MANUAL TRANSMISSION AND DIFFERENTIAL
6-SPEED (6MT)
# General Description

## Manual Transmission and Front Differential

### A: Specification

#### 1. Manual Transmission and Front Differential

<table>
<thead>
<tr>
<th>Type</th>
<th>6-forward speeds and 1-reverse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmission gear ratio</td>
<td></td>
</tr>
<tr>
<td>1st</td>
<td>3.636</td>
</tr>
<tr>
<td>2nd</td>
<td>2.235</td>
</tr>
<tr>
<td>3rd</td>
<td>1.521</td>
</tr>
<tr>
<td>4th</td>
<td>1.137</td>
</tr>
<tr>
<td>5th</td>
<td>0.971</td>
</tr>
<tr>
<td>6th</td>
<td>0.756</td>
</tr>
<tr>
<td>Reverse</td>
<td>3.545</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Front reduction gear</th>
<th>Final</th>
<th>Type of gear</th>
<th>Hypoid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gear ratio</td>
<td>3.900</td>
<td></td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Rear reduction gear</th>
<th>Transfer</th>
<th>Type of gear</th>
<th>Helical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gear ratio</td>
<td>1.103</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Final</th>
<th>Type of gear</th>
<th>Hypoid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gear ratio</td>
<td>3.545</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Front differential</th>
<th>Type and number of gear: Planetary gear (pinion gear: 8, gear: 2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LSD type</td>
<td>Helical</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Center differential</th>
<th>Type and number of gear: Planetary gear (Internal gear: 1, pinion gear: 6, sun gear: 1, and solenoid compression variable control multiplate clutch)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Transmission gear oil</th>
<th>GL-5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmission gear oil capacity</td>
<td>4.1 l (4.3 US qt, 3.6 Imp qt)</td>
</tr>
</tbody>
</table>

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**Recommended oil:**

**GL-5 (75W-90) or equivalent**
B: COMPONENT

1. CLUTCH HOUSING

(1) Gasket
(2) Plug
(3) Pitching stopper bracket
(4) Clip
(5) Clutch housing
(6) Gasket
(7) Oil seal
(8) Clutch release bearing guide
(9) Return spring bracket
(10) Plug
(11) Drain plug

Tightening torque: N·m (kgf-m, ft-lb)

- **T1**: 6.4 (0.7, 4.7)
- **T2**: 41 (4.2, 30.2)
- **T3**: 50 (5.1, 36.9)
- **T4**: 70 (7.1, 51.6)
- **T5**: 46 (4.7, 33.9)

MT-01701
2. ADAPTER PLATE

(1) Breather hose
(2) Transmission harness stay
(3) Check plug
(4) O-ring
(5) Checking spring
(6) Plunger
(7) Check plug
(8) O-ring
(9) Checking spring
(10) Check ball
(11) Oil guide A
(12) Oil guide B
(13) Adapter plate

Tightening torque:N·m (kgf-m, ft-lb)
T1: 18 (1.8, 13.3)
T2: 37 (3.8, 27.3)
T3: 50 (5.1, 36.9)
3. TRANSMISSION CASE

<table>
<thead>
<tr>
<th>Part</th>
<th>Number</th>
<th>Description</th>
<th>Tightening torque: N·m (kgf-m, ft-lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pilot bolt</td>
<td>1</td>
<td>Plunger</td>
<td></td>
</tr>
<tr>
<td>Neutral position switch</td>
<td>2</td>
<td>Spring</td>
<td>( T1: 16 ) (1.6, 11.8)</td>
</tr>
<tr>
<td>Back-up light switch</td>
<td>3</td>
<td>Plug</td>
<td>( T2: 32 ) (3.3, 23.6)</td>
</tr>
<tr>
<td>Adapter plate</td>
<td>4</td>
<td>Gasket</td>
<td>( T3: 34 ) (3.5, 25.1)</td>
</tr>
<tr>
<td>Transmission case</td>
<td>5</td>
<td>Filler plug</td>
<td>( T4: 41 ) (4.2, 30.2)</td>
</tr>
<tr>
<td>Harness bracket</td>
<td>6</td>
<td>Band clip</td>
<td>( T5: 50 ) (5.1, 36.9)</td>
</tr>
</tbody>
</table>
General Description

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4. OIL PAN AND OIL GUIDE

(1) Transmission case
(2) Transfer bearing holder
(3) Oil guide G
(4) Oil guide H
(5) Oil pan
(6) Gasket
(7) Oil guide F
(8) Oil guide D
(9) Oil guide E
(10) Oil guide C
(11) Filler plug
(12) Drain plug

Tightening torque: N·m (kgf·m, ft·lb)

T1: 6.4 (0.7, 4.7)
T2: 18 (1.8, 13.3)
T3: 25 (2.5, 18.4)
T4: 50 (5.1, 36.9)
5. EXTENSION CASE AND CENTER DIFFERENTIAL

| (1) Taper roller bearing | (14) Snap ring | (27) Reverse check lever COMPL |
| (2) Transfer driven gear | (15) Oil guide | (28) Straight pin |
| (3) Taper roller bearing | (16) Extension case | (29) Reverse check plug |
| (4) Shim | (17) Oil seal | (30) Spring |
| (5) Oil plate | (18) Oil seal | (31) Gasket |
| (6) Snap ring | (19) Dust cover | (32) Plug |
| (7) Collar | (20) Snap ring | (33) Plunger |
| (8) Center differential | (21) Washer | |
| (9) Shim | (22) Bushing | |
| (10) Needle bearing | (23) Spring | |
| (11) Needle bearing | (24) Reverse check shaft | |
| (12) Transfer drive gear | (25) Ball bearing | |
| (13) Ball bearing (with flange) | (26) Oil seal | |

Tightening torque: N·m (kgf·m, ft·lb)

- **T1**: 25 (2.5, 18.4)
- **T2**: 41 (4.2, 30.2)
- **T3**: 48 (4.9, 35.4)
6. SHIFTER FORK AND FORK ROD

(1) Spring pin  (9) Washer  (17) 5th-6th shifter arm
(2) Interlock arm  (10) Snap ring  (18) 5th-6th fork COMPL
(3) Interlock block  (11) Reverse fork COMPL  (19) 3rd-4th fork rod
(4) Reverse interlock block  (12) Reverse shifter arm  (20) 3rd-4th shifter arm
(5) Interlock arm  (13) Reverse fork rod  (21) 1st-2nd shifter arm
(6) Striking rod  (14) Selector arm  (22) 3rd-4th fork COMPL
(7) Selector arm No. 2  (15) Shifter arm shaft  (23) 1st-2nd fork rod
(8) Neutral set spring  (16) 5th-6th fork rod  (24) 1st-2nd fork COMPL
General Description

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7. MAIN SHAFT ASSEMBLY

(1) Main shaft (12) 4th bushing (23) Needle bearing
(2) Needle bearing (13) Needle bearing (24) 6th bushing
(3) 3rd drive gear (14) 5th bushing (25) Taper roller bearing
(4) Inner baulk ring (15) Needle bearing (26) Snap ring
(5) Synchro cone (16) 5th drive gear (27) Washer
(6) Outer baulk ring (17) 5th baulk ring (28) Washer
(7) 3rd-4th sleeve (18) 5th-6th sleeve (29) Lock nut
(8) 3rd-4th hub (19) 5th-6th hub
(9) Shifting insert (20) Shifting insert
(10) 4th baulk ring (21) 6th baulk ring
(11) 4th gear (22) 6th drive gear

Tightening torque:N·m (kgf-m, ft-lb)

T: 392 (40.0, 289.1)
## General Description

### MANUAL TRANSMISSION AND DIFFERENTIAL

### 8. DRIVE PINION AND DRIVE SHAFT ASSEMBLY

**Tightening torque:** N·m (kgf·m, ft-lb)

<table>
<thead>
<tr>
<th>Component</th>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive pinion shaft</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Taper roller bearing</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Shim</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Washer</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Lock nut</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Thrust bearing</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Needle bearing</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Driven shaft</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Key</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Needle bearing</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>1st driven gear</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>1st synchronizer set</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>1st-2nd sleeve</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>Shifting insert</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Outer baulk ring</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Synchro cone</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Inner baulk ring</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>2nd driven gear</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>Needle bearing</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>2nd bushing</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>3rd-4th driven gear</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>5th-6th driven gear</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>Ball bearing</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>Lock nut</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Shim</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>Collar</td>
<td>27</td>
<td></td>
</tr>
</tbody>
</table>

**T1:** 285 (29.1, 210.2)  
* 265 (27.0, 195.4)

**T2:** 570 (58.1, 420.4)  
* 530 (54.0, 390.9)

**T3:** 54 (5.5, 39.8)  
* Tightening torque when using the ST
9. REVERSE IDLER GEAR ASSY

(1) Base COMPL  (9) Reverse coupling sleeve  (17) Reverse idler holder
(2) Counter high and low washer  (10) Reverse idler gear
(3) Reverse idler gear No. 2  (11) Spring
(4) Needle bearing  (12) Sub gear
(5) Reverse idler synchro set  (13) Friction plate
(6) Reverse idler gear bushing  (14) Snap ring
(7) Needle bearing  (15) Counter high and low washer
(8) Shifting insert  (16) Snap ring

**Tightening torque:** N·m (kgf-m, ft-lb)

| T | 25 (2.5, 18.4) |
10. FRONT DIFFERENTIAL

(1) Drive pinion shaft
(2) Hypoid driven gear
(3) Roller bearing
(4) Differential ASSY
(5) Oil seal
(6) Differential side retainer
(7) O-ring
(8) Retainer lock plate

**Tightening torque:** N·m (kgf-m, ft-lb)

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>Drive pinion shaft</td>
<td>(5)</td>
<td>Oil seal</td>
</tr>
<tr>
<td>(2)</td>
<td>Hypoid driven gear</td>
<td>(6)</td>
<td>Differential side retainer</td>
</tr>
<tr>
<td>(3)</td>
<td>Roller bearing</td>
<td>(7)</td>
<td>O-ring</td>
</tr>
<tr>
<td>(4)</td>
<td>Differential ASSY</td>
<td>(8)</td>
<td>Retainer lock plate</td>
</tr>
</tbody>
</table>

**T1:** 25 (2.5, 18.4)
**T2:** 69 (7.0, 50.9)
11. TRANSMISSION MOUNTING

(1) Pitching stopper (8) Upper cushion rubber
(2) Spacer (9) Center crossmember
(3) Lower cushion rubber (10) Rear plate
(4) Front plate (11) Front crossmember
(5) Dynamic damper (12) Rear crossmember
(6) Transmission cushion rubber
(7) Rear crossmember

Tightening torque: \( N \cdot m \) (kgf \( \cdot m \), ft-lb)

- \( T1 \): 7.5 (0.8, 5.5)
- \( T2 \): 35 (3.6, 25.8)
- \( T3 \): 50 (5.1, 36.9)
- \( T4 \): 58 (5.9, 42.8)
- \( T5 \): 70 (7.1, 51.6)
- \( T6 \): 140 (14.3, 103.3)
C: CAUTION

- Wear appropriate work clothing, including a cap, protective goggles and protective shoes when performing any work.
- Remove contamination including dirt and corrosion before removal, installation or disassembly.
- Keep the disassembled parts in order and protect them from dust and dirt.
- Before removal, installation or disassembly, be sure to clarify the abnormal condition. Avoid unnecessary removal, installation, disassembly and replacement.
- When disassembling the case and other light alloy parts, disassemble by using a plastic hammer. Do not pry apart with screwdrivers or other tools.
- Vehicle components are extremely hot after driving. Be wary of receiving burns from heated parts.
- Use SUBARU genuine transmission gear oil, grease or the equivalent. Do not mix transmission gear oil, grease etc. of different grades or manufacturers.
- Be sure to tighten fasteners including bolts and nuts to the specified torque.
- Place shop jacks or rigid racks at the specified points.
- Apply transmission gear oil onto sliding or revolving surfaces before installation.
- Always replace deformed or damaged snap rings.
- Before installing O-rings or oil seals, apply sufficient amount of transmission gear oil to avoid damage and deformation.
- Be careful not to incorrectly install or fail to install O-rings, snap rings and other parts.
- Before securing a part on a vise, place cushioning materials such as wood blocks, aluminum plates, or waste cloth between the part and the vise.
- Avoid damaging the mating surface of the case.
- Before applying liquid gasket, completely remove the old liquid gasket.
### D: PREPARATION TOOL

#### 1. SPECIAL TOOL

<table>
<thead>
<tr>
<th>ILLUSTRATION</th>
<th>TOOL NUMBER</th>
<th>DESCRIPTION</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="ST-398791700" /></td>
<td>398791700</td>
<td>REMOVER</td>
<td>Used for removing and installing the spring pin (6 mm).</td>
</tr>
<tr>
<td><img src="image2.png" alt="ST-399527700" /></td>
<td>399527700</td>
<td>PULLER SET</td>
<td>Used for removing and installing the roller bearing (Differential).&lt;br&gt;(1) BOLT (899521412)&lt;br&gt;(2) PULLER (399527702)&lt;br&gt;(3) HOLDER (399527703)&lt;br&gt;(4) ADAPTER (398497701)&lt;br&gt;(5) BOLT (899520107)&lt;br&gt;(6) NUT (021008000)</td>
</tr>
<tr>
<td><img src="image3.png" alt="ST-498515700" /></td>
<td>498515700</td>
<td>REMOVER</td>
<td>Used for removing the roller bearing of the drive pinion shaft.</td>
</tr>
<tr>
<td><img src="image4.png" alt="ST-498247001" /></td>
<td>498247001</td>
<td>MAGNET BASE</td>
<td>• Used for measuring backlash between the side gear, pinion, and hypoid gear.&lt;br&gt;• Used with DIAL GAUGE (498247100).</td>
</tr>
</tbody>
</table>
### General Description

**MANUAL TRANSMISSION AND DIFFERENTIAL**

<table>
<thead>
<tr>
<th>ILLUSTRATION</th>
<th>TOOL NUMBER</th>
<th>DESCRIPTION</th>
<th>REMARKS</th>
</tr>
</thead>
</table>
| ST-498247100 | 498247100   | DIAL GAUGE  | • Used for measuring backlash between the side gear, pinion, and hypoid gear.  
• Used with MAGNET BASE (498247001). |
| ST-498077000 | 498077000   | REMOVER     | Used for removing the differential taper roller bearing. |
| ST-899858600 | 899858600   | REMOVER     | Used for removing the roller bearing. |
| ST-499757002 | 499757002   | INSTALLER   | Used for installing the bearing cone of the transfer driven gear (extension core side). |
| ST-18630AA010| 18630AA010  | WRENCH COMPL RETAINER | • Used for removing and installing the differential side retainer RH.  
• WRENCH ASSEMBLY (499787000) can also be used. |
## General Description

### MANUAL TRANSMISSION AND DIFFERENTIAL

<table>
<thead>
<tr>
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<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST-499877000</td>
<td>499877000</td>
<td>RACE 4-5 INSTALLER</td>
<td>Used for disassembling the driven shaft and transfer driven gear.</td>
</tr>
<tr>
<td>ST-899864100</td>
<td>899864100</td>
<td>REMOVER</td>
<td>Used for removing the transmission main shaft and drive pinion parts.</td>
</tr>
<tr>
<td>ST-498057300</td>
<td>498057300</td>
<td>INSTALLER</td>
<td>Used for installing the extension oil seal.</td>
</tr>
<tr>
<td>ST-498255400</td>
<td>498255400</td>
<td>PLATE</td>
<td>Used for measuring backlash.</td>
</tr>
<tr>
<td>ST-41099AA010</td>
<td>41099AA010</td>
<td>ENGINE SUPPORT BRACKET</td>
<td>Used for supporting engine.</td>
</tr>
<tr>
<td>ILLUSTRATION</td>
<td>TOOL NUMBER</td>
<td>DESCRIPTION</td>
<td>REMARKS</td>
</tr>
<tr>
<td>--------------</td>
<td>-------------</td>
<td>-------------------</td>
<td>-----------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>41099AA020</td>
<td>ENGINE SUPPORT</td>
<td>Used for supporting engine.</td>
</tr>
<tr>
<td>ST41099AA020</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>398527700</td>
<td>PULLER ASSY</td>
<td>Used for removing the extension case oil seal and the front side retainer bearing outer race.</td>
</tr>
<tr>
<td>ST-398527700</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>398643600</td>
<td>GAUGE</td>
<td>Used for measuring the total end play, extension end play and drive pinion height.</td>
</tr>
<tr>
<td>ST-398643600</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>398177700</td>
<td>INSTALLER</td>
<td>Used for assembling the main shaft.</td>
</tr>
<tr>
<td>ST-398177700</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>399893600</td>
<td>PLIER</td>
<td>• Used for removing and installing the neutral set spring.</td>
</tr>
<tr>
<td>ST-399893600</td>
<td></td>
<td></td>
<td>• Used together with the CLAW (18756AA000).</td>
</tr>
</tbody>
</table>
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<thead>
<tr>
<th>ILLUSTRATION</th>
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<th>REMARKS</th>
</tr>
</thead>
</table>
| [Claw Illustration](ST18756AA000) | 18756AA000 | CLAW | - Used for removing and installing the neutral set spring.  
- Used together with PLIER (399893600). |
| [Installer Illustration](ST499247400) | 499247400 | INSTALLER | Used for installing the ball bearing of the transfer drive gear. |
| [Seat Illustration](ST398497701) | 398497701 | SEAT | Used for installing the ball bearing of the transfer drive gear. |
| [Installer Illustration](ST398437700) | 398437700 | INSTALLER | Used for installing the front differential side bearing. |
| [Stand Assy Illustration](ST18632AA000) | 18632AA000 | STAND ASSY | Used for disassembling and assembling the transmission. |
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<table>
<thead>
<tr>
<th>ILLUSTRATION</th>
<th>TOOL NUMBER</th>
<th>DESCRIPTION</th>
<th>REMARKS</th>
</tr>
</thead>
</table>
| ST18671AA000 | 18671AA000 | OIL SEAL GUIDE | • Used for installing the oil seal to the reverse check.  
• Used together with the INSTALLER (18657AA010). |
| ST18657AA010 | 18657AA010 | INSTALLER | • Used for installing the oil seal to the reverse check.  
• Used together with the OIL SEAL GUIDE (18671AA000). |
<p>| ST18657AA000 | 18657AA000 | INSTALLER | Used for installing the oil seal to the shift rod. |
| ST18758AA000 | 18758AA000 | PULLER | Used for removing the extension taper roller bearing outer race. |
| ST18831AA000 | 18831AA000 | GAUGE | Used for measuring the extension taper roller bearing. |</p>
<table>
<thead>
<tr>
<th>ILLUSTRATION</th>
<th>TOOL NUMBER</th>
<th>DESCRIPTION</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST18631AA000</td>
<td>18631AA000</td>
<td>HANDLE</td>
<td>Used for measuring the front differential backlash.</td>
</tr>
<tr>
<td>ST18754AA000</td>
<td>18754AA000</td>
<td>REMOVER</td>
<td>Used to remove parts of the driven gear.</td>
</tr>
<tr>
<td>ST18757AA000</td>
<td>18757AA000</td>
<td>STRAIGHT PIN REMOVER</td>
<td>Used for installing the reverse idler gear.</td>
</tr>
</tbody>
</table>
| ST18665AA000 | 18665AA000 | HOLDER      | • Used for removing and installing the main shaft lock nut.  
• Used together with the BASE (18664AA000). |
| ST18666AA000 | 18666AA000 | HOLDER      | • Used for removing and installing the driven shaft lock nut.  
• Used together with the BASE (18664AA000). |
## General Description

**MANUAL TRANSMISSION AND DIFFERENTIAL**

<table>
<thead>
<tr>
<th>ILLUSTRATION</th>
<th>TOOL NUMBER</th>
<th>DESCRIPTION</th>
<th>REMARKS</th>
</tr>
</thead>
</table>
|               | ST18667AA000 | HOLDER      | • Used for removing and installing the drive pinion shaft lock nut.  
• Used together with the BASE (18664AA000). |
|               | ST18664AA000 | BASE        | • Used for removing and installing the main shaft lock nut.  
• Used for removing and installing the drive pinion shaft lock nut.  
• Used for removing and installing the driven shaft lock nut. |
|               | ST18722AA010 | REMOVER     | Used for disassembling the main shaft. |
|               | ST18651AA000 | INSTALLER   | Used for assembling the main shaft. |
|               | ST18852AA000 | TORQUE WRENCH | • Used to tighten the main shaft lock nut.  
• Used to tighten the drive pinion shaft lock nut.  
• Used to tighten the driven shaft lock nut. |

**ILLUSTRATION TOOL NUMBER DESCRIPTION REMARKS**

ST18667AA000

ST18664AA000

ST18722AA010

ST18651AA000

ST18852AA000
## General Description

**MANUAL TRANSMISSION AND DIFFERENTIAL**

<table>
<thead>
<tr>
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<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST18668AA000</td>
<td>18668AA000</td>
<td>PUNCH</td>
<td>Used to crimp the main shaft lock nut.</td>
</tr>
<tr>
<td>ST18669AA000</td>
<td>18669AA000</td>
<td>PUNCH</td>
<td>Used to crimp the driven shaft lock nut.</td>
</tr>
<tr>
<td>ST18670AA000</td>
<td>18670AA000</td>
<td>PUNCH</td>
<td>Used to crimp the drive pinion shaft lock nut.</td>
</tr>
<tr>
<td>ST18620AA000</td>
<td>18620AA000</td>
<td>ADAPTER WRENCH</td>
<td>Used for removing and installing the driven gear shaft lock nut.</td>
</tr>
<tr>
<td>ST18621AA000</td>
<td>18621AA000</td>
<td>ADAPTER WRENCH</td>
<td>Used for removing and installing the drive pinion shaft lock nut.</td>
</tr>
</tbody>
</table>
## General Description

**MANUAL TRANSMISSION AND DIFFERENTIAL**

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<tr>
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<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST18723AA000</td>
<td>18723AA000</td>
<td>REMOVER</td>
<td>Used for disassembling the driven shaft.</td>
</tr>
<tr>
<td>ST18630AA000</td>
<td>18630AA000</td>
<td>WRENCH ASSY</td>
<td>Used for removing and installing the differential side retainer LH.</td>
</tr>
<tr>
<td>ST18672AA000</td>
<td>18672AA000</td>
<td>GUIDE CLIP</td>
<td>Used for installing the reverse idler snap ring.</td>
</tr>
<tr>
<td>ST18720AA000</td>
<td>18720AA000</td>
<td>REMOVER</td>
<td>Used for disassembling the main shaft.</td>
</tr>
<tr>
<td>ST18654AA000</td>
<td>18654AA000</td>
<td>INSTALLER</td>
<td>Used for assembling the driven shaft.</td>
</tr>
</tbody>
</table>
### General Description

**MANUAL TRANSMISSION AND DIFFERENTIAL**

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<tr>
<th>ILLUSTRATION</th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>18663AA000</td>
<td>SOCKET</td>
<td>Used for removing and installing the transfer bearing holder.</td>
</tr>
<tr>
<td>ST18663AA000</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>18853AA000</td>
<td>HEIGHT GAUGE</td>
<td>Used for selecting the shift rod.</td>
</tr>
<tr>
<td>ST18853AA000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>18760AA000</td>
<td>CLAW</td>
<td>• Used for removing the front side retainer bearing outer race.</td>
</tr>
<tr>
<td>ST18760AA000</td>
<td></td>
<td></td>
<td>• Used together with PULLER ASSY (398527700).</td>
</tr>
<tr>
<td></td>
<td>18675AA000</td>
<td>DIFFERENTIAL SIDE OIL SEAL</td>
<td>Used for installing the differential side retainer oil seal.</td>
</tr>
<tr>
<td>ST18675AA000</td>
<td>INSTALLER</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>28399SA010</td>
<td>OIL SEAL PROTECTOR</td>
<td>Used for protecting oil seal when installing front drive shaft.</td>
</tr>
<tr>
<td>ST28399SA010</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
General Description

2. GENERAL TOOL

<table>
<thead>
<tr>
<th>TOOL NAME</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circuit tester</td>
<td>Used for measuring resistance, voltage and current.</td>
</tr>
<tr>
<td>TORX® bit T70</td>
<td>Used for removing and installing transmission gear oil drain plug.</td>
</tr>
<tr>
<td>Depth gauge</td>
<td>Used for measuring the transmission end play.</td>
</tr>
</tbody>
</table>
2. Transmission Gear Oil

A: INSPECTION
1) Lift up the vehicle.
2) Remove the transmission under cover.
3) Remove the filler plug, and then check the transmission gear oil.

4) Check that the transmission gear oil level is up to the bottom of the filler plug. If the transmission gear oil level is low, refill up to the bottom of filler plug.
5) Using a new gasket, and tighten the filler plug.

Tightening torque:
50 N·m (5.1 kgf-m, 36.9 ft-lb)

B: REPLACEMENT
1) Lift up the vehicle.
2) Remove the transmission under cover.
3) Remove the filler plug.

4) Remove the two drain plugs (oil pan side, clutch housing side), and then drain the transmission gear oil completely.

CAUTION:
• Immediately after the engine has been running, the transmission gear oil is hot. Be careful not to burn yourself.
• Be careful not to spill the transmission gear oil on exhaust pipe to prevent it from emitting smoke or causing fires. If transmission gear oil is spilled on the exhaust pipe, wipe it off completely.

NOTE:
• Tighten the drain plug of the transmission gear oil after draining the transmission gear oil.
• Always use a new gasket.
• Use TORX® bit T70 to remove and install the drain plug on clutch housing side.

Tightening torque:

- Oil pan side
  50 N·m (5.1 kgf-m, 36.9 ft-lb)

- Clutch housing side
  70 N·m (7.1 kgf-m, 51.6 ft-lb)

5) Pour transmission gear oil to the bottom end of filler plug.

NOTE:
Carefully refill transmission gear oil while checking the level. Excessive or insufficient oil must be avoided.

RECOMMENDED GEAR OIL
Use GL-5 or the equivalent.

Transmission gear oil capacity
4.1 ℓ (4.3 US qt, 3.6 Imp qt)

6) Check the level of the transmission gear oil.
7) Using a new gasket, and tighten the filler plug.

Tightening torque:
50 N·m (5.1 kgf-m, 36.9 ft-lb)
3. Oil Seal

A: INSPECTION

Check that there is no oil leaking from the oil seal. If there is any deformation, hardening, wear or other malfunctions of the oil seal, perform the following:

- Replace the oil seal.
- Inspect the propeller shaft.

B: REPLACEMENT

1) Clean the transmission exterior.
2) Drain transmission gear oil completely. <Ref. to 6MT-27, REPLACEMENT, Transmission Gear Oil.>
3) Remove the rear exhaust pipe and muffler.
4) Remove the heat shield cover.
5) Remove the propeller shaft. <Ref. to DS-10, REMOVAL, Propeller Shaft.>
6) Using the ST, remove the oil seal.
   ST 398527700 PULLER ASSY
7) Using the ST, install the oil seal.
   ST 498057300 INSTALLED
8) Install the propeller shaft. <Ref. to DS-11, INSTALLATION, Propeller Shaft.>
9) Install the heat shield cover.
10) Install the rear exhaust pipe and muffler.
11) Pour in transmission gear oil and check the oil level. <Ref. to 6MT-27, REPLACEMENT, Transmission Gear Oil.>
4. Differential Side Retainer Oil Seal

A: INSPECTION

Check that there is no oil leaking from the differential side retainer oil seal. If there is oil leakage, perform the following procedures.
- Replace the oil seal.
- Check the front drive shaft.

B: REPLACEMENT

1) Lift up the vehicle.
2) Remove the front exhaust pipe and center exhaust pipe. <Ref. to EX(STI)-5, REMOVAL, Front Exhaust Pipe.>
3) Drain transmission gear oil completely. <Ref. to 6MT-27, REPLACEMENT, Transmission Gear Oil.>
4) Separate the front drive shaft from the transmission. <Ref. to DS-25, REMOVAL, Front Drive Shaft.>
5) Remove the differential side retainer oil seal by using a flat tip screwdriver or similar tools.
6) Using the ST, install the differential side retainer oil seal by lightly tapping with a hammer.
   ST 18675AA000 DIFFERENTIAL SIDE OIL SEAL INSTALLER
7) Apply transmission gear oil to the oil seal lips.
8) Set the ST to the side retainer.
   ST 28399SA010 OIL SEAL PROTECTOR
9) Install the front drive shaft into the transmission.

NOTE:

Replace the circlip of drive shaft with a new part.
10) Install the front drive shaft into transmission, remove the ST and insert the drive shaft securely.
   ST 28399SA010 OIL SEAL PROTECTOR
11) Install the front exhaust pipe and the center exhaust pipe. <Ref. to EX(STI)-6, INSTALLATION, Front Exhaust Pipe.>
12) Pour transmission gear oil to the bottom end of filler plug. <Ref. to 6MT-27, REPLACEMENT, Transmission Gear Oil.>
13) Lower the vehicle.
5. Transmission Mounting System

A: REMOVAL

1. PITCHING STOPPER
   1) Disconnect the ground cable from the battery.
   2) Remove the intercooler. <Ref. to IN(STI)-11, REMOVAL, Intercooler.>
   3) Remove the pitching stopper.

2. CROSSMEMBER AND CUSHION RUBBER
   1) Disconnect the ground cable from the battery.
   2) Lift up the vehicle.
   3) Remove the transmission under cover.
   4) Remove the center exhaust pipe. <Ref. to EX(STI)-7, REMOVAL, Center Exhaust Pipe.>
   5) Remove the rear exhaust pipe and muffler. <Ref. to EX(STI)-12, REMOVAL, Rear Exhaust Pipe.>
   6) Remove the heat shield cover.
   7) Set the transmission jack under the transmission body.
   CAUTION:
   Always support the transmission case with a transmission jack.
   8) Remove the rear crossmember.
   9) Remove the rear cushion rubber.

B: INSTALLATION

1. PITCHING STOPPER
   1) Install the pitching stopper.
      Tightening torque:
      \[ T1: 50 \text{ N·m (5.1 kgf-m, 36.9 ft-lb)} \]
      \[ T2: 58 \text{ N·m (5.9 kgf-m, 42.8 ft-lb)} \]
   2) Install the intercooler. <Ref. to IN(STI)-12, INSTALLATION, Intercooler.>
   3) Connect the battery ground cable to the battery.

2. CROSSMEMBER AND CUSHION RUBBER
   1) Install the rear cushion rubber.
      Tightening torque:
      \[ T1: 70 \text{ N·m (7.1 kgf-m, 51.6 ft-lb)} \]
      \[ T2: 140 \text{ N·m (14.3 kgf-m, 103 ft-lb)} \]
   2) Install the crossmember.
      Tightening torque:
      \[ T1: 35 \text{ N·m (3.6 kgf-m, 25.8 ft-lb)} \]
   3) Remove the transmission jack.
   4) Install the heat shield cover.
   5) Install the rear exhaust pipe and muffler. <Ref. to EX(STI)-12, INSTALLATION, Rear Exhaust Pipe.>
      \[ <Ref. to EX(STI)-14, INSTALLATION, Muffler.> \]
   6) Install the center exhaust pipe. <Ref. to EX(STI)-8, INSTALLATION, Center Exhaust Pipe.>
C: INSPECTION
Perform the following inspection procedures and repair or replace faulty parts.

1. PITCHING STOPPER
Check the pitching stopper for bends or damage. Check that the rubber is not stiff, cracked or otherwise damaged.

2. CROSSMEMBER AND CUSHION RUBBER
Check crossmember for bends or damage. Check that the cushion rubber is not stiff, cracked, or otherwise damaged.
6. Manual Transmission Assembly

A: REMOVAL

1) Set the vehicle on a lift.
2) Open the front hood completely.
3) Disconnect the ground cable from the battery.
4) Remove the intercooler. <Ref. to IN(STI)-11, REMOVAL, Intercooler.>
5) Disconnect the following harness connectors, and then remove the engine hanger rear.
6) Remove the secondary air combination valve. <Ref. to EC(STI)-23, SECONDARY AIR COMBINATION VALVE LH, REMOVAL, Secondary Air Combination Valve.>
7) Disconnect the ground cable on the upper side of the transmission case and body.
8) Remove the starter assembly. <Ref. to SC(STI)-5, REMOVAL, Starter.>
9) Remove the operating cylinder from the transmission.

NOTE:
Hang the removed operating cylinder with a piece of wire.

10) Remove the pitching stopper and pitching stopper bracket.
11) Set the ST.
ST1 41099AA010 ENGINE SUPPORT
BRACKET
ST2 41099AA020 ENGINE SUPPORT

12) Remove the clutch release shaft.
   (1) Remove the plug using a hexagon wrench.
   (2) Attach a 6 mm (0.24 in) bolt to the release shaft, and pull out the release shaft.
   (3) Lift the release fork, and remove from the claw of the release bearing. Pull the release fork to the engine side, and make it so that it moves freely.

13) Remove the front wheels.

14) Lift up the vehicle, and remove the transmission under cover.

15) Drain transmission gear oil completely. <Ref. to 6MT-27, REPLACEMENT, Transmission Gear Oil.>

16) Remove the center exhaust pipe. <Ref. to EX(STI)-7, REMOVAL, Center Exhaust Pipe.>

17) Remove the rear exhaust pipe and muffler. <Ref. to EX(STI)-12, REMOVAL, Rear Exhaust Pipe.> <Ref. to EX(STI)-14, REMOVAL, Muffler.>

CAUTION:
When removing the exhaust pipes, be careful each exhaust pipe does not drop out.

18) Remove the bolts which hold upper side of transmission to engine.

19) Remove the heat shield cover.

20) Remove the propeller shaft. <Ref. to DS-10, REMOVAL, Propeller Shaft.>

21) Remove the front stabilizer link.

22) Remove the ball joint of front arm from the housing.

23) Remove the front drive shaft. <Ref. to DS-25, REMOVAL, Front Drive Shaft.>

24) Set the transmission jack under the transmission, and remove the front crossmember and rear crossmember.
**MANUAL TRANSMISSION AND DIFFERENTIAL**

25) Move the transmission to the right side of the vehicle, and remove the joint COMPL, stay bolts and reverse check cable.

**NOTE:**
If the transmission is not moved aside, the joint COMPL and stay bolts may contact the body and cause damage.

![Diagram of transmission components](MT-00886)

(A) Joint COMPL bolt  
(B) Stay bolt  
(C) Reverse check cable

26) Tighten the turnbuckle of the ST to tilt the engine assembly towards the back.

![Diagram of engine tilt](MT-00463)

27) Remove the bolts and nuts holding the bottom of transmission to the engine, and remove the transmission from the vehicle.

**NOTE:**
- During removal, be careful not to hit the transmission against the body when pulling towards the rear.  
- The clutch pipe and breather pipe may interfere with each other. Remove carefully.

![Diagram of transmission assembly](MT-01090)

**B: INSTALLATION**

1) Set the release fork, release bearing and release shaft to the transmission. <Ref. to CL-11, INSTALLATION, Release Bearing and Lever.>

2) Replace the front differential side retainer oil seal.
   - (1) Remove the oil seal by using flat tip screwdriver etc.  
   - (2) Apply gear oil to the lip of new oil seals.  
   - (3) Install a new oil seal using ST.
   
   **ST 18675AA000 DIFFERENTIAL SIDE OIL SEAL INSTALLER**

**NOTE:**
Be sure to replace the differential side oil seal after the procedure of removing front drive shaft from transmission.

3) Loosen the turnbuckle of ST to return the engine to its original position.

![Diagram of engine tilt](MT-01527)

4) Install the transmission.

5) Tighten the bolts and nuts which hold the lower side of transmission to the engine.

**NOTE:**
- Make sure that the main shaft spline is completely inserted.  
- Make sure that the rear end of the engine is set low.

**Tightening torque:**
50 N·m (5.1 kgf·m, 36.9 ft-lb)

![Diagram of transmission tightening](MT-00464)
6) Move the transmission to the right side of the vehicle, and attach the joint COMPL, stay bolts and reverse check cable.

**Tightening torque:**
- **T1:** 11.8 N·m (1.2 kgf-m, 8.7 ft-lb)
- **T2:** 32 N·m (3.3 kgf-m, 23.6 ft-lb)

7) Install the front crossmember and rear crossmember.

**Tightening torque:**
- **T1:** 70 N·m (7.1 kgf-m, 51.6 ft-lb)
- **T2:** 140 N·m (14.3 kgf-m, 103 ft-lb)

8) Tighten the bolts which hold the upper side of the transmission to the engine.

**Tightening torque:**
- 50 N·m (5.1 kgf-m, 36.9 ft-lb)

9) Make sure that the release bearing is completely inserted.

**NOTE:**
- Push the release fork towards the operating cylinder side until a clicking sound is heard. Pull the release fork towards the engine side. If the release fork is not in contact with the case, the setting is complete.
- Confirm that the boot cover is set securely.

10) Install the pitching stopper bracket.

**Tightening torque:**
- 41 N·m (4.2 kgf-m, 30.2 ft-lb)

11) Attach the pitching stopper.

**Tightening torque:**
- **T1:** 50 N·m (5.1 kgf-m, 36.9 ft-lb)
- **T2:** 58 N·m (5.9 kgf-m, 42.8 ft-lb)

12) Install the clutch operating cylinder.

**Tightening torque:**
- 41 N·m (4.2 kgf-m, 30.2 ft-lb)

**NOTE:**
Check that the clutch hose is routed properly.
13) Install the starter assembly. <Ref. to SC(STI)-5, INSTALLATION, Starter.>
14) Attach the ground cable to the transmission and body.

15) Install the secondary air combination valve. <Ref. to EC(STI)-24, SECONDARY AIR COMBINATION VALVE LH, INSTALLATION, Secondary Air Combination Valve.>

16) Connect the following harness connectors, then attach the engine hanger rear.

17) Set the ST to side retainer.
ST 28399SA010 OIL SEAL PROTECTOR

18) Install the front drive shaft into the transmission.

NOTE:
Replace the circlip of drive shaft with a new part.

19) Install the front drive shaft into transmission, remove the ST and insert the drive shaft securely.
ST 28399SA010 OIL SEAL PROTECTOR

20) Install the ball joint of the front arm.

_Tightening torque:_
50 N·m (5.1 kgf·m, 36.9 ft-lb)
21) Install the front stabilizer link.

**Tightening torque:**

45 N·m (4.6 kgf-m, 33.2 ft-lb)

**NOTE:**

Use a new self-locking nut.

22) Install the propeller shaft. <Ref. to DS-11, INSTALLATION, Propeller Shaft.>

23) Install the heat shield cover.

24) Install the rear exhaust pipe and muffler. <Ref. to EX(STI)-12, INSTALLATION, Rear Exhaust Pipe.> <Ref. to EX(STI)-14, INSTALLATION, Muffler.>

25) Install the center exhaust pipe. <Ref. to EX(STI)-8, INSTALLATION, Center Exhaust Pipe.>

26) Fill the transmission gear oil. <Ref. to 6MT-27, REPLACEMENT, Transmission Gear Oil.>

27) Install the transmission under cover.

28) Install the intercooler. <Ref. to IN(STI)-12, INSTALLATION, Intercooler.>

29) Connect the battery ground cable to the battery.
7. Preparation for Overhaul

A: PROCEDURE

1) Clean oil, grease, dirt and dust from the transmission.
2) Attach the transmission to ST.
   ST  18632AA000  STAND ASSY

3) Apply oil to rotating parts before assembly.
4) When reusing disassembled parts, reinstall in the original positions and directions.
5) Gaskets, lock washers and lock nuts must be replaced with new parts.
6) Apply liquid gasket to the specified areas to prevent leakage.
8. Air Breather Hose

**A: REMOVAL**
Disconnect the air breather hose.

**B: INSTALLATION**
Connect the air breather hose.

**C: INSPECTION**
Make sure the hose is not cracked or clogged.
9. Back-up Light Switch

A: REMOVAL
1) Remove the manual transmission assembly from the vehicle. <Ref. to 6MT-32, REMOVAL, Manual Transmission Assembly.>
2) Disconnect the back-up light switch connector.
3) Disconnect the back-up light switch.

B: INSTALLATION
1) Install the back-up light switch.
NOTE:
Use a new gasket.
Tightening torque:
32 N·m (3.3 kgf-m, 23.6 ft-lb)
2) Connect the back-up light switch connector.
3) Install the manual transmission assembly to the vehicle. <Ref. to 6MT-34, INSTALLATION, Manual Transmission Assembly.>
C: INSPECTION

1) Disconnect the ground cable from the battery.
2) Remove the intercooler. <Ref. to IN(STI)-11, REMOVAL, Intercooler.>
3) Disconnect the transmission harness and chassis harness.

4) Measure the resistance between the back-up light switch terminals. If it is not within the specification, replace the back-up light switch.

<table>
<thead>
<tr>
<th>Gear shift position</th>
<th>Terminal No.</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Back position</td>
<td>3 and 6</td>
<td>Less than 1 Ω</td>
</tr>
<tr>
<td>Other positions</td>
<td></td>
<td>1 MΩ or more</td>
</tr>
</tbody>
</table>

(A) Transmission connector
(B) Pitching stopper
10. Neutral Position Switch

A: REMOVAL
1) Remove the manual transmission assembly from the vehicle. <Ref. to 6MT-32, REMOVAL, Manual Transmission Assembly.>
2) Disconnect the connector and clip of the neutral position switch.
3) Remove the neutral position switch.

B: INSTALLATION
1) Install the neutral position switch.

NOTE:
Use a new gasket.

Tightening torque:
32 N·m (3.3 kgf-m, 23.6 ft-lb)

2) Connect the connector and clip of the neutral position switch.

3) Install the manual transmission assembly to the vehicle. <Ref. to 6MT-34, INSTALLATION, Manual Transmission Assembly.>
C: INSPECTION

1) Disconnect the ground cable from the battery.
2) Remove the intercooler. <Ref. to IN(STI)-11, REMOVAL, Intercooler.>
3) Disconnect the transmission harness and chassis harness.

4) Measure the resistance between neutral position switch terminals. If not within the standard values, replace the neutral position switch.

<table>
<thead>
<tr>
<th>Gear shift position</th>
<th>Terminal No.</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neutral position</td>
<td>2 and 5</td>
<td>Less than 1 Ω</td>
</tr>
<tr>
<td>Other positions</td>
<td></td>
<td>1 MΩ or more</td>
</tr>
</tbody>
</table>

(A) Transmission connector
(B) Pitching stopper
11. Extension Case

A: REMOVAL
1) Remove the manual transmission assembly from the vehicle. <Ref. to 6MT-32, REMOVAL, Manual Transmission Assembly.>
2) Prepare the transmission for overhaul. <Ref. to 6MT-38, Preparation for Overhaul.>
3) Remove the extension case.

4) Remove any remaining liquid gasket from the extension case and transmission case.

B: INSTALLATION
1) Select the thrust washer of the transfer driven gear, and attach to the extension case. <Ref. to 6MT-47, ADJUSTMENT, Extension Case.>
2) Apply a thin coat of oil to the outer surface of the bearing cone, and attach to the extension case.
3) Select the thrust washer of the transfer drive gear, and attach to the center differential.
4) Apply liquid gasket to the transmission case.

Liquid gasket:
THREE BOND 1215 (Part No. 004403007) or equivalent

5) Install the extension case.

Tightening torque:
48 N·m (4.9 kgf-m, 35.4 ft-lb)

NOTE:
Insert the stopper section of the center differential between the oil guide.

6) Install the manual transmission assembly to the vehicle. <Ref. to 6MT-34, INSTALLATION, Manual Transmission Assembly.>
C: DISASSEMBLY

1) Remove the transfer drive gear. <Ref. to 6MT-54, REMOVAL, Transfer Drive Gear.>
2) Remove the oil guide.

3) Remove the shift bracket.

4) Remove the bearing cone using the ST.  
   ST  18758AA000  PULLER

5) Remove the thrust washer and oil plate.

6) Remove the shifter arm oil seal.

7) Remove the reverse check system. <Ref. to 6MT-51, REMOVAL, Reverse Check System.>
8) Remove the extension oil seal. <Ref. to 6MT-28, REPLACEMENT, Oil Seal.>
**D: ASSEMBLY**

1) Install the reverse check system. <Ref. to 6MT-52, INSTALLATION, Reverse Check System.>
2) Install the extension case oil seal. <Ref. to 6MT-28, REPLACEMENT, Oil Seal.>
3) Install a shifter arm oil seal using the ST.
   ST1  18657AA000  INSTALLER
   ST2  18671AA000  OIL SEAL GUIDE

4) Install the oil plate.

5) Select the thrust washer of the bearing, and attach to the extension case. <Ref. to 6MT-47, ADJUSTMENT, Extension Case.>
6) Apply a thin coat of oil to the outer surface of the bearing cone, and attach to the extension case.
7) Install the shift bracket.

**Tightening torque:**

25 N·m (2.5 kgf·m, 18.4 ft·lb)

8) Attach the oil guide and the transfer driven gear. <Ref. to 6MT-54, INSTALLATION, Transfer Drive Gear.>

---

**E: INSPECTION**

1) Check to make sure there is no damage or cracks on the extension case. If damage or cracking is found, replace the extension case.
2) Inspect for oil leaks at the extension case and transmission case oil seals and mating surfaces. If there are oil leaks, replace the oil seal and liquid gasket.
F: ADJUSTMENT

1. TRANSFER DRIVEN GEAR BEARING THRUST WASHER ADJUSTMENT

1) Remove the bearing cone from the extension case using the ST.
   ST 18758AA000 PULLER

2) Remove the thrust washer.

3) Measure depth “Z” between the extension case end area and bearing cone contact area.
   ST 398643600 GAUGE

   NOTE:
   When measuring depth “Z”, subtract the thickness of the ST [15 mm (0.59 in)] from the measured value.

4) Remove the transfer driven gear. <Ref. to 6MT-56, REMOVAL, Transfer Driven Gear.>

5) Remove the center differential. <Ref. to 6MT-58, REMOVAL, Center Differential.>

6) Remove the oil guides G and H.

7) Remove the snap ring and flat washer from the selector arm area.

8) Using an ST, remove the neutral set spring and support.
   ST1 18756AA000 CLAW
   ST2 399893600 PLIER
9) Lift the striking rod, and remove the spring pin.

10) Remove the selector arm No. 2 and the shifter arm.

11) Attach the bearing cone to the transfer driven gear.

12) Set the ST.

13) Turn the transfer driven gear 10 or more times to seat the bearing properly.

14) Measure depth “Y” between the end of the ST and the bearing cone.

ST 18831AA000 GAUGE

15) Using the following calculation, calculate the transfer driven gear bearing thrust washer value “t”.

\[ t = Z - (100 - Y) - (0.02 - 0.11 \text{ mm} \) (0.0008 — 0.0043 in)]

<table>
<thead>
<tr>
<th>t mm (in)</th>
<th>Transfer driven gear bearing thrust washer thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y mm (in)</td>
<td>Depth between the end of the ST and the bearing cone.</td>
</tr>
<tr>
<td>Z mm (in)</td>
<td>Depth between the end of the extension case and the bearing cone contact area.</td>
</tr>
<tr>
<td>0.02 — 0.11 mm (0.0008 — 0.0043 in)</td>
<td>Standard clearance between the thrust washer and taper roller bearing</td>
</tr>
<tr>
<td>100 mm (3.94 in)</td>
<td>Height of ST</td>
</tr>
</tbody>
</table>
16) Refer to the calculated value “t” to select the closest thrust washer from the following table.

**Standard clearance between the thrust washer and taper roller bearing**

0.02 — 0.11 mm (0.0008 — 0.0043 in)

**NOTE:**
Match to be within the standard clearance range.

<table>
<thead>
<tr>
<th>Thrust washer (50 x 61 x t)</th>
<th>Part No.</th>
<th>Thickness t mm (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>803050060</td>
<td>0.50 (0.0197)</td>
</tr>
<tr>
<td></td>
<td>803050061</td>
<td>0.55 (0.0217)</td>
</tr>
<tr>
<td></td>
<td>803050062</td>
<td>0.60 (0.0236)</td>
</tr>
<tr>
<td></td>
<td>803050063</td>
<td>0.65 (0.0256)</td>
</tr>
<tr>
<td></td>
<td>803050064</td>
<td>0.70 (0.0276)</td>
</tr>
<tr>
<td></td>
<td>803050065</td>
<td>0.75 (0.0295)</td>
</tr>
<tr>
<td></td>
<td>803050066</td>
<td>0.80 (0.0315)</td>
</tr>
<tr>
<td></td>
<td>803050067</td>
<td>0.85 (0.0335)</td>
</tr>
<tr>
<td></td>
<td>803050068</td>
<td>0.90 (0.0354)</td>
</tr>
<tr>
<td></td>
<td>803050069</td>
<td>0.95 (0.0374)</td>
</tr>
<tr>
<td></td>
<td>803050070</td>
<td>1.00 (0.0394)</td>
</tr>
<tr>
<td></td>
<td>803050071</td>
<td>1.05 (0.0413)</td>
</tr>
<tr>
<td></td>
<td>803050072</td>
<td>1.10 (0.0433)</td>
</tr>
<tr>
<td></td>
<td>803050073</td>
<td>1.15 (0.0453)</td>
</tr>
<tr>
<td></td>
<td>803050074</td>
<td>1.20 (0.0472)</td>
</tr>
<tr>
<td></td>
<td>803050075</td>
<td>1.25 (0.0492)</td>
</tr>
<tr>
<td></td>
<td>803050076</td>
<td>1.30 (0.0512)</td>
</tr>
<tr>
<td></td>
<td>803050077</td>
<td>1.35 (0.0531)</td>
</tr>
<tr>
<td></td>
<td>803050078</td>
<td>1.40 (0.0551)</td>
</tr>
<tr>
<td></td>
<td>803050079</td>
<td>1.45 (0.0570)</td>
</tr>
</tbody>
</table>

17) Install the selector arm No. 2 and the shifter arm.

18) Install a new spring pin.

19) Using the ST, install the neutral set spring and support.

ST1 18756AA000 CLAW
ST2 399893600 PLIER

20) Install the flat washer and snap ring to the selector arm area.

21) Install the center differential. <Ref. to 6MT-58, INSTALLATION, Center Differential.>
2. TRANSFER DRIVE GEAR THRUST WASHER SELECTION

1) Measure height “Z” between the transmission case end area and ST.
   ST 398643600 GAUGE

2) Measure depth “Y” between the end of the ST and the transfer drive gear.
   ST 398643600 GAUGE

3) Using the following calculation, calculate the transfer drive gear thrust washer value “t”.
   \[
   t = (Y - 15 \text{ mm (0.59 in)}) - (Z - 15 \text{ mm (0.59 in)}) - 0.75 - 0.95 \text{ mm (0.030 — 0.037 in)}
   \]

4) Refer to the calculated value “t” to select the closest thrust washer from the following table.

   **Standard clearance between the thrust washer and transfer drive gear**
   \[
   0.75 — 0.95 \text{ mm (0.030 — 0.037 in)}
   \]

   **NOTE:**
   Match to be within the standard clearance range.

<table>
<thead>
<tr>
<th>Thrust washer (36.3 x 52 x t)</th>
<th>Part No.</th>
<th>Thickness mm (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>803036070</td>
<td>0.80 (0.0315)</td>
<td></td>
</tr>
<tr>
<td>803036071</td>
<td>0.95 (0.0374)</td>
<td></td>
</tr>
<tr>
<td>803036072</td>
<td>1.10 (0.0433)</td>
<td></td>
</tr>
<tr>
<td>803036073</td>
<td>1.25 (0.0492)</td>
<td></td>
</tr>
<tr>
<td>803036074</td>
<td>1.40 (0.0551)</td>
<td></td>
</tr>
<tr>
<td>803036075</td>
<td>0.65 (0.0256)</td>
<td></td>
</tr>
</tbody>
</table>

5) Install the selected thrust washer.
12. Reverse Check System

A: REMOVAL

1) Remove the manual transmission assembly from the vehicle. <Ref. to 6MT-32, REMOVAL, Manual Transmission Assembly.>
2) Prepare the transmission for overhaul. <Ref. to 6MT-38, Preparation for Overhaul.>
3) Remove the extension case. <Ref. to 6MT-44, REMOVAL, Extension Case.>
4) Remove the snap ring and washer from the reverse check shaft.

5) Remove the reverse check shaft and spring from the extension case.

6) Remove the spring pin, and remove the reverse check lever and oil seal from the reverse check shaft.

NOTE:
Do not reuse the oil seal.

7) Remove the plug from the extension case, and remove the gasket, spring and plunger.

NOTE:
Do not reuse the gasket.

8) Remove the reverse lock plunger.
B: INSTALLATION

1) Insert the reverse lock plunger.
2) Install the reverse check plug, spring, gasket, and plug in order.

**Tightening torque:**
41 N·m (4.2 kgf-m, 30.2 ft-lb)

3) Install the spring and reverse check shaft to the extension case.

**NOTE:**
Confirm that the end of the spring matches the hole of the reverse check shaft and the cut out of the extension case.

4) Install the washer and snap ring.

5) Attach ST1 to the reverse check shaft. Install the new oil seal, and push it in using ST2.

ST1 18671AA000 OIL SEAL GUIDE
ST2 18657AA010 INSTALLER

6) Insert the reverse check lever, and turn the reverse check shaft until the plunger is first pushed in.

(A) Snap ring
(B) Washer

(A) Oil seal

(A) Plunger
(B) Reverse check shaft
7) Match the hole of the reverse check lever and the reverse check shaft, and attach the spring pin.

8) Check that the reverse check is operating correctly. <Ref. to 6MT-53, INSPECTION, Reverse Check System.>

9) Install the extension case. <Ref. to 6MT-44, INSTALLATION, Extension Case.>

10) Install the manual transmission assembly to the vehicle. <Ref. to 6MT-34, INSTALLATION, Manual Transmission Assembly.>

C: INSPECTION

1) Check that there is no damage on any parts.
2) Check that the reverse check lever is operating smoothly.
3) Inspect that there is no oil leak at the oil seal section of the reverse check shaft. If there is oil leakage, replace the oil seal.
4) Check the operation of the reverse check. (1) When the reverse check lever is in the following position, the plunger is pressed, or the gear can shift into reverse.

(2) When the reverse check lever is in the following position, the plunger is not pressed, or the gear cannot shift into reverse.

5) If not according to the standard, reassemble the reverse check system.
13. Transfer Drive Gear

A: REMOVAL
1) Remove the manual transmission assembly from the vehicle. <Ref. to 6MT-32, REMOVAL, Manual Transmission Assembly.>
2) Prepare the transmission for overhaul. <Ref. to 6MT-38, Preparation for Overhaul.>
3) Remove the extension case. <Ref. to 6MT-44, REMOVAL, Extension Case.>
4) Remove the transfer drive gear.

B: INSTALLATION
1) Install the transfer drive gear.

Tightening torque:
25 N·m (2.5 kgf-m, 18.4 ft-lb)

2) When the ball bearing, transfer drive gear or snap ring are replaced, select an appropriate thrust washer for the transfer drive gear. <Ref. to 6MT-46, ASSEMBLY, Extension Case.>
3) Install the extension case. <Ref. to 6MT-44, INSTALLATION, Extension Case.>
4) Install the manual transmission assembly to the vehicle. <Ref. to 6MT-34, INSTALLATION, Manual Transmission Assembly.>

C: DISASSEMBLY
1) Remove the snap ring.

2) Remove the bearing using the ST.

NOTE:
Do not reuse the ball bearing.

MT-00505

ST 499877000 RACE 4-5 INSTALLER

MT-00506

MT-00507
Transfer Drive Gear

MANUAL TRANSMISSION AND DIFFERENTIAL

D: ASSEMBLY

1) Using the ST, install the ball bearing.
ST1 499247400 INSTALLER
ST2 398497701 SEAT

2) Install the snap ring.

3) Inspect the clearance between the snap ring and the ball bearing. <Ref. to 6MT-55, INSPECTION, Transfer Drive Gear.>

E: INSPECTION

1) Bearing
Replace the bearings in the following cases.
- Damage or rust on the bearings
- Wear, or damage
- The bearing does not rotate smoothly or an abnormal noise is emitted.

2) Drive gear
Replace the drive gear in following case:
- If the drive gear tooth surface and shaft are excessively damaged or broken.

3) Measure the clearance between the snap ring and ball bearing inner race with a thickness gauge.

**Standard clearance between the snap ring and inner race:**

\[0 — 0.15 \text{ mm} \ (0 — 0.0059 \text{ in})\]

4) If the measurement is out of specifications, reselect an appropriate snap ring.

<table>
<thead>
<tr>
<th>Thrust washer</th>
<th>Thickness mm (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>805045050</td>
<td>1.76 (0.069)</td>
</tr>
<tr>
<td>805045060</td>
<td>1.88 (0.074)</td>
</tr>
<tr>
<td>805045070</td>
<td>2.00 (0.079)</td>
</tr>
</tbody>
</table>

After replacing the snap ring, reinspect the clearance.
14. Transfer Driven Gear

A: REMOVAL
1) Remove the manual transmission assembly from the vehicle. <Ref. to 6MT-32, REMOVAL, Manual Transmission Assembly.>
2) Prepare the transmission for overhaul. <Ref. to 6MT-38, Preparation for Overhaul.>
3) Remove the extension case. <Ref. to 6MT-44, REMOVAL, Extension Case.>
4) Remove the transfer driven gear.

B: INSTALLATION
1) Install the transfer driven gear.
2) When the bearing or the transfer driven gear is replaced, select an appropriate thrust washer for the transfer driven gear. <Ref. to 6MT-47, ADJUSTMENT, Extension Case.>
3) Install the extension case. <Ref. to 6MT-44, INSTALLATION, Extension Case.>
4) Install the manual transmission assembly to the vehicle. <Ref. to 6MT-34, INSTALLATION, Manual Transmission Assembly.>

C: DISASSEMBLY
1) Using the ST, remove the roller bearing (extension case side).
   ST  498515700  REMOVER

2) Using the ST, remove the roller bearing (transmission case side).
   ST1  899858600  REMOVER
   ST2  899864100  REMOVER
D: ASSEMBLY
1) Using the ST, install the roller bearing (extension case side).
   ST1 398177700 INSTALLER
   ST2 899864100 REMOVER
   CAUTION:
   Do not apply pressure in excess of 10 kN (1 ton, 1.1 US ton, 1.0 Imp ton).

2) Using the ST, install the roller bearing (transmission case side).
   ST 499757002 INSTALLER
   CAUTION:
   Do not apply pressure in excess of 10 kN (1 ton, 1.1 US ton, 1.0 Imp ton).

E: INSPECTION
1) Bearing
   Replace the bearings in the following cases.
   • Damage or rust on the bearings
   • Wear, or damage
   • After applying transmission gear oil, bearing does not rotate smoothly or an abnormal noise is emitted.
2) Driven gear
   Replace the driven gear in the following cases.
   • If the driven gear tooth surface and shaft are excessively damaged or broken.
15. Center Differential

A: REMOVAL

1) Remove the manual transmission case from the vehicle. <Ref. to 6MT-32, REMOVAL, Manual Transmission Assembly.>
2) Prepare the transmission for overhaul. <Ref. to 6MT-38, Preparation for Overhaul.>
3) Remove the extension case. <Ref. to 6MT-44, REMOVAL, Extension Case.>
4) Remove the transfer driven gear. <Ref. to 6MT-56, REMOVAL, Transfer Driven Gear.>
5) Disconnect the center differential connector.
6) Remove the thrust washer and center differential.

7) Remove the needle bearing.

B: INSTALLATION

1) Install the needle bearing.
2) Install the thrust washer and center differential.
3) When replacing the center differential, select and install the appropriate transfer drive gear and thrust washer. <Ref. to 6MT-47, ADJUSTMENT, Extension Case.>
4) Connect the center differential connector, and affix to the oil guide.
5) Install the transfer driven gear. <Ref. to 6MT-56, INSTALLATION, Transfer Driven Gear.>
6) Install the extension case. <Ref. to 6MT-44, INSTALLATION, Extension Case.>
7) Install the manual transmission case assembly to the vehicle. <Ref. to 6MT-34, INSTALLATION, Manual Transmission Assembly.>

C: INSPECTION

Check that there is no damage on the center differential. Replace if damaged.
16. Transmission Case

A: REMOVAL

1) Remove the manual transmission assembly from the vehicle. <Ref. to 6MT-32, REMOVAL, Manual Transmission Assembly.>
2) Prepare the transmission for overhaul. <Ref. to 6MT-38, Preparation for Overhaul.>
3) Remove the neutral position switch, back-up light switch and harness. <Ref. to 6MT-42, REMOVAL, Neutral Position Switch.> <Ref. to 6MT-40, REMOVAL, Back-up Light Switch.>
4) Remove the extension case. <Ref. to 6MT-44, REMOVAL, Extension Case.>
5) Remove the transfer driven gear. <Ref. to 6MT-56, REMOVAL, Transfer Driven Gear.>
6) Remove the center differential. <Ref. to 6MT-58, REMOVAL, Center Differential.>
7) Remove the oil guides G and H.
8) Remove the snap ring and flat washer from the selector arm area.
9) Using an ST, remove the neutral set spring and support.
   ST1 18756AA000 CLAW
   ST2 399893600 PLIER
10) Lift the striking rod, and remove the spring pin.
11) Remove the selector arm No. 2 and the shifter arm.
12) Remove the transfer bearing holder.

NOTE:
Using a general tool may cause damage. Remove the bolt using the ST.
ST 18663AA000 SOCKET

13) Remove the thrust washer on the main shaft section.
14) Remove the driven gear assembly shim and spacer.

(A) Driven gear ASSY

15) Remove the snap ring.

16) Remove the pilot bolt.

17) Remove the holder reverse bolt.

18) Remove the transmission case.

NOTE:
If the oil guide is caught between the shift fork, it may be difficult to remove the transmission case. Move the oil guide, then remove. Do not pull on the transmission case with excessive force.

19) Remove any remaining liquid gasket from the transmission case and adapter plate.
B: INSTALLATION

1) Check that the shifter fork and the interlock block are both shifted into the neutral position. If they are not, shift into the neutral position.

2) Apply liquid gasket to the adapter plate.

   Liquid gasket:
   THREE BOND 1215 (Part No. 004403007) or equivalent

3) Install the transmission case.

4) By inspecting from the pilot bolt attachment hole, check that the interlock block and the reverse interlock block aligned in the neutral position. If not aligned in neutral, remove the transmission case, and shift the shifter fork and interlock block to the neutral position.

5) Temporarily attach the pilot bolt with a new gasket.

6) Affix the transmission case with the bolts and nuts.

   **Tightening torque:**
   50 N·m (5.1 kgf-m, 36.9 ft-lb)

7) Tighten the pilot bolt.

   **Tightening torque:**
   34 N·m (3.5 kgf-m, 25.1 ft-lb)

8) Tighten the holder reverse bolt.

   **Tightening torque:**
   25 N·m (2.5 kgf-m, 18.4 ft-lb)
9) Install the snap ring, washer and collar of the driven gear assembly.

10) Attach the thrust washer to the main shaft.
11) Install the transfer bearing holder.

**Tightening torque:**

*25 N·m (2.5 kgf-m, 18.4 ft-lb)*

STS 18663AA000 SOCKET

12) When replacing the transfer bearing holder, select the appropriate transfer driven gear and thrust washer, and install to the extension case. <Ref. to 6MT-47, ADJUSTMENT, Extension Case.>

13) Install the selector arm No. 2 and the shifter arm.

14) Install a new spring pin.
15) Using the ST, install the neutral set spring.
STS 18756AA000 CLAW
STS 399893600 PLIER

16) Install the snap ring and flat washer to the selector arm area.
17) Install the oil guides G and H.

18) Install the center differential. <Ref. to 6MT-58, INSTALLATION, Center Differential.>
19) Install the transfer driven gear. <Ref. to 6MT-56, INSTALLATION, Transfer Driven Gear.>
20) Install the extension case. <Ref. to 6MT-44, INSTALLATION, Extension Case.>
21) Install the neutral position switch, back-up light switch and harness. <Ref. to 6MT-42, INSTALLATION, Neutral Position Switch.> <Ref. to 6MT-40, INSTALLATION, Back-up Light Switch.>
22) Install the manual transmission assembly to the vehicle. <Ref. to 6MT-34, INSTALLATION, Manual Transmission Assembly.>

C: DISASSEMBLY

1) Remove the transmission harness from the transmission case.

NOTE: Remove the connector by disengaging the connector claw from the inside of the transmission.
2) Remove the oil guides C, D, E, F and harness bracket.

3) Remove the oil pan.

4) Remove any remaining liquid gasket from the transmission case and oil pan.
1) Apply liquid gasket to the oil pan.

**Liquid gasket:**
THREE BOND 1215 (Part No. 004403007) or equivalent

2) Install the oil pan.

**Tightening torque:**
6.4 N·m (0.7 kgf-m, 4.7 ft-lb)

3) Install the oil guides C, D, E, F and harness bracket.

**Tightening torque:**
T1: 16 N·m (1.6 kgf-m, 11.8 ft-lb)
T2: 18 N·m (1.8 kgf-m, 13.3 ft-lb)
4) Attach the transmission harness to the transmission.

NOTE:
Install the transmission harness connector by aligning the protrusions of the transmission and transmission harness connector.

E: INSPECTION
1) If the sludge is accumulated in the oil pan, use a waste cloth to wipe it off completely.
2) Check that there is no damage on any parts. Replace damaged parts with new parts.
17. Main Shaft Assembly

A: REMOVAL

1) Remove the manual transmission assembly from the vehicle. <Ref. to 6MT-32, REMOVAL, Manual Transmission Assembly.>

2) Prepare the transmission for overhaul. <Ref. to 6MT-38, Preparation for Overhaul.>

3) Remove the neutral position switch, back-up light switch and harness. <Ref. to 6MT-42, REMOVAL, Neutral Position Switch.> <Ref. to 6MT-40, REMOVAL, Back-up Light Switch.>

4) Remove the extension case. <Ref. to 6MT-44, REMOVAL, Extension Case.>

5) Remove the transfer driven gear. <Ref. to 6MT-56, REMOVAL, Transfer Driven Gear.>

6) Remove the center differential. <Ref. to 6MT-58, REMOVAL, Center Differential.>

7) Remove the transmission case. <Ref. to 6MT-59, REMOVAL, Transmission Case.>

8) Remove the striking rod.

9) Remove the oil guide B.

10) Use a screw driver to shift to the 4th gear position.

11) Remove the reverse idler holder.

12) Remove the check plug, O-ring, check spring, plunger and check ball from the adapter plate.

NOTE:
Do not reuse the gasket.

(A) Reverse idler holder

(A) Check plug
(B) O-ring
(C) Checking spring
(D) Plunger
(E) Check ball
13) Remove the bolt and gasket holding the reverse idler shaft.

14) Push the main shaft assembly, driven gear assembly, reverse idler gear and shifter forks to remove from the adapter plate all at once.

**NOTE:**
A helper is required to perform this work.

**B: INSTALLATION**

1) Adjust the 3rd-4th and 5th-6th shifter fork rods. <Ref. to 6MT-115, ADJUSTMENT, Shifter Fork and Rod.>

2) Turn the sub gear counterclockwise for approximately 3 teeth. Match the sub gear and reverse idler gear holes, and insert the ST.

3) Attach the driven gear assembly to the 1st-2nd shifter fork assembly.

4) Attach the main shaft assembly to the 3rd-4th shifter fork, and assemble to the driven gear assembly.
5) Attach the 5th-6th shifter fork assembly to the main shaft assembly.

6) Attach the reverse shifter fork assembly to the reverse idler gear assembly.

7) Install the reverse idler gear assembly.

9) Push on the shifter forks, main shaft assembly, driven gear assembly and reverse idler gear assemblies, to attach to the adapter plate all at once.

   NOTE:
   A helper is required to perform this work.

10) Install the plunger, check spring, new O-ring and check plugs.

   **Tightening torque:**
   37 N·m (3.8 kgf-m, 27.3 ft-lb)

8) Install the thrust bearing of the driven gear assembly.
11) Install the check ball, check spring, new O-ring and check plugs.

**Tightening torque:**

- 37 N·m (3.8 kgf-m, 27.3 ft-lb)

12) Attach the bolt and a new gasket.

**Tightening torque:**

- 25 N·m (2.5 kgf-m, 18.4 ft-lb)

13) Use a screw driver to shift to the 4th gear position.

14) Install the reverse idler holder.

15) Install the oil guide B.

**Tightening torque:**

- 18 N·m (1.8 kgf-m, 13.3 ft-lb)

16) Install the striking rod.

17) Install the transmission case. <Ref. to 6MT-61, INSTALLATION, Transmission Case.>

18) Install the selected main shaft snap ring and washers.

19) Install the center differential. <Ref. to 6MT-58, INSTALLATION, Center Differential.>

20) Install the transfer driven gear. <Ref. to 6MT-56, INSTALLATION, Transfer Driven Gear.>

21) Install the extension case. <Ref. to 6MT-44, INSTALLATION, Extension Case.>

22) Install the neutral position switch, back-up light switch and harness. <Ref. to 6MT-42, INSTALLATION, Neutral Position Switch.> <Ref. to 6MT-40, INSTALLATION, Back-up Light Switch.>

23) Install the manual transmission assembly to the vehicle. <Ref. to 6MT-34, INSTALLATION, Manual Transmission Assembly.>
C: DISASSEMBLY

NOTE:
Individual sleeves and hubs meet at a specified position. Before disassembly, mark the meeting position of the sleeve and hub.

1) Affix the ST to the work table.
   ST 18664AA000 BASE
2) Flatten the locknut tab.
3) Set the main shaft assembly to the ST, and remove the lock nut and washer.
   ST1 18665AA000 HOLDER
   ST2 18664AA000 BASE

NOTE:
Use a 38 mm socket wrench.

4) Remove the main shaft assembly from the ST.

5) Set the ST1 to the 6th drive gear, and use a press to remove the taper roller bearing, bushing and 6th drive gear.
   ST1 18722AA010 REMOVER
   ST2 899864100 REMOVER

6) Remove the 5th-6th sleeve, 6th needle bearing and 6th baulk ring.
7) Set the ST to the 3rd drive gear, and use a press to remove individual parts.

ST 18720AA000 REMOVER

D: ASSEMBLY

NOTE:
When replacing the following parts, replace as a set.
- Sleeve and hub
- Outer baulk ring, 3rd synchro cone and inner baulk ring
- Taper roller bearing

1) Apply adequate transmission gear oil to the main shaft, 3rd needle bearing and 3rd drive gear inner surface.
2) Install the 3rd needle bearing and 3rd drive gear to the main shaft.

3) Install the inner baulk ring, 3rd synchro cone and outer baulk ring.

(A) 3rd needle bearing
(B) 3rd drive gear

(A) Inner baulk ring
(B) Outer baulk ring
NOTE:
Install the 3rd synchro cone by aligning the protrusion of the 3rd synchro cone with the hole on the 3rd drive gear.

4) Install the 3rd-4th hub and 4th bushing.
   (1) Being careful of the install direction of the 3rd-4th hub, set to the main shaft.
   (2) Being careful not to cover the oil holes of the main shaft and 4th bushing, attach to the main shaft.

(A) Main shaft
(B) 3rd-4th hub
(C) 3rd drive gear
(D) 4th bushing oil hole
(A) 4th bushing
(B) 3rd-4th hub
(C) 4th bushing oil hole
(D) Main shaft oil hole
(3) Using the ST, push in to the 3rd-4th hub and 4th bushing all at once.

ST1 18651AA000 INSTALLER
ST2 398177700 INSTALLER

CAUTION:
Do not apply pressure in excess of 40 kN (4.0 ton, 4.4 US ton, 3.9 Imp ton).

NOTE:
When pushing into the 3rd-4th hub and 4th bushing, move the outer baulk ring to match the protrusion of the outer baulk ring and the cut out on the 3rd-4th bushing.

5) Make sure that the 3rd drive gear can be turned smoothly by hand. If it does not turn smoothly, reassemble.

6) Attach the 3rd-4th shifting insert key at the appropriate position of the 3rd-4th sleeve.

NOTE:
- The location angle of each shifting insert key is 120°.
- Refer to the following figure to install the shifting insert key.

7) Attach the 3rd-4th sleeve to the 3rd-4th hub.

NOTE:
- There is an identification groove on the 3rd-4th sleeve.
- Place the groove towards the 3rd drive gear, and attach the 3rd-4th sleeve.
8) Install the 4th baulk ring.

9) Apply adequate transmission gear oil to the main shaft, 4th needle bearing and 4th drive gear inner surface.
10) Install the 4th needle bearing and 4th drive gear.

11) Install the 5th bushing.
    (1) Being careful not to cover the oil holes of the main shaft and 5th bushing, attach to the main shaft.

(A) 5th bushing
(B) Main shaft oil hole
(C) Main shaft
(D) 5th bushing oil hole
(E) 4th drive gear

(2) Using the ST, push into the 5th bushing.
ST1 18651AA000 INSTALLER
ST2 398177700 INSTALLER

CAUTION:
Do not apply pressure in excess of 40 kN (4.0 ton, 4.4 US ton, 3.9 Imp ton).

12) Make sure that the 4th drive gear can be turned smoothly by hand. If it does not turn smoothly, reassemble.
13) Apply adequate transmission gear oil to the main shaft, 5th needle bearing and 5th drive gear inner surface.
14) Install the 5th needle bearing and 5th drive gear.

15) Install the 5th baulk ring.

16) Install the 5th-6th hub.
(1) Being careful of the install direction of the 5th-6th hub, set to the main shaft.

17) Make sure that the 5th drive gear can be turned smoothly by hand. If it does not turn smoothly, reassemble.

CAUTION:
Do not apply pressure in excess of 40 kN (4.0 ton, 4.4 US ton, 3.9 Imp ton).

NOTE:
When pushing into the 5th-6th hub, move the outer baulk ring to match the protrusion of the outer baulk ring and the cut out on the 5th-6th bushing.
18) Attach the 5th-6th shifting insert key at the appropriate position of the 5th-6th sleeve.

NOTE:
- The location angle of each shifting insert key is 120°.
- Refer to the following figure to install the shifting insert key.

19) Attach the 5th-6th sleeve to the 5th-6th hub.

NOTE:
- There are two identification grooves on the 5th-6th sleeve.
- Place the grooves towards the 5th drive gear, and attach the 5th-6th sleeve.

20) Install the 6th baulk ring.

21) Apply adequate transmission gear oil to the main shaft, 6th needle bearing and 6th drive gear inner surface.

22) Install the 6th drive gear.

23) Install the 6th needle bearing.

24) Being careful not to cover the oil holes of the 6th bushing and the main shaft, set the 6th bushing to the main shaft.
25) Using the ST, install the 6th bushing.
ST1 18651AA000 INSTALLER
ST2 398177700 INSTALLER

CAUTION:
Do not apply pressure in excess of 40 kN (4.0 ton, 4.4 US ton, 3.9 Imp ton).

26) Make sure that the 6th drive gear can be turned smoothly by hand. If it does not turn smoothly, reassemble.

27) Using the ST, install the inner bearing of the taper roller bearing.
ST1 18651AA000 INSTALLER
ST2 398177700 INSTALLER

CAUTION:
Do not apply pressure in excess of 40 kN (4.0 ton, 4.4 US ton, 3.9 Imp ton).

NOTE:
• Confirm that the outer race is installed in the proper direction.
• Push in until there is no backlash on the outer race and the bearing turns smoothly by hand.

28) Using the ST, install the outer race and the outer bearing of the taper roller bearing.
ST1 18651AA000 INSTALLER
ST2 398177700 INSTALLER

CAUTION:
Do not apply pressure in excess of 40 kN (4.0 ton, 4.4 US ton, 3.9 Imp ton).

29) Make sure that the taper roller bearing turns smoothly by hand. If it does not rotate smoothly, replace the taper roller bearing as a set, and reassemble.

30) Attach the lock washer and a new lock nut.
31) Set the main shaft assembly to the ST, and tighten the lock nut.
ST1 18665AA000 HOLDER
ST2 18664AA000 BASE

**Tightening torque:**

392 N·m (40.0 kgf-m, 289.1 ft-lb)

32) Using the ST, crimp the lock nut in 4 locations, with dimensions within A 27±0.3 mm (1.06±0.01 in).
ST 18668AA000 PUNCH

**NOTE:**
Do not damage the crimp area of the lock nut.

---

**E: INSPECTION**

Disassembled parts should be washed clean first with cleaning solvent and then inspected carefully.

1) **Bearing**
Replace the bearings in the following cases.
- Wear, rusting or damage of the bearings
- The bearing does not rotate smoothly or an abnormal noise is emitted when turning.
- When the bearing has other defects

2) **Bushing (each gear)**
Replace the bushing in following cases.
- The sliding surface is damaged or abnormally worn.

3) **Gear**
Replace gears in the following cases.
- The gear teeth surface is damaged or excessively worn.
- If the contact area of the baulk ring is damaged.
- If the inner face of the gear is worn.

4) **Baulk ring, synchro cone**
Replace the baulk ring and synchro cone in following cases:
- Wear, rusting or damage of the baulk ring

5) **Shifting insert key**
Replace the shifting insert key if deformed, excessively worn or defective in any way.
F: ADJUSTMENT

1. MAIN SHAFT SNAP RING & WASHER SELECTION

NOTE:
In the following conditions, perform the procedures below.
- 1st to 6th driven gear replacement
- 1st and 2nd synchro ring assembly replacement
- Ball bearing replacement
- Adapter plate replacement
- Driven shaft replacement

1) Insert the drive pinion assembly into the adapter plate.

NOTE:
Confirm that the thrust bearing outer race has not been removed and the drive pinion is not lifted.

2) Set the height gauge to the adapter plate. Lower the height gauge indicator to the mating surface of the adapter plate and case, and set to zero points.

ST 18853AA000 HEIGHT GAUGE

3) Measure the height to the ball bearing end face (height H).

NOTE:
- The adapter plate will be the base point for the measurement. Use a scraper to remove any gasket material remaining on the end face.
- During measurement, do not place the height gauge in the shaded area shown in the figure.

NOTE:
Set the height gauge indicator near the measurement target, and lock dial (1) as shown in the figure. Turn dial (2), and set the indicator to the end face of the bearing.

Turn approximately 120° at a time, and measure the ball bearing in 5 locations. Round off the 2 highest and 2 lowest measurement values. The remaining center value is used as the measurement value.
4) According to the measurement value, select the snap ring and washer from the following table.

**Snap ring**

<table>
<thead>
<tr>
<th>H: mm (in)</th>
<th>Part No.</th>
<th>Thickness: mm (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>270.83 — 271.40 (10.66 — 10.69)</td>
<td>805072010</td>
<td>1.65 (0.065)</td>
</tr>
<tr>
<td>271.41 — 271.98 (10.69 — 10.71)</td>
<td>805072011</td>
<td>1.95 (0.077)</td>
</tr>
<tr>
<td>271.99 — 272.56 (10.71 — 10.73)</td>
<td>805072012</td>
<td>2.25 (0.089)</td>
</tr>
</tbody>
</table>

**Washer**

<table>
<thead>
<tr>
<th>H: mm (in)</th>
<th>Part No.</th>
<th>Thickness: mm (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>270.83 — 271.40 (10.66 — 10.69)</td>
<td>803067012</td>
<td>1.6 (0.063)</td>
</tr>
<tr>
<td>271.41 — 271.98 (10.69 — 10.71)</td>
<td>803067011</td>
<td>1.3 (0.051)</td>
</tr>
<tr>
<td>271.99 — 272.56 (10.71 — 10.73)</td>
<td>803067010</td>
<td>1.0 (0.039)</td>
</tr>
</tbody>
</table>
18. Driven Gear Assembly

A: REMOVAL

1) Remove the manual transmission assembly from the vehicle. <Ref. to 6MT-32, REMOVAL, Manual Transmission Assembly.>
2) Prepare the transmission for overhaul. <Ref. to 6MT-38, Preparation for Overhaul.>
3) Remove the neutral position switch, back-up light switch and harness. <Ref. to 6MT-42, REMOVAL, Neutral Position Switch.> <Ref. to 6MT-40, REMOVAL, Back-up Light Switch.>
4) Remove the extension case. <Ref. to 6MT-44, REMOVAL, Extension Case.>
5) Remove the transfer driven gear. <Ref. to 6MT-56, REMOVAL, Transfer Driven Gear.>
6) Remove the center differential. <Ref. to 6MT-58, REMOVAL, Center Differential.>
7) Remove the transmission case. <Ref. to 6MT-59, REMOVAL, Transmission Case.>
8) Remove the driven gear assembly. <Ref. to 6MT-66, REMOVAL, Main Shaft Assembly.>
9) Remove the 1st needle bearing.
10) Remove the thrust needle bearing.

B: INSTALLATION

1) Adjust the main shaft snap ring. <Ref. to 6MT-79, ADJUSTMENT, Main Shaft Assembly.>
2) Adjust the 1st-2nd shifter rod. <Ref. to 6MT-115, ADJUSTMENT, Shifter Fork and Rod.>
3) Install the thrust needle bearing.

NOTE:
Confirm that the thrust needle bearing is installed in the proper direction.

4) Install the 1st needle bearing.
5) Install the driven gear assembly. <Ref. to 6MT-67, INSTALLATION, Main Shaft Assembly.>
6) Install the transmission case. <Ref. to 6MT-61, INSTALLATION, Transmission Case.>
7) Adjust the backlash of the driven gear assembly in the axial direction. <Ref. to 6MT-89, ADJUSTMENT, Driven Gear Assembly.>
8) Install the center differential. <Ref. to 6MT-58, INSTALLATION, Center Differential.>
9) Install the transfer driven gear. <Ref. to 6MT-56, INSTALLATION, Transfer Driven Gear.>
10) Install the extension case. <Ref. to 6MT-44, INSTALLATION, Extension Case.>
11) Install the neutral position switch, back-up light switch and harness. <Ref. to 6MT-42, INSTALLATION, Neutral Position Switch.> <Ref. to 6MT-40, INSTALLATION, Back-up Light Switch.>
12) Install the manual transmission assembly to the vehicle. <Ref. to 6MT-34, INSTALLATION, Manual Transmission Assembly.>
NOTE:
Individual sleeves and hubs meet at a specified position. Before disassembly, mark the meeting position of the sleeve and hub.

1) Affix the ST to the work table.
   ST  18664AA000 BASE
2) Flatten the locknut tab.
3) Attach ST3 to the lock nut, set the driven gear assembly to the ST, and remove the lock nut and washer.
   ST1 18666AA000 HOLDER
   ST2 18664AA000 BASE
   ST3 18620AA000 ADAPTER WRENCH

4) Attach ST1 to the 6th gear, then remove the ball bearing and 5th-6th driven gear.
   ST1 18723AA000 REMOVER
   ST2 499877000 RACE 4-5 INSTALLER

5) Attach ST1 to the 4th gear, then remove the 3rd-4th driven gear.
   ST1 18723AA000 REMOVER
   ST2 499877000 RACE 4-5 INSTALLER

6) Remove the driven gear key.

7) Remove the 2nd gear.

8) Remove the needle bearing and 1st-2nd sleeve.
9) Remove the outer baulk ring, 2nd synchro cone and inner baulk ring.

(A) Outer baulk ring
(B) 2nd synchro cone
(C) Inner baulk ring

10) Using the ST, remove individual parts.

ST 18754AA000 REMOVER

D: ASSEMBLY

NOTE:
When replacing the following parts, replace as a set.
• Sleeve and hub
• Outer baulk ring, 1st synchro cone and inner baulk ring
• Outer baulk ring, 2nd synchro cone and inner baulk ring

1) Apply adequate transmission gear oil to the main shaft, 1st needle bearing and 1st drive gear inner surface.

2) Install the 1st needle bearing.

3) Attach the 1st driven gear to the driven shaft.

4) Install the inner baulk ring.

(A) 2nd bushing
(B) 1st-2nd hub
(C) Outer baulk ring
(D) 1st synchro cone
(E) Inner baulk ring
(F) 1st driven gear
(G) 1st needle bearing
5) Match the protrusion of the 1st synchro cone to the hole of the 1st drive gear, then install.

6) Install the outer baulk ring.

7) Install the 1st-2nd hub.

NOTE:
- Match the cut out of the 1st-2nd hub with the protrusion on the outer baulk ring, then install.
- Make sure that the 1st-2nd hub is installed in the correct direction.

8) Using the ST, install the 1st-2nd hub and 2nd bush.

ST 18654AA000 INSTALLER

CAUTION:
Do not apply pressure in excess of 40 kN (4.0 ton, 4.4 US ton, 3.9 Imp ton).
9) Make sure that the 1st driven gear can be turned smoothly by hand. If it does not turn smoothly, re-assemble.

10) Attach the 1st-2nd sleeve to the 1st-2nd hub.

NOTE:
• Make sure that the 1st-2nd sleeve is installed in the correct direction.
• Align the 1st-2nd hub cut out section (three places) and the key grooves (three places) of shifting insert key that are located inside the 1st-2nd sleeve.
• Set the 1st-2nd sleeve and 1st driven gear so that they contact each other.

11) Attach the shifting insert key to the appropriate position of the 1st-2nd sleeve.

NOTE:
• The location angle of each shifting insert key is 120°.
• Install the shifting insert key to the key grooves (three places) of shifting insert key that are located inside the 1st-2nd sleeve.

12) Install the outer baulk ring.

13) Install the 2nd synchro cone.
14) Install the inner baulk ring.

15) Apply adequate transmission gear oil to the bushing, 2nd needle bearing and 2nd drive gear inner surface.

16) Install the 2nd needle bearing and 2nd driven gear.

NOTE: Match the protrusion of the 2nd synchro cone to the hole of the 2nd driven gear, then install.

17) Attach the key.

18) Using the ST, install the 3rd-4th driven gear.

ST 18654AA000 INSTALLER

CAUTION: Do not apply pressure in excess of 40 kN (4.0 ton, 4.4 US ton, 3.9 imp ton).

NOTE:
• Make sure that the 3rd-4th driven gear is installed in the correct direction.
• Match the groove on the 3rd-4th driven gear to the key.

19) Make sure that the 2nd driven gear can be turned smoothly by hand. If it does not turn smoothly, reassemble.

20) Attach the key.
21) Using the ST, install the 5th-6th driven gear.
   ST 18654AA000 INSTALLER

   **CAUTION:**
   Do not apply pressure in excess of 40 kN (4.0 ton, 4.4 US ton, 3.9 Imp ton).

   **NOTE:**
   - Make sure that the 5th-6th driven gear is installed in the correct direction.
   - Match the groove on the 5th-6th driven gear to the key.

22) Using the ST, install the ball bearing.
   ST 18654AA000 INSTALLER

   **CAUTION:**
   Do not apply pressure in excess of 40 kN (4.0 ton, 4.4 US ton, 3.9 Imp ton).

   **NOTE:**
   Confirm that the ball bearing is installed in the proper direction.

23) Make sure that the ball bearing turns smoothly by hand. If it does not turn smoothly, reassemble.

24) Install a new lock nut.

25) Attach ST3 to the lock nut, attach ST to the driven gear assembly, and tighten the lock nut.
   ST1 18666AA000 HOLDER
   ST2 18664AA000 BASE
   ST3 18620AA000 ADAPTER WRENCH
   ST4 18852AA000 TORQUE WRENCH

   **Tightening torque:**
   530 N·m (54.0 kgf·m, 390.9 ft-lb)

   **NOTE:**
   When using a torque wrench other than ST4, use the calculation below to calculate and tighten the lock nut.
   \[ T = \frac{L1}{0.1 + L1} \times 570 \]

   \[ \begin{array}{|c|c|c|}
   \hline
   T & N·m (kgf·m, ft-lb) & Torque wrench setting \\
   \hline
   L1 & m (in) & Torque wrench length \\
   \hline
   0.1 m (3.94 in) & & Length of ST \\
   570 N·m (58.1 kgf·m, 420 ft-lb) & & Tightening torque (lock nut): \\
   \hline
   \end{array} \]

   \[ \begin{array}{c}
   (A) 0.1 \text{ m (3.94 in)}
   \end{array} \]
26) Using the ST, crimp the lock nut in 4 locations, with dimensions within A 44±0.5 mm (1.73±0.02 in).

ST 18669AA000 PUNCH DRIVEN SHAFT

NOTE:
Do not damage the crimp area of the lock nut.

---

E: INSPECTION

Disassembled parts should be washed clean first with cleaning solvent and then inspected carefully.

1) Bearing
Replace the bearings in the following cases.
- Wear, rusting or damage of the bearings
- The bearing does not rotate smoothly or an abnormal noise is emitted when turning.
- When the bearing has other defects

2) Bushing (each gear)
Replace the bushing in following cases.
- The sliding surface is damaged or abnormally worn.

3) Gear
Replace gears in the following cases.
- The gear teeth surface is damaged or excessively worn.
- If the contact area of the baulk ring is damaged.
- If the inner face of the gear is worn.

4) Baulk ring, synchro cone
Replace the baulk ring and synchro cone in following cases:
- Wear, rusting or damage of the baulk ring

5) Shifting insert key
Replace the shifting insert key if deformed, excessively worn or defective in any way.
F: ADJUSTMENT

1) Measure the length “H” from the transmission case and transfer bearing holder mating surface, to the end face of the ball bearing.

2) Using the following calculation, calculate the thickness of the driven gear assembly washer.

\[ T = H - \{5.8 \pm 0.05 \text{ mm (0.23} \pm 0.002 \text{ in)}\} - \{0.1 - 0.3 \text{ mm (0.0039 - 0.0118 in)}\} \]

<table>
<thead>
<tr>
<th>t</th>
<th>Washer thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>Length from the transmission case and transfer bearing holder mating surface to the end face of the ball bearing</td>
</tr>
<tr>
<td>5.8 \pm 0.05 \text{ mm (0.23} \pm 0.002 \text{ in)}</td>
<td>Collar thickness</td>
</tr>
<tr>
<td>0.1 - 0.3 \text{ mm (0.0039 - 0.0118 in)}</td>
<td>Driven gear assembly axial direction backlash standard</td>
</tr>
</tbody>
</table>

3) Select 0 to 3 washers from the following table, and adjust to the backlash that is closest to the standard value.

**Driven gear assembly axial direction backlash standard:**

\[ 0.1 - 0.3 \text{ mm (0.0039 - 0.0118 in)} \]

<table>
<thead>
<tr>
<th>Washer</th>
<th>Thickness t mm (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part No.</td>
<td>803072030</td>
</tr>
<tr>
<td></td>
<td>803072031</td>
</tr>
<tr>
<td></td>
<td>803072032</td>
</tr>
<tr>
<td></td>
<td>803072033</td>
</tr>
</tbody>
</table>
19. Reverse Idler Gear Assembly

A: REMOVAL

1) Remove the manual transmission assembly from the vehicle. <Ref. to 6MT-32, REMOVAL, Manual Transmission Assembly.>
2) Prepare the transmission for overhaul. <Ref. to 6MT-38, Preparation for Overhaul.>
3) Remove the neutral position switch, back-up light switch and harness. <Ref. to 6MT-42, REMOVAL, Neutral Position Switch.> <Ref. to 6MT-40, REMOVAL, Back-up Light Switch.>
4) Remove the extension case. <Ref. to 6MT-44, REMOVAL, Extension Case.>
5) Remove the transfer driven gear. <Ref. to 6MT-56, REMOVAL, Transfer Driven Gear.>
6) Remove the center differential. <Ref. to 6MT-58, REMOVAL, Center Differential.>
7) Remove the transmission case. <Ref. to 6MT-59, REMOVAL, Transmission Case.>
8) Remove the reverse idler gear assembly. <Ref. to 6MT-66, REMOVAL, Main Shaft Assembly.>

B: INSTALLATION

1) Select the reverse fork rod. <Ref. to 6MT-115, ADJUSTMENT, Shifter Fork and Rod.>
2) Install the reverse idler gear assembly. <Ref. to 6MT-67, INSTALLATION, Main Shaft Assembly.>
3) Install the transmission case. <Ref. to 6MT-61, INSTALLATION, Transmission Case.>
4) Install the center differential. <Ref. to 6MT-58, INSTALLATION, Center Differential.>
5) Install the transfer driven gear. <Ref. to 6MT-56, INSTALLATION, Transfer Driven Gear.>
6) Install the extension case. <Ref. to 6MT-44, INSTALLATION, Extension Case.>
7) Install the neutral position switch, back-up light switch and harness. <Ref. to 6MT-42, INSTALLATION, Neutral Position Switch.> <Ref. to 6MT-40, INSTALLATION, Back-up Light Switch.>
8) Install the manual transmission assembly to the vehicle. <Ref. to 6MT-34, INSTALLATION, Manual Transmission Assembly.>

C: DISASSEMBLY

NOTE:
Sleeves and reverse gears meet at a specified position. Before disassembly, mark the meeting position of the sleeve and hub.

1) Remove the spring pin.

2) Remove the snap ring and washer.

3) Remove the counter high & low washer and reverse idler gear.

(A) Counter high & low washer
(B) Reverse idler gear
4) Remove the knock pin and reverse idler gear needle bearing.

5) Remove the collar.
6) Remove the reverse sleeve.

7) Remove the outer baulk ring, reverse synchro cone and inner baulk ring from the reverse sleeve.

8) Remove reverse idler gear No. 2.

9) Remove the counter high & low washer and needle bearing.

10) Remove the knock pin.

11) Remove the snap ring and friction plate from reverse gear.
12) Remove the sub gear and spring.

2) Install the friction plate and snap ring.

NOTE:
Confirm that the friction plate is installed in the proper direction.

D: ASSEMBLY

1) Attach the sub gear and spring.

NOTE:
• Turn the white marking on the hook section towards the sub gear side, and attach the spring.
• Point the stamp (marking A) towards the outside, and install the sub gear.

3) Apply adequate transmission gear oil to the shaft, needle bearing and reverse drive gear inner surface.

4) Install the knock pin.

5) Install the counter high & low washer and needle bearing.

NOTE:
Point the groove towards the reverse idler gear, and attach the washer.
6) Install the reverse idler gear No. 2.

7) Attach the shifting insert key to the appropriate location of the reverse sleeve.

NOTE:
• The location angle of each shifting insert key is 120°.
• Refer to the following figure to install the shifting insert key.

8) Attach the reverse sleeve to the reverse idler gear No. 2.

NOTE:
Confirm that the reverse sleeve is installed in the proper direction.

9) Apply adequate transmission gear oil to the collar, needle bearing and reverse drive gear inner surface.

10) Install the outer baulk ring, reverse synchro cone and inner baulk ring.

11) Install the collar and needle bearing, then the knock pin.
12) Match the protrusion of the reverse synchro cone to the hole on the reverse idler gear, and install the reverse idler gear.

13) Point the groove towards the reverse idler gear, and attach the counter high & low washer and the washer.

14) Using the ST, install the snap ring.

15) Inspect and adjust the clearance between the snap ring and the washer. <Ref. to 6MT-94, INSPECTION, Reverse Idler Gear Assembly.>

16) Install a new spring pin.

E: INSPECTION

Disassembled parts should be washed clean first with cleaning solvent and then inspected carefully.

1) Bearing
Replace the bearings in the following cases.
• Wear, rusting or damage of the bearings
• The bearing does not rotate smoothly or an abnormal noise is emitted when turning.
• When the bearing has other defects

2) Bushing (each gear)
Replace the bushing in following cases.
• The sliding surface is damaged or abnormally worn.

3) Gear
Replace gears in the following cases.
• The gear teeth surface is damaged or excessively worn.
• If the contact area of the baulk ring is damaged.
• If the inner face of the gear is worn.

4) Baulk ring, synchro cone
Replace the baulk ring and synchro cone in following cases:
• Wear, rusting or damage of the baulk ring

5) Shifting insert key
Replace the shifting insert key if deformed, excessively worn or defective in any way.

6) Check clearance between the snap ring and washer.

**Clearance specification:**

- 0.1 — 0.3 mm (0.0039 — 0.0118 in)

If the clearance is out of the specification, select a snap ring from the following table and perform replacement.

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Thickness mm (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>031319000</td>
<td>1.50 (0.059)</td>
</tr>
<tr>
<td>805019030</td>
<td>1.60 (0.062)</td>
</tr>
<tr>
<td>805019010</td>
<td>1.72 (0.068)</td>
</tr>
</tbody>
</table>

After replacing the snap ring, inspect the clearance.
20. Drive Pinion Shaft Assembly

A: REMOVAL

1) Remove the manual transmission assembly from the vehicle. <Ref. to 6MT-32, REMOVAL, Manual Transmission Assembly.>
2) Prepare the transmission for overhaul. <Ref. to 6MT-38, Preparation for Overhaul.>
3) Remove the neutral position switch, back-up light switch and harness. <Ref. to 6MT-42, REMOVAL, Neutral Position Switch.> <Ref. to 6MT-40, REMOVAL, Back-up Light Switch.>
4) Remove the extension case. <Ref. to 6MT-44, REMOVAL, Extension Case.>
5) Remove the transfer driven gear. <Ref. to 6MT-56, REMOVAL, Transfer Driven Gear.>
6) Remove the center differential. <Ref. to 6MT-58, REMOVAL, Center Differential.>
7) Remove the transmission case. <Ref. to 6MT-59, REMOVAL, Transmission Case.>
8) Remove the individual gear assemblies. <Ref. to 6MT-66, REMOVAL, Main Shaft Assembly.>
9) Remove the drive pinion shaft assembly.

B: INSTALLATION

1) Remove any remaining gasket material from the drive plate and clutch housing.
2) Apply liquid gasket to the clutch housing.

Liquid gasket:
THREE BOND 1215 (Part No. 004403007) or equivalent

3) Install the individual gear assemblies. <Ref. to 6MT-67, INSTALLATION, Main Shaft Assembly.>
4) Install the transmission case. <Ref. to 6MT-61, INSTALLATION, Transmission Case.>
5) Install the center differential. <Ref. to 6MT-58, INSTALLATION, Center Differential.>
6) Install the transfer driven gear. <Ref. to 6MT-56, INSTALLATION, Transfer Driven Gear.>
7) Install the extension case. <Ref. to 6MT-44, INSTALLATION, Extension Case.>
8) Install the neutral position switch, back-up light switch and harness. <Ref. to 6MT-42, INSTALLATION, Neutral Position Switch.> <Ref. to 6MT-40, INSTALLATION, Back-up Light Switch.>
9) Install the manual transmission assembly to the vehicle. <Ref. to 6MT-34, INSTALLATION, Manual Transmission Assembly.>
C: DISASSEMBLY

NOTE:
Replace the drive pinion shaft and the hypoid driven gear as a set.

1) Remove the oil guide A.

2) Remove the drive pinion shaft and shim from the adapter plate.

3) Affix the ST to the work table.
   ST 18664AA000 BASE
4) Flatten the locknut tab.
5) Attach ST3 to the locknut, and set the drive pinion shaft to the ST. Remove the lock nut and washer.
   ST1 18667AA000 HOLDER
   ST2 18664AA000 BASE
   ST3 18621AA000 ADAPTER WRENCH

6) Using the ST, remove the taper roller bearing assembly.
   ST 18723AA000 REMOVER
D: ASSEMBLY

1) Using the ST, measure drive pinion measurement “A”.

NOTE:
When selecting the drive pinion shim, refer to measurement “A”.

ST 398643600 GAUGE

2) Using the ST and a press, attach the inner bearing of the taper roller bearing to the drive pinion shaft.

ST 18723AA000 REMOVER

CAUTION:
Do not apply pressure in excess of 40 kN (4.0 ton, 4.4 US ton, 3.9 Imp ton).

3) Using the ST and a press, attach the outer race and the taper roller bearing to the drive pinion shaft.

ST 18723AA000 REMOVER

NOTE:
Push in to a position where the bearing rotates smoothly.

4) Attach the washer and a new lock nut.

5) Set the ST to the drive pinion, and tighten the lock nut.

NOTE:
Tighten using the ST and the straight line torque wrench.

Tightening torque:
265 N·m (27.0 kgf-m, 195.4 ft-lb)

6) Measure the starting torque. <Ref. to 6MT-99, INSPECTION, Drive Pinion Shaft Assembly.>
7) Using the ST, crimp the lock nut in 2 locations, with dimensions within “A” 37±0.5 mm (1.46±0.02 in).
NOTE:
Do not damage the crimp area of the lock nut.

8) Using the ST, measure drive pinion measurement “B”.

9) Calculate from the calculation below to select 1 or 2 drive pinion shims from the following table.

6.5±0.0625 mm – (B – A) [0.26±0.0025 in – (B – A)]

NOTE:
A: Measurement value in step 1)
B: Measurement value in step 8)

<table>
<thead>
<tr>
<th>Drive pinion shim</th>
<th>Thickness mm (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part No.</td>
<td>Thickness mm (in)</td>
</tr>
<tr>
<td>32295AA270</td>
<td>0.15 (0.0059)</td>
</tr>
<tr>
<td>32295AA280</td>
<td>0.175 (0.0069)</td>
</tr>
<tr>
<td>32295AA290</td>
<td>0.20 (0.0079)</td>
</tr>
<tr>
<td>32295AA300</td>
<td>0.225 (0.0089)</td>
</tr>
<tr>
<td>32295AA310</td>
<td>0.25 (0.0098)</td>
</tr>
<tr>
<td>32295AA320</td>
<td>0.275 (0.0108)</td>
</tr>
</tbody>
</table>

10) Apply transmission gear oil to the side face of the taper roller bearing, and attach the drive pinion shaft and the selected shims to the adapter plate.

Tightening torque:
54 N·m (5.5 kgf-m, 39.8 ft-lb)

11) Install the oil guide A.

Tightening torque:
18 N·m (1.8 kgf-m, 13.3 ft-lb)
E: INSPECTION

1) Using a spring scale, measure the starting torque. If the starting torque is outside the specification range, replace the taper roller bearing.

Starting torque:

0 — 0.95 N (0 — 0.097 kgf, 0 — 0.21 lb)

2) Gear
Replace gears in the following cases.
• The gear teeth surface is damaged or excessive-ly worn.

3) Bearing
Replace the bearings in the following cases.
• Wear, rusting or damage of the bearings
• The bearing does not rotate smoothly or an ab-normal noise is emitted when turning.

4) Adapter plate
Replace the adapter plate in the following cases:
• Wear, rusting or damage of the bearings
• Damage of the adapter plate

5) Check that the pipes and pipe chambers are not damaged or clogged. Repair or replace if damaged or clogged.

F: ADJUSTMENT

1) Inspect and adjust the hypoid driven gear-to-drive pinion backlash. <Ref. to 6MT-108, HYPOID GEAR BACKLASH, ADJUSTMENT, Front Differential Assembly.>

2) Apply a thin uniform coat of lead-free red dye on the surfaces of 3 or 4 hypoid driven gear teeth.

3) Attach the drive pinion shaft assembly to the clutch housing, and tighten with at least 4 bolts.

NOTE:
Install with the remaining liquid gasket, so that the clutch housing and the adapter plate will not be damaged.

Tightening torque:

50 N·m (5.1 kgf-m, 36.9 ft-lb)

4) Turn a few times using the ST.

ST 18631AA000 HANDLE
5) Remove the drive pinion shaft assembly, and inspect the mating condition of the teeth. If the mating condition of the teeth is not correct, change shim thickness to adjust backlash.
- Correct tooth contact
  **Check item:** Tooth contact surface is slightly shifted toward the toe side under a no-load condition. (When driving, it moves towards the heel side.)

- Face contact
  **Check item:** Backlash is too large.
  **Contact pattern**

- Toe contact (inside contact)
  **Check item:** Teeth contact area is too small.
  **Contact pattern**

Corrective action: Reconfirm and adjust backlash.

Corrective action: Reduce the thickness of the drive pinion shim according to the procedure for moving the drive pinion away from the driven gear.
• Heel contact (outside end contact)

**Check item: Teeth contact area is too small.**

Contact pattern

Corrective action: Increase thickness of the drive pinion shim according to the procedures for moving the drive pinion closer to the driven gear.
Front Differential Assembly

A: REMOVAL


2) Prepare the transmission for overhaul. <Ref. to 6MT-38, Preparation for Overhaul.>

3) Remove the neutral position switch, back-up light switch and harness. <Ref. to 6MT-42, REMOVAL, Neutral Position Switch.> <Ref. to 6MT-40, REMOVAL, Back-up Light Switch.>

4) Remove the extension case. <Ref. to 6MT-44, REMOVAL, Extension Case.>

5) Remove the transfer driven gear. <Ref. to 6MT-56, REMOVAL, Transfer Driven Gear.>

6) Remove the center differential. <Ref. to 6MT-58, REMOVAL, Center Differential.>

7) Remove the transmission case. <Ref. to 6MT-59, REMOVAL, Transmission Case.>

8) Remove the individual gear assemblies. <Ref. to 6MT-66, REMOVAL, Main Shaft Assembly.>

9) Remove the drive pinion shaft assembly. <Ref. to 6MT-95, REMOVAL, Drive Pinion Shaft Assembly.>

10) Remove the lock plates on both sides.

11) Remove the differential side retainers on both sides using the ST.
    ST1 18630AA010 WRENCH COMPL RETAINER (RH side)
    ST2 18630AA000 WRENCH ASSY (LH side)

    NOTE:
    Be careful not to damage the section where the clutch case retainer will be attached.

12) Remove the front differential.
B: INSTALLATION

1) Install the differential assembly to the clutch housing.
2) Apply oil to the screw threads of the side retainer.
3) Remove the O-rings on both sides of the side retainer.
4) Install the differential side retainers to both sides, using the ST.
   ST1 18630AA010 WRENCH COMPL RETAINER (RH side)
   ST2 18630AA000 WRENCH ASSY (LH side)

NOTE:
Be careful not to damage the oil seal.

5) Inspect and adjust the hypoid gear backlash.
   <Ref. to 6MT-107, HYPOID GEAR BACKLASH, INSPECTION, Front Differential Assembly.>
6) Inspect and adjust the tooth contact. <Ref. to 6MT-99, ADJUSTMENT, Drive Pinion Shaft Assembly.>

7) Mark the mating positions of the left and right side retainers and the clutch housing.

8) Remove the differential side retainers from both sides.

NOTE:
When removing the side retainer, record how many times it was turned to remove.
9) Install new O-rings to the side retainers on both sides.
10) Attach the differential side retainers to both sides.

NOTE:
When attaching, turn the side retainer the same number of turns it took to remove, and align the marks.
11) Install the lock plate.

**Tightening torque:**
   25 N·m (2.5 kgf·m, 18.4 ft-lb)

NOTE:
Be careful not to confuse the left and right side lock plates.

12) Remove any remaining liquid gasket from the clutch housing and adapter plate.
13) Apply liquid gasket to the clutch housing.

**Liquid gasket:**
THREE BOND 1215 (Part No. 004403007) or equivalent

14) Install the drive pinion shaft assembly. <Ref. to 6MT-95, INSTALLATION, Drive Pinion Shaft Assembly.>
15) Install the individual gear assemblies all at once. <Ref. to 6MT-67, INSTALLATION, Main Shaft Assembly.>
16) Install the transmission case. <Ref. to 6MT-61, INSTALLATION, Transmission Case.>
17) Install the center differential. <Ref. to 6MT-58, INSTALLATION, Center Differential.>
18) Install the transfer driven gear. <Ref. to 6MT-56, INSTALLATION, Transfer Driven Gear.>
19) Install the extension case. <Ref. to 6MT-44, INSTALLATION, Extension Case.>
20) Install the neutral position switch, back-up light switch and harness. <Ref. to 6MT-42, INSTALLATION, Neutral Position Switch.> <Ref. to 6MT-40, INSTALLATION, Back-up Light Switch.>
21) Install the manual transmission assembly to the vehicle. <Ref. to 6MT-34, INSTALLATION, Manual Transmission Assembly.>

### C: DISASSEMBLY

#### 1. DIFFERENTIAL CASE

1) Fix the differential assembly on a vice, and remove the hypoid driven gear.

   **ST 18270KA020 SOCKET (E20)**

2) Remove the side bearing of the hypoid driven gear using the ST.

   **ST 399527700 PULLER SET**

3) Using the ST, remove the roller bearing.

   **ST 498077000 REMOVER**

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MT-00532

MT-00660

MT-00663

MT-00665
2. SIDE RETAINER

1) Remove the O-ring.

2) Remove the oil seal.

3) Remove the claw of ST1, and attach the claw of ST2.

ST1  398527700  PULLER ASSY
ST2  18760AA000  CLAW

4) Remove the bearing outer race from the side retainer, using the ST.

ST1  398527700  PULLER ASSY
ST2  18760AA000  CLAW
D: ASSEMBLY

1. DIFFERENTIAL CASE

1) Use the ST to attach the RH and LH bearing inner races to the differential case.
   ST1  398437700 INSTALLER
   ST2  398497701 SEAT

CAUTION:
Do not apply pressure in excess of 20 kN (2.0 ton, 2.2 US ton, 2.0 Imp ton).

NOTE:
Always replace inner races and outer races as a set.

2) Attach the hypoid driven gear to the differential case.
   ST  18270KA020 SOCKET (E20)

Tightening torque:
69 N·m (7.0 kgf-m, 50.9 ft-lb)

2. SIDE RETAINER

NOTE:
Install the oil seal and O-ring of side retainer after the adjustment of backlash and tooth contact.
1) Install the bearing outer race to side retainer.
2) Using the ST, install the oil seal.
   ST  18675AA000 DIFFERENTIAL SIDE OIL SEAL INSTALLER

NOTE:
- Use a new oil seal.
- Apply oil to the oil seal lips.

3) Install the O-ring.

NOTE:
Use new O-rings.
E: INSPECTION
Repair or replace the differential in the following cases:
- If gears are damaged, seized, or are excessively worn.
- If differential case sliding surfaces are damaged, seized, or are excessively worn.
- If there is damage, rust or wear in the bearings or bearing locations.
- If the bearing does not rotate smoothly or an abnormal noise is emitted when turning.

1. HYPOID GEAR BACKLASH

2. TOOTH CONTACT OF HYPOID GEAR
1) Check that the hypoid gear backlash is within the standard value. Adjust if out of standard. <Ref. to 6MT-108, HYPOID GEAR BACKLASH, ADJUSTMENT, Front Differential Assembly.>
2) Apply a thin uniform coat of lead-free red dye on the surfaces of 3 or 4 hypoid driven gear teeth.
3) Attach the drive pinion shaft assembly, and affix with 4 bolts.

NOTE:
Use old gaskets and washers to prevent the mating surfaces of the housing from becoming damaged.

**Tightening torque:**
50 N·m (5.1 kgf-m, 36.9 ft-lb)
4) Turn the drive pinion shaft to the left and right for several turns.

5) Remove the drive pinion shaft assembly, and inspect the mating condition of the teeth. If tooth contact is not correct, perform adjustment. <Ref. to 6MT-99, ADJUSTMENT, Drive Pinion Shaft Assembly.>

- Correct tooth contact

NOTE:
In a no load condition, the tooth contact from the center to the toe side is 50-60% (While driving, the tooth contact will shift towards the heel side.).
F: ADJUSTMENT

1. HYPOID GEAR BACKLASH

1) Attach the RH and LH side retainers.
ST1 18630AA010  WRENCH COMPL RETAINER (RH side)
ST2 18630AA000  WRENCH ASSY (LH side)

NOTE:
• Screw in the RH side side retainer a little further than the LH side.
• WRENCH ASSY (499787000) can also be used.

2) Attach the drive pinion shaft assembly, and affix with 5 bolts.

NOTE:
Use old gaskets and washers to prevent the mating surfaces of the housing from becoming damaged.

Tightening torque:
50 N·m (5.1 kgf-m, 36.9 ft-lb)

3) Using the ST, loosen the differential side retainer RH, and screw in the differential side retainer LH until the hypoid driven gear just contacts the drive pinion.
ST1 18630AA010  WRENCH COMPL RETAINER (RH side)
ST2 18630AA000  WRENCH ASSY (LH side)

4) Use the ST to turn the drive pinion shaft a few times.
ST 18631AA000  HANDLE

5) Repeat steps 3) and 4) until differential side retainer LH does not turn anymore. For differential side retainer RH, screw in until the inner race and outer race just comes into contact. This is the “zero” backlash state.

6) Mark the mating positions of the left and right side retainers and the clutch housing.

7) Turn the back differential side retainer LH by 3 notches, and screw in the differential side retainer RH by 3 notches.

8) Temporarily attach the LH side retainer lock plate.

9) Turn the differential side retainer RH by 1.25 notches.

10) Temporarily attach the RH side retainer lock plate.

NOTE:
• If the lock plate cannot be aligned, adjust the position toward the tightened side.
• The notch on the lock plate moves by 0.5 notch if the lock plate is turned upside down when installed.

11) Use the ST to fix the drive pinion shaft in place.
ST 18621AA000  ADAPTER WRENCH

12) Install the SUBARU genuine axle shaft to the front differential left and right sides.
Part No. 38415AA000 AXLE SHAFT
13) Move the axle shaft, and measure the hypoid gear backlash.
ST1 498255400 PLATE
ST2 498247001 MAGNET BASE
ST3 498247100 DIAL GAUGE

Hypoid gear backlash:
0.13 — 0.18 mm (0.0051 — 0.0071 in)

14) If the backlash is out of specified range, remove the left and right retainer lock plates and loosen RH side differential side retainer. Then, adjust the LH side differential side retainer by turning it, and attach the LH side retainer lock plate.
15) Screw in the RH side differential side retainer until the inner race and outer race just come into contact.

2. TOOTH CONTACT OF HYPOID GEAR
Regarding teeth contact conditions, refer to the drive pinion section. <Ref. to 6MT-107, TOOTH CONTACT OF HYPOID GEAR, INSPECTION, Front Differential Assembly.>
22. Shifter Fork and Rod

A: REMOVAL

1) Remove the manual transmission assembly from the vehicle. <Ref. to 6MT-32, REMOVAL, Manual Transmission Assembly.>
2) Prepare the transmission for overhaul. <Ref. to 6MT-38, Preparation for Overhaul.>
3) Remove the neutral position switch, back-up light switch and harness. <Ref. to 6MT-42, REMOVAL, Neutral Position Switch.> <Ref. to 6MT-40, REMOVAL, Back-up Light Switch.>
4) Remove the extension case. <Ref. to 6MT-44, REMOVAL, Extension Case.>
5) Remove the transfer driven gear. <Ref. to 6MT-56, REMOVAL, Transfer Driven Gear.>
6) Remove the center differential. <Ref. to 6MT-58, REMOVAL, Center Differential.>
7) Remove the transmission case. <Ref. to 6MT-59, REMOVAL, Transmission Case.>
8) Remove the individual gear assemblies. <Ref. to 6MT-66, REMOVAL, Main Shaft Assembly.>

B: INSTALLATION

1) Install the individual gear assemblies all at once. <Ref. to 6MT-67, INSTALLATION, Main Shaft Assembly.>
2) Install the transmission case. <Ref. to 6MT-61, INSTALLATION, Transmission Case.>
3) Install the center differential. <Ref. to 6MT-58, INSTALLATION, Center Differential.>
4) Install the transfer driven gear. <Ref. to 6MT-56, INSTALLATION, Transfer Driven Gear.>
5) Install the extension case. <Ref. to 6MT-44, INSTALLATION, Extension Case.>
6) Install the neutral position switch, back-up light switch and harness. <Ref. to 6MT-42, INSTALLATION, Neutral Position Switch.> <Ref. to 6MT-40, INSTALLATION, Back-up Light Switch.>
7) Install the manual transmission assembly to the vehicle. <Ref. to 6MT-34, INSTALLATION, Manual Transmission Assembly.>

C: DISASSEMBLY

NOTE:
Discard the removed spring pin, and replace with a new part.

1. REVERSE SHIFTER FORK

1) Remove the reverse fork using the ST.
ST 398791700 REMOVER

2) Remove the reverse shifter arm using the ST.
ST 398791700 REMOVER
2. 1ST-2ND, 3RD-4TH SHIFTER FORK
1) Using the ST, remove the 3rd-4th shifter fork.
ST 398791700 REMOVER

2) Using the ST, remove the 3rd-4th shifter arm.
ST 398791700 REMOVER

3) Using the ST, remove the 1st-2nd shifter arm and 1st-2nd shifter fork.
ST 398791700 REMOVER

3. 5TH-6TH SHIFTER FORK
1) Using the ST, remove the 5th-6th shifter fork.
ST 398791700 REMOVER

2) Using the ST, remove the 5th-6th shifter arm.
ST 398791700 REMOVER

4. SHIFTER ARM SHAFT
Remove the selector arm using the ST.
ST 398791700 REMOVER

(A) 1st-2nd shifter arm
(B) 1st-2nd shifter fork
5. STRIKING ROD
1) Remove the reverse interlock block and the interlock block from the striking rod.

2) Remove the reverse interlock arm using the ST.
   ST 398791700 REMOVER

3) Remove the interlock arm using the ST.
   ST 398791700 REMOVER

D: ASSEMBLY
1. REVERSE SHIFTER FORK
1) Using the ST, install the reverse fork.
   ST 398791700 REMOVER
   
   NOTE:
   Confirm that the reverse fork and rod are installed in the proper direction.

2) Using the ST, install the reverse arm.
   ST 398791700 REMOVER
   
   NOTE:
   Confirm that the reverse arm and rod are installed in the proper direction.
2. 1ST-2ND, 3RD-4TH SHIFTER FORK

1) Using the ST, install the 1st-2nd shifter fork.
ST  398791700  REMOVER

NOTE:
Make sure that the 1st-2nd shifter fork and rod are installed in the correct direction.

2) Using the ST, install the 1st-2nd shifter arm.
ST  398791700  REMOVER

NOTE:
Make sure that the 1st-2nd shifter arm and fork are installed in the correct direction.

3) Using the ST, install the 3rd-4th shifter arm.
ST  398791700  REMOVER

NOTE:
Make sure that the 3rd-4th shifter arm and rod are installed in the correct direction.

4) Attach the 3rd-4th fork rod to the 1st-2nd shifter arm.

5) Using the ST, install the 3rd-4th shifter fork.
ST  398791700  REMOVER

NOTE:
Make sure that the 3rd-4th shifter fork is installed in the correct direction.
3. 5TH-6TH SHIFTER FORK

1) Using the ST, install the 5th-6th shifter arm.
   ST 398791700  REMOVER

   NOTE:
   Make sure that the 5th-6th shifter arm and rod are installed in the correct direction.

2) Using the ST, install the 5th-6th shifter fork.
   ST 398791700  REMOVER

   NOTE:
   Check that the 5th-6th shifter fork and arm are installed.

4. SHIFTER ARM SHAFT

   Using the ST, install the selector arm.
   ST 398791700  REMOVER

   NOTE:
   Confirm that the selector arm and rod are installed in the proper direction.
5. STRIKING ROD

1) Using the ST, install the reverse interlock arm and interlock arm.

ST 398791700 REMOVER

NOTE:
* Confirm that the reverse interlock arm and rod are installed in the proper direction.
* Confirm that the interlock arm and rod are installed in the proper direction.

2) Attach the reverse interlock block and interlock block to the striking rod.

NOTE:
Confirm that the reverse interlock block and interlock block are installed in the proper direction.

E: INSPECTION

1) Check the shift shaft and shift rod for damage. Replace if damaged.
2) Repair or replace the gearshift mechanism if excessively worn, bent or defective in any way.

F: ADJUSTMENT

1. 1ST-2ND FORK ROD SELECTION

NOTE:
In the following conditions, perform the procedures below.
* Replacement of the 1st and 2nd driven gear
* 1st and 2nd synchro ring assembly replacement
* Adapter plate replacement
* Driven shaft replacement
* 1st-2nd hub and sleeve assembly replacement.

1) Insert the drive pinion assembly into the adapter plate.

NOTE:
Confirm that the thrust bearing outer race has not been removed and the drive pinion is not lifted.

2) Set the height gauge to the adapter plate. Lower the height gauge indicator to the mating surface of the adapter plate and case, and set to zero points.

ST 18853AA000 HEIGHT GAUGE

NOTE:
* The adapter plate will be the base point for the measurement. Use a scraper to remove any gasket material remaining on the end face.
* During measurement, do not place the height gauge in the shaded area shown in the figure.

3) Select the main shaft snap ring. <Ref. to 6MT-79, ADJUSTMENT, Main Shaft Assembly.>
4) Measure “B1” and “B2” as shown in the figure.

5) Shift the 1st-2nd sleeve to the 1st driven gear side, push down to the stopper, and measure “B1”.

NOTE:
• Set the height gauge indicator near the measurement target, and lock dial (1) as shown in the figure. Turn dial (2), and set the indicator to the 1st side end surface of the sleeve.
• Turn approximately 72° at a time, and measure the sleeve in 5 locations. Round off the 2 highest and 2 lowest measurement values. The remaining center value is used as the measurement value.

6) Set the height gauge indicator upside down.

7) Shift the 1st-2nd sleeve to the 2nd driven gear side, push up on the stopper, and measure “B2”.

NOTE:
• Set the height gauge indicator near the measurement target, and lock dial (1) as shown in the figure. Turn dial (2), and set the indicator to the 2nd side end surface of the sleeve.
• The measurement is to be performed with two persons, while holding the sleeve straight.
• Turn approximately 72° at a time, and measure the sleeve in 5 locations. Round off the 2 highest and 2 lowest measurement values. The remaining center value is used as the measurement value.
8) According to both of the measurements, calculate the neutral position of the 1st-2nd sleeve. From the following calculation, select a fork rod which matches the calculated value.

Calculation: \( T = \frac{(B1 + B2)}{2} \)

- **T**: 1st-2nd sleeve center position
- **B1**: Height from the adapter plate end to the sleeve end, when shifted to 1st gear
- **B2**: Measured height from the adapter plate end to the sleeve end, when shifted to 2nd gear: +55 mm (2.17 in)

**NOTE:**
Attach the indicator upside down in comparison to the setting procedures for the zero point. Add “d1” [Value: 55 mm (2.17 in)] from the figure below to “B2”, and measure “B2”.

### 2. 3RD-4TH FORK ROD SELECTION

**NOTE:**
In the following conditions, perform the procedures below.
- Main shaft replacement
- 3rd, and 3rd to 6th drive gear and bushing replacement
- 3rd, and 3rd to 6th synchro assembly replacement
- 3rd-4th hub and sleeve assembly replacement

1) Insert the main shaft assembly into the adapter plate.
2) Set the height gauge to the adapter plate. Lower the height gauge indicator to the top surface of the snap ring groove, and set to the zero point on the upper side of the main rear bearing.

**ST 18853AA000 HEIGHT GAUGE**

<table>
<thead>
<tr>
<th>( T ) mm (in)</th>
<th>Lot No. (marking)</th>
</tr>
</thead>
<tbody>
<tr>
<td>62.63 — 62.93</td>
<td>32801AA240 (3)</td>
</tr>
<tr>
<td>(2.4657 — 2.4776)</td>
<td></td>
</tr>
<tr>
<td>62.93 — 63.23</td>
<td>32801AA180 (1)</td>
</tr>
<tr>
<td>(2.4776 — 2.4894)</td>
<td></td>
</tr>
<tr>
<td>63.23 — 63.53</td>
<td>32801AA190 (none)</td>
</tr>
<tr>
<td>(2.4894 — 2.5012)</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:**
- The height gauge will be set on the adapter plate during the measurement. Use a scraper to remove any gasket material remaining on the end face.
- During measurement, do not place the height gauge in the shaded area shown in the figure.
3) Use a height gauge to measure “C1” and “C2” as shown in the figure.

(1) Shift the 3rd-4th sleeve to the 4th gear side, push up on the stopper, and measure “C2”.

NOTE:
- Set the height gauge indicator near the measurement target, and lock dial (1) as shown in the figure.
- Turn dial (2), and set the indicator to the 4th side end surface of the sleeve.
- The measurement is to be performed with two persons, while holding the sleeve straight.
- Turn approximately 72° at a time, and measure the sleeve in 5 locations. Round off the 2 highest and 2 lowest measurement values. The remaining center value is used as the measurement value.

(2) Set the height gauge indicator upside down.
(3) Shift the 3rd-4th sleeve to the 3rd drive gear side, push down to the stopper, and measure “C1”.

NOTE:
- Set the height gauge indicator near the measurement target, and lock dial (1) as shown in the figure. Turn dial (2), and set the indicator to the 3rd side end surface of the sleeve.
- Turn approximately 72° at a time, and measure the sleeve in 5 locations. Round off the 2 highest and 2 lowest measurement values. The remaining center value is used as the measurement value.

4) According to both of the measurements, calculate the neutral position of the 3rd-4th sleeve. From the following calculation, select a fork rod which matches the calculated value.

Calculation: \[ T = \frac{(C_1 + C_2)}{2} \]

- **T**: 3rd-4th sleeve center position
- **C1**: Measured depth from the main shaft rear bearing snap ring groove to the sleeve end, when shifted to 3rd gear: +55 mm (2.17 in)
- **C2**: Measured depth from the main shaft rear bearing snap ring groove to the sleeve end, when shifted to 4th gear

NOTE:
Attach the indicator upside down in comparison to the setting procedures for the zero point. Add “d1” [Value: 55 mm (2.17 in)] from the figure below to “C1”, and measure “C1”.

<table>
<thead>
<tr>
<th>T mm (in)</th>
<th>Lot No. (marking)</th>
<th>M.SFT Snap ring 805072010 [t = 1.65 mm (0.065 in)]</th>
<th>M.SFT Snap ring 805072011 [t = 1.95 mm (0.077 in)]</th>
<th>M.SFT Snap ring 805072012 [t = 2.25 mm (0.089 in)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>137.22 — 137.52 (5.4024 — 5.4142)</td>
<td>32809AA171 (none)</td>
<td>32809AA181 (2)</td>
<td>32809AA191 (4)</td>
<td></td>
</tr>
<tr>
<td>137.52 — 137.82 (5.4142 — 5.4260)</td>
<td>32809AA161 (1)</td>
<td>32809AA171 (none)</td>
<td>32809AA181 (2)</td>
<td></td>
</tr>
<tr>
<td>137.82 — 138.12 (5.4260 — 5.4379)</td>
<td>32809AA141 (3)</td>
<td>32809AA161 (1)</td>
<td>32809AA171 (none)</td>
<td></td>
</tr>
</tbody>
</table>

T = Thickness
3. 5TH-6TH FORK ROD SELECTION

NOTE:
In the following conditions, perform the procedures below.
- Main shaft replacement
- 3rd to 6th drive gear and bushing replacement
- 3rd to 6th synchro ring assembly replacement
- 3rd-4th hub and sleeve assembly replacement
- 5th-6th hub and sleeve assembly replacement

1) Insert the main shaft assembly into the adapter plate.
2) Set the height gauge to the adapter plate. Lower the height gauge indicator to the upper face of the snap ring groove or the upper side of the main rear bearing. Set to zero point.

ST 18853AA000 HEIGHT GAUGE

NOTE:
- The height gauge will be set on the adapter plate during the measurement. Use a scraper to remove any gasket material remaining on the end face.
- During measurement, do not place the height gauge in the shaded area shown in the figure.

3) Use a height gauge to measure “D1” and “D2” as shown in the figure.
(1) Shift the 5th-6th sleeve to the 6th main gear side, push up on the stopper, and measure “D2”.

NOTE:
- Set the height gauge indicator near the measurement target, and lock dial (1) as shown in the figure. Turn dial (2), and set the indicator to the 6th side end surface of the sleeve.
- The measurement is to be performed with two persons, while holding the sleeve straight.
- Turn approximately 72° at a time, and measure the sleeve in 5 locations. Round off the 2 highest and 2 lowest measurement values. The remaining center value is used as the measurement value.

(2) Set the height gauge indicator upside down.

(3) Shift the 5th-6th sleeve to the 5th main gear side, push down to the stopper, and measure “D1”.

NOTE:
- Set the height gauge indicator near the measurement target, and lock dial (1) as shown in the figure. Turn dial (2), and set the indicator to the 5th side end surface of the sleeve.
- Turn approximately 72° at a time, and measure the sleeve in 5 locations. Round off the 2 highest and 2 lowest measurement values. The remaining center value is used as the measurement value.
4) According to both of the measurements, calculate the neutral position of the 5th-6th sleeve. From the following calculation, select a fork rod which matches the calculated value.
Calculation: \[ T = \frac{(D1 + D2)}{2} \]
T: 5th-6th sleeve center position
D1: Measured length from the shaft rear bearing snap ring groove to the sleeve groove end, when shifted to 5th gear [Value: +55 mm (2.17 in)]
D2: Measured length from the main shaft rear bearing snap ring groove to the sleeve groove end, when shifted to 6th gear

NOTE:
Attach the indicator upside down in comparison to the setting procedures for the zero point. Add “d1” [Value: 55 mm (2.17 in)] from the figure below to “D1”, and measure “D1”.

4. REVERSE FORK ROD SELECTION

NOTE:
In the following conditions, perform the procedures below.
• Reverse idler gear replacement.
• Reverse idler gear No. 2 replacement.
• Adapter plate replacement.
• Base replacement.
1) Insert the reverse idler gear assembly into the adapter plate.
2) Tighten the base COMPL attachment bolts.

Tightening torque: 25 N-m (2.5 kgf-m, 18.4 ft-lb)

3) Set the height gauge to the adapter plate. Lower the height gauge indicator to the mating surface of the adapter plate and case, and set to zero points. ST 18853AA000 HEIGHT GAUGE

NOTE:
• The adapter plate will be the base point for the measurement. Use a scraper to remove any gasket material remaining on the end face.
• During measurement, do not place the height gauge in the shaded area shown in the figure.
4) Press fit the reverse sleeve to the reverse idler gear No. 2, and measure “T”.

5) Calculate the neutral position of the reverse sleeve according to the measurement. From the following calculation, select a fork rod which matches the calculated value.

Calculation: \( T + 4.8 \text{ mm} \) (0.189 in)

<table>
<thead>
<tr>
<th>( T + 4.8 \text{ mm} ) (0.189 in) mm (in)</th>
<th>Lot No. (marking)</th>
</tr>
</thead>
<tbody>
<tr>
<td>33.50 — 33.80 (1.3189 — 1.3307)</td>
<td>32816AA110 (1)</td>
</tr>
<tr>
<td>33.80 — 34.10 (1.3307 — 1.3425)</td>
<td>32816AA130 (none)</td>
</tr>
<tr>
<td>34.10 — 34.40 (1.3425 — 1.3543)</td>
<td>32816AA140 (2)</td>
</tr>
</tbody>
</table>

\( T = \text{Thickness} \)

NOTE:
- Set the height gauge indicator near the measurement target, and lock dial (1) as shown in the figure. Turn dial (2), and set the indicator to the end face of the reverse sleeve side.
- Turn approximately 72° at a time, and measure the sleeve in 5 locations. Round off the 2 highest and 2 lowest measurement values. The remaining center value is used as the measurement value.
23. Clutch Housing

A: REMOVAL

1) Remove the manual transmission assembly from the vehicle. <Ref. to 6MT-32, REMOVAL, Manual Transmission Assembly.>
2) Prepare the transmission for overhaul. <Ref. to 6MT-38, Preparation for Overhaul.>
3) Remove the neutral position switch, back-up light switch and harness. <Ref. to 6MT-42, REMOVAL, Neutral Position Switch.> <Ref. to 6MT-40, REMOVAL, Back-up Light Switch.>
4) Remove the extension case. <Ref. to 6MT-44, REMOVAL, Extension Case.>
5) Remove the transfer driven gear. <Ref. to 6MT-56, REMOVAL, Transfer Driven Gear.>
6) Remove the center differential. <Ref. to 6MT-58, REMOVAL, Center Differential.>
7) Remove the transmission case. <Ref. to 6MT-59, REMOVAL, Transmission Case.>
8) Remove the individual gear assemblies. <Ref. to 6MT-66, REMOVAL, Main Shaft Assembly.>
9) Remove the drive pinion shaft assembly. <Ref. to 6MT-95, REMOVAL, Drive Pinion Shaft Assembly.>
10) Remove the front differential assembly. <Ref. to 6MT-102, REMOVAL, Front Differential Assembly.>

B: INSTALLATION

1) Install the pitching stopper bracket.

**Tightening torque:**

41 N·m (4.2 kgf·m, 30.2 ft·lb)

2) Install the front differential assembly. <Ref. to 6MT-103, INSTALLATION, Front Differential Assembly.>
3) Install the drive pinion shaft assembly. <Ref. to 6MT-95, INSTALLATION, Drive Pinion Shaft Assembly.>
4) Install the individual gear assemblies all at once. <Ref. to 6MT-67, INSTALLATION, Main Shaft Assembly.>
5) Install the transmission case. <Ref. to 6MT-61, INSTALLATION, Transmission Case.>
6) Install the center differential. <Ref. to 6MT-58, INSTALLATION, Center Differential.>
7) Install the transfer driven gear. <Ref. to 6MT-56, INSTALLATION, Transfer Driven Gear.>
8) Install the extension case. <Ref. to 6MT-44, INSTALLATION, Extension Case.>
9) Install the neutral position switch, back-up light switch and harness. <Ref. to 6MT-42, INSTALLATION, Neutral Position Switch.> <Ref. to 6MT-40, INSTALLATION, Back-up Light Switch.>

C: DISASSEMBLY

1) Remove the clutch release bearing guide.

2) Remove the oil seal.
D: ASSEMBLY

1) Attach the oil seal to the clutch housing, being careful not to damage the seal.

NOTE:
Use a new oil seal.
ST 18657AA020 OIL SEAL INSTALLER

2) Install the clutch release bearing guide.

Tightening torque:

6.4 N-m (0.7 kgf-m, 4.7 ft-lb)

E: INSPECTION

1) Check to make sure there is no damage or cracks on the clutch housing. If there is excessive damage, replace the clutch housing.
2) Inspect the clutch housing for transmission gear oil leakage. If any oil leaks are found, repair or replace the applicable part.
24. Driver’s Control Center Differential Control Module

A: REMOVAL

1) Disconnect the ground cable from the battery.
2) Remove the instrument panel lower. <Ref. to EI-46, INSTRUMENT PANEL LOWER, REMOVAL, Center Console.>
3) Remove the driver’s control center differential control module by disconnecting the connector.

B: INSTALLATION

Install in the reverse order of removal.

Tightening torque:
15 N·m (1.5 kgf-m, 11.1 ft-lb)
# General Diagnostic Table

## A: INSPECTION

### 1. MANUAL TRANSMISSION

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Possible cause</th>
<th>Corrective action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Gears are difficult to engage.</td>
<td>(a) Worn, damaged or burred chamfer at internal spline of the sleeve</td>
<td>Replace.</td>
</tr>
<tr>
<td>NOTE:</td>
<td>(b) Gear spline wear, damage, dents</td>
<td>Replace.</td>
</tr>
<tr>
<td>If it is difficult to shift, there are two possible causes. One is a defective gear shift system and the other is defective transmission. However, if the operation is heavy and engagement of the gears is difficult, a defective clutch function may also be responsible. Check whether the clutch is correctly functioning, before checking the gear shift system and transmission.</td>
<td>(c) Worn or scratched bushings</td>
<td>Replace.</td>
</tr>
<tr>
<td></td>
<td>(d) Incorrect contact or wear between synchronizer ring and gear cone</td>
<td>Repair or replace.</td>
</tr>
<tr>
<td>2. Gear slip-out</td>
<td>(a) Defective pitching stopper adjustment</td>
<td>Adjust.</td>
</tr>
<tr>
<td>• Gear slips out when coasting on rough road.</td>
<td>(b) Loose engine mounting bolts</td>
<td>Tighten or replace.</td>
</tr>
<tr>
<td>• Gear slips out during acceleration.</td>
<td>(c) Worn fork shifter, broken shifter fork rail spring</td>
<td>Replace.</td>
</tr>
<tr>
<td></td>
<td>(d) Worn or damaged ball bearing</td>
<td>Replace.</td>
</tr>
<tr>
<td></td>
<td>(e) Excessive clearance between splines of synchronizer hub and synchronizer sleeve</td>
<td>Replace.</td>
</tr>
<tr>
<td></td>
<td>(f) Worn in the synchronizer hub chamfer angle</td>
<td>Replace.</td>
</tr>
<tr>
<td></td>
<td>(g) Worn 1st driven gear, needle bearing and race</td>
<td>Replace.</td>
</tr>
<tr>
<td></td>
<td>(h) Worn 2nd driven gear, needle bearing and race</td>
<td>Replace.</td>
</tr>
<tr>
<td></td>
<td>(i) Worn 3rd drive gear and bushing</td>
<td>Replace.</td>
</tr>
<tr>
<td></td>
<td>(j) Worn 4th drive gear and bushing</td>
<td>Replace.</td>
</tr>
<tr>
<td></td>
<td>(k) Worn 5th drive gear and bushing</td>
<td>Replace.</td>
</tr>
<tr>
<td></td>
<td>(l) Worn 6th drive gear and bushing</td>
<td>Replace.</td>
</tr>
<tr>
<td></td>
<td>(m) Worn reverse idler gear and bushing</td>
<td>Replace.</td>
</tr>
<tr>
<td>3. Abnormal noise emitted from transmission</td>
<td>(a) Insufficient or improper lubrication</td>
<td>Replenish or replace with the specified amount of recommended oil.</td>
</tr>
<tr>
<td>NOTE:</td>
<td>(b) Worn or damaged gears and bearings</td>
<td>Replace.</td>
</tr>
<tr>
<td>If a noise is heard when the vehicle is parked with its engine idling and ceases when the clutch is disengaged, it may be considered that the noise is coming from the transmission.</td>
<td>NOTE: If the trouble is only wear of the gear teeth surfaces, only a high whirring noise will occur at high speeds, but if any part is broken, rhythmical clicking sounds will be heard even at low speeds.</td>
<td>Replace.</td>
</tr>
</tbody>
</table>
## General Diagnostic Table

### MANUAL TRANSMISSION AND DIFFERENTIAL

#### 2. DIFFERENTIAL

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Possible cause</th>
<th>Corrective action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Broken differential (case, gear, bearing, etc.)</td>
<td>(a) Insufficient or improper oil</td>
<td>Disassemble the differential and replace broken components. At the same time check other components for any trouble, and replace if necessary.</td>
</tr>
<tr>
<td></td>
<td>(b) Use of vehicle under severe conditions such as excessive load and improper use of the clutch</td>
<td>Readjust the preload and backlash of the bearing, and the contact surface of gear.</td>
</tr>
<tr>
<td></td>
<td>(c) Improper adjustment of taper roller bearing</td>
<td>Adjust.</td>
</tr>
<tr>
<td></td>
<td>(d) Improper adjustment of the drive pinion and the hypoid driven gear</td>
<td>Adjust.</td>
</tr>
<tr>
<td></td>
<td>(e) Loose hypoid driven gear clamping bolts</td>
<td>Tighten.</td>
</tr>
<tr>
<td>2. Differential and hypoid gear noise</td>
<td>(a) Insufficient oil</td>
<td>Replenish or replace with the specified amount of recommended oil.</td>
</tr>
<tr>
<td></td>
<td>(b) Improper adjustment of hypoid driven gear and drive pinion</td>
<td>Check the tooth contact.</td>
</tr>
<tr>
<td></td>
<td>(c) Worn teeth of hypoid driven gear and drive pinion</td>
<td>Replace as a set. Readjust the bearing preload.</td>
</tr>
<tr>
<td></td>
<td>(d) Loose roller bearing</td>
<td>Readjust the backlash of the hypoid driven gear to drive pinion, and check the tooth contact.</td>
</tr>
<tr>
<td></td>
<td>(e) Distorted hypoid driven gear or differential case</td>
<td>Replace.</td>
</tr>
</tbody>
</table>

**NOTE:**

Noise will occur, and eventually the differential will not be able to operate due to broken pieces obstructing the gear revolution.