.**



c. Remove reverse idler gear and final drive assembly.

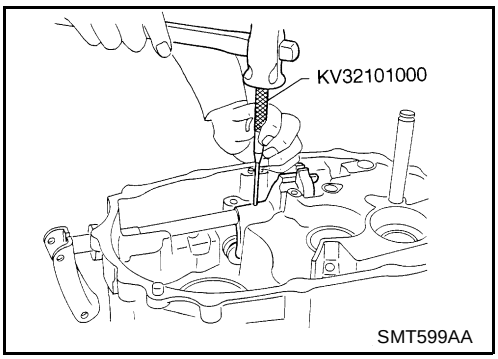


5. Remove oil pocket, shift check ball, shift check spring and check ball plug.

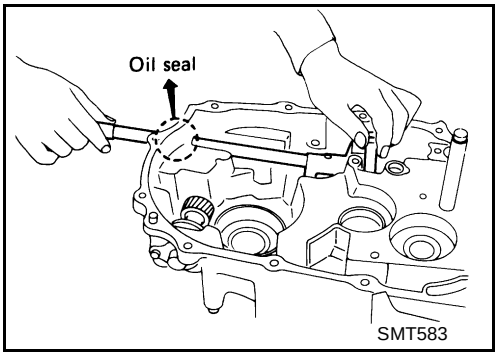


6. Drive retaining pin out of striking lever, then remove striking rod, striking lever and striking interlock.

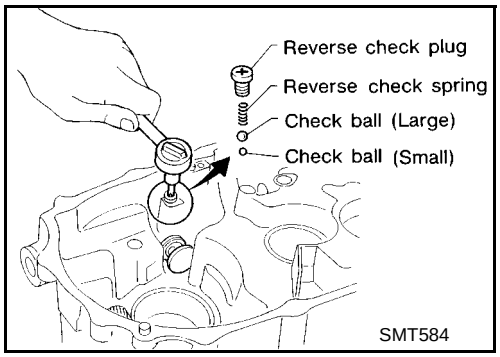
- **Select a position where retaining pin does not interfere with clutch housing when removing retaining pin.**



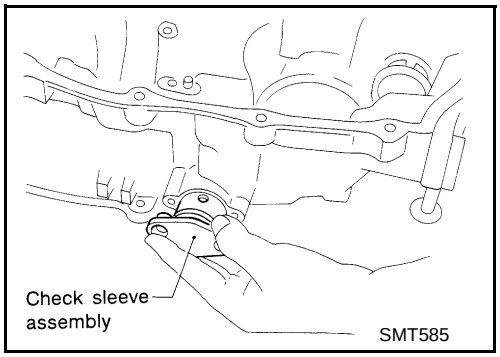
- **Be careful not to damage oil seal lip, when removing striking rod. If necessary, tape edges of striking rod.**



7. Remove reverse check plug, then detach reverse check spring and check balls.

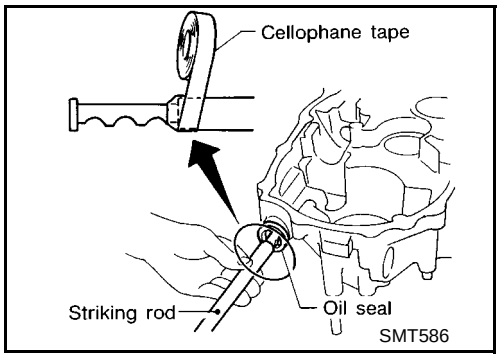


8. Remove check sleeve assembly.

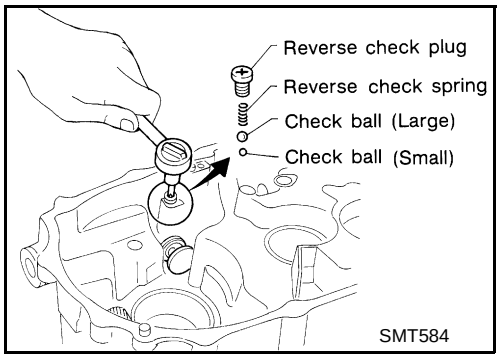


ASSEMBLY

1. Install striking rod, lever and interlock.
   - **Tape edges of striking rod to avoid damaging oil seal lip during installation.**
   - **When taped edges of striking rod are past the oil seal, remove tape.**



2. Install reverse check sleeve assembly.
3. Install check balls, reverse check spring and check plug.

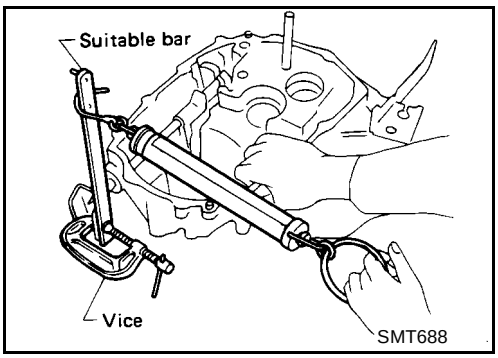


4. Check reverse check turning torque (At striking rod).

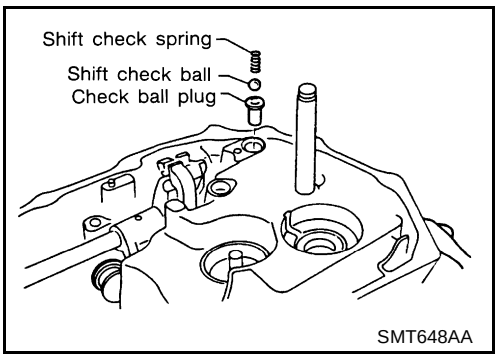
Reverse check turning torque (At striking rod)	**: Refer to MT-49, "REVERSE CHECK PLUGS" .**

- If not within specification, select another check plug having a different length and reinstall it.

Reverse check plug	**: Refer to MT-49, "REVERSE CHECK PLUGS" .**

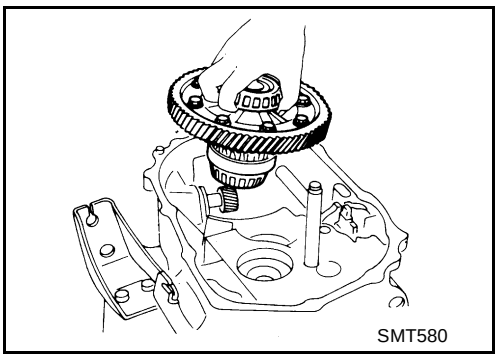


5. Install selected reverse check plug.
   - **Apply locking sealant to thread of plug before installing it.**
6. Install check ball plug, shift check ball and shift check spring.
7. Install oil pocket.

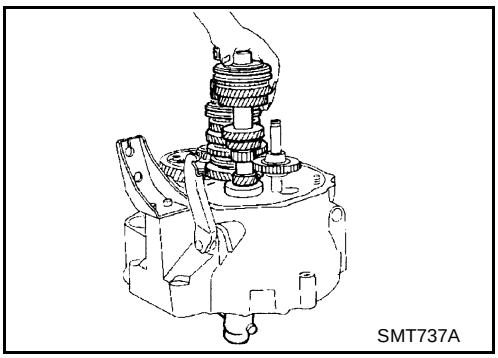


8. Install gear components onto clutch housing.

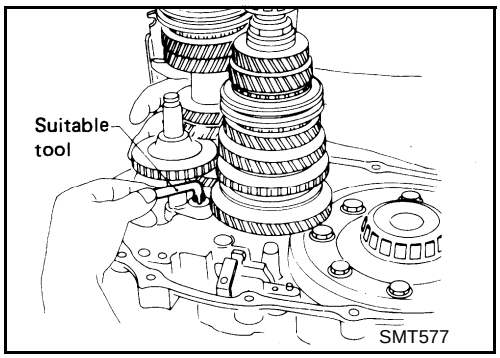
a. Install final drive assembly and reverse idler gear.



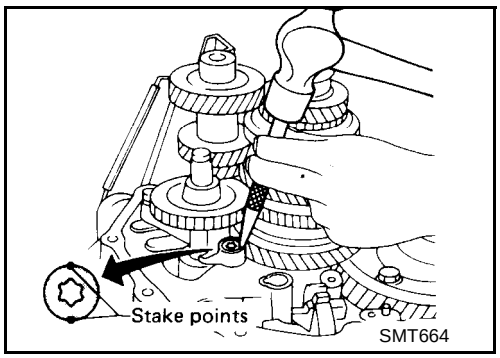
b. Install mainshaft and input gear as a set.
   - **Take care not to damage oil seal lip with splines of input shaft while shaft is being inserted into clutch housing.**
   - **Take care not to damage oil channel when inserting mainshaft into clutch housing.**



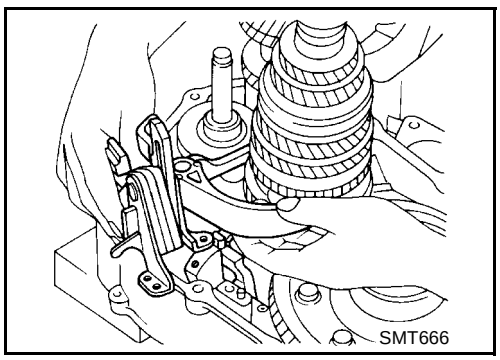
c. Install bearing retainer.
   - **One of these three screws is torx type and should be installed with suitable tool, as shown.**



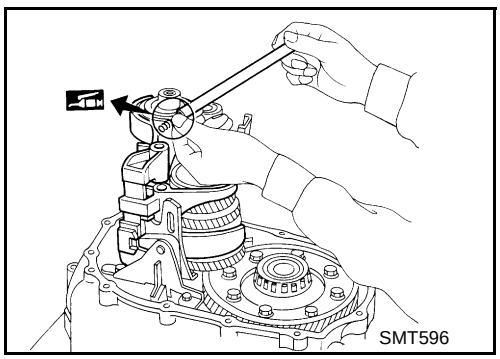
d. After installing torx screw, stake it at two points.



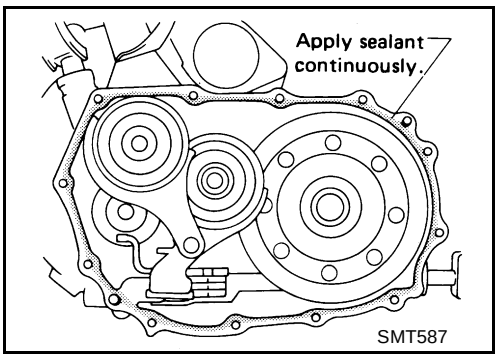
9. Apply grease to shifter caps, then install it to control bracket. Install control bracket with 1st & 2nd shift fork.
10. Install 3rd & 4th and 5th shift forks.



11. Insert fork shaft.
    - **Apply multi-purpose grease to support spring before installing.**
12. Install reverse idler spacer.



13. Apply recommended sealant to mating surface of clutch housing.
14. Install transaxle case on clutch housing.



Adjustment

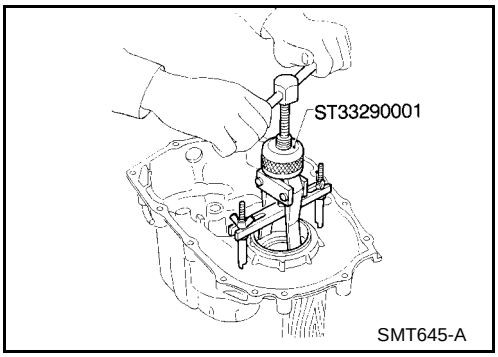
ECS005PL

DIFFERENTIAL SIDE BEARING PRELOAD

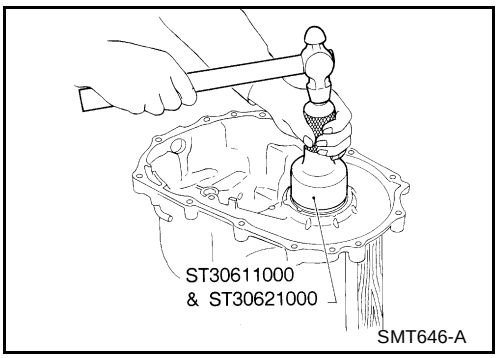
If any of the following parts are replaced, adjust differential side bearing preload.

- **Differential case**
- **Differential side bearing**
- **Clutch housing**
- **Transaxle case**

1. Remove differential side bearing outer race (transaxle case side) and shim(s).

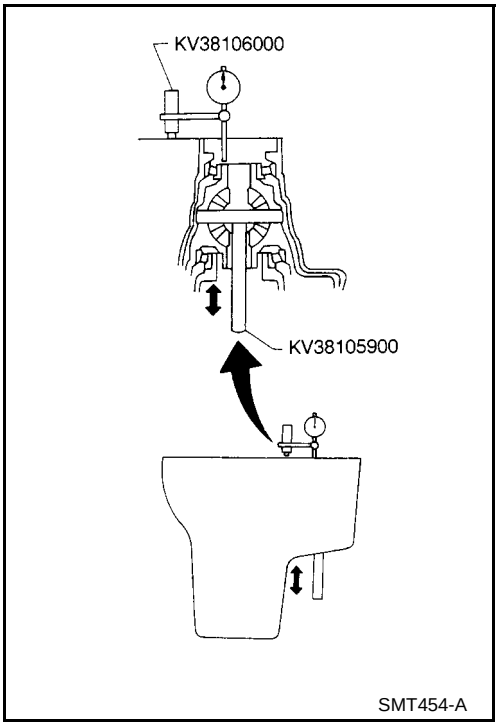


2. Reinstall differential side bearing outer race without shim(s).
3. Install final drive assembly on clutch housing.
4. Install transaxle case on clutch housing.
   - **Tighten transaxle case fixing bolts to the specified torque. Refer to .**



5. Set dial indicator on front end of differential case.
6. Insert Tool all the way into differential side gear.
7. Move Tool up and down and measure dial indicator deflection.
8. Select shim considering bearing preload.

Suitable shim thickness =	**Dial indicator deflection + specified bearing preload**
Differential side bearing preload and adjusting shims	**: Refer to MT-51, "BEARING PRELOAD" .**



9. Install selected shim(s) and differential side bearing outer race.
10. Check differential side bearing turning torque.

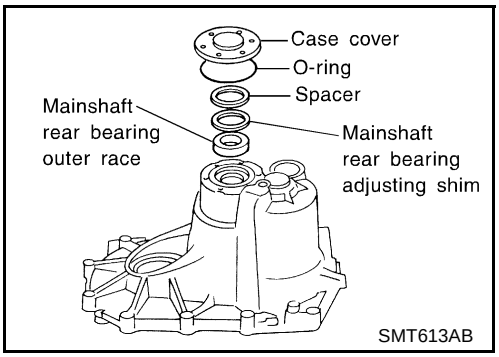
a. Install final drive assembly on clutch housing.
b. Install transaxle case on clutch housing.
   - **Tighten transaxle case fixing bolts to the specified torque. Refer to MT-19, "CASE AND HOUSING COMPONENTS" .**

MAINSHAFT BEARING PRELOAD

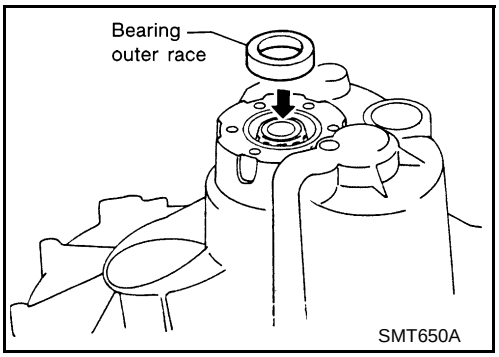
If any of the following parts are replaced, adjust mainshaft bearing preload.

- **Mainshaft**
- **Mainshaft bearings**
- **Clutch housing**
- **Transaxle case**

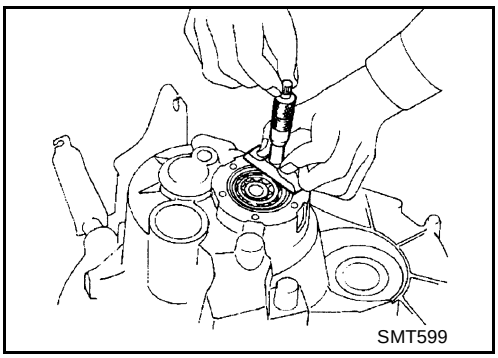
1. Remove case cover, O-ring, spacer, mainshaft rear bearing adjusting shim and mainshaft rear bearing outer race from transaxle case.
2. Install mainshaft assembly on clutch housing.
3. Install transaxle case on clutch housing.
   - **Tighten transaxle case fixing bolts to the specified torque. Refer to MT-19, "CASE AND HOUSING COMPONENTS" .**



4. Install mainshaft rear bearing outer race on inner race.



5. Measure distance ("ℓ") from transaxle case to bearing outer race.
   - **Make sure that bearing is properly seated.**
6. Select shim considering bearing preload.
   Suitable shim thickness = measure distance ("ℓ") – 12.5 mm (0.492 in) + (specified bearing preload)
   Mainshaft rear bearing preload and adjusting shims:
   Refer to SDS, MT-51, "BEARING PRELOAD" .


SMT599

INPUT SHAFT AND GEARS

PFP:32200

Assembly and Disassembly

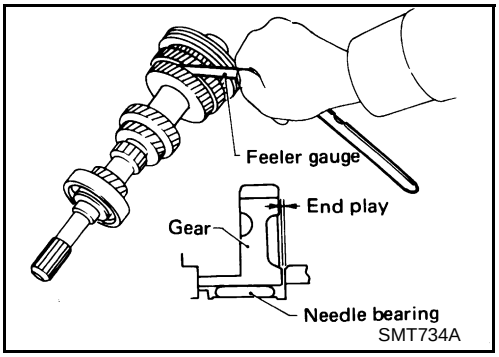
ECS005GY

DISASSEMBLY

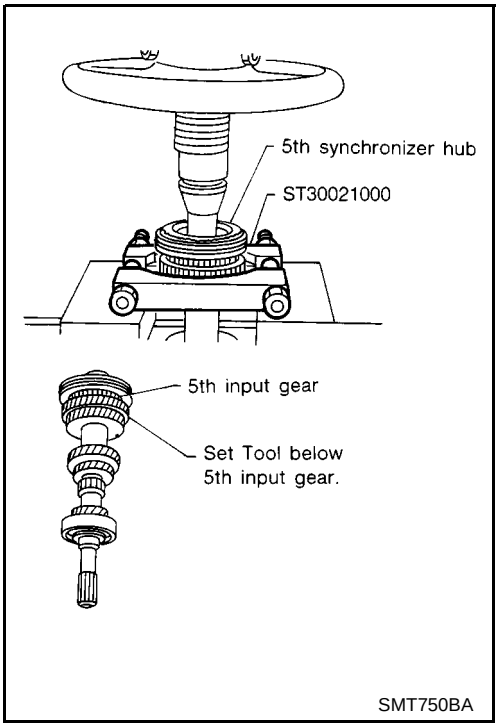
1. Before disassembly, check 5th input gear end play.

Gear end play **: Refer to MT-49, "Gear End Play"**

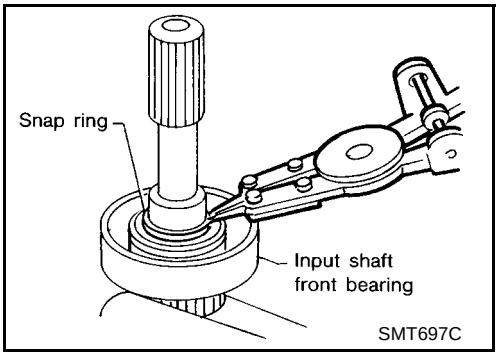
- If not within specification, disassemble and check contact surface of gear, shaft and hub. Then check clearance of snap ring groove. Refer to MT-32, "ASSEMBLY" .



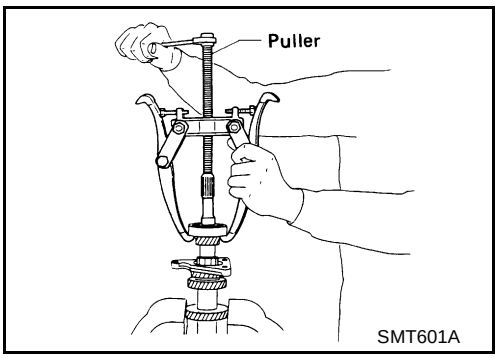
2. Remove snap ring and rear bearing.
3. Remove snap ring and 5th stopper.
4. Remove 5th synchronizer, 5th input gear and 5th gear needle bearing.



5. Remove snap ring of input shaft front bearing and input gear spacer.



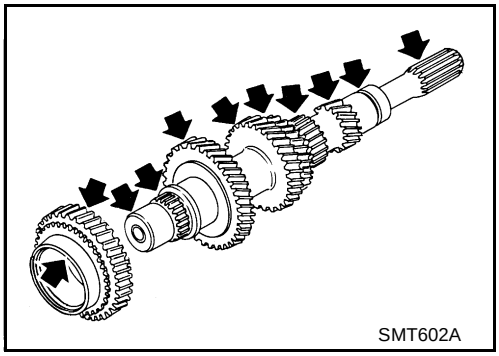
6. Pull out input shaft front bearing.
7. Remove bearing retainer.



INSPECTION AFTER DISASSEMBLY

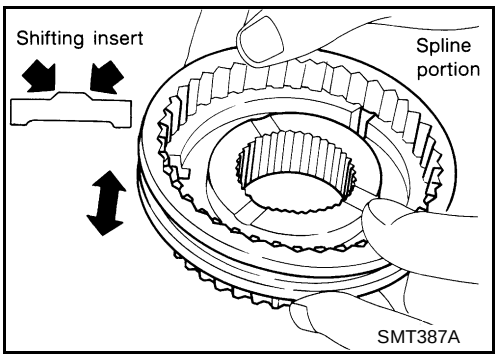
Input Shaft and Gear

- Check shaft for cracks, wear or bending.
- Check gears for excessive wear, chips or cracks.



Synchronizer

- Check spline portion of coupling sleeves, hubs and gears for wear or cracks.
- Check baulk rings for cracks or deformation.
- Check shifting inserts for wear or deformation.



- Measure clearance between baulk ring and 5th input gear.

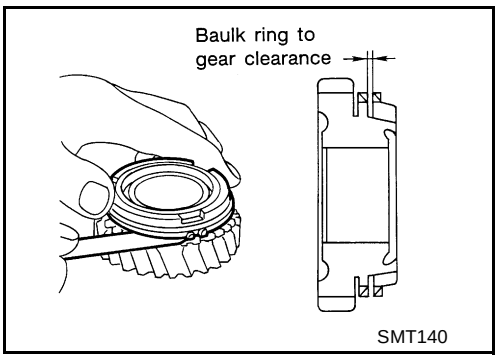
Clearance between baulk ring and 5th input gear:

Standard

1.0 - 1.35 mm (0.0394 - 0.0531 in)

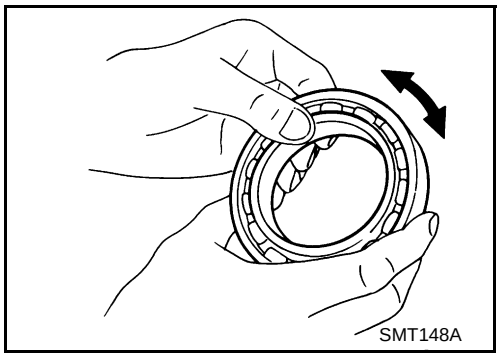
Wear limit

0.7 mm (0.028 in)



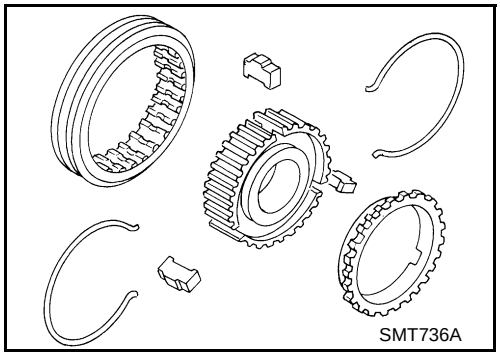
Bearing

- Make sure bearings roll freely and are free from noise, cracks, pitting or wear.

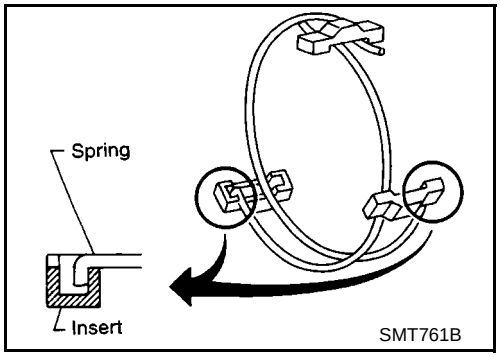

SMT148A

ASSEMBLY

1. Assemble 5th synchronizer.

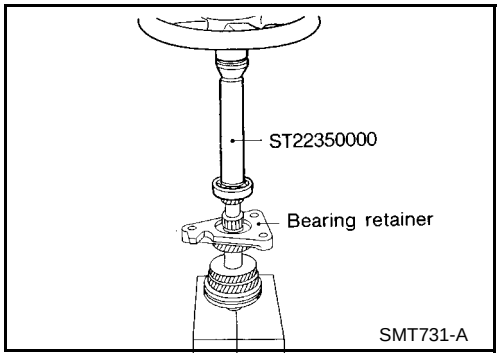

SMT736A

- **Be careful not to hook front and rear ends of spread spring to the same insert.**



SMT761B

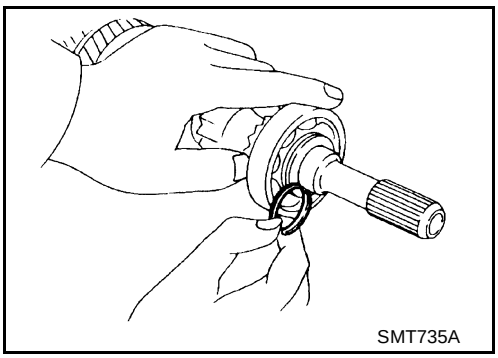
2. Install bearing retainer.
3. Press on input shaft front bearing.
4. Install spacer.



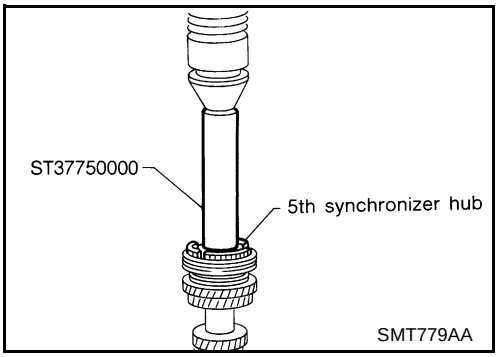
SMT731-A

5. Select and install snap ring that gives the proper clearance of input shaft groove.

Allowable clearance of groove	**: 0 - 0.1 mm (0 - 0.004 in)**
Snap ring of input shaft front bearing	**: Refer to MT-49, "INPUT SHAFT FRONT BEARING" .**


SMT735A

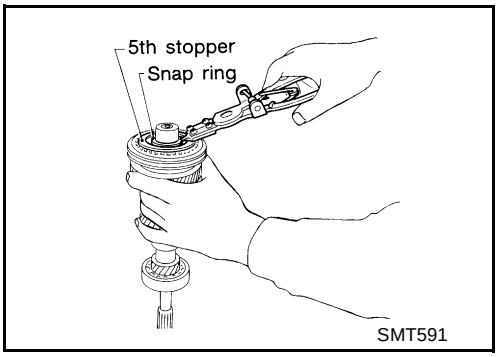
6. Install 5th gear needle bearing, 5th input gear, 5th synchronizer and 5th stopper.
7. Measure gear end play as the final check. Refer to MT-30, "DISASSEMBLY" .



SMT779AA

8. Select and install snap ring that gives the proper clearance of input shaft groove.

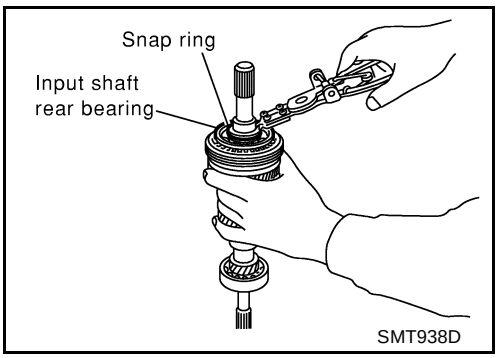
Allowable clearance of groove	**: 0 - 0.1 mm (0 - 0.004 in)**
Snap ring of input shaft 5th synchronizer hub	**: Refer to MT-50, "INPUT SHAFT 5TH SYNCHRONIZER HUB" .**



SMT591

9. Install input shaft rear bearing.
10. Select and install snap ring that gives the proper clearance of input shaft groove.

Allowable clearance of groove	**: 0 - 0.1 mm (0 - 0.004 in)**
Snap ring of input shaft rear bearing	**: Refer to MT-50, "INPUT SHAFT REAR BEARING" .**



SMT938D

MAINSHAFT AND GEARS

PFP:32241

Assembly and Disassembly

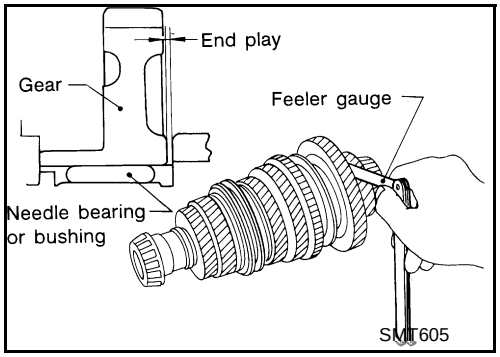
ECS005GZ

DISASSEMBLY

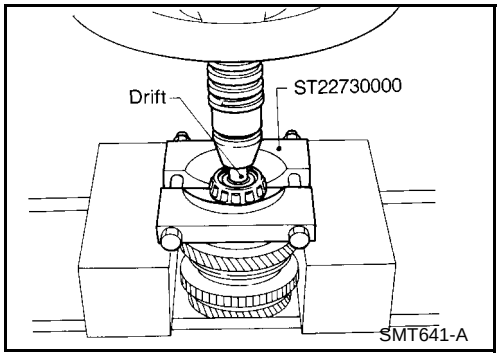
1. Before disassembly, check 1st, 2nd, 3rd and 4th main gear end plays.

   Gear end play **: Refer to MT-49, "Gear End Play".**

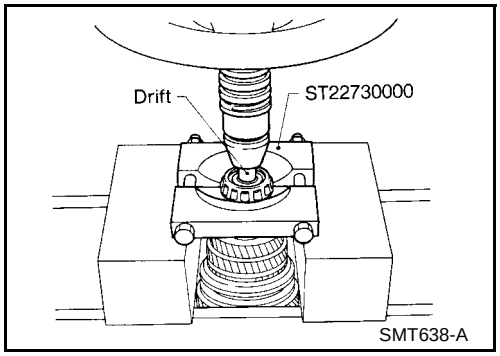
   - If not within specification, disassemble and check contact surface of gear, shaft and hub. Then check clearance of C-ring groove. Refer to MT-37, "ASSEMBLY" .



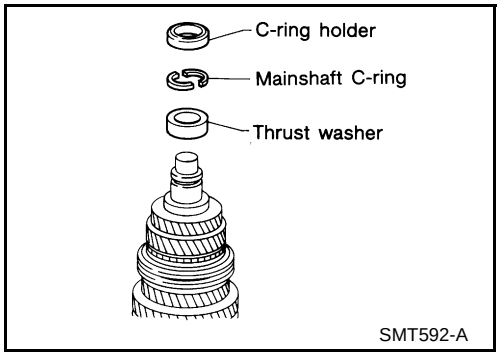
2. Press out mainshaft front bearing.



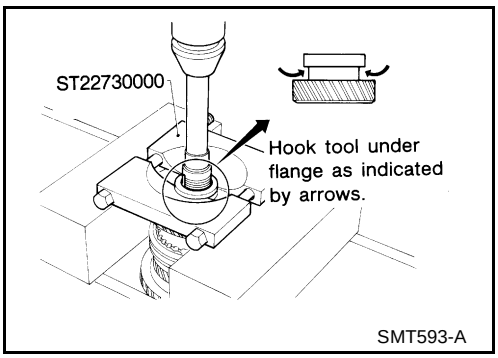
3. Press out mainshaft rear bearing.



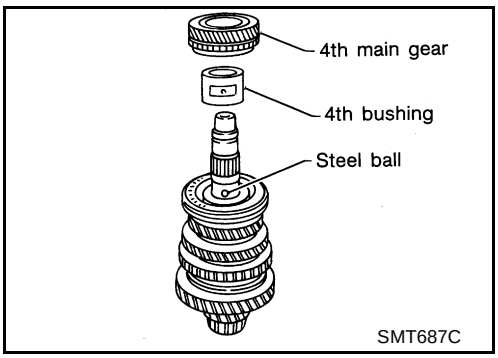
4. Remove C-ring holder, mainshaft C-rings and thrust washer.



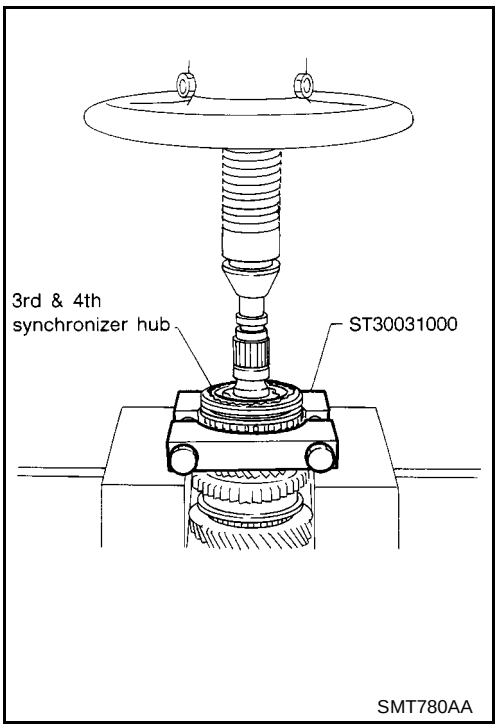
5. Press out 5th main gear.



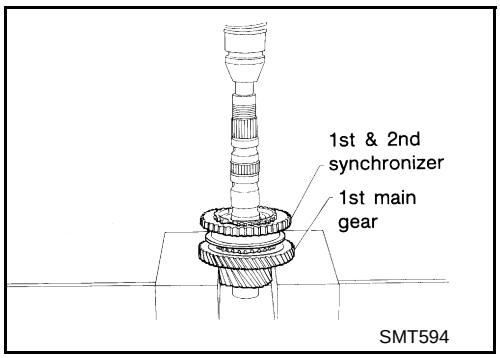
6. Remove 4th main gear, 4th bushing and steel ball.
   - **Be careful not to lose steel ball.**



7. Remove & 4th synchronizer, 3rd main gear, 2nd & 3rd bushing, steel ball and 2nd main gear.
   - **Be careful not to lose steel ball.**



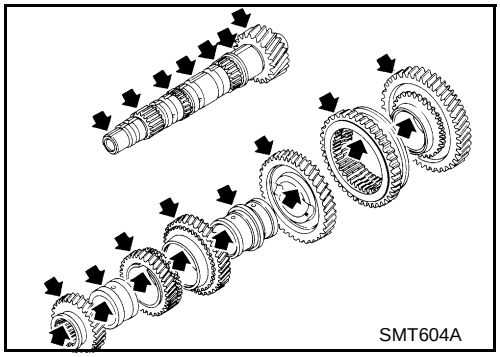
8. Remove 1st & 2nd synchronizer and 1st main gear, then remove 1st gear needle bearing.



INSPECTION AFTER DISASSEMBLY

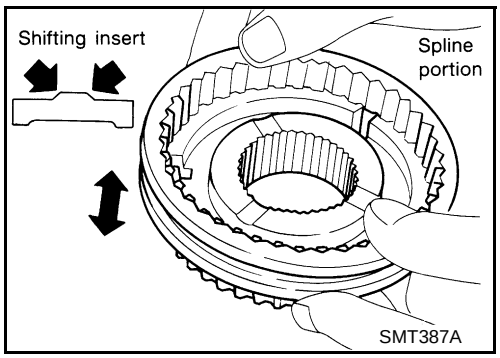
Mainshaft and Gears

- Check shaft for cracks, wear or bending.
- Check gears for excessive wear, chips or cracks.



Synchronizer

- Check spline portion of coupling sleeves, hubs and gears for wear or cracks.
- Check baulk rings for cracks or deformation.
- Check shifting inserts for wear or deformation.



- Measure clearance between baulk ring and main gears.

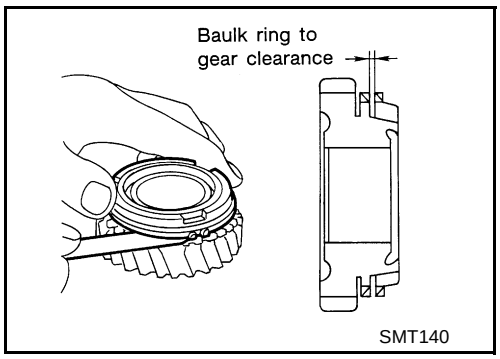
Clearance between baulk rings and main gears:

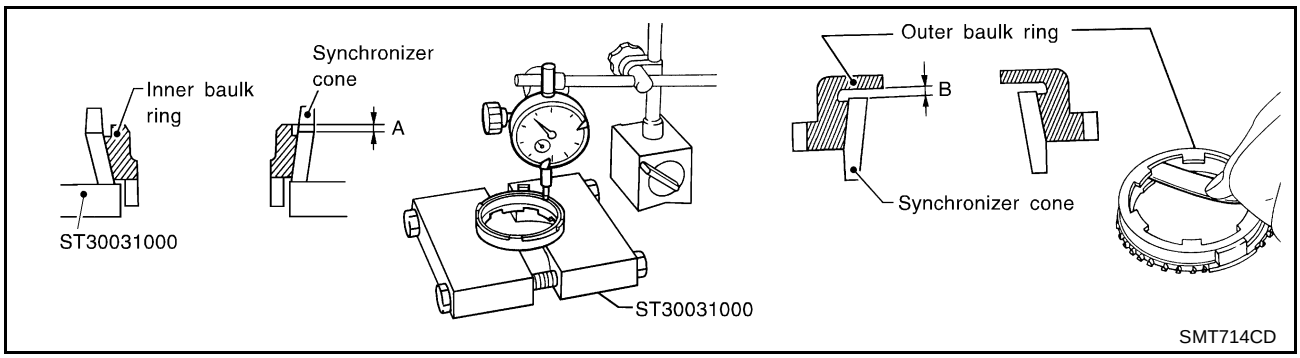
Standard

1.0 - 1.35 mm (0.0394 - 0.0531 in)

Wear limit

0.7 mm (0.028 in)





- Measure wear of 1st and 2nd baulk ring.
  - Place baulk rings in position on synchronizer cone.
  - While holding baulk ring against synchronizer cone as far as it will go, measure dimensions “A” and “B”.

Standard:

A

0.7 - 0.9 mm (0.028 - 0.035 in)

B

0.7 - 1.0 mm (0.028 - 0.039 in)

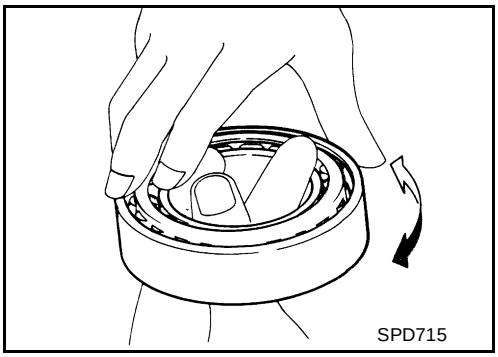
Wear limit:

0.2 mm (0.008 in)

- **If dimension “A” or “B” is smaller than the wear limit, replace outer baulk ring, inner baulk ring and synchronizer cone as a set.**

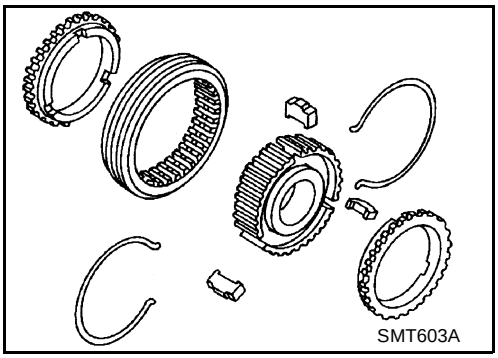
Bearing

- Make sure bearings roll freely and are free from noise, cracks, pitting or wear.
- **When replacing tapered roller bearing, replace outer and inner race as a set.**

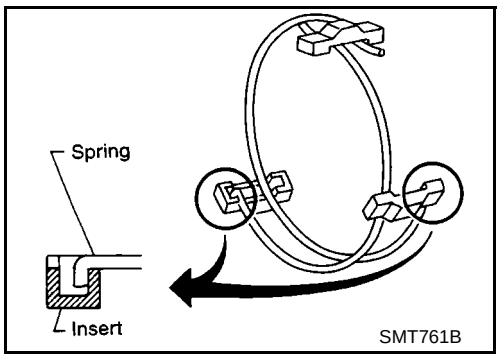


ASSEMBLY

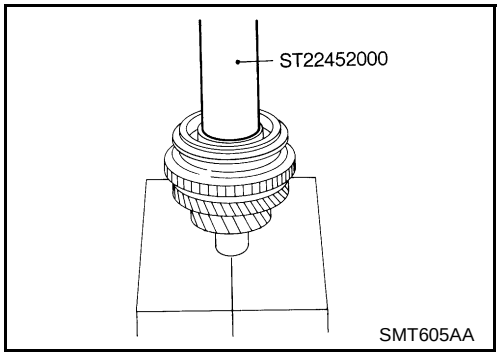
1. Assemble 1st & 2nd and 3rd & 4th synchronizers.



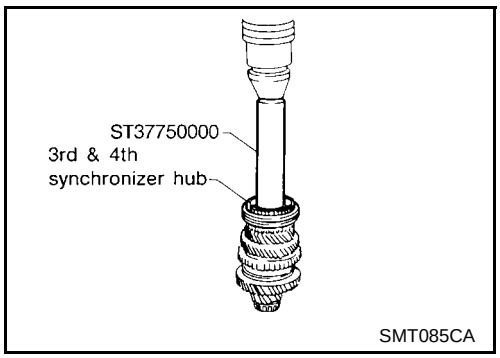
- **Be careful not to hook front and rear ends of spread spring to the same insert.**



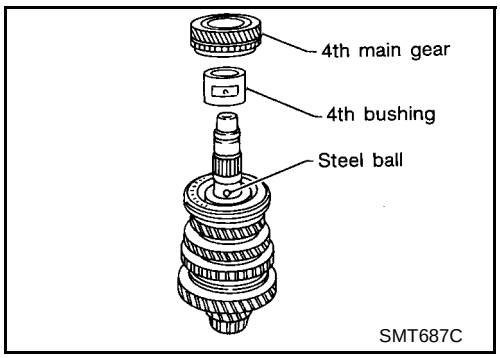
2. Install 1st gear needle bearing and 1st main gear.
3. Press on 1st & 2nd synchronizer.



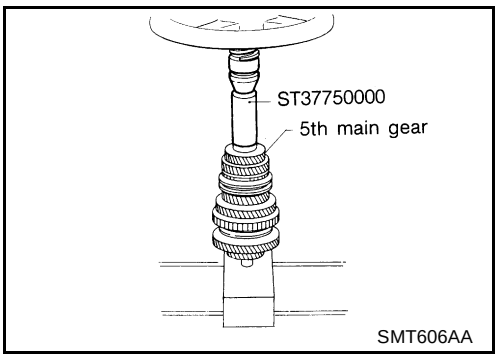
4. Install steel ball, 2nd main gear, 2nd & 3rd bushing, 3rd main gear and 3rd & 4th synchronizer.
   - **Apply multi-purpose grease to steel ball before installing it.**
   - **2nd & 3rd bushing has a groove in which steel ball fits.**



5. Install steel ball, 4th bushing and 4th main gear.
   - **Apply multi-purpose grease to steel ball before installing it.**
   - **4th bushing has a groove in which steel ball fits.**



6. Press on 5th main gear.

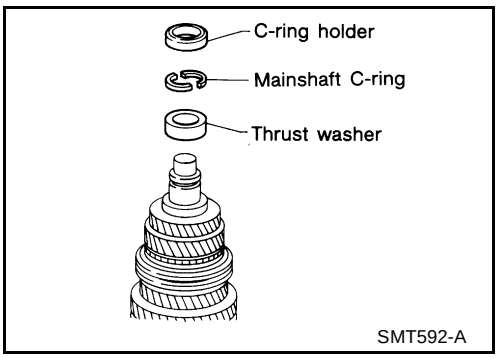


7. Install thrust washer.
8. Select and install mainshaft C-ring that gives proper clearance of groove in mainshaft.

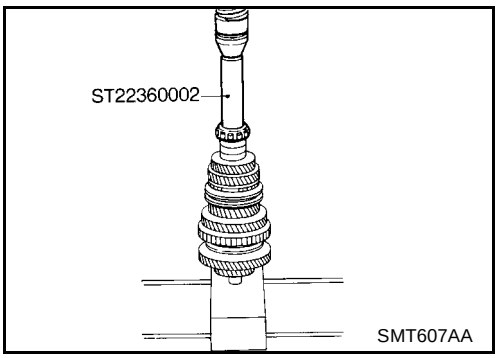
Allowable clearance of groove **: 0 - 0.1 mm (0 - 0.004 in)**

Mainshaft C-ring **: Refer to MT-50, "MAINSHAFT C-RING" .**

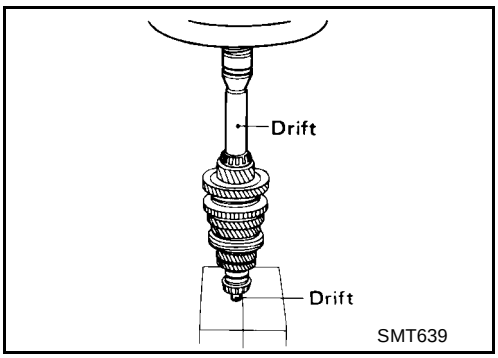
9. Install C-ring holder.



10. Press on mainshaft rear bearing.



11. Press on mainshaft front bearing.
12. Measure gear end play as the final check — Refer to MT-34, "DISASSEMBLY" .



FINAL DRIVE

PFP:38411

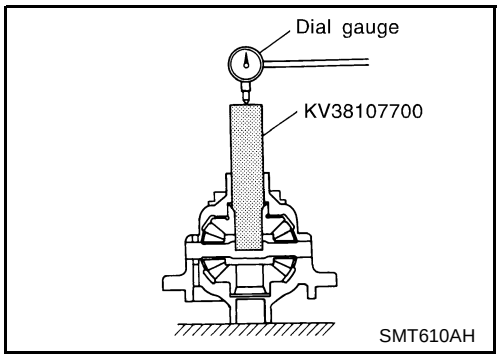
Assembly and Disassembly

ECS005PN

PRE-INSPECTION

- Check the clearance between side gear and differential case as follows.

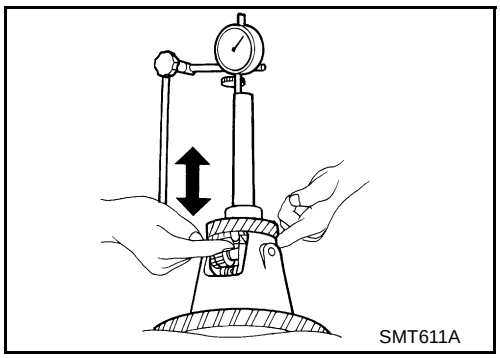
1. Clean final drive assembly sufficiently to prevent side gear thrust washer, differential case, side gear, and other parts from sticking by gear oil.



2. Upright the differential case so that the side gear to be measured faces upward.
3. Place final drive adapter and dial gauge onto side gear. Move side gear up and down, and measure the clearance.

Clearance between side gear and differential case

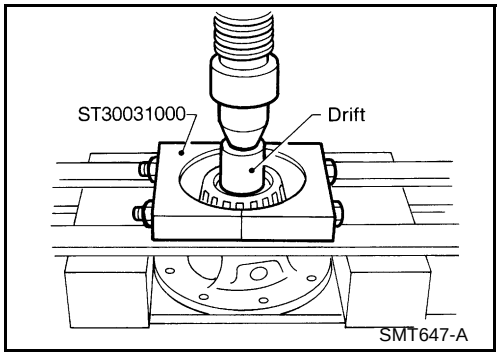
: 0.1 - 0.2 mm (0.004 - 0.008 in)



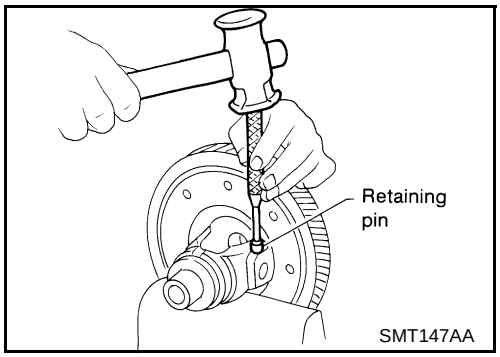
4. If not within specification, adjust the clearance by changing thrust washer thickness.
5. Turn differential case upside down, and measure the clearance between side gear and differential case on the other side in the same way.

DISASSEMBLY

1. Remove final gear.
2. Remove speedometer drive gear by cutting it.
3. Press out differential side bearings.
   - **Be careful not to mix up the right and left bearings.**



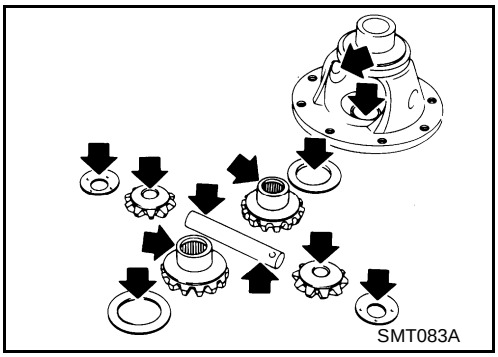
4. Drive out retaining pin and draw out pinion mate shaft.
5. Remove pinion mate gears and side gears.



INSPECTION AFTER DISASSEMBLY

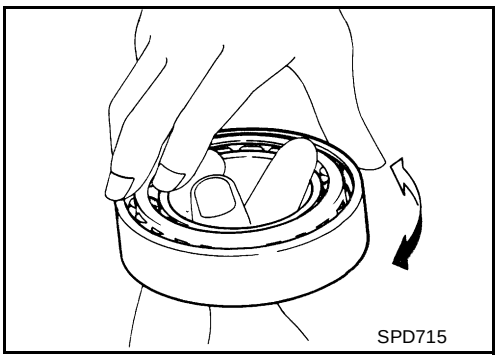
Gear, Washer, Shaft and Case

- Check mating surfaces of differential case, side gears and pinion mate gears.
- Check washers for wear.


SMT083A

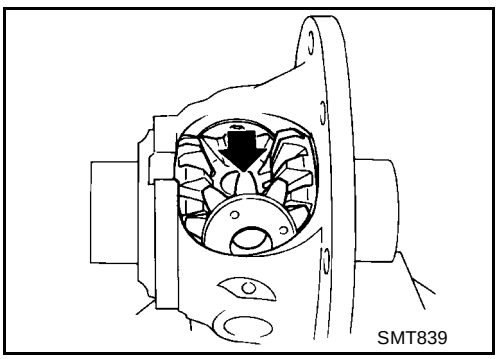
Bearing

- Make sure bearings roll freely and are free from noise, cracks, pitting or wear.
- **When replacing tapered roller bearing, replace outer and inner race as a set.**

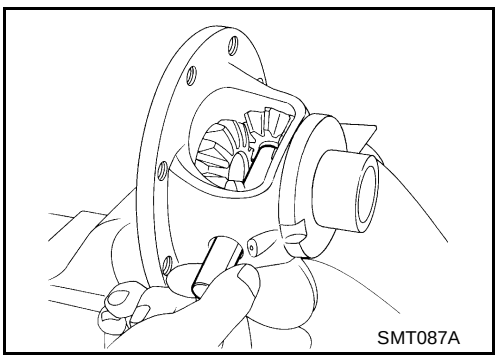

SPD715

ASSEMBLY

1. Attach side gear thrust washers to side gears and install in differential case.
2. Install pinion mate thrust washers and pinion mate gears.

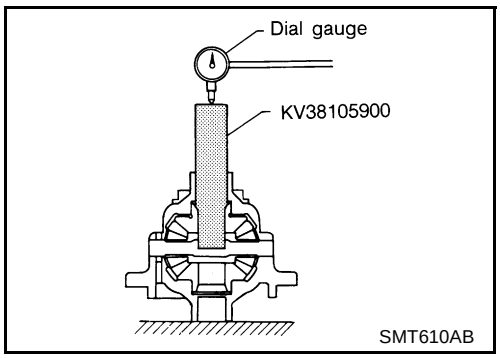

SMT839

3. Insert pinion mate shaft.
   - **When inserting, be careful not to damage pinion mate thrust washers.**


SMT087A

4. Measure clearance between side gear and differential case with washers following the procedure below:

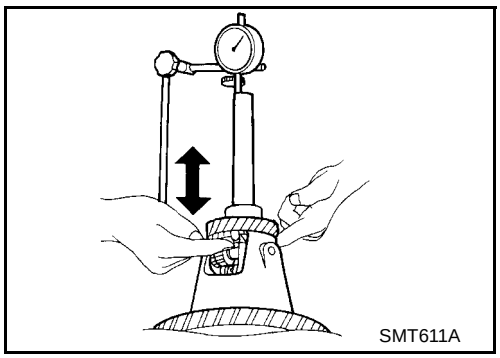
a. Set Tool and dial indicator on side gear.



b. Move side gear up and down to measure dial indicator deflection. Always measure indicator deflection on both side gears.

Clearance between side gear and differential case with washers

: 0.1 - 0.2 mm (0.004 - 0.008 in)

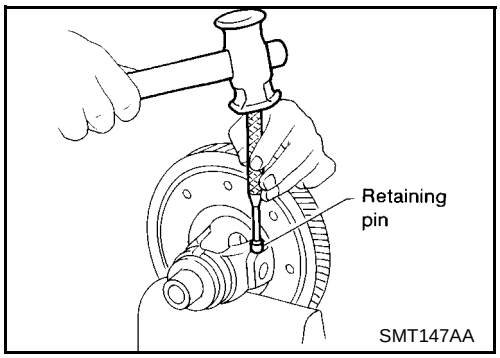


c. If not within specification, adjust clearance by changing thickness of side gear thrust washers.

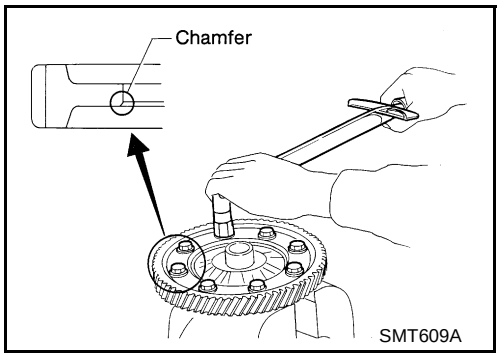
Differential side gear thrust washer

: Refer to MT-50, "DIFFERENTIAL SIDE GEAR THRUST WASHER" .

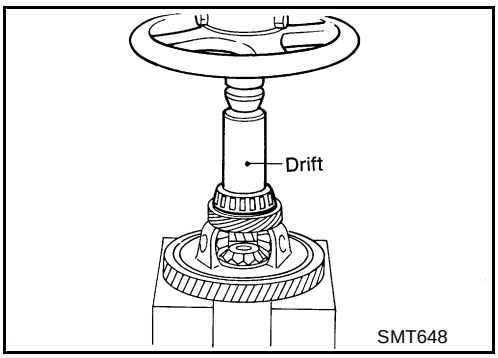
5. Install retaining pin.
   - **Make sure that retaining pin is flush with case.**



6. Install final gear.
   - **Apply locking sealant to final gear fixing bolts before installing them.**
7. Install speedometer drive gear and stopper.



8. Press on differential side bearings.



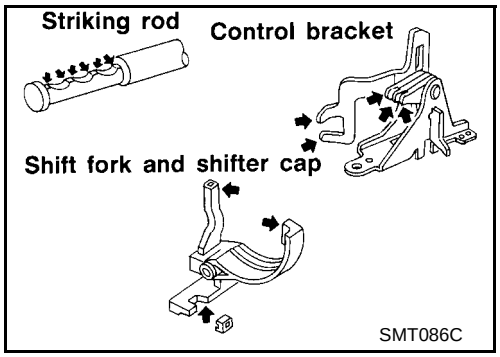
SHIFT CONTROL

PFP:32982

Inspection

ECS005H1

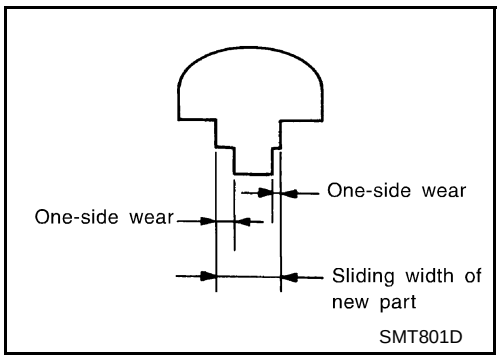
- Check contact surfaces and sliding area for wear, scratches, projections or other damage.



SHIFT FORK

- Check if the width of shift fork hook (sliding area with coupling sleeve) is within allowable specification below.

Item	One-side wear specification	Sliding width of new part
1st & 2nd	0.3 mm (0.012 in)	10.80 - 11.00 mm (0.4252 - 0.4331 in)
3rd & 4th	0.3 mm (0.012 in)	5.80 - 6.00 mm (0.2283 - 0.2362 in)
5th	0.3 mm (0.012 in)	5.80 - 6.00 mm (0.2283 - 0.2362 in)



CASE AND HOUSING

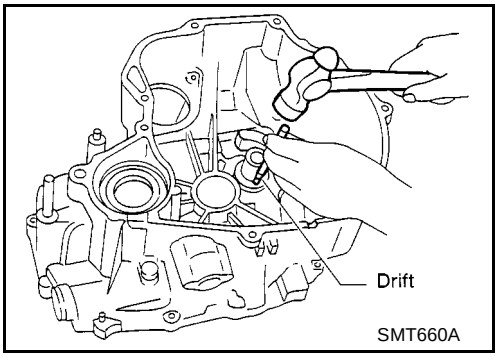
PFP:32100

Assembly and Disassembly

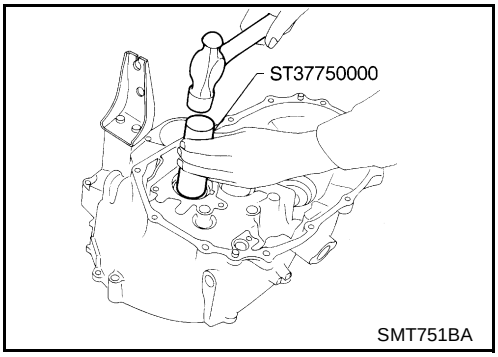
ECS005H2

INPUT SHAFT OIL SEAL

1. Drive out input shaft oil seal.

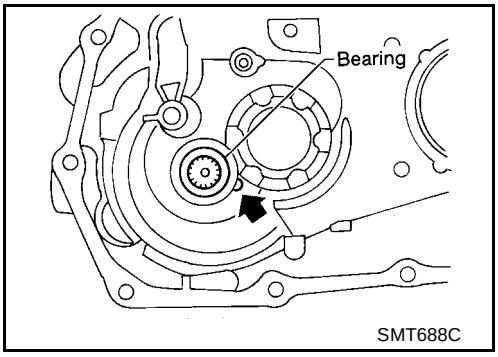


2. Install input shaft oil seal.
   - **Apply multi-purpose grease to seal lip of oil seal before installing.**

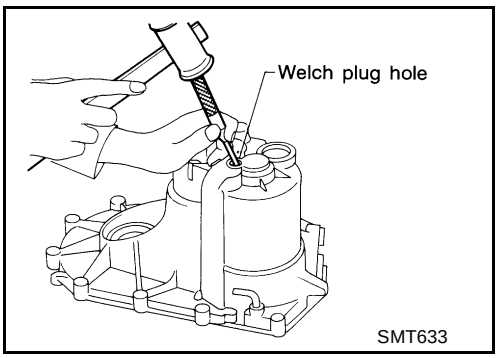


INPUT SHAFT REAR BEARING

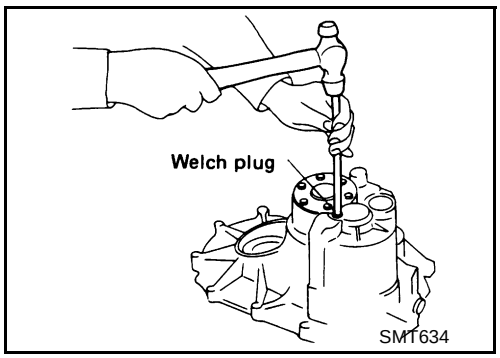
1. Remove welch plug from transmission case.



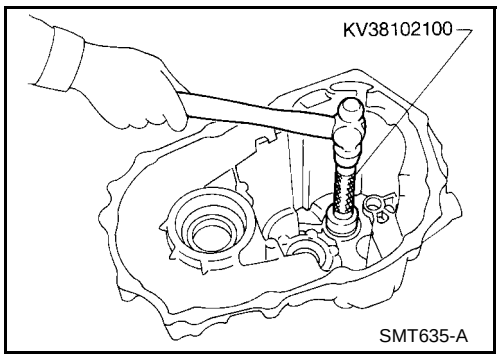
2. Remove input shaft rear bearing by tapping it from welch plug hole.



3. Install welch plug.
   - **Apply recommended sealant to mating surface of transmission case.**

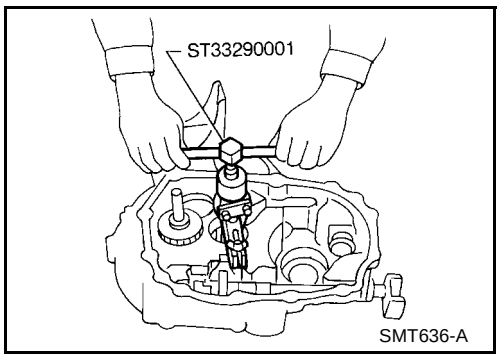


4. Install input shaft rear bearing.

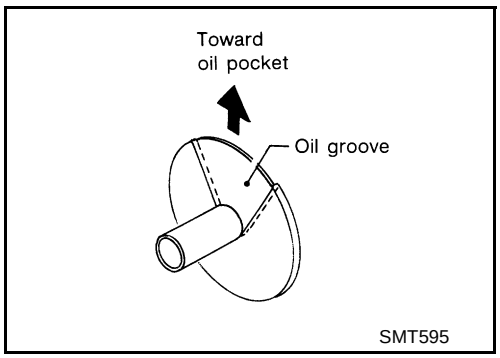


MAINSHAFT FRONT BEARING OUTER RACE AND OIL CHANNEL

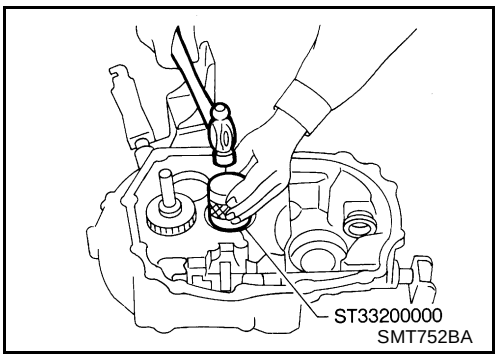
1. Remove mainshaft front bearing outer race.
2. Remove oil channel.



3. Install oil channel.
   - **Ensure the oil groove faces the oil pocket.**



4. Install mainshaft front bearing outer race.



SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

General Specifications

ECS005PO

TRANSAXLE

Engine			QG16DE
Transaxle model			RS5F30A
Model code number			AV708
Number of speed			5
Synchromesh type			Warner
Shift pattern			
Gear ratio	1st		3.333
	2nd		1.955
	3rd		1.286
	4th		0.926
	5th		0.756
	Reverse		3.417
Number of teeth	Input gear	1st	15
		2nd	22
		3rd	28
		4th	41
		5th	45
		Reverse	12
	Main gear	1st	50
		2nd	43
		3rd	36
		4th	38
		5th	34
		Reverse	41
	Reverse idler gear		30
Oil capacity ℓ (Imp pt)			2.8 - 3.0 (4-7/8 - 5-1/4)
Remarks			1st & 2nd double baulk ring type synchronizer

FINAL GEAR

Engine		QG16DE
Transaxle model		RS5F30A
Model code number		AV708
Final gear ratio		4.471
Number of teeth	Final gear/Pinion	76/17
	Side gear/Pinion mate gear	14/10

Gear End Play

ECS005PP

Unit: mm (in)

Gear	End play
1st main gear	0.18 - 0.31 (0.0071 - 0.0122)
2nd main gear	0.20 - 0.30 (0.0079 - 0.0118)
3rd input gear	0.20 - 0.30 (0.0079 - 0.0118)
4th input gear	0.20 - 0.30 (0.0079 - 0.0118)
5th input gear	0.18 - 0.31 (0.0071 - 0.0122)

Clearance Between Baulk Ring and Gear

ECS005PQ

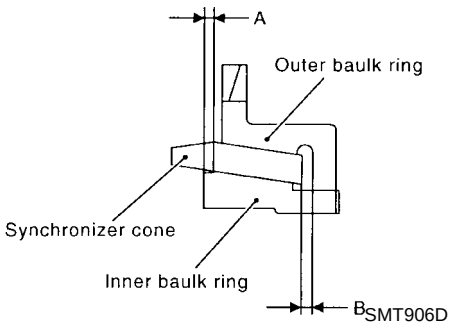
3RD, 4TH & 5TH BAULK RING

Unit: mm (in)

Standard	Wear limit
1.0 - 1.35 (0.0394 - 0.0531)	0.7 (0.028)

1ST AND 2ND DOUBLE BAULK RING

Unit: mm (in)



Dimension	Standard	Wear limit
A	0.7 - 0.9 (0.028 - 0.035)	0.2 (0.008)
B	0.7 - 1.0 (0.028 - 0.039)	

Available Check Plugs

ECS005PR

REVERSE CHECK PLUGS

Reverse check turning torque (At striking rod) N·m (kg-cm, in-lb)	4.9 - 7.4 (50 - 75, 43 - 65)
Thickness mm (in)	Part number*2
8.3 (0.327)	32188-M8001*1
7.1 (0.280)	32188-M8002
7.7 (0.303)	32188-M8003
8.9 (0.350)	32188-M8004

*1: Standard size check plug

*2 : Always check with the Parts Department for the latest parts information.

Available Snap Rings

ECS005PS

INPUT SHAFT FRONT BEARING

Allowable clearance	0 - 0.1 mm (0 - 0.004 in)
Thickness mm (in)	Part number*
1.27 (0.0500)	32204-M8004
1.33 (0.0524)	32204-M8005
1.39 (0.0547)	32204-M8006
1.45 (0.0571)	32204-M8007

*: Always check with the Parts Department for the latest parts information.

INPUT SHAFT 5TH SYNCHRONIZER HUB

Allowable clearance	0 - 0.1 mm (0 - 0.004 in)
Thickness mm (in)	Part number*
2.00 (0.0787)	32311-M8812
2.05 (0.0807)	32311-M8813
2.10 (0.0827)	32311-M8814
2.15 (0.0846)	32311-M8815
2.20 (0.0866)	32311-M8816
2.25 (0.0886)	32311-M8817
2.30 (0.0906)	32311-M8818

*: Always check with the Parts Department for the latest parts information.

INPUT SHAFT REAR BEARING

Allowable clearance	0 - 0.1 mm (0 - 0.004 in)
Thickness mm (in)	Part number*
1.27 (0.0500)	32204-4M400
1.33 (0.0524)	32204-4M401
1.39 (0.0547)	32204-4M402
1,45 (0.0571)	32204-4M403

*: Always check with the Parts Department for the latest parts information.

Available C-rings

ECS005PT

MAINSHAFT C-RING

Allowable clearance		0 - 0.1 mm (0 - 0.004 in)	
Thickness mm (in)	Part number*	Thickness mm (in)	Part number*
3.63 (0.1429	32348-M8800	4.12 (0.1622)	32348-M8807
3.70 (0.1457)	32348-M8801	4.19 (0.1650)	32348-M8808
3.77 (0.1484)	32348-M8802	4.26 (0.1677)	32348-M8809
3.84 (0.1512)	32348-M8803	4.33 (0.1705)	32348-M8810
3.91 (0.1539)	32348-M8804	4.40 (0.1732)	32348-M8811
3.98 (0.1567)	32348-M8805	4.47 (0.1760)	32348-M8812
4.05 (0.1594)	32348-M8806	4.54 (0.1787)	32348-M8813

*: Always check with the Parts Department for the latest parts information.

Available Thrust Washer

ECS005PU

DIFFERENTIAL SIDE GEAR THRUST WASHER

Allowable clearance between side gear and differential case with washer	0.1 - 0.2 mm (0.004 - 0.008 in)
Thickness mm (in)	Part number*
0.76 - 0.81 (0.0299 - 0.0319)	38424-01M10
0.81 - 0.86 (0.0319 - 0.0339)	38424-01M11
0.86 - 0.91 (0.0339 - 0.0358)	38424-01M12
0.91 - 0.96 (0.0358 - 0.0378)	38424-01M13

*: Always check with the Parts Department for the latest parts information.

Available Adjusting Shims

ECS005PV

BEARING PRELOAD

Unit: mm (in)

Mainshaft bearing	Differential side bearing
0.20 - 0.25 (0.0079 - 0.0098)	0.24 - 0.32 (0.0094 - 0.0126)

MAINSHAFT REAR BEARING ADJUSTING SHIMS

Thickness mm (in)	Part number*
0.10 (0.0039)	32137-M8000
0.15 (0.0059)	32137-M8001
0.20 (0.0079)	32137-M8002
0.25 (0.0098)	32137-M8003
0.30 (0.0118)	32137-M8004
0.35 (0.0138)	32137-M8005
0.40 (0.0157)	32137-M8006
0.45 (0.0177)	32137-M8007
0.50 (0.0197)	32137-M8008
0.55 (0.0217)	32137-M8009
0.60 (0.0236)	32137-M8010
0.65 (0.0256)	32137-M8011
0.70 (0.0276)	32137-M8012
0.75 (0.0295)	32137-M8013
0.80 (0.0315)	32137-M8014
0.85 (0.0335)	32137-M8015
0.90 (0.0354)	32137-M8016
0.95 (0.0374)	32137-M8017
1.00 (0.0394)	32137-M8018

*: Always check with the Parts Department for the latest parts information.

DIFFERENTIAL SIDE BEARING ADJUSTING SHIMS

Thickness mm (in)	Part number*
0.44 (0.0173)	38454-M8000
0.48 (0.0189)	38454-M8001
0.56 (0.0220)	38454-M8003
0.60 (0.0236)	38454-M8004
0.64 (0.0252)	38454-M8005
0.68 (0.0268)	38454-M8006
0.72 (0.0283)	38454-M8007
0.76 (0.0299)	38454-M8008
0.80 (0.0315)	38454-M8009
0.84 (0.0331)	38454-M8010
0.88 (0.0346)	38454-M8011

*: Always check with the Parts Department for the latest parts information.

PRECAUTIONS

PFP:00001

Caution

ECS005HB

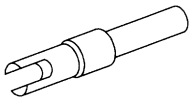
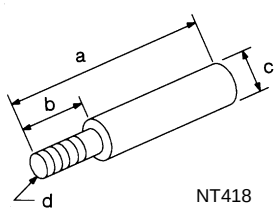
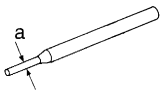
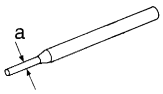
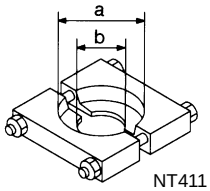
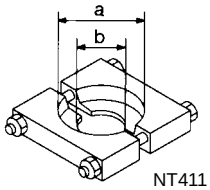
- Do not reuse transaxle oil, once it has been drained.
- Check oil level or replace oil with vehicle on level ground.
- During removal or installation, keep inside of transaxle clear of dust or dirt.
- Check for the correct installation status prior to removal or disassembly. If mating marks are required, be certain they do not interfere with the function of the parts they are applied to.
- In principle, tighten bolts or nuts gradually in several steps working diagonally from inside to outside. If tightening sequence is specified, observe it.
- Be careful not to damage sliding surfaces and mating surfaces.

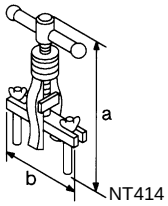
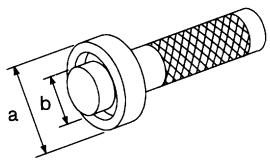
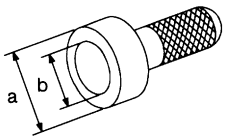
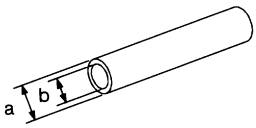
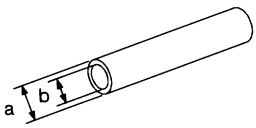
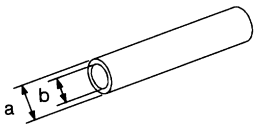
PREPARATION

PFP:00002

Special Service Tools

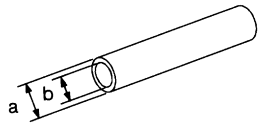
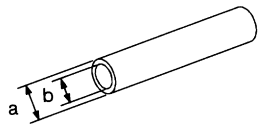
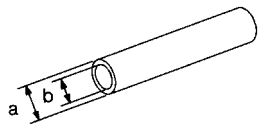
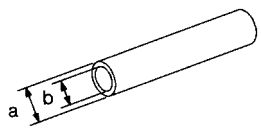
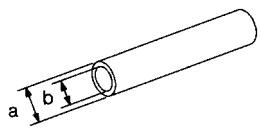
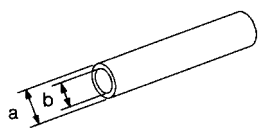
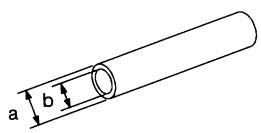
ECS006BP

Tool number Tool name	Description
KV38107700 Preload adapter  NT087	● Measuring turning torque of final drive assembly ● Measuring total turning torque ● Measuring clearance between side gear and differential case with washer ● Selecting differential side bearing adjusting shim (Use with KV38106000.)
KV38106000 Height gauge adapter (differential side bearing) a: 140 mm (5.51 in) b: 40 mm (1.57 in) c: 16 mm (0.63 in) dia. d: M8 x 1.25P  NT418	● Selecting differential side bearing adjusting shim (Use with KV38107700.)
KV32101000 Pin punch a: 4 mm (0.16 in) dia.  NT410	● Removing and installing retaining pin ● Removing and installing lock pin ● Removing selector shaft ● Removing welch plug
KV31100300 Pin punch a: 4.5 mm (0.177 in) dia.  NT410	● Removing and installing retaining pin
ST30031000 Puller a: 90 mm (3.54 in) dia. b: 50 mm (1.97 in) dia.  NT411	● Removing 3rd, 5th input gear ● Removing 3rd & 4th and 5th & reverse synchronizer hub ● Removing mainshaft rear bearing ● Removing 2nd gear, 5th gear bushing ● Removing 1st & 2nd synchronizer hub, 1st and 4th main gear ● Removing and installing differential side bearing
ST30021000 Puller a: 110 mm (4.33 in) dia. b: 68 mm (2.68 in) dia.  NT411	● Removing input shaft front and rear bearing ● Installing input shaft front and rear bearing ● Installing 5th input gear, 3rd main gear and 4th main gear ● Installing 1st & 2nd, 3rd & 4th and 5th & reverse synchronizer hub ● Installing 2nd gear bushing, 5th gear bushing, reverse gear bushing ● Installing mainshaft rear bearing

Tool number Tool name	Description
ST33290001 Puller a: 250 mm (9.84 in) b: 160 mm (6.30 in)  NT414	● Removing idler gear bearing outer race
ST33230000 Drift a: 51 mm (2.01 in) dia. b: 28.5 mm (1.122 in) dia.  NT084	● Installing differential side bearing
ST30720000 Drift a: 77 mm (3.03 in) dia. b: 55.5 mm (2.185 in) dia.  NT115	● Installing differential side bearing outer race
ST22350000 Drift a: 34 mm (1.34 in) dia. b: 28 mm (1.10 in) dia.  NT065	● Installing input shaft front and rear bearing
ST22452000 Drift a: 45 mm (1.77 in) dia. b: 36 mm (1.42 in) dia.  NT065	● Installing 3rd and 4th main gear ● Installing 5th gear bushing ● Installing 5th & reverse synchronizer hub ● Installing reverse gear bushing ● Installing mainshaft rear bearing
ST37750000 Drift a: 40 mm (1.57 in) dia. b: 31 mm (1.22 in) dia.  NT065	● Installing input shaft oil seal ● Installing 5th synchronizer ● Installing mainshaft rear bearing ● Installing 5th main gear ● Installing 3rd & 4th synchronizer hub ● Installing striking rod oil seal ● Installing clutch housing dust seal

Commercial Service Tools

ECS006BQ

Tool name	Description
Drift a: 12 mm (0.47 in) dia. b: 10 mm (0.39 in) dia.  NT065	● Installing welch plug
Drift a: 22 mm (0.87 in) dia. b: 16 mm (0.63 in) dia.  NT065	● Removing input shaft rear bearing ● Removing mainshaft rear bearing
Drift a: 58 mm (2.28 in) dia. b: 50 mm (1.97 in) dia.  NT065	● Installing differential oil seal
Drift a: 54 mm (2.13 in) dia. b: 50 mm (1.97 in) dia.  NT065	● Installing differential oil seal
Drift a: 38 mm (1.50 in) dia. b: 33 mm (1.30 in) dia.  NT065	● Installing 2nd gear bushing
Drift a: 50 mm (1.97 in) dia. b: 41 mm (1.61 in) dia.  NT065	● Installing 3rd & 4th and 1st & 2nd synchronizer hub ● Installing mainshaft front bearing
Drift a: 39 mm (1.54 in) dia. b: 30 mm (1.18 in) dia.  NT065	● Installing input shaft oil seal ● Installing 5th input gear

NOISE, VIBRATION, AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

ECS005HE

Use the chart below to help you find the cause of the symptom. The numbers indicate the order of the inspection. If necessary, repair or replace these parts.

MANUAL TRANSAXLE

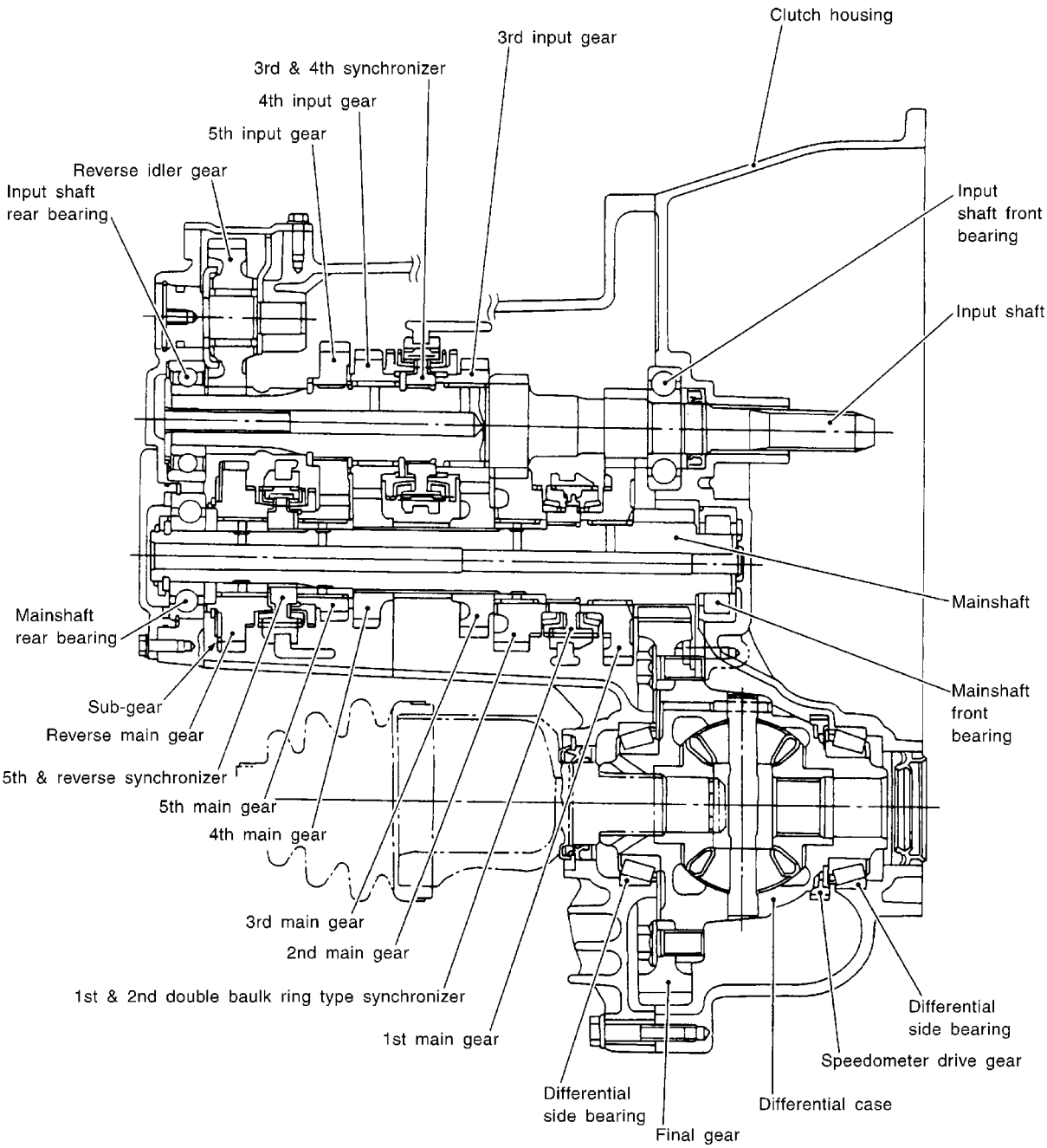
Reference page		MT-59	MT-59	MT-59	MT-67	MT-67	MT-67	MT-63	MT-69	MT-69	MT-68	MT-68	MT-68	MT-68
SUSPECTED PARTS (Possible cause)		(Oil level is low.)	(Wrong oil)	(Oil level is high.)	GASKET (Damaged)	OIL SEAL (Worn or damaged)	O-RING (Worn or damaged)	SHIFT CONTROL ROD (Worn)	CHECK PLUG RETURN SPRING AND CHECK BALL (Worn or damaged)	SHIFT FORK (Worn)	GEAR (Worn or damaged)I	BEARING (Worn or damaged)	BAULK RING (Worn or damaged)	INSERT SPRING (Damaged)
Symptoms	Noise	1	2									3	3	
	Oil leakage		3	1	2	2	2							
	Hard to shift or will not shift		1	1				2					3	3
	Jumps out of gear							1	2	3	3			

DESCRIPTION

PFP:00000

Cross-sectional View

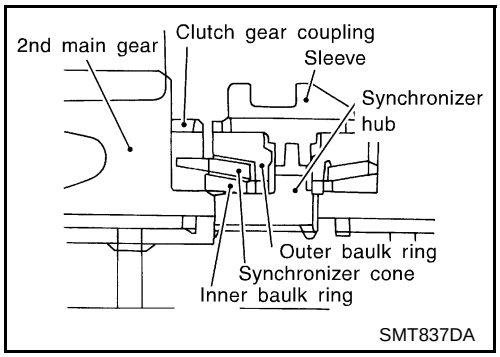
ECS005HF



SMT924D

DOUBLE-CONE SYNCHRONIZER

Double-cone synchronizer is adopted for 1st and 2nd gears to reduce operating force of the shift lever.



M/T OIL

PFP:KLD20

Changing M/T Oil

ECS005HG

DRAINING

1. Start the engine and let it run to warm up the transaxle.
2. Stop the engine. Remove drain plug and drain oil.
3. Set a gasket on the drain plug and install it to the transaxle.

Drain plug:

: 25 - 34 N·m (2.5 - 3.5 kg-m, 18 - 25 ft-lb)

CAUTION:
Do not reuse gasket.

FILLING

1. Remove filler plug. Fill with new oil until oil level reaches the specified limit near filler plug mounting hole.

Oil grade : API GL-4
Capacity (reference) : Approx. 2.9 - 3.1 ℓ (5-1/4 Imp pt)

2. After refilling oil, check oil level. Assemble gasket to filler plug, then install it to transaxle body.

Filler plug:

: 10 - 19 N·m (1.0 - 2.0 kg-m, 87 - 173 in-lb)

CAUTION:
Do not reuse gasket.

Checking M/T Oil

ECS005HH

OIL LEAKAGE AND OIL LEVEL

- Check that oil is not leaking from transaxle or around it.
- Check oil level from filler plug mounting hole as shown in the figure.

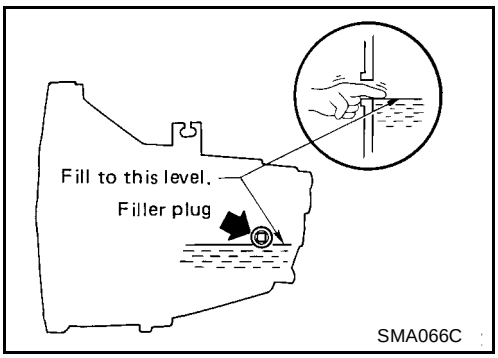
CAUTION:
Never start engine while checking oil level.

- Set a new gasket on the filler plug and install it on the transaxle.

Filler plug:

: 10 - 19 N·m (1.0 - 2.0 kg-m, 87 - 173 ft-lb)

CAUTION:
Do not reuse gasket.



SIDE OIL SEAL

PFP:32113

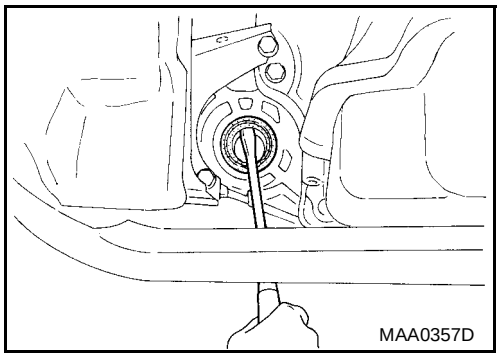
Removal and Installation

ECS005HI

REMOVAL

1. Remove the drive shaft from the transaxle. Refer to FAX-11, "FRONT DRIVE SHAFT" .
2. Remove oil seal with a slotted screwdriver.

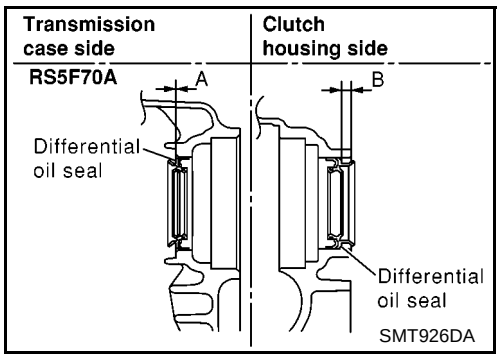
CAUTION:
Be careful not to damage the case surface when removing the oil seal.



INSTALLATION

1. Using a drift, drive the oil seal straight until it protrudes from the case end equal to dimension A shown in the figure.

Dimension A : Within 0.5 mm of flush with the case.



CAUTION:
- **When installing oil seals, apply multi-purpose grease to oil seal lips.**
- **Do not reuse oil seal.**

2. Install all parts in reverse order of removal and check oil level after installation.

STRIKING ROD OIL SEAL

PFP:32858

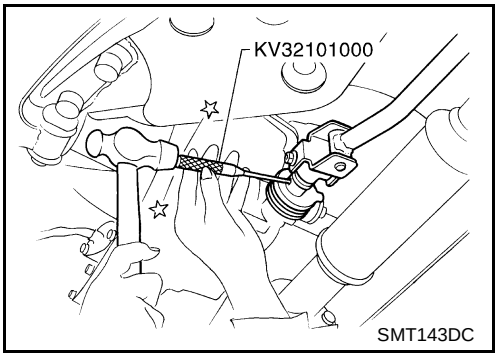
Removal and Installation

ECS005HJ

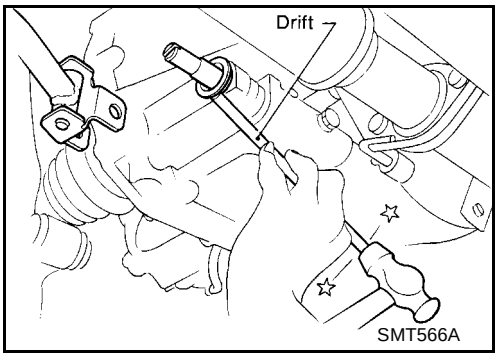
REMOVAL

1. Remove transaxle control rod from yoke.
2. Remove retaining pin of yoke.

- **Be careful not to damage boot.**



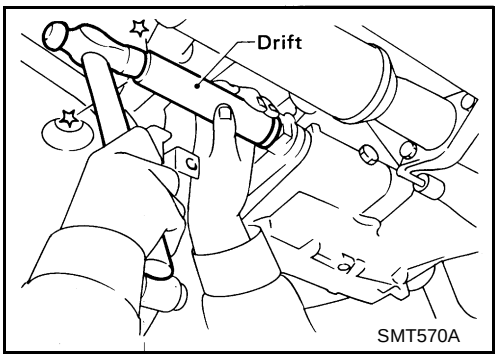
3. Remove striking rod oil seal.



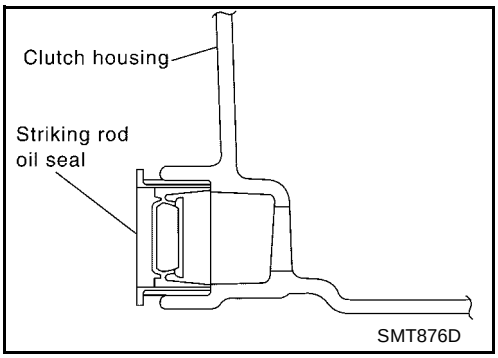
INSTALLATION

1. Install striking rod oil seal.

- **Apply multi-purpose grease to seal lip of oil seal before installing.**



- **Drive it in as far as it will go.**



POSITION SWITCH

PFP:32005

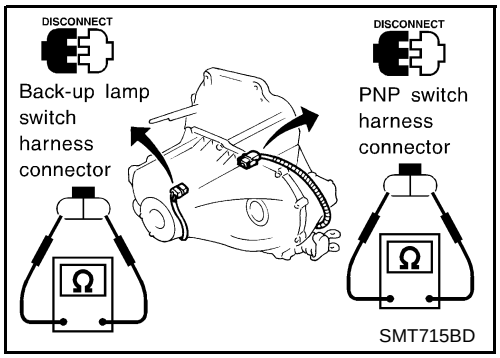
Checking

ECS005HK

BACK-UP LAMP SWITCH

- Check continuity.

Gear position	Continuity
Reverse	Yes
Except reverse	No



PNP SWITCH

- Check continuity.

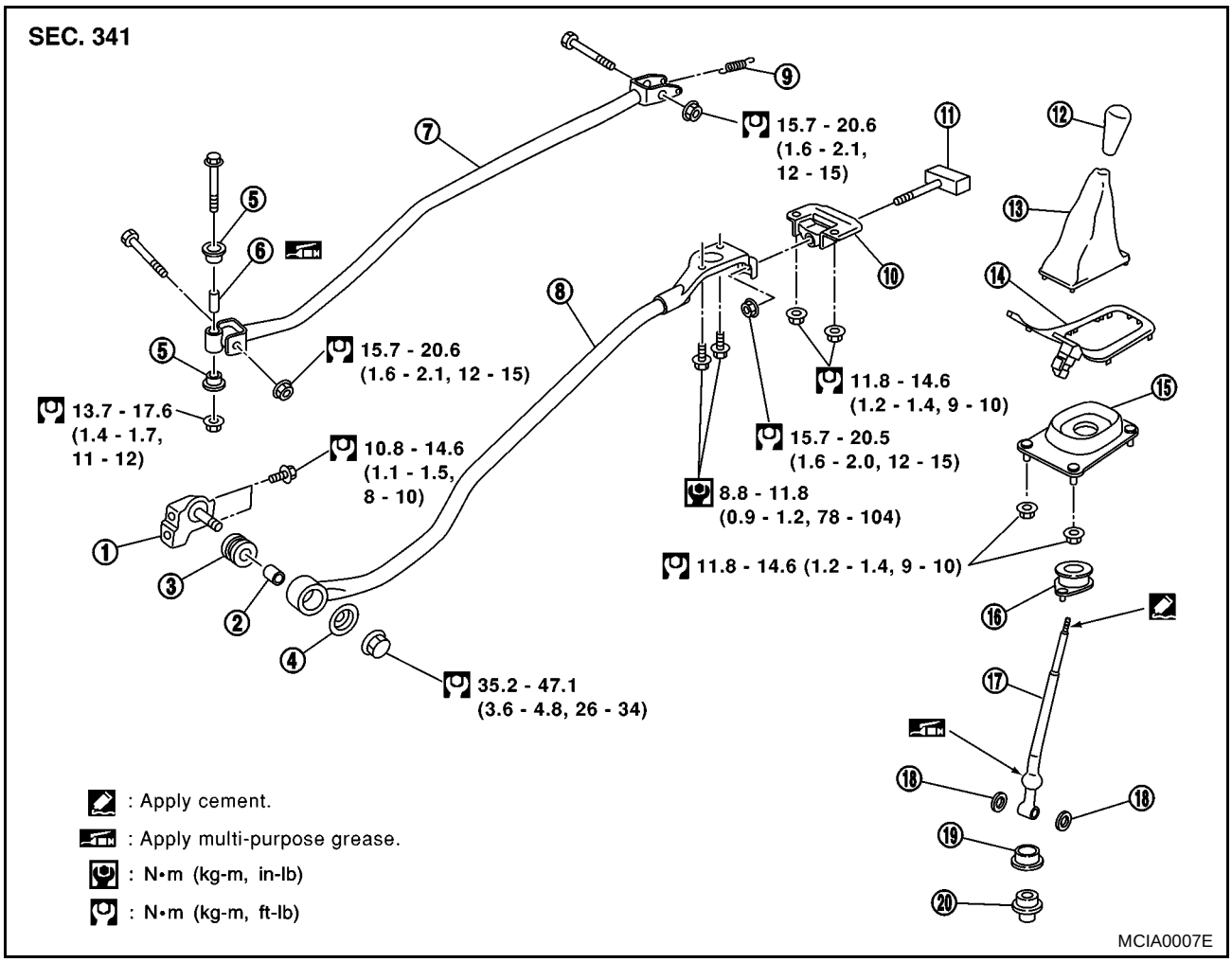
Gear position	Continuity
Neutral	Yes
Except neutral	No

CONTROL LINKAGE

PFP:34103

Removal and Installation

ECS005HL



1. Support rod bracket
2. Collar
3. Bushing
4. Washer
5. Bushing
6. Collar
7. Control rod
8. Support rod
9. Return spring
10. Holder bracket
11. Mass damper
12. Control lever knob
13. Boot
14. Finisher
15. Transaxle hole cover
16. Control lever socket
17. Control lever
18. Bushing
19. Ball socket
20. Dust boot

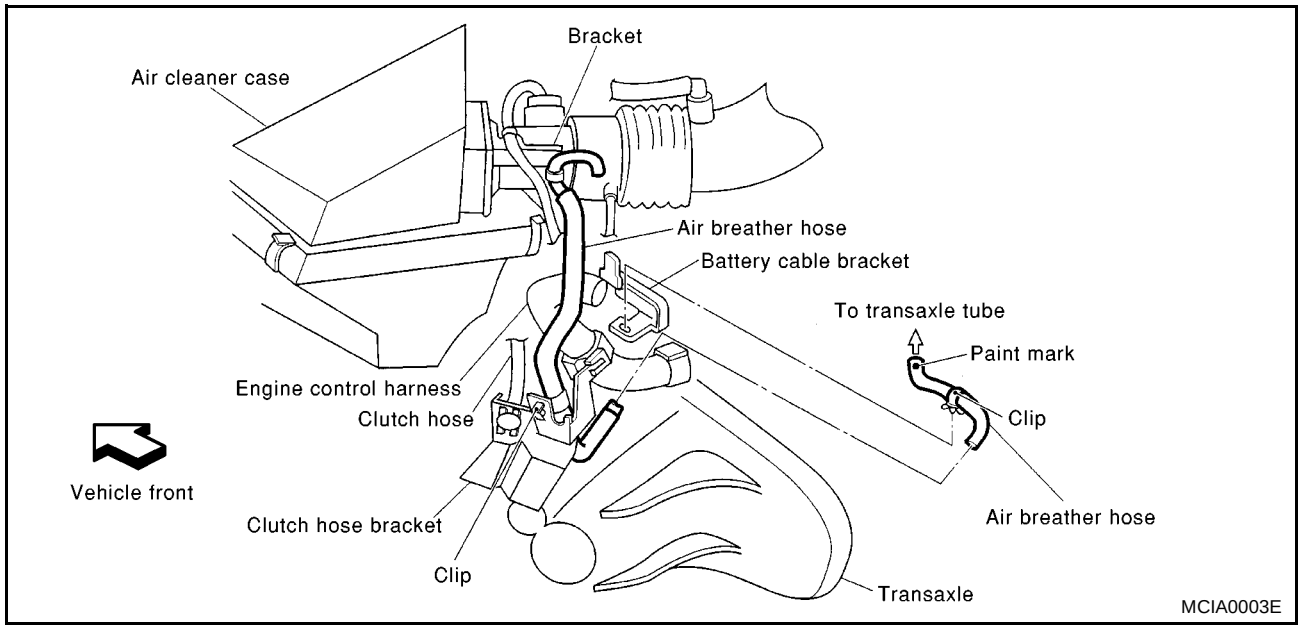
AIR BREATHER HOSE

PFP:31098

Removal and Installation

ECS005HM

Refer to the figure for air breather hose removal and installation information.



CAUTION:

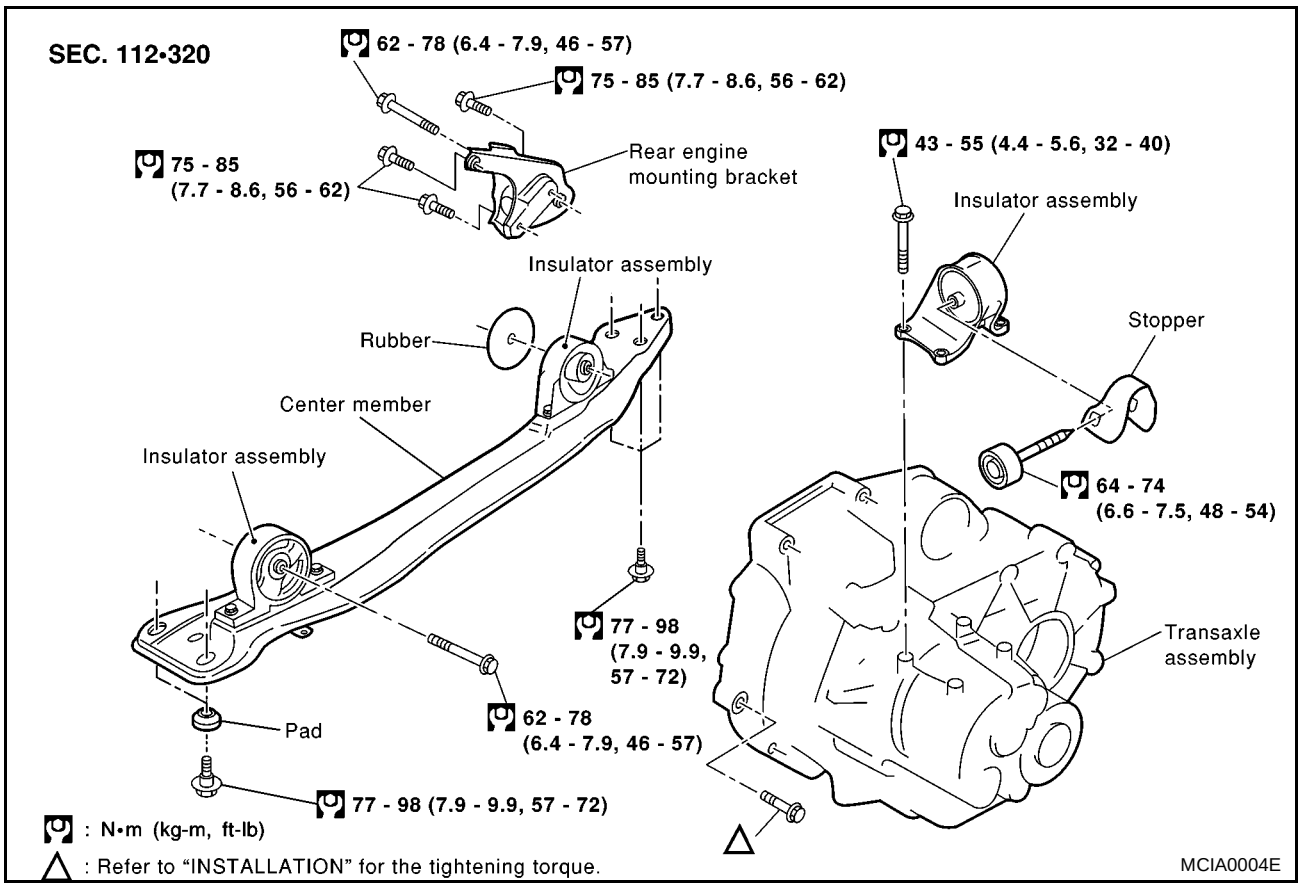
- **Make sure there are no pinched or restricted areas on the air breather hose caused by bending or winding when installing it.**
- **Be sure to insert hose into the transaxle tube until overlap area reaches the spool.**

TRANSAXLE ASSEMBLY

PFP:32010

Removal and Installation

ECS005PW



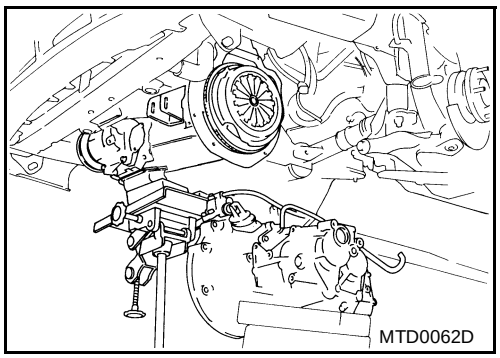
REMOVAL

1. Remove air cleaner, air duct, and battery.
2. Remove the air breather hose.
3. Remove clutch operating cylinder.

   CAUTION:
   Do not depress clutch pedal during removal procedure.
4. Disconnect control linkage from transaxle.
5. Disconnect PNP switch, back-up lamp switch, vehicle speed sensor and ground harness connectors.
6. Remove starter motor.
7. Drain gear oil from transaxle.
8. Remove suspension cross bar.
9. Remove exhaust front tube and the driveshaft.
10. Place a jack onto the transaxle.

    CAUTION:
    When setting jack, be careful not to bring it into contact with the switch.
11. Remove center member, engine insulator and engine mount bracket.
12. Support engine by placing a jack under oil pan.
13. Remove bolts securing transaxle to engine.

14. Remove transaxle from vehicle.

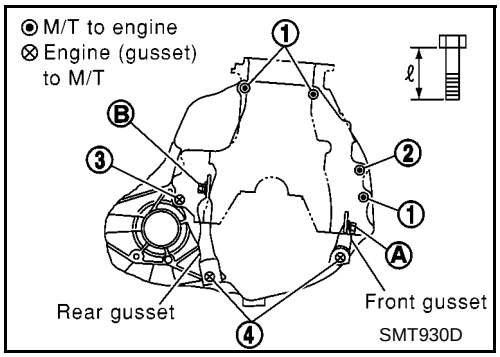


INSTALLATION

Paying attention to the following items, install in the reverse order of removal.

- When installing the transaxle to the engine, tighten to the specified torque.

CAUTION:
When installing transaxle, be careful not to bring transaxle input shaft into contact with the clutch cover.



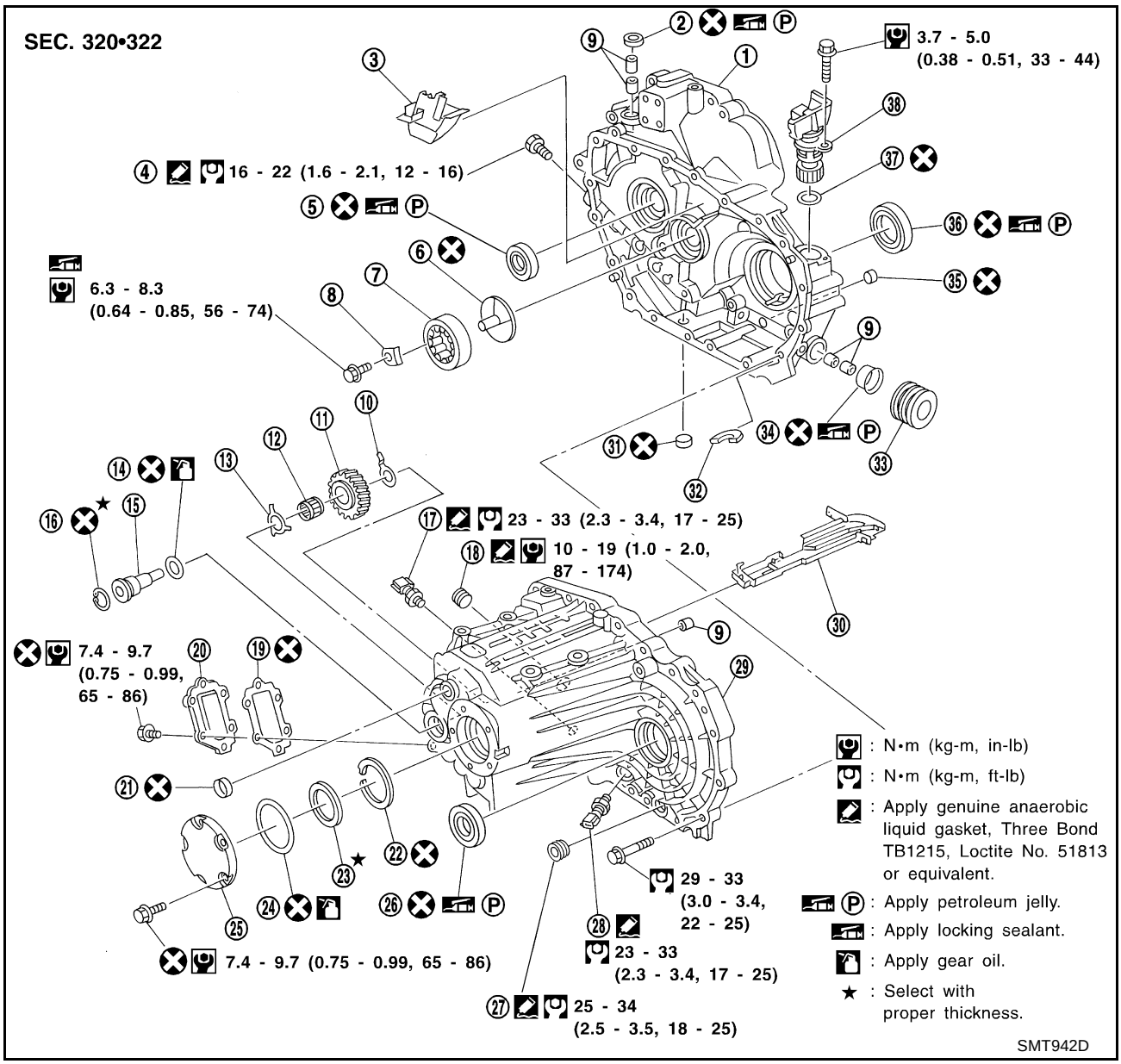
Bolt No.	Tightening torque N·m (kg-m, ft-lb)	" ℓ " mm (in)
1	30 - 40 (3.1 - 4.1, 22 - 30)	70 (2.76)
2	30 - 40 (3.1 - 4.1, 22 - 30)	95 (3.74)
3	30 - 40 (3.1 - 4.1, 22 - 30)	30 (1.18)
4*1	16 - 21 (1.6 - 2.1, 12 - 15)	25 (0.98)
Front gusset A to engine	30 - 40 (3.1 - 4.1, 22 - 30)	20 (0.79)
Rear gusset B to engine	16 - 21 (1.6 - 2.1, 12 - 15)	16 (0.63)

*1: With gussets

Component Parts

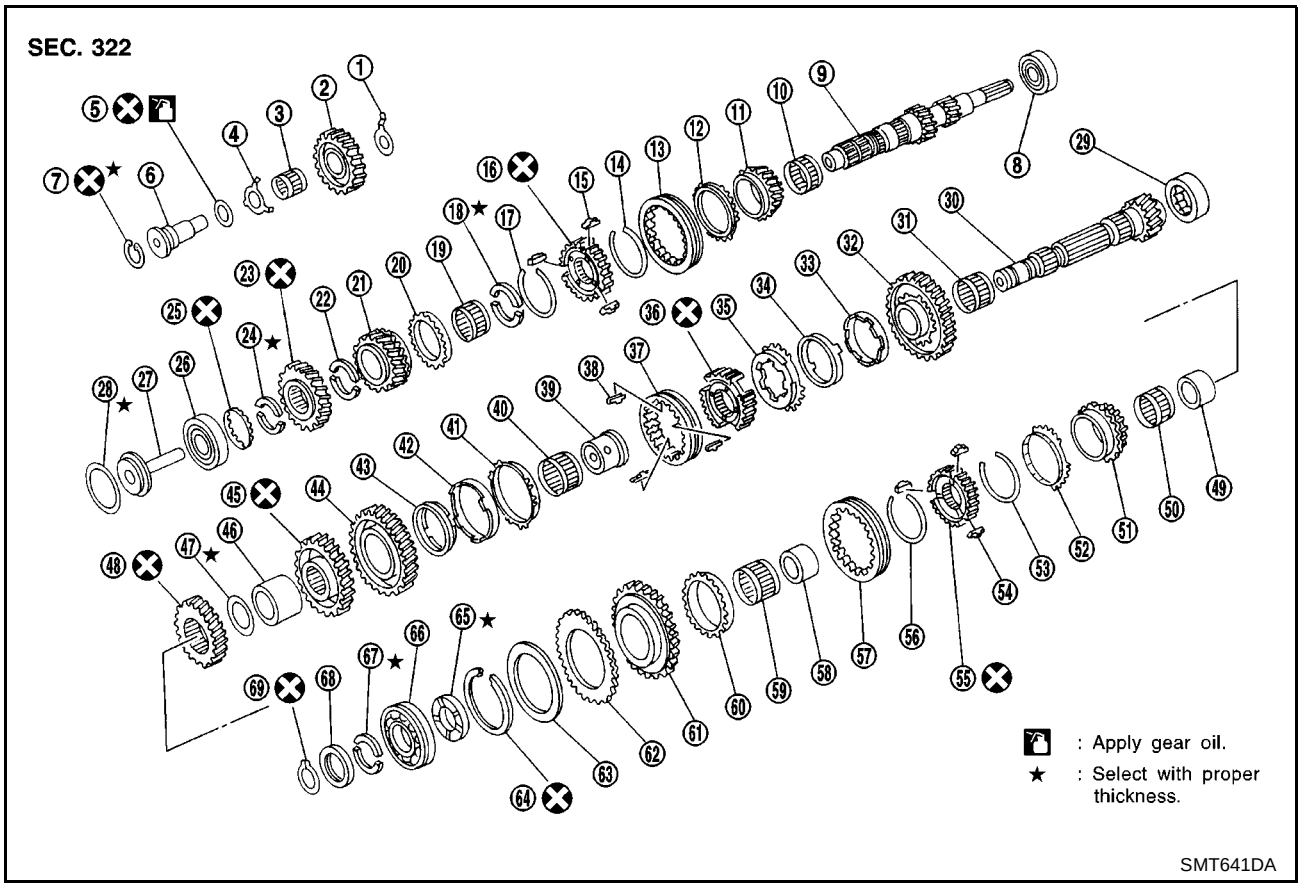
ECS005PX

CASE AND HOUSING COMPONENTS



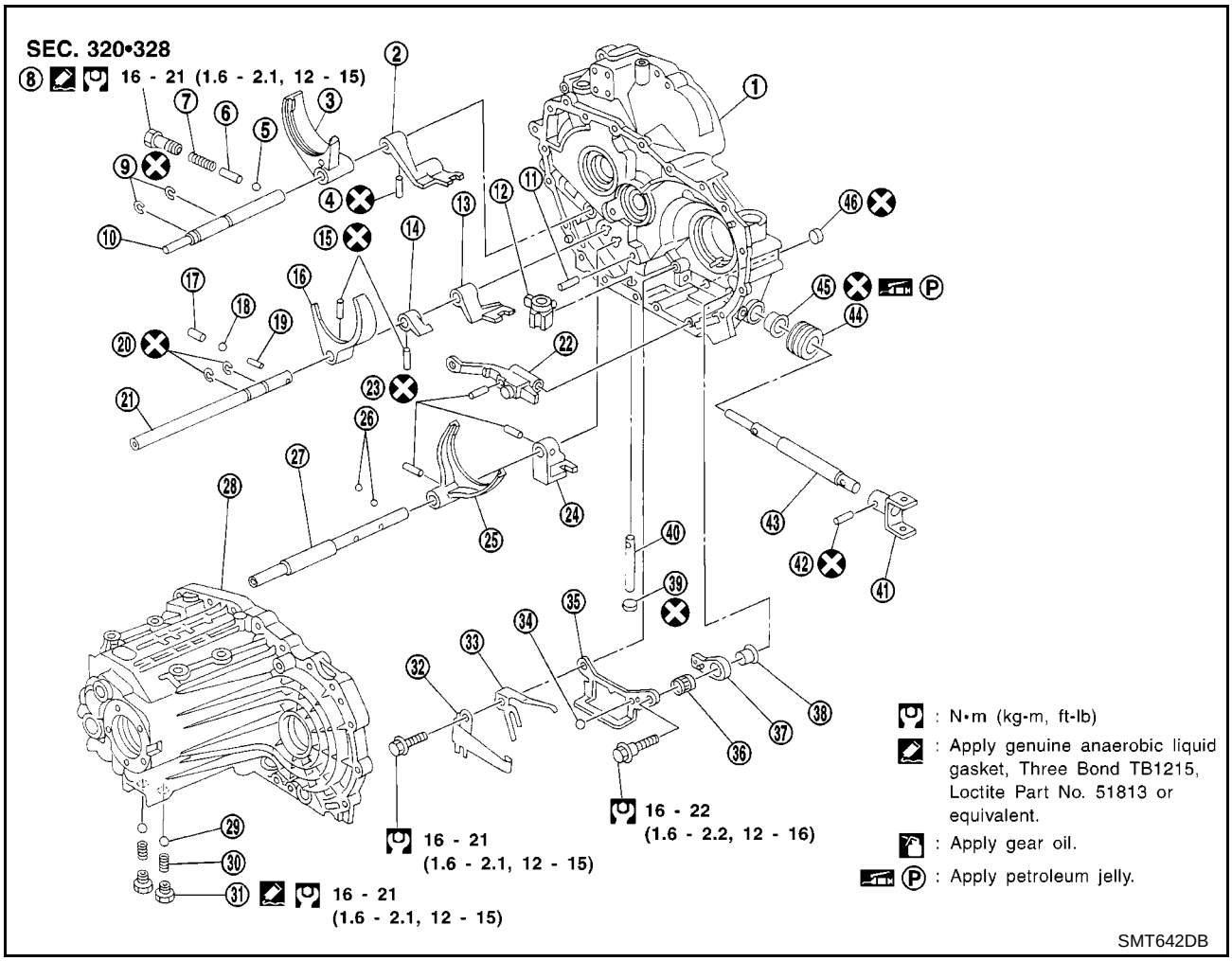
1. Clutch housing
2. Dust seal
3. Oil pocket
4. Check plug
5. Input shaft oil seal
6. Oil channel
7. Mainshaft front bearing
8. Bearing retainer
9. Bushing
10. Reverse idler gear front thrust washer
11. Reverse idler gear
12. Reverse idler gear bearing
13. Reverse idler gear rear thrust washer
14. O-ring
15. Reverse idler gear shaft
16. Snap ring
17. Reverse switch
18. Filler plug
19. Side cover gasket
20. Side cover
21. Welch plug
22. Mainshaft bearing snap ring
23. Mainshaft rear bearing adjusting shim
24. O-ring
25. Rear cover
26. Differential oil seal
27. Drain plug
28. PNP switch
29. Transmission case
30. Oil gutter
31. Welch plug
32. Magnet
33. Boot
34. Striking rod oil seal
35. Welch plug
36. Differential oil seal
37. O-ring
38. Speedometer pinion

GEAR COMPONENTS



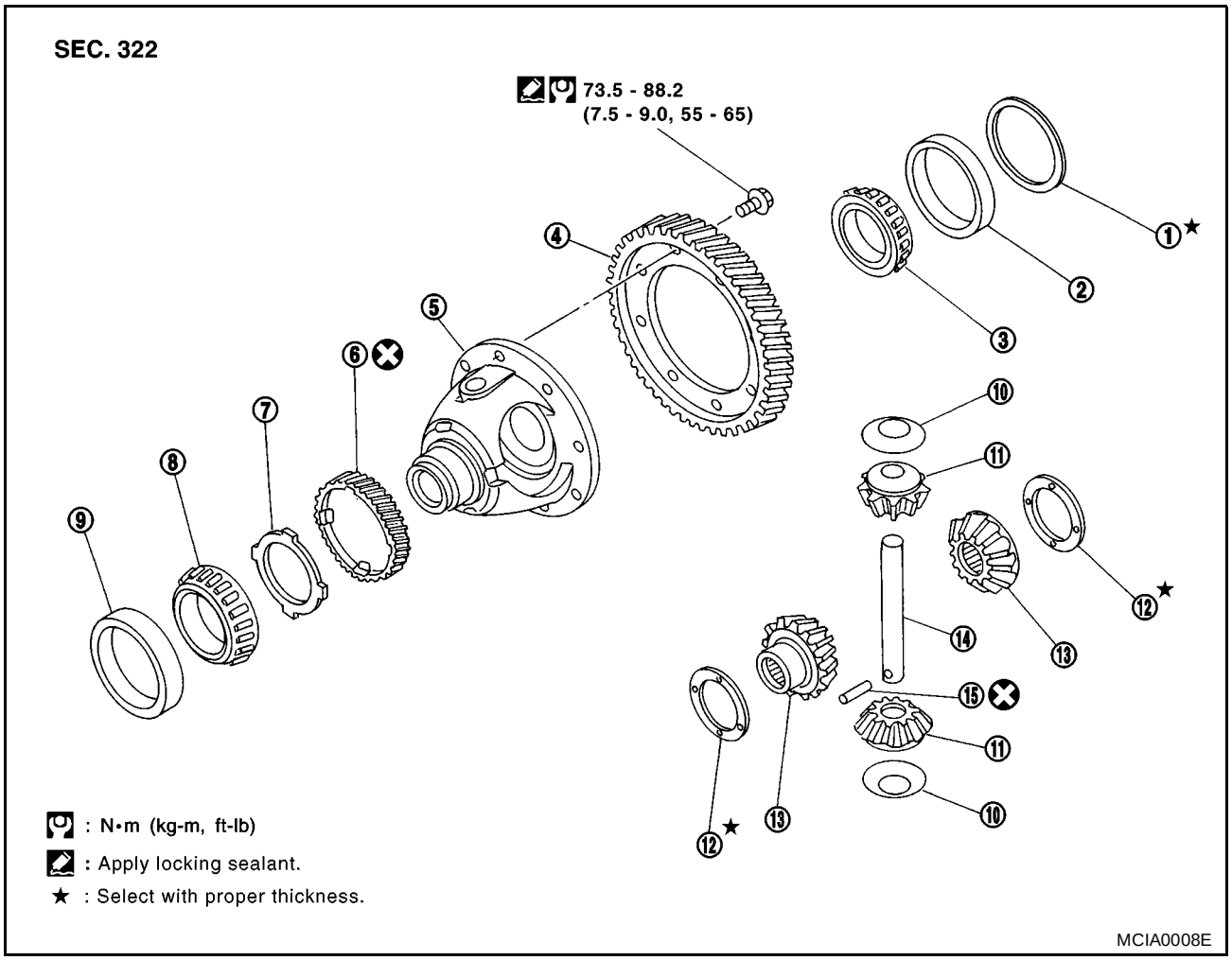
1. Reverse idler gear front thrust washer
2. Reverse idler gear
3. Reverse idler gear bearing
4. Reverse idler gear rear thrust washer
5. O-ring
6. Reverse idler gear shaft
7. Snap ring
8. Input shaft front bearing
9. Input shaft
10. 3rd gear needle bearing
11. 3rd input gear
12. 3rd gear baulk ring
13. Coupling sleeve
14. Spread spring
15. Shifting insert
16. 3rd & 4th synchronizer hub
17. Spread spring
18. 4th gear C-ring
19. 4th gear needle bearing
20. 4th gear baulk ring
21. 4th input gear
22. 5th gear front C-ring
23. 5th input gear
24. 5th gear rear C-ring
25. C-ring holder
26. Input shaft rear bearing
27. Oil channel
28. Input shaft rear bearing adjusting shim
29. Mainshaft front bearing
30. Mainshaft
31. 1st gear needle bearing
32. 1st main gear
33. 1st inner baulk ring
34. 1st synchronizer cone
35. 1st outer baulk ring
36. 1st & 2nd synchronizer hub
37. Coupling sleeve
38. Insert spring
39. 2nd gear bush
40. 2nd gear needle bearing
41. 2nd gear outer baulk ring
42. 2nd gear synchronizer cone
43. 2nd inner baulk ring
44. 2nd main gear
45. 3rd main gear
46. Spacer
47. Mainshaft adjusting shim
48. 4th main gear
49. 5th gear bushing
50. 5th gear needle bearing
51. 5th main gear
52. 5th gear baulk ring
53. Spread spring
54. Shifting insert
55. 5th & reverse synchronizer hub
56. Spread spring
57. Coupling sleeve
58. Reverse gear bushing
59. Reverse gear needle bearing
60. Reverse gear baulk ring
61. Reverse main gear
62. Sub-gear
63. Sub-gear washer
64. Snap ring
65. Mainshaft thrust washer
66. Mainshaft rear bearing
67. Mainshaft C-ring
68. C-ring holder
69. Snap ring

SHIFT CONTROL COMPONENTS



1. Clutch housing
2. 3rd & 4th bracket
3. 3rd & 4th shift fork
4. Retaining pin
5. Check ball
6. Check pin
7. Check spring
8. Check plug
9. Stopper ring
10. 3rd & 4th fork rod
11. Selector shaft pin
12. Selector
13. 5th & reverse bracket
14. Reverse switch bracket
15. Retaining pin
16. 5th & reverse shift fork
17. Interlock plunger
18. Check ball
19. Interlock pin
20. Stopper ring
21. 5th & reverse fork rod
22. Striking lever
23. Retaining pin
24. 1st & 2nd bracket
25. 1st & 2nd shift fork
26. Check ball
27. 1st & 2nd fork rod
28. Transaxle case
29. Check ball
30. Check spring
31. Check plug
32. Select check leaf spring
33. Return spring
34. Steel ball
35. Reverse gate
36. Return bearing
37. Selector arm
38. Bushing
39. Welch plug
40. Selector shaft
41. Striking yoke
42. Retaining pin
43. Striking rod
44. Dust boot
45. Striking rod oil seal
46. Welch plug

FINAL DRIVE COMPONENTS



1. Differential side bearing adjusting shim
2. Differential side bearing outer race
3. Differential side bearing
4. Final gear
5. Differential case
6. Speedometer drive gear
7. Speedometer stopper
8. Differential side bearing
9. Differential side bearing outer race
10. Pinion mate thrust washer
11. Pinion mate gear
12. Side gear thrust washer
13. Side gear
14. Pinion mate shaft
15. Lock pin

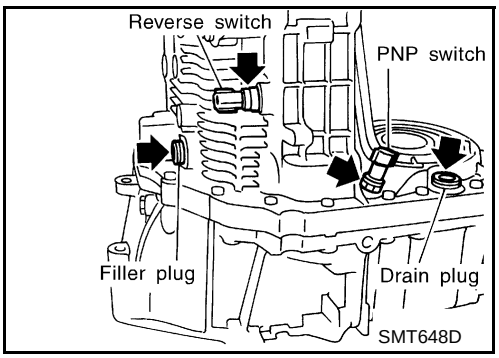
Disassembly and Assembly

ECS005PY

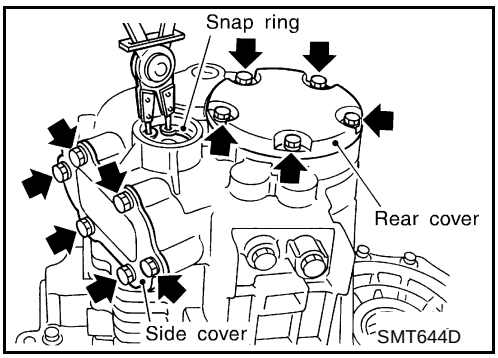
DISASSEMBLY

Transaxle Case

1. Remove reverse switch, PNP switch, drain plug, and filler plug from transaxle case.



2. Remove snap rings from reverse idler shaft.
3. Remove side cover and rear cover from case.
4. Remove O-ring and mainshaft bearing adjusting shim.

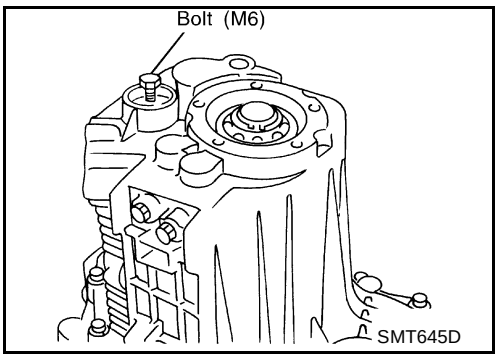


5. Remove reverse idler gear shaft.

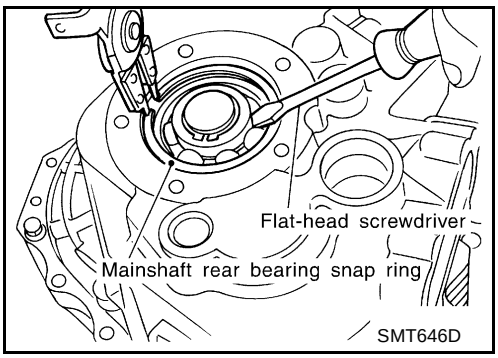
a. Attach bolt (M6) to thread of reverse idler gear shaft end.

b. Pull out the attached bolt, and remove reverse idler gear shaft from case.

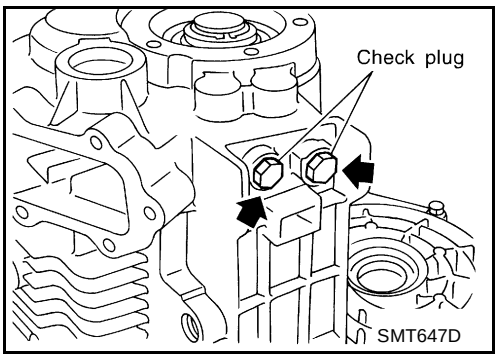
6. Remove reverse idler gear, thrust washer (front, rear), and bearing from case.



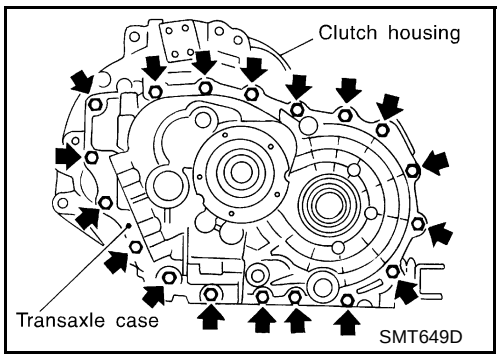
7. Remove snap ring of mainshaft bearing from case.



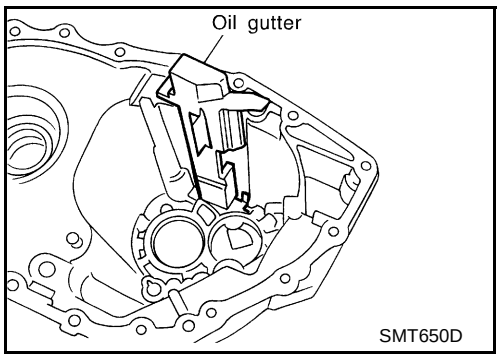
8. Remove check plugs, springs, and check balls from case.



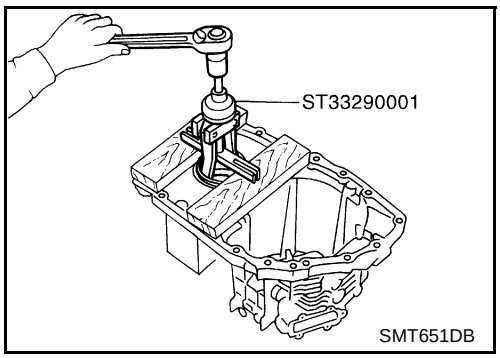
9. Remove mounting bolts.
10. Remove input shaft rear bearing adjusting shim from transaxle case.



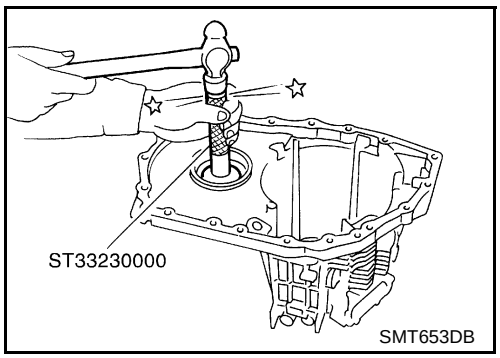
11. Remove oil gutter from case.



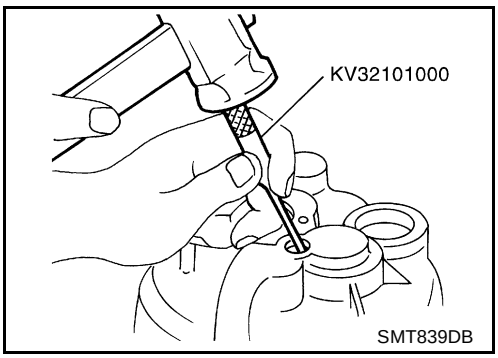
12. Remove differential side bearing outer race and adjusting shim from case.



13. Remove differential oil seal from case.

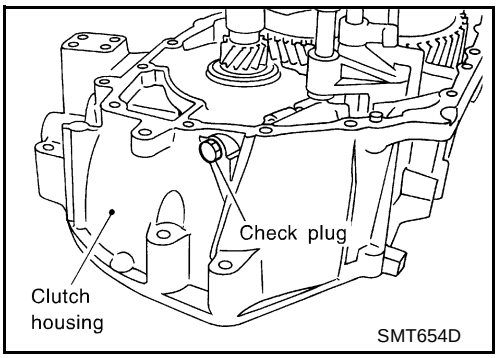


14. Remove welch plugs from case.

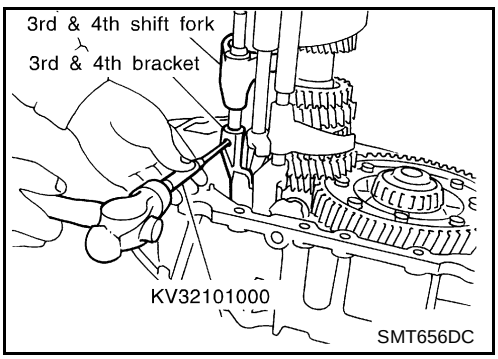


Clutch Housing

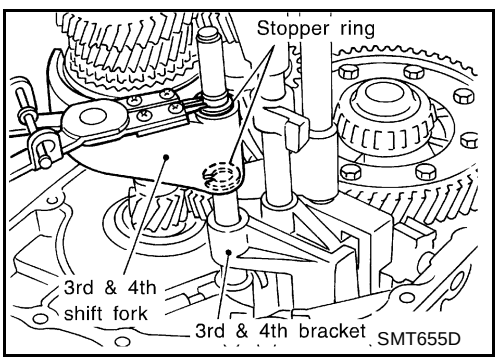
1. Remove transaxle case from clutch housing.
2. Remove magnet from housing.
3. Remove check plugs, check springs, check pins, and check balls from housing.



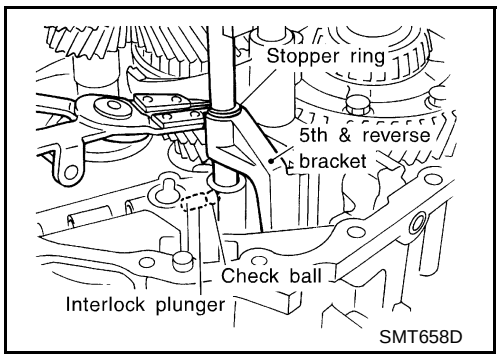
4. Remove 3rd & 4th bracket retaining pin.



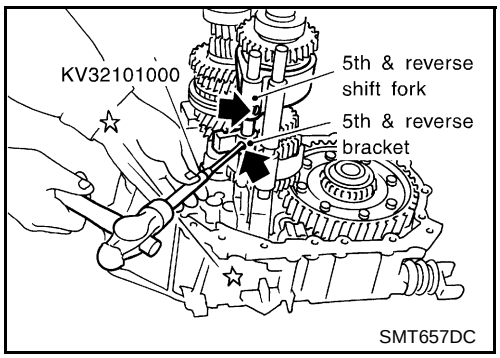
5. Remove 3rd & 4th shift fork stopper ring.
6. Remove 3rd & 4th fork rod.
7. Remove 3rd & 4th shift fork and bracket.



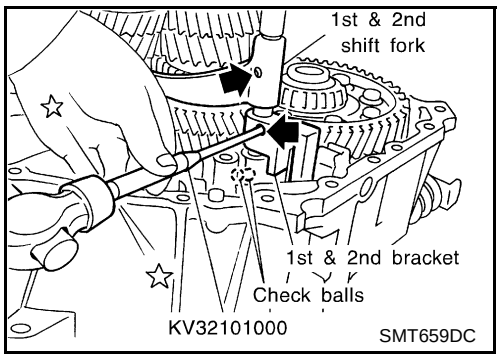
8. Remove interlock plunger and check ball.
9. Remove 5th & reverse bracket stopper ring.



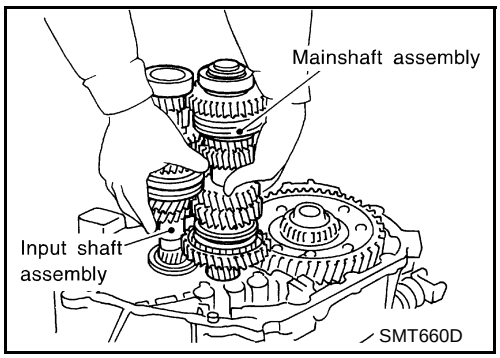
10. Remove retaining pin from 5th & reverse shift fork and reverse switch bracket.
11. Remove 5th & reverse fork rod.
12. Remove interlock pin from 5th & reverse fork rod.
13. Remove reverse switch bracket and 5th & reverse bracket.



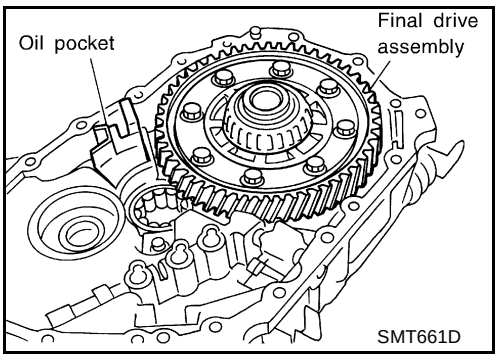
14. Remove check ball from housing.
15. Remove retaining pin for 1st & 2nd shift fork and bracket.
16. Remove 1st & 2nd fork rod.
17. Remove 5th & reverse and 1st & 2nd shift forks, and 1st & 2nd bracket.



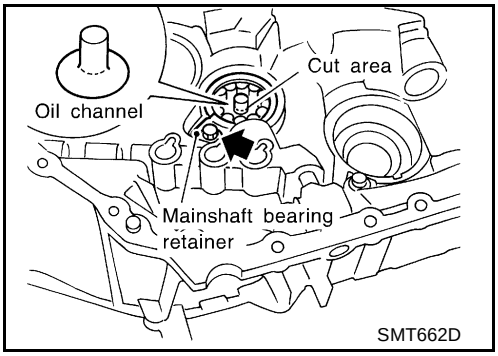
18. Remove both input shaft and mainshaft assemblies from housing.



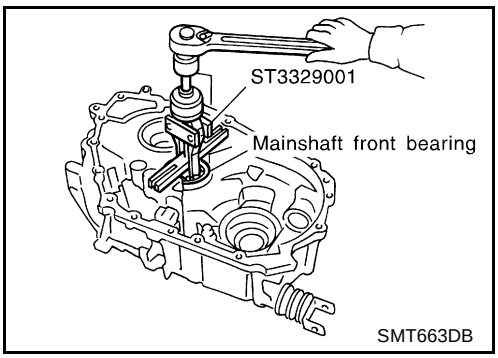
19. Remove final drive assembly from housing.
20. Remove oil pocket from housing.



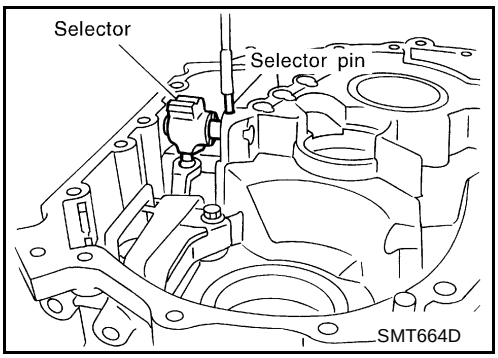
21. Remove mainshaft bearing retainer from housing.
22. Cut off oil channel using a cutter as shown in the figure.



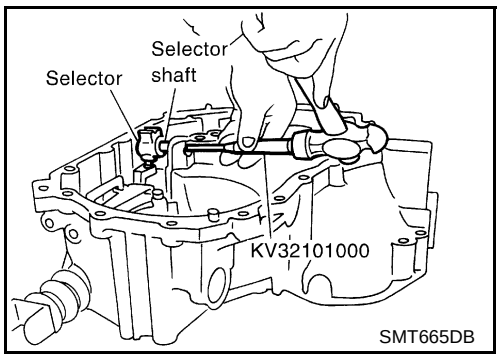
23. Remove mainshaft front bearing from housing.



24. Using a magnet or other suitable tool, remove retaining pin from selector shaft.

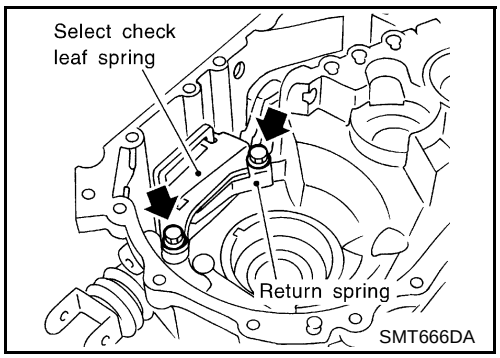


25. Remove selector shaft and plug, then remove selector.

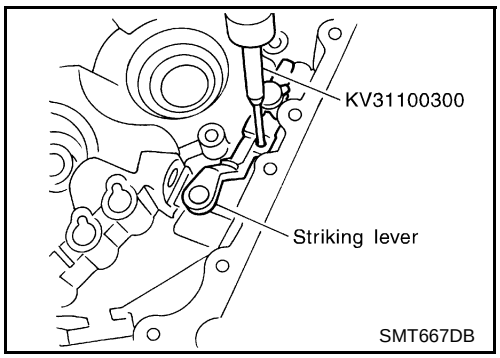


26. Remove reamer bolt, then remove select check leaf spring, return spring, steel ball, reverse gate, selector arm, bearing, and bushing.

CAUTION:
Be careful not to lose the steel ball.

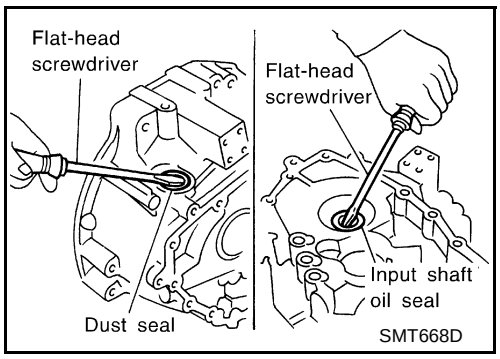


27. Remove retaining pin and plug from striking lever.
28. Remove striking rod, then striking lever from housing.

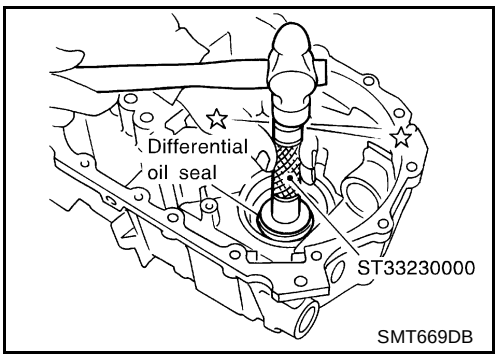


29. Using a flat-head screwdriver or other suitable tool, remove dust seal, input shaft oil seal, and striking rod oil seal from housing.

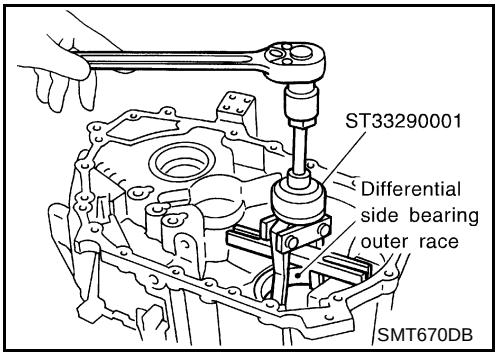
CAUTION:
When removing dust and oil seals, be careful not to damage mounting surfaces of dust seal and oil seal.



30. Remove differential oil seal from housing.



31. Remove differential side outer race from housing.

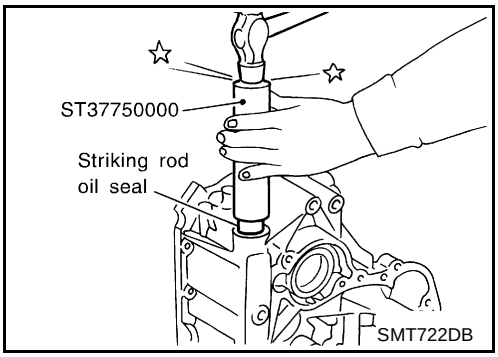


ASSEMBLY

Clutch Housing

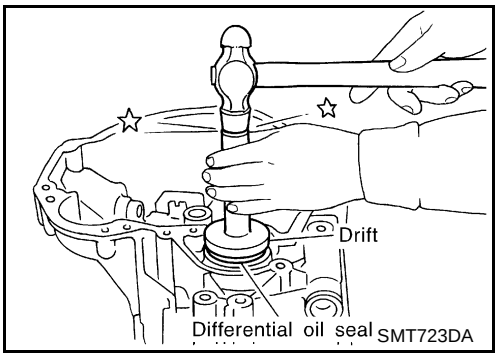
1. Hammer the striking rod oil seal into clutch housing as far as it will go.

   CAUTION:
   Do not reuse striking rod oil seal.



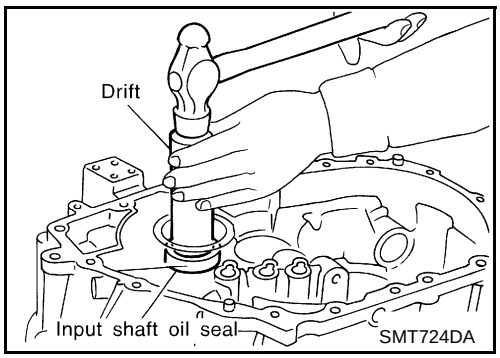
2. Hammer the differential oil seal into clutch housing until it becomes flush with clutch housing end face.

   CAUTION:
   Do not reuse differential oil seal.



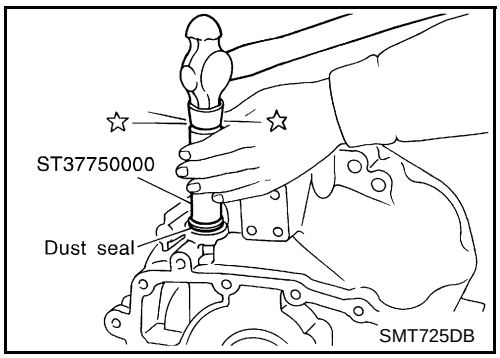
3. Hammer input shaft oil seal into clutch housing as far as it will go.

CAUTION:
Do not reuse input shaft oil seal.

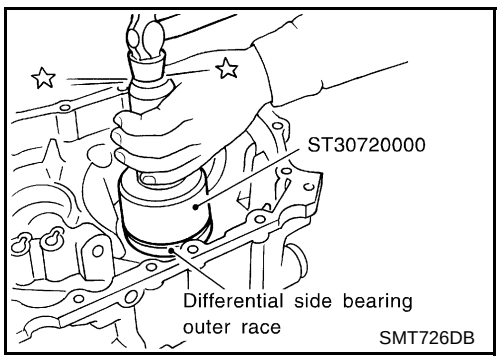


4. Hammer the dust seal into clutch housing as far as it will go.

CAUTION:
Do not reuse dust seal.

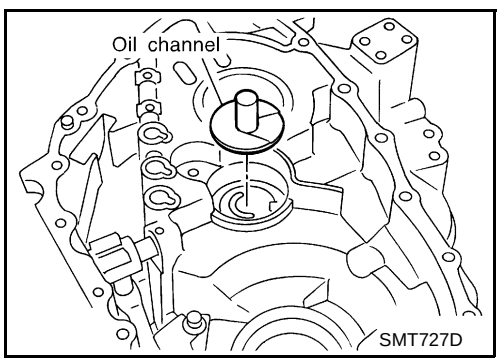


5. Install outer race of differential side bearing.

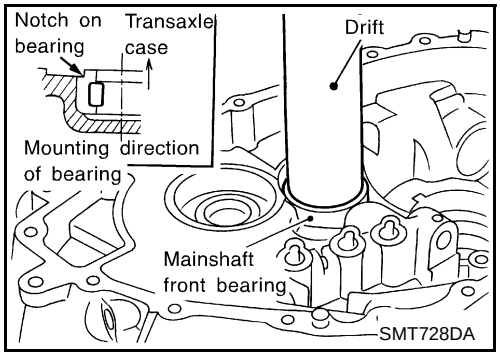


6. Install new oil channel (mainshaft).

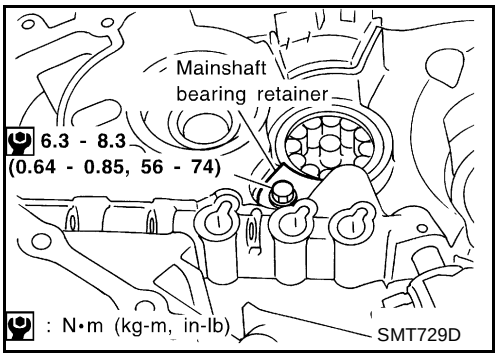
CAUTION:
Pay attention to installation direction of oil channel.



7. Align the notches on mainshaft front bearing and transaxle case. Then, install mainshaft front bearing.



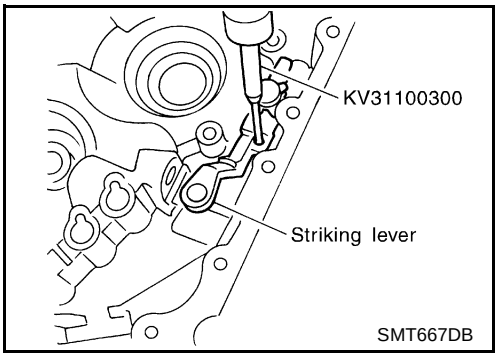
8. Install mainshaft bearing retainer, and tighten bolts with specified torque.



9. Attach boot, striking rod, and striking lever to clutch housing. And install retaining pin for selector lever.

CAUTION:

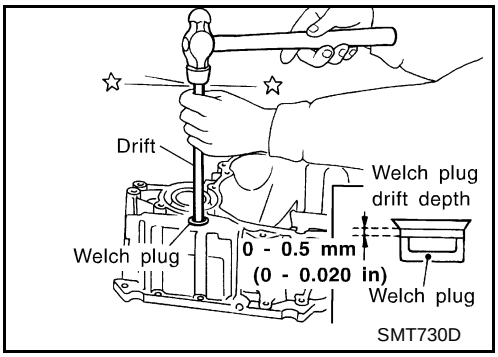
- **Before installing striking rod, wrap the end with a vinyl tape or the like to prevent oil seal from being damaged.**
- **Do not reuse retaining pin.**



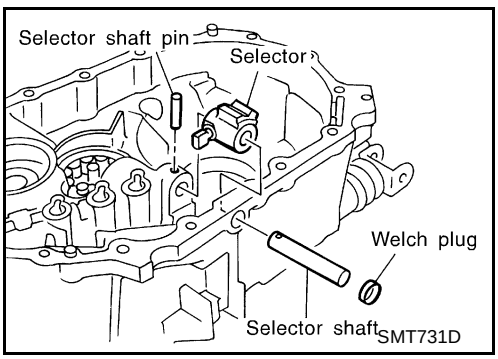
10. Hammer the welch plug (striking lever side) with a general-purpose drift [OD: 12 mm (0.47 in)].

CAUTION:

Do not reuse welch plug.

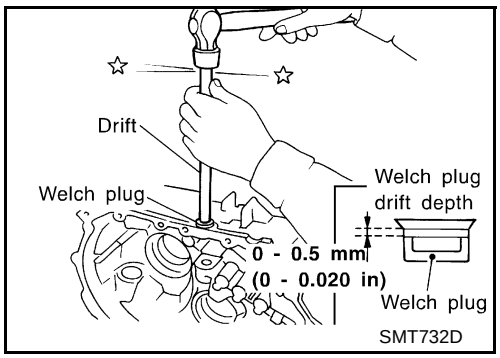


11. Install selector, selector shaft, and selector shaft pin into clutch housing.



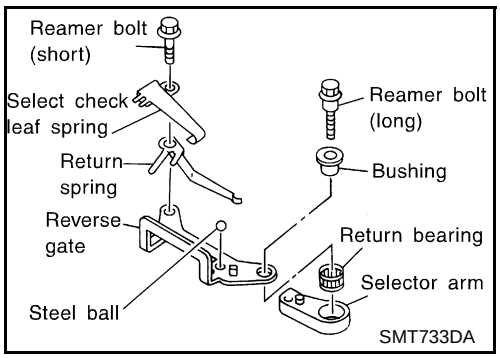
12. Hammer the welch plug (selector shaft side) with a general-purpose drift [OD: 12 mm (0.47 in)].

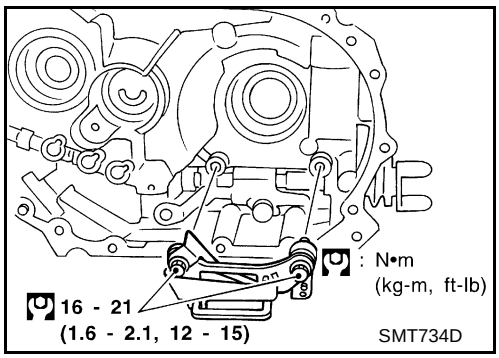
CAUTION:
Do not reuse welch plug.



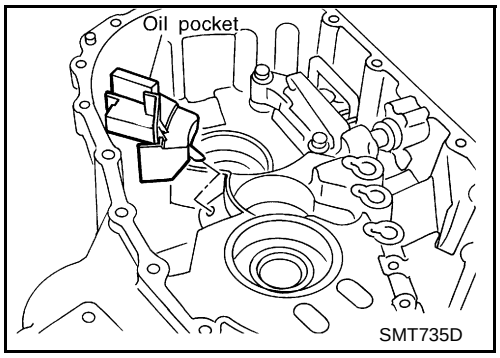
13. Install select check leaf spring, return spring, steel ball, reverse gate, selector arm, bushing, and return bearing. Then, tighten two reamer bolts with specified torque.

CAUTION:
Use correct reamer bolts for each installation point, because each bolt has a different length.



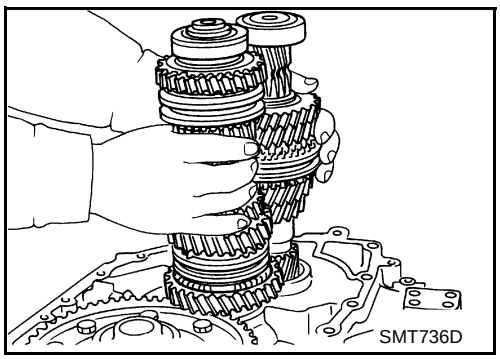


14. Install oil pocket.



15. Install differential assembly, input shaft assembly, and mainshaft assembly into clutch housing.

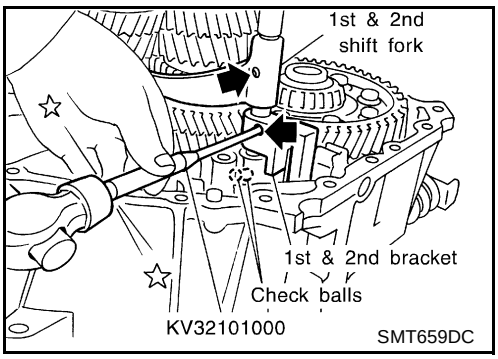
CAUTION:
Be careful not to damage input shaft oil seal during installation of input shaft assembly.



16. Install 5th & reverse shift fork.
17. Install 1st & 2nd shift fork, bracket, and fork rod.
18. Install retaining pin for 1st & 2nd bracket.

CAUTION:
Do not reuse retaining pin.

19. Install two check balls.

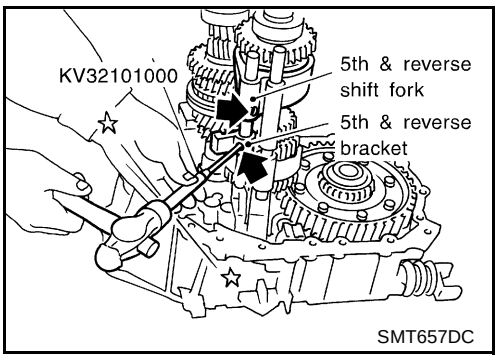


20. Install interlock pin into 5th & reverse fork rod.
21. Install reverse switch bracket, 5th & reverse bracket, and fork rod.
22. Install retaining pin for 5th & reverse shift fork and reverse switch bracket.

CAUTION:
Do not reuse retaining pin.

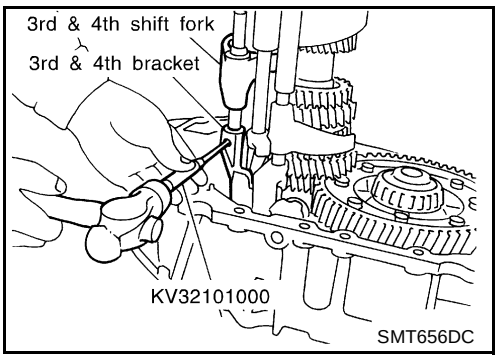
23. Install 5th & reverse bracket stopper ring.

CAUTION:
Do not reuse stopper pin.



24. Install check ball and interlock plunger.
25. Install 3rd & 4th shift fork, bracket, and fork rod.
26. Install 3rd & 4th bracket retaining pin.

CAUTION:
Do not reuse retaining pin.

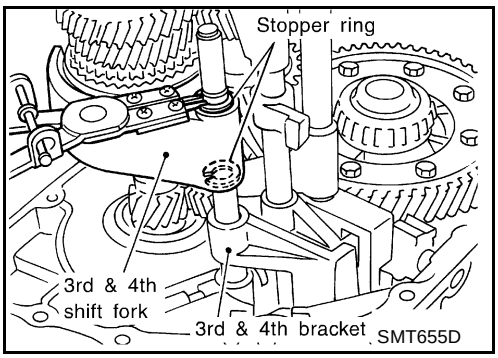


27. Install 3rd & 4th shift fork stopper ring.

CAUTION:
Do not reuse stopper ring.

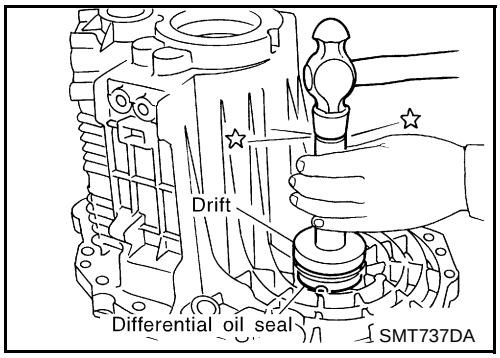
28. Install check ball, check pin, and check spring, and apply Three Bond TB1215, Loctite Part No. 51813 or equivalent onto check plug. Then, tighten it with specified torque.

Tightening torque : **Refer to** **MT-69, "SHIFT CONTROL COMPONENTS"** **.**

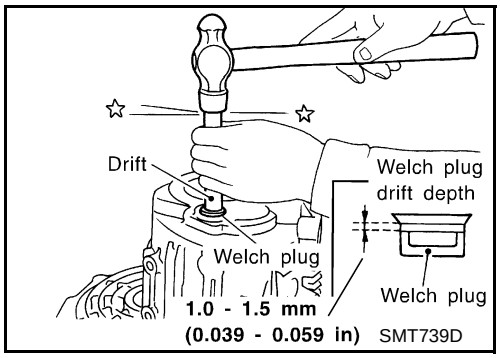


Transaxle Case

1. Insert differential oil seal into differential case until it becomes flush with case end face.



2. Install welch plug into transaxle case.



3. Calculate dimension “N” (thickness of adjusting shim) using the following procedure to satisfy specification of preload for differential side bearing.

Preload : 0.15 - 0.21 mm (0.0059 - 0.0083 in)

Dimension“N” = (N_1 – N_2) + Preload

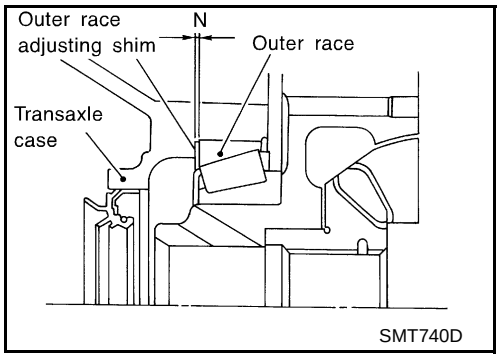
N : Thickness of adjusting shim

N_1 : Distance between clutch housing case end face and mounting face of adjusting shim

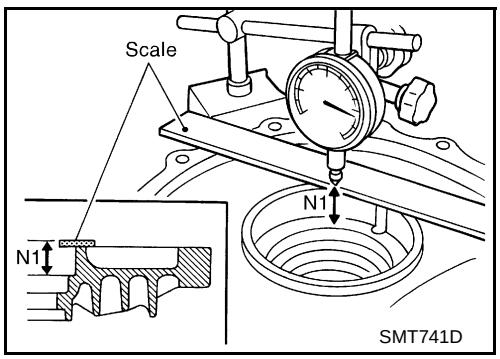
N_2 : Distance between differential side bearing and transaxle case

Differential side bearing adjusting shims:

Refer to MT-116, "DIFFERENTIAL SIDE BEARING ADJUSTING SHIMS" .

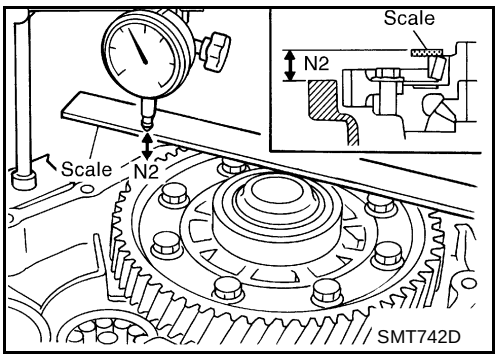


a. Using dial gauge and scale, measure dimension “N1” between clutch housing case end face and mounting face of adjusting shim.

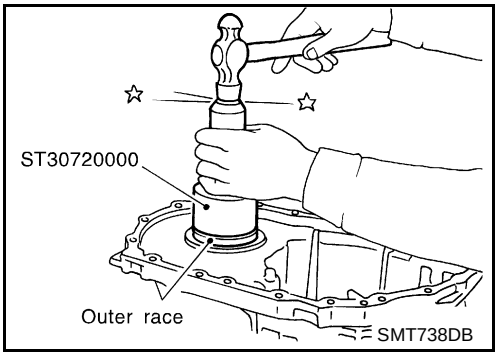


b. Install outer race onto differential side bearing on final gear side. Holding lightly the outer race horizontally by hand, rotate final gear five times or more (for smooth movement of bearing roller).

c. Using dial gauge and scale as shown in the figure, measure dimension “N2” between differential side bearing outer race and transaxle case end face.



4. Install selected shim and bearing outer race.

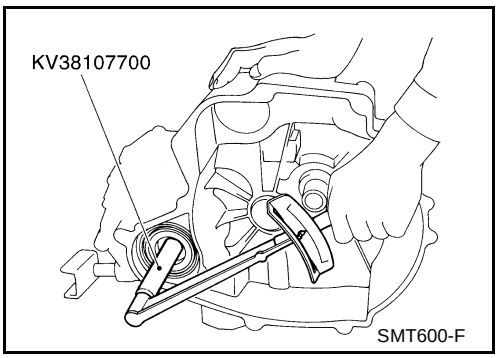


5. Measure turning torque of final drive assembly.

Turning torque of final drive assembly (New bearing):

2.9 - 6.9 N·m (30 - 70 kg-m, 26 - 61 in-lb)

- **When old bearing is used again, turning torque will be slightly less than the above.**
- **Make sure torque is close to the specified range.**
- **Changes in turning torque of final drive assembly per revolution should be within 1.0 N-m (10 kg-cm, 8.7 in-lb) without binding.**



6. Calculate dimension “O” (thickness of adjusting shim) using the following procedure to satisfy specification of end play for input shaft rear bearing.

End play : 0 - 0.06 mm (0 - 0.0024 in)

Dimension “O” = (O_1 – O_2) + Preload

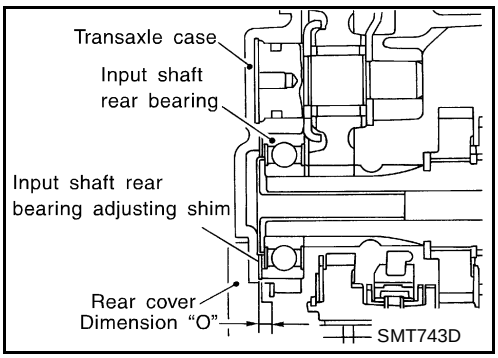
O : Thickness of adjusting shim

O_1 : Distance between transaxle case end face and mounting face of adjusting shim

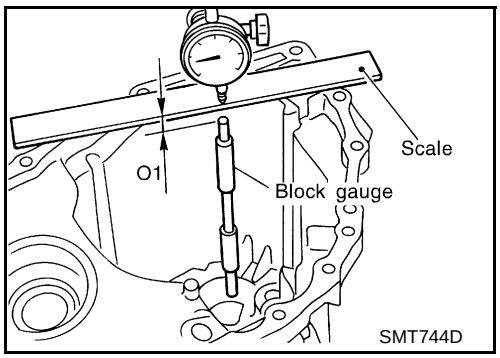
O_2 : Distance between clutch housing case end face and end face of input shaft rear bearing

Input shaft rear bearing adjusting shims:

Refer to MT-115, "INPUT SHAFT REAR BEARING ADJUSTING SHIM" .

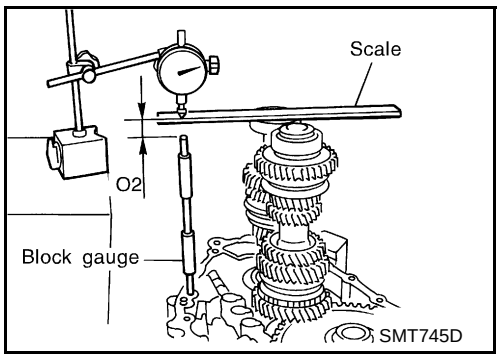


a. Using block gauge, scale, and dial gauge, measure dimension “O1” between transaxle case end face and mounting face of adjusting shim.

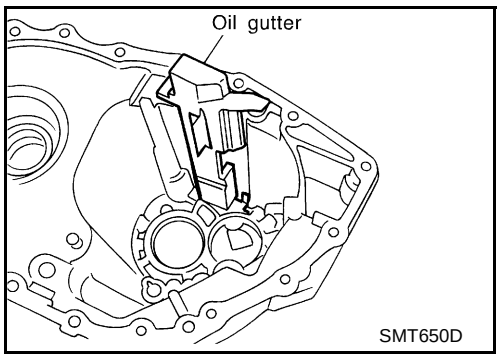


b. Using gauge block, scale, and dial gauge as shown in the figure, measure dimension “O2” between clutch housing case end face and end face of input shaft rear bearing.

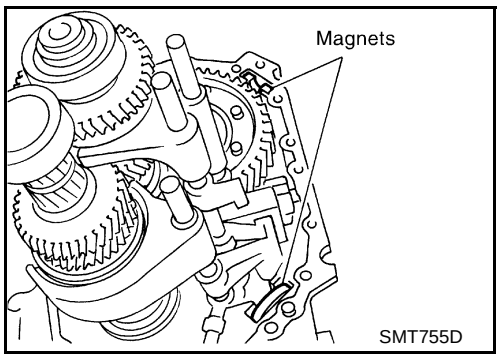
7. Install selected input shaft rear bearing adjusting shim onto input shaft.



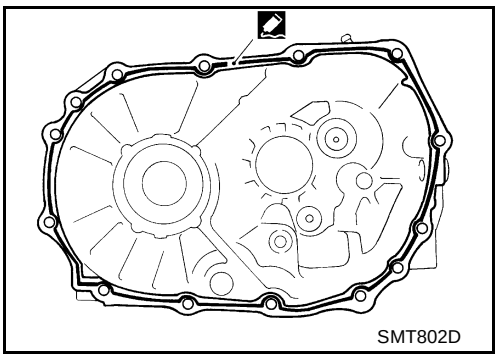
8. Install oil gutter into transaxle case.



9. Install two magnets.

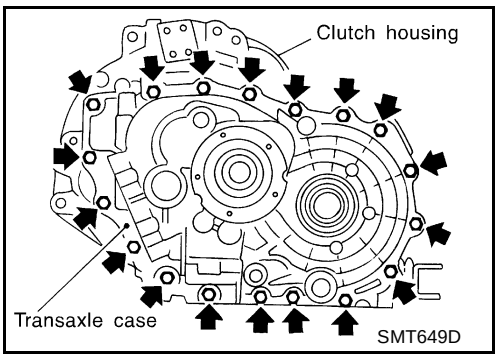


10. Clean mating surfaces of clutch housing and transaxle case. Check for cracks and damage. Then, apply Three Bond TB1215, Loctite Part No. 51813 or equivalent.



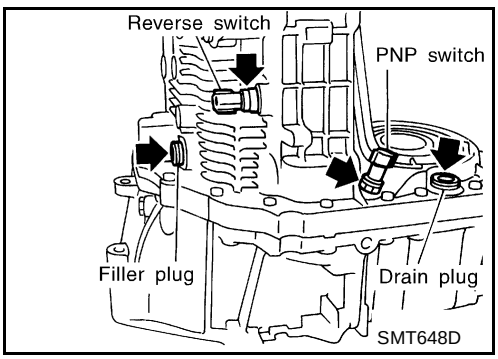
11. Install transaxle case onto clutch housing, and tighten mounting bolts with specified torque.

Tightening torque : Refer to MT-67, "CASE AND HOUSING COMPONENTS" .

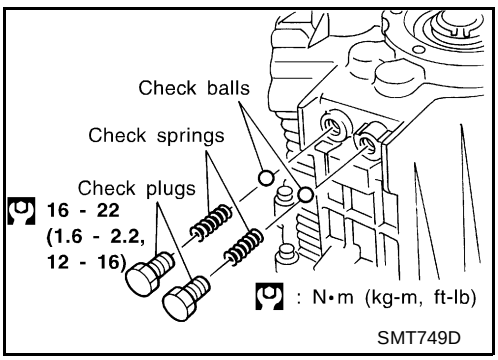


12. Apply Three Bond TB1215, Loctite Part No. 51813 or equivalent to threads of reverse switch, PNP switch, and drain plug, and install them. (Fill the case with oil before installation of filler plug.)
13. Install speedometer pinion assembly.

CAUTION:
Do not reuse O-ring.



14. Install check springs and check balls. Apply sealant to the thread on the check plug, and install it.



15. Calculate thickness of adjusting shim using the following procedure to satisfy specification of end play for mainshaft rear bearing.

End play : 0 - 0.06 mm (0 - 0.0024 in)

Dimension "P" = (P_1 – P_2) + End play

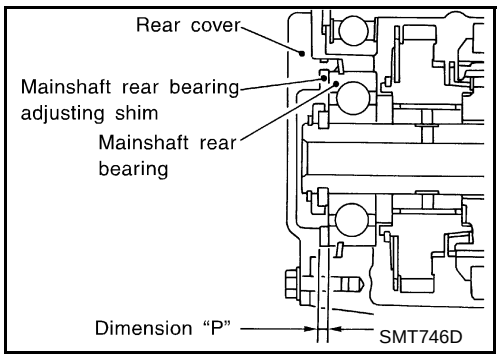
P : Thickness of adjusting shim

P_1 : Distance between transaxle case end face and mainshaft rear bearing

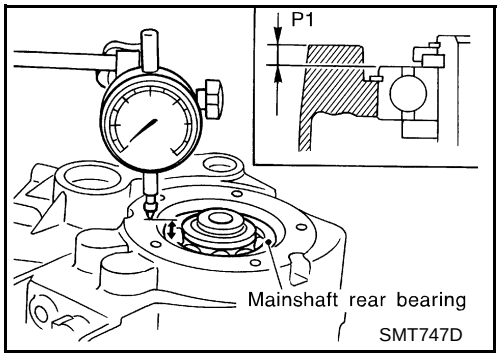
P_2 : Distance between adjusting shim end face of rear cover and transaxle mounting face

Mainshaft rear bearing adjusting shims:

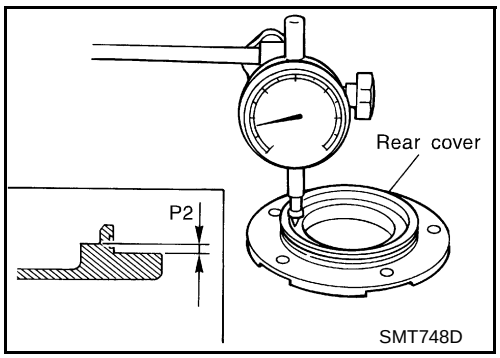
Refer to MT-115, "MAINSHAFT REAR BEARING ADJUSTING SHIM" .



a. Using dial gauge as shown in the figure, measure dimension "P1" between transaxle case end face and mainshaft rear bearing.



b. Using dial gauge as shown in the figure, measure dimension "P2" between adjusting shim mounting face of rear cover and transaxle mounting face.

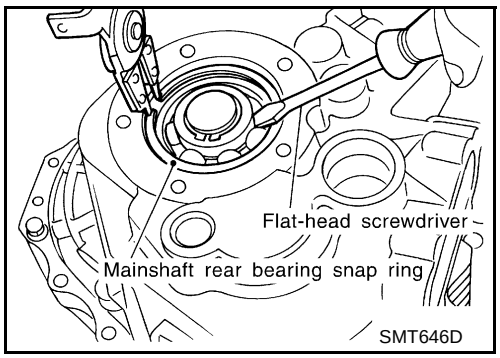


16. Using snap ring pliers as shown in the figure, install snap ring.

CAUTION:

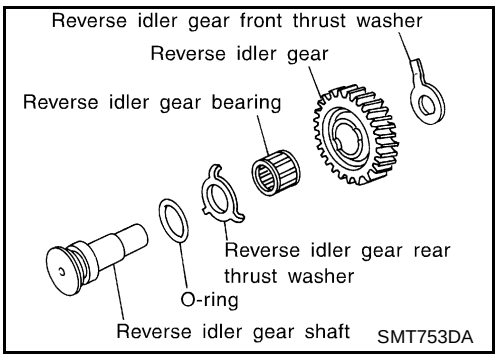
Do not reuse snap ring.

17. Install selected mainshaft adjusting shim.



18. Install reverse idler gear, O-ring, thrust washers (front, rear), and bearing onto reverse idler shaft.
19. Install snap ring into transaxle case using snap ring pliers.

CAUTION:
- **Do not reuse snap ring.**
- **Do not reuse O-ring.**
- **Before installation, apply gear oil to O-ring.**



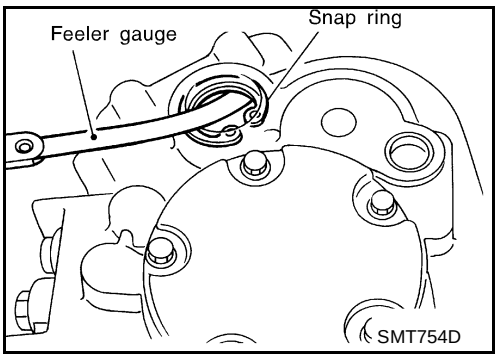
20. Using feeler gauge, measure the end play of snap ring, and select a snap ring suitable to satisfy the following specification.

End play:

0.05 - 0.25 mm (0.0020 - 0.0098 in)

Available snap ring:

Refer to MT-112, "SNAP RING" .



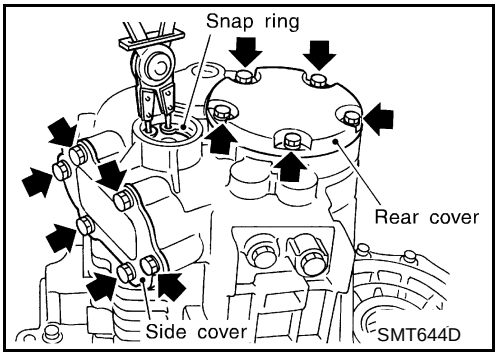
21. Install selected snap ring.

CAUTION:
Do not reuse snap ring.

22. Apply gear oil to rear cover O-ring, and install rear cover, side cover gasket, and side cover. Then tighten mounting bolts with specified torque.

Tightening torque	**: Refer to MT-67, "CASE AND HOUSING COMPONENTS" .**

CAUTION:
Do not reuse mounting bolts for rear cover and side cover.



INPUT SHAFT AND GEARS

PFP:32200

Assembly and Disassembly

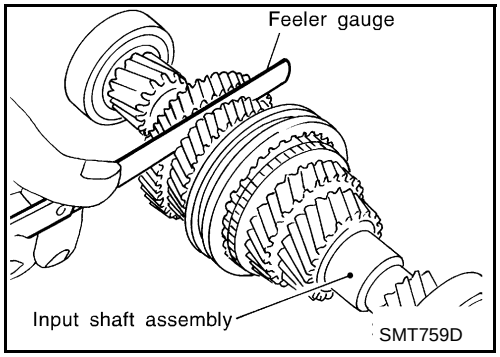
ECS005HR

DISASSEMBLY

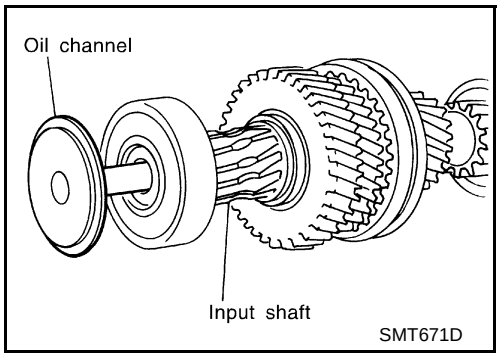
1. Before disassembly, measure the end plays of 3rd and 4th input gears.

Gear end play **: Refer to MT-112, "Gear End Play" .**

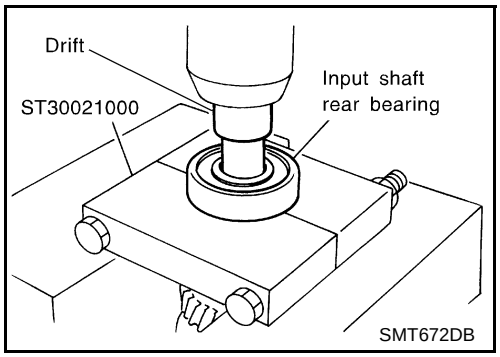
- If end play is not within specification, disassemble and check the parts.



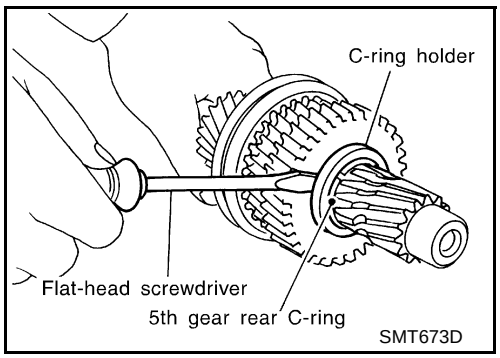
2. Remove oil channel from input shaft rear bearing.



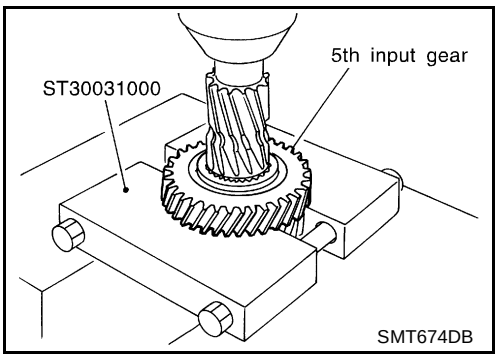
3. Press out input shaft rear bearing.



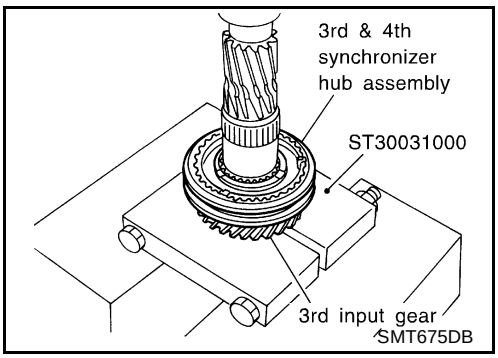
4. Remove C-ring holder.
5. Remove 5th gear rear C-ring.



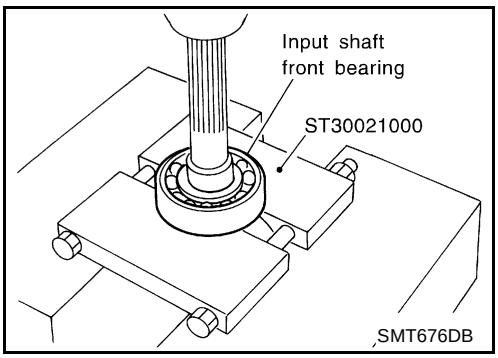
6. Remove 5th input gear from input shaft.
7. Remove 5th gear front C-ring.



8. Remove 4th input gear, baulk ring, 4th gear needle bearing, and 4th gear C-ring from input shaft.
9. Press out both 3rd & 4th synchronizer hub assembly and 3rd input gear from input shaft.
10. Remove 3rd gear needle bearing.



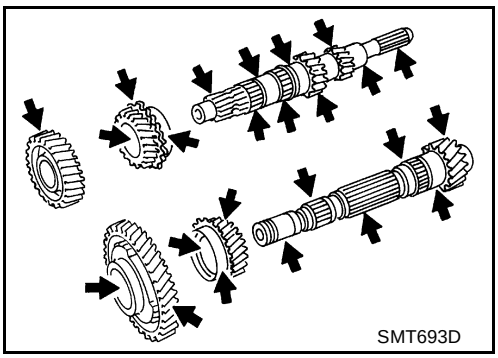
11. Press out input shaft front bearing from input shaft.



INSPECTION AFTER DISASSEMBLY

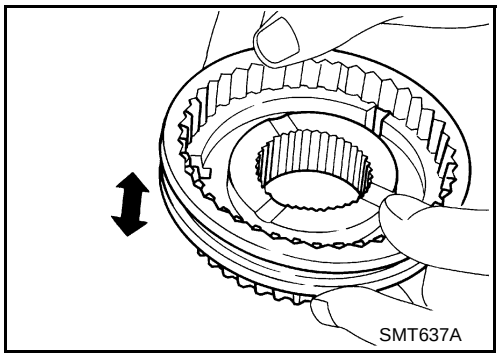
Input Shaft and Gear

- Check shaft for cracks, wear or bending.
- Check gears for excessive wear, chips or cracks.

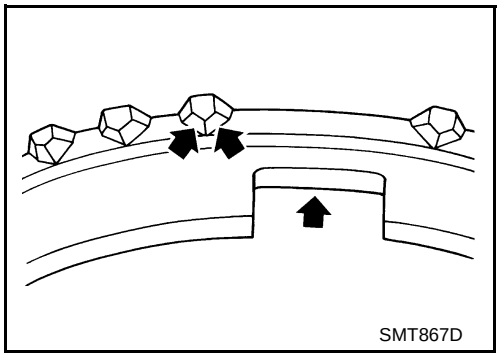


Synchronizer

- Check spline area of coupling sleeves, hubs and gears for wear or cracks.
- Check baulk rings for cracks or deformation.
- Check insert springs for wear or deformation.

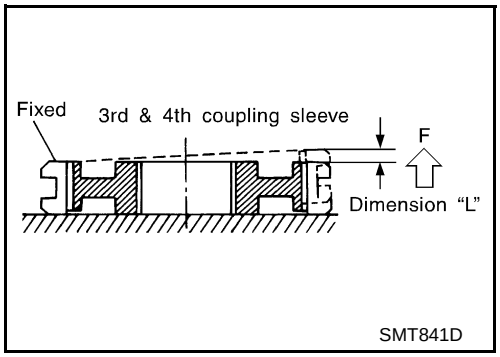

SMT637A

- If any crack, damage, or excessive wear is found on cam face of baulk ring or working face of insert, replace it.


SMT867D

- Measure the movement (play, dimension “L”) of 3rd & 4th coupling sleeve with their end fixed and the other end lifted as shown in the figure. If the movement exceeds specification, replace the sleeve.

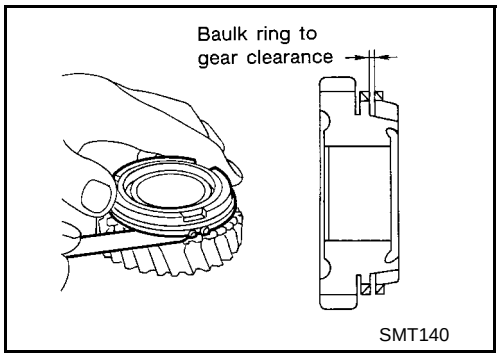
Coupling sleeve length “L”	**: Refer to MT-112, "1ST, 2ND, 3RD, 4TH, 5TH & REVERSE COUPLING SLEEVE" .**



SMT841D

- Measure clearance between baulk ring and gear.

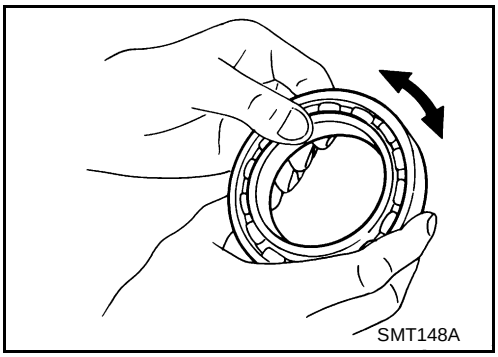
Clearance between baulk ring and gear	**: Refer to MT-112, "Clearance Between Baulk Ring and Gear" .**



SMT140

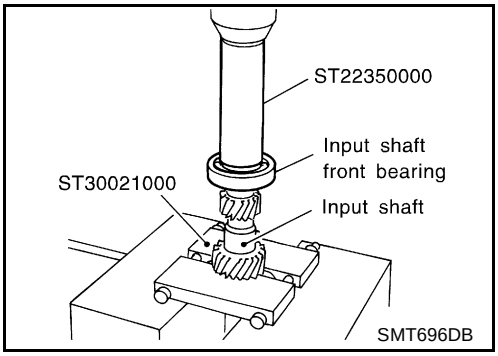
Bearing

- Make sure bearings roll freely and are free from noise, cracks, pitting or wear.



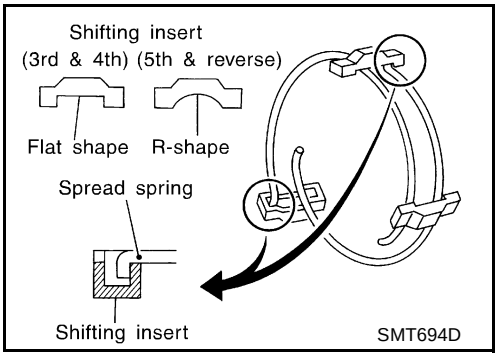
ASSEMBLY

1. Press on input shaft front bearing.
2. Install 3rd gear needle, 3rd input gear and 3rd gear baulk ring bearing to input shaft.

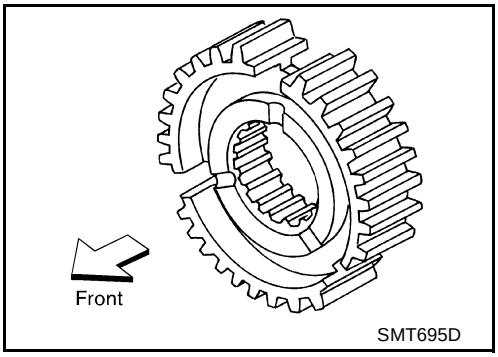


3. Install spread spring, shifting insert, and 3rd & 4th synchronizer hub onto 3rd & 4th coupling sleeve.
   - Pay attention to the shape of spread spring and shifting insert for correct assembly.
     Do not install spread spring hook onto the same shifting insert.

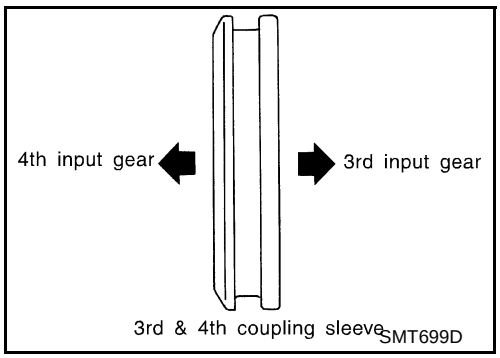
     CAUTION:
     Do not reuse 3rd & 4th synchronizer hub.



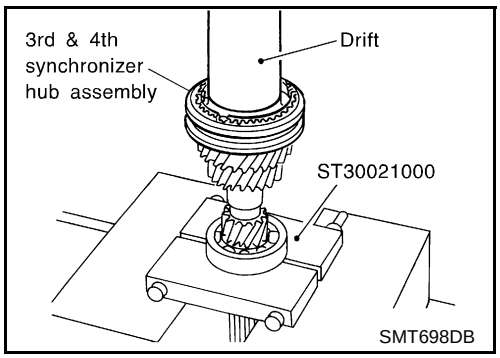
   - Install synchronizer hub with its three grooves facing the front side (3rd input gear side).



- Install 3rd & 4th coupling sleeve with its chamfered surface facing the 4th input gear side.



4. Position bearing replacer to the front side of input shaft front bearing.
   - Align grooves of shifting insert and 3rd gear baulk ring. Then, press it onto 3rd & 4th synchronizer hub assembly using a drift.
5. Install 4th gear C-ring onto input shaft.

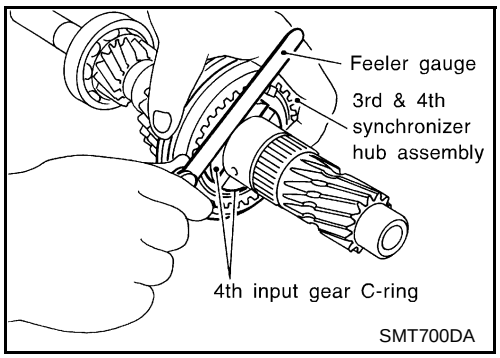


6. Measure the end play of 3rd & 4th synchronizer hub, and check if it is within allowable specification below.

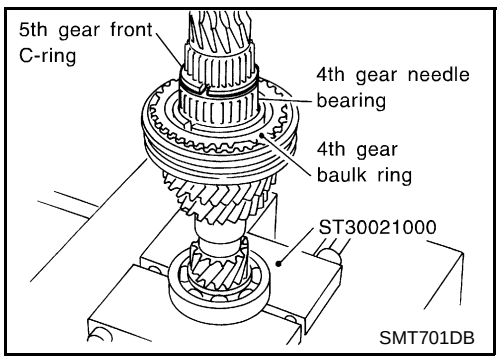
End play **: 0 - 0.06 mm (0 - 0.0024 in)**

7. If not within specification, adjust the end play by changing thickness of 4th input gear C-ring.

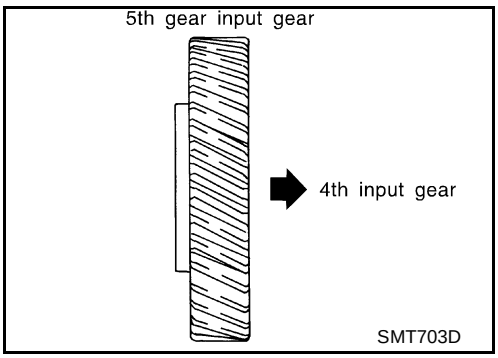
4th input gear C-ring **: Refer to MT-113, "4TH INPUT GEAR C-RING" .**



8. Install 4th gear needle bearing, 4th gear baulk ring, and 5th gear front C-ring.
9. Install 4th input gear.



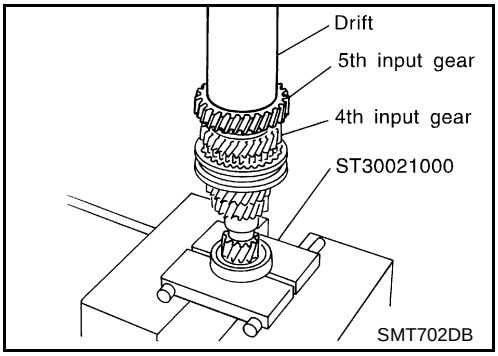
10. Position 5th input gear as shown in the figure, and install it on input shaft.



11. Install 5th input gear.

CAUTION:
Do not reuse 5th input gear.

12. Install 5th gear rear C-ring onto input shaft.

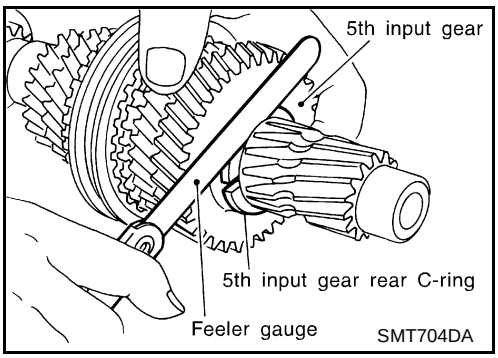


13. Measure the end play of 5th input gear, and check if it is within the allowable specification below.

End play : 0 - 0.06 mm (0 - 0.0024 in)

14. If not within specification, adjust the end play by changing thickness of the 5th input gear rear C-ring.

5th input gear rear C-ring : Refer to MT-113, "5TH INPUT GEAR REAR C-RING" .

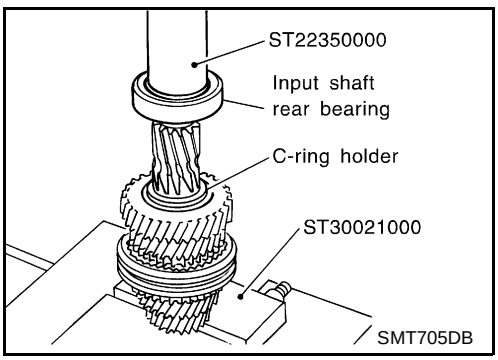


15. Install C-ring holder onto 5th gear rear C-ring.

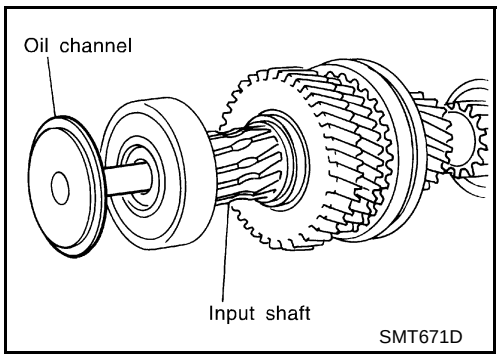
CAUTION:
Do not reuse C-ring holder.

16. Install input shaft rear bearing.

CAUTION:
Install input shaft rear bearing with its brown surface facing the input gear side.



17. Install oil channel onto input shaft.
18. Measure gear end play as a final check. Refer to MT-88, "DISASSEMBLY" .



MAINSHAFT AND GEARS

PFP:32241

Assembly and Disassembly

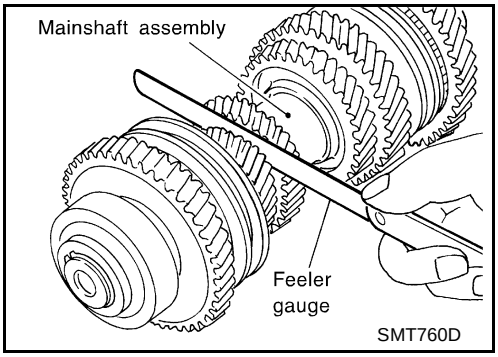
ECS005HS

DISASSEMBLY

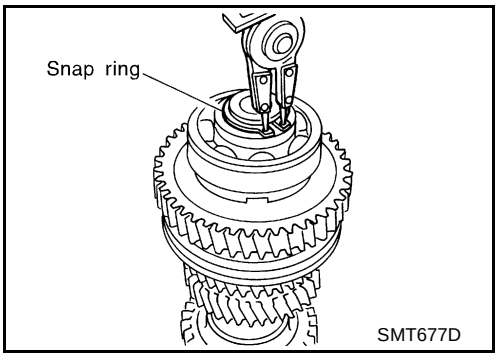
1. Before disassembly, measure gear end play.

Gear end play **: Refer to MT-112, "Gear End Play" .**

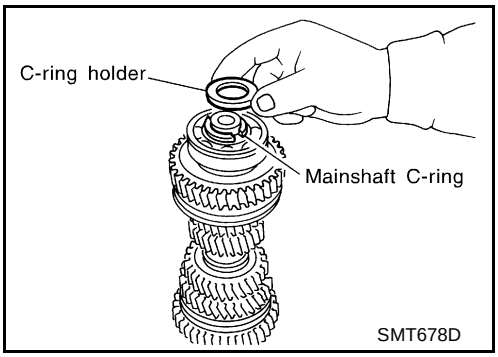
- If end play is not within specification, disassemble and check the parts.



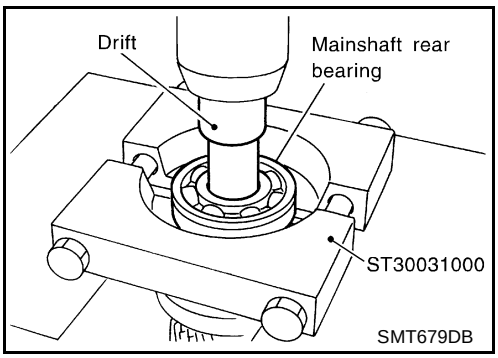
2. Remove snap ring.



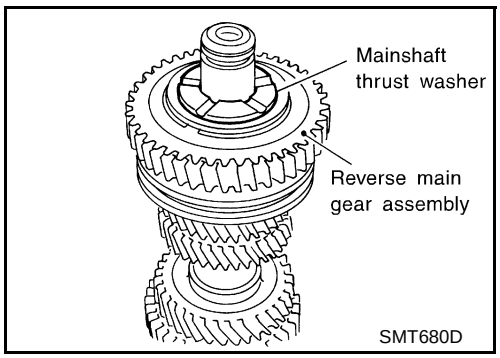
3. Remove C-ring holder and mainshaft C-ring.



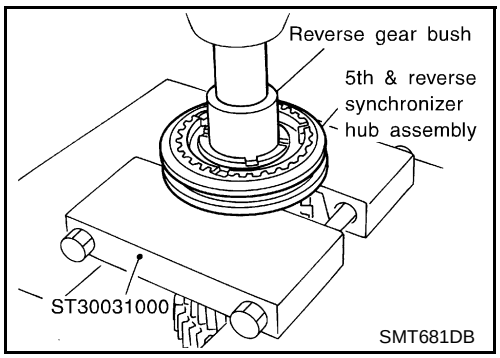
4. Press out mainshaft rear bearing from mainshaft.



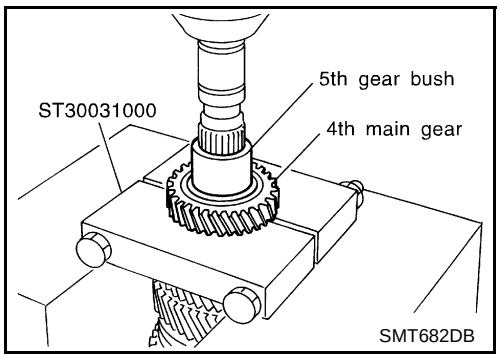
5. Remove mainshaft thrust washer.
6. Remove snap ring from mainshaft. Then, remove reverse main gear assembly, reverse gear needle bearing, and reverse gear baulk ring.



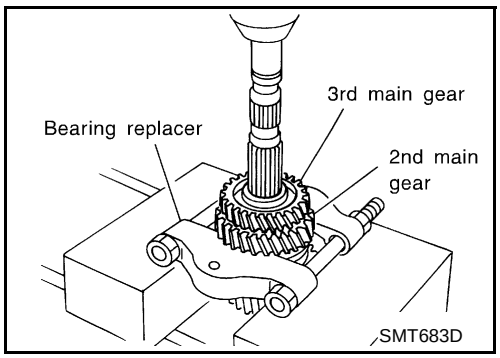
7. Place bearing replacer between 5th & reverse synchronizer hub and 5th main gear, and press out both reverse gear bushing and 5th & reverse synchronizer assembly.
8. Remove 5th main gear, 5th gear baulk ring, and 5th gear needle bearing.



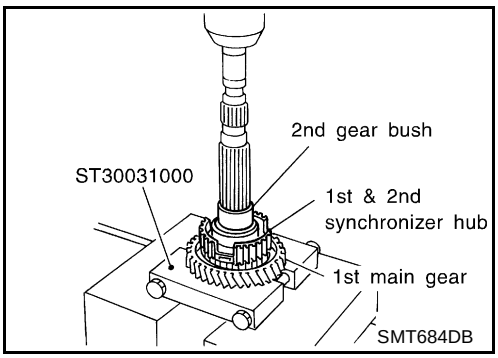
9. Place bearing replacer between 3rd and 4th main gears, and press out both 5th gear bushing and 4th main gear.



10. Remove mainshaft adjusting shim and spacer.
11. Place bearing replacer between 2nd main gear and 1st & 2nd synchronizer hub, and press out both 3rd and 2nd main gears.



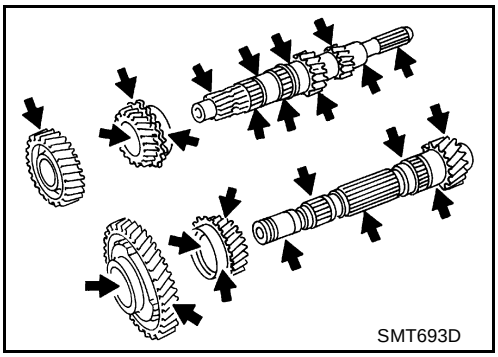
12. Remove 2nd double cone assembly, 2nd gear bushing, and coupling sleeve assembly.
13. Place bearing replacer on 1st gear front side, and press out all of 2nd gear bushing, 1st & 2nd synchronizer hub, 1st main gear, and 1st double cone.
14. Remove 1st gear needle bearing.



INSPECTION AFTER DISASSEMBLY

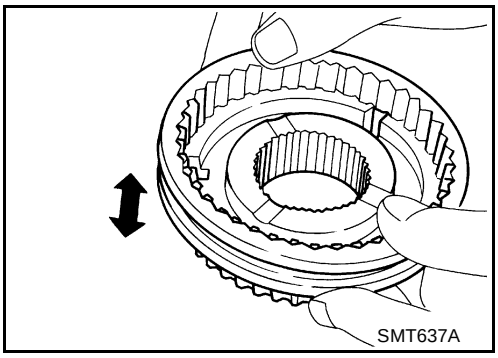
Mainshaft and Gears

- Check shaft for cracks, wear or bending.
- Check gears for excessive wear, chips or cracks.

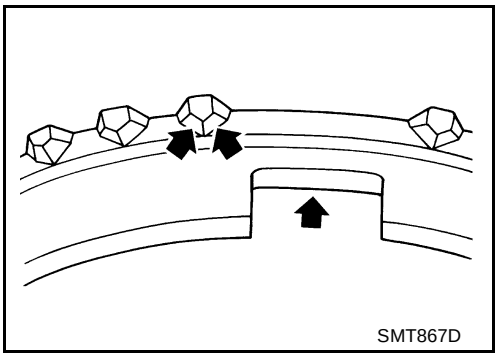


Synchronizer

- Check spline area of coupling sleeves, hubs and gears for wear or cracks.
- Check baulk rings for cracks or deformation.
- Check insert springs for wear or deformation.

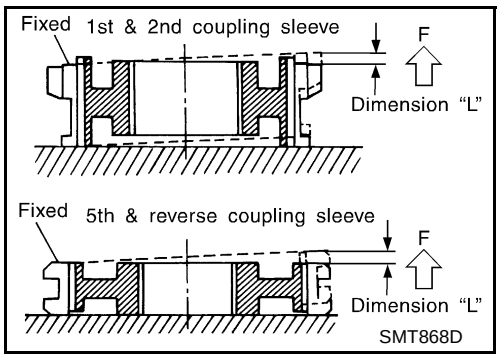


- If any crack, damage, or excessive wear is found on cam face of baulk ring or working face of insert, replace it.



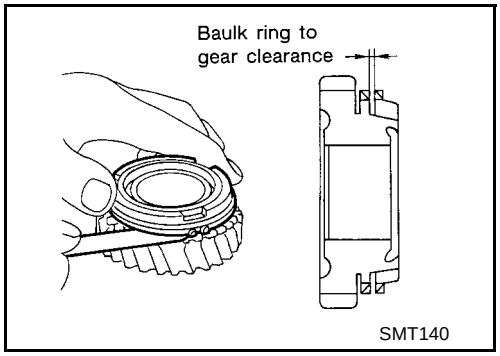
- Measure the movement (play, dimension “L”) of 1st & 2nd coupling sleeve and 5th & reverse coupling sleeve with their end fixed and the other end lifted as shown in the figure. If the movement exceeds specification, replace the sleeve.

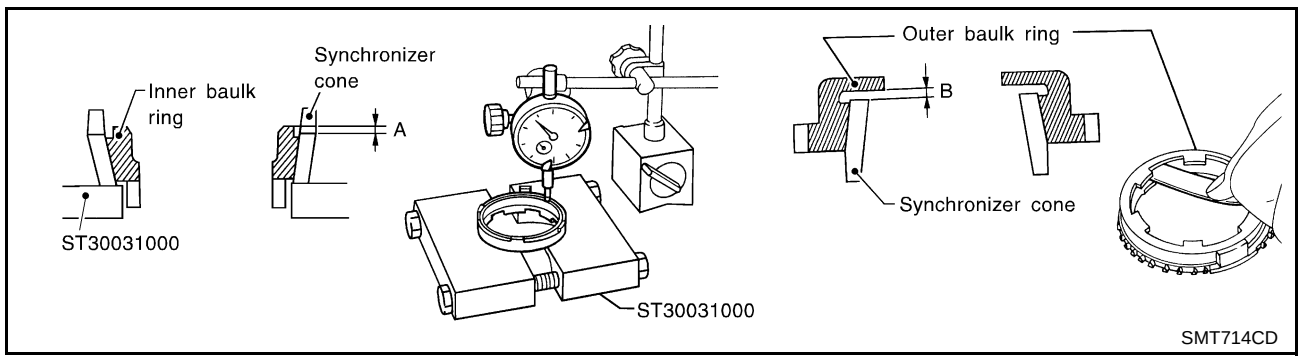
Coupling sleeve length “L” : **Refer to** MT-112, "1ST, 2ND, 3RD, 4TH, 5TH & REVERSE COUPLING SLEEVE" **.**



- Measure clearance between baulk ring and gear.

Clearance between baulk ring and gear : **Refer to** MT-112, "Clearance Between Baulk Ring and Gear" **.**





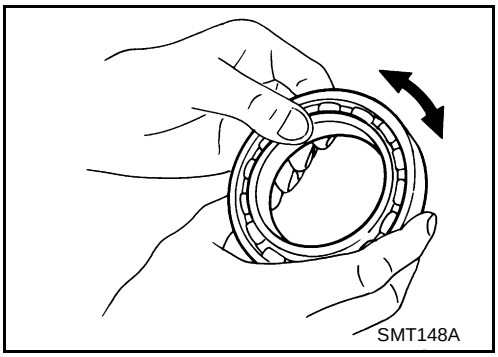
- Measure wear of 1st and 2nd baulk ring.
  - Place baulk rings in position on synchronizer cone.
  - While holding baulk ring against synchronizer cone as far as it will go, measure dimensions “A” and “B”.

Standard : **A 0.6 - 0.8 mm (0.024 - 0.031 in)**
: **B 0.6 - 1.1 mm (0.024 - 0.043 in)**
Wear limit : **0.2 mm (0.008 in)**

- **If dimension “A” or “B” is smaller than the wear limit, replace outer baulk ring, inner baulk ring and synchronizer cone as a set.**

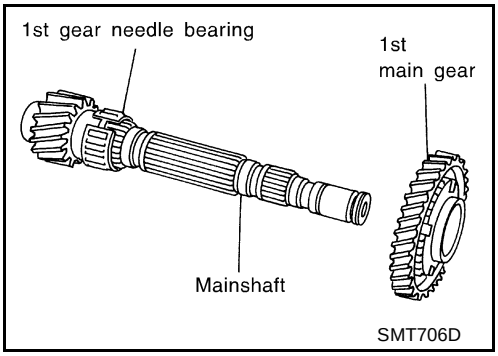
Bearing

- Make sure bearings roll freely and are free from noise, cracks, pitting or wear.


SMT148A

ASSEMBLY

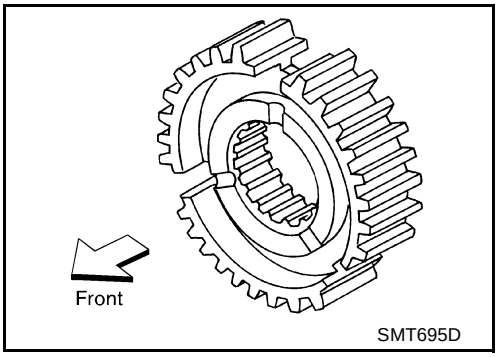
1. Install 1st gear needle bearing and 1st main gear onto mainshaft.
2. Install 1st double cone assembly onto mainshaft.



SMT706D

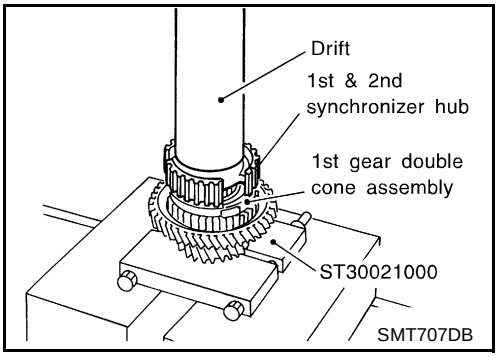
3. Install 1st & 2nd synchronizer hub with its three grooves facing the front side (1st main gear side) onto mainshaft.

   CAUTION:
   Do not reuse 1st & 2nd synchronizer hub.



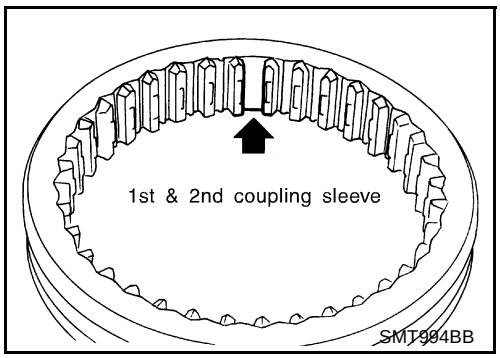
SMT695D

4. Install 1st & 2nd synchronizer hub.

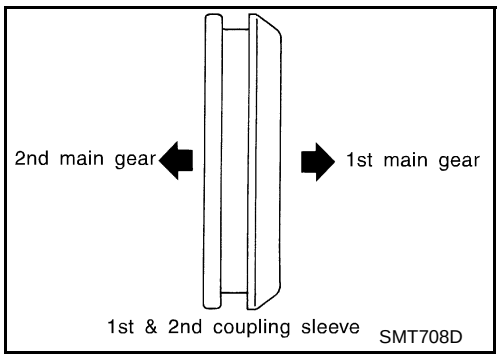


SMT707DB

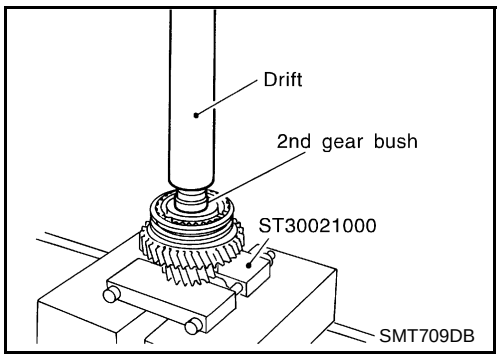
5. Install insert spring onto 1st & 2nd coupling sleeve.



6. Install 1st & 2nd coupling sleeve with its chamfered surface facing the 1st main gear side onto 1st & 2nd synchronizer hub.

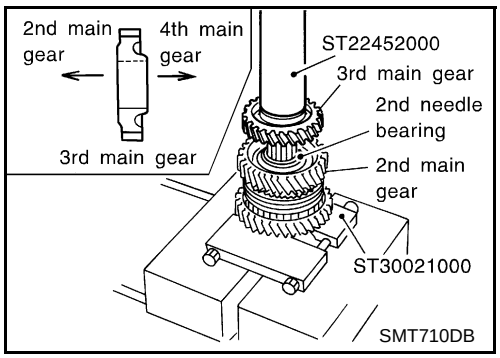


7. Install 2nd gear bushing with its flange surface facing 1st & 2nd synchronizer hub side.



8. Install 2nd needle bearing, 2nd double cone assembly, and 2nd main gear onto mainshaft.
9. Position 3rd main gear as shown in the figure, and install it.

CAUTION:
Do not reuse 3rd main gear.



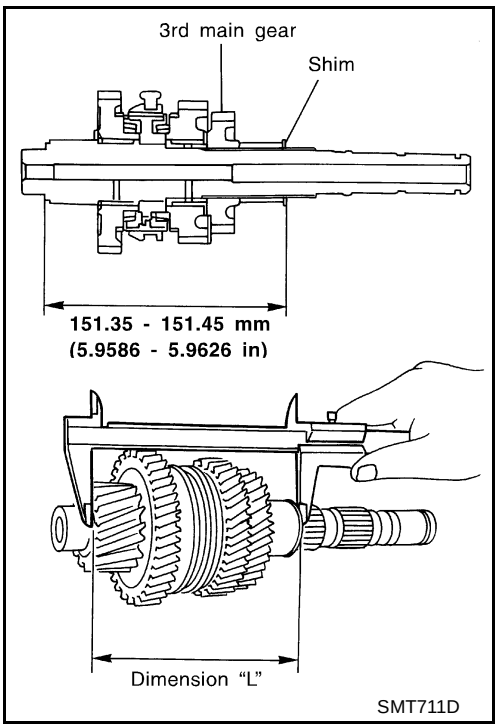
10. Install spacer and mainshaft adjusting shim onto mainshaft.
11. Select a mainshaft adjusting shim suitable to satisfy the following specification of dimension “L” and install it onto mainshaft.

Specification of dimension “L”:

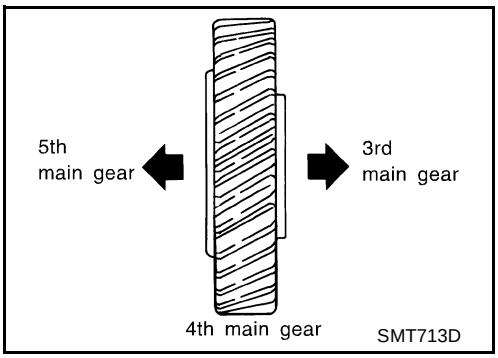
151.35 - 151.45 mm (5.9586 - 5.9626 in)

Mainshaft adjusting shims:

Refer to MT-114, "MAINSHAFT ADJUSTING SHIM"



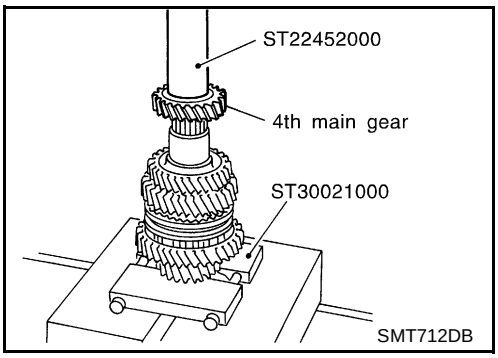
12. Position 4th main gear as shown in the figure, and install it onto mainshaft.



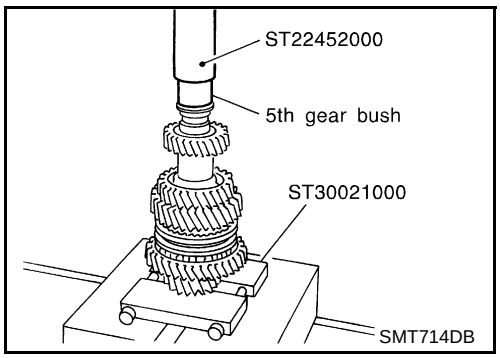
13. Install 4th main gear onto mainshaft.

CAUTION:

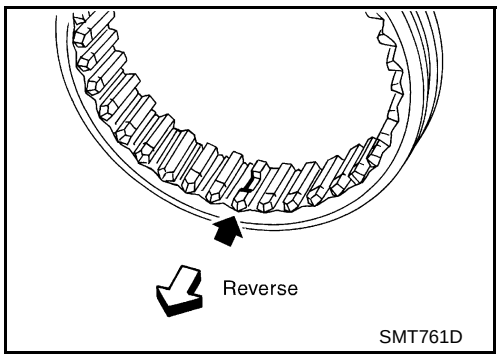
Do not reuse 4th main gear.



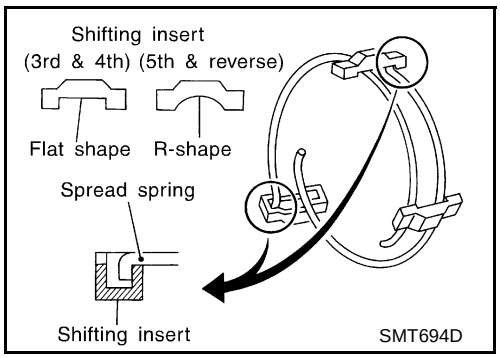
14. Install 5th gear bushing with its flange surface facing the 4th main gear side.



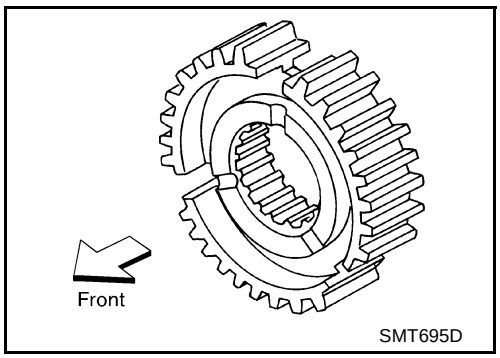
15. Install 5th needle bearing, 5th main gear, and 5th gear baulk ring onto mainshaft.



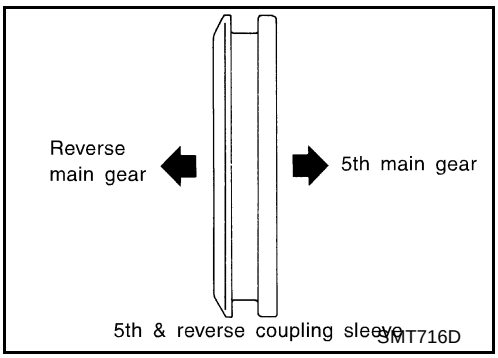
16. Being careful of the following points, install spread spring, shifting insert, and 5th & reverse synchronizer hub onto 5th & reverse coupling sleeve.
    - Pay attention to the shape of spread spring and shifting insert for correct assembly.
      Do not install spread spring hook onto the same shifting insert.



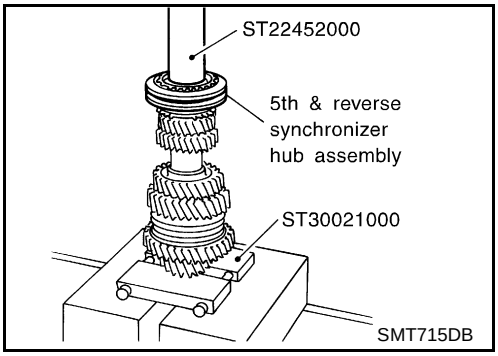
    - Install synchronizer hub with its three grooves facing the front side (5th main gear side).
      CAUTION:
      Do not reuse 5th & reverse synchronizer hub.



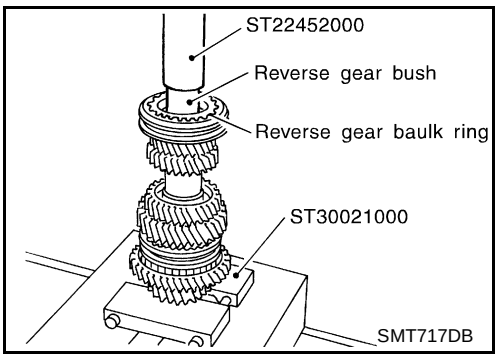
- Install 5th & reverse coupling sleeve with its chamfered surface facing the reverse main gear side.



17. Install 5th & reverse synchronizer hub assembly.



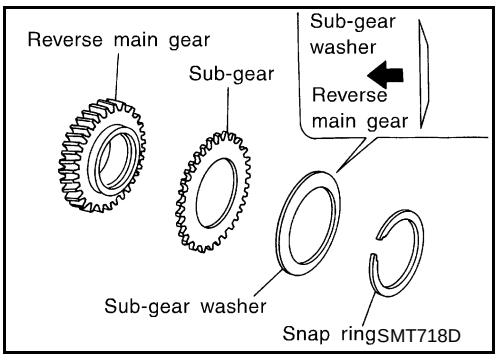
18. Install reverse gear baulk ring.
19. Install reverse gear busing.
20. Install reverse gear needle bearing.



21. Install sub-gear, sub-gear washer, and snap ring onto reverse main gear.

CAUTION:

- **Pay attention to direction of sub-gear washer.**
- **Do not reuse snap ring.**



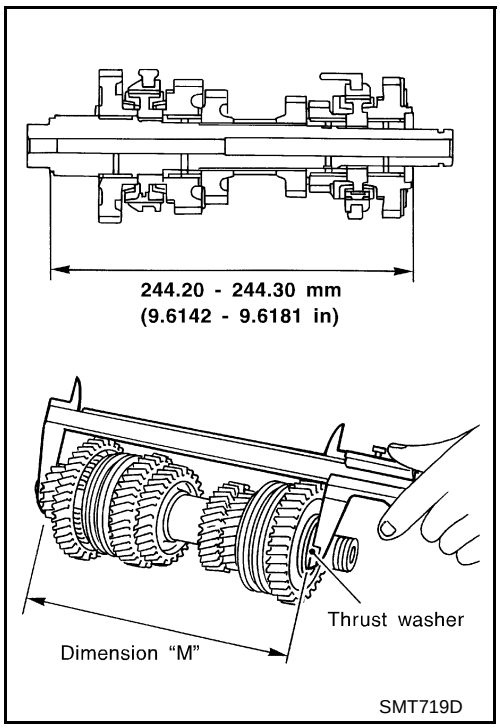
22. Install reverse main gear assembly onto mainshaft.
23. Select a thrust washer suitable to satisfy the following specification of dimension “M” (as shown in the figure), and install it onto mainshaft.

Specification of dimension “M”:

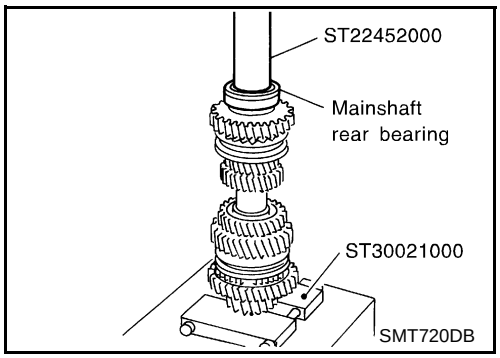
244.20 - 244.30 mm (9.6142 - 9.6181 in)

Available mainshaft thrust washers:

Refer to MT-114, "MAINSHAFT THRUST WASHER" .



24. Install mainshaft rear bearing.



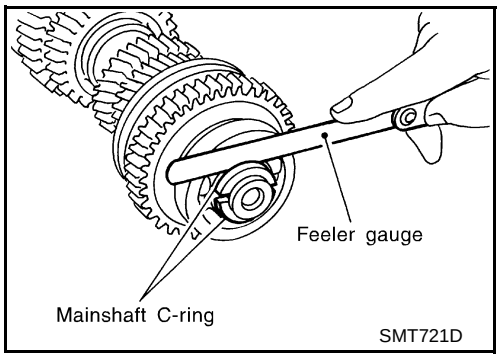
25. Install mainshaft C-ring.
26. Using feeler gauge, measure the end play of mainshaft rear bearing, and check if it satisfies the following specification.

End play:

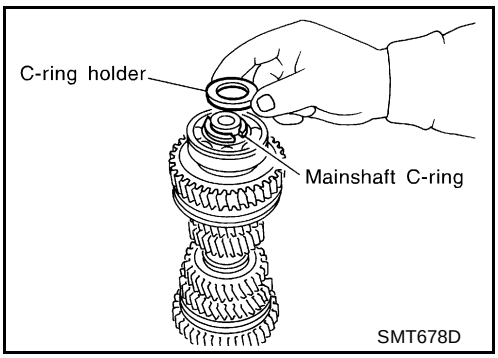
0 - 0.06 mm (0 - 0.0024 in)

Mainshaft C-rings:

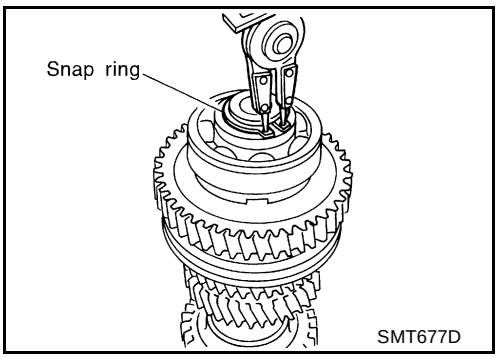
Refer to MT-113, "MAINSHAFT C-RING" .



27. Install C-ring holder.



28. Install snap ring.
29. Measure gear end play as a final check. Refer to MT-95, "DISASSEMBLY" .



FINAL DRIVE

PFP:38411

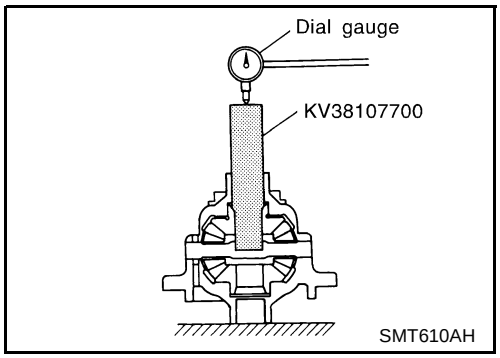
Assembly and Disassembly

ECS005HT

PRE-INSPECTION

- Check the clearance between side gear and differential case as follows.

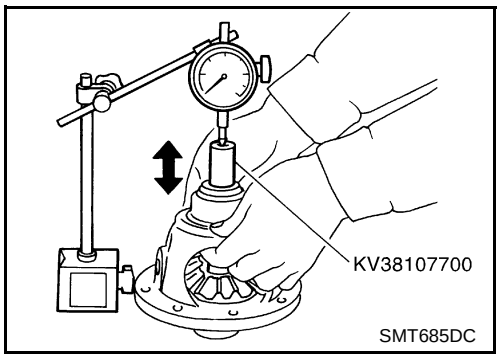
1. Clean final drive assembly sufficiently to prevent side gear thrust washer, differential case, side gear, and other parts from sticking by gear oil.



2. Upright the differential case so that the side gear to be measured faces upward.
3. Place final drive adapter and dial gauge onto side gear. Move side gear up and down, and measure the clearance.

Clearance between side gear and differential case

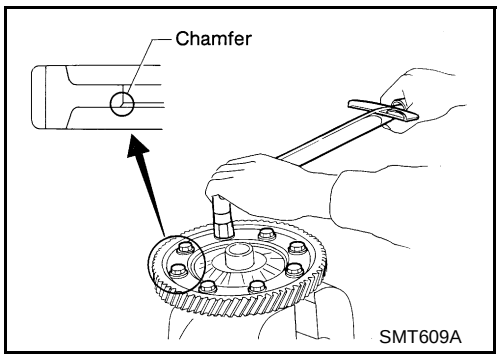
: 0.1 - 0.2 mm (0.004 - 0.008 in)



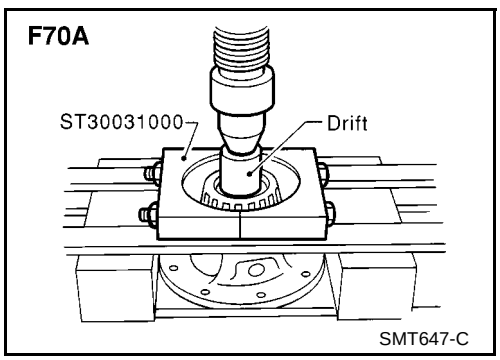
4. If not within specification, adjust the clearance by changing thrust washer thickness.
5. Turn differential case upside down, and measure the clearance between side gear and differential case on the other side in the same way.

DISASSEMBLY

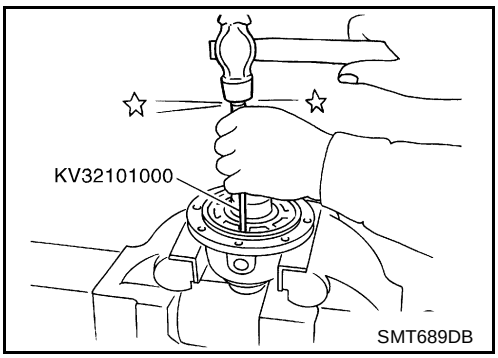
1. Remove mounting bolts. Then, separate the final gear from differential case.
2. Make a notch and remove speedometer drive gear using a scraper or other suitable tool.
   - **Bearing replacer cannot be positioned unless speedometer drive gear is removed.**



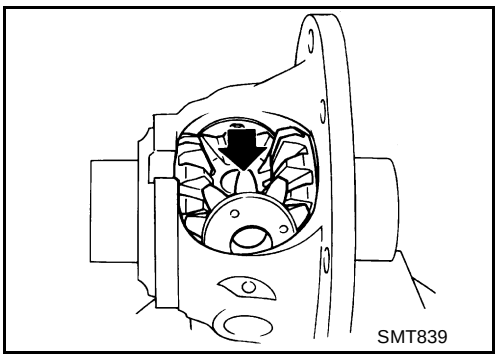
3. Remove differential side bearing of final gear side.
4. Turn differential case upside down, and remove differential side bearing of speedometer drive gear side.
   - **Be careful not to mix up the differential side bearings.**
5. Remove speedometer stopper.



6. Remove lock pins from pinion mate shaft.



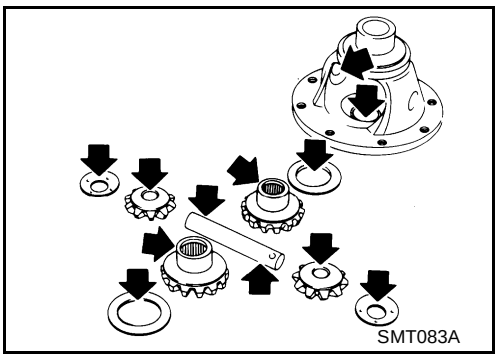
7. Remove pinion mate shaft.
8. Rotate pinion mate gear, and remove pinion mate gear, pinion mate thrust washer, side gear, and side gear thrust washer from differential case.



INSPECTION AFTER DISASSEMBLY

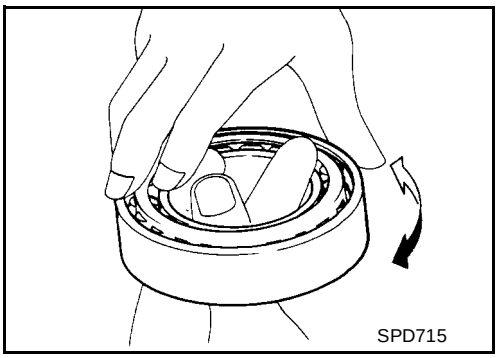
Gear, Washer, Shaft and Case

- Check mating surfaces of differential case, side gears and pinion mate gears.
- Check washers for wear.



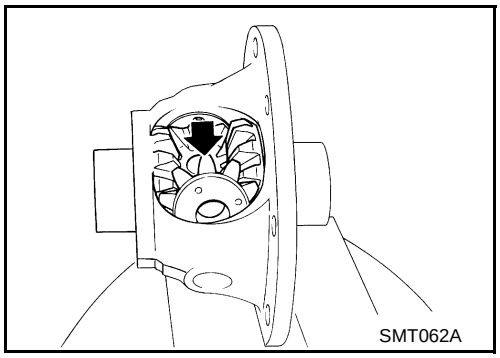
Bearing

- Make sure bearings roll freely and are free from noise, cracks, pitting or wear.
- **When replacing tapered roller bearing, replace outer and inner race as a set.**

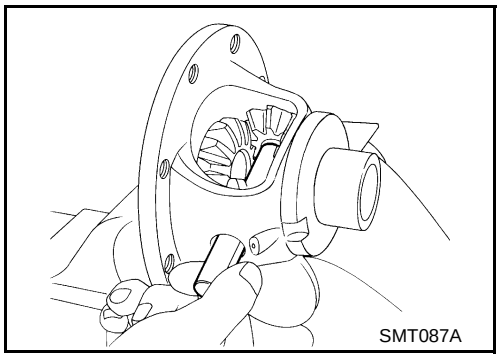


ASSEMBLY

1. Apply gear oil to sliding area of differential case, each gear, and thrust washer.
2. Install side gear thrust washer and side gear into differential case.
3. Position pinion mate gear and pinion mate thrust washer diagonally, and install them into differential case while rotating.



4. Insert pinion mate shaft into differential case.



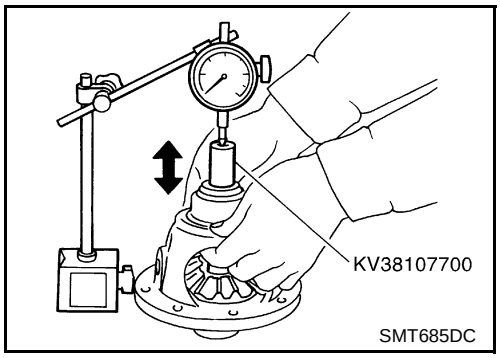
5. Upright the differential case so that its side gear to be measured faces upward.
6. Place preload adapter and dial gauge onto side gear. Move side gear up and down, and measure the clearance.
7. Turn differential case upside down, and measure the clearance between side gear and differential case on the other side in the same way.

Clearance of side gear and differential case:

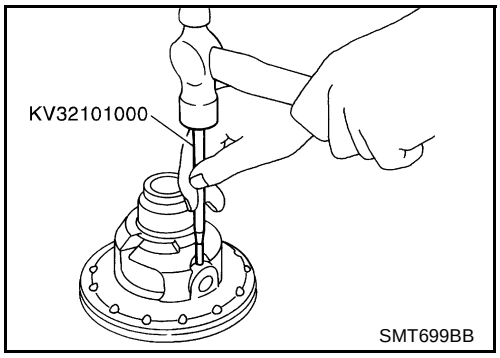
0.1 - 0.2 mm (0.004 - 0.008 in)

Differential side gear thrust washers:

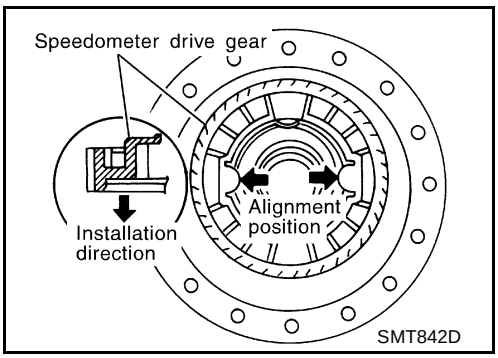
Refer to MT-114, "DIFFERENTIAL SIDE GEAR THRUST WASHER" .



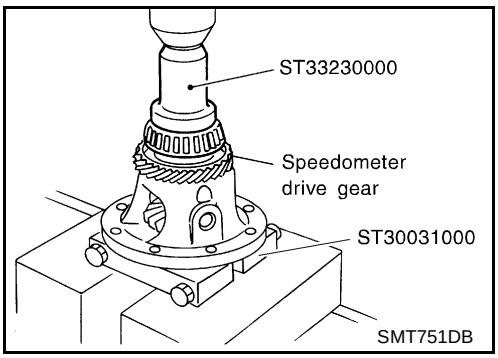
8. Install retaining pin.
   - **Make sure that retaining pin is flush with case.**



9. Align and install speedometer drive gear into differential case.
10. Install speedometer stopper.

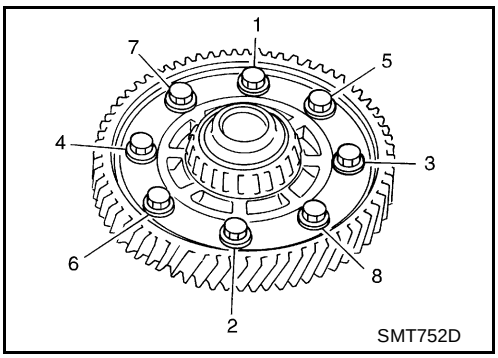


11. Install differential side bearing.
12. Turn differential case upside down, and install another differential side bearing on the other side in the same way.



13. Install differential gear into differential case. Apply sealant onto mounting bolts, and tighten them in order as shown in the figure with specified torque.

Tightening torque **: Refer to MT-70, "FINAL DRIVE COMPONENTS" .**



SHIFT CONTROL

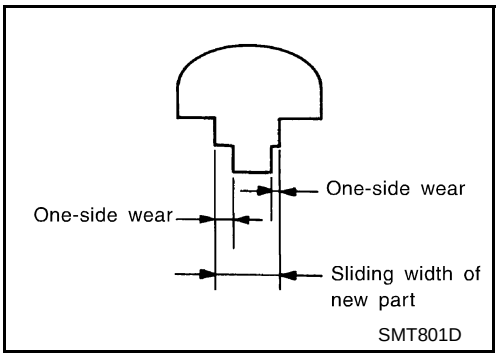
PFP:32982

Inspection

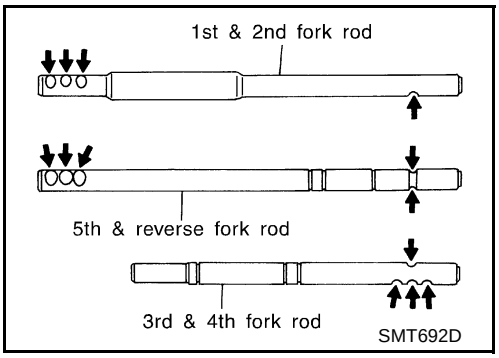
ECS005HU

- Check if the width of shift fork hook (sliding area with coupling sleeve) is within allowable specification below.

Item	One-side wear specification	Sliding width of new part
1st & 2nd	0.2 mm (0.008 in)	7.80 - 7.93 mm (0.3071 - 0.3122 in)
3rd & 4th	0.2 mm (0.008 in)	7.80 - 7.93 mm (0.3071 - 0.3122 in)
5th & reverse	0.2 mm (0.008 in)	7.80 - 7.93 mm (0.3071 - 0.3122 in)



- Check if shift check groove of fork rod or 5th & reverse check groove is worn, or has any other unusual conditions.



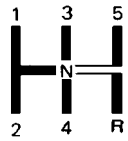
SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

General Specification

ECS005HV

TRANSAXLE

Engine			QG18DE
Transaxle model			RS5F70A
Model code number			AV709
Number of speed			5
Synchromesh type			Warner
Shift pattern			
Gear ratio	1st		3.333
	2nd		1.955
	3rd		1.286
	4th		0.926
	5th		0.756
	Reverse		3.214
Number of teeth	Input gear	1st	15
		2nd	22
		3rd	28
		4th	41
		5th	45
		Reverse	14
	Main gear	1st	50
		2nd	43
		3rd	36
		4th	38
		5th	34
		Reverse	45
	Reverse idler gear		37
Oil capacity ℓ (Imp pt)			2.9 - 3.1 (5-1/4)
Remarks			1st & 2nd double baulk ring type synchronizer
			Reverse sub-gear

FINAL GEAR

Engine		QG18DE
Transaxle model		RS5F70A
Model code number		AV709
Final gear ratio		4.437
Number of teeth	Final gear/Pinion	71/16
	Side gear/Pinion mate gear	16/10

Gear End Play

ECS005HW

Unit: mm (in)

Gear	End play
1st main gear	0.18 - 0.31 (0.0071 - 0.0122)
2nd main gear	
5th main gear	
Reverse main gear	
3rd input gear	
4th input gear	0.17 - 0.44 (0.0067 - 0.0173)

Clearance Coupling Sleeve

ECS005HX

1ST, 2ND, 3RD, 4TH, 5TH & REVERSE COUPLING SLEEVE

Coupling sleeve	Length “L”
1st & 2nd	0 - 0.68 mm (0 - 0.0268 in)
3rd & 4th	0 - 0.95 mm (0 - 0.0374 in)
5th & Reverse	0 - 0.89 mm (0 - 0.0350 in)

Clearance Between Baulk Ring and Gear

ECS005HY

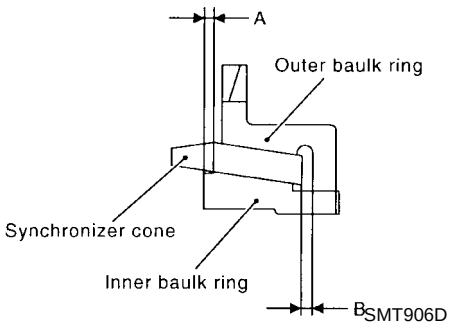
3RD, 4TH, 5TH, REVERSE BAULK RING

Unit: mm (in)

Standard		Wear limit
3rd	0.90 - 1.45 (0.0354 - 0.0571)	0.7 (0.028)
4th		
5th		
Reverse	0.9 - 1.35 (0.0354 - 0.0531)	

1ST AND 2ND DOUBLE BAULK RING

Unit: mm (in)



Dimension	Standard	Wear limit
A	0.6 - 0.8 (0.024 - 0.031)	0.2 (0.008)
B	0.6 - 1.1 (0.024 - 0.043)	

Available Snap Rings

ECS005HZ

SNAP RING

End play	0.05 - 0.25 mm (0.0020 - 0.0098 in)
Thickness mm (in)	Part number*
1.45 (0.0571)	32204-6J000
1.55 (0.0610)	32204-6J001
1.65 (0.0650)	32204-6J002

1.75 (0.0689)	32204-6J003
1.85 (0.0728)	32204-6J004

*: Always check with the parts department for the latest information.

Available C-rings

ECS005I0

4TH INPUT GEAR C-RING

End play	0 - 0.06 mm (0 - 0.0024 in)
Thickness mm (in)	Part number*
3.00 (0.1181)	32205-6J000
3.03 (0.1193)	32205-6J001
3.06 (0.1205)	32205-6J002
3.09 (0.1217)	32205-6J003
3.12 (0.1228)	32205-6J004

*: Always check with the Parts Department for the latest parts information.

5TH INPUT GEAR REAR C-RING

End play	0 - 0.06 mm (0 - 0.0024 in)
Thickness mm (in)	Part number*
2.59 (0.1020)	32205-6J005
2.62 (0.1031)	32205-6J006
2.65 (0.1043)	32205-6J007
2.68 (0.1055)	32205-6J008
2.71 (0.1067)	32205-6J009
2.74 (0.1079)	32205-6J010

*: Always check with the Parts Department for the latest parts information.

MAINSHAFT C-RING

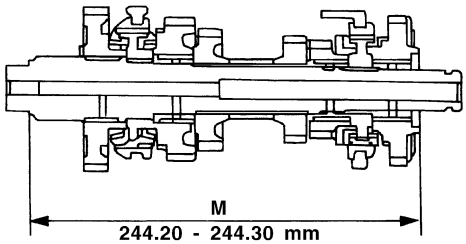
End play	0 - 0.06 mm (0 - 0.0024 in)
Thickness mm (in)	Part number*
3.48 (0.1370)	32348-6J000
3.51 (0.1382)	32348-6J001
3.54 (0.1394)	32348-6J002
3.57 (0.1406)	32348-6J003
3.60 (0.1417)	32348-6J004
3.63 (0.1429)	32348-6J005
3.66 (0.1441)	32348-6J006
3.69 (0.1453)	32348-6J007
3.72 (0.1465)	32348-6J008
3.75 (0.1476)	32348-6J009
3.78 (0.1488)	32348-6J010
3.81 (0.1500)	32348-6J011
3.84 (0.1512)	32348-6J012
3.87 (0.1524)	32348-6J013
3.90 (0.1535)	32348-6J014
3.93 (0.1547)	32348-6J015
3.96 (0.1559)	32348-6J016

*: Always check with the parts department for the latest information.

Available Thrust Washer

ECS005I1

MAINSHAFT THRUST WASHER



SMT843D

Standard length “M”	244.20 - 244.30 mm (9.6142 - 9.6181 in)
Thickness mm (in)	Part number*
6.04 (0.2378)	32246-6J000
6.12 (0.2409)	32246-6J001
6.20 (0.2441)	32246-6J002
6.28 (0.2472)	32246-6J003
6.36 (0.2504)	32246-6J004

*: Always check with the Parts Department for the latest parts information.

DIFFERENTIAL SIDE GEAR THRUST WASHER

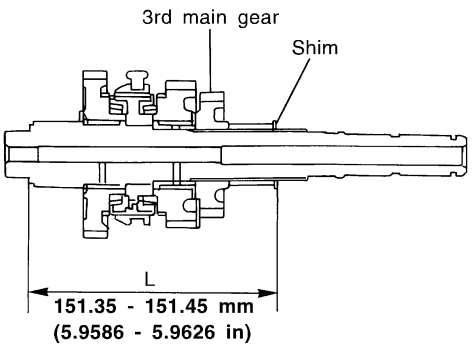
Clearance between side gear and differential case	0.1 - 0.2 mm (0.004 - 0.008 in)
Thickness mm (in)	Part number*
0.75 - 0.80 (0.0295 - 0.0315)	38424-D2111
0.80 - 0.85 (0.0315 - 0.0335)	38424-D2112
0.85 - 0.90 (0.0335 - 0.0354)	38424-D2113
0.90 - 0.95 (0.0354 - 0.0374)	38424-D2114
0.95 - 1.00 (0.0374 - 0.0394)	38424-D2115

*: Always check with the Parts Department for the latest parts information.

Available Adjusting Shims

ECS005I2

MAINSHAFT ADJUSTING SHIM



SMT907D

Standard length “L”	151.35 - 151.45 mm (5.9586 - 5.9626 in)
Thickness mm (in)	Part number*
0.48 (0.0189)	32238-6J000
0.56 (0.0220)	32238-6J001
0.64 (0.0252)	32238-6J002
0.72 (0.0283)	32238-6J003

0.80 (0.0315)	32238-6J004
0.88 (0.0346)	32238-6J005

*: Always check with the Parts Department for the latest parts information.

INPUT SHAFT REAR BEARING ADJUSTING SHIM

End play	0 - 0.06 mm (0 - 0.0024 in)
Thickness mm (in)	Part number*
0.74 (0.0291)	32225-6J003
0.78 (0.0307)	32225-6J004
0.82 (0.0323)	32225-6J005
0.86 (0.0339)	32225-6J006
0.90 (0.0354)	32225-6J007
0.94 (0.0370)	32225-6J008
0.98 (0.0386)	32225-6J009
1.02 (0.0402)	32225-6J010
1.06 (0.0417)	32225-6J011
1.10 (0.0433)	32225-6J012
1.14 (0.0449)	32225-6J013
1.18 (0.0465)	32225-6J014
1.22 (0.0480)	32225-6J015
1.26 (0.0496)	32225-6J016
1.30 (0.0512)	32225-6J017
1.34 (0.0528)	32225-6J018
1.38 (0.0543)	32225-6J019
1.42 (0.0559)	32225-6J020
1.46 (0.0575)	32225-6J021
1.50 (0.0591)	32225-6J022
1.54 (0.0606)	32225-6J023
1.58 (0.0622)	32225-6J024
1.62 (0.0638)	32225-6J060
1.66 (0.0654)	32225-6J061

*: Always check with the Parts Department for the latest parts information.

MAINSHAFT REAR BEARING ADJUSTING SHIM

End play	0 - 0.06 mm (0 - 0.0024 in)
Thickness mm (in)	Part number*
2.99 (0.1177)	32238-6J010
3.03 (0.1193)	32238-6J011
3.07 (0.1209)	32238-6J012
3.11 (0.1224)	32238-6J013
3.15 (0.1240)	32238-6J014
3.19 (0.1256)	32238-6J015
3.23 (0.1272)	32238-6J016
3.27 (0.1287)	32238-6J017
3.31 (0.1303)	32238-6J018
3.35 (0.1319)	32238-6J019

3.39 (0.1335)	32238-6J020
3.43 (0.1350)	32238-6J021
3.47 (0.1366)	32238-6J022
3.51 (0.1382)	32238-6J023

*: Always check with the Parts Department for the latest parts information.

Available Shims

ECS005I3

BEARING PRELOAD

Unit: mm (in)

Differential side bearing preload: T*	0.15 - 0.21 (0.0059 - 0.0083)

*: Install shims which are “deflection of differential case” + “T” in thickness.

DIFFERENTIAL SIDE BEARING ADJUSTING SHIMS

Thickness mm (in)	Part number*
0.44 (0.0173)	38454-M8000
0.48 (0.0189)	38454-M8001
0.52 (0.0205)	38454-M8002
0.56 (0.0220)	38454-M8003
0.60 (0.0236)	38454-M8004
0.64 (0.0252)	38454-M8005
0.68 (0.0268)	38454-M8006
0.72 (0.0283)	38454-M8007
0.76 (0.0299)	38454-M8008
0.80 (0.0315)	38454-M8009
0.84 (0.0331)	38454-M8010
0.88 (0.0346)	38454-M8011

*: Always check with the Parts Department for the latest parts information.

PRECAUTIONS

PFP:00001

Caution

ECS006CY

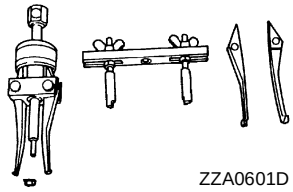
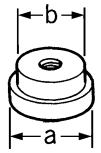
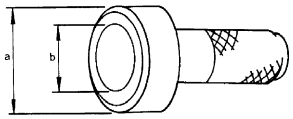
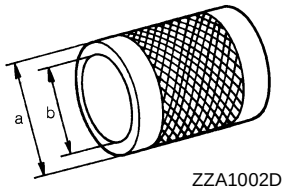
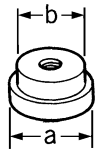
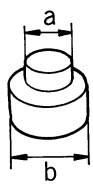
- Do not reuse transaxle oil, once it has been drained.
- Check oil level or replace oil with vehicle on level ground.
- During removal or installation, keep inside of transaxle clear of dust or dirt.
- Check for the correct installation status prior to removal or disassembly. If mating marks are required, be certain they do not interfere with the function of the parts they are applied to.
- In principle, tighten bolts or nuts gradually in several steps working diagonally from inside to outside. If tightening sequence is specified, observe it.
- Be careful not to damage sliding surfaces and mating surfaces.

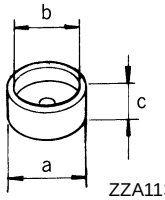
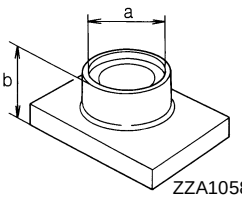
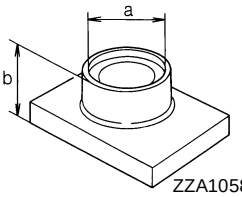
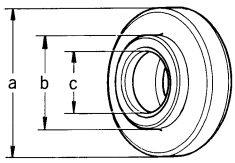
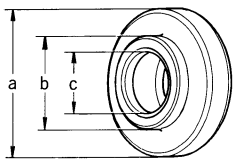
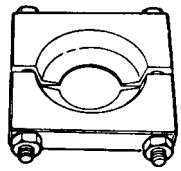
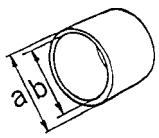
PREPARATION

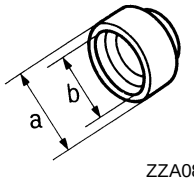
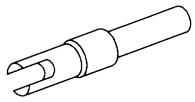
PFP:00002

Special Service Tools

ECS006CZ

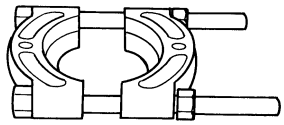
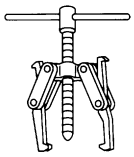
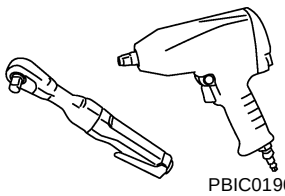
Tool number Tool name		Description
KV381054S0 Puller	 ZZA0601D	● Side bearing outer race removal ● Mainshaft front bearing removal
ST35321000 Drift a: 49 mm (1.93 in) dia. b: 41 mm (1.61 in) dia.	 ZZA1000D	● Input shaft oil seal installation ● Reverse main gear installation ● 1st bushing installation ● 1st-2nd synchronizer hub installation ● 2nd bushing installation ● 3rd main gear installation
ST30720000 Drift a: 77 mm (3.03 in) dia. b: 55.5 mm (2.185 in) dia.	 ZZA0811D	● Differential oil seal installation ● Differential side bearing outer race installation ● Mainshaft rear bearing installation ● Differential side bearing installation
ST33200000 Drift a: 60 mm (2.36 in) dia. b: 44.5 mm (1.752 in) dia.	 ZZA1002D	● Mainshaft front bearing installation ● 6th bushing installation ● 4th main gear installation ● 5th main gear installation ● 6th main gear installation
ST33061000 Drift a: 38 mm (1.50 in) dia. b: 28.5 mm (1.122 in) dia.	 ZZA1000D	● Bore plug installation ● Differential side bearing removal
ST33052000 Drift a: 22 mm (0.87 in) dia. b: 28 mm (1.10 in) dia.	 ZZA1023D	● Welch plug installation ● Input shaft rear bearing removal ● 5th bushing, thrust washer, 4th input gear, 4th gear bushing, 3rd-4th synchronizer hub and 3rd input gear removal ● Input shaft front bearing installation ● 6th input gear and 6th bushing removal ● Mainshaft rear bearing removal ● 4th main gear and 5th main gear removal ● 6th main gear removal

Tool number Tool name		Description
KV40105020 Drift a: 39.7 mm (1.563 in) dia. b: 35 mm (1.38 in) dia. c: 15 mm (0.59 in)	 ZZA1133D	● 5th input gear and synchronizer hub removal ● 3rd main gear, 2nd main gear, 2nd bushing, 1st-2nd synchronizer hub, 1st main gear, reverse main gear and 1st bushing removal
KV40105710 Press stand a: 46 mm (1.81 in) dia. b: 41 mm (1.61 in)	 ZZA1058D	● 3rd-4th synchronizer hub installation ● 4th bushing installation ● 5th busing installation ● 5th-6th synchronizer hub installation ● 2nd bushing installation ● 3rd main gear installation
ST38220000 Press stand a: 63 mm (2.48 in) dia. b: 65 mm (2.56 in)	 ZZA1058D	● Reverse main gear installation ● 1st bushing installation ● 1st-2nd synchronizer hub installation
ST30032000 Drift a: 80 mm (3.15 in) dia. b: 38 mm (1.50 in) dia. c: 31 mm (1.22 in) dia.	 ZZA0978D	● Input shaft front bearing installation
ST30901000 Drift a: 79 mm (3.11 in) dia. b: 45 mm (1.77 in) dia. c: 35.2 mm (1.386 in) dia.	 ZZA0978D	● Input shaft rear bearing installation ● 4th main gear installation ● 5th main gear installation ● 6th main gear installation ● Mainshaft rear bearing installation
ST30031000 Puller	 ZZA0537D	● Measuring wear of 1st and 2nd baulk ring
KV40101630 Drift a: 68 mm (2.68 in) dia. b: 60 mm (2.36 in) dia.	 ZZA1003D	● Reverse main gear installation

Tool number Tool name	Description
KV38102510 Drift a: 71 mm (2.80 in) dia. b: 65 mm (2.56 in) dia.  ZZA0838D	● 1st bushing installation ● 1st-2nd synchronizer hub installation ● Differential side bearing installation
KV38105900 Preload adapter  NT087	● Checking differential side gear end play

Commercial Service Tools

ECS006D0

Tool name	Description
Puller  ZZB0823D	● Each bearing gear and bushing removal
Puller  NT077	● Each bearing gear and bushing removal
Pin punch Tip diameter: 4.5 mm (0.177 in) dia.  ZZA0815D	● Each retaining pin removal and installation
Power tool  PBIC0190E	● Loosening bolts and nuts

NOISE, VIBRATION, AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

ECS006D1

Use the chart below to help you find the cause of the symptom. The numbers indicate the order of the inspection. If necessary, repair or replace these parts.

MANUAL TRANSAXLE

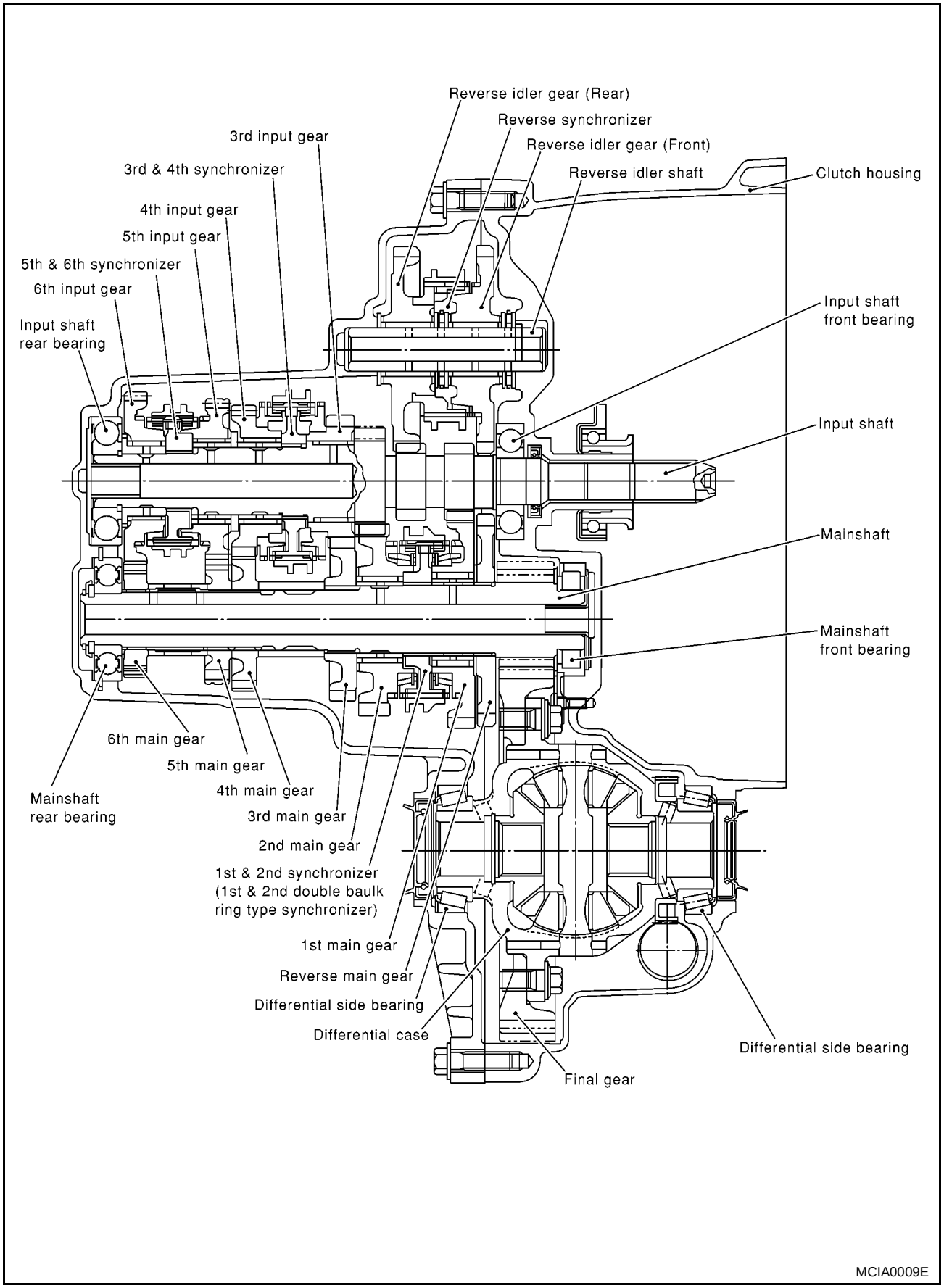
Reference page		MT-124			MT-131	MT-131	MT-131	MT-127	MT-134	MT-134	MT-132	MT-132	MT-132	MT-132
SUSPECTED PARTS (Possible cause)		OIL (Oil level is low.)	OIL (Wrong oil.)	OIL (Oil level is high.)	GASKET (Damaged)	OIL SEAL (Worn or damaged)	O-RING (Worn or damaged)	SHIFT CONTROL LINKAGE (Worn)	CHECK PLUG RETURN SPRING AND CHECK BALL (Worn or damaged)	SHIFT FORK (Worn)	GEAR (Worn or damaged)	BEARING (Worn or damaged)	BAULK RING (Worn or damaged)	INSERT SPRING (Damaged)
Symptoms	Noise	1	2								3	3		
	Oil leakage		3	1	2	2	2							
	Hard to shift or will not shift		1	1				2					3	3
	Jumps out of gear							1	2	3	3			

DESCRIPTION

PFP:00000

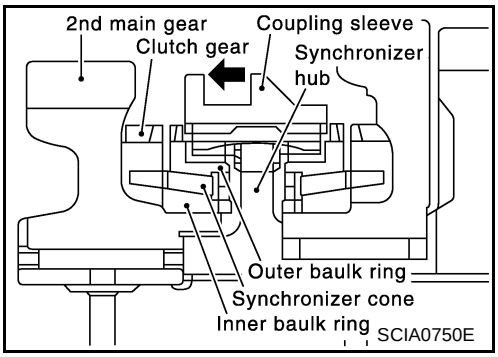
Cross-Sectional View

ECS006D2



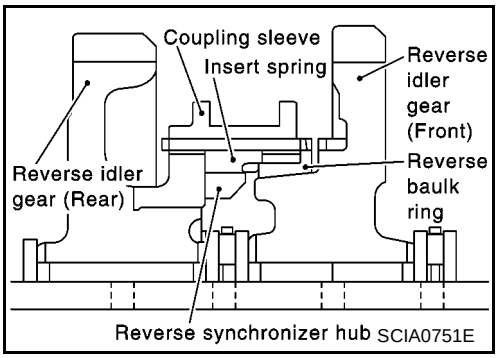
DOUBLE-CONE SYNCHRONIZER

Double-cone synchronizer is adopted for 1st and 2nd gears to reduce operating force of the shift lever.



REVERSE GEAR NOISE PREVENTION FUNCTION (SYNCHRONIZING METHOD)

The gear can be matched smoothly in a structure by setting synchronizer hub, coupling sleeve, baulk ring and insert spring to reverse gear, and letting gear be synchronized.



M/T OIL

PFP:KLD20

Changing M/T Oil

ECS006D3

DRAINING

1. Start the engine and let it run to warm up the transaxle.
2. Stop the engine. Remove drain plug and drain oil.
3. Set a gasket on the drain plug and install it to the transaxle.

Drain plug:

: 30 - 39 N·m (3.1 - 4.0 kg-m, 23 - 28 ft-lb)

CAUTION:
Do not reuse gasket.

FILLING

1. Remove filler plug. Fill with new oil until oil level reaches the specified limit near filler plug mounting hole.

Oil grade : API GL-4
Capacity (reference) : Approx. 2.3 ℓ (4 lmp pt)

2. After refilling oil, check oil level. Assemble gasket to filler plug, then install it to transaxle body.

Filler plug:

: 30 - 39 N·m (3.1 - 4.0 kg-m, 23 - 28 ft-lb)

CAUTION:
Do not reuse gasket.

Checking M/T Oil

ECS006D4

OIL LEAKAGE AND OIL LEVEL

- Check that oil is not leaking from transaxle or around it.
- Check oil level from filler plug mounting hole as shown in the figure.

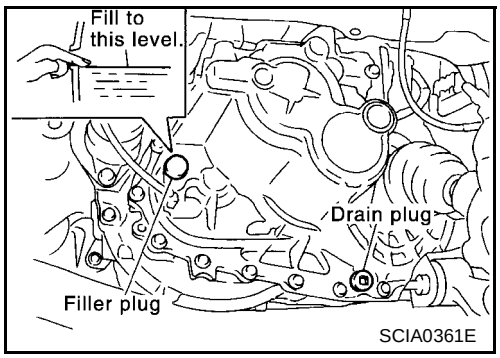
CAUTION:
Never start engine while checking oil level.

- Set a new gasket on the filler plug and install it on the transaxle.

Filler plug:

: 30 - 39 N·m (3.1 - 4.0 kg-m, 23 - 28 ft-lb)

CAUTION:
Do not reuse gasket.



SIDE OIL SEAL

PFP:32113

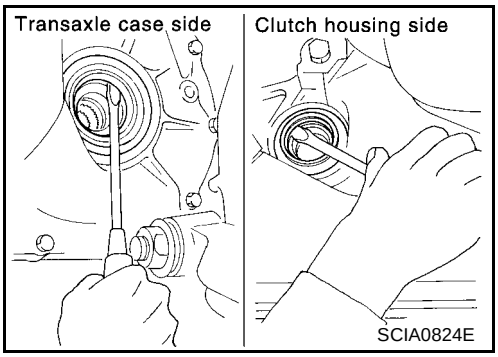
Removal and Installation

ECS006D5

REMOVAL

1. Remove the drive shaft from the transaxle. Refer to FAX-11, "FRONT DRIVE SHAFT" .
2. Remove oil seal with a slotted screwdriver.

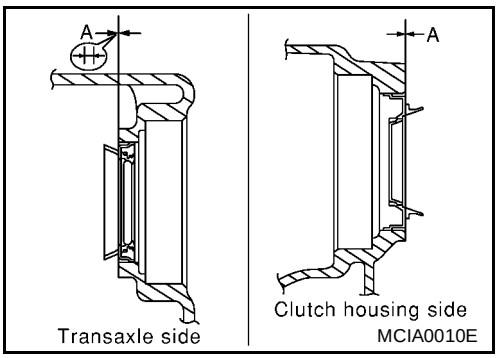
CAUTION:
Be careful not to damage the case surface when removing the oil seal.



INSTALLATION

1. Using a drift (special service tool), drive the oil seal straight until it protrudes from the case end equal to dimension A shown in the figure.

Dimension A : Within 0.5 mm of flush with the case.



Drift to be used:

Transaxle case side	ST3072 0000
Clutch housing side	

CAUTION:
- **When installing oil seals, apply multi-purpose grease to oil seal lips.**
- **Do not reuse oil seal.**

2. Install all parts in reverse order of removal and check oil level after installation.

POSITION SWITCH

PFP:32005

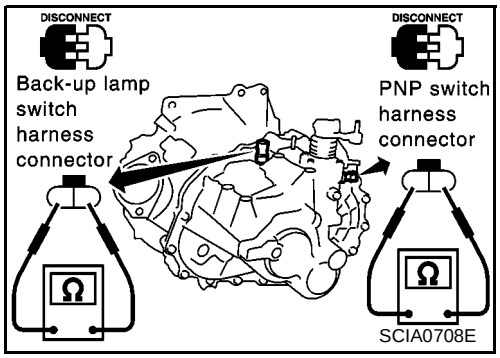
Checking

ECS006D6

BACK-UP LAMP SWITCH

- Check continuity.

Gear position	Continuity
Reverse	Yes
Except reverse	No



PARK/NEUTRAL POSITION SWITCH

- Check continuity.

Gear position	Continuity
Neutral	Yes
Except neutral	No

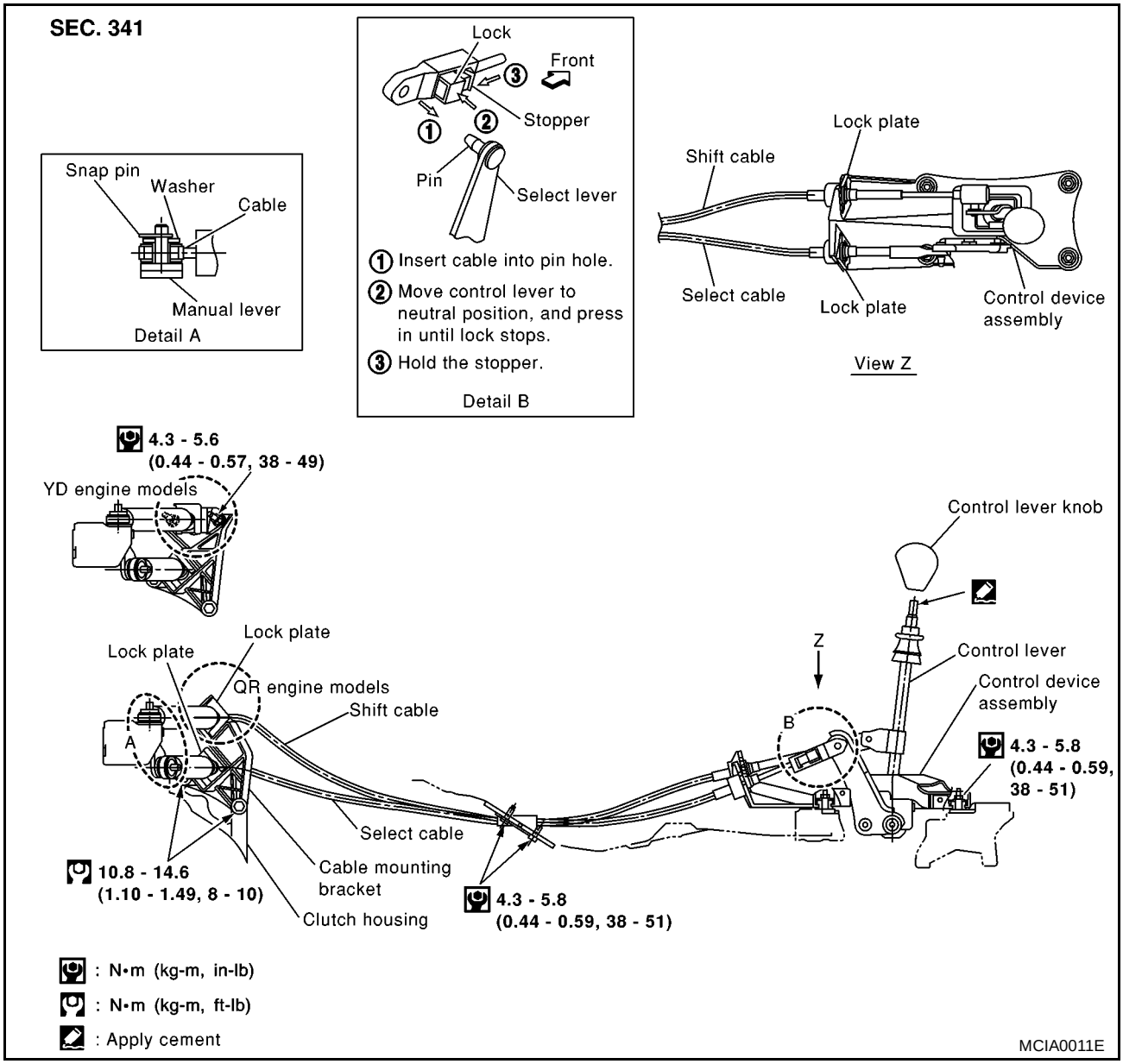
CONTROL LINKAGE

PFP:34103

Removal and Installation of Control Device and Cable

ECS006D7

Refer to the figure for removal and installation procedure.



CAUTION:

- **Keep in mind that the select side lock plate for securing the control cable is different from the one on the shift side.**
- **After assembly, make sure selector lever automatically returns to Neutral when it is moved to 1st, 2nd, or Reverse.**

AIR BREATHER HOSE

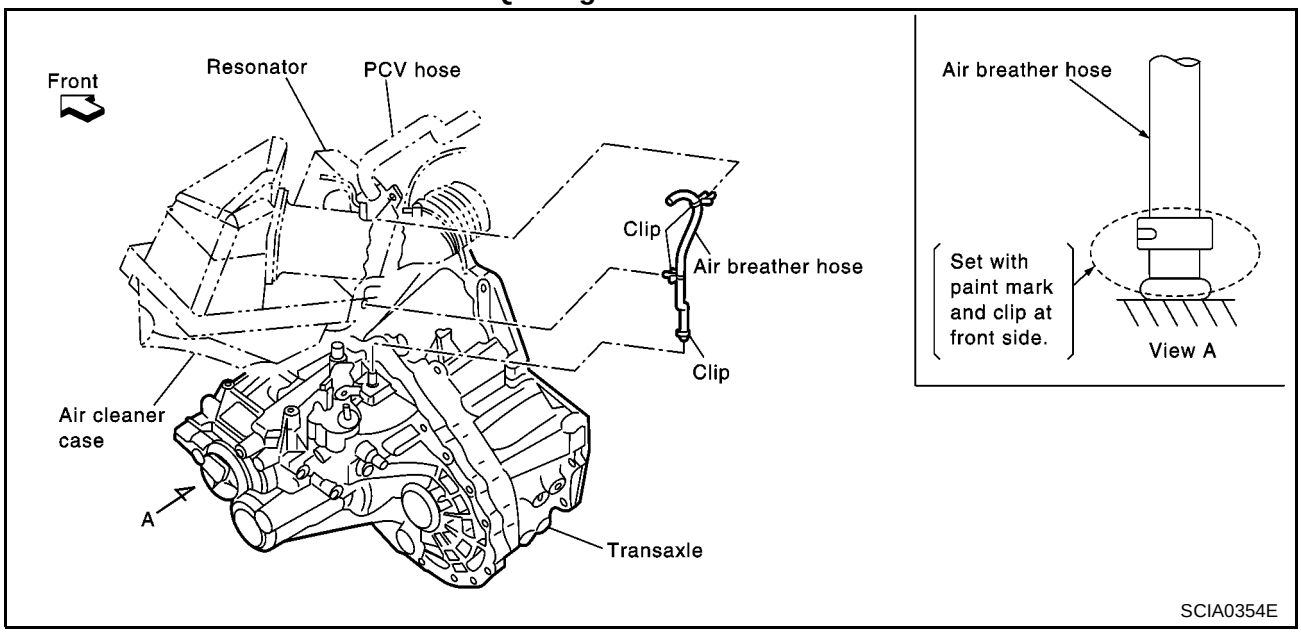
PFP:31098

Removal and Installation

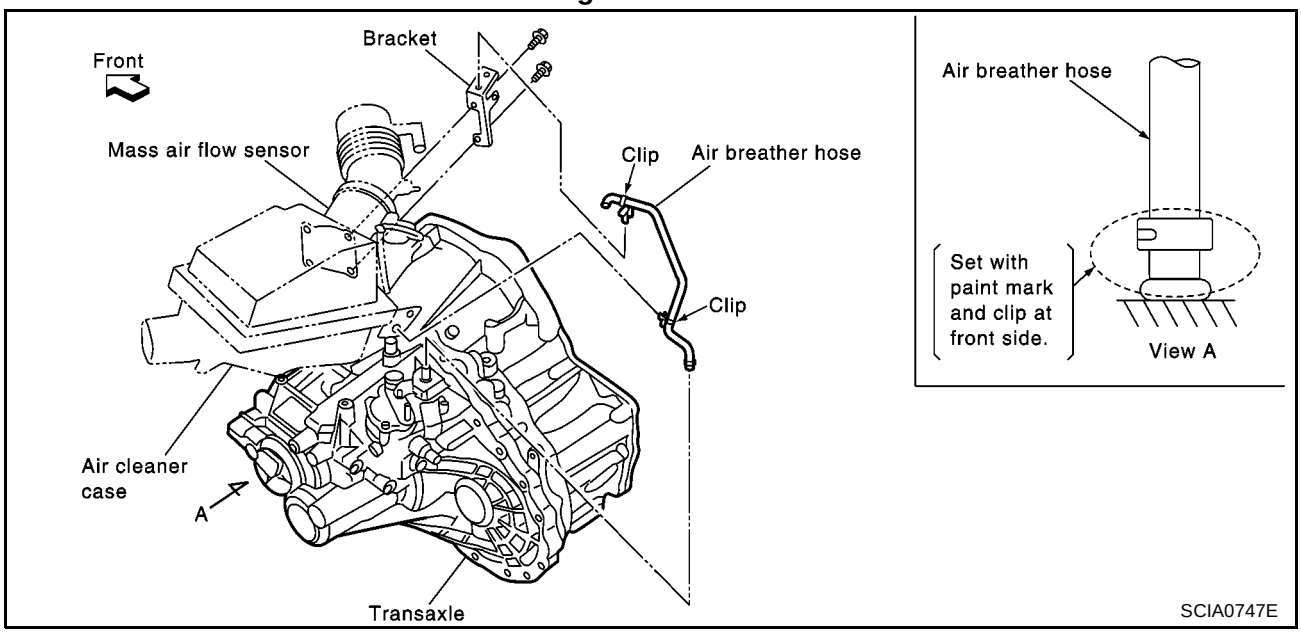
ECS006D8

Refer to the figure for air breather hose removal and installation information.

QR engine models



YD engine models



CAUTION:

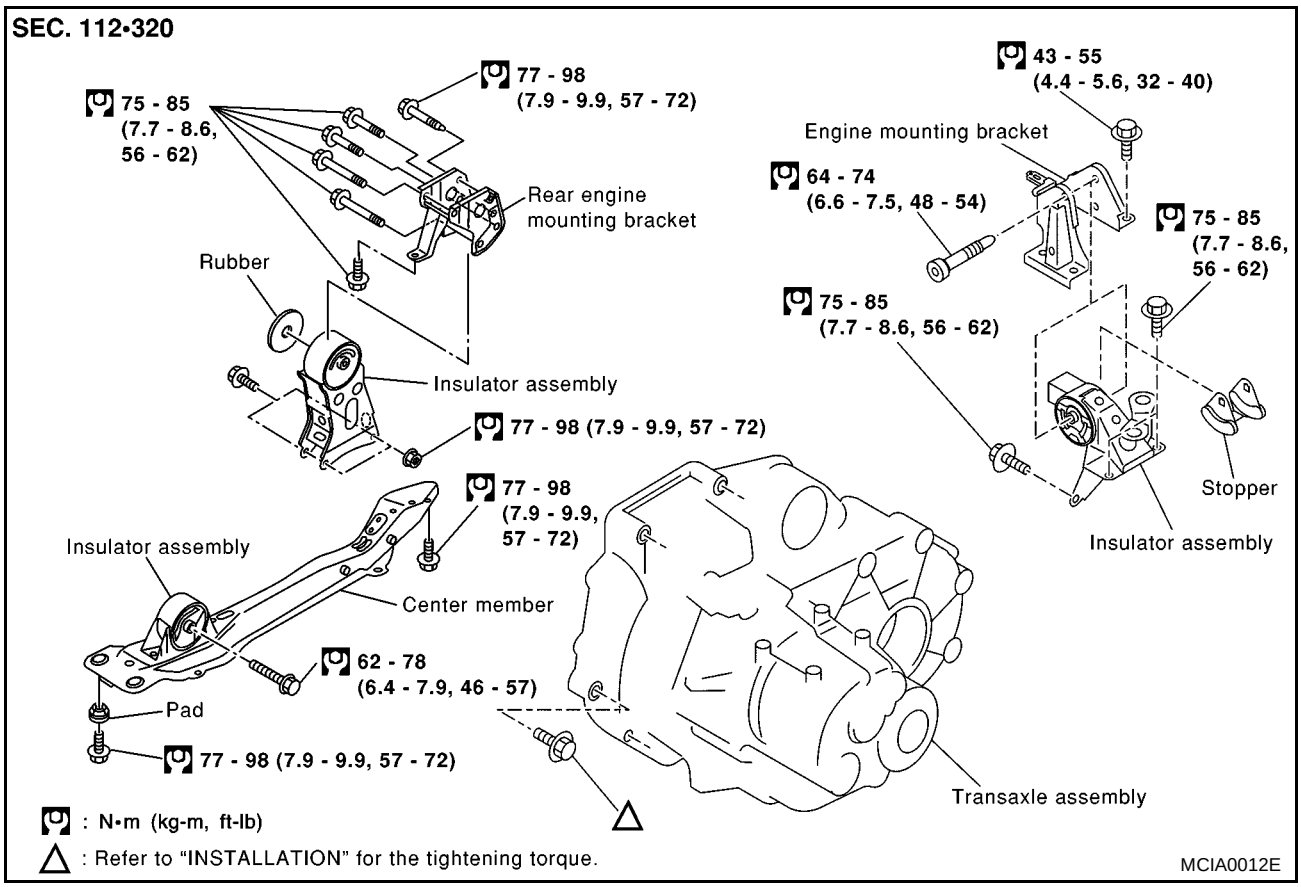
- **Make sure there are no pinched or restricted areas on the air breather hose caused by bending or winding when installing it.**
- **Be sure to insert hose into the transaxle tube until overlap area reaches the spool.**

TRANSAXLE ASSEMBLY

PFP:32010

Removal and Installation

ECS006D9



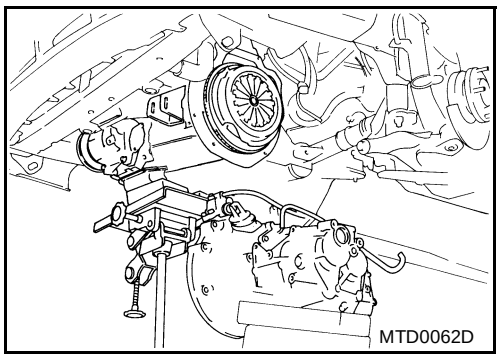
REMOVAL

1. Remove air cleaner, air duct, and battery.
2. Remove the air breather hose.
3. Remove clutch operating cylinder.

   CAUTION:
   Do not depress clutch pedal during removal procedure.
4. Disconnect control cable from transaxle.
5. Drain gear oil from transaxle.
6. Disconnect PNP switch, back-up lamp switch, and ground harness connectors.
7. Remove starter motor.
8. Remove suspension cross bar.
9. Remove exhaust front tube and the drive shaft.
10. Place a jack onto the transaxle.

    CAUTION:
    When setting jack, be careful not to bring it into contact with the switch.
11. Remove center member, engine insulator and engine mount bracket.
12. Support engine by placing a jack under oil pan.
13. Remove bolts securing transaxle to engine.

14. Remove transaxle from vehicle.



INSTALLATION

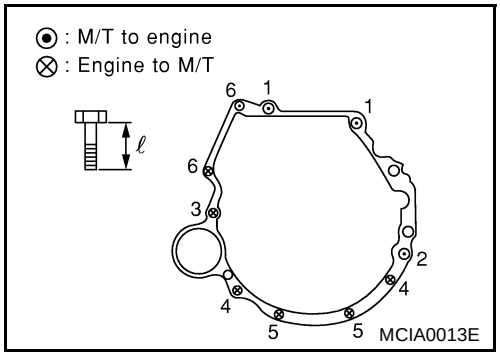
Paying attention to the following items, install in the reverse order of removal.

- When installing the transaxle to the engine, tighten to the specified torque.

  CAUTION:
  When installing transaxle, be careful not to bring transaxle input shaft into contact with the clutch cover.

QR engine models:

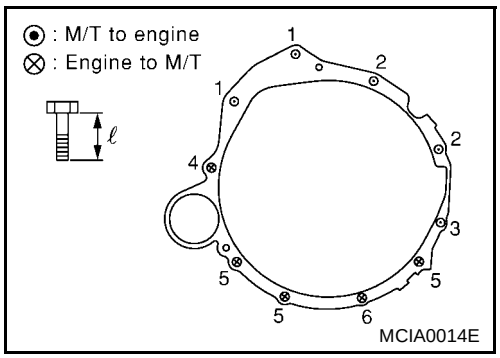
Bolt No.	1	2	3	4	5	6
Quantity	2	1	1	2	2	2
" ℓ " mm (in)	40 (1.57)	75 (2.95)	45 (1.77)	40 (1.57)	30 (1.18)	40 (1.57)
Tightening torque N·m (kg - m, ft- lb)	69.6 - 79.4 (7.1 - 8.1, 52 - 58)			39.2 - 46.1 (4.0 - 4.7, 29 - 34)		30.4 - 40.2 (3.1 - 4.1, 23 - 29)



YD engine models:

Bolt No.	1	2	3	4	5	6
Quantity	2	2	1	1	3	1
" ℓ " mm (in)	55 (2.17)	70 (2.76)	120 (4.72)	45 (1.77)	40 (1.57)	35 (1.38)
Tightening torque N·m (kg-m, ft-lb)	39 - 49 (4.0 - 5.0, 29 - 36)				31 - 36 (3.1 - 3.7, 23 - 26)	

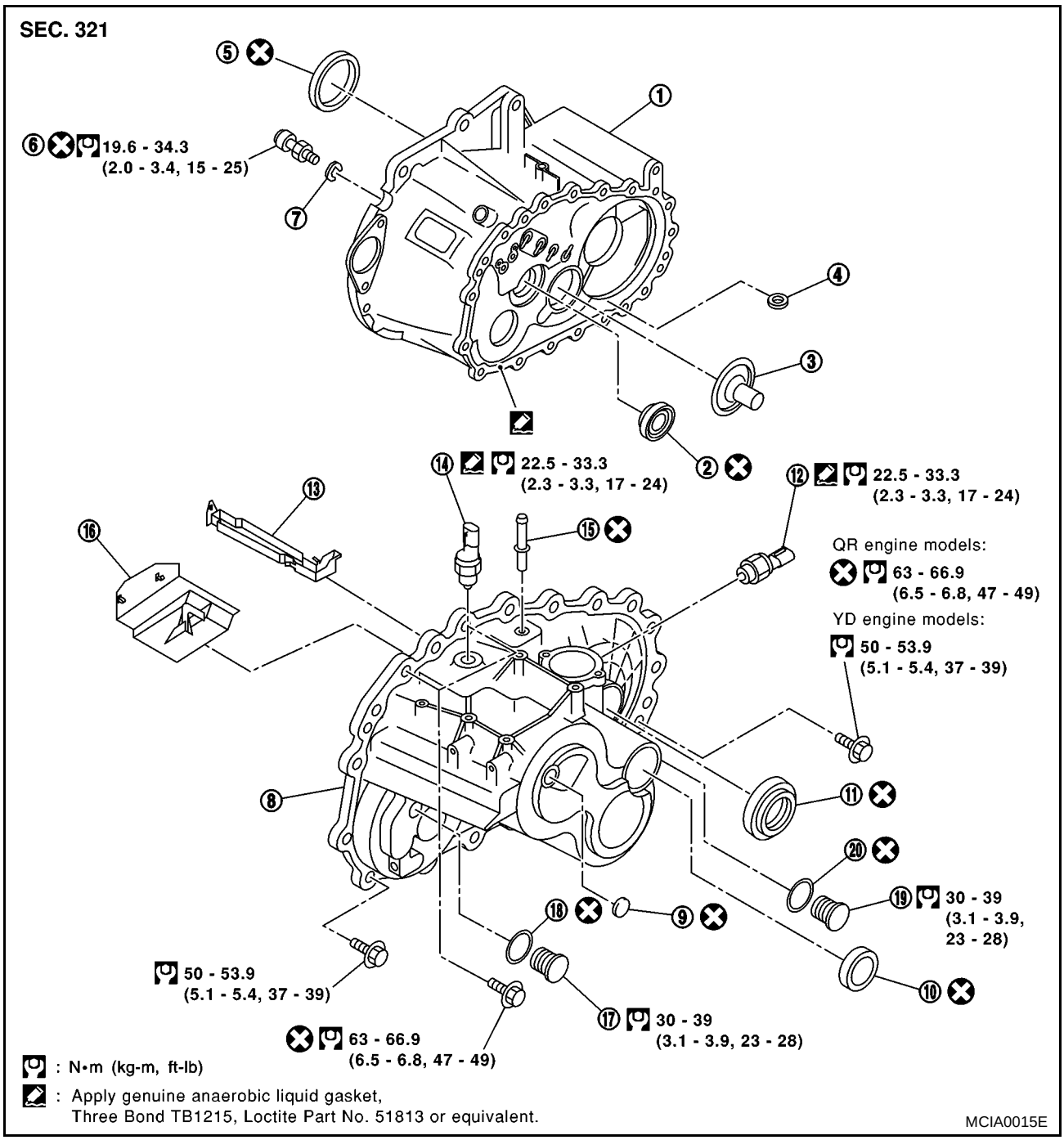
- After installation, check oil level, and look for leaks and loose mechanisms.



Component Parts

ECS006DA

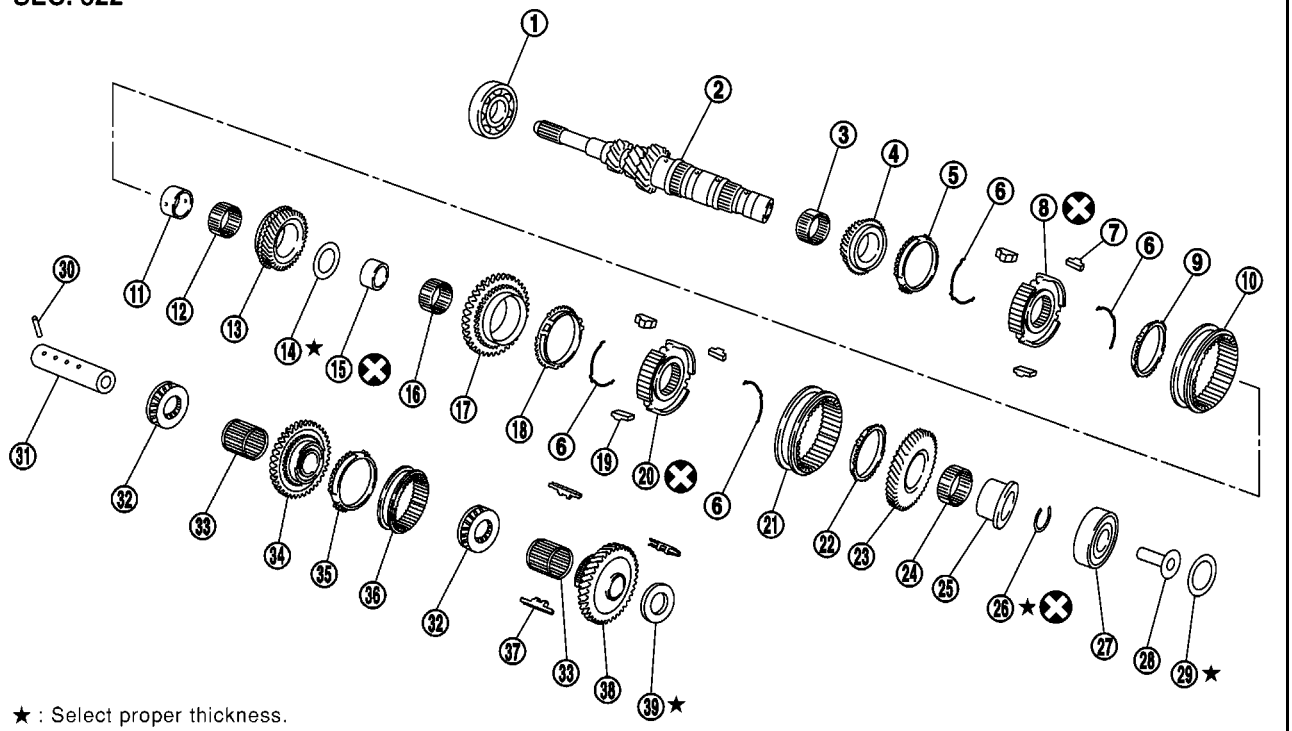
CASE AND HOUSING COMPONENTS



1. Clutch housing
2. Input shaft oil seal
3. Oil channel
4. Magnet
5. Differential oil seal
6. Ball pin
7. Washer
8. Transaxle case
9. Welch plug
10. Bore plug
11. Differential oil seal
12. Park/Neutral position switch
13. Oil gutter
14. Back-up lamp switch
15. Air breather tube
16. Baffle plate
17. Filler plug
18. Gasket
19. Drain plug
20. Gasket

GEAR COMPONENTS

SEC. 322



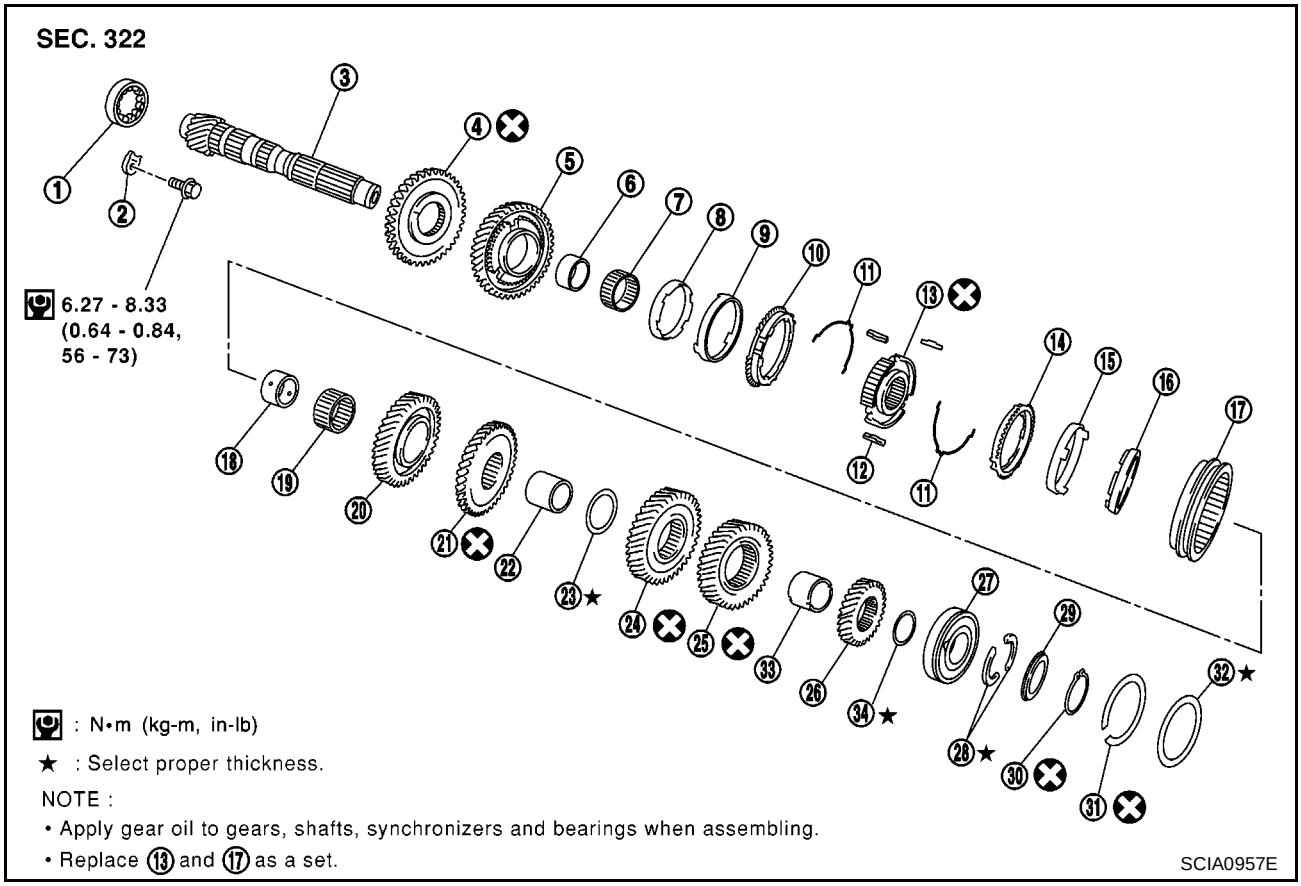
★ : Select proper thickness.

NOTE :

- Apply gear oil to gears, shafts, synchronizers and bearings when assembling.
- Replace (8) and (10), (20) and (21) as a set.

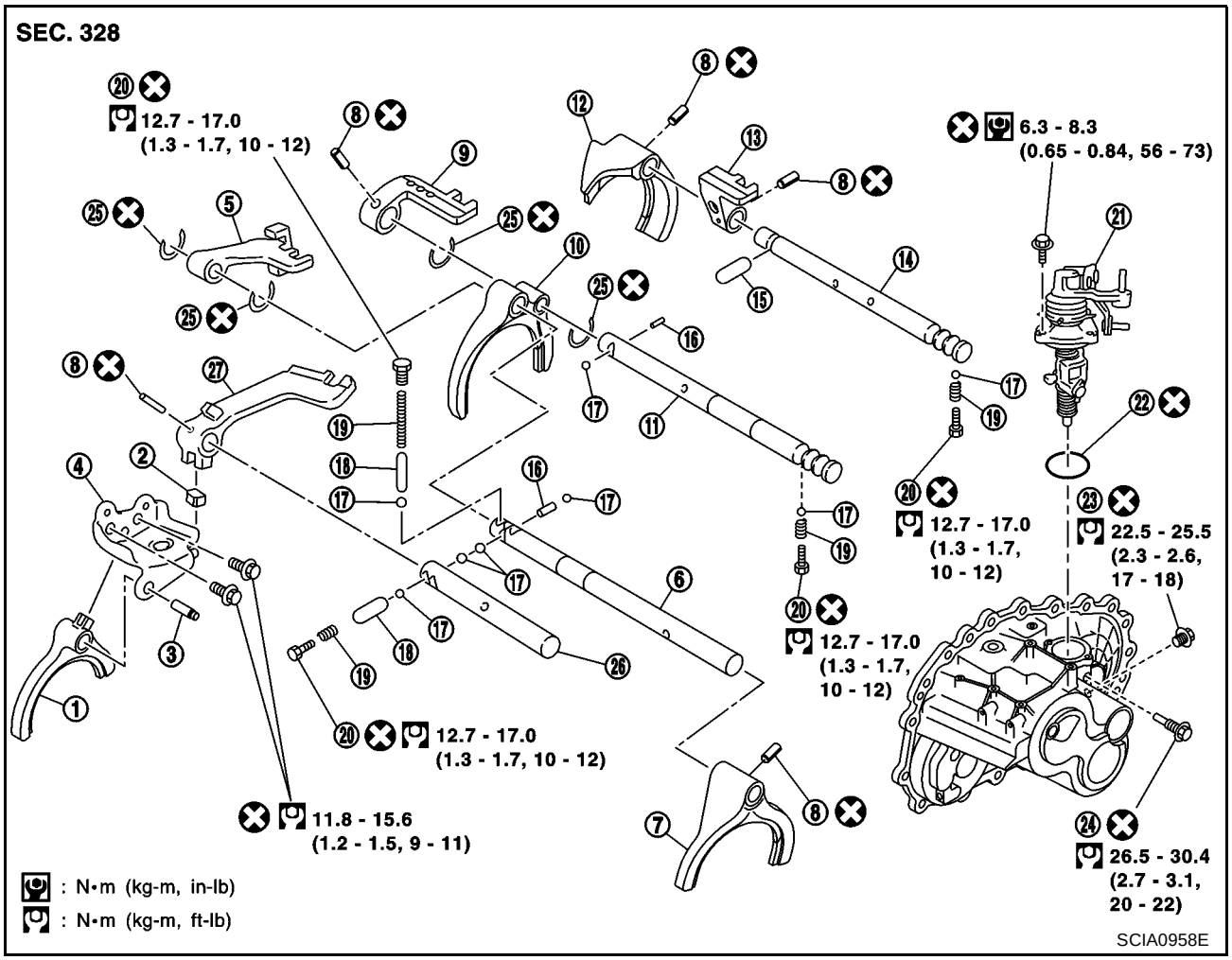
SCIA0956E

1. Input shaft front bearing
2. Input shaft
3. Needle bearing
4. 3rd input gear
5. 3rd baulk ring
6. Spread spring
7. 3rd & 4th shifting insert
8. 3rd & 4th synchronizer hub
9. 4th baulk ring
10. 3rd & 4th coupling sleeve
11. Bushing
12. Needle bearing
13. 4th input gear
14. Thrust washer
15. Bushing
16. Needle bearing
17. 5th input gear
18. 5th baulk ring
19. 5th & 6th shifting insert
20. 5th & 6th synchronizer hub
21. 5th & 6th coupling sleeve
22. 6th baulk ring
23. 6th input gear
24. Needle bearing
25. Bushing
26. Snap ring
27. Input shaft rear bearing
28. Oil channel
29. Input shaft rear bearing adjusting shim
30. Retaining pin
31. Reverse idler shaft
32. Thrust bearing
33. Needle bearing
34. Reverse idler gear (Front)
35. Reverse baulk ring
36. Reverse coupling sleeve
37. Insert spring
38. Reverse idler gear (Rear)
39. Reverse idler gear adjusting shim



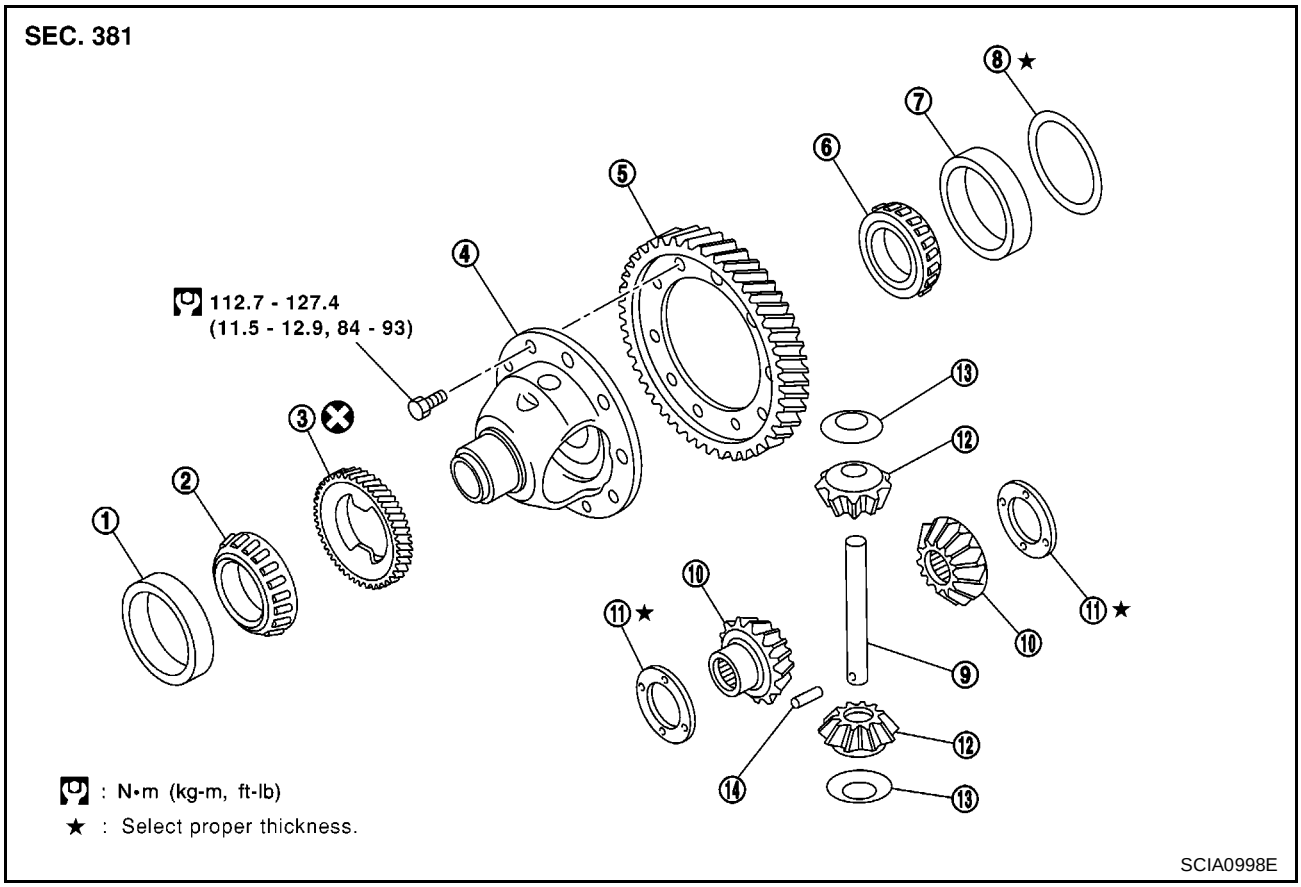
1. Mainshaft front bearing
2. Mainshaft bearing retainer
3. Mainshaft
4. Reverse main gear
5. 1st main gear
6. Bushing
7. Needle bearing
8. 1st inner baulk ring
9. 1st gear synchronizer cone
10. 1st outer baulk ring
11. Spread spring
12. 1st & 2nd shifting insert
13. 1st & 2nd synchronizer hub
14. 2nd outer baulk ring
15. 2nd gear synchronizer cone
16. 2nd inner baulk ring
17. 1st & 2nd coupling sleeve
18. Bushing
19. Needle bearing
20. 2nd main gear
21. 3rd main gear
22. 3rd & 4th mainshaft spacer
23. 4th main adjusting shim
24. 4th main gear
25. 5th main gear
26. 6th main gear
27. Mainshaft rear bearing
28. Mainshaft C ring
29. C ring holder
30. Snap ring
31. Snap ring
32. Mainshaft rear bearing adjusting shim
33. 5th & 6th mainshaft spacer
34. 6th main adjusting shim

SHIFT CONTROL COMPONENTS



1. Reverse shift fork
2. Shifter cap
3. Reverse fork rod
4. Reverse lever assembly
5. 5th & 6th bracket
6. 5th & 6th fork rod
7. 5th & 6th shift fork
8. Retaining pin
9. 3rd & 4th bracket
10. 3rd & 4th shift fork
11. 3rd & 4th fork rod
12. 1st & 2nd shift fork
13. 1st & 2nd bracket
14. 1st & 2nd fork rod
15. Shift check sleeve
16. Inter lock pin
17. Check ball
18. Shift check sleeve
19. Check spring
20. Check plug
21. Control assembly
22. O ring
23. Shift check
24. Stopper bolt
25. Stopper ring
26. Reverse bracket fork rod
27. Reverse bracket

FINAL DRIVE COMPONENTS



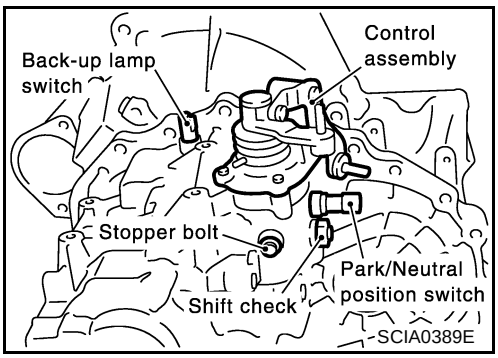
1. Differential side bearing outer race
2. Differential side bearing
3. Speedometer drive gear
4. Differential case
5. Final gear
6. Differential side bearing
7. Differential side bearing outer race
8. Differential side bearing adjusting shim
9. Pinion mate shaft
10. Side gear
11. Side gear thrust washer
12. Pinion mate gear
13. Pinion mate gear washer
14. Retaining pin

Disassembly and Assembly

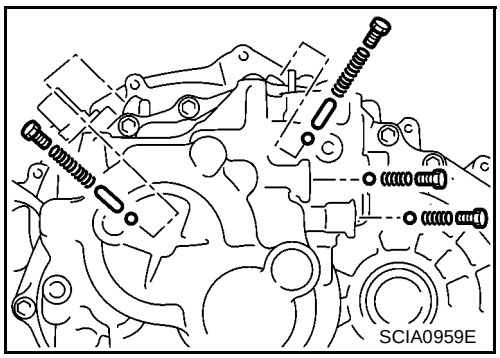
ECS006DB

DISASSEMBLY

1. Remove drain plug and filler plug.
2. Remove park/neutral position switch and back-up lamp switch.
3. After removing shift check and stopper bolt, remove control assembly.

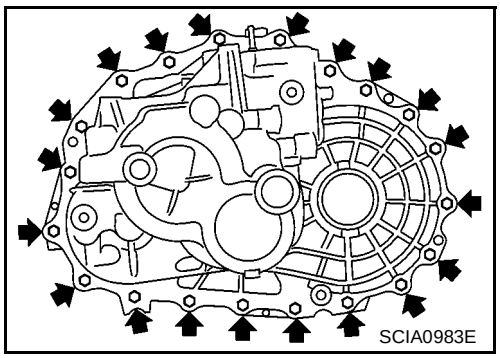


4. Remove check plugs (4 pieces), check springs (4 pieces), check balls (4 pieces) and shift check sleeve (2 pieces).

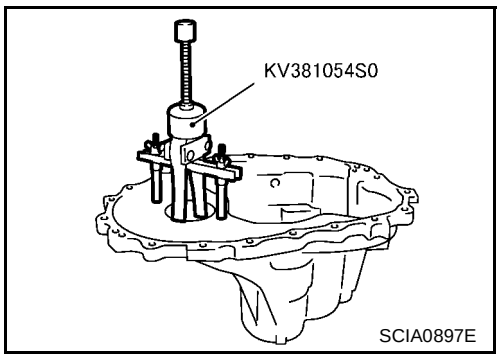

SCIA0959E

5. Remove transaxle case fixing bolts.
6. Remove bore plug.

   CAUTION:
   Be careful not to damage transaxle case.
7. While spreading the snap ring of mainshaft rear bearing located at bore plug hole, remove transaxle case.
8. Remove oil gutter, baffle plate.
9. Remove snap ring, mainshaft rear bearing adjusting shim and input shaft rear bearing adjusting shim from transaxle case.

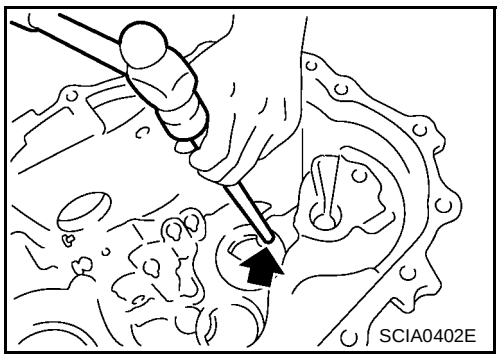

SCIA0983E

10. Remove differential side bearing outer race (transaxle case side) and then adjusting shim.

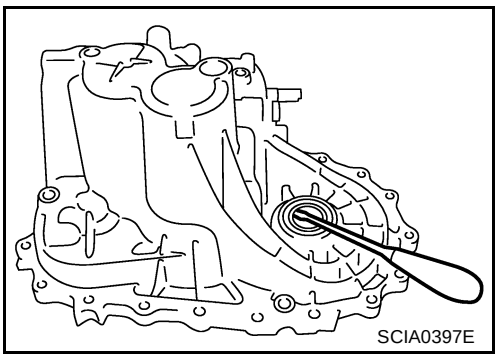


SCIA0897E

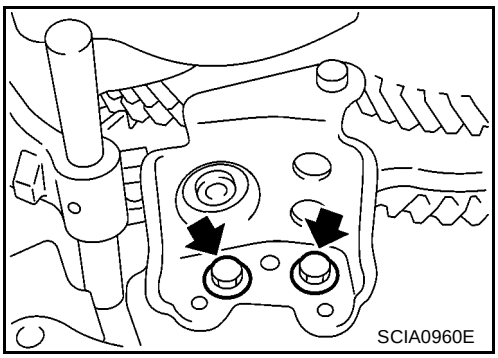
11. Remove welch plug.


SCIA0402E

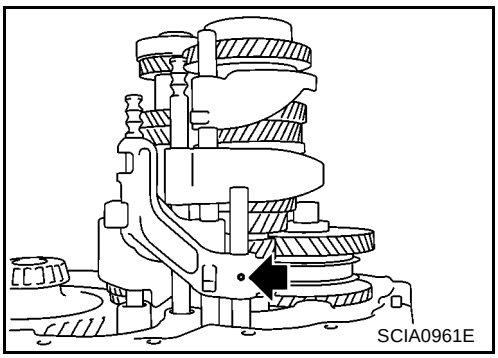
12. Remove differential oil seal (transaxle case side).
13. Remove magnet from clutch housing.


SCIA0397E

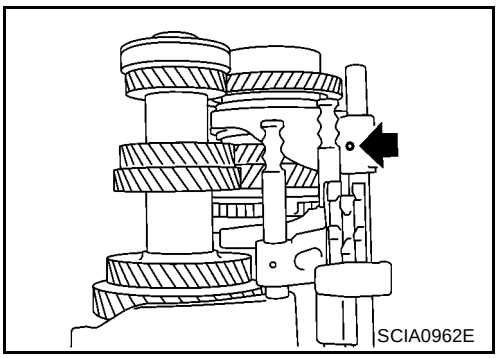
14. With shift lever in 5th position, remove bracket bolts from reverse lever assembly. Lift reverse lever assembly to remove.
    CAUTION:
    Be careful not to lose shifter cap.
15. Pull out reverse fork rod then remove reverse shift fork.


SCIA0960E

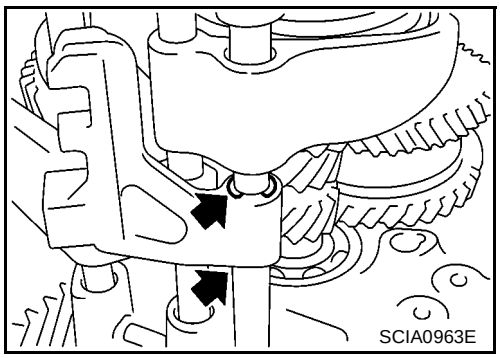
16. Remove retaining pin of reverse bracket.
17. Pull out reverse bracket and reverse bracket fork rod.
18. Remove check ball (2 pieces) and inter lock pin.


SCIA0961E

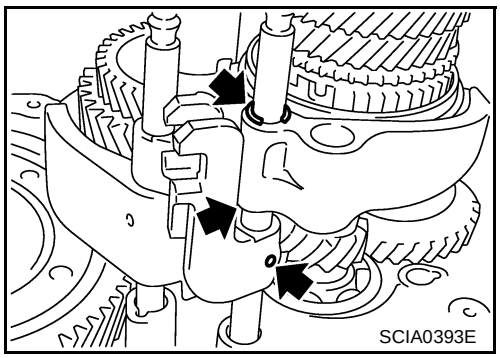
19. Shift 3rd & 4th fork rod to 3rd position. Remove retaining pin of 5th & 6th shift fork using pin punch.


SCIA0962E

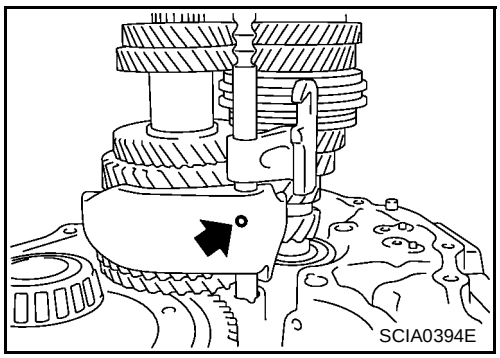
20. Remove stopper rings for 5th & 6th bracket.
21. Pull out 5th & 6th fork rod and remove 5th & 6th shift fork and 5th & 6th bracket.
22. Remove check balls (2 pieces) and inter lock pin.


SCIA0963E

23. Remove retaining pin of 3rd & 4th bracket using pin punch.
24. Remove stopper rings for 3rd & 4th shift fork.
25. Pull out 3rd & 4th fork rod and remove 3rd & 4th shift fork and bracket.
26. Remove shift check sleeve from clutch housing.


SCIA0393E

27. Remove retaining pin of 1st & 2nd shift fork using pin punch.
28. Pull out 1st & 2nd fork rod with bracket.
29. Remove 1st & 2nd shift fork.
30. Remove retaining pin of 1st & 2nd bracket using pin punch and separate fork rod and bracket.

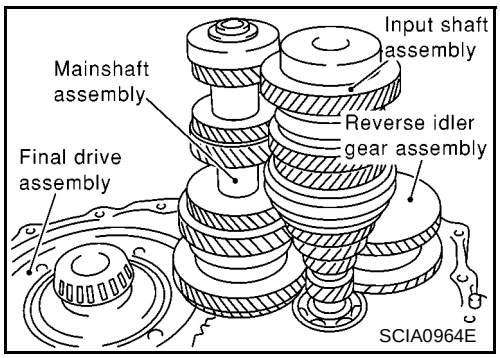

SCIA0394E

31. Remove gear components from clutch housing in the following procedure.

a. While tapping input shaft with plastic hammer, remove input shaft assembly, mainshaft assembly and reverse idler gear assembly as a set.

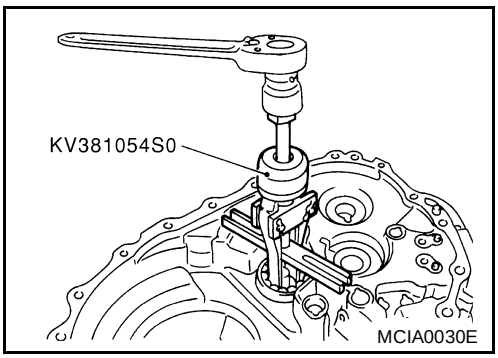
CAUTION:
Always withdraw mainshaft straight out. Failure to do so can damage resin oil channel on clutch housing side.

b. Remove final drive assembly.

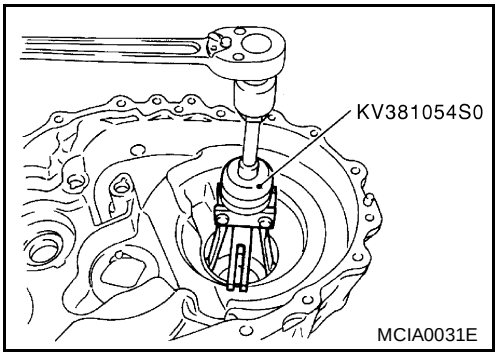


SCIA0964E

32. Remove mainshaft bearing retainer and then mainshaft front bearing.
33. Remove oil channel on mainshaft side.
34. Remove differential oil seal (clutch housing side).

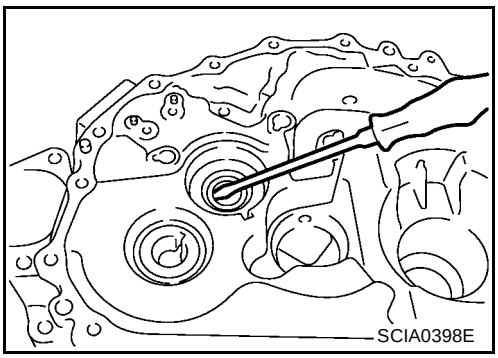


35. Remove differential side bearing outer race (clutch housing side).



36. Remove input shaft oil seal.

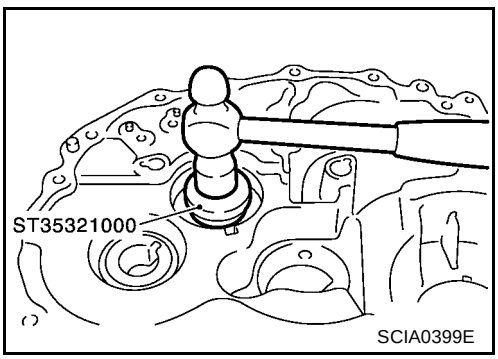
CAUTION:
Be careful not to damage clutch housing.



ASSEMBLY

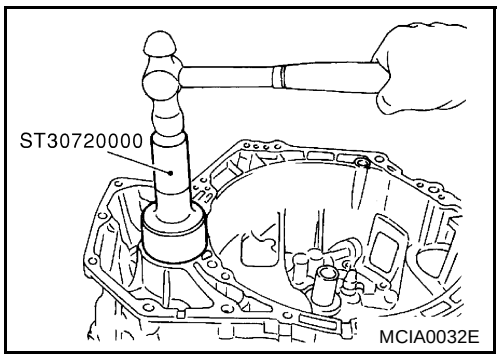
1. Using a drift, install input shaft oil seal from clutch housing end of side to the depth of 1.8 to 2.8 mm (0.071 to 0.110 in).

CAUTION:
Do not reuse oil seal.



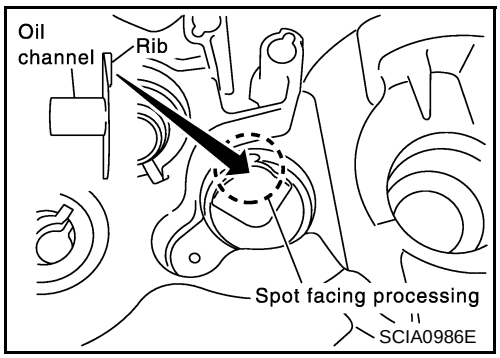
2. Using a drift, install differential oil seal until the face is flush with clutch housing.

CAUTION:
Do not reuse oil seal.



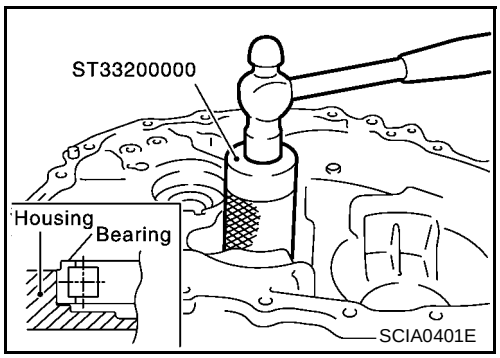
3. Install oil channel on mainshaft side.

CAUTION:
Be careful with orientation of installation.



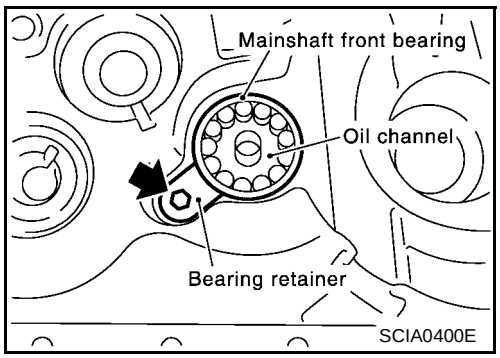
4. Using a drift, install mainshaft front bearing.

CAUTION:
Be careful with orientation of installation.

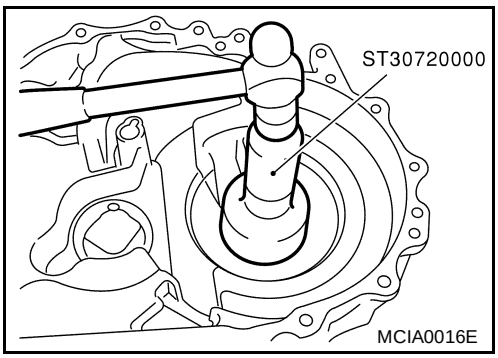


5. Install bearing retainer.

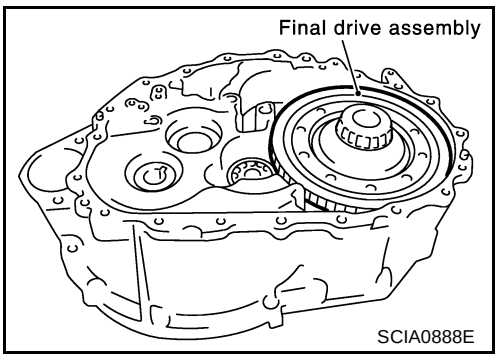
CAUTION:
Install with punched surface facing up.



6. Install differential side bearing outer race.

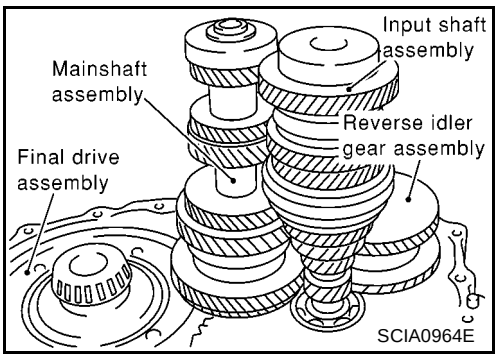


7. Install final drive assembly into clutch housing.



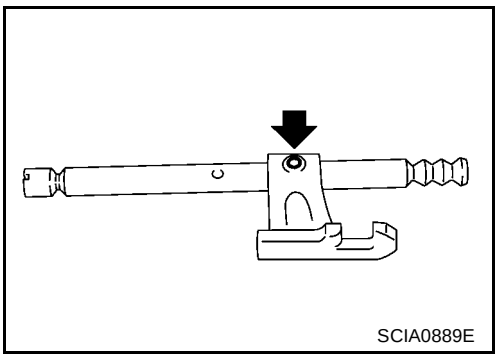
8. Install input shaft assembly, mainshaft assembly, and reverse idler gear assembly into clutch housing.

CAUTION:
Be sure not to damage input shaft oil seal.



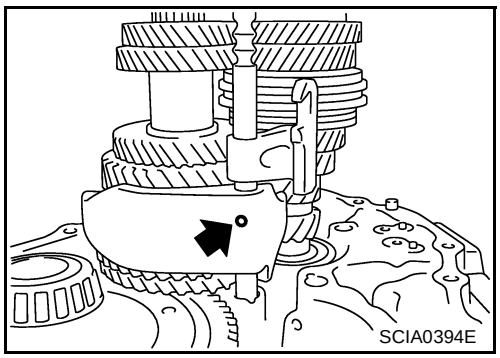
9. Install 1st-2nd fork rod bracket onto 1st-2nd fork rod, and then install retaining pin.

CAUTION:
Do not reuse retaining pin.



10. Install 1st-2nd fork rod and 1st-2nd shift fork, and then install retaining pin.

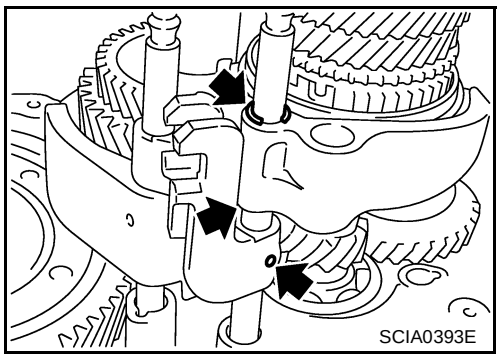
    CAUTION:
    Do not reuse retaining pin.
11. Install shift check sleeve.


SCIA0394E

12. Install 3rd-4th bracket, 3rd-4th shift fork, and 3rd-4th fork rod with inter lock pin.
13. Install stopper ring onto 3rd-4th shift fork.

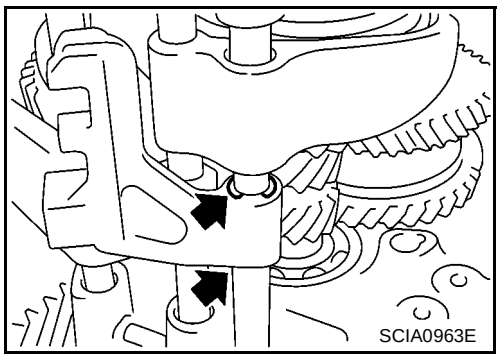
    CAUTION:
    Do not reuse stopper ring.
14. Install retaining pin onto 3rd-4th bracket.

    CAUTION:
    Do not reuse retaining pin.
15. Install 2 check balls.


SCIA0393E

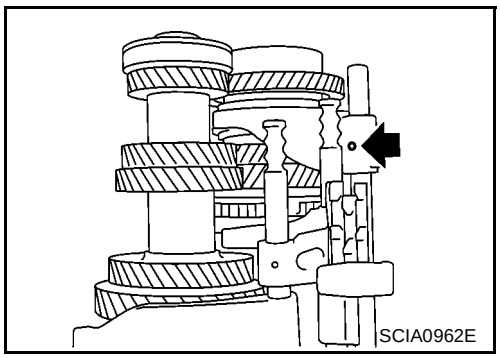
16. Install 5th-6th bracket, 5th-6th shift fork, and 5th-6th fork rod with interlock pin.
17. Install stopper ring onto 5th-6th bracket.

    CAUTION:
    Do not reuse stopper ring.


SCIA0963E

18. Install retaining pin onto 5th-6th shift fork.

    CAUTION:
    Do not reuse retaining pin.
19. Install 2 check balls.
20. Install reverse bracket fork rod and reverse lever bracket.


SCIA0962E

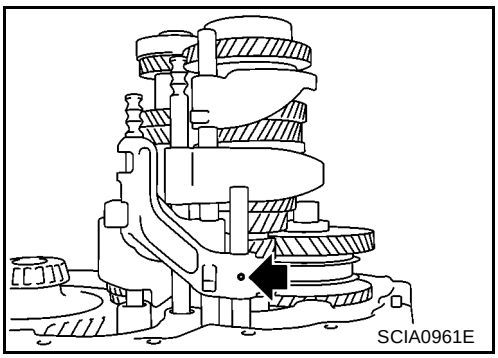
21. Install retaining pin onto reverse bracket.

CAUTION:
Do not reuse retaining pin.

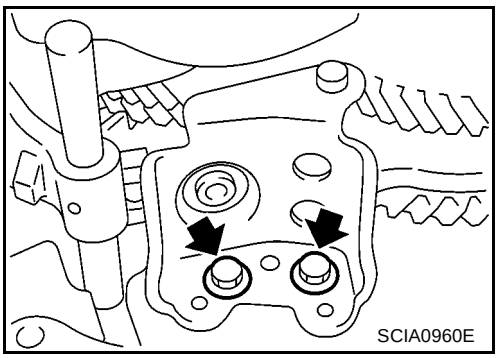
22. Install reverse shift fork and reverse fork rod.
23. Install reverse lever assembly following procedures below.

a. Install shifter cap onto reverse lever assembly cam, and then install them onto reverse shift fork.

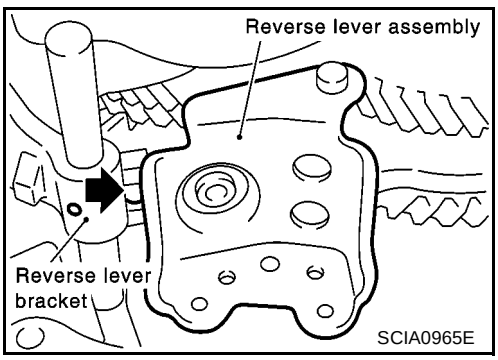
CAUTION:
Do not drop shifter cap.



b. While lifting reverse shift fork, align cam with reverse bracket.

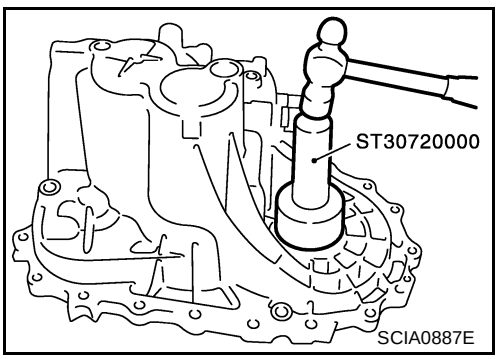


c. Tighten mounting bolts to specified torque, and then install reverse lever assembly.
24. Install the magnet onto clutch housing.



25. Using a drift, install differential oil seal until it is flush with end face of transaxle case.

CAUTION:
Do not reuse oil seal.



26. Install selected input shaft adjusting shim onto input shaft.
    - For selection of adjusting shims: Refer to MT-146, "INPUTSHAFT END PLAY" .
27. Install baffle plate and oil gutter.
28. Install transaxle case following procedures below.

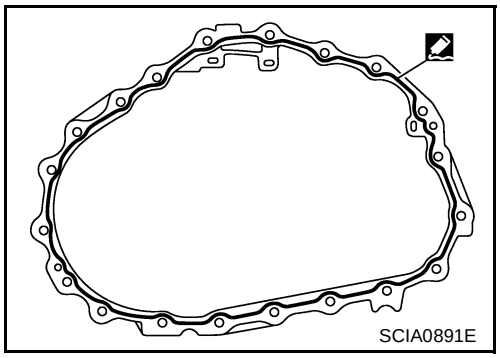
a. Install selected mainshaft rear bearing adjusting shim into transaxle case.
    - For selection of adjusting shims: Refer to MT-148, "MAINSHAFT END PLAY" .

b. Temporarily install snap ring of mainshaft rear bearing into transaxle case.

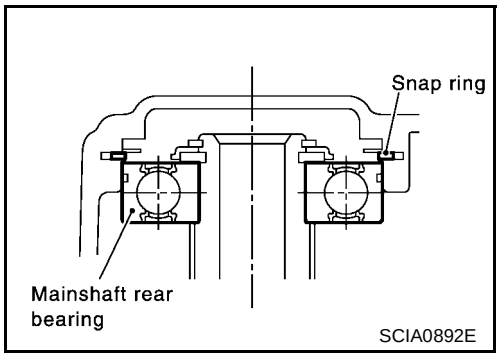
CAUTION:
Do not reuse the snap ring.

c. Apply recommended sealant to mating surfaces of transaxle case and clutch housing.

CAUTION:
Remove old sealant adhering to mounting surfaces. Also remove any moisture, oil, or foreign material adhering to application and mounting surfaces.


SCIA0891E

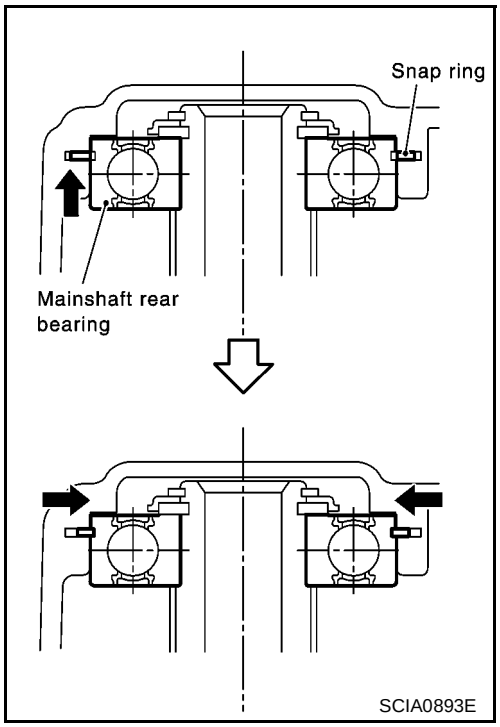
d. With snap ring of mainshaft rear bearing temporarily installed, place transaxle case over clutch housing.



SCIA0892E

e. Through bore plug mounting hole, with snap ring stretched, and lift up mainshaft assembly from the control assembly mounting hole.

f. Securely install snap ring onto mainshaft rear bearing.



SCIA0893E

g. Tighten mounting bolts.

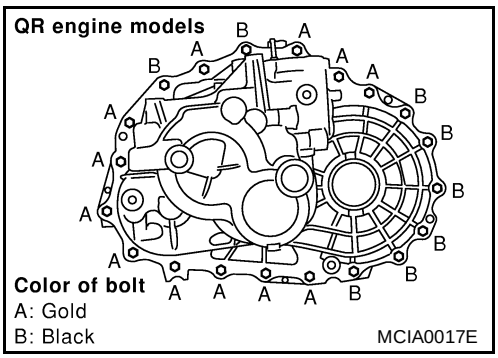
Bolt A:

: 50.0 - 53.9 N·m (5.1 - 5.4 kg-m, 37 - 39 ft-lb)

Bolt B:

: 63.0 - 66.9 N·m (6.5 - 6.8 kg-m, 47 - 49 ft-lb)

CAUTION:
Always replace bolts B as they are self-sealing bolts.

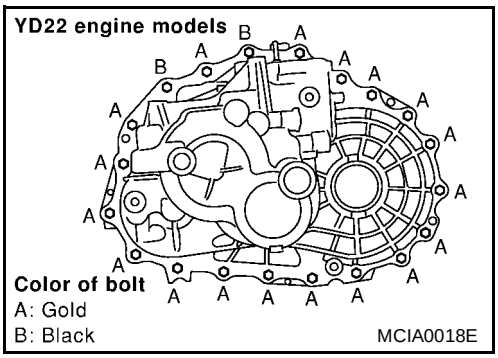


h. Install control assembly.

CAUTION:
Do not reuse the O-ring.

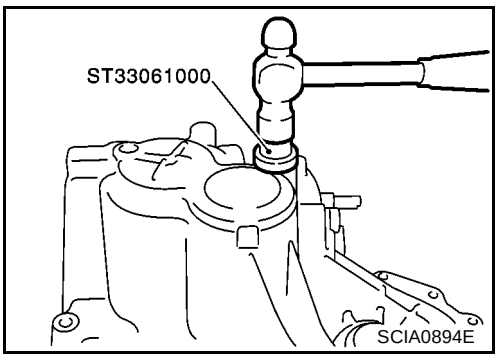
i. Install shift check and stopper bolt.

CAUTION:
Do not reuse shift check and stopper bolt.



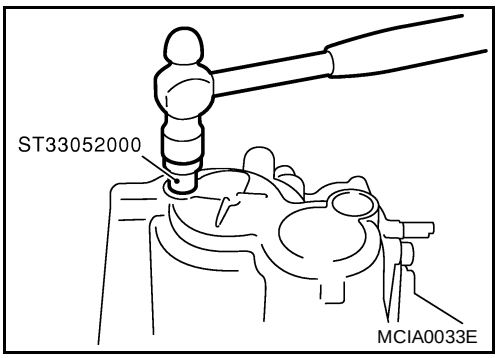
29. Using a drift, install bore plug.

CAUTION:
Do not reuse bore plug.



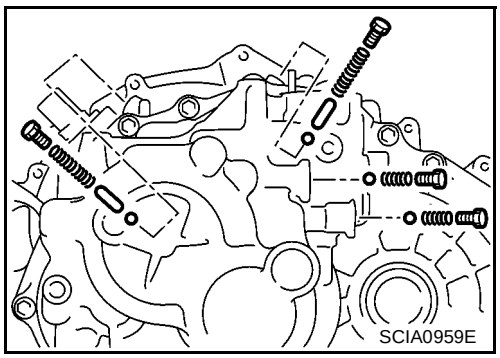
30. Using a drift, install welch plug.

CAUTION:
Do not reuse welch plug.



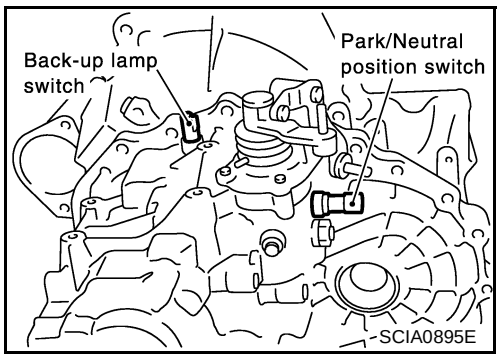
31. Install 2 shift check sleeves, 4 check balls, 4 check springs, and 4 check ball plugs.

CAUTION:
Do not reuse check ball plug.



32. Apply recommended sealant to threads of neutral switch and reverse lamp switch. Then install them into transaxle case.
33. Install gaskets onto drain plug and filler plug, and then install them into transaxle case.

CAUTION:
- **Do not reuse gasket.**
- **After oil is filled, tighten plug to specified torque.**

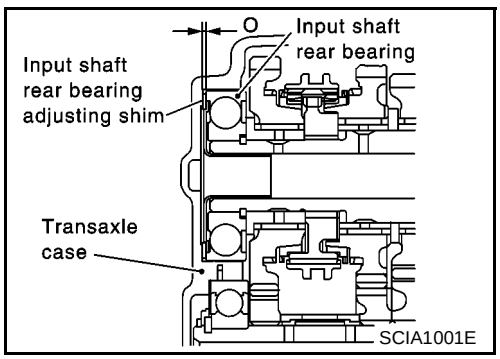


Adjustment

ECS006DC

INPUTSHAFT END PLAY

- When adjusting input shaft end play, select adjusting shim for input shaft bearing. To select adjusting shim, measure clearance between transaxle case and input shaft rear bearing.
- Calculate dimension “O” (thickness of adjusting shim) using the following procedure to satisfy specification of end play for input shaft rear bearing.



End play : 0 - 0.06 mm (0 - 0.0024 in)

Dimension “O” = (O_1 – O_2) + End play

O : Thickness of adjusting shim

O_1 : Distance between transaxle case end face and mounting face of adjusting shim

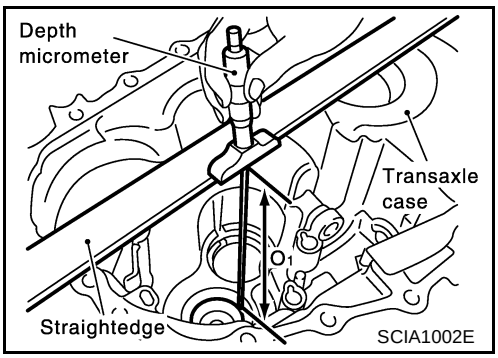
O_2 : Distance between clutch housing case end face and end face of input shaft rear bearing

Adjusting Shim

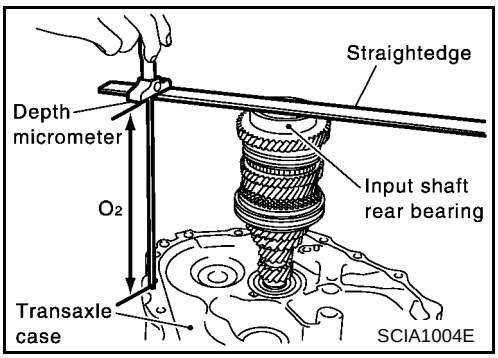
Shim thickness	Part number	Shim thickness	Part number	Shim thickness	Part number
0.40 mm (0.0157 in)	32225 8H500	0.88 mm (0.0346 in)	32225 8H512	1.36 mm (0.0535 in)	32225 8H524
0.44 mm (0.0173 in)	32225 8H501	0.92 mm (0.0362 in)	32225 8H513	1.40 mm (0.0551 in)	32225 8H560
0.48 mm (0.0189 in)	32225 8H502	0.96 mm (0.0378 in)	32225 8H514	1.44 mm (0.0567 in)	32225 8H561
0.52 mm (0.0205 in)	32225 8H503	1.00 mm (0.0394 in)	32225 8H515	1.48 mm (0.0583 in)	32225 8H562
0.56 mm (0.0220 in)	32225 8H504	1.04 mm (0.0409 in)	32225 8H516	1.52 mm (0.0598 in)	32225 8H563
0.60 mm (0.0236 in)	32225 8H505	1.08 mm (0.0425 in)	32225 8H517	1.56 mm (0.0614 in)	32225 8H564
0.64 mm (0.0252 in)	32225 8H506	1.12 mm (0.0441 in)	32225 8H518	1.60 mm (0.0630 in)	32225 8H565
0.68 mm (0.0268 in)	32225 8H507	1.16 mm (0.0457 in)	32225 8H519	1.64 mm (0.0646 in)	32225 8H566
0.72 mm (0.0283 in)	32225 8H508	1.20 mm (0.0472 in)	32225 8H520		
0.76 mm (0.0299 in)	32225 8H509	1.24 mm (0.0488 in)	32225 8H521		
0.80 mm (0.0315 in)	32225 8H510	1.28 mm (0.0504 in)	32225 8H522		
0.84 mm (0.0331 in)	32225 8H511	1.32 mm (0.0520 in)	32225 8H523		

CAUTION:
Only 1 adjusting shim can be selected.

1. Using depth micrometer and straight edge, measure dimension "O_1 " between transaxle case end face and mounting face of adjusting shim.



2. Using depth micrometer and straight edge as shown in the figure, measure dimension "O_2 " between clutch housing case end face and end face of input shaft rear bearing.
3. Install selected input shaft rear bearing adjusting shim onto input shaft.



DIFFERENTIAL SIDE BEARING PRELOAD

- When adjusting differential side bearing preload, select adjusting shim for differential side bearing. To select adjusting shim, measure clearance "L" between transaxle case and differential side bearing outer race.
- Calculate dimension "L" (thickness of adjusting shim) using the following procedure to satisfy specification of preload for differential side bearing.

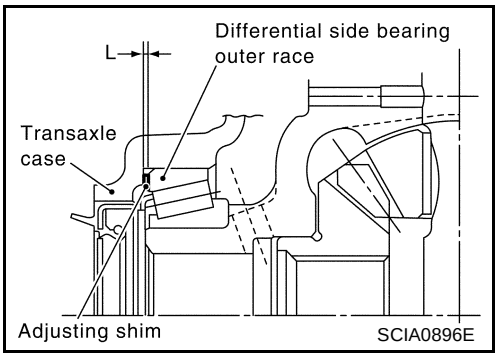
Preload : 0.15 - 0.21 mm (0.0059 - 0.0083 in)

Dimension "L" = (L_1 – L_2) + Preload

L : Thickness of adjusting shim

L_1 : Distance between clutch housing case end face and mounting face of adjusting shim

L_2 : Distance between differential side bearing and transaxle case



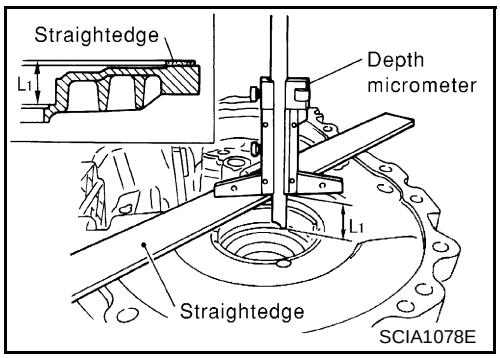
Adjusting Shim

Shim thickness	Part number
0.48 mm (0.0189 in)	31438 80X00
0.52 mm (0.0205 in)	31438 80X01
0.56 mm (0.0220 in)	31438 80X02
0.60 mm (0.0236 in)	31438 80X03
0.64 mm (0.0252 in)	31438 80X04
0.68 mm (0.0268 in)	31438 80X05
0.72 mm (0.0283 in)	31438 80X06
0.76 mm (0.0299 in)	31438 80X07
0.80 mm (0.0315 in)	31438 80X08
0.84 mm (0.0331 in)	31438 80X09
0.88 mm (0.0346 in)	31438 80X10
0.92 mm (0.0362 in)	31438 80X11

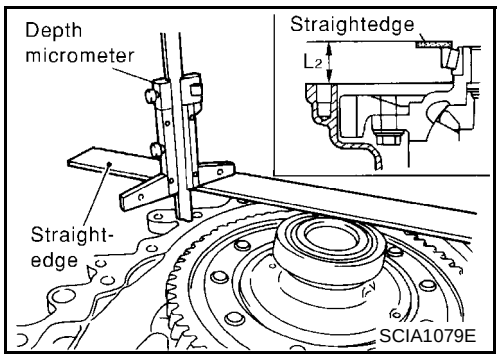
CAUTION:

Up to 2 adjusting shims can be selected.

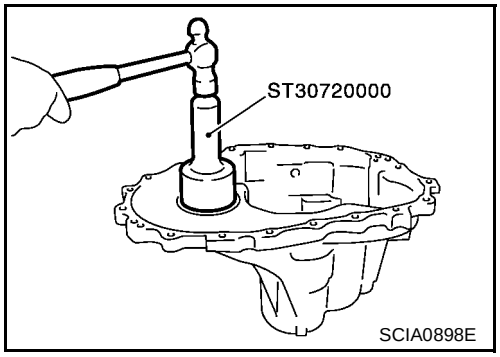
1. Using depth micrometer and straightedge, measure dimension "L_1 " between clutch housing case end face and mounting face of adjusting shim.
2. Install outer race onto differential side bearing on final gear side. Holding lightly the outer race horizontally by hand, rotate final gear five times or more (for smooth movement of bearing roller).



3. Using depth micrometer and straightedge as shown in the figure, measure dimension "L_2 " between differential side bearing outer race and transaxle case end face.



4. Install selected adjusting shim and then differential side bearing outer race.



MAINSHAFT END PLAY

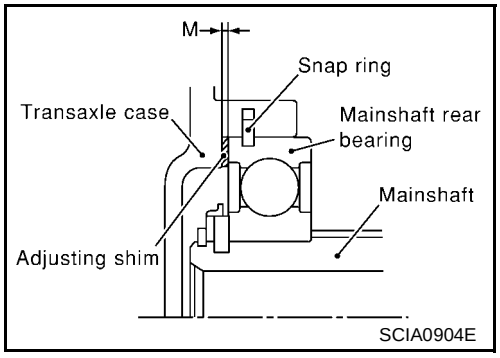
- When adjusting mainshaft end play, select adjusting shim for mainshaft rear bearing. To select adjusting shim, measure clearance "M" between transaxle case and mainshaft rear bearing.
- Calculate dimension "P" (thickness of adjusting shim) using the following procedure to satisfy specification of end play for mainshaft rear bearing.

End play : 0 - 0.06 mm (0 - 0.0024 in)

Dimension "P" = "M" + End play

P : Thickness of adjusting shim

M : Distance between mainshaft rear bearing and transaxle case

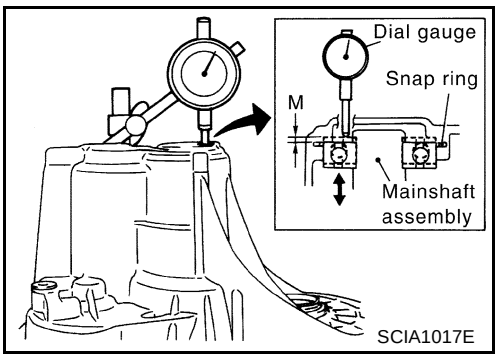


Adjusting Shim

Shim thickness	Part number
0.44 mm (0.0173 in)	32238 8H510
0.48 mm (0.0189 in)	32238 8H511
0.52 mm (0.0205 in)	32238 8H512
0.56 mm (0.0220 in)	32238 8H513
0.60 mm (0.0236 in)	32238 8H514
0.64 mm (0.0252 in)	32238 8H515
0.68 mm (0.0268 in)	32238 8H516
0.72 mm (0.0283 in)	32238 8H517
0.76 mm (0.0299 in)	32238 8H518
0.80 mm (0.0315 in)	32238 8H519
0.84 mm (0.0331 in)	32238 8H520
0.88 mm (0.0346 in)	32238 8H521
0.92 mm (0.0362 in)	32238 8H522
0.96 mm (0.0378 in)	32238 8H523
1.00 mm (0.0394 in)	32238 8H524
1.04 mm (0.0409 in)	32238 8H560
1.08 mm (0.0425 in)	32238 8H561

CAUTION:
Only 1 adjusting shim can be selected.

1. Install mainshaft assembly to clutch housing.
2. Install snap ring to transaxle case.
3. Install transaxle case to clutch housing, and temporarily assemble them with fixing bolts. Install temporarily snap ring to mainshaft rear bearing.
4. Install dial gauge to snap ring access hole, and expand snap ring. Lift mainshaft assembly through control assembly installation hole, and push it against transaxle case. This state shall be defined as base. Moving distance of mainshaft assembly, with snap ring fit on main bearing, becomes “M”.



REVERSE IDLER GEAR END PLAY

- When adjusting reverse idler gear end play, select adjusting shim for reverse idler gear. To select adjusting shim, measure clearance between transaxle case and reverse idler gear.
- Calculate dimension “Q” (thickness of adjusting shim) using the following procedure to satisfy specification of end play for reverse idler gear.

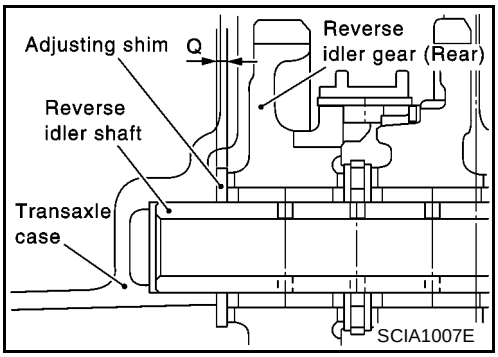
End play : 0.04 - 0.14 mm (0.0016 - 0.0055 in)

Dimension “Q” = (Q_1 – Q_2) + End play

Q : Thickness of adjusting shim

Q_1 : Distance between transaxle case end face and mounting face of adjusting shim

Q_2 : Distance between clutch housing case end face and end face of reverse idler gear



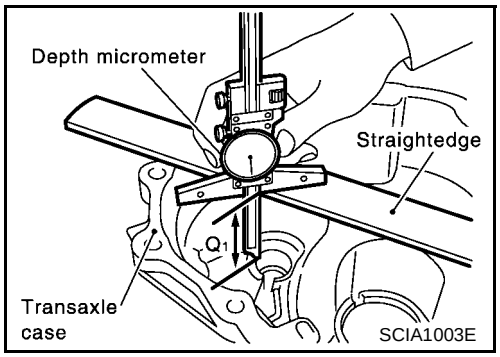
Adjusting Shim

Shim thickness	Part number
1.76 mm (0.0693 in)	32237 8H500
1.84 mm (0.0724 in)	32237 8H501
1.92 mm (0.0756 in)	32237 8H502
2.00 mm (0.0787 in)	32237 8H503
2.08 mm (0.0819 in)	32237 8H504
2.16 mm (0.0850 in)	32237 8H505
2.24 mm (0.0882 in)	32237 8H506
2.32 mm (0.0913 in)	32237 8H507
2.40 mm (0.0945 in)	32237 8H508
2.48 mm (0.0976 in)	32237 8H509
2.56 mm (0.1008 in)	32237 8H510
2.64 mm (0.1039 in)	32237 8H511

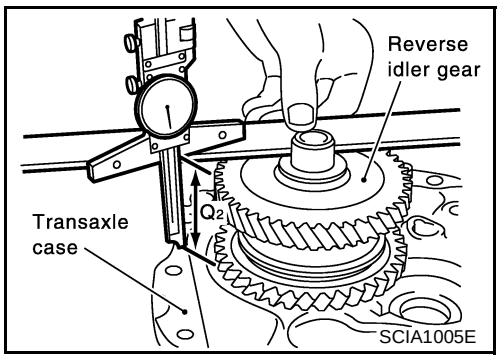
CAUTION:

Only 1 adjusting shim can be selected.

1. Using depth micrometer and straight edge, measure dimension "Q_1 " between transaxle case end face and mounting face of adjusting shim.



2. Using depth micrometer and straight edge as shown in the figure, measure dimension "Q_2 " between clutch housing case end face and end face of reverse idler gear.
3. Install selected reverse idler gear adjusting shim onto reverse idler gear assembly.



INPUT SHAFT AND GEARS

PFP:32200

Assembly and Disassembly

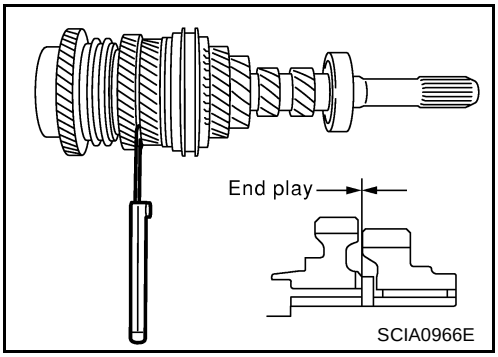
ECS006DD

DISASSEMBLY

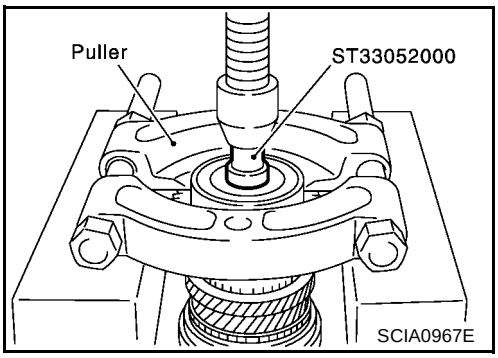
1. Before disassembling, measure end play for 3rd, 4th, 5th and 6th input gears.

End play standard value

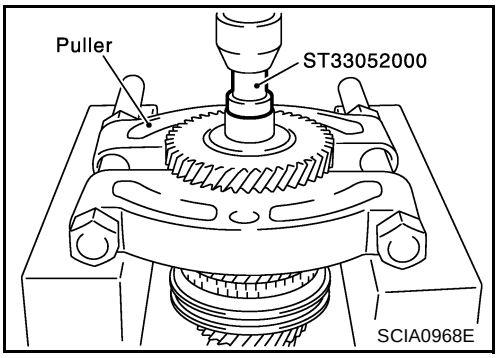
3rd gear : 0.18 - 0.31 mm (0.0071 - 0.0122 in)
4th gear : 0.20 - 0.30 mm (0.0079 - 0.0118 in)
5th gear : 0.06 - 0.16 mm (0.0024 - 0.0063 in)
6th gear : 0.06 - 0.16 mm (0.0024 - 0.0063 in)



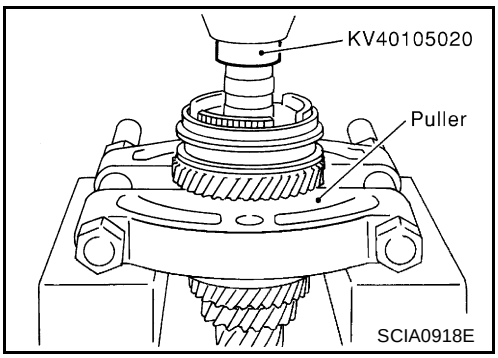
2. Remove oil channel.
3. Remove input shaft rear bearing.
4. Remove the snap ring.



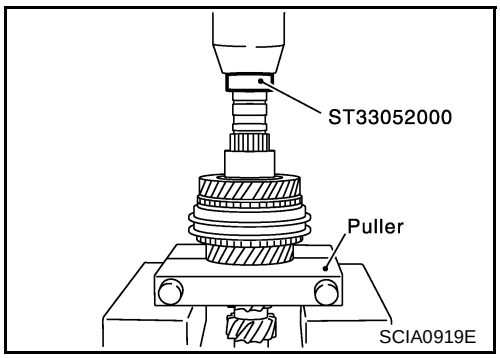
5. Remove 6th input gear, 6th bushing and 6th needle bearing.
6. Remove 6th baulk ring, 5th-6th coupling sleeve and shifting insert.



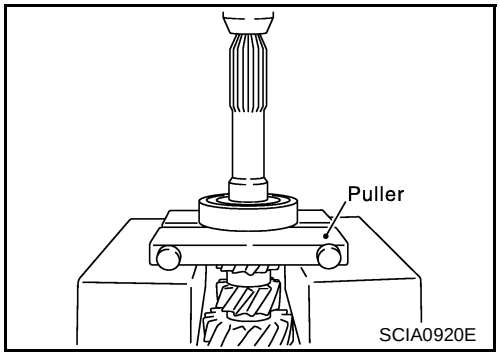
7. Remove 5th input gear and 5th synchronizer hub assembly simultaneously.
8. Remove 5th needle bearing.



9. Remove 5th bushing, thrust washer, 4th input gear, 4th needle bearing, 4th bushing, 4th baulk ring, 3rd-4th synchronizer hub assembly, 3rd baulk ring and 3rd input gear simultaneously.
10. Remove 3rd needle bearing.



11. Remove input shaft front bearing.

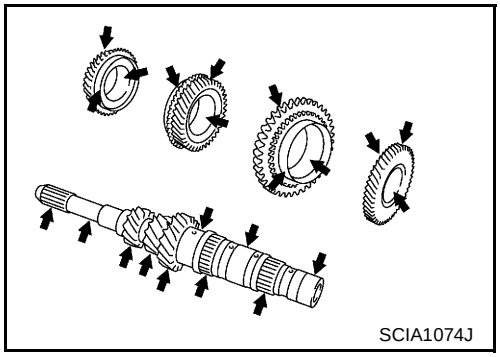


INSPECTION AFTER DISASSEMBLY

Input Shaft and Gear

Check items below. If necessary, replace them with new ones.

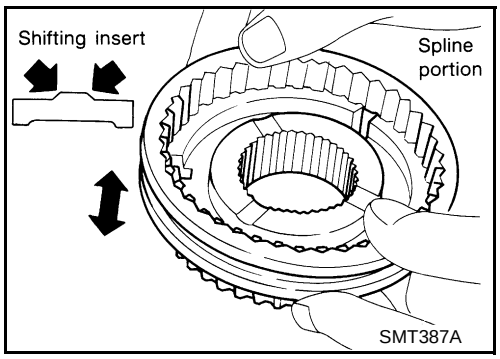
- Damage, peeling, dent, uneven wear, bending, etc. of shaft
- Excessive wear, damage, peeling, etc. of gears



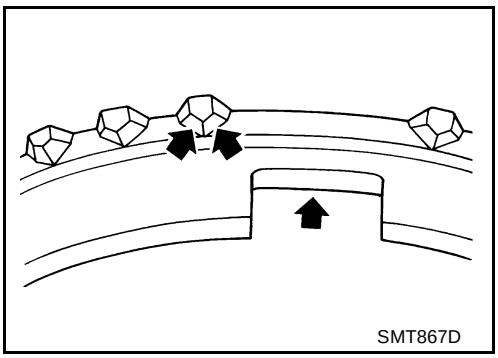
Synchronizer

Check items below. If necessary, replace them with new ones.

- Damage and excessive wear of contact surfaces of coupling sleeve, synchronizer hub, and shifting insert
- Coupling sleeve and synchronizer hub must move smoothly.



- If any crack, damage, or excessive wear is found on cam face of baulk ring or working face of insert, replace it.


SMT867D

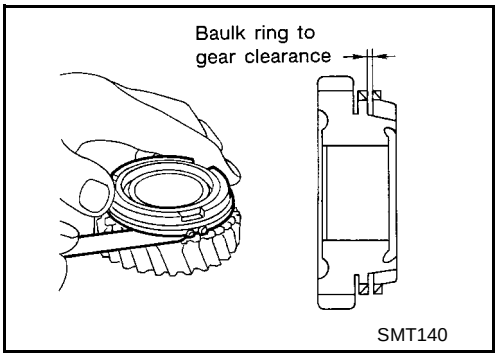
Baulk ring clearance

- Press baulk ring against cone, and measure clearance between baulk ring and cone. If measurement is below limit, replace it with a new one.

Clearance

Standard

3rd and 4th	**: 0.9 - 1.45 mm (0.0354 - 0.0571 in)**
5th and 6th	**: 0.95 - 1.4 mm (0.0374 - 0.0551 in)**
Limit value	**: 0.7 mm (0.0276 in)**

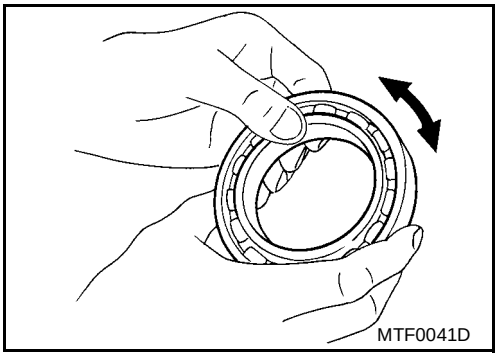


SMT140

Bearing

Check items below. If necessary, replace them with new ones.

- Damage and rough rotation of bearing

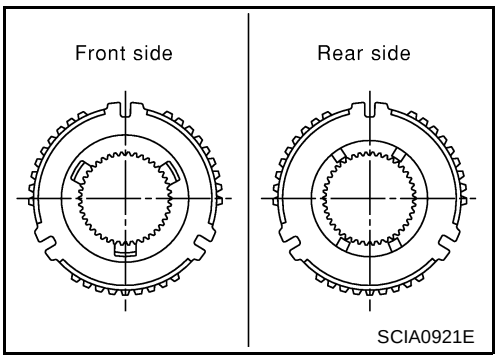

MTF0041D

ASSEMBLY

1. Install 3rd needle bearing.
2. Install 3rd input gear and 3rd baulk ring.
3. Install spread spring, shifting insert and 3rd-4th synchronizer hub onto 3rd-4th coupling sleeve.

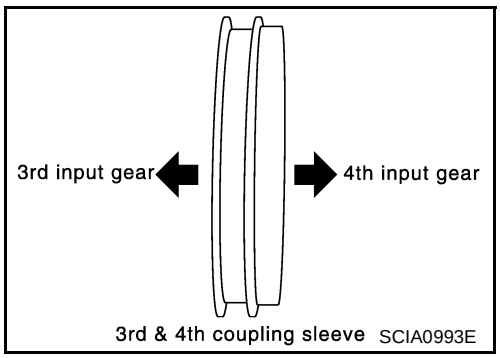
CAUTION:

- **Be careful with orientation of synchronizer hub.**
- **Do not reuse 3rd-4th synchronizer hub.**

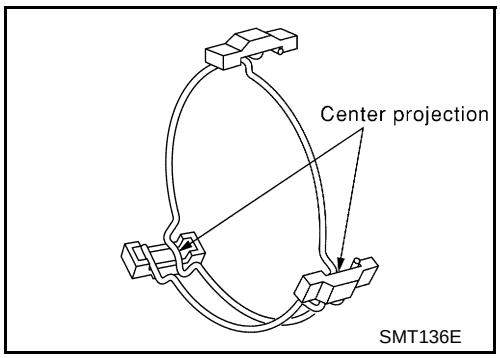


SCIA0921E

- **Be careful with orientation of coupling sleeve.**

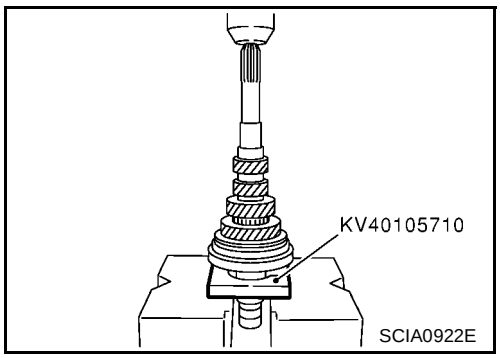


- **Be sure not to hook center projection of 2 spread springs on same shifting insert.**

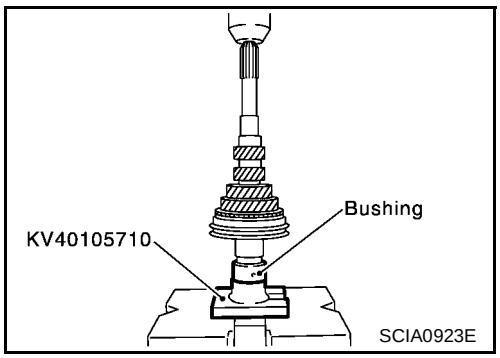


4. Install 3rd-4th synchronizer hub assembly.

CAUTION:
Align grooves of shifting insert and 3rd baulk ring.

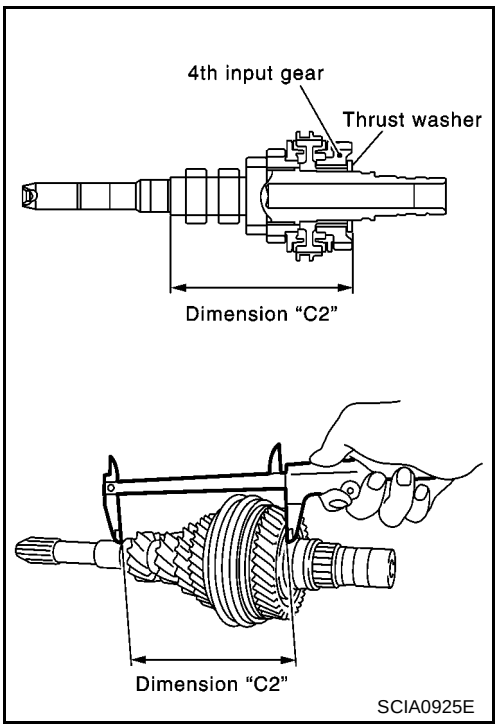


5. Install 4th bushing.
6. Install 4th baulk ring.
7. Install 4th input gear and 4th needle bearing.



8. Select thrust washer so that dimension “C2” satisfies standard below. Then install it onto input shaft.

Standard for dimension C2 : 154.7 - 154.8 mm (6.091 - 6.094 in)

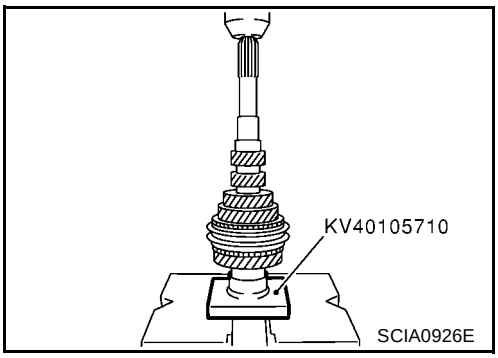


Thrust Washer

Thickness	Part number	Thickness	Part number
3.84 mm (0.1512 in)	32347 8H500	4.02 mm (0.1583 in)	32347 8H503
3.90 mm (0.1535 in)	32347 8H501	4.08 mm (0.1606 in)	32347 8H504
3.96 mm (0.1559 in)	32347 8H502	4.14 mm (0.1630 in)	32347 8H505

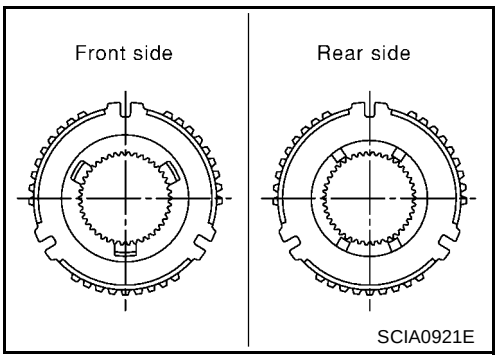
CAUTION:
Only one thrust wahser can be selected.

9. Install 5th bushing.
10. Install 5th needle bearing and 5th input gear.
11. Install 5th baulk ring.

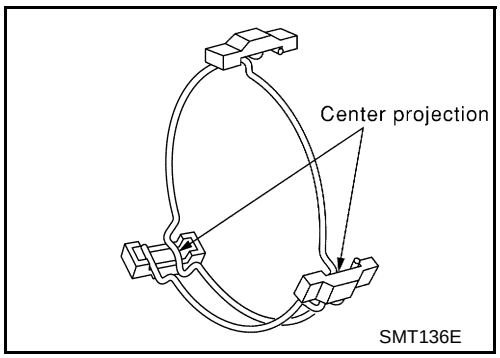


12. Install 5th-6th synchronizer hub, spread spring and shifting insert onto 5th-6th coupling sleeve.

CAUTION:
- **Be careful with orientation of synchronizer hub.**
- **Do not reuse 5th-6th synchronizer hub.**

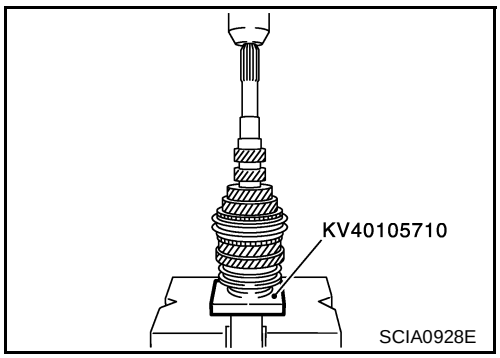


- **Be sure not to hook center projection of 2 spread springs on same shifting insert.**

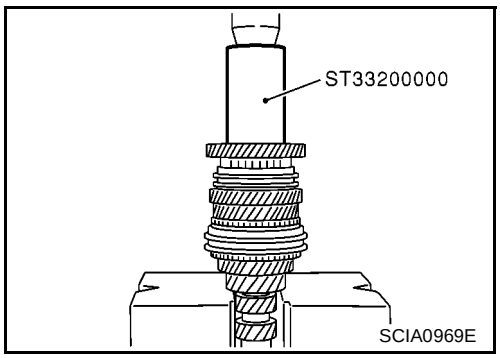


13. Install 5th-6th synchronizer hub assembly.

CAUTION:
Align grooves of 5th-6th shifting insert and 5th-6th baulk ring.



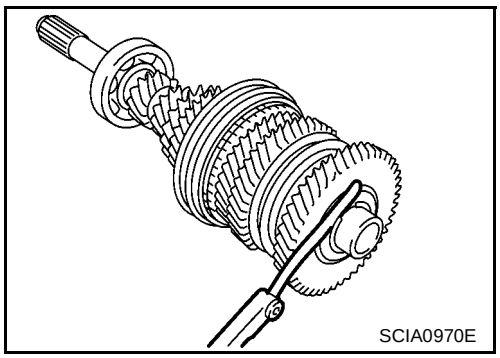
14. Install 6th needle bearing, 6th input gear onto 6th bushing, and then install them onto input shaft.



15. Install snap ring onto input shaft, and check that end play (gap between snap ring and groove) of 6th bushing satisfies standard.

End play standard value : 0 - 0.1 mm (0 - 0.004 in)

- If measurement is outside the standard range, select snap ring.

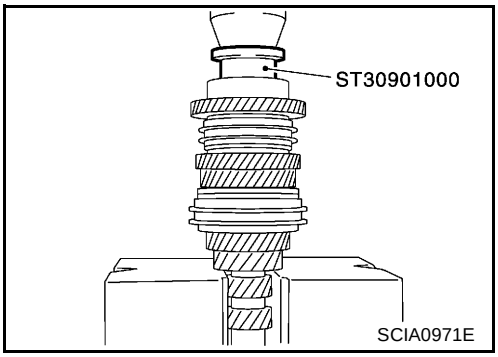


Snap Rings

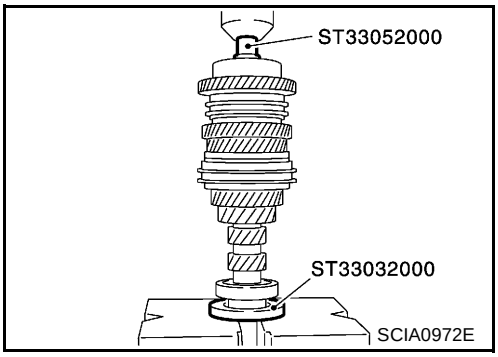
Thickness	Part number	Thickness	Part number
1.76 mm (0.0693 in)	32204 8H511	2.01 mm (0.0791 in)	32204 8H516
1.81 mm (0.0713 in)	32204 8H512	2.06 mm (0.0811 in)	32204 8H517
1.86 mm (0.0732 in)	32204 8H513	2.11 mm (0.0831 in)	32204 8H518
1.91 mm (0.0752 in)	32204 8H514	2.16 mm (0.0850 in)	32204 8H519
1.96 mm (0.0772 in)	32204 8H515	2.21 mm (0.0870 in)	32204 8H520

16. Install input shaft rear bearing.

CAUTION:
Install input shaft rear bearing with its brown surface facing the 6th input gear side.



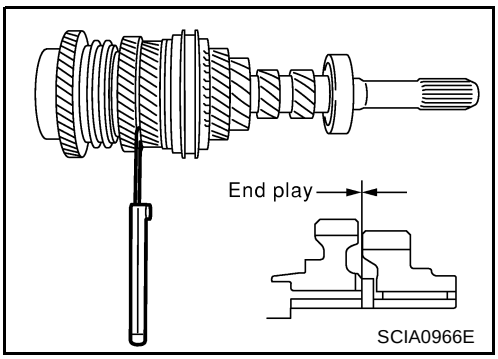
17. Install input shaft front bearing.
18. Install oil channel onto input shaft.



19. Check end play of 3rd, 4th, 5th and 6th input gears.

End play standard value

3rd gear : 0.18 - 0.31 mm (0.0071 - 0.0122 in)
4th gear : 0.20 - 0.30 mm (0.0079 - 0.0118 in)
5th gear : 0.06 - 0.16 mm (0.0024 - 0.0063 in)
6th gear : 0.06 - 0.16 mm (0.0024 - 0.0063 in)



MAINSHAFT AND GEARS

PFP:32241

Assembly and Disassembly

ECS006DE

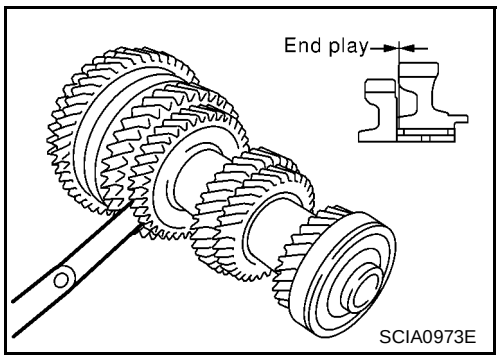
DISASSEMBLY

1. Before disassembling, measure end play of 1st and 2nd main gears.

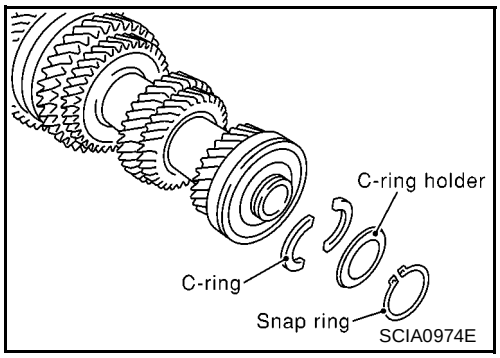
End play standard value

1st gear : 0.20 - 0.30 mm (0.0079 - 0.0118 in)

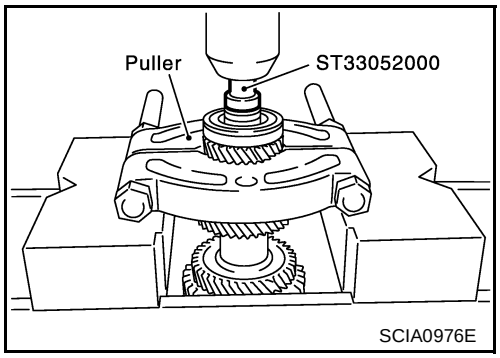
2nd gear : 0.06 - 0.16 mm (0.0024 - 0.0063 in)



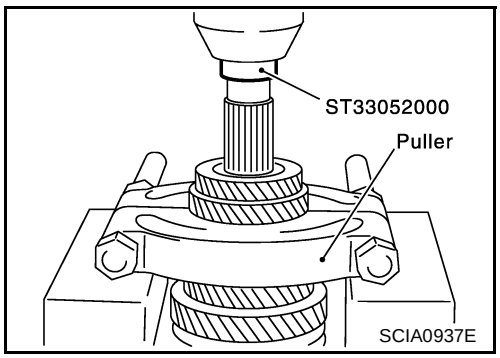
2. Remove the snap ring.
3. Remove C-ring holder, and then mainshaft C-ring.



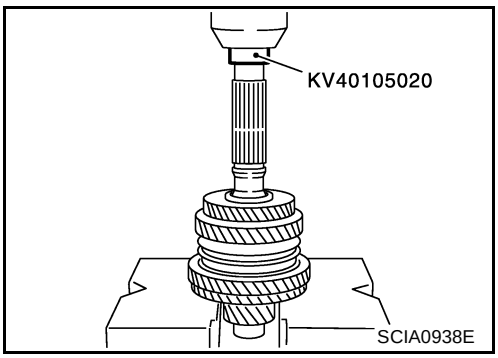
4. Remove mainshaft rear bearing, adjust shim and 6th main gear.
5. Remove 5th-6th mainshaft spacer.



6. Remove 4th main gear and 5th main gear simultaneously.
7. Remove adjusting shim.
8. Remove 3rd & 4th mainshaft spacer.



9. Remove 3rd main gear, 2nd main gear, 2nd gear needle bearing, 2nd bushing, 1st-2nd synchronizer assembly, 1st main gear, reverse main gear, 1st gear needle bearing, and 1st bushing simultaneously.

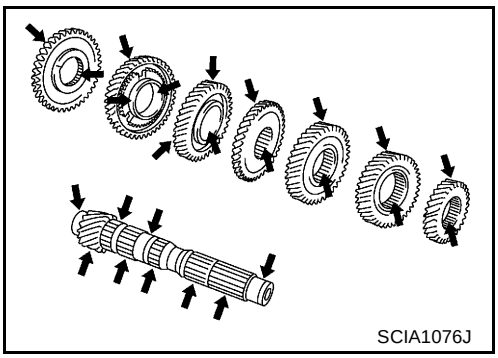


INSPECTION AFTER DISASSEMBLY

Mainshaft and Gears

Check items below. If necessary, replace them with new ones.

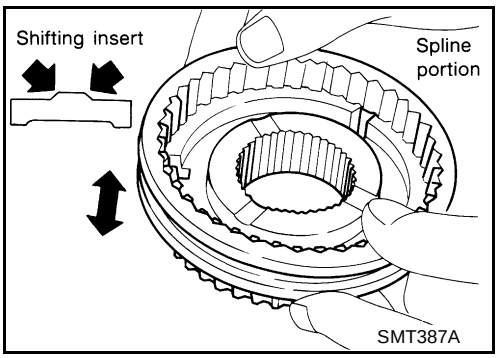
- Damage, peeling, dent, uneven wear, bending, and other non-standard conditions of the shaft.
- Excessive wear, damage, peeling, and other non-standard conditions of the gears.



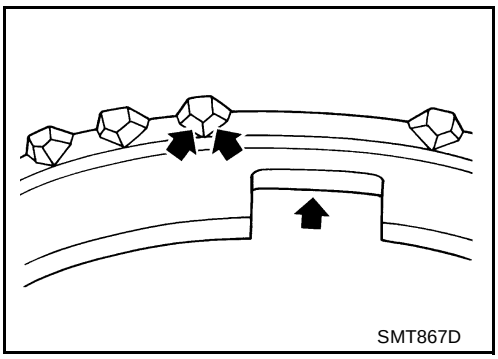
Synchronizer

Check items below. If necessary, replace them with new ones.

- Damage and unusual wear on contact surfaces of coupling sleeve, synchronizer hub, and shifting insert.
- Coupling sleeve and synchronizer hub must move smoothly.



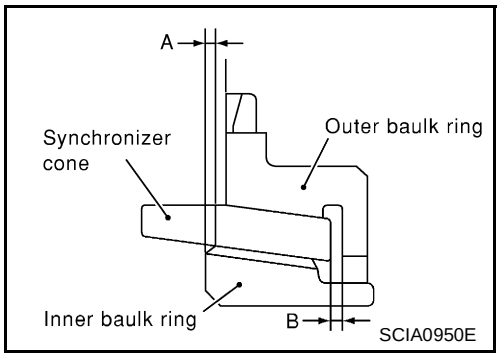
- If any crack, damage, or excessive wear is found on cam face of baulk ring or working face of insert, replace it.



Baulk ring clearance

- Double cone synchronizer (1st and 2nd)
  Check clearance of outer baulk ring, synchronizer cone, and inner baulk ring of 1st and 2nd double cone synchronizers, following procedure below.

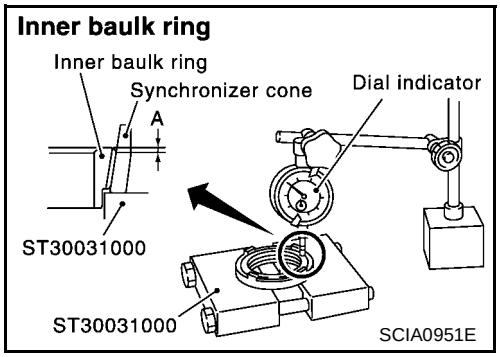
  CAUTION:
  Outer baulk ring, synchronizer cone, and inner baulk ring as a set control clearance A and B. If measurement exceeds service limit value, replace all of them as a set.



1. Using a dial gauge, measure clearance A at 2 or more points diagonally opposite, and calculate mean value.

   Clearance A

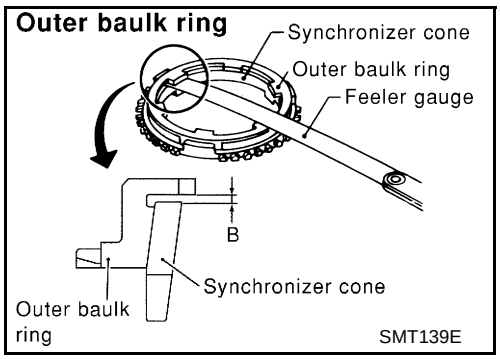
Standard	**: 0.6 - 0.8 mm (0.024 - 0.031 in)**
Limit value	**: 0.2 mm (0.008 in) or less**



2. Using a feeler gauge, measure clearance B at 2 or more points diagonally opposite, and calculate mean value.

   Clearance B

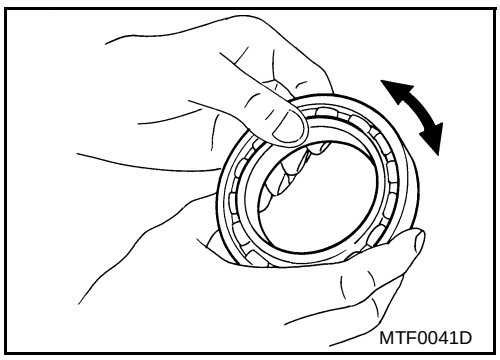
Standard	**: 0.6 - 1.1 mm (0.024 - 0.043 in)**
Limit value	**: 0.2 mm (0.008 in) or less**



Bearing

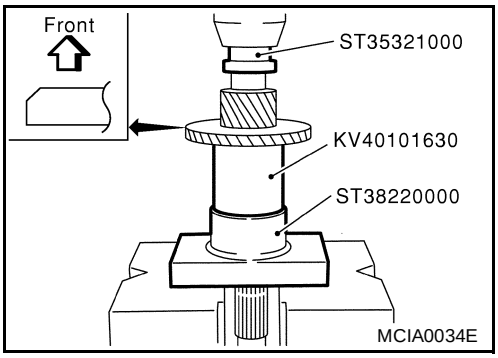
Check items below. If necessary, replace them with new ones.

- Damage and rough rotation of bearing

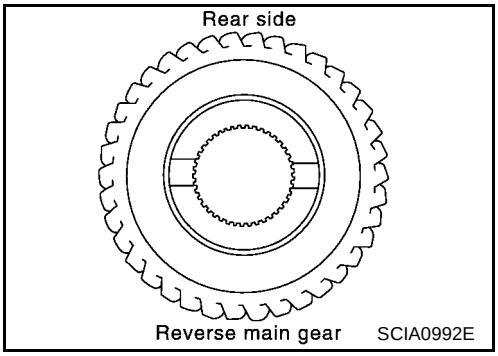


ASSEMBLY

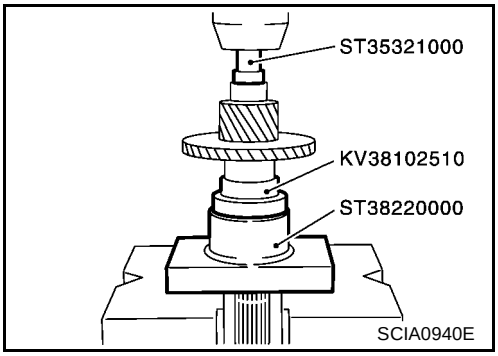
1. Install reverse main gear.



CAUTION:
Be careful with orientation of reverse main gear.

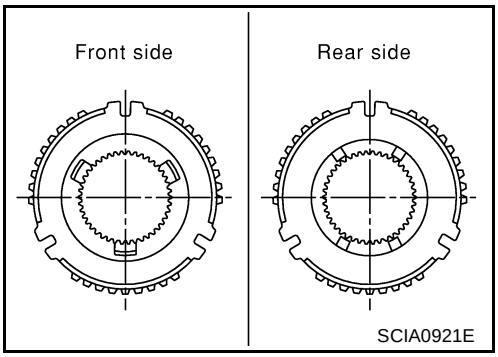


2. Install 1st bushing.
3. Install needle bearing, and then 1st main gear.

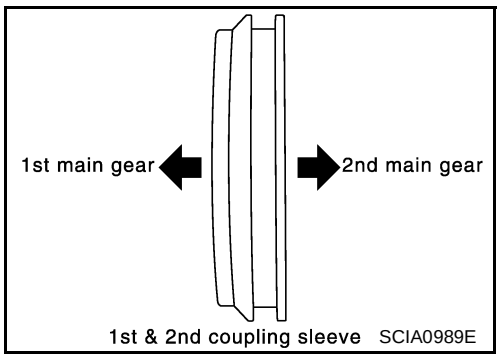


4. Install spread spring, shifting insert and 1st-2nd synchronizer hub onto 1st-2nd coupling sleeve.

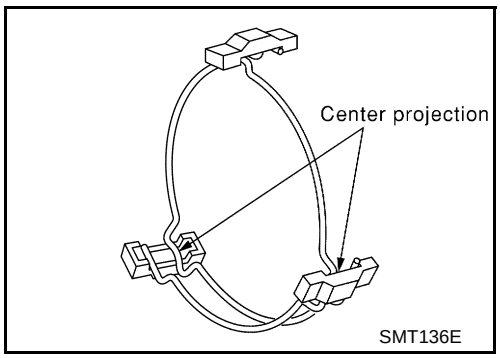
CAUTION:
- **Be careful with orientation of synchronizer hub.**
- **Do not reuse 1st-2nd synchronizer hub.**



- **Be careful with orientation of coupling sleeve.**

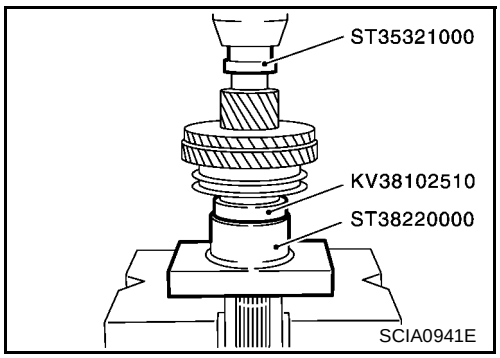


- **Be sure not to hook center projection of 2 spread springs on same shifting insert.**

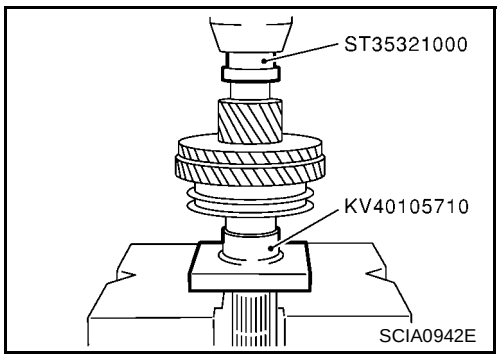


5. Install 1st gear synchronizer assembly onto mainshaft, and synchronizer hub assembly onto mainshaft.

   CAUTION:
   - **Outer baulk ring, synchronizer cone, and inner baulk ring on 2nd gear-side must have been removed.**
   - **Be careful with orientation of coupling sleeve.**



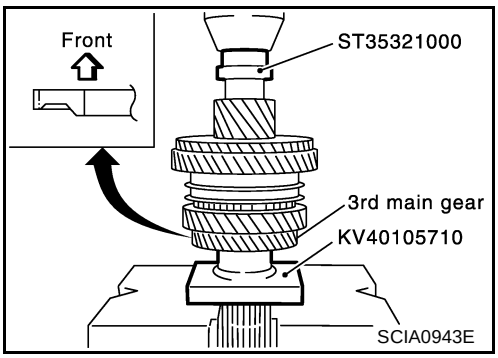
6. Install 2nd bushing.
7. Install outer baulk ring, synchronizer cone, and inner baulk ring on 2nd gear-side.
8. Install 2nd needle bearing and 2nd gear.



9. Install 3rd main gear.

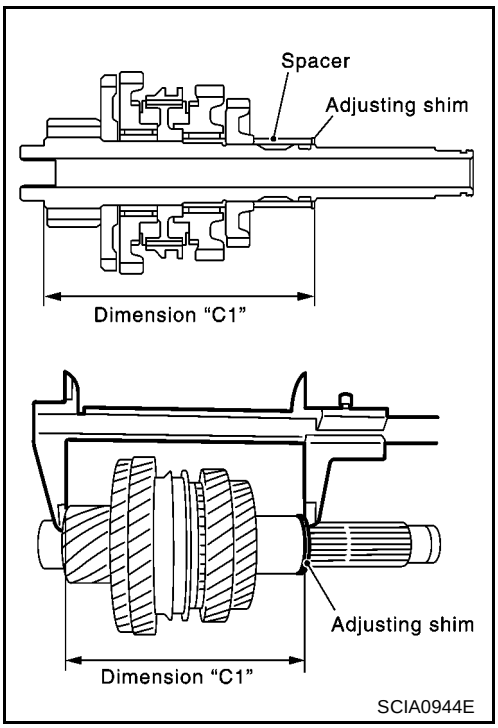
CAUTION:
Be careful with orientation of 3rd main gear.

10. Install 3rd-4th mainshaft spacer.



11. Select suitable adjusting shim so that dimension "C1" satisfies standard value below, and install it onto mainshaft.

Standard for dimension C1 : **173.85 - 173.95 mm (6.844 - 6.848 in)**



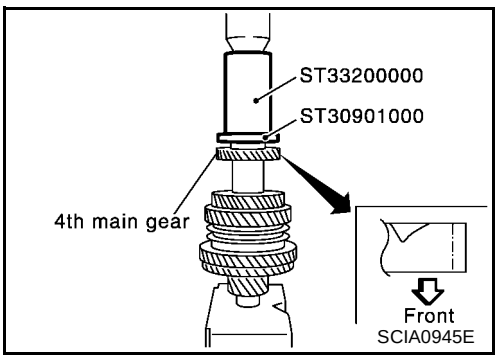
Adjusting Shim

Thickness	Part number	Thickness	Part number
0.52 mm (0.0205 in)	32238 8H500	0.84 mm (0.0331 in)	32238 8H504
0.60 mm (0.0236 in)	32238 8H501	0.92 mm (0.0362 in)	32238 8H505
0.68 mm (0.0268 in)	32238 8H502	1.00 mm (0.0394 in)	32238 8H506
0.76 mm (0.0299 in)	32238 8H503	1.08 mm (0.0425 in)	32238 8H507

CAUTION:
Only one adjusting shim can be selected.

12. Install 4th main gear.

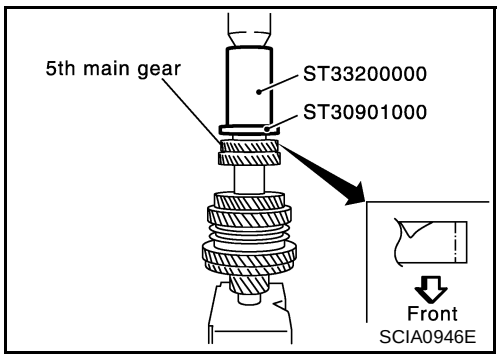
CAUTION:
Be careful with orientation of 4th main gear.



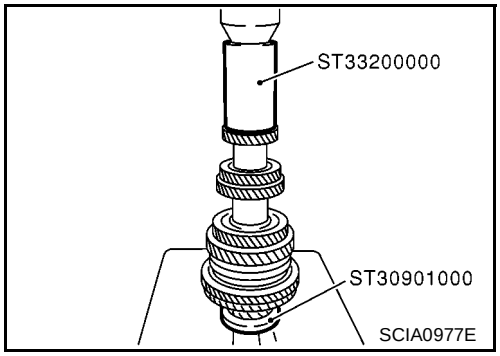
13. Install 5th main gear.

CAUTION:
Be careful with orientation of 5th main gear.

14. Install 5th-6th mainshaft spacer.



15. Install 6th main gear.



16. Select 6th main adjusting shim and then install it onto mainshaft.
    - Calculate thickness "S" of 6th main adjusting shim by procedure below so that end play dimension between 6th main gear and mainshaft rear bearing becomes the dimension shown below.

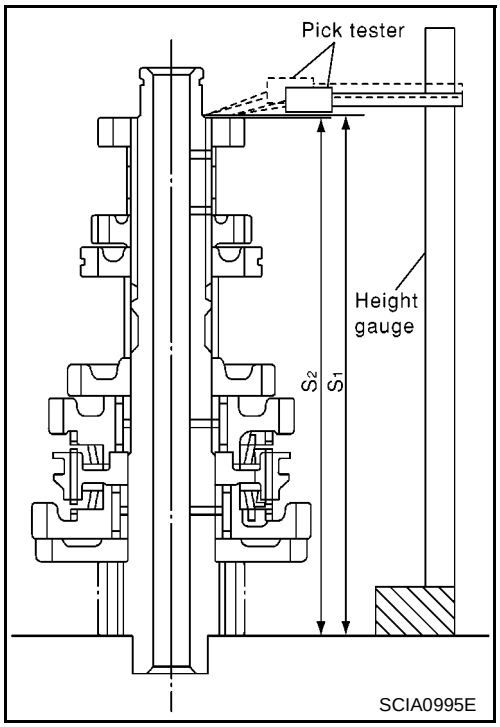
End play : 0 - 0.1 mm (0 - 0.004 in)

Dimension "S" = (S_1 – S_2) + End play

S : Thickness of adjusting shim

S_1 : Dimension from mainshaft standard face to mainshaft rear bearing press-fit end face

S_2 : Dimension from mainshaft standard face to 6th main gear end face



Adjusting Shim

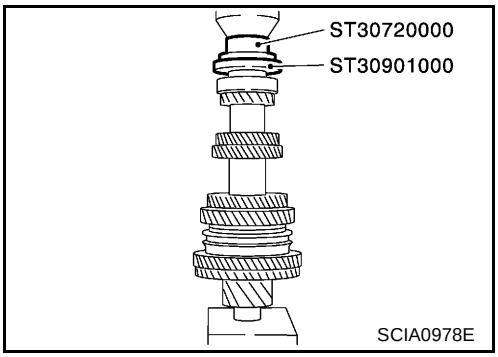
Thickness	Part number	Thickness	Part number
0.88 mm (0.0346 in)	32237 8H560	1.20 mm (0.0472 in)	32237 8H564
0.96 mm (0.0378 in)	32237 8H561	1.28 mm (0.0504 in)	32237 8H565
1.04 mm (0.0409 in)	32237 8H562	1.36 mm (0.0535 in)	32237 8H566
1.12 mm (0.0441 in)	32237 8H563		

CAUTION:
Only one adjusting shim can be selected.

a. Using height gauge, measure dimension "S_1 " and "S_2 ".

b. Install selected 6th main adjusting shim to mainshaft.

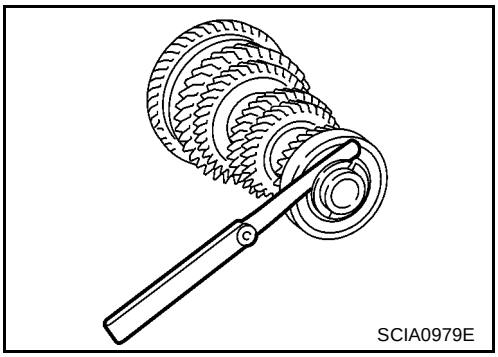
17. Install mainshaft rear bearing.



18. Install C-ring onto mainshaft, and check that end play of mainshaft rear bearing satisfies standard value.

End play standard value : 0 - 0.06 mm (0 - 0.0024 in)

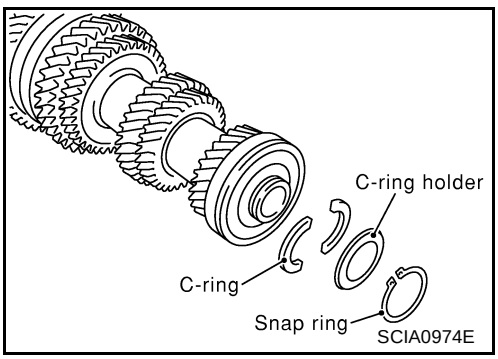
- If measurement is outside the standard range, reselect C-ring.



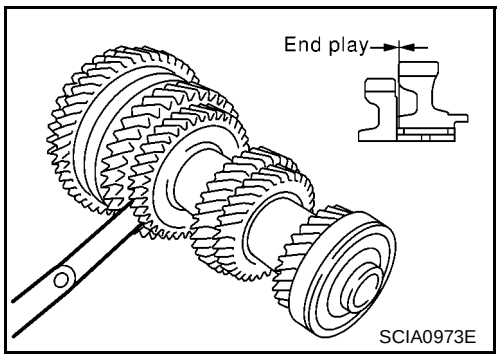
C-ring

Thickness	Part number	Thickness	Part number
2.535 mm (0.0998 in)	32348 8H800	2.835 mm (0.1116 in)	32348 8H810
2.565 mm (0.1010 in)	32348 8H801	2.865 mm (0.1128 in)	32348 8H811
2.595 mm (0.1022 in)	32348 8H802	2.895 mm (0.1140 in)	32348 8H812
2.625 mm (0.1033 in)	32348 8H803	2.925 mm (0.1152 in)	32348 8H813
2.655 mm (0.1045 in)	32348 8H804	2.955 mm (0.1163 in)	32348 8H814
2.685 mm (0.1057 in)	32348 8H805	2.985 mm (0.1175 in)	32348 8H815
2.715 mm (0.1069 in)	32348 8H806	3.015 mm (0.1187 in)	32348 8H816
2.745 mm (0.1081 in)	32348 8H807	3.045 mm (0.1199 in)	32348 8H817
2.775 mm (0.1093 in)	32348 8H808	3.075 mm (0.1211 in)	32348 8H818
2.805 mm (0.1104 in)	32348 8H809		

19. Fit C-ring holder, and install snap ring.



20. Check end play of 1st and 2nd main gears.



End play standard value

1st gear : 0.20 - 0.30 mm (0.0079 - 0.0118 in)

2nd gear : 0.06 - 0.16 mm (0.0024 - 0.0063 in)

REVERSE IDLER SHAFT AND GEARS

PFP:32281

Assembly and Disassembly

ECS006DF

DISASSEMBLY

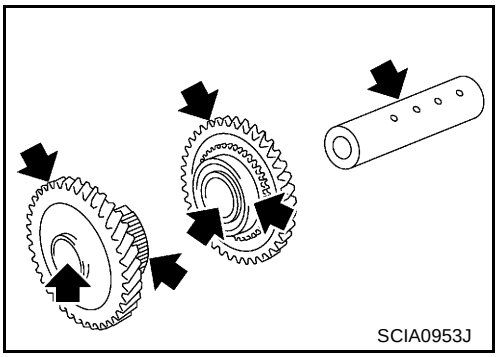
1. Remove reverse idler gear adjusting shim.
2. Remove reverse idler gear (rear), reverse coupling sleeve and insert spring simultaneously.
3. Remove reverse idler gear needle bearing.
4. Remove thrust needle bearing.
5. Remove reverse baulk ring.
6. Remove reverse idler gear (front).
7. Remove reverse idler gear needle bearing.
8. Remove thrust needle bearing.
9. Pull off locking pin from reverse idler shaft.

INSPECTION AFTER DISASSEMBLY

Reverse Idler Shaft and Gears

Check items below. If necessary, replace them with new ones.

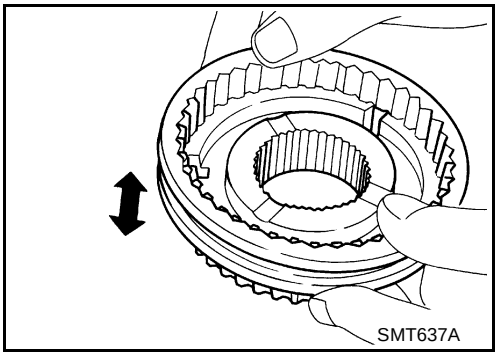
- Damage, peeling, dent, uneven wear, bending, and other non-standard conditions of the shaft.
- Excessive wear, damage, peeling, and other non-standard conditions of the gears.


SCIA0953J

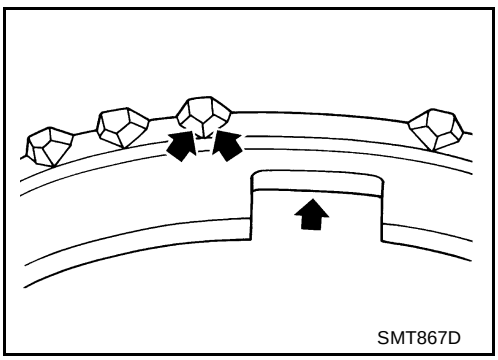
Synchronizer

Check items below. If necessary, replace them with new ones.

- Damage and unusual wear on contact surfaces of coupling sleeve, synchronizer hub, and insert spring.
- Coupling sleeve and synchronizer hub must move smoothly.


SMT637A

- If any crack, damage, or excessive wear is found on cam face of baulk ring or working face of insert, replace it.

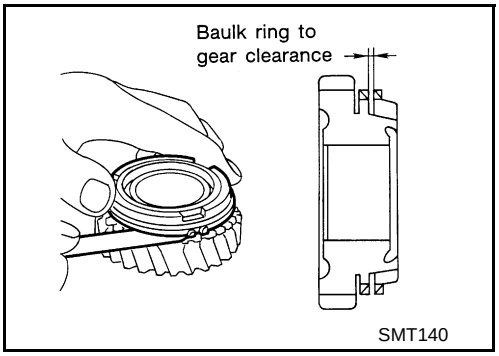

SMT867D

Baulk ring clearance

- Press baulk ring against cone, and measure clearance between baulk ring and cone. If measurement is below limit, replace it with a new one.

Clearance

Standard	**: 0.95 - 1.4 mm (0.0374 - 0.0551 in)**
Limit value	**: 0.7 mm (0.0276 in)**



Bearing

Check items below. If necessary, replace them with new ones.

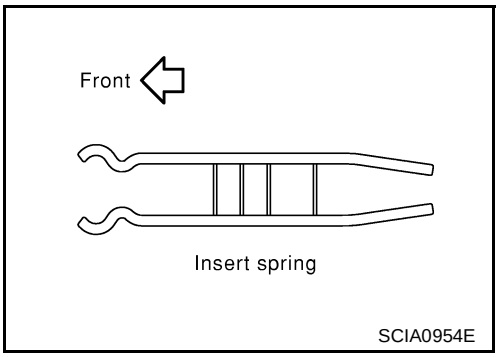
- Damage and rough rotation of bearing.

ASSEMBLY

Paying attention to following work, assemble in reverse order of disassembly.

CAUTION:

- **Be careful with orientation of insert spring.**



FINAL DRIVE

PFP:38411

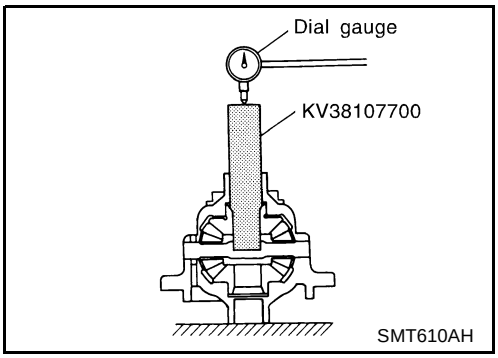
Assembly and Disassembly

ECS006DG

PRE-INSPECTION

- Check the clearance between side gear and differential case as follows.

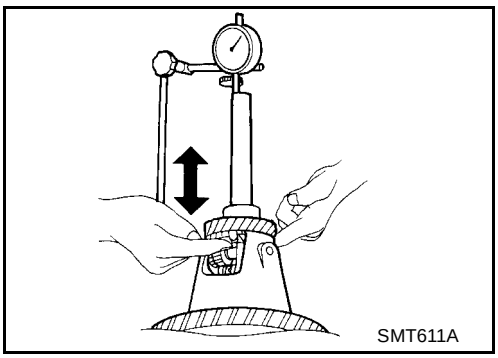
1. Clean final drive assembly sufficiently to prevent side gear thrust washer, differential case, side gear, and other parts from sticking by gear oil.



2. Upright the differential case so that the side gear to be measured faces upward.
3. Place final drive adapter and dial gauge onto side gear. Move side gear up and down, and measure the clearance.

Clearance between side gear and differential case : 0.1 - 0.2 mm (0.004 - 0.008 in)

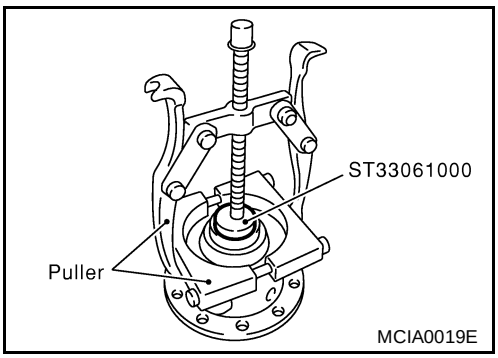
CAUTION:
There should be no resistance and gears should rotate freely.



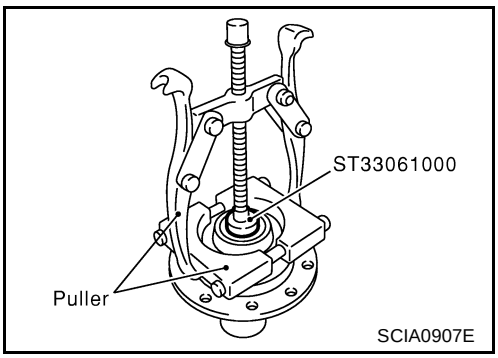
4. If not within specification, adjust the clearance by changing thrust washer thickness.
5. Turn differential case upside down, and measure the clearance between side gear and differential case on the other side in the same way.

DISASSEMBLY

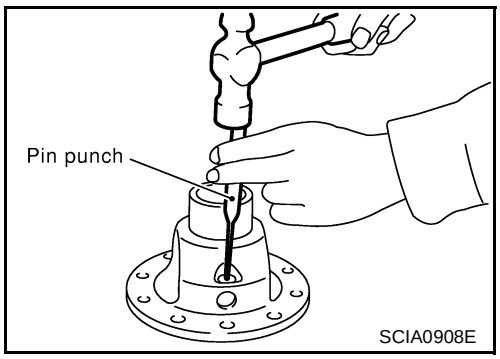
1. Remove mounting bolts. Then, separate the final gear from differential case.
2. Remove speedometer drive gear.
3. Using a drift and puller, remove differential side bearing (clutch housing side).



4. Using a drift and puller, remove differential side bearing (transaxle case side).



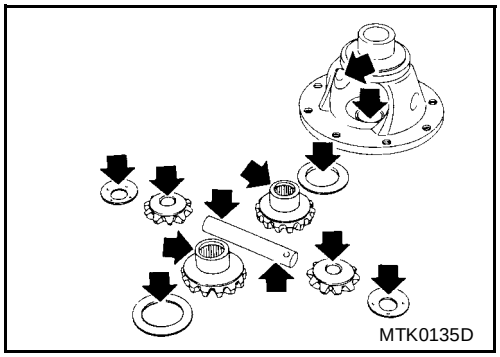
5. Using a pin punch, pull out lock pin and pinion mate shaft.
6. Rotate pinion mate gears, and remove pinion mate gears, pinion mate thrust washers, side gears, and side gear thrust washers from differential case.



INSPECTION AFTER DISASSEMBLY

Gear Washer, Shaft and Case

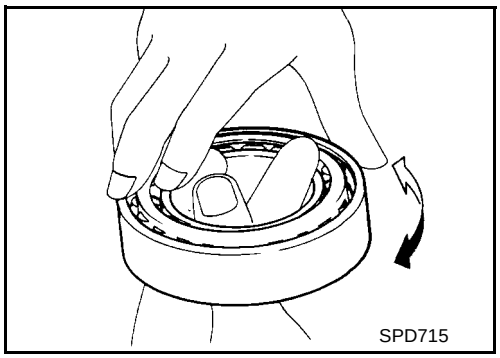
- Check side gears, side gear thrust washers, pinion mate shaft, pinion mate gears, pinion mate thrust washers and differential case. If necessary, replace with a new one.



Bearing

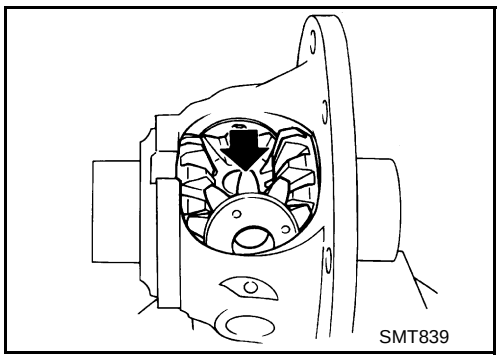
- Check for bearing damage and rough rotation. If necessary, replace with a new one.

  CAUTION:
  When replacing tapered roller bearing, replace outer and inner race as a set.



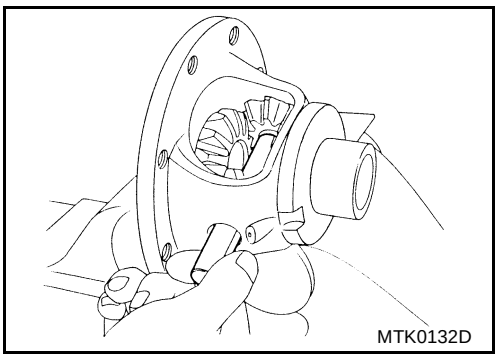
ASSEMBLY

1. Apply gear oil to sliding area of differential case, each gear, and thrust washer.
2. Install side gear thrust washer and side gears into differential case.
3. While rotating pinion mate thrust washers and pinion mate gears, aligning them diagonally, install them into differential case.



4. Insert pinion mate shaft into differential case.

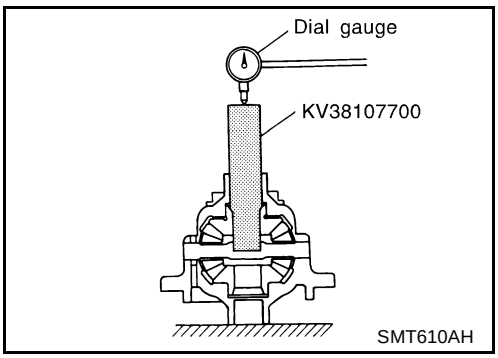
CAUTION:
Be sure not to damage pinion mate thrust washers.



5. Measure end play of side gears following procedure below. Then select side gear thrust washer.

a. Upright the differential case so that its side gear to be measured face upward.

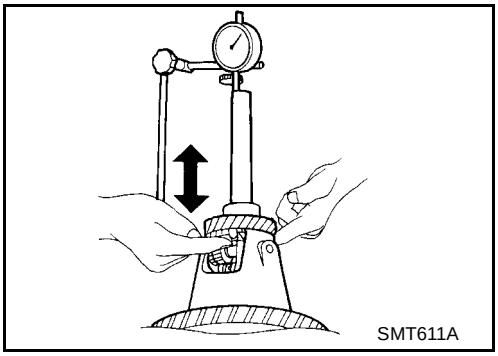
b. Place final drive adapter and dial gauge onto side gears.



c. Move side gears up and down to measure end play, and select thrust washer so that it satisfies standard.

End play standard value : 0.1 - 0.2 mm (0.004 - 0.008 in)

CAUTION:
- **There should be no resistance and gears should rotate freely.**
- **Place differential case upside down. Be sure to measure end play for opposite side-gears likewise.**



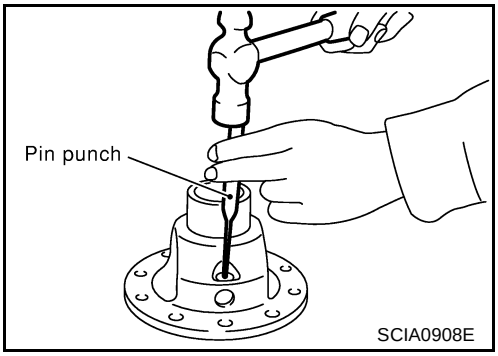
Thrust washer

Shim thickness	Part number
0.75 mm (0.0295 in)	38424 81X00
0.80 mm (0.0315 in)	38424 81X01
0.85 mm (0.0335 in)	38424 81X02
0.90 mm (0.0354 in)	38424 81X03
0.95 mm (0.0374 in)	38424 81X04

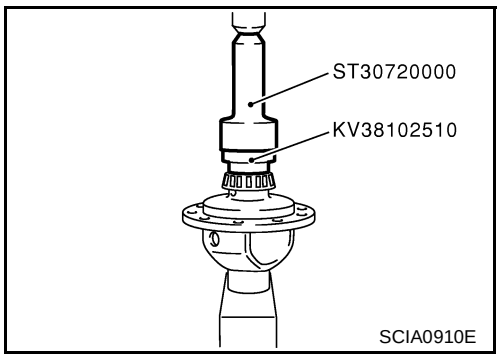
CAUTION:
Only one thrust washer can be selected.

6. Using a pin punch (special service tool), drive a lock pin into the pinion mate shaft.

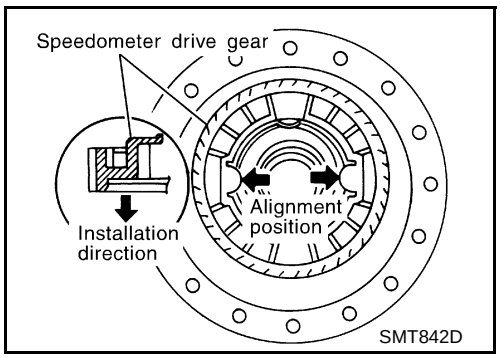
CAUTION:
Do not reuse the lock pin.



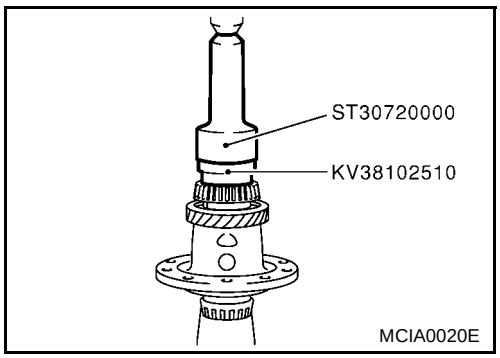
7. Using a drift (special service tool), install differential side bearing (transaxle case side).



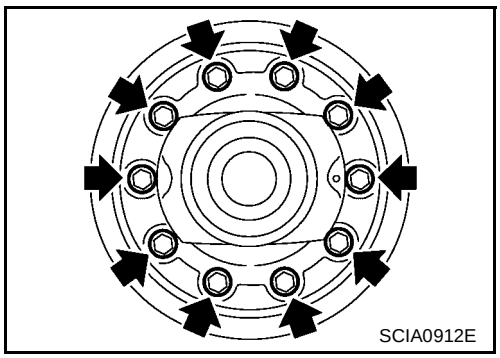
8. Align and install speedometer drive gear onto differential case.



9. Using a drift (special service tool), install differential side bearing (clutch housing side).



10. Install final gear into differential case, and tighten final gear mounting bolts.



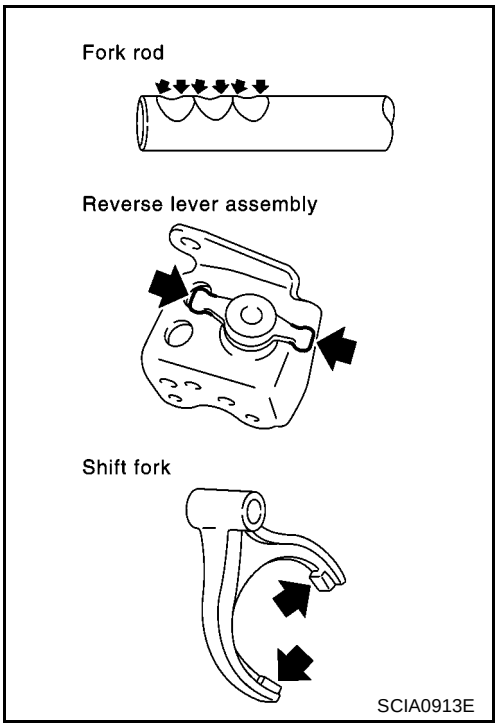
SHIFT CONTROL

PFP:32982

Inspection

ECS006DH

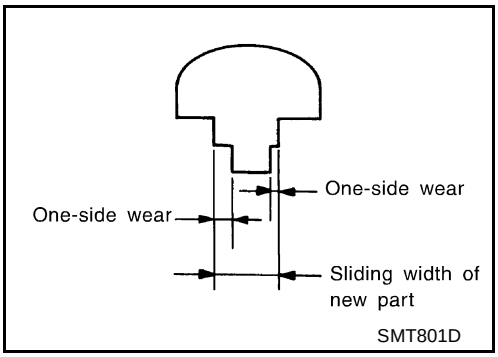
- Check contact surfaces and sliding area for wear, damage, bending, etc. If necessary, replace parts.



SHIFT FORK

- Check if the width of shift fork hook (sliding area with coupling sleeve) is within allowable specification below.

Item	One-side wear specification	Sliding width of new part
1st & 2nd	0.2 mm (0.008 in)	7.80 - 7.93 mm (0.3071 - 0.3122 in)
3rd & 4th	0.2 mm (0.008 in)	7.80 - 7.93 mm (0.3071 - 0.3122 in)
5th & 6th	0.2 mm (0.008 in)	6.10 - 6.23 mm (0.2402 - 0.2453 in)
Reverse	0.2 mm (0.008 in)	12.80 - 12.93 mm (0.5039 - 0.5091 in)



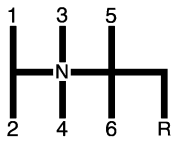
SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

General Specifications

ECS006DI

TRANSAXLE

Engine			QR20DE	YD22DDTi
Transaxle model			RS6F51A	
Model code number			—	AV964
Number of speed			6	
Synchromesh type			Warner	
Shift pattern			 SCIA0955E	
Gear ratio	1st		3.153	3.416
	2nd		1.944	
	3rd		1.392	1.258
	4th		1.055	0.902
	5th		0.809	0.673
	6th		0.673	0.540
	Reverse		3.002	3.252
Number of teeth	Input gear	1st	13	12
		2nd	18	
		3rd	28	31
		4th	36	41
		5th	42	46
		6th	49	50
		Reverse	13	12
	Main gear	1st	41	
		2nd	35	
		3rd	39	
		4th	38	37
		5th	34	31
		6th	33	27
		Reverse	38	
	Reverse idler gear	Front	37	
		Rear	38	
Oil capacity ℓ (Imp pt)			2.3 (4)	
Remarks	Reverse synchronizer		Installed	
	Double baulk ring type synchronizer		1st & 2rd synchronizer	

FINAL GEAR

Engine		QR20DE	YD22DDTi
Transaxle model		RS6F51A	
Model code number		—	AV964
Final gear ratio		4.750	3.812
Number of teeth	Final gear/Pinion	76/16	61/16
	Side gear/Pinion mate gear	14/10	

Gear End Play

ECS006DJ

Unit: mm (in)

Gear	End play
1st main gear	0.20 - 0.30 (0.0079 - 0.0118)
2nd main gear	0.06 - 0.16 (0.0024 - 0.0063)
3rd input gear	0.18 - 0.31 (0.0071 - 0.0122)
4th input gear	0.20 - 0.30 (0.0079 - 0.0118)
5th input gear	0.06 - 0.16 (0.0024 - 0.0063)
6th input gear	0.06 - 0.16 (0.0024 - 0.0063)

Clearance Between Baulk Ring and Gear

ECS006DK

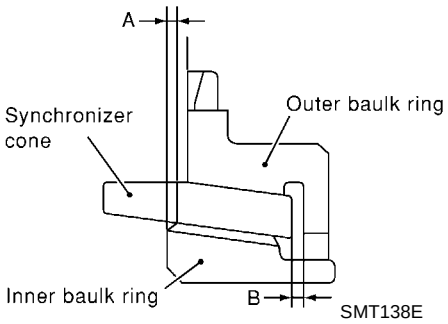
3RD, 4TH, 5TH, 6TH & REVERSE BAULK RING

Unit: mm (in)

	Standard	Wear limit
3rd	0.9 - 1.45 (0.0354 - 0.0571)	0.7 (0.0276)
4th	0.9 - 1.45 (0.0354 - 0.0571)	
5th	0.95 - 1.4 (0.0374 - 0.0551)	
6th	0.95 - 1.4 (0.0374 - 0.0551)	
Reverse	0.95 - 1.4 (0.0374 - 0.0551)	

1ST AND 2ND DOUBLE BAULK RING

Unit: mm (in)



Dimension	Standard	Wear limit
A	0.6 - 0.8 (0.024 - 0.031)	0.2 (0.008)
B	0.6 - 1.1 (0.024 - 0.043)	

Available Snap Rings

ECS006DL

6TH BUSHING

End play	0 - 0.1 mm (0 - 0.004 in)

Thickness mm (in)	Part number*	Thickness mm (in)	Part number*
1.76 (0.0693)	32204 8H511	2.01 (0.0791)	32204 8H516
1.81 (0.0713)	32204 8H512	2.06 (0.0811)	32204 8H517
1.86 (0.0732)	32204 8H513	2.11 (0.0831)	32204 8H518
1.91 (0.0752)	32204 8H514	2.16 (0.0850)	32204 8H519
1.96 (0.0772)	32204 8H515	2.21 (0.0870)	32204 8H520

*: Always check with the Parts Department for the latest parts information.

Available C-rings

ECS006DM

MAINSHAFT C-RING

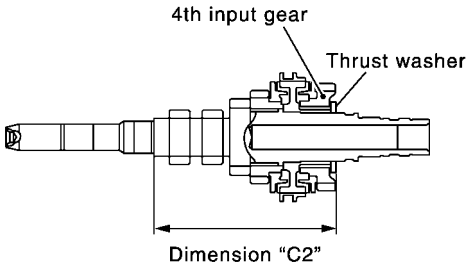
End play		0 - 0.06 mm (0 - 0.0024 in)	
Thickness mm (in)	Part number*	Thickness mm (in)	Part number*
2.535 (0.0998)	32348 8H800	2.835 (0.1116)	32348 8H810
2.565 (0.1010)	32348 8H801	2.865 (0.1128)	32348 8H811
2.595 (0.1022)	32348 8H802	2.895 (0.1140)	32348 8H812
2.625 (0.1033)	32348 8H803	2.925 (0.1152)	32348 8H813
2.655 (0.1045)	32348 8H804	2.955 (0.1163)	32348 8H814
2.685 (0.1057)	32348 8H805	2.985 (0.1175)	32348 8H815
2.715 (0.1069)	32348 8H806	3.015 (0.1187)	32348 8H816
2.745 (0.1081).	32348 8H807	3.045 (0.1199)	32348 8H817
2.775 (0.1093)	32348 8H808	3.075 (0.1211)	32348 8H818
2.805 (0.1104)	32348 8H809		

*: Always check with the Parts Department for the latest parts information.

Available Thrust Washer

ECS006DN

INPUT SHAFT THRUST WASHER



SCIA1008E

Standard length “C2”		154.7 - 154.8 mm (6.091 - 6.094 in)	
Thickness mm (in)	Part number*	Thickness mm (in)	Part number*
3.84 (0.1512)	32347 8H500	4.02 (0.1583)	32347 8H503
3.90 (0.1535)	32347 8H501	4.08 (0.1606)	32347 8H504
3.96 (0.1559)	32347 8H502	4.14 (0.1630)	32347 8H505

*: Always check with the Parts Department for the latest parts information.

DIFFERENTIAL SIDE GEAR THRUST WASHER

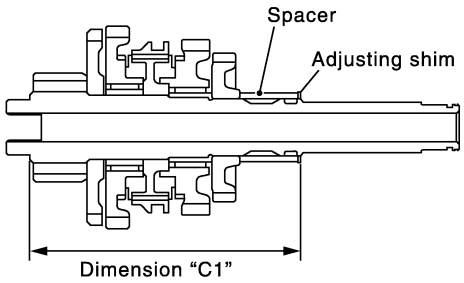
Allowable clearance between side gear and differential case with washer	0.1 - 0.2 mm (0.004 - 0.008 in)
Thickness mm (in)	Part number*
0.75 (0.0295)	38424 81X00
0.80 (0.0315)	38424 81X01
0.85 (0.0335)	38424 81X02
0.90 (0.0354)	38424 81X03
0.95 (0.0374)	38424 81X04

*: Always check with the Parts Department for the latest parts information.

Available Adjusting Shims

ECS006DO

MAINSHAFT ADJUSTING SHIM



SCIA1009E

Standard length “C1”		173.85 - 173.95 mm (6.844 - 6.848 in)	
Thickness mm (in)	Part number*	Thickness mm (in)	Part number*
0.52 (0.0205)	32238 8H500	0.84 (0.0331)	32238 8H504
0.60 (0.0236)	32238 8H501	0.92 (0.0362)	32238 8H505
0.68 (0.0268)	32238 8H502	1.00 (0.0394)	32238 8H506
0.76 (0.0299)	32238 8H503	1.08 (0.0425)	32238 8H507

*: Always check with the Parts Department for the latest parts information.

INPUT SHAFT REAR BEARING ADJUSTING SHIM

End play			0 - 0.06 mm (0 - 0.0024 in)		
Thickness mm (in)	Part number*	Thickness mm (in)	Part number*	Thickness mm (in)	Part number*
0.40 (0.0157)	32225 8H500	0.88 (0.0346)	32225 8H512	1.36 (0.0535)	32225 8H524
0.44 (0.0173)	32225 8H501	0.92 (0.0362)	32225 8H513	1.40 (0.0551)	32225 8H560
0.48 (0.0189)	32225 8H502	0.96 (0.0378)	32225 8H514	1.44 (0.0567)	32225 8H561
0.52 (0.0205)	32225 8H503	1.00 (0.0394)	32225 8H515	1.48 (0.0583)	32225 8H562
0.56 (0.0220)	32225 8H504	1.04 (0.0409)	32225 8H516	1.52 (0.0598)	32225 8H563
0.60 (0.0236)	32225 8H505	1.08 (0.0425)	32225 8H517	1.56 (0.0614)	32225 8H564
0.64 (0.0252)	32225 8H506	1.12 (0.0441)	32225 8H518	1.60 (0.0630)	32225 8H565
0.68 (0.0268)	32225 8H507	1.16 (0.0457)	32225 8H519	1.64 (0.0646)	32225 8H566
0.72 (0.0283)	32225 8H508	1.20 (0.0472)	32225 8H520		
0.76 (0.0299)	32225 8H509	1.24 (0.0488)	32225 8H521		
0.80 (0.0315)	32225 8H510	1.28 (0.0504)	32225 8H522		
0.84 (0.0331)	32225 8H511	1.32 (0.0520)	32225 8H523		

*: Always check with the parts department for the latest information.

MAINSHAFT REAR BEARING ADJUSTING SHIM

End play		0 - 0.06 mm (0 - 0.0024 in)	
Thickness mm (in)	Part number*	Thickness mm (in)	Part number*
0.44 (0.0173)	32238 8H510	0.80 (0.0315)	32238 8H519
0.48 (0.0189)	32238 8H511	0.84 (0.0331)	32238 8H520
0.52 (0.0205)	32238 8H512	0.88 (0.0346)	32238 8H521
0.56 (0.0220)	32238 8H513	0.92 (0.0362)	32238 8H522
0.60 (0.0236)	32238 8H514	0.96 (0.0378)	32238 8H523
0.64 (0.0252)	32238 8H515	1.00 (0.0394)	32238 8H524
0.68 (0.0268)	32238 8H516	1.04 (0.0409)	32238 8H560
0.72 (0.0283)	32238 8H517	1.08 (0.0425)	32238 8H561
0.76 (0.0299)	32238 8H518		

*: Always check with the Parts Department for the latest parts information.

REVERSE IDLER GEAR ADJUSTING SHIM

End play	0.04 - 0.14 mm (0.0016 - 0.0055 in)

Thickness mm (in)	Part number*	Thickness mm (in)	Part number*
1.76 (0.0693)	32237 8H500	2.24 (0.0882)	32237 8H506
1.84 (0.0724)	32237 8H501	2.32 (0.0913)	32237 8H507
1.92 (0.0756)	32237 8H502	2.40 (0.0945)	32237 8H508
2.00 (0.0787)	32237 8H503	2.48 (0.0976)	32237 8H509
2.08 (0.0819)	32237 8H504	2.56 (0.1008)	32237 8H510
2.16 (0.0850)	32237 8H505	2.64 (0.1039)	32237 8H511

*: Always check with the Parts Department for the latest parts information.

6TH MAIN GEAR ADJUSTING SHIM

End play		0 - 0.1 mm (0 - 0.004 in)	
Thickness mm (in)	Part number*	Thickness mm (in)	Part number*
0.88 (0.0346)	32237 8H560	1.20 (0.0472)	32237 8H564
0.96 (0.0378)	32237 8H561	1.28 (0.0504)	32237 8H565
1.04 (0.0409)	32237 8H562	1.36 (0.0535)	32237 8H566
1.12 (0.0441)	32237 8H563		

*: Always check with the Parts Department for the latest parts information.

Available Shims

ECS006DP

— Differential Side Bearing Preload and Adjusting Shim

BEARING PRELOAD

Differential side bearing preload: L*	0.15 - 0.21 mm (0.0059 - 0.0083 in)

*: Install shims which are “deflection of differential case” + “L” in thickness.

DIFFERENTIAL SIDE BEARING ADJUSTING SHIM (S)

Thickness mm (in)	Part number*	Thickness mm (in)	Part number*
0.48 (0.0189)	31438 80X00	0.72 (0.0283)	31438 80X06
0.52 (0.0205)	31438 80X01	0.76 (0.0299)	31438 80X07
0.56 (0.0220)	31438 80X02	0.80 (0.0315)	31438 80X08
0.60 (0.0236)	31438 80X03	0.84 (0.0331)	31438 80X09
0.64 (0.0252)	31438 80X04	0.88 (0.0346)	31438 80X10
0.68 (0.0268)	31438 80X05	0.92 (0.0362)	31438 80X11

*: Always check with the Parts Department for the latest parts information.