

SECTION **MT**
MANUAL TRANSAXLE

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PRECAUTIONS

PRECAUTIONS

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Caution

ECS008BM

- 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.

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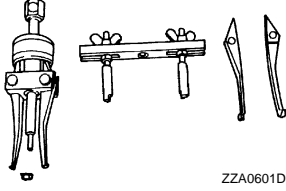
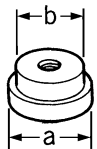
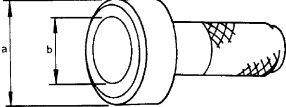
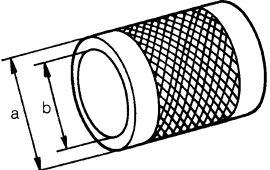
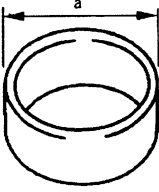
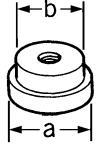
PREPARATION

PREPARATION

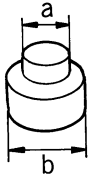
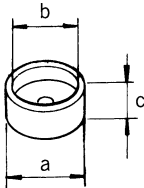
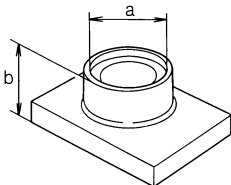
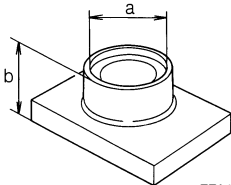
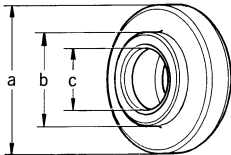
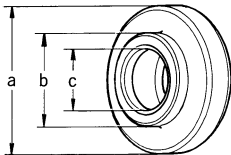
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Special Service Tools

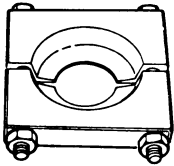
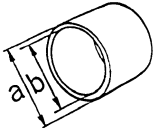
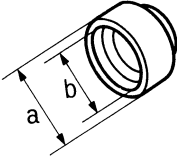
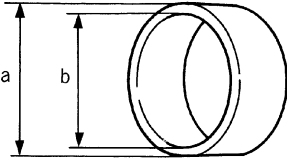
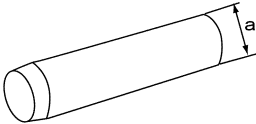
ECS008BN

Tool number Tool name		Description
KV381054S0 Puller	 ZZA0601D	<ul style="list-style-type: none"> ● Differential side bearing outer race removal ● Mainshaft front bearing removal
ST35321000 Drift a: 49 mm (1.93 in) dia. b: 41 mm (1.61 in) dia.	 ZZA1000D	<ul style="list-style-type: none"> ● Input shaft oil seal installation ● Reverse main gear installation ● 1st main gear bushing installation ● 1st-2nd synchronizer hub assembly installation ● 2nd main gear bushing installation ● 3rd main gear installation ● Differential side bearing (clutch housing side) removal
ST30720000 Drift a: 77 mm (3.03 in) dia. b: 55.5 mm (2.185 in) dia.	 ZZA0811D	<ul style="list-style-type: none"> ● Differential oil seal installation ● Differential side bearing outer race installation ● Mainshaft rear bearing installation ● Differential side bearing installation
ST33200000 Drift a: 60 mm (2.36 in) dia. b: 44.5 mm (1.752 in) dia.	 ZZA1002D	<ul style="list-style-type: none"> ● Mainshaft front bearing installation ● 6th input gear bushing installation (RS6F51A) ● 4th main gear installation ● 5th main gear installation ● 6th main gear installation (RS6F51A)
KV40105320 Drift a: 88 mm (3.46 in) dia.	 ZZA0898D	Differential side bearing outer race installation
ST33061000 Drift a: 38 mm (1.50 in) dia. b: 28.5 mm (1.122 in) dia.	 ZZA1000D	<ul style="list-style-type: none"> ● Bore plug installation ● Differential side bearing (transaxle case side) removal

PREPARATION

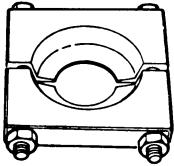
Tool number Tool name	Description
ST33052000 Drift a: 22 mm (0.87 in) dia. b: 28 mm (1.10 in) dia.  ZZA1023D	<ul style="list-style-type: none"> ● Welch plug installation ● Input shaft rear bearing removal ● Input shaft bearing spacer and 5th stopper removal (RS5F51A) ● 5th input gear bushing, thrust washer, 4th input gear, 4th gear bushing, 3rd-4th synchronizer hub assembly and 3rd input gear removal ● Input shaft front bearing installation ● 6th input gear and 6th input gear bushing removal (RS6F51A) ● Mainshaft rear bearing removal ● 4th main gear and 5th main gear removal ● 6th main gear removal (RS6F51A)
KV40105020 Drift a: 39.7 mm (1.563 in) dia. b: 35 mm (1.38 in) dia. c: 15 mm (0.59 in)  ZZA1133D	<ul style="list-style-type: none"> ● 5th input gear and 5th synchronizer hub assembly removal ● 3rd main gear, 2nd main gear, 2nd main gear bushing, 1st-2nd synchronizer hub assembly, 1st main gear, reverse main gear and 1st main gear bushing removal
KV40105710 Press stand a: 46 mm (1.81 in) dia. b: 41 mm (1.61 in)  ZZA1058D	<ul style="list-style-type: none"> ● 3rd-4th synchronizer hub assembly installation ● 4th input gear bushing installation ● 5th input gear bushing installation ● 5th synchronizer hub assembly installation (RS5F51A) ● 5th-6th synchronizer hub assembly installation (RS6F51A) ● 2nd main gear bushing installation ● 3rd main gear installation
ST38220000 Press stand a: 63 mm (2.48 in) dia. b: 65 mm (2.56 in)  ZZA1058D	<ul style="list-style-type: none"> ● Reverse main gear installation ● 1st main gear bushing installation ● 1st-2nd synchronizer hub assembly installation
ST30032000 Drift a: 80 mm (3.15 in) dia. b: 38 mm (1.50 in) dia. c: 31 mm (1.22 in) dia.  ZZA0978D	<ul style="list-style-type: none"> ● 5th stopper and input shaft bearing spacer installation (RS5F51A) ● Input shaft front bearing installation
ST30901000 Drift a: 79 mm (3.11 in) dia. b: 45 mm (1.77 in) dia. c: 35.2 mm (1.386 in) dia.  ZZA0978D	<ul style="list-style-type: none"> ● Input shaft rear bearing installation ● 4th main gear installation ● 5th main gear installation ● 6th main gear installation (RS6F51A) ● Mainshaft rear bearing installation

PREPARATION

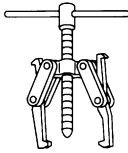

Tool number Tool name		Description
ST30031000 Puller	 ZZA0537D	Measuring wear of inner baulk ring
KV40101630 Drift a: 68 mm (2.68 in) dia. b: 60 mm (2.36 in) dia.	 ZZA1003D	Reverse main gear installation
KV38102510 Drift a: 71 mm (2.80 in) dia. b: 65 mm (2.56 in) dia.	 ZZA0838D	<ul style="list-style-type: none"> • 1st main gear bushing installation • 1st-2nd synchronizer hub assembly installation • Differential side bearing (transaxle case side) installation
KV40104830 Drift a: 70 mm (2.76 in) dia. b: 63.5 mm (2.500 in) dia.	 ZZA0936D	Differential side bearing (clutch housing side) installation
ST15243000 Drift a: ϕ 30mm	 SCIA1088J	Measuring end play of side gear

Commercial Service Tools

ECS008B0

Tool name		Description
Puller	 ZZA0537D	Each bearing, gear and bushing removal

PREPARATION

Tool name	Description
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

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NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

EC5008BP

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

MANUAL TRANSAXLE

Reference page		MA-37			MT-19(RS5F51A), MT-24 (RS6F51A)	MT-19(RS5F51A), MT-24 (RS6F51A)	MT-19(RS5F51A), MT-24 (RS6F51A)	MT-14	MT-22(RS5F51A), MT-27 (RS6F51A)	MT-22(RS5F51A), MT-27 (RS6F51A)	MT-20(RS5F51A), MT-25 (RS6F51A)	MT-20(RS5F51A), MT-25 (RS6F51A)	MT-20(RS5F51A), MT-25 (RS6F51A)	MT-20(RS5F51A), MT-25 (RS6F51A)
SUSPECTED PARTS (Possible cause)		OIL (Oil level is low.)	OIL (Wrong oil.)	OIL (Oil level is high.)	GASKET (Damaged)	OIL SEAL (Worn or damaged)	O-RING (Worn or damaged)	SHIFT CONTROL LINKAGE (Worn)	CHECK PLUG RETURN SPRING AND CHECK BALL (Worn or damaged)	SHIFT FORK (Worn)	GEAR (Worn or damaged)	BEARING (Worn or damaged)	BAULK RING (Worn or damaged)	INSERT SPRING (Damaged)
Symptoms	Noise	1	2								3	3		
	Oil leakage		3	1	2	2	2							
	Hard to shift or will not shift		1	1				2					3	3
	Jumps out of gear							1	2	3	3			

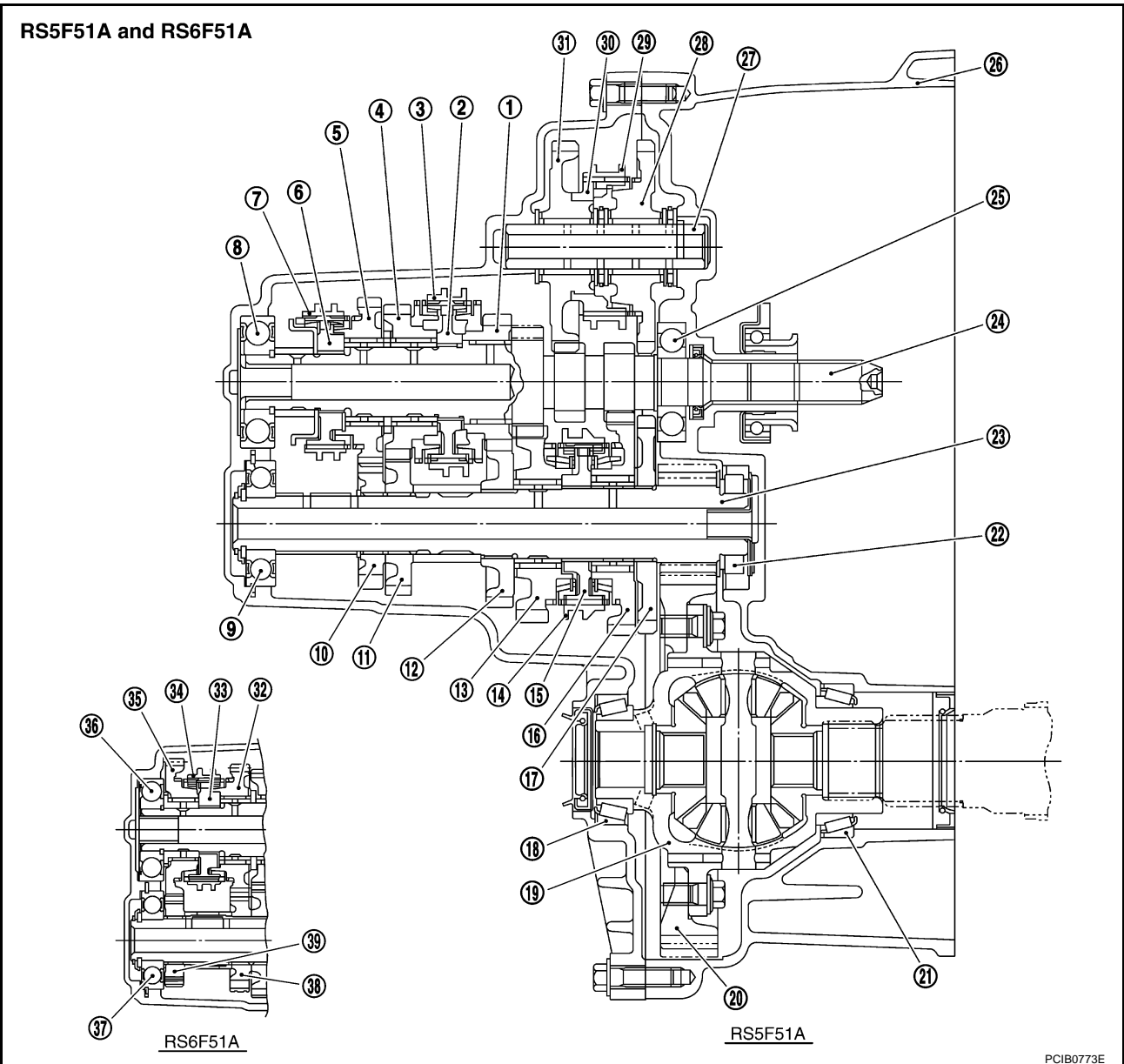
DESCRIPTION

DESCRIPTION

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Cross-Sectional View

ECS008BQ



- | | | |
|--------------------------------|-----------------------------|-------------------------------|
| 1. 3rd input gear | 2. 3rd-4th synchronizer hub | 3. 3rd-4th coupling sleeve |
| 4. 4th input gear | 5. 5th input gear | 6. 5th synchronizer hub |
| 7. 5th coupling sleeve | 8. Input shaft rear bearing | 9. Mainshaft rear bearing |
| 10. 5th main gear | 11. 4th main gear | 12. 3rd main gear |
| 13. 2nd main gear | 14. 1st-2nd coupling sleeve | 15. 1st-2nd synchronizer hub |
| 16. 1st main gear | 17. Reverse main gear | 18. Differential side bearing |
| 19. Differential case | 20. Final gear | 21. Differential side bearing |
| 22. Mainshaft front bearing | 23. Mainshaft | 24. Input shaft |
| 25. Input shaft front bearing | 26. Clutch housing | 27. Reverse idler shaft |
| 28. Reverse idler gear (Front) | 29. Reverse coupling sleeve | 30. Reverse synchronizer hub |
| 31. Reverse idler gear (Rear) | 32. 5th input gear | 33. 5th-6th synchronizer hub |
| 34. 5th-6th coupling sleeve | 35. 6th input gear | 36. Input shaft rear bearing |
| 37. Mainshaft rear bearing | 38. 5th main gear | 39. 6th main gear |

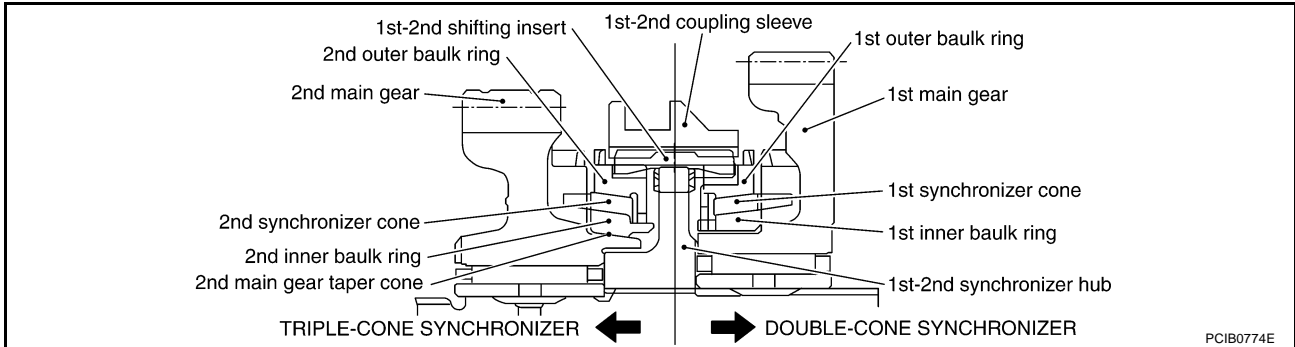
DESCRIPTION

DOUBLE-CONE SYNCHRONIZER

Double-cone synchronizer is adopted for 1st gear to reduce operating force of the shift lever.

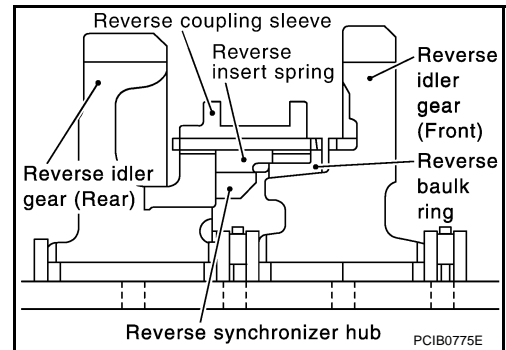
TRIPLE-CONE SYNCHRONIZER

Triple-cone synchronizer is adopted for 2nd gear to reduce operating force of the shift lever.



REVERSE GEAR NOISE PREVENTION FUNCTION (SYNCHRONIZING METHOD)

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



M/T OIL

PFP:KLD20

Changing M/T Oil DRAINING

ECS008BR

1. Start engine and let it run to warm up transaxle.
2. Stop engine. Remove drain plug and drain oil.
3. Set a new gasket on drain plug and install it to transaxle. Refer to [MT-19, "CASE AND HOUSING COMPONENTS"](#) , [MT-24, "CASE AND HOUSING COMPONENTS"](#) .

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

Oil capacity (reference) : Approx. 2.3 ℓ (4 Imp pt)

2. After refilling oil, check oil level. Assemble a new gasket to filler plug, then install it to transaxle. Refer to [MT-19, "CASE AND HOUSING COMPONENTS"](#) , [MT-24, "CASE AND HOUSING COMPONENTS"](#) .

CAUTION:

Do not reuse gasket.

Checking M/T Oil

OIL LEAKAGE AND OIL LEVEL

ECS008BS

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

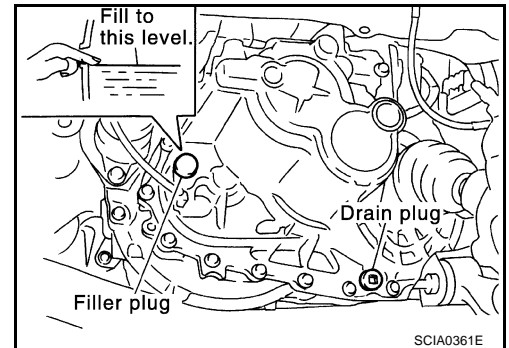
CAUTION:

Never start engine while checking oil level.

- Set a new gasket on filler plug and install it on transaxle. Refer to [MT-19, "CASE AND HOUSING COMPONENTS"](#) , [MT-24, "CASE AND HOUSING COMPONENTS"](#) .

CAUTION:

Do not reuse gasket.



SCIA0361E

SIDE OIL SEAL

SIDE OIL SEAL

PFP:32113

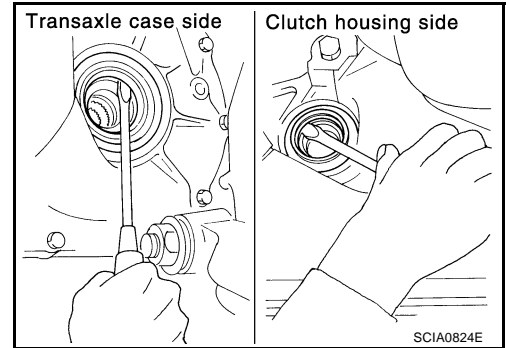
Removal and Installation REMOVAL

ECS008BT

- Clutch housing side oil seal used on 4WD vehicles is attached to transfer. Be sure to replace it when transfer is removed.
1. Remove drive shaft from transaxle. Refer to [FAX-11, "Removal and Installation"](#).
 2. Remove oil seal with a flat-bladed screwdriver.

CAUTION:

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



INSTALLATION

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

Dimension "A":

Within 0.5 mm (0.020 in) of flush with the case.

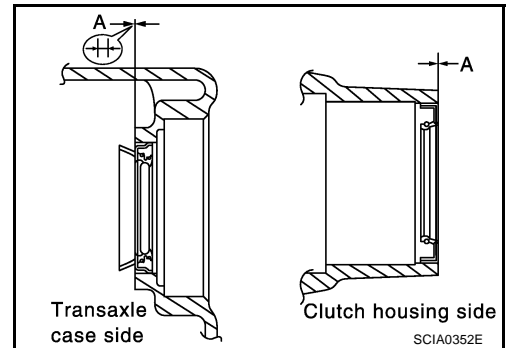
Drift to be used:

Transaxle case side: ST30720000

Clutch housing side: ST30720000

CAUTION:

- When installing oil seals, apply multi-purpose grease to oil seal lips.
 - Oil seals are not reusable. Never reuse them.
2. Install all parts in reverse order of removal and check oil level after installation. Refer to [MT-11, "Checking M/T Oil"](#).



POSITION SWITCH

POSITION SWITCH

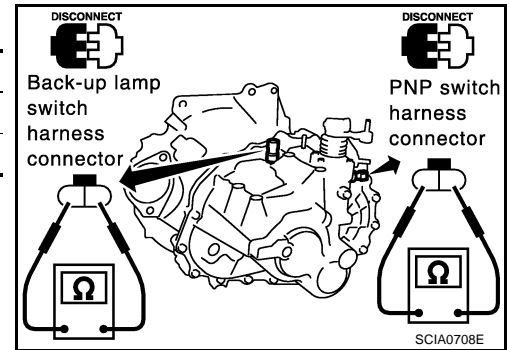
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Checking BACK-UP LAMP SWITCH

ECS008BU

- 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

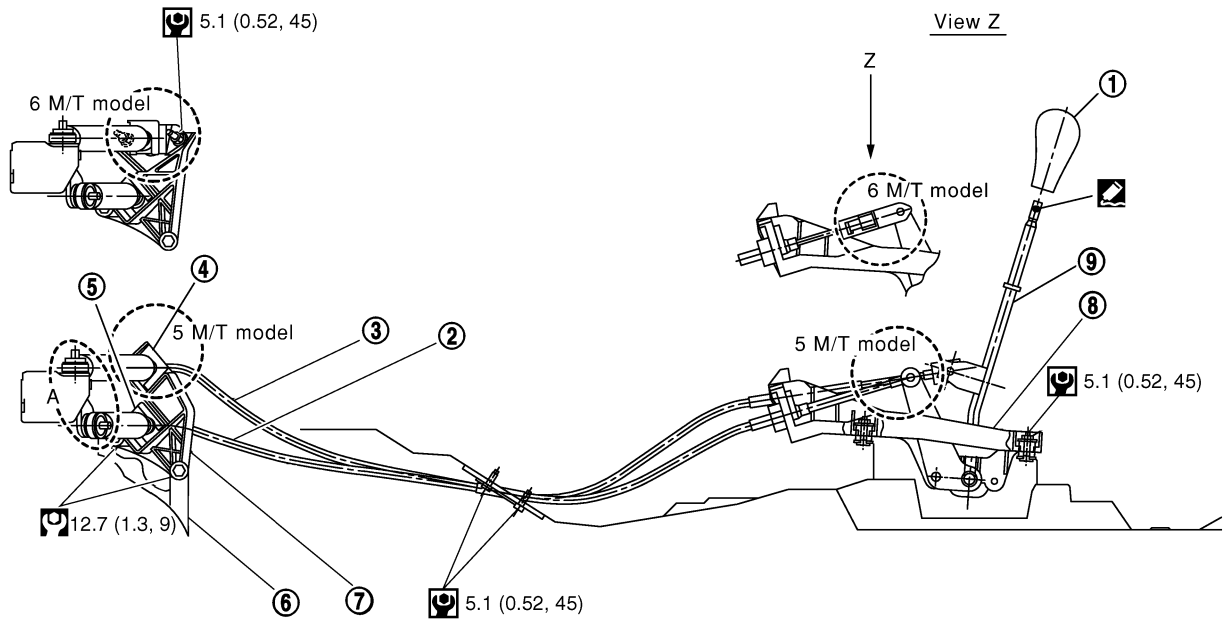
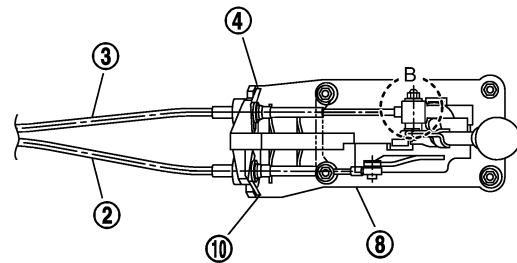
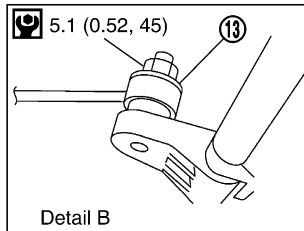
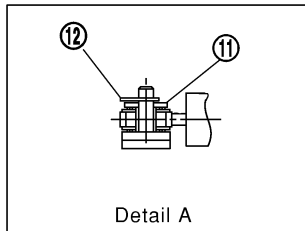
CONTROL LINKAGE

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Components of Control Device and Cable

ECS008BV

SEC.341



: N·m (kg-m, in-lb)

: N·m (kg-m, ft-lb)

: Apply cement

PCIB0777E

- | | | |
|---------------------------|----------------------------|-------------------|
| 1. Control lever knob | 2. Select cable | 3. Shift cable |
| 4. Lock plate | 5. Lock plate | 6. Clutch housing |
| 7. Cable mounting bracket | 8. Control device assembly | 9. Control lever |
| 10. Lock plate | 11. Washer | 12. Snap pin |
| 13. Washer | | |

CONTROL LINKAGE

Removal and Installation

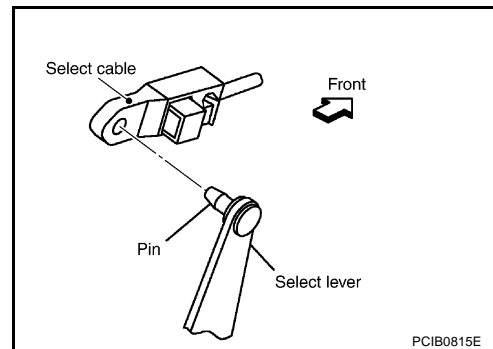
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CAUTION:

- Keep in mind that the select side lock plate for securing 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.
- Shift control lever to the neutral position for removal.

Install select cable according to the following procedure.

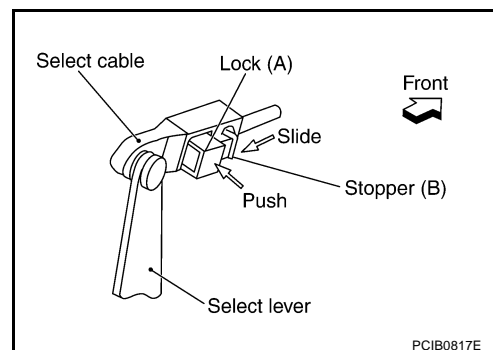
1. Install select cable of transaxle side to control assembly.
2. Install select cable to pin on select lever part of control device assembly.



3. Push lock part (A) of select cable all the way to the direction of the arrow. (6 M/T model only)
4. Slide stopper part (B) all the way to lock part (A) as shown by the arrow. (6 M/T model only)

CAUTION:

Make sure that select cable and select lever are installed securely.



AIR BREATHER HOSE

PFP:31098

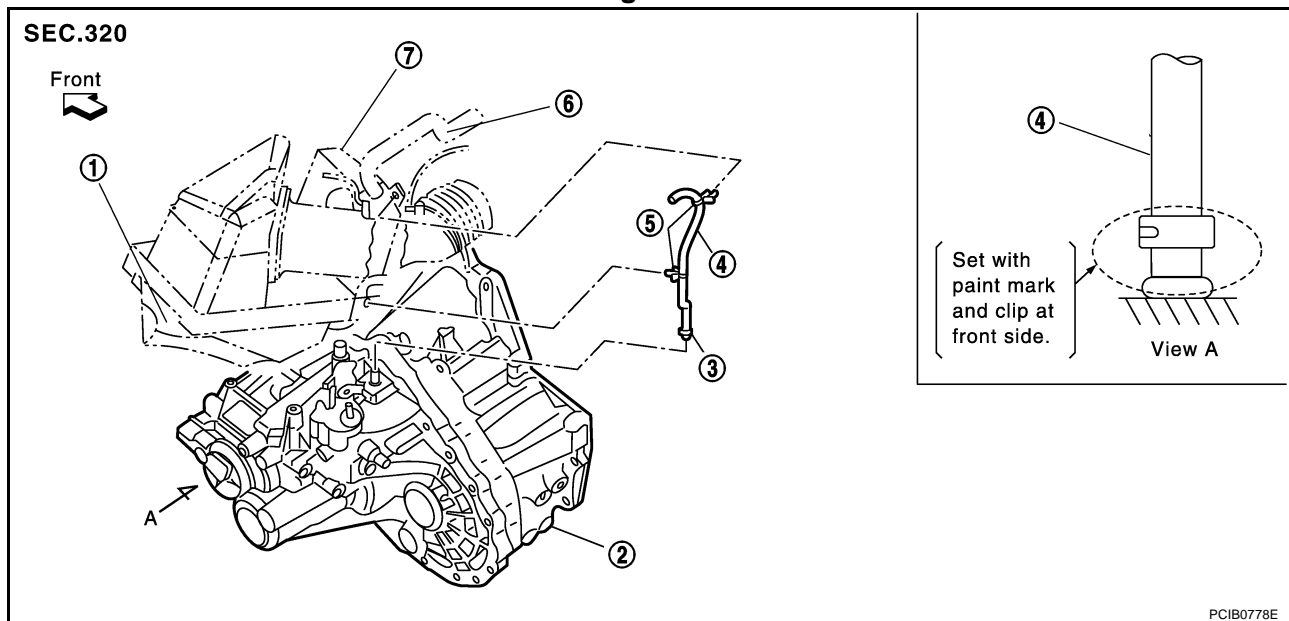
ECS008BW

AIR BREATHER HOSE

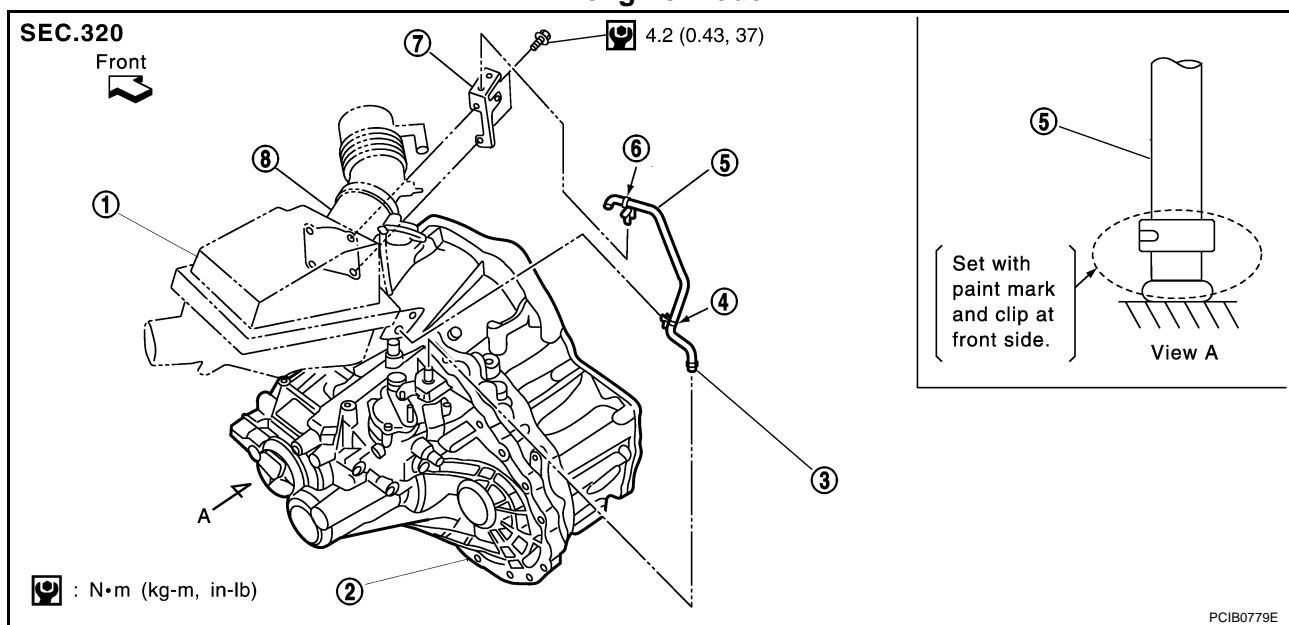
Removal and Installation

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

QR engine model



YD engine model



CAUTION:

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

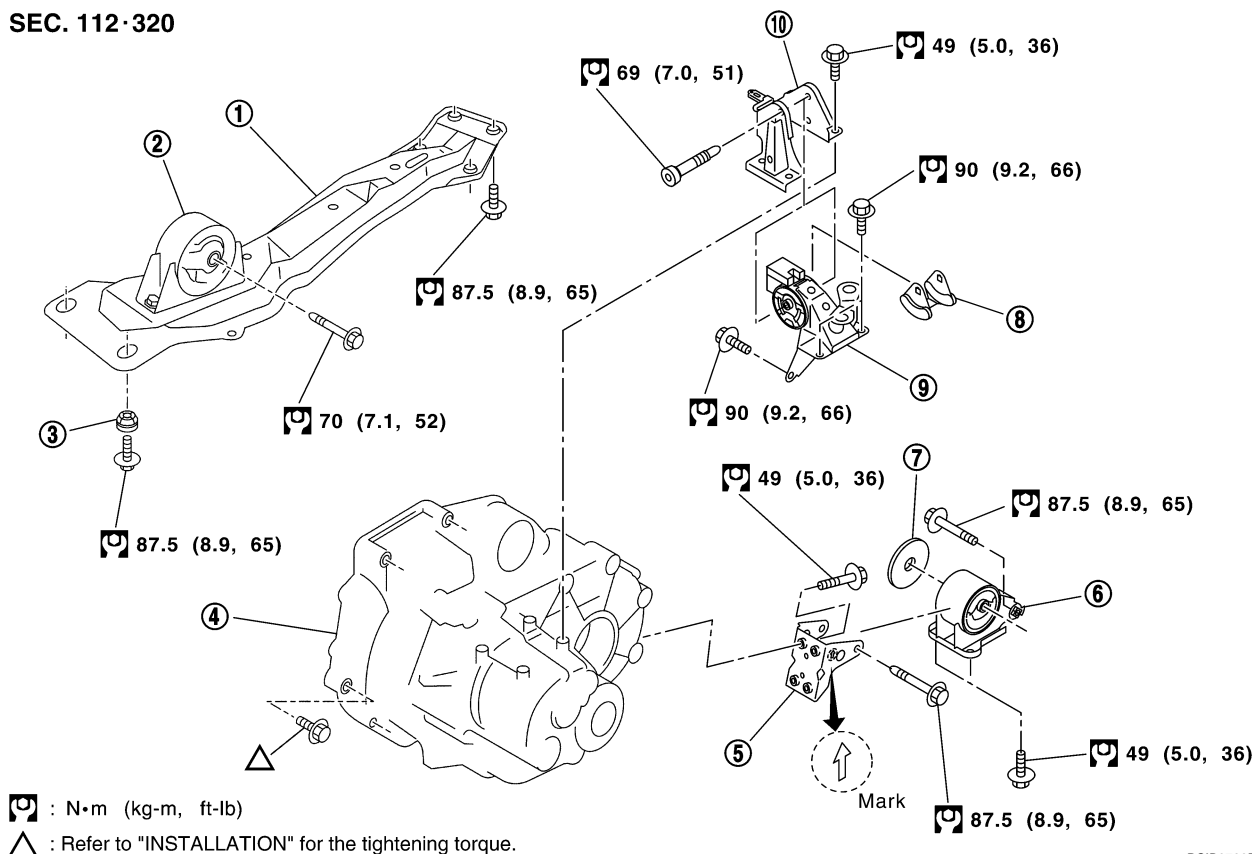
TRANSAXLE ASSEMBLY

PFP:32010

Removal and Installation

ECS008BX

SEC. 112-320



- | | | |
|-------------------------------------|---------------------------------|-----------------------------------|
| 1. Center member | 2. Insulator assembly | 3. Grommet |
| 4. Transaxle | 5. Rear engine mounting bracket | 6. Rear engine mounting insulator |
| 7. Stopper rubber (YD engine model) | 8. Stopper | 9. LH engine mounting insulator |
| 10. LH engine mounting bracket | | |

REMOVAL

1. Remove air cleaner, air duct, and battery. Refer to [EM-15, "Removal and Installation"](#), [EM-133, "Removal and Installation"](#).
2. Remove air breather hose. Refer to [MT-16, "Removal and Installation"](#).
3. Remove clutch operating cylinder. Refer to [CL-10, "Removal and Installation"](#).

CAUTION:

Do not depress clutch pedal during removal procedure.

4. Disconnect control cable from transaxle. Refer to [MT-15, "Removal and Installation"](#).
5. Drain gear oil from transaxle. Refer to [MT-11, "DRAINING"](#).
6. Disconnect park/neutral position switch, back-up lamp switch, and ground harness connectors.
7. Remove exhaust front tube and the drive shaft. Refer to [EX-2, "Removal and Installation"](#).
8. Remove transfer. Refer to [TF-55, "Removal and Installation"](#).
9. Remove starter motor. Refer to [SC-25, "Removal and Installation"](#).
10. Place a jack onto transaxle.

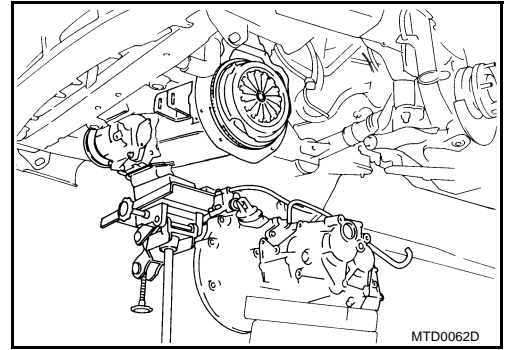
CAUTION:

When setting jack, be careful not to bring it into contact with switch.

11. Remove center member, engine insulator and engine mount bracket. Refer to [EM-78, "ENGINE ASSEMBLY"](#) (QR engine model) or [EM-208, "ENGINE ASSEMBLY"](#) (YD engine model).
12. Remove suspension members. Refer to [FSU-12, "FRONT SUSPENSION MEMBER"](#).
13. Support engine by placing a jack under oil pan.

TRANSAXLE ASSEMBLY

14. Remove bolts securing transaxle to engine.
15. Remove transaxle from vehicle.



INSTALLATION

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

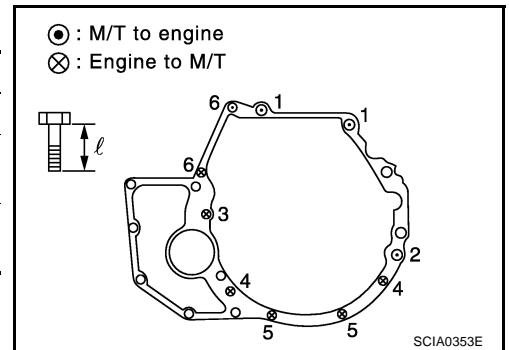
- When installing transaxle to engine, tighten bolts to the specified torque.

CAUTION:

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

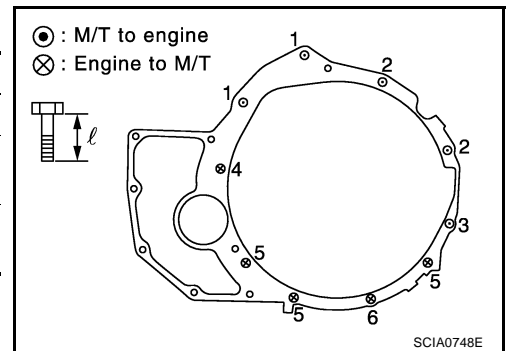
QR engine model:

Bolt No.	1	2	3	4	5	6
Quantity	2	1	1	2	2	2
" ℓ " mm (in)	40 (1.57)	75 (2.95)	45 (1.77)	40 (1.57)	30 (1.18)	40 (1.57)
Tightening torque N·m (kg - m, ft- lb)	74.5 (7.6, 55)			42.7 (4.4, 31)		35.3 (3.6, 26)



YD engine model:

Bolt No.	1	2	3	4	5	6
Quantity	2	2	1	1	3	1
" ℓ " mm (in)	55 (2.17)	50 (2.76)	120 (4.72)	45 (1.77)	40 (1.57)	35 (1.38)
Tightening torque N·m (kg - m, ft- lb)	44 (4.5, 32)			33.5 (3.4, 25)		



- After installation, check oil level, and check for leaks and loose mechanisms. Refer to [MT-11, "Checking M/T Oil"](#).

TRANSAXLE ASSEMBLY

Component Parts (RS5F51A) CASE AND HOUSING COMPONENTS

ECS008BY

A

B

MT

D

E

F

G

H

I

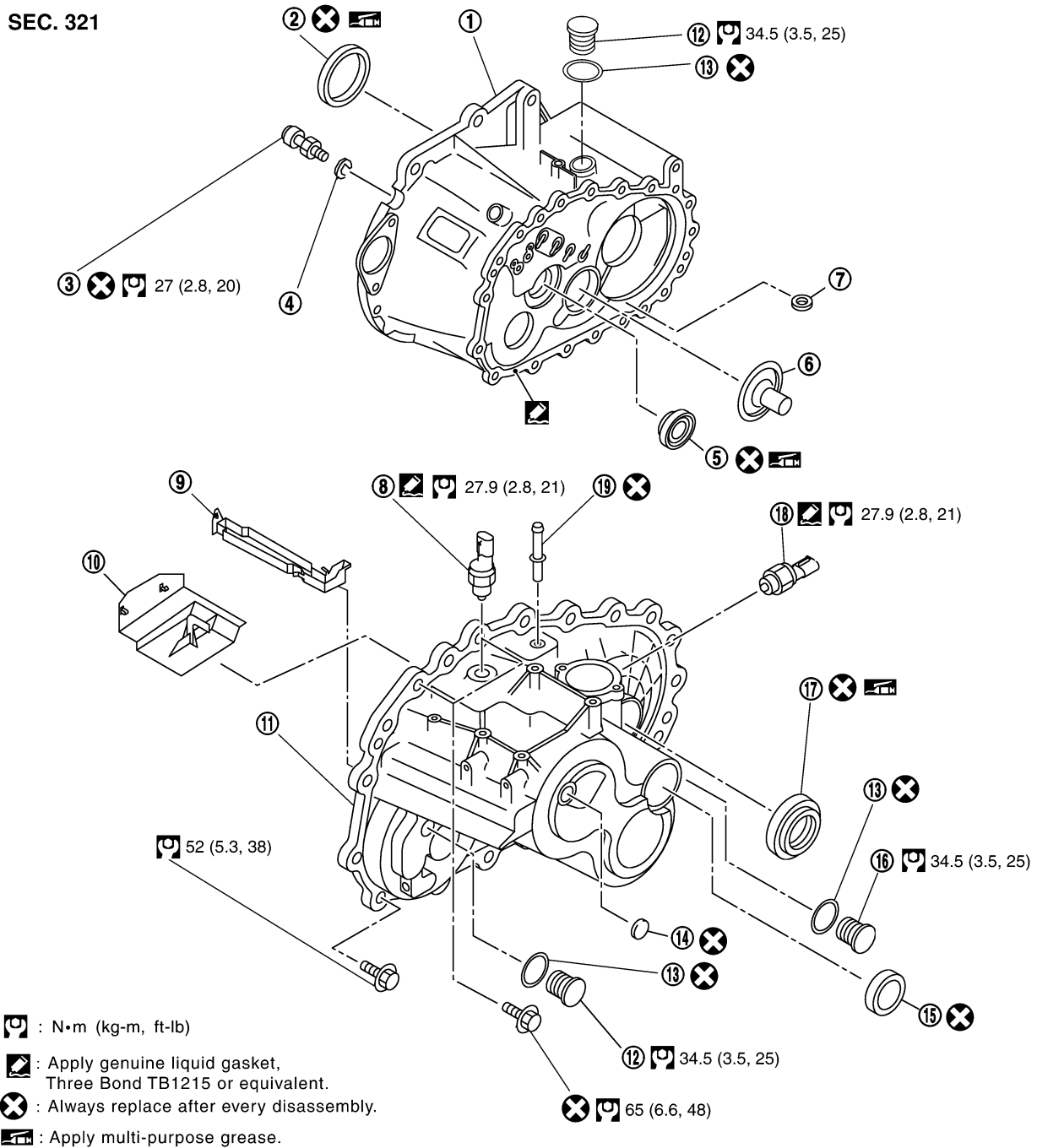
J

K

L

M

SEC. 321



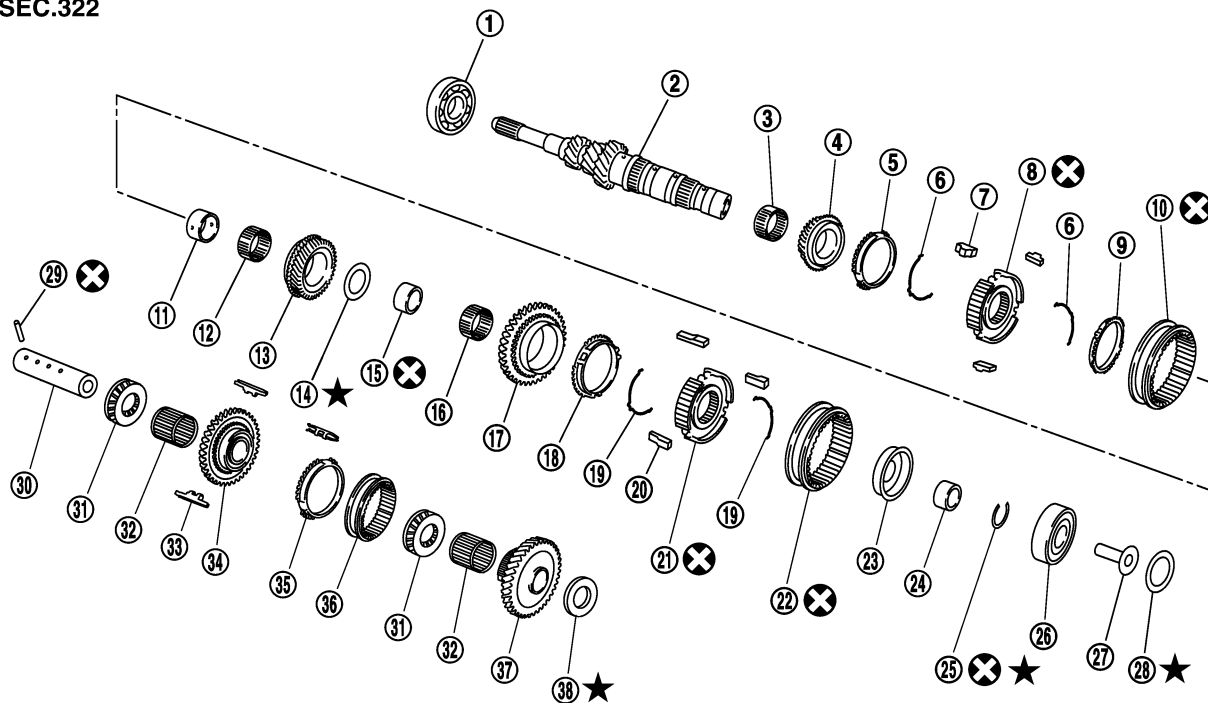
PCIB0781E

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

TRANSAXLE ASSEMBLY

GEAR COMPONENTS

SEC.322



★ : Select with proper thickness.

✕ : Always replace after every disassembly.

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

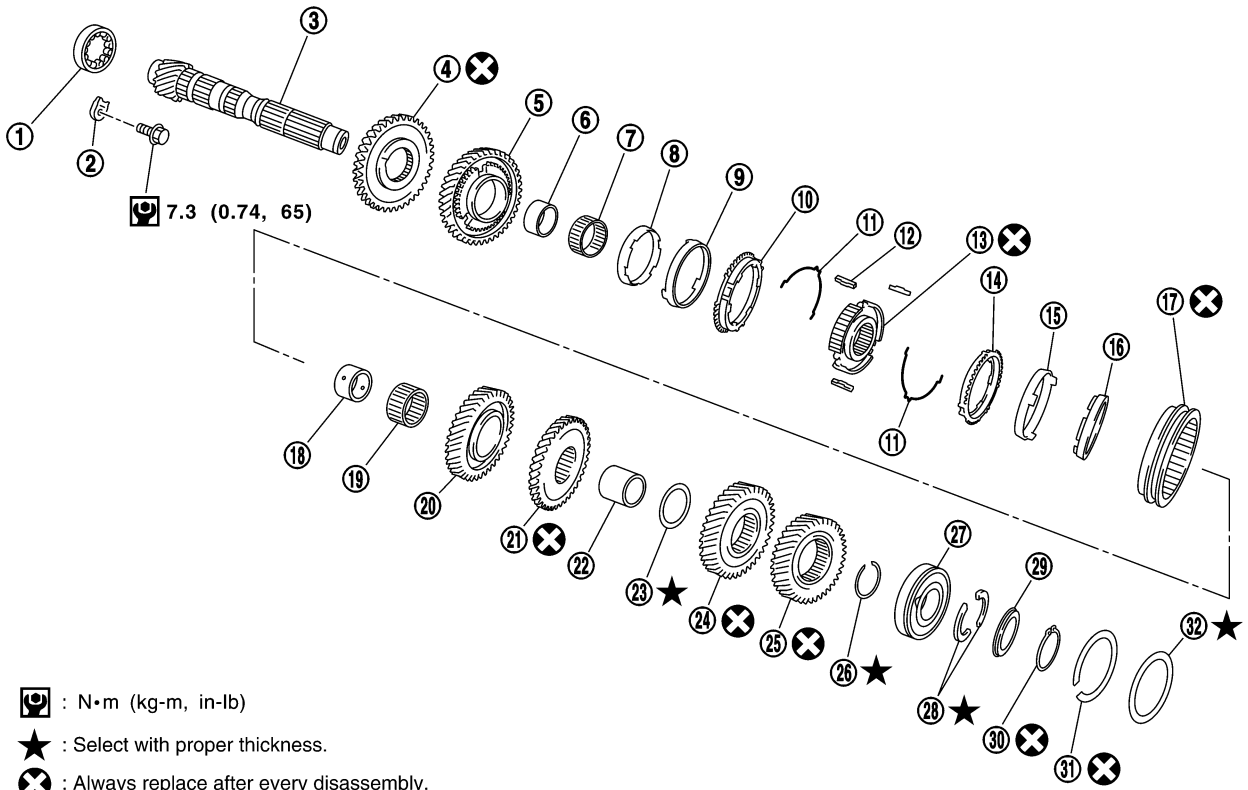
• Replace ⑧ and ⑩, ⑪ and ⑫ as a set.

PCIB0782E

- | | | |
|---|---------------------------------------|--------------------------------|
| 1. Input shaft front bearing | 2. Input shaft | 3. 3rd needle bearing |
| 4. 3rd input gear | 5. 3rd baulk ring | 6. 3rd-4th spread spring |
| 7. 3rd-4th shifting insert | 8. 3rd-4th synchronizer hub | 9. 4th baulk ring |
| 10. 3rd-4th coupling sleeve | 11. 4th input gear bushing | 12. 4th needle bearing |
| 13. 4th input gear | 14. Thrust washer | 15. 5th input gear bushing |
| 16. 5th needle bearing | 17. 5th input gear | 18. 5th baulk ring |
| 19. 5th spread spring | 20. 5th shifting insert | 21. 5th synchronizer hub |
| 22. 5th coupling sleeve | 23. 5th stopper | 24. Input shaft bearing spacer |
| 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 needle bearing | 32. Reverse idler gear needle bearing | 33. Reverse insert spring |
| 34. Reverse idler gear (Front) | 35. Reverse baulk ring | 36. Reverse coupling sleeve |
| 37. Reverse idler gear (Rear) | 38. Reverse idler gear adjusting shim | |

TRANSAXLE ASSEMBLY

SEC. 322



: N·m (kg-m, in-lb)

★ : Select with proper thickness.

✕ : Always replace after every disassembly.

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

• Replace (13) and (17) as a set.

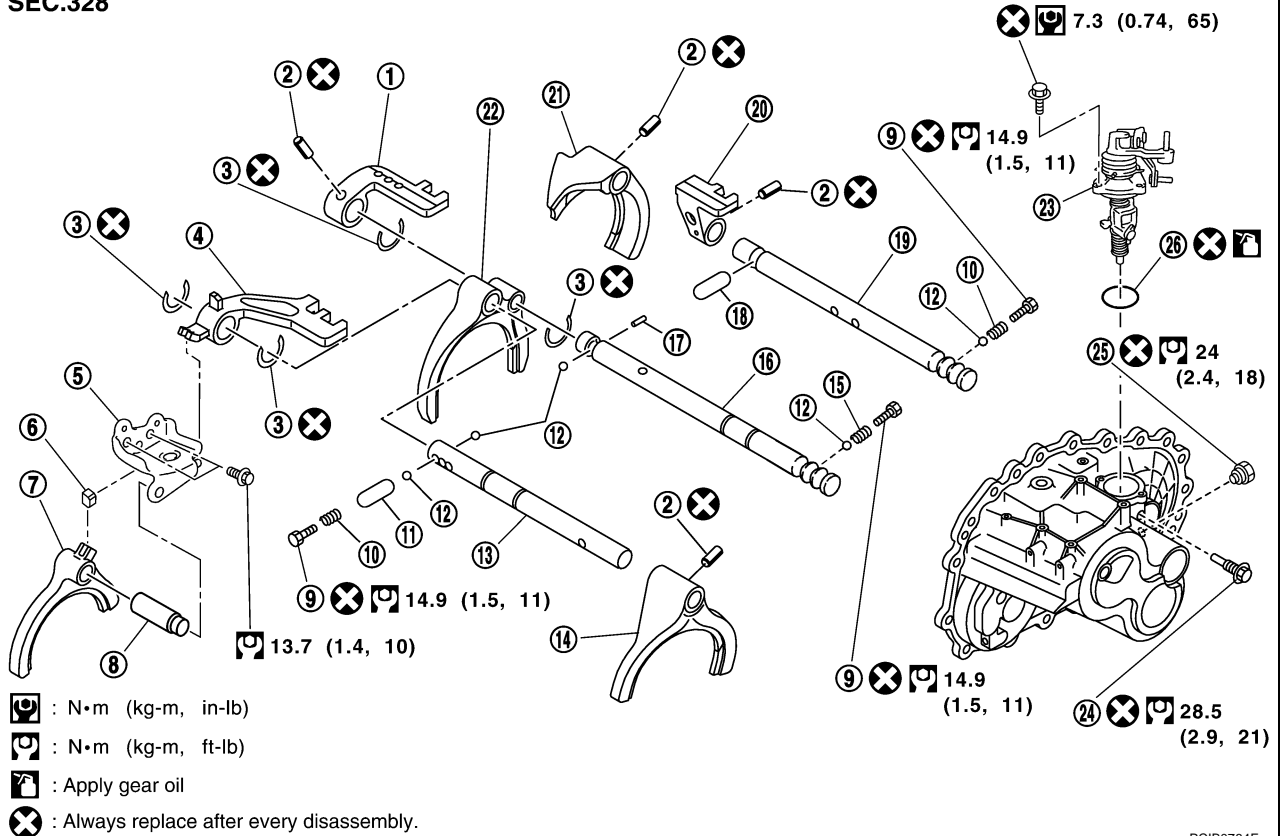
PCIB0783E

- | | | |
|------------------------------|---|--------------------------------|
| 1. Mainshaft front bearing | 2. Mainshaft bearing retainer | 3. Mainshaft |
| 4. Reverse main gear | 5. 1st main gear | 6. 1st main gear bushing |
| 7. 1st needle bearing | 8. 1st inner baulk ring | 9. 1st gear synchronizer cone |
| 10. 1st outer baulk ring | 11. 1st-2nd 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. 2nd main gear bushing |
| 19. 2nd needle bearing | 20. 2nd main gear | 21. 3rd main gear |
| 22. 3rd-4th mainshaft spacer | 23. 4th main gear 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 | |

TRANSAXLE ASSEMBLY

SHIFT CONTROL COMPONENTS

SEC.328

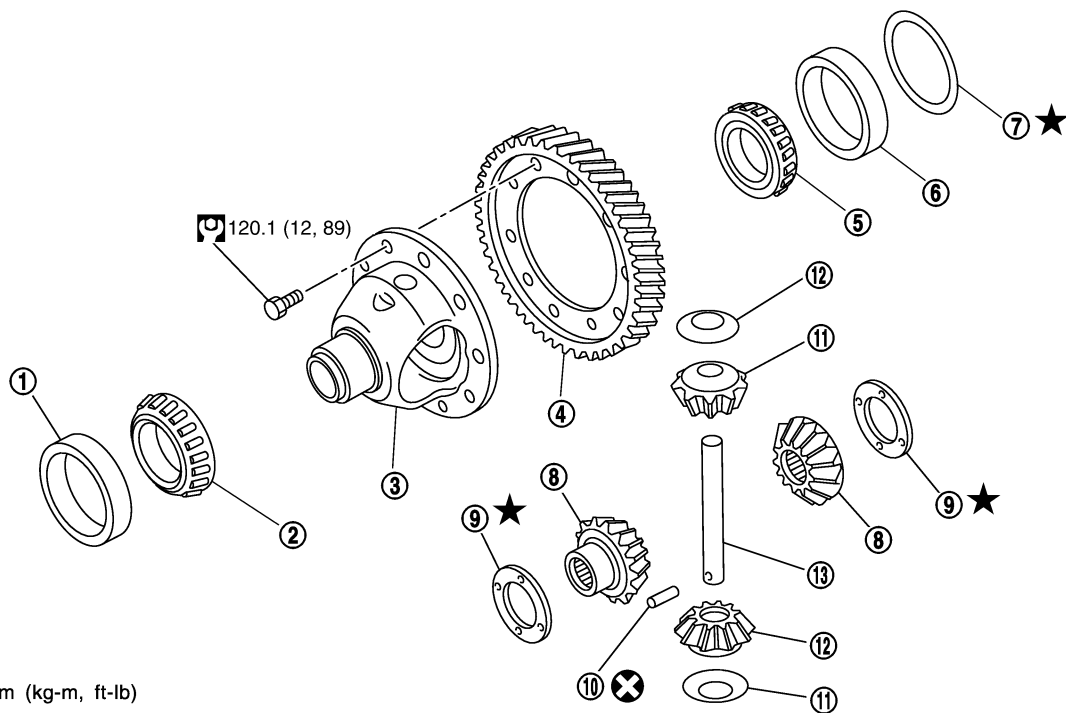


- | | | |
|--------------------------|---------------------------|------------------------|
| 1. 3rd-4th bracket | 2. Retaining pin | 3. Stopper ring |
| 4. 5th-reverse bracket | 5. Reverse lever assembly | 6. Shifter cap |
| 7. Reverse shift fork | 8. Reverse fork rod | 9. Check plug |
| 10. Check spring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

TRANSAXLE ASSEMBLY

FINAL DRIVE COMPONENTS

SEC. 381



PCIB0785E

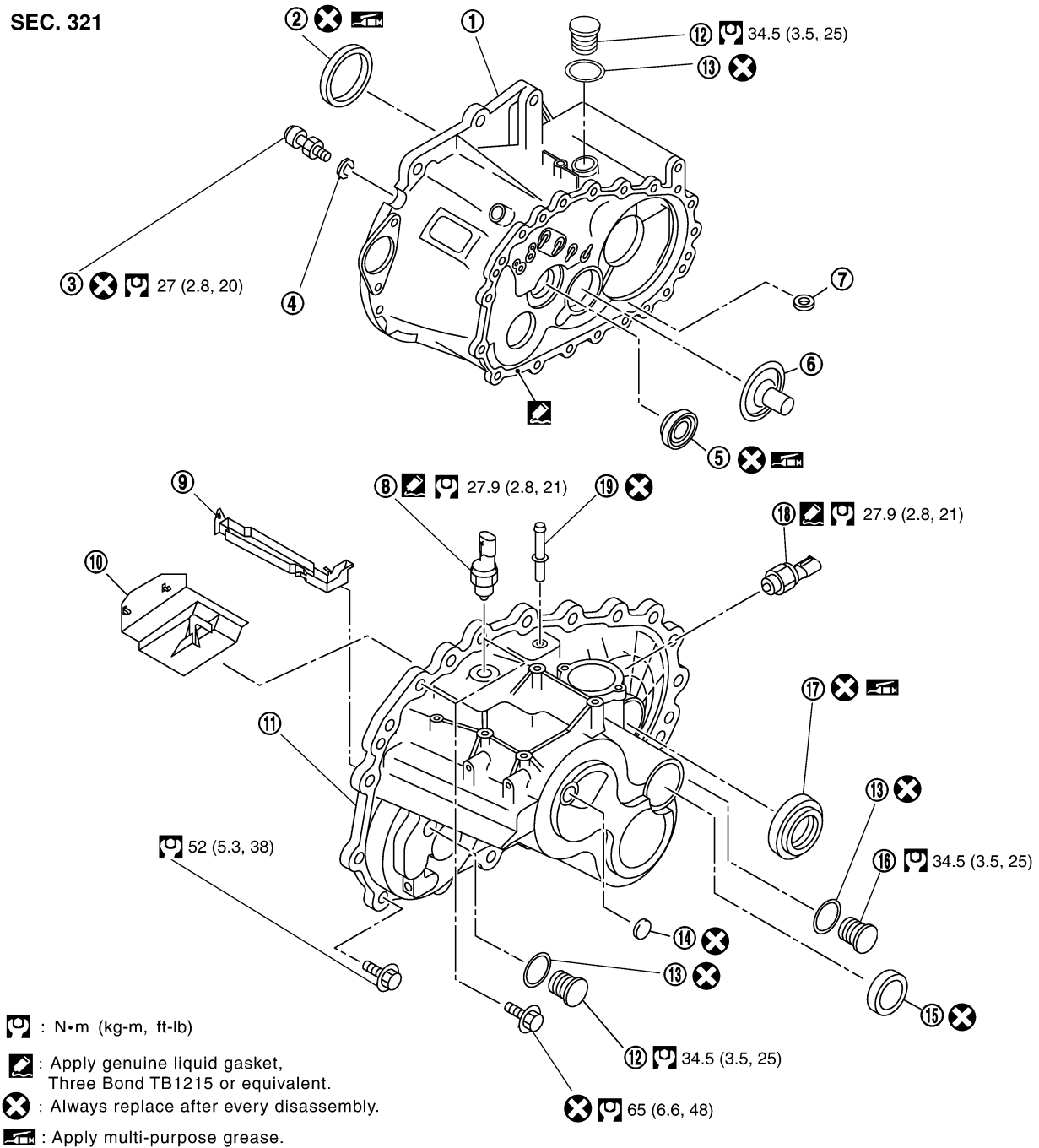
- | | | |
|---|--|---|
| 1. Differential side bearing outer race | 2. Differential side bearing (clutch housing side) | 3. Differential case |
| 4. Final gear | 5. Differential side bearing (transaxle case side) | 6. Differential side bearing outer race |
| 7. Differential side bearing adjusting shim | 8. Side gear | 9. Side gear thrust washer |
| 10. Retaining pin | 11. Pinion mate thrust washer | 12. Pinion mate gear |
| 13. Pinion mate shaft | | |

TRANSAXLE ASSEMBLY

Component Parts (RS6F51A) CASE AND HOUSING COMPONENTS

ECS008BZ

SEC. 321



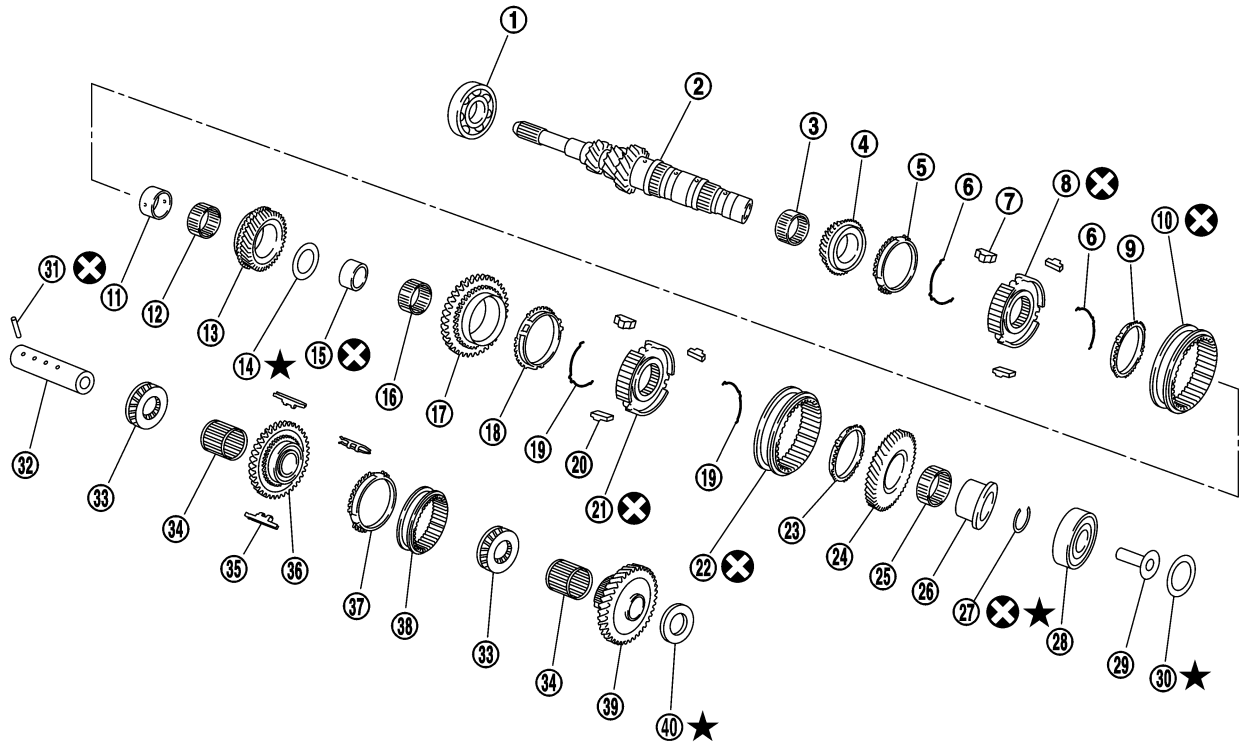
PCIB0781E

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

TRANSAXLE ASSEMBLY

GEAR COMPONENTS

SEC. 322



★ : Select with proper thickness.

✗ : Always replace after every disassembly.

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

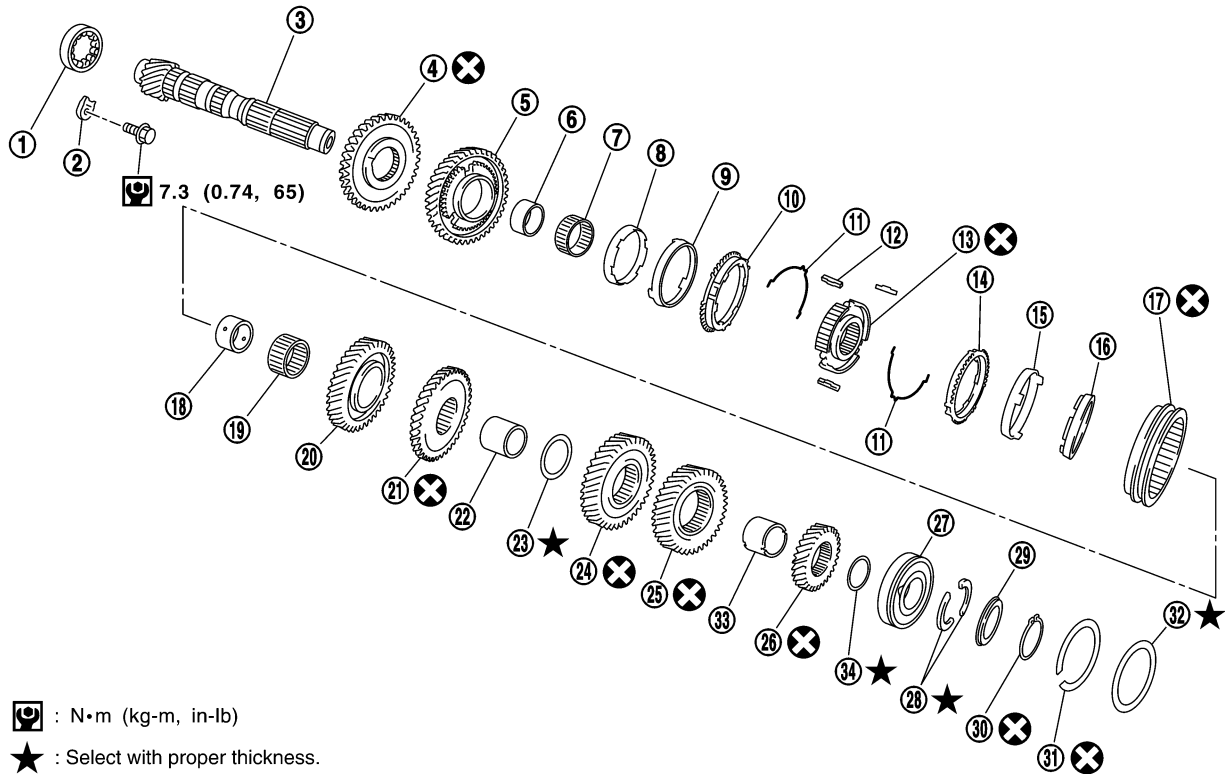
- Replace (8) and (10), (21) and (22) as a set.

PCIB0786E

- | | | |
|---------------------------------------|-----------------------------|---|
| 1. Input shaft front bearing | 2. Input shaft | 3. 3rd needle bearing |
| 4. 3rd input gear | 5. 3rd baulk ring | 6. 3rd-4th spread spring |
| 7. 3rd-4th shifting insert | 8. 3rd-4th synchronizer hub | 9. 4th baulk ring |
| 10. 3rd-4th coupling sleeve | 11. 4th input gear bushing | 12. 4th needle bearing |
| 13. 4th input gear | 14. Thrust washer | 15. 5th input gear bushing |
| 16. 5th needle bearing | 17. 5th input gear | 18. 5th baulk ring |
| 19. 5th-6th spread spring | 20. 5th-6th shifting insert | 21. 5th-6th synchronizer hub |
| 22. 5th-6th coupling sleeve | 23. 6th baulk ring | 24. 6th input gear |
| 25. 6th needle bearing | 26. 6th input gear bushing | 27. Snap ring |
| 28. Input shaft rear bearing | 29. Oil channel | 30. Input shaft rear bearing adjusting shim |
| 31. Retaining pin | 32. Reverse idler shaft | 33. Thrust needle bearing |
| 34. Reverse idler gear needle bearing | 35. Reverse insert spring | 36. Reverse idler gear (Front) |
| 37. Reverse baulk ring | 38. Reverse coupling sleeve | 39. Reverse idler gear (Rear) |
| 40. Reverse idler gear adjusting shim | | |

TRANSAXLE ASSEMBLY

SEC. 322



: N·m (kg-m, in-lb)

★ : Select with proper thickness.

⊗ : Always replace after every disassembly.

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

• Replace (13) and (17) as a set.

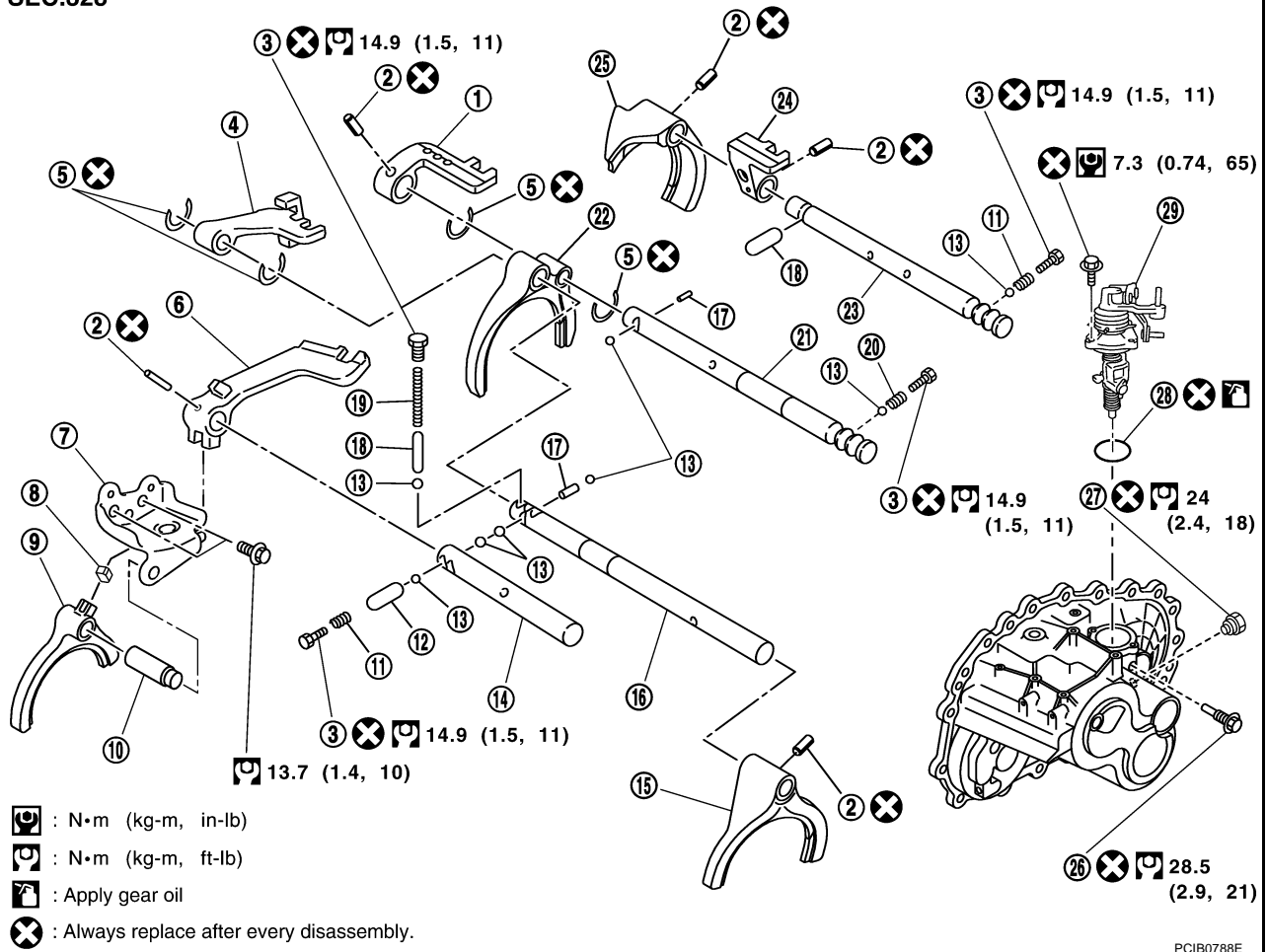
PCIB0787E

- | | | |
|------------------------------|---|--------------------------------|
| 1. Mainshaft front bearing | 2. Mainshaft bearing retainer | 3. Mainshaft |
| 4. Reverse main gear | 5. 1st main gear | 6. 1st main gear bushing |
| 7. 1st needle bearing | 8. 1st inner baulk ring | 9. 1st gear synchronizer cone |
| 10. 1st outer baulk ring | 11. 1st-2nd 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. 2nd main gear bushing |
| 19. 2nd 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 | | |

TRANSAXLE ASSEMBLY

SHIFT CONTROL COMPONENTS

SEC.328



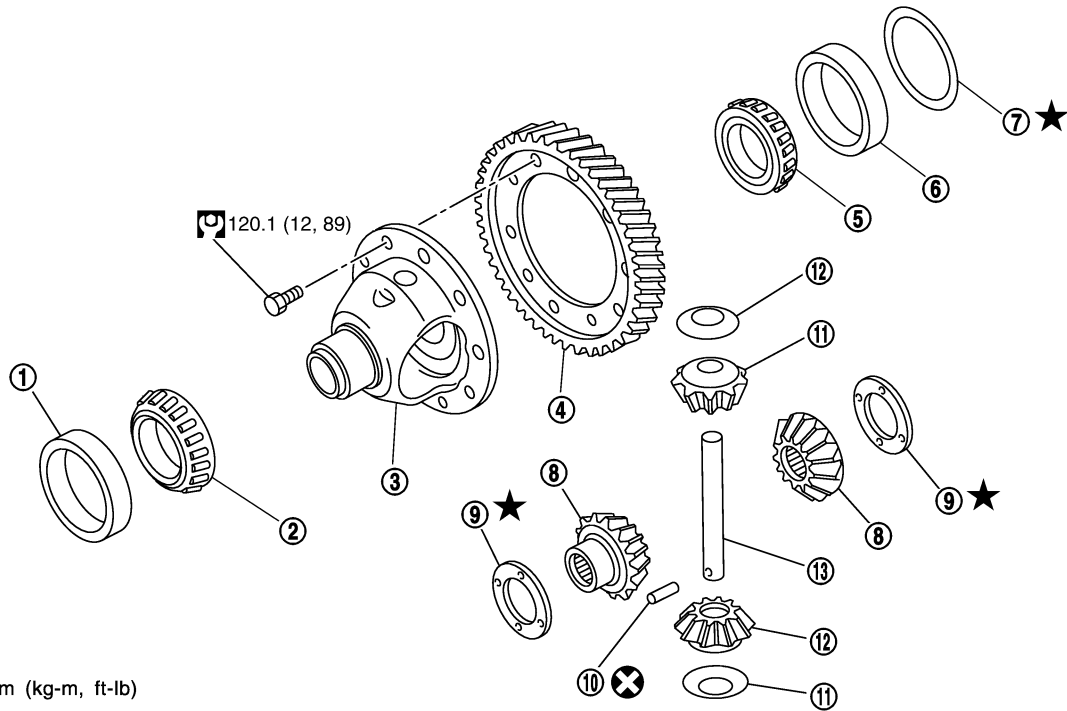
- | | | |
|---------------------------|------------------------------|------------------------------|
| 1. 3rd-4th bracket | 2. Retaining pin | 3. Check plug |
| 4. 5th-6th bracket | 5. Stopper ring | 6. Reverse bracket |
| 7. Reverse lever assembly | 8. Shifter cap | 9. Reverse shift fork |
| 10. Reverse fork rod | 11. Check spring | 12. Shift check sleeve |
| 13. Check ball | 14. Reverse bracket fork rod | 15. 5th-6th shift fork |
| 16. 5th-6th fork rod | 17. Interlock pin | 18. Shift check sleeve |
| 19. Check spring | 20. Check spring | 21. 3rd-4th fork rod |
| 22. 3rd-4th shift fork | 23. 1st-2nd fork rod | 24. 1st-2nd fork rod bracket |
| 25. 1st-2nd shift fork | 26. Stopper bolt | 27. Shift check |
| 28. O-ring | 29. Control assembly | |

PCIB0788E

TRANSAXLE ASSEMBLY

FINAL DRIVE COMPONENTS

SEC. 381



: N•m (kg-m, ft-lb)

★ : Select with proper thickness.

✕ : Always replace after every disassembly.

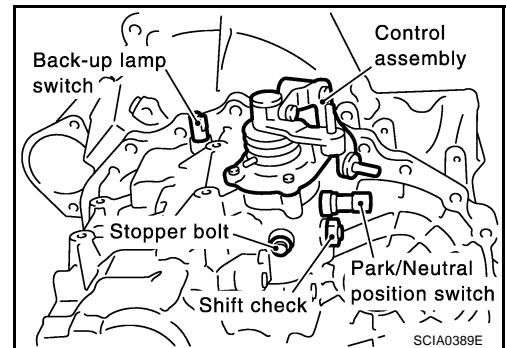
PCIB0785E

- | | | |
|---|--|---|
| 1. Differential side bearing outer race | 2. Differential side bearing (clutch housing side) | 3. Differential case |
| 4. Final gear | 5. Differential side bearing (transaxle case side) | 6. Differential side bearing outer race |
| 7. Differential side bearing adjusting shim | 8. Side gear | 9. Side gear thrust washer |
| 10. Retaining pin | 11. Pinion mate thrust washer | 12. Pinion mate gear |
| 13. Pinion mate shaft | | |

Disassembly and Assembly (RS5F51A)

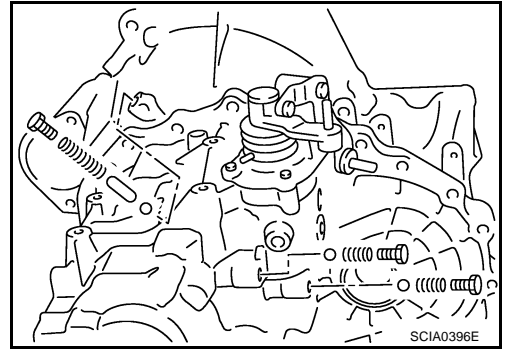
DISASSEMBLY

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



TRANSAXLE ASSEMBLY

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

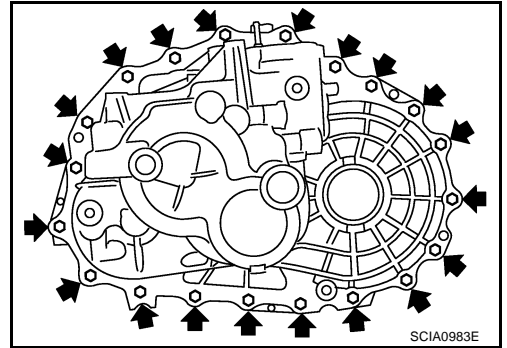


5. Remove transaxle case mounting bolts.
6. Remove bore plug from transaxle case.

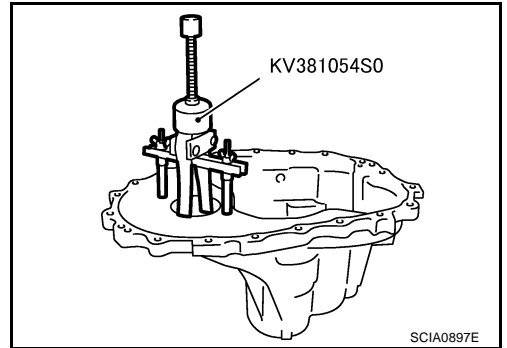
CAUTION:

Be careful not to damage transaxle case.

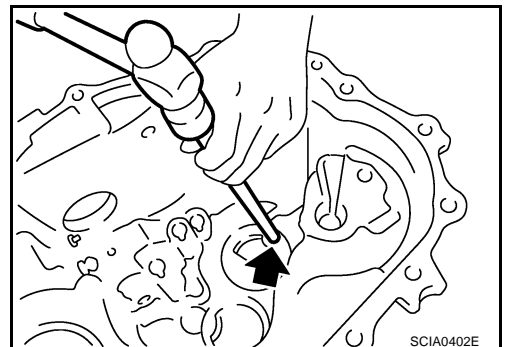
7. While spreading the snap ring of mainshaft rear bearing located at bore plug hole, remove transaxle case from clutch housing.
8. Remove oil gutter, baffle plate from transaxle case.
9. Remove snap ring, mainshaft rear bearing adjusting shim and input shaft rear bearing adjusting shim from transaxle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



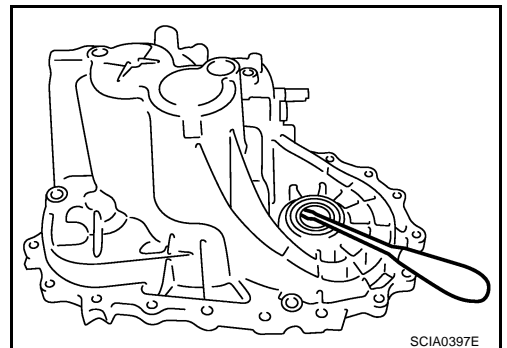
10. Remove differential side bearing outer race (transaxle case side) from transaxle case using the puller, and then remove differential side bearing adjusting shim from transaxle case.



11. Remove welch plug from transaxle case.



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



A

B

MT

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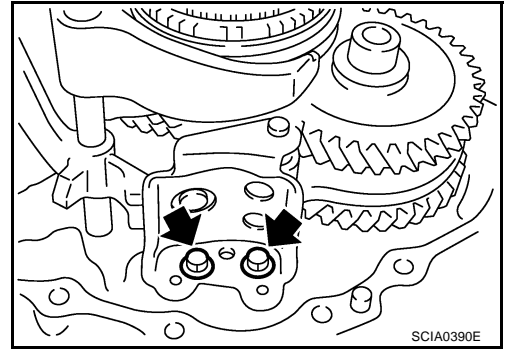
TRANSAXLE ASSEMBLY

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

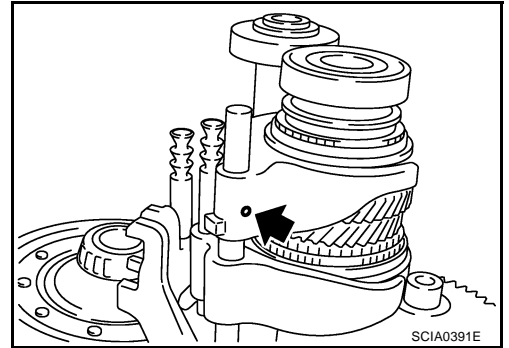
CAUTION:

Be careful not to lose shifter cap.

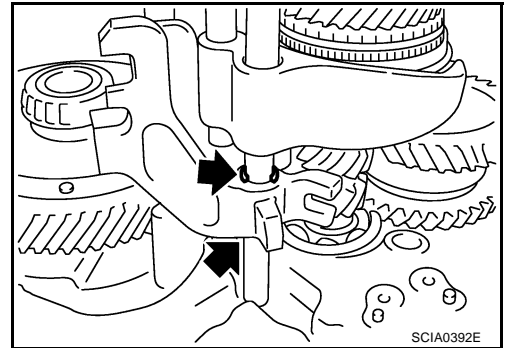
15. Pull out reverse fork rod then remove reverse shift fork.



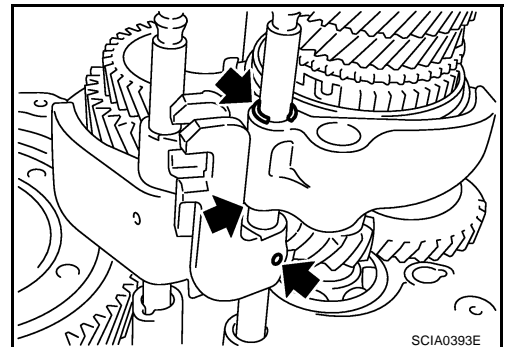
16. Shift 3rd-4th fork rod to 3rd position. Remove retaining pin of 5th shift fork using a pin punch.



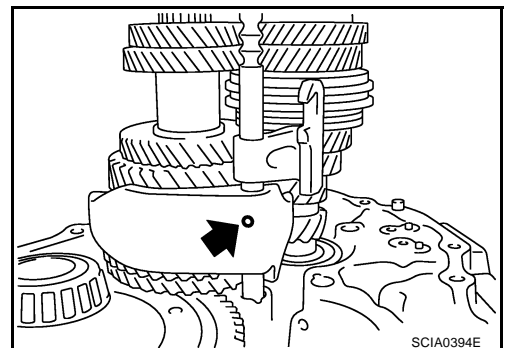
17. Remove stopper rings for 5th-reverse bracket.
18. Pull out 5th-reverse fork rod and remove 5th shift fork and 5th-reverse bracket.
19. Remove check balls (2 pieces) from clutch housing.



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



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



TRANSAXLE ASSEMBLY

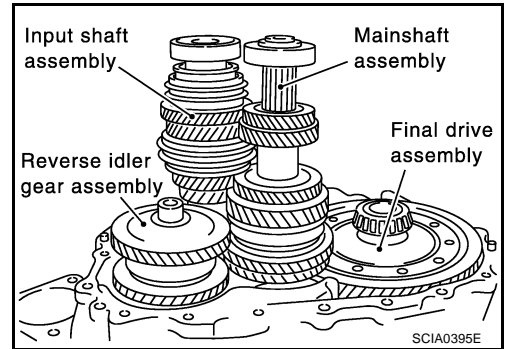
28. Remove gear components from clutch housing in the following procedure.

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

CAUTION:

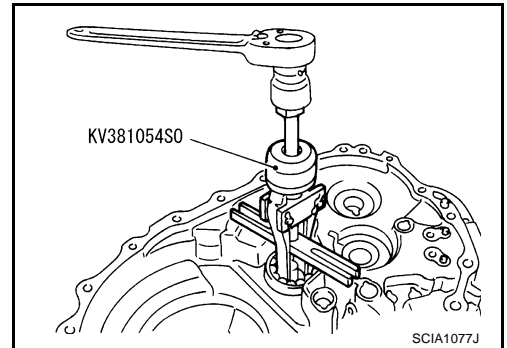
Always withdraw mainshaft straight out. Failure to do so can damage resin oil channel on clutch housing side.

- b. Remove final drive assembly.



29. Remove mainshaft bearing retainer and then mainshaft front bearing from clutch housing using the puller.

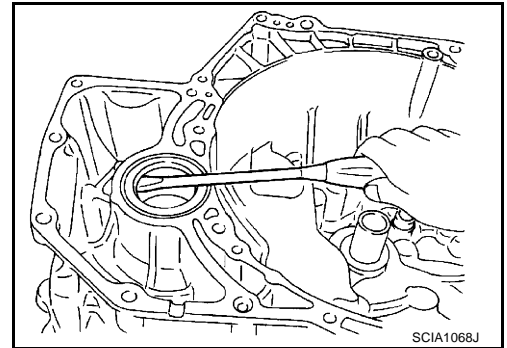
30. Remove oil channel from clutch housing.



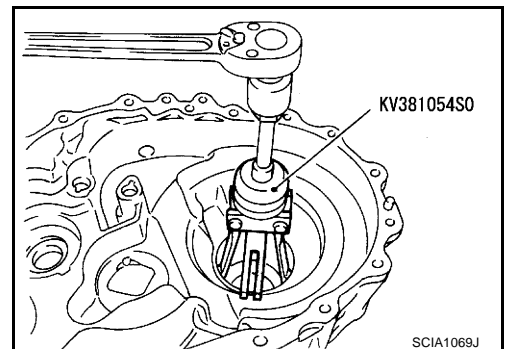
31. Remove differential oil seal (clutch housing side) from clutch housing.

CAUTION:

Be careful not to damage clutch housing.



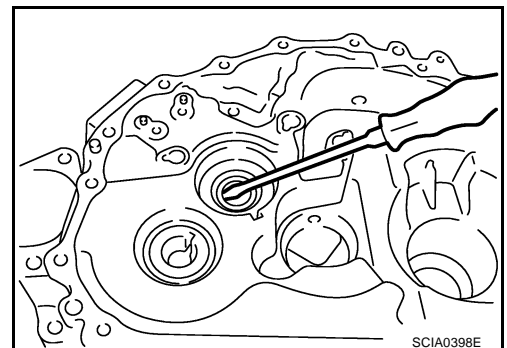
32. Remove differential side bearing outer race (clutch housing side) from clutch housing using the puller.



33. Remove input shaft oil seal from clutch housing.

CAUTION:

Be careful not to damage clutch housing.



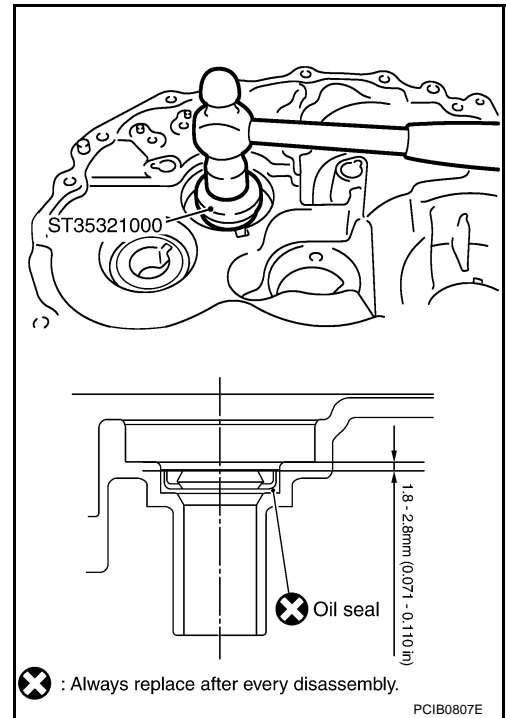
TRANSAXLE ASSEMBLY

ASSEMBLY

1. Apply multi-purpose grease to input shaft oil seal lip. Install a new input shaft oil seal 1.8-2.8mm (0.071-0.110 in) above from clutch housing edge surface using the drift.

CAUTION:

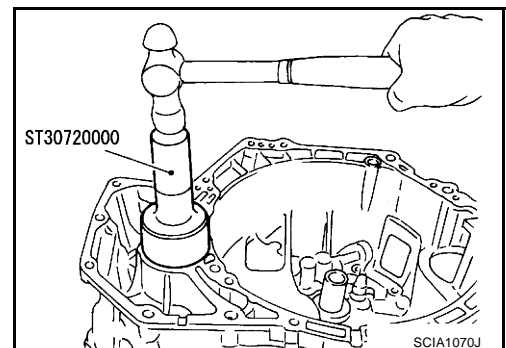
Do not reuse oil seals.



2. Apply multi-purpose grease to differential oil seal lip, and then install a new oil seal to clutch housing using the drift.

CAUTION:

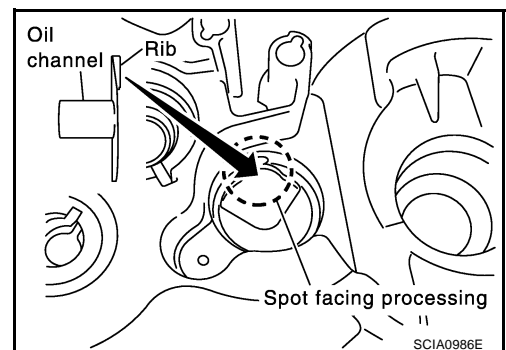
Do not reuse oil seals.



3. Install oil channel on mainshaft side.

CAUTION:

Be careful with the orientation of installation.

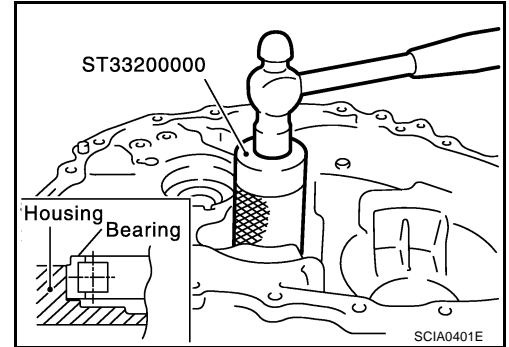


TRANSAXLE ASSEMBLY

4. Install mainshaft front bearing to clutch housing using the drift.

CAUTION:

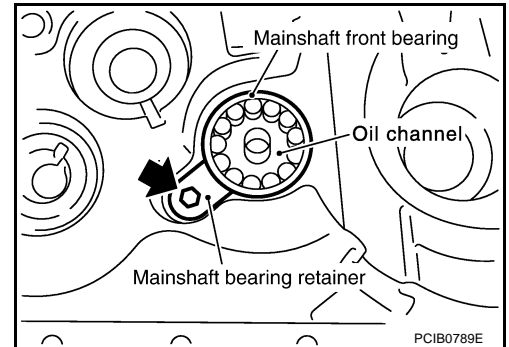
Be careful with the orientation of installation.



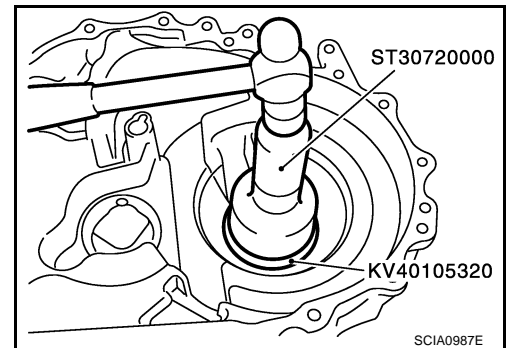
5. Install mainshaft bearing retainer to clutch housing and tighten mounting bolt to the specified torque. Refer to [MT-20, "GEAR COMPONENTS"](#).

CAUTION:

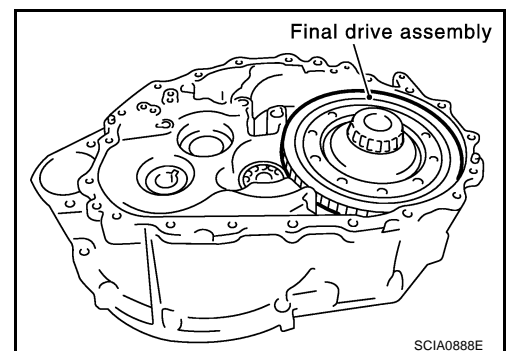
Install with punched surface facing up.



6. Install differential side bearing outer race to clutch housing using the drifts.



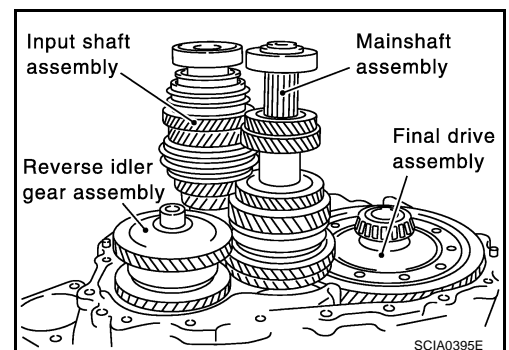
7. Install final drive assembly into clutch housing.



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.

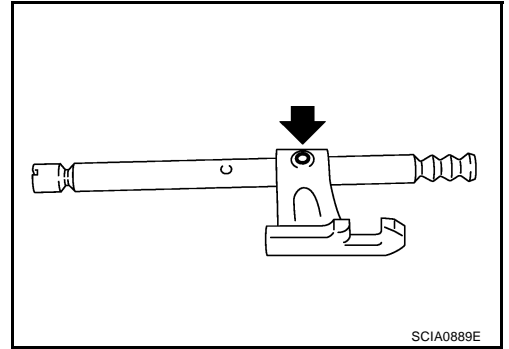


TRANSAXLE ASSEMBLY

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

CAUTION:

Do not reuse retaining pins.

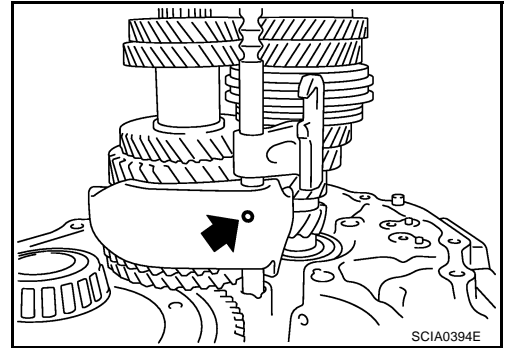


10. Install 1st-2nd fork rod and 1st-2nd shift fork, and then install a new retaining pin to 1st-2nd shift fork.

CAUTION:

Do not reuse retaining pins.

11. Install shift check sleeve to clutch housing.



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

CAUTION:

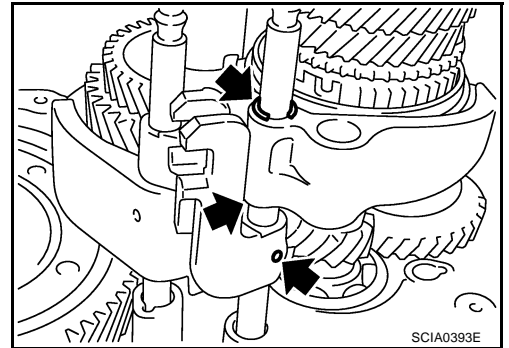
Do not reuse stopper ring.

15. Install a new retaining pin onto 3rd-4th bracket.

CAUTION:

Do not reuse retaining pins.

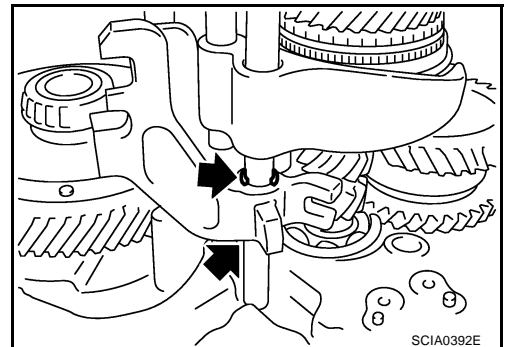
16. Install 2 check balls to clutch housing.



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

CAUTION:

Do not reuse stopper ring.



19. Install a new retaining pin onto 5th shift fork.

CAUTION:

Do not reuse retaining pins.

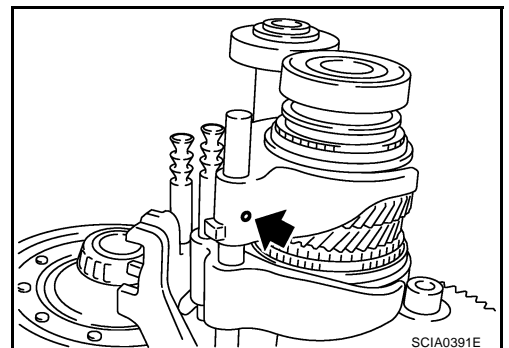
20. Install reverse shift fork and reverse fork rod.

21. Install reverse lever assembly following the procedures below.

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

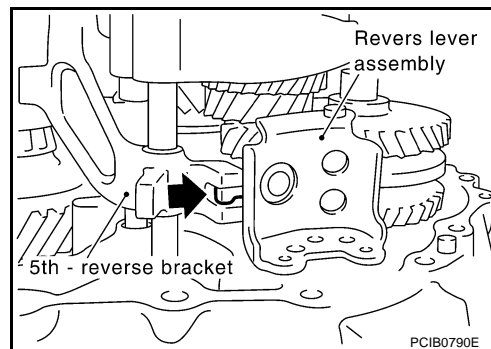
CAUTION:

Do not drop shifter cap.



TRANSAXLE ASSEMBLY

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



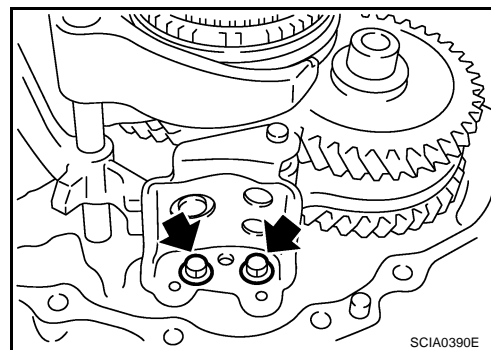
- c. Install reverse lever assembly to clutch housing, and then tighten mounting bolts to the specified torque. Refer to [MT-22, "SHIFT CONTROL COMPONENTS"](#).

22. Install check ball, shift check sleeve, check spring and a new check plug to clutch housing.

CAUTION:

- Do not reuse check plug.
- Do not drop check ball.

23. Install the magnet onto clutch housing.



24. Apply multi-purpose grease to differential oil seal lip, and then install a new differential oil seal to transaxle case using the drift.

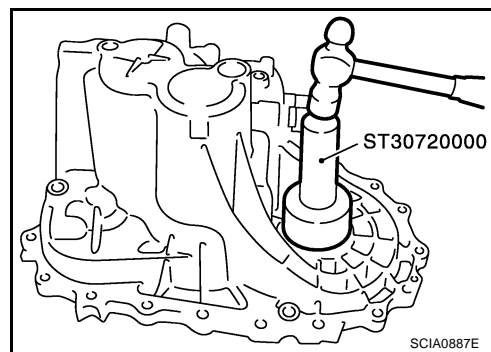
CAUTION:

Do not reuse differential oil seals.

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

- For selection of adjusting shims, refer to [MT-47, "INPUT SHAFT END PLAY"](#).

26. Install selected differential side bearing adjusting shim and differential side bearing. For selection adjusting shim, refer to [MT-48, "DIFFERENTIAL SIDE BEARING PRELOAD"](#).



27. Install baffle plate and oil gutter to transaxle case.

28. Install transaxle case following the procedures below.

- a. Install selected mainshaft rear bearing adjusting shim into transaxle case.

- For selection of adjusting shims, refer to [MT-48, "MAINSHAFT END PLAY"](#).

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

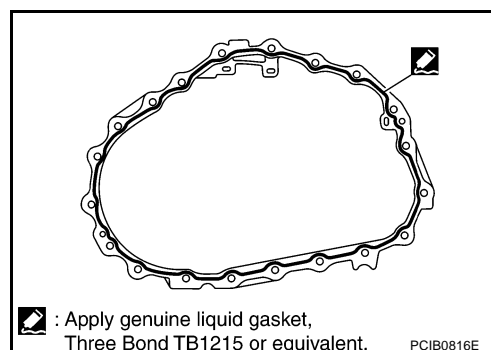
CAUTION:

Do not reuse snap ring.

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

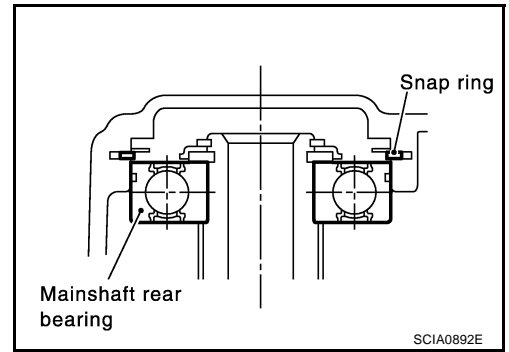
CAUTION:

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

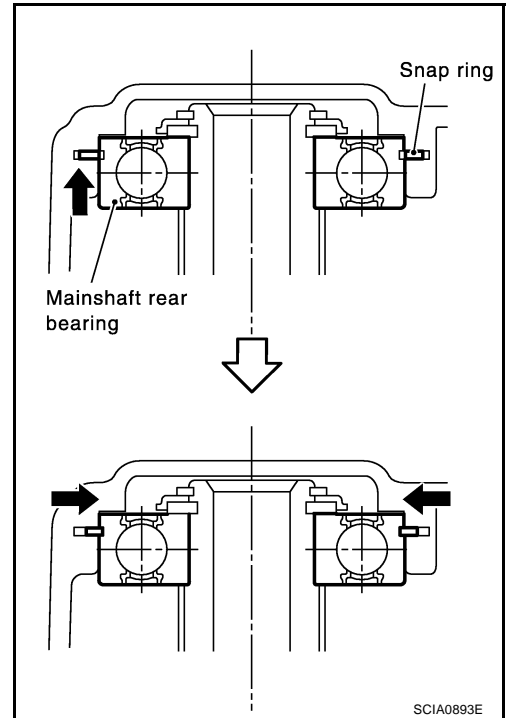


TRANSAXLE ASSEMBLY

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



- e. Through bore plug mounting hole, with snap ring stretched, and lift up mainshaft assembly from the control assembly mounting hole.
- f. Securely install snap ring onto mainshaft rear bearing.



- g. Tighten mounting bolts to the specified torque.

Bolt A:

: 52 N·m (5.3 kg-m, 38 ft-lb)

Bolt B:

: 65 N·m (6.6 kg-m, 48 ft-lb)

CAUTION:

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

- h. Install control assembly to transaxle case.

CAUTION:

Do not reuse O-ring.

- i. Install a new shift check to transaxle case, and then tighten shift check to the specified torque. Refer to [MT-22, "SHIFT CONTROL COMPONENTS"](#).

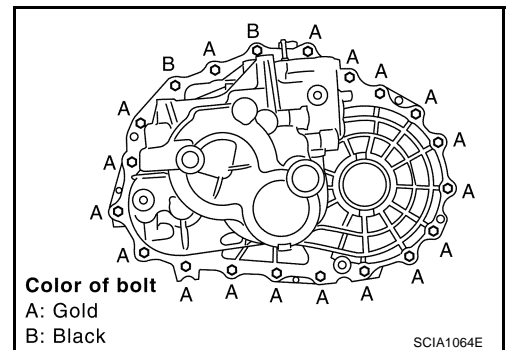
CAUTION:

Do not reuse shift check.

- j. Install a new stopper bolt to transaxle case, and then tighten stopper bolt to the specified torque. Refer to [MT-22, "SHIFT CONTROL COMPONENTS"](#).

CAUTION:

Do not reuse stopper bolt.

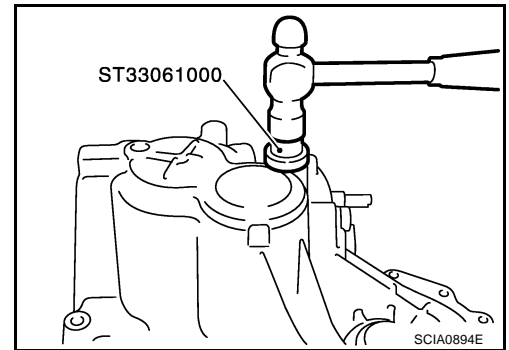


TRANSAXLE ASSEMBLY

29. Install a new bore plug to transaxle case using the drift.

CAUTION:

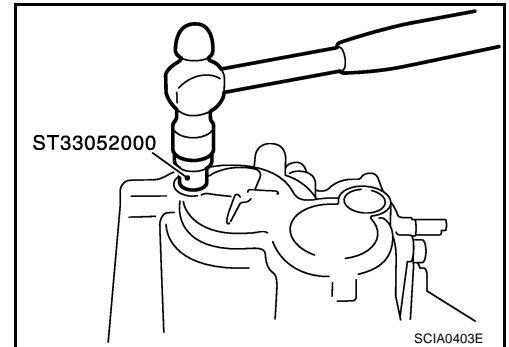
Do not reuse bore plug.



30. Install a new welch plug to transaxle case using the drift.

CAUTION:

Do not reuse welch plug.



31. Install 2 check balls, 2 check springs and 2 new check plugs to transaxle case, and then tighten check plug to the specified torque. Refer to [MT-22, "SHIFT CONTROL COMPONENTS"](#).

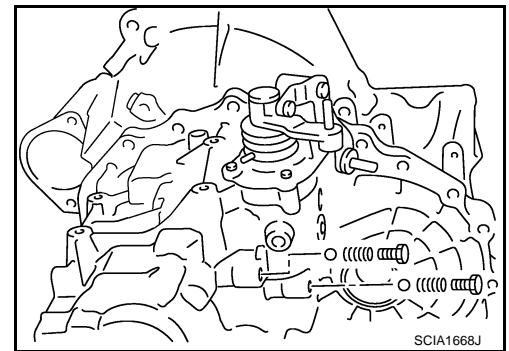
CAUTION:

Do not reuse check plug.

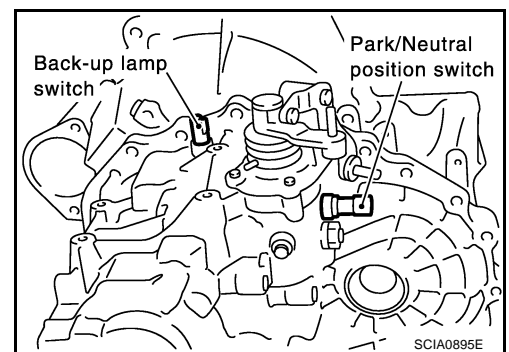
32. Install new O-ring applied gear oil on control assembly. And then install control assembly on transaxle case. After the previous service tighten bolts to the specified torque. Refer to [MT-22, "SHIFT CONTROL COMPONENTS"](#).

CAUTION:

Do not reuse O-ring.



33. Apply genuine liquid gasket or equivalent to threads of park/neutral position switch and back-up lamp switch. Then install them into transaxle case. Tighten park/neutral position switch and back-up lamp switch to the specified torque. Refer to [MT-19, "CASE AND HOUSING COMPONENTS"](#).



34. Install new gaskets onto drain plug and filler plug, and then install them into transaxle case. Tighten park/neutral position switch and back-up lamp switch to the specified torque. Refer to [MT-19, "CASE AND HOUSING COMPONENTS"](#).

CAUTION:

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

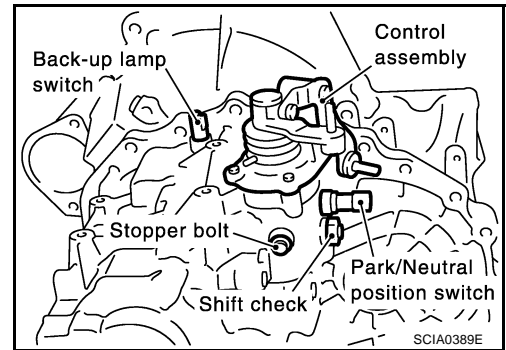
Disassembly and Assembly (RS6F51A) DISASSEMBLY

ECS008C1

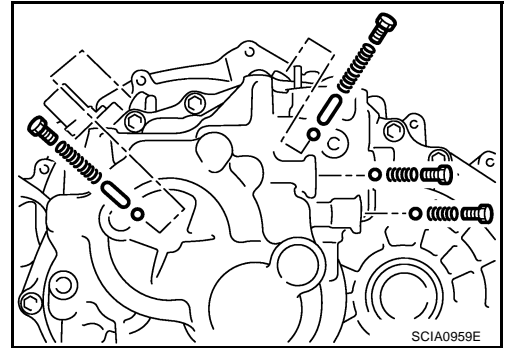
1. Remove drain plug and filler plug from transaxle case.

TRANSAXLE ASSEMBLY

2. Remove park/neutral position switch and back-up lamp switch from transaxle case.
3. Remove shift check and stopper bolt from transaxle case, and then remove control assembly from transaxle case.



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

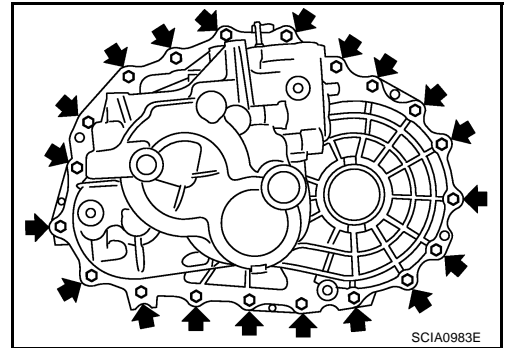


5. Remove transaxle case mounting bolts.
6. Remove bore plug from transaxle case.

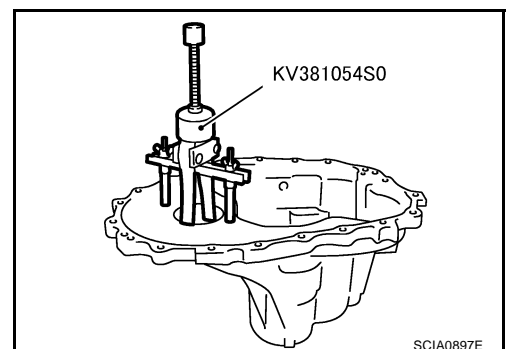
CAUTION:

Be careful not to damage transaxle case.

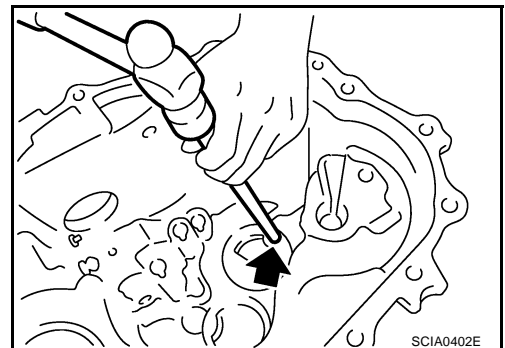
7. While spreading the snap ring of mainshaft rear bearing located at bore plug hole, remove transaxle case from clutch housing.
8. Remove oil gutter, baffle plate from transaxle case.
9. Remove snap ring, mainshaft rear bearing adjusting shim and input shaft rear bearing adjusting shim from transaxle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



10. Remove differential side bearing outer race (transaxle case side) from transaxle case using the puller, and then remove differential side bearing adjusting shim from transaxle case.

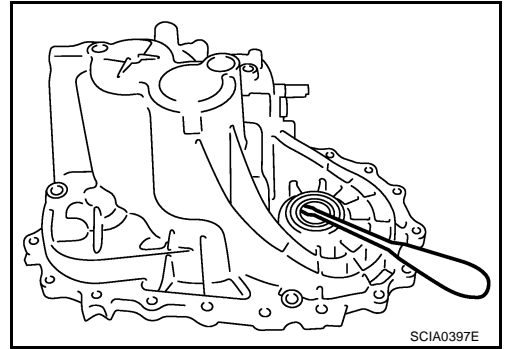


11. Remove welch plug from transaxle case.



TRANSAXLE ASSEMBLY

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

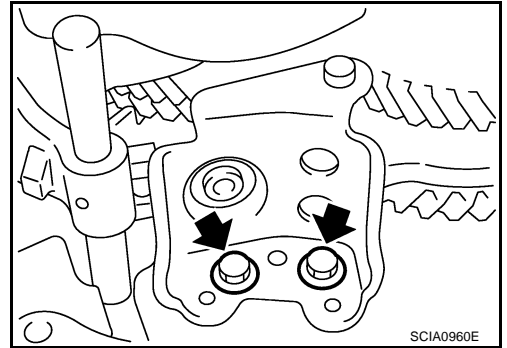


14. With shift lever in 5th position, remove mounting bolts from reverse lever assembly. Lift reverse lever assembly to remove.

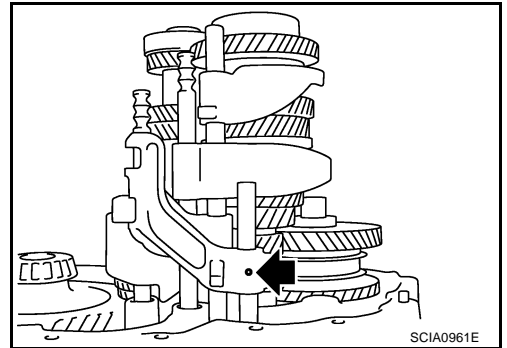
CAUTION:

Be careful not to lose shifter cap.

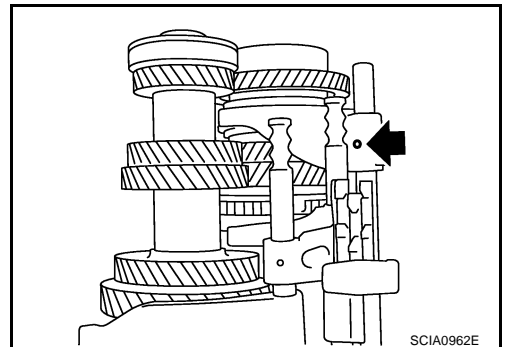
15. Pull out reverse fork rod then remove reverse shift fork.



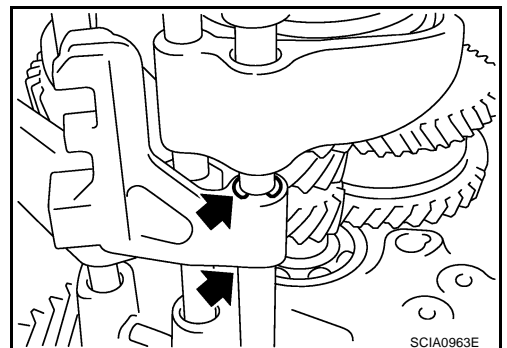
16. Remove retaining pin of reverse bracket using a pin punch.
17. Pull out reverse bracket and reverse bracket fork rod.
18. Remove check ball (2 pieces) and interlock pin from clutch housing.



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

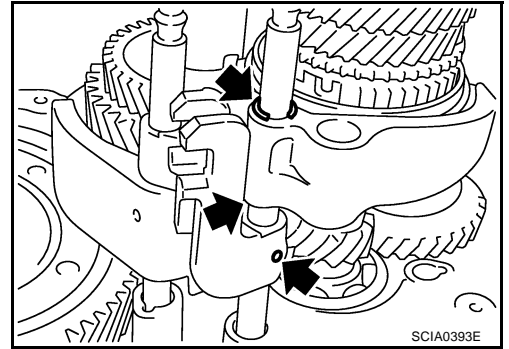


20. Remove stopper rings for 5th-6th bracket.
21. Pull out 5th-6th fork rod and remove 5th-6th shift fork and 5th-6th bracket.
22. Remove check balls (2 pieces) and interlock pin.

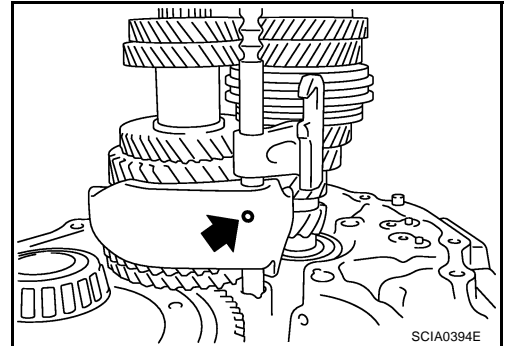


TRANSAXLE ASSEMBLY

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



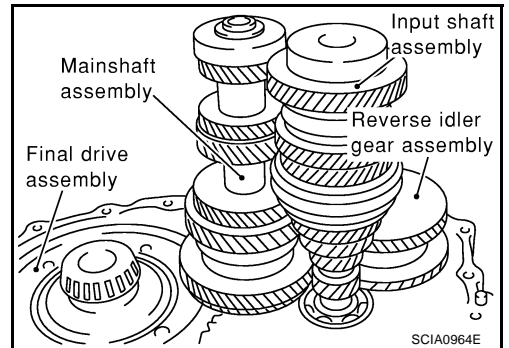
27. Remove retaining pin of 1st-2nd shift fork using a pin punch.
28. Pull out 1st-2nd fork rod with 1st-2nd bracket.
29. Remove 1st-2nd shift fork.
30. Remove retaining pin of 1st-2nd bracket using a pin punch and separate fork rod and 1st-2nd bracket.



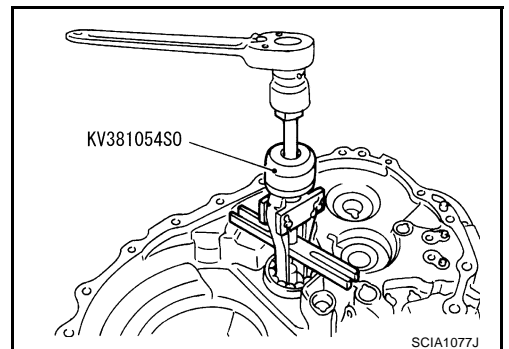
31. Remove gear components from clutch housing in the following procedure.
 - a. Remove input shaft assembly, mainshaft assembly and reverse idler gear assembly as a set, tapping input shaft with plastic hammer.

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

 - b. Remove final drive assembly.
32. Remove mainshaft bearing retainer and then mainshaft front bearing from clutch housing using the puller.
33. Remove oil channel from clutch housing.

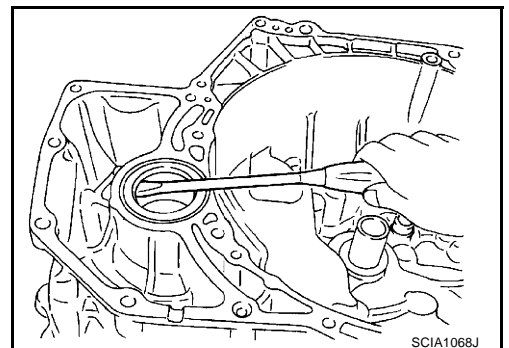


32. Remove mainshaft bearing retainer and then mainshaft front bearing from clutch housing using the puller.
33. Remove oil channel from clutch housing.



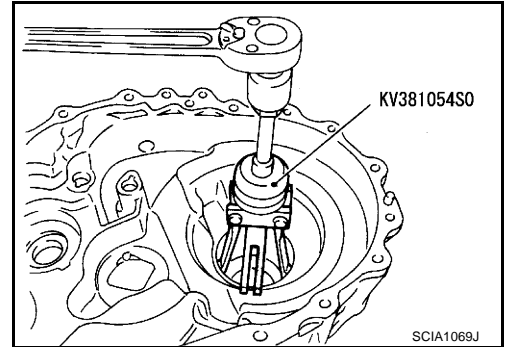
34. Remove differential oil seal (clutch housing side) from clutch housing.

CAUTION:
Be careful not to damage clutch housing.



TRANSAXLE ASSEMBLY

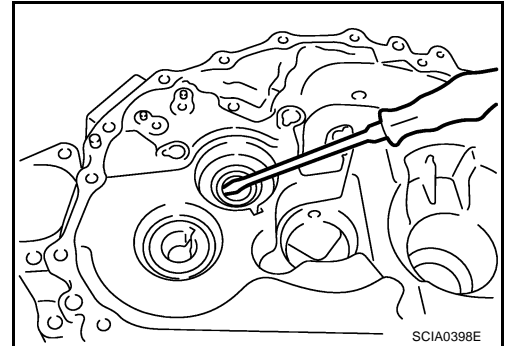
35. Remove differential side bearing outer race (clutch housing side) from clutch housing using the puller.



36. Remove input shaft oil seal from clutch housing.

CAUTION:

Be careful not to damage clutch housing.

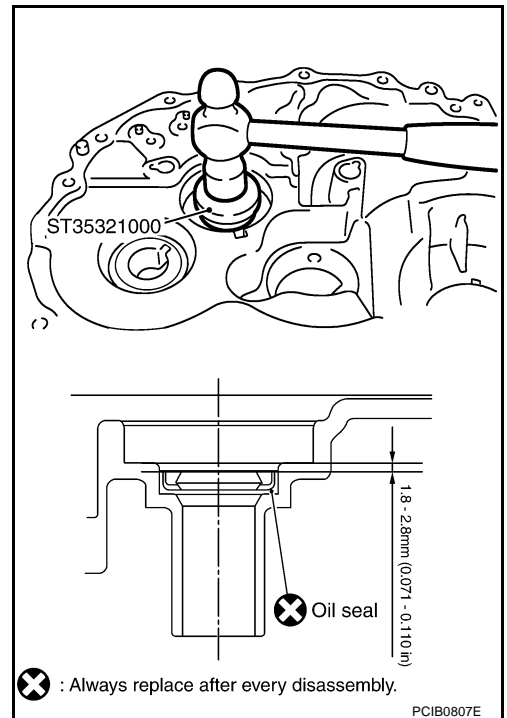


ASSEMBLY

1. Apply multi-purpose grease to input shaft oil seal lip. Install a new input shaft oil seal 1.8-2.8 mm (0.071-0.110 in) above from clutch housing edge surface using the drift.

CAUTION:

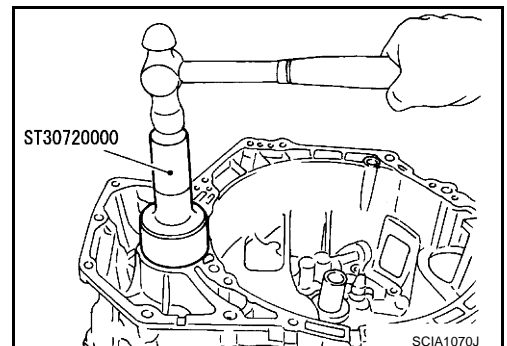
Do not reuse oil seals.



2. Apply multi-purpose grease to differential oil seal lip, and then install a new oil seal to clutch housing using the drift.

CAUTION:

Do not reuse oil seals.

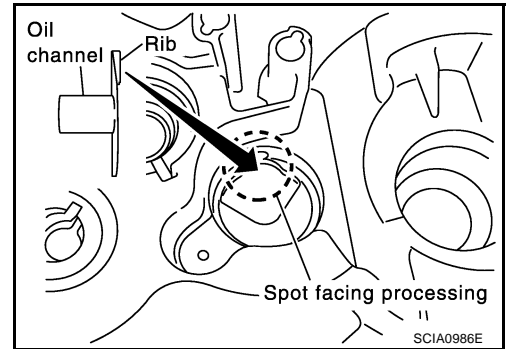


TRANSAXLE ASSEMBLY

3. Install oil channel on mainshaft side.

CAUTION:

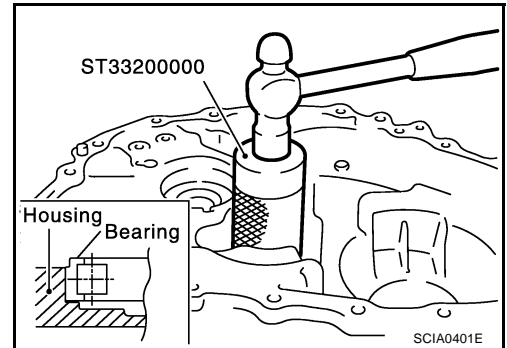
Be careful with the orientation of installation.



4. Install mainshaft front bearing to clutch housing using the drift.

CAUTION:

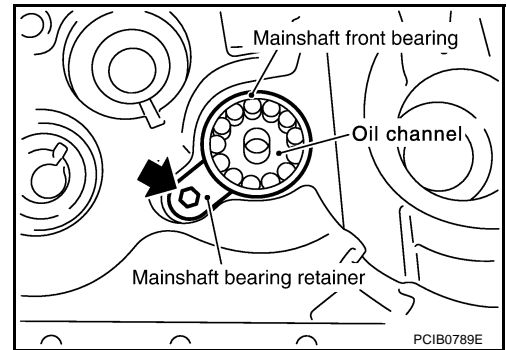
Be careful with the orientation of installation.



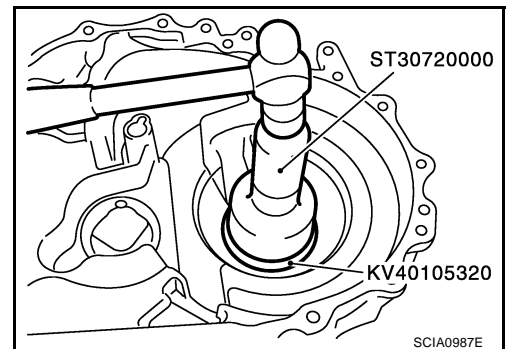
5. Install mainshaft bearing retainer to clutch housing and tighten mounting bolt to the specified torque. Refer to [MT-25, "GEAR COMPONENTS"](#).

CAUTION:

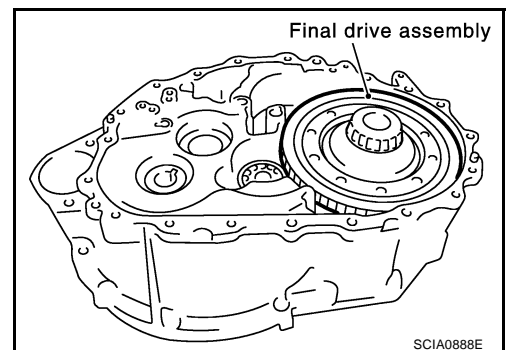
Install with punched surface facing up.



6. Install differential side bearing outer race to clutch housing using the drifts.



7. Install final drive assembly into clutch housing.

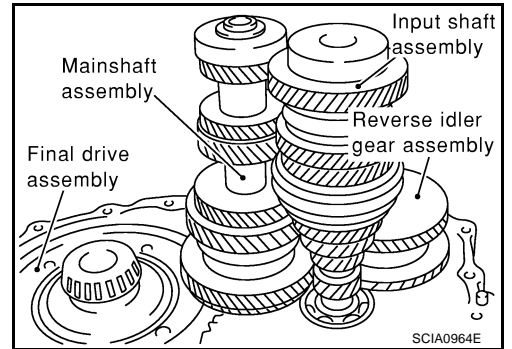


TRANSAXLE ASSEMBLY

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

CAUTION:

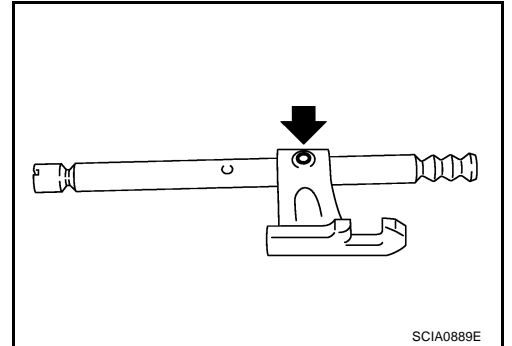
Be sure not to damage input shaft oil seal.



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

CAUTION:

Do not reuse retaining pin.

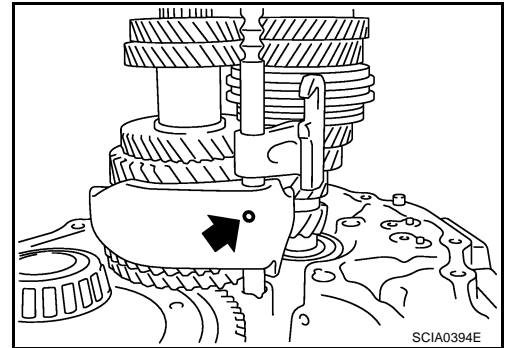


10. Install 1st-2nd fork rod and 1st-2nd shift fork, and then install a new retaining pin to 1st-2nd shift fork.

CAUTION:

Do not reuse retaining pin.

11. Install shift check sleeve to clutch housing.



12. Install interlock pin to 3rd-4th fork rod.

13. Install 3rd-4th bracket, 3rd-4th shift fork, and 3rd-4th fork rod.

14. Install a new stopper ring onto 3rd-4th shift fork.

CAUTION:

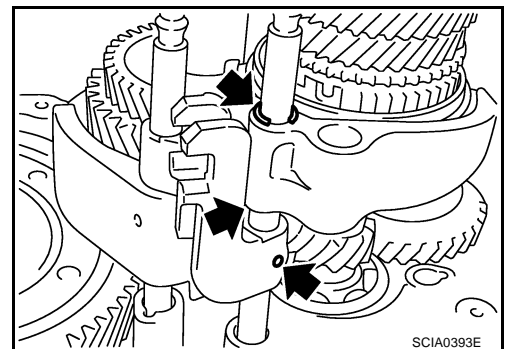
Do not reuse stopper ring.

15. Install a new retaining pin onto 3rd-4th bracket.

CAUTION:

Do not reuse retaining pin.

16. Install 2 check balls to clutch housing.

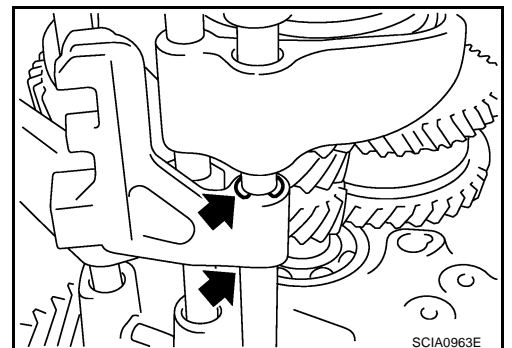


17. Install 5th-6th bracket, 5th-6th shift fork, and 5th-6th fork rod with interlock pin.

18. Install a new stopper ring onto 5th-6th bracket.

CAUTION:

Do not reuse stopper ring.



TRANSAXLE ASSEMBLY

19. Install a new retaining pin onto 5th-6th shift fork.

CAUTION:

Do not reuse retaining pin.

20. Install 2 check balls.

21. Install check ball, shift check sleeve, check spring and a new check plug.

CAUTION:

- Do not reuse check plug.
- Do not drop check ball.

22. Install reverse bracket fork rod and reverse bracket.

23. Install a new retaining pin onto reverse bracket.

CAUTION:

Do not reuse retaining pin.

24. Install reverse shift fork and reverse fork rod.

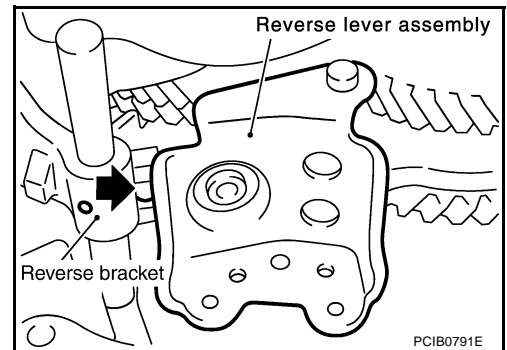
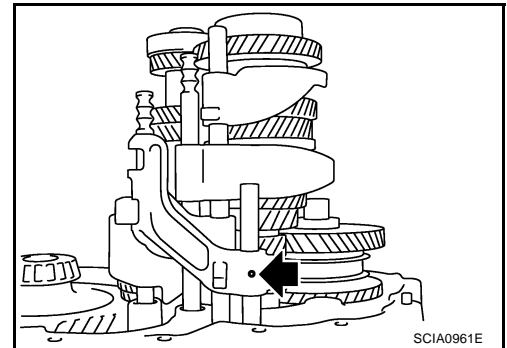
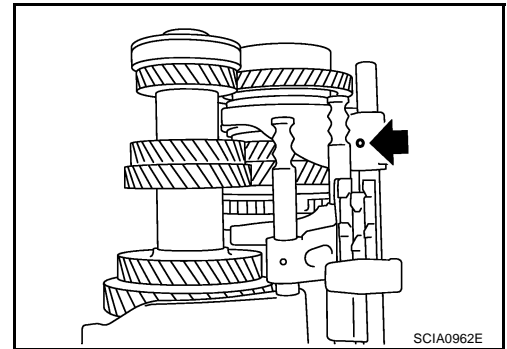
25. Install reverse lever assembly following the procedures below.

- 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.



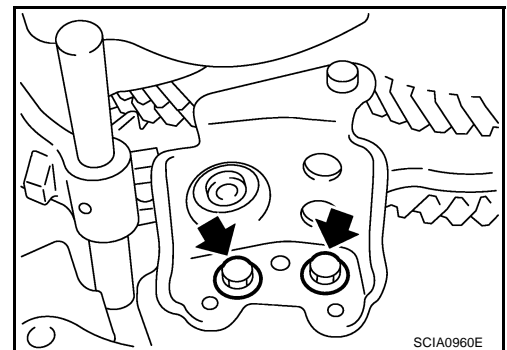
- c. Install reverse lever assembly to clutch housing, and then tighten mounting bolts to the specified torque. Refer to [MT-27, "SHIFT CONTROL COMPONENTS"](#).

26. Install check ball, shift check sleeve, check spring and a new check plug to clutch housing.

CAUTION:

- Do not reuse check plug.
- Do not drop check ball.

27. Install the magnet onto clutch housing.



28. Apply multi-purpose grease to differential oil seal lip, and then install a new differential oil seal to transaxle case using the drift.

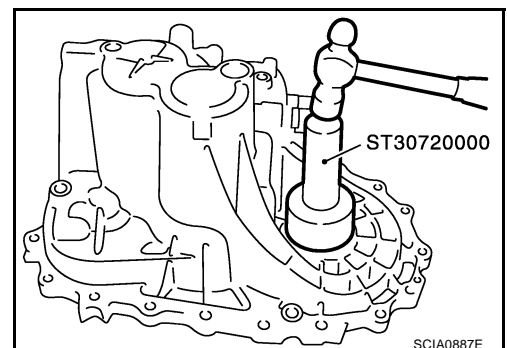
CAUTION:

Do not reuse differential oil seals.

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

- For selection of adjusting shims, refer to [MT-50, "INPUT SHAFT END PLAY"](#).

30. Install selected differential side bearing adjusting shim and differential side bearing. For selection adjusting shim, refer to [MT-52, "DIFFERENTIAL SIDE BEARING PRELOAD"](#).



TRANSAXLE ASSEMBLY

31. Install baffle plate and oil gutter to transaxle case.
32. Install transaxle case following the procedures below.
 - a. Install selected mainshaft rear bearing adjusting shim into transaxle case.
 - For selection of adjusting shims, refer to [MT-51, "MAINSHAFT END PLAY"](#) .
 - b. Temporarily install a new snap ring of mainshaft rear bearing into transaxle case.

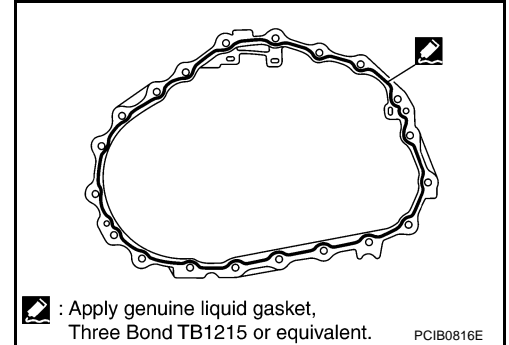
CAUTION:

Do not reuse snap ring.

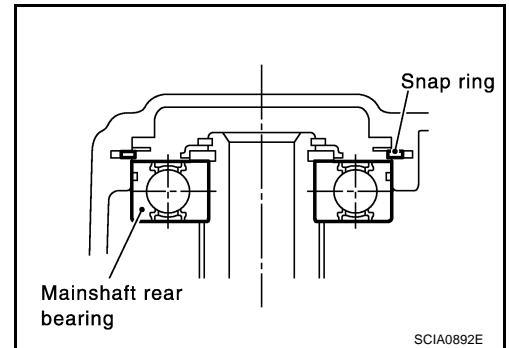
- c. Apply recommended sealant to mating surfaces of transaxle case and clutch housing.

CAUTION:

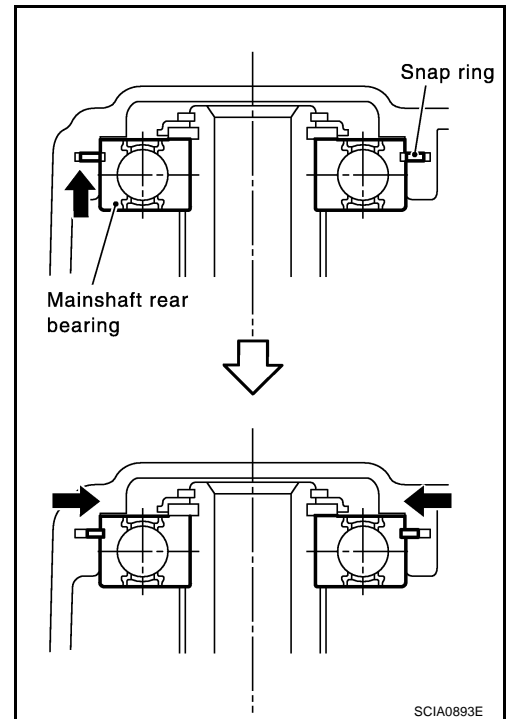
Remove old sealant adhering to mounting surfaces. Also remove any moisture, oil, or foreign material adhering to application and mounting surfaces.



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



- e. Through bore plug mounting hole, with snap ring stretched, and lift up mainshaft assembly from the control assembly mounting hole.
- f. Securely install snap ring onto mainshaft rear bearing.



TRANSAXLE ASSEMBLY

- g. Tighten mounting bolts to the specified torque.

Bolt A:

: 52 N-m (5.3 kg-m, 38 ft-lb)

Bolt B:

: 65 N-m (6.6 kg-m, 48 ft-lb)

CAUTION:

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

- h. Install control assembly to transaxle case to transaxle case.

CAUTION:

Do not reuse O-ring.

- i. Install a new shift check to transaxle case, and then tighten shift check to the specified torque. Refer to [MT-27, "SHIFT CONTROL COMPONENTS"](#).

CAUTION:

Does not reuse shift check.

- j. Install a new stopper bolt to transaxle case, and then tighten stopper bolt to the specified torque. Refer to [MT-27, "SHIFT CONTROL COMPONENTS"](#).

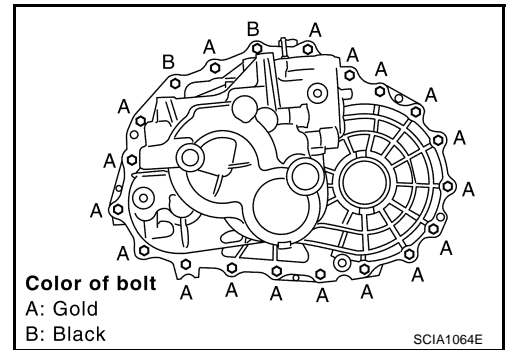
CAUTION:

Do not reuse stopper bolt.

33. Install a new bore plug to transaxle case using the drift.

CAUTION:

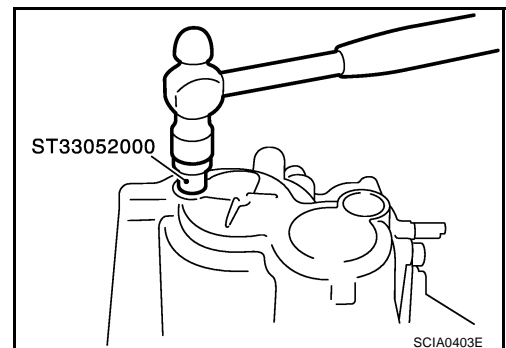
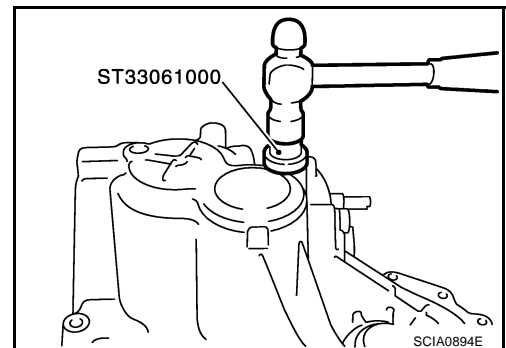
Do not reuse bore plug.



34. Install a new welch plug to transaxle case using the drift.

CAUTION:

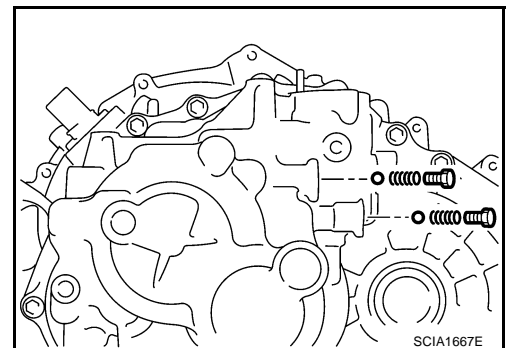
Do not reuse welch plug.



35. Install 2 check balls, 2 check springs and 2 new check plugs to transaxle case, and then tighten check plug to the specified torque. Refer to [MT-27, "SHIFT CONTROL COMPONENTS"](#).

CAUTION:

Do not reuse check plug.



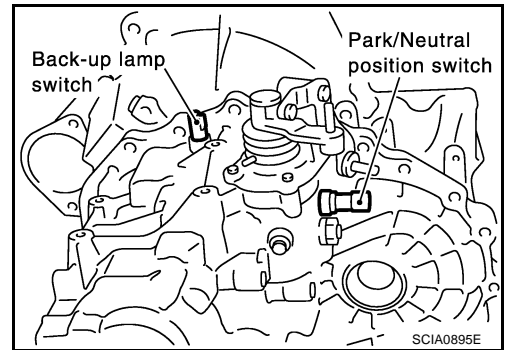
TRANSAXLE ASSEMBLY

36. Install new O-ring applied gear oil on control assembly. And then install control assembly on transaxle case. After the precious service tighten bolts to the specified torque. Refer to [MT-27, "SHIFT CONTROL COMPONENTS"](#) .

CAUTION:

Do not reuse O-ring.

37. Apply genuine liquid gasket or equivalent to threads of park/neutral position switch and back-up lamp switch. Then install them into transaxle case. Tighten park/neutral position switch and back-up lamp switch to the specified torque. Refer to [MT-24, "CASE AND HOUSING COMPONENTS"](#) .



38. Install new gaskets onto drain plug and filler plug, and then install them into transaxle case. Tighten drain plug and filler plug to the specified torque. Refer to [MT-24, "CASE AND HOUSING COMPONENTS"](#) .

CAUTION:

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

Adjustment (RS5F51A) INPUT SHAFT END PLAY

ECS008C2

- When adjusting input shaft end play, select adjusting shim for input shaft rear bearing. To select adjusting shim, measure clearance between transaxle case and input shaft rear bearing. Refer to [MT-102, "INPUT SHAFT REAR BEARING ADJUSTING SHIM"](#) .

CAUTION:

Only 1 adjusting shim can be selected.

- 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)

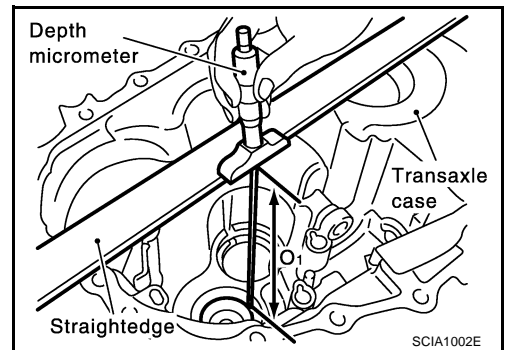
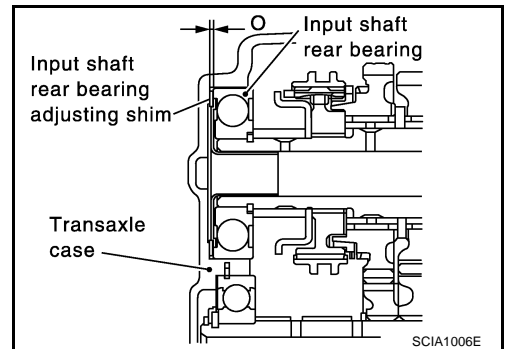
Dimension "O" = (O₁ - O₂) - End play

O: Thickness of adjusting shim

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

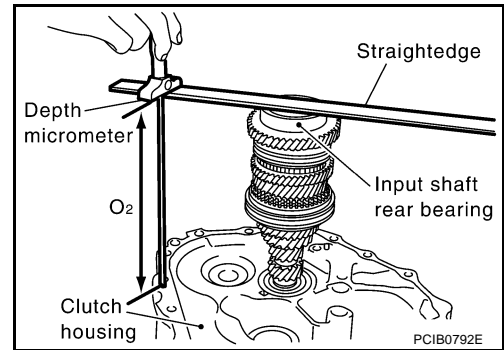
O₂: Distance between clutch housing end face and end face of input shaft rear bearing

1. Using depth micrometer and straightedge, measure dimension "O₁" between transaxle case end face and mounting face of adjusting shim.



TRANSAXLE ASSEMBLY

- Using depth micrometer and straightedge as shown in the figure, measure dimension "O₂" between clutch housing end face and end face of input shaft rear bearing.
- Install selected input shaft rear bearing adjusting shim onto input shaft.



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. Refer to [MT-102, "MAINSHAFT REAR BEARING ADJUSTING SHIM"](#).

CAUTION:

Only 1 adjusting shim can be selected.

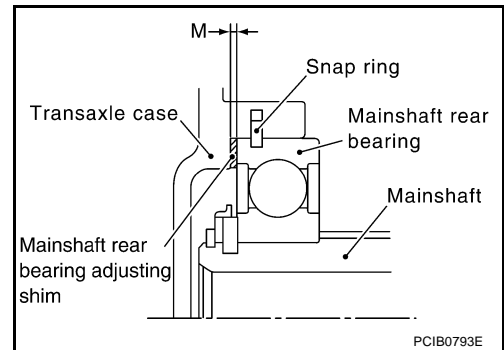
- Calculate dimension "P" (thickness of adjusting shim) using the following procedure to satisfy specification of end play for mainshaft rear bearing.

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

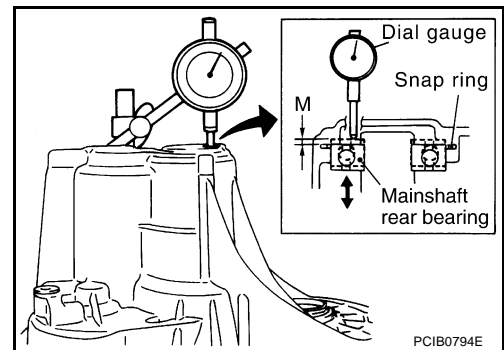
Dimension "P" = "M" - End play

P: Thickness of adjusting shim

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



- Install mainshaft assembly to clutch housing.
- Install snap ring to transaxle case.
- Install transaxle case to clutch housing, and temporarily assemble them with fixing bolts. Install temporarily snap ring to mainshaft rear bearing.
- Install dial gauge to bore plug mounting 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 rear bearing, becomes "M".



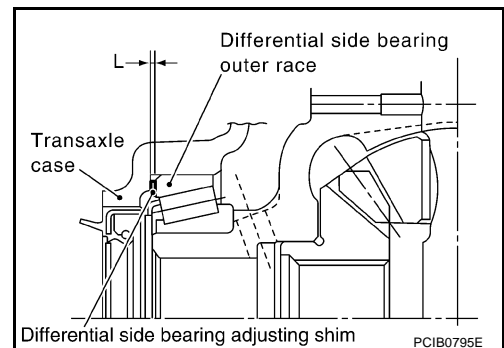
DIFFERENTIAL SIDE BEARING PRELOAD

- 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. Refer to [MT-103, "DIFFERENTIAL SIDE BEARING ADJUSTING SHIM\(S\)"](#).

CAUTION:

Up to 2 adjusting shims can be selected.

- Calculate dimension "L" (thickness of adjusting shim) using the following procedure to satisfy specification of preload for differential side bearing.



TRANSAXLE ASSEMBLY

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

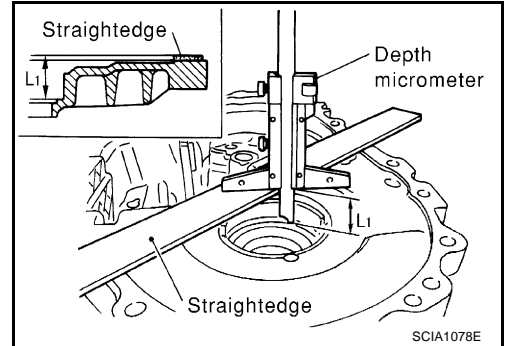
Dimension "L" = (L₁ - L₂) + Preload

L: Thickness of adjusting shim

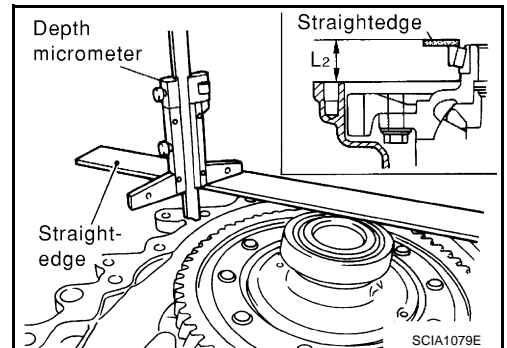
L₁: Distance between transaxle case end face and mounting face of adjusting shim

L₂: Distance between differential side bearing outer race and clutch housing end face

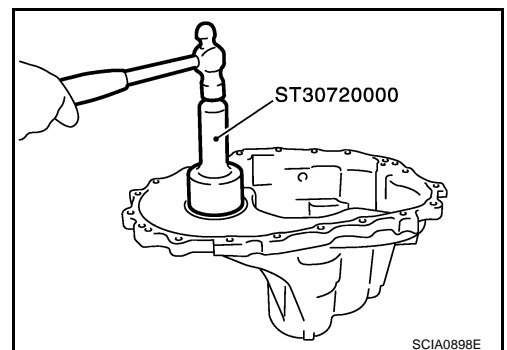
1. Using depth micrometer and straightedge, measure dimension "L₁" between transaxle case end face and mounting face of adjusting shim.
2. Install differential side bearing outer race onto differential side bearing on final gear side. Holding lightly differential side bearing outer race horizontally by hand, rotate final gear five times or more (for smooth movement of bearing roller).



3. Using depth micrometer and straightedge as shown in the figure, measure dimension "L₂" between differential side bearing outer race and clutch housing end face.



4. Install selected differential side bearing adjusting shim, and then install differential side bearing outer race using the drift.



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. Refer to [MT-102, "REVERSE IDLER GEAR ADJUSTING SHIM"](#).

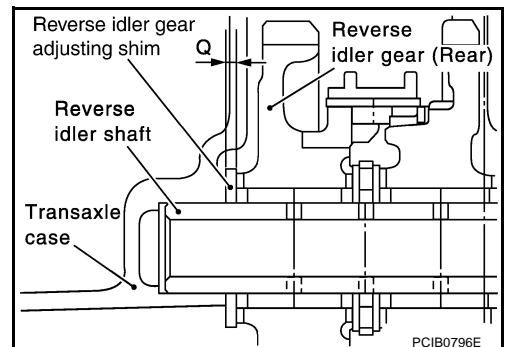
CAUTION:

Only 1 adjusting shim can be selected.

- Calculate dimension "Q" (thickness of adjusting shim) using the following procedure to satisfy specification of end play for reverse idler gear.

End play: 0.04 - 0.10 mm (0.0016 - 0.0039 in)

Dimension "Q" = (Q₁ - Q₂) - End play



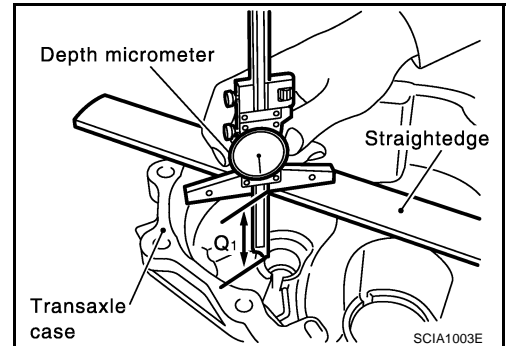
TRANSAXLE ASSEMBLY

Q: Thickness of adjusting shim

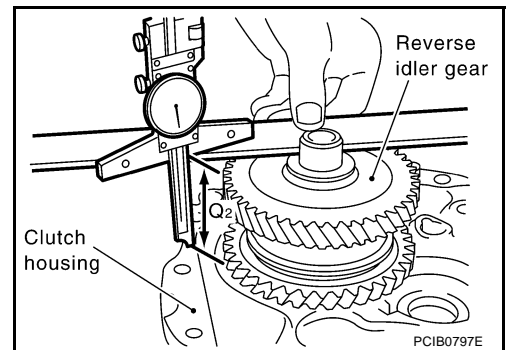
Q1 : Distance between transaxle case end face and mounting face of adjusting shim

Q2 : Distance between clutch housing end face and end face of reverse idler gear (Rear)

1. Using depth micrometer and straightedge, measure dimension "Q1 " between transaxle case end face and mounting face of adjusting shim.



2. Using depth micrometer and straightedge as shown in the figure, measure dimension "Q2 " between clutch housing end face and end face of reverse idler gear (Rear).
3. Install selected reverse idler gear adjusting shim onto reverse idler gear assembly.



Adjustment (RS6F51A) INPUT SHAFT END PLAY

ECS008C3

- When adjusting input shaft end play, select adjusting shim for input shaft rear bearing. To select adjusting shim, measure clearance between transaxle case and input shaft rear bearing. Refer to [MT-102, "INPUT SHAFT REAR BEARING ADJUSTING SHIM"](#).

CAUTION:

Only 1 adjusting shim can be selected.

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

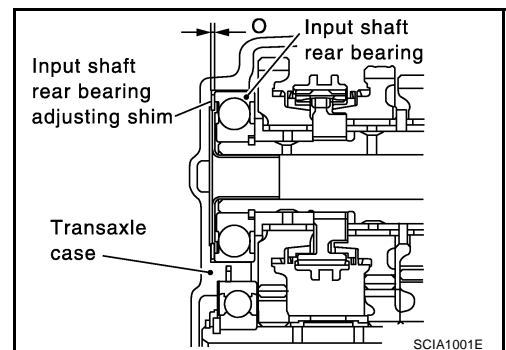
End play: 0 - 0.06 mm (0 - 0.0024 in)

Dimension "O" = (O1 - O2) - End play

O: Thickness of adjusting shim

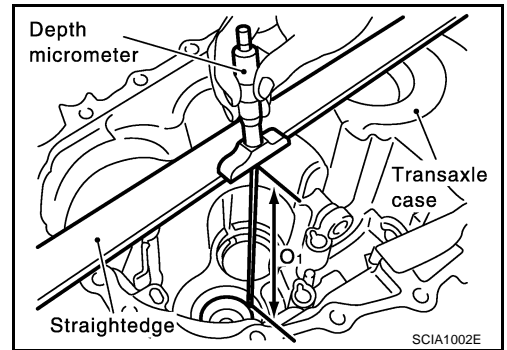
O1 Distance between transaxle case end face and mounting face of adjusting shim

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

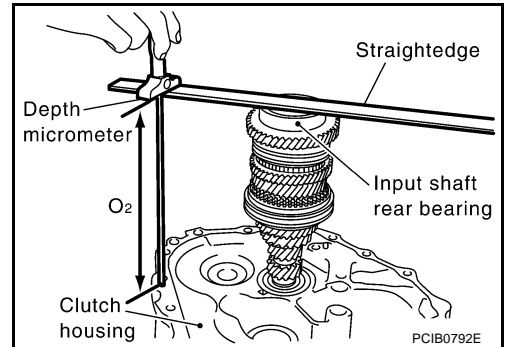


TRANSAXLE ASSEMBLY

1. Using depth micrometer and straightedge, measure dimension "O₁" between transaxle case end face and mounting face of adjusting shim.



2. Using depth micrometer and straightedge as shown in the figure, measure dimension "O₂" between clutch housing end face and end face of input shaft rear bearing.
3. Install selected input shaft rear bearing adjusting shim onto input shaft.



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. Refer to [MT-102, "MAINSHAFT REAR BEARING ADJUSTING SHIM"](#).

CAUTION:

Only 1 adjusting shim can be selected.

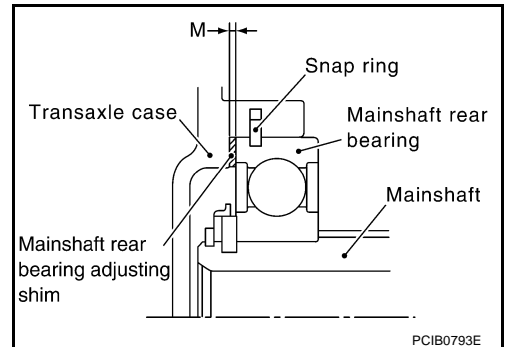
- Calculate dimension "P" (thickness of adjusting shim) using the following procedure to satisfy specification of end play for mainshaft rear bearing.

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

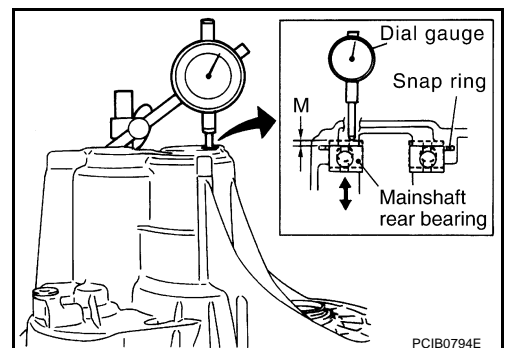
Dimension "P" = "M" - End play

P: Thickness of adjusting shim

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



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 bore plug mounting 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 rear bearing, becomes "M".



TRANSAXLE ASSEMBLY

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. Refer to [MT-103, "DIFFERENTIAL SIDE BEARING ADJUSTING SHIM\(S\)"](#).

CAUTION:

Up to 2 adjusting shims can be selected.

- Calculate dimension "L" (thickness of adjusting shim) using the following procedure to satisfy specification of preload for differential side bearing.

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

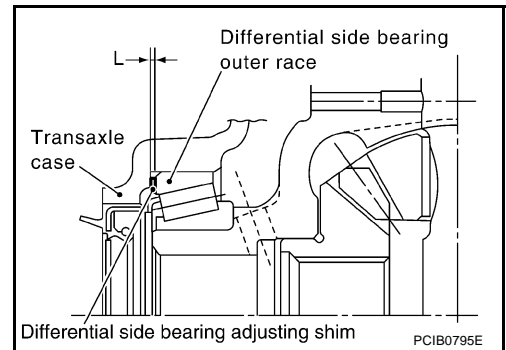
Dimension "L" = (L₁ - L₂) + Preload

L: Thickness of adjusting shim

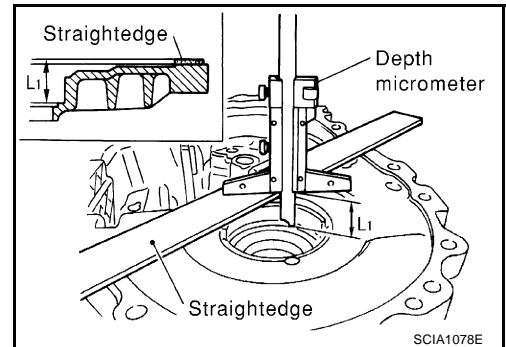
L₁: Distance between transaxle case end face and mounting face of adjusting shim

L₂: Distance between differential side bearing outer race and clutch housing end face

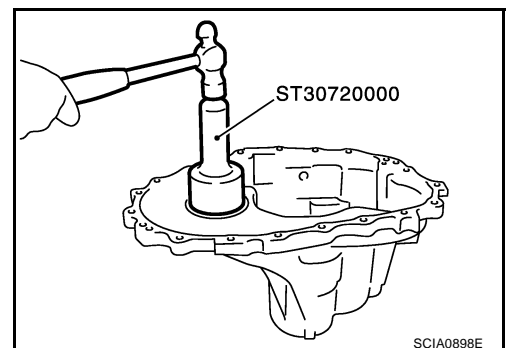
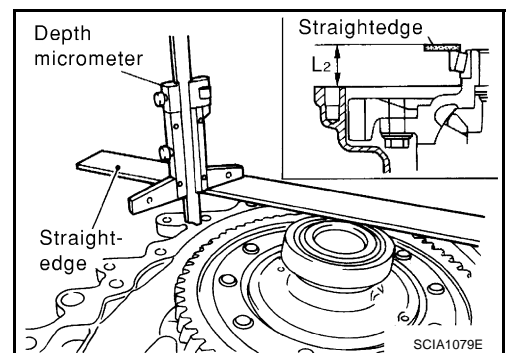
- Using depth micrometer and straightedge, measure dimension "L₁" between transaxle case end face and mounting face of adjusting shim.
- Install differential side bearing outer race onto differential side bearing on final gear side. Holding lightly differential side bearing outer race horizontally by hand, rotate final gear five times or more (for smooth movement of bearing roller).



- Using depth micrometer and straightedge as shown in the figure, measure dimension "L₂" between differential side bearing outer race and clutch housing end face.



- Install selected differential side bearing adjusting shim, and then install differential side bearing outer race using the drift.



TRANSAXLE ASSEMBLY

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. Refer to [MT-102, "REVERSE IDLER GEAR ADJUSTING SHIM"](#).

CAUTION:

Only 1 adjusting shim can be selected.

- Calculate dimension "Q" (thickness of adjusting shim) using the following procedure to satisfy specification of end play for reverse idler gear.

End play: 0.04 - 0.10 mm (0.0016 - 0.0039 in)

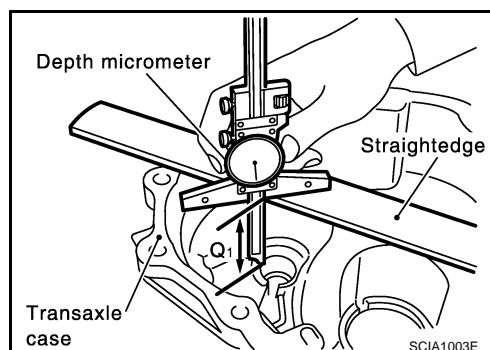
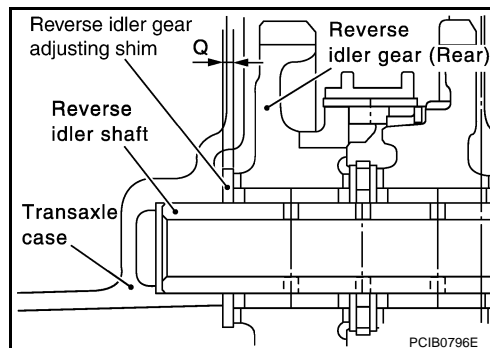
Dimension "Q" = (Q₁ - Q₂) - End play

Q: Thickness of adjusting shim

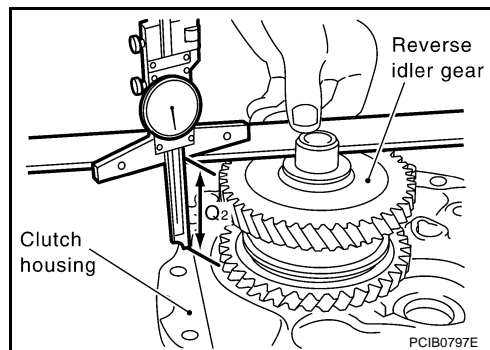
Q₁ : Distance between transaxle case end face and mounting face of adjusting shim

Q₂ : Distance between clutch housing end face and end face of reverse idler gear (Rear)

- Using depth micrometer and straightedge, measure dimension "Q₁" between transaxle case end face and mounting face of adjusting shim.



- Using depth micrometer and straightedge as shown in the figure, measure dimension "Q₂" between clutch housing end face and end face of reverse idler gear (Rear).
- Install selected reverse idler gear adjusting shim onto reverse idler gear assembly.



INPUT SHAFT AND GEARS

INPUT SHAFT AND GEARS

PFP:32200

Assembly and Disassembly (RS5F51A) DISASSEMBLY

ECS008C4

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

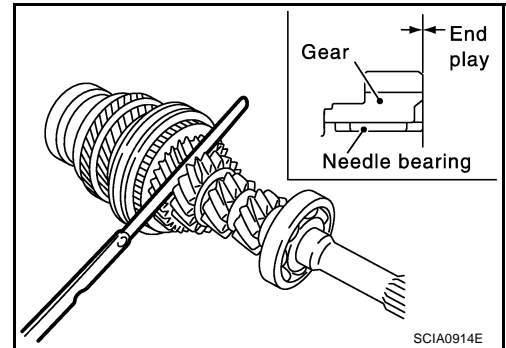
End play standard value

3rd gear : 0.18 - 0.31 mm (0.0071 - 0.0122 in)

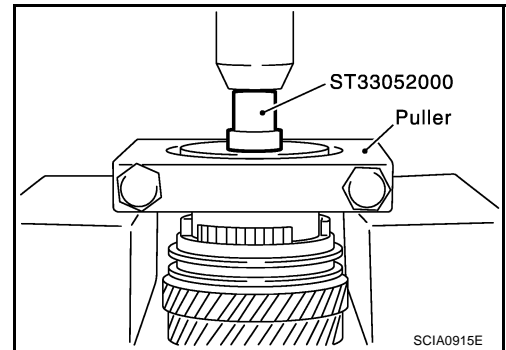
4th gear : 0.20 - 0.30 mm (0.0079 - 0.0118 in)

5th gear : 0.06 - 0.16 mm (0.0024 - 0.0063 in)

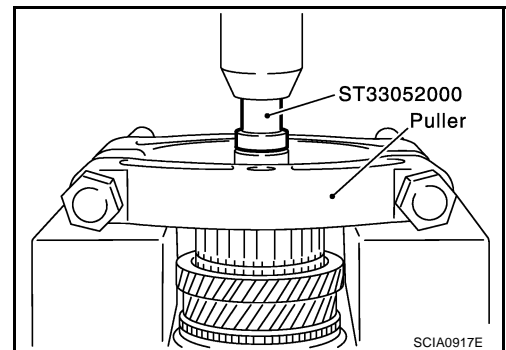
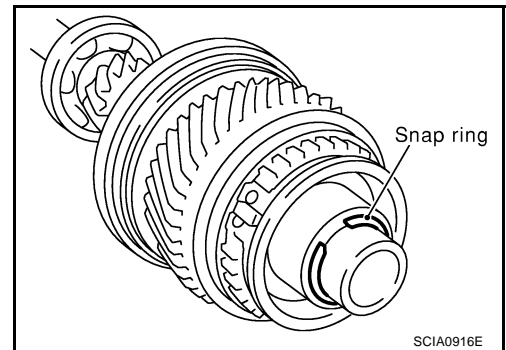
2. Remove oil channel.
3. Press out input shaft rear bearing using the drift and a puller.



4. Remove the snap ring.

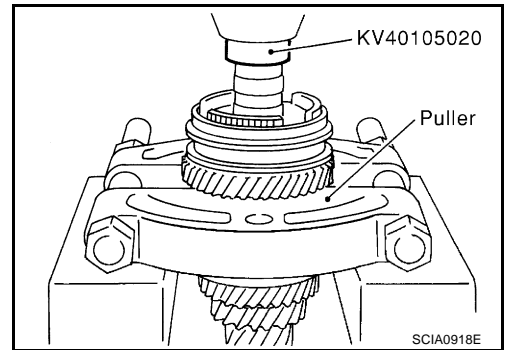


5. Press out input shaft bearing spacer and 5th stopper using the drift and a puller.

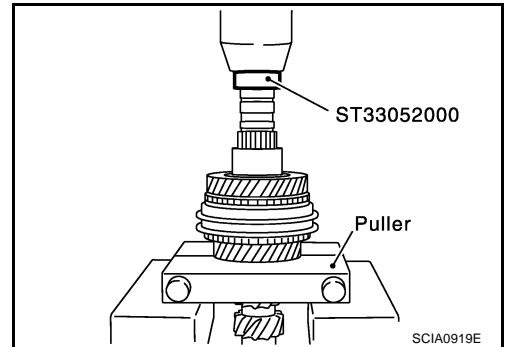


INPUT SHAFT AND GEARS

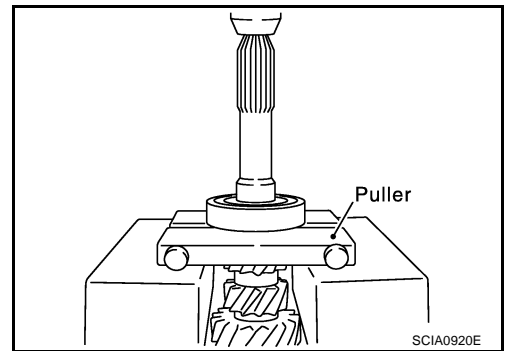
6. Press out 5th input gear and 5th synchronizer hub assembly using the drift and a puller.
7. Remove 5th needle bearing.



8. Press out 5th input gear bushing, thrust washer, 4th input gear, 4th needle bearing, 4th input gear bushing, 4th baulk ring, 3rd-4th synchronizer hub assembly, 3rd baulk ring and 3rd input gear using the drift and a puller.
9. Remove 3rd needle bearing.



10. Press out input shaft front bearing using a puller.

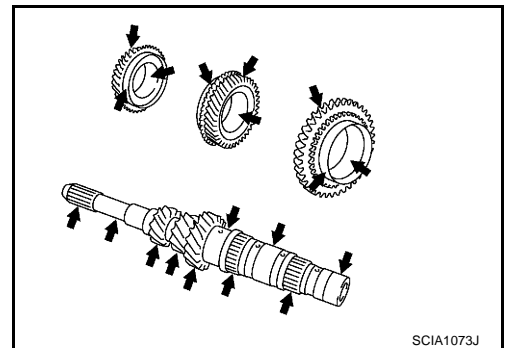


INSPECTION AFTER DISASSEMBLY

Input Shaft and Gears

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

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

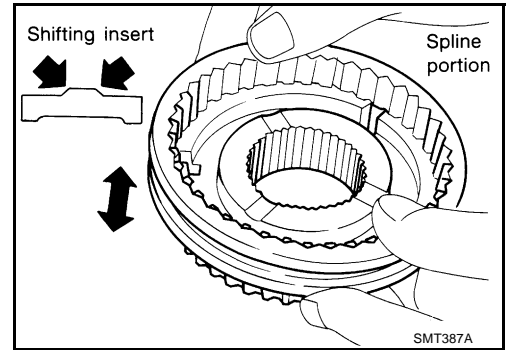


INPUT SHAFT AND GEARS

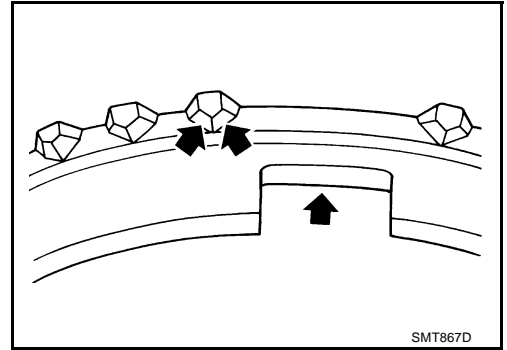
Synchronizer

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

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

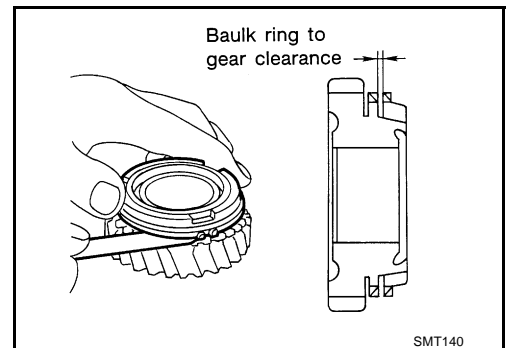
Clearance

Standard value

3rd and 4th : 0.9 - 1.45 mm (0.035 - 0.057 in)

5th : 0.95 - 1.4 mm (0.037 - 0.055 in)

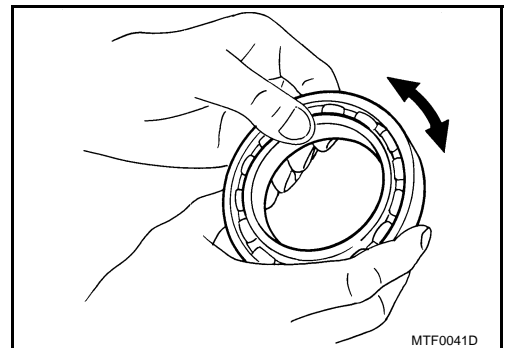
Limit value : 0.7 mm (0.028 in)



Bearing

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

- Damage and rough rotation of bearing



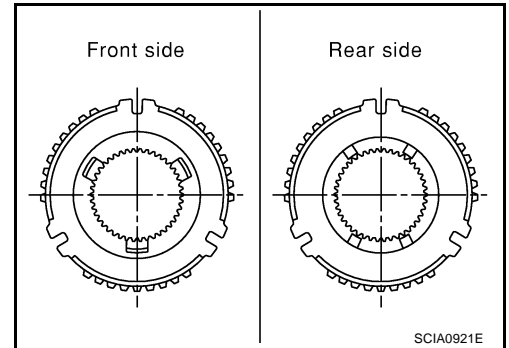
INPUT SHAFT AND GEARS

ASSEMBLY

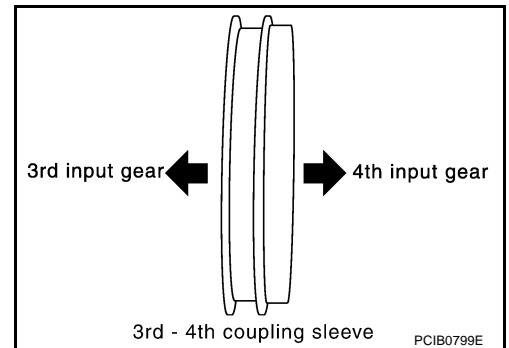
1. Install 3rd needle bearing to input shaft.
2. Install 3rd input gear and 3rd baulk ring to input shaft.
3. Install 3rd-4th spread spring, 3rd-4th shifting insert and a new 3rd-4th synchronizer hub onto a new 3rd-4th coupling sleeve.

CAUTION:

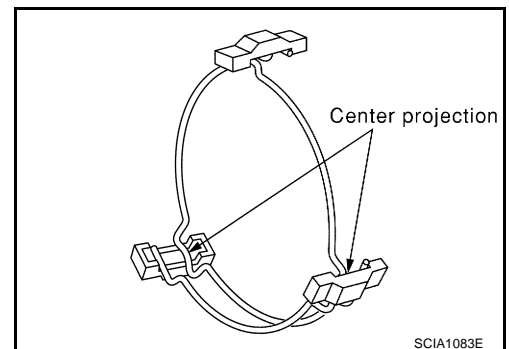
- Be careful with orientation of 3rd-4th synchronizer hub.
- Do not reuse 3rd-4th synchronizer hub.



- Be careful with orientation of 3rd-4th coupling sleeve.
- Do not reuse 3rd-4th coupling sleeve.



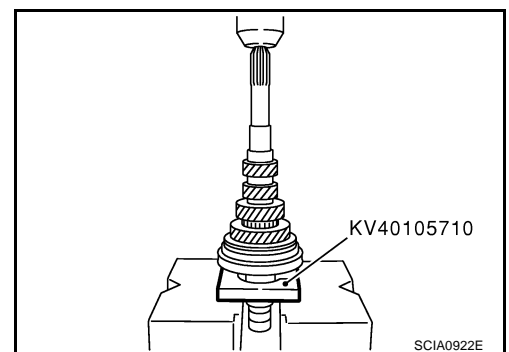
- Be sure not to hook center projection of 2 spread springs on same shifting insert.



4. Press in 3rd-4th synchronizer hub assembly using the press stand.

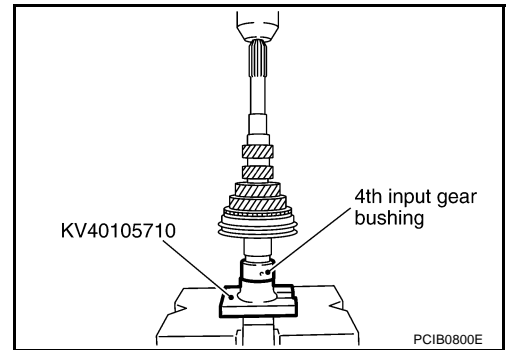
CAUTION:

Align grooves of 3rd-4th shifting insert and 3rd baulk ring.



INPUT SHAFT AND GEARS

5. Press in 4th input gear bushing using the press stand.
6. Install 4th baulk ring.
7. Install 4th needle bearing and 4th input gear to input shaft.



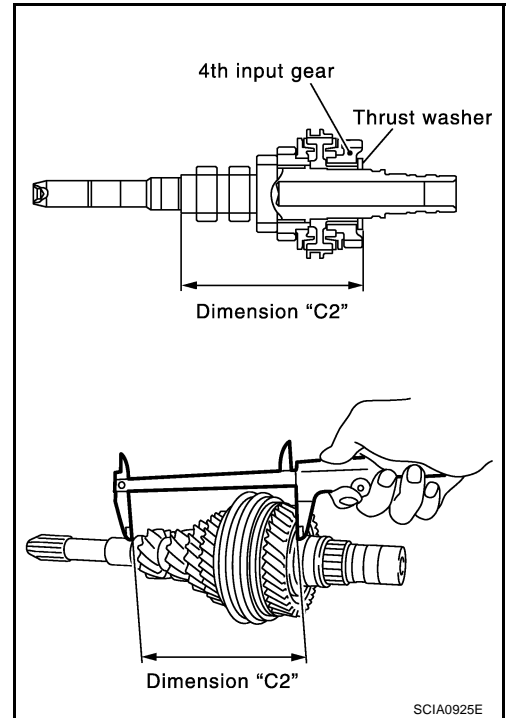
8. Select thrust washer so that dimension "C2" satisfies the standard value below. Then install thrust washer onto input shaft. Refer to [MT-101, "INPUT SHAFT THRUST WASHER"](#).

Standard for dimension C2

: 154.7 - 154.8 mm (6.091 - 6.094 in)

CAUTION:

Only one thrust washer can be selected.

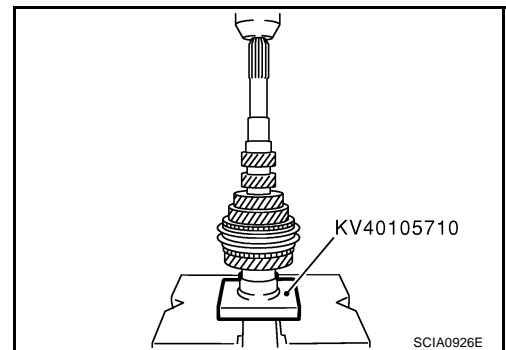


9. Press in a new 5th input gear bushing using the press stand.

CAUTION:

Do not reuse 5th input gear bushing.

10. Install 5th needle bearing and 5th input gear to input shaft.
11. Install 5th baulk ring.

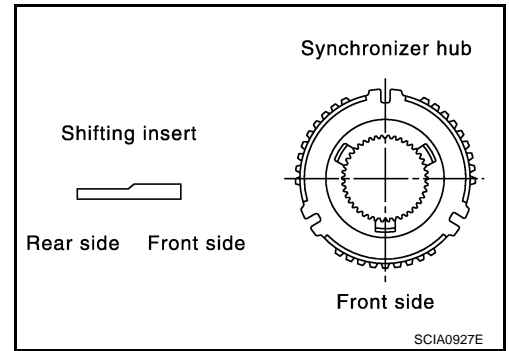


12. Install a new 5th synchronizer hub and 5th spread spring, 5th shifting insert onto a new 5th coupling sleeve.

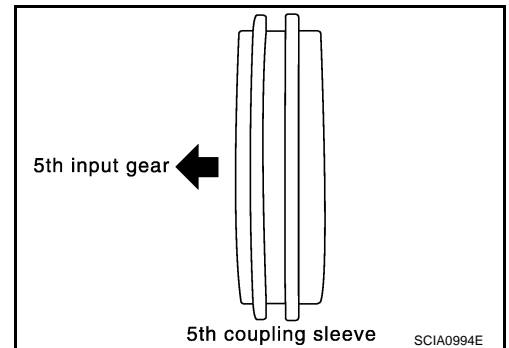
INPUT SHAFT AND GEARS

CAUTION:

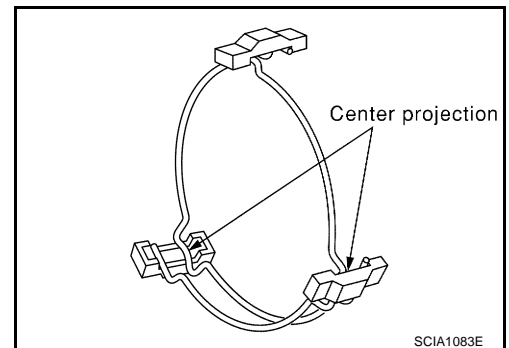
- Be careful with orientation of 5th synchronizer hub and shifting insert.
- Do not reuse 5th synchronizer hub.



- Be careful with orientation of 5th coupling sleeve.
- Do not reuse 5th coupling sleeve.



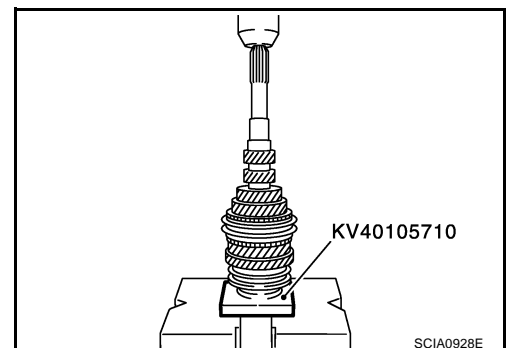
- Be sure not to hook center projection of 2 spread springs on same shifting insert.



13. Press in 5th synchronizer hub assembly using the press stand.

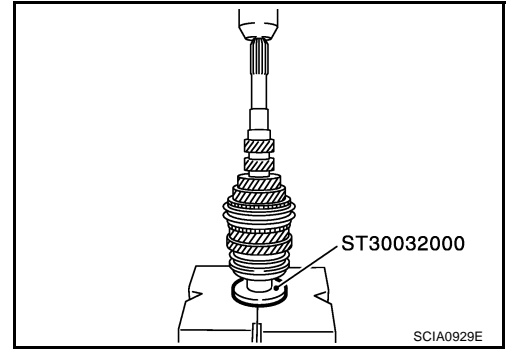
CAUTION:

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



INPUT SHAFT AND GEARS

14. Press in 5th stopper and then input shaft bearing spacer using the drift.



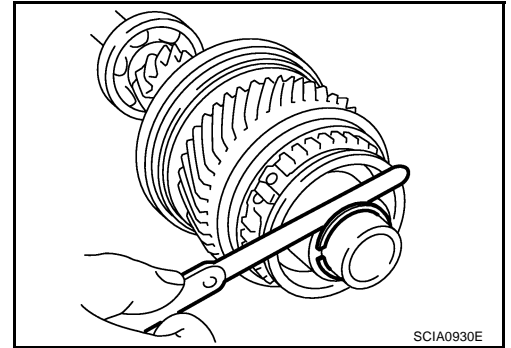
15. Install a new snap ring onto input shaft, and check that end play (gap between snap ring and groove) of input shaft bearing spacer satisfies the standard value.

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

- If measurement is outside the standard range, select snap ring. Refer to [MT-100, "INPUT SHAFT BEARING SPACER"](#).

CAUTION:

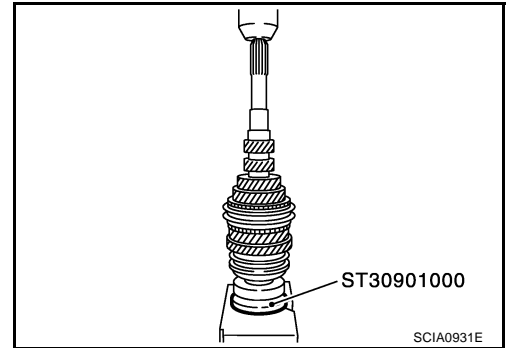
Do not reuse snap ring.



16. Press in input shaft rear bearing using the drift.

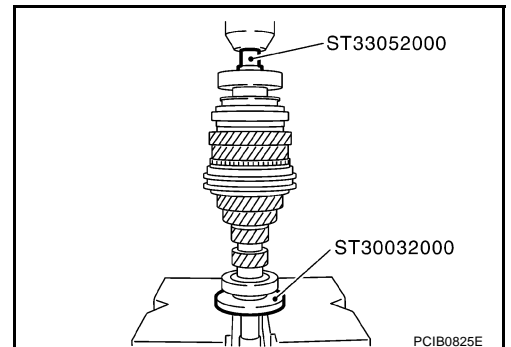
CAUTION:

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



17. Press in input shaft front bearing using the drifts.

18. Install oil channel onto input shaft.



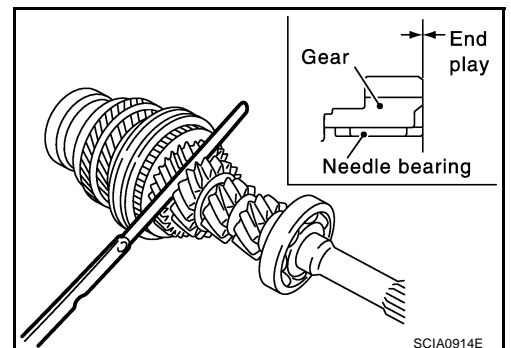
19. Check end play of 3rd, 4th, and 5th input gears.

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)



INPUT SHAFT AND GEARS

Assembly and Disassembly (RS6F51A)

ECS008C5

DISASSEMBLY

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

End play standard value

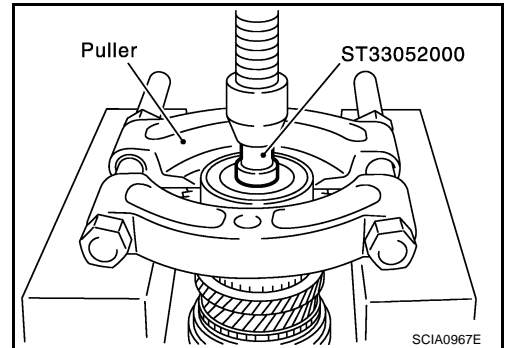
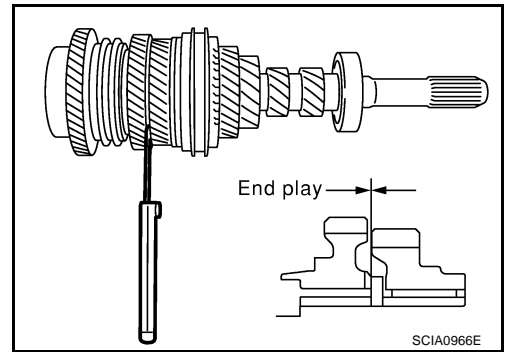
3rd gear : 0.18 - 0.31 mm (0.0071 - 0.0122 in)

4th gear : 0.20 - 0.30 mm (0.0079 - 0.0118 in)

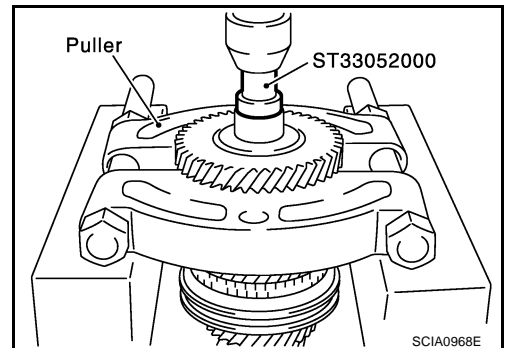
5th gear : 0.06 - 0.16 mm (0.0024 - 0.0063 in)

6th gear : 0.06 - 0.16 mm (0.0024 - 0.0063 in)

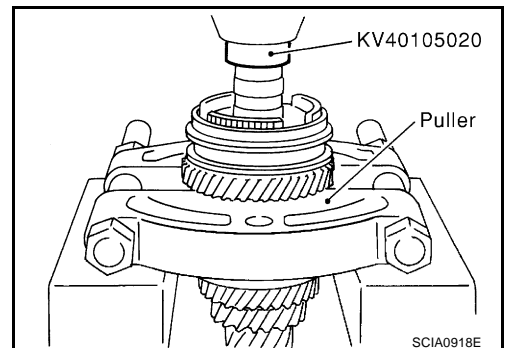
2. Remove oil channel.
3. Press out input shaft rear bearing using the drift and a puller.
4. Remove snap ring.



5. Press out 6th input gear, 6th needle bearing and 6th input gear bushing using the drift and a puller.
6. Remove 6th baulk ring.

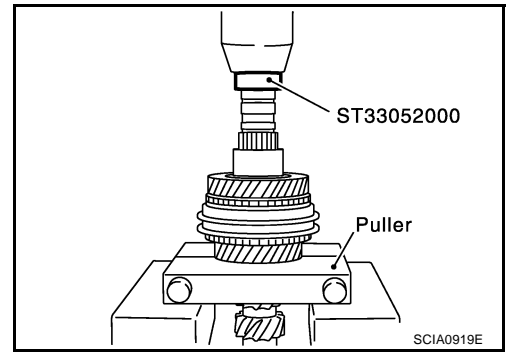


7. Press out 5th input gear and 5th-6th synchronizer hub assembly using the drift and a puller.
8. Remove 5th needle bearing.

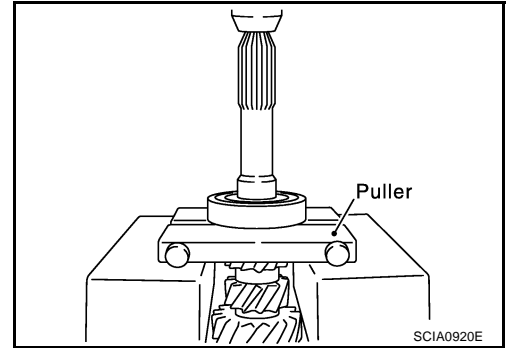


INPUT SHAFT AND GEARS

9. Press out 5th input gear bushing, thrust washer, 4th input gear, 4th needle bearing, 4th input gear bushing, 4th baulk ring, 3rd-4th synchronizer hub assembly, 3rd baulk ring and 3rd input gear using the drift and a puller.
10. Remove 3rd needle bearing.



11. Press out input shaft front bearing using a puller.

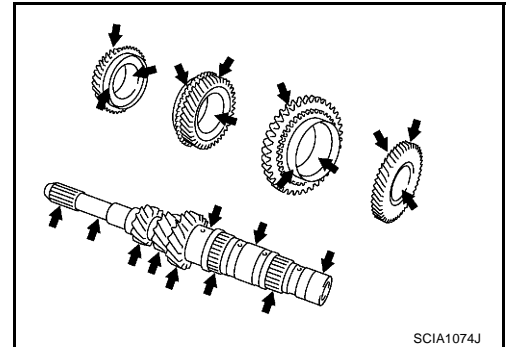


INSPECTION AFTER DISASSEMBLY

Input Shaft and Gears

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

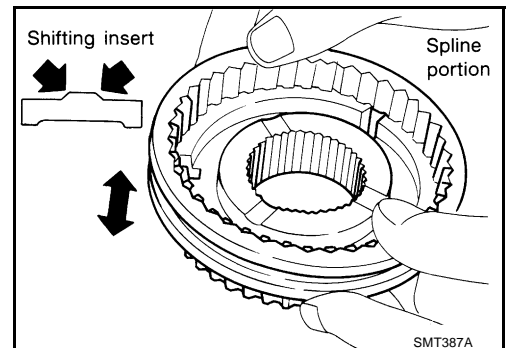
- Damage, peeling, dent, uneven wear, bending, etc. of shaft
- Excessive wear, damage, peeling, etc. of gears



Synchronizer

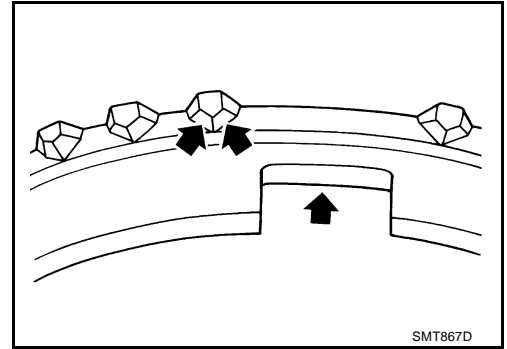
Check items below. If necessary, replace them with new ones.

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



INPUT SHAFT AND GEARS

- 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

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

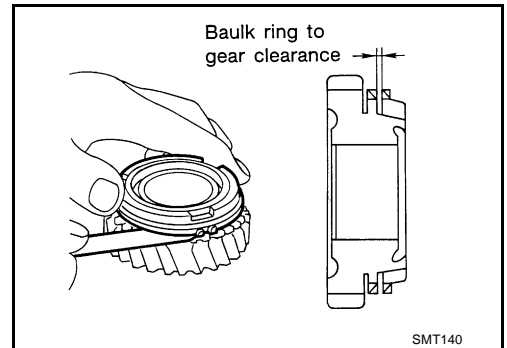
Clearance

Standard value

3rd and 4th : 0.9 - 1.45 mm (0.035 - 0.057 in)

5th and 6th : 0.95 - 1.4 mm (0.037 - 0.055 in)

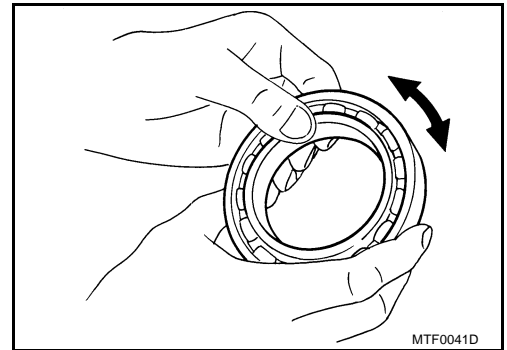
Limit value : 0.7 mm (0.028 in)



Bearing

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

- Damage and rough rotation of bearing



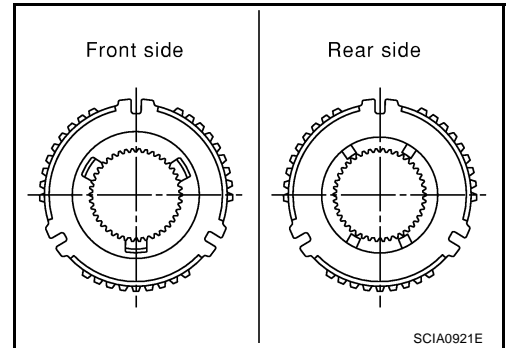
INPUT SHAFT AND GEARS

ASSEMBLY

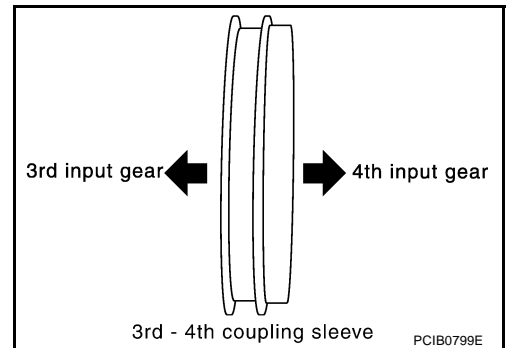
1. Install 3rd needle bearing to input shaft.
2. Install 3rd input gear and 3rd baulk ring to input shaft.
3. Install 3rd-4th spread spring, 3rd-4th shifting insert and a new 3rd-4th synchronizer hub onto a new 3rd-4th coupling sleeve.

CAUTION:

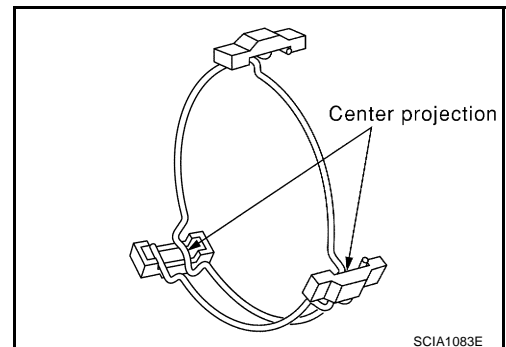
- Be careful with orientation of 3rd-4th synchronizer hub.
- Do not reuse 3rd-4th synchronizer hub.



- Be careful with orientation of 3rd-4th coupling sleeve.
- Do not reuse 3rd-4th coupling sleeve.



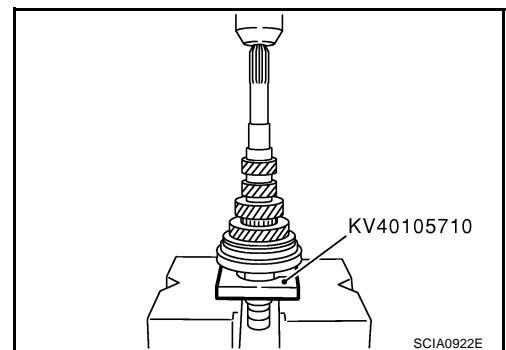
- Be sure not to hook center projection of 2 spread springs on same shifting insert.



4. Press in 3rd-4th synchronizer hub assembly using the press stand.

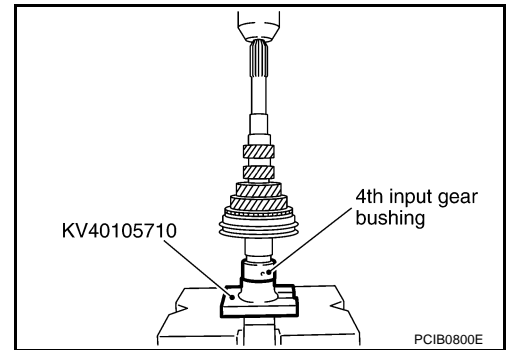
CAUTION:

Align grooves of 3rd-4th shifting insert and 3rd baulk ring.



INPUT SHAFT AND GEARS

5. Press in 4th input gear bushing using the press stand.
6. Install 4th baulk ring.
7. Install 4th needle bearing and 4th input gear to input shaft.



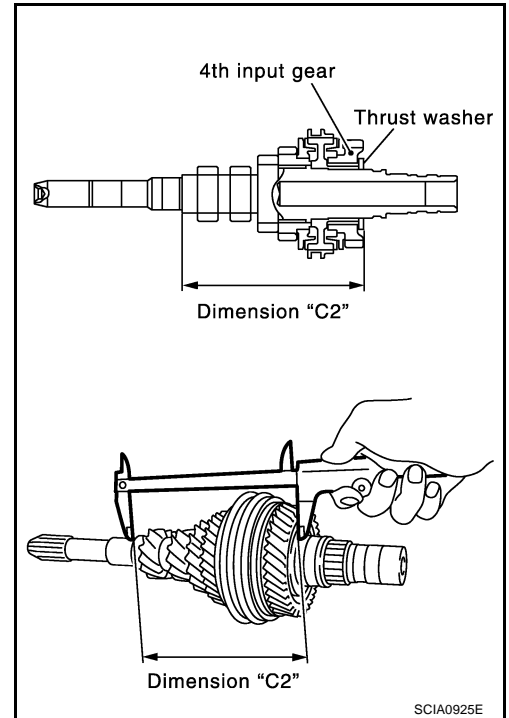
8. Select thrust washer so that dimension "C2" satisfies the standard value below. Then install thrust washer onto input shaft. Refer to [MT-101, "INPUT SHAFT THRUST WASHER"](#).

Standard value for dimension C2

: 154.7 - 154.8 mm (6.091 - 6.094 in)

CAUTION:

Only one thrust washer can be selected.

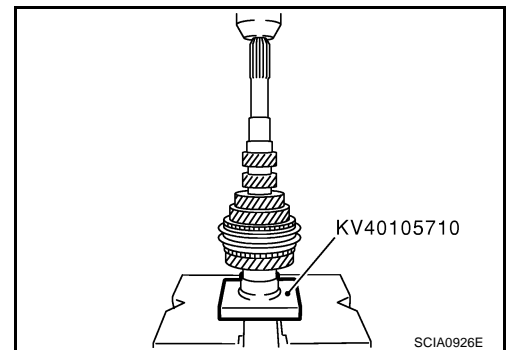


9. Press in a new 5th input gear bushing using the press stand.

CAUTION:

Do not reuse 5th input gear bushing.

10. Install 5th needle bearing and 5th input gear to input shaft.
11. Install 5th baulk ring.

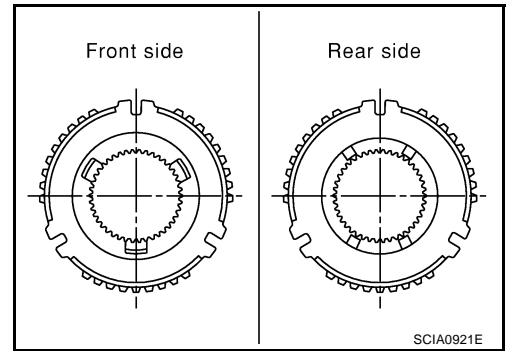


12. Install a new 5th-6th synchronizer hub, 5th-6th spread spring and 5th-6th shifting insert onto a new 5th-6th coupling sleeve.

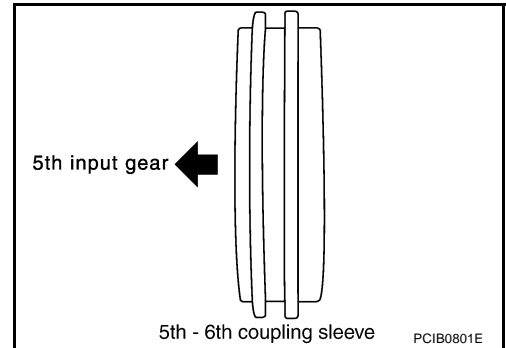
INPUT SHAFT AND GEARS

CAUTION:

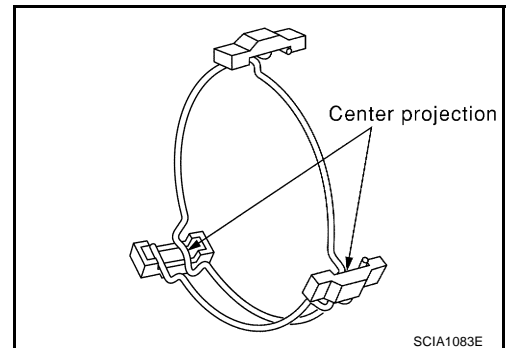
- Be careful with orientation of 5th-6th synchronizer hub.
- Do not reuse 5th-6th synchronizer hub.



- Be careful with orientation of 5th-6th coupling sleeve.
- Do not reuse 5th-6th coupling sleeve.



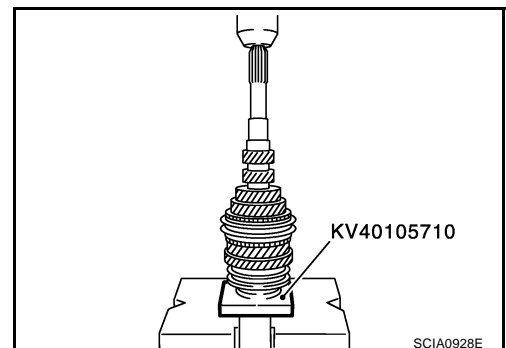
- Be sure not to hook center projection of 2 spread springs on same shifting insert.



13. Press in 5th-6th synchronizer hub assembly using the press stand.

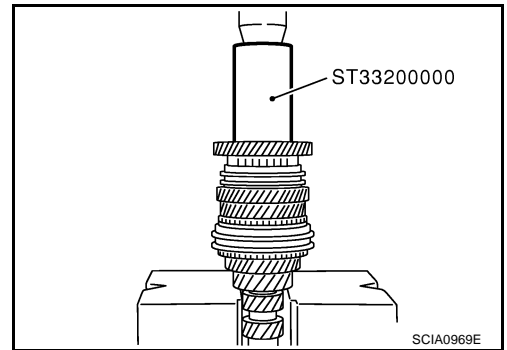
CAUTION:

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



INPUT SHAFT AND GEARS

14. Install 6th needle bearing, 6th input gear, 6th baulk ring onto 6th input gear bushing, and then press in 6th bushing onto input shaft using the drift.



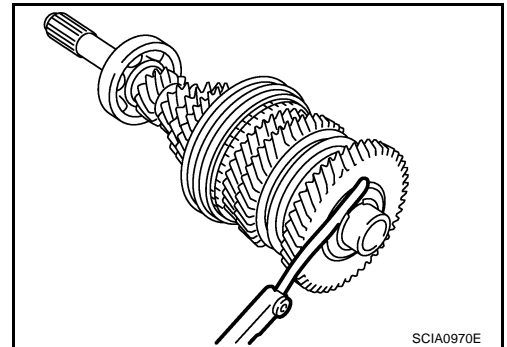
15. Install a new snap ring onto input shaft, and check that end play (gap between snap ring and groove) of 6th input gear bushing satisfies the standard value.

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

- If measurement is outside the standard range, select snap ring. Refer to [MT-100, "6TH INPUT GEAR BUSHING"](#).

CAUTION:

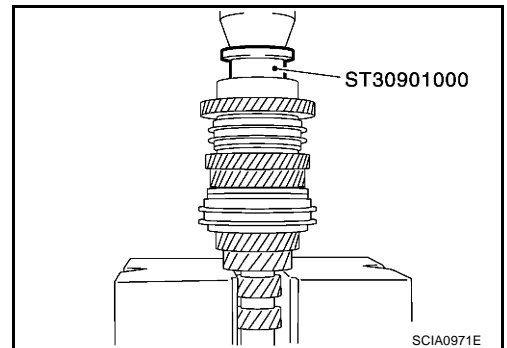
Do not reuse snap ring.



16. Press in input shaft rear bearing using the drift.

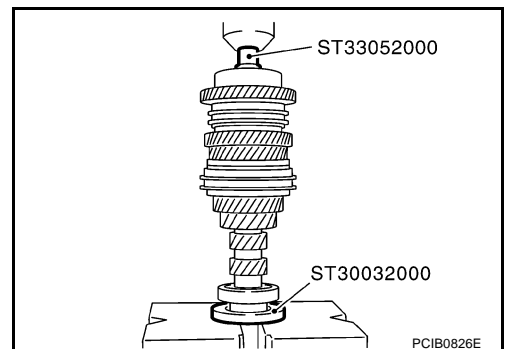
CAUTION:

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



17. Press in input shaft front bearing using the drifts.

18. Install oil channel onto input shaft.



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

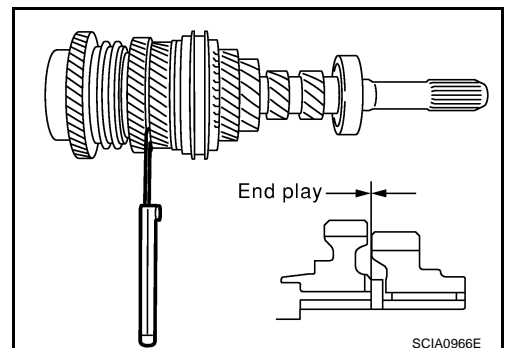
End play standard value

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

MAINSHAFT AND GEARS

PFP:32241

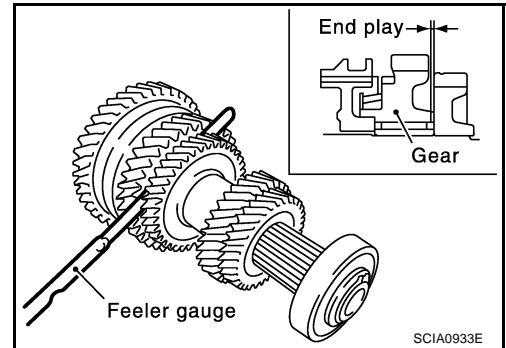
Assembly and Disassembly (RS5F51A) DISASSEMBLY

ECS008C6

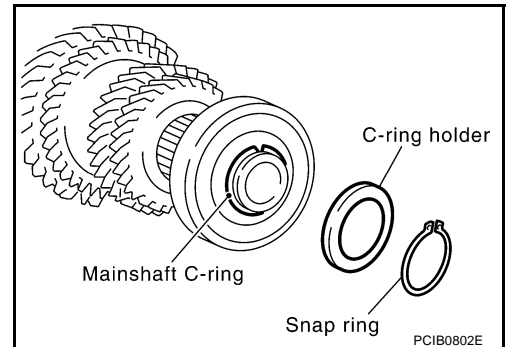
1. Before disassembling, measure the end play of 1st and 2nd main gears.

End play standard value

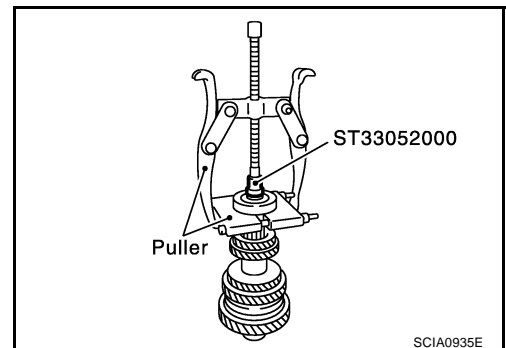
- 1st main gear : 0.20 - 0.30 mm (0.0079 - 0.0118 in)
2nd main gear : 0.06 - 0.16 mm (0.0024 - 0.0063 in)



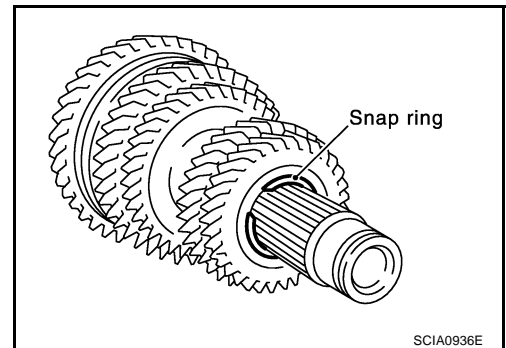
2. Remove snap ring.
3. Remove C-ring holder, and then remove mainshaft C-ring.



4. Remove mainshaft rear bearing using the drift and pullers.

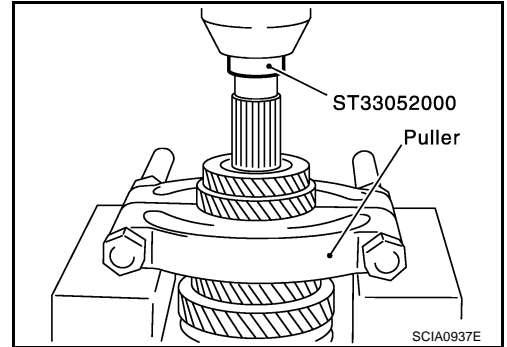


5. Remove snap ring.

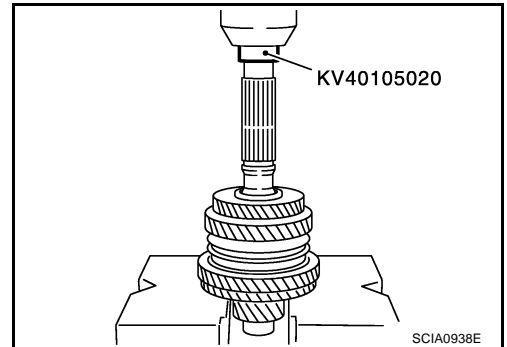


MAINSHAFT AND GEARS

6. Press out 4th main gear and 5th main gear using the drift and a puller.
7. Remove 4th main gear adjusting shim.
8. Remove 3rd-4th mainshaft spacer.



9. Press out 3rd main gear, 2nd main gear, 2nd needle bearing, 2nd main gear bushing, 1st-2nd synchronizer hub assembly, 1st main gear, 1st needle bearing, and 1st main gear bushing reverse main gear using the drift.

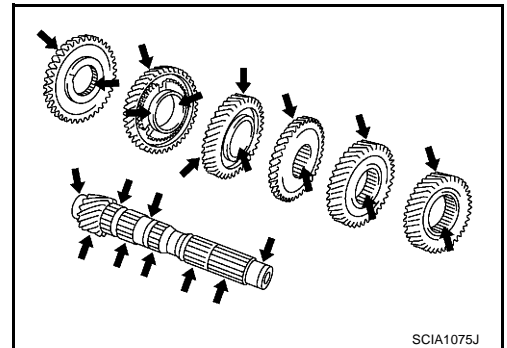


INSPECTION AFTER DISASSEMBLY

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.

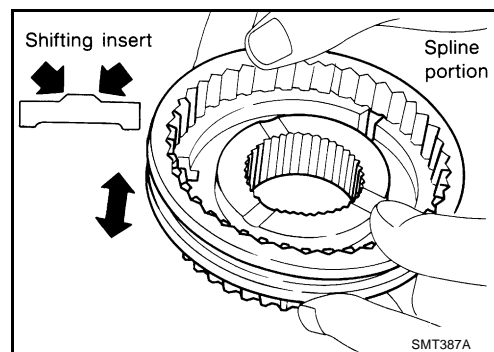


MAINSHAFT AND GEARS

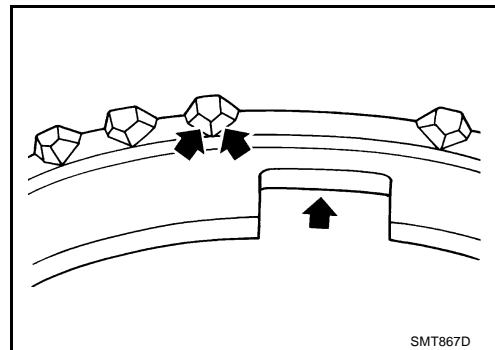
Synchronizer

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.

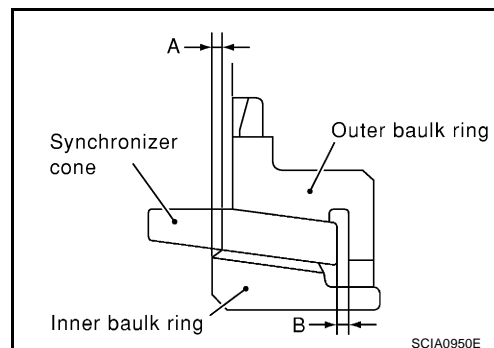


Baulk ring clearance

- Double cone synchronizer (1st)
Follow the instructions below and inspect the clearance of outer baulk ring, synchronizer cone, inner baulk ring.

CAUTION:

Outer baulk ring, synchronizer cone and inner baulk ring control clearances "A" and "B" as a set. Replace them as a set if they are outside the limit value.

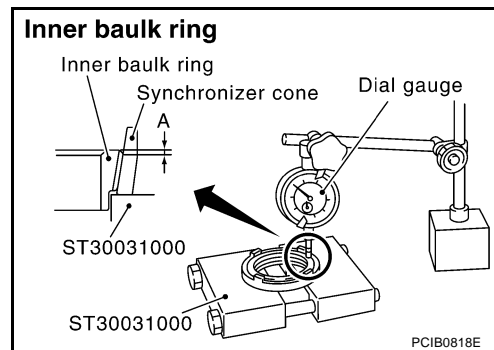


1. Measure clearance A at 2 or more points diagonally opposite using a dial gauge, and calculate mean value.

Clearance A

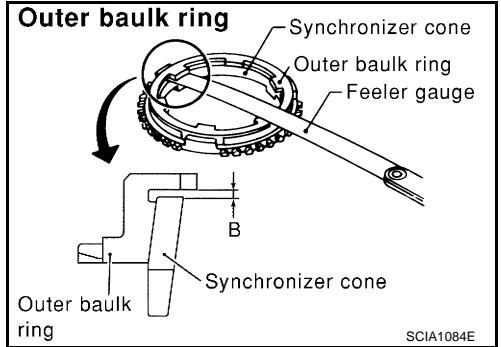
Standard value : 0.6 - 0.8 mm (0.024 - 0.031 in)

Limit value : 0.2 mm (0.008 in)



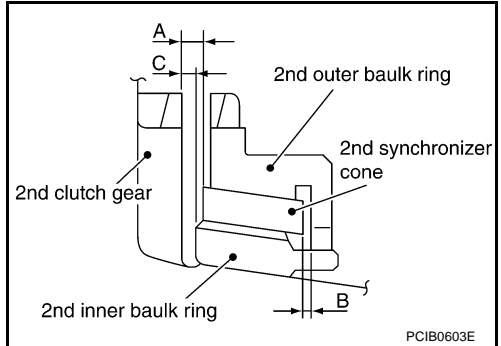
- Measure clearance B at 2 or more points diagonally opposite using a feeler gauge, and calculate mean value.

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



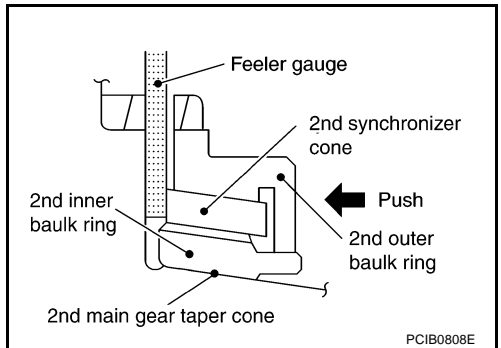
- Triple cone synchronizer (2nd)
 Follow the instructions below and inspect the clearance of outer baulk ring, synchronizer cone, inner baulk ring.

Outer baulk ring, synchronizer cone and inner baulk ring control clearances "A", "B" and "C" as a set. Replace them as a set if they are outside the limit value.



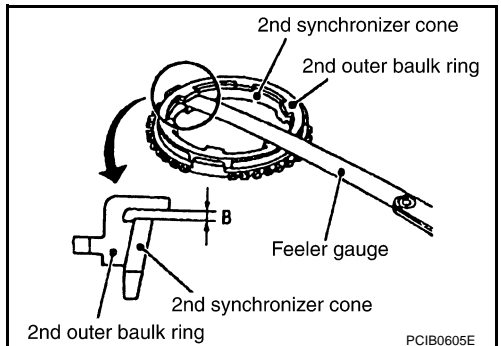
- Measure clearance "A" at 2 points or more on the opposite side using a feeler gauge when pressing baulk ring toward clutch gear taper cone. Then calculate the average.

Standard value : 0.6 - 1.2 mm (0.024 - 0.047 in)
Limit value : 0.3 mm (0.012 in)



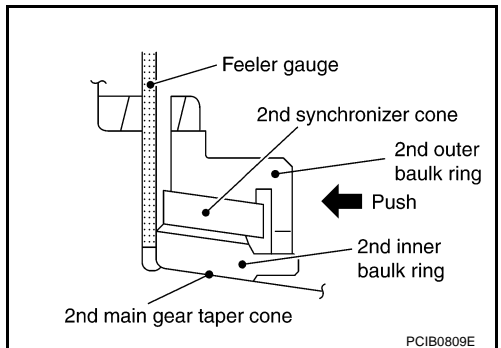
- Measure clearance "B" at 2 points or more on the opposite side using a feeler gauge. Then calculate the average.

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



- Measure clearance "C" at 2 points or more on the opposite side using a feeler gauge when pressing baulk ring toward clutch gear taper cone. Then calculate the average.

Standard value : 0.7 - 1.1 mm (0.028 - 0.043 in)
Limit value : 0.3 mm (0.012 in)

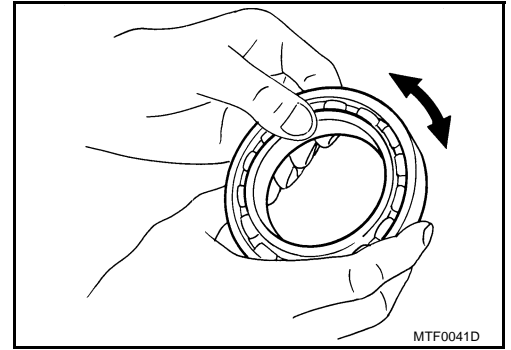


MAINSHAFT AND GEARS

Bearing

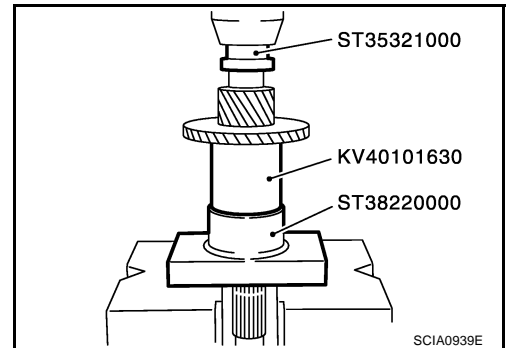
Check items below. If necessary, replace them with new ones.

- Damage and rough rotation of bearing



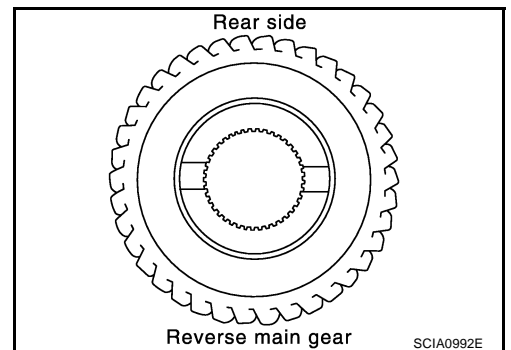
ASSEMBLY

1. Press in reverse main gear using the drifts and the press stand.

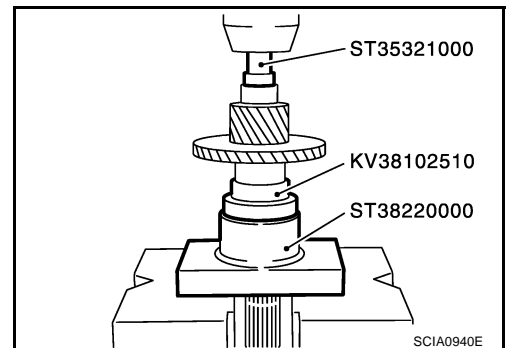


CAUTION:

- Be careful with orientation of reverse main gear.
- Do not reuse reverse main gear.



2. Press in 1st main gear bushing using the drifts and the press stand.
3. Install 1st needle bearing, and then 1st main gear.

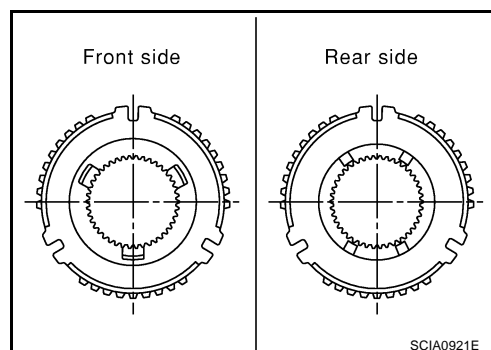


4. Install 1st-2nd spread spring, 1st-2nd shifting insert and a new 1st-2nd synchronizer hub onto a new 1st-2nd coupling sleeve.

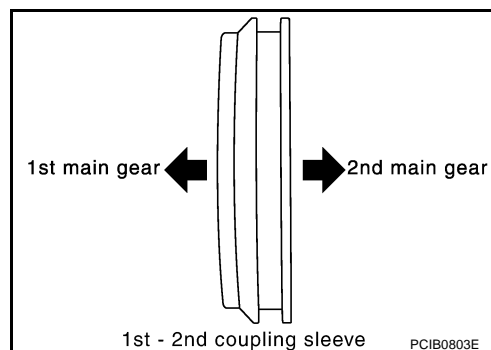
MAINSHAFT AND GEARS

CAUTION:

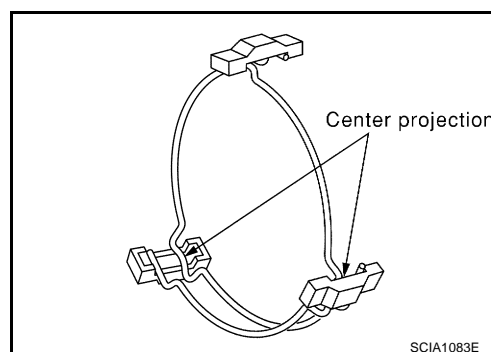
- Be careful with orientation of 1st-2nd synchronizer hub.
- Do not reuse 1st-2nd synchronizer hub.



- Be careful with orientation of 1st-2nd coupling sleeve.
- Do not reuse 1st-2nd coupling sleeve.



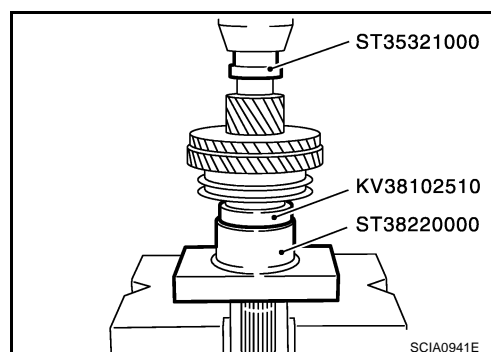
- Be sure not to hook center projection of 2 spread springs on same 1st-2nd shifting insert.



5. Install 1st inner baulk ring, 1st synchronizer cone, 1st outer baulk ring onto mainshaft, and then press in 1st-2nd synchronizer hub assembly onto mainshaft using the drifts and the press stand.

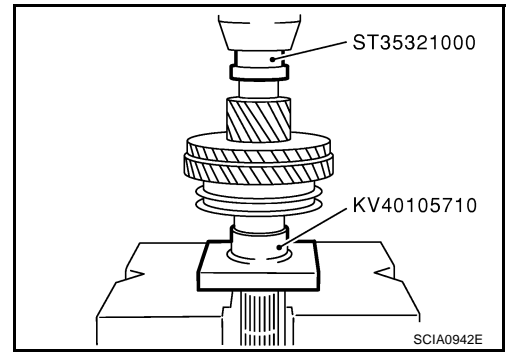
CAUTION:

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



MAINSHAFT AND GEARS

6. Press in 2nd main gear bushing using the drift and the press stand.
7. Install 2nd outer baulk ring, 2nd synchronizer cone, and 2nd inner baulk ring.
8. Install 2nd needle bearing and 2nd main gear.

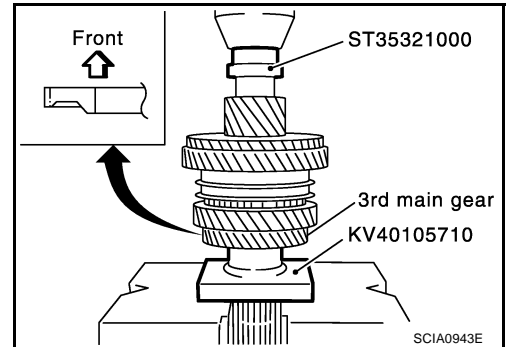


9. Press in a new 3rd main gear using the drift and the press stand.

CAUTION:

- Be careful with orientation of 3rd main gear.
- Do not reuse 3rd main gear.

10. Install 3rd-4th mainshaft spacer.



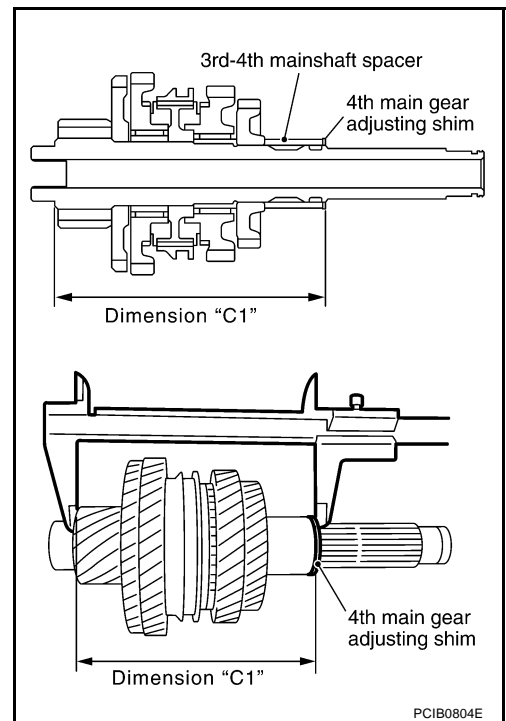
11. Select 4th main gear adjusting shim so that dimension "C1" satisfies the standard value below, and install 4th main gear adjusting shim onto mainshaft. Refer to [MT-101, "4TH MAIN GEAR ADJUSTING SHIM"](#).

Standard value for dimension C1

: 173.85 - 173.95 mm (6.844 - 6.848 in)

CAUTION:

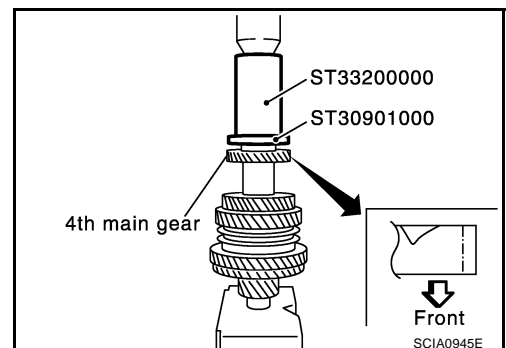
Only one adjusting shim can be selected.



12. Press in a new 4th main gear using the drifts.

CAUTION:

- Be careful with orientation of 4th main gear.
- Do not reuse 4th main gear.

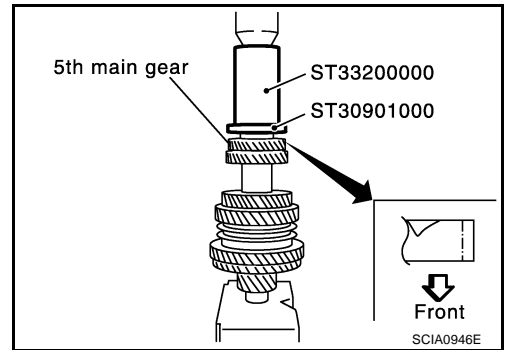


MAINSHAFT AND GEARS

13. Press in a new 5th main gear using the drifts.

CAUTION:

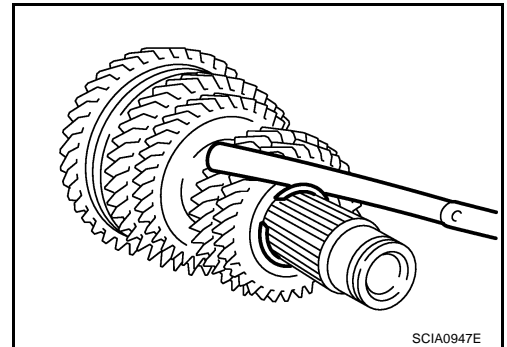
- Be careful with orientation of 5th main gear.
- Do not reuse 5th main gear.



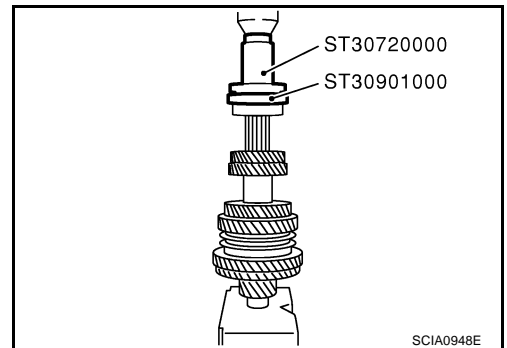
14. Install snap ring onto mainshaft, and check that end play of 5th main gear satisfies the standard value.

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

- If measurement is outside the standard range, reselect snap ring. Refer to [MT-100, "5TH MAIN GEAR"](#).



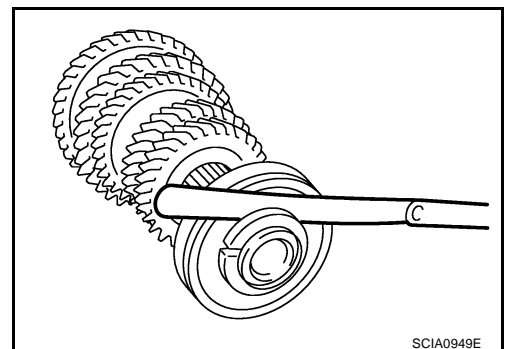
15. Press in mainshaft rear bearing using the drifts.



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

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

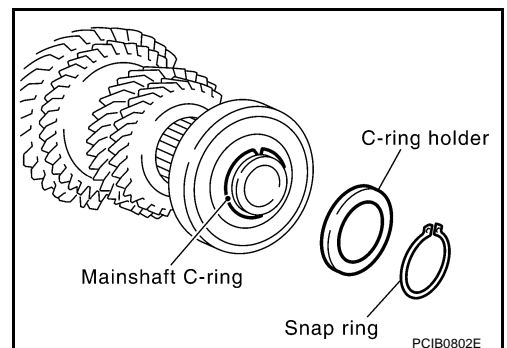
- If measurement is outside the standard range, reselect mainshaft C-ring. Refer to [MT-100, "MAINSHAFT C-RING"](#).



17. Install C-ring holder, and then install a new snap ring.

CAUTION:

Do not reuse snap ring.

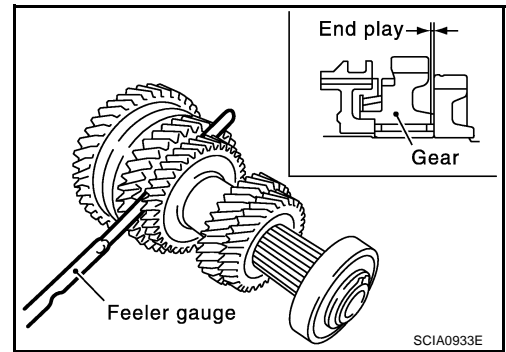


MAINSHAFT AND GEARS

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

End play standard value

- 1st main gear : 0.20 - 0.30 mm (0.0079 - 0.0118 in)
2nd main gear : 0.06 - 0.16 mm (0.0024 - 0.0063 in)



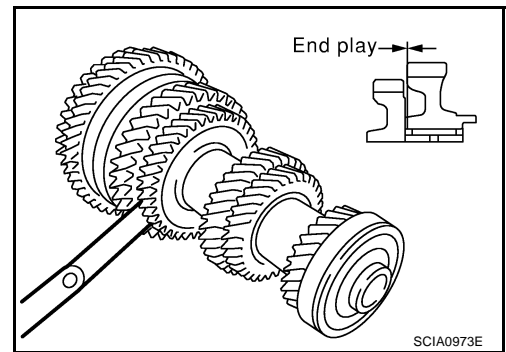
ECS008C7

Assembly and Disassembly (RS6F51A) DISASSEMBLY

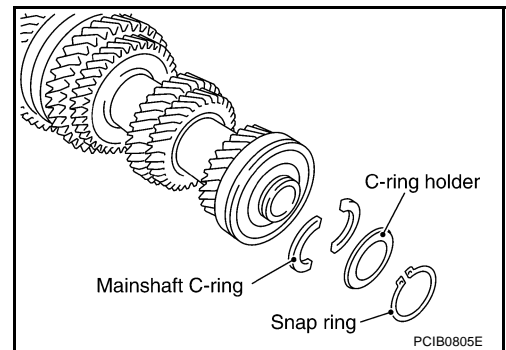
1. Before disassembling, measure the end play of 1st and 2nd main gears.

End play standard value

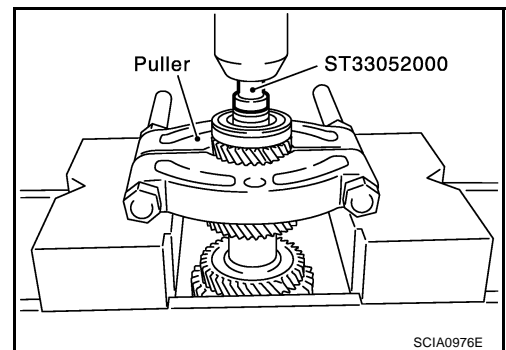
- 1st main gear : 0.20 - 0.30 mm (0.0079 - 0.0118 in)
2nd main gear : 0.06 - 0.16 mm (0.0024 - 0.0063 in)



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

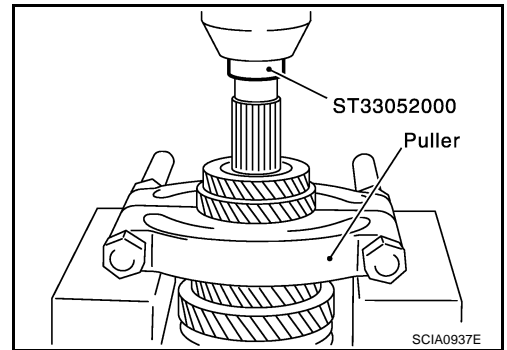


4. Press out mainshaft rear bearing, 6th main adjusting shim and 6th main gear using the drift and a puller.
5. Remove 5th-6th mainshaft spacer.

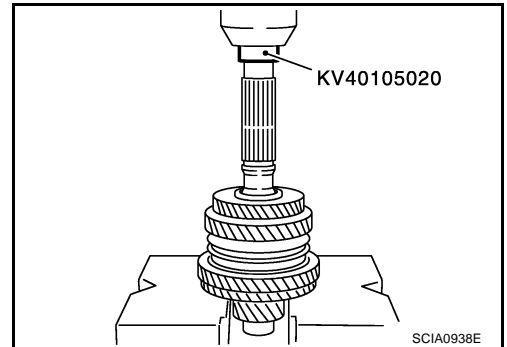


MAINSHAFT AND GEARS

6. Press out 4th main gear and 5th main gear using the drift and a puller.
7. Remove 4th main gear adjusting shim.
8. Remove 3rd-4th mainshaft spacer.



9. Press out 3rd main gear, 2nd main gear, 2nd needle bearing, 2nd main gear bushing, 1st-2nd synchronizer hub assembly, 1st main gear, 1st needle bearing, and 1st main gear bushing reverse main gear using the drift.

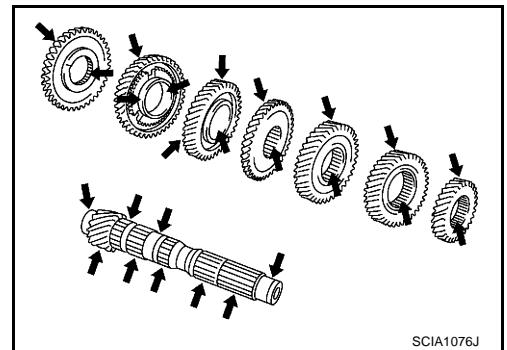


INSPECTION AFTER DISASSEMBLY

Mainshaft and Gears

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

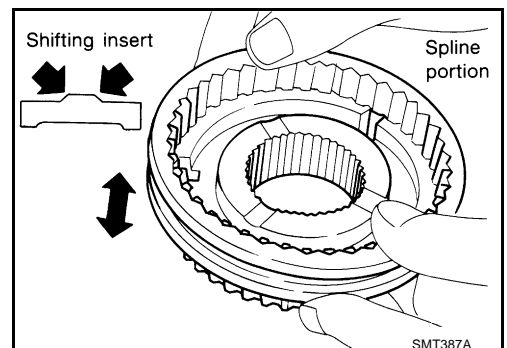
- Damage, peeling, dent, uneven wear, bending, and other non-standard conditions of the shaft.
- Excessive wear, damage, peeling, and other non-standard conditions of the gears.



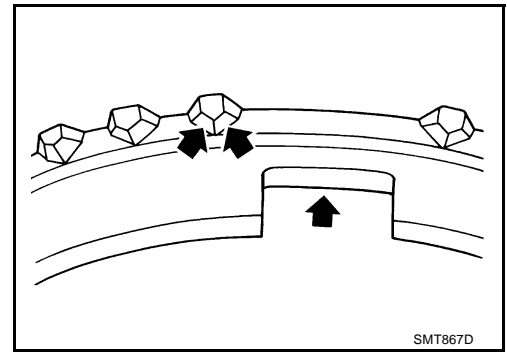
Synchronizer

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.

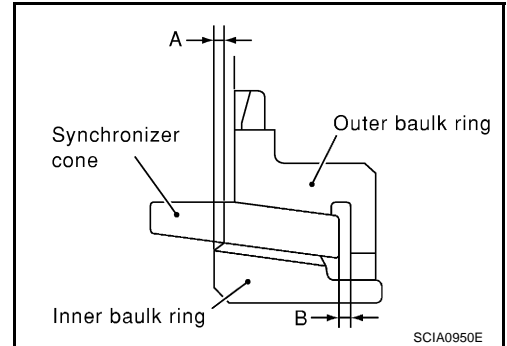


Baulk ring clearance

- Double cone synchronizer (1st)
Follow the instructions below and inspect the clearance of outer baulk ring, synchronizer cone, inner baulk ring.

CAUTION:

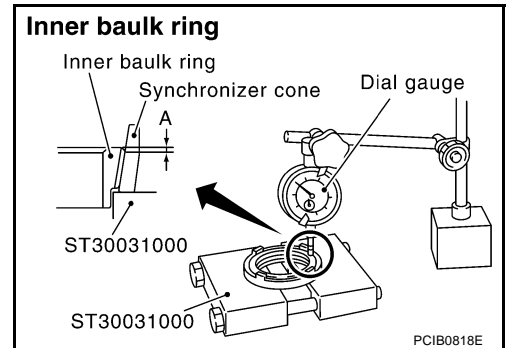
Outer baulk ring, synchronizer cone, and inner baulk ring control clearances "A" and "B" as a set. Replace them as a set if they are outside the limit value.



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

Clearance A

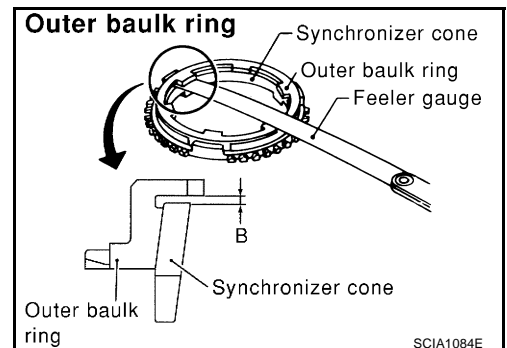
Standard value : 0.6 - 0.8 mm (0.024 - 0.031 in)
Limit value : 0.2 mm (0.008 in)



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

Clearance B

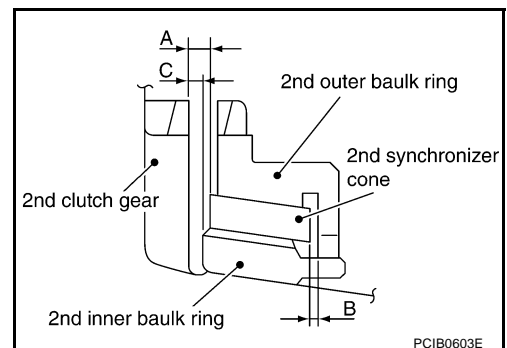
Standard value : 0.6 - 1.1 mm (0.024 - 0.043 in)
Limit value : 0.2 mm (0.008 in)



- Triple cone synchronizer (2nd)
Follow the instructions below and inspect the clearance of outer baulk ring, synchronizer cone, inner baulk ring.

CAUTION:

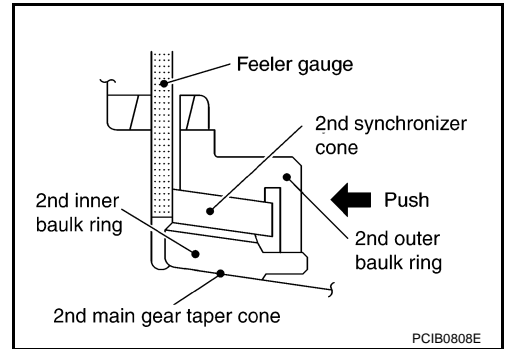
Outer baulk ring, synchronizer cone and inner baulk ring control clearances "A", "B" and "C" as a set. Replace them as a set if they are outside the limit value.



1. Measure clearance "A" at 2 points or more on the opposite side using a feeler gauge when pressing baulk ring toward clutch gear taper cone. Then calculate the average.

Standard value : 0.6 - 1.2 mm (0.024- 0.047)

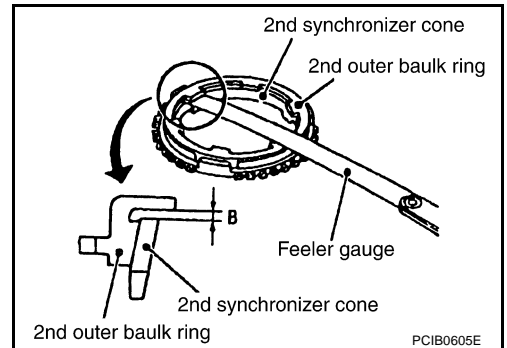
Limit value : 0.3 mm (0.012 in)



2. Measure clearance "B" at 2 points or more on the opposite side using a feeler gauge. Then calculate the average.

Standard value : 0.6 - 1.1 mm (0.024 - 0.043)

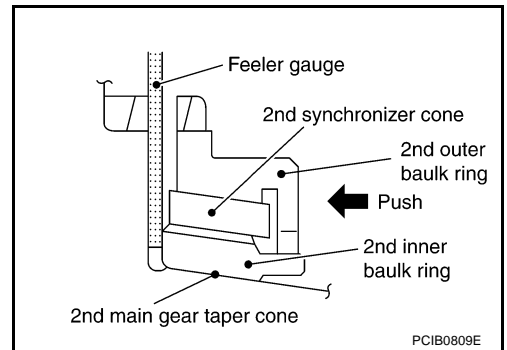
Limit value : 0.2 mm (0.008 in)



3. Measure clearance "C" at 2 points or more on the opposite side using a feeler gauge when pressing baulk ring toward clutch gear taper cone. Then calculate the average.

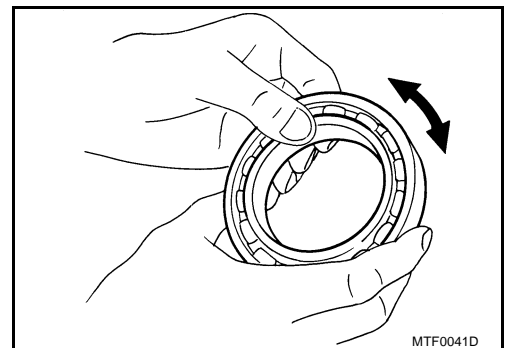
Standard value : 0.7 - 1.1 mm (0.028 - 0.043 in)

Limit value : 0.3 mm (0.012 in)



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

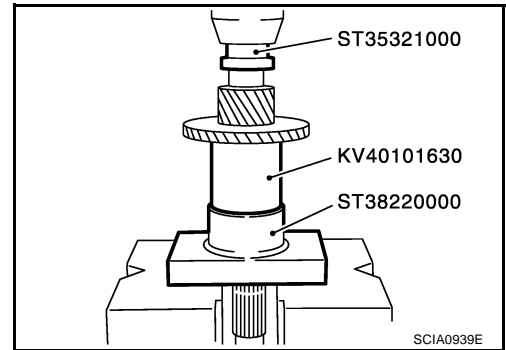
- Damage and rough rotation of bearing



MAINSHAFT AND GEARS

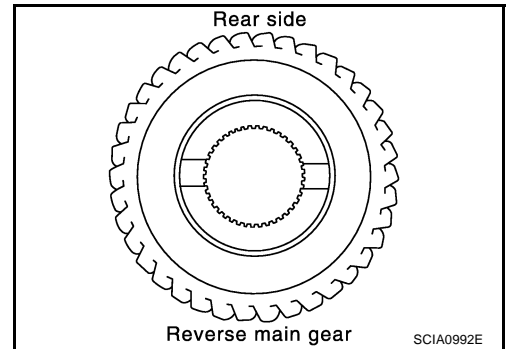
ASSEMBLY

1. Press in reverse main gear using the drifts and the press stand.

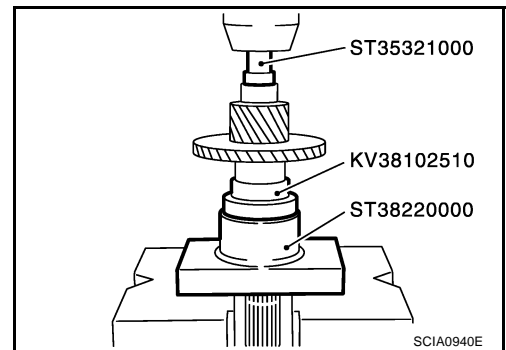


CAUTION:

- Be careful with orientation of reverse main gear.
- Do not reuse reverse main gear.



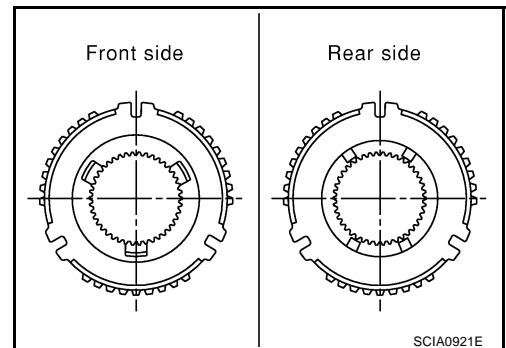
2. Press in 1st main gear bushing using the drifts and the press stand.
3. Install 1st needle bearing, and then 1st main gear.



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

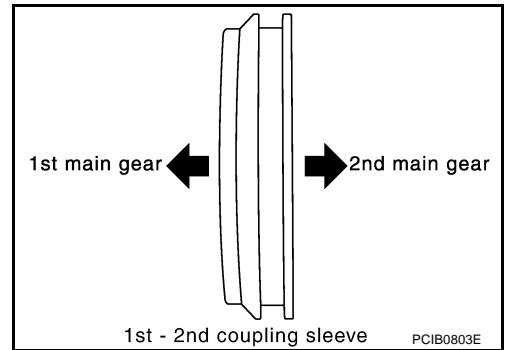
CAUTION:

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

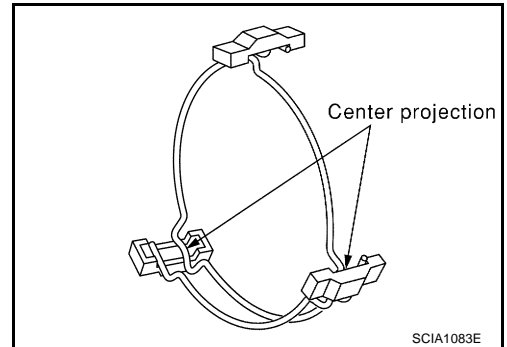


MAINSHAFT AND GEARS

- Be careful with orientation of 1st-2nd coupling sleeve.
- Do not reuse 1st-2nd coupling sleeve.



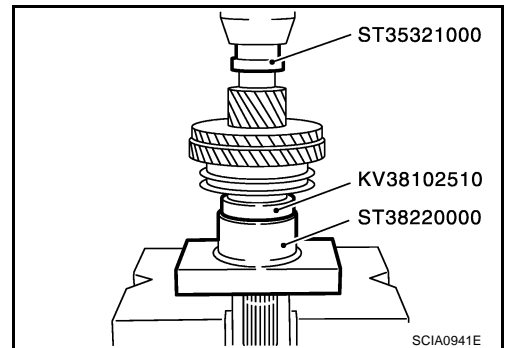
- Be sure not to hook center projection of 2 spread springs on same 1st-2nd shifting insert.



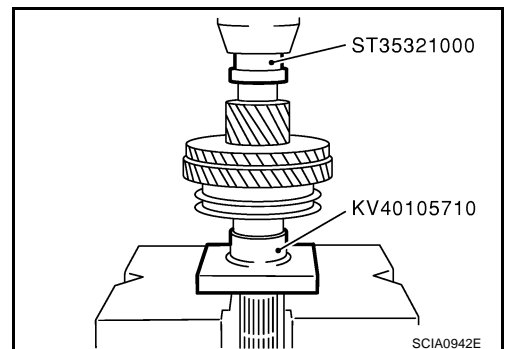
5. Install 1st inner baulk ring, 1st synchronizer cone, 1st outer baulk ring onto mainshaft, and then press in 1st-2nd synchronizer hub assembly onto mainshaft using the drifts and the press stand.

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. Press in 2nd main gear bushing using the drift and the press stand.
7. Install 2nd outer baulk ring, 2nd synchronizer cone, and 2nd inner baulk ring.
8. Install 2nd needle bearing and 2nd main gear.

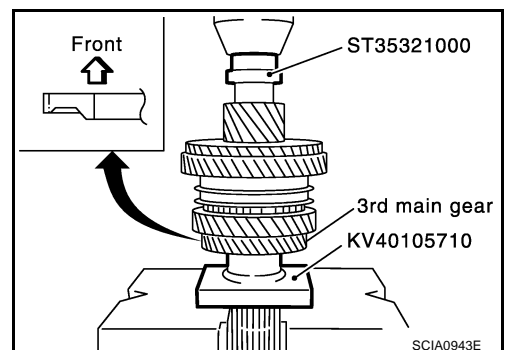


9. Press in a new 3rd main gear using the drift and the press stand.

CAUTION:

- Be careful with orientation of 3rd main gear.
- Do not reuse 3rd main gear.

10. Install 3rd-4th mainshaft spacer.



MAINSHAFT AND GEARS

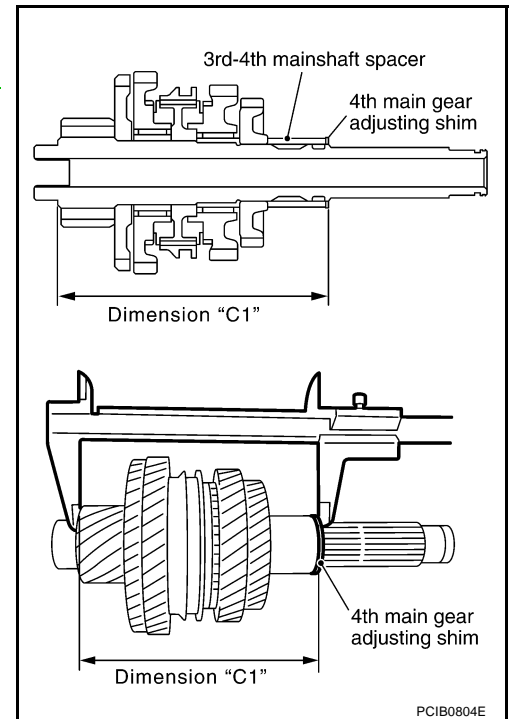
11. Select 4th main gear adjusting shim so that dimension "C1" satisfies the standard value below, and install 4th main gear adjusting shim onto mainshaft. Refer to [MT-101, "4TH MAIN GEAR ADJUSTING SHIM"](#).

Standard value for dimension C1

: 173.85 - 173.95 mm (6.844 - 6.848 in)

CAUTION:

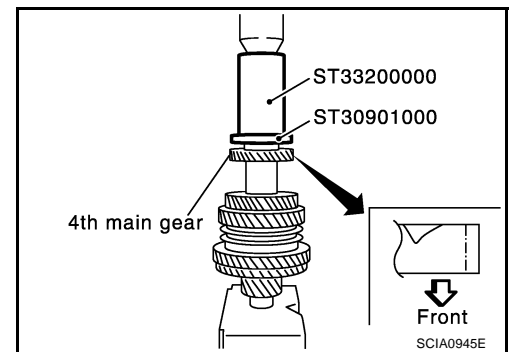
Only one adjusting shim can be selected.



12. Press in a new 4th main gear using the drifts.

CAUTION:

- Be careful with orientation of 4th main gear.
- Do not reuse 4th main gear.

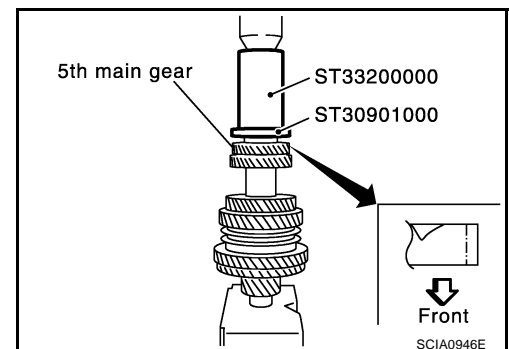


13. Press in a new 5th main gear using the drifts.

CAUTION:

- Be careful with orientation of 5th main gear.
- Do not reuse 5th main gear.

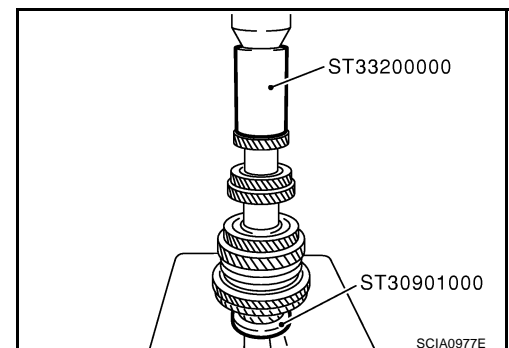
14. Install 5th-6th mainshaft spacer.



15. Press in 6th main gear using the drifts.

CAUTION:

Do not reuse 6th main gear.



MAINSHAFT AND GEARS

16. Select 6th main adjusting shim and then install it onto mainshaft.

- Calculate thickness “S” of 6th main adjusting shim following the procedure below so that end play dimension between 6th main gear and mainshaft rear bearing becomes the dimension shown below. Refer to [MT-102, "6TH MAIN GEAR ADJUSTING SHIM"](#).

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

Dimension “S” = (S₁ - S₂) - End play

S: Thickness of adjusting shim

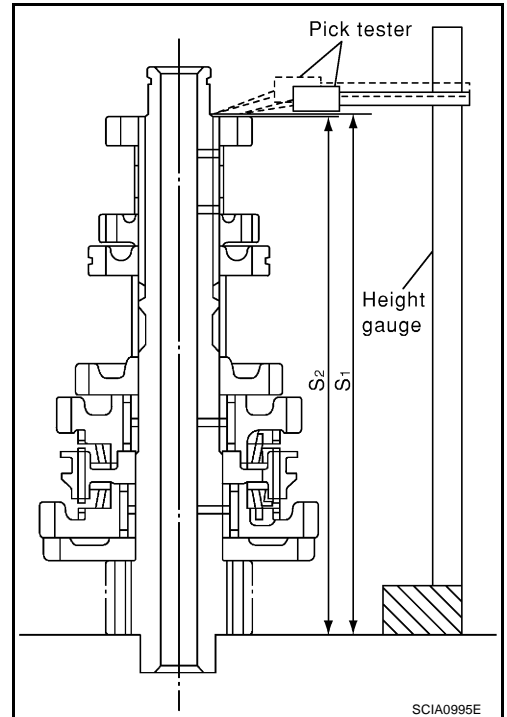
S₁: Dimension from mainshaft standard face to mainshaft rear bearing press-fit end face

S₂: Dimension from mainshaft standard face to 6th main gear end face

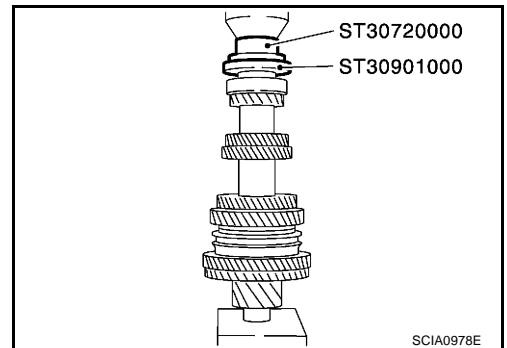
CAUTION:

Only one adjusting shim can be selected.

- Using height gauge, measure dimension “S₁” and “S₂”.
- Install selected 6th main adjusting shim to mainshaft.



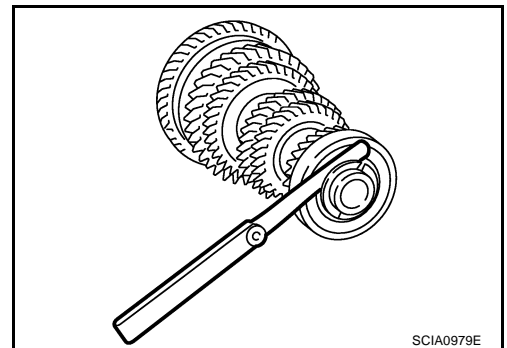
17. Press in mainshaft rear bearing using the drifts.



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

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

- If measurement is outside the standard range, reselect mainshaft C-ring. Refer to [MT-100, "MAINSHAFT C-RING"](#).

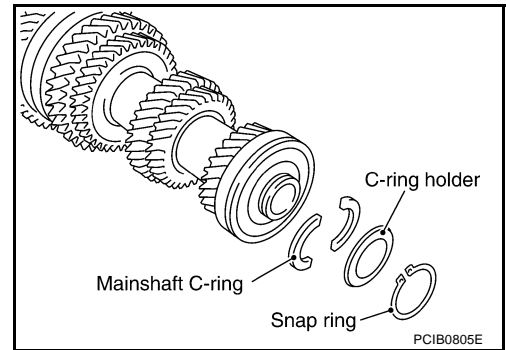


MAINSHAFT AND GEARS

19. Install C-ring holder, and then install a new snap ring.

CAUTION:

Do not reuse snap ring.

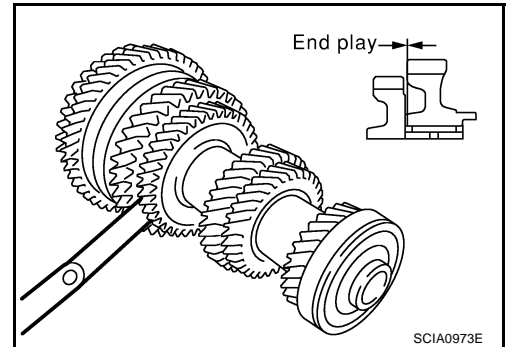


20. Check end play of 1st and 2nd main gears.

End play standard value

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

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



REVERSE IDLER SHAFT AND GEARS

REVERSE IDLER SHAFT AND GEARS

PFP:32281

Assembly and Disassembly (RS5F51A) DISASSEMBLY

ECS008C8

1. Remove reverse idler gear adjusting shim.
2. Remove reverse idler gear (rear), reverse coupling sleeve and reverse 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. Remove retaining pin from reverse idler shaft.

CAUTION:

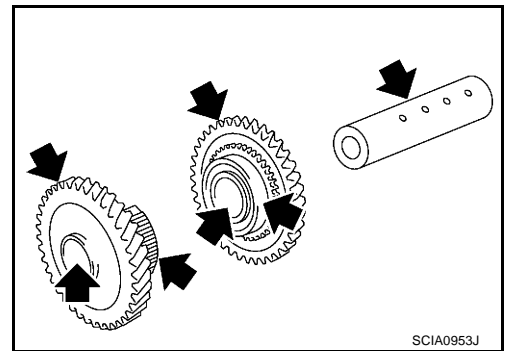
Do not reuse retaining pin.

INSPECTION AFTER DISASSEMBLY

Reverse Idler Shaft and Gears

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

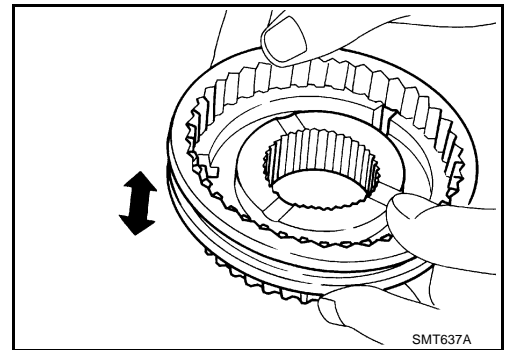
- Damage, peeling, dent, uneven wear, bending, and other non-standard conditions of the shaft.
- Excessive wear, damage, peeling, and other non-standard conditions of the gears.



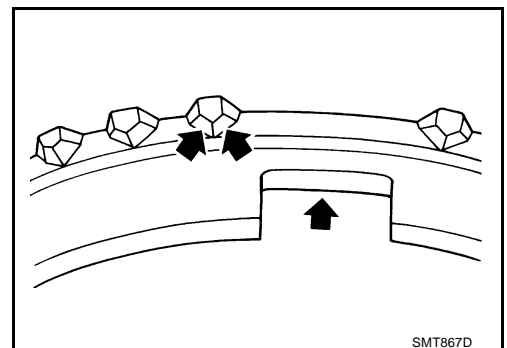
Synchronizer

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

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



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



REVERSE IDLER SHAFT AND GEARS

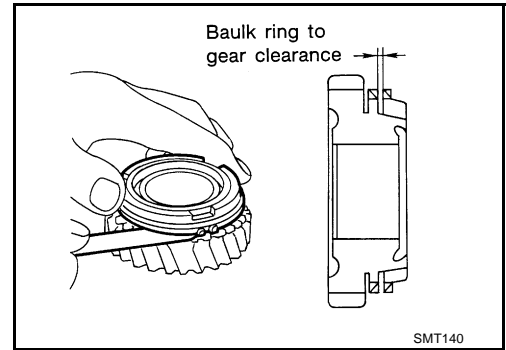
Baulk ring clearance

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

Clearance

Standard value : 0.95 - 1.4 mm (0.037 - 0.055 in)

Limit value : 0.7 mm (0.028 in)



Bearing

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

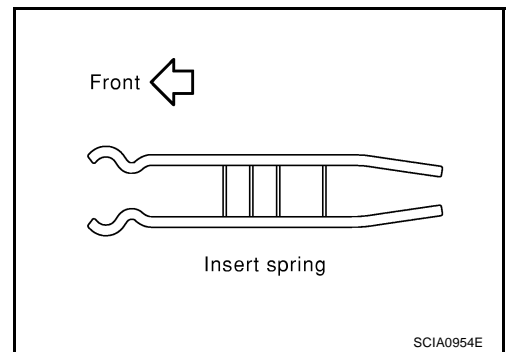
- Damage and rough rotation of bearing.

ASSEMBLY

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

CAUTION:

- Be careful with orientation of reverse insert spring.



Assembly and Disassembly (RS6F51A)

DISASSEMBLY

1. Remove reverse idler gear adjusting shim.
2. Remove reverse idler gear (rear), reverse coupling sleeve and reverse 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. Remove retaining pin from reverse idler shaft.

CAUTION:

Do not reuse retaining pin.

ECS008C9

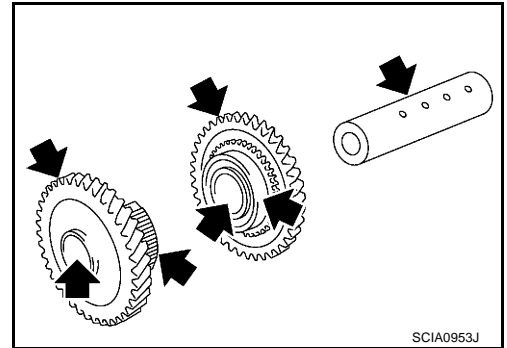
REVERSE IDLER SHAFT AND GEARS

INSPECTION AFTER DISASSEMBLY

Reverse Idler Shaft and Gears

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

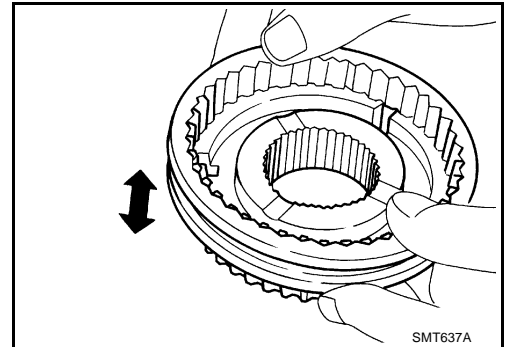
- Damage, peeling, dent, uneven wear, bending, and other non-standard conditions of the shaft.
- Excessive wear, damage, peeling, and other non-standard conditions of the gears.



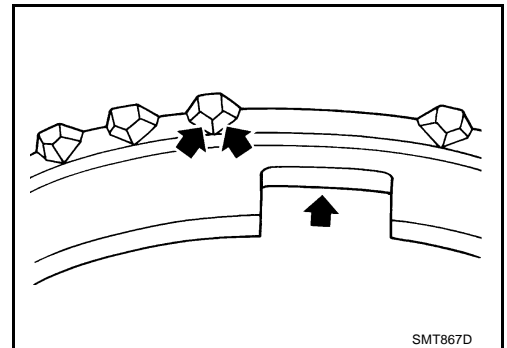
Synchronizer

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

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



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



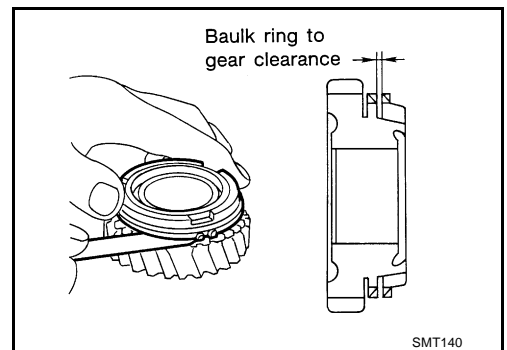
Baulk ring clearance

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

Clearance

Standard value : 0.95 - 1.4 mm (0.037 - 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.

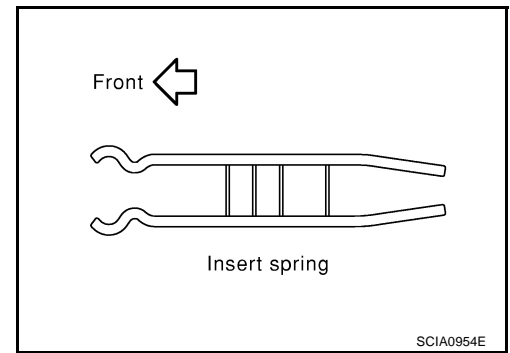
ASSEMBLY

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

REVERSE IDLER SHAFT AND GEARS

CAUTION:

- Be careful with orientation of reverse insert spring.



FINAL DRIVE

FINAL DRIVE

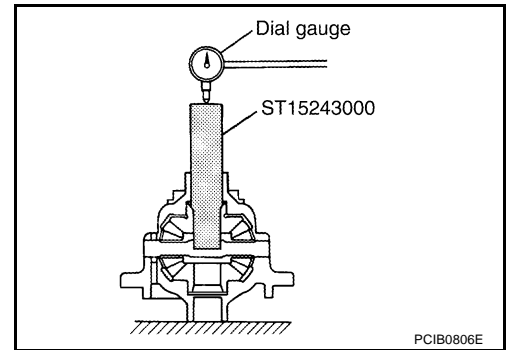
PFP:38411

Assembly and Disassembly (RS5F51A)

ECS008CA

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.



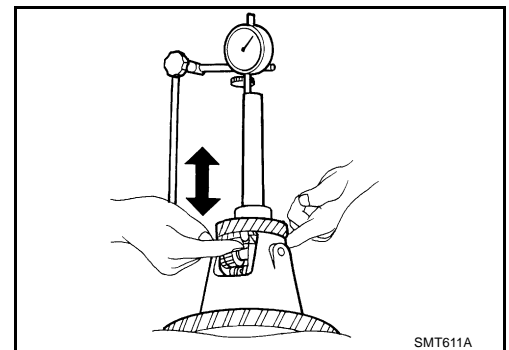
2. Upright differential case so that side gear to be measured faces upward.
3. Place the drift below and a dial gauge onto side gear. Move side gear up and down, and measure the clearance.

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

CAUTION:

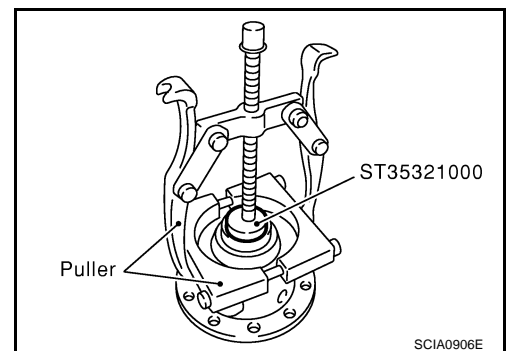
There should be no resistance and gears should rotate freely.

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

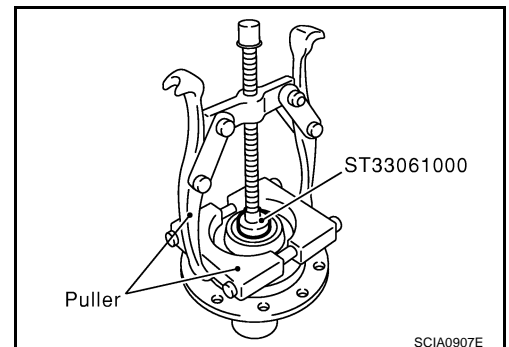


DISASSEMBLY

1. Remove final gear mounting bolts, and then separate the final gear from differential case.
2. Remove differential side bearing (clutch housing side) using the drift and pullers.

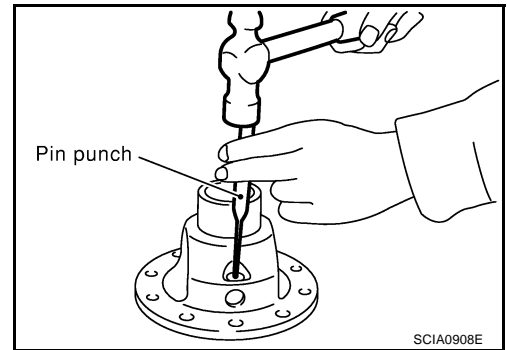


3. Remove differential side bearing (transaxle case side) using the drift and pullers.



FINAL DRIVE

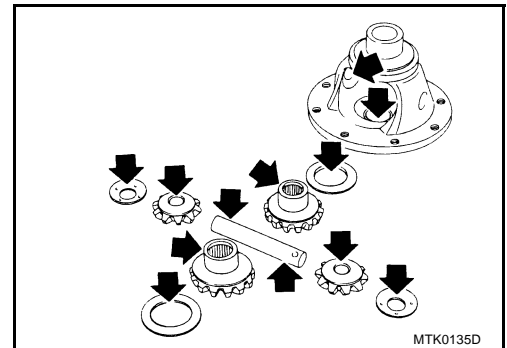
4. Remove retaining pin from differential case, and then remove pinion mate shaft using a pin punch.
5. Rotate pinion mate gears, and remove pinion mate gears, pinion mate thrust washers, side gears, and side gear thrust washers from differential case.



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.

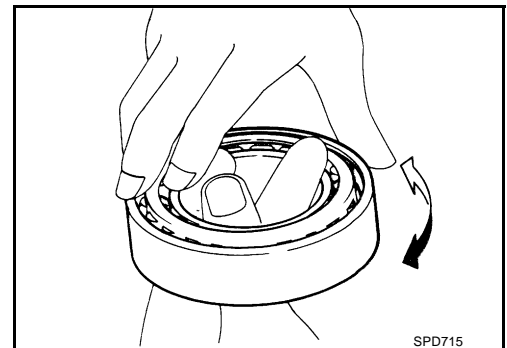


Bearing

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

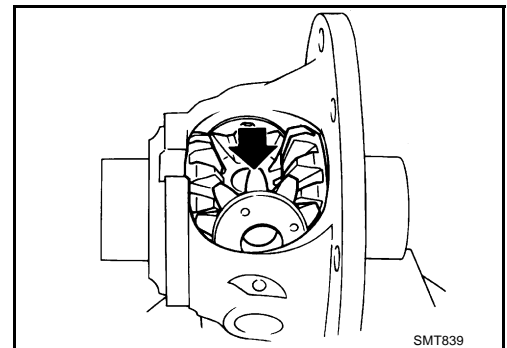
CAUTION:

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, aligning them diagonally, install them into differential case.

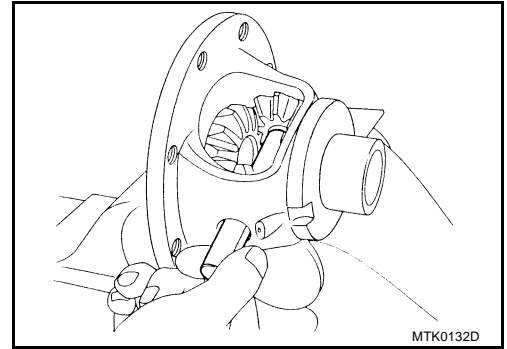


FINAL DRIVE

4. Insert pinion mate shaft into differential case.

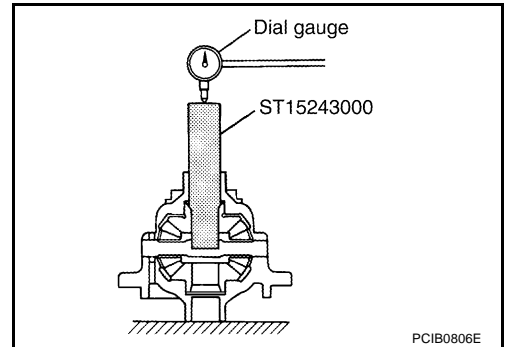
CAUTION:

Be sure not to damage pinion mate thrust washers.



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

- Upright the differential case so that its side gear to be measured faces upward.
- Place the drift below and a dial gauge onto side gears.



- Move side gears up and down to measure end play, and select thrust washer so that it satisfies the standard value. Refer to [MT-101, "DIFFERENTIAL SIDE GEAR THRUST WASHER"](#).

End play standard value

: 0.1 - 0.2 mm (0.004 - 0.008 in)

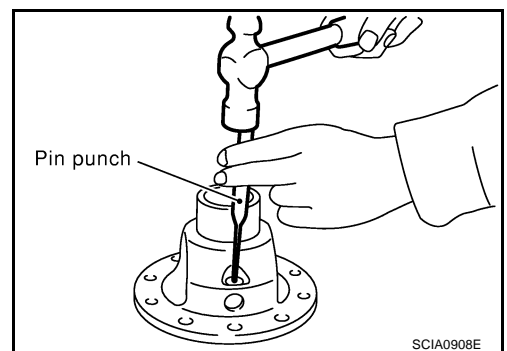
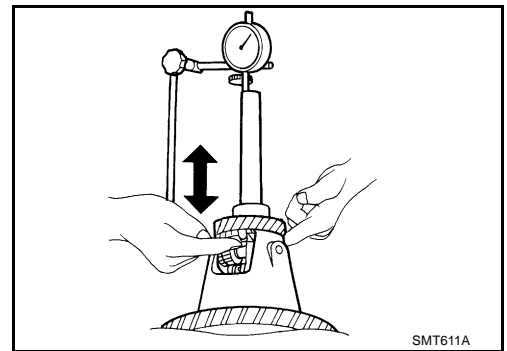
CAUTION:

- There should be no resistance and gears should rotate freely.
- Place differential case upside down. Be sure to measure end play for opposite side-gears likewise.
- Only one thrust washer can be selected.

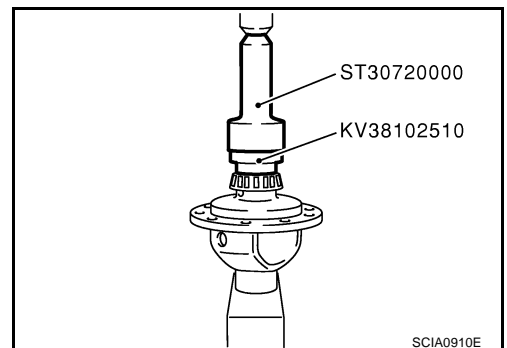
6. Install a new retaining pin into pinion mate shaft using a pin punch.

CAUTION:

Do not reuse retaining pin.

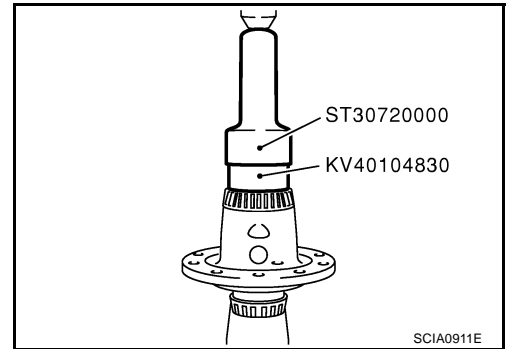


7. Press in differential side bearing (transaxle case side) to differential case using the drifts.

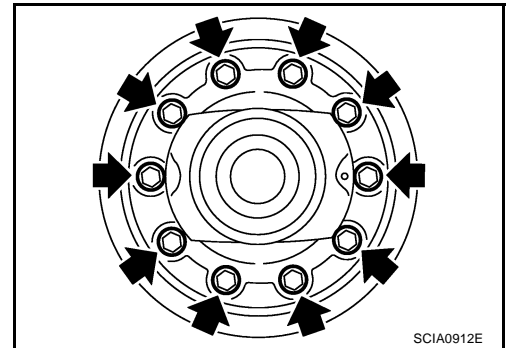


FINAL DRIVE

- Press in differential side bearing (clutch housing side) to differential case using the drifts.

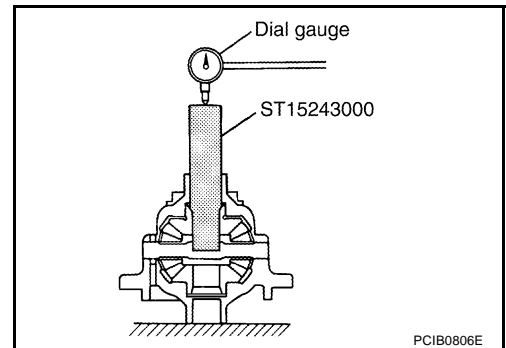


- Install final gear into differential case, and tighten final gear mounting bolts to the specified torque. Refer to [MT-23, "FINAL DRIVE COMPONENTS"](#).



Assembly and Disassembly (RS6F51A) PRE-INSPECTION

- Check the clearance between side gear and differential case as follows.
- Clean final drive assembly sufficiently to prevent side gear thrust washer, differential case, side gear, and other parts from sticking by gear oil.



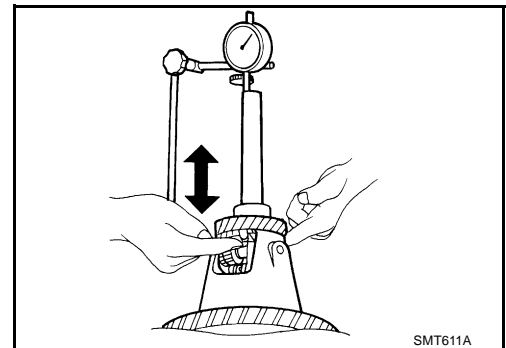
- Upright differential case so that side gear to be measured faces upward.
- Place the drift below and a dial gauge onto side gear. Move side gear up and down, and measure the clearance.

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

CAUTION:

There should be no resistance and gears should rotate freely.

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

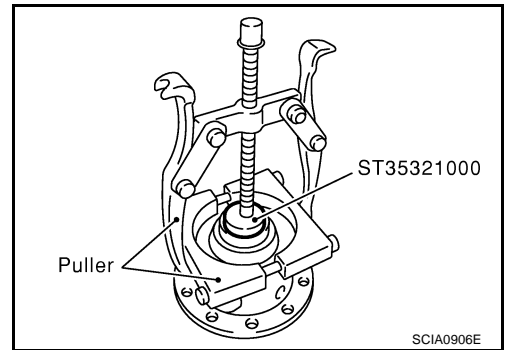


DISASSEMBLY

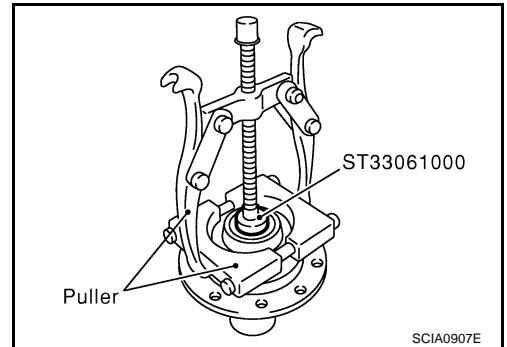
- Remove final gear mounting bolts, and then separate the final gear from differential case.

FINAL DRIVE

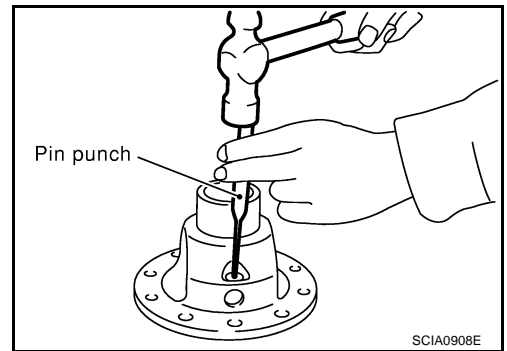
2. Remove differential side bearing (clutch housing side) using the drift and pullers.



3. Remove differential side bearing (transaxle case side) using the drift and pullers.



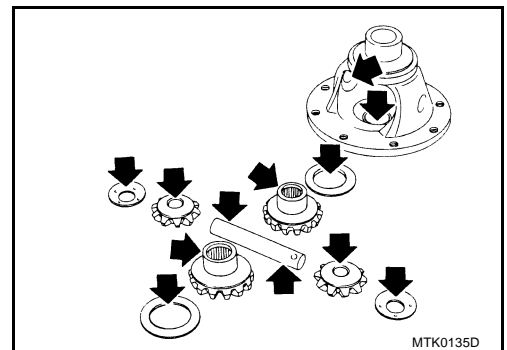
4. Remove retaining pin from differential case, and then remove pinion mate shaft using a pin punch.
5. Rotate pinion mate gears, and remove pinion mate gears, pinion mate thrust washers, side gears, and side gear thrust washers from differential case.



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.



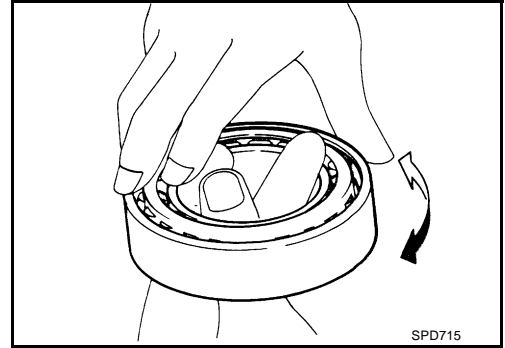
FINAL DRIVE

Bearing

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

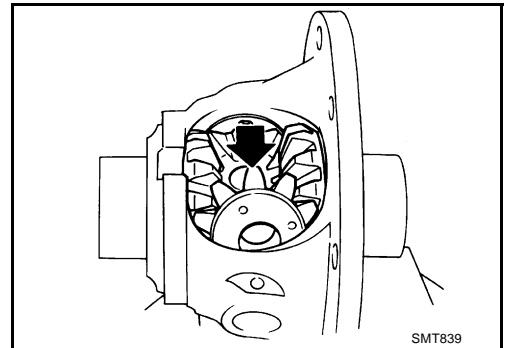
CAUTION:

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



ASSEMBLY

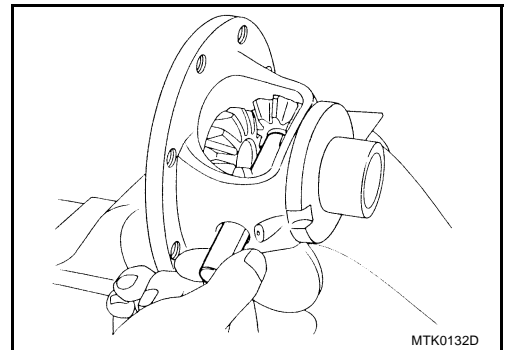
1. Apply gear oil to sliding area of differential case, each gear, and thrust washer.
2. Install side gear thrust washers and side gears into differential case.
3. While rotating pinion mate thrust washers and pinion mate gears, aligning them diagonally, install them into differential case.



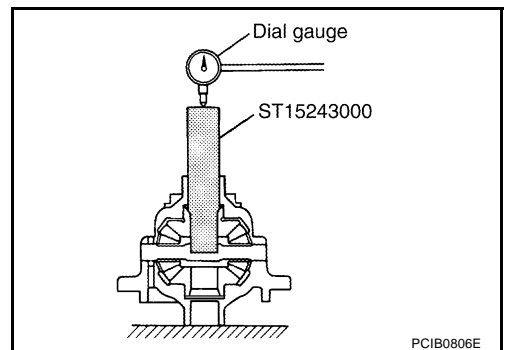
4. Insert pinion mate shaft into differential case.

CAUTION:

Be sure not to damage pinion mate thrust washers.



5. Measure end play of side gears following the 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 the drift below and a dial gauge onto side gears.



FINAL DRIVE

- c. Move side gears up and down to measure end play, and select thrust washer so that it satisfies the standard value. Refer to [MT-101, "DIFFERENTIAL SIDE GEAR THRUST WASHER"](#).

End play standard value

: 0.1 - 0.2 mm (0.004 - 0.008 in)

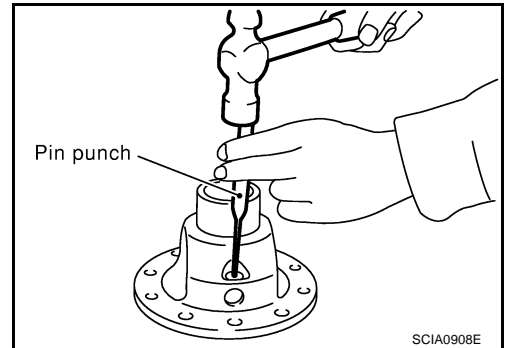
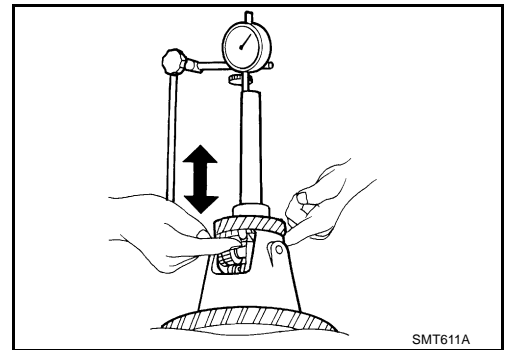
CAUTION:

- There should be no resistance and gears should rotate freely.
- Place differential case upside down. Be sure to measure end play for opposite side-gears likewise.
- Only one thrust washer can be selected.

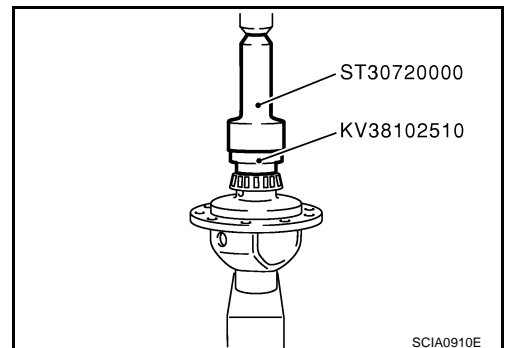
6. Install a new retaining pin into pinion mate shaft using a pin punch.

CAUTION:

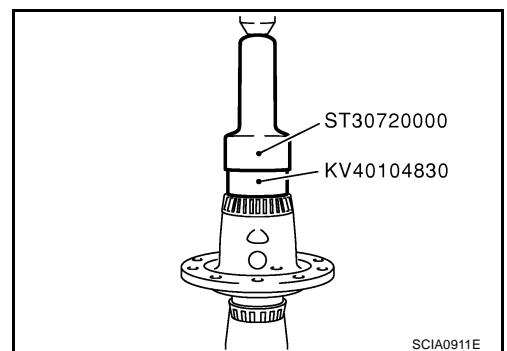
Do not reuse retaining pin.



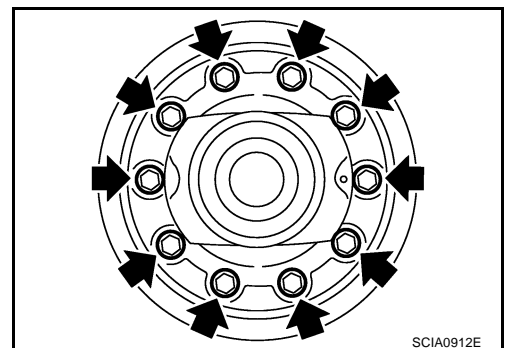
7. Press in differential side bearing (transaxle case side) to differential case using the drifts.



8. Press in differential side bearing (clutch housing side) to differential case using the drifts.



9. Install final gear into differential case, and tighten final gear mounting bolts to the specified torque. Refer to [MT-28, "FINAL DRIVE COMPONENTS"](#).



SHIFT CONTROL

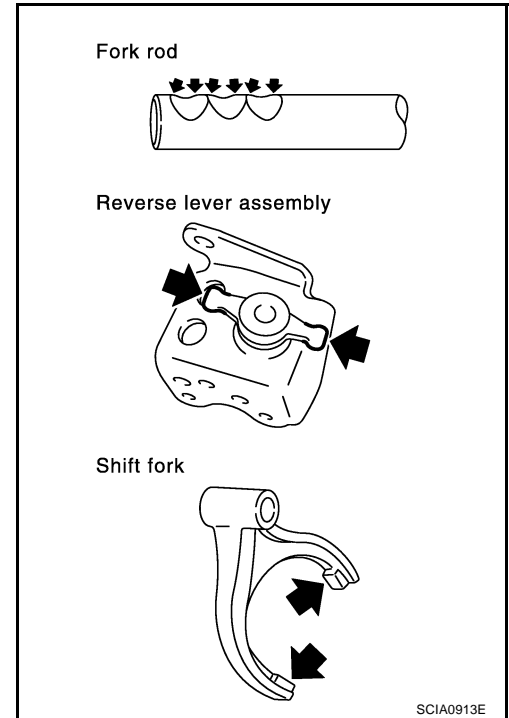
SHIFT CONTROL

PFP:32982

Inspection (RS5F51A)

ECS008CC

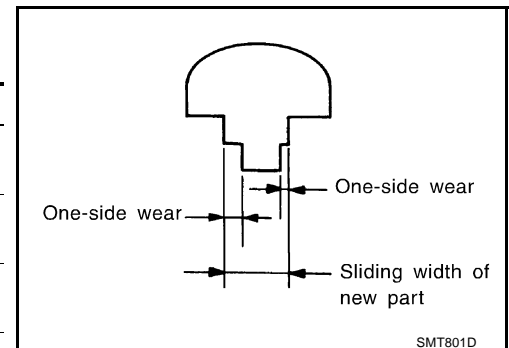
- Check contact surfaces and sliding area for wear, damage, bending, etc. If necessary, replace parts.



SHIFT FORK

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

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

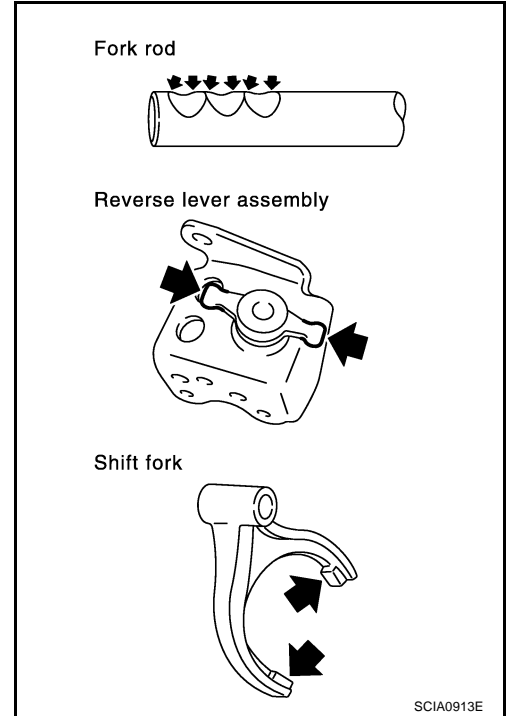


SHIFT CONTROL

Inspection (RS6F51A)

ECS008CD

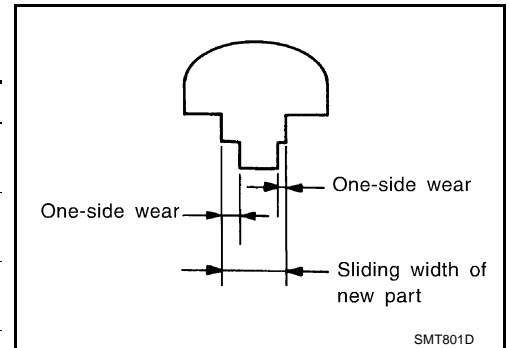
- Check contact surfaces and sliding area for wear, damage, bending, etc. If necessary, replace parts.



SHIFT FORK

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

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



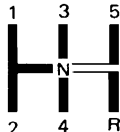
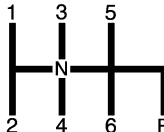
SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

General Specifications TRANSAXLE

ECS008CE

Engine			QR20DE	QR25DE	YD22DDTi	
Transaxle model			RS5F51A		RS6F51A	
Model code number			EQ000	EQ008	EQ068	
Number of speed			5		6	
Synchromesh type			Warner			
Shift pattern			5 speed			 SCIA0821E
			6 speed			 SCIA0955E
Gear ratio	1st		3.500	3.416	3.500	
	2nd		1.944			
	3rd		1.258			
	4th		0.947			
	5th		0.772	0.733	0.772	
	6th		—		0.630	
	Reverse		3.374	3.252	3.374	
Number of teeth	Input gear	1st	14	12	14	
		2nd	18			
		3rd	31			
		4th	38			
		5th	44	45	44	
		6th	—		46	
		Reverse	14	12	14	
	Main gear	1st	49	41	49	
		2nd	35			
		3rd	39			
		4th	36			
		5th	34	33	34	
		6th	—		29	
		Reverse	38			
	Reverse idler gear	Front	37			
		Rear	46	38	46	
Oil capacity ℓ (Imp pt)			2.3 (4)			

SERVICE DATA AND SPECIFICATIONS (SDS)

Engine	QR20DE	QR25DE	YD22DDTi
Transaxle model	RS5F51A		RS6F51A
Model code number	EQ000	EQ008	EQ068
Remarks	Reverse synchronizer	Installed	
	Double-cone synchronizer	1st	
	Triple-cone synchronizer	2nd	

FINAL GEAR

Engine	QR20DE	QR25DE	YD22DDTi
Transaxle model	RS5F51A		RS6F51A
Model code number	EQ000	EQ008	EQ068
Final gear ratio	4.750	4.428	
Number of teeth	Final gear/Pinion	76/16	62/14
	Side gear/Pinion mate gear	14/10	

End Play

ECS008CF

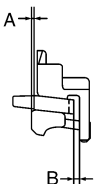
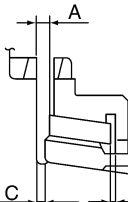
Unit: mm (in)

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 (For RS6F51A model)	0.06 - 0.16 (0.0024 - 0.0063)

Baulk Ring Clearance

ECS00CV4

Unit: mm (in)

Measurement point	Standard	Limit value
1st (Double-cone synchronizer) <ul style="list-style-type: none"> ● Clearance between synchronizer cone and inner baulk ring end face "A" ● Clearance between outer baulk ring pawl and synchronizer cone "B"  <p>PCIB0249E</p>	A: 0.6 - 0.8 (0.024 - 0.031) B: 0.6 - 1.1 (0.024 - 0.043)	0.2 (0.008) 0.2 (0.008)
2nd (Triple-cone synchronizer) <ul style="list-style-type: none"> ● Clearance between synchronizer cone and clutch gear end face "A" ● Clearance between outer baulk ring pawl and synchronizer cone "B" ● Clearance between inner baulk ring and clutch gear end face "C"  <p>PCIB0772E</p>	A: 0.6 - 1.2 (0.024 - 0.047) B: 0.6 - 1.1 (0.024 - 0.043) C: 0.7 - 1.1 (0.028 - 0.043)	0.3 (0.012) 0.2 (0.008) 0.3 (0.012)
3rd&4th	0.9 - 1.45 (0.035 - 0.057)	0.7 (0.028)

SERVICE DATA AND SPECIFICATIONS (SDS)

Measurement point	Standard	Limit value
5th	0.95 - 1.4 (0.037 - 0.055)	0.7 (0.028)
6th (For RS6F51A model)	0.95 - 1.4 (0.037 - 0.055)	0.7 (0.028)
Reverse	0.95 - 1.4 (0.037 - 0.055)	0.7 (0.028)

Available Snap Rings INPUT SHAFT BEARING SPACER

ECS008CH

—For RS5F51A Model—

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 (0.0870)	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.

6TH INPUT GEAR BUSHING

—For RS6F51A Model—

End play		0 - 0.1 mm (0 - 0.004 in)	
Thickness mm (in)	Part number*	Thickness mm (in)	Part number*
1.76 (0.0693)	32204 8H511	2.01 (0.0791)	32204 8H516
1.81 (0.0713)	32204 8H512	2.06 (0.0811)	32204 8H517
1.86 (0.0732)	32204 8H513	2.11 (0.0831)	32204 8H518
1.91 (0.0752)	32204 8H514	2.16 (0.0850)	32204 8H519
1.96 (0.0772)	32204 8H515	2.21 (0.0870)	32204 8H520

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

5TH MAIN GEAR

—For RS5F51A Model—

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 MAINSHAFT C-RING

ECS008CI

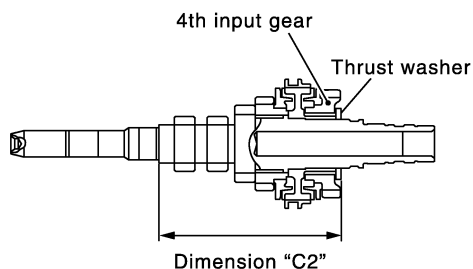
End play		0 - 0.06 mm (0 - 0.0024 in)	
Thickness mm (in)	Part number*	Thickness mm (in)	Part number*
2.535 (0.0998)	32348 8H800	2.835 (0.1116)	32348 8H810
2.565 (0.1010)	32348 8H801	2.865 (0.1128)	32348 8H811
2.595 (0.1022)	32348 8H802	2.895 (0.1140)	32348 8H812
2.625 (0.1033)	32348 8H803	2.925 (0.1152)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

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

SERVICE DATA AND SPECIFICATIONS (SDS)

Available Thrust Washer INPUT SHAFT THRUST WASHER

ECS008CJ



SCIA1008E

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

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

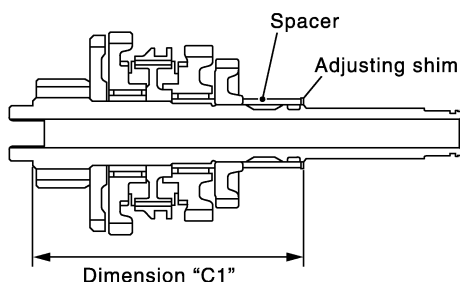
DIFFERENTIAL SIDE GEAR THRUST WASHER

Allowable clearance between side gear and differential case with washer		0.1 - 0.2 mm (0.004 - 0.008 in)	
Thickness mm (in)	Part number*	Thickness mm (in)	Part number*
0.75 (0.0295)	38424 81X00	0.84 (0.0331)	32238 8H504
0.80 (0.0315)	38424 81X01	0.92 (0.0362)	32238 8H505
0.85 (0.0335)	38424 81X02	1.00 (0.0394)	32238 8H506
0.90 (0.0354)	38424 81X03	1.08 (0.0425)	32238 8H507
0.95 (0.0374)	38424 81X04		

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

Available Adjusting Shims 4TH MAIN GEAR ADJUSTING SHIM

ECS008CK



SCIA1009E

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

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

SERVICE DATA AND SPECIFICATIONS (SDS)

INPUT SHAFT REAR BEARING ADJUSTING SHIM

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

** : RS5F51A model only.

MAINSHAFT REAR BEARING ADJUSTING SHIM

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

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

REVERSE IDLER GEAR ADJUSTING SHIM

End play		0.04 - 0.10 mm (0.0016 - 0.0039 in)	
Thickness mm (in)	Part number*	Thickness mm (in)	Part number*
1.76 (0.0693)	32237 8H800	2.24 (0.0882)	32237 8H812
1.80 (0.0709)	32237 8H801	2.28 (0.0898)	32237 8H813
1.84 (0.0724)	32237 8H802	2.32 (0.0913)	32237 8H814
1.88 (0.0740)	32237 8H803	2.36 (0.0929)	32237 8H815
1.92 (0.0756)	32237 8H804	2.40 (0.0945)	32237 8H816
1.96 (0.0772)	32237 8H805	2.44 (0.0961)	32237 8H817
2.00 (0.0787)	32237 8H806	2.48 (0.0976)	32237 8H818
2.04 (0.0803)	32237 8H807	2.52 (0.0992)	32237 8H819
2.08 (0.0819)	32237 8H808	2.56 (0.1008)	32237 8H820
2.12 (0.0835)	32237 8H809	2.60 (0.1024)	32237 8H821
2.16 (0.0850)	32237 8H810	2.64 (0.1039)	32237 8H822
2.20 (0.0866)	32237 8H811		

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

6TH MAIN GEAR ADJUSTING SHIM

—For RS6F51A Model—

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

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

SERVICE DATA AND SPECIFICATIONS (SDS)

Available Shims

ECS008CL

— Differential Side Bearing Preload and Adjusting Shim

BEARING PRELOAD

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

SERVICE DATA AND SPECIFICATIONS (SDS)
