C TRANSMISSION/TRANSAXLE

SECTION MT
MANUAL TRANSMISSION

CONTENTS

PRECAUTIONS ..................................................... 2
Caution ................................................................ 2
Precautions for Battery Service ........................... 2

PREPARATION ...................................................... 3
Special Service Tools .......................................... 3
Commercial Service Tools ................................... 6

NOISE, VIBRATION AND HARSHNESS (NVH)
TROUBLESHOOTING ........................................... 7
NVH Troubleshooting Chart .................................... 7
MANUAL TRANSMISSION ...................................... 7

DESCRIPTION ....................................................... 8
Cross-Sectional View ......................................... 8
DOUBLE-CONE SYNCHRONIZER (MODEL CODE NUMBER. CD000) ........................................... 9
DOUBLE-CONE SYNCHRONIZER (MODEL CODE NUMBER. CD005) ........................................... 9
TRIPLE-CONE SYNCHRONIZER (MODEL CODE NUMBER. CD005) ........................................... 9

M/T OIL ................................................................ 10
Replacement ....................................................... 10
DRAINING ........................................................ 10
FILLING .......................................................... 10
Checking .......................................................... 10
OIL LEAKAGE AND OIL LEVEL ....................... 10

REAR OIL SEAL .................................................. 11
Removal and Installation ..................................... 11
REMOVAL ....................................................... 11
INSTALLATION ................................................ 11

POSITION SWITCH ............................................. 12
Checking .......................................................... 12
COMPONENT LOCATION .................................... 12
BACK-UP LAMP SWITCH .................................... 12
NEUTRAL POSITION SWITCH ......................... 12

SHIFT CONTROL ................................................... 13
Removal and Installation of Control Lever Assembly .. 13
REMOVAL ....................................................... 13
INSTALLATION .................................................. 15
INSPECTION AFTER INSTALLATION ................... 17

AIR BREATHER HOSE ........................................... 18
Removal and Installation ..................................... 18

TRANSMISSION ASSEMBLY ...................................... 19
Removal and Installation from Vehicle ................. 19
REMOVAL ....................................................... 19
INSTALLATION ................................................ 21
Component Parts Drawing ..................................... 22
CASE COMPONENTS .......................................... 22
GEAR COMPONENTS (MODEL CODE NUMBER. CD000) .................................................... 23
GEAR COMPONENTS (MODEL CODE NUMBER. CD005) .................................................... 25
SHIFT CONTROL COMPONENTS ..................... 27
Disassembly and Assembly ................................. 29
DISASSEMBLY ................................................. 29
INSPECTION AFTER DISASSEMBLY .......... 39
ASSEMBLY ..................................................... 44

SERVICE DATA AND SPECIFICATIONS (SDS). .... 61
General Specifications ......................................... 61
End Play .......................................................... 62
Snap Rings ....................................................... 62
Baulk Ring Clearance (Model code number. CD000) .................................................... 63
Baulk Ring Clearance (Model code number. CD005) .................................................... 63
Caution

- Do not reuse transmission oil, once it has been drained.
- Check oil level or replace oil with vehicle on level ground.
- During removal or installation, keep inside of transmission 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.

Precautions for Battery Service

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.
## Special Service Tools

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

<table>
<thead>
<tr>
<th>Tool number (Kent-Moore No.)</th>
<th>Tool name</th>
<th>Description</th>
</tr>
</thead>
</table>
| ST30911000                  | Inserter  | Mainshaft ball bearing installation  
5th - 6th synchronizer assembly installation  
Reverse main gear installation |
| ST30022000                  | Inserter  | 3rd main gear installation  
4th main gear installation |
| ST27861000                  | Support ring | 1st - 2nd synchronizer assembly installation  
1st gear bushing installation |
| ST33400001                  | Drift     | Rear oil seal installation |
| KV381054S0                  | Oil seal puller | Remove rear oil seal |
| ST30032000                  | Inserter  | Counter rear bearing inner race installation |

a: 98 mm (3.86 in) dia.  
b: 40 mm (1.57 in) dia.

a: 110 mm (4.33 in) dia.  
b: 46 mm (1.81 in) dia.

a: 62 mm (2.44 in) dia.  
b: 52 mm (2.05 in) dia.

a: 60 mm (2.36 in) dia.  
b: 47 mm (1.85 in) dia.

a: 80 mm (3.15 in) dia.  
b: 31 mm (1.22 in) dia.
<table>
<thead>
<tr>
<th>Tool number</th>
<th>(Kent-Moore No.)</th>
<th>Description</th>
<th>Tool name</th>
</tr>
</thead>
<tbody>
<tr>
<td>KV32102700</td>
<td></td>
<td>Main drive gear ball bearing installation</td>
<td>ZZD05340</td>
</tr>
<tr>
<td></td>
<td>( — )</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a: 48 mm (1.89 in) dia.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b: 41 mm (1.61 in) dia.</td>
<td>Drift</td>
<td></td>
</tr>
<tr>
<td>ST23860000</td>
<td></td>
<td>Reverse counter gear installation</td>
<td>ZZD05340</td>
</tr>
<tr>
<td></td>
<td>( — )</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a: 38 mm (1.50 in) dia.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b: 33 mm (1.30 in) dia.</td>
<td>Drift</td>
<td></td>
</tr>
<tr>
<td>ST01530000</td>
<td></td>
<td>Reverse synchronizer assembly installation</td>
<td>ZZD05340</td>
</tr>
<tr>
<td></td>
<td>( — )</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a: 50 mm (1.97 in) dia.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b: 41 mm (1.61 in) dia.</td>
<td>Drift</td>
<td></td>
</tr>
<tr>
<td>ST35291000</td>
<td></td>
<td>Control shaft oil seal installation</td>
<td>ZZD05340</td>
</tr>
<tr>
<td></td>
<td>( — )</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a: 40 mm (1.57 in) dia.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b: 29.5 mm (1.161 in) dia.</td>
<td>Drift</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c: 22.5 mm (0.886 in) dia.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KV40100630</td>
<td>(J26092)</td>
<td>4th counter gear thrust washer installation</td>
<td>ZZD0920D</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4th counter gear bushing installation</td>
<td></td>
</tr>
<tr>
<td>KV38102100</td>
<td>(J25803-01)</td>
<td>Front cover oil seal installation</td>
<td>ZZ1002D</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a: 44 mm (2.36 in) dia.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b: 28 mm (1.10 in) dia.</td>
<td>Drift</td>
<td></td>
</tr>
<tr>
<td>KV32103300</td>
<td>(J46529)</td>
<td>Reverse main gear installation</td>
<td>ZZB0165J</td>
</tr>
<tr>
<td>Press plate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tool number</td>
<td>Description</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------</td>
<td>----------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ST30031000</td>
<td>Inter balk ring support</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(J22912-01)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Puller</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ST224490000</td>
<td>Hold a adapter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(—)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adapter plate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Revision; 2004 April  
MT-5  
2003 350Z
## Commercial Service Tools

<table>
<thead>
<tr>
<th>Tool name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Puller</td>
<td>Each bearing gear and bushing removal</td>
</tr>
<tr>
<td>Pin punch</td>
<td>Each retaining pin removal and installation</td>
</tr>
<tr>
<td>Power tool</td>
<td>Loosening bolts and nuts</td>
</tr>
</tbody>
</table>
| Puller    | Reverse synchronizer assembly removal  
|           | Reverse counter gear removal  
|           | Reverse main gear removal |

*Images of tools are included.*
<table>
<thead>
<tr>
<th>Symptoms</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>3</th>
<th>2</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noise</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oil leakage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hard to shift or will not shift</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jumps out of gear</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SUSPECTED PARTS (Possible cause)

- OIL (Oil level is low.)
- OIL (Wrong oil.)
- OIL (Oil level is high.)
- GASKET (Damaged)
- OIL SEAL (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)
### DESCRIPTION

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Front cover</td>
<td>2.</td>
</tr>
<tr>
<td>4.</td>
<td>5th - 6th coupling sleeve</td>
<td>5.</td>
</tr>
<tr>
<td>7.</td>
<td>2nd main gear</td>
<td>8.</td>
</tr>
<tr>
<td>10.</td>
<td>1st main gear</td>
<td>11.</td>
</tr>
<tr>
<td>19.</td>
<td>6th counter gear</td>
<td>20.</td>
</tr>
<tr>
<td>22.</td>
<td>3rd counter gear</td>
<td>23.</td>
</tr>
<tr>
<td>25.</td>
<td>Drain plug</td>
<td>26.</td>
</tr>
<tr>
<td>31.</td>
<td>Rear extension case</td>
<td></td>
</tr>
</tbody>
</table>

### DOUBLE-CONE SYNCHRONIZER (MODEL CODE NUMBER. CD000)

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

![Double-cone synchronizer diagram](image)

### DOUBLE-CONE SYNCHRONIZER (MODEL CODE NUMBER. CD005)

The 1st and 3rd, 4th gears is equipped with a double-cone synchronizer to reduce the operating force of the shift lever as shown.

### TRIPLE-CONE SYNCHRONIZER (MODEL CODE NUMBER. CD005)

The 2nd gear is equipped with a triple-cone synchronizer to reduce the operating force of the shift lever as shown.

![Triple-cone synchronizer diagram](image)
M/T OIL

Replacement

DRAINING
1. Start the engine and warm up the transmission unit sufficiently.
2. After stopping engine, remove filler plug and drain plug and then drain fluid.
3. After replace a new gasket on drain plug, screw drain plug into transmission body and tighten to the specified torque.

\[
\text{Drain plug:} \quad \bullet \quad 30 - 39 \text{ N·m} (3.1 - 3.9 \text{ kg·m}, 23 - 28 \text{ ft·lb})
\]

**CAUTION:**
Gaskets are not reusable. Never reuse them.

FILLING
1. Remove filler plug. Fill new oil into the transmission to the level of the filler plug mounting hole.

\[
\begin{align*}
\text{Oil grade:} & \quad \text{API GL-4} \\
\text{Viscosity:} & \quad \text{Refer to MA-11, "RECOMMENDED FLUIDS AND LUBRICANTS".} \\
\text{Oil capacity:} & \quad \text{Approx. 2.9 ℓ (3-1/4 US qt, 2-3/4 Imp qt)}
\end{align*}
\]

2. After filling, check fluid level, replace a new gasket on filler plug, screw filler plug into transmission body, and tighten to the specified torque.

\[
\text{Filler plug:} \quad \bullet \quad 30 - 39 \text{ N·m} (3.1 - 3.9 \text{ kg·m}, 23 - 28 \text{ ft·lb})
\]

**CAUTION:**
Gaskets are not reusable. Never reuse them.

Checking

OIL LEAKAGE AND OIL LEVEL
- Check if oil is leaking from transmission or around it.
- Check oil level from filler plug mounting hole as shown in the figure.

**CAUTION:**
Never start engine while checking oil level.
- When screwing in filler plug with a new gasket, first screw into the transmission by hand, then tighten to the specified torque.

\[
\text{Filler plug:} \quad \bullet \quad 30 - 39 \text{ N·m} (3.1 - 3.9 \text{ kg·m}, 23 - 28 \text{ ft·lb})
\]

**CAUTION:**
Gaskets are not reusable. Never reuse them.
REAR OIL SEAL

Removal and Installation

REMOVAL
1. Remove propeller shaft. Refer to PR-7, "REMOVAL".
   CAUTION:
   Do not impact or damage propeller shaft tube.
2. Using oil seal puller, remove oil seal.
   Tool number : KV381054S0 (—)

INSTALLATION
1. Apply multi-purpose grease to oil seal lip. Using a drift, drive in oil seal until the edge is approximately 1.2 - 2.2 mm (0.047 - 0.087 in) above the boss edge.
   Tool number : ST33400001 (J26082)
   CAUTION:
   ● Oil seals are not reusable. Never reuse them.
   ● When installing, do not incline the oil seal.

2. Install propeller shaft. Refer to PR-8, "INSTALLATION".
   CAUTION:
   ● Do not impact or damage propeller shaft tube.
   ● If lubricant leak has occurred, after finishing work, check oil level. Refer to MT-10, "Checking".
BACK-UP LAMP SWITCH
- Check continuity.

<table>
<thead>
<tr>
<th>Gear position</th>
<th>Continuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reverse</td>
<td>Yes</td>
</tr>
<tr>
<td>Except reverse</td>
<td>No</td>
</tr>
</tbody>
</table>

NEUTRAL POSITION SWITCH
- Check continuity.

<table>
<thead>
<tr>
<th>Gear position</th>
<th>Continuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neutral</td>
<td>Yes</td>
</tr>
<tr>
<td>Except neutral</td>
<td>No</td>
</tr>
</tbody>
</table>
Removal and Installation of Control Lever Assembly

REMOVAL
1. Remove the shift knob with the following procedure.
   a. Disconnect console boot from center console. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY"
b. Lift console boot, and push down hole cover. Set water pump plier and others to control lever assembly.

**CAUTION:**
Put waste cloth between water pump plier and control lever assembly to avoid damaging control lever assembly.

![Image](PCIB0222E)

![Image](PCIB0246E)

c. Set monkey wrench to shift knob.

**CAUTION:**
Put waste cloth between shift knob and suitable plier to avoid damaging shift knob.

![Image](PCIB0247E)

d. Turn monkey wrench with water pump plier and others fixed. Loosen shift knob, and remove shift knob from control lever assembly.

**NOTE:**
Remove shift knob from control assembly with water pump plier and others fixed. Because a certain power to turn shift knob is necessary even after adhesive is peeled.

![Image](PCIB0245E)

2. Loosen the shift knob to remove the control lever.
3. Remove console boot. Refer to IP-11, **“Removal and Installation”**.
4. Push back the boot, remove control lever assembly mounting bolt, and separate control lever and control rod assembly.
SHIFT CONTROL

5. Remove the mounting bolts to remove the hole cover.
6. Remove the control lever boot.

7. Remove guide plate mounting bolts, and then remove control lever assembly and control lever spring.

INSTALLATION
1. Set control lever assembly and control lever spring in the control lever housing assembly and loosely mount the guide plate.
2. After installing control lever assembly in the control rod assembly, tighten bolts to the specified torque.

\[ \text{torque: } 13 \text{ - } 14 \text{ N} \cdot \text{m (1.3 - 1.5 kg} \cdot \text{m, 9.4 - 10.8 ft-lb)} \]
3. Shifting control lever assembly to 6th gear, the control lever assembly is light pressed to the reverse side.

4. At the point where the control lever assembly stops, bring the guide plate closer until guide plate stopper contacts control lever assembly claw, and then loosely tighten mounting bolt A.

5. Shifting control lever assembly to 5th gear, the control lever assembly light pressed to the reverse side.

6. At the point where control lever assembly stops, bring guide plate closer until the guide plate stopper contacts control lever assembly claw, and then loosely tighten mounting bolt C.

   - : 8.4 - 10 N·m (0.86 - 1.0 kg-m, 75 - 88 in-lb)

7. Tighten guide plate bolts A and B to the specified torque.

   - : 8.4 - 10 N·m (0.86 - 1.0 kg-m, 75 - 88 in-lb)

8. Install control lever boot.

9. Install hole cover.

   - : 5.1 - 6.3 N·m (0.52 - 0.64 kg-m, 46 - 55 in-lb)

10. Install console finisher. Refer to IP-11, "Removal and Installation".

11. As shown in the figure, assemble seat and insulator to control lever assembly.

   - **CAUTION:** Do not reuse the insulator.

12. Apply locking sealant to control lever threads, install shift knob.

   - **CAUTION:** Remove the remaining adhesive on control lever and shift knob threads.
13. Put the shift knob in the correct position as the following indicates.
   a. When tightening shift knob, if shift knob position is the correct position a less than 1/2 rotation from starting resistance, tighten 1 more rotation and set the correct position again.
   b. If shift knob position is the correct position more than 1/2 rotation from starting resistance, tighten and set the correct position.

   **CAUTION:**
   - Do not adjust the knob with loosing.
   - After adjusting to regular position, until 30 minute passes since a locking sealant because stiff. Do not operate the shift intensely such as screwing or turning the shift knob to opposite direction.

**INSPECTION AFTER INSTALLATION**
After installing, confirm the following items:
   - When control lever assembly is shifted to each position, make sure there is no binding or disconnection in each boot.
   - When shifted to each position, make sure there is no noise, bending, and backlash. Especially when control lever assembly is shifted to 5th, 6th without pressing downward, check for bending.
   - When control lever assembly is shifted to 1st, 2nd side and 5th, 6th side, confirm control lever assembly returns to neutral position smoothly.
   - In any position other than reverse, confirm that control lever assembly can be pressed downward.
   - With control lever assembly pressed downward, confirm that it can be shifted to reverse.
   - When shifted from reverse to neutral position, confirm control lever assembly returns to neutral position smoothly with spring power.
   - Without control lever assembly pressed downward, confirm that it cannot be shifted to reverse.
AIR BREATHER HOSE

Removal and Installation

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

CAUTION:
- Make sure there are no pinched or blocked areas on the air breather hose caused by bending or winding when installing it.
- Be sure to insert the hose until the overlap area reaches the tube edge or the pressing part of spool, insulator, etc.
Removal and Installation from Vehicle

**REMOVAL**

1. Disconnect battery negative cable.
2. Remove tower bar.
3. Remove front cross bar with power tool. Refer to FSU-9, "Removal and Installation".
4. Remove catalytic converter stay mounting nuts and bolts, and then remove catalytic converter bracket. Refer to EX-3, "Removal and Installation".
5. Remove nut connecting catalytic converter to exhaust manifold, and then remove catalytic converter and exhaust front tube as one unit.
6. Remove propeller shaft. Refer to PR-7, "REMOVAL".
   **CAUTION:**
   Do not impact or damage propeller shaft tube.
7. Remove control rod mounting bolts and then separate shift lever assembly from the control rod assembly.
8. Using a screwdriver wrapped in tape to remove claw and then separate console finisher from the center console. Refer to IP-11, "Removal and Installation".

9. Remove hole cover mounting bolts and then separate hole cover from the floor panel.

10. Separate control lever boot from the guide plate.

11. Remove guide plate mounting bolts and then separate shift lever assembly from the shift lever housing assembly.

12. Remove clutch operating cylinder mounting bolts and then separate clutch operating cylinder from the transmission case.

13. Remove crankshaft position sensor (POS).

   **CAUTION:**
   - Do not subject it to impact by dropping or hitting.
   - Do not disassemble.
   - Do not allow metal filings, etc., to get on the sensor's front edge magnetic area.
   - Do not place in an area affected by magnetism.

14. Disconnect neutral switch and reverse switch.
TRANSMISSION ASSEMBLY

15. Separate heated oxygen sensor 2 wire harness, crankshaft position sensor (POS), wire harness, back-up lamp switch wire harness, PNP switch wire harness from the transmission.

16. Remove starter motor. Refer to SC-19, "Removal and Installation".

17. Set transmission jack to the transmission.

CAUTION:
When setting transmission jack, be careful not to contact with the switch.

18. Remove rear engine mounting member. Refer to EM-90, "Removal and Installation".

19. Remove engine and transmission mounting bolts with power tool.

20. Remove transmission from the vehicle.

INSTALLATION

Install in the reverse order of removal procedure, following the cautions below:

- When installing transmission to the engine, install mounting bolts in accordance with the standards below.

<table>
<thead>
<tr>
<th>Bolt No.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity</td>
<td>1</td>
<td>5</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>“Φ” mm (in)</td>
<td>55</td>
<td>65</td>
<td>56</td>
<td>35</td>
</tr>
<tr>
<td>(2.17)</td>
<td>(2.56)</td>
<td>(1.97)</td>
<td>(1.38)</td>
<td></td>
</tr>
<tr>
<td>Tightening torque</td>
<td>70 - 80</td>
<td>49 - 61</td>
<td>42 - 52</td>
<td></td>
</tr>
<tr>
<td>N·m (kg-m, ft-lb)</td>
<td>(7.1 - 8.1, 52 - 59)</td>
<td>(5.0 - 6.2, 37 - 44)</td>
<td>(4.3 - 5.3, 31 - 38)</td>
<td></td>
</tr>
</tbody>
</table>

CAUTION:
- When installing, be careful to avoid interference between transmission main drive shaft and clutch cover.
- Do not impact or damage propeller shaft tube.
- Refer to MT-15, "INSTALLATION" MT-17, "INSPECTION AFTER INSTALLATION" for control lever installation information.
- After installation, check oil level, and oil leaks and loose mechanisms.
Component Parts Drawing
CASE COMPONENTS

1. Withdrawal lever ball pin
2. Washer
3. Bolt
4. Bolt
5. Front cover gasket
6. Front cover
7. Front cover oil seal
8. Oil gutter
9. Nut
10. Bolt
11. Bracket
12. Breather
13. Transmission case
14. Drain plug
15. Gasket
16. Sliding ball bearing
17. Bushing
18. Bushing
19. Magnet
20. Dowel pin
21. Bushing
22. Bushing
23. Filler plug
24. Sliding ball bearing
25. Sliding ball bearing
26. Main shaft bearing retainer plate
27. Main shaft bearing retainer plate
28. Bolt
29. Bolt
30. Bracket
31. Neutral position switch
32. Rear extension upper cover gasket
33. Rear extension upper cover

N·m(kg-m,in-lb)
N·m(kg-m,ft-lb)
Apply Genuine Anaerobic Liquid Gasket, or equivalent. Refer to GI section.
Apply Genuine Medium Strength Locking Sealant or equivalent locking sealant. Refer to GI section.
Pay attention to its direction.
Apply multi-purpose grease.
Always replace after every disassembly.
TRANSMISSION ASSEMBLY

34. Bolt 35. Sliding ball bearing 36. Bushing
40. Bolt 41. Rear extension oil gutter 42. Gasket
43. Bolt 44. Bolt 45. Bracket
46. Reverse switch 47. Rear oil seal 48. Rear extension dust cover
49. Sliding ball bearing 50. Control shaft oil seal 51. Rear extension case
52. Plunger 53. Adapter plate 54. Check select spring
55. Check ball

GEAR COMPONENTS (MODEL CODE NUMBER: CD000)

4. Main drive gear (5th gear) 5. Main pilot bearing 6. Pilot bearing spacer
7. Snap ring 8. 5th gear baulk ring 9. 5th - 6th spread spring
10. 5th - 6th shifting insert 11. 5th - 6th synchronizer hub 12. 5th - 6th coupling sleeve
13. 6th gear baulk ring 14. 6th main gear 15. 6th needle bearing
16. Mainshaft 17. 2nd main gear 18. 2nd needle bearing
19. 2nd gear inner baulk ring 20. 2nd gear synchronizer cone 21. 2nd gear outer baulk ring
22. 1st - 2nd spread spring 23. 1st - 2nd synchronizer hub 24. 1st - 2nd shifting insert
25. 1st - 2nd coupling sleeve 26. 1st gear outer baulk ring 27. 1st gear synchronizer cone
28. 1st gear inner baulk ring 29. 1st main gear 30. 1st needle bearing
31. 1st gear bushing 32. 3rd main gear 33. 3rd - 4th main spacer
34. 4th main gear 35. Mainshaft bearing 36. Snap ring
37. Reverse main gear 38. Reverse main needle bearing 39. Reverse main gear bushing
40. Reverse baulk ring 41. Reverse spread spring 42. Reverse synchronizer hub
43. Reverse shifting insert 44. Reverse coupling sleeve 45. Snap ring
46. Snap ring

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

★: Select proper thickness.
*: Pay attention to its direction.

Apply lithium-based grease including molybdenum disulphide.

*: Always replace after every disassembly.
TRANSMISSION ASSEMBLY

1. Snap ring
2. Reverse counter gear
3. Counter rear bearing spacer
4. Counter rear bearing
5. Counter rear bearing inner race
6. 4th counter gear thrust washer
7. 4th gear bushing
8. 4th needle bearing
9. Counter front bearing
10. Countershaft
11. 3rd gear bushing
12. 3rd needle bearing
13. 3rd counter gear
14. 3rd gear baulk ring
15. 3rd - 4th spread spring
16. 3rd - 4th synchronizer hub
17. 3rd - 4th shifting insert
18. 3rd - 4th coupling sleeve
19. 4th gear baulk ring
20. Reverse idler shaft
21. Reverse idler needle bearing
22. Reverse idler gear
23. Reverse idler thrust washer
24. 4th counter gear
25. Counter end bearing

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

★: Select proper thickness.
☆: Pay attention to its direction.
ŧ: Apply lithium-based grease including molybdenum disulphide.
˟: Always replace after every disassembly.
Transmit Assembly

Gear Components (Model Code Number: CD005)

1. Snap ring  
2. Main drive gear bearing  
3. Snap ring  
4. Main drive gear (5th gear)  
5. Main pilot bearing  
6. Pilot bearing spacer  
7. Snap ring  
8. 5th gear baulk ring  
9. 5th - 6th spread spring  
10. 5th - 6th shifting insert  
11. 5th - 6th synchronizer hub  
12. 5th - 6th coupling sleeve  
13. 6th gear baulk ring  
14. 6th main gear  
15. 6th needle bearing  
16. Main shaft  
17. 2nd main gear  
18. 2nd needle bearing  
19. 2nd gear inner baulk ring  
20. 2nd gear synchronizer cone  
21. 2nd gear outer baulk ring  
22. 1st - 2nd spread spring  
23. 1st - 2nd synchronizer hub  
24. 1st - 2nd shifting insert  
25. 1st - 2nd coupling sleeve  
26. 1st gear outer baulk ring  
27. 1st gear synchronizer cone  
28. 1st gear inner baulk ring  
29. 1st main gear  
30. 3rd main gear  
31. 1st gear bushing  
32. 3rd main gear  
33. 3rd - 4th main spacer  
34. 4th main gear  
35. Main shaft bearing  
36. Snap ring  
37. Reverse main gear  
38. Reverse main needle bearing  
39. Reverse main gear bushing  
40. Reverse baulk ring  
41. Reverse spread spring  
42. Reverse synchronizer hub  
43. Reverse shifting insert  
44. Reverse coupling sleeve  
45. Snap ring

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

★ : Select proper thickness.

☆ : Pay attention to its direction.

$: Apply lithium-based grease including molybdenum disulphide.

+: Always replace after every disassembly.

Revision: 2004 April

MT-25

2003 350Z
Apply gear oil to gears, shafts, synchronizers and bearings when assembling.

★ : Select proper thickness.
☆ : Pay attention to its direction.
|m & | : Apply lithium-based grease including molybdenum disulphide.
|x | : Always replace after every disassembly.

1. Snap ring
2. Reverse counter gear
3. Counter rear bearing spacer
4. Counter rear bearing
5. Counter rear bearing inner race
6. 4th counter gear thrust washer
7. 4th gear bushing
8. 4th needle bearing
9. Counter front bearing
10. Counter shaft
11. 3rd gear bushing
12. 3rd needle bearing
13. 3rd counter gear
14. 3rd inner baulk ring
15. 3rd synchronizer cone
16. 3rd outer baulk ring
17. 3rd - 4th spread spring
18. 3rd - 4th synchronizer hub
19. 3rd - 4th shifting insert
20. 3rd - 4th coupling sleeve
21. 4th outer baulk ring
22. 4th synchronizer cone
23. 4th inner baulk ring
24. Reverse idler shaft
25. Reverse idler needle bearing
26. Reverse idler gear
27. Reverse idler thrust washer
28. 4th counter gear
29. Counter end bearing
SHIFT CONTROL COMPONENTS

1. 5th - 6th shift fork
2. 1st - 2nd shift fork
3. Retaining pin
4. 1st - 2nd fork rod
5. 3rd - 4th shift fork
6. 5th - 6th fork rod (reversal side)
7. 3rd - 4th fork rod (reversal side)
8. 5th - 6th fork rod
9. Adapter plate
10. Check ball plug
11. Check ball spring
12. Check ball
13. Interlock pin
14. Interlock plunger
15. Bolt
16. 3rd - 4th fork rod
17. Shifter cap
18. 3rd - 4th control lever
19. 3rd - 4th fork rod bracket
20. Striking lever
21. 5th - 6th fork rod bracket
22. 5th - 6th control lever
23. Reverse fork rod
24. Striking rod
25. Stopper ring
26. Reverse shift fork
27. Low/high control lever

-N·m(kg·m, ft·lb)

Apply Genuine Anaerobic Liquid Gasket, or equivalent. Refer to GI section.

Apply lithium-based grease including molybdenum disulphide.

Always replace after every disassembly.
1. Rear extension case  
2. Return spring plug  
4. Return spring plunger  
3. Return spring  
5. Return spring plug  
6. Return spring  
7. Return spring plug  
8. Check ball  
9. Check select spring  
10. Control bracket  
11. Check shift pin  
12. Bolt  
13. Boot  
14. Control rod  
15. Retaining pin  
16. Bolt  
17. Boot  
18. Bolt  
19. Bolt  
20. Control lever housing  
21. Control lever  
22. Bolt  
23. Control lever spring  
24. Dynamic damper bracket  
25. Nut  
26. Dynamic damper

- N-m(kg-m, in-lb)  
- N-m(kg-m, ft-lb)  
- Apply Genuine Anaerobic Liquid Gasket or equivalent. Refer to GI section.  
- Apply Gear oil  
- Pay attention to its direction.  
- Apply lithium-based grease including molybdenum disulphide.  
- Always replace after every disassembly.
Disassembly and Assembly
DISASSEMBLY
Case Components
1. Remove rear extension upper cover mounting bolts.
2. Remove rear extension upper cover and rear extension upper cover gasket.
3. Remove check select spring and check ball from the rear extension case.
4. Using a pin punch [6 mm (0.24 in) dia.] to knock out retaining pin and then remove control rod.
5. Remove neutral position switch, plunger and reverse switch.
6. Remove control bracket mounting bolts. Then remove check shift pin and control bracket as one unit.
7. Remove right and left return spring plug. Then remove return spring and plunger from the rear extension.

**CAUTION:**
Return spring and plunger have different lengths for right and left sides. Identify right and left side and then store.

8. Using oil seal puller, remove rear oil seal.

   Tool number : KV381054S0 ( – )

9. Remove rear extension case mounting bolt. Using a soft hammer, tap rear extension assembly to remove.

10. Remove control lever housing mounting bolts, and remove control lever housing. Refer to MT-27, "SHIFT CONTROL COMPONENTS".

11. Remove control shaft oil seal. Refer to MT-22, "CASE COMPONENTS".

12. Remove rear extension oil gutter. Refer to MT-22, "CASE COMPONENTS".

13. Remove reverse idler thrust washer, revers idler gear, idler needle bearing from the idler shaft.

14. Remove reverse idler shaft.

15. Remove withdrawal lever ball pin.

16. Remove front cover mounting bolt, then remove front cover and from cover gasket.
17. Remove front cover oil seal, using a flat-bladed screwdriver.

**CAUTION:**
Be careful not to damage front cover mating surface.

18. Remove nut shown in the figure.

19. Remove snap ring of main drive gear bearing, using snap ring pliers.

20. Using a soft hammer to carefully tap main shaft and counter shaft from the transmission case side, and then separate adapter plate and transmission case.

21. Remove counter front bearing.
Shift Control Components

1. Using a vise, secure the adapter plate.
   
   Tool number: ST224490000 (–)
   
   CAUTION:
   Do not directly secure the surface in a vise.

2. Remove baffle plate mounting bolts, and remove baffle plate.

3. Knock out retaining pin, using a pin punch [6 mm (0.24 in) dia.]. Then remove striking rod and striking lever.

4. Remove check ball plug then remove check ball spring and check ball, from the adapter plate.
5. Remove 3rd - 4th control lever mounting bolts then remove 3rd - 4th control lever and shifter cap assembly.

6. Remove check ball plug and then remove check ball spring and check ball, from the adapter plate.

7. Using a pin punch [6 mm (0.24 in) dia.] to knock out retaining pin of 3rd - 4th fork rod bracket and then remove 3rd - 4th fork rod from the adapter plate.

8. Using a pin punch [6 mm (0.24 in) dia.] to knock out retaining pin, and then remove 3rd - 4th fork rod (reversal side) and shift fork.

9. Remove check ball from the adapter plate.
10. Using a pin punch [6 mm (0.24 in) dia.] to knock out retaining pin, and then remove 1st - 2nd fork rod and shift fork.

11. Remove interlock plunger and interlock pin.

12. Using a pin punch [6 mm (0.24 in) dia.] to knock out retaining pin, and then remove reverse fork rod and shift fork.

13. Remove check ball.

14. Remove 5th - 6th control lever mounting bolts and then remove 5th - 6th control lever assembly.
15. Using a pin punch [6 mm (0.24 in) dia.] to knock out retaining pin of 5th - 6th fork rod bracket and then remove 5th - 6th fork rod.

16. Using a pin punch [6 mm (0.24 in) dia.] to knock out retaining pin, and then remove 5th - 6th fork rod (reversal side) and shift fork.

**Gear Components**

1. Before disassembly, measure end play for each position. If the end play or backlash is outside the standards, disassemble and inspect.

   - Main drive gear.
     
     \[
     \text{End play} \quad : \quad 0 - 0.10\text{mm} (0 - 0.004\text{in})
     \]

   - Mainshaft front
     
     \[
     \text{End play} \quad : \quad 0 - 0.10\text{mm} (0 - 0.004\text{in})
     \]
2. After removing snap ring and reverse coupling snap ring, using puller to remove reverse main gear and reverse synchronizer assembly.

3. Remove bolts shown in the figure and then remove mainshaft bearing retainer plate.

4. After removing snap ring, using the puller to remove reverse counter gear and counter rear bearing spacer.
5. Remove mainshaft bearing snap ring.

6. Carefully tap mainshaft with a plastic hammer and then remove mainshaft, main drive gear, and counter shaft from adapter plate.

7. Remove counter rear bearing.

8. Remove snap ring from main drive gear, using snap ring pliers.

9. Set the suitable puller on the main drive gear and then using a press to remove main drive gear bearing from the main drive gear.
10. Using a press to remove the reverse main gear bushing, mainshaft bearing, and 4th main gear.

11. Remove 3rd - 4th main spacer.
12. Using a press to remove 1st main gear and 3rd main gear.
   **CAUTION:**
   Be careful not to damage the baulk ring.

13. Using a press to remove 1st gear bushing, 1st - 2nd synchronizer assembly, and 2nd main gear.
   **CAUTION:**
   Be aware that when using the press, if the mainshaft gear positioner catches on the V-block, etc., the mainshaft could be damaged.

15. Using a press to remove the 3rd counter gear, 3rd - 4th synchro-
nizer assembly, 4th counter gear, 4th gear bushing, and counter
rear bearing inner race.

16. Using a press to remove the 3rd gear bushing.

INSPECTION AFTER DISASSEMBLY

Shift Control
If the contact surface on striking lever, fork rod, fork, etc. has exces-
sive wear, abrasion, bend, or any other damage, replace the compo-
nents.
Gear and Shaft
If the contact surface on each gear, mainshaft, main drive gear, or counter gear, etc. has damage, peeling, abrasion, dent, bent, or any other damage, replace the components.

Synchronizer
- If the contact surface on coupling sleeve, synchronizer hub, and shifting insert has damage or abrasion, replace the components.
- Coupling sleeve and synchronizer hub shall move smoothly.

- If the cam surface on baulk ring or contact surface on insert has damage or excessive wear, replace with a new one.
- If insert spring is damaged, replace with a new one.
TRANSMISSION ASSEMBLY

Single Cone Synchronizer (Model code number. CD000: 3rd&4th&5th&6th, Model code number. CD005: 5th&6th)

- Push baulk ring on the cone and measure baulk ring back surface clearance at two locations or more on opposite sides, find the average value, and replace it if it is outside the limit value.

  Clearance
  Standard : 0.70 - 1.25 mm (0.028 - 0.049 in)
  Limit value : 0.5 mm (0.020 in) or less

**NOTE:**

- 5th and 6th baulk rings have three spaces that two gear teeth are missing as shown in the figure.
- 5th and 6th baulk rings resemble reverse baulk ring in shape. Reverse baulk ring has a ditch for identification. (Refer to pages of baulk ring.)

Double Cone Synchronizer (Model code number. CD000:1st&2nd, Model code number. CD005: 1st&3rd&4th)

Follow the instructions below and inspect the clearance of the 1st and 2nd gear outer baulk ring, synchronizer cone, inner baulk ring.

**CAUTION:**

Clearances “A” and “B” of the outer baulk ring, synchronizer cone, and inner baulk ring are controlled as a set, so if the clearance is outside the limit value, replace the synchronizer assembly.

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

  Clearance A
  Standard : 0.5 - 0.7 mm (0.020 - 0.028 in)
  Limit value : 0.3 mm (0.012 in) or less
  Tool number : ST30031000 (J22912 - 01)
2. Using a feeler gauge, measure clearance B at 2 or more points diagonally opposite, and calculate mean value.

**Clearance B**

- **Standard 1st**: 1.0 - 1.5 mm (0.039 - 0.059 in)
- **Standard 2nd (Model code number. CD005)**: 1.0 - 1.5 mm (0.039 - 0.059 in)
- **Standard 3rd, 4th (Model code number. CD000)**: 0.85 - 1.35 mm (0.033 - 0.053 in)
- **Limit value**: 0.7 mm (0.028 in) or less

**NOTE:**

1st baulk ring has three spaces that one gear tooth is missing as shown in the figure.

---

**Triple cone synchronizer (Model code number. CD 005:2nd)**

Check clearance for outer baulk ring, synchronizer cone and inner baulk ring of triple cone synchronizer following the direction.

**NOTE:**

Outer baulk ring, synchronizer cone and inner baulk ring, three control “clearance A, B and C” as a three - piece suite. If the value exceeds the limit value, replace them as a three - piece suite.

---

1. Using feeler gauge put and press synchronizer on 2nd main gear taper cone. And then measure “clearance A” at more then 2 diagonal points, and calculate the average.

**Clearance A**

- **Reference value**: 0.6 - 1.3 mm (0.054 - 0.051in)
- **Limit value**: 0.3 mm (0.012 in) or less
2. Using feeler gauge measure “clearance B” at more than 2 diagonal positions, and calculate the average.

- **Clearance B**
  - Reference value: 0.85 - 1.35 mm (0.033 - 0.053 in)
  - Limit value: 0.7 mm (0.028 in) or less

3. Using filler gauge put and press synchronizer on 2nd main gear taper cone. And then measure “clearance C” at more than 2 diagonal points, and calculate the average.

- **Clearance C**
  - Reference value: 0.7 - 1.25 mm (0.028 - 0.049 in)
  - Limit value: 0.3 mm (0.012 in) or less

**Reverse Synchronizer Assembly**

Push baulk on the cone and measure baulk ring back surface clearance at two locations or more on opposite sides, find the average value, and replace if it is outside the limit value.

- **Clearance**
  - Standard: 0.75 - 1.2 mm (0.030 - 0.047 in)
  - Limit value: 0.5 mm (0.020 in) or less

**NOTE:**
Reverse baulk ring has three spaces that two gear teeth are missing, and each space has small ditch for identification as shown in the figure.
Bearing
If the bearing does not rotate smoothly or the contact surface on ball or race is damaged or peeled, replace with new ones.

ASSEMBLY

Gear Components
1. Install coupling sleeve and shifting insert in the 5th-6th synchronizer hub.
   **CAUTION:**
   Install coupling sleeve with the larger chamfer on the rear side.

2. Install spread spring in the shifting insert.

- Be careful with the shape of insert key to avoid misassembly.
  **CAUTION:**
  Do not install spread spring hook onto the same shifting insert.
3. After installing the needle bearing and 6th main gear on the mainshaft, using an inserter and a press to press fit the 5th - 6th synchronizer assembly.

   Tool number : ST30911000 ( — )

   CAUTION:
   - The synchronizer hub is not reusable. Never reuse it.
   - When press fitting, install with the side having the three boss edge oil grooves facing the rear side.

4. Select and install a snap ring so that the end play comes within the standard value.

   End play : 0 - 0.10 mm (0 - 0.004 in)

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

**Mainshaft Snap Ring (Front Side)**

<table>
<thead>
<tr>
<th>Thickness</th>
<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.08 mm (0.0819 in)</td>
<td>32204 CD000</td>
</tr>
<tr>
<td>2.14 mm (0.0843 in)</td>
<td>32204 CD001</td>
</tr>
<tr>
<td>2.20 mm (0.0866 in)</td>
<td>32204 CD002</td>
</tr>
<tr>
<td>2.26 mm (0.0890 in)</td>
<td>32204 CD003</td>
</tr>
</tbody>
</table>

5. Install coupling sleeve and shifting insert into the 1st - 2nd synchronizer hub.

   CAUTION:
   Install coupling sleeve with the identification groove side facing the rear side.
6. Install spread spring in the shifting insert.

- Be careful with the shape of insert key to avoid misassembly. **CAUTION:**
  Do not install spread spring hook onto the same shifting insert.

7. Install needle bearing and 2nd main gear on the mainshaft and then using a support ring and a press to press fit the 1st - 2nd synchronizer assembly.

  **Tool number** : ST27861000

**CAUTION:**
- The synchronizer hub is not reusable. Never reuse it.
- When press fitting, install with the side having the three boss edge oil grooves facing the front side.
8. Using a support ring and a press to press fit the 1st gear bushing.
   Tool number : ST27861000 ( — )

9. Install needle bearing and 1st main gear on the mainshaft and then using the inserter and a press to press fit the 3rd main gear.
   Tool number : ST30022000 ( — )
   CAUTION:
   3rd main gear is not reusable. Never reuse it.

10. Install 3rd - 4th main spacer on the mainshaft and then using the inserter and a press to press fit the 4th main gear.
    Tool number : ST30022000 ( — )
    CAUTION:
    ● 4th main gear is not reusable. Never reuse it.
    ● When installing, set boss to rear side.

11. Using the inserter and a press to press fit the mainshaft bearing onto the mainshaft.
    Tool number : ST30911000 ( — )

12. Using the inserter and a press to press fit the reverse main gear bushing onto the mainshaft.
    Tool number : ST30911000 ( — )
13. Using the inserter to press fit the 3rd gear bushing onto the countershaft.

   **Tool number**: ST30911000 (—)


15. Install spread spring in the shifting insert.

   Install coupling sleeve with the identification groove side facing the rear side.

   - Be careful with the shape of insert key to avoid misassembly.
   
   **CAUTION:**
   Do not install spread spring hook onto the same shifting insert.
16. Install the 3rd - 4th synchronizer assembly with the following procedure.
   a. Install 3rd needle bearing and 3rd counter gear on the countershaft.
   b. · Install 3rd baulk ring on the countershaft. (Model code number.CD000)
      · Install 3rd inner baulk ring, 3rd synchronizer cone, 3rd outer baulk ring on the countershaft. (Model code number.CD005)
   c. Using the inserter and a press to press fit the 3rd - 4th synchronizer assembly.
      Tool number : ST30911000 ( — )
   CAUTION: The synchronizer hub is not reusable. Never reuse it.

17. Install the 4th counter gear thrust washer with the following procedure.
   a. · Install 4th baulk ring on the countershaft. (Model code number.CD000)
      · Install 4th inner baulk ring, 4th synchronizer cone, 4th outer baulk ring on the countershaft. (Model code number.CD005)
   b. Install 4th gear bushing and 4th needle bearing on the countershaft.
   c. Using the inserter and a press to press fit the 4th counter gear thrust washer.
      Tool number : KV40100630 (J26029)

18. Using the drift and a press to press fit the counter rear bearing inner race onto the counter shaft.
    Tool number : ST30032000 (J26010-1)

19. Using the drift and a press to press fit the main drive gear bearing onto the main drive gear.
    Tool number : KV32102700 ( — )
20. Select and install a snap ring to the main drive gear so that the end play comes within the standard value. Refer to MT-62, "Snap Rings".

   *End play: 0 - 0.10 mm (0 - 0.004 in)*

   **CAUTION:**
   Snap rings are not reusable. Never reuse them.

21. Install counter rear bearing onto the adapter plate, install the main driver gear, mainshaft, and counter gear as one unit, and then install the snap ring on the mainshaft bearing.

   **CAUTION:**
   Snap rings are not reusable. Never reuse them.

22. Install counter rear bearing onto the adapter plate using soft hammer or the equivalent.

23. Apply genuine medium strength locking sealant or equivalent refer to GI section to the end of the bolt (first 3 to 4 threads), screw the bolt into the mainshaft bearing retainer plate, and tighten it to the specified torque.

   *: 19 - 24 N·m (2.0 - 2.4 kg-m, 14 - 17 ft-lb)*

24. Install coupling sleeve and shifting insert into the reverse synchrizer hub.

   **CAUTION:**
   Install coupling sleeve with the larger chamfer on the rear side.
25. Install spread spring in the shifting insert.

**CAUTION:**
Do not install spread spring hook onto the same shifting insert.

26. After installing the reverse main gear bushing and needle bearing and reverse main gear onto the mainshaft, using the drift and install the reverse synchronizer assembly.

**Tool number (A)** : KV32103300 (J46529)
**Tool number (B)** : ST01530000 (—)

**CAUTION:**
- The synchronizer hub is not reusable. Never reuse it.
- When installing the synchronizer assembly, the shifting insert may fall out of the synchronizer hub, so have an assistant hold together the synchronizer assembly while conducting the work.
- When installing, face the side with three ditches to the front side.

27. Install reverse coupling snap ring.
28. Select and install a snap ring so that the end play comes within the standard value.

   **End play**: 0 - 0.10 mm (0 - 0.004 in)

   **CAUTION:**
   Snap rings are not reusable. Never reuse them.

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<tr>
<td>2.38 mm (0.0937 in)</td>
<td>32204 CD005</td>
</tr>
<tr>
<td>2.44 mm (0.0961 in)</td>
<td>32204 CD006</td>
</tr>
<tr>
<td>2.50 mm (0.0984 in)</td>
<td>32204 CD007</td>
</tr>
<tr>
<td>2.56 mm (0.1008 in)</td>
<td>32204 CD008</td>
</tr>
<tr>
<td>2.62 mm (0.1031 in)</td>
<td>32204 CD009</td>
</tr>
<tr>
<td>2.68 mm (0.1055 in)</td>
<td>32204 CD010</td>
</tr>
<tr>
<td>2.74 mm (0.1079 in)</td>
<td>32204 CD011</td>
</tr>
<tr>
<td>2.80 mm (0.1102 in)</td>
<td>32204 CD012</td>
</tr>
<tr>
<td>2.86 mm (0.1126 in)</td>
<td>32204 CD013</td>
</tr>
<tr>
<td>2.92 mm (0.1150 in)</td>
<td>32204 CD014</td>
</tr>
<tr>
<td>2.98 mm (0.1173 in)</td>
<td>32204 CD015</td>
</tr>
</tbody>
</table>

29. After installing counter rear spacer, press and fit reverse counter gear onto counter shaft with drift and press.

   **Tool number**: ST23860000

   **CAUTION:**
   Reverse counter gear is not reusable. Never reuse it.
   When installing counter bearing spacer, maker’s stamp should face to the rear

30. Select and install a snap ring so that the end play comes within the standard value.

   **End play**: 0 - 0.10 mm (0 - 0.004 in)

   **CAUTION:**
   Snap rings are not reusable. Never reuse them.
Counter Gear

<table>
<thead>
<tr>
<th>Thickness</th>
<th>Part No.</th>
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<tbody>
<tr>
<td>1.96 mm (0.0772 in)</td>
<td>32236 CD000</td>
</tr>
<tr>
<td>2.02 mm (0.0795 in)</td>
<td>32236 CD001</td>
</tr>
<tr>
<td>2.08 mm (0.0819 in)</td>
<td>32236 CD002</td>
</tr>
<tr>
<td>2.14 mm (0.0843 in)</td>
<td>32236 CD003</td>
</tr>
<tr>
<td>2.20 mm (0.0866 in)</td>
<td>32236 CD004</td>
</tr>
<tr>
<td>2.26 mm (0.0890 in)</td>
<td>32236 CD005</td>
</tr>
<tr>
<td>2.32 mm (0.0913 in)</td>
<td>32236 CD006</td>
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<tr>
<td>2.38 mm (0.0937 in)</td>
<td>32236 CD007</td>
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<tr>
<td>2.44 mm (0.0961 in)</td>
<td>32236 CD008</td>
</tr>
<tr>
<td>2.50 mm (0.0984 in)</td>
<td>32236 CD009</td>
</tr>
<tr>
<td>2.56 mm (0.1008 in)</td>
<td>32236 CD010</td>
</tr>
<tr>
<td>2.62 mm (0.1031 in)</td>
<td>32236 CD011</td>
</tr>
</tbody>
</table>

Shift Control Components

1. Install 5th-6th shift fork to 5th-6th coupling sleeve.
2. Install 5th-6th fork rod (reversal side) to 5th-6th shift fork.
3. Using a pin punch [6 mm (0.24 in) dia.] to tap the retaining pin into the 5th - 6th shift fork.
   
   **CAUTION:**
   Retaining pins are not reusable. Never reuse them.

4. Install 5th-6th fork rod to adapter plate.
5. Install 5th-6th fork rod bracket to 5th-6th fork rod.
6. Using a pin punch [6 mm (0.24 in) dia.] to tap the retaining pin into the 5th - 6th fork rod bracket.
   
   **CAUTION:**
   Retaining pins are not reusable. Never reuse them.

7. Install 5th - 6th control lever assembly.

   ![Image](PCIB0238E)

   **CAUTION:**
   Set the projection upward.

   ![Image](PCIB0172E)
8. Install check ball to adapter plate.

9. Install reverse shift fork to reverse coupling sleeve.
10. Install reverse fork rod to reverse shift fork.
11. Using a pin punch [6 mm (0.24 in) dia.] to tap the retaining pin into the reverse shift fork.
   **CAUTION:**
   Retaining pins are not reusable. Never reuse them.

12. Install interlock pin and interlock plunger.

13. Install 1st-2nd shift fork to 1st-2nd coupling sleeve.
15. Using a pin punch [6 mm (0.24 in) dia.] to tap the retaining pin into the 1st - 2nd shift fork.
   **CAUTION:**
   Retaining pins are not reusable. Never reuse them.

17. Install 3rd-4th fork rod (reversal side) to 3rd-4th shift fork.
18. Using a pin punch [6 mm (0.24 in) dia.] to tap the retaining pin into the 3rd - 4th shift fork (reversal side).
   **CAUTION:**
   Retaining pins are not reusable. Never reuse them.
19. Install interlock pin and check ball.

20. Install 3rd-4th fork rod to adapter plate.
22. Using a pin punch [6 mm (0.24 in) dia.] to tap the retaining pin into the 3rd - 4th fork rod bracket.
   **CAUTION:**
   Retaining pins are not reusable. Never reuse them.

23. Install check ball, check ball spring and check ball plug.

24. Install 3rd - 4th control lever assembly.
   ![Image](PCIB0145E)
   **CAUTION:**
   Make sure the top and bottom are oriented correctly.

25. Insert check ball spring, steel ball, interlock pin, and interlock plunger into the adapter plate, apply genuine anaerobic liquid gasket or equivalent refer to GI section to the check ball plug threads, and tighten to the specified torque.
   ![Image](PCIB0146E)
   **CAUTION:**
   Make sure the top and bottom are oriented correctly.
26. Install striking rod to adapter plate.
27. Install striking lever and stoppering, low/high control lever to striking rod.
28. Using a pin punch [6 mm (0.24 in) dia.] to tap the retaining pin into the striking lever and stoppering and low/high control lever.
   **CAUTION:**
   Retaining pins are not reusable. Never reuse them.

Case Components
1. Install counter front bearing in the transmission case.
2. Install oil gutter to transmission case.
3. Apply genuine anaerobic liquid gasket or equivalent to the transmission case adapter plate mounting surface as shown in the figure.
   **CAUTION:**
   Complete remove all moisture and oil, etc., from the transmission case and adapter plate mounting surfaces.
4. Place the adapter plate in the transmission case, using a plastic hammer to tap the adapter plate to install it into the transmission case.
5. Install snap ring, using snap ring pliers.
   **CAUTION:**
   Snap rings are not reusable. Never reuse them.

6. Tighten nuts shown in the figure.
   ![Image](image1)
   **CAUTION:**
   Use: 4.9 - 5.6 N·m (0.50 - 0.57 kg-m, 44 - 49 in-lb)

7. Apply multi-purpose grease to the lip of the oil seal. Using a drift, to install oil seal approx. 8.55-9.55 mm (0.336-0.376 in) above from the front cover edge surface.
   **CAUTION:**
   Oil seals are not reusable. Never reuse them.
   When installing, do not incline the oil seal.

8. Install front cover gasket and front cover to transmission case.
   **CAUTION:**
   Gasket is not reusable, Never reuse them.

9. Temporary tightening 2 bolts in the positions shown in the figure.
TRANSMISSION ASSEMBLY

10. Insert remaining 9 bolts, tighten them to the specified torque.
   - : 16 - 20 N·m (1.7 - 2.0 kg·m, 12 - 14 ft-lb)
   CAUTION:
   Four bolts pointed by arrows in the figure are not reusable.

11. Tighten bolts to the specified torque in order.

12. Install washer to withdrawal lever ball pin, and install it to front cover.
   - : 38 - 41 N·m (3.9 - 4.1 kg·m, 28 - 30 ft-lb)

13. Install rear extension oil gutter.


15. Apply multi-purpose grease to the oil seal lip, and then using the drift, to install control shaft oil seal.
   Tool number : ST35291000 ( — )
   CAUTION:
   - Oil seals are not reusable. Never reuse them.
   - When installing, do not incline the oil seal.
16. Apply multi-purpose grease to the lip of the oil seal. Using a drift, to install oil seal. 1.2-2.2 mm (0.047-0.87 in) above from the rear extension case edge surface.

   Tool number: ST33400001 (J26082)

   **CAUTION:**
   - Oil seals are not reusable. Never reuse them.
   - When installing, do not incline the oil seal.

17. Apply genuine anaerobic liquid gasket or equivalent refer to GI section to the adapter plate rear extension mounting surface as shown in the figure.

   **CAUTION:**
   Completely remove all moisture, oil, etc., from the adapter plate and rear extension mounting surfaces.

18. For rear extension case, tighten bolts to the specified torque in order as shown on the figure.

19. Install rear extension.

   : 24 - 31 N·m (2.5 - 3.1 kg-m, 18 - 22 ft-lb)

20. Install control lever housing.

   : 17 - 22 N·m (1.8 - 2.2 kg-m, 13 - 16 ft-lb)

21. Install left/right return spring plugs. Insert return spring and plunger in the rear extension, apply sealant genuine anaerobic liquid gasket or equivalent to the return spring threads, and then tighten to the specified torque.

   **CAUTION:**
   The right and left return springs and plungers are different, so make sure they are installed correctly.

<table>
<thead>
<tr>
<th>Return spring identification mark</th>
<th>Plunger notch</th>
</tr>
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<tbody>
<tr>
<td>RH</td>
<td>Brown</td>
</tr>
<tr>
<td>No</td>
<td></td>
</tr>
<tr>
<td>LH</td>
<td>Blue</td>
</tr>
<tr>
<td>Yes</td>
<td></td>
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</tbody>
</table>

   : 20 - 29 N·m (2.1 - 2.9 kg-m, 15 - 21 ft-lb)
22. Install check shift pin as a signal unit with the control bracket.  
\[
\begin{align*}
& \text{\textbullet} \quad 8.4 - 9.7 \text{ N-m (0.86 - 0.98 kg-m, 75 - 85 in-lb)}
\end{align*}
\]

23. Install neutral position switch and reverse switch.  
\[
\begin{align*}
& \text{\textbullet} \quad 23 - 33 \text{ N-m (2.4 - 3.3 kg-m, 17 - 24 ft-lb)}
\end{align*}
\]

24. Install retaining pin into the control rod, using a pin punch [6 mm (0.24 in) dia.].  
\textbf{CAUTION:}  
Retaining pins are not reusable. Never reuse them.

25. Install check select spring and check ball into the rear extension case.

26. Insert rear extension upper cover gasket in to rear extension case.  
\textbf{CAUTION:}  
Gaskets are not reusable. Never reuse them.

27. Tighten rear extension upper cover bolts to specified torque, and then install rear extension upper cover.  
\[
\begin{align*}
& \text{\textbullet} \quad 5.3 - 7.4 \text{ N-m (0.54 - 0.75 kg-m, 47 - 65 in-lb)}
\end{align*}
\]
## General Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
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</thead>
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<tr>
<td><strong>Applied model</strong></td>
<td>VQ35DE</td>
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<tr>
<td><strong>Transmission</strong></td>
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<td><strong>Model code number</strong></td>
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### Shift pattern

![Shift pattern diagram](image)

### Synchronesh type

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<tr>
<th>Gear ratio</th>
<th>Synchomesh type</th>
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### Gear ratio

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### Main gear (Number of teeth)

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### Counter gear (Number of teeth)

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### Reverse idler gear (Number of teeth)

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### Oil capacity

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### Remarks

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<th>Remarks</th>
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<td>Reverse synchronizer</td>
<td>Installed</td>
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<tr>
<td>Double cone synchronizer</td>
<td>1st, 2nd</td>
</tr>
<tr>
<td>Triple cone synchronizer</td>
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</table>

**Oil capacity**

Approx. 2.9 (3-1/4 US qt, 2-3/4 Imp qt)
## End Play

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counter gear</td>
<td>0 - 0.10 (0 - 0.004)</td>
</tr>
<tr>
<td>Main drive gear</td>
<td>0 - 0.10 (0 - 0.004)</td>
</tr>
<tr>
<td>Main shaft front</td>
<td>0 - 0.10 (0 - 0.004)</td>
</tr>
<tr>
<td>Main shaft rear</td>
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## Snap Rings

<table>
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<td>2.07 (0.0815)</td>
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<td>2.11 (0.0831)</td>
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<tr>
<td><strong>Counter gear</strong></td>
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</tr>
<tr>
<td></td>
<td>2.68 (0.1055)</td>
<td>32204 CD010</td>
</tr>
<tr>
<td></td>
<td>2.74 (0.1079)</td>
<td>32204 CD011</td>
</tr>
<tr>
<td></td>
<td>2.80 (0.1102)</td>
<td>32204 CD012</td>
</tr>
<tr>
<td></td>
<td>2.86 (0.1126)</td>
<td>32204 CD013</td>
</tr>
<tr>
<td></td>
<td>2.92 (0.1150)</td>
<td>32204 CD014</td>
</tr>
<tr>
<td></td>
<td>2.98 (0.1173)</td>
<td>32204 CD015</td>
</tr>
</tbody>
</table>
## SERVICE DATA AND SPECIFICATIONS (SDS)

### Baulk Ring Clearance (Model code number. CD000)

<table>
<thead>
<tr>
<th>Measurement point</th>
<th>Standard</th>
<th>Limit value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st &amp; 2nd (Double - cone synchronizer)</td>
<td>Inner baulk ring clearance “A”</td>
<td>0.50 - 0.70 (0.020 - 0.028)</td>
</tr>
<tr>
<td></td>
<td>Outer baulk ring clearance “B”</td>
<td>1.00 - 1.50 (0.039 - 0.059)</td>
</tr>
<tr>
<td>3rd &amp; 4th, 5th &amp; 6th</td>
<td>0.70 - 1.25 (0.028 - 0.049)</td>
<td>0.5 (0.020)</td>
</tr>
<tr>
<td>Reverse</td>
<td>0.75 - 1.20 (0.030 - 0.047)</td>
<td>0.5 (0.020)</td>
</tr>
</tbody>
</table>

### Baulk Ring Clearance (Model code number. CD005)

<table>
<thead>
<tr>
<th>Measurement point</th>
<th>Standard</th>
<th>Limit value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st &amp; 3rd &amp; 4th (Double - cone synchronizer)</td>
<td>Inner baulk ring clearance “A”</td>
<td>0.50 - 0.70 (0.020 - 0.028)</td>
</tr>
<tr>
<td></td>
<td>Outer baulk ring clearance “B”</td>
<td>1.00 - 1.50 (0.039 - 0.059)</td>
</tr>
<tr>
<td></td>
<td>B (3rd, 4th): 0.85 - 1.35 (0.033 - 0.053)</td>
<td>0.7 (0.028)</td>
</tr>
<tr>
<td>2nd (Triple - cone synchronizer)</td>
<td>Main gear taper corn clearance “A”</td>
<td>0.60 - 1.30 (0.024 - 0.051)</td>
</tr>
<tr>
<td></td>
<td>Outer baulk ring clearance “B”</td>
<td>0.85 - 1.35 (0.033 - 0.053)</td>
</tr>
<tr>
<td></td>
<td>Inner baulk ring clearance “C”</td>
<td>0.70 - 1.25 (0.028 - 0.049)</td>
</tr>
<tr>
<td>5th &amp; 6th</td>
<td>0.70 - 1.25 (0.028 - 0.049)</td>
<td>0.5 (0.020)</td>
</tr>
<tr>
<td>Reverse</td>
<td>0.75 - 1.20 (0.030 - 0.047)</td>
<td>0.5 (0.020)</td>
</tr>
</tbody>
</table>