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SECTION **MT**

MANUAL TRANSAXLE

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1ST AND 2ND DOUBLE BAULK RING	60	Available Adjusting Shims	62
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PRECAUTIONS

PRECAUTIONS

PFP:00001

Caution

ECS004PV

- 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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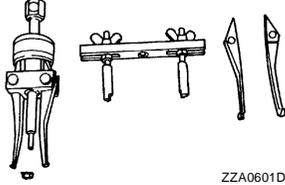
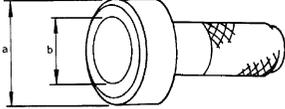
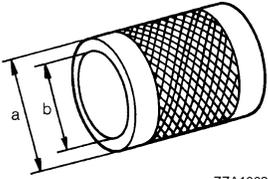
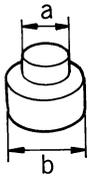
PREPARATION

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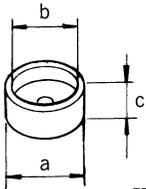
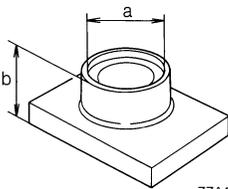
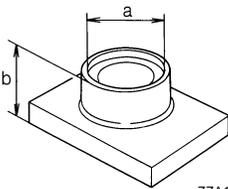
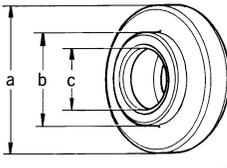
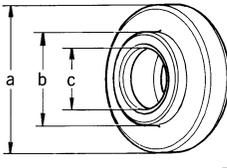
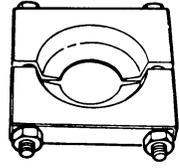
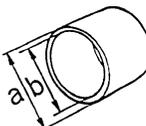
ECS004PW

PREPARATION

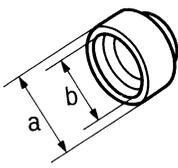
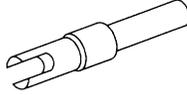
Special Service Tools

Tool number (Kent-More No.) Tool name		Description
KV381054S0 (J34286) Puller		<ul style="list-style-type: none"> ● Side bearing outer race removal
ST35321000 (—) Drift a: 49 mm (1.93 in) dia. b: 41 mm (1.61 in) dia.		<ul style="list-style-type: none"> ● Input shaft oil seal installation ● Reverse main gear installation ● 1st bushing installation ● 1st-2nd synchronizer hub installation ● 2nd bushing installation ● 3rd main gear installation
ST30720000 (J25405) Drift a: 77 mm (3.03 in) dia. b: 55.5 mm (2.185 in) dia.		<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 (J26082) Drift a: 60 mm (2.36 in) dia. b: 44.5 mm (1.752 in) dia.		<ul style="list-style-type: none"> ● Mainshaft front bearing installation ● 4th main gear installation ● 5th main gear installation
ST33061000 (J8107-2) Drift a: 38 mm (1.50 in) dia. b: 28.5 mm (1.122 in) dia.		<ul style="list-style-type: none"> ● Bore plug installation ● Differential side bearing removal
ST33052000 (—) Drift a: 22 mm (0.87 in) dia. b: 28 mm (1.10 in) dia.		<ul style="list-style-type: none"> ● Input shaft rear bearing removal and installation ● Input shaft bearing spacer and 5th stopper removal ● 5th bushing, thrust washer, 4th input gear, 4th gear bushing, 3rd-4th synchronizer hub and 3rd input gear removal ● Input shaft front bearing installation ● Mainshaft rear bearing removal ● 4th main gear and 5th main gear removal

PREPARATION

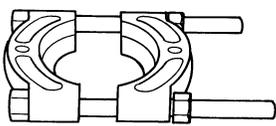
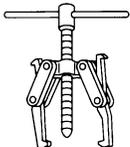
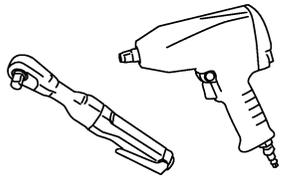
Tool number (Kent-More No.) Tool name	Description	
KV40105020 (—) Drift a: 39.7 mm (1.563 in) dia. b: 35 mm (1.38 in) dia. c: 15 mm (0.59 in).	 <ul style="list-style-type: none"> ● 5th input gear and synchronizer hub removal ● 3rd main gear, 2nd main gear, 2nd bushing, 1st-2nd synchronizer hub, 1st main gear, reverse main gear and 1st bushing removal 	A B MT
KV40105710 (—) Press stand a: 46 mm (1.81 in) dia. b: 41 mm (1.61 in).	 <ul style="list-style-type: none"> ● 3rd-4th synchronizer hub installation ● 4th bushing installation ● 5th bushing installation ● 5th synchronizer hub installation ● 2nd bushing installation ● 3rd main gear installation 	D E F
ST38220000 (—) Press stand a: 63 mm (2.48 in) dia. b: 65 mm (2.56 in).	 <ul style="list-style-type: none"> ● Reverse main gear installation ● 1st bushing installation ● 1st-2nd synchronizer hub installation 	G H
ST30032000 (J26010-01) Drift a: 80 mm (3.15 in) dia. b: 38 mm (1.50 in) dia. c: 31 mm (1.22 in) dia.	 <ul style="list-style-type: none"> ● 5th stopper and input shaft bearing spacer installation ● Input shaft front bearing installation 	I J
ST30901000 (J26010-01) Drift a: 79 mm (3.11 in) dia. b: 45 mm (1.77 in) dia. c: 35.2 mm (1.386 in) dia.	 <ul style="list-style-type: none"> ● Input shaft rear bearing installation ● 4th main gear installation ● 5th main gear installation ● Mainshaft rear bearing installation 	K L
ST30031000 (J22912-01) Puller	 <ul style="list-style-type: none"> ● Measuring wear of 1st and 2nd baulk ring 	M
KV40101630 (J35870) Drift a: 68 mm (2.68 in) dia. b: 60 mm (2.36 in) dia.	 <ul style="list-style-type: none"> ● Reverse main gear installation 	

PREPARATION

Tool number (Kent-More No.) Tool name	Description
KV38102510 (—) Drift a: 71 mm (2.80 in) dia. b: 65 mm (2.56 in) dia.	 <p style="text-align: center; font-size: small;">ZZA0838D</p> <ul style="list-style-type: none"> ● 1st bushing installation ● 1st-2nd synchronizer hub installation ● Differential side bearing installation
(J39713) Preload adapter	 <p style="text-align: center; font-size: small;">NT087</p> <ul style="list-style-type: none"> ● Checking differential side gear end play

Commercial Service Tools

ECS004PX

Tool name	Description
Puller	 <p style="text-align: center; font-size: small;">ZZB0823D</p> <ul style="list-style-type: none"> ● Each bearing gear and bushing removal
Puller	 <p style="text-align: center; font-size: small;">NT077</p> <ul style="list-style-type: none"> ● Each bearing gear and bushing removal
Pin punch Tip diameter: 4.5 mm (0.177 in) dia.	 <p style="text-align: center; font-size: small;">ZZA0815D</p> <ul style="list-style-type: none"> ● Each retaining pin removal and installation
Power tool	 <p style="text-align: center; font-size: small;">PBIC0190E</p> <ul style="list-style-type: none"> ● Loosening bolts and nuts

NOISE, VIBRATION, AND HARSHNESS (NVH) TROUBLESHOOTING

NOISE, VIBRATION, AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

ECS004PY

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

MANUAL TRANSAXLE

Reference page	MT-10	MT-10	MT-10	MT-19	MT-19	MT-19	MT-13	MT-19	MT-19 , MT-58	MT-19	MT-19	MT-19	MT-19
SUSPECTED PARTS (Possible cause)	(Oil level is low.)	(Wrong oil)	(Oil level is high.)	GASKET (Damaged)	OIL SEAL (Worn or damaged)	O-RING (Worn or damaged)	SHIFT CONTROL 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							
	Hard to shift or will not shift		1	1			2					3	3
	Jumps out of gear						1	2	3	3			

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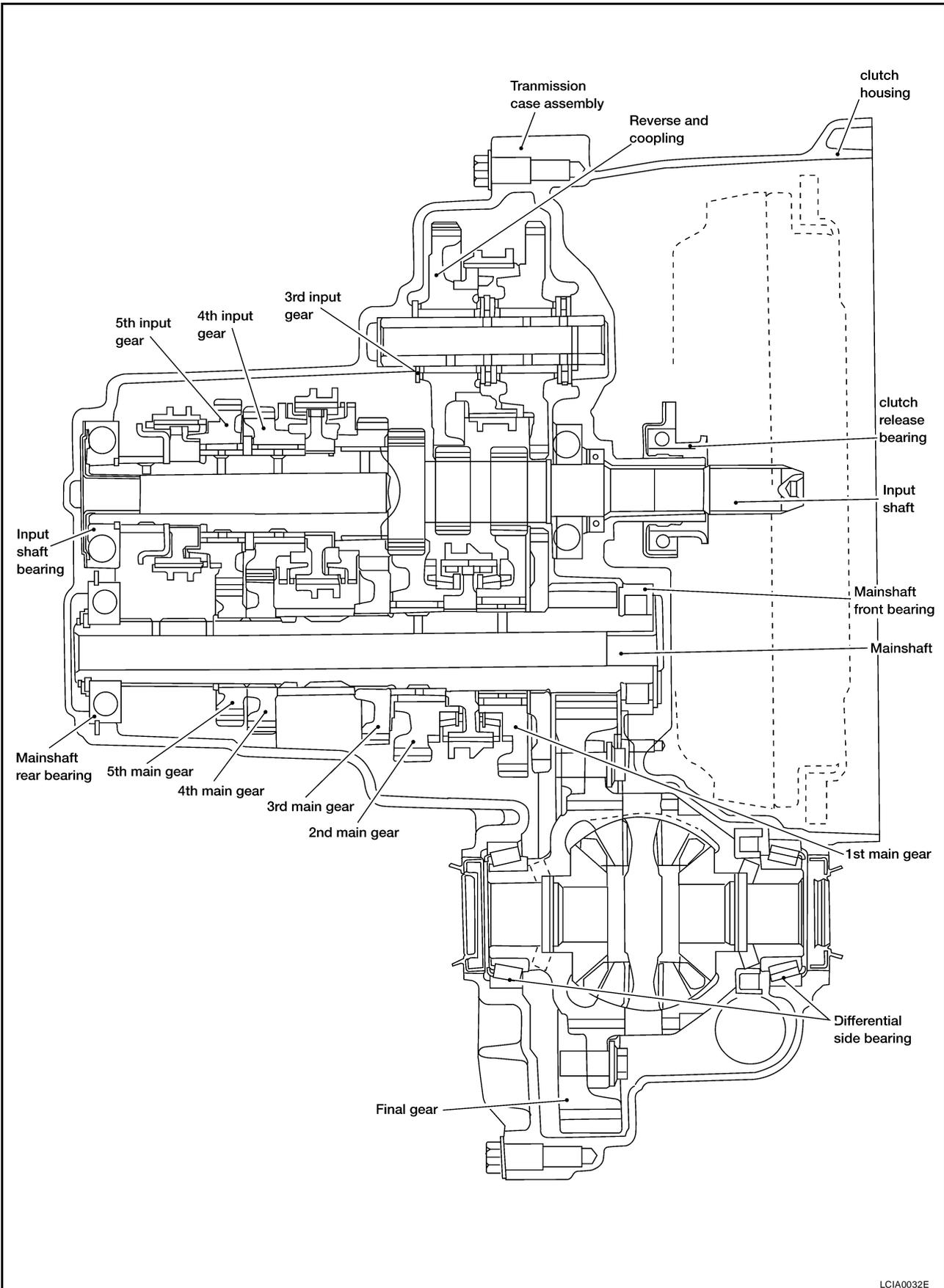
DESCRIPTION

DESCRIPTION

PFP:00000

Cross-sectional View

ECS004PZ

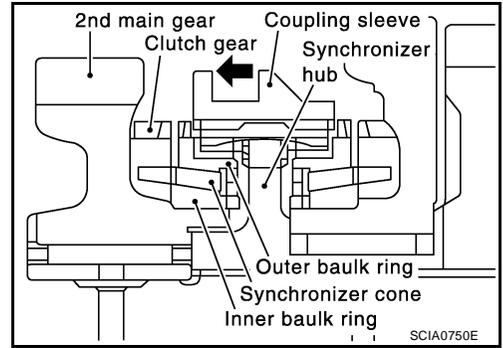


LCIA0032E

DESCRIPTION

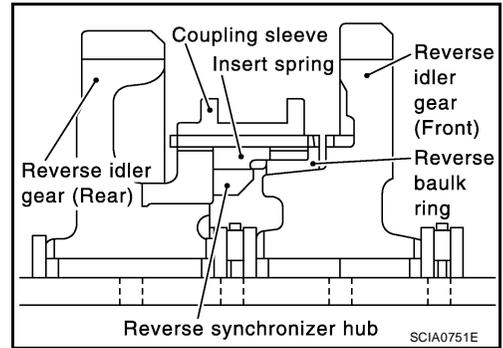
DOUBLE-CONE SYNCHRONIZER

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



REVERSE GEAR

See figure for description of reverse gear components.



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M/T OIL

Replacement DRAINING

1. Start the engine and let it run to warm up the transaxle oil.
2. Stop the engine. Remove the drain plug and drain the transaxle oil into a suitable container.
3. Set a new gasket on the drain plug, and install the drain plug in the transaxle body.

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

CAUTION:

Do not reuse the drain plug gasket.

FILLING

1. Remove the filler plug after the drain plug has been installed. Fill the transaxle with new oil until the oil level reaches the rim of the filler plug hole as shown.

Oil grade : API GL-4, Viscosity SAE 75W-85

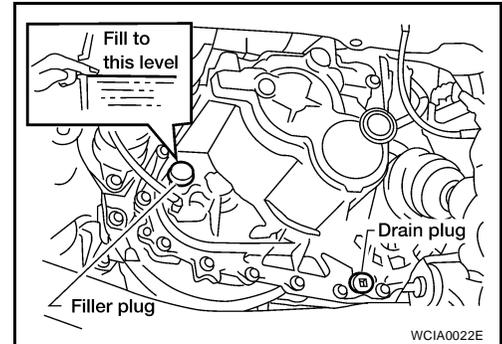
Oil capacity : 2.3 ℓ (4 7/8 US pt, 4 Imp pt)

2. After refilling the transaxle with oil, check the oil level as shown. Set a new gasket on the filler plug, and install the filler plug in the transaxle body.

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

CAUTION:

Do not reuse the filler plug gasket.



Checking

OIL LEAKAGE AND OIL LEVEL

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

CAUTION:

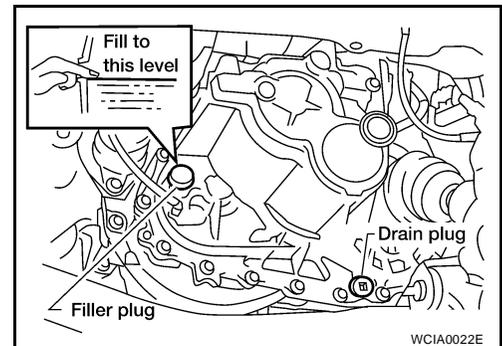
Never start the engine while checking the oil level.

- Set a new gasket on the filler plug, and install the filler plug in the transaxle body.

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

CAUTION:

Do not reuse the filler plug gasket.



SIDE OIL SEAL

SIDE OIL SEAL

PF3:32113

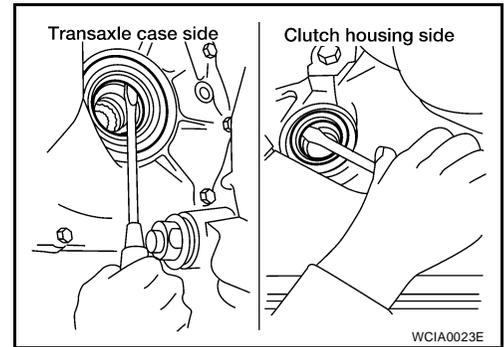
Removal and Installation

ECS004Q2

1. Remove the drive shaft from the transaxle body. Refer to [FAX-11, "Removal and Installation"](#).
2. Remove oil seal with a slotted screwdriver.

CAUTION:

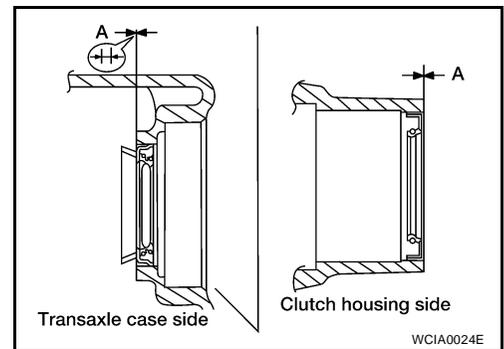
Be careful not to damage the case surface when removing the oil seal.



INSTALLATION

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

Dimension A : Within 0.5 mm (0.02 in) of flush with the case.



Drift to be used:

Transaxle case side	ST3340 0001
Clutch housing side	KV401 00621

CAUTION:

- When installing oil seals, apply multi-purpose grease to oil seal lips.
 - Oil seals are not reusable. Never reuse them.
2. Installation is in the reverse order of removal. Check oil level after installation.

POSITION SWITCH

PFP:32005

ECS004Q3

POSITION SWITCH

Checking BACK-UP LAMP SWITCH

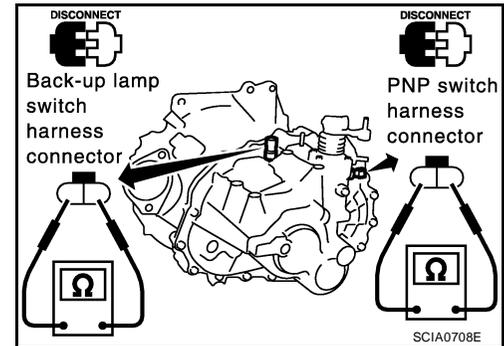
- Check continuity.

Gear position	Continuity
Reverse	Yes
Except reverse	No

PARK/NEUTRAL POSITION SWITCH

- Check continuity.

Gear position	Continuity
Neutral	Yes
Except neutral	No



CONTROL LINKAGE

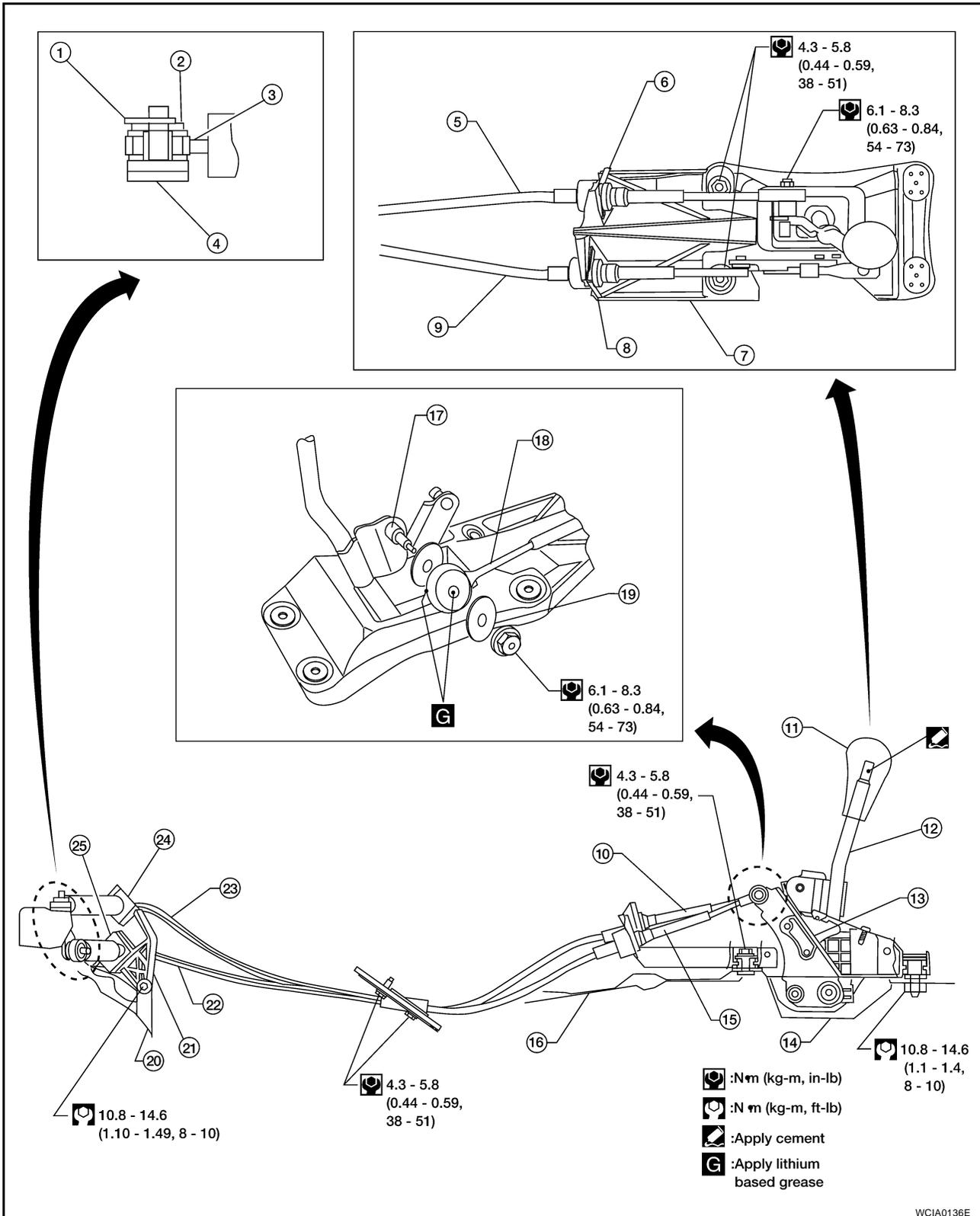
PFP:34103

ECS004Q4

CONTROL LINKAGE

Removal and Installation of Control Device and Cable

Refer to the figure below for removal and installation procedure.



WCIA0136E

1. Snap pin
2. Washer
3. Cable
4. Manual lever
5. Shift cable
6. Lock plate
7. Control device assembly
8. Lock plate
9. Select cable

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CONTROL LINKAGE

- | | | |
|-----------------------------|------------------------|----------------------------|
| 10. Shift cable | 11. Control lever knob | 12. Control lever |
| 13. Control device assembly | 14. Cover plate | 15. Select cable |
| 16. Floor pan | 17. Control lever | 18. Shift cable |
| 19. Washer | 20. Clutch housing | 21. Cable mounting bracket |
| 22. Select cable | 23. Shift cable | 24. Lock plate |
| 25. Lock plate | | |

CAUTION:

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

AIR BREATHER HOSE

PFP:31098

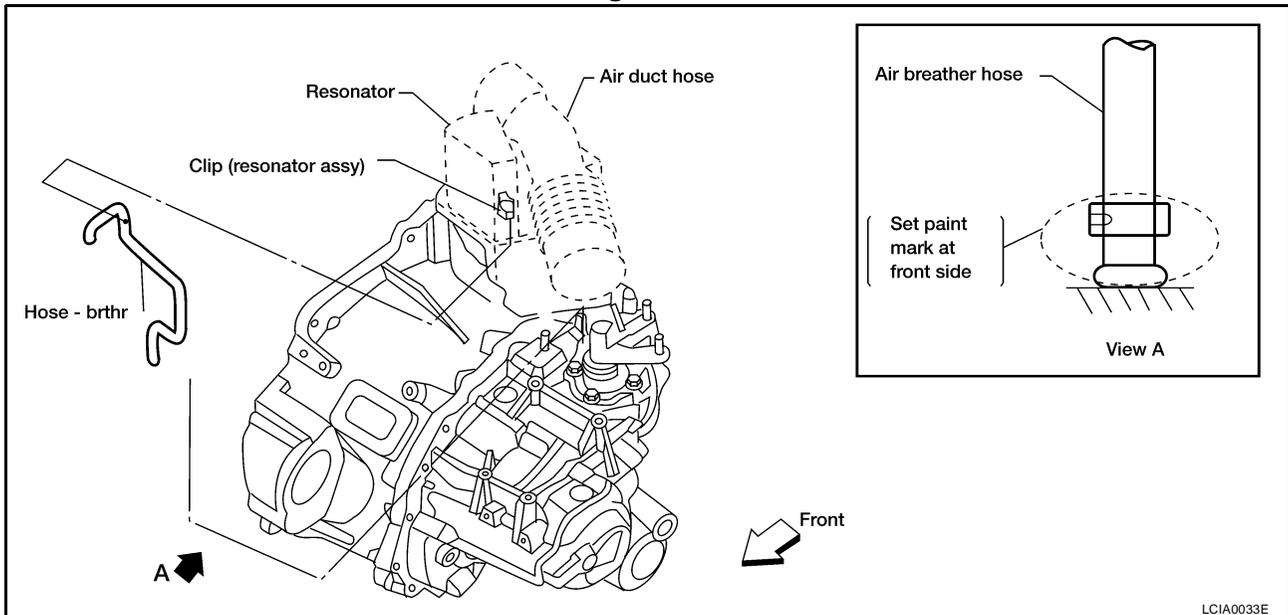
AIR BREATHER HOSE

Removal and Installation

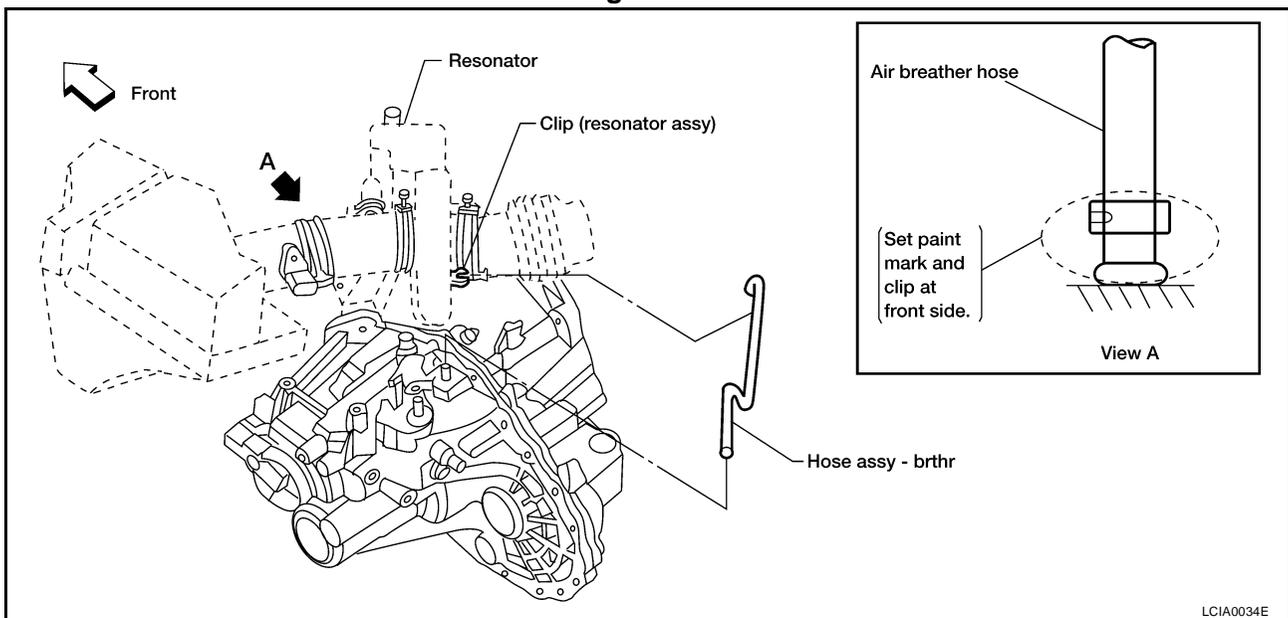
ECS004Q5

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

QR engine models



VQ engine models



CAUTION:

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

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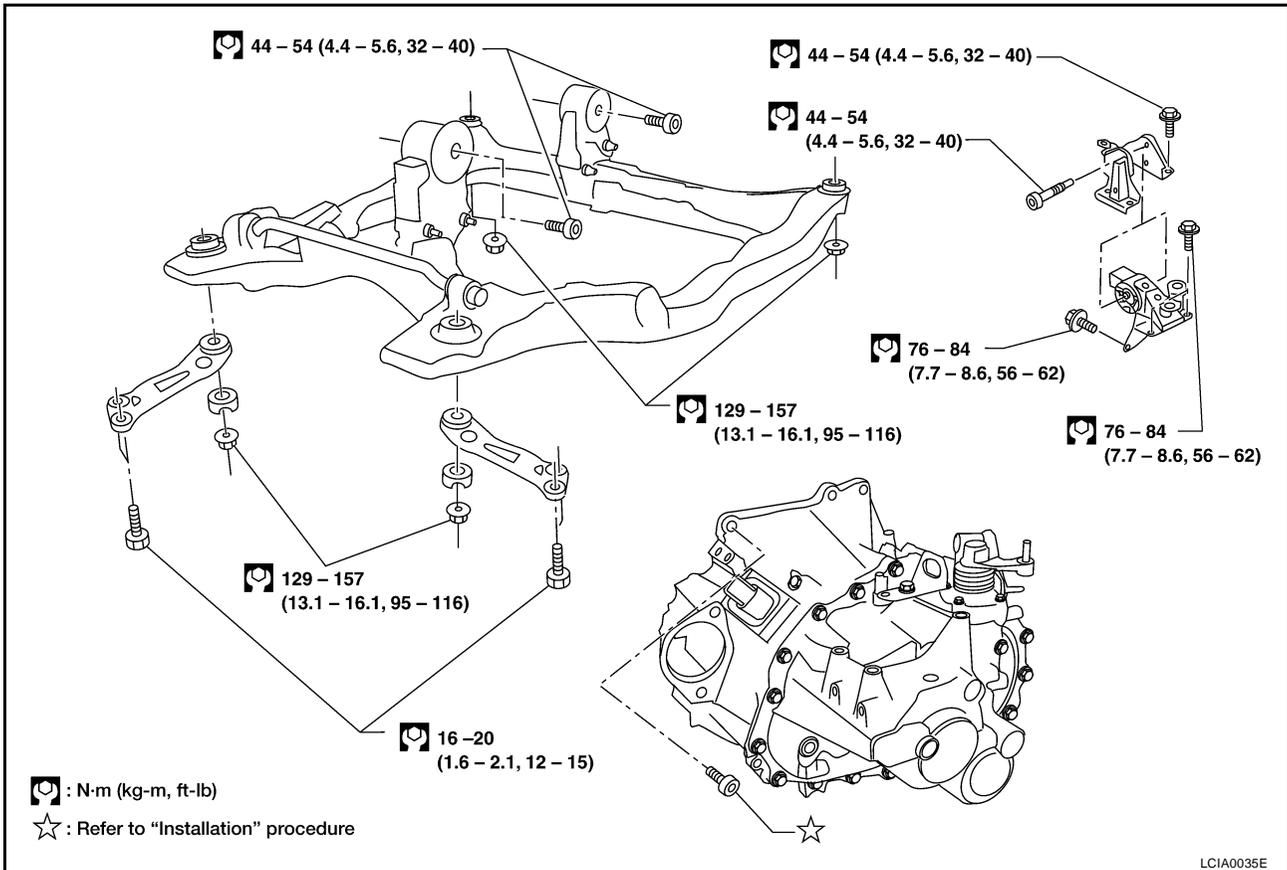
TRANSAXLE ASSEMBLY

PFP:32010

TRANSAXLE ASSEMBLY

Removal and Installation

ECS00406



REMOVAL

1. Remove the air cleaner and air duct. Refer to [EM-14, "Removal and Installation"](#) (QR25DE), [EM-110, "Removal and Installation"](#) (VQ35DE).
2. Remove the battery and battery tray.
3. Remove the air breather hose.
4. Disconnect the clutch operating cylinder and position it aside without disconnecting the hydraulic lines. Refer to [CL-10, "Removal and Installation"](#).

CAUTION:

Do not depress clutch pedal during removal procedure.

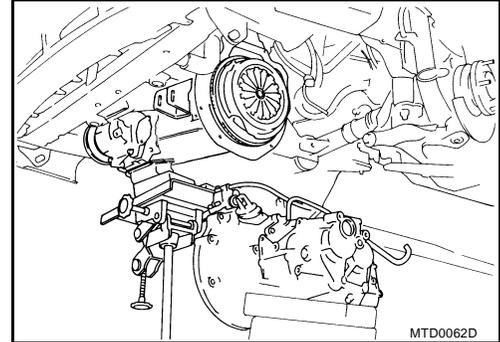
5. Remove the control cable from the transaxle.
6. Drain gear oil from transaxle.
7. Remove connectors and harnesses for:
 - Speed sensor
 - PNP switch
 - Back-up lamp switch
 - Ground
 - Harness clips
8. Remove the exhaust front tube and hanger bracket using power tool. Refer to [EX-3, "Removal and Installation"](#) (QR25DE), [EX-6, "Removal and Installation"](#) (VQ35DE).
9. Remove the transaxle vent tube.
10. Remove the drive shafts using power tool. Refer to [FAX-11, "Removal and Installation"](#).
11. Remove the starter motor, using power tool. Refer to [SC-23, "Removal and Installation"](#).
12. Place a jack under the transaxle.

TRANSAXLE ASSEMBLY

CAUTION:

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

13. Disconnect LH transaxle mounting insulator.
14. Remove the engine insulator and the engine mount bracket using power tool.
15. Remove suspension member.
 - Refer to [FSU-14, "Removal and Installation"](#) .
16. Support engine by placing a jack under oil pan.
17. Remove the bolts that mount the engine to the transaxle using power tool.
18. Remove the transaxle from the vehicle.



INSTALLATION

Installation is the reverse order of removal.

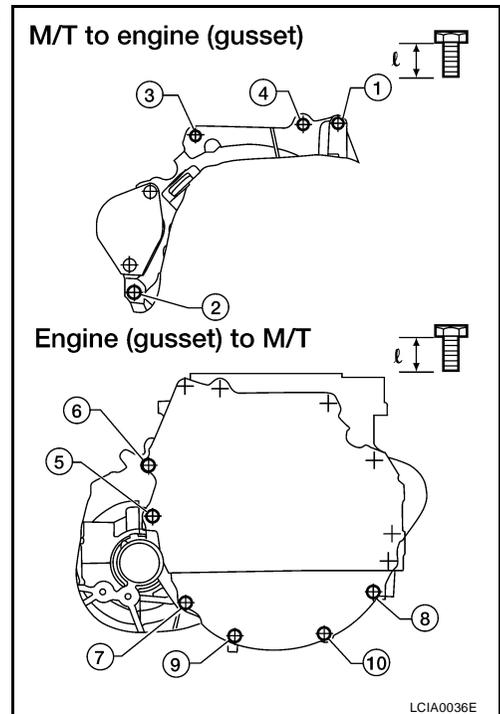
- When installing the transaxle to the engine, use the tightening torque and sequence shown below:

CAUTION:

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

QR engine models:

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

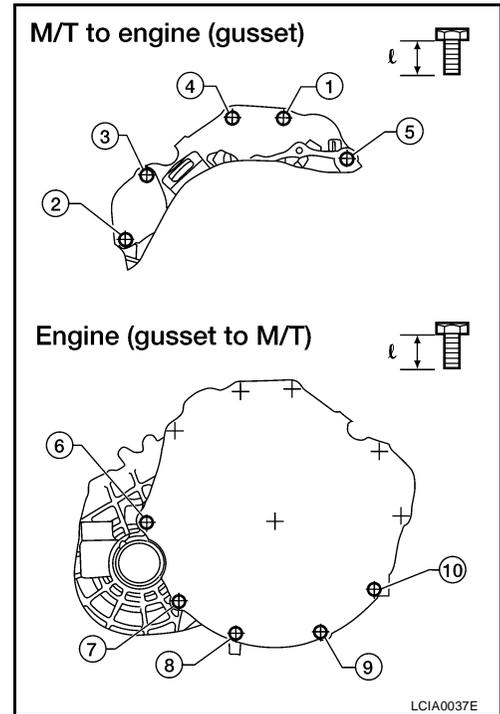


TRANSAXLE ASSEMBLY

VQ engine models:

Bolt No.	1	2	3	4	5	6	7	8	9	10
" ℓ " mm (in)	52	113	113	52	52	52	40	40	40	40
Tightening torque N·m (kg·m, ft·lb)	70 - 80 (7.1 - 8.1, 52 - 59)						30 - 40 (3.1 - 4.1, 22 - 29)			

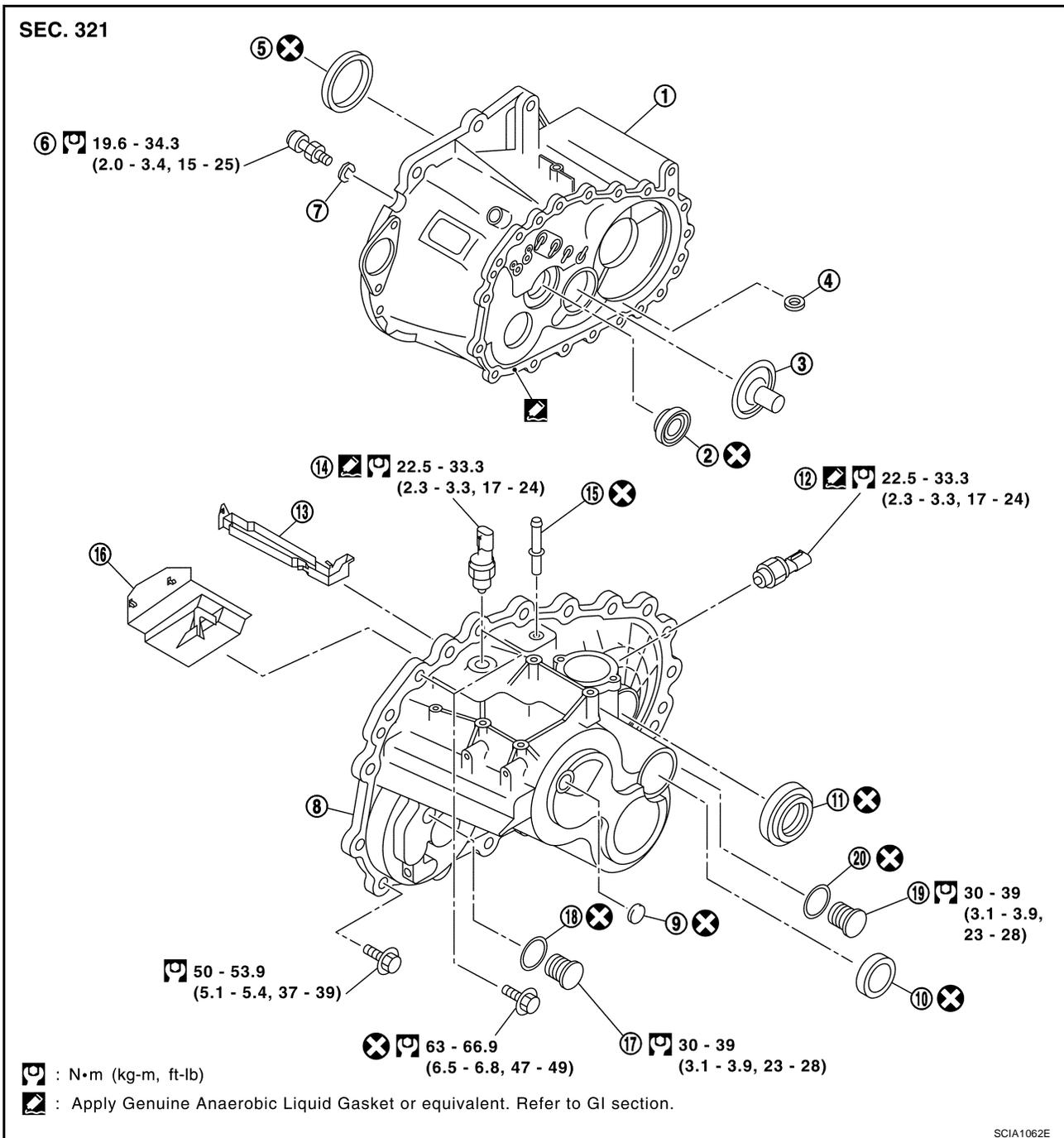
- After installation, check oil level, and look for leaks and loose mechanisms.



TRANSAXLE ASSEMBLY

ECS00407

Component Parts CASE AND HOUSING COMPONENTS

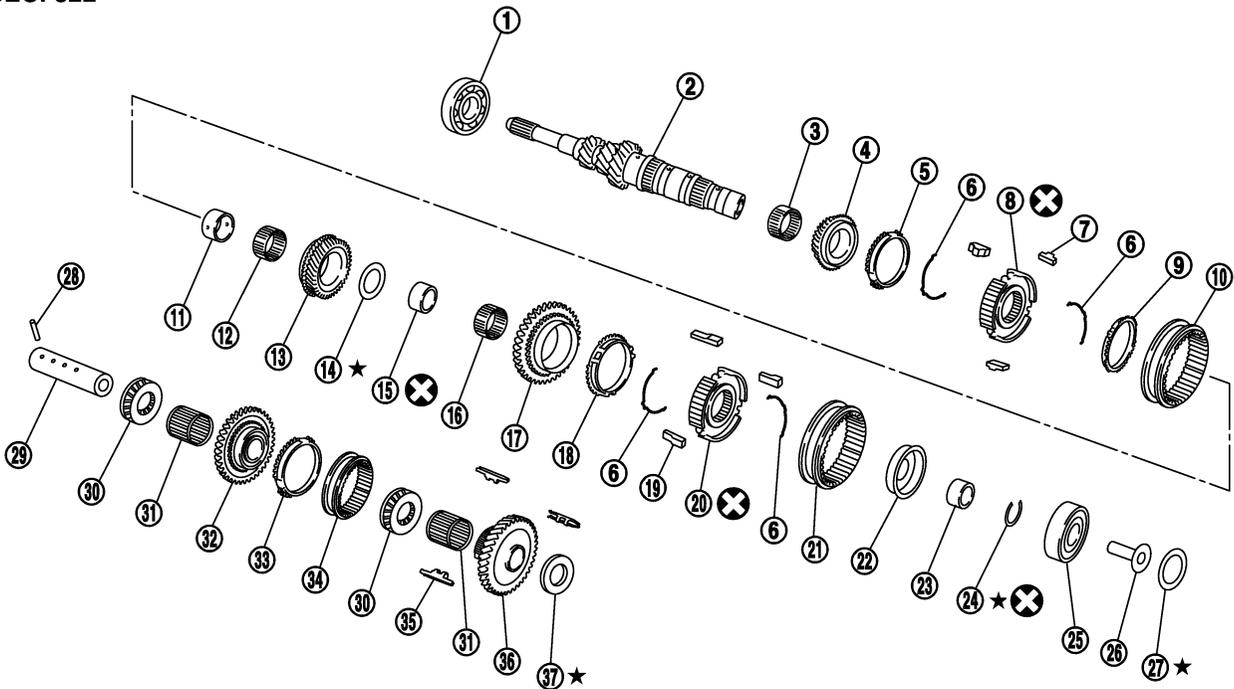


- | | | |
|-------------------|---------------------------|----------------------------------|
| 1. Clutch housing | 2. Input shaft oil seal | 3. Oil channel |
| 4. Magnet | 5. Differential oil seal | 6. Ball pin |
| 7. Washer | 8. Transaxle case | 9. Welch plug |
| 10. Bore plug | 11. Differential oil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

TRANSAXLE ASSEMBLY

GEAR COMPONENTS

SEC. 322



★ : Select proper thickness.

NOTE :

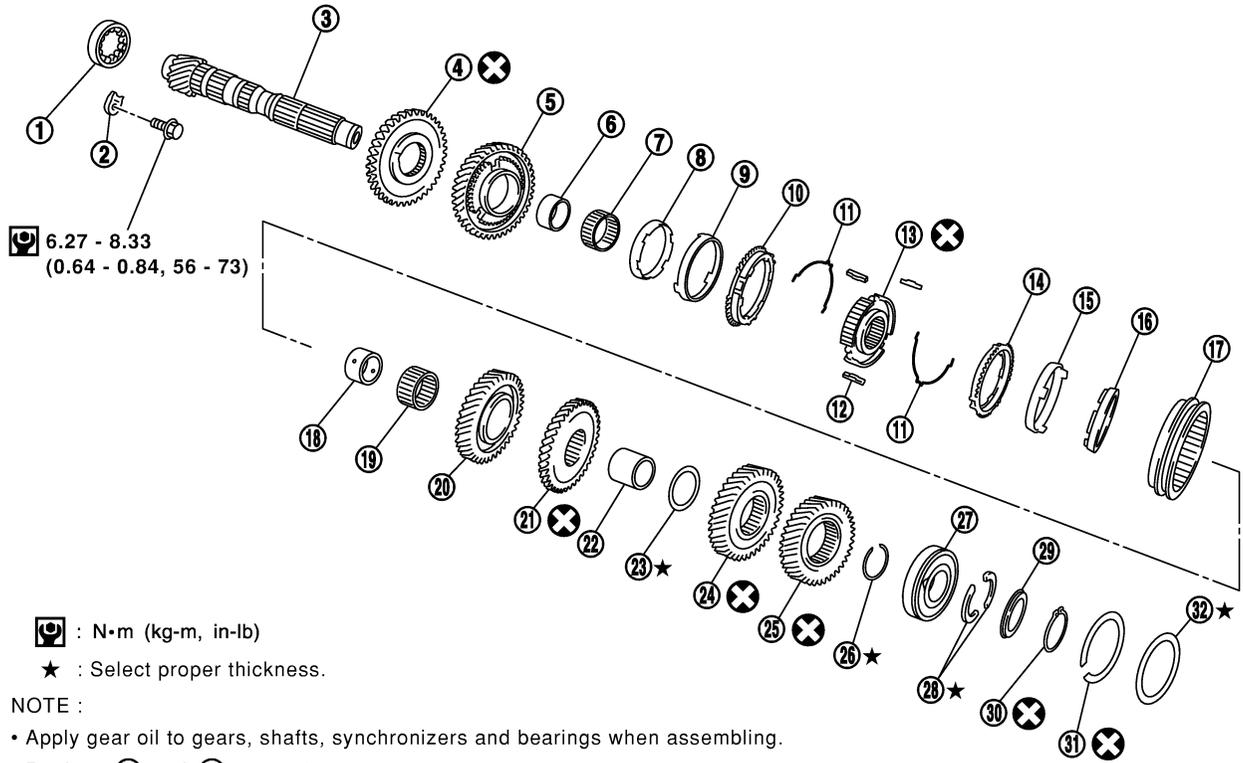
- Apply gear oil to gears, shafts, synchronizers and bearings when assembling.
- Replace (8) and (10), (20) and (21) as a set.

SCIA0385E

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

TRANSAXLE ASSEMBLY

SEC. 322



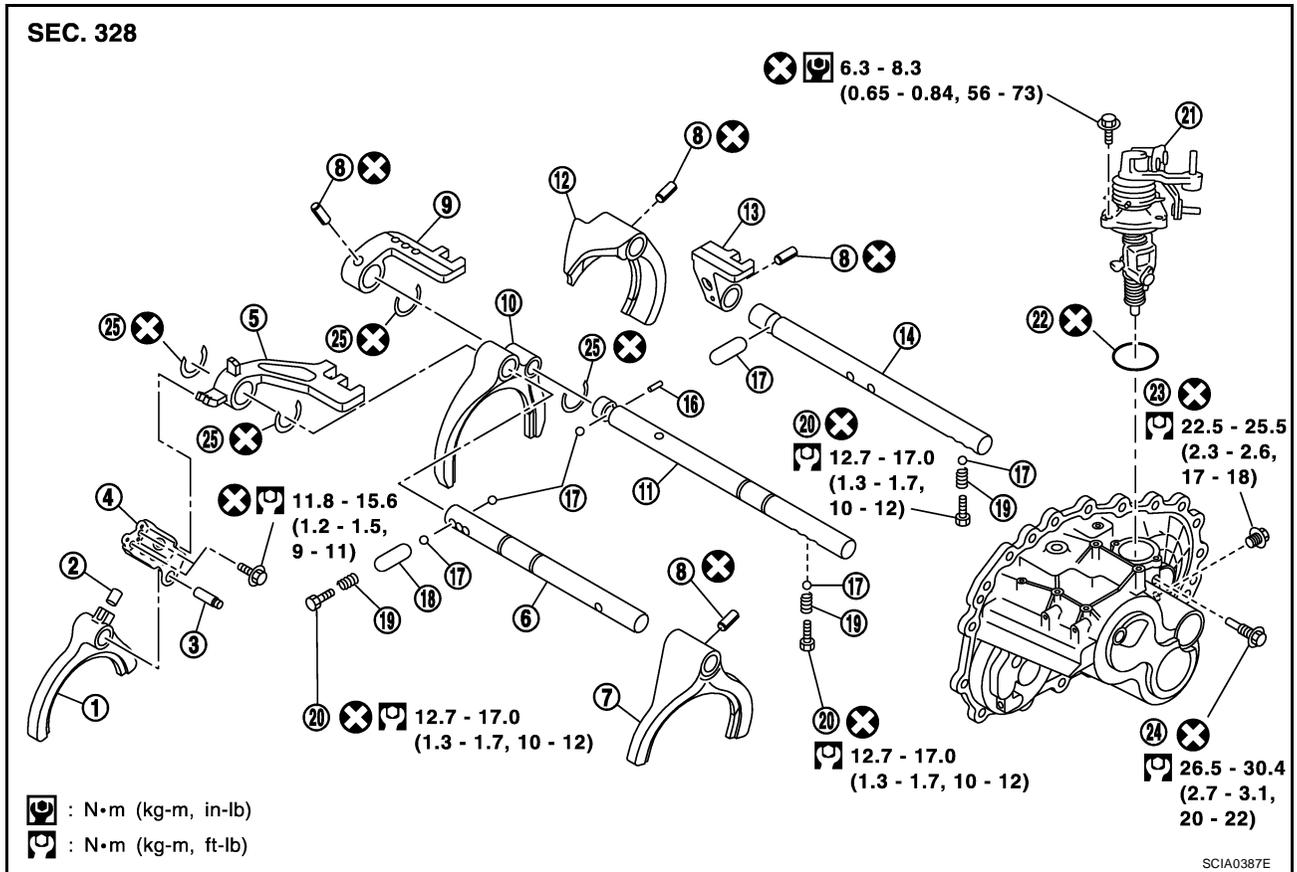
SCIA0386E

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

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TRANSAXLE ASSEMBLY

SHIFT CONTROL COMPONENTS



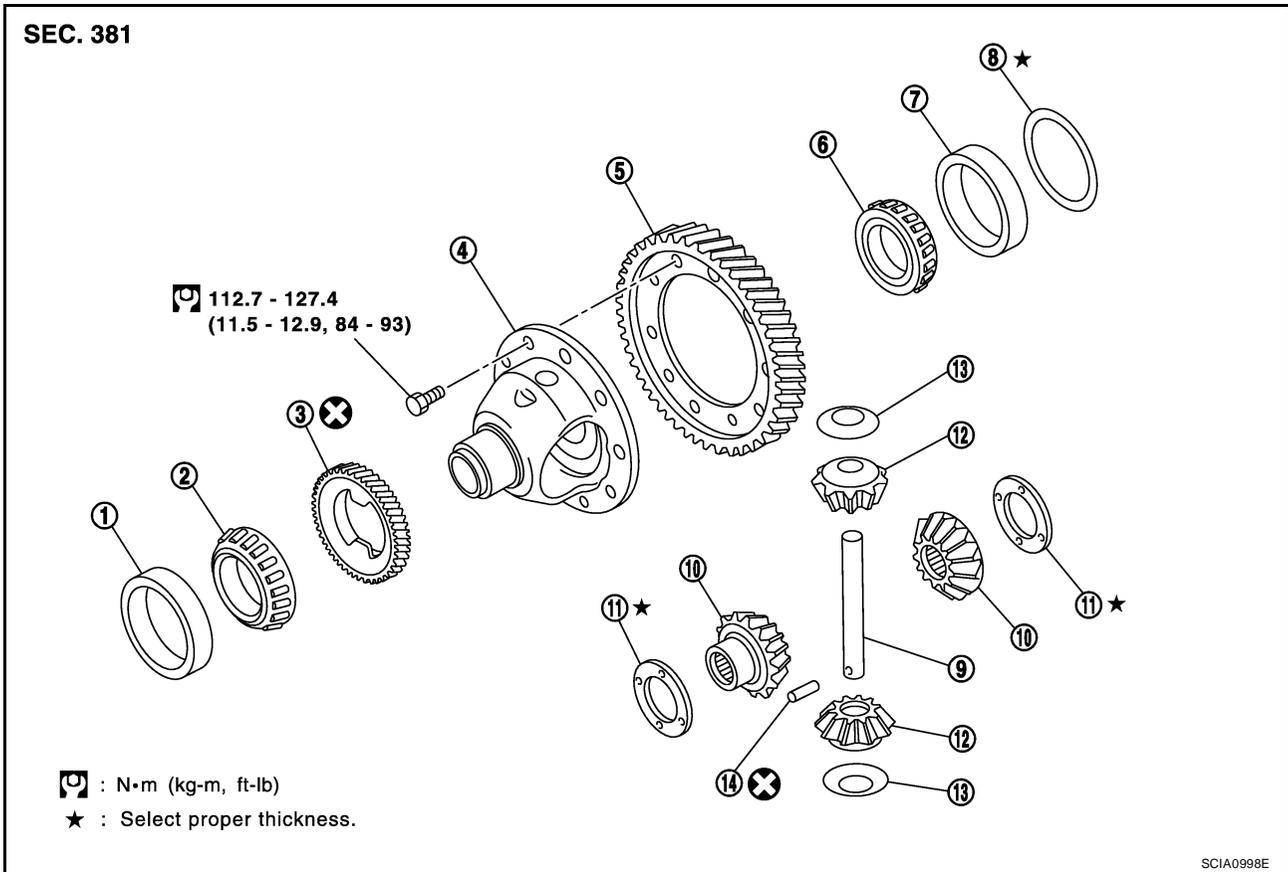
SCIA0387E

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

TRANSAXLE ASSEMBLY

FINAL DRIVE COMPONENTS

SEC. 381



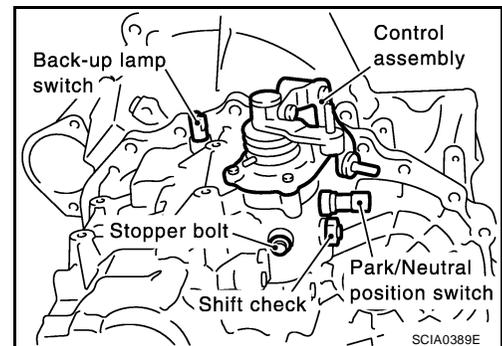
- | | | |
|---|---|------------------------------|
| 1. Differential side bearing outer race | 2. Differential side bearing | 3. Speedometer drive gear |
| 4. Differential case | 5. Final gear | 6. Differential side bearing |
| 7. Differential side bearing outer race | 8. Differential side bearing adjusting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

Disassembly and Assembly

DISASSEMBLY

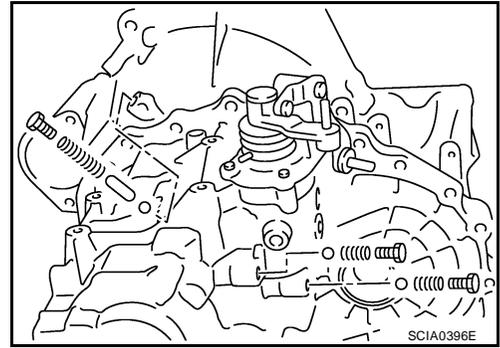
ECS004Q8

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



TRANSAXLE ASSEMBLY

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

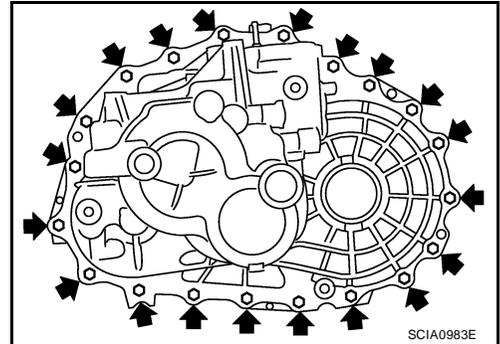


5. Remove transaxle case fixing bolts.
6. Remove bore plug.

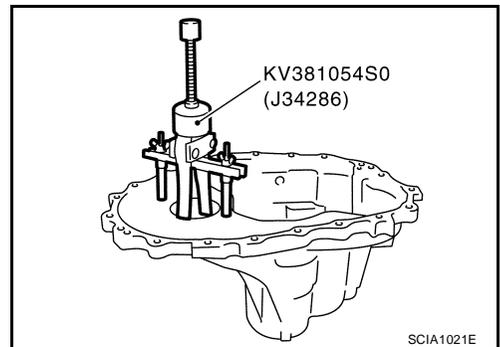
CAUTION:

Be careful not to damage transaxle case.

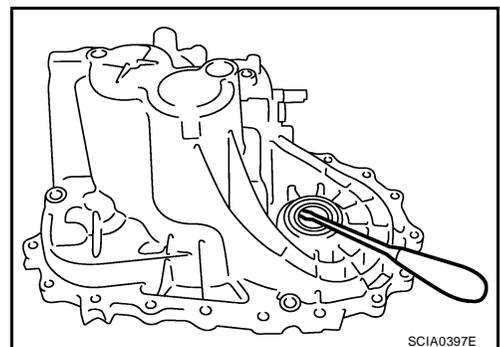
7. While spreading the snap ring of mainshaft rear bearing located at bore plug hole, remove transaxle case.
8. Remove oil gutter, baffle plate.
9. Remove snap ring, mainshaft rear bearing adjusting shim and input shaft rear bearing adjusting shim from transaxle case.



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



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

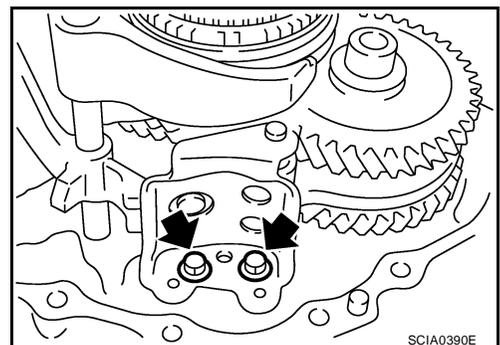


13. With shift lever in 5th position, remove bracket bolts from reverse lever assembly. Lift reverse lever assembly to remove.

CAUTION:

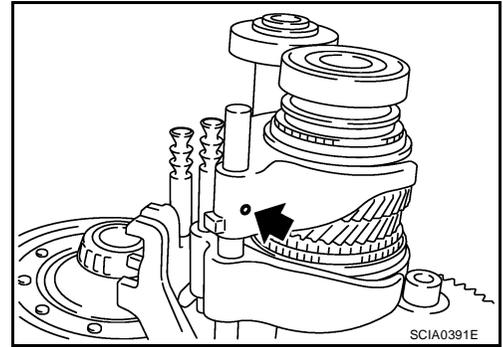
Be careful not to lose shifter cap.

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

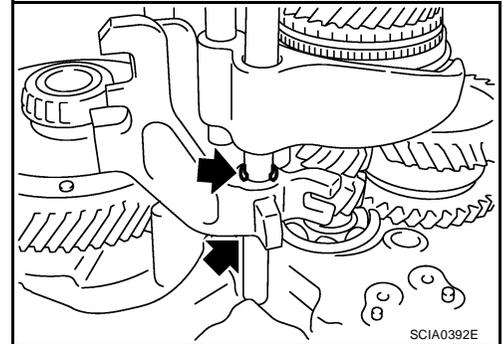


TRANSAXLE ASSEMBLY

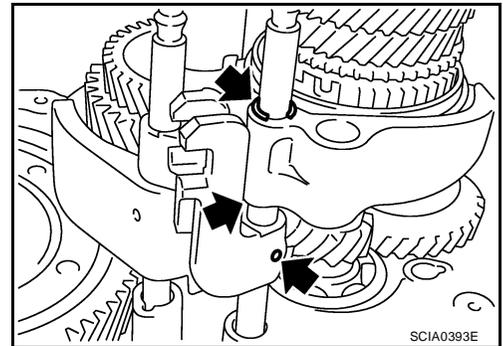
15. Shift 3rd & 4th fork rod to 3rd position. Remove retaining pin of 5th shift fork using pin punch.



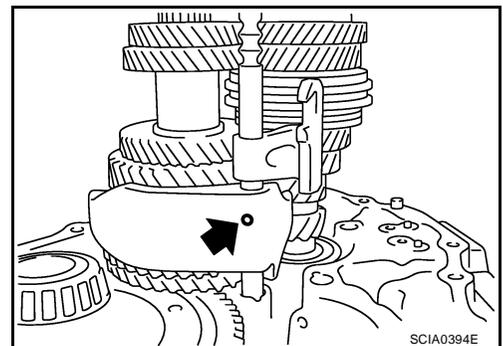
16. Remove stopper rings for 5th & reverse bracket.
 17. Pull out 5th & reverse fork rod and remove 5th shift fork and 5th & reverse bracket.
 18. Remove check balls (2 pieces) and inter lock pin.



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



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

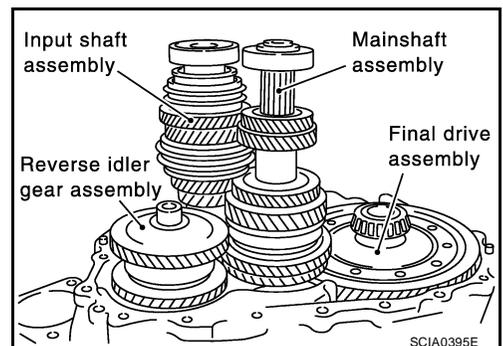


27. Remove gear components from clutch housing in the following procedure.
 a. While tapping input shaft with plastic hammer, remove input shaft assembly, mainshaft assembly and reverse idler gear assembly as a set.

CAUTION:

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

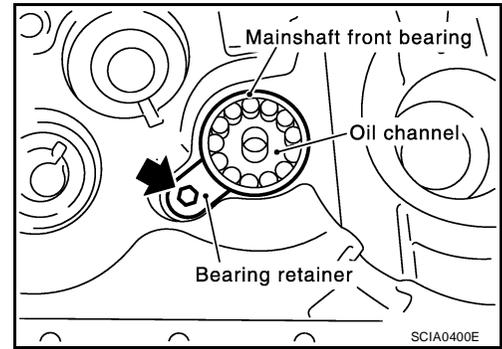
- b. Remove final drive assembly.



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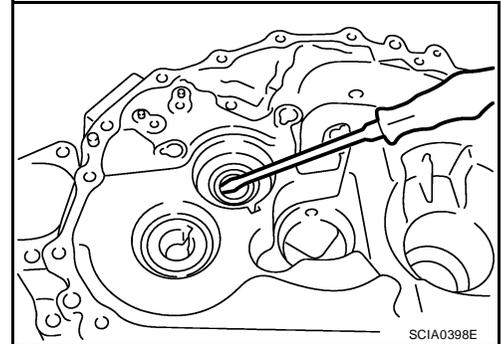
TRANSAXLE ASSEMBLY

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



32. Remove input shaft oil seal.

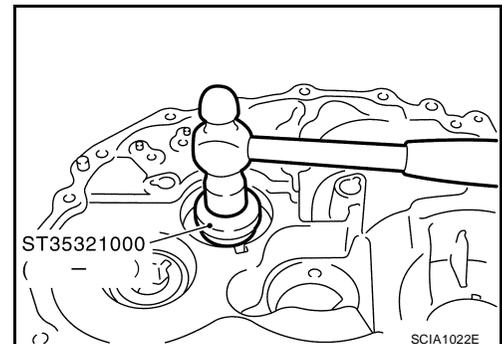
CAUTION:
Be careful not to damage clutch housing.



ASSEMBLY

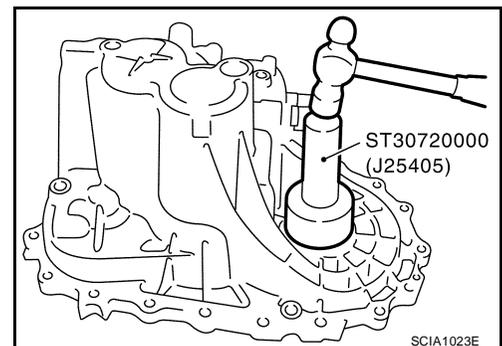
1. Using a drift, install input shaft oil seal.

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



2. Using a drift, install differential oil seal.

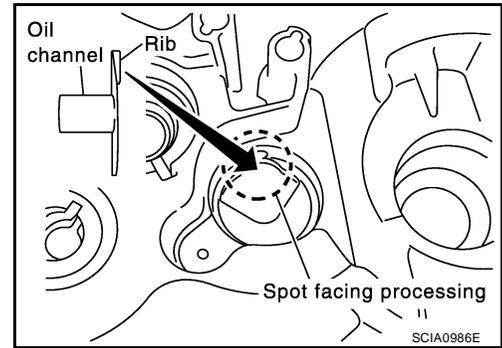
CAUTION:
Oil seals are not reusable. Never reuse them.



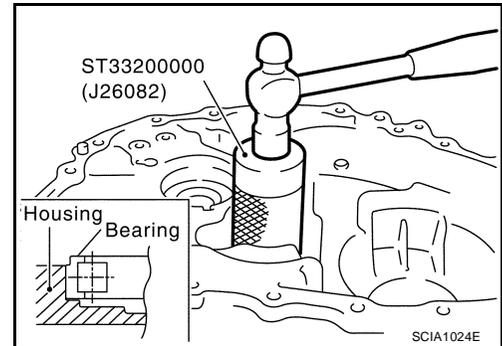
TRANSAXLE ASSEMBLY

3. Install oil channel on mainshaft side.

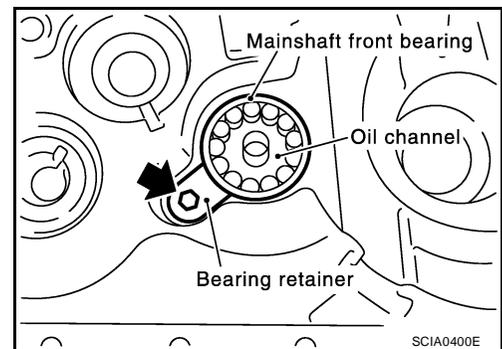
CAUTION:
Be careful with orientation of installation.



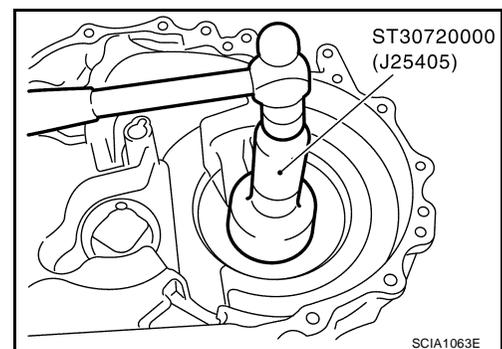
4. Using a drift, install mainshaft front bearing.



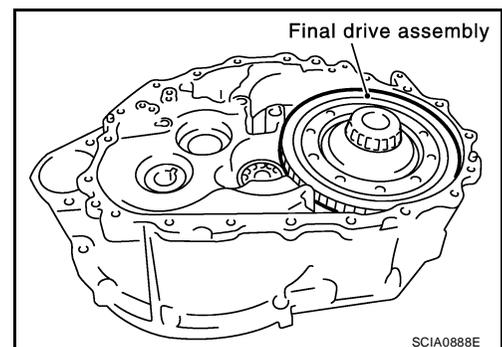
5. Install bearing retainer.



6. Install differential side bearing outer race.



7. Install final drive assembly into clutch housing.



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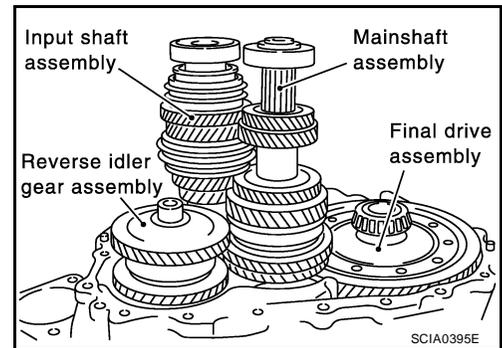
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TRANSAXLE ASSEMBLY

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

CAUTION:

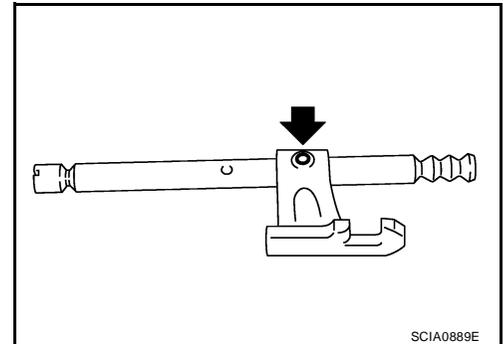
Be sure not to damage input shaft oil seal.



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

CAUTION:

Retaining pins are not reusable. Never reuse them.

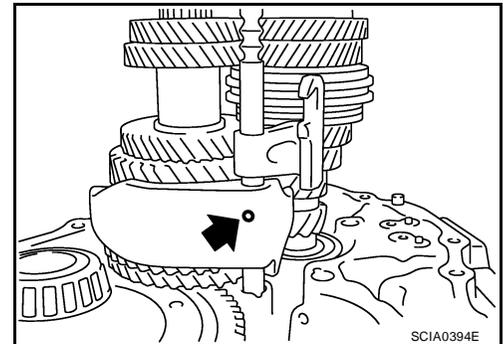


10. Install 1st-2nd fork rod and 1st-2nd shift fork, and then install retaining pin.

CAUTION:

Retaining pins are not reusable. Never reuse them.

11. Install shift check sleeve.



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

13. Install stopper ring onto 3rd-4th shift fork.

CAUTION:

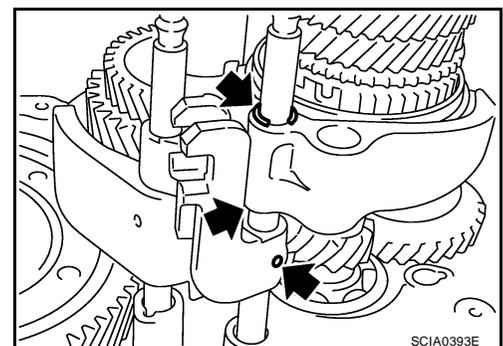
Stopper rings are not reusable. Never reuse them.

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

CAUTION:

Retaining pins are not reusable. Never reuse them.

15. Install 2 check balls.

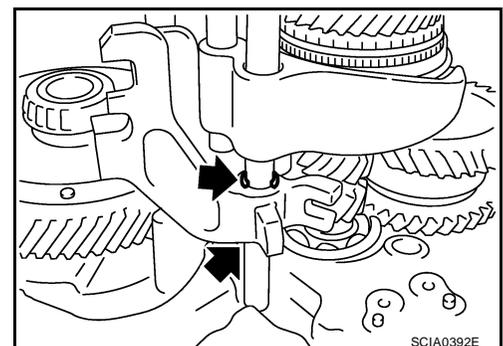


16. Install 5th-reverse bracket, 5th shift fork, and 5th-reverse fork rod.

17. Install stopper ring onto 5th-reverse bracket.

CAUTION:

Stopper rings are not reusable. Never reuse them.



TRANSAXLE ASSEMBLY

18. Install retaining pin onto 5th shift fork.

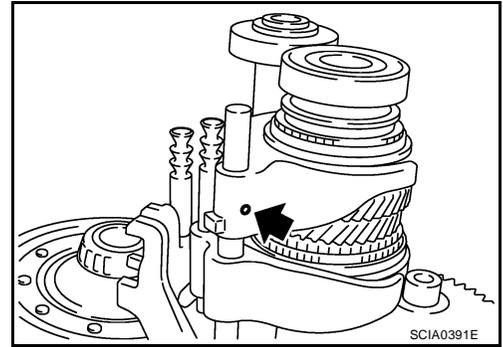
CAUTION:

Retaining pins are not reusable. Never reuse them.

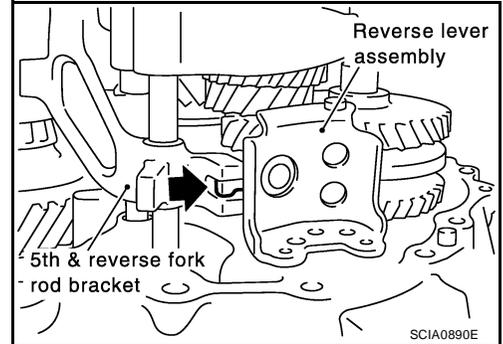
19. Install reverse shift fork and reverse fork rod.
20. Install reverse lever assembly following procedures below.
a. Install shifter cap onto reverse lever assembly cam, and then install them onto reverse shift fork.

CAUTION:

Do not drop shifter cap.



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



- c. Tighten mounting bolts to specified torque, and then install reverse lever assembly.
d. Install snap ring.
21. Install the magnet onto clutch housing.
22. Install selected input shaft adjusting shim onto input shaft.

- For selection of adjusting shims, refer to [MT-31, "INPUT-SHAFT END PLAY"](#).

23. Install baffle plate and oil gutter.
24. Install transaxle case following procedures below.
a. Install selected mainshaft rear bearing adjusting shim into transaxle case.

- For selection of adjusting shims, refer to [MT-33, "MAINSHAFT END PLAY"](#).

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

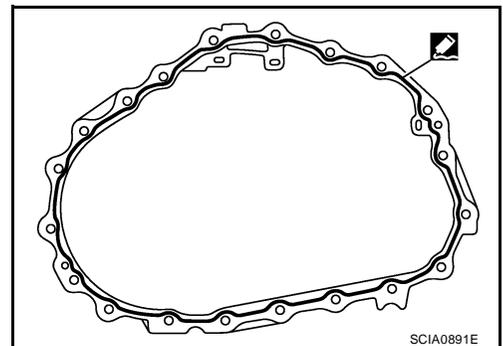
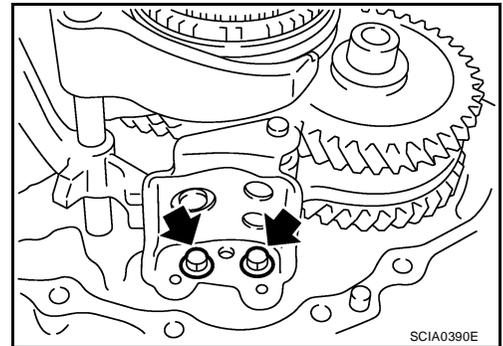
CAUTION:

Do not reuse the snap ring.

- c. Apply Anaerobic Liquid Gasket, Three Bond TB1215, Loctite Part No. 51813 or equivalent to mating surfaces of transaxle case and clutch housing. Refer to [GI-42, "Recommended Chemical Products and Sealants"](#).

CAUTION:

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



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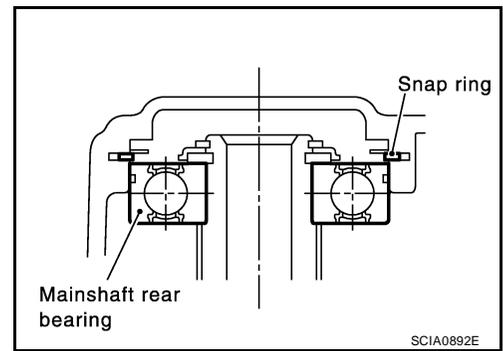
TRANSAXLE ASSEMBLY

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

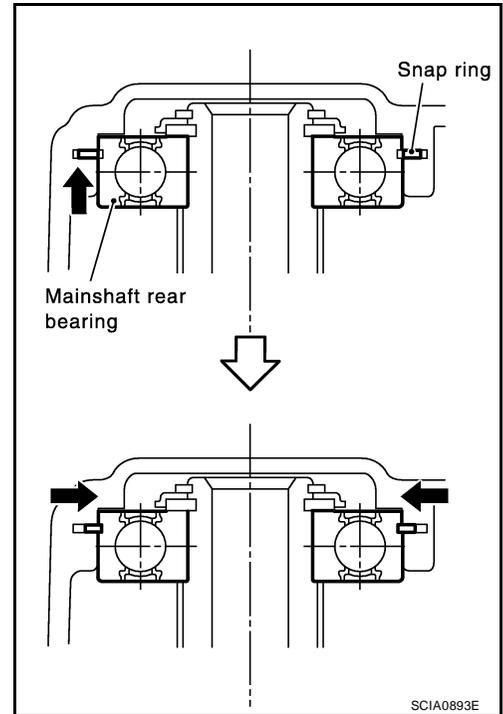
CAUTION:
Do not reuse the O-ring.

- f. Install shift check and stopper bolt.

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



- g. Through bore plug mounting hole, with snap ring stretched, move shift lever of striking rod assembly to 2nd speed, and lift up mainshaft assembly.
- h. Securely install snap ring onto mainshaft rear bearing.



- i. Tighten mounting bolts.

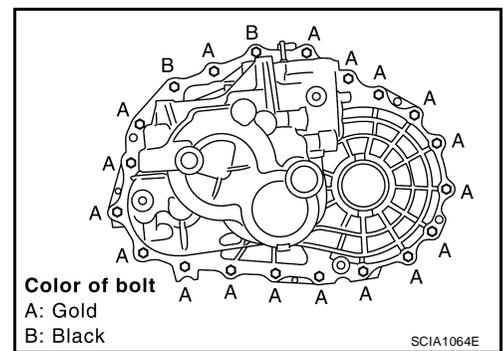
Bolt A:

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

Bolt B:

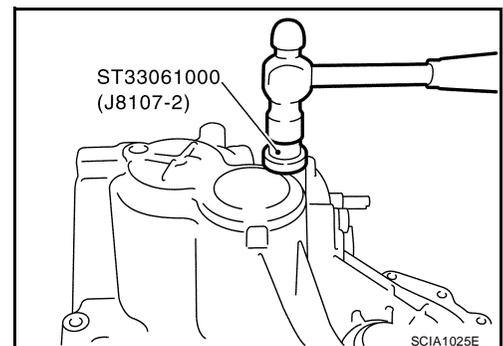
 : 63.0 - 66.9 N-m (6.5 - 6.8 kg-m, 47 - 49 ft-lb)

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



- 25. Using a drift, install bore plug.

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

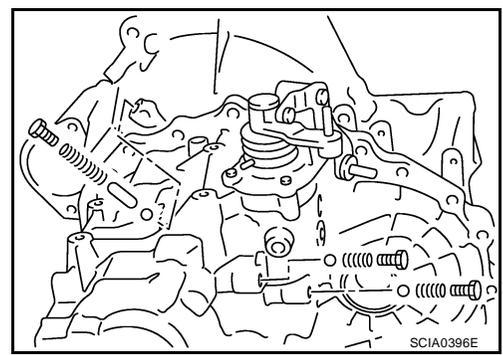


TRANSAXLE ASSEMBLY

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

CAUTION:

Check ball plugs are not reusable. Never reuse them.

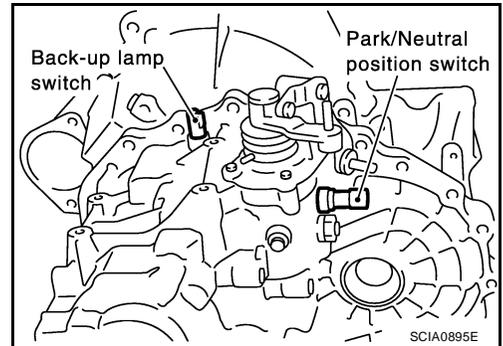


27. Apply Anaerobic Liquid Gasket, Three Bond TB1215, Loctite Part No. 51813 or equivalent to threads of neutral switch and reverse lamp switch. Then install them into transaxle case. Refer to [GI-42, "Recommended Chemical Products and Sealants"](#).

28. Install gaskets onto drain plug and filler plug, and then install them into transaxle case.

CAUTION:

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



Adjustment INPUTSHAFT END PLAY

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

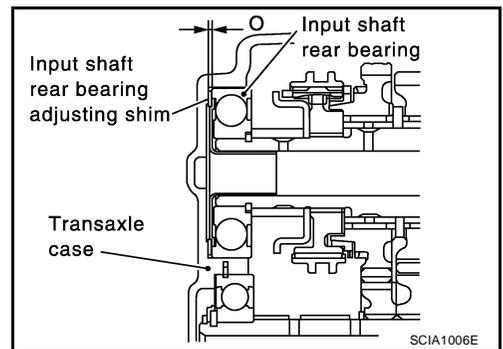
End play : 0 - 0.06 mm (0 - 0.0024 in)

Dimension "O" = (O₁ - O₂) + End play

O : Thickness of adjusting shim

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

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



Adjusting Shim

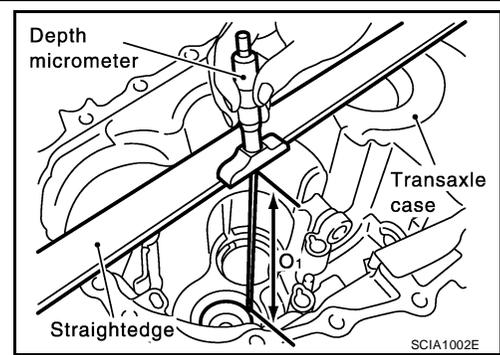
Shim thickness	Part number	Shim thickness	Part number	Shim thickness	Part number
0.40 mm (0.0157 in)	32225 8H500	0.88 mm (0.0346 in)	32225 8H512	1.36 mm (0.0520 in)	32225 8H524
0.44 mm (0.0173 in)	32225 8H501	0.92 mm (0.0362 in)	32225 8H513	1.40 mm (0.0551 in)	32225 8H560
0.48 mm (0.0189 in)	32225 8H502	0.96 mm (0.0378 in)	32225 8H514	1.44 mm (0.0567 in)	32225 8H561
0.52 mm (0.0205 in)	32225 8H503	1.00 mm (0.0396 in)	32225 8H515	1.48 mm (0.0583 in)	32225 8H562
0.56 mm (0.0220 in)	32225 8H504	1.04 mm (0.0409 in)	32225 8H516	1.52 mm (0.0598 in)	32225 8H563
0.60 mm (0.0236 in)	32225 8H505	1.08 mm (0.0425 in)	32225 8H517	1.56 mm (0.0614 in)	32225 8H564
0.64 mm (0.0252 in)	32225 8H506	1.12 mm (0.0441 in)	32225 8H518	1.60 mm (0.0630 in)	32225 8H565
0.68 mm (0.0268 in)	32225 8H507	1.16 mm (0.0457 in)	32225 8H519	1.64 mm (0.0646 in)	32225 8H566
0.72 mm (0.0283 in)	32225 8H508	1.20 mm (0.0472 in)	32225 8H520	1.68 mm (0.0661 in)	32225 8H567
0.76 mm (0.0299 in)	32225 8H509	1.24 mm (0.0488 in)	32225 8H521	1.72 mm (0.0677 in)	32225 8H568
0.80 mm (0.0315 in)	32225 8H510	1.28 mm (0.0504 in)	32225 8H522		
0.84 mm (0.0331 in)	32225 8H511	1.32 mm (0.0520 in)	32225 8H523		

CAUTION:

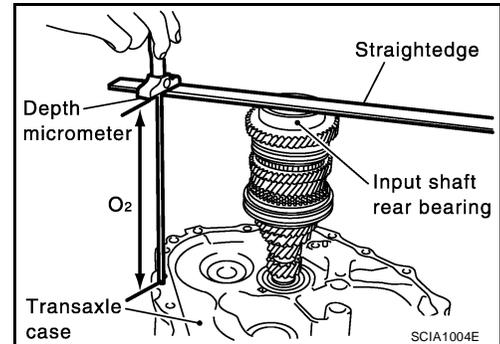
Only 1 adjusting shim can be selected.

TRANSAXLE ASSEMBLY

- Using depth micrometer and straight edge, measure dimension "O1" between transaxle case end face and mounting face of adjusting shim.



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



DIFFERENTIAL SIDE BEARING PRELOAD

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

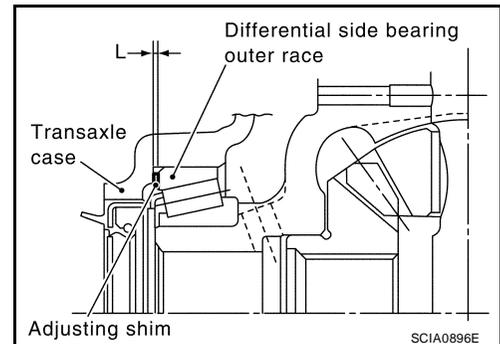
Preload : 0.15 - 0.21 mm (0.0059 - 0.0083 in)

Dimension "L" = (L1 - L2) + Preload

L : Thickness of adjusting shim

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

L2 : Distance between differential side bearing and transaxle case



Adjusting Shim

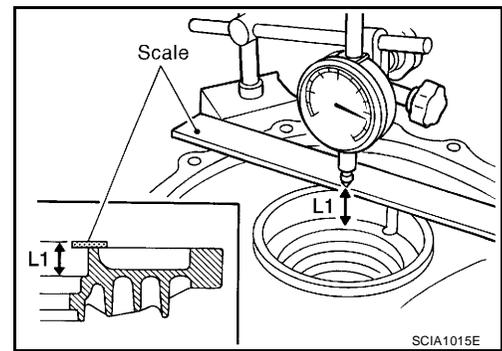
Shim thickness	Part number
0.48 mm (0.0189 in)	31438 80X00
0.52 mm (0.0205 in)	31438 80X01
0.56 mm (0.0220 in)	31438 80X02
0.60 mm (0.0236 in)	31438 80X03
0.64 mm (0.0252 in)	31438 80X04
0.68 mm (0.0268 in)	31438 80X05
0.72 mm (0.0283 in)	31438 80X06
0.76 mm (0.0299 in)	31438 80X07
0.80 mm (0.0315 in)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

CAUTION:

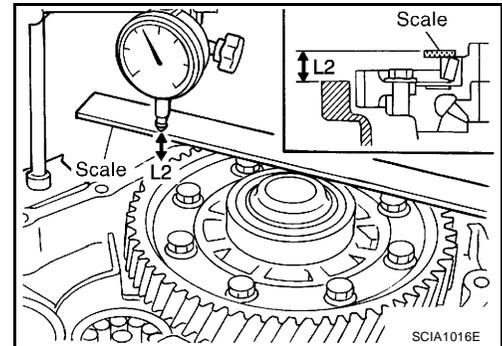
Up to 2 adjusting shims can be selected.

TRANSAXLE ASSEMBLY

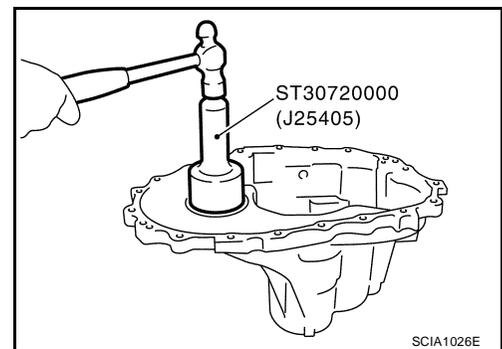
- Using dial gauge and scale, measure dimension "L1" between clutch housing case end face and mounting face of adjusting shim.
- Install outer race onto differential side bearing on final gear side. Holding lightly the outer race horizontally by hand, rotate final gear five times or more (for smooth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



- Using dial gauge and scale as shown in the figure, measure dimension "L2" between differential side bearing outer race and transaxle case end face.



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



MAINSHAFT END PLAY

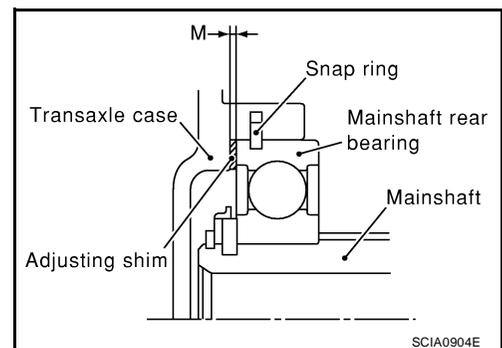
- When adjusting mainshaft end play, select adjusting shim for mainshaft rear bearing. To select adjusting shim, measure clearance "M" between transaxle case and mainshaft rear bearing.
- Calculate dimension "P" (thickness of adjusting shim) using the following procedure to satisfy specification of end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

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

Dimension "P" = "M" + End play

P : Thickness of adjusting shim

M : Distance between mainshaft rear bearing and transaxle case



TRANSAXLE ASSEMBLY

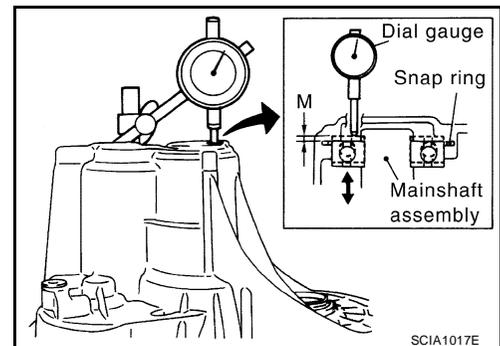
Adjusting Shim

Shim thickness	Part number
0.44 mm (0.0173 in)	32238 8H510
0.48 mm (0.0189 in)	32238 8H511
0.52 mm (0.0205 in)	32238 8H512
0.56 mm (0.0220 in)	32238 8H513
0.60 mm (0.0236 in)	32238 8H514
0.64 mm (0.0252 in)	32238 8H515
0.68 mm (0.0268 in)	32238 8H516
0.72 mm (0.0283 in)	32238 8H517
0.76 mm (0.0299 in)	32238 8H518
0.80 mm (0.0315 in)	32238 8H519
0.84 mm (0.0331 in)	32238 8H520
0.88 mm (0.0346 in)	32238 8H521
0.92 mm (0.0362 in)	32238 8H522
0.96 mm (0.0378 in)	32238 8H523
1.00 mm (0.0396 in)	32238 8H524
1.04 mm (0.0409 in)	32238 8H560
1.08 mm (0.0425 in)	32238 8H561

CAUTION:

Only 1 adjusting shim can be selected.

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



REVERSE IDLER GEAR END PLAY

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

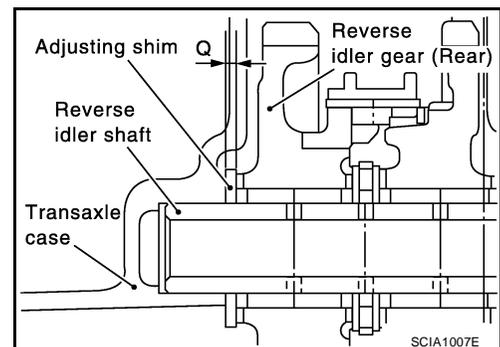
End play : 0.04 - 0.14 mm (0.0016 - 0.0055 in)

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 case end face and end face of reverse idler gear



TRANSAXLE ASSEMBLY

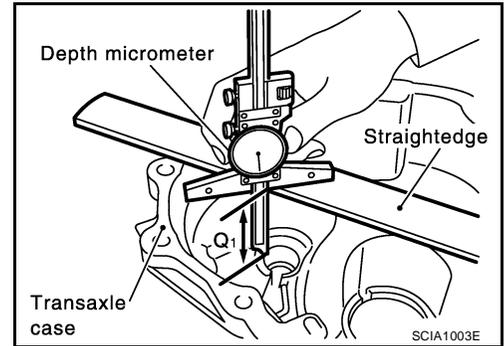
Adjusting Shim

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

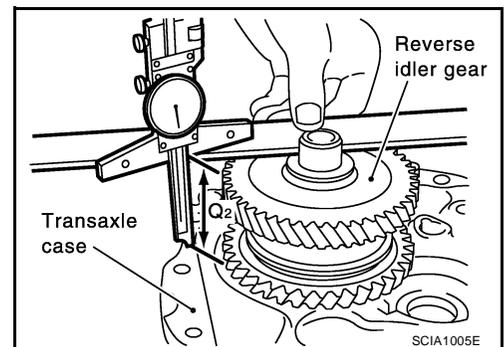
CAUTION:

Only 1 adjusting shim can be selected.

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



- Using depth micrometer and straight edge as shown in the figure, measure dimension "Q2" between clutch housing case end face and end face of reverse idler gear.
- Install selected reverse idler gear adjusting shim onto reverse idler gear.



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INPUT SHAFT AND GEARS

PFP:32200

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INPUT SHAFT AND GEARS

Disassembly and Assembly DISASSEMBLY

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

End play standard value

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

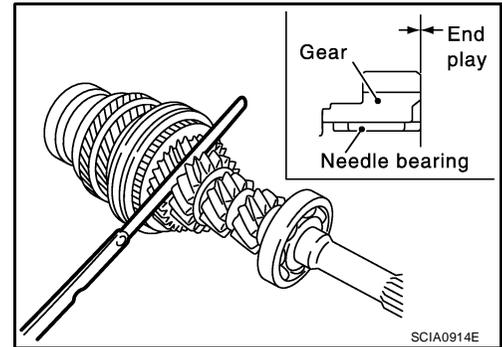
4th gear : 0.20 - 0.30 mm (0.0079 - 0.0118 in)

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

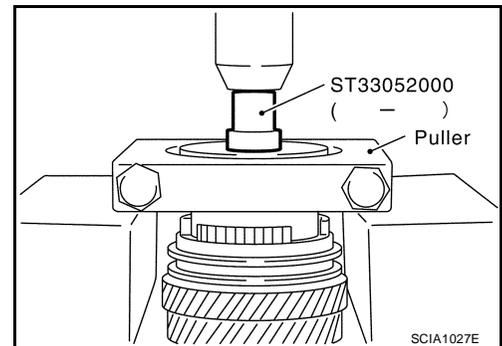
CAUTION:

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

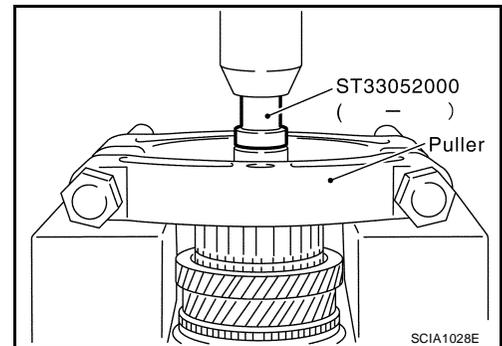
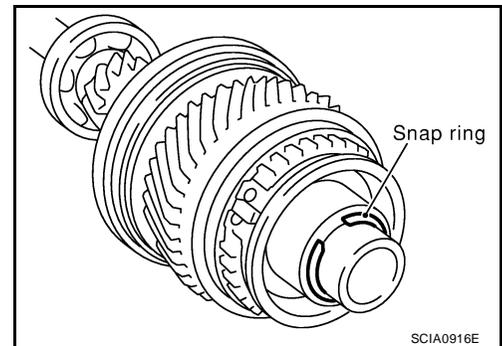
2. Remove oil channel.
3. Remove input shaft rear bearing.



4. Remove the snap ring.

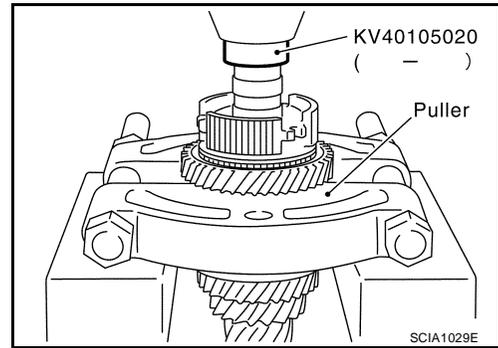


5. Remove input shaft bearing spacer and 5th stopper simultaneously.

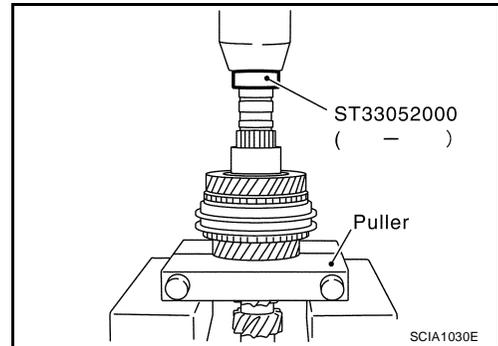


INPUT SHAFT AND GEARS

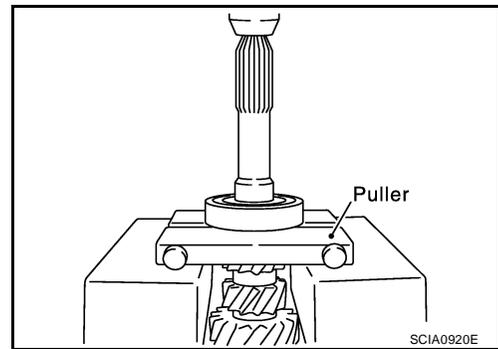
6. Remove 5th input gear and synchronizer hub assembly simultaneously.
7. Remove 5th needle bearing.



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



10. Remove input shaft front bearing.

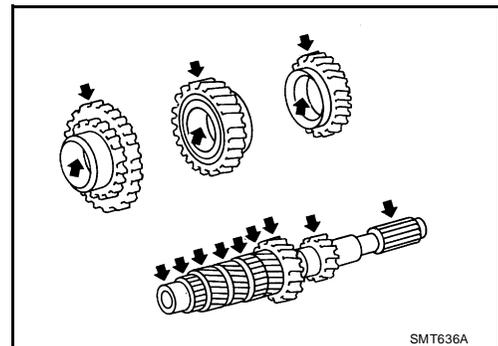


INSPECTION AFTER DISASSEMBLY

Input Shaft and Gear

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

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



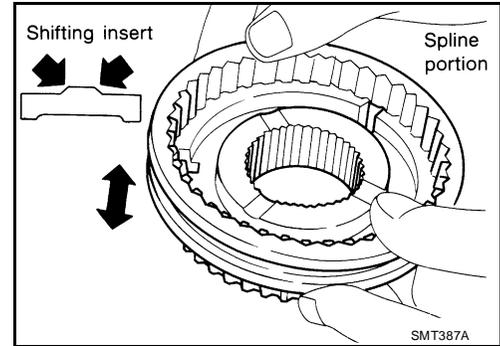
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INPUT SHAFT AND GEARS

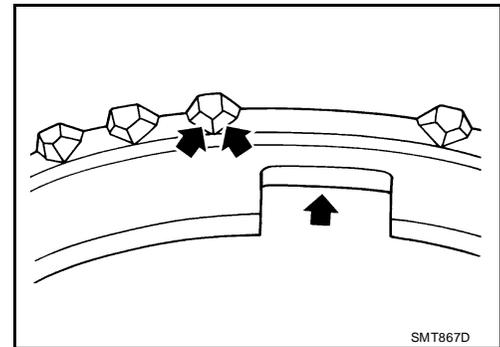
Synchronizer

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

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

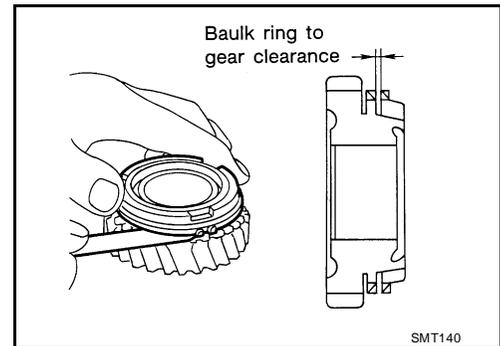
Clearance

Standard

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

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

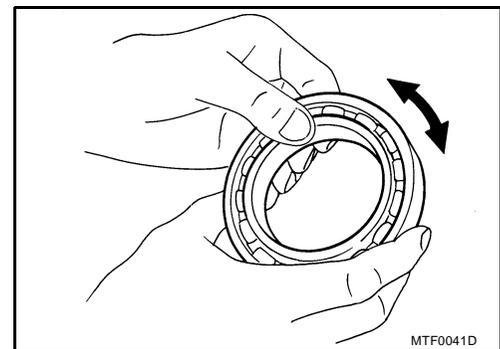
Limit value : 0.7 mm (0.028 in)



Bearing

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

- Damage and rough rotation of bearing



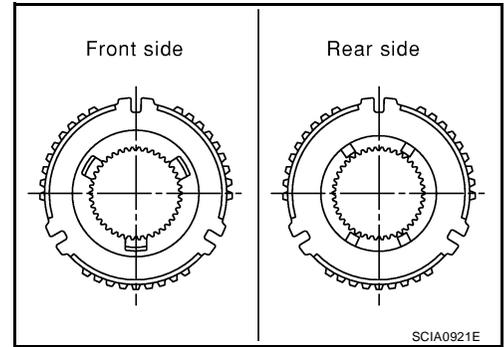
ASSEMBLY

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

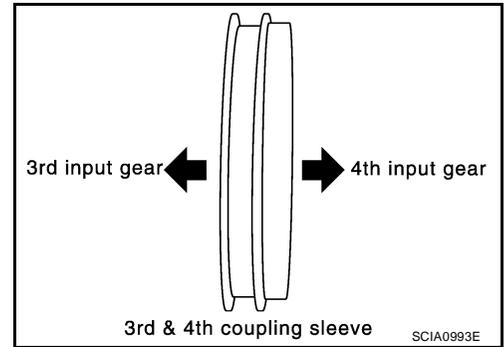
INPUT SHAFT AND GEARS

CAUTION:

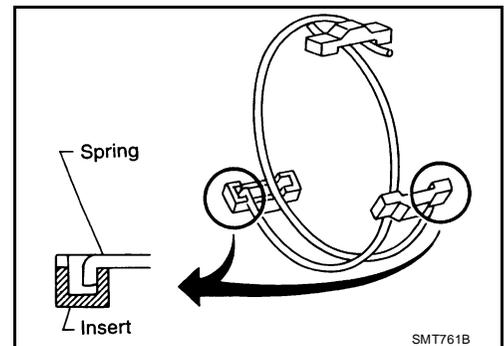
- Be careful with orientation of synchronizer hub.



- Be careful with orientation of coupling sleeve.



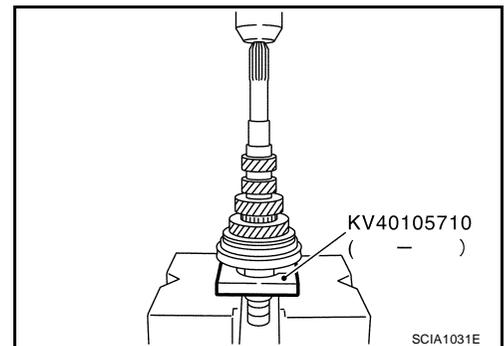
- Be sure not to hook ends of 2 spread springs (front and back: 2 each) on same shifting insert.



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

CAUTION:

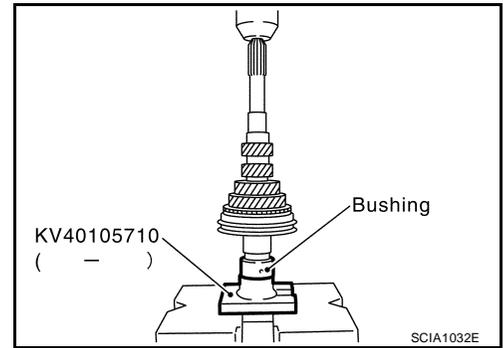
- Align grooves of shifting insert and 3rd baulk ring.



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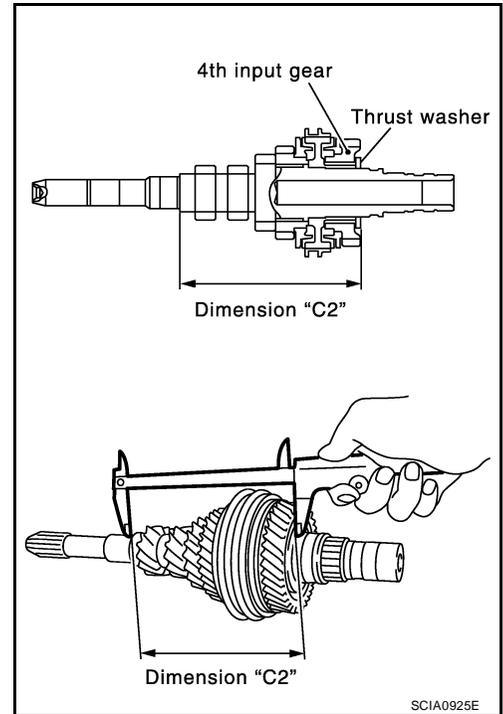
INPUT SHAFT AND GEARS

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



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

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



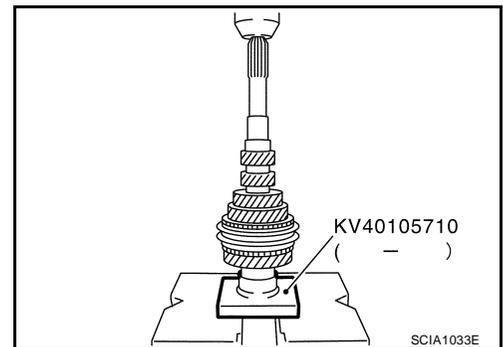
Thrust Washer

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

CAUTION:

Only one thrust washer can be selected.

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

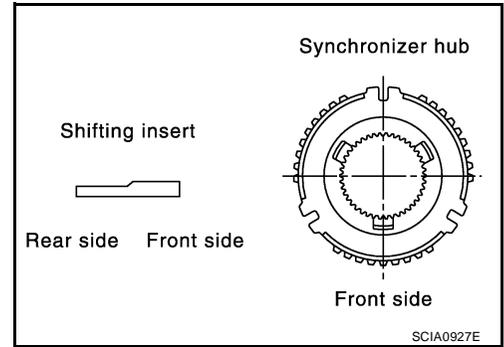


12. Install spread spring, shifting insert and 5th synchronizer hub onto 5th coupling sleeve.

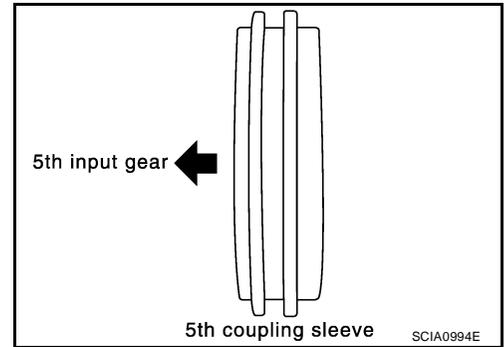
INPUT SHAFT AND GEARS

CAUTION:

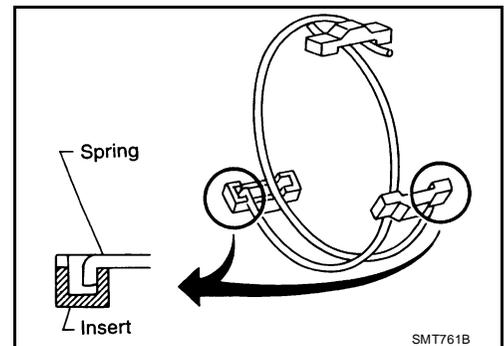
- Be careful with orientation of synchronizer hub and shifting insert.



- Be careful with orientation of coupling sleeve.



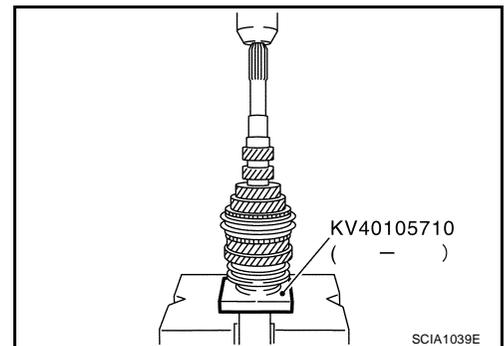
- Be sure not to hook ends of 2 spread springs (front and back: 2 each) on same shifting insert.



13. Install 5th synchronizer hub assembly.

CAUTION:

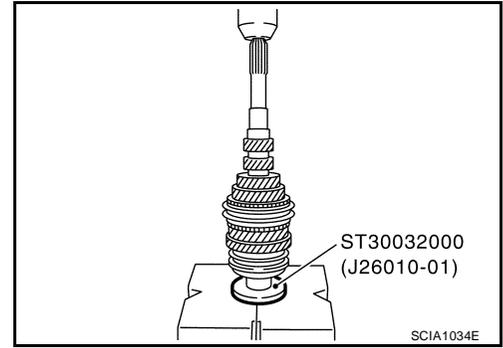
Align grooves of 5th shifting insert and 5th baulk ring.



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INPUT SHAFT AND GEARS

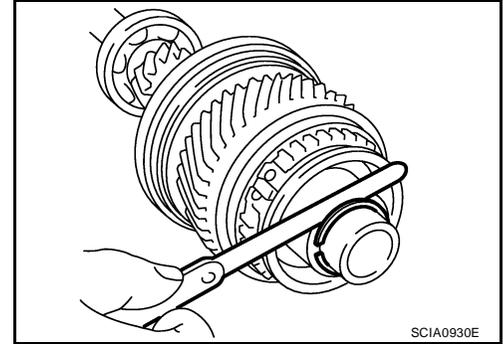
14. Install 5th stopper and then input shaft bearing spacer.



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

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

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

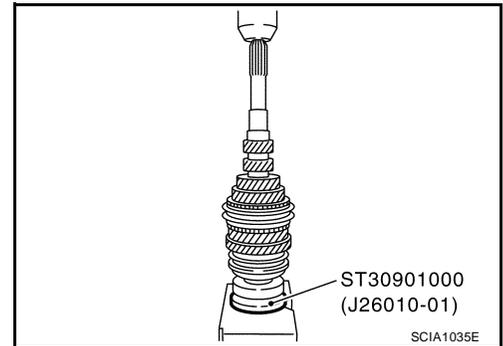


Snap Rings

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

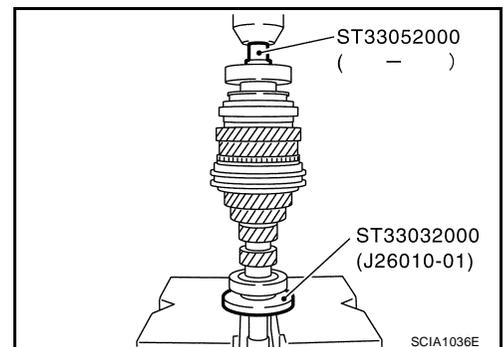
16. Install input shaft rear bearing.

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



17. Install input shaft front bearing.

18. Install oil channel onto input shaft.



INPUT SHAFT AND GEARS

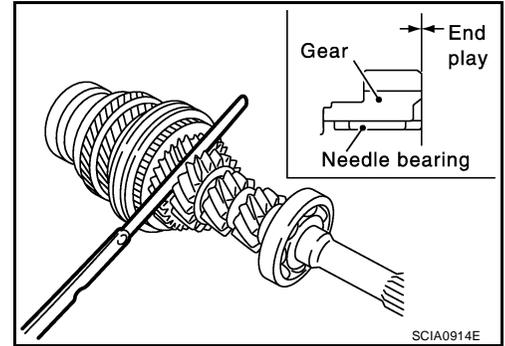
19. Check end play of 3rd, 4th, and 5th input gears.

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)



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MAINSHAFT AND GEARS

PFP:32241

ECS004QB

MAINSHAFT AND GEARS

Disassembly and Assembly DISASSEMBLY

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

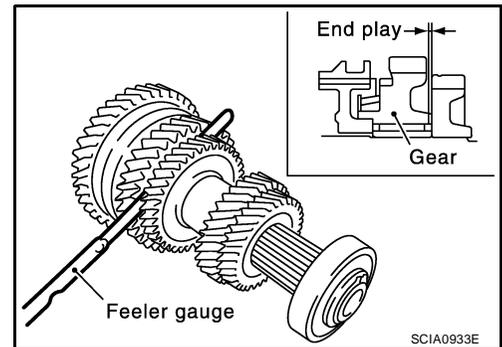
End play standard value

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

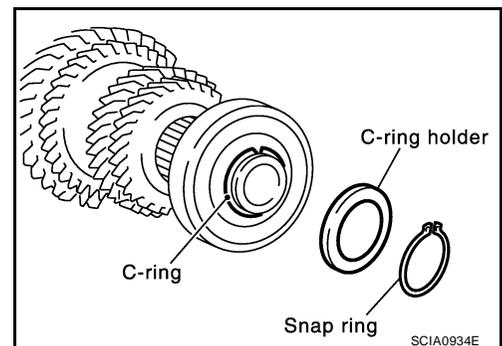
2nd gear : 0.06 - 0.16 mm (0.0024 - 0.0063 in)

CAUTION:

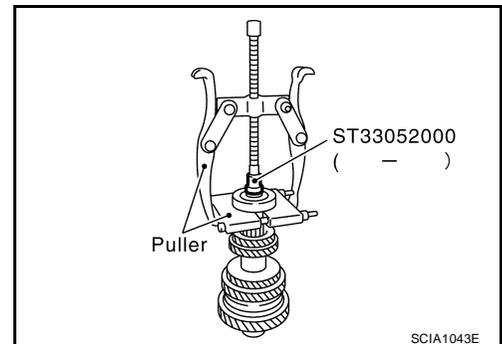
If measurement is outside the standard range, disassemble to check contact surfaces of gear, shaft, and hub. Adjust with snap ring at assembly.



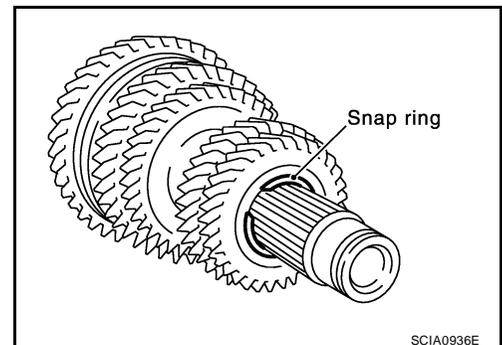
2. Remove the snap ring.
3. Remove C-ring holder, and then mainshaft C-ring.



4. Remove mainshaft rear bearing.

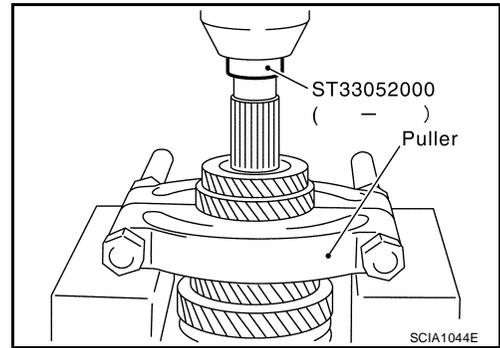


5. Remove the snap ring.

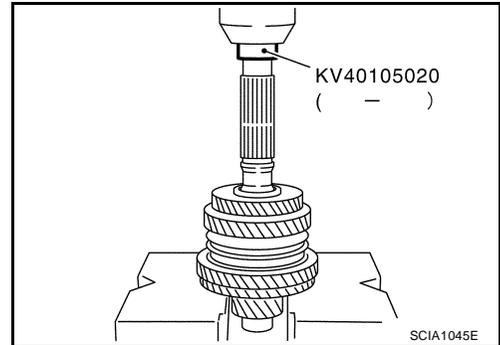


MAINSHAFT AND GEARS

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



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

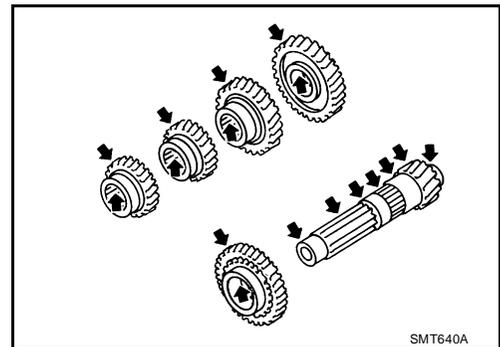


INSPECTION AFTER DISASSEMBLY

Mainshaft and Gears

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

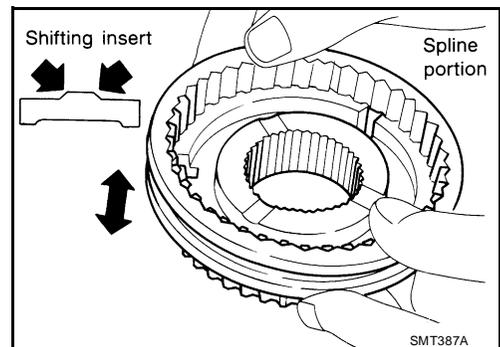
- Damage, peeling, dent, uneven wear, bending, and other non-standard conditions of the shaft.
- Excessive wear, damage, peeling, and other non-standard conditions of the gears.



Synchronizer

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

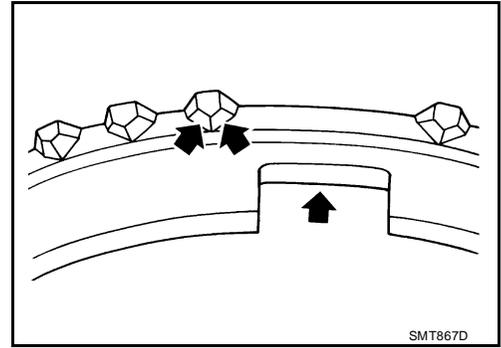
- Damage and unusual wear on contact surfaces of coupling sleeve, synchronizer hub, and shifting insert.
- Coupling sleeve and synchronizer hub must move smoothly.



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MAINSHAFT AND GEARS

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

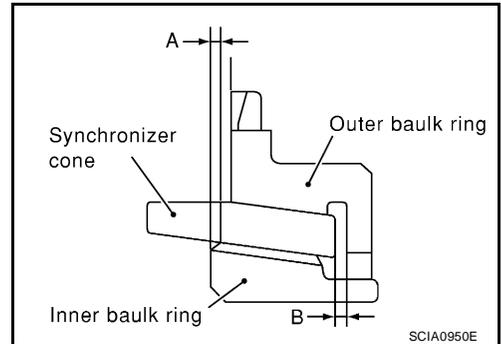


Baulk Ring Clearance

- For the double cone synchronizer (1st and 2nd) check the clearance of the outer baulk ring, synchronizer cone, and inner baulk ring of the 1st and 2nd double cone synchronizers using the following procedure.

CAUTION:

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

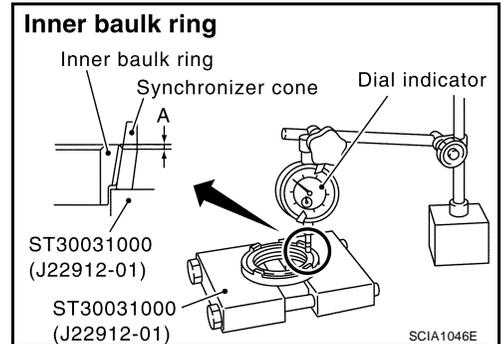


1. Using a dial gauge, measure clearance A at 2 or more points diagonally opposite, and calculate mean value.

Clearance A

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

Limit value : 0.2 mm (0.008 in) or less

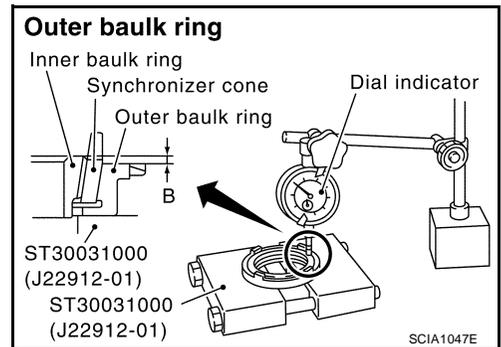


2. Using a dial gauge, measure clearance B at 2 or more points diagonally opposite, and calculate mean value.

Clearance B

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

Limit value : 0.2 mm (0.008 in) or less

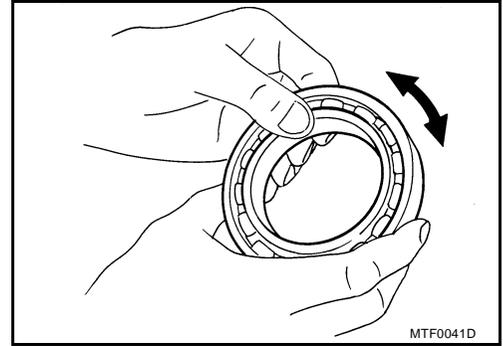


MAINSHAFT AND GEARS

Bearing

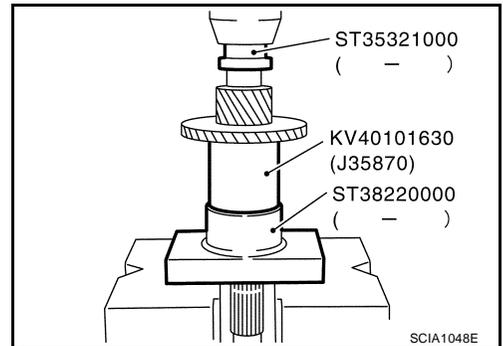
Check items below. If necessary, replace them with new ones.

- Damage and rough rotation of bearing



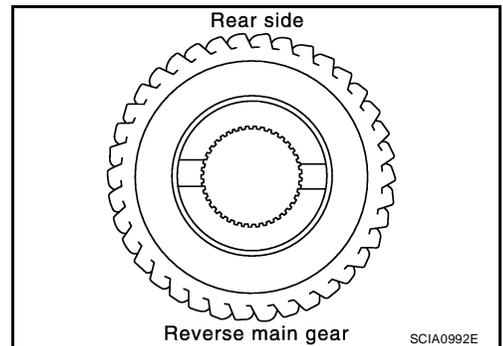
ASSEMBLY

1. Install reverse main gear.

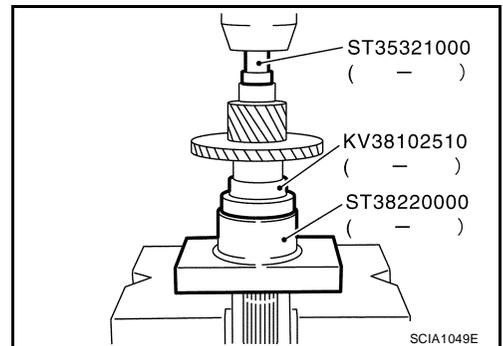


CAUTION:

Be careful with orientation of reverse main gear.



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



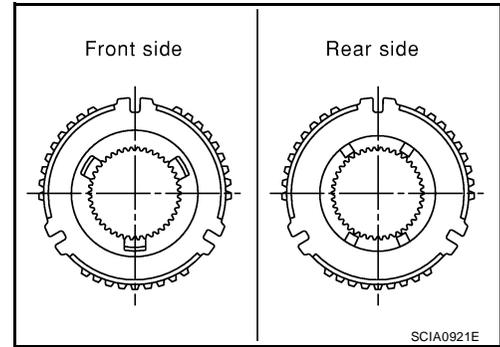
4. Install spread spring, shifting insert and 1st-2nd synchronizer hub onto 1st-2nd coupling sleeve.

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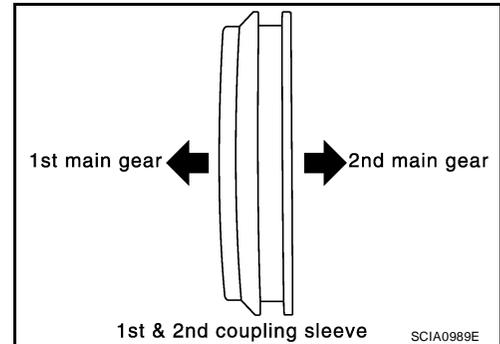
MAINSHAFT AND GEARS

CAUTION:

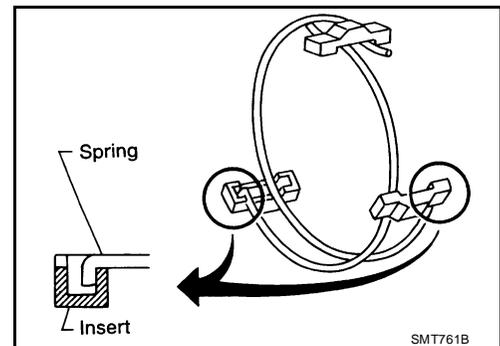
- Be careful with orientation of synchronizer hub.



- Be careful with orientation of coupling sleeve.



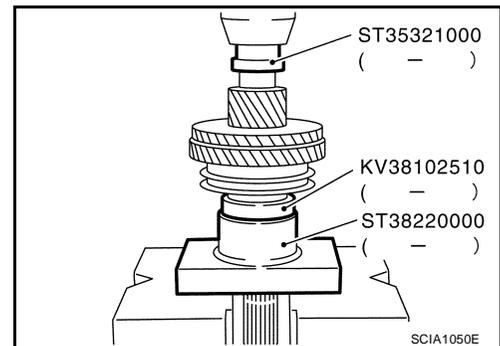
- Be sure not to hook ends of 2 spread springs (front and back: 2 each) on same shifting insert.



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

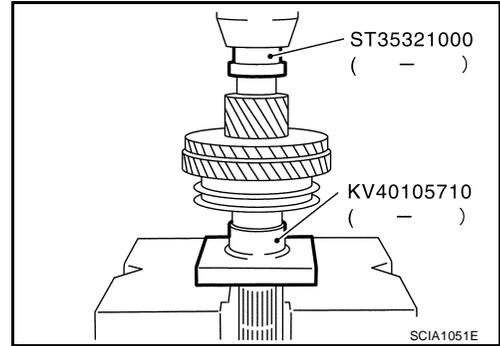
CAUTION:

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

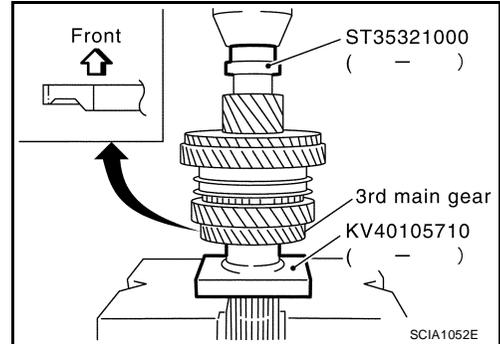


MAINSHAFT AND GEARS

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

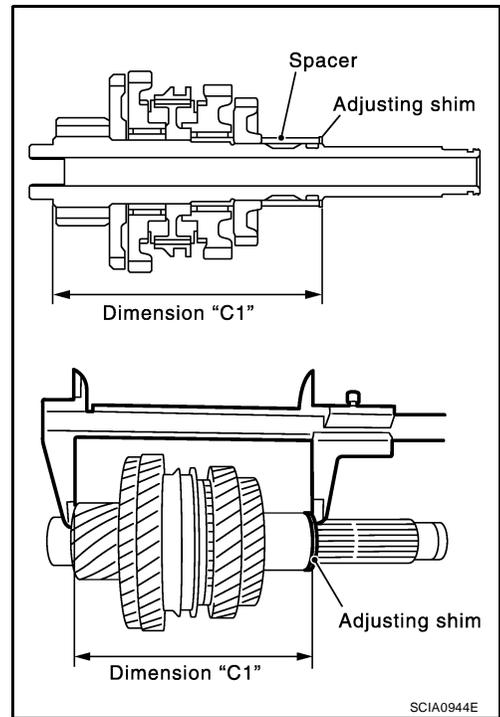


9. Install 3rd main gear.
CAUTION:
Be careful with orientation of 3rd main gear.
10. Install 3rd-4th mainshaft spacer.



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

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



Adjusting Shim

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

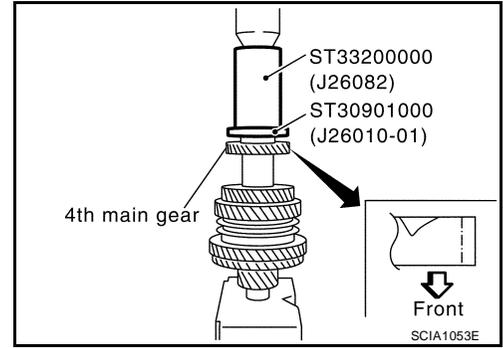
CAUTION:
Only one adjusting shim can be selected.

MAINSHAFT AND GEARS

12. Install 4th main gear.

CAUTION:

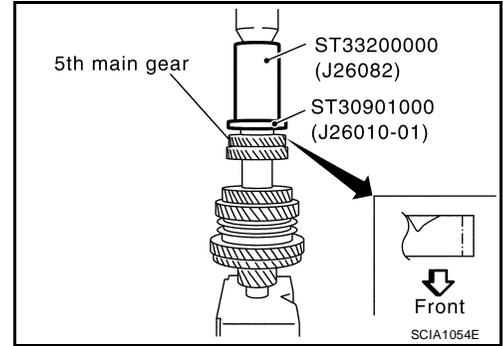
Be careful with orientation of 4th main gear.



13. Install 5th main gear.

CAUTION:

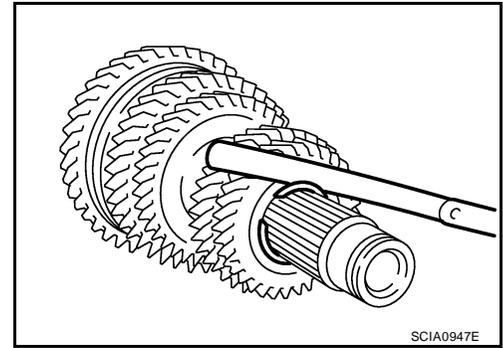
Be careful with orientation of 5th main gear.



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

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

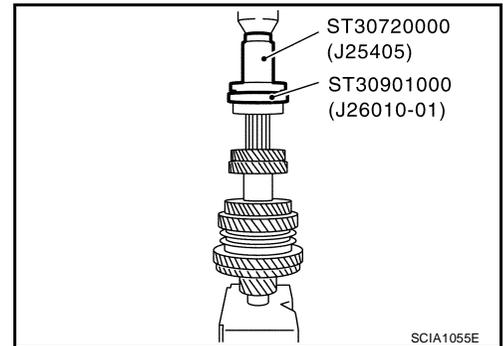
- If measurement is outside the standard range, reselect snap ring.



Snap Rings

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

15. Install mainshaft rear bearing.

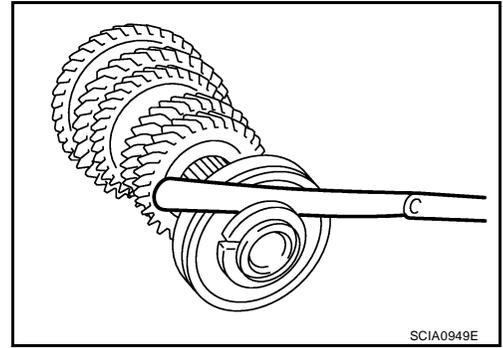


MAINSHAFT AND GEARS

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

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

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



C-ring

Thickness	Part number	Thickness	Part number
2.535 mm (0.0866 in)	32348 8H800	2.835 mm (0.1116 in)	32348 8H810
2.565 mm (0.1010 in)	32348 8H801	2.865 mm (0.1128 in)	32348 8H811
2.595 mm (0.1022 in)	32348 8H802	2.895 mm (0.1140 in)	32348 8H812
2.625 mm (0.1033 in)	32348 8H803	2.925 mm (0.1152 in)	32348 8H813
2.655 mm (0.1045 in)	32348 8H804	2.955 mm (0.1163 in)	32348 8H814
2.685 mm (0.1057 in)	32348 8H805	2.985 mm (0.1175 in)	32348 8H815
2.715 mm (0.1069 in)	32348 8H806	3.015 mm (0.1187 in)	32348 8H816
2.745 mm (0.1081 in)	32348 8H807	3.045 mm (0.1199 in)	32348 8H817
2.775 mm (0.1093 in)	32348 8H808	3.075 mm (0.1211 in)	32348 8H818
2.805 mm (0.1104 in)	32348 8H809		

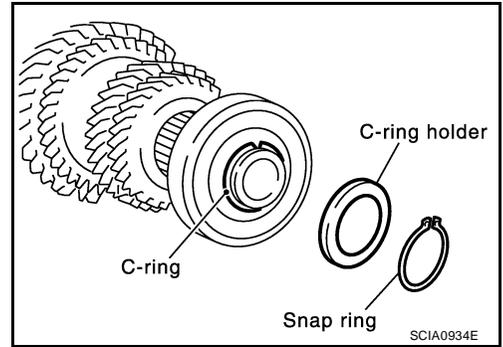
17. Fit C-ring holder, and install snap ring.

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

End play standard value

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

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



REVERSE IDLER SHAFT AND GEARS

PFP:32281

REVERSE IDLER SHAFT AND GEARS

Disassembly and Assembly DISASSEMBLY

ECS0040C

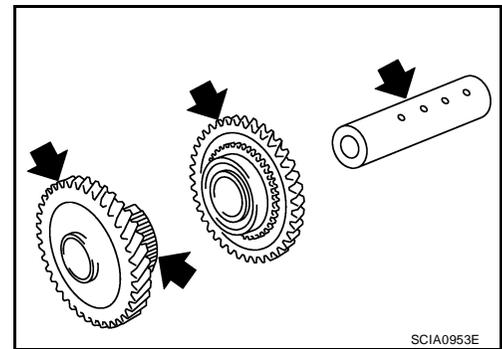
1. Remove reverse idler gear adjusting shim.
2. Remove reverse idler gear (rear), reverse coupling sleeve and insert spring simultaneously.
3. Remove reverse idler gear needle bearing.
4. Remove thrust needle bearing.
5. Remove reverse baulk ring.
6. Remove reverse idler gear (front).
7. Remove reverse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

INSPECTION AFTER DISASSEMBLY

Reverse Idler Shaft and Gears

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

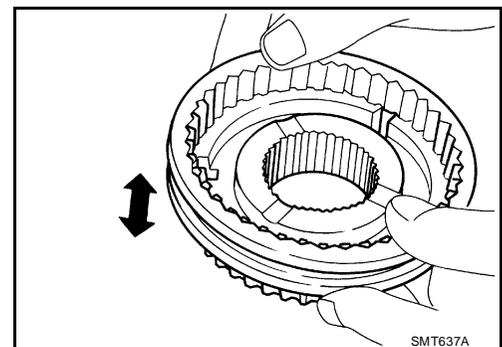
- Damage, peeling, dent, uneven wear, bending, and other non-standard conditions of the shaft.
- Excessive wear, damage, peeling, and other non-standard conditions of the gears.



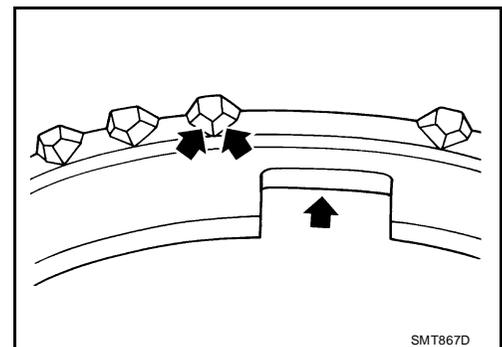
Synchronizer

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

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



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



REVERSE IDLER SHAFT AND GEARS

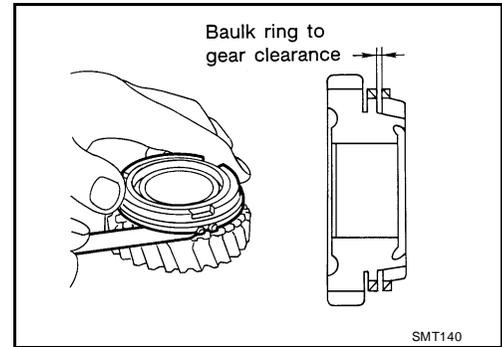
Baulk Ring Clearance

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

Clearance

Standard : 0.95 - 1.4 mm (0.0374 - 0.055 in)

Limit value : 0.7 mm (0.028 in)



Bearing

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

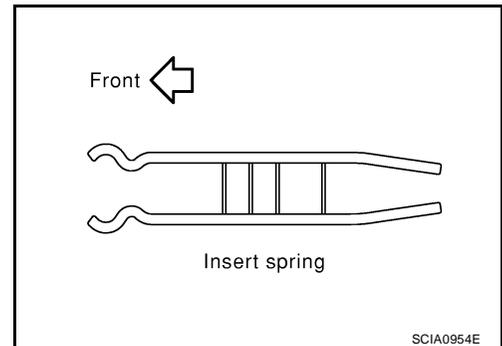
- Damage and rough rotation of bearing.

ASSEMBLY

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

CAUTION:

- Be careful with orientation of insert spring.



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FINAL DRIVE

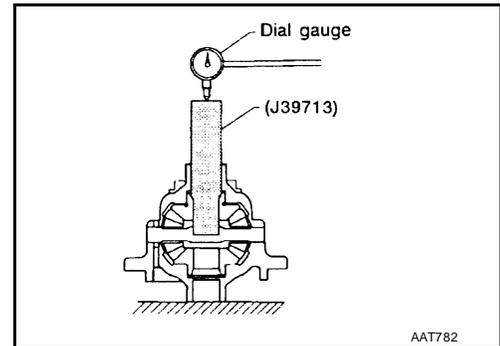
FINAL DRIVE

PF3:38411

Disassembly and Assembly PRE-INSPECTION

ECS004QD

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

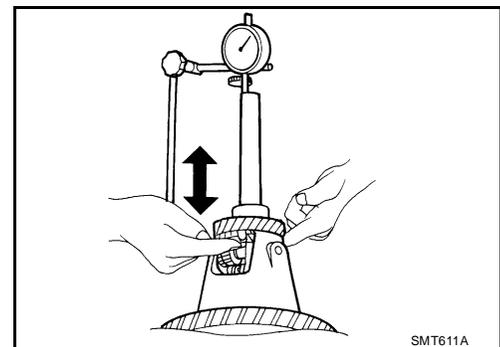


2. Upright the differential case so that the side gear to be measured faces upward.
3. Place final drive adapter and dial gauge onto side gear. Move side gear up and down, and measure the clearance.

Between side gear and differential case

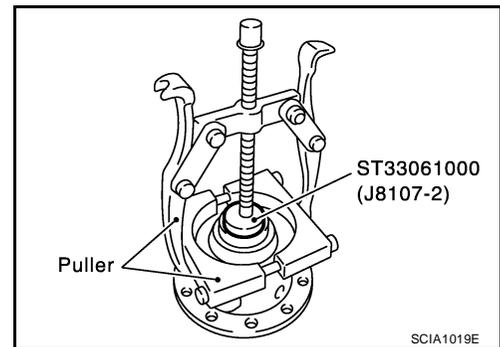
Clearance : 0.1 - 0.2 mm (0.004 - 0.008 in)

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

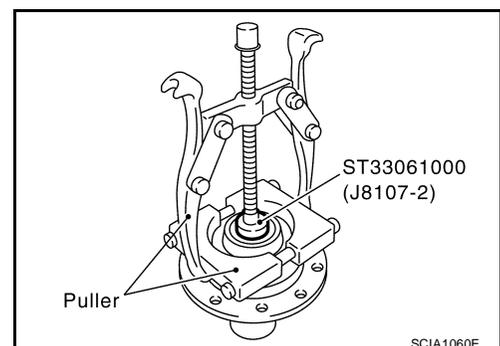


DISASSEMBLY

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

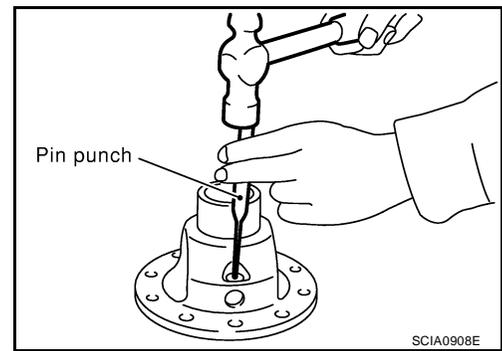


4. Using a drift and puller, remove differential side bearing (transaxle case side).



FINAL DRIVE

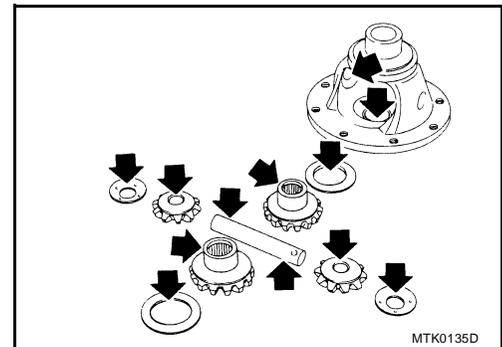
- Using a pin punch, pull out lock pin and pinion mate shaft.
- Rotate pinion mate gears, and remove pinion mate gears, pinion mate thrust washers, side gears, and side gear thrust washers from differential case.



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.

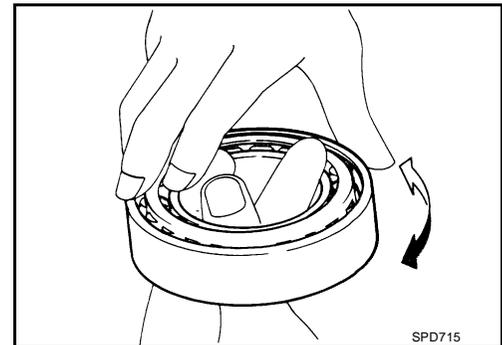


Bearing

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

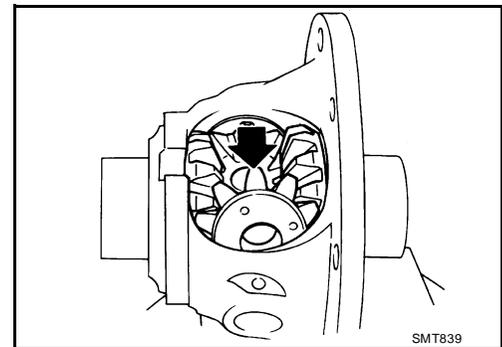
CAUTION:

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



ASSEMBLY

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

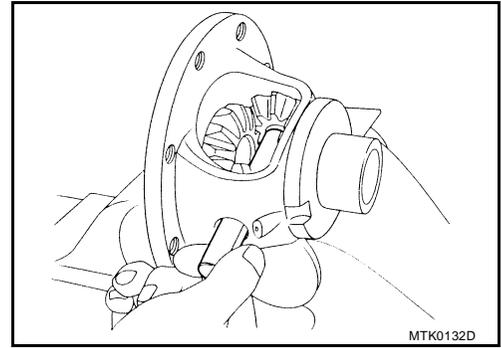


FINAL DRIVE

4. Insert pinion mate shaft into differential case.

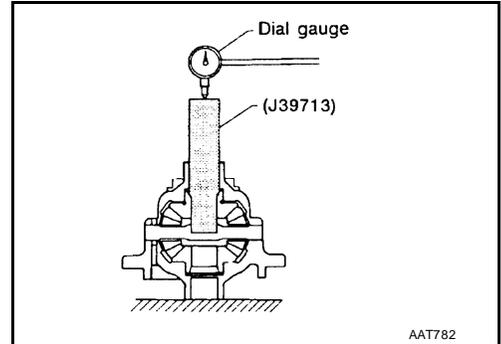
CAUTION:

Be sure not to damage pinion mate thrust washers.



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

- a. Upright the differential case so that its side gear to be measured face upward.
b. Place final drive adapter and dial gauge onto side gears.



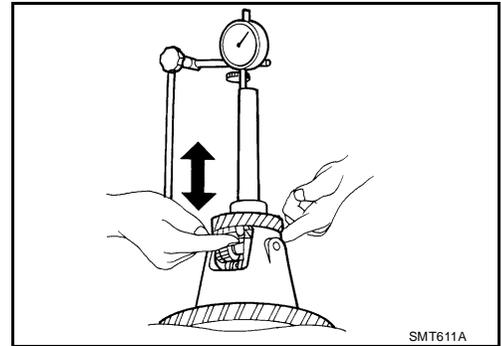
- c. Move side gears up and down to measure end play, and select thrust washer so that it satisfies standard.

End Play

Standard value : 0.1 - 0.2 mm (0.004 - 0.008 in)

CAUTION:

Place differential case upside down. Be sure to measure end play for opposite side-gears likewise.



Thrust washer

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

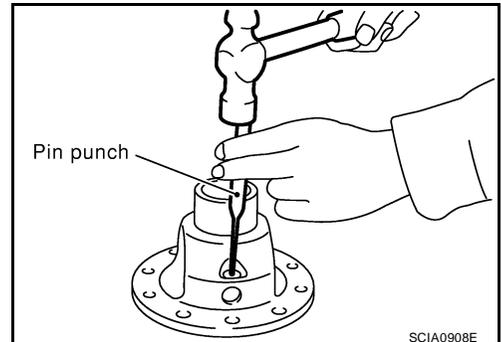
CAUTION:

Only one thrust washer can be selected.

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

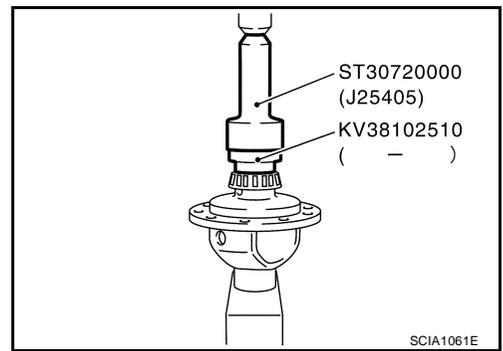
CAUTION:

Do not reuse the lock pin.

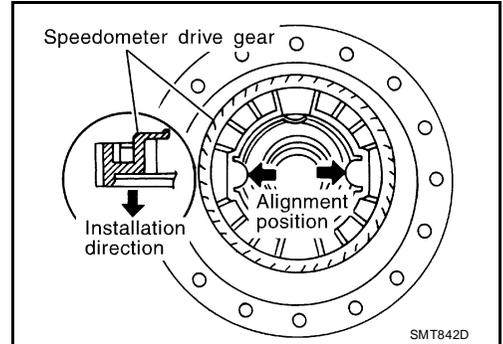


FINAL DRIVE

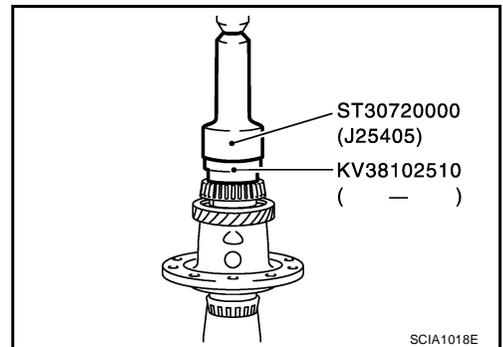
7. Using a drift (special service tool), install differential side bearing (transaxle case side).



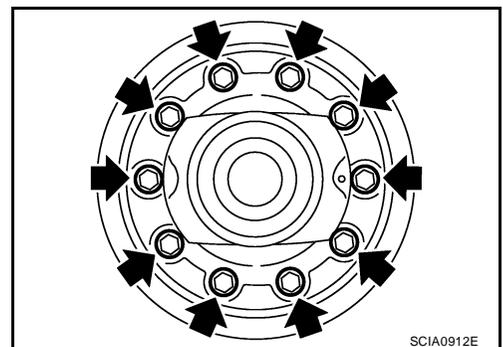
8. Align and install speedometer drive gear onto differential case.



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



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



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SHIFT CONTROL

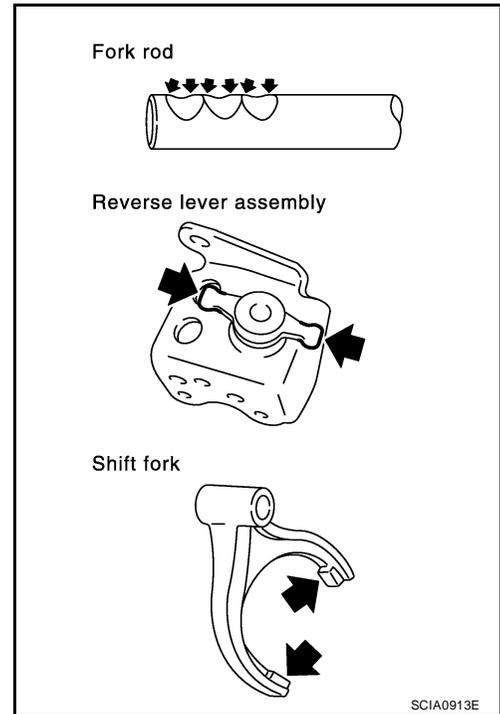
PF3:32982

SHIFT CONTROL

ECS004QE

Inspection

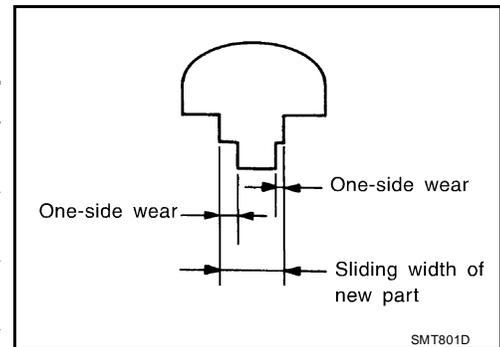
- Check contact surfaces and sliding area for wear, damage, bending, etc. If necessary, replace parts.



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)



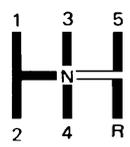
SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

PF0:00030

General Specifications TRANSAXLE

ECS0040F

Engine	QR25DE	VQ35DE		
Transaxle model	RS5F51A			
Model code number	8J206	8J204		
Number of speed	5			
Synchromesh type	Warner			
Shift pattern	 <p style="text-align: center; font-size: small;">SCIA0821E</p>			
Gear ratio	1st	3.416	3.153	
	2nd	1.944	1.842	
	3rd	1.258		
	4th	0.947		
	5th	0.772		
	Reverse	3.252	3.002	
Number of teeth	Input gear	1st	12	13
		2nd	18	19
		3rd	31	
		4th	38	
		5th	44	
		Reverse	12	13
	Main gear	1st	49	
		2nd	35	
		3rd	39	
		4th	36	
		5th	34	
		Reverse	38	
	Reverse idler gear	Front	37	
		Rear	38	
Oil capacity	2.3 ℓ (4 7/8 US pt, 4 Imp pt)			
Oil grade	API GL-4, Viscosity SAE 75W-85			
Remarks	Reverse synchronizer	Installed		
	Double baulk ring type synchronizer	1st & 2rd synchronizer		

FINAL GEAR

Engine	QR25DE	VQ35DE	
Transaxle model	RS5F51A		
Model code number	8J206	8J204	
Final gear ratio	4.133	3.812	
Number of teeth	Final gear/Pinion	62/15	61/16
	Side gear/Pinion mate gear	14/10	14/10

SERVICE DATA AND SPECIFICATIONS (SDS)

Gear End Play

ECS004QG

Unit: mm (in)

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

Clearance Between Baulk Ring and Gear 3RD,4TH,5TH & REVERSE BAULK RING

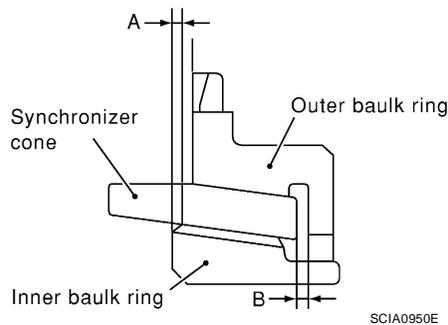
ECS004QH

Unit: mm (in)

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

1ST AND 2ND DOUBLE BAULK RING

Unit: mm (in)



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

Available Snap Rings INPUT SHAFT SPACER

ECS004QI

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

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

5TH MAIN GEAR

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

SERVICE DATA AND SPECIFICATIONS (SDS)

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

Available C-rings MAINSHAFT C-RING

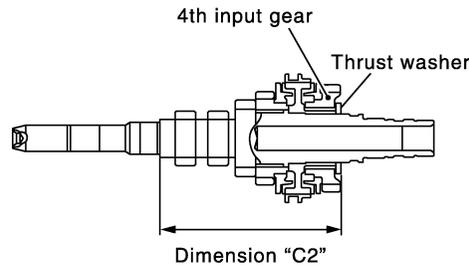
ECS004QJ

End play		0 - 0.06 mm (0 - 0.0024 in)	
Thickness mm (in)	Part number*	Thickness mm (in)	Part number*
2.535 (0.0866)	32348 8H800	2.835 (0.1116)	32348 8H810
2.565 (0.1010)	32348 8H801	2.865 (0.1128)	32348 8H811
2.595 (0.1022)	32348 8H802	2.895 (0.1140)	32348 8H812
2.625 (0.1033)	32348 8H803	2.925 (0.1152)	32348 8H813
2.655 (0.1045)	32348 8H804	2.955 (0.1163)	32348 8H814
2.685 (0.1057)	32348 8H805	2.985 (0.1175)	32348 8H815
2.715 (0.1069)	32348 8H806	3.015 (0.1187)	32348 8H816
2.745 (0.1081)	32348 8H807	3.045 (0.1199)	32348 8H817
2.775 (0.1093)	32348 8H808	3.075 (0.1211)	32348 8H818
2.805 (0.1104)	32348 8H809		

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

Available Thrust Washer INPUT SHAFT THRUST WASHER

ECS004QK



SCIA1008E

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

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

DIFFERENTIAL SIDE GEAR THRUST WASHER

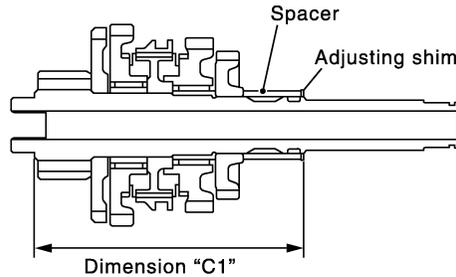
Allowable clearance between side gear and differential case with washer	0.1 - 0.2 mm (0.004 - 0.008 in)
Thickness mm (in)	Part number*
0.75 (0.0295)	38424 81X00
0.80 (0.0315)	38424 81X01
0.85 (0.0335)	38424 81X02
0.90 (0.0354)	38424 81X03
0.95 (0.0374)	38424 81X04

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

SERVICE DATA AND SPECIFICATIONS (SDS)

Available Adjusting Shims MAINSHAFT ADJUSTING SHIM

ECS004QL



SCIA1009E

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

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

INPUT SAFT REAR BEARING ADJUSTING SHIM

End play			0 - 0.06 mm (0 - 0.0024 in)		
Thickness mm (in)	Part number*	Thickness mm (in)	Part number*	Thickness mm (in)	Part number*
0.40 (0.0157)	32225 8H500	0.88 (0.0346)	32225 8H512	1.36 (0.0520)	32225 8H524
0.44 (0.0173)	32225 8H501	0.92 (0.0362)	32225 8H513	1.40 (0.0551)	32225 8H560
0.48 (0.0189)	32225 8H502	0.96 (0.0378)	32225 8H514	1.44 (0.0567)	32225 8H561
0.52 (0.0205)	32225 8H503	1.00 (0.0396)	32225 8H515	1.48 (0.0583)	32225 8H562
0.56 (0.0220)	32225 8H504	1.04 (0.0409)	32225 8H516	1.52 (0.0598)	32225 8H563
0.60 (0.0236)	32225 8H505	1.08 (0.0425)	32225 8H517	1.56 (0.0614)	32225 8H564
0.64 (0.0252)	32225 8H506	1.12 (0.0441)	32225 8H518	1.60 (0.0630)	32225 8H565
6.68 (0.0268)	32225 8H507	1.16 (0.0457)	32225 8H519	1.64 (0.0646)	32225 8H566
0.72 (0.0283)	32225 8H508	1.20 (0.0472)	32225 8H520	1.68 (0.0661)	32225 8H567
0.76 (0.0299)	32225 8H509	1.24 (0.0488)	32225 8H521	1.72 (0.0677)	32225 8H568
0.80 (0.0315)	32225 8H510	1.28 (0.0504)	32225 8H522		
0.84 (0.0331)	32225 8H511	1.32 (0.0520)	32225 8H523		

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

MAINSAFT REAR BEARING ADJUSTING SHIM

End play		0 - 0.06 mm (0 - 0.0024 in)	
Thickness mm (in)	Part number*	Thickness mm (in)	Part number*
0.44 (0.0173)	32238 8H510	0.80 (0.0315)	32238 8H519
0.48 (0.0189)	32238 8H511	0.84 (0.0331)	32238 8H520
0.52 (0.0205)	32238 8H512	0.88 (0.0346)	32238 8H521
0.56 (0.0220)	32238 8H513	0.92 (0.0362)	32238 8H522
0.60 (0.0236)	32238 8H514	0.96 (0.0378)	32238 8H523
0.64 (0.0252)	32238 8H515	1.00 (0.0396)	32238 8H524
0.68 (0.0268)	32238 8H516	1.04 (0.0409)	32238 8H560
0.72 (0.0283)	32238 8H517	1.08 (0.0425)	32238 8H561
0.76 (0.0299)	32238 8H518		

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

SERVICE DATA AND SPECIFICATIONS (SDS)

REVERSE IDLER GEAR ADJUSTING SHIM

End play		0.04 - 0.14 mm (0.0016 - 0.0055 in)	
Thickness mm (in)	Part number*	Thickness mm (in)	Part number*
1.76 (0.0693)	32237 8H500	2.24 (0.0882)	32237 8H506
1.84 (0.0724)	32237 8H501	2.32 (0.0913)	32237 8H507
1.92 (0.0756)	32237 8H502	2.40 (0.0945)	32237 8H508
2.00 (0.0787)	32237 8H503	2.48 (0.0976)	32237 8H509
2.08 (0.0819)	32237 8H504	2.56 (0.1008)	32237 8H510
2.16 (0.0850)	32237 8H505	2.64 (0.1039)	32237 8H511

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

Available Shims

ECS004QM

— Differential Side Bearing Preload and Adjusting Shim

BEARING PRELOAD

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