SECTION MT
MANUAL TRANSAXLE

CONTENTS

RS5F70A

RS5F51A

RS6F51H

PRECAUTIONS

PFP:00001

Caution

ECS004A3

- 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.

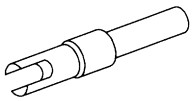
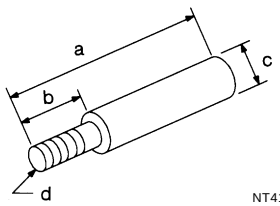
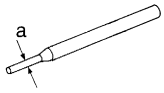
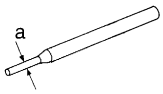
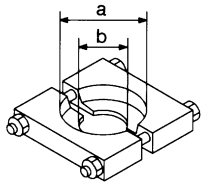
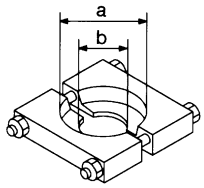
PREPARATION

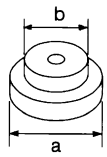
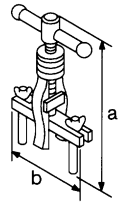
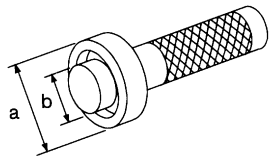
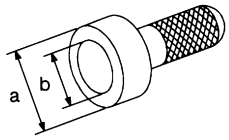
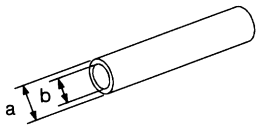
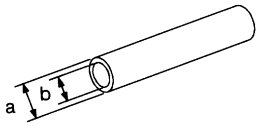
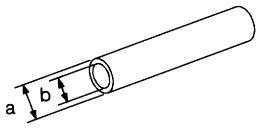
PFP:00002

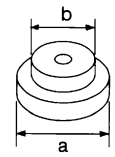
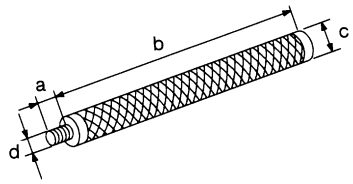
Special Service Tools

ECS004A4

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

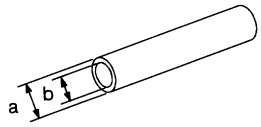
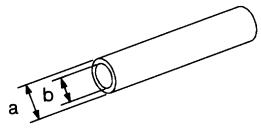
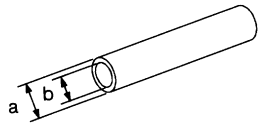
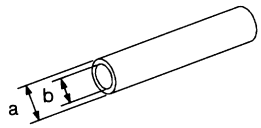
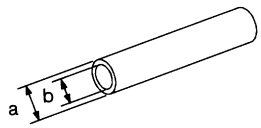
Tool number (Kent-Moore No.) Tool name	Description
KV38107700 (J39027) Preload adapter  NT087	Measuring turning torque of final drive assembly Measuring total turning torque Measuring clearance between side gear and differential case with washer Selecting differential side bearing adjusting shim [Use with KV38106000 (J34291-B).]
KV38106000 (J34291-B) Height gauge adapter (differential side bearing)  NT418	Selecting differential side bearing adjusting shim [Use with KV38107700 (J39027).] **a: 140 mm (5.51 in)** **b: 40 mm (1.57 in)** **c: 16 mm (0.63 in) dia.** **d: M8 × 1.25P**
KV32101000 (J25689-A) Pin punch  NT410	Removing and installing retaining pin Removing and installing lock pin Removing selector shaft Removing welch plug **a: 4 mm (0.16 in) dia.**
KV31100300 (J25689-A) Pin punch  NT410	Removing and installing retaining pin **a: 4.5 mm (0.177 in) dia.**
ST30031000 (J22912-O1) Puller  NT411	Removing 3rd, 5th input gear Removing 3rd & 4th and 5th & Rev synchronizer hub Removing mainshaft rear bearing Removing 2nd gear, 5th gear bush Removing 1st & 2nd synchronizer hub, 1st and 4th main gear Removing and installing differential side bearing **a: 90 mm (3.54 in) dia.** **b: 50 mm (1.97 in) dia.**
ST30021000 (J22912-O1) Puller  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 & Rev synchronizer hub Installing 2nd gear bush, 5th gear bush, Rev gear bush Installing mainshaft rear bearing **a: 110 mm (4.33 in) dia.** **b: 68 mm (2.68 in) dia.**

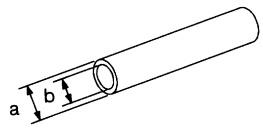
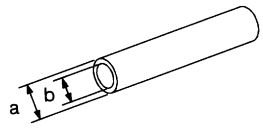
Tool number (Kent-Moore No.) Tool name		Description
ST33061000 (J8107-2) Drift	 NT073	Removing differential side bearing **a: 39 mm (1.54 in) dia.** **b: 29.5 mm (1.16 in) dia.**
ST33290001 (J34286) Puller	 NT414	● Removing idler gear bearing outer race **a: 250 mm (9.84 in)** **b: 160 mm (6.30 in)**
ST33230000 (J25805-O1) Drift	 NT084	Removing differential oil seal Installing differential side bearing **a: 51 mm (2.01 in) dia.** **b: 28.5 mm (1.122 in) dia.**
ST30720000 (J25405) Drift	 NT115	Installing differential side bearing outer race **a: 77 mm (3.03 in) dia.** **b: 55.5 mm (2.185 in) dia.**
ST22350000 (J25678-O1) Drift	 NT065	Installing input shaft front and rear bearing **a: 34 mm (1.34 in) dia.** **b: 28 mm (1.10 in) dia.**
ST22452000 (J34335) Drift	 NT065	Installing 3rd and 4th main gear Installing 5th gear bush Installing 5th & Rev synchronizer hub Installing Rev gear bush Installing mainshaft rear bearing **a: 45 mm (1.77 in) dia.** **b: 36 mm (1.42 in) dia.**
ST37750000 (J34335) Drift	 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 **a: 40 mm (1.57 in) dia.** **b: 31 mm (1.22 in) dia.**

Tool number (Kent-Moore No.) Tool name	Description
ST30621000 (J35869) Drift  NT073	Installing differential side bearing outer race [Use with ST30611000 (J25742-1).] **a: 79 mm (3.11 in) dia.** **b: 59 mm (2.32 in) dia.**
ST30611000 (J25742-1) Drift handle  NT419	Installing differential side bearing outer race [Use with ST30621000 (J35869).] **a: 15 mm (0.59 in)** **b: 335 mm (13.19 in)** **c: 25 mm (0.98 in) dia.** **d: M12 × 1.5P**

Commercial Service Tools

ECS004A5

Tool name	Description
Drift  NT065	Installing differential side bearing inner race **a: 56 mm (2.20 in) dia.** **b: 50.5 mm (1.988 in) dia.**
Drift  NT065	Removing input shaft rear bearing Removing mainshaft rear bearing **a: 22 mm (0.87 in) dia.** **b: 16 mm (0.63 in) dia.**
Drift  NT065	Installing differential oil seal (Transaxle case side) **a: 58 mm (2.28 in) dia.** **b: 50 mm (1.97 in) dia.**
Drift  NT065	Installing differential oil seal (Clutch housing side) **a: 54 mm (2.13 in) dia.** **b: 50 mm (1.97 in) dia.**
Drift  NT065	Installing 2nd gear bush **a: 38 mm (1.50 in) dia.** **b: 33 mm (1.30 in) dia.**

Tool name	Description
Drift  NT065	Installing 3rd & 4th and 1st & 2nd synchronizer hub Installing mainshaft front bearing **a: 50 mm (1.97 in) dia.** **b: 41 mm (1.61 in) dia.**
Drift  NT065	Installing input shaft oil seal Installing 5th input gear **a: 39 mm (1.54 in) dia.** **b: 30 mm (1.18 in) dia.**

NOISE, VIBRATION, AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

ECS004A6

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.

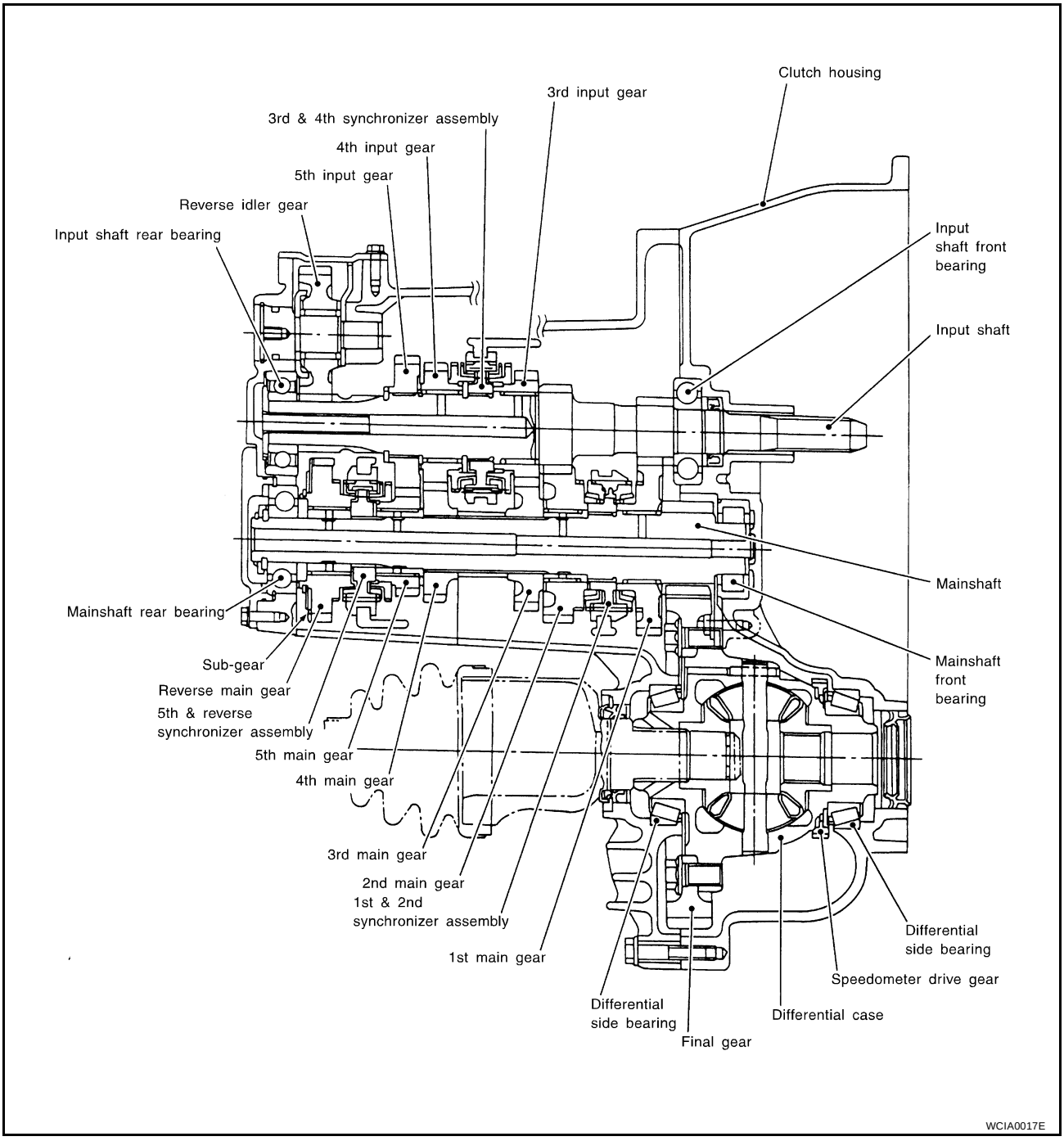
Reference page		MT-11	MT-11	MT-11	MT-19			MT-14	MT-21		MT-20, MT-22			
SUSPECTED PARTS (Possible cause)		(Oil level is low)	(Wrong oil)	(Oil level is high)	GASKET (Damaged)	OIL SEAL (Worn or damaged)	O-RING (Worn or damaged)	CONTROL ROD (Worn)	CHECK PLUG RETURN SPRING AND CHECK BALL (Worn or damaged)	SHIFT FORK (Worn)	GEAR (Worn or damaged)	BEARING (Worn or damaged)	BAULK RING (Worn or damaged)	INSERT SPRING, SHIFTING INSERT (Damaged)
Symptom	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

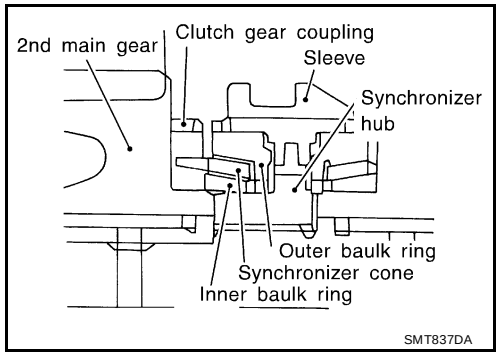
CROSS-SECTIONAL VIEW

ECS004A7



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

Replacement

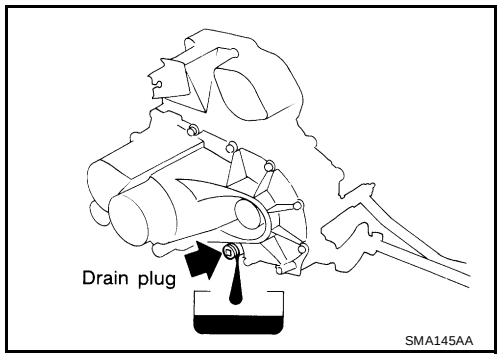
ECS004A8

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 on the transaxle.

Drain plug : 10 - 19 N·m (1.0 - 2.0 kg-m, 87 - 173 in-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, Viscosity SAE 75W-85
Capacity (reference) : Approximately 3.0 ℓ (3 1/8 US qt, 2 5/8 Imp qt)

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

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

CAUTION:
Do not reuse gasket.

Checking

ECS004A9

OIL LEAKAGE AND OIL LEVEL

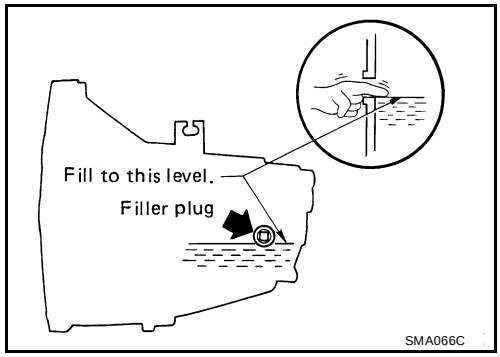
- Check that oil is not leaking from transaxle.
- Check oil level from filler plug mounting hole as shown in the figure.

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.



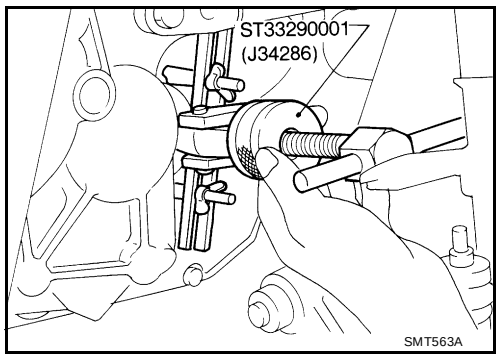
SIDE OIL SEAL

PFP:32113

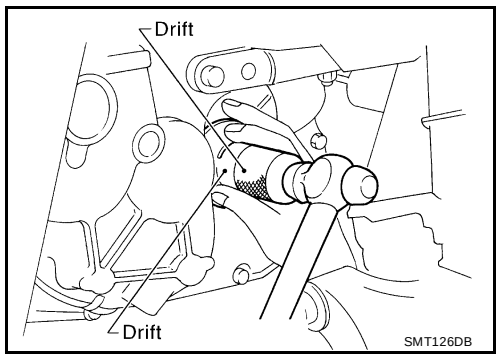
Removal and Installation

ECS004AA

1. Remove drain plug and drain gear oil from transaxle.
2. Remove drive shafts. Refer to FAX-16, "Removal" .
3. Remove differential oil seal using Tool.



4. Install differential oil seal with a suitable tool.
   - Apply multi-purpose grease to seal lip of oil seal before installing.

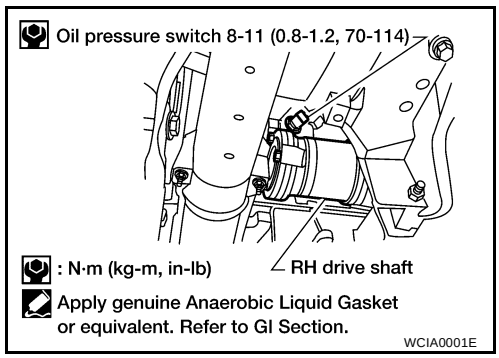


5. Install drive shafts. Refer to FAX-18, "Installation" .

- Install differential oil seal so that dimension “A” and “B” are within specifications.

Unit: mm (in)

Item	Model	A	B
Dimension	QG18DE (RS5F70A)	0.5 (0.020) or less	5.5 - 6.5 (0.217 - 0.256)



POSITION SWITCH

PFP:32005

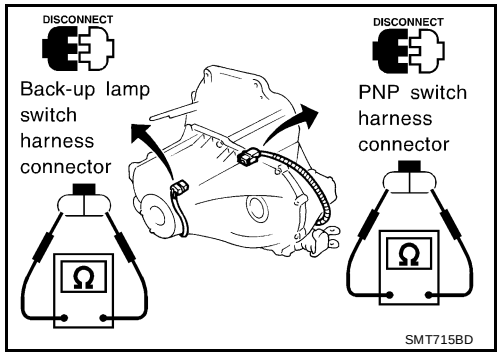
Position Switch Check

ECS004AB

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

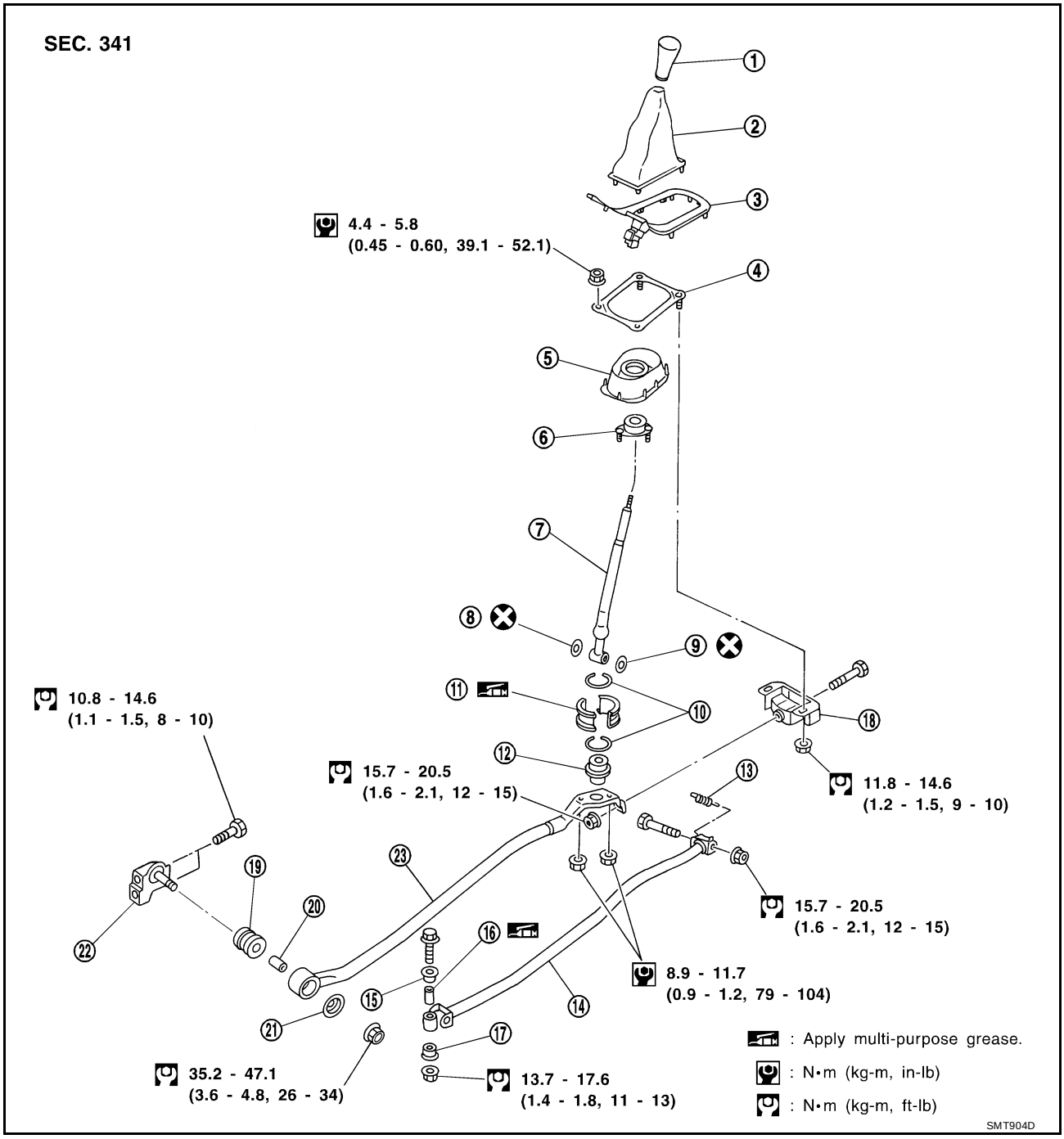
PFP:34103

Removal and Installation

ECS004AC

TRANSAXLE GEAR CONTROL

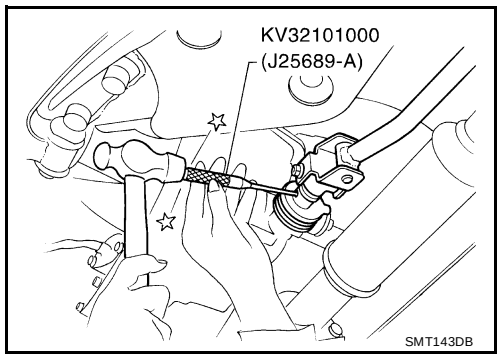
Refer to the figure below for removal and installation procedure.



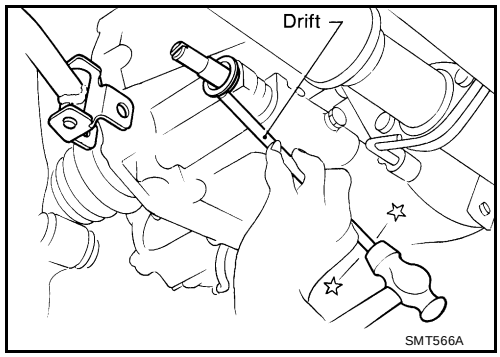
1.	Control lever knob	2.	Boot	3.	Finisher
4.	Control lever bracket	5.	Dust cover	6.	Socket
7.	Control lever	8.	O-ring	9.	O-ring
10.	Ring spring	11.	Bearing seat	12.	Seat
13.	Return spring	14.	Control rod	15.	Bushing
16.	Collar	17.	Bushing	18.	Bracket
19.	Bushing	20.	Collar	21.	Washer
22.	Support rod bracket	23.	Support rod		

STRIKING ROD OIL SEAL

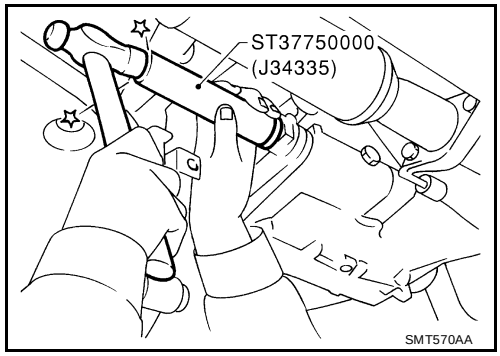
1. Remove transaxle control rod from yoke.
2. Remove retaining pin of yoke using Tool.
   - Be careful not to damage boot.
3. Remove the boot.



4. Remove striking rod oil seal with a suitable tool.



5. Install striking rod oil seal using Tool.
   - Apply multi-purpose grease to seal lip of oil seal before installing.
6. Install the boot.
7. Install yoke and retaining pin.
8. Connect the transaxle control rod to the yoke.



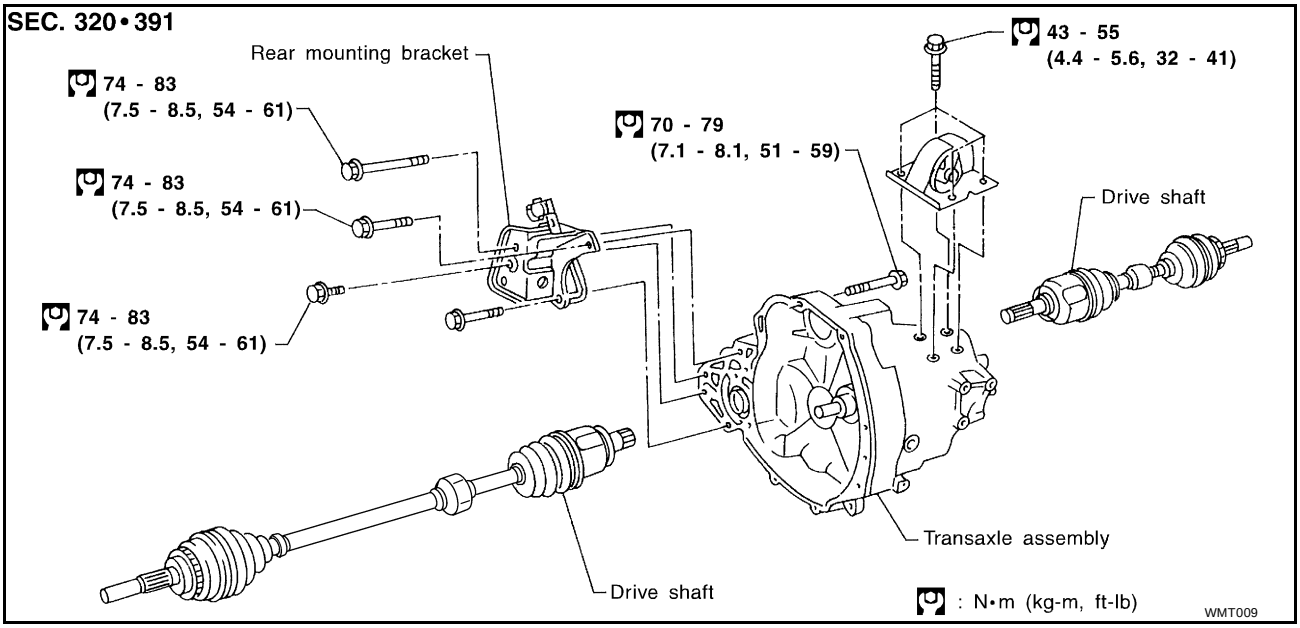
TRANSAXLE ASSEMBLY

PFP:32010

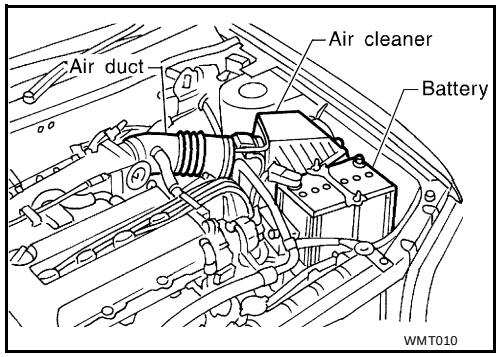
Removal and Installation

ECS004AD

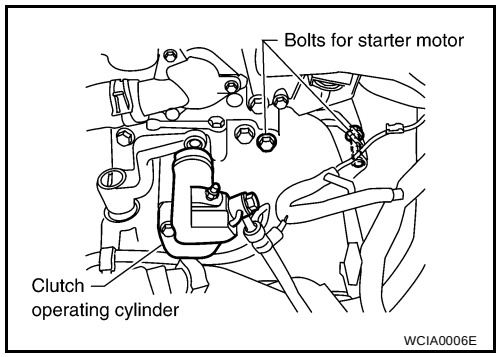
REMOVAL



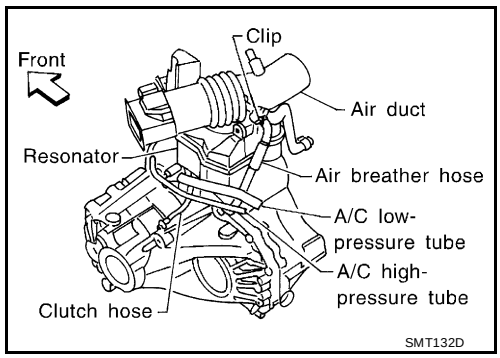
1. Remove battery negative terminal.
2. Remove air cleaner and air duct.
3. Remove clutch operating cylinder from transaxle. Refer to CL-11, "Removal" .
4. Disconnect back-up lamp switch, speedometer sensor, PNP switch and ground harness connectors.



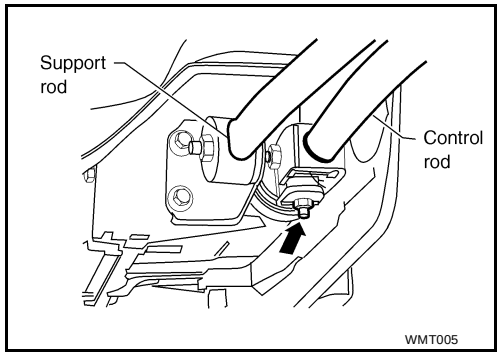
5. Remove starter motor from transaxle. Refer to SC-20, "Removal" .



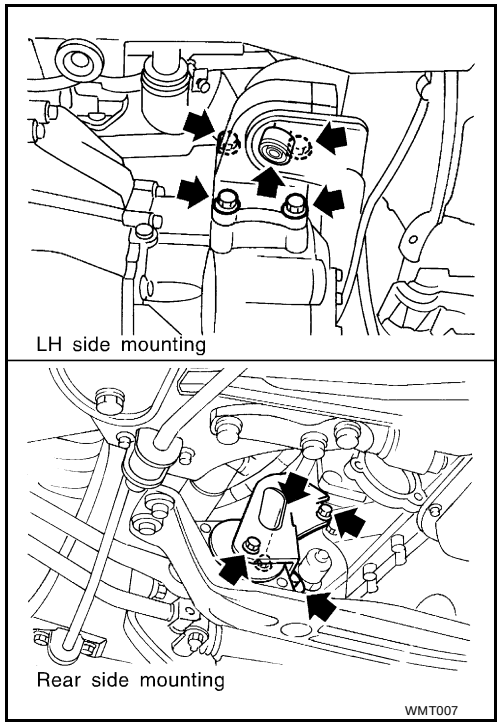
6. Remove air breather hose.



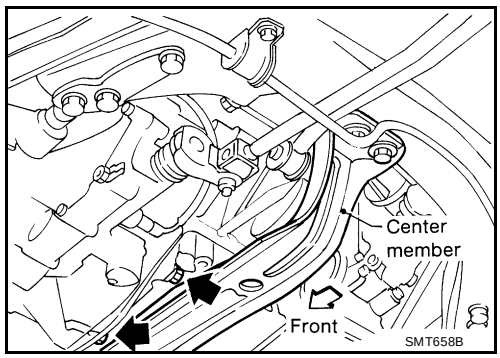
7. Remove shift control rod and support rod from transaxle.
8. Remove the drain plug and drain gear oil from transaxle.
9. Draw out drive shafts from transaxle. Refer to FAX-16, "Removal" .



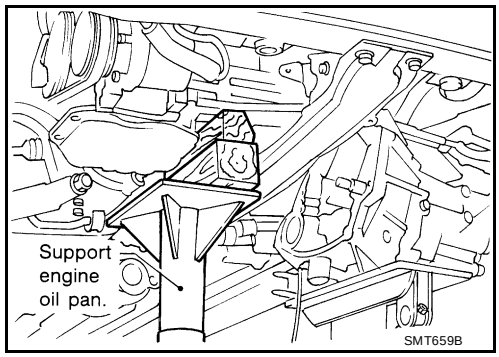
10. Support engine by placing a jack under oil pan.
    CAUTION:
    Do not place jack under oil pan drain plug.
11. Remove LH side and rear side mounting bolts.



12. Remove lower housing bolts.



13. Remove bolts securing transaxle.
14. Lower transaxle while supporting it with a jack.



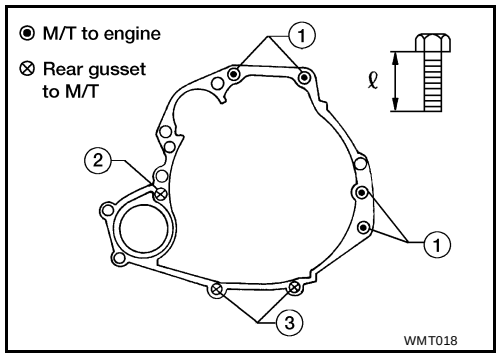
INSTALLATION

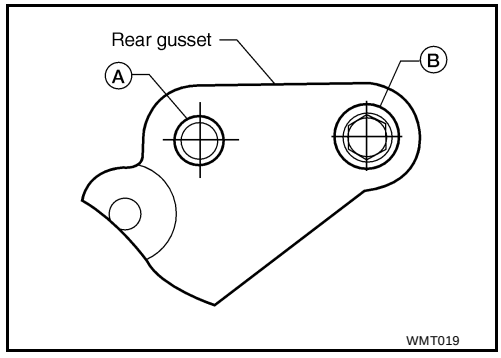
- Tighten starter motor to transaxle.

Starter motor bolt tightening torque : 31 - 42 N·m (3.2 - 4.3 kg-m, 23 - 31 ft-lb)

- Tighten LH and rear mounts to the specified torque. Refer to EM-54, "Removal and Installation" .
- Install transaxle and any part removed.

Bolt No.		Tightening torque N·m (kg-m, ft-lb)	"ℓ" mm (in)
1		30 - 40 (3.1 - 4.1, 22 - 30)	50 (1.97)
2		30 - 40 (3.1 - 4.1, 22 - 30)	30 (1.18)
3		16 - 21 (1.6 - 2.1, 12 - 15)	25 (0.98)
Front gusset to engine		30 - 40 (3.1 - 4.1, 22 - 30)	20 (0.79)
Rear gusset to engine	A	16 - 21 (1.6 - 2.1, 12 - 15)	17.5 (0.689)
	B		20 (0.79)

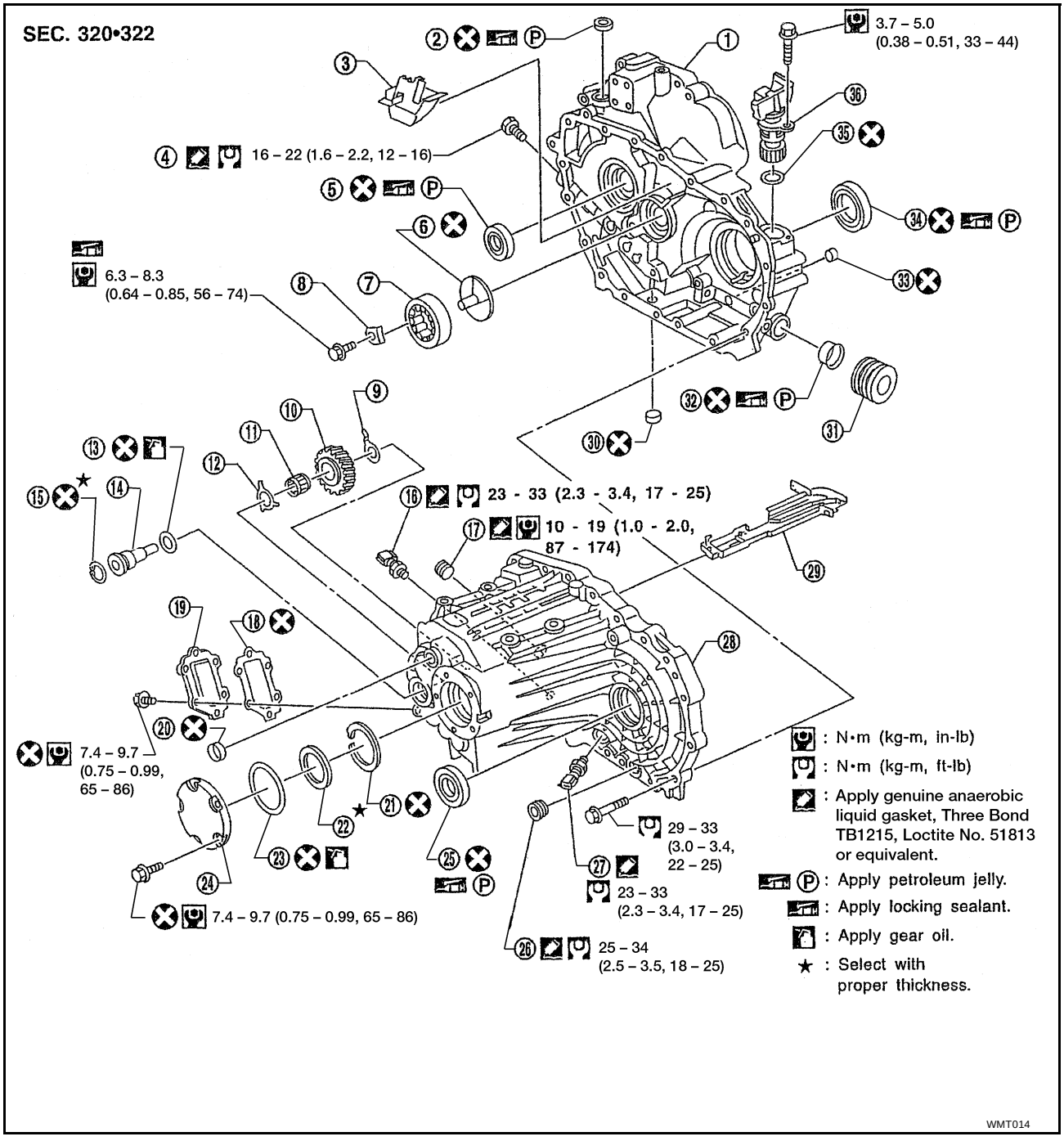




Component Parts

ECS004AE

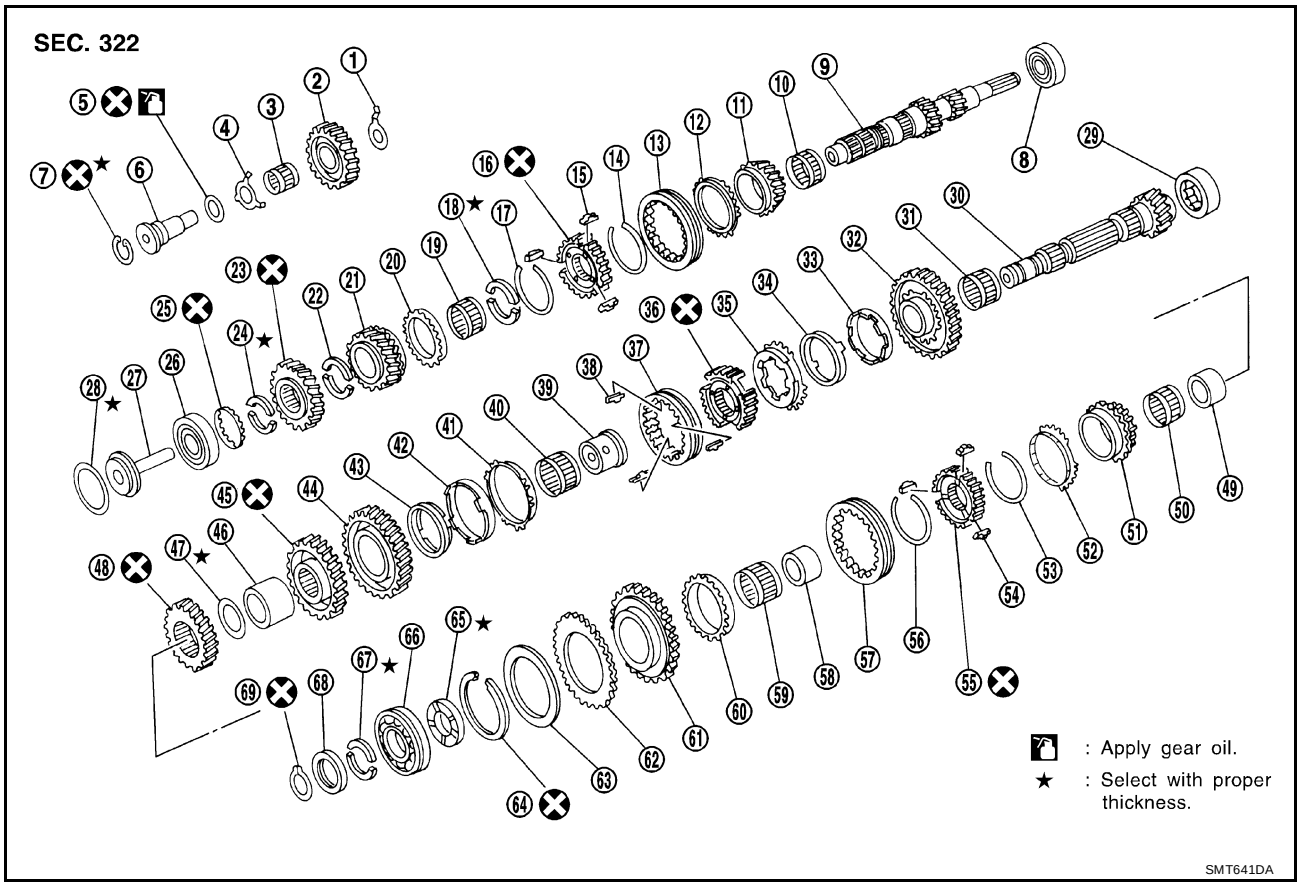
CASE COMPONENTS



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.	Reverse idler gear front thrust washer
10.	Reverse idler gear	11.	Reverse idler gear bearing	12.	Reverse idler gear rear thrust washer
13.	O-ring	14.	Reverse idler gear shaft	15.	Snap ring
16.	Back-up lamp switch	17.	Filler plug	18.	Side cover gasket
19.	Side cover	20.	Welch plug	21.	Mainshaft bearing snap ring
22.	Mainshaft rear bearing adjusting shim	23.	O-ring	24.	Rear cover
25.	Differential oil seal	26.	Drain plug	27.	PNP switch
28.	Transmission case	29.	Oil gutter	30.	Welch plug

31. Boot
32. Striking rod oil seal
33. Welch plug
34. Differential oil seal
35. O-ring
36. Speedometer pinion

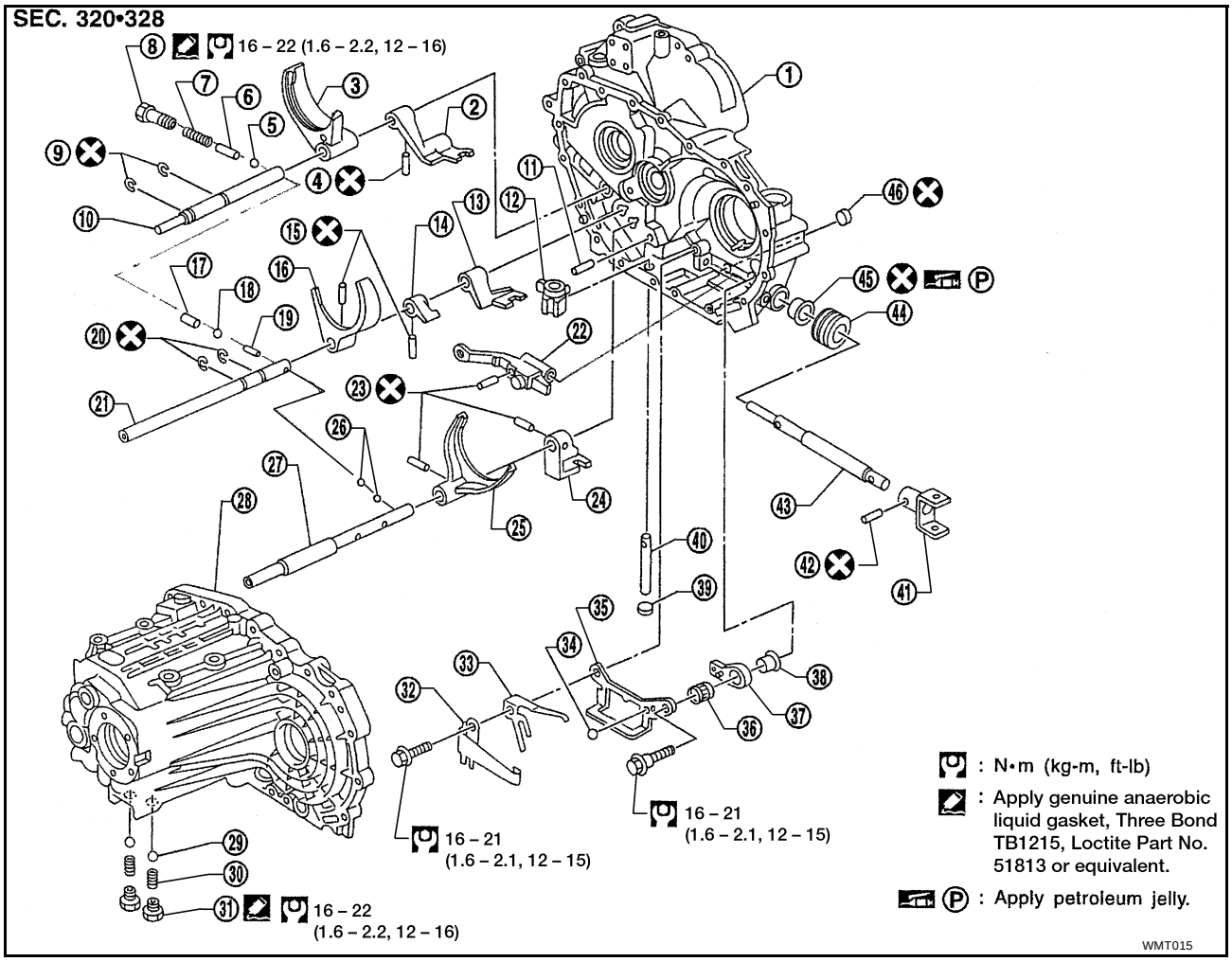
GEAR COMPONENTS



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 bushing
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

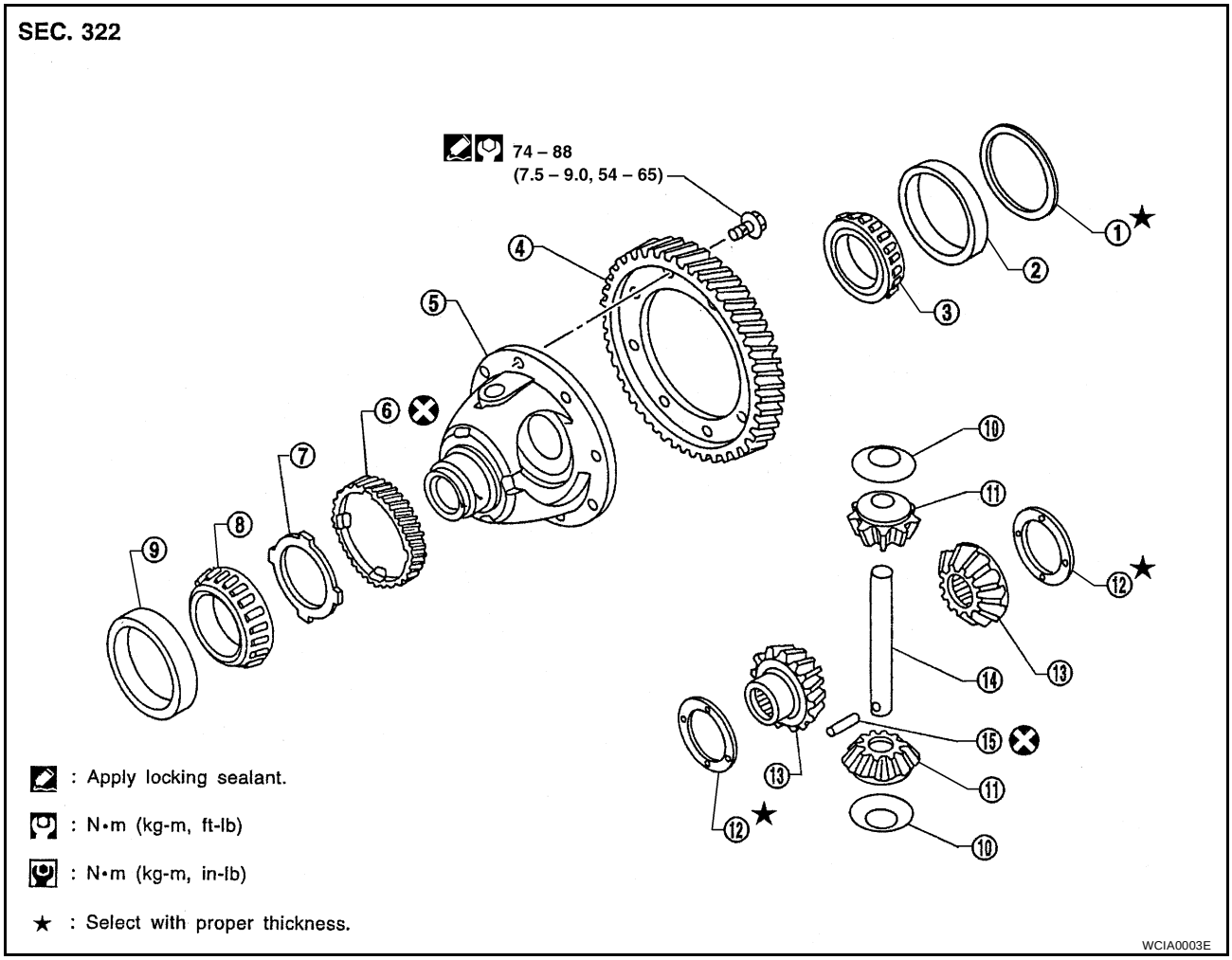
SHIFT CONTROL COMPONENTS



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

SEC. 322



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

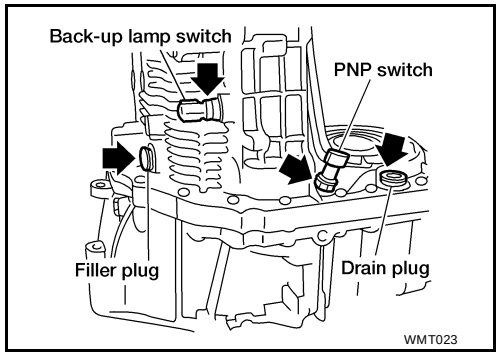
Disassembly and Assembly

ECS004AF

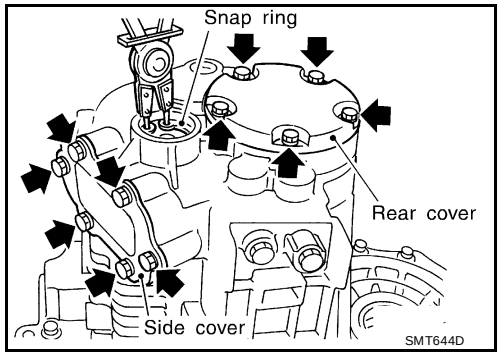
DISASSEMBLY

Transaxle Case

1. Remove back-up lamp switch, PNP switch, drain plug, and filler plug from transaxle case.



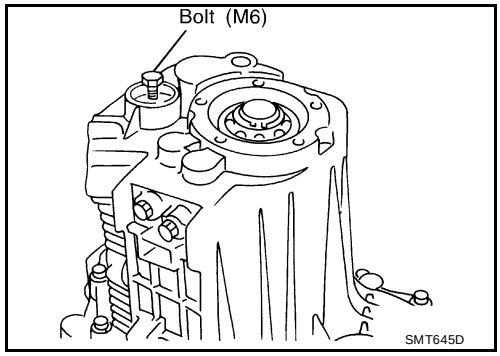
2. Remove snap rings from reverse idler shaft.
3. Remove side cover and rear cover from case.
4. Remove O-ring and mainshaft bearing adjusting shim.



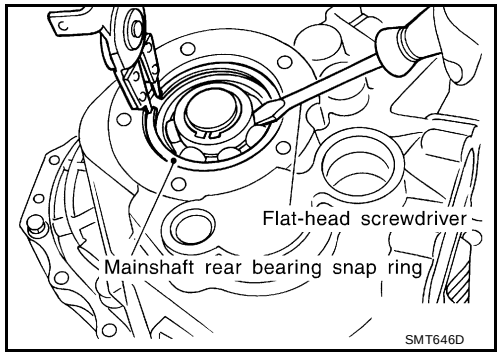
5. Remove reverse idler gear shaft.

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.

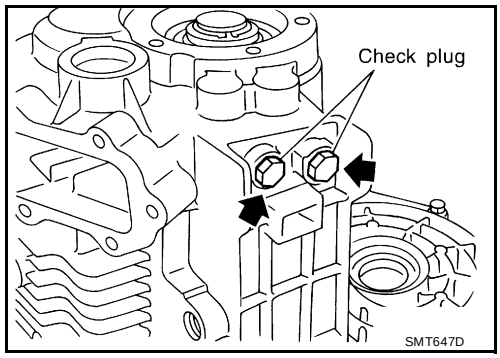
6. Remove reverse idler gear, thrust washer (front, rear), and bearing from case.



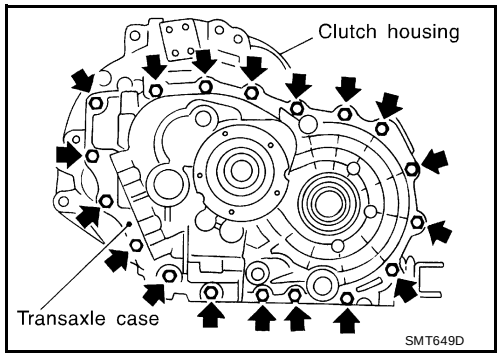
7. Remove snap ring of mainshaft bearing from case.



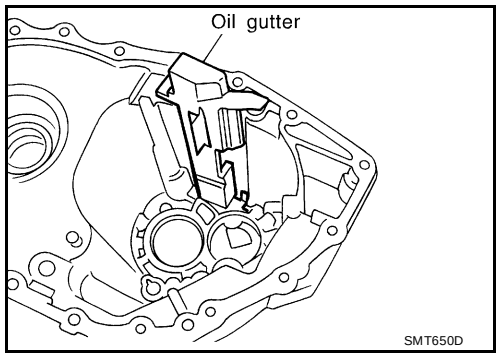
8. Remove check plugs, springs, and check balls from case.



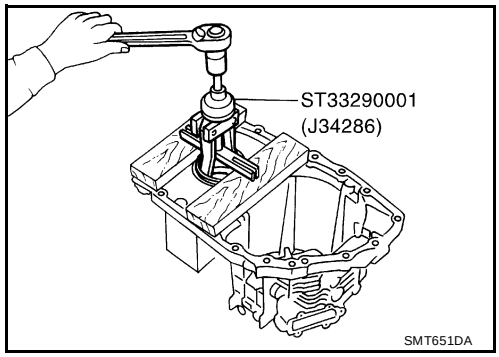
9. Remove mounting bolts.
10. Remove input shaft rear bearing adjusting shim from transaxle case.



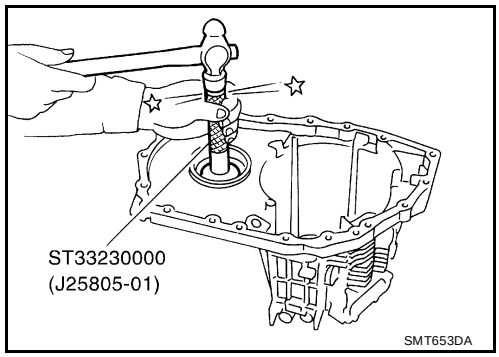
11. Remove oil gutter from case.



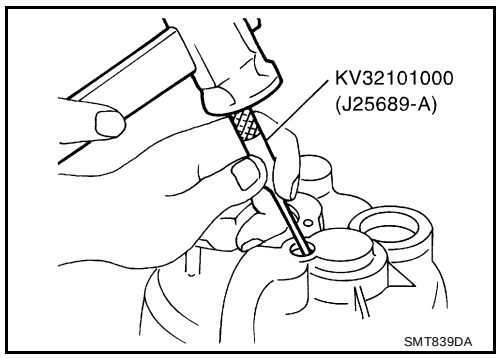
12. Remove differential side bearing outer race and adjusting shim from case using Tool.



13. Remove differential oil seal from case using Tool.

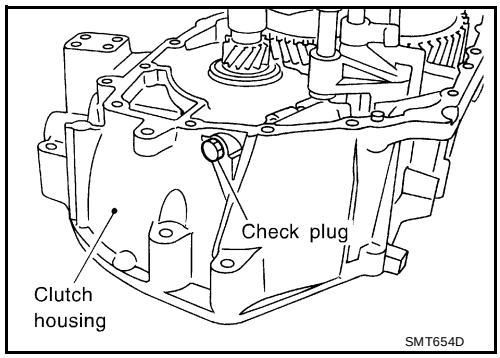


14. Remove welch plugs from case using Tool.

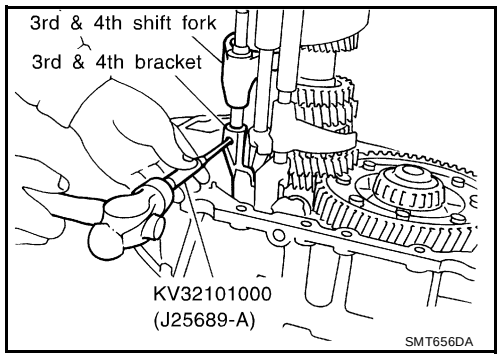


Clutch Housing

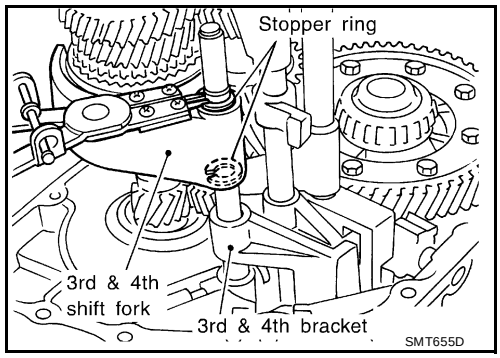
1. Remove transaxle case from clutch housing.
2. Remove check plugs, check springs, check pins, and check balls from housing.



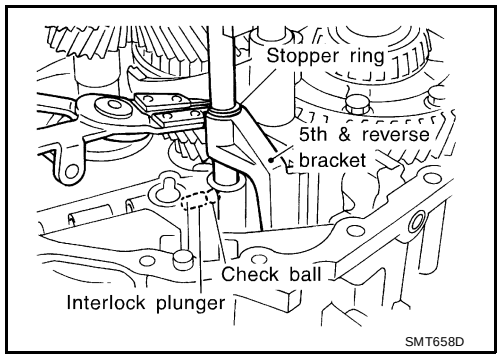
3. Remove 3rd & 4th bracket retaining pin using Tool.



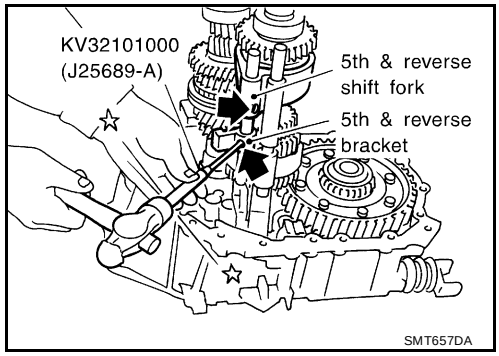
4. Remove 3rd & 4th shift fork stopper ring.
5. Remove 3rd & 4th fork rod.
6. Remove 3rd & 4th shift fork and bracket.



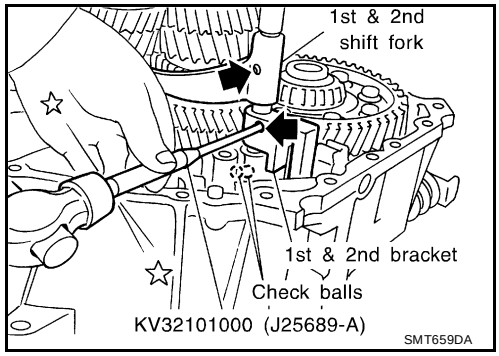
7. Remove interlock plunger and check ball.
8. Remove 5th & reverse bracket stopper ring.



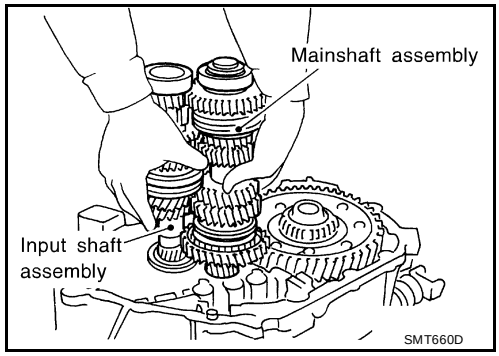
9. Remove retaining pin from 5th & reverse shift fork and reverse switch bracket using Tool.
10. Remove 5th & reverse fork rod.
11. Remove interlock pin from 5th & reverse fork rod using Tool.
12. Remove reverse switch bracket and 5th & reverse bracket.



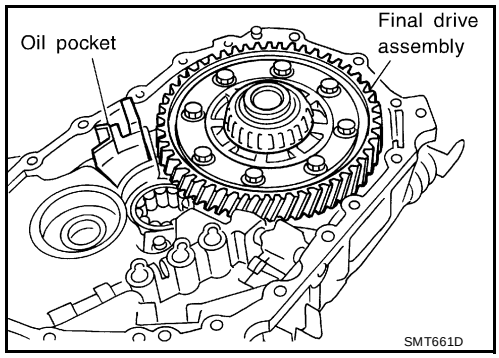
13. Remove check ball from housing.
14. Remove retaining pin for 1st & 2nd shift fork and bracket using Tool.
15. Remove 1st & 2nd fork rod.
16. Remove 5th & reverse and 1st & 2nd shift forks, and 1st & 2nd bracket.



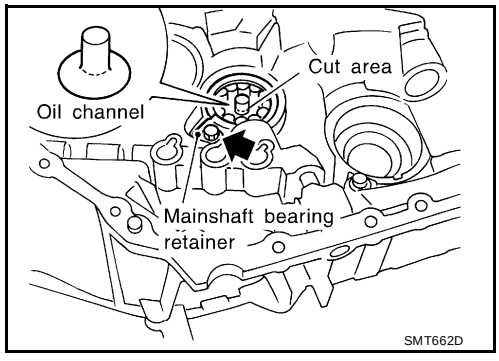
17. Remove both input shaft and mainshaft assemblies from housing.



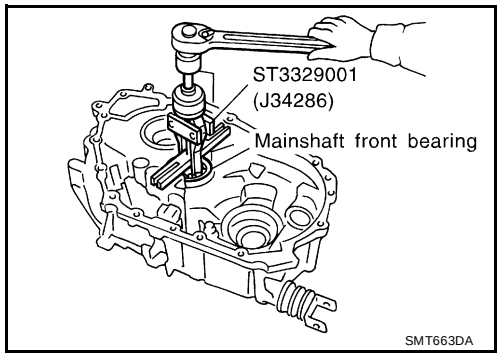
18. Remove final drive assembly from housing.
19. Remove oil pocket from housing.



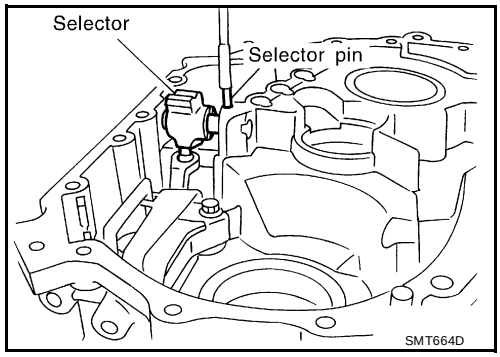
20. Remove mainshaft bearing retainer from housing.
21. Cut off oil channel using a cutter as shown in the figure.



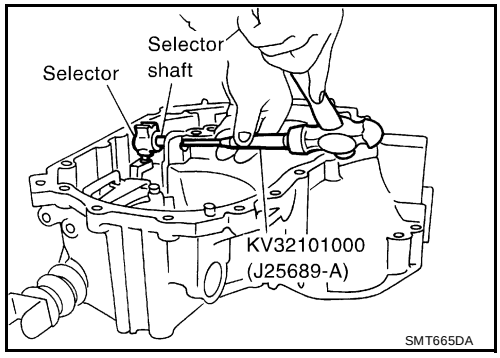
22. Remove mainshaft front bearing from housing using Tool.



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

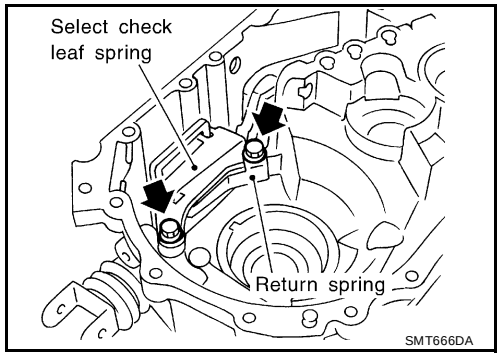


24. Remove selector shaft and plug, then remove selector using Tool.

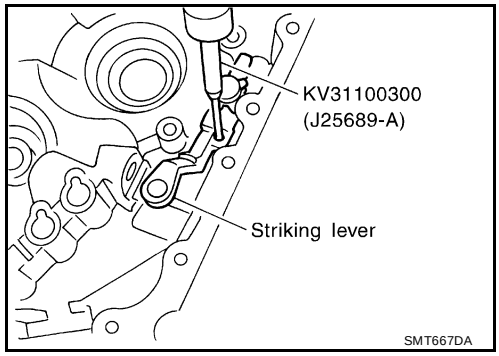


25. Remove reamer bolts, then remove select check leaf spring, return spring, steel ball, reverse gate, selector arm, bearing, and bushing.

CAUTION:
Be careful not to lose the steel ball.

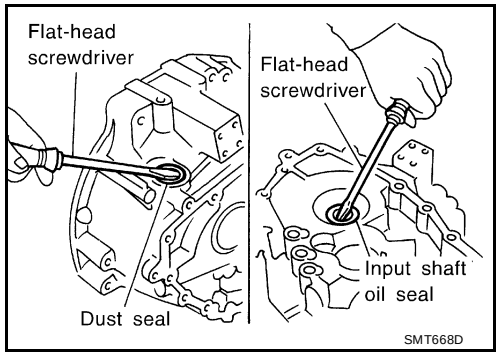


26. Remove retaining pin and plug from striking lever using Tool.
27. Remove striking rod, then striking lever from housing.

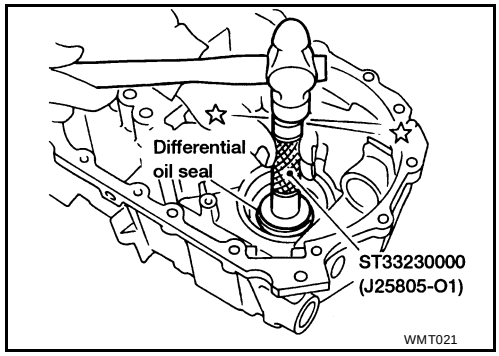


28. Using a flat-head screwdriver or other suitable tool, remove dust seal, input shaft oil seal, and striking rod oil seal from housing.

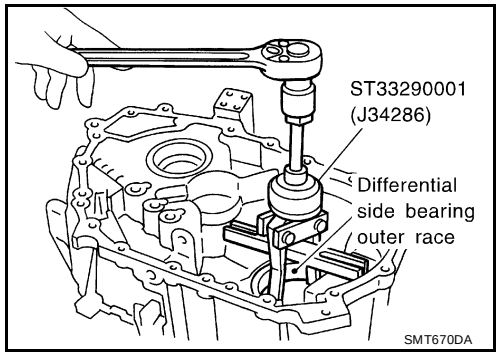
CAUTION:
When removing dust and oil seals, be careful not to damage mounting surfaces of dust seal and oil seal.



29. Remove differential oil seal from housing using Tool.



30. Remove differential side outer race from housing using Tool.

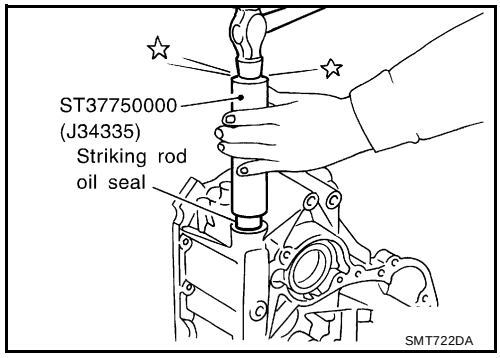


ASSEMBLY

Clutch Housing

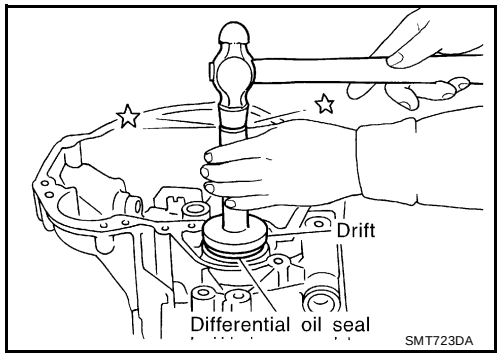
1. Hammer the striking rod oil seal into clutch housing as far as it will go using Tool.

   CAUTION:
   Do not reuse striking rod oil seal.



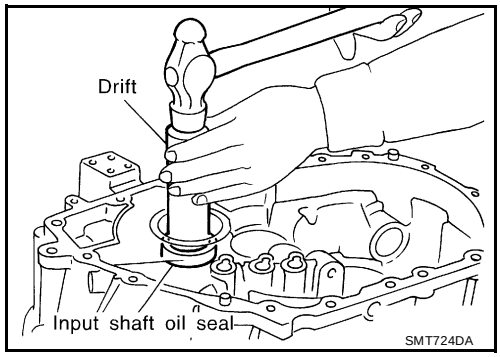
2. Hammer the differential oil seal into clutch housing with a suitable tool until it becomes flush with clutch housing end face.

   CAUTION:
   Do not reuse differential oil seal.



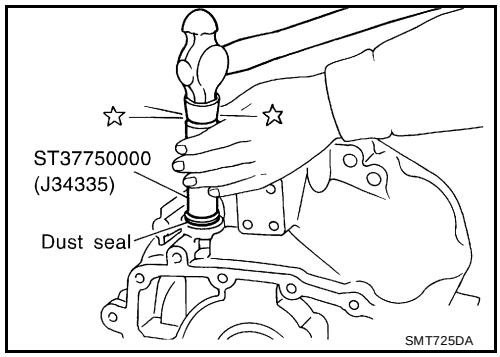
3. Hammer input shaft oil seal into clutch housing as far as it will go with a suitable tool.

   CAUTION:
   Do not reuse input shaft oil seal.

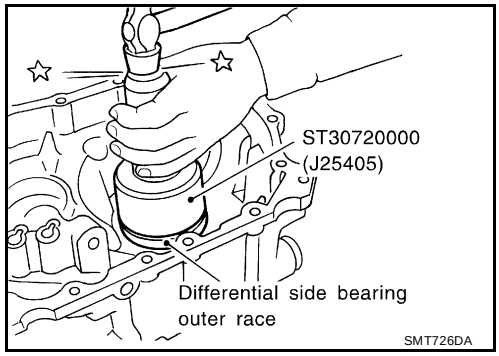


4. Hammer the dust seal into clutch housing as far as it will go using Tool.

   CAUTION:
   Do not reuse dust seal.

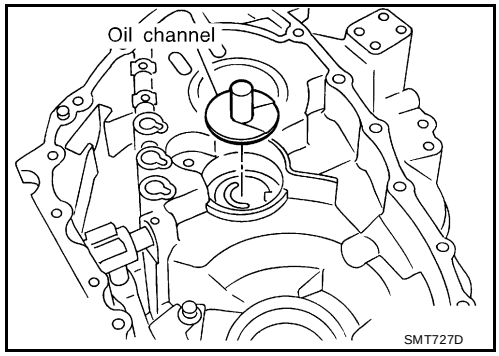


5. Install outer race of differential side bearing using Tool.

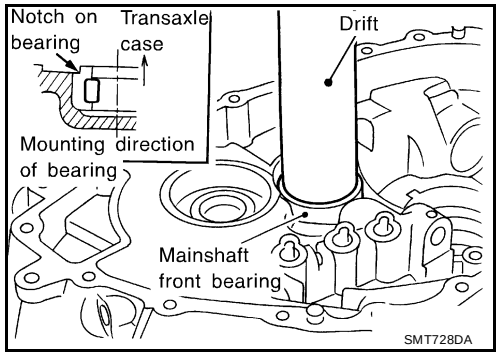


6. Install new oil channel (mainshaft).

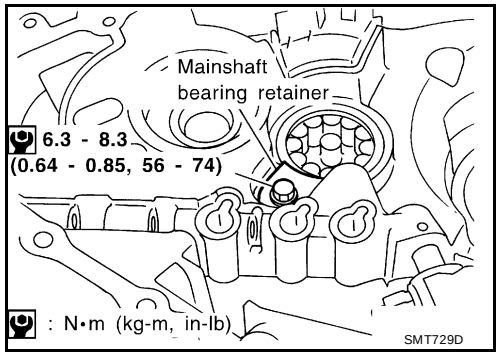
CAUTION:
Pay attention to installation direction of oil channel.



7. Align the notches on mainshaft front bearing and transaxle case. Then, install mainshaft front bearing with a suitable tool.



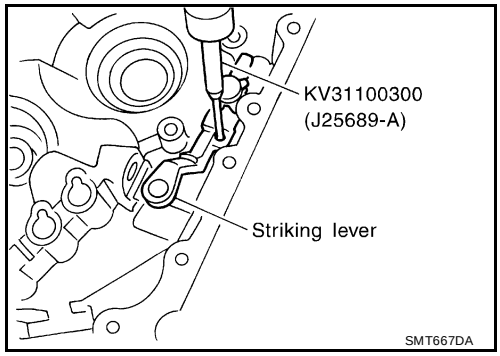
8. Install mainshaft bearing retainer, and tighten bolts with specified torque.



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

CAUTION:

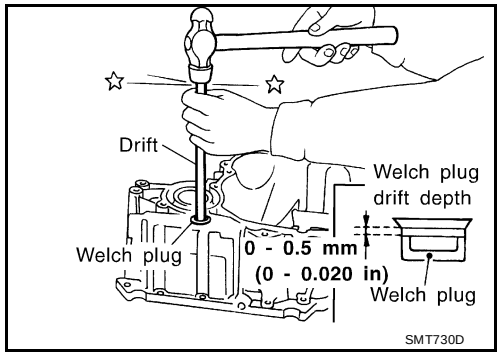
- **Before installing striking rod, wrap the end with a vinyl tape or similar product to prevent oil seal from being damaged.**
- **Do not reuse retaining pin.**



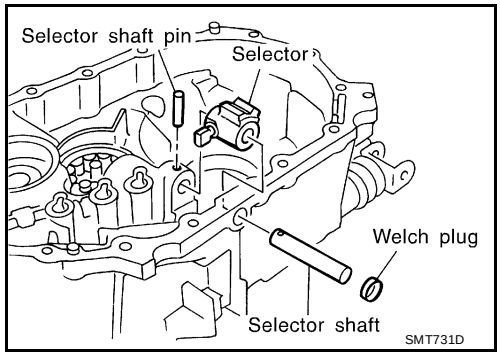
10. Hammer the welch plug (striking lever side) with a general-purpose drift [OD: 12 mm (0.47 in)] with a suitable tool.

CAUTION:

Do not reuse welch plug.



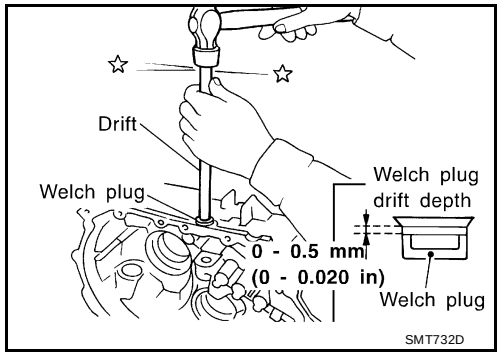
11. Install selector, selector shaft, and selector shaft pin into clutch housing.



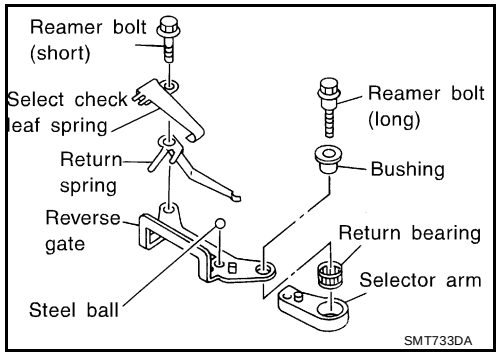
12. Hammer the welch plug (selector shaft side) with a general-purpose drift [OD: 12 mm (0.47 in)] with a suitable tool.

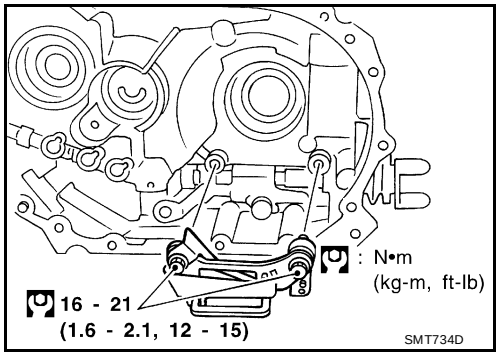
CAUTION:

Do not reuse welch plug.



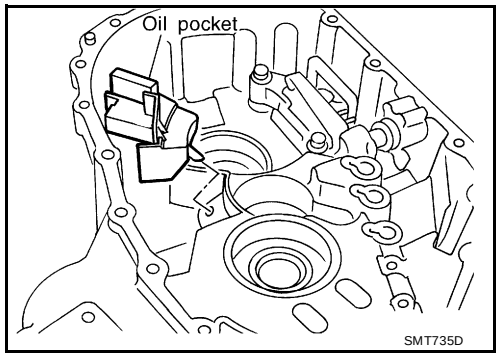
13. Install select check leaf spring, return spring, steel ball, reverse gate, selector arm, bushing, and return bearing. Then, tighten two reamer bolts with specified torque.





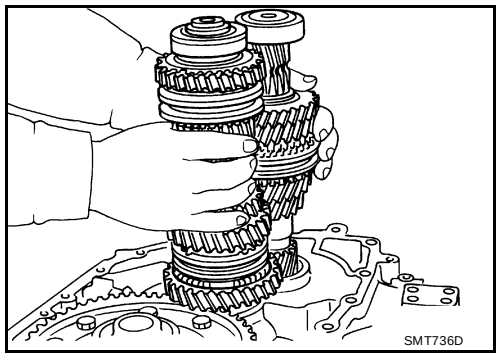
CAUTION:
Use correct reamer bolts for each installation point, because each bolt has a different length.

14. Install oil pocket.



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

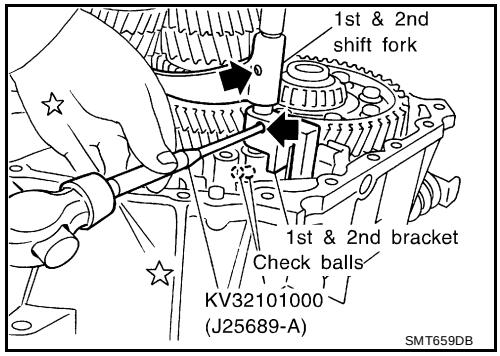
CAUTION:
Be careful not to damage input shaft oil seal during installation of input shaft assembly.



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

CAUTION:
Do not reuse retaining pin.

19. Install two check balls.

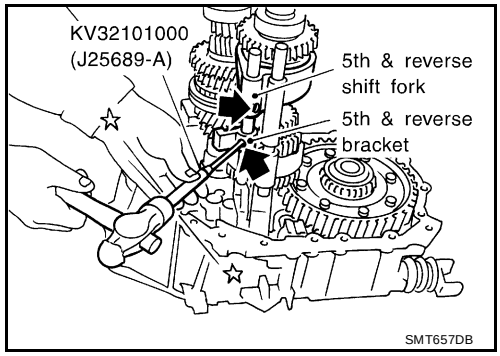


20. Install interlock pin into 5th & reverse fork rod using Tool.
21. Install reverse switch bracket, 5th & reverse bracket, and fork rod using Tool.
22. Install retaining pin for 5th & reverse shift fork and reverse switch bracket using Tool.

CAUTION:
Do not reuse retaining pin.

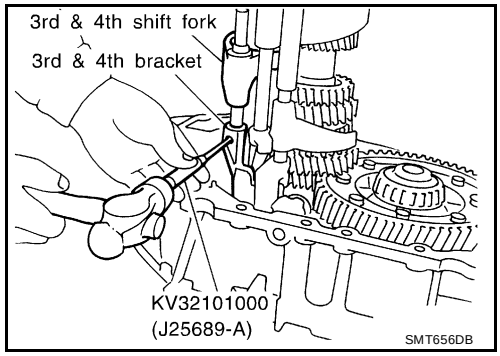
23. Install 5th & reverse bracket stopper ring.

CAUTION:
Do not reuse stopper pin.



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

CAUTION:
Do not reuse retaining pin.

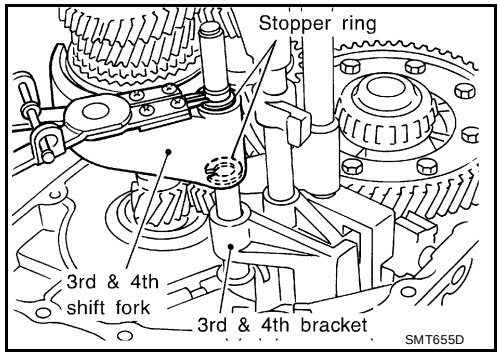


27. Install 3rd & 4th shift fork stopper ring.

CAUTION:
Do not reuse stopper ring.

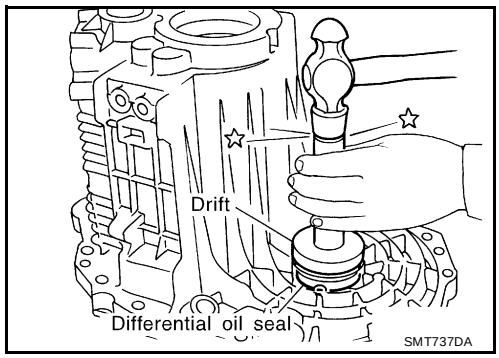
28. Install check ball, check pin, and check spring, and apply Three Bond TB1215, Loctite Part No. 51813 or equivalent onto check plug. Then, tighten it with specified torque.

Tightening torque **: Refer to MT-21, "SHIFT CONTROL COMPONENTS" .**

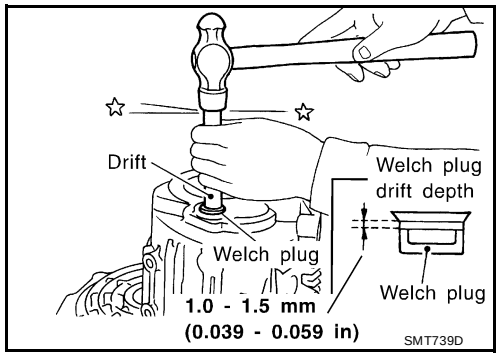


Transaxle Case

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



2. Install welch plug into transaxle case with a suitable tool.



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

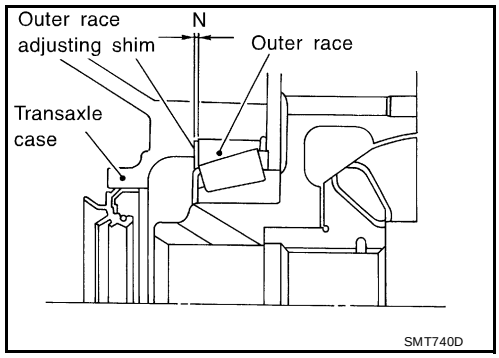
End play : 0.15 - 0.21 mm (0.0059 - 0.0083 in)

Dimension “N” = (N1 – N2) + End play

N : Thickness of adjusting shim

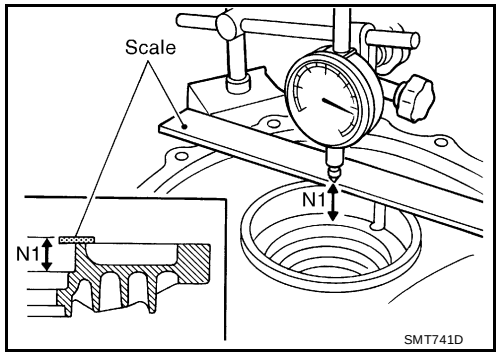
N1 : Distance between clutch housing case end face and mounting face of adjusting shim

N2 : Distance between differential side bearing and transaxle case



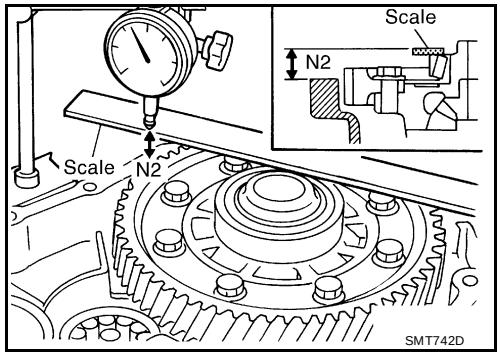
Differential side bearing adjusting shims : Refer to MT-67, "Available Shims — Differential Side Bearing Preload and Adjusting Shim" .

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

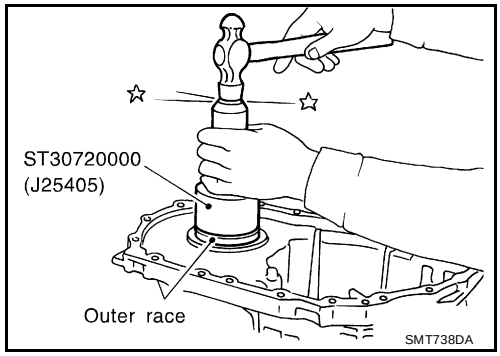


b. Install outer race onto differential side bearing on final gear side. Holding lightly the outer race horizontally by hand, rotate final gear five times or more (for smooth movement of bearing roller).

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.



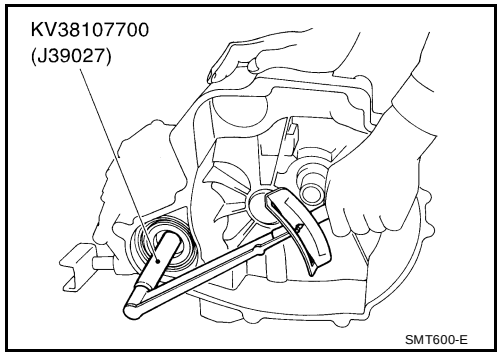
4. Install selected shim and bearing outer race using Tool.



5. Measure turning torque of final drive assembly using Tool.

Turning torque of final drive assembly (New bearing) : 2.9 - 6.9 N-m (30 - 70 kg-cm, 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.

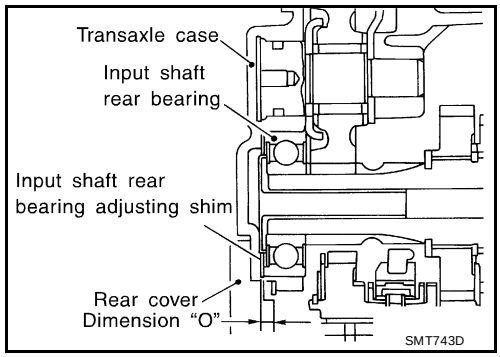
End play : 0 - 0.06 mm (0 - 0.0024 in)

Dimension “O” = (O1 – O2) + End play

O : Thickness of adjusting shim

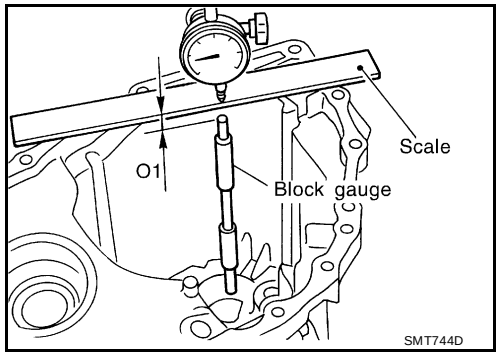
O1 : Distance between transaxle case end face and mounting face of adjusting shim

O2 : Distance between clutch housing case end face and end face of input shaft rear bearing



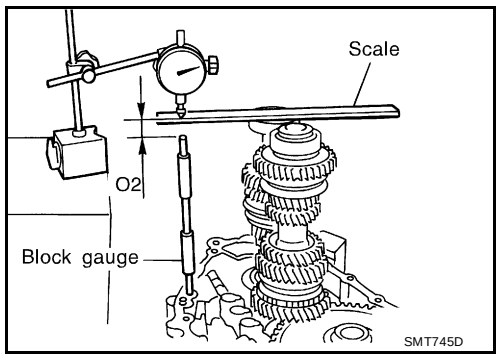
Input shaft rear bearing adjusting shims : Refer to MT-64, "Available Adjusting Shims" .

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

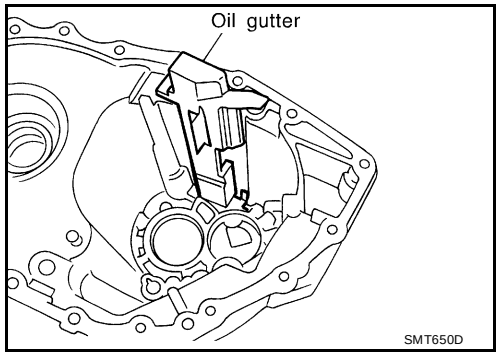


b. Using block gauge, scale, and dial gauge as shown in the figure, measure dimension “O2” between clutch housing case end face and end face of input shaft rear bearing.

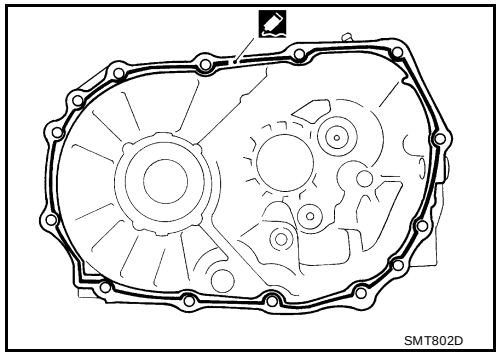
7. Install selected input shaft rear bearing adjusting shim onto input shaft.



8. Install oil gutter into transaxle case.

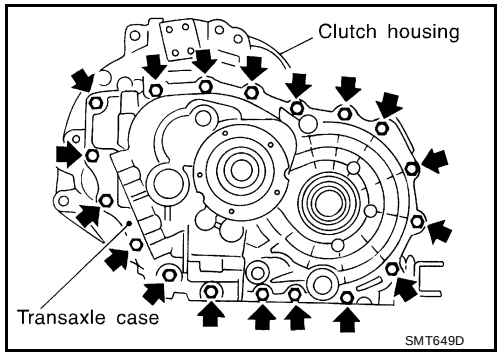


9. Clean mating surfaces of clutch housing and transaxle case. Check for cracks and damage, then apply sealant. Use Genuine Anaerobic Liquid Gasket or equivalent. Refer to GI-44, "Recommended Chemical Products and Sealants" .



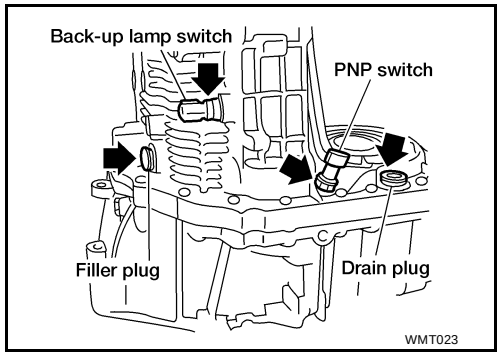
10. Install transaxle case onto clutch housing, and tighten mounting bolts with specified torque.

Tightening torque **: Refer to MT-19, "CASE COMPONENTS" .**

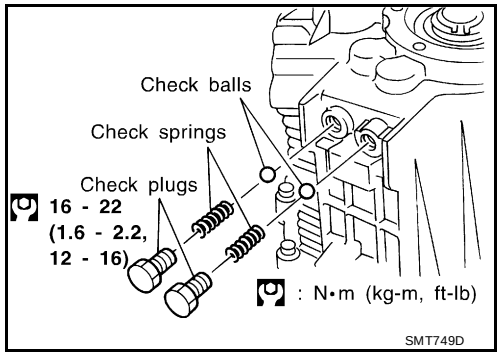


11. Apply sealant to threads of back-up lamp switch, PNP switch, and drain plug, then install them. Use Genuine Anaerobic Liquid Gasket or equivalent. Refer to GI-44, "Recommended Chemical Products and Sealants" . (Fill the case with oil before installation of filler plug.)
12. Install speedometer pinion assembly.

CAUTION:
Do not reuse O-ring.

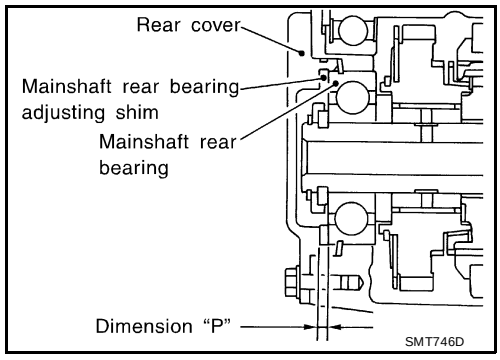


13. Install check springs and check balls. Apply sealant to the thread on the check plug, and install it.



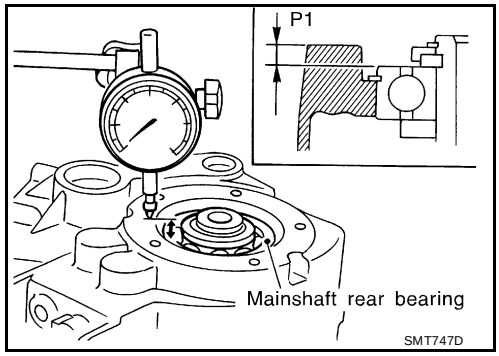
14. Calculate thickness of adjusting shim using the following procedure to satisfy specification of end play for mainshaft rear bearing.

End play **: 0 - 0.06 mm (0 - 0.0024 in)**
Dimension "P" = (P1 – P2) + End play
P **: Thickness of adjusting shim**
P1 **: Distance between transaxle case end face and mainshaft rear bearing**
P2 **: Distance between adjusting shim end face of rear cover and transaxle mounting face**

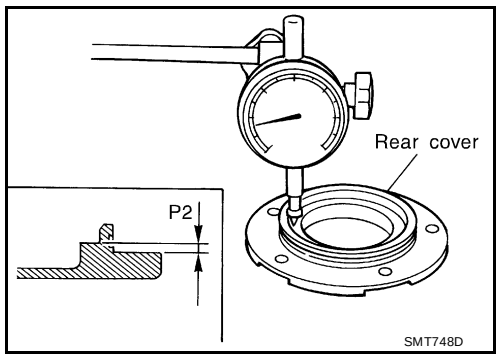


Mainshaft rear bearing adjusting shims **: Refer to MT-64, "Available Adjusting Shims" .**

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



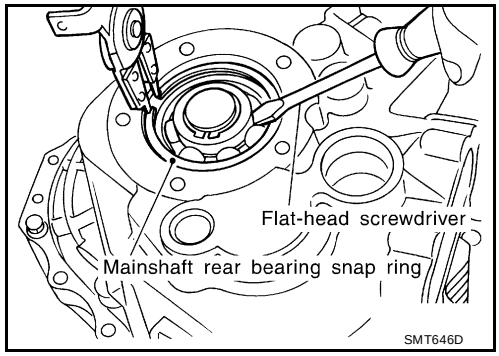
b. Using dial gauge as shown in the figure, measure dimension “P2” between adjusting shim mounting face of rear cover and transaxle mounting face.



15. Using snap ring pliers and flat-head screwdriver as shown in the figure, install snap ring.

CAUTION:
Do not reuse snap ring.

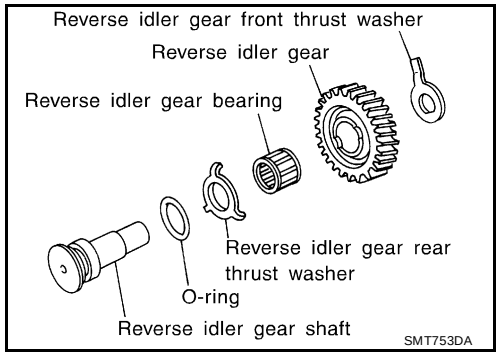
16. Install selected mainshaft adjusting shim.



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

CAUTION:

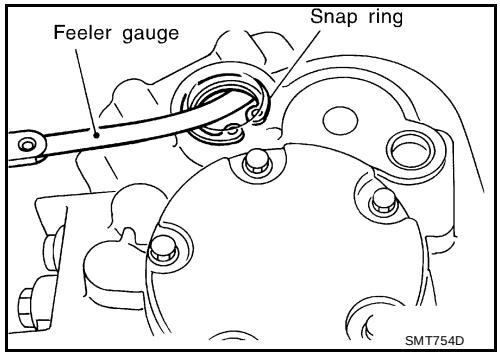
- **Do not reuse snap ring.**
- **Do not reuse O-ring.**
- **Before installation, apply gear oil to O-ring.**



19. 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-63, "Available Snap Rings" .



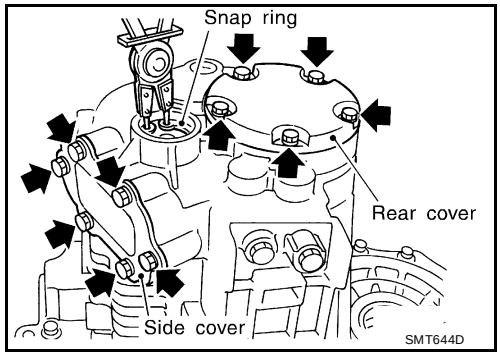
20. Install selected snap ring with a suitable tool.

CAUTION:
Do not reuse snap ring.

21. 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-19, "CASE COMPONENTS" .

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



INPUT SHAFT AND GEARS

PFP:32200

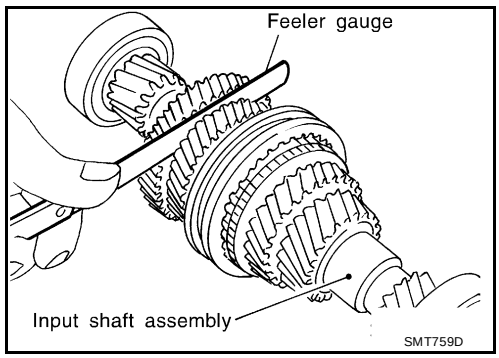
Disassembly

ECS004AG

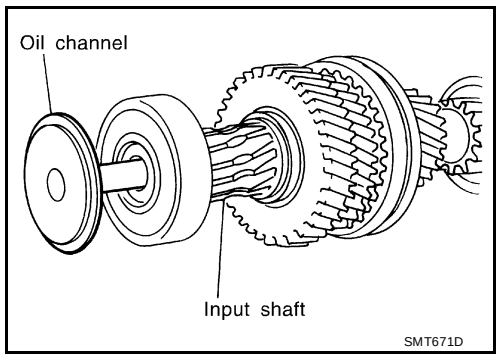
1. Before disassembly, measure the end plays of 3rd and 4th input gears with a suitable tool.

   Gear end play **: Refer to MT-63, "Gear End Play" .**

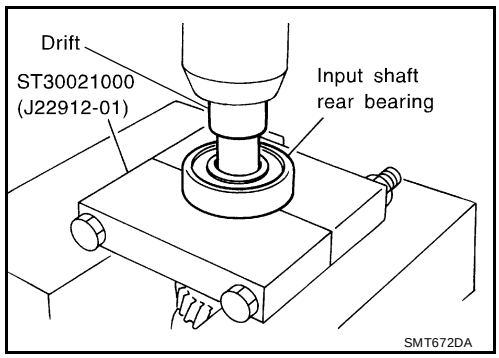
   - If end play is not within specification, disassemble and check the parts.



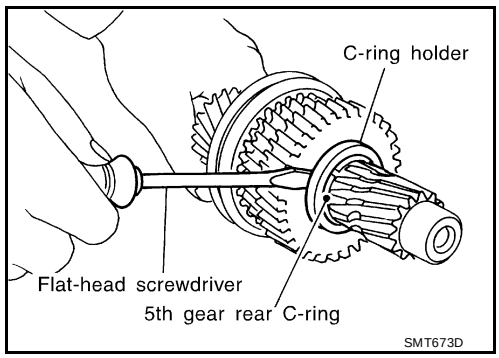
2. Remove oil channel from input shaft rear bearing.



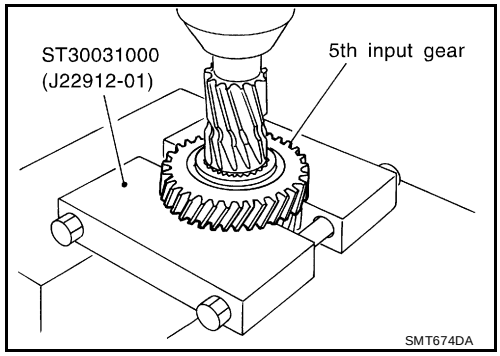
3. Press out input shaft rear bearing using Tool.



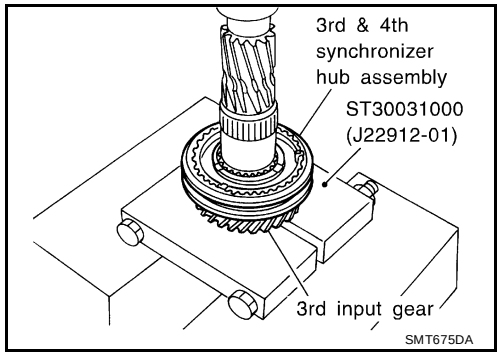
4. Remove C-ring holder.
5. Remove 5th gear rear C-ring.



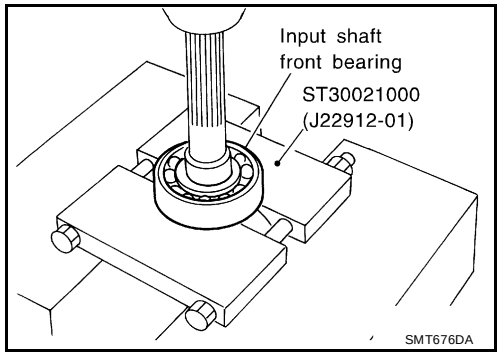
6. Remove 5th input gear from input shaft using Tool.
7. Remove 5th gear front C-ring.



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 using Tool.
10. Remove 3rd gear needle bearing.



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

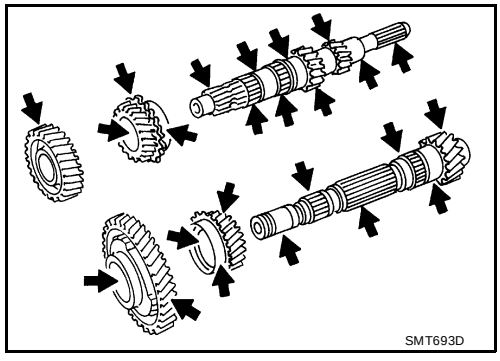


Inspection

GEAR AND SHAFT

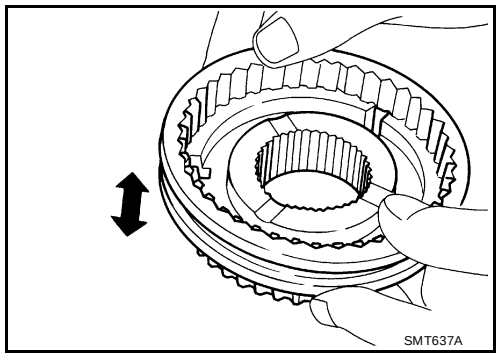
ECS004AH

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

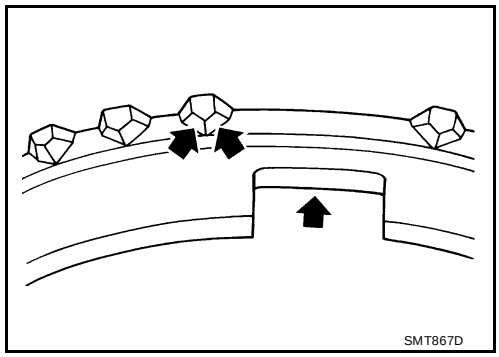


SYNCHRONIZERS

- 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.

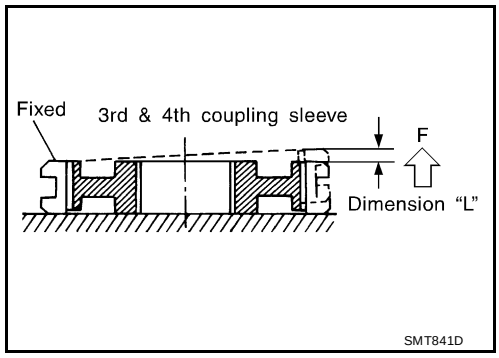

SMT637A

- 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 the end fixed and the other end lifted as shown in the figure. If the movement exceeds specification, replace the sleeve.

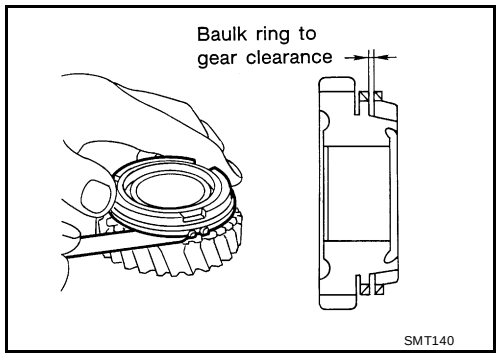
Coupling sleeve	Length “L”
3rd & 4th	0 - 0.95 mm (0 - 0.0374 in)



SMT841D

- Measure clearance between baulk ring and gear.

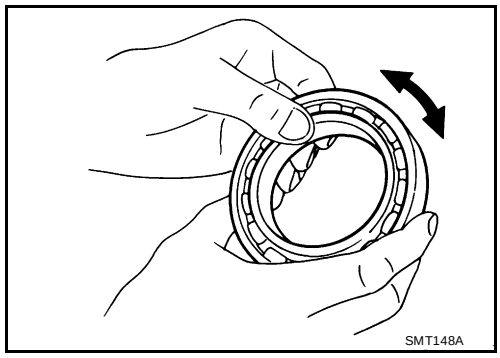
Clearance between baulk ring and gear : **Refer to** **MT-63, "Clearance Between Baulk Ring and Gear"** **.**



SMT140

BEARING

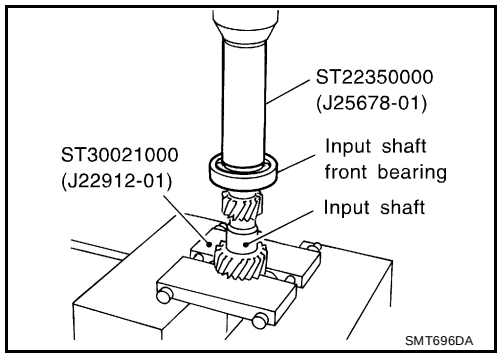
- Make sure bearings roll freely and are free from noise, cracks, pitting or wear.



Assembly

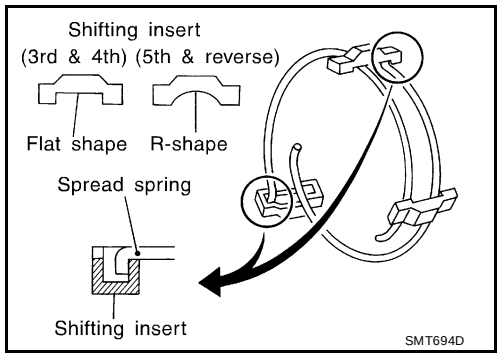
ECS004AI

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

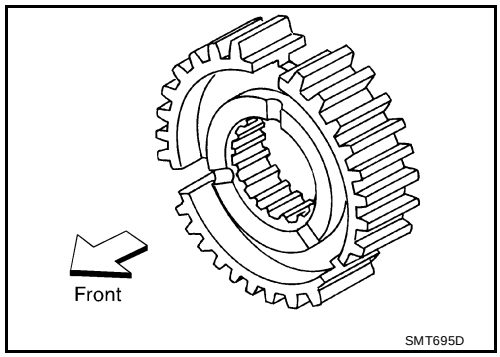


3. Install spread spring, shifting insert, and 3rd & 4th synchronizer hub onto 3rd & 4th coupling sleeve.
   - Pay attention to the shape of spread spring and shifting insert for correct assembly.
     Do not install spread spring hook onto the same shifting insert.

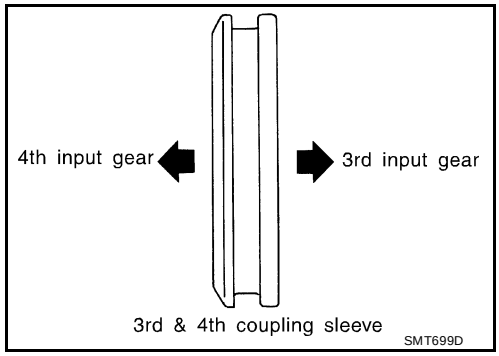
     CAUTION:
     Do not reuse 3rd & 4th synchronizer hub.



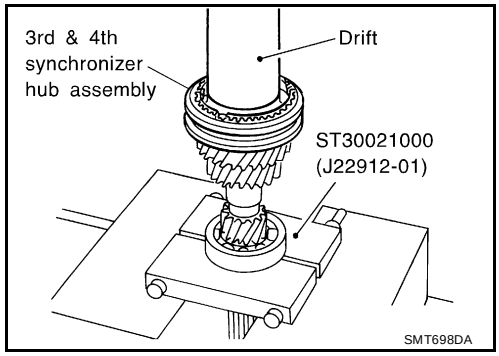
   - Install synchronizer hub with its three grooves facing the front side (3rd input gear side).



- 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 using Tool.

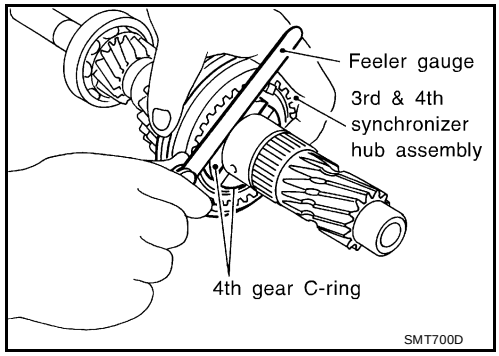


6. Measure the end play of 3rd & 4th synchronizer hub with a suitable tool, and check if it is within allowable specification below.

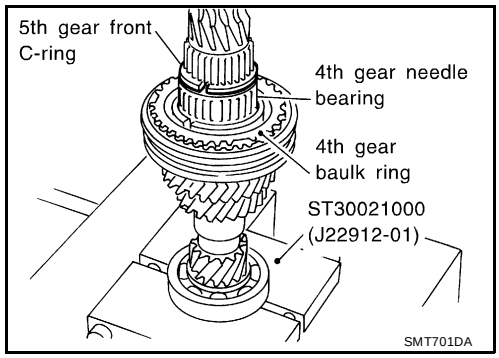
   End play : 0 - 0.06 mm (0 - 0.0024 in)

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

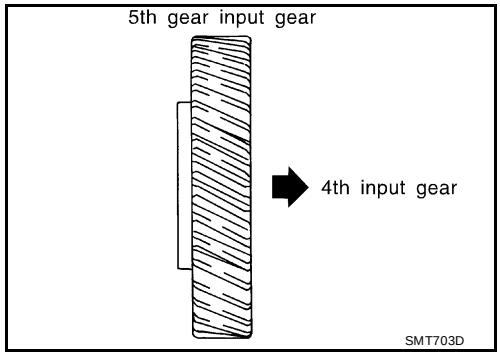
   4th (input) gear C-ring : Refer to MT-63, "Available C-rings" .



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



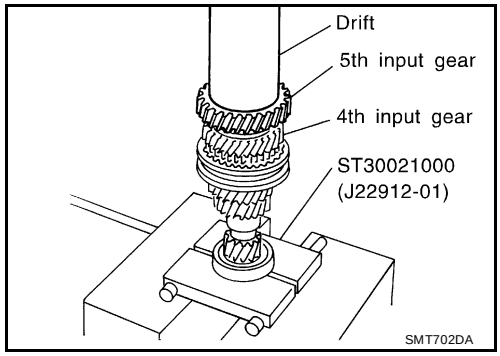
10. Position 5th input gear as shown in the figure, and install it on input shaft.



11. Install 5th input gear.

CAUTION:
Do not reuse 5th input gear.

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

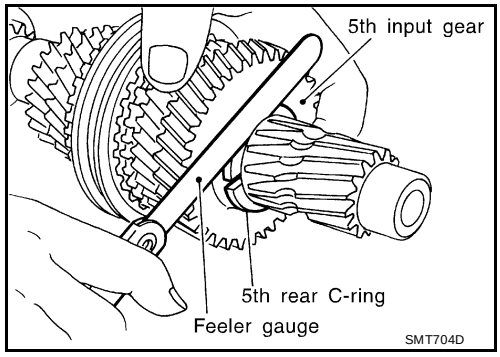


13. Measure the end play of 5th input gear with a suitable tool, and check if it is within the allowable specification below.

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-63, "Available C-rings" .

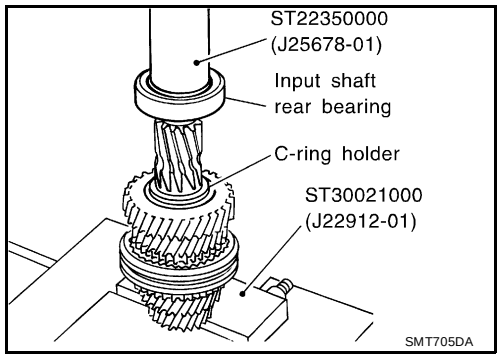


15. Install C-ring holder onto 5th gear rear C-ring using Tool.

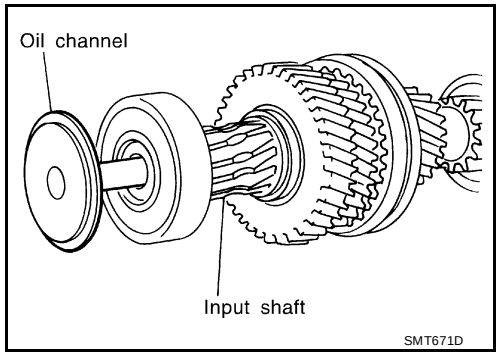
CAUTION:
Do not reuse C-ring holder.

16. Install input shaft rear bearing using Tool.

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-63, "Gear End Play" .



MAINSHAFT AND GEARS

PFP:32241

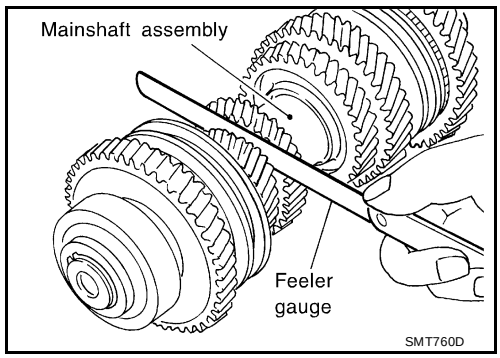
Disassembly

ECS004AJ

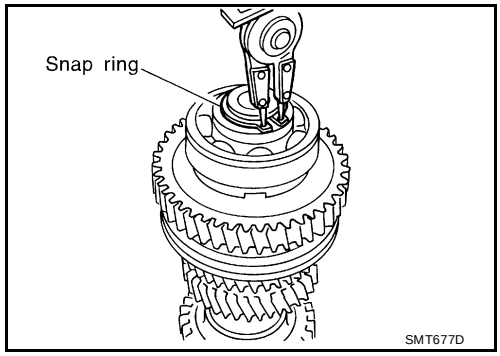
1. Before disassembly, measure gear end play with a suitable tool.

Gear end play **: Refer to MT-63, "Gear End Play" .**

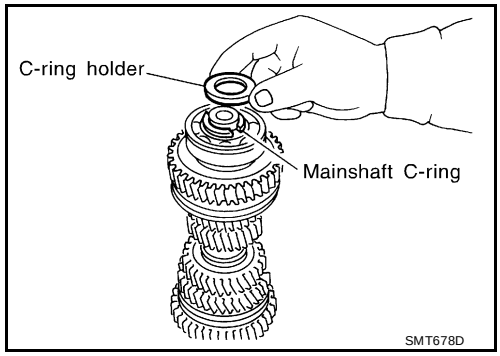
- If end play is not within the specified limit, disassemble and check the parts.



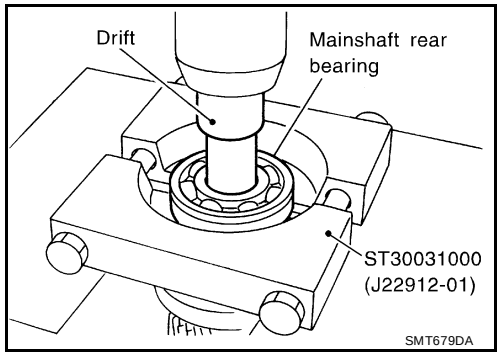
2. Remove snap ring with a suitable tool.



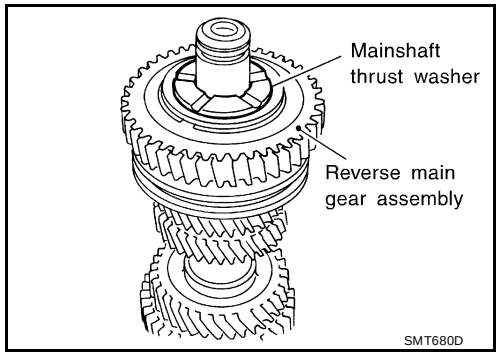
3. Remove C-ring holder and mainshaft C-ring.



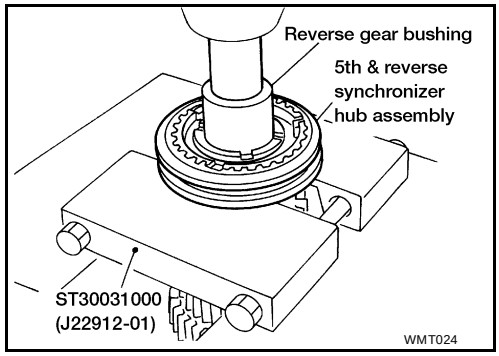
4. Press out mainshaft rear bearing from mainshaft using Tool.



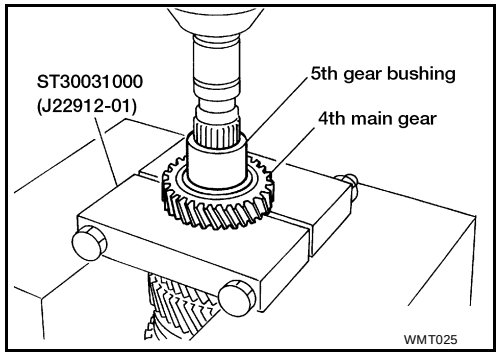
5. Remove mainshaft thrust washer.
6. Remove snap ring from mainshaft. Then, remove reverse main gear assembly, reverse gear needle bearing, and reverse gear baulk ring.



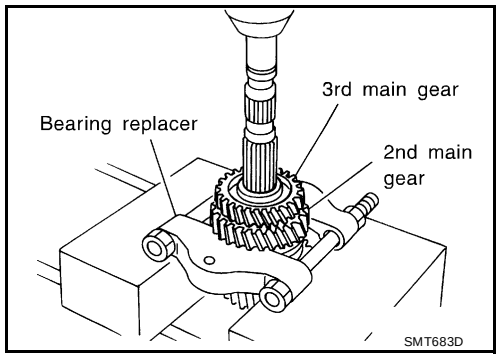
7. Place bearing replacer between 5th & reverse synchronizer hub and 5th main gear, and press out both reverse gear bushing and 5th & reverse synchronizer assembly using Tool.
8. Remove 5th main gear, 5th gear baulk ring, and 5th gear needle bearing.



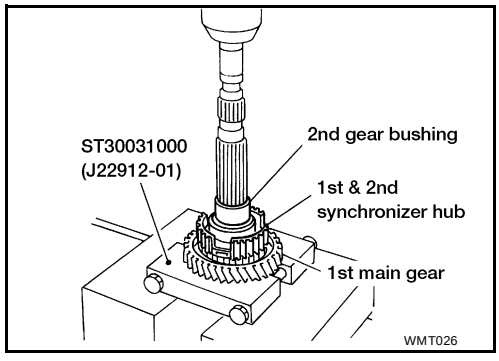
9. Place bearing replacer between 3rd and 4th main gears, and press out both 5th gear bushing and 4th main gear using Tool.



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 using Tool.
14. Remove 1st gear needle bearing.

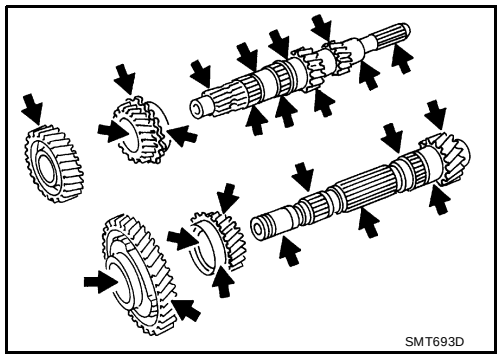


Inspection

ECS004AK

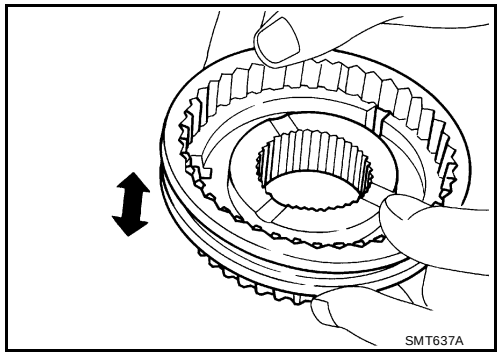
GEAR AND SHAFT

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

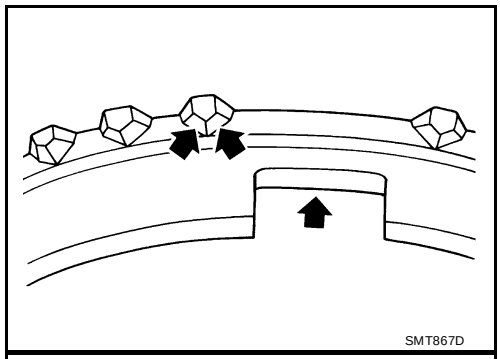

SMT693D

SYNCHRONIZERS

- 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.

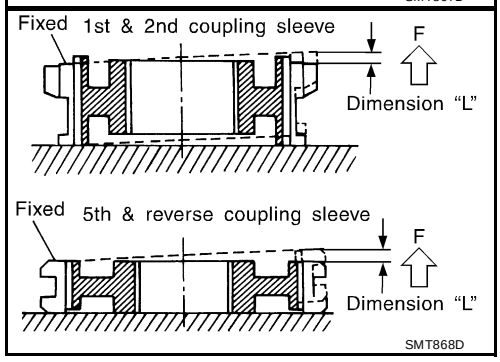

SMT637A

- 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 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.

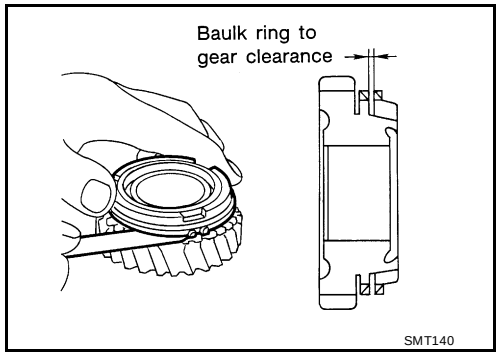
Coupling sleeve	Length “L”
1st & 2nd	0 - 0.68 mm (0 - 0.0268 in)
5th & Reverse	0 - 0.89 mm (0 - 0.0350 in)



SMT868D

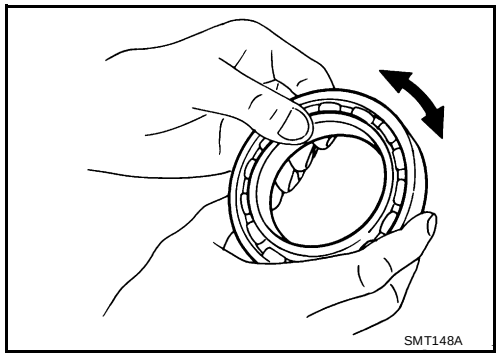
- Measure clearance between baulk ring and gear.

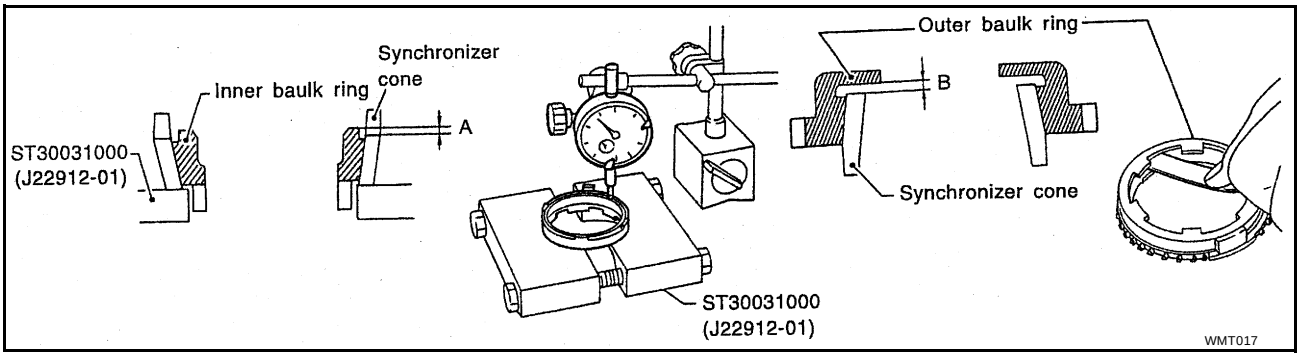
Clearance between baulk ring and gear	**: Refer to MT-63, "Clearance Between Baulk Ring and Gear" .**



BEARING

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





- Measure wear of inner and outer 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” using Tool.

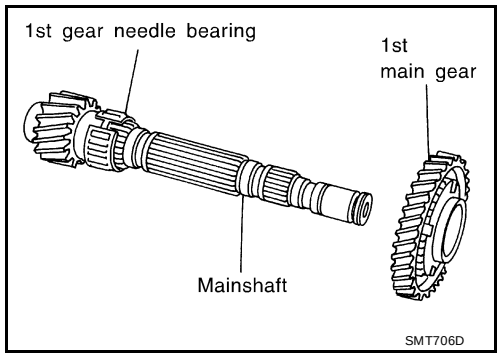
Standard	**A: 0.6 - 0.8 mm (0.024 - 0.031 in)**
	B: 0.6 - 1.1 mm (0.024 - 0.043 in)
Wear limit	**: 0.2 mm (0.008 in)**

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

Assembly

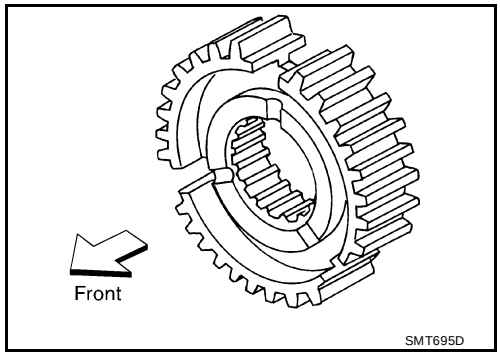
ECS004AL

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

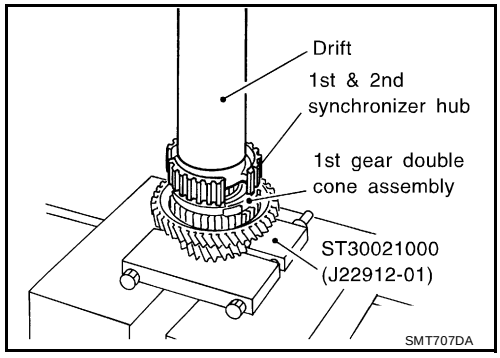


3. Install 1st & 2nd synchronizer hub with its three grooves facing the front side (1st main gear side) onto mainshaft.

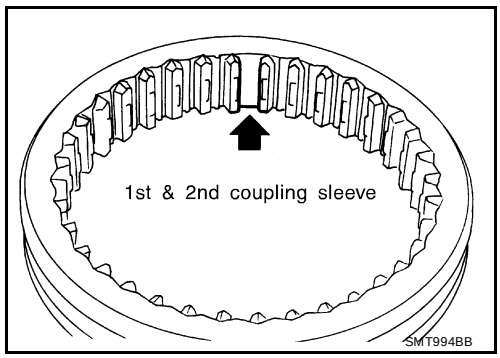
CAUTION:
Do not reuse 1st & 2nd synchronizer hub.



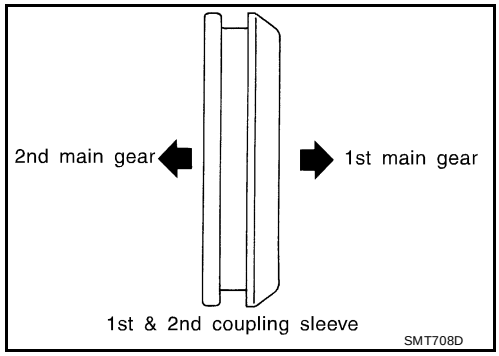
4. Install 1st & 2nd synchronizer hub using Tool.



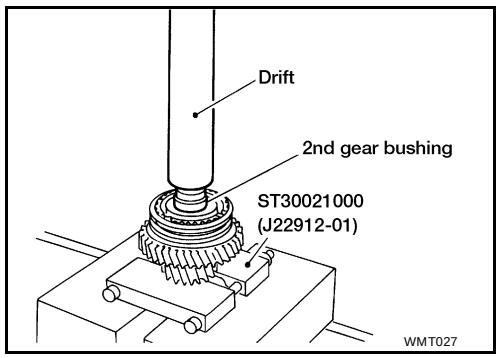
5. Install insert spring onto 1st & 2nd coupling sleeve.



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

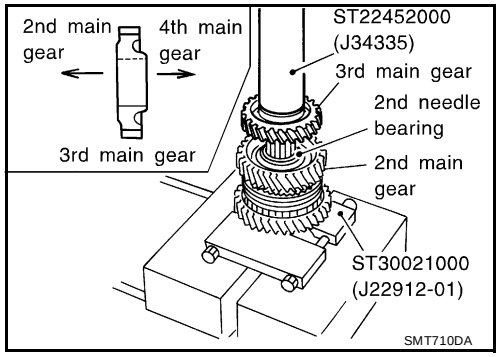


7. Install 2nd gear bushing with its flange surface facing 1st & 2nd synchronizer hub side using Tool.



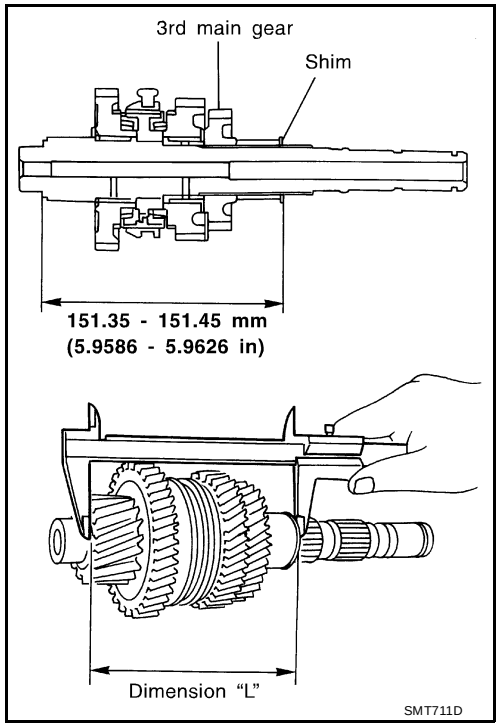
8. Install 2nd needle bearing, 2nd double cone assembly, and 2nd main gear onto mainshaft using Tool.
9. Position 3rd main gear as shown in the figure, and install it using Tool.

   CAUTION:
   Do not reuse 3rd main gear.
10. Install spacer and mainshaft adjusting shim onto mainshaft.

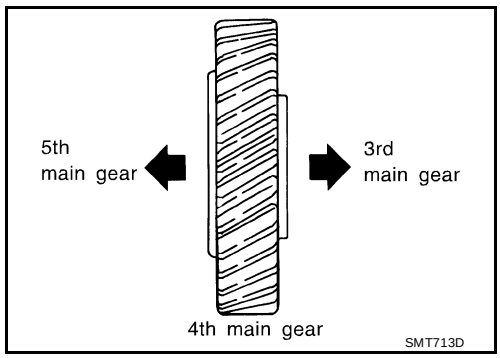


11. Select a mainshaft adjusting shim suitable to satisfy the following specification of dimension “L” and install it onto mainshaft.

Specification of dimension “L”	**: 151.35 - 151.45 mm (5.9586 - 5.9626 in)**
Mainshaft adjusting shims	**: Refer to MT-64, "Available Adjusting Shims" .**

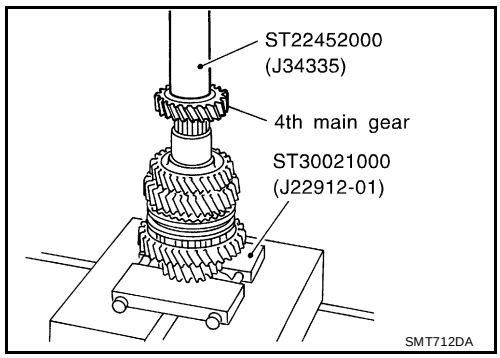


12. Position 4th main gear as shown in the figure, and install it onto mainshaft.

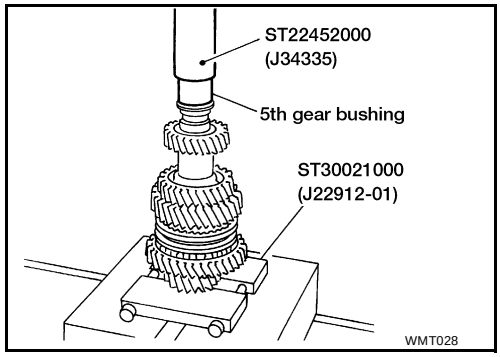


13. Install 4th main gear onto mainshaft using Tool.

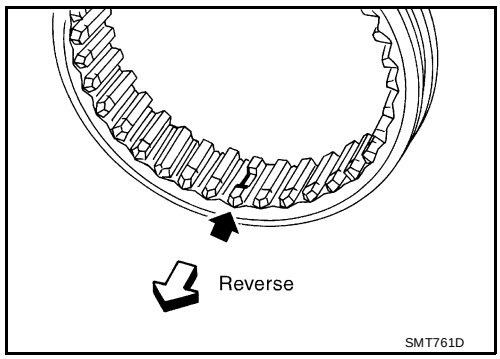
CAUTION:
Do not reuse 4th main gear.



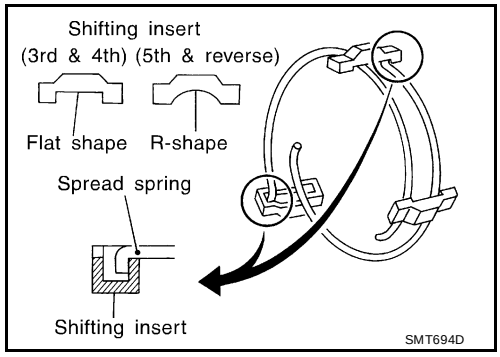
14. Install 5th gear bushing with its flange surface facing the 4th main gear side using Tool.



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

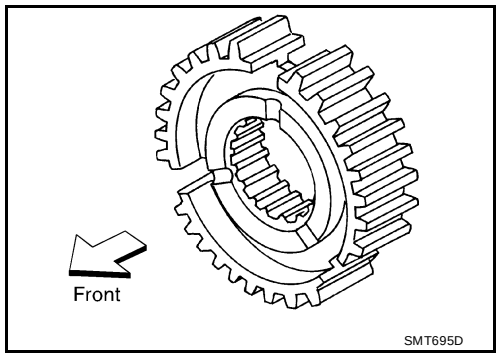


16. Being careful of the following points, install spread spring, shifting insert, and 5th & reverse synchronizer hub onto 5th & reverse coupling sleeve.

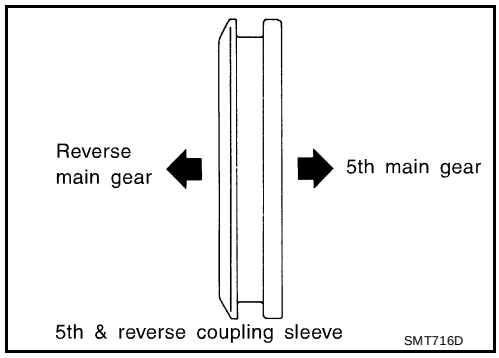


- Pay attention to the shape of spread spring and shifting insert for correct assembly.
  Do not install spread spring hook onto the same shifting insert.
- Install synchronizer hub with its three grooves facing the front side (5th main gear side).

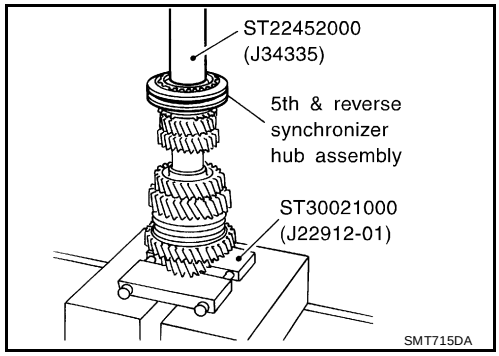
  CAUTION:
  Do not reuse 5th & reverse synchronizer hub.



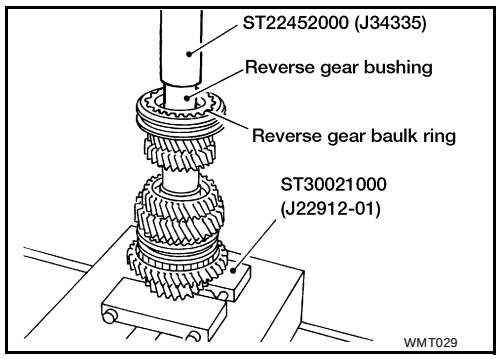
- Install 5th & reverse coupling sleeve with its chamfered surface facing the reverse main gear side.



17. Install 5th & reverse synchronizer hub assembly using Tool.



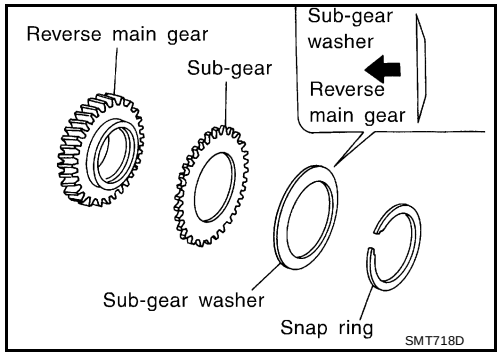
18. Install reverse gear baulk ring using Tool.
19. Install reverse gear bushing using Tool.
20. Install reverse gear needle bearing using Tool.



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

CAUTION:

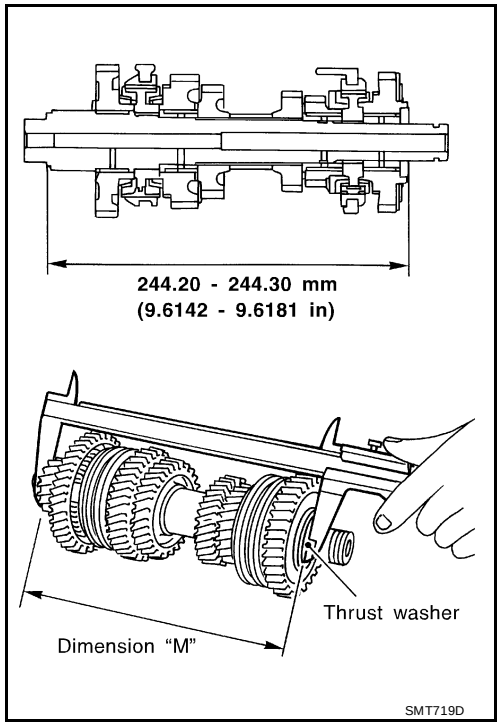
- **Pay attention to direction of sub-gear washer.**
- **Do not reuse snap ring.**



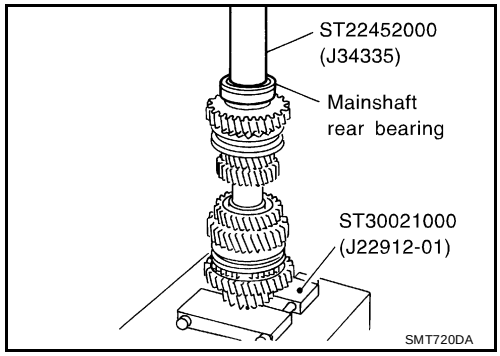
22. Install the reverse main gear assembly onto the mainshaft.
23. Select a thrust washer suitable to satisfy the following specification of dimension “M” as shown, and install it onto the mainshaft.

Specification of dimension “M” : **244.20 - 244.30 mm (9.6142 - 9.6181 in)**

Available thrust washers : **Refer to MT-66, "Available Thrust Washer" .**



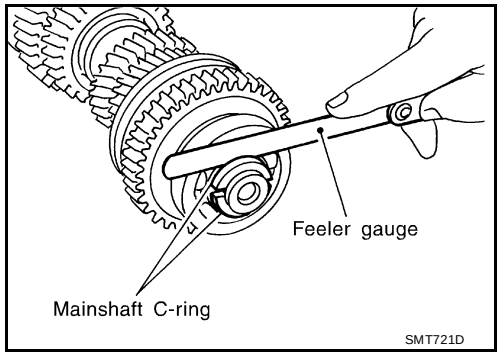
24. Install the mainshaft rear bearing using Tool.



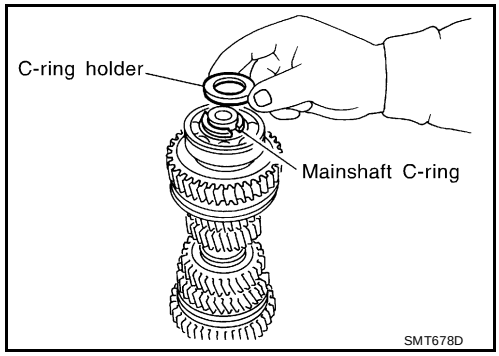
25. Install mainshaft C-ring.
26. Using feeler gauge, measure the end play of mainshaft rear bearing with a suitable tool, and check that it is within specification.

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

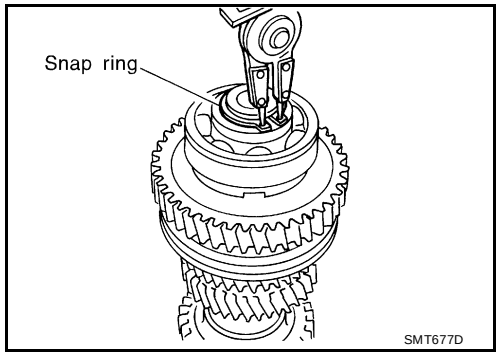
Mainshaft C-rings : **refer to MT-63, "Available C-rings"**



27. Install C-ring holder.



28. Install snap ring with a suitable tool.
29. Measure gear end play as a final check. Refer to MT-63, "Gear End Play" .



FINAL DRIVE

PFP:38411

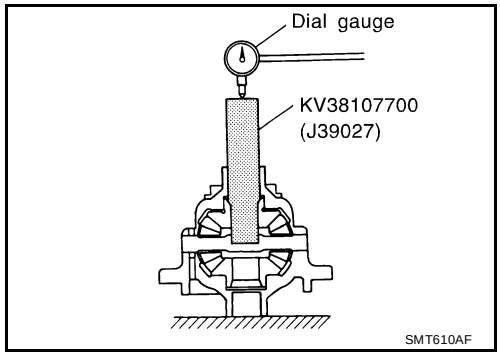
Pre-inspection

ECS004AM

DIFFERENTIAL CASE SIDE

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

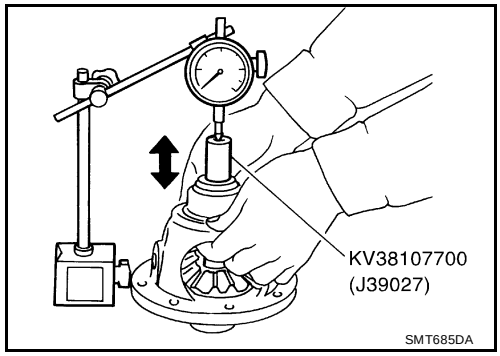
1. Clean final drive assembly sufficiently to prevent side gear thrust washer, differential case, side gear, and other parts from sticking by gear oil.



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 using Tool.

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

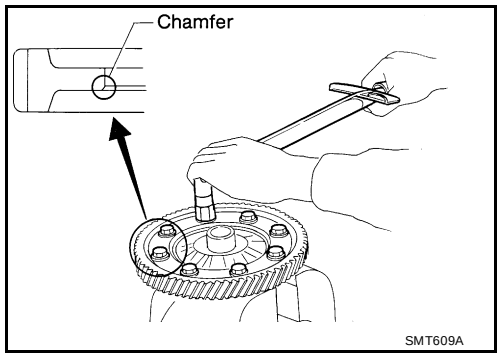
4. If not within specification, adjust the clearance by changing thrust washer thickness.
5. Turn differential case upside down, and measure the clearance between side gear and differential case on the other side in the same way using Tool.



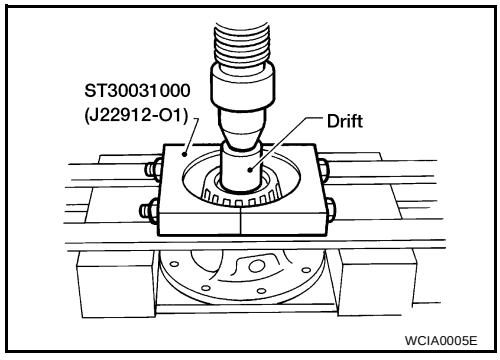
Disassembly

ECS004AN

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.

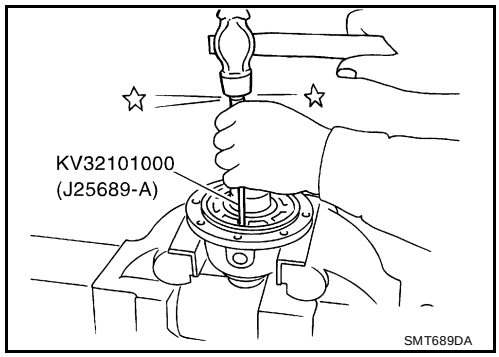


3. Remove differential side bearing of final gear side using Tool.

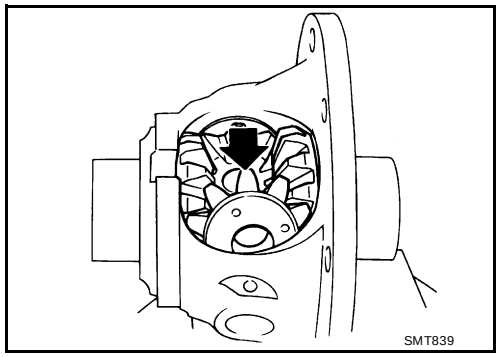


4. Turn differential case upside down, and remove differential side bearing of speedometer drive gear side using Tool.
   - Be careful not to mix up the differential side bearings.
5. Remove speedometer stopper.

6. Remove lock pins from pinion mate shaft using Tool.



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.

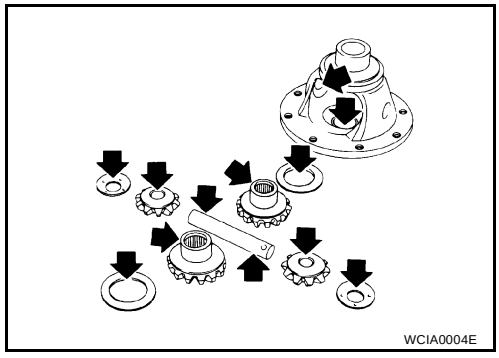


Inspection

ECS004AO

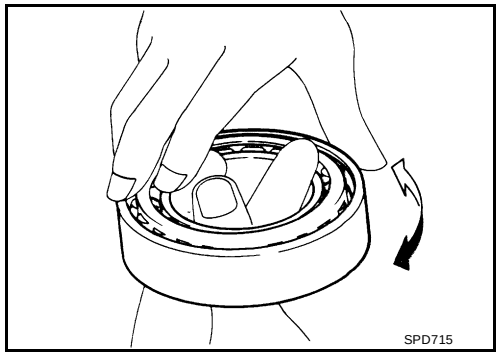
GEAR, WASHER, SHAFT AND CASE

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



BEARING

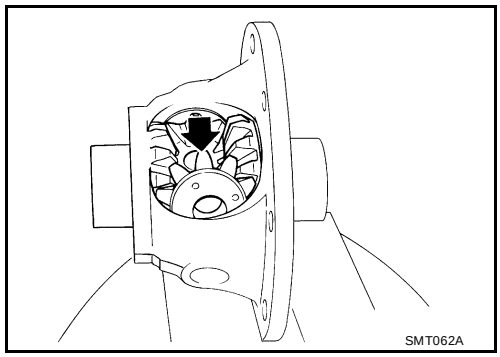
- Make sure bearings roll freely and are free from noise, cracks, pitting or wear.
- When replacing tapered roller bearing, replace outer and inner race as a set.



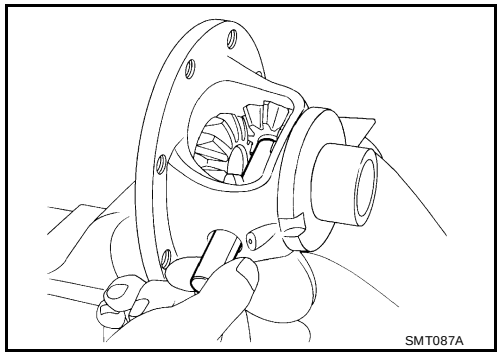
Assembly

ECS004AP

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.



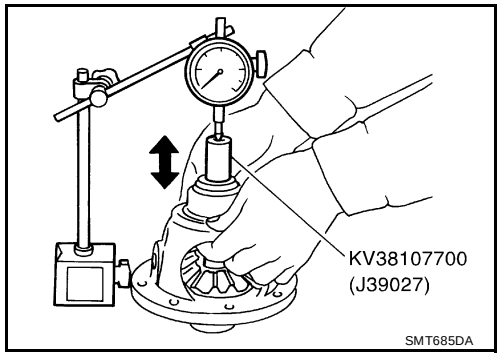
4. Insert pinion mate shaft into differential case.



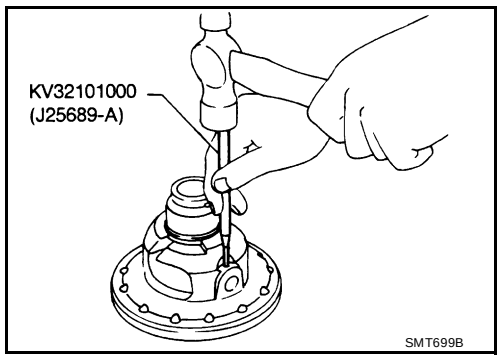
5. Upright the differential case so that its side gear to be measured faces upward.
6. Place preload adapter and dial gauge onto side gear. Move side gear up and down, and measure the clearance using Tool.
7. Turn differential case upside down, and measure the clearance between side gear and differential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

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

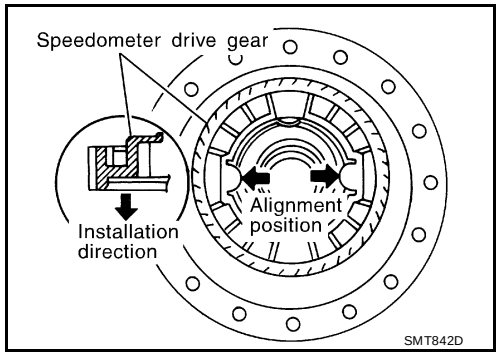
Differential side gear thrust washers : **Refer to MT-66, "Available Washers" .**



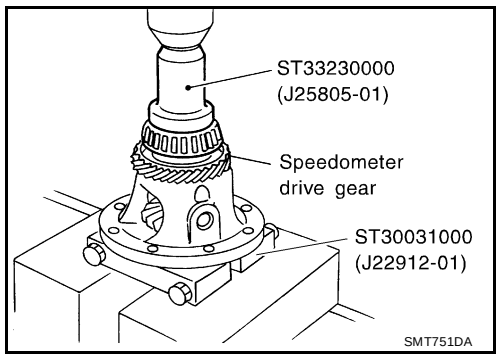
8. Install retaining pin using Tool.
   - Make sure that retaining pin is flush with case.



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

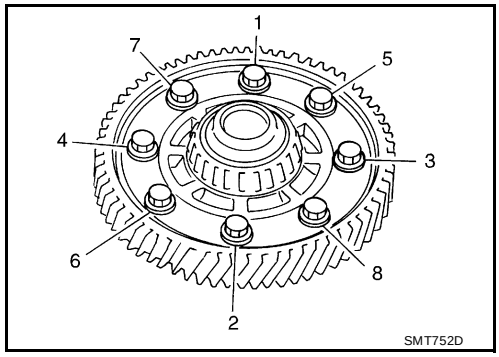


11. Install differential side bearing using Tool.
12. Turn differential case upside down, and install another differential side bearing on the other side in the same way using Tool.



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-22, "FINAL DRIVE COMPONENTS" .**



SHIFT CONTROL

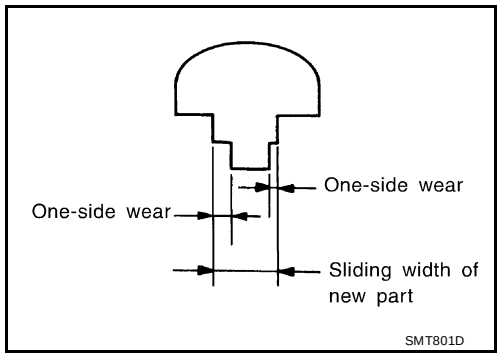
PFP:32982

Inspection

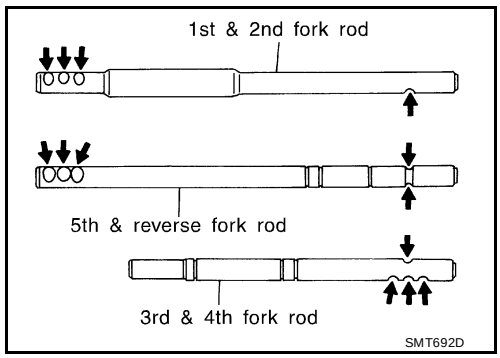
ECS004AQ

- 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 abnormalities.



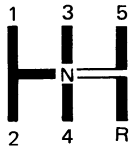
SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

General Specifications

ECS004AR

TRANSAXLE

Engine			QG18DE
Transaxle model			RS5F70A
Number of speeds			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
		Rev.	14
	Main gear	1st	50
		2nd	43
		3rd	36
		4th	38
		5th	34
		Rev.	45
	Reverse idler gear		37
Oil level (Reference) mm (in)*1			75.5 - 80.5 (2.972 - 3.169)
Oil capacity ℓ (US qt, Imp qt)*1			3.0 (3 1/8, 2 5/8)
Remarks			1st & 2nd double baulk ring type synchronizer
			Reverse sub-gear

*1: Refer to MA-13, "Fluids and Lubricants" .

FINAL GEAR

Engine		QG18DE
Transaxle model		RS5F70A
Final gear ratio		4.176
Number of teeth	Final gear/Pinion	71/17
	Side gear/Pinion mate gear	16/10

Gear End Play

ECS004AS

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 Between Baulk Ring and Gear

ECS004AT

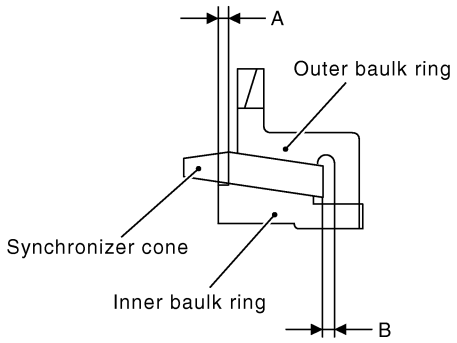
3RD, 4TH, 5TH, REVERSE BAULK RING

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 BAULK RING

Unit: mm (in)



SMT906D

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

ECS004AU

SNAP RING

End play	0.05 - 0.25 mm (0.0020 - 0.0098 in)
Thickness	Part number*
1.45 mm (0.0571 in)	32204-6J000
1.55 mm (0.0610 in)	32204-6J001
1.65 mm (0.0650 in)	32204-6J002
1.75 mm (0.0689 in)	32204-6J003
1.85 mm (0.0728 in)	32204-6J004

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

Available C-rings

ECS004AV

4TH INPUT GEAR C-RING

End play	0 - 0.06 mm (0 - 0.0024 in)
Thickness	Part number*

3.00 mm (0.1181 in)	32205-6J000
3.03 mm (0.1193 in)	32205-6J001
3.06 mm (0.1205 in)	32205-6J002
3.09 mm (0.1217 in)	32205-6J003
3.12 mm (0.1228 in)	32205-6J004

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

5TH INPUT GEAR REAR C-RING

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

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

MAINSHAFT C-RING

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

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

Available Adjusting Shims

ECS004AW

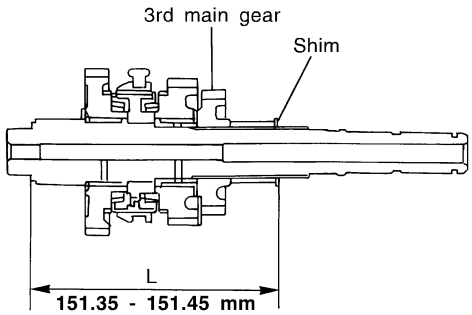
INPUT SHAFT REAR BEARING ADJUSTING SHIM

End play	0 - 0.06 mm (0 - 0.0024 in)
Thickness	Part number*
0.74 mm (0.0291 in)	32225-6J003
0.78 mm (0.0307 in)	32225-6J004
0.82 mm (0.0323 in)	32225-6J005
0.86 mm (0.0339 in)	32225-6J006

0.90 mm (0.0354 in)	32225-6J007
0.94 mm (0.0370 in)	32225-6J008
0.98 mm (0.0386 in)	32225-6J009
1.02 mm (0.0402 in)	32225-6J010
1.06 mm (0.0417 in)	32225-6J011
1.10 mm (0.0433 in)	32225-6J012
1.14 mm (0.0449 in)	32225-6J013
1.18 mm (0.0465 in)	32225-6J014
1.22 mm (0.0480 in)	32225-6J015
1.26 mm (0.0496 in)	32225-6J016
1.30 mm (0.0512 in)	32225-6J017
1.34 mm (0.0528 in)	32225-6J018
1.38 mm (0.0543 in)	32225-6J019
1.42 mm (0.0559 in)	32225-6J020
1.46 mm (0.0575 in)	32225-6J021
1.50 mm (0.0591 in)	32225-6J022
1.54 mm (0.0606 in)	32225-6J023
1.58 mm (0.0622 in)	32225-6J024
1.62 mm (0.0638 in)	32225-6J060
1.66 mm (0.0654 in)	32225-6J061

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

MAINSHAFT ADJUSTING SHIM



SMT907D

Standard length “L”	151.35 - 151.45 mm (5.9586 - 5.9626 in)
Thickness	Part number*
0.48 mm (0.0189 in)	32238-6J000
0.56 mm (0.0220 in)	32238-6J001
0.64 mm (0.0252 in)	32238-6J002
0.72 mm (0.0283 in)	32238-6J003
0.80 mm (0.0315 in)	32238-6J004
0.88 mm (0.0346 in)	32238-6J005

*: 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	Part number*
2.99 mm (0.1177 in)	32238-6J010
3.03 mm (0.1193 in)	32238-6J011

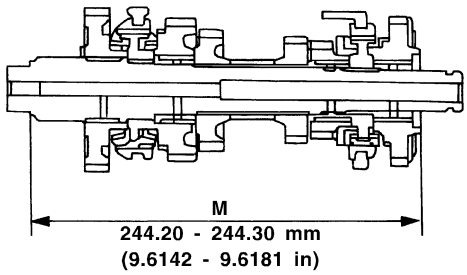
3.07 mm (0.1209 in)	32238-6J012
3.11 mm (0.1224 in)	32238-6J013
3.15 mm (0.1240 in)	32238-6J014
3.19 mm (0.1256 in)	32238-6J015
3.23 mm (0.1272 in)	32238-6J016
3.27 mm (0.1287 in)	32238-6J017
3.31 mm (0.1303 in)	32238-6J018
3.35 mm (0.1319 in)	32238-6J019
3.39 mm (0.1335 in)	32238-6J020
3.43 mm (0.1350 in)	32238-6J021
3.47 mm (0.1366 in)	32238-6J022
3.51 mm (0.1382 in)	32238-6J023

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

Available Thrust Washer

ECS004AX

MAINSHAFT THRUST WASHER



SMT843D

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

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

Available Washers

ECS004AY

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 information.

Available Shims — Differential Side Bearing Preload and Adjusting Shim

ECS004AZ

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 information.

PRECAUTIONS

PFP:00001

Caution

ECS004B0

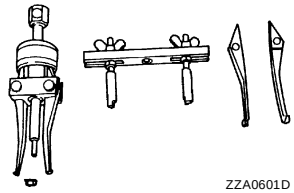
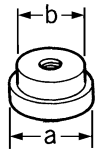
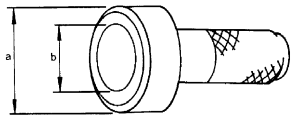
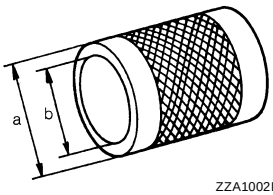
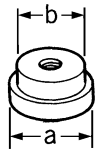
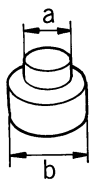
- Do not reuse transaxle oil, once it has been drained.
- Check oil level or replace oil with vehicle on level ground.
- During removal or installation, keep inside of transaxle clear of dust or dirt.
- Check for the correct installation status prior to removal or disassembly. If mating marks are required, 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.

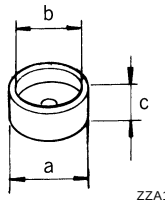
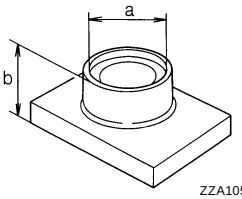
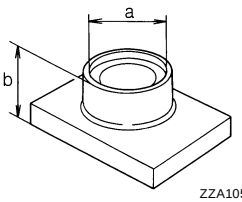
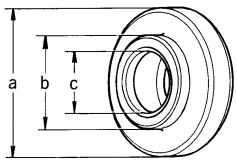
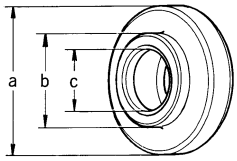
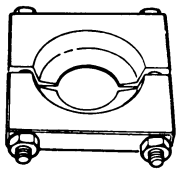
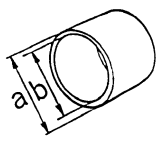
PREPARATION

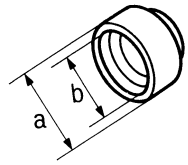
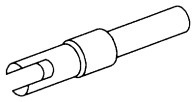
PFP:00002

Special Service Tools

ECS004B1

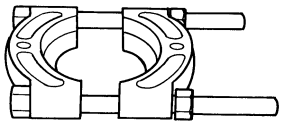
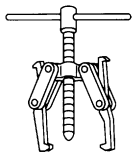
Tool number (Kent-More No.) Tool name		Description
KV381054S0 (J34286) Puller	 ZZA0601D	● Side bearing outer race removal
ST35321000 (—) Drift a: 49 mm (1.93 in) dia. b: 41 mm (1.61 in) dia.	 ZZA1000D	● Input shaft oil seal installation ● Reverse main gear installation ● 1st bushing installation ● 1st-2nd synchronizer hub installation ● 2nd bushing installation ● 3rd main gear installation
ST30720000 (J25405) 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 (J26082) Drift a: 60 mm (2.36 in) dia. b: 44.5 mm (1.752 in) dia.	 ZZA1002D	● Mainshaft front bearing installation ● 6th bushing installation (RS6F51H) ● 4th main gear installation ● 5th main gear installation ● 6th main gear installation (RS6F51H)
ST33061000 (J8107-2) 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	● Input shaft rear bearing removal and installation ● Input shaft bearing spacer and 5th stopper removal (RS5F51A) ● 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 (RS6F51H) ● Mainshaft rear bearing removal ● 4th main gear and 5th main gear removal ● 6th main gear removal (RS6F51H)

Tool number (Kent-More No.) 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 bushing installation ● 5th synchronizer hub installation (RS5F51A) ● 5th-6th synchronizer hub installation (RS6F51H) ● 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 (J26010-01) Drift a: 80 mm (3.15 in) dia. b: 38 mm (1.50 in) dia. c: 31 mm (1.22 in) dia.	 ZZA0978D	● 5th stopper and input shaft bearing spacer installation (RS5F51A) ● Input shaft front bearing installation
ST30901000 (J26010-01) 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 ● Mainshaft rear bearing installation
ST30031000 (J22912-01) Puller	 ZZA0537D	● Measuring wear of 1st and 2nd baulk ring
KV40101630 (J35870) Drift a: 68 mm (2.68 in) dia. b: 60 mm (2.36 in) dia.	 ZZA1003D	● Reverse main gear installation

Tool number (Kent-More No.) 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
(J39713) Preload adapter  NT087	● Checking differential side gear end play (RS5F51A)

Commercial Service Tools

ECS004B2

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

NOISE, VIBRATION, AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

ECS004B3

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.

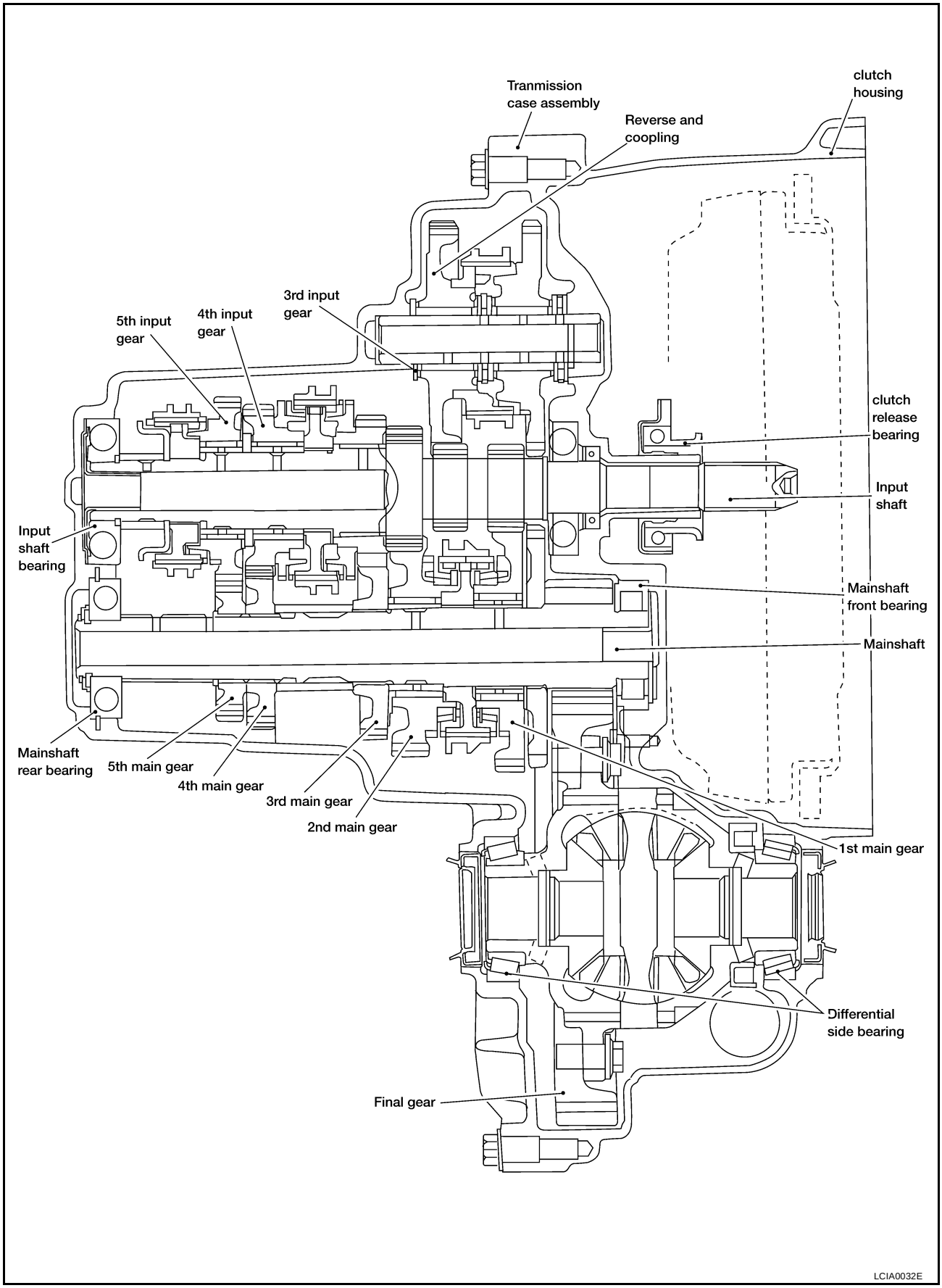
Reference page		MT-75	MT-75	MT-75	MT-82			MT-78	MT-85		MT-83, MT-86			
SUSPECTED PARTS (Possible cause)		(Oil level is low)	(Wrong oil)	(Oil level is high)	GASKET (Damaged)	OIL SEAL (Worn or damaged)	O-RING (Worn or damaged)	CONTROL DEVICE AND CABLE (Worn)	CHECK PLUG RETURN SPRING AND CHECK BALL (Worn or damaged)	SHIFT FORK (Worn)	GEAR (Worn or damaged)	BEARING (Worn or damaged)	BAULK RING (Worn or damaged)	INSERT SPRING, SHIFTING INSERT (Damaged)
Symptom	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

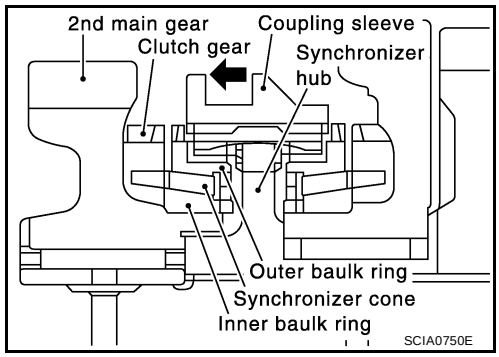
Cross-sectional View

ECS004B4



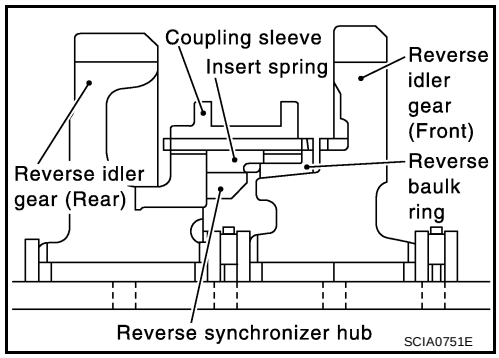
DOUBLE-CONE SYNCHRONIZER

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



REVERSE GEAR

See figure for description of reverse gear components.



M/T OIL

PFP:KLD20

Replacement

ECS004B5

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 on 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, Viscosity SAE 75W-85
Capacity (reference) : Approximately 2.3 ℓ (2 3/8 US qt, 2 Imp qt)

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

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

CAUTION:
Do not reuse gasket.

Checking

ECS004B6

OIL LEAKAGE AND OIL LEVEL

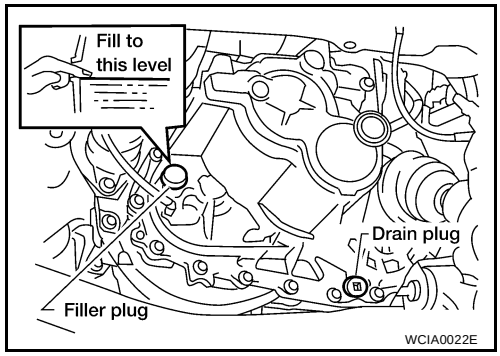
- Check that oil is not leaking from transaxle.
- Check oil level from filler plug mounting hole as shown in the figure.

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

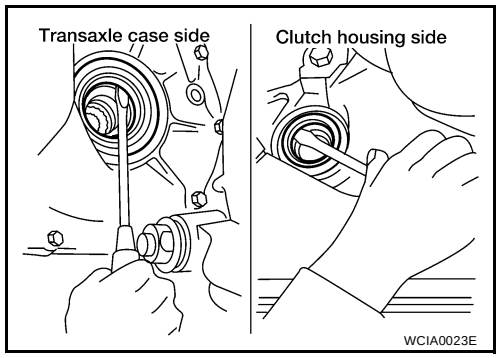
Removal and Installation

ECS004B7

REMOVAL

1. Remove the drive shaft from the transaxle body. Refer to FAX-16, "Removal" .
2. Remove oil seal with a slotted screwdriver.

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

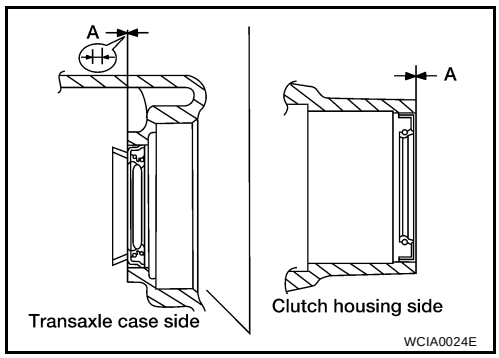


INSTALLATION

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 (0.02 in) or flush with the case

CAUTION:
- **When installing oil seals, apply multi-purpose grease to oil seal lips.**
- **Oil seals are not reusable. Never reuse them.**



Drift to be used:

Transaxle case side	ST3340 0001
Clutch housing side	KV401 00621

2. Installation is in the reverse order of removal. Check oil level after installation.

POSITION SWITCH

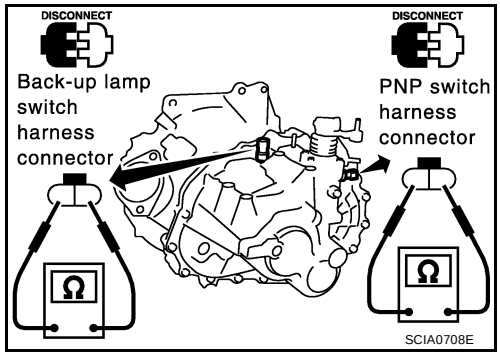
PFP:32005

Checking

ECS004B8

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

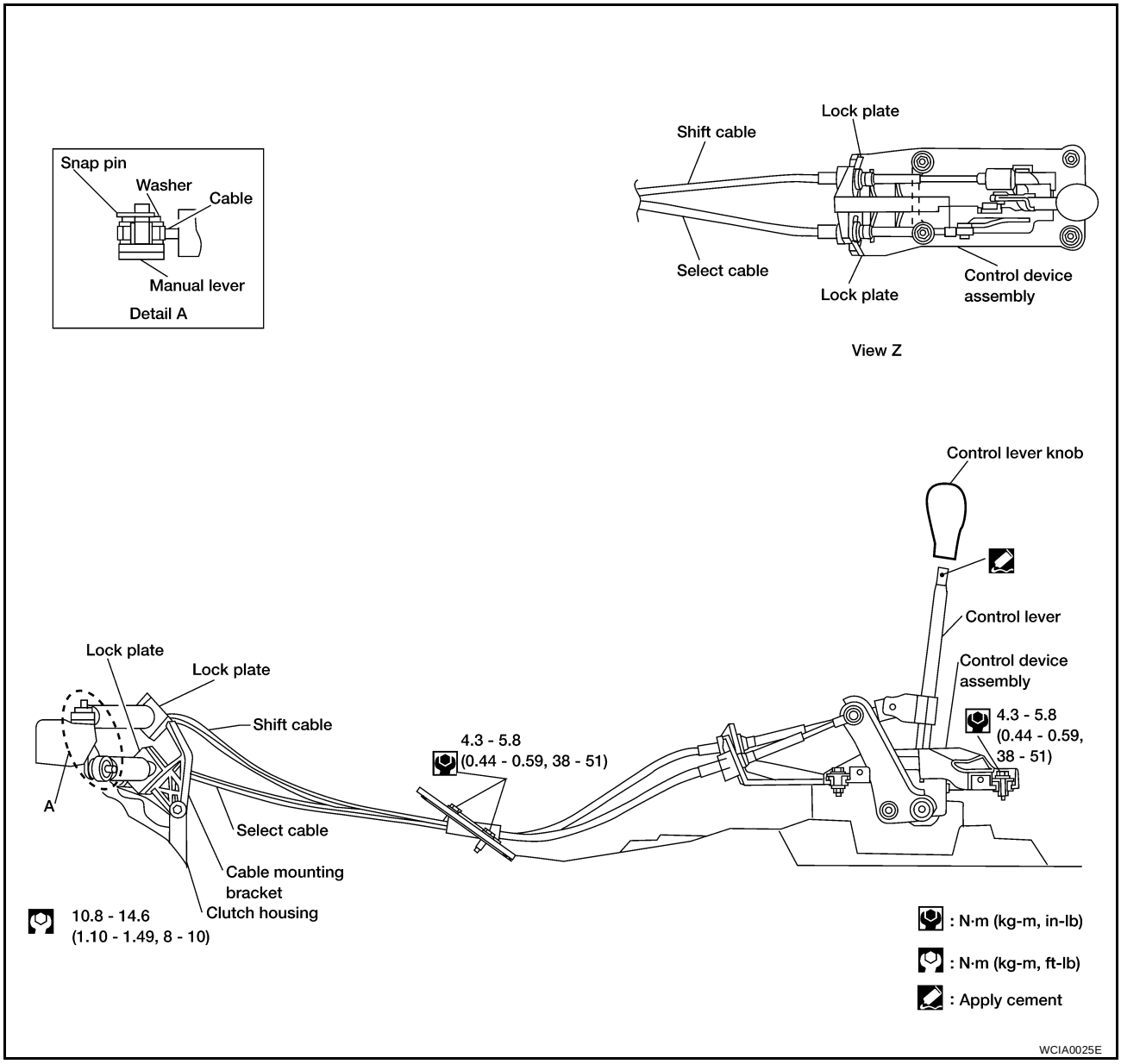
CONTROL LINKAGE

PFP:34103

Removal and Installation of Control Device and Cable

ECS004B9

Refer to the figure below for removal and installation procedure.



CAUTION:

- **Note 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.**

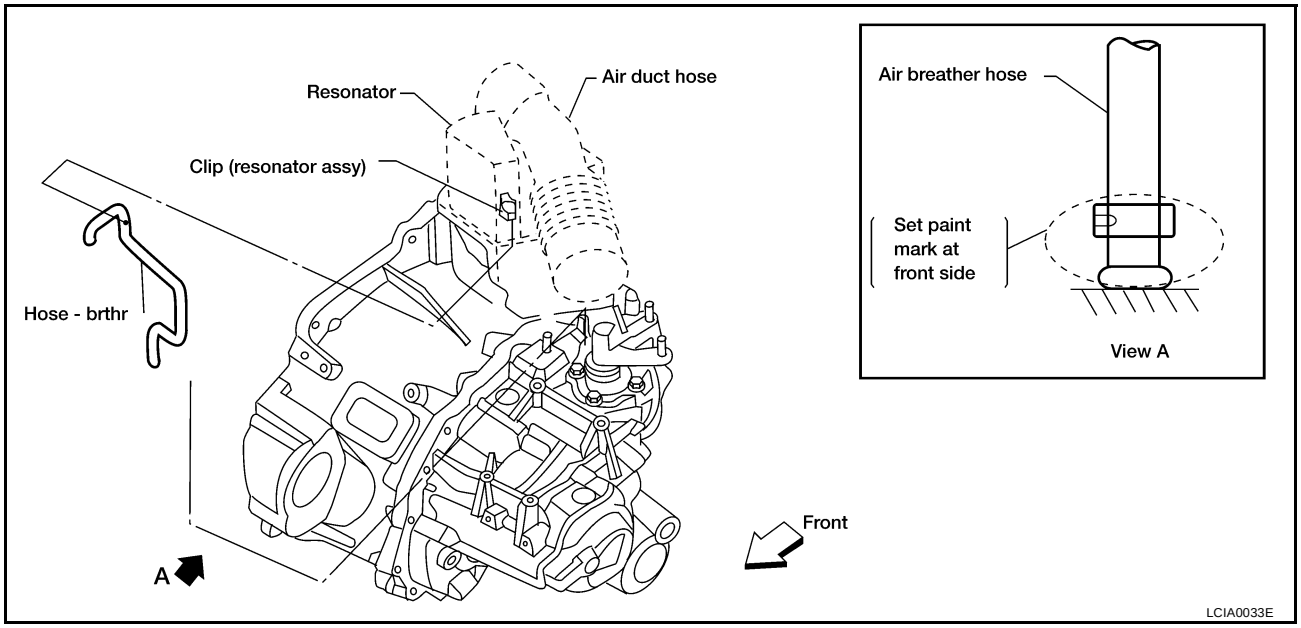
AIR BREATHER HOSE

PFP:31098

Removal and Installation

ECS004BA

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



CAUTION:

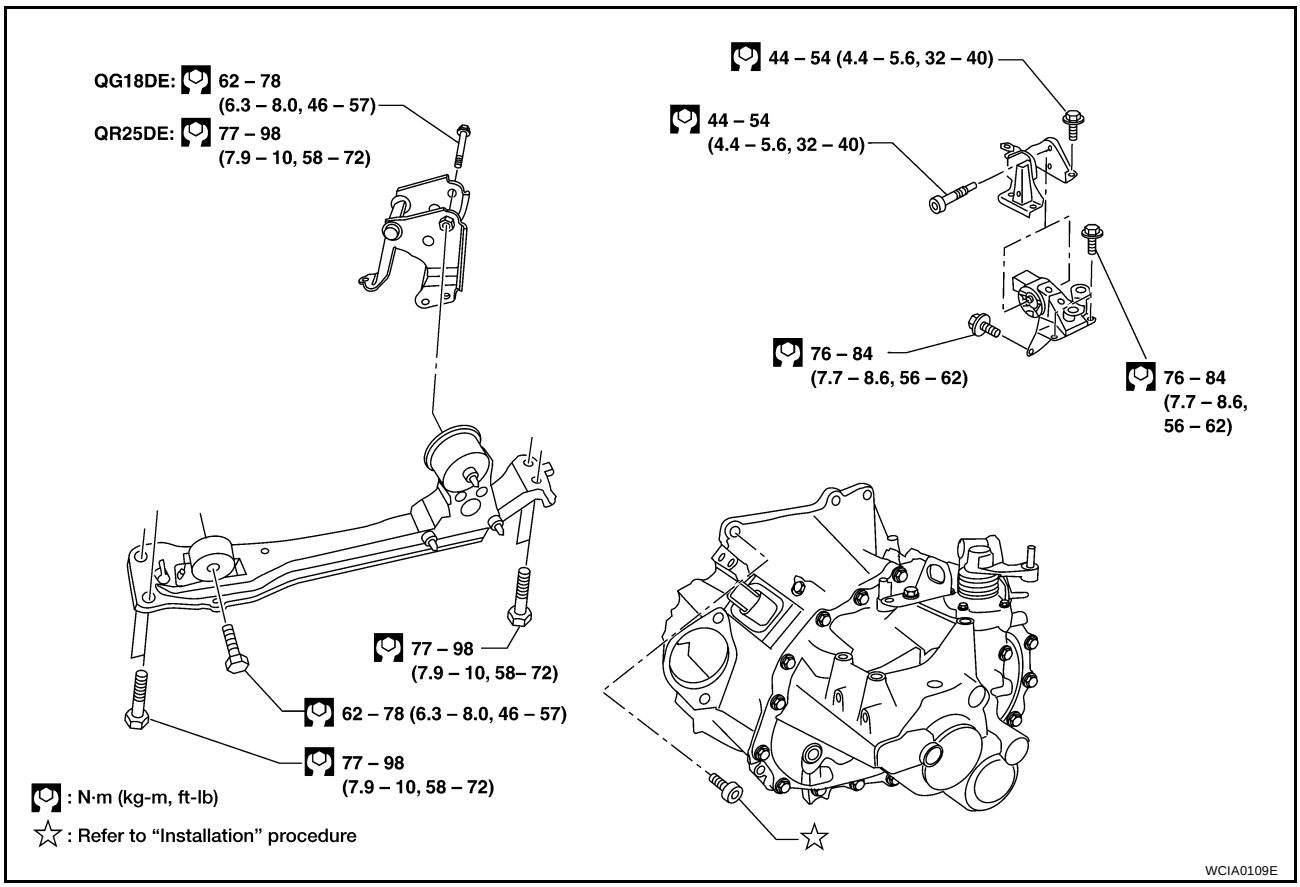
- **Make sure there are no pinched or restricted areas on the air breather hose caused by bending or winding when installing it.**
- **Be sure to insert hose into the transaxle tube until overlap area reaches the spool.**

TRANSAXLE ASSEMBLY

PFP:32010

Removal and Installation

ECS004BB



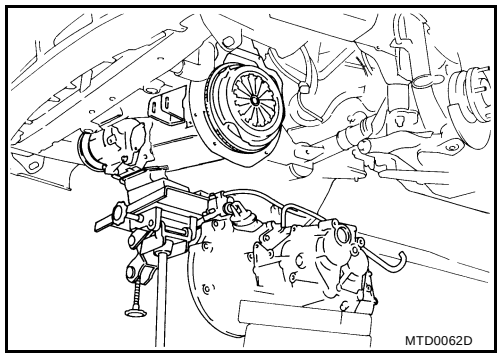
REMOVAL

1. Remove air cleaner and air duct.
2. Remove battery.
3. Remove the air breather hose. Refer to MT-79, "Removal and Installation" .
4. Remove clutch operating cylinder.

   CAUTION:
   Do not depress clutch pedal during removal procedure.
5. Remove engine under cover.
6. Remove the control cable from the transaxle. Refer to MT-78, "Removal and Installation of Control Device and Cable" .
7. Drain gear oil from transaxle. Refer to MT-75, "Replacement" .
8. Remove connectors and harnesses for:
   - PNP switch.
   - Speed sensor.
   - Back-up lamp switch.
   - Ground.
9. Remove the exhaust front tube. Refer to EX-3, "Removal and Installation" .
10. Remove the drive shafts. Refer to FAX-16, "Removal" .
11. Remove starter motor. Refer to SC-20, "Removal and Installation" .
12. Place a jack under the transaxle.

    CAUTION:
    When setting jack, be careful not to bring it into contact with the switch.
13. Remove the center member, the engine insulator and the engine mount bracket using power tool.
14. Support engine by placing a jack under oil pan.

15. Remove the bolts that mount the engine to the transaxle.
16. Remove the transaxle from the vehicle.



INSTALLATION

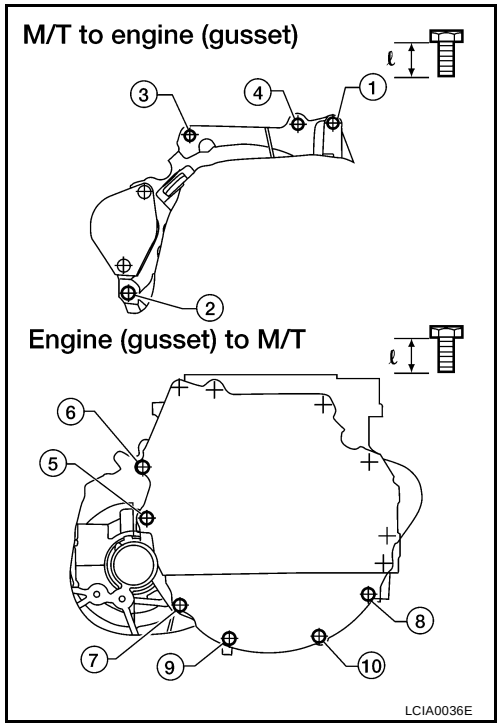
Installation is the reverse order of removal.

- When installing the transaxle to the engine, use the tightening torque and sequence shown below:

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

Bolt No.	1	2	3	4	5	6	7	8	9	10
" ℓ " mm (in)	40	82	47	47	52	40	40	40	30	30
Tightening torque N·m (kg-m, ft-lb)	30 - 40 (3.1 - 4.1, 22 - 29)	70 - 80 (7.1 - 8.1, 52 - 59)				30 - 40 (3.1 - 4.1, 22 - 29)				

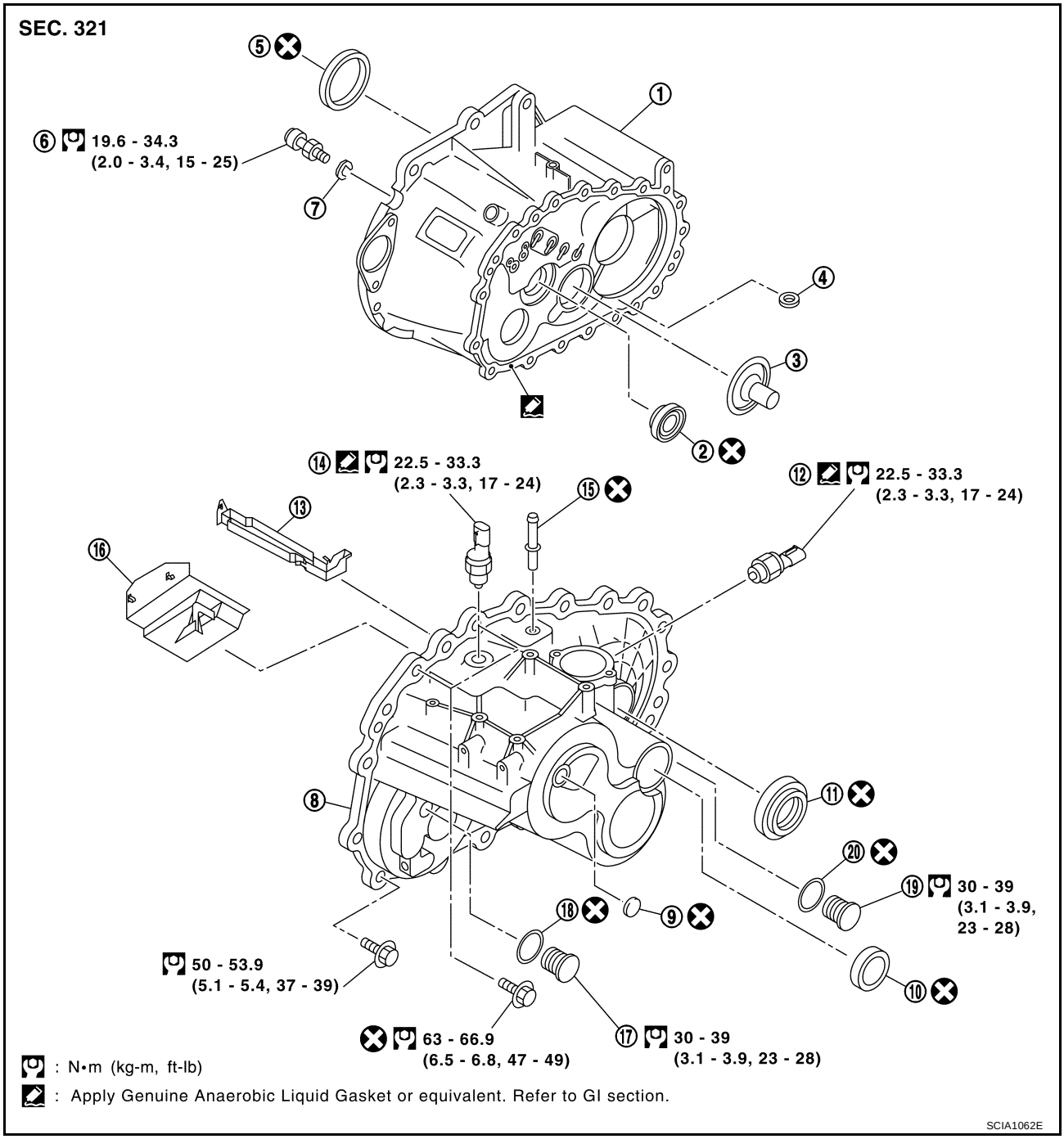
- After installation, check oil level, and look for leaks and loose mechanisms.



Component Parts

ECS004BC

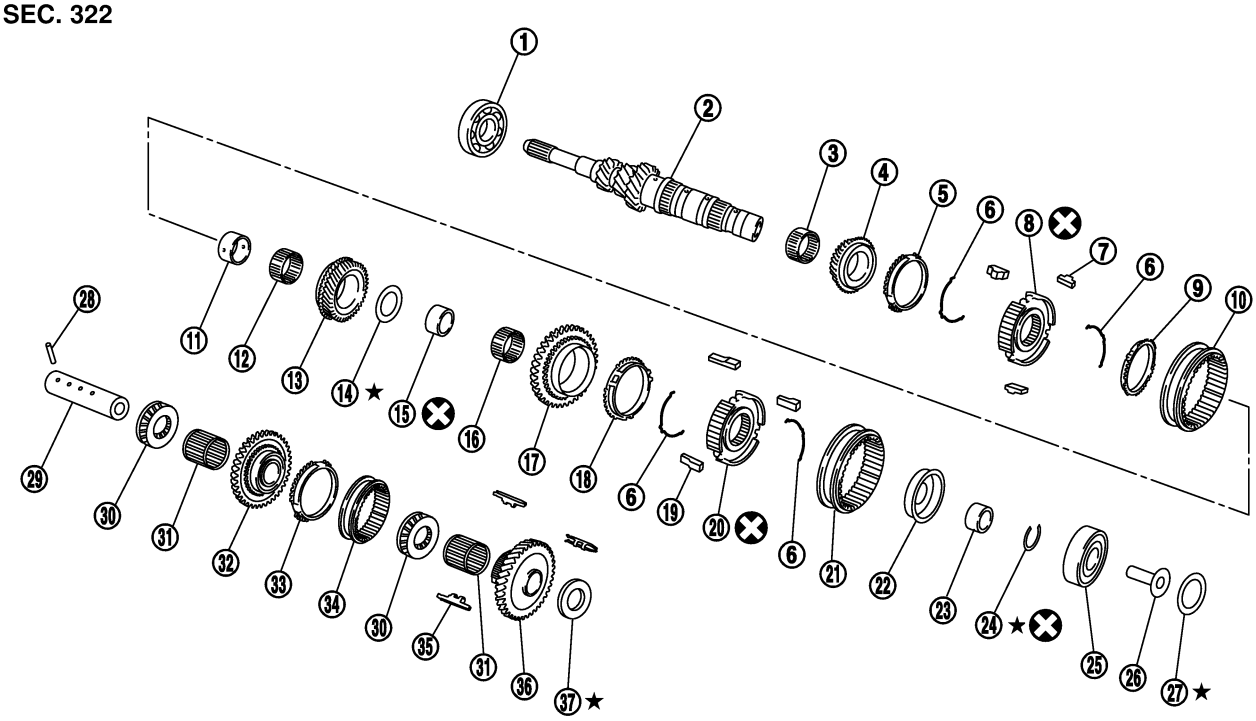
CASE AND HOUSING COMPONENTS



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 :

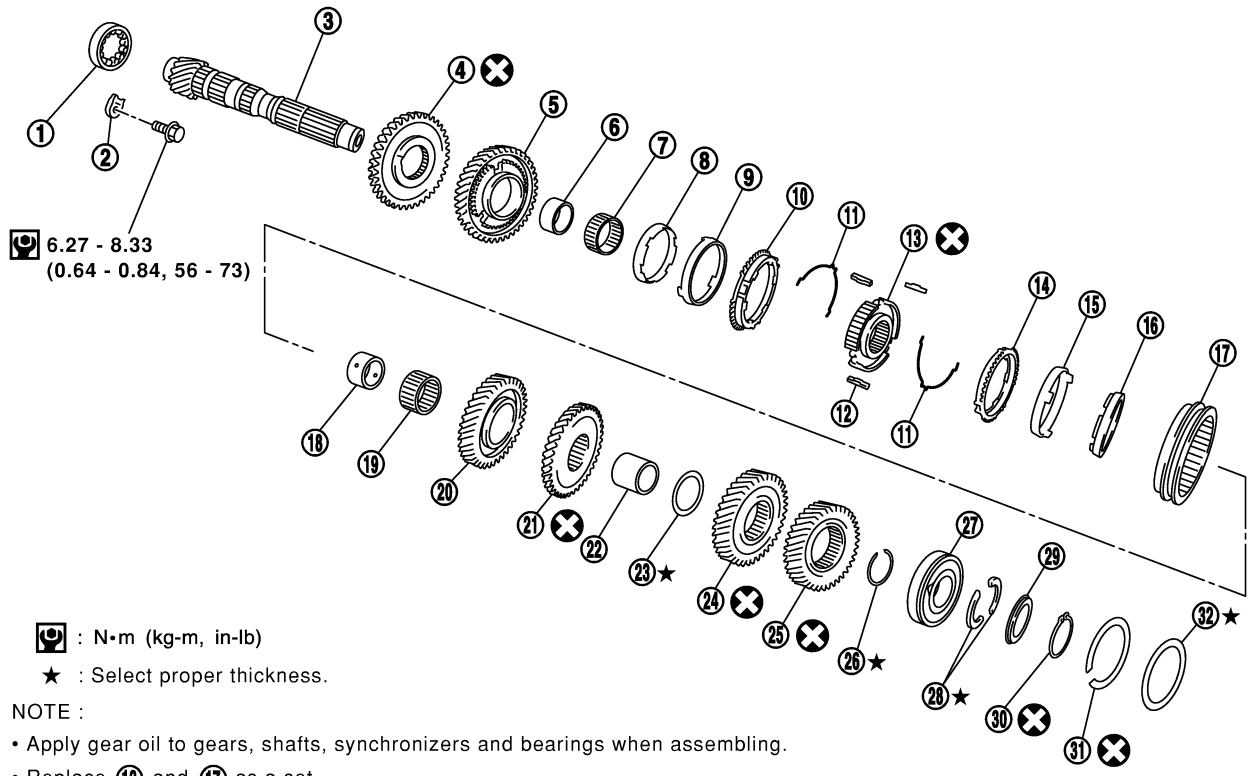
• Apply gear oil to gears, shafts, synchronizers and bearings when assembling.

• Replace ⑧ and ⑩, ⑳ and ㉑ as a set.

SCIA0385E

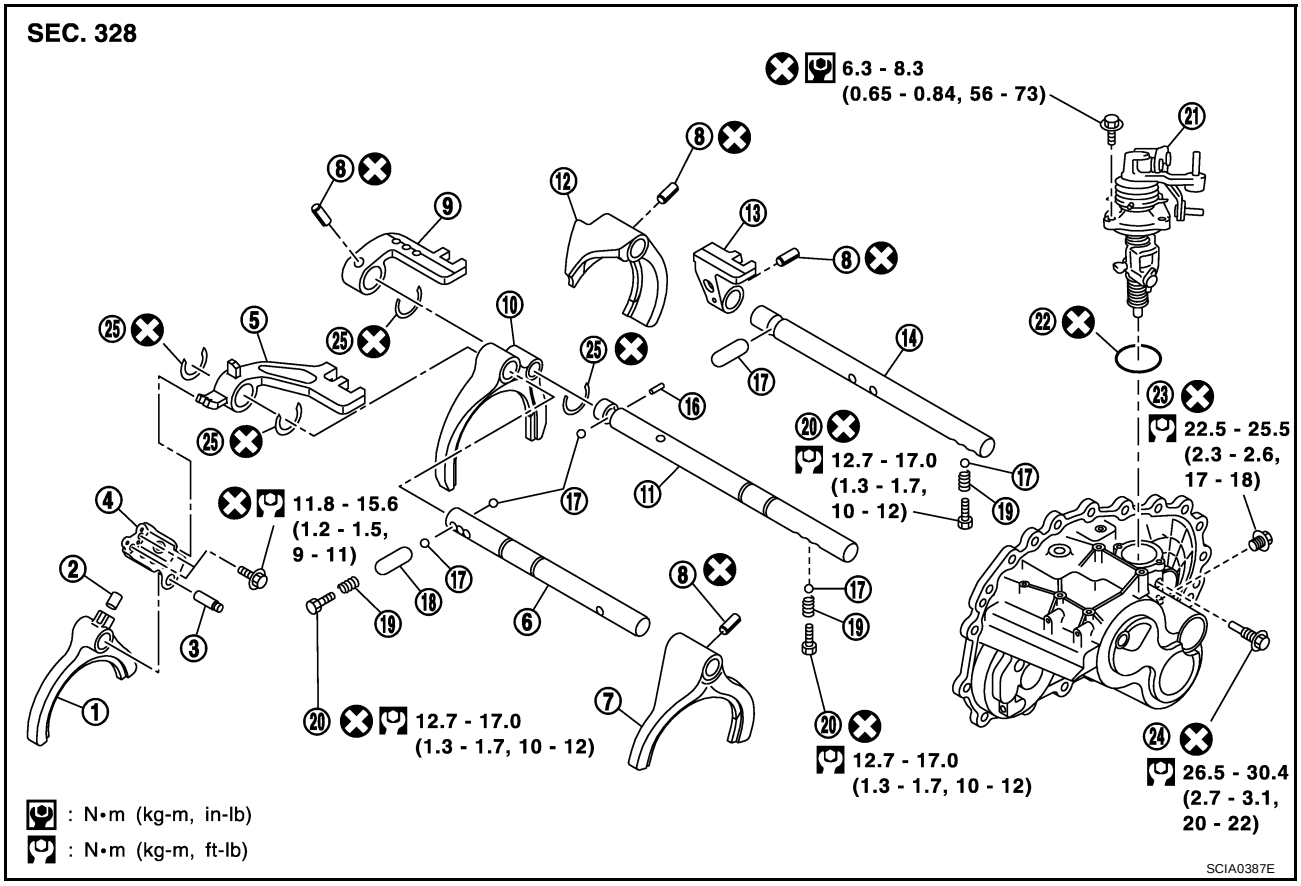
1.	Input shaft front bearing	2.	Input shaft	3.	Needle bearing
4.	3rd input gear	5.	3rd baulk ring	6.	Spread spring
7.	3rd & 4th shifting insert	8.	3rd & 4th synchronizer hub	9.	4th baulk ring
10.	Bushing	11.	Needle bearing	12.	4th input gear
13.	Thrust washer	14.	Bushing	15.	Needle bearing
16.	5th input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

SEC. 322



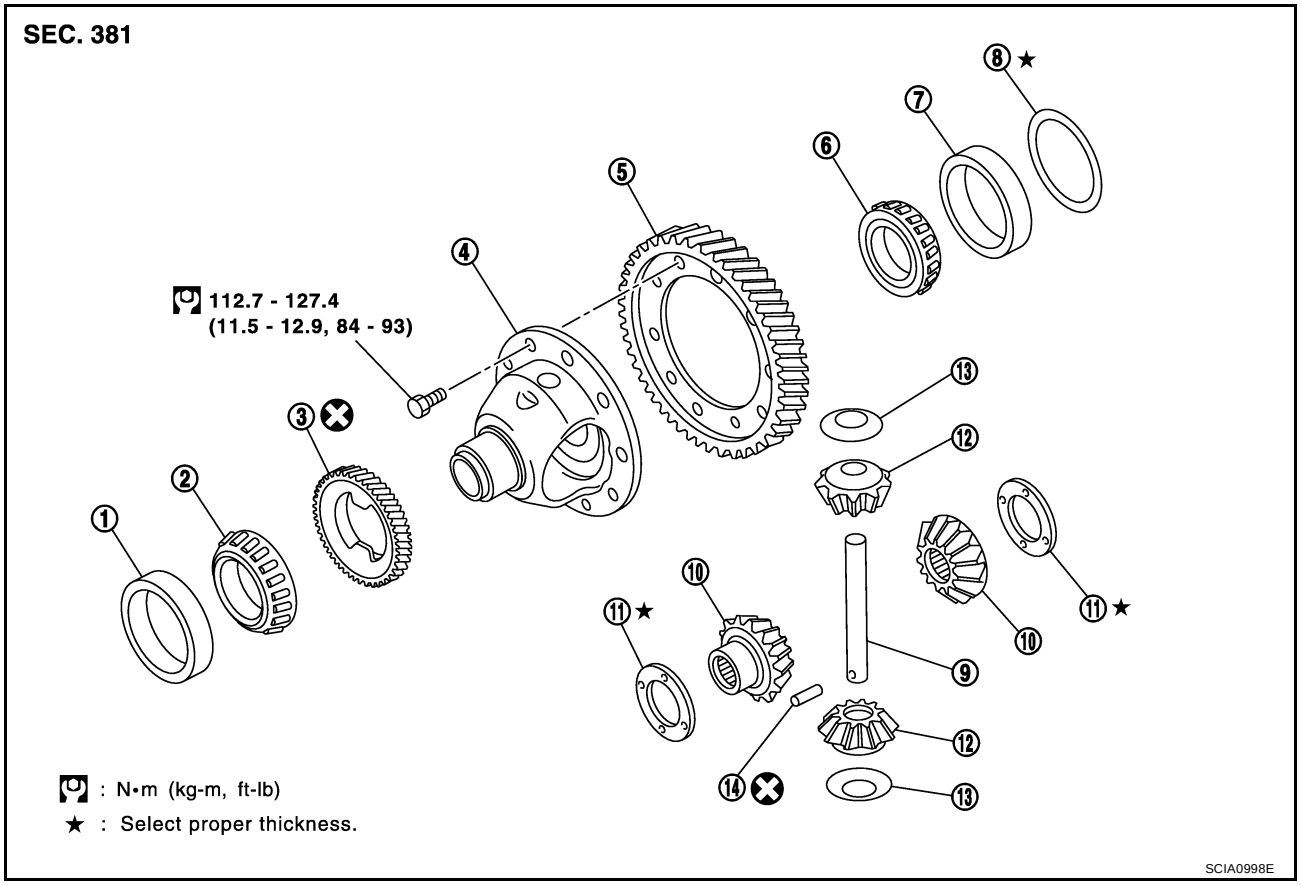
1. Mainshaft front bearing
2. Mainshaft bearing retainer
3. Mainshaft
4. Reverse main gear
5. 1st main gear
6. Bushing
7. Needle bearing
8. 1st inner baulk ring
9. 1st gear synchronizer cone
10. 1st outer baulk ring
11. Spread spring
12. 1st & 2nd shifting insert
13. 1st & 2nd synchronizer hub
14. 2nd 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. Snap ring
27. Mainshaft rear bearing
28. Mainshaft C-ring
29. C-ring holder
30. Snap ring
31. Snap ring
32. Mainshaft rear bearing adjusting shim

SHIFT CONTROL COMPONENTS



1.	Reverse shift fork	2.	Shifter cap	3.	Reverse fork rod
4.	Reverse lever assembly	5.	5th & reverse bracket	6.	5th & reverse fork rod
7.	5th 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 rod assembly
22.	O-ring	23.	Shift check	24.	Stopper bolt
25.	Stopper ring				

FINAL DRIVE COMPONENTS



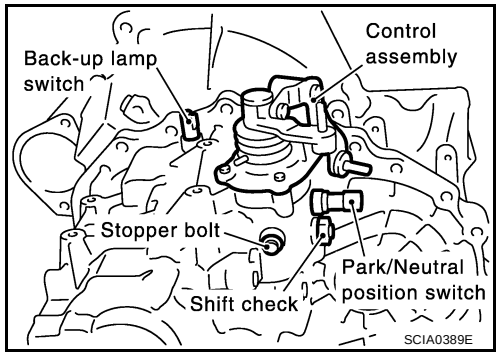
1.	Differential side bearing outer race	2.	Differential side bearing	3.	Speedometer drive gear
4.	Differential case	5.	Final gear	6.	Differential side bearing
7.	Differential side bearing outer race	8.	Differential side bearing adjusting shim	9.	Pinion mate shaft
10.	Side gear	11.	Side gear thrust washer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

Disassembly and Assembly

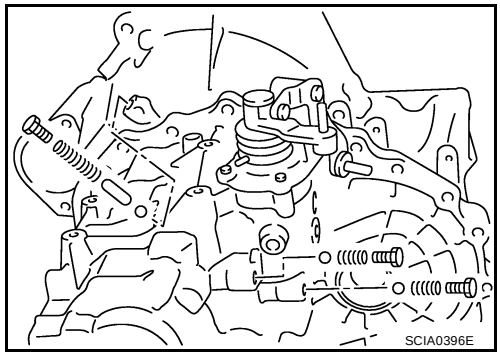
ECS004BD

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.



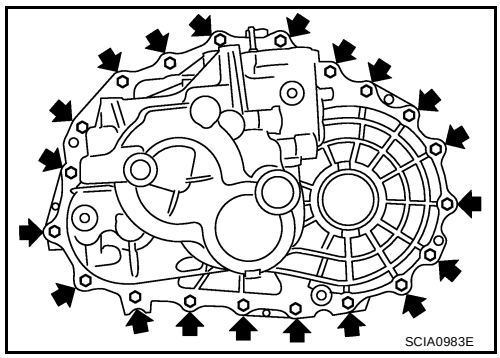
4. Remove check plugs (3 pieces), check springs (3 pieces), check balls (3 pieces) and shift check sleeve (1 piece).



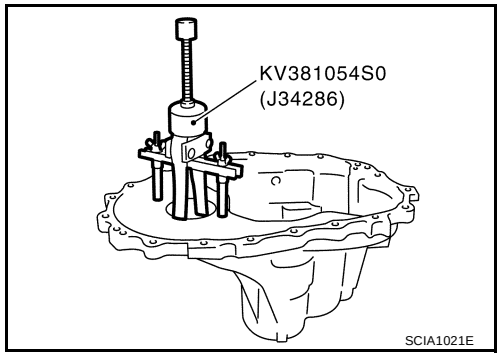
5. Remove transaxle case fixing bolts.
6. Remove bore plug.

CAUTION:
Be careful not to damage transaxle case.

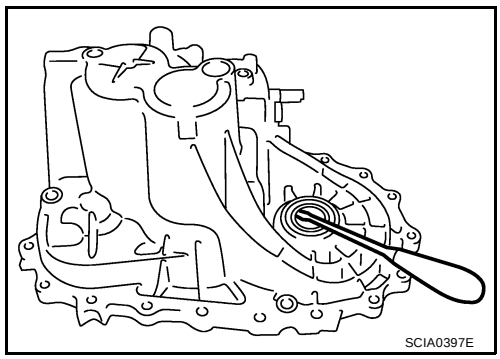
7. While spreading the snap ring of mainshaft rear bearing located at bore plug hole, remove transaxle case.
8. Remove oil gutter, baffle plate.
9. Remove snap ring, mainshaft rear bearing adjusting shim and input shaft rear bearing adjusting shim from transaxle case.



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



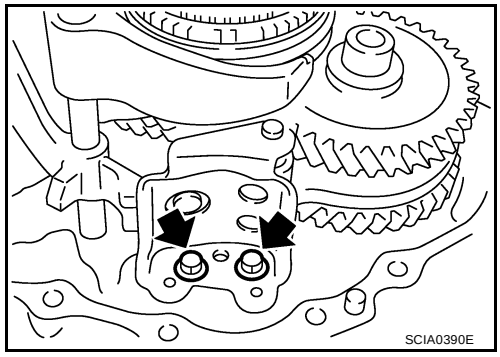
11. Remove differential oil seal.
12. Remove magnet from clutch housing.



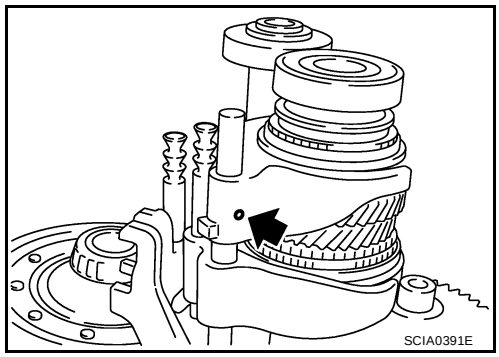
13. With shift lever in 5th position, remove bracket bolts from reverse lever assembly. Lift reverse lever assembly to remove.

CAUTION:
Be careful not to lose shifter cap.

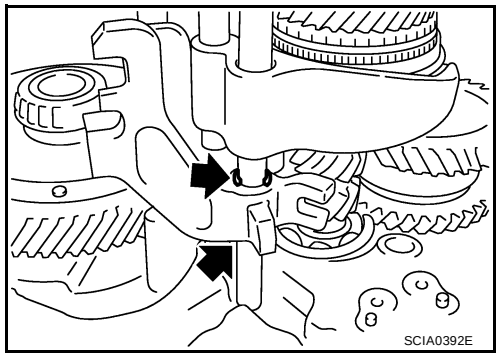
14. Pull out reverse fork rod then remove reverse shift fork.



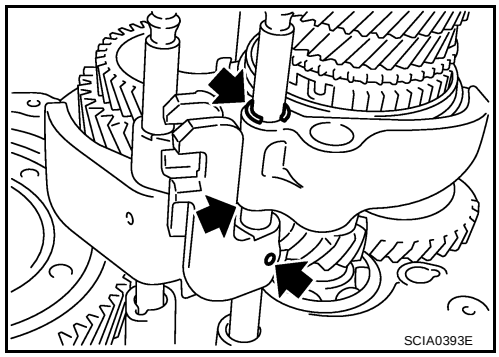
15. Shift 3rd & 4th fork rod to 3rd position. Remove retaining pin of 5th shift fork using pin punch.


SCIA0391E

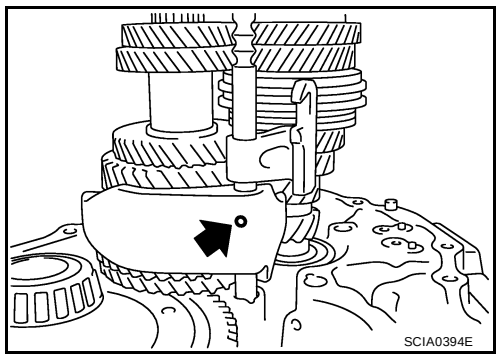
16. Remove stopper rings for 5th & reverse bracket.
17. Pull out 5th & reverse fork rod and remove 5th shift fork and 5th & reverse bracket.
18. Remove check balls (2 pieces) and inter lock pin.


SCIA0392E

19. Remove retaining pin of 3rd & 4th bracket using pin punch.
20. Remove stopper rings for 3rd & 4th shift fork.
21. Pull out 3rd & 4th fork rod and remove 3rd & 4th shift fork and bracket.
22. Remove shift check sleeve from clutch housing.


SCIA0393E

23. Remove retaining pin of 1st & 2nd shift fork using pin punch.
24. Pull out 1st & 2nd with bracket.
25. Remove 1st & 2nd shift fork.
26. Remove retaining pin of 1st & 2nd bracket using pin punch and separate 1st & 2nd fork rod and bracket.

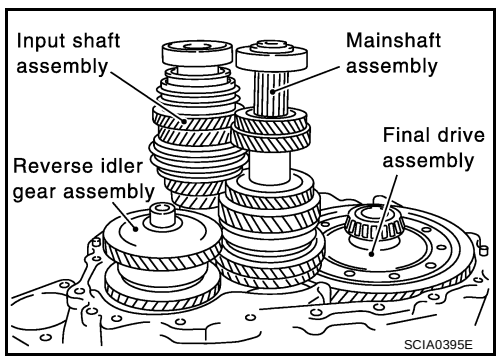

SCIA0394E

27. Remove gear components from clutch housing.

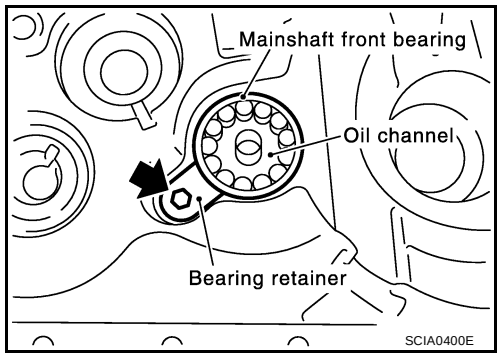
a. While tapping input shaft with plastic hammer, remove input shaft assembly, mainshaft assembly and reverse idler gear assembly as a set.

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

b. Remove final drive assembly.

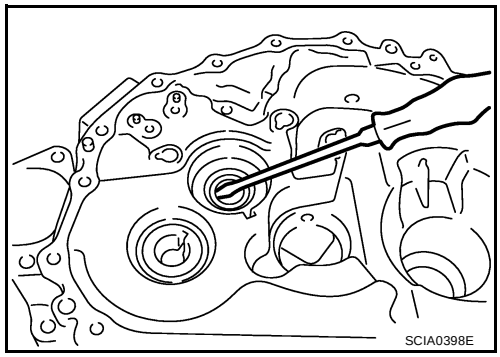


28. Remove bearing retainer and then the mainshaft front bearing.
29. Remove oil channel on mainshaft side.
30. Remove differential oil seal.
31. Remove differential side bearing outer race (clutch housing side).



32. Remove input shaft oil seal.

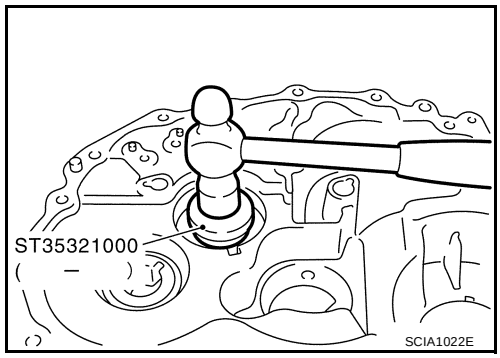
CAUTION:
Be careful not to damage clutch housing.



ASSEMBLY

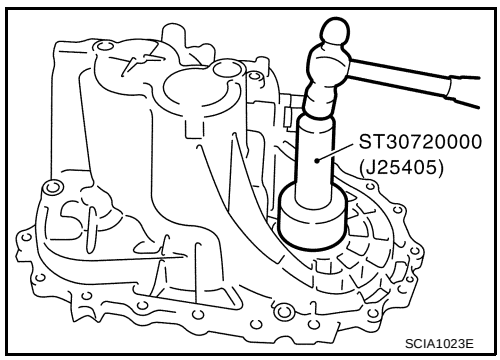
1. Using a drift, install input shaft oil seal.

CAUTION:
Oil seals are not reusable. Never reuse them.



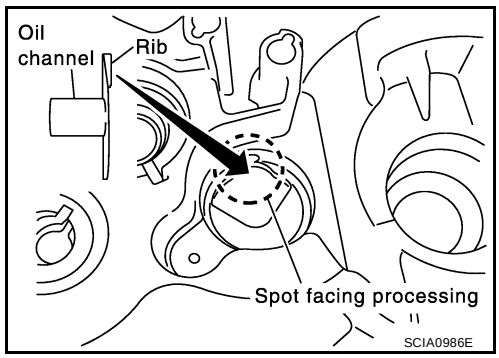
2. Using a drift, install differential oil seal.

CAUTION:
Oil seals are not reusable. Never reuse them.

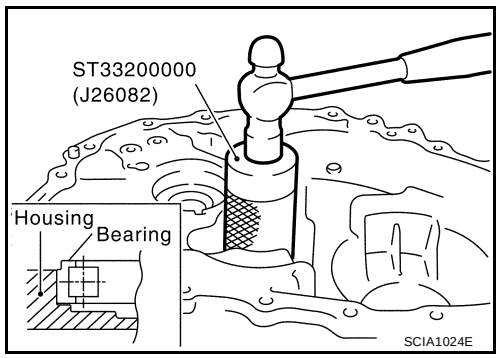


3. Install oil channel on mainshaft side.

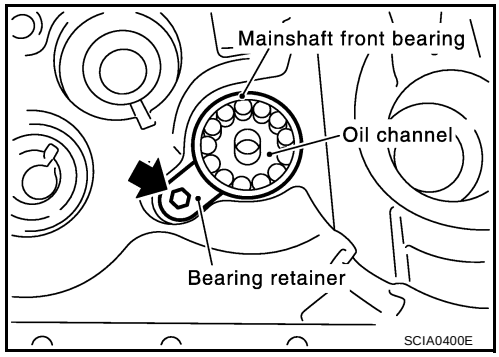
CAUTION:
Be careful with orientation of installation.



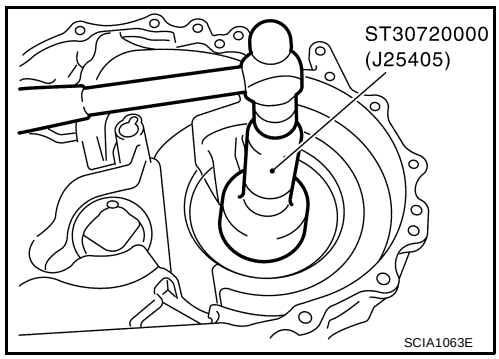
4. Using a drift, install mainshaft front bearing.



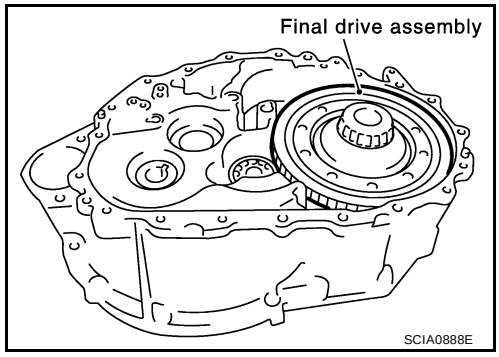
5. Install bearing retainer.



6. Install differential side bearing outer race.

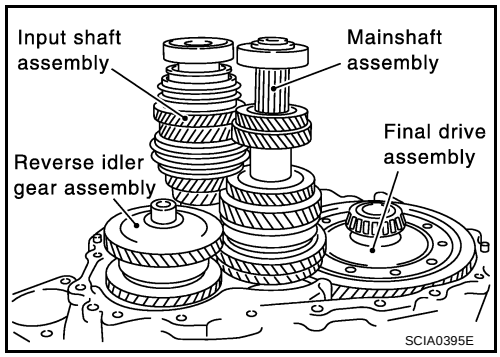


7. Install final drive assembly into clutch housing.



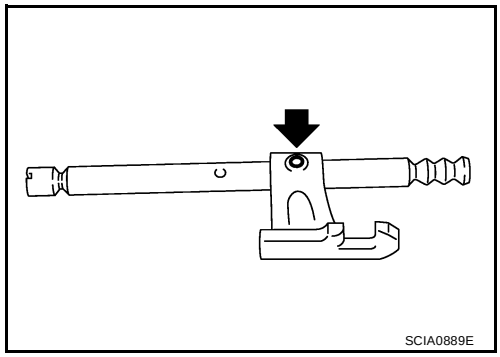
8. Install input shaft assembly, mainshaft assembly, and reverse idler gear assembly into clutch housing.

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.

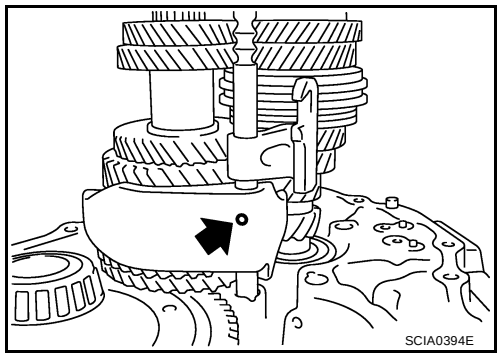
CAUTION:
Retaining pins are not reusable. Never reuse them.



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

CAUTION:
Retaining pins are not reusable. Never reuse them.

11. Install shift check sleeve.



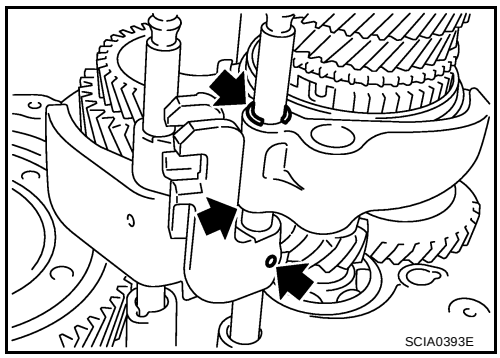
12. Install 3rd-4th bracket, 3rd-4th shift fork, and 3rd-4th fork rod with interlock pin.
13. Install stopper ring onto 3rd-4th shift fork.

CAUTION:
Stopper rings are not reusable. Never reuse them.

14. Install retaining pin onto 3rd-4th bracket.

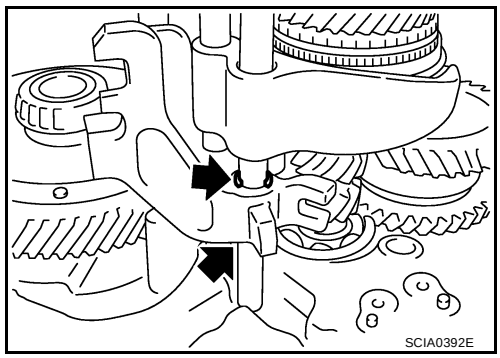
CAUTION:
Retaining pins are not reusable. Never reuse them.

15. Install 2 check balls.



16. Install 5th-reverse bracket, 5th shift fork, and 5th-reverse fork rod.
17. Install stopper ring onto 5th-reverse bracket.

CAUTION:
Stopper rings are not reusable. Never reuse them.



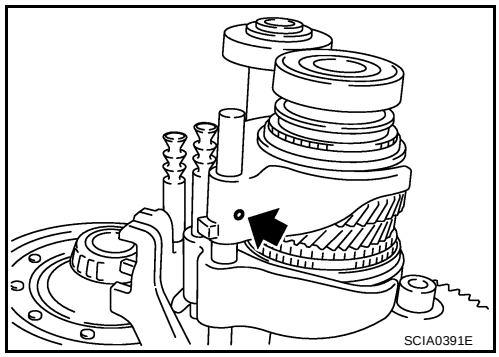
18. Install retaining pin onto 5th shift fork.

CAUTION:
Retaining pins are not reusable. Never reuse them.

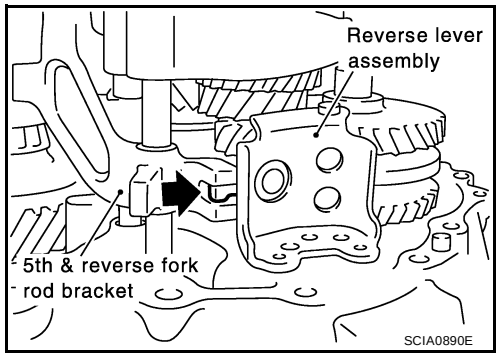
19. Install reverse shift fork and reverse fork rod.
20. Install reverse lever assembly following procedures below.

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

CAUTION:
Do not drop shifter cap.

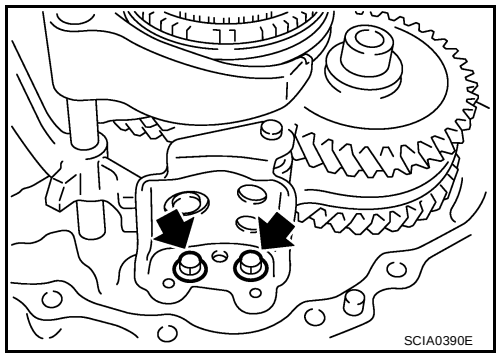


b. While lifting reverse shift fork, align cam with 5th-reverse bracket.



c. Tighten mounting bolts to specified torque, and then install reverse lever assembly.
21. Install the magnet onto clutch housing.
22. Install selected input shaft adjusting shim onto input shaft.
    - For selection of adjusting shims, refer to MT-94, "INPUT-SHAFT END PLAY" .
23. Install baffle plate and oil gutter.
24. 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-96, "MAIN-SHAFT END PLAY" .

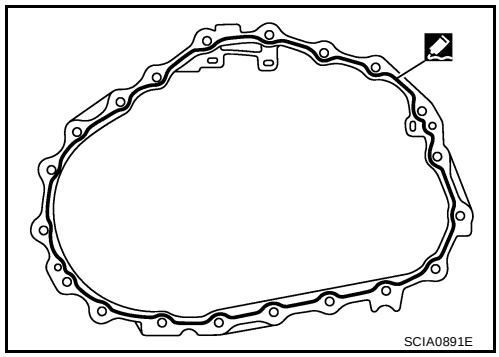


b. Temporarily install snap ring of mainshaft rear bearing into transaxle case.

CAUTION:
Do not reuse the snap ring.

c. Apply sealant to mating surfaces of transaxle case and clutch housing. Use Genuine Anaerobic Liquid Gasket or equivalent. Refer to GI-44, "Recommended Chemical Products and Sealants" .

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



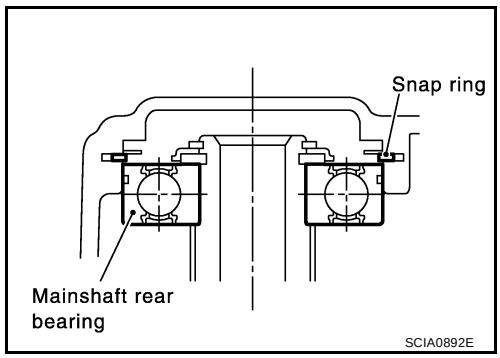
d. With snap ring of mainshaft rear bearing temporarily installed, place transaxle case over clutch housing.

e. Install control assembly.

CAUTION:
Do not reuse the O-ring.

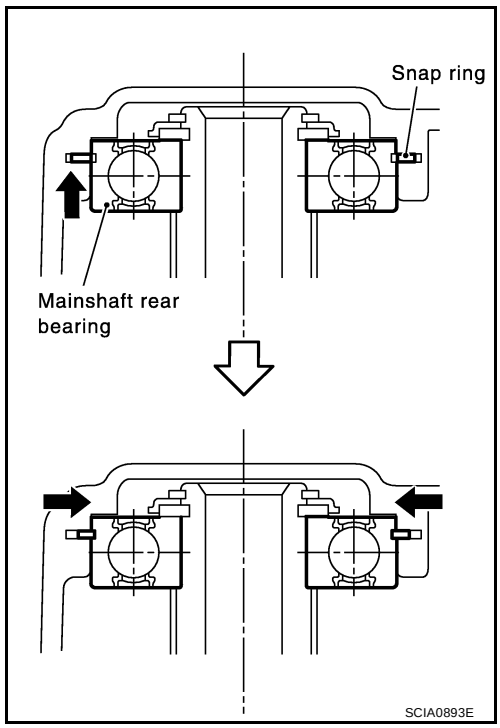
f. Install shift check and stopper bolt.

CAUTION:
Shift check and stopper bolt are not reusable. Never reuse them.



g. Through bore plug mounting hole, with snap ring stretched, move shift lever of control assembly to 2nd speed, and lift up mainshaft assembly.

h. Securely install snap ring onto mainshaft rear bearing.



i. Tighten mounting bolts.

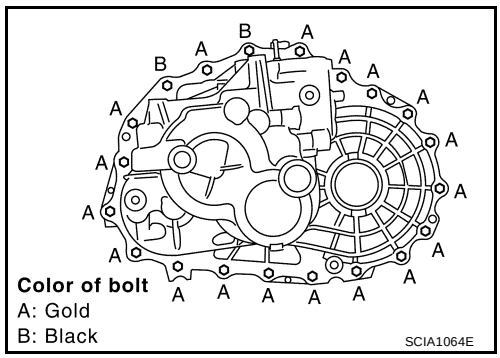
Bolt A

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

Bolt B

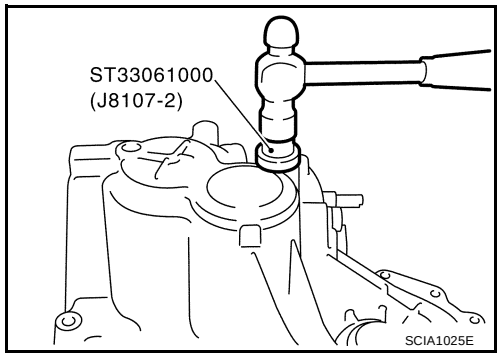
: 63.0 - 66.9 N·m (6.5 - 6.8 kg-m, 47 - 49 ft-lb)

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



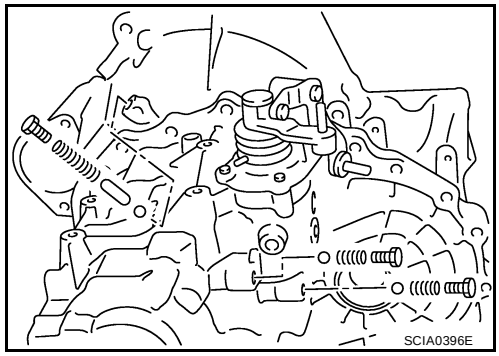
25. Using a drift, install bore plug.

CAUTION:
Bore plugs are not reusable. Never reuse them.



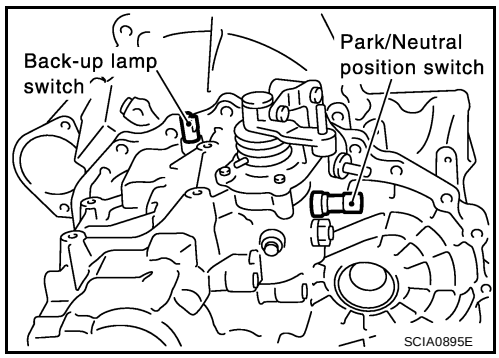
26. Install 1 shift check sleeve, 3 check balls, 3 check springs, and 3 check ball plugs.

CAUTION:
Check ball plugs are not reusable. Never reuse them.



27. Apply sealant to threads of neutral switch and reverse lamp switch, then install them into transaxle case. Use Genuine Anaerobic Liquid Gasket or equivalent. Refer to GI-44, "Recommended Chemical Products and Sealants" .
28. Install gaskets onto drain plug and filler plug, and then install them into transaxle case.

CAUTION:
- **Gaskets are not reusable. Never reuse them.**
- **After oil is filled, tighten filler plug to specified torque.**



Adjustment

ECS004BE

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 meet specification of end play for input shaft rear bearing.

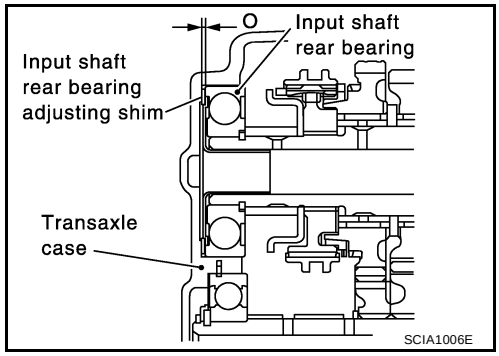
End play : 0 - 0.06 mm (0 - 0.0024 in)

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

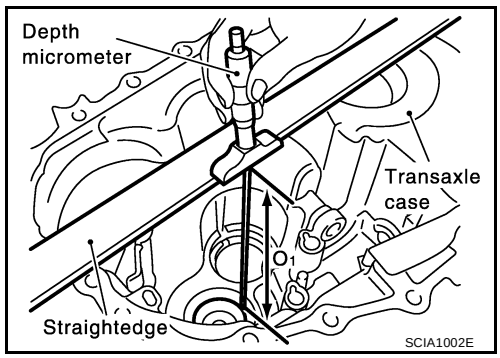


Adjusting Shim

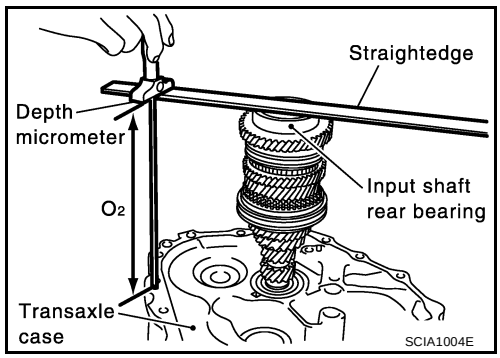
Shim thickness	Part number	Shim thickness	Part number	Shim thickness	Part number
0.40 mm (0.0157 in)	32225 8H500	0.88 mm (0.0346 in)	32225 8H512	1.36 mm (0.0520 in)	32225 8H524
0.44 mm (0.0173 in)	32225 8H501	0.92 mm (0.0362 in)	32225 8H513	1.40 mm (0.0551 in)	32225 8H560
0.48 mm (0.0189 in)	32225 8H502	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 (0.0396 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	1.68 mm (0.0661 in)	32225 8H567
0.76 mm (0.0299 in)	32225 8H509	1.24 mm (0.0488 in)	32225 8H521	1.72 mm (0.0677 in)	32225 8H568
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 meet specification of preload for differential side bearing.

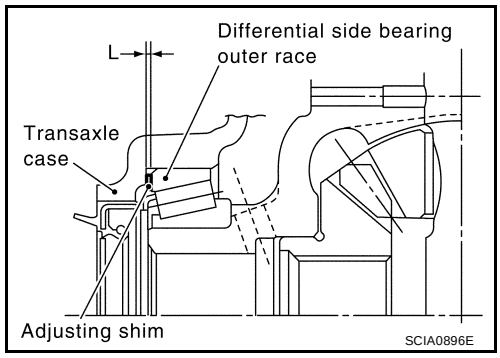
Preload : 0.15 - 0.21 mm (0.0059 - 0.0083 in)

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



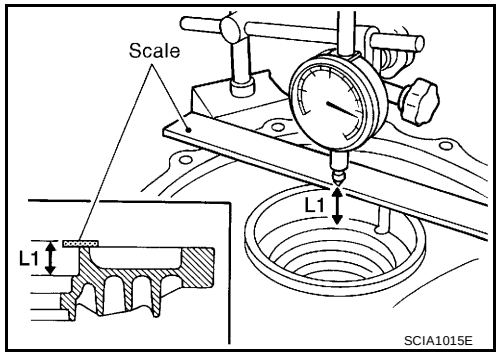
Adjusting Shim

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

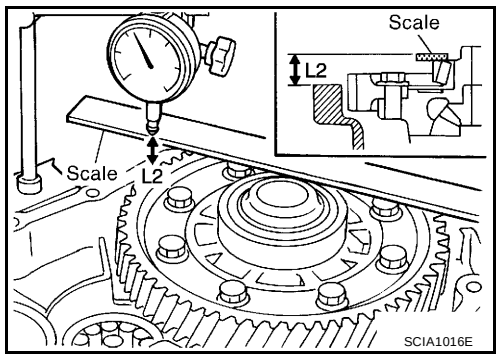
CAUTION:

Up to 2 adjusting shims can be selected.

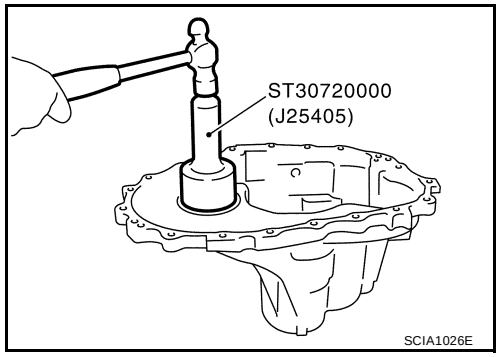
1. Using dial gauge and scale, measure dimension "L_1 " between clutch housing case end face and mounting face of adjusting shim.
2. Install outer race onto differential side bearing on final gear side. Holding the outer race horizontally by hand, rotate final gear five times or more (for smooth movement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



3. Using dial gauge and scale 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

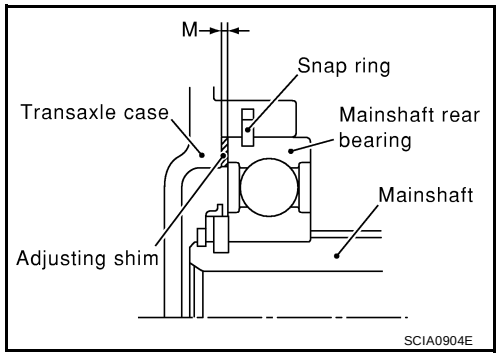
- When adjusting mainshaft end play, select adjusting shim for mainshaft rear bearing. To select adjusting shim, measure clearance “M” between transaxle case and mainshaft rear bearing.
- Calculate dimension "P" (thickness of adjusting shim) using the following procedure to meet specification of end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

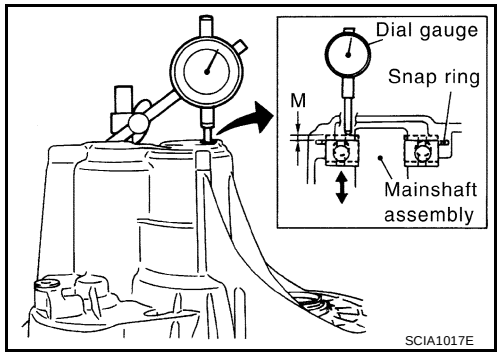


Adjusting Shim

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 (0.0396 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 meet specification of end play for reverse idler gear.

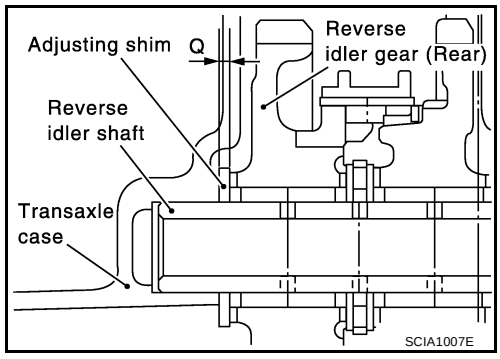
End play : 0.04 - 0.14 mm (0.0016 - 0.0055 in)

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



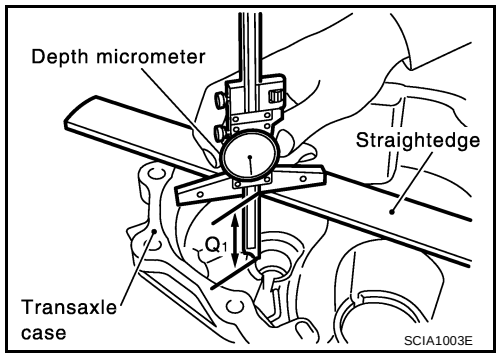
Adjusting Shim

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

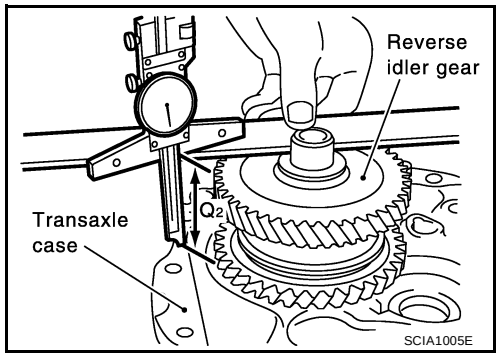
CAUTION:

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.



INPUT SHAFT AND GEARS

PFP:32200

Disassembly and Assembly

ECS004BF

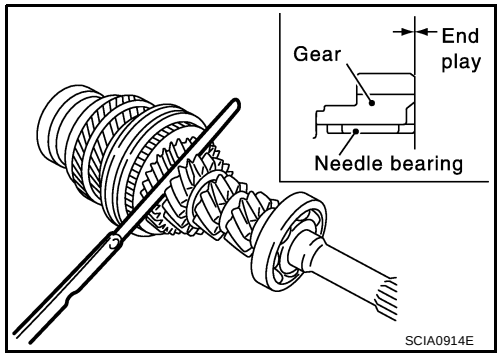
DISASSEMBLY

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

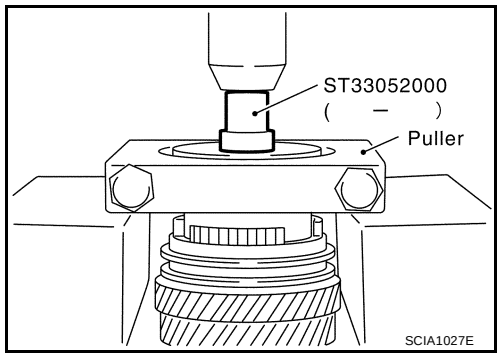
   End play standard value

   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)

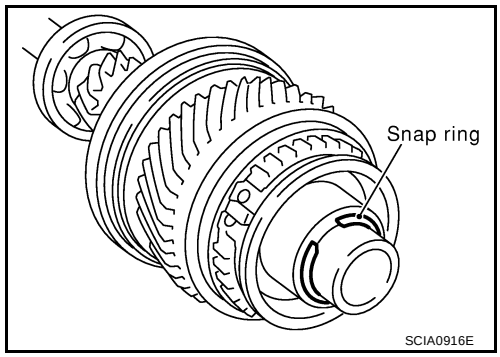
   CAUTION:
   If measurement is outside the standard range, disassemble to check contact surfaces of gear, shaft, and hub. Adjust with snap ring at assembly.



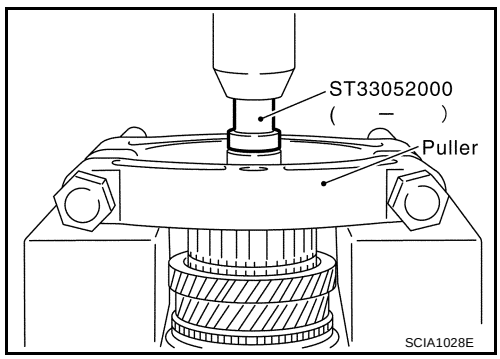
2. Remove oil channel.
3. Remove input shaft rear bearing.



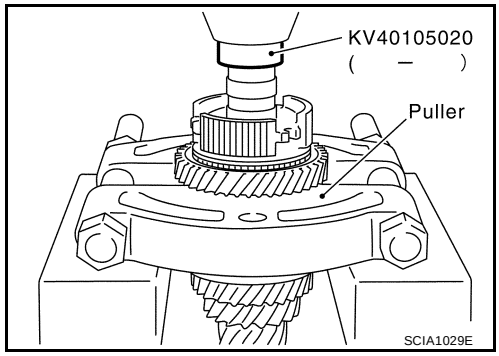
4. Remove the snap ring.



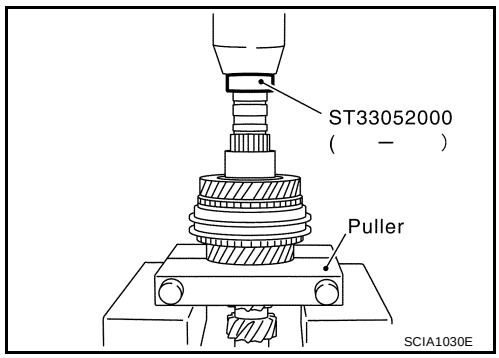
5. Remove input shaft bearing spacer and 5th stopper simultaneously.



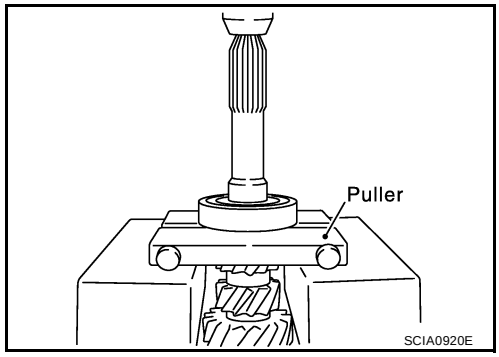
6. Remove 5th input gear and synchronizer hub assembly simultaneously.
7. Remove 5th needle bearing.



8. 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.
9. Remove 3rd needle bearing.



10. Remove input shaft front bearing.

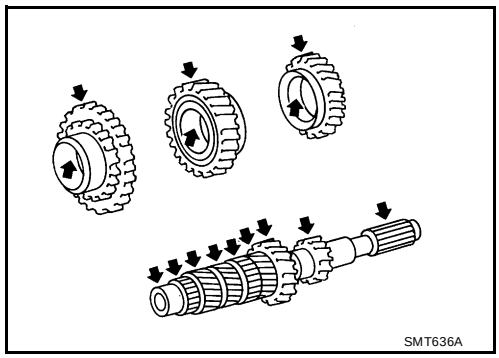


INSPECTION AFTER DISASSEMBLY

Input Shaft and Gear

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

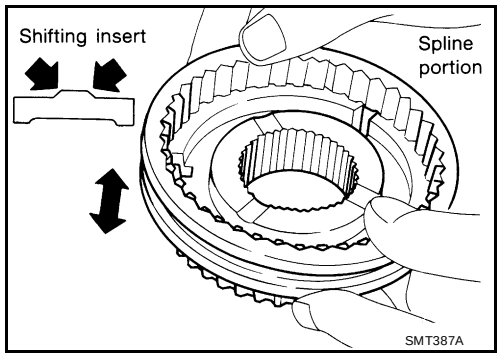
- Damage, peeling, dent, uneven wear, bending of shaft.
- Excessive wear, damage, peeling of gears.



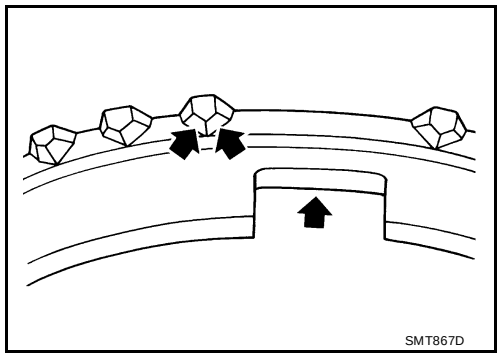
Synchronizer

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.



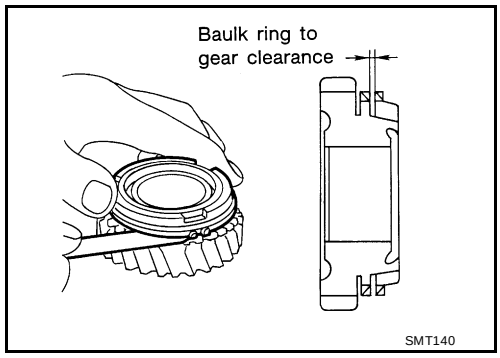
Baulk ring clearance

- 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

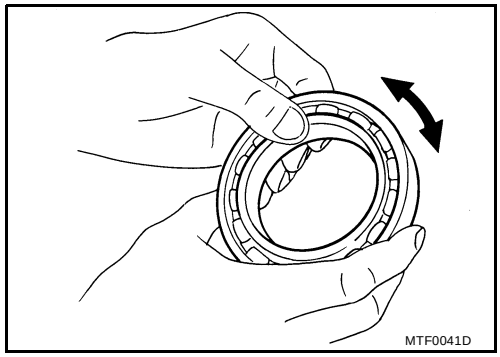
3rd and 4th	**: 0.9 - 1.45 mm (0.035 - 0.0571 in)**
5th	**: 0.95 - 1.4 mm (0.0374 - 0.055 in)**
Limit value	**: 0.7 mm (0.028 in)**



Bearing

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

- Damage and rough rotation of bearing

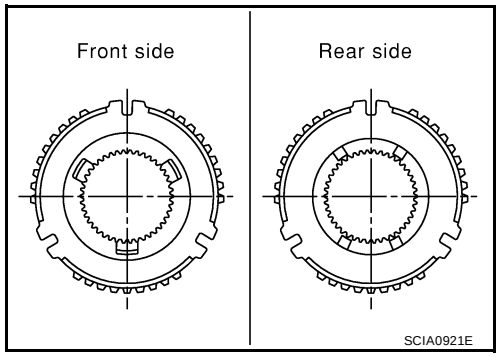


ASSEMBLY

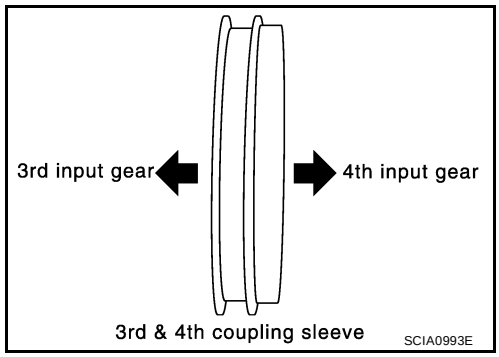
1. Install 3rd needle bearing.
2. Install 3rd input gear and 3rd baulk ring.
3. Install spread spring, shifting insert and 3rd-4th synchronizer hub onto 3rd-4th coupling sleeve.

CAUTION:

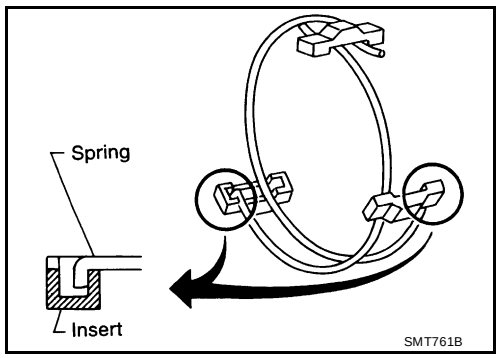
- **Be careful with orientation of synchronizer hub.**



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



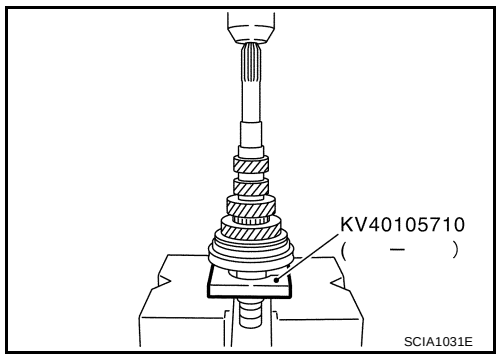
- **Be sure not to hook ends of 2 spread springs (front and back: 2 each) on same shifting insert.**



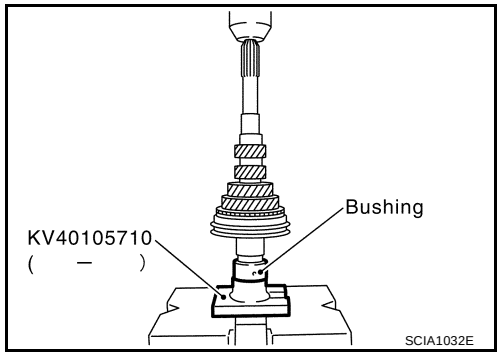
4. Install 3rd-4th synchronizer hub assembly.

CAUTION:

Align grooves of shifting insert and 3rd baulk ring.

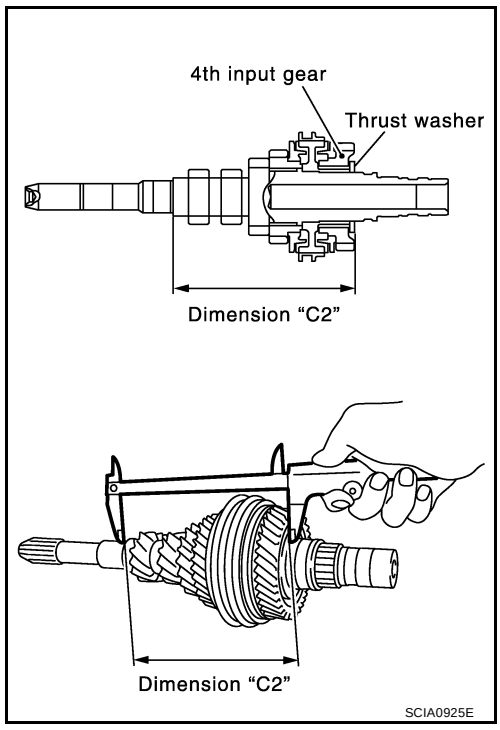


5. Install 4th bushing.
6. Install 4th baulk ring.
7. Install 4th input gear and 4th needle bearing.



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)

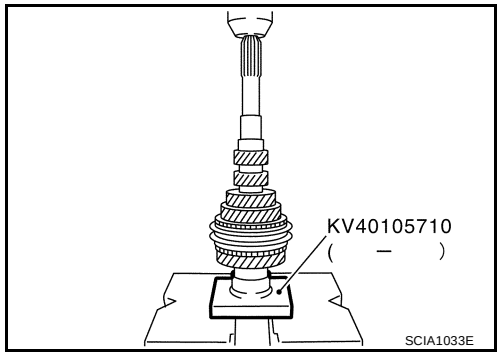


Thrust Washer

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 washer can be selected.

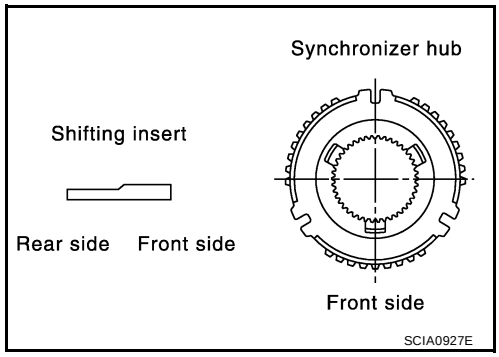
9. Install 5th bushing.
10. Install 5th needle bearing and 5th input gear.
11. Install 5th baulk ring.



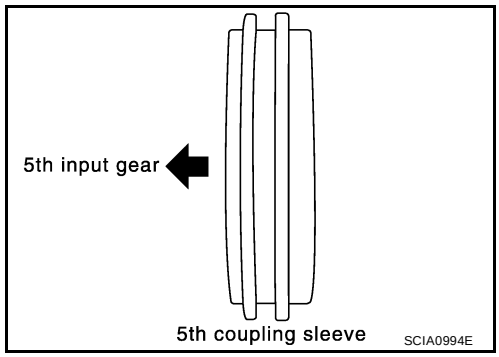
12. Install spread spring, shifting insert and 5th synchronizer hub onto 5th coupling sleeve.

CAUTION:

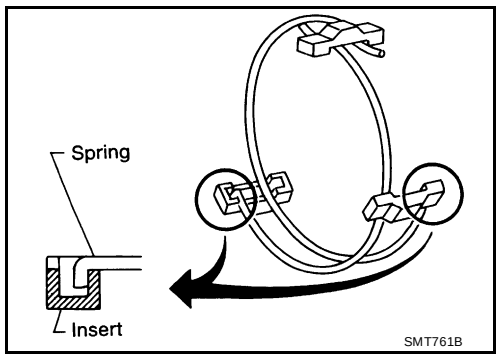
- **Be careful with orientation of synchronizer hub and shifting insert.**



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



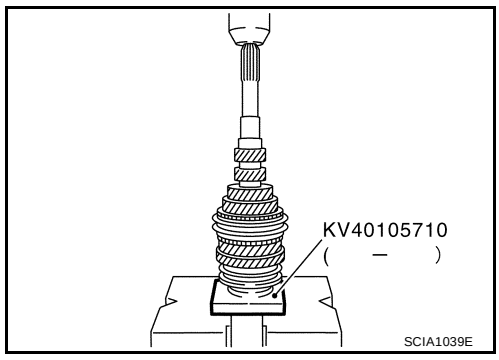
- **Be sure not to hook ends of 2 spread springs (front and back: 2 each) on same shifting insert.**



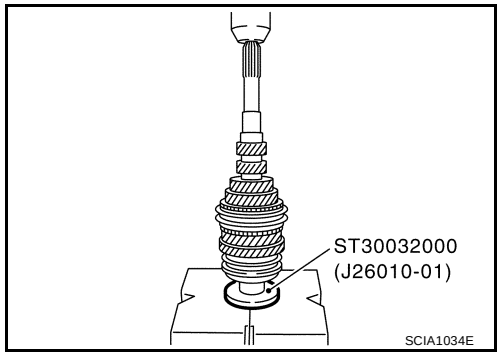
13. Install 5th synchronizer hub assembly.

CAUTION:

Align grooves of 5th shifting insert and 5th baulk ring.



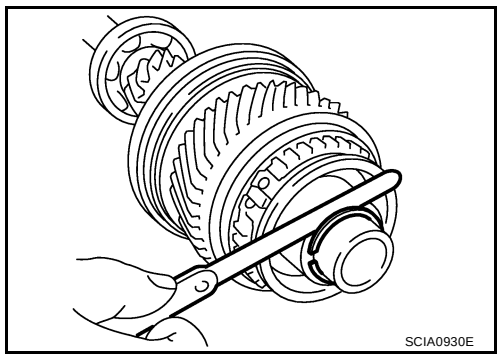
14. Install 5th stopper and then input shaft bearing spacer.



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

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

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

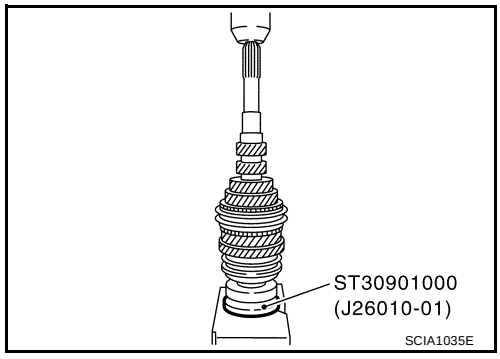


Snap Rings

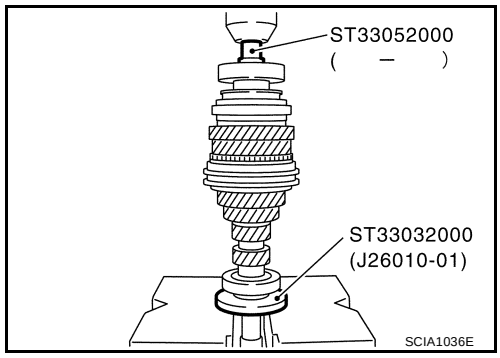
Thickness	Part number	Thickness	Part number
1.71 mm (0.0673 in)	32204 8H510	2.01 mm (0.0791 in)	32204 8H516
1.76 mm (0.0693 in)	32204 8H511	2.06 mm (0.0811 in)	32204 8H517
1.81 mm (0.0713 in)	32204 8H512	2.11 mm (0.0831 in)	32204 8H518
1.86 mm (0.0732 in)	32204 8H513	2.16 mm (0.0850 in)	32204 8H519
1.91 mm (0.0752 in)	32204 8H514	2.21 mm (0.0871 in)	32204 8H520
1.96 mm (0.0772 in)	32204 8H515	2.26 mm (0.0890 in)	32204 8H521

16. Install input shaft rear bearing.

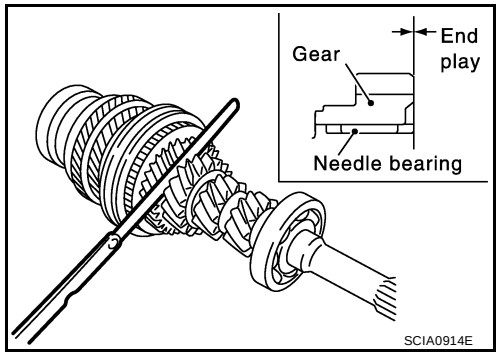
CAUTION:
Install input shaft rear bearing with its brown surface facing the input gear side.



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



19. Check end play of 3rd, 4th, and 5th 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)

MAINSHAFT AND GEARS

PFP:32241

Disassembly and Assembly

ECS004BG

DISASSEMBLY

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

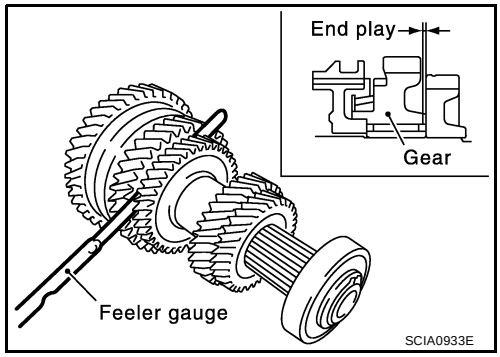
   End play standard value

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

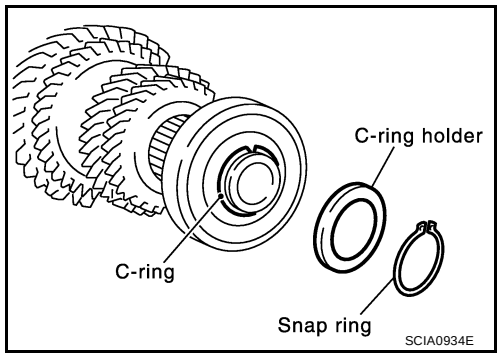
   2nd gear : 0.06 - 0.16 mm (0.0024 - 0.0063 in)

   CAUTION:

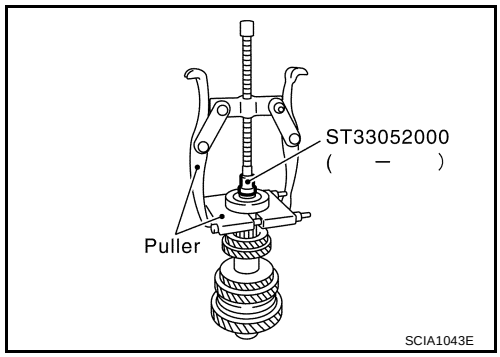
   If measurement is outside the standard range, disassemble to check contact surfaces of gear, shaft, and hub. Adjust with snap ring at assembly.



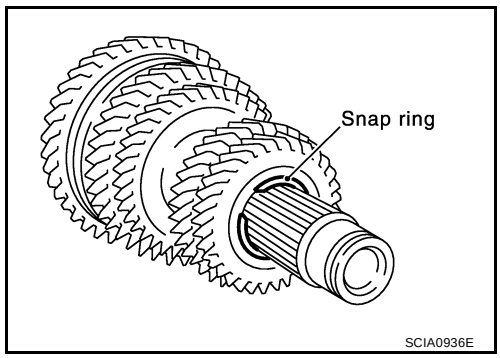
2. Remove the snap ring.
3. Remove C-ring holder, and then mainshaft C-ring.



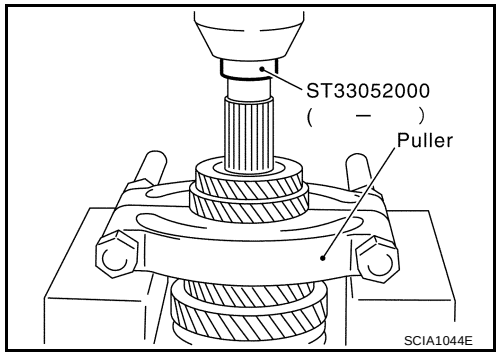
4. Remove mainshaft rear bearing.



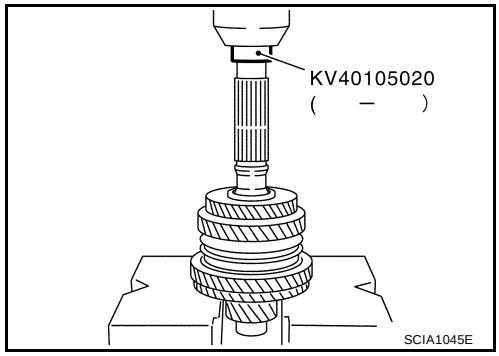
5. Remove the snap ring.



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 needle bearing, 2nd bushing, 1st-2nd synchronizer hub assembly, 1st main gear, reverse main gear, 1st needle bearing, and 1st bushing simultaneously.

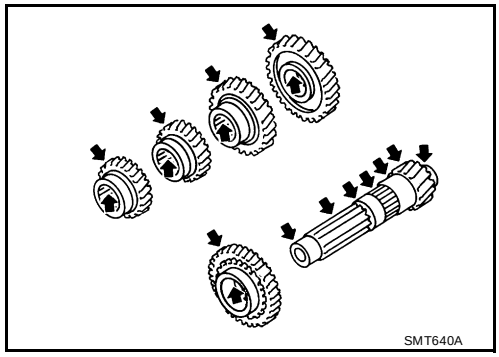


INSPECTION AFTER DISASSEMBLY

Main Shaft and Gears

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

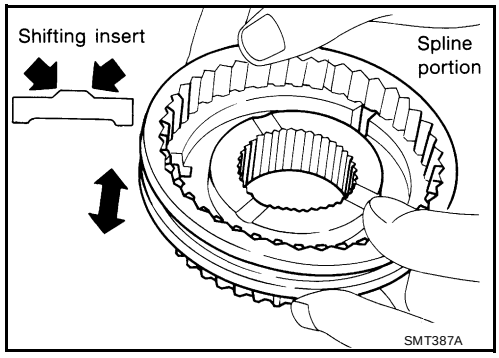
- Damage, peeling, dent, uneven wear, bending, and other non-standard conditions of the shaft.
- Excessive wear, damage, peeling, and other non-standard conditions of the gears.



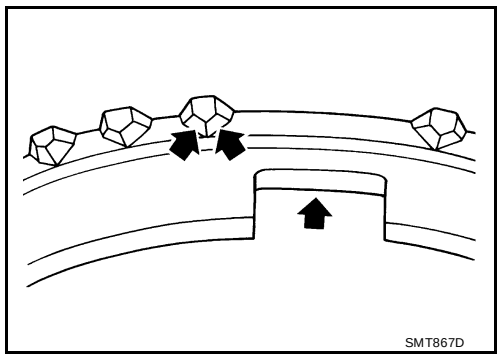
Synchronizer

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.



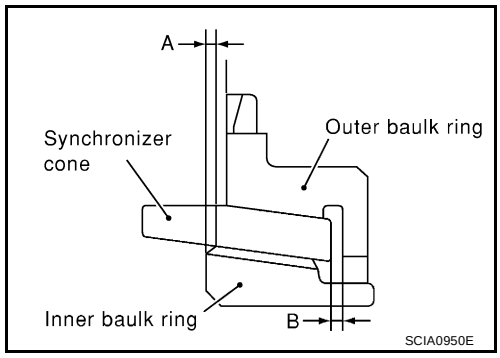
- If any crack, damage, or excessive wear is found on cam face of baulk ring or working face of insert, replace it.



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.

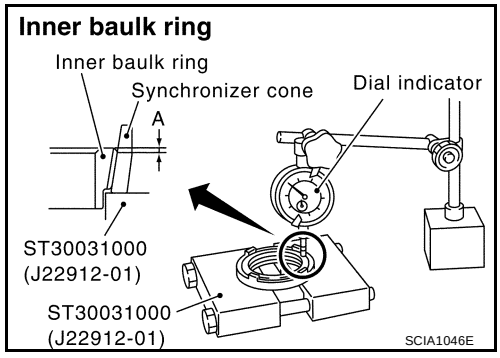
  CAUTION:
  Outer baulk ring, synchronizer cone, and inner baulk ring as a set control clearance A and B. If measurement exceeds service limit value, replace all of them as a set.



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

   Clearance A

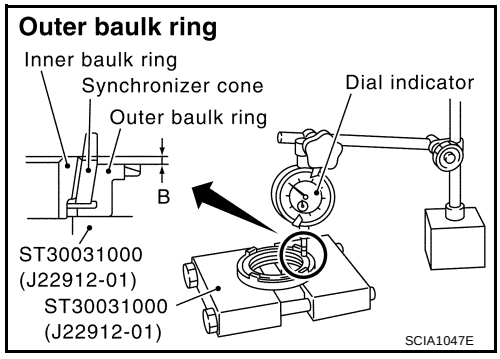
   Standard : 0.6 - 0.8 mm (0.024 - 0.031 in)
   Limit value : 0.2 mm (0.008 in) or less



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

   Clearance B

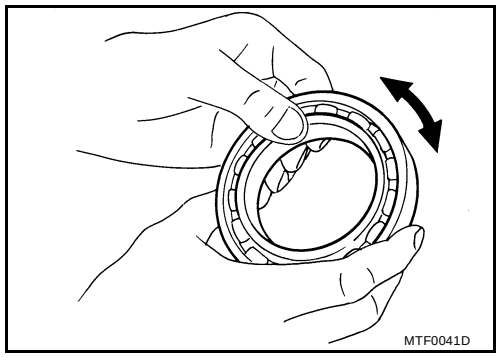
   Standard : 1.3 - 1.5 mm (0.051 - 0.059 in)
   Limit value : 0.2 mm (0.008 in) or less



Bearing

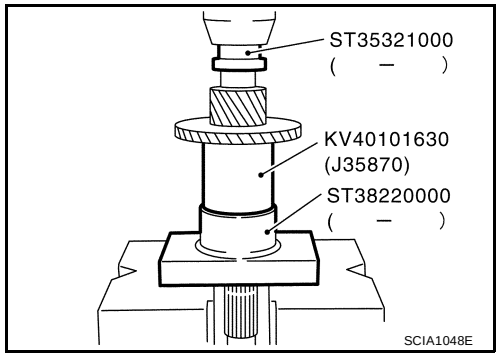
Check items below. If necessary, replace them with new ones.

- Damage and rough rotation of bearing

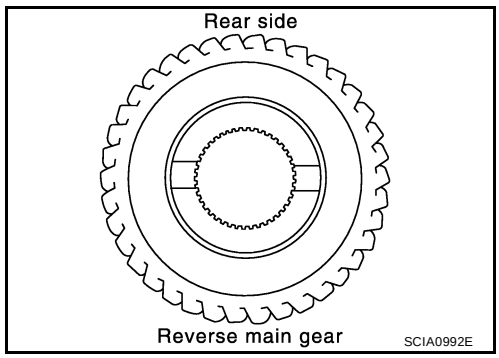


ASSEMBLY

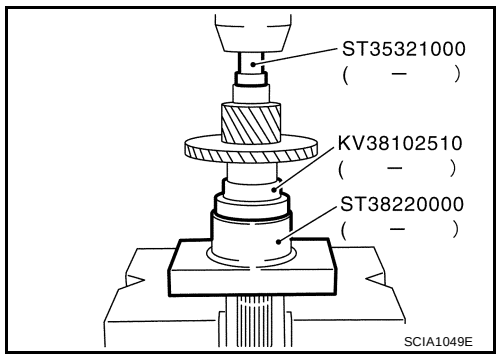
1. Install reverse main gear.



CAUTION:
Be careful with orientation of reverse main gear.



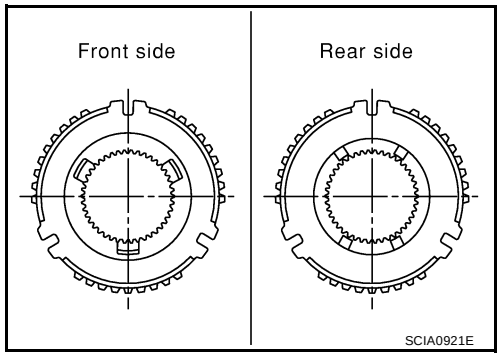
2. Install 1st bushing.
3. Install needle bearing, and then 1st main gear.



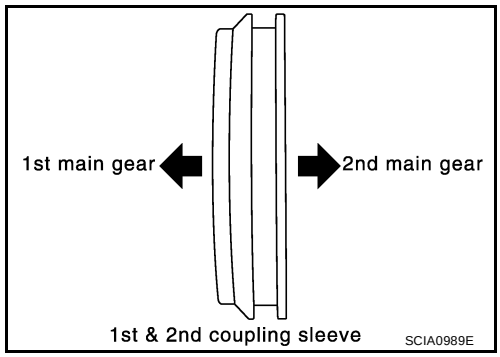
4. Install spread spring, shifting insert and 1st-2nd synchronizer hub onto 1st-2nd coupling sleeve.

CAUTION:

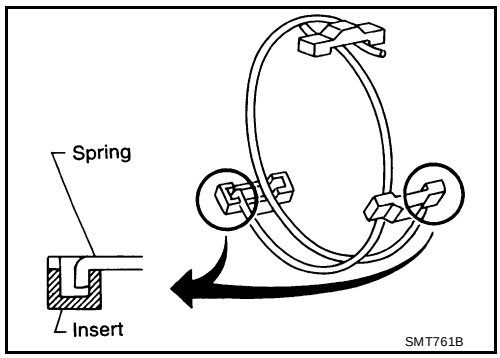
- **Be careful with orientation of synchronizer hub.**



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



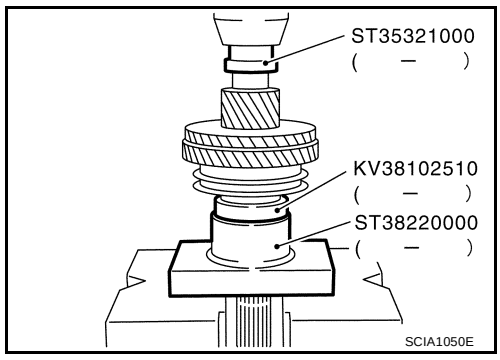
- **Be sure not to hook ends of 2 spread springs (front and back: 2 each) on same shifting insert.**



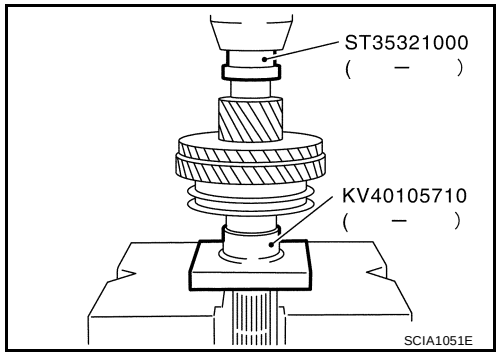
5. Install 1st gear synchronizer assembly onto mainshaft, and synchronizer hub assembly onto mainshaft.

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.**



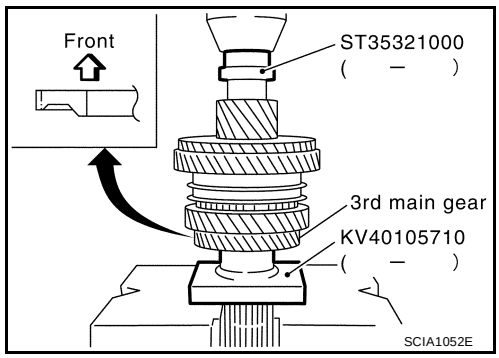
6. Install 2nd bushing.
7. Install outer baulk ring, synchronizer cone, and inner baulk ring on 2nd gear-side.
8. Install 2nd needle bearing and 2nd gear.



9. Install 3rd main gear.

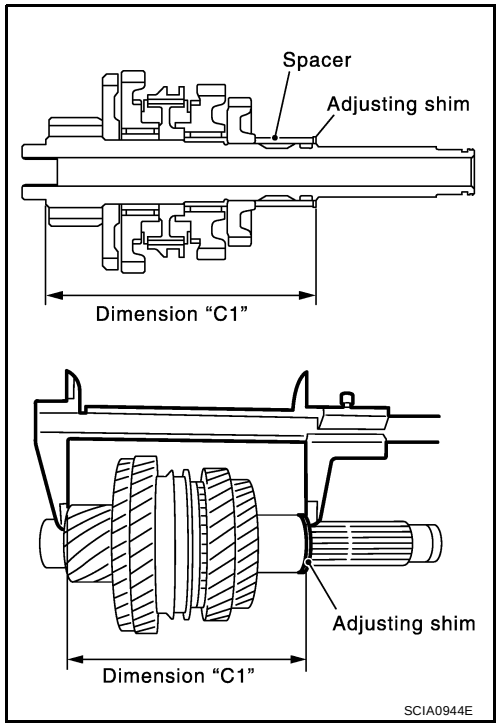
CAUTION:
Be careful with orientation of 3rd main gear.

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)



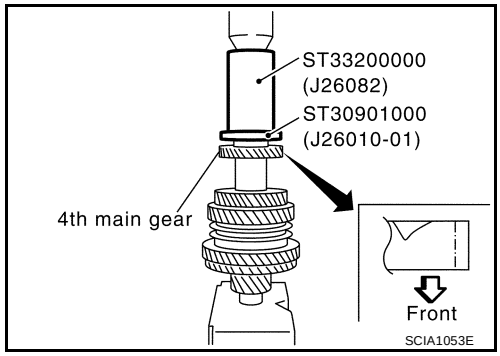
Adjusting Shims

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 1 adjusting shim can be selected.

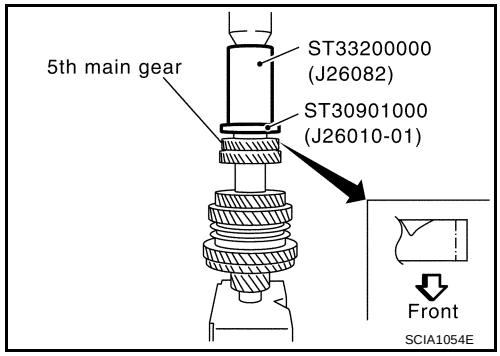
12. Install 4th main gear.

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



13. Install 5th main gear.

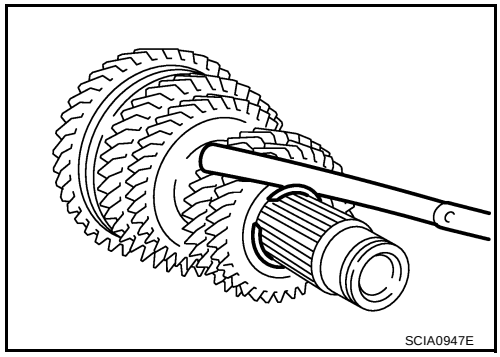
CAUTION:
Be careful with orientation of 5th main gear.



14. Install snap ring onto mainshaft, and check that end play of 5th main gear satisfies standard value.

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

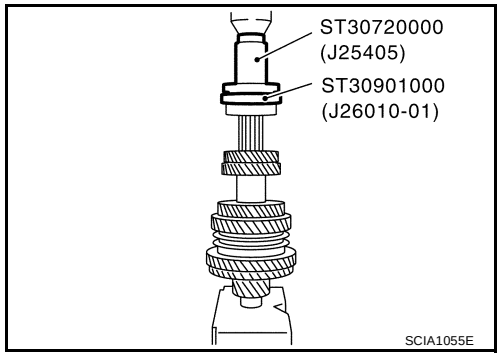
- If measurement is outside the standard range, reselect snap ring.



Snap Rings

Thickness	Part number	Thickness	Part number
1.85 mm (0.0728 in)	32204 8H500	2.05 mm (0.0807 in)	32204 8H504
1.90 mm (0.0748 in)	32204 8H501	2.10 mm (0.0827 in)	32204 8H505
1.95 mm (0.0768 in)	32204 8H502	2.15 mm (0.0846 in)	32204 8H506
2.00 mm (0.0787 in)	32204 8H503	2.20 mm (0.0866 in)	32204 8H507

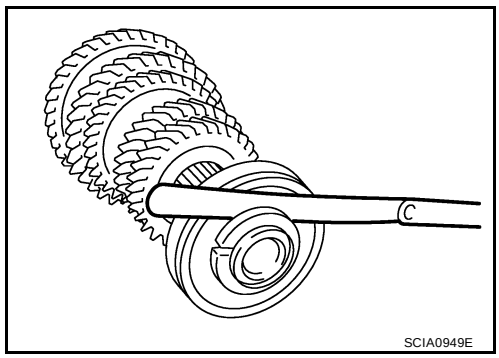
15. Install mainshaft rear bearing.



16. Install C-ring onto mainshaft, and check that end play of mainshaft rear bearing meets specifications.

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

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



C-rings

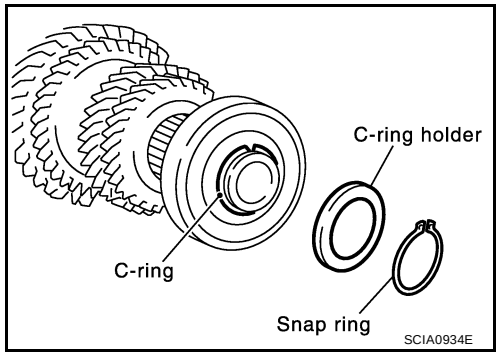
Thickness	Part number	Thickness	Part number
2.535 mm (0.0866 in)	32348 8H800	2.835 mm (0.1116 in)	32348 8H810
2.565 mm (0.1010 in)	32348 8H801	2.865 mm (0.1128 in)	32348 8H811
2.595 mm (0.1022 in)	32348 8H802	2.895 mm (0.1140 in)	32348 8H812
2.625 mm (0.1033 in)	32348 8H803	2.925 mm (0.1152 in)	32348 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		

17. Fit C-ring holder, and install snap ring.
18. 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

Disassembly and Assembly

ECS004BH

DISASSEMBLY

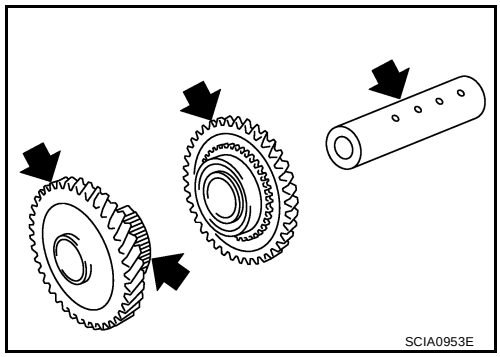
1. Remove reverse idler gear adjusting shim.
2. Remove reverse idler gear (rear), reverse coupling sleeve and insert spring simultaneously.
3. Remove reverse idler gear needle bearing.
4. Remove thrust needle bearing.
5. Remove reverse baulk ring.
6. Remove reverse idler gear (front).
7. Remove reverse 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.

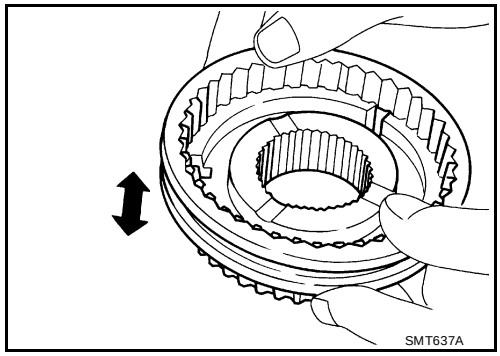
- Damage, peeling, dent, uneven wear, bending, and other non-standard conditions of the shaft.
- Excessive wear, damage, peeling, and other non-standard conditions of the gears.



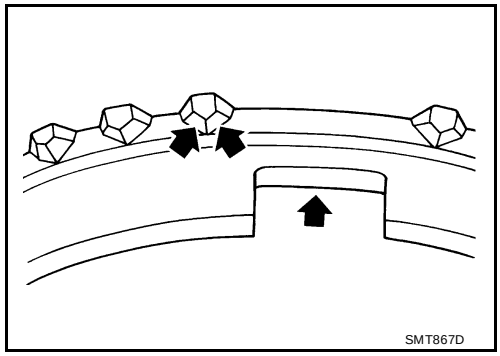
Synchronizer

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.



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

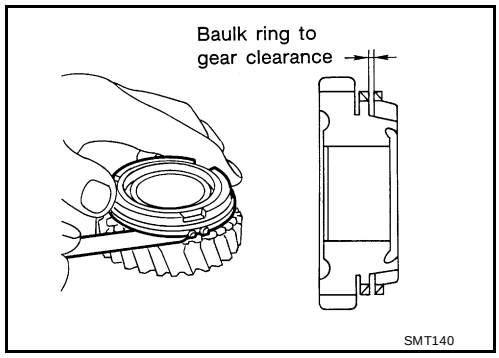


Baulk ring clearance

- 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 - 0.055 in)**
Limit value	**: 0.7 mm (0.028 in)**



Bearing

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

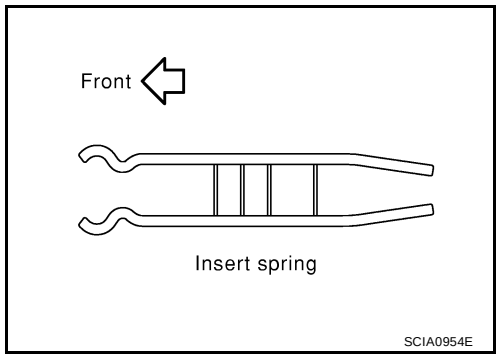
- Damage and rough rotation of bearing.

ASSEMBLY

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

CAUTION:

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



FINAL DRIVE

PFP:38411

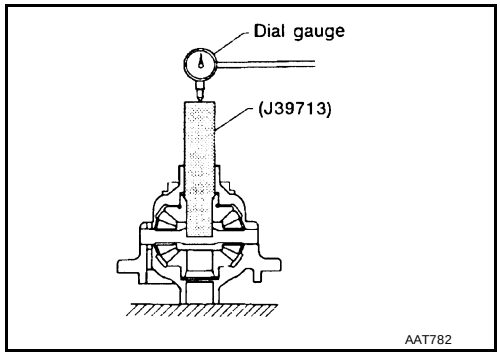
Disassembly and Assembly

ECS004BI

PRE-INSPECTION

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

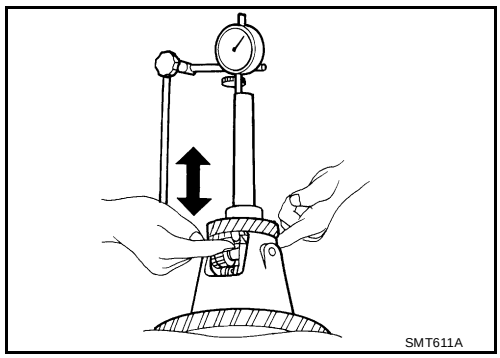
1. Clean final drive assembly sufficiently to prevent side gear thrust washer, differential case, side gear, and other parts from sticking by gear oil.



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.

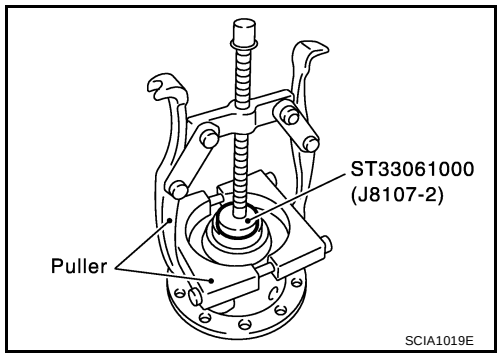
Clearance between side gear and differential case	**: 0.1 - 0.2 mm (0.004 - 0.008 in)**

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.

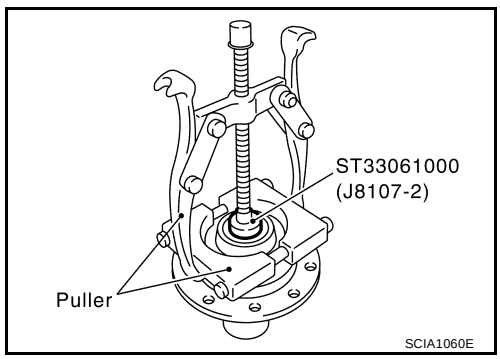


DISASSEMBLY

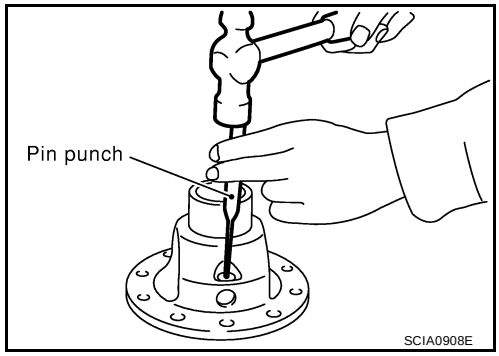
1. Remove mounting bolts.Then, separate the final gear from differential case.
2. Remove speedometer drive gear.
3. Using a drift and puller, remove differential side bearing (clutch housing side).



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



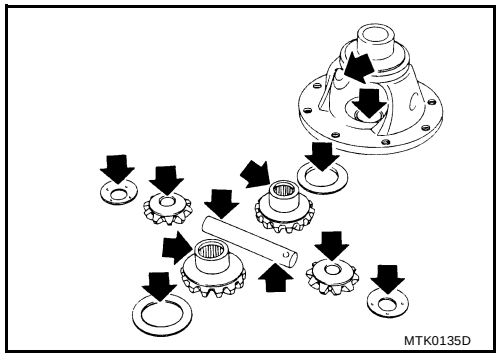
5. Using a pin punch, pull out lock pin and pinion mate shaft.
6. Rotate pinion mate gears, and remove pinion mate gears, pinion mate thrust washers, side gears, and side gear thrust washers from differential case.



INSPECTION AFTER DISASSEMBLY

Gear, Washer, Shaft and Case

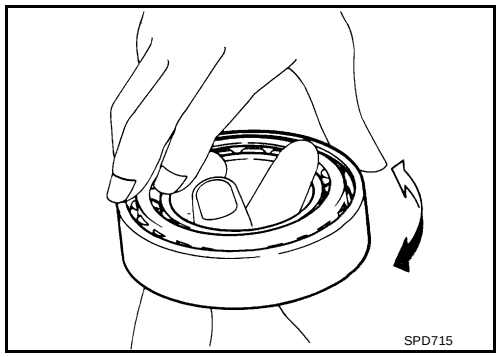
- Check side gears, side gear thrust washers, pinion mate shaft, pinion mate gears, pinion mate thrust washers and differential case. If necessary, replace with a new one.



Bearing

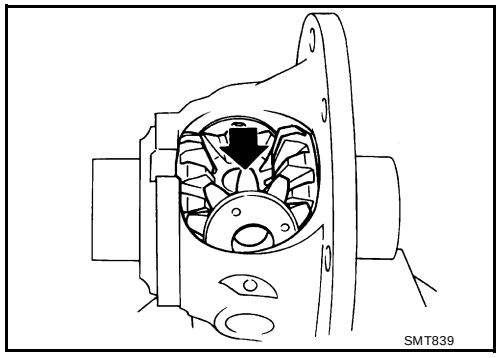
- Check for bearing damage and rough rotation. If necessary, replace with a new one.

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



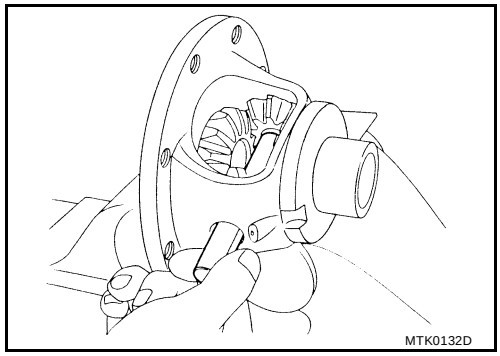
ASSEMBLY

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



4. Insert pinion mate shaft into differential case.

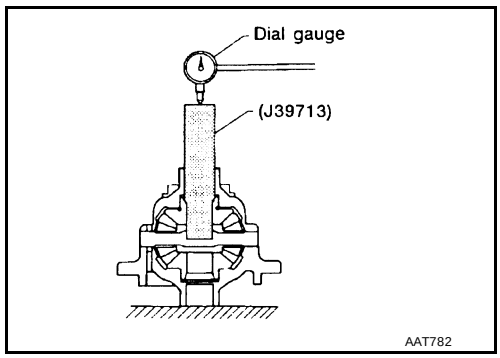
CAUTION:
Be sure not to damage pinion mate thrust washers.



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 faces upward.

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

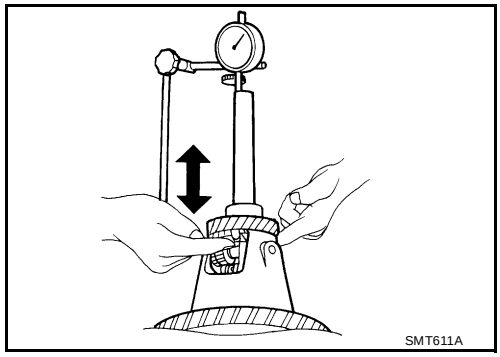


c. Move side gears up and down to measure end play, and select thrust washer so that it meets specification.

End play standard value

: 0.1 - 0.2 mm (0.004 - 0.008 in)

CAUTION:
Place differential case upside down. Be sure to measure end play for opposite side-gears in the same way.



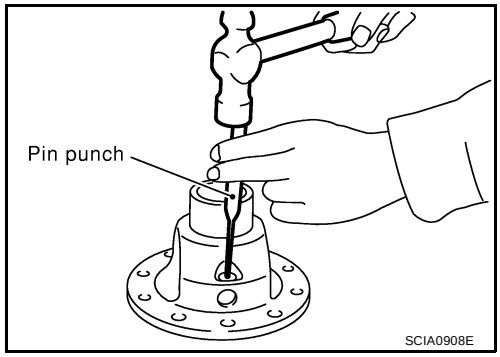
Thrust washer

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

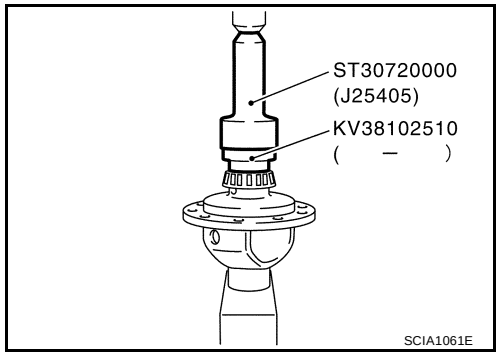
CAUTION:
Only 1 thrust washer can be selected.

6. Drive a lock pin into the pinion mate shaft using tool.

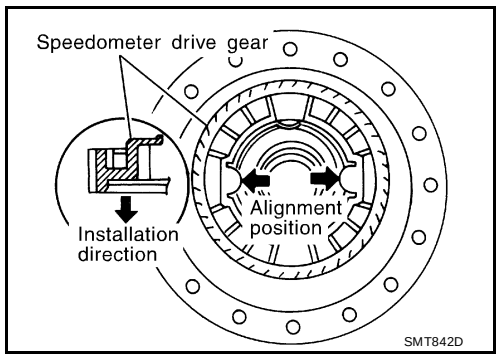
CAUTION:
Do not reuse the lock pin.



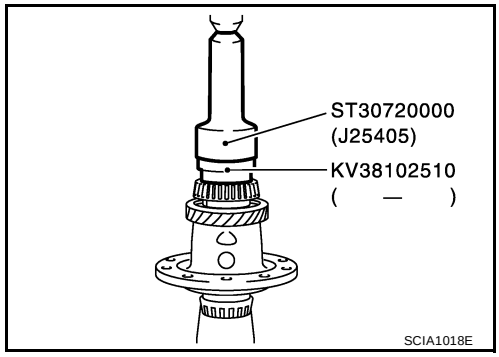
7. Install differential side bearing (transaxle case side) using tool.



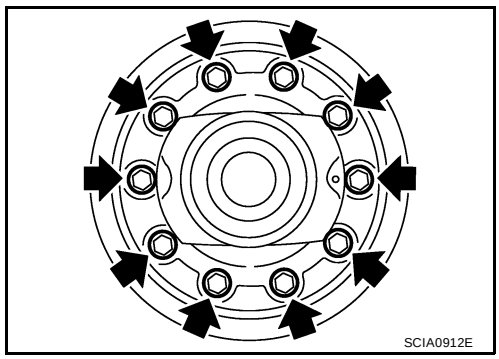
8. Align and install speedometer drive gear onto differential case.



9. Install differential side bearing (clutch housing side) using tool.



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



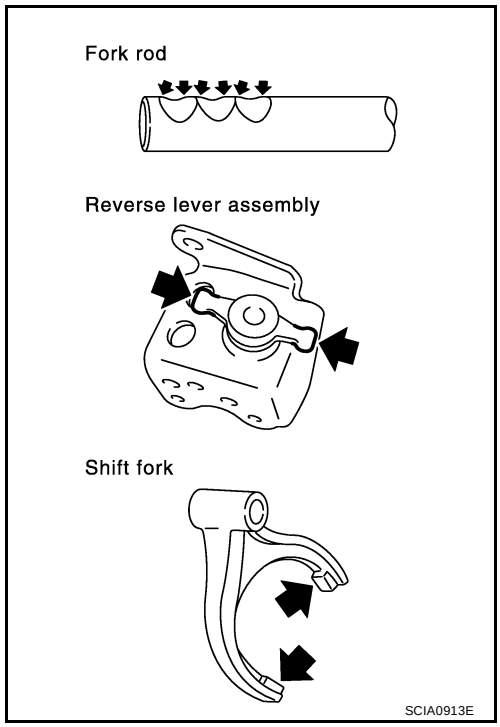
SHIFT CONTROL

PFP:32982

Inspection

ECS004BJ

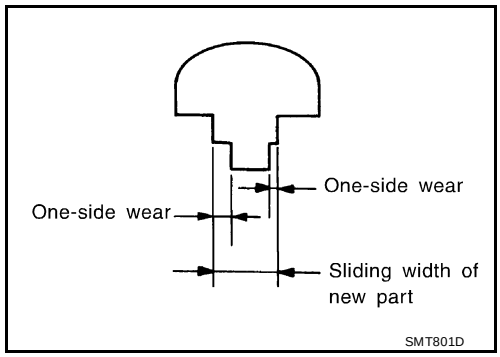
- Check contact surfaces and sliding area for wear, damage, and bending. If necessary, replace parts.



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	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)



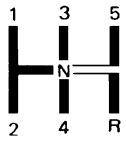
SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

General Specifications

ECS004BK

TRANSAXLE

Engine			QR25DE
Transaxle model			RS5F51A
Model code number			8U006
Number of speed			5
Synchromesh type			Warner
Shift pattern			 SCIA0821E
Gear ratio	1st		3.153
	2nd		1.842
	3rd		1.258
	4th		0.947
	5th		0.772
	Reverse		3.002
Number of teeth	Input gear	1st	13
		2nd	19
		3rd	31
		4th	38
		5th	44
		Reverse	13
	Main gear	1st	41
		2nd	35
		3rd	39
		4th	36
		5th	34
		Reverse	38
	Reverse idler gear	Front	37
		Rear	38
Oil capacity ℓ (US qt, Imp qt)			2.3 (2 3/8, 2)
Remarks	Reverse synchronizer		Installed
	Double baulk ring type synchronizer		1st & 2rd synchronizer

FINAL GEAR

Engine		QR25DE
Transaxle model		RS5F51A
Model code number		8U006
Final gear ratio		4.133
Number of teeth	Final gear/Pinion	62/15
	Side gear/Pinion mate gear	14/10

Gear End Play

ECS004BL

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)

Clearance Between Baulk Ring and Gear

ECS004BM

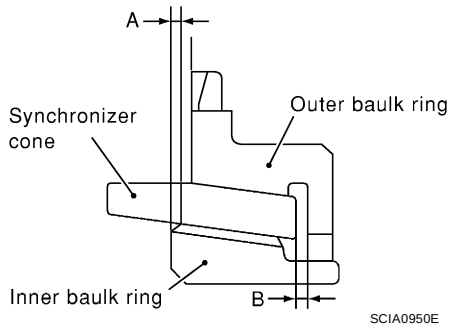
3RD, 4TH, 5TH & REVERSE BAULK RING

Unit: mm (in)

Standard		Wear limit
3rd	0.9 - 1.45 (0.035 - 0.0571)	0.7 (0.028)
4th	0.9 - 1.45 (0.035 - 0.0571)	0.7 (0.028)
5th	0.95 - 1.4 (0.0374 - 0.055)	0.7 (0.028)
Reverse	0.95 - 1.4 (0.0374 - 0.055)	0.7 (0.028)

1ST AND 2ND DOUBLE BAULK RING

Unit: mm (in)



SCIA0950E

Dimension	Standard	Wear limit
A	0.6 - 0.8 (0.024 - 0.031)	0.2 (0.008)
B	1.3 - 1.5 (0.051 - 0.059)	0.2 (0.008)

Available Snap Rings

ECS004BN

INPUT SHAFT SPACER

End play		0 - 0.1 mm (0 - 0.004 in)	
Thickness mm (in)	Part number*	Thickness mm (in)	Part number*
1.71 (0.0673)	32204 8H510	2.01 (0.0791)	32204 8H516
1.76 (0.0693)	32204 8H511	2.06 (0.0811)	32204 8H517
1.81 (0.0713)	32204 8H512	2.11 (0.0831)	32204 8H518
1.86 (0.0732)	32204 8H513	2.16 (0.0850)	32204 8H519
1.91 (0.0752)	32204 8H514	2.21 (0.0871)	32204 8H520
1.96 (0.0772)	32204 8H515	2.26 (0.0890)	32204 8H521

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

5TH MAIN GEAR

End play		0 - 0.1 mm (0 - 0.004 in)	
Thickness mm (in)	Part number*	Thickness mm (in)	Part number*
1.85 (0.0728)	32204 8H500	2.05 (0.0807)	32204 8H504
1.90 (0.0748)	32204 8H501	2.10 (0.0827)	32204 8H505
1.95 (0.0768)	32204 8H502	2.15 (0.0846)	32204 8H506
2.00 (0.0787)	32204 8H503	2.20 (0.0866)	32204 8H507

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

Available C-rings

ECS004BO

MAINSHAFT C-RING

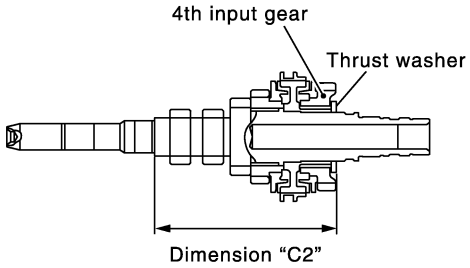
End play		0 - 0.06 mm (0 - 0.0024 in)	
Thickness mm (in)	Part number*	Thickness mm (in)	Part number*
2.535 (0.0866)	32348 8H800	2.835 (0.1116)	32348 8H810
2.565 (0.1010)	32348 8H801	2.865 (0.1128)	32348 8H811
2.595 (0.1022)	32348 8H802	2.895 (0.1140)	32348 8H812
2.625 (0.1033)	32348 8H803	2.925 (0.1152)	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 Washers

ECS004BP

INPUT SHAFT THRUST WASHER



SCIA1008E

Standard length “C2”		154.7 - 154.8 mm (6.091 - 6.094in)	
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

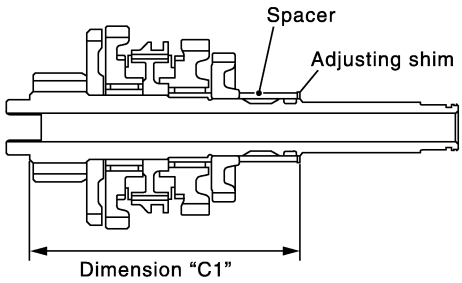
Allowable clearance between side gear and differential case with washer	0.1 - 0.2 mm (0.004 - 0.008 in)
Thickness mm (in)	Part number*
0.75 (0.0295)	38424 81X00
0.80 (0.0315)	38424 81X01
0.85 (0.0335)	38424 81X02
0.90 (0.0354)	38424 81X03
0.95 (0.0374)	38424 81X04

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

Available Adjusting Shims

ECS004BQ

MAINSHAFT ADJUSTING SHIM



SCIA1009E

Standard length “C1”		173.85 - 173.95 mm (6.844 - 6.848in)	
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 (0.0520)	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 (0.0396)	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
6.68 (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	1.68 (0.0661)	32225 8H567
0.76 (0.0299)	32225 8H509	1.24 (0.0488)	32225 8H521	1.72 (0.0677)	32225 8H568
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 parts 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 (0.0396)	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.

REVERASE 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.

Available Shims

ECS004BR

— Differential Side Bearing Preload and Adjusting Shim —

BEARING PRELOAD

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

*: 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.

PRECAUTIONS

PFP:00001

Caution

ECS004BS

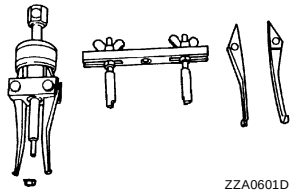
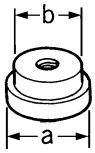
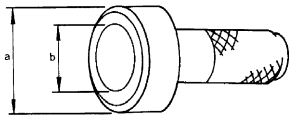
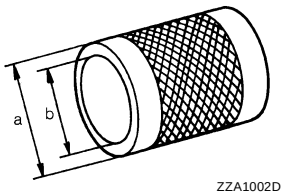
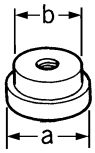
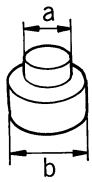
- Do not reuse transaxle oil, once it has been drained.
- Check oil level or replace oil with vehicle on level ground.
- During removal or installation, keep inside of transaxle clear of dust or dirt.
- Check for the correct installation status prior to removal or disassembly. If mating marks are required, 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.

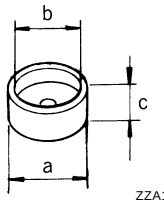
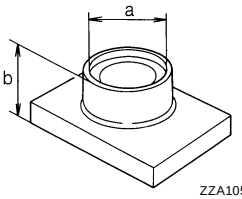
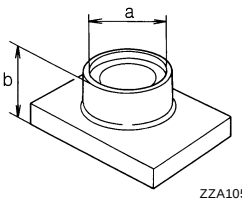
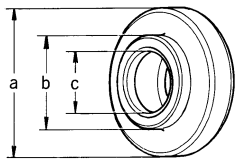
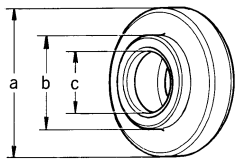
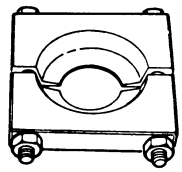
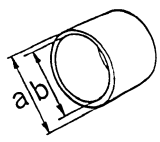
PREPARATION

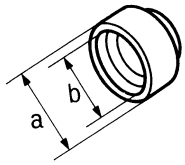
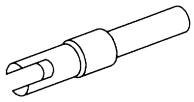
PFP:00002

Special Service Tools

ECS004BT

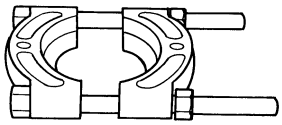
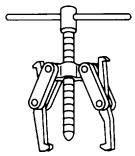
Tool number (Kent-More No.) Tool name		Description
KV381054S0 (J34286) Puller	 ZZA0601D	● Side bearing outer race removal
ST35321000 (—) Drift a: 49 mm (1.93 in) dia. b: 41 mm (1.61 in) dia.	 ZZA1000D	● Input shaft oil seal installation ● Reverse main gear installation ● 1st bushing installation ● 1st-2nd synchronizer hub installation ● 2nd bushing installation ● 3rd main gear installation
ST30720000 (J25405) 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 (J26082) Drift a: 60 mm (2.36 in) dia. b: 44.5 mm (1.752 in) dia.	 ZZA1002D	● Mainshaft front bearing installation ● 6th bushing installation (RS6F51H) ● 4th main gear installation ● 5th main gear installation ● 6th main gear installation (RS6F51H)
ST33061000 (J8107-2) 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	● Input shaft rear bearing removal and installation ● Input shaft bearing spacer and 5th stopper removal (RS5F51A) ● 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 (RS6F51H) ● Mainshaft rear bearing removal ● 4th main gear and 5th main gear removal ● 6th main gear removal (RS6F51H)

Tool number (Kent-More No.) 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 bushing installation ● 5th synchronizer hub installation (RS5F51A) ● 5th-6th synchronizer hub installation (RS6F51H) ● 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 (J26010-01) Drift a: 80 mm (3.15 in) dia. b: 38 mm (1.50 in) dia. c: 31 mm (1.22 in) dia.	 ZZA0978D	● 5th stopper and input shaft bearing spacer installation (RS5F51A) ● Input shaft front bearing installation
ST30901000 (J26010-01) 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 ● Mainshaft rear bearing installation
ST30031000 (J22912-01) Puller	 ZZA0537D	● Measuring wear of 1st and 2nd baulk ring
KV40101630 (J35870) Drift a: 68 mm (2.68 in) dia. b: 60 mm (2.36 in) dia.	 ZZA1003D	● Reverse main gear installation

Tool number (Kent-More No.) 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
(J39713) Preload adapter  NT087	● Checking differential side gear end play (RS5F51A)

Commercial Service Tools

ECS004BU

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

NOISE, VIBRATION, AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

ECS004BV

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.

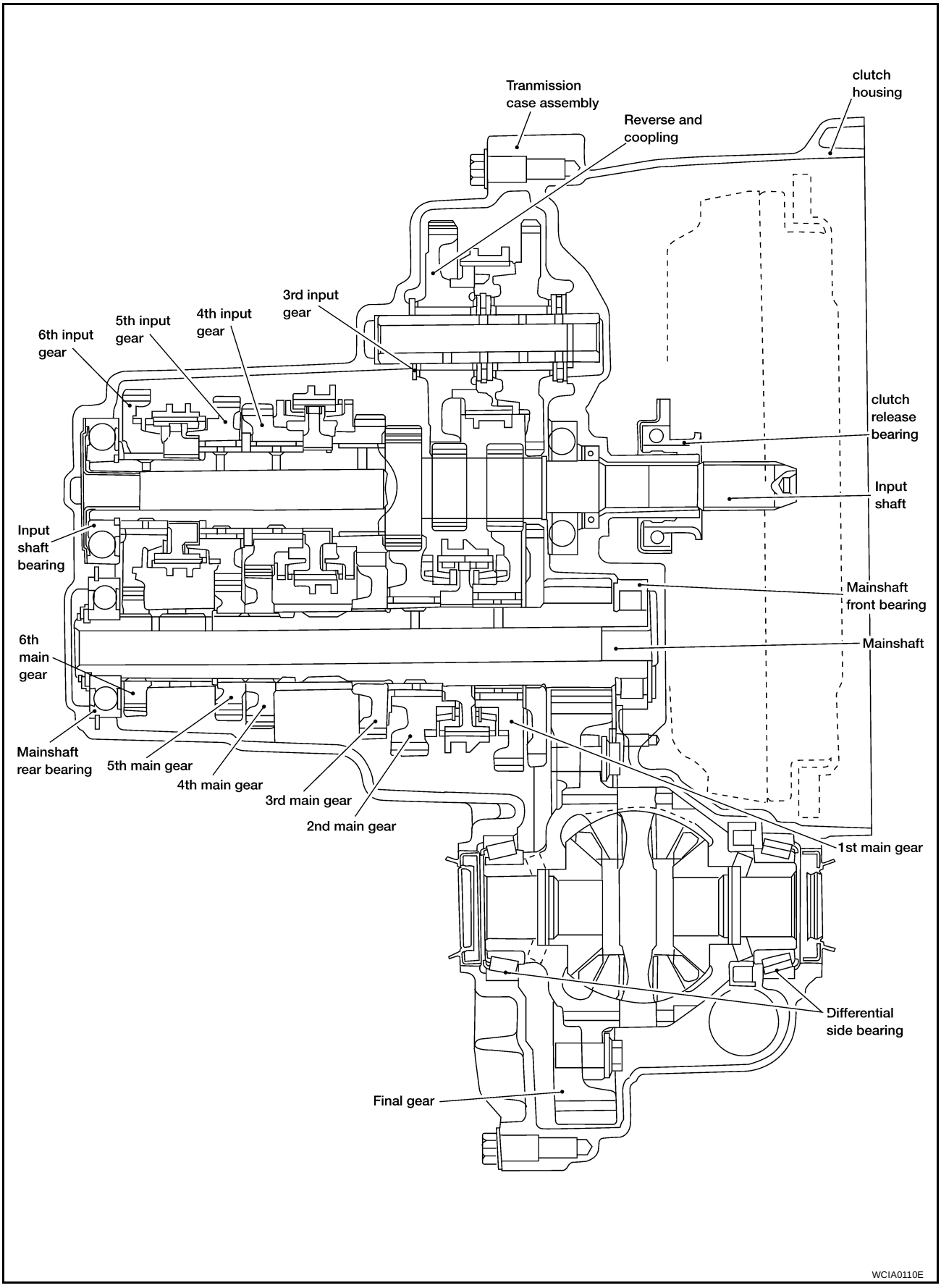
Reference page		MT-75	MT-75	MT-75	MT-82			MT-78	MT-85		MT-83, MT-86			
SUSPECTED PARTS (Possible cause)		(Oil level is low)	(Wrong oil)	(Oil level is high)	GASKET (Damaged)	OIL SEAL (Worn or damaged)	O-RING (Worn or damaged)	CONTROL DEVICE AND CABLE (Worn)	CHECK PLUG RETURN SPRING AND CHECK BALL (Worn or damaged)	SHIFT FORK (Worn)	GEAR (Worn or damaged)	BEARING (Worn or damaged)	BAULK RING (Worn or damaged)	INSERT SPRING, SHIFTING INSERT (Damaged)
Symptom	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

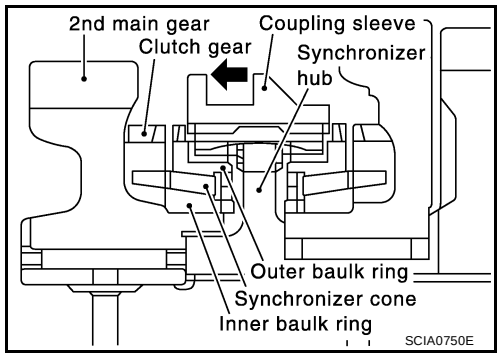
Cross-sectional View

ECS004BW



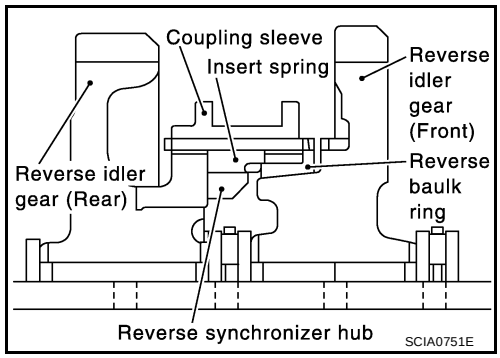
DOUBLE-CONE SYNCHRONIZER

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



REVERSE GEAR

See figure for description of reverse gear components.



M/T OIL

PFP:KLD20

Replacement

ECS004BX

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 on 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, Viscosity 75W-85
Capacity (reference) : Approximately 2.3 ℓ (2 3/8 US qt, 2 Imp qt)

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

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

CAUTION:
Do not reuse gasket.

Checking

ECS004BY

OIL LEAKAGE AND OIL LEVEL

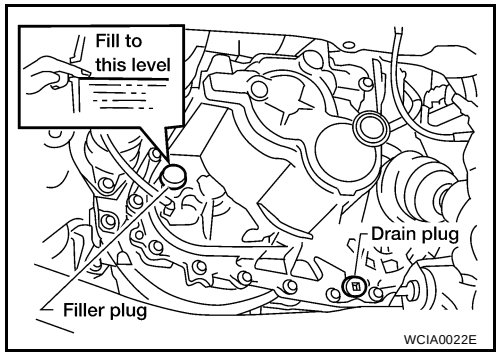
- Check that oil is not leaking from transaxle.
- Check oil level from filler plug mounting hole as shown in the figure.

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

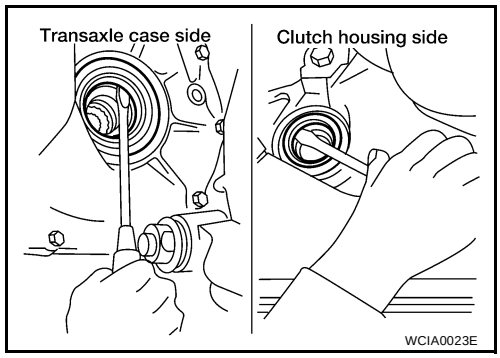
Removal and Installation

ECS004BZ

REMOVAL

1. Remove the drive shaft from the transaxle body. Refer to FAX-16, "Removal" .
2. Remove oil seal with a slotted screwdriver.

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

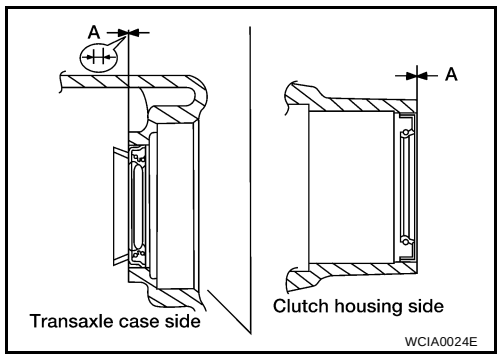


INSTALLATION

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 (0.02 in) or flush with case

CAUTION:
- **When installing oil seals, apply multi-purpose grease to oil seal lips.**
- **Oil seals are not reusable. Never reuse them.**



Drift to be used:

Transaxle case side	ST3340 0001
Clutch housing side	KV401 00621

2. Installation is in the reverse order of removal. Check oil level after installation.

POSITION SWITCH

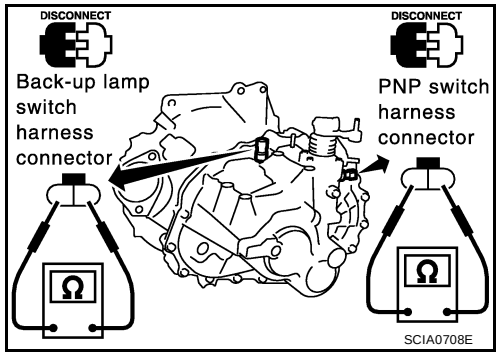
PFP:32005

Checking

ECS004C0

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

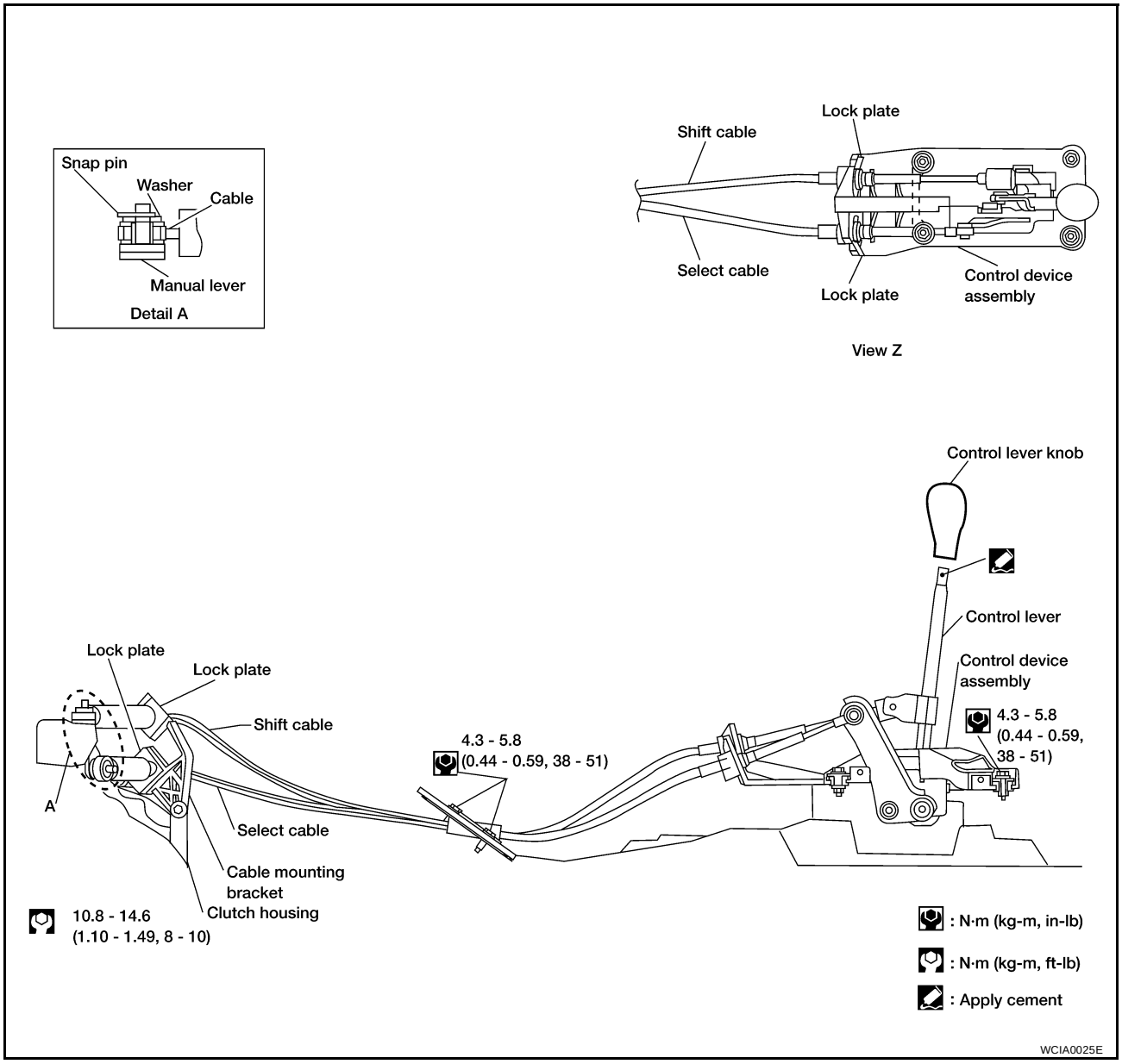
CONTROL LINKAGE

PFP:34103

Removal and Installation of Control Device and Cable

ECS004C1

Refer to the figure below for removal and installation procedure.



CAUTION:

- **Note 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.**

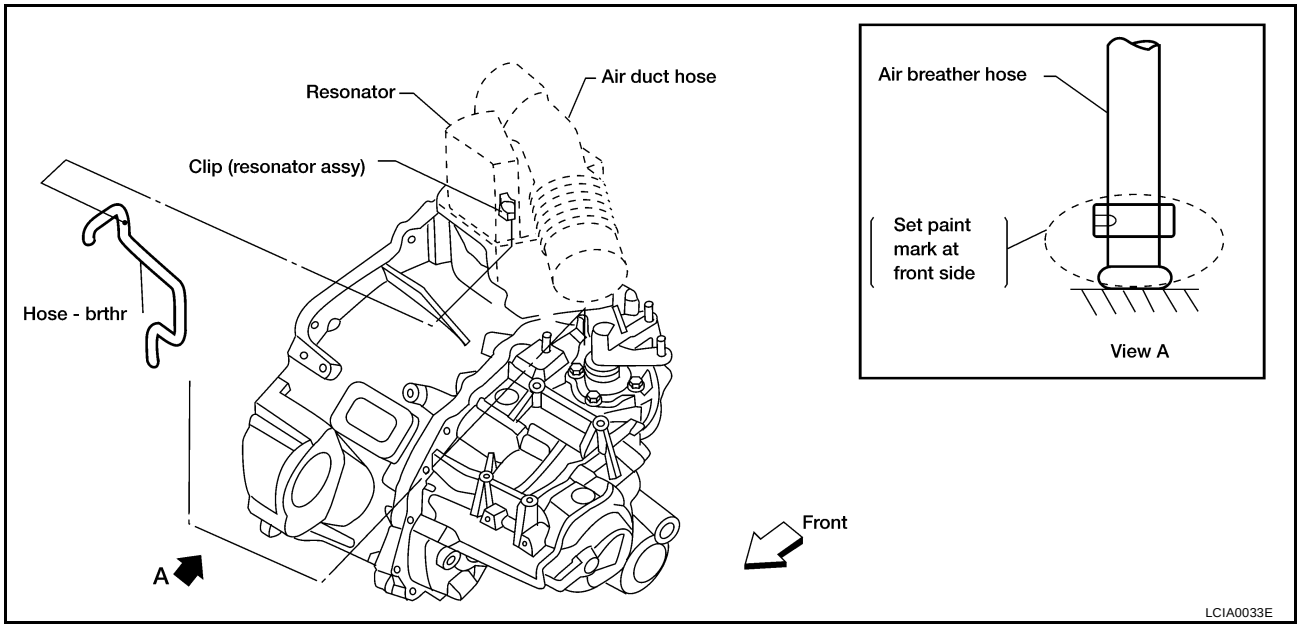
AIR BREATHER HOSE

PFP:31098

Removal and Installation

ECS004C2

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



CAUTION:

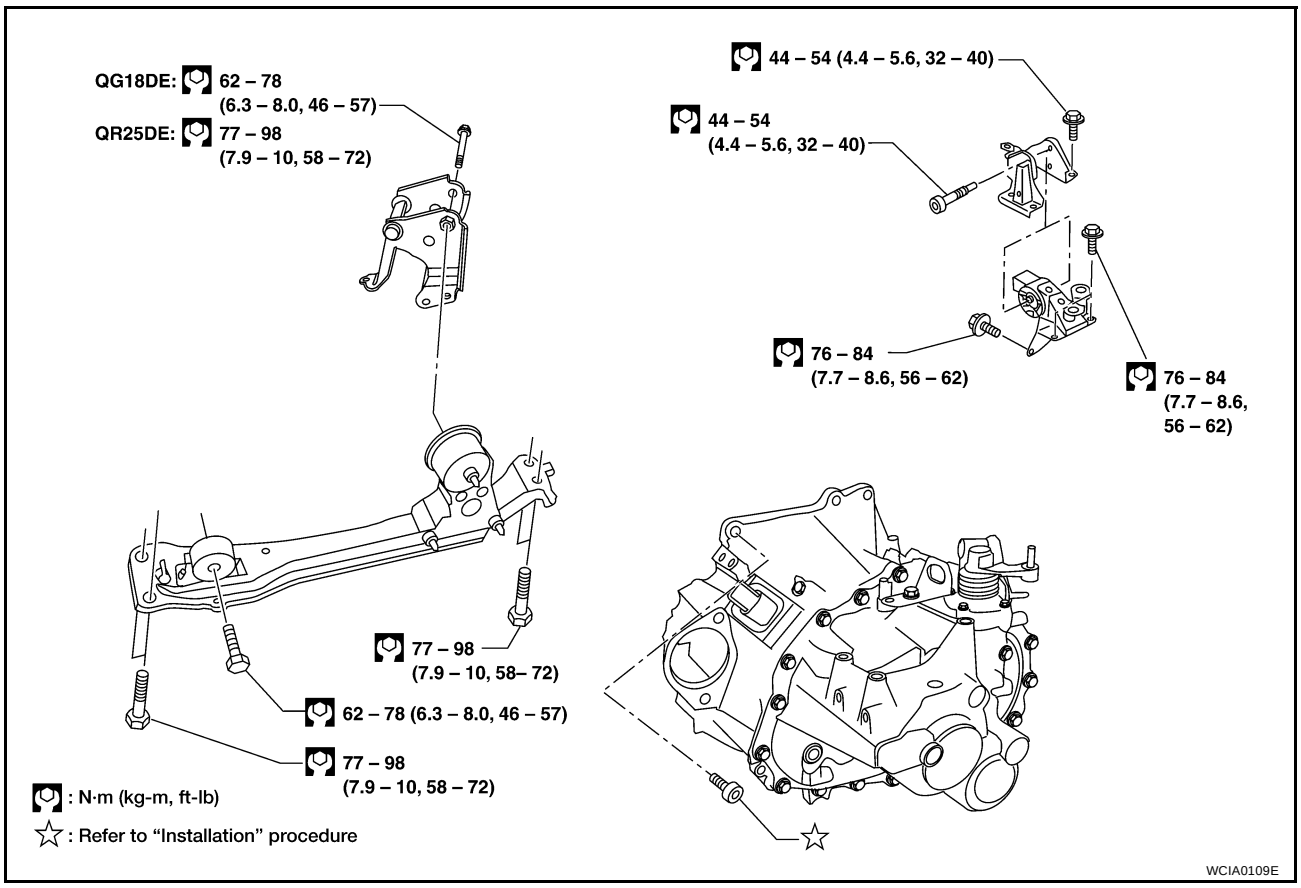
- **Make sure there are no pinched or restricted areas on the air breather hose caused by bending or winding when installing it.**
- **Be sure to insert hose into the transaxle tube until overlap area reaches the spool.**

TRANSAXLE ASSEMBLY

PFP:32010

Removal and Installation

ECS004C3



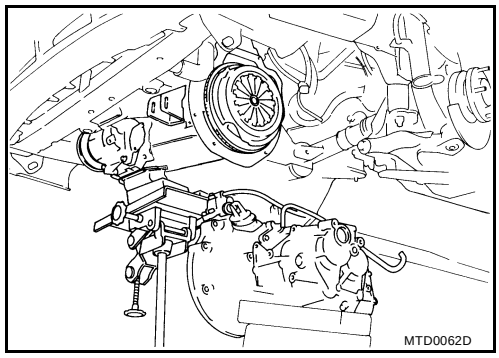
REMOVAL

1. Remove air cleaner and air duct.
2. Remove battery.
3. Remove the air breather hose. Refer to MT-79, "Removal and Installation" .
4. Remove clutch operating cylinder.

   CAUTION:
   Do not depress clutch pedal during removal procedure.
5. Remove engine under cover.
6. Remove the control cable from the transaxle. Refer to MT-78, "Removal and Installation of Control Device and Cable" .
7. Drain gear oil from transaxle. Refer to MT-75, "Replacement" .
8. Remove connectors and harnesses for:
   - PNP switch.
   - Speed sensor.
   - Back-up lamp switch.
   - Ground.
9. Remove the exhaust front tube using power tool. Refer to EX-3, "Removal and Installation" .
10. Remove the drive shaft using power tool. Refer to FAX-16, "Removal" .
11. Remove starter motor, using power tool. Refer to SC-20, "Removal and Installation" .
12. Place a jack under the transaxle.

    CAUTION:
    When setting jack, be careful not to bring it into contact with the switch.
13. Remove the center member, the engine insulator and the engine mount bracket using power tool.
14. Support engine by placing a jack under oil pan.

15. Remove the bolts that mount the engine to the transaxle using power tool.
16. Remove the transaxle from the vehicle.



INSTALLATION

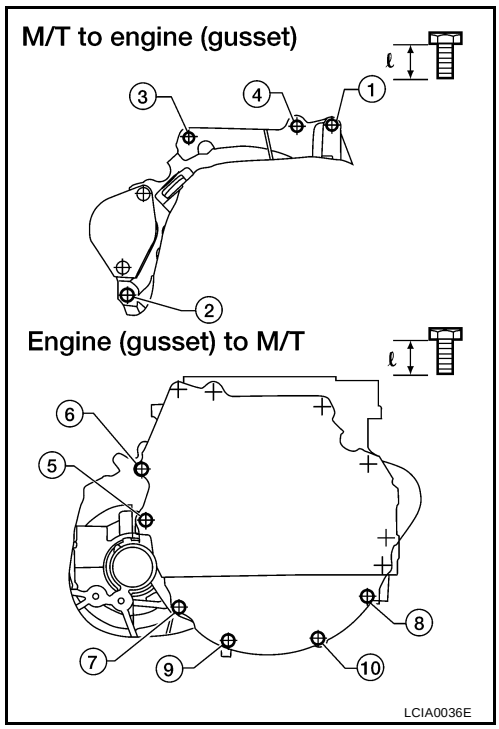
Installation is the reverse order of removal.

- When installing the transaxle to the engine, use the tightening torque and sequence shown below:

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

Bolt No.	1	2	3	4	5	6	7	8	9	10
"ℓ" mm (in)	40	82	47	47	52	40	40	40	30	30
Tightening torque N·m (kg-m, ft-lb)	30 - 40 (3.1 - 4.1, 22 - 29)	70 - 80 (7.1 - 8.1, 52 - 59)				30 - 40 (3.1 - 4.1, 22 - 29)				

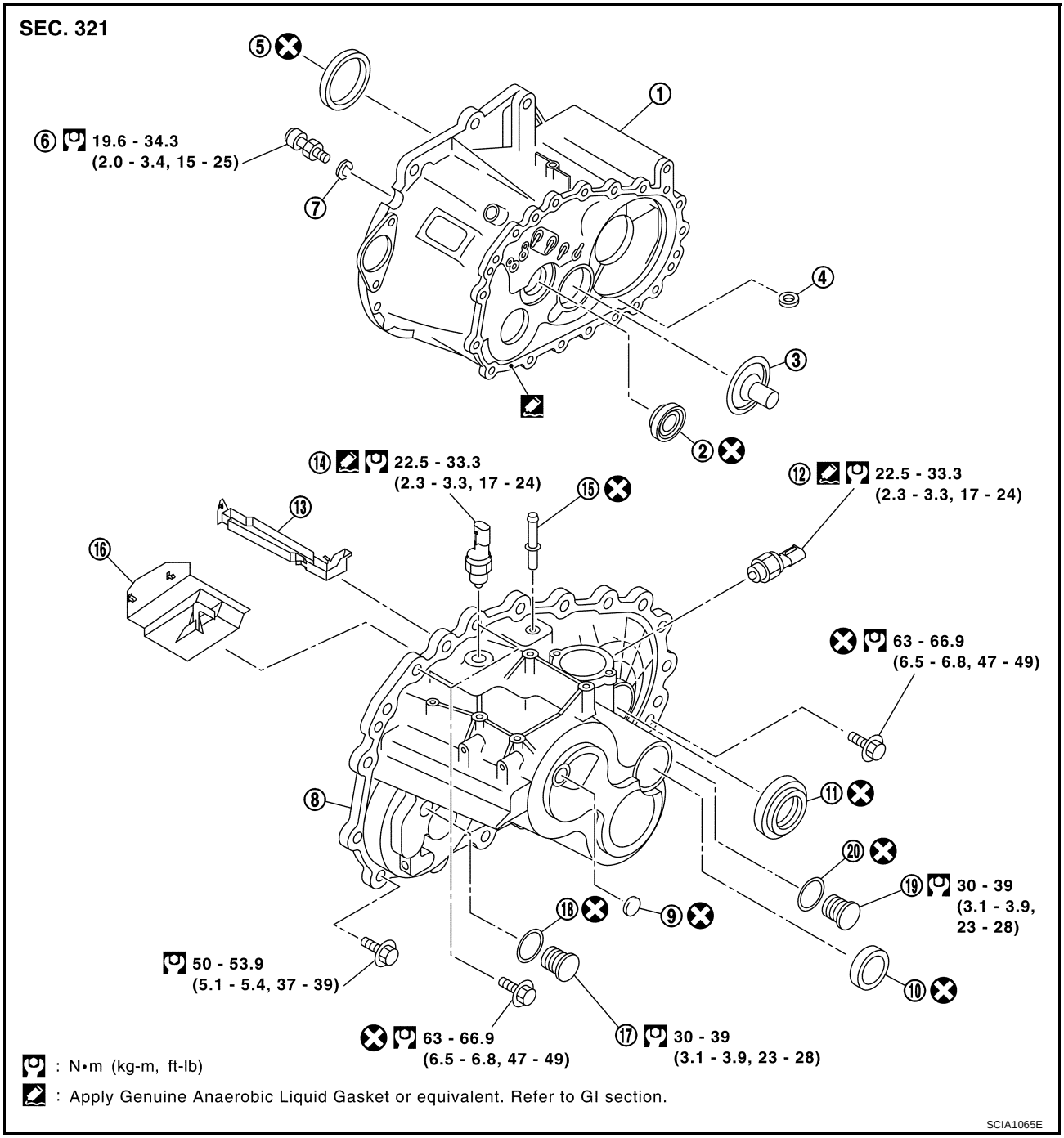
- After installation, check oil level, and look for leaks and loose mechanisms.



Component Parts

ECS004C4

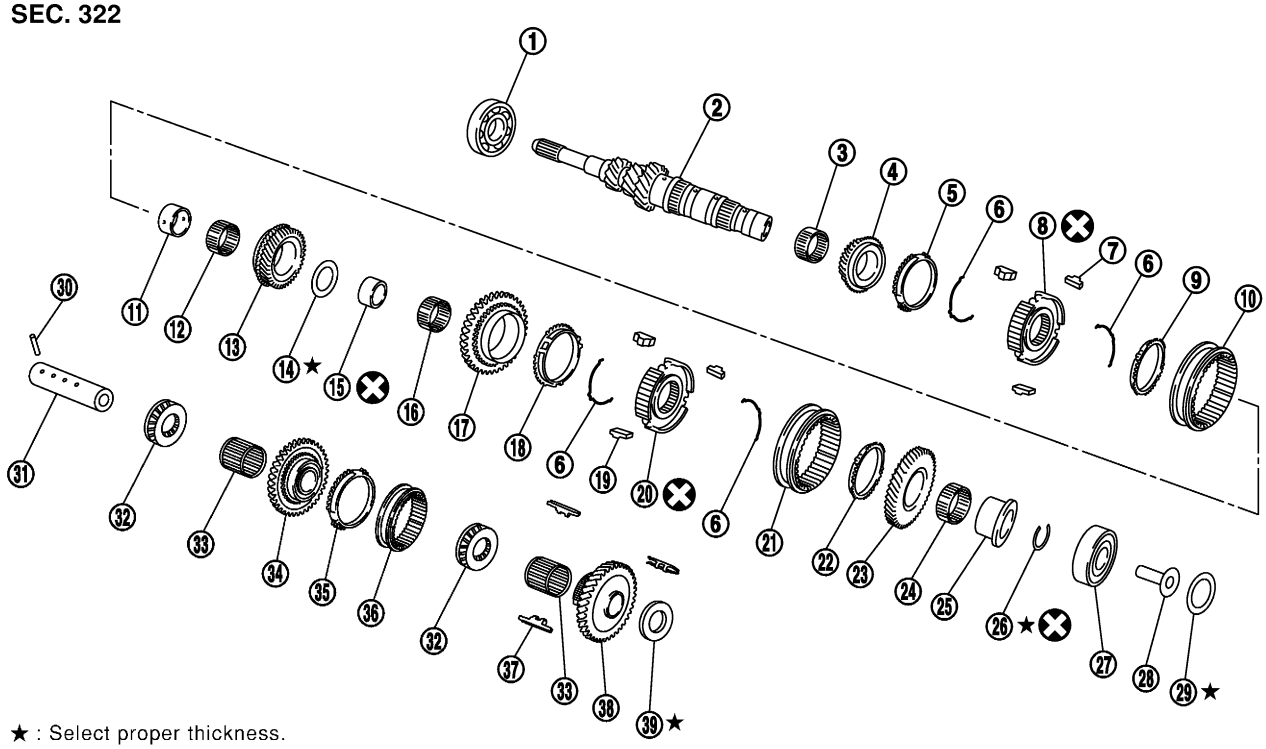
CASE AND HOUSING COMPONENTS



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



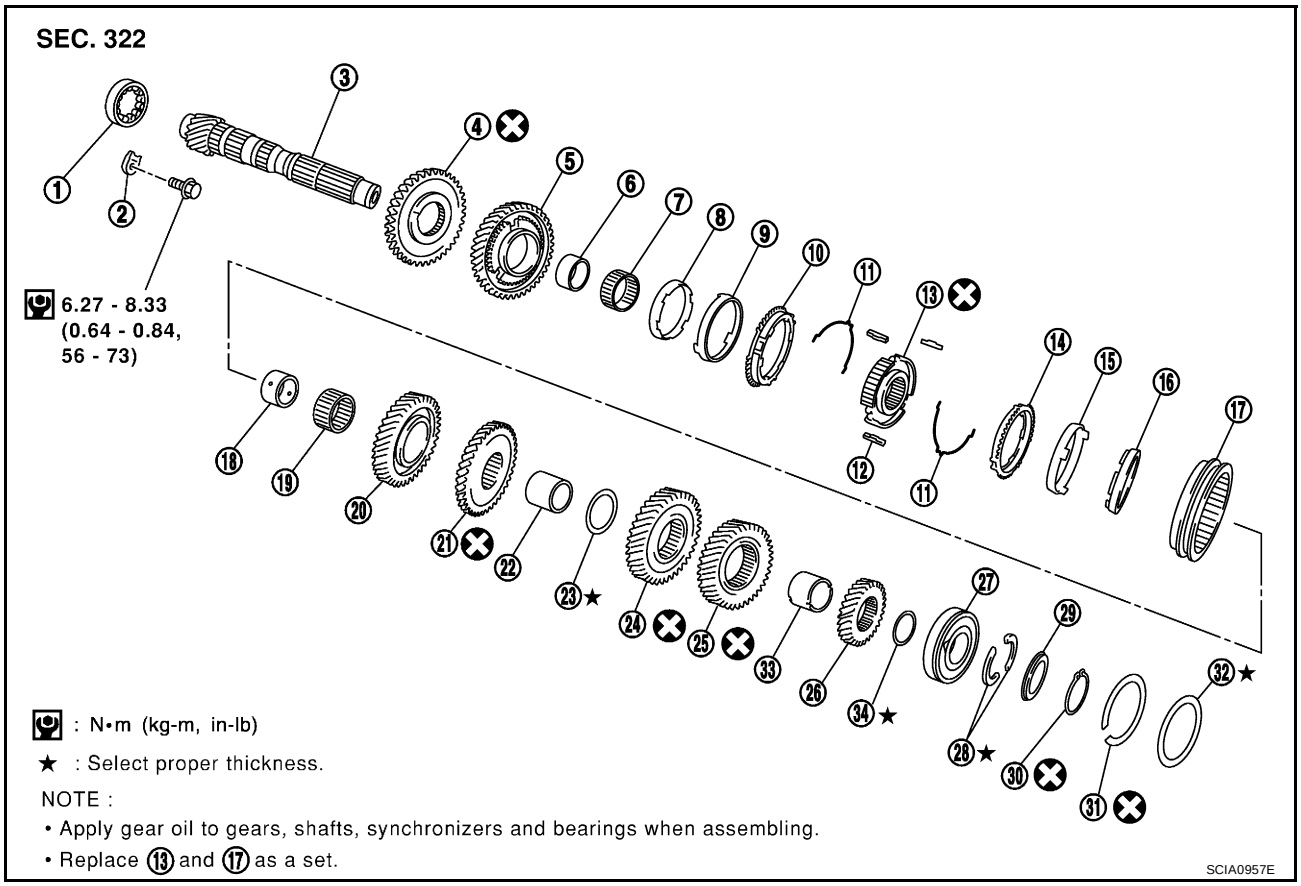
★ : Select proper thickness.

NOTE :

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

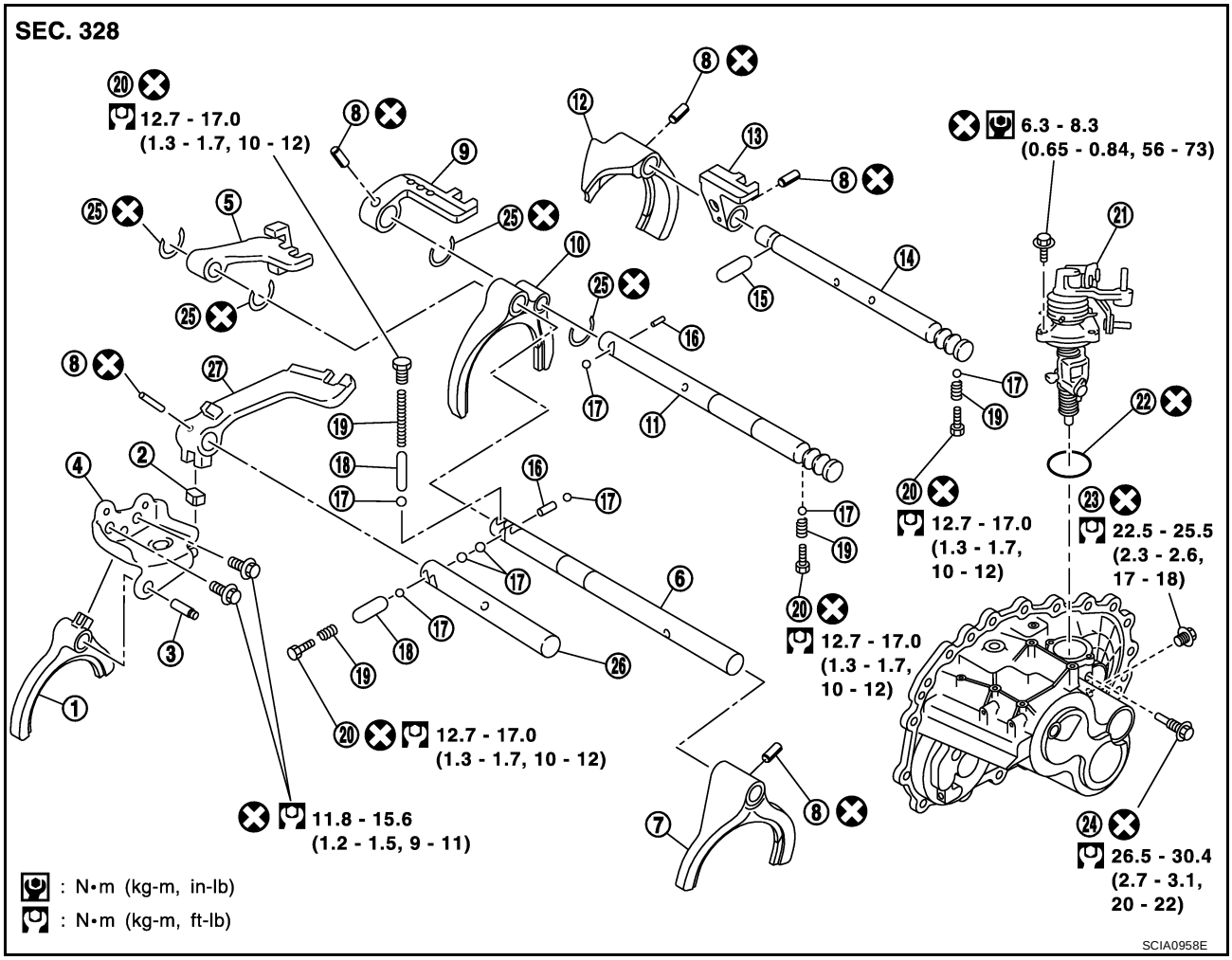
SCIA0956E

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



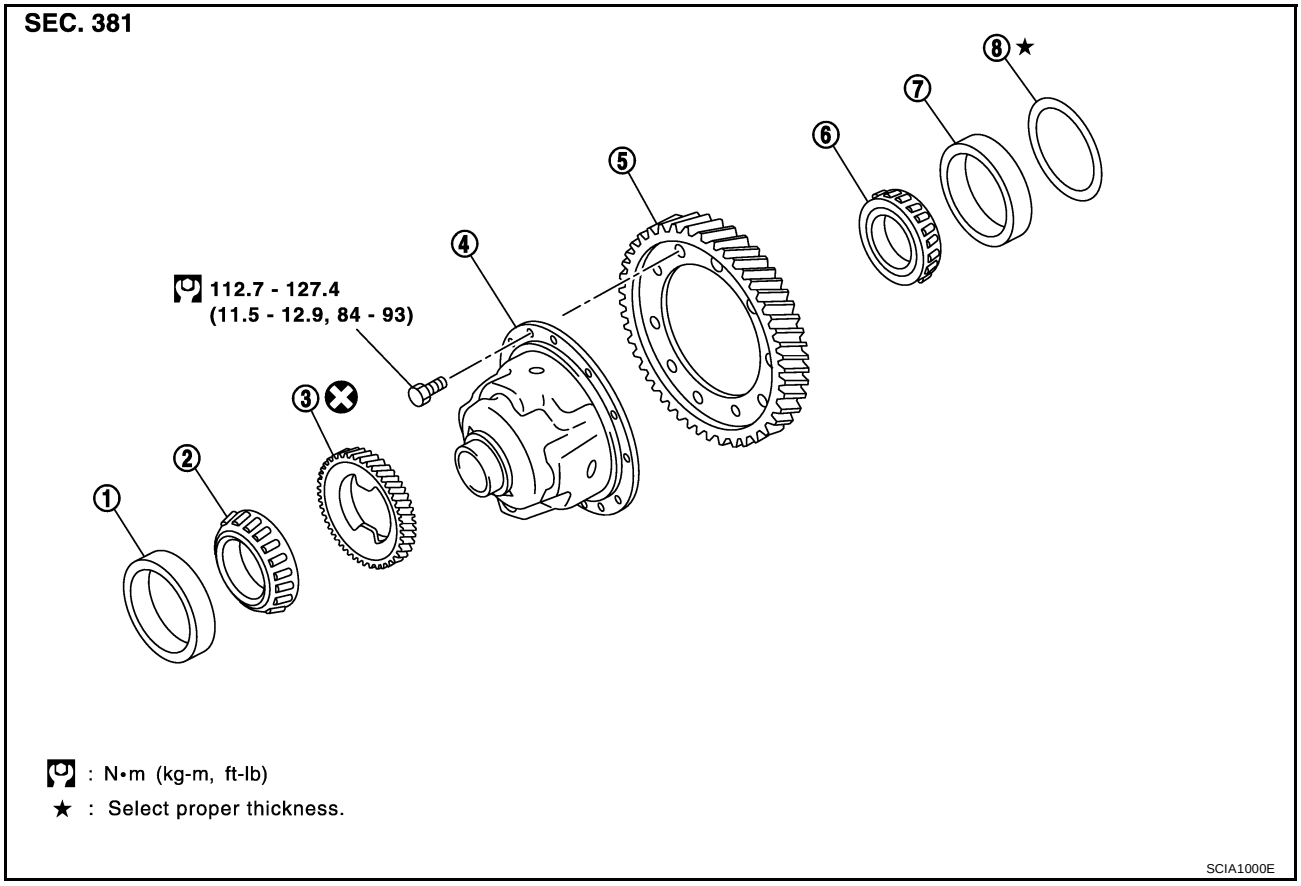
1. Mainshaft front bearing
2. Mainshaft bearing retainer
3. Mainshaft
4. Reverse main gear
5. 1st main gear
6. Bushing
7. Needle bearing
8. 1st inner baulk ring
9. 1st gear synchronizer cone
10. 1st outer baulk ring
11. Spread spring
12. 1st & 2nd shifting insert
13. 1st & 2nd synchronizer hub
14. 2nd 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



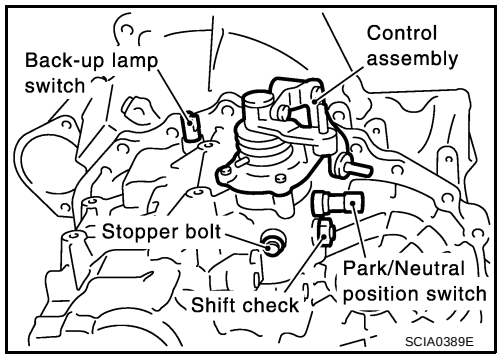
1. Differential side bearing outer race
2. Differential side bearing
3. Speedometer drive gear
4. Differential case
5. Final gear
6. Differential side bearing
7. Differential side bearing outer race
8. Differential side bearing adjusting shim

Disassembly and Assembly

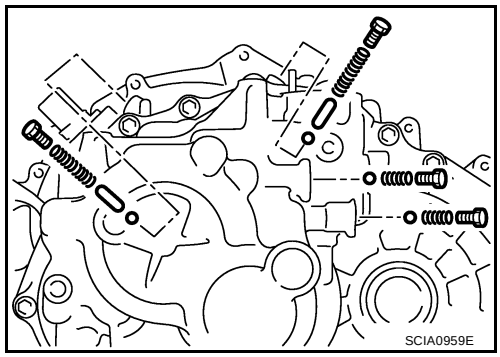
ECS004C5

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.

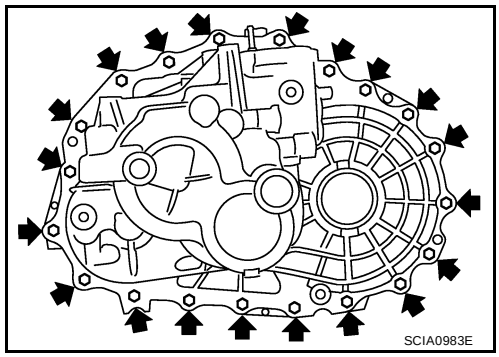


4. Remove check plugs (4 pieces), check springs (4 pieces), check balls (4 pieces) and shift check sleeve (2 pieces).

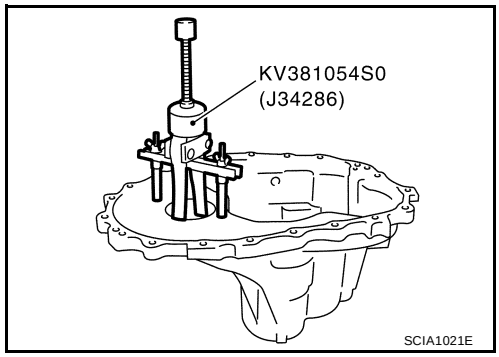


5. Remove transaxle case fixing bolts.
6. Remove bore plug.

   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.

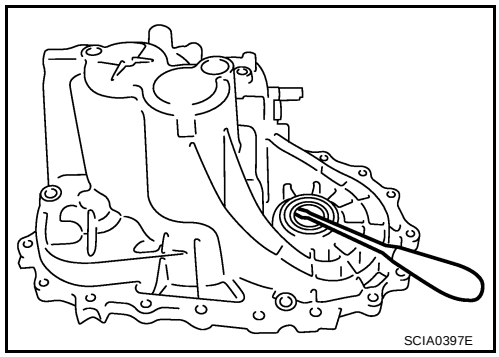

SCIA0983E

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



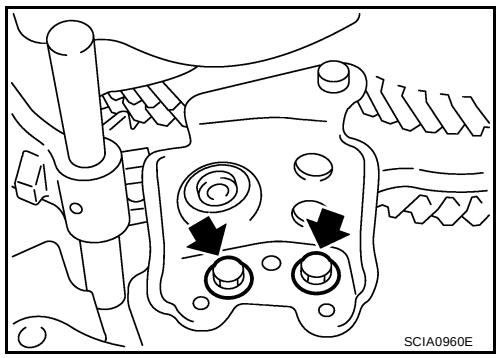
SCIA1021E

11. Remove differential oil seal.
12. Remove magnet from clutch housing.

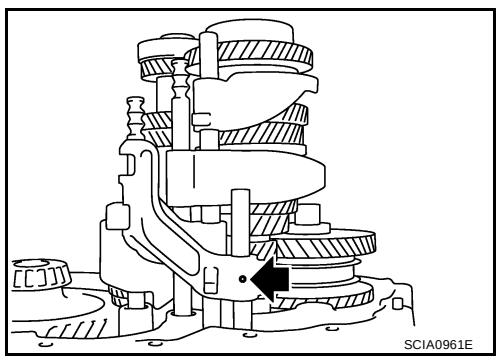

SCIA0397E

13. With shift lever in 5th position, remove bracket bolts from reverse lever assembly. Lift reverse lever assembly to remove.

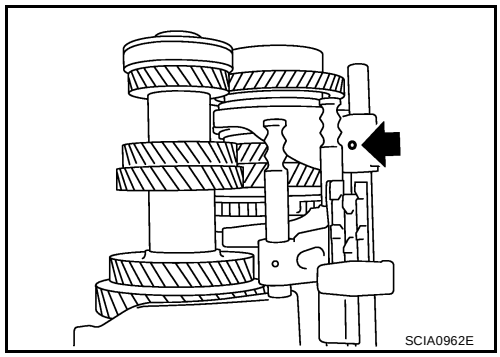
    CAUTION:
    Be careful not to lose shifter cap.
14. Pull out reverse fork rod then remove reverse shift fork.


SCIA0960E

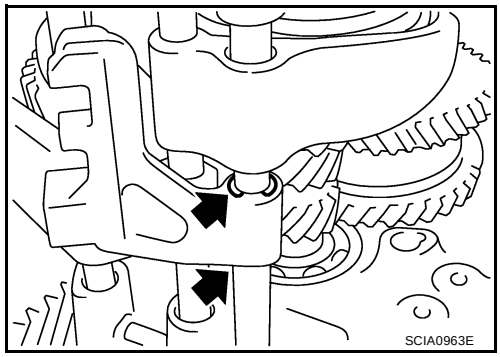
15. Remove retaining pin of reverse bracket.
16. Pull out reverse lever and reverse bracket fork rod.
17. Remove check ball (2 pieces) and interlock pin.


SCIA0961E

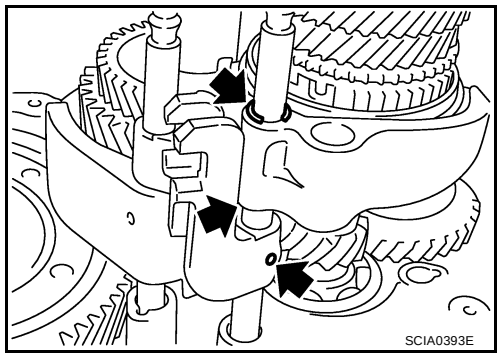
18. Shift 3rd & 4th fork rod to 3rd position. Remove retaining pin of 5th & 6th shift fork using pin punch.



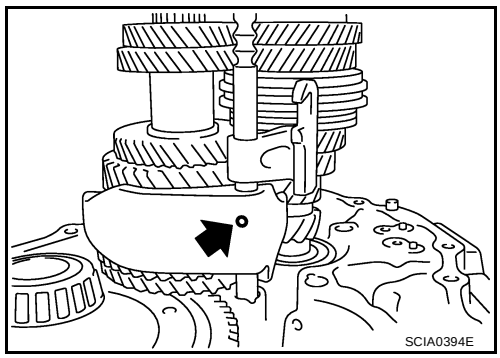
19. Remove stopper rings for 5th & 6th bracket.
20. Pull out 5th & 6th fork rod and remove 5th & 6th shift fork and 5th & 6th bracket.
21. Remove check balls (2 pieces) and interlock pin.



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



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

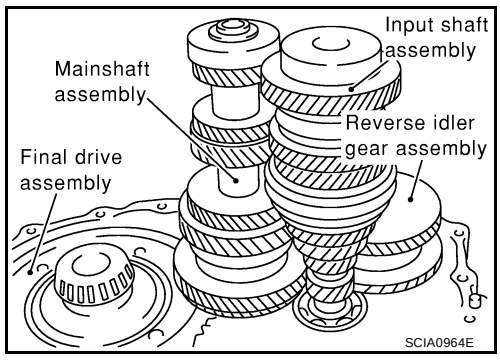


30. Remove gear components from clutch housing.

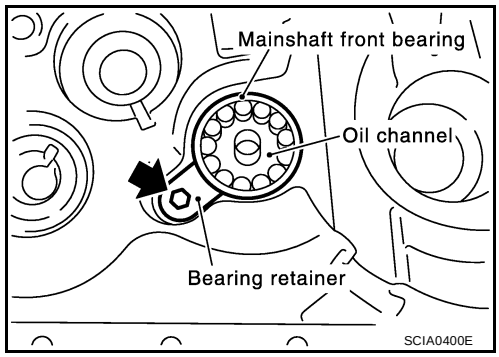
a. While tapping input shaft with plastic hammer, remove input shaft assembly, mainshaft assembly and reverse idler gear assembly as a set.

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

b. Remove final drive assembly.

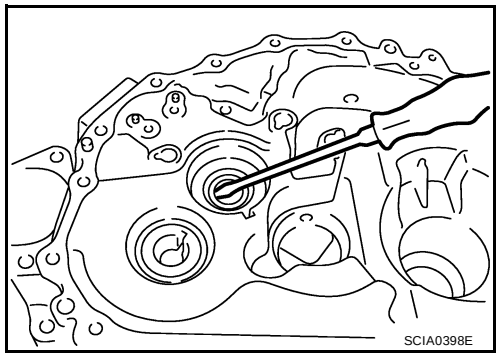


31. Remove bearing retainer and then mainshaft front bearing.
32. Remove oil channel on mainshaft side.
33. Remove differential oil seal.
34. Remove differential side bearing outer race (clutch housing side).



35. Remove input shaft oil seal.

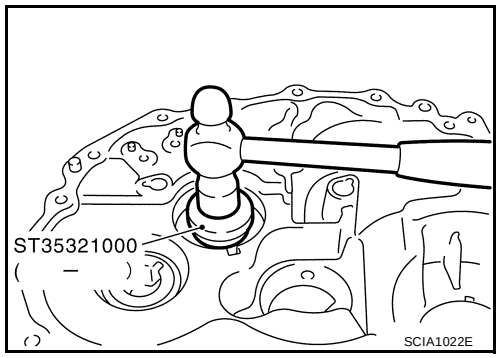
CAUTION:
Be careful not to damage clutch housing.



ASSEMBLY

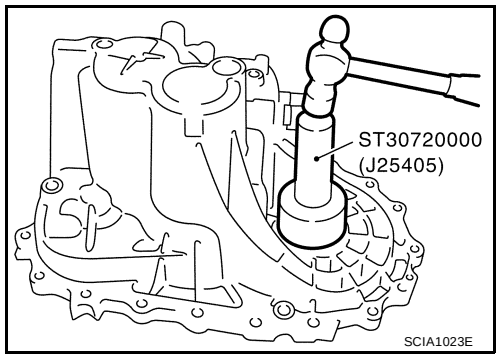
1. Using a drift, install input shaft oil seal.

CAUTION:
Oil seals are not reusable. Never reuse them.



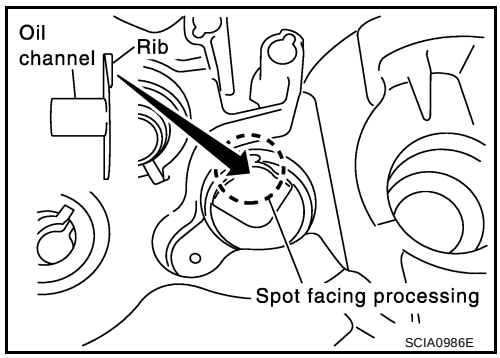
2. Using a drift, install differential oil seal.

CAUTION:
Oil seals are not reusable. Never reuse them.

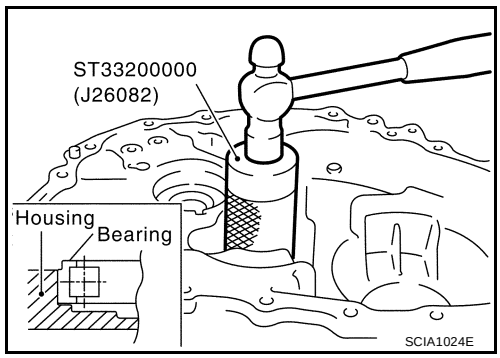


3. Install oil channel on mainshaft side.

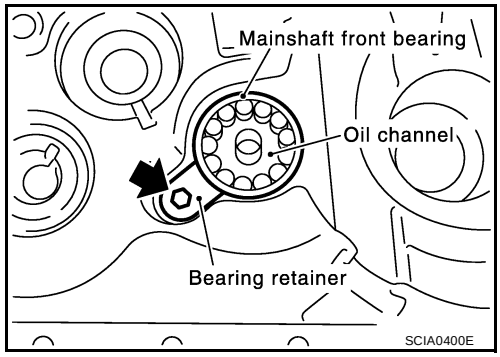
CAUTION:
Be careful with orientation of installation.



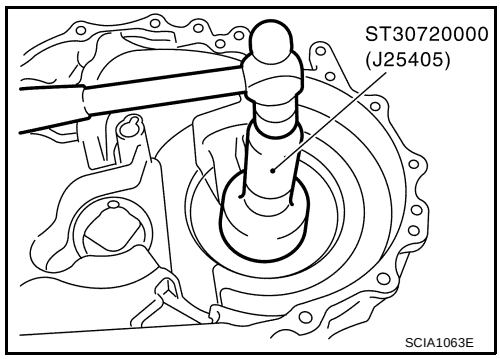
4. Using a drift, install mainshaft front bearing.



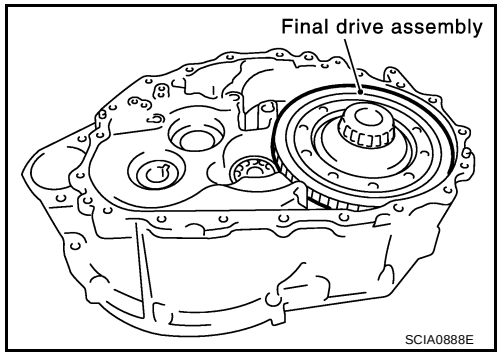
5. Install bearing retainer.



6. Install differential side bearing outer race.

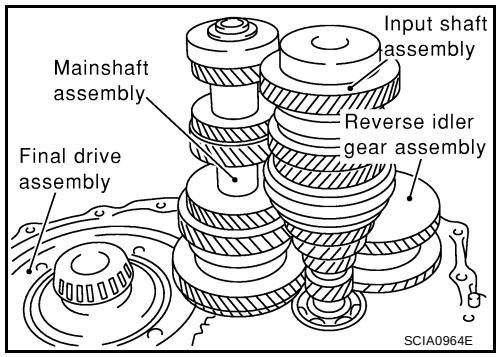


7. Install final drive assembly into clutch housing.



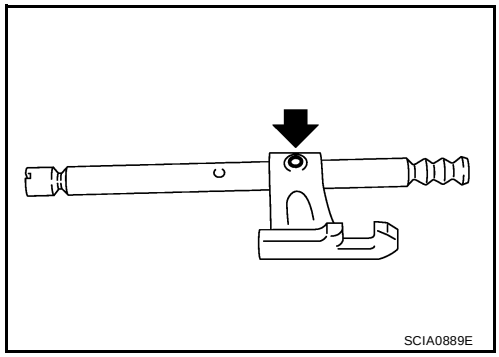
8. Install input shaft assembly, mainshaft assembly, and reverse idler gear assembly into clutch housing.

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.

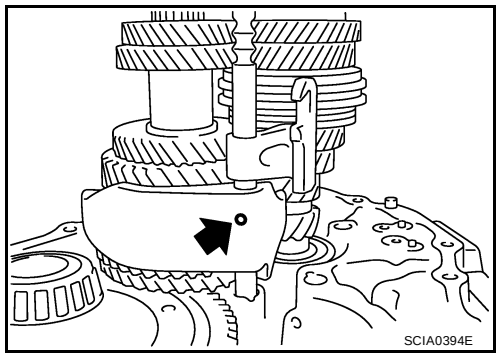
CAUTION:
Retaining pins are not reusable. Never reuse them.



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

CAUTION:
Retaining pins are not reusable. Never reuse them.

11. Install shift check sleeve.



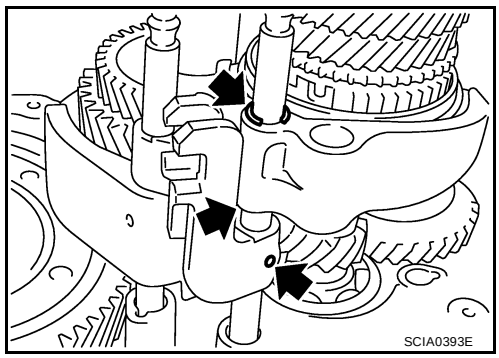
12. Install 3rd-4th bracket, 3rd-4th shift fork, and 3rd-4th fork rod with interlock pin.
13. Install stopper ring onto 3rd-4th shift fork.

CAUTION:
Stopper rings are not reusable. Never reuse them.

14. Install retaining pin onto 3rd-4th bracket.

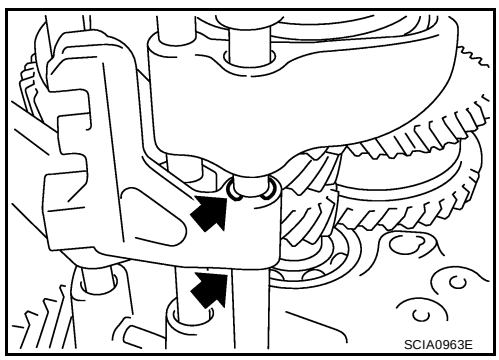
CAUTION:
Retaining pins are not reusable. Never reuse them.

15. Install 2 check balls.



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

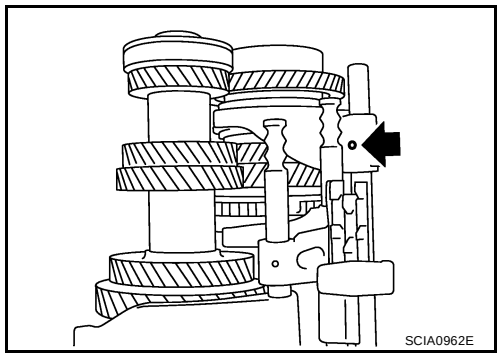
CAUTION:
Stopper rings are not reusable. Never reuse them.



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

CAUTION:
Retaining pins are not reusable. Never reuse them.

19. Install 2 check balls.
20. Install reverse bracket fork rod and reverse lever bracket.



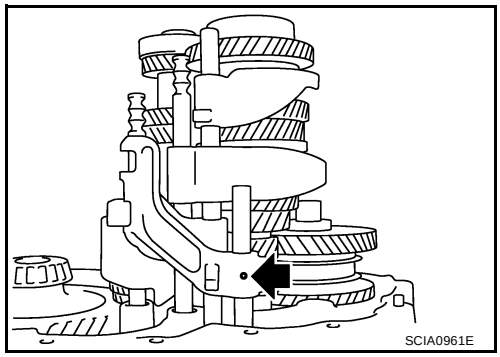
21. Install retaining pin onto reverse bracket.

CAUTION:
Retaining pins are not reusable. Never reuse them.

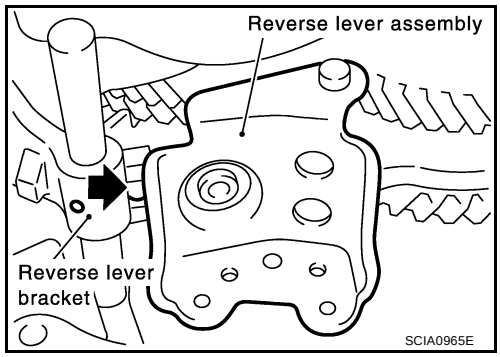
22. Install reverse shift fork and reverse fork rod.
23. Install reverse lever assembly following procedures below.

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

CAUTION:
Do not drop shifter cap.

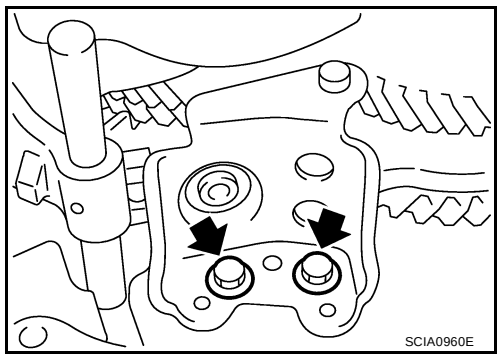


b. While lifting reverse shift fork, align cam with reverse bracket.



c. Tighten mounting bolts to specified torque, and then install reverse lever assembly.
24. Install the magnet onto clutch housing.
25. Install selected input shaft adjusting shim onto input shaft.
    - For selection of adjusting shims, refer to MT-153, "INPUT-SHAFT END PLAY" .
26. Install baffle plate and oil gutter.
27. 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-156, "MAINSHAFT END PLAY" .

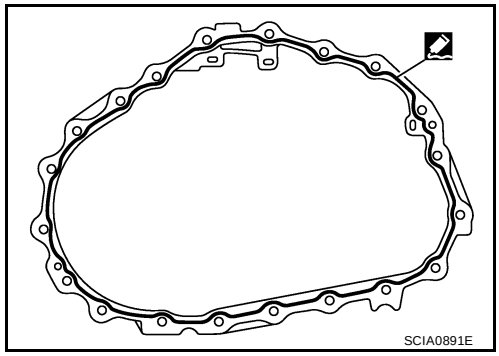


b. Temporarily install snap ring of mainshaft rear bearing into transaxle case.

CAUTION:
Do not reuse the snap ring.

c. Apply sealant to mating surfaces of transaxle case and clutch housing. Use Genuine Anaerobic Liquid Gasket or equivalent. Refer to GI-44, "Recommended Chemical Products and Sealants" .

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


SCIA0891E

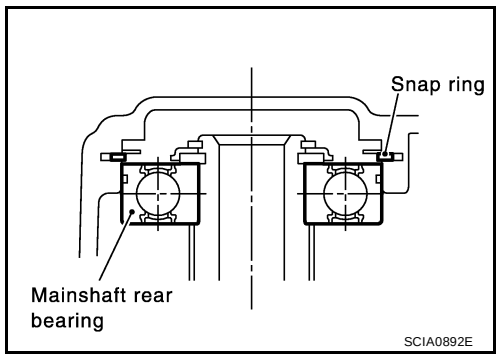
d. With snap ring of mainshaft rear bearing temporarily installed, place transaxle case over clutch housing.

e. Install control assembly.

CAUTION:
Do not reuse the O-ring.

f. Install shift check and stopper bolt.

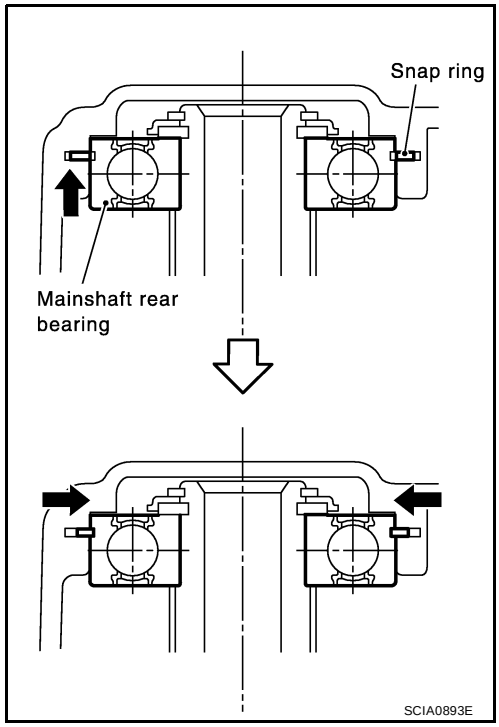
CAUTION:
Shift check and stopper bolt are not reusable. Never reuse them.



SCIA0892E

g. Through bore plug mounting hole, with snap ring stretched, move shift lever of control assembly to 2nd speed, and lift up mainshaft assembly.

h. Securely install snap ring onto mainshaft rear bearing.

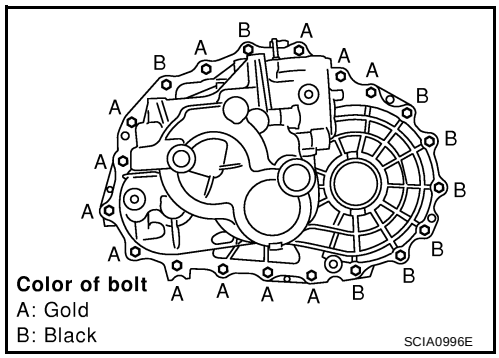


SCIA0893E

i. Tighten the mounting bolts A and B to specification.

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)

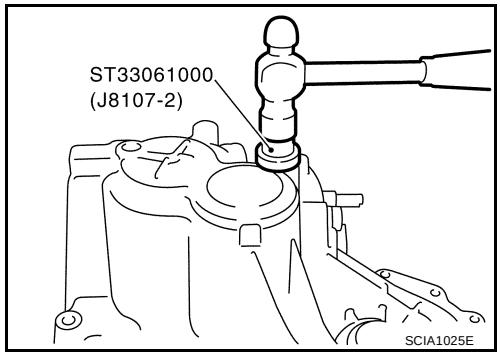
CAUTION:
Always replace bolts B because they are self-sealing bolts.



SCIA0996E

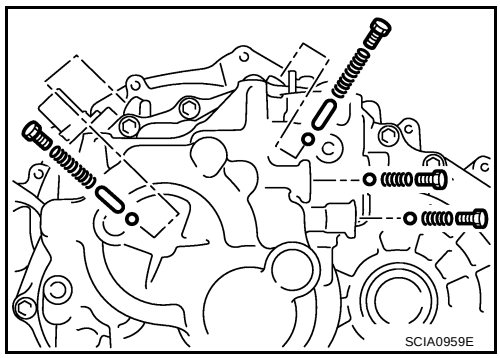
28. Using a drift, install bore plug.

CAUTION:
Bore plugs are not reusable. Never reuse them.



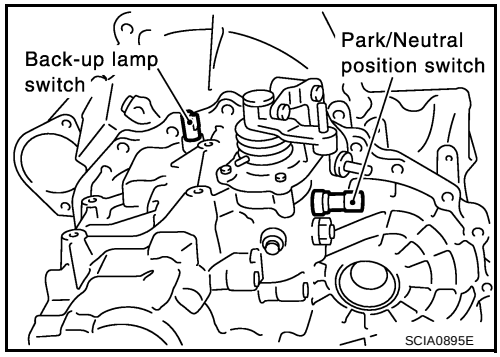
29. Install 2 shift check sleeves, 4 check balls, 4 check springs, and 4 check ball plugs.

CAUTION:
Check ball plugs are not reusable. Never reuse them.



30. Apply sealant to threads of neutral switch and reverse lamp switch. Then install them into transaxle case. Use Genuine Anaerobic Liquid Gasket or equivalent. Refer to GI-44, "Recommended Chemical Products and Sealants" .
31. Install gaskets onto drain plug and filler plug, and then install them into transaxle case.

CAUTION:
- **Gaskets are not reusable. Never reuse them.**
- **After oil is filled, tighten filler plug to specified torque.**



Adjustment

INPUTSHAFT END PLAY

ECS004C6

- 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 meet specification of end play for input shaft rear bearing.

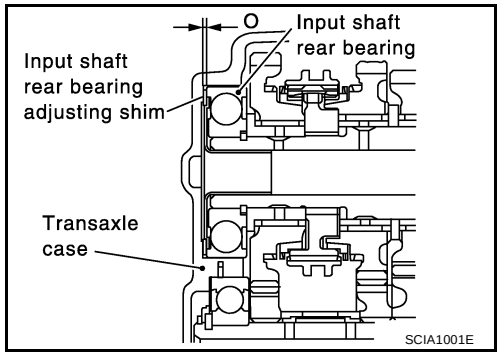
End play : 0 - 0.06 mm (0 - 0.0024 in)

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



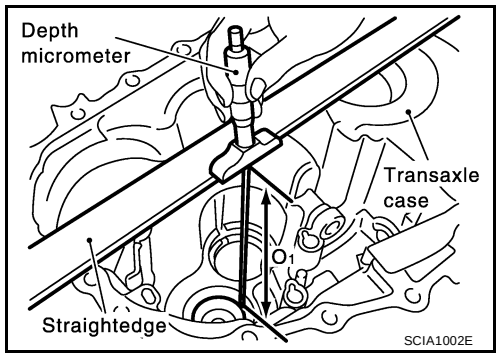
Adjusting Shim

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 (0.0520 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 (0.0396 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		

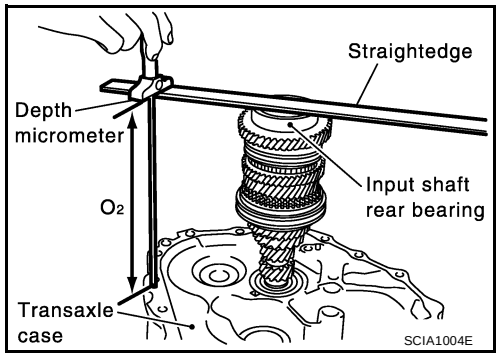
CAUTION:

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.

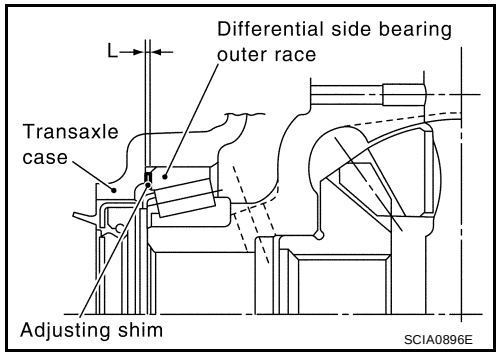


2. Using depth micrometer and straight edge as shown in the figure, measure dimension "O_2 " between clutch housing case end face and end face of input shaft rear bearing.
3. Install selected input shaft rear bearing adjusting shim onto input shaft.



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 meet 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

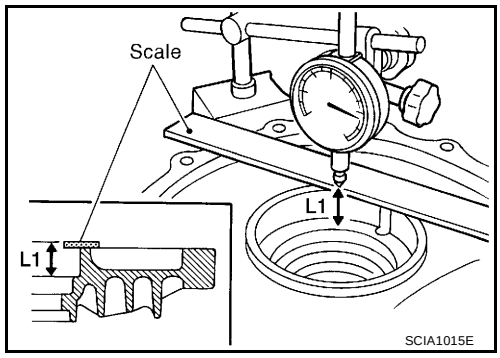
Adjusting Shim

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

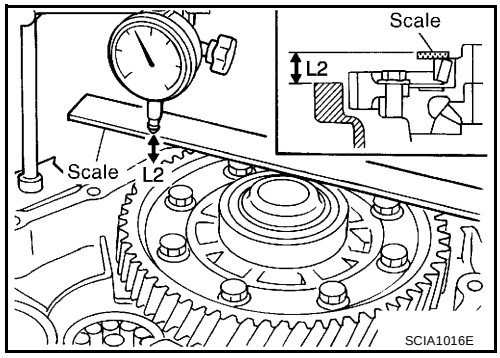
CAUTION:

Up to 2 adjusting shims can be selected.

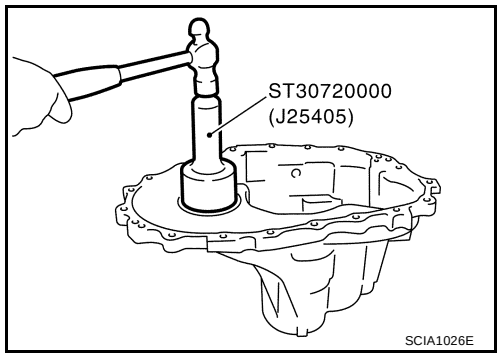
1. Using dial gauge and scale, measure dimension "L_1 " between clutch housing case end face and mounting face of adjusting shim.
2. Install outer race onto differential side bearing on final gear side. Holding the outer race horizontally by hand, rotate final gear five times or more (for smooth movement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



3. Using dial gauge and scale 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

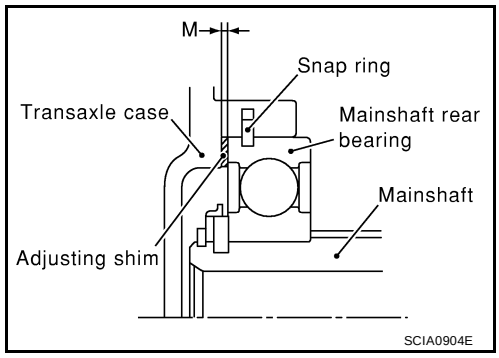
- When adjusting mainshaft end play, select adjusting shim for mainshaft rear bearing. To select adjusting shim, measure clearance “M” between transaxle case and mainshaft rear bearing.
- Calculate dimension "P" (thickness of adjusting shim) using the following procedure to meet specification of end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



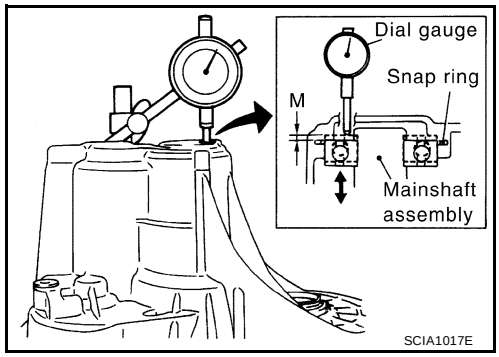
Adjusting Shim

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 (0.0396 in)	32238 8H524
1.04 mm (0.0409 in)	32238 8H560
1.08 mm (0.0425 in)	32238 8H561

CAUTION:

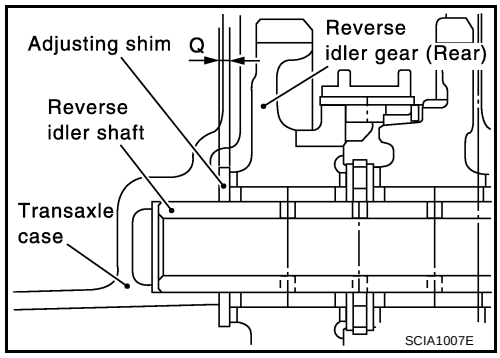
Only 1 adjusting shim can be selected.

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 meet 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

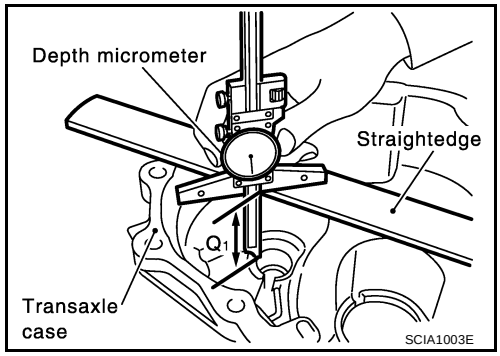
Adjusting Shim

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

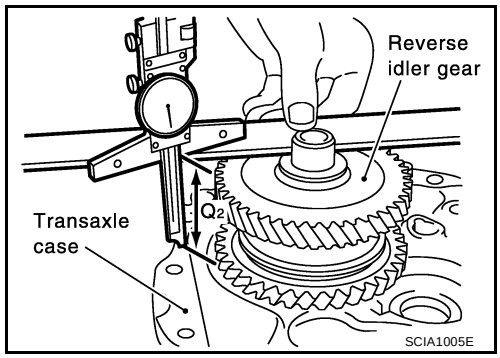
CAUTION:

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.



INPUT SHAFT AND GEARS

PFP:32200

Disassembly and Assembly

ECS004C7

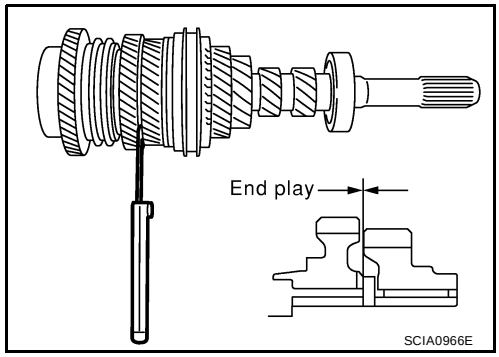
DISASSEMBLY

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

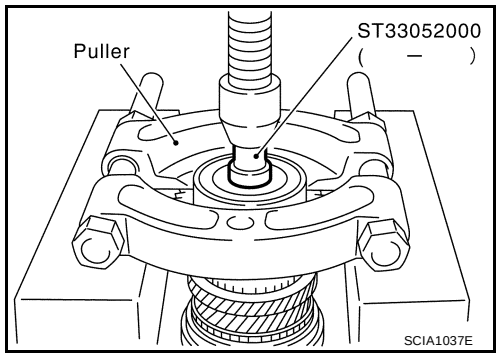
End play standard value

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)

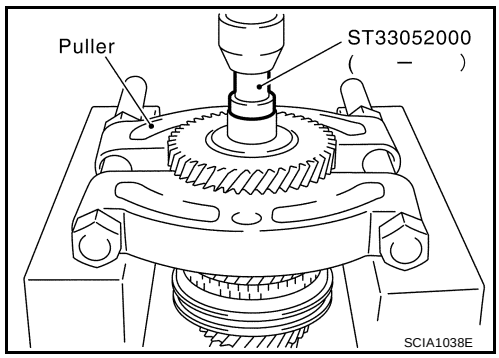
CAUTION:
If measurement is outside the standard range, disassemble to check contact surfaces of gear, shaft, and hub. Adjust with snap ring at assembly.



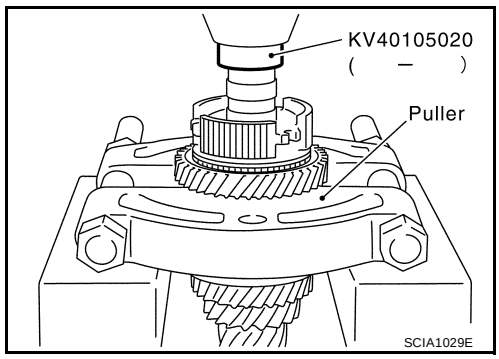
2. Remove oil channel.
3. Remove input shaft rear bearing.
4. Remove the snap ring.



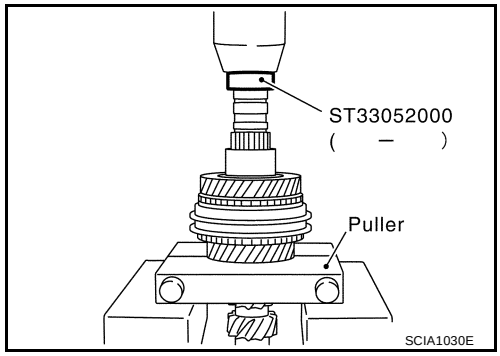
5. Remove 6th input gear, 6th bushing and 6th needle bearing.
6. Remove 6th baulk ring, 5th-6th coupling sleeve and shifting insert.



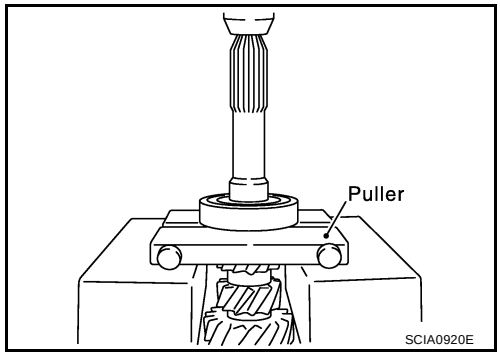
7. Remove 5th input gear and synchronizer hub assembly simultaneously.
8. Remove 5th needle bearing.



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.

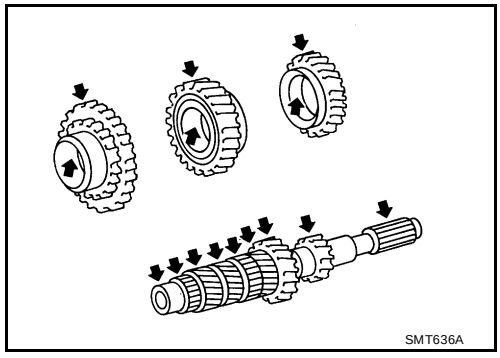


INSPECTION AFTER DISASSEMBLY

Input Shaft and Gear

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

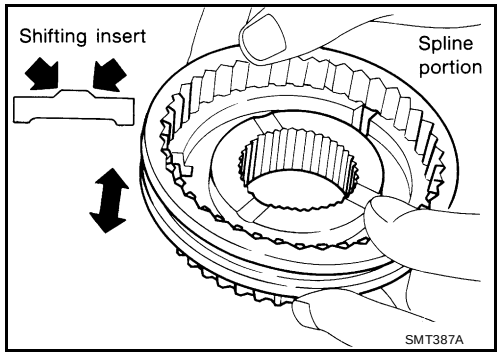
- Damage, peeling, dent, uneven wear, or bending of shaft.
- Excessive wear, damage, or peeling of gears.



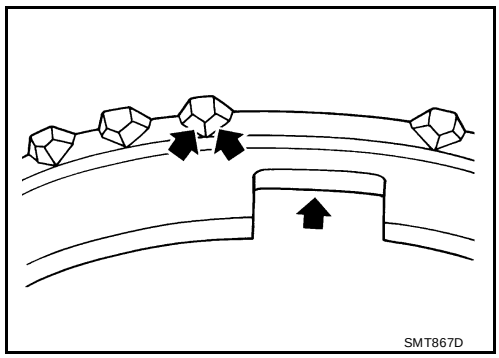
Synchronizer

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.



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.

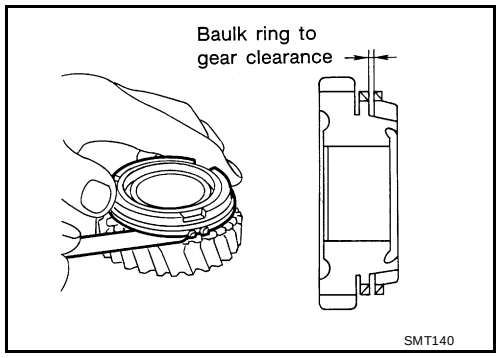
Clearance

Standard

3rd and 4th : 0.9 - 1.45 mm (0.035 - 0.0571 in)

5th and 6th : 0.95 - 1.4 mm (0.0374 - 0.055 in)

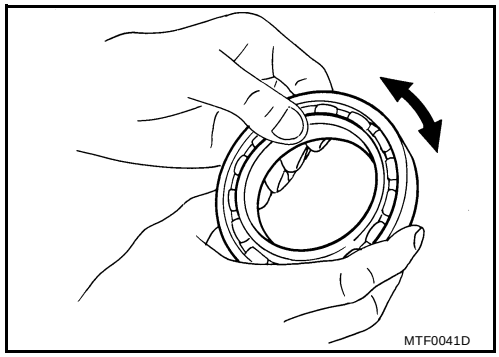
Limit value : 0.7 mm (0.028 in)



Bearing

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

- Damage and rough rotation of bearing

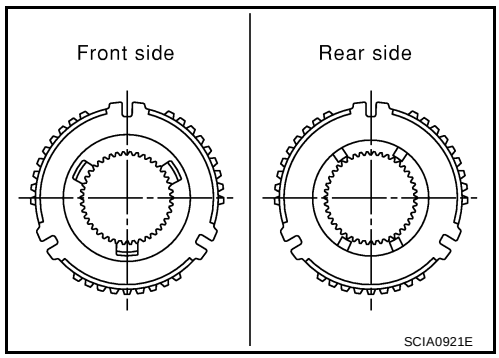


ASSEMBLY

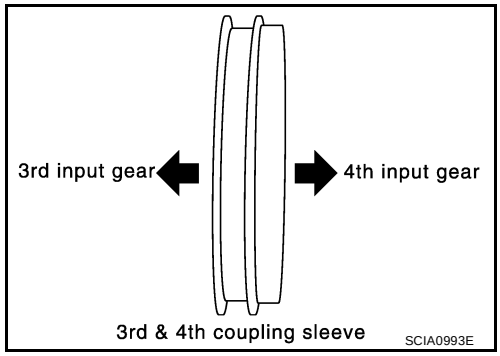
1. Install 3rd needle bearing.
2. Install 3rd input gear and 3rd baulk ring.
3. Install spread spring, shifting insert and 3rd-4th synchronizer hub onto 3rd-4th coupling sleeve.

CAUTION:

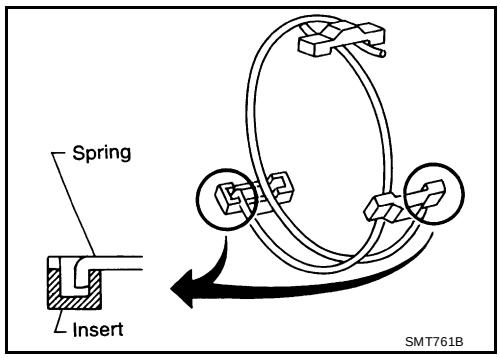
- **Be careful with orientation of synchronizer hub.**



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

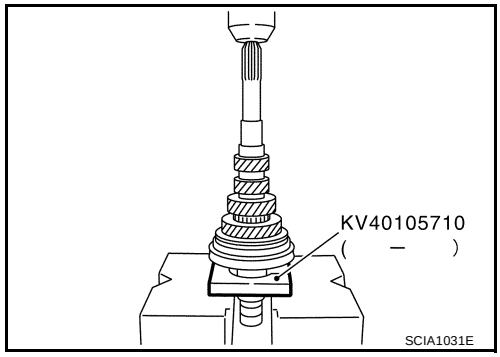


- **Be sure not to hook ends of 2 spread springs (front and back: 2 each) on same shifting insert.**

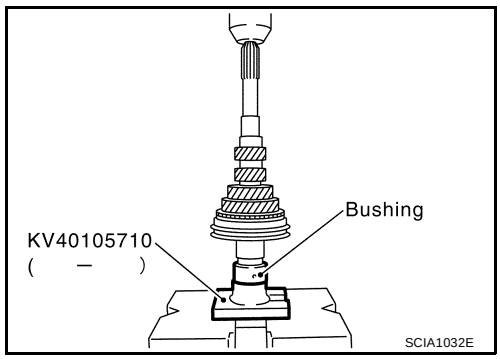


4. Install 3rd-4th synchronizer hub assembly.

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

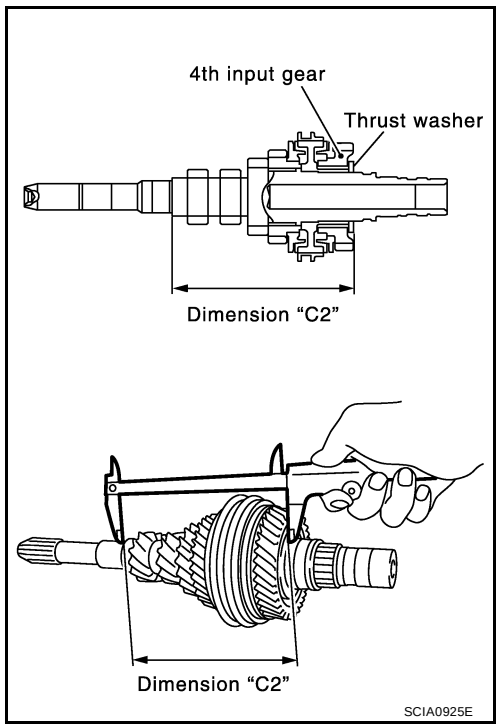


5. Install 4th bushing.
6. Install 4th baulk ring.
7. Install 4th input gear and 4th needle bearing.



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)**

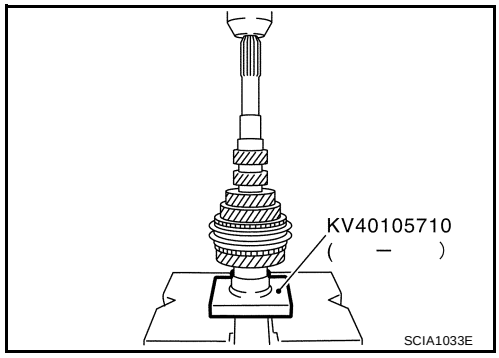


Thrust Washer

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

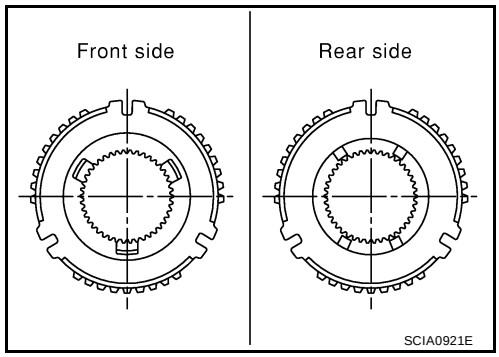
CAUTION:
Only 1 thrust washer can be selected.

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

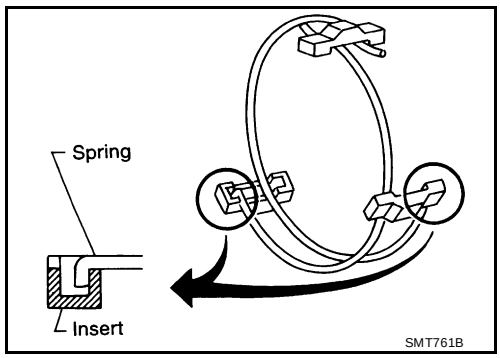


12. Install synchronizer assembly onto 5th-6th synchronizer hub.

CAUTION:
- **Be careful with orientation of synchronizer hub.**

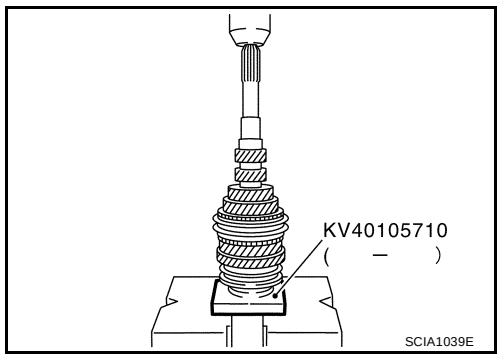


- **Be sure not to hook ends of 2 spread springs (front and back: 2 each) on same shifting insert.**

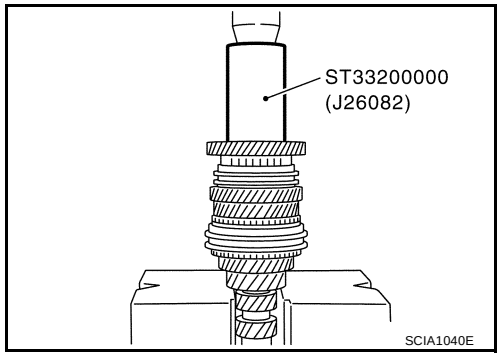


13. Install 5th-6th synchronizer hub assembly.

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



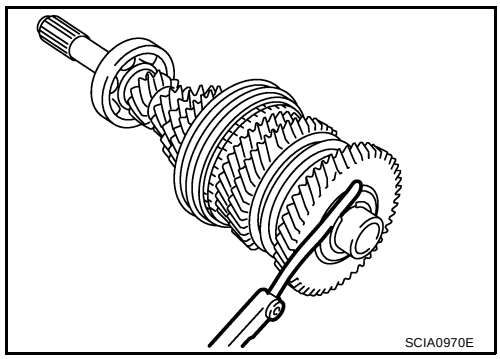
14. Install needle bearing, 6th input gear and then 6th bushing.



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

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

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

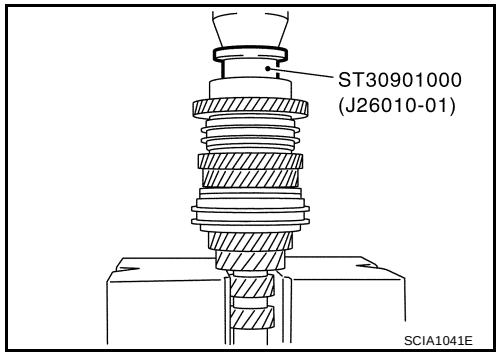


Snap Rings

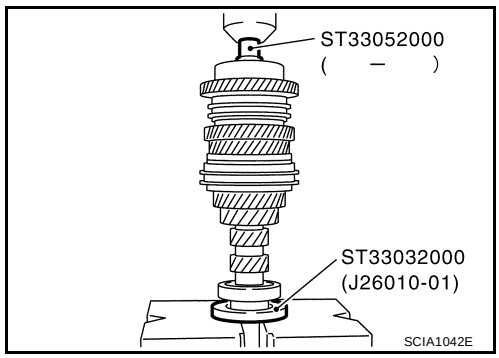
Thickness	Part number	Thickness	Part number
1.76 mm (0.0693 in)	32204 8H511	2.01 mm (0.0791 in)	32204 8H516
1.81 mm (0.0713 in)	32204 8H512	2.06 mm (0.0811 in)	32204 8H517
1.86 mm (0.0732 in)	32204 8H513	2.11 mm (0.0831 in)	32204 8H518
1.91 mm (0.0752 in)	32204 8H514	2.16 mm (0.0850 in)	32204 8H519
1.96 mm (0.0772 in)	32204 8H515	2.21 mm (0.0871 in)	32204 8H520

16. Install input shaft rear bearing.

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



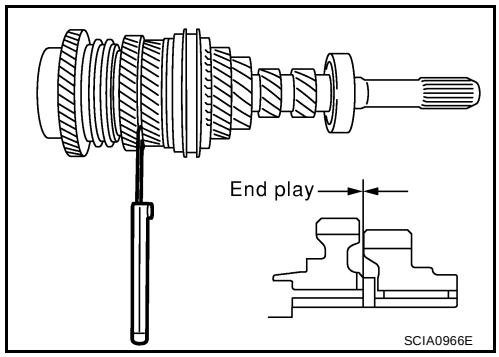
17. Install input shaft front bearing.
18. Install oil channel onto input shaft.



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

Disassembly and Assembly

ECS004C8

DISASSEMBLY

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

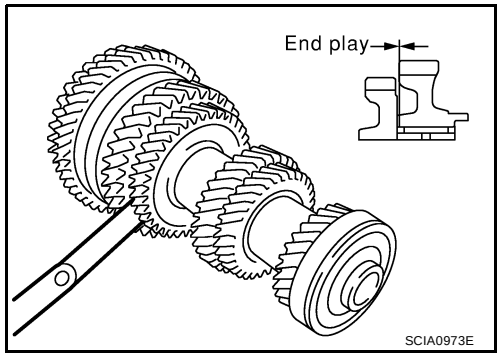
End play standard value

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

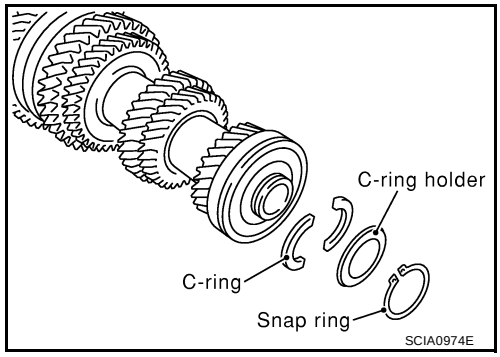
2nd gear : 0.06 - 0.16 mm (0.0024 - 0.0063 in)

CAUTION:

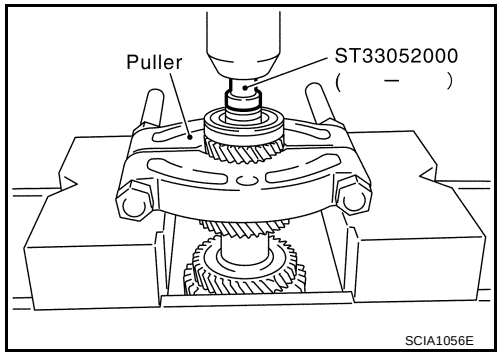
If measurement is outside the standard range, disassemble to check contact surfaces of gear, shaft, and hub. Adjust with snap ring at assembly.



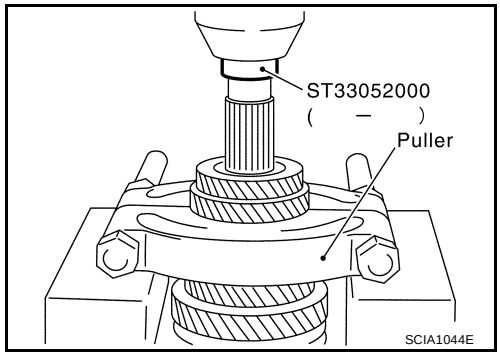
2. Remove the snap ring.
3. Remove C-ring holder, and then mainshaft C-ring.



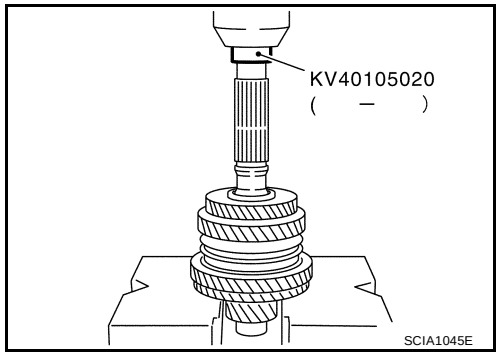
4. Remove mainshaft rear bearing, adjust shim and 6th main gear.
5. Remove 5th-6th mainshaft spacer.



6. Remove 4th main gear and 5th main gear simultaneously.
7. Remove adjusting shim.
8. Remove 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.

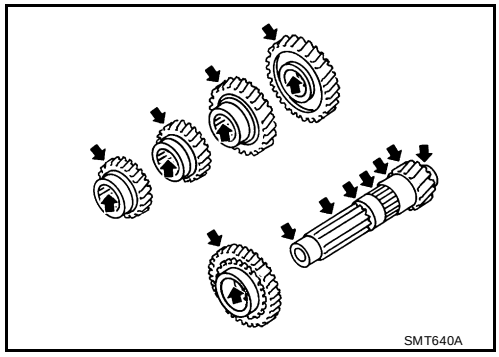


INSPECTION AFTER DISASSEMBLY

Mainshaft and Gears

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

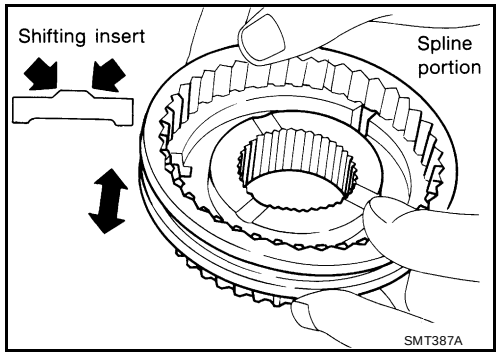
- Damage, peeling, dent, uneven wear, bending, and other non-standard conditions of the shaft.
- Excessive wear, damage, peeling, and other non-standard conditions of the gears.



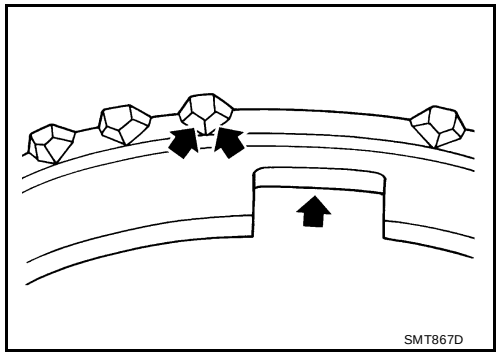
Synchronizer

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.



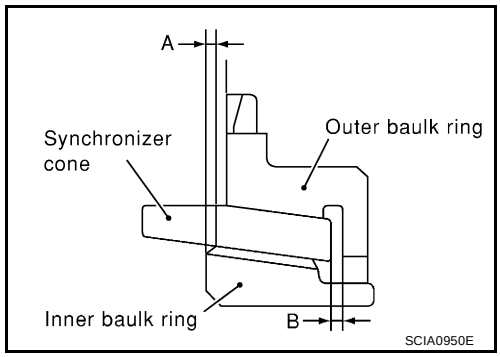
- If any crack, damage, or excessive wear is found on cam face of baulk ring or working face of insert, replace it.



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.

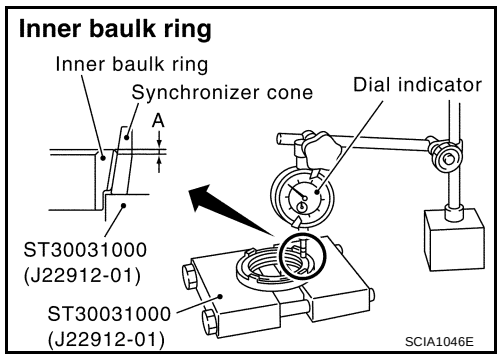


1. Using a dial gauge, measure clearance "A" at 2 or more points diagonally opposite, and calculate mean value.

   Clearance A

   Standard : 0.6 - 0.8 mm (0.024 - 0.031 in)

   Limit value : 0.2 mm (0.008 in) or less

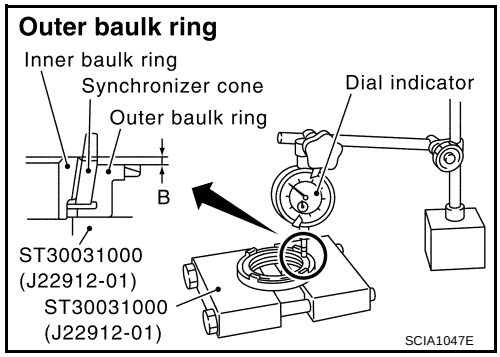


2. Using a dial gauge, measure clearance "B" at 2 or more points diagonally opposite, and calculate mean value.

   Clearance B

   Standard : 1.3 - 1.5 mm (0.051 - 0.059 in)

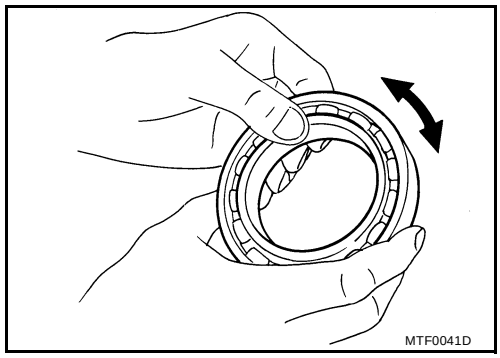
   Limit value : 0.2 mm (0.008 in) or less



Bearing

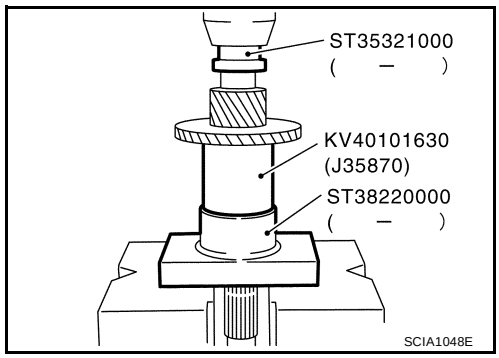
Check items below. If necessary, replace them with new ones.

- Damage and rough rotation of bearing

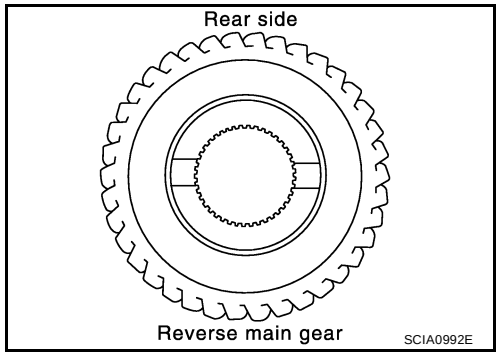


ASSEMBLY

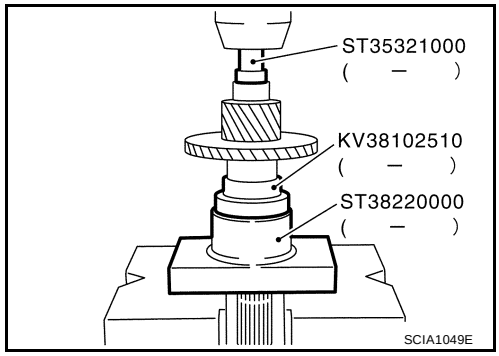
1. Install reverse main gear.



CAUTION:
Be careful with orientation of reverse main gear.

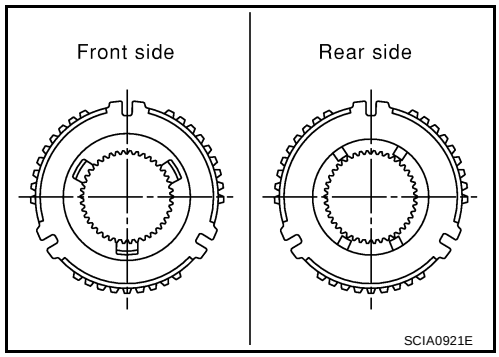


2. Install 1st bushing.
3. Install needle bearing, and then 1st main gear.

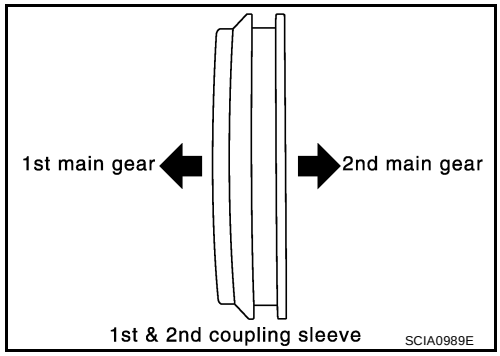


4. Install spread spring, shifting insert and 1st-2nd synchronizer hub onto 1st-2nd coupling sleeve.

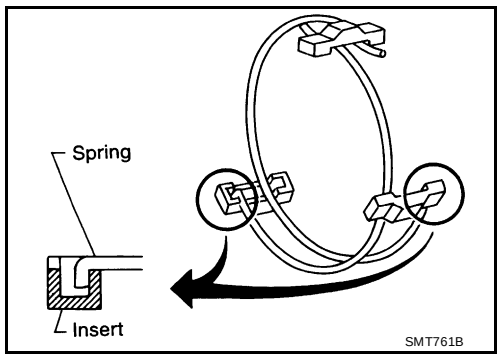
CAUTION:
- **Be careful with orientation of synchronizer hub.**



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



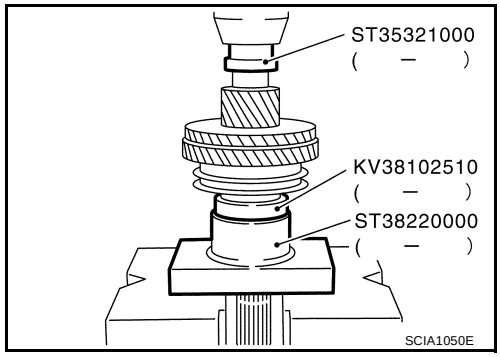
- **Be sure not to hook ends of 2 spread springs (front and back: 2 each) on same shifting insert.**



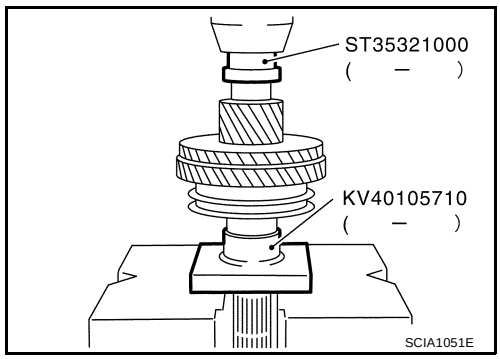
5. Install 1st gear synchronizer assembly onto mainshaft, and synchronizer hub assembly onto mainshaft.

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.

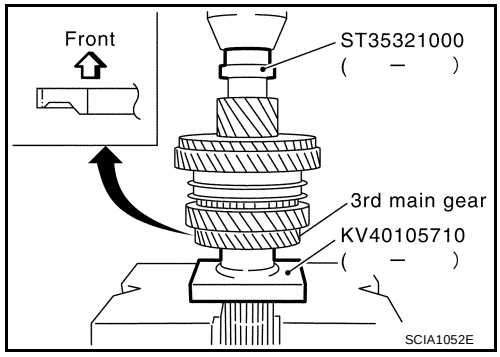


9. Install 3rd main gear.

CAUTION:

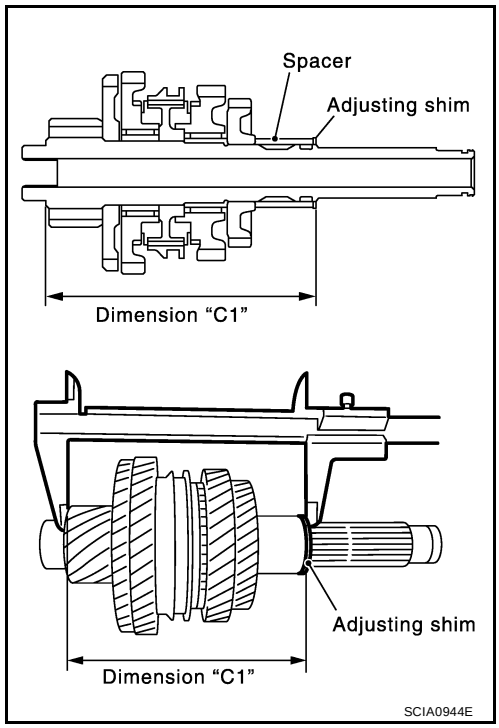
Be careful with orientation of 3rd main gear.

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)**



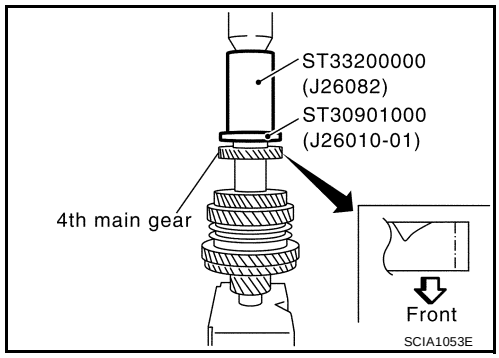
Adjusting Shim

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 1 adjusting shim can be selected.

12. Install 4th main gear.

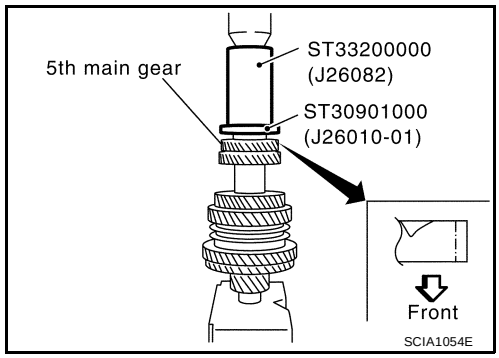
CAUTION:
Be careful with orientation of 4th main gear.



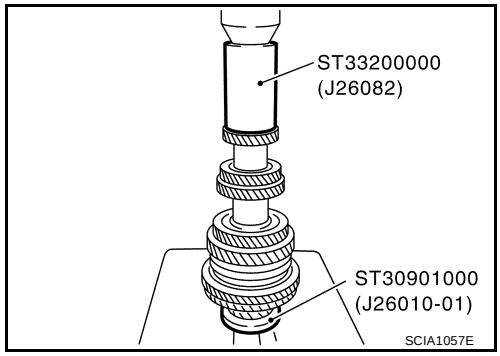
13. Install 5th main gear.

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

14. Install 5th-6th mainshaft spacer.



15. Install 6th main gear.



16. Adjustment between 6th main gear and 6th main adjusting shim.
    - Calculate thickness “S” of 6th main adjusting shim so that end play dimension between 6th main gear and mainshaft rear bearing is the dimension shown below.

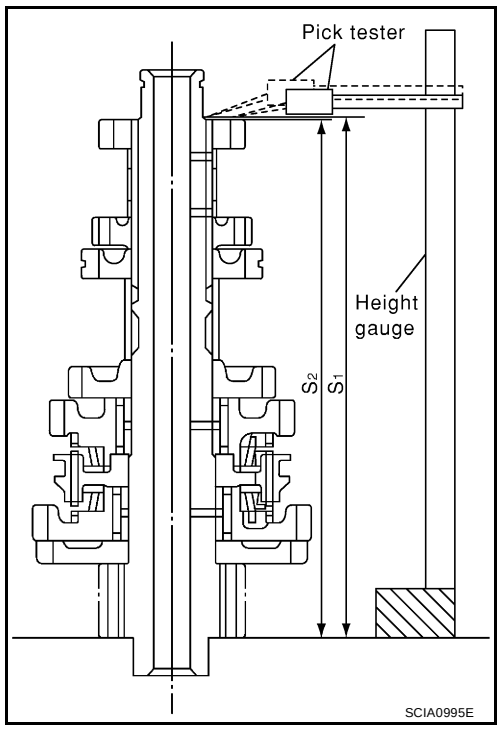
End play : 0 - 0.1 mm (0 - 0.004 in)

Dimension “S” = (S_1 - S_2) + End play

S : Thickness of adjusting shim

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

S_2 : Dimension from mainshaft reference 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		

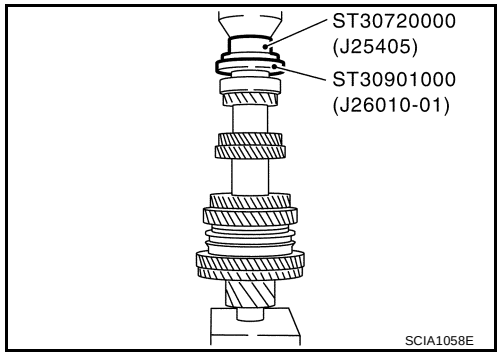
CAUTION:

Only 1 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.

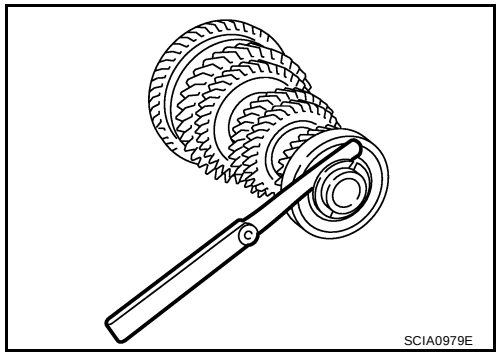
17. Install mainshaft rear bearing.



18. Install C-ring onto mainshaft, and check that end play of mainshaft rear bearing meets specifications.

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

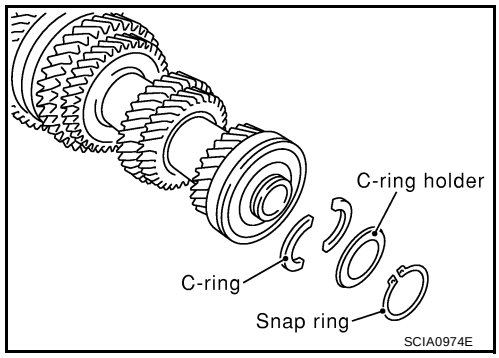
- If measurement is outside the standard range, reselect C-ring.



C-ring

Thickness	Part number	Thickness	Part number
2.535 mm (0.0866 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.

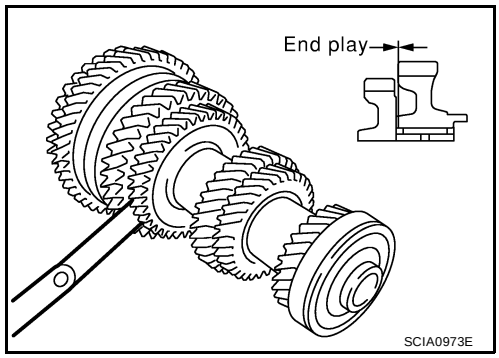


20. Check end play of 1st and 2nd main gears.

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

Disassembly and Assembly

ECS004C9

DISASSEMBLY

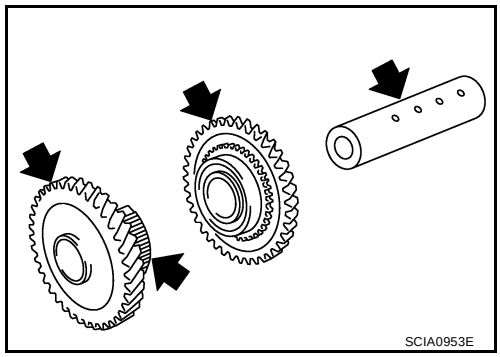
1. Remove reverse idler gear adjusting shim.
2. Remove reverse idler gear (rear), reverse coupling sleeve and insert spring simultaneously.
3. Remove reverse idler gear needle bearing.
4. Remove thrust needle bearing.
5. Remove reverse baulk ring.
6. Remove reverse idler gear (front).
7. Remove reverse 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.

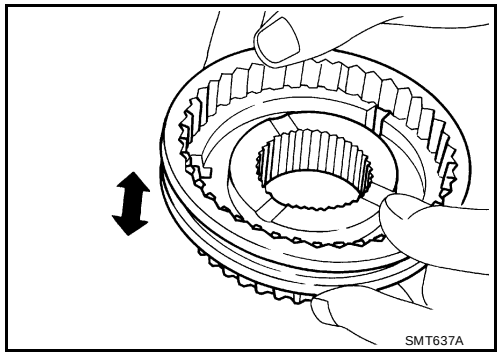
- Damage, peeling, dent, uneven wear, bending, and other non-standard conditions of the shaft.
- Excessive wear, damage, peeling, and other non-standard conditions of the gears.



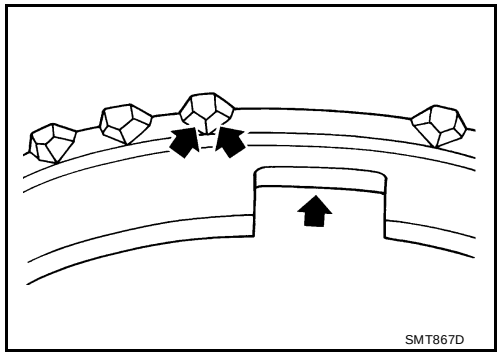
Synchronizer

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.



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

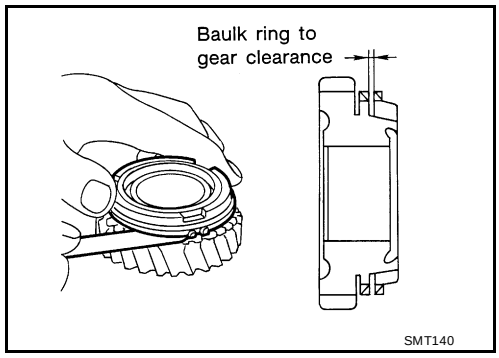


Baulk ring clearance

- 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 - 0.055 in)**
Limit value	**: 0.7 mm (0.028 in)**



Bearing

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

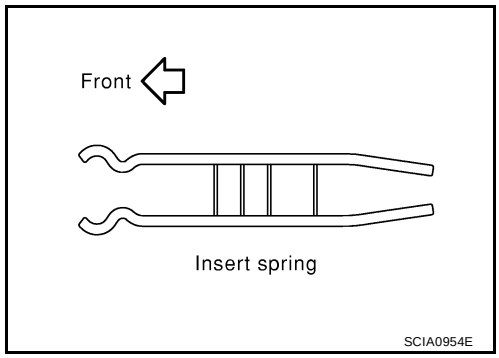
- Damage and rough rotation of bearing.

ASSEMBLY

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

CAUTION:

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



FINAL DRIVE

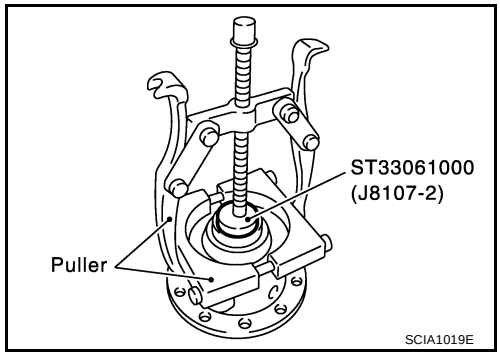
PFP:38411

Disassembly and Assembly

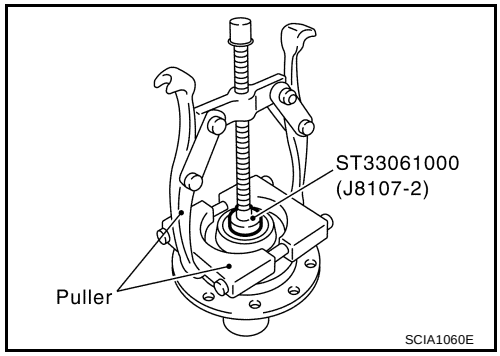
ECS004CA

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).



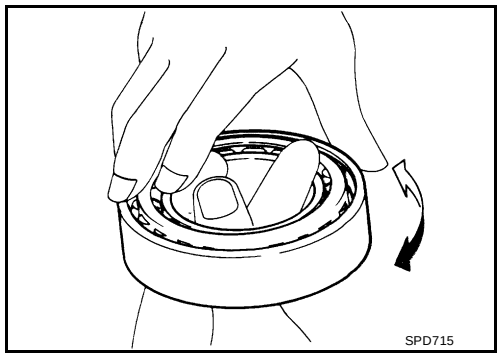
INSPECTION AFTER DISASSEMBLY

Bearing

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

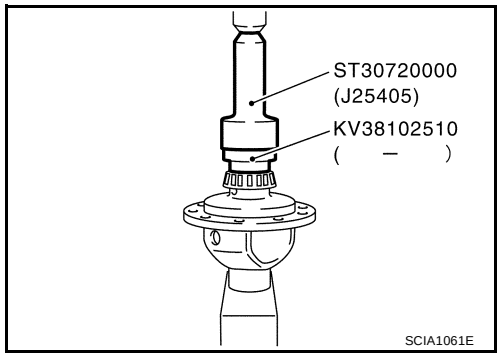
CAUTION:

When replacing tapered roller bearing, replace outer and inner races as a set.

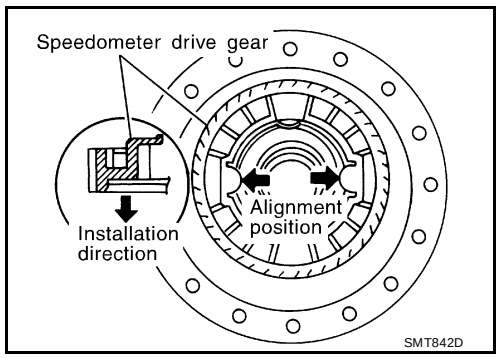


ASSEMBLY

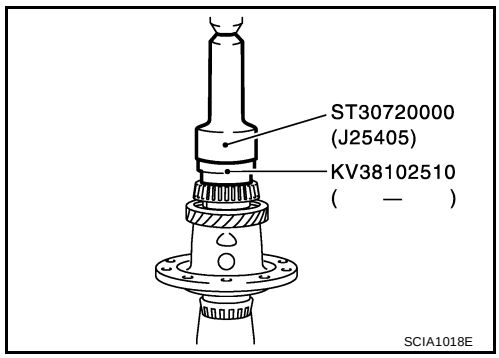
1. Using a drift (special service tool), install differential side bearing (transaxle case side).



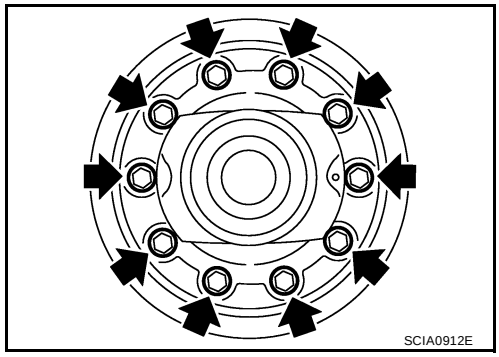
2. Align and install speedometer drive gear onto differential case.



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



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



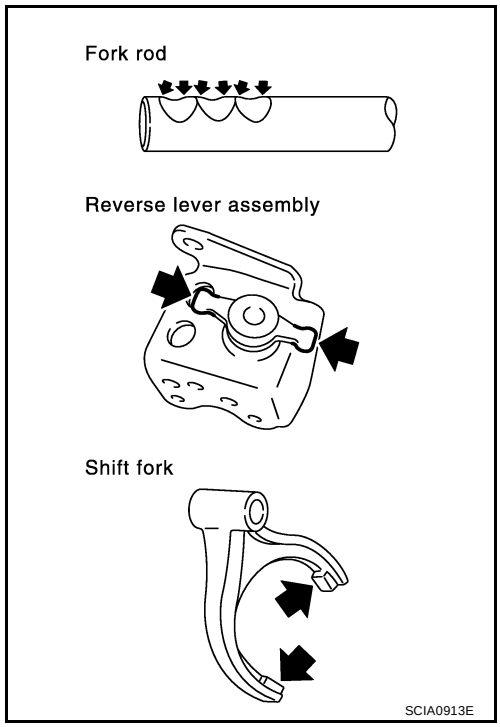
SHIFT CONTROL

PFP:32982

Inspection

ECS004CB

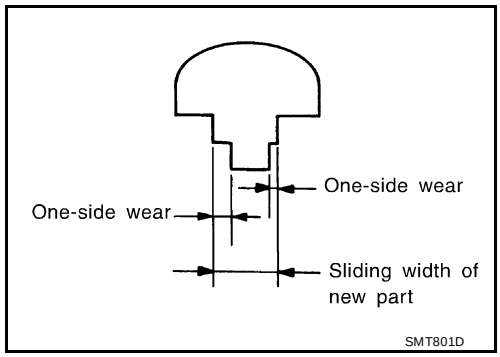
- Check contact surfaces and sliding area for wear, damage, or bending. If necessary, replace parts.



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)



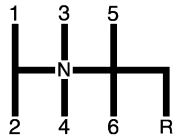
SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

General Specifications

ECS004CC

TRANSAXLE

Engine			QR25DE
Transaxle model			RS6F51H
Model code number			8U078
Number of speed			6
Synchromesh type			Warner
Shift pattern			 SCIA0955E
Gear ratio	1st		3.416
	2nd		1.944
	3rd		1.258
	4th		0.947
	5th		0.772
	6th		0.630
	Reverse		3.252
Number of teeth	Input gear	1st	12
		2nd	18
		3rd	31
		4th	38
		5th	44
		6th	46
		Reverse	12
	Main gear	1st	41
		2nd	35
		3rd	39
		4th	36
		5th	34
		6th	29
		Reverse	38
	Reverse idler gear	Front	37
		Rear	38
Oil capacity ℓ (US qt, Imp qt)			2.3 (2 3/8, 2)
Remarks	Reverse synchronizer		Installed
	Double baulk ring type synchronizer		1st & 2rd synchronizer

FINAL GEAR

Engine		QR25DE
Transaxle model		RS6F51H
Model code number		8U078
Final gear ratio		4.428
Number of teeth	Final gear/Pinion	62/14
	Side gear/Pinion mate gear	—

Gear End Play

ECS004CD

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

ECS004CE

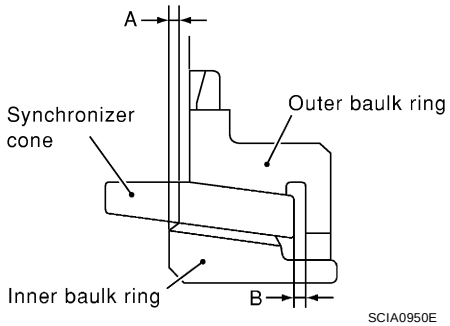
3RD, 4TH, 5TH, 6TH & REVERSE BAULK RING

Unit: mm (in)

Standard		Wear limit
3rd	0.9 - 1.45 (0.035 - 0.0571)	0.7 (0.028)
4th	0.9 - 1.45 (0.035 - 0.0571)	0.7 (0.028)
5th	0.95 - 1.4 (0.0374 - 0.055)	0.7 (0.028)
6th	0.95 - 1.4 (0.0374 - 0.055)	0.7 (0.028)
Reverse	0.95 - 1.4 (0.0374 - 0.055)	0.7 (0.028)

1ST AND 2ND DOUBLE BAULK RING

Unit: mm (in)



SCIA0950E

Dimension	Standard	Wear limit
A	0.6 - 0.8 (0.024 - 0.031)	0.2 (0.008)
B	1.3 - 1.5 (0.051 - 0.059)	0.2 (0.008)

Available Snap Rings

ECS004CF

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 (0.0871)	32204 8H520

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

Available C-rings

ECS004CG

MAINSHAFT C-RING

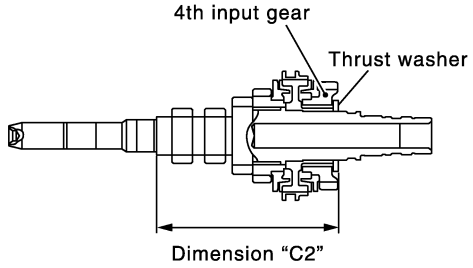
End play		0 - 0.06 mm (0 - 0.0024 in)	
Thickness mm (in)	Part number*	Thickness mm (in)	Part number*
2.535 (0.0866)	32348 8H800	2.835 (0.1116)	32348 8H810
2.565 (0.1010)	32348 8H801	2.865 (0.1128)	32348 8H811
2.595 (0.1022)	32348 8H802	2.895 (0.1140)	32348 8H812
2.625 (0.1033)	32348 8H803	2.925 (0.1152)	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 Washers

ECS004CH

INPUT SHAFT THRUST WASHER



SCIA1008E

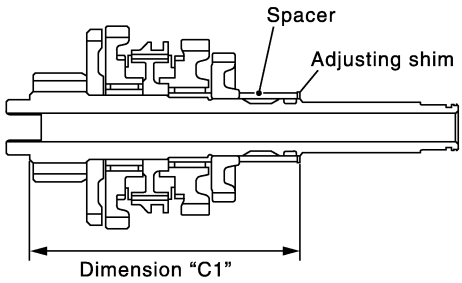
Standard length “C2”		154.7 - 154.8 mm (6.091 - 6.094in)	
Thickness mm (in)	Part number*	Thickness mm (in)	Part number*
3.84 (0.1512)	32347 8H500	4.02 (0.1583)	32347 8H503
3.90 (0.1535)	32347 8H501	4.08 (0.1606)	32347 8H504
3.96 (0.1559)	32347 8H502	4.14 (0.1630)	32347 8H505

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

Available Adjusting Shims

ECS004CI

MAINSHAFT ADJUSTING SHIM



SCIA1009E

Standard length “C1”		173.85 - 173.95 mm (6.844 - 6.848in)	
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 (0.0520)	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 (0.0396)	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
6.68 (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	1.68 (0.0661)	32225 8H567
0.76 (0.0299)	32225 8H509	1.24 (0.0488)	32225 8H521	1.72 (0.0677)	32225 8H568
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 parts 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 (0.0396)	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.

REVERASE 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 (0.0520)	32237 8H566
1.12 (0.0441)	32237 8H563		

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

Available Shims

ECS004CJ

— Differential Side Bearing Preload and Adjusting Shim —

BEARING PRELOAD

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

*: 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.