

# General Description

## AUTOMATIC TRANSMISSION

### 1. General Description

#### A: SPECIFICATION

##### 1. TORQUE CONVERTER CLUTCH

| Model                      | Turbo  | Non-turbo         |
|----------------------------|--|-------------------|
| Type                       | Symmetric, 3 element, single stage, 2 phase torque converter |                   |
| Stall torque ratio         | 2.0  | 1.9               |
| Nominal diameter           | 250 mm (9.84 in)   |                   |
| Stall speed (at sea level) | 3,100 — 3,500 rpm  | 2,400 — 2,800 rpm |
| One-way clutch             | Sprague type one-way clutch                                  |                   |

##### 2. OIL PUMP

|                 |                                       |    |
|-----------------|---------------------------------------|----|
| Type            | Internal gear fixed displacement pump |    |
| Driving method  | Driven by engine                      |    |
| Number of teeth | Inner rotor                           | 9  |
|                 | Outer rotor                           | 10 |

##### 3. TRANSMISSION CONTROL ELEMENT

|                               |  |
|-------------------------------|--|
| Type                          | 5-forward, 1-reverse, double-row planetary gears |
| Multi-plate clutch            | 3 sets   |
| Multi-plate brake             | 4 sets   |
| One-way clutch (sprague type) | 3 sets   |

##### 4. TRANSMISSION GEAR RATIO

|      |       |
|------|-------|
| 1st  | 3.540 |
| 2nd  | 2.264 |
| 3rd  | 1.471 |
| 4th  | 1.000 |
| 5th  | 0.834 |
| Rev. | 2.370 |

### 5. PLANETARY GEAR AND PLATE

| Model  | Turbo | Non-turbo |
|--|-------|-----------|
| Number of front internal gear teeth              | 106   |           |
| Number of front carrier teeth                    | 28    |           |
| Number of front sun gear teeth                   | 50    |           |
| Number of mid internal gear teeth                | 78    |           |
| Number of mid carrier teeth                      | 18    |           |
| Number of mid sun gear teeth                     | 42    |           |
| Number of rear internal gear teeth               | 110   |           |
| Number of rear carrier teeth                     | 24    |           |
| Number of rear sun gear teeth                    | 62    |           |
| Number of front brake drive plates               | 2     |           |
| Number of input clutch drive plates              | 6     | 5         |
| Number of high & low reverse clutch drive plates | 4     |           |
| Number of direct clutch drive plates             | 5     |           |
| Number of reverse brake drive plates             | 5     |           |
| Number of forward brake drive plates             | 5     | 4         |
| Number of low coast brake drive plates           | 3     |           |

### 6. SELECTOR POSITION

|                 |  |
|-----------------|--|
| P (Park)        | Transmission is in neutral, output member is immovable, engine start is possible   |
| R (Reverse)     | Transmission is in reverse.  |
| N (Neutral)     | Transmission is in neutral and engine start is possible  |
| D (Drive)       | Automatic gear change<br>1st $\leftarrow \rightarrow$ 2nd $\leftarrow \rightarrow$ 3rd $\leftarrow \rightarrow$ 4th $\leftarrow \rightarrow$ 5th |
| Manual mode (+) | Manual gear change<br>1st $\rightarrow$ 2nd $\rightarrow$ 3rd $\rightarrow$ 4th $\rightarrow$ 5th  |
| Manual mode (-) | Manual gear change<br>1st $\leftarrow$ 2nd $\leftarrow$ 3rd $\leftarrow$ 4th $\leftarrow$ 5th  |
| Control method  | Wire cable type  |

# General Description

AUTOMATIC TRANSMISSION

## 7. HYDRAULIC CONTROL AND LUBRICATION

|                                     |   |
|-------------------------------------|---|
| Type                                | Electronic/hydraulic control<br>[5 forward gear changes made by electronic signals of vehicle speed and accelerator (throttle) opening]   |
| Fluid                               | Specified fluid: SUBARU ATF<br>Recommended fluid: IDEMITSU ATF HP<br>Castrol Transmax J<br><br>NOTE:<br>Use of the recommended fluid is permitted only in regions where the specified fluid is not available. |
| Fluid capacity<br>ℓ (US qt, Imp qt) | 9.6 — 10.0<br>(10.1 — 10.6, 8.4 — 8.8)  |
| Lubrication system                  | Forced feed lubrication with oil pump   |

## 8. COOLING AND HARNESS

|                      |  |
|----------------------|--|
| Cooling system       | Liquid-cooler incorporated in radiator |
| Transmission harness | 20 + 8 poles                           |

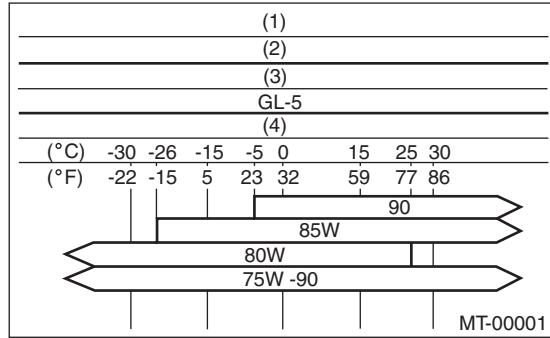
## 9. TRANSFER

| Model  | 2.5 L                              | 3.0 L |
|--|------------------------------------|-------|
| Transfer type                                      | Variable torque distribution (VTD) |       |
| Number of transfer clutch drives and driven plates |                                    | 3     |
| Reduction gear ratio                               | 1.000 (41/41)                      |       |

## 10. FINAL REDUCTION GEAR

| Model                            | OBK 2.5 XT<br>OBK 3.0 R | 2.5 GT LTD |
|----------------------------------|-------------------------|------------|
| Front final reduction gear ratio | 3.272                   | 3.083      |

## 11. RECOMMENDED GEAR OIL

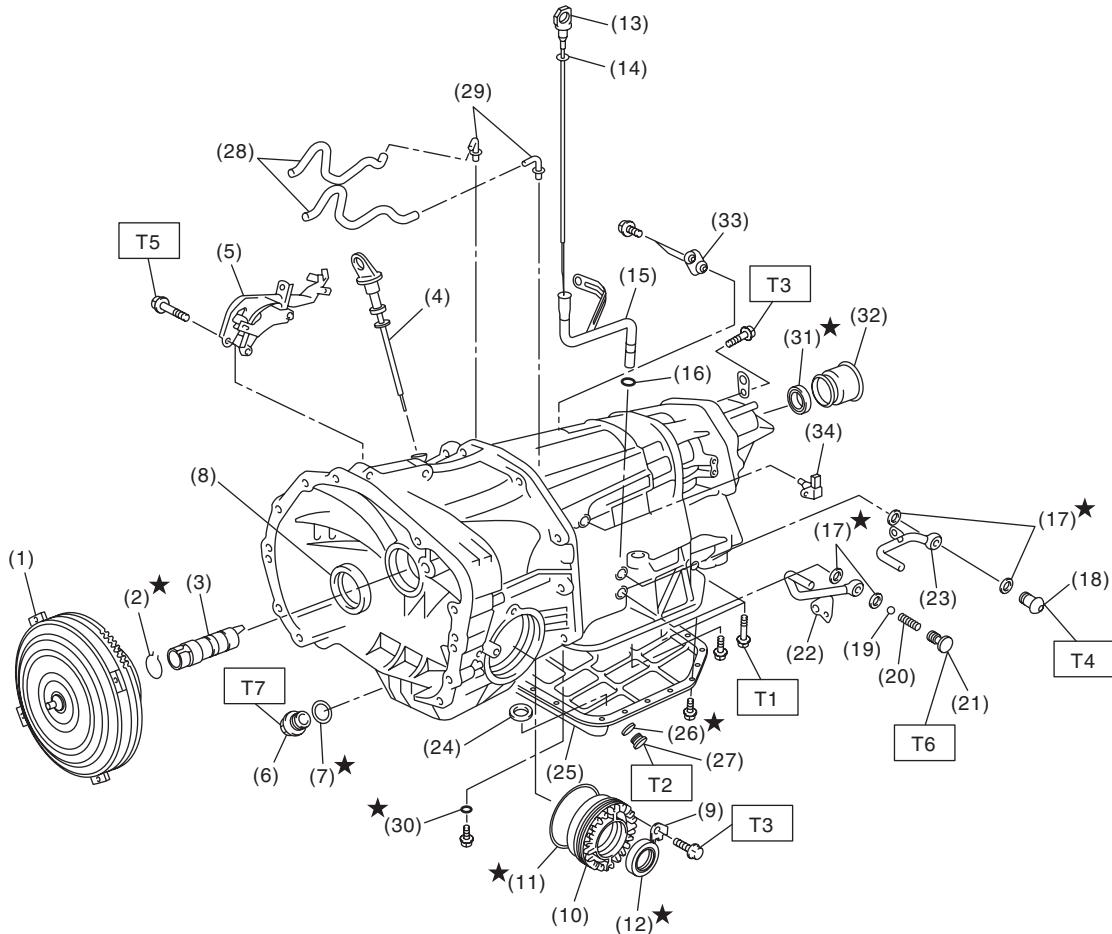
|   |   |
|---|---|
| Lubrication oil   |  <p>(1) Item<br/>(2) Front differential gear oil<br/>(3) API standard<br/>(4) SAE viscosity No. and applicable temperature</p> |
| Front differential gear oil capacity<br>ℓ (US qt, Imp qt) | 1.3 — 1.5 (1.4 — 1.6, 1.1 — 1.3)  |

# General Description

## AUTOMATIC TRANSMISSION

### B: COMPONENT

#### 1. TORQUE CONVERTER CLUTCH & TRANSMISSION ASSEMBLY



AT-03871

# General Description

AUTOMATIC TRANSMISSION

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|                                  |                      |                             |
|----------------------------------|----------------------|-----------------------------|
| (1) Torque converter ASSY        | (16) O-ring          | (30) O-ring                 |
| (2) Circlip                      | (17) Gasket          | (31) Oil seal               |
| (3) Oil pump shaft               | (18) Union screw     | (32) Dust cover             |
| (4) Differential oil level gauge | (19) Ball            | (33) Floating bracket       |
| (5) Pitching stopper bracket     | (20) Spring          | (34) Turbine speed sensor 1 |
| (6) Differential oil drain plug  | (21) Union screw     |                             |
| (7) Gasket                       | (22) ATF outlet pipe |                             |
| (8) Oil seal                     | (23) ATF inlet pipe  |                             |
| (9) Lock plate                   | (24) Magnet          |                             |
| (10) Side retainer               | (25) Oil pan         |                             |
| (11) O-ring                      | (26) Gasket          |                             |
| (12) Oil seal                    | (27) ATF drain hose  |                             |
| (13) ATF level gauge             | (28) Breather hose   |                             |
| (14) O-ring                      | (29) Nipple          |                             |
| (15) Oil charge pipe             |                      |                             |

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

***T1: 5 (0.5, 3.7)***

***T2: 20 (2.0, 14.8)***

***T3: 25 (2.5, 18)***

***T4: 40 (4.1, 29.5)***

***T5: 41 (4.2, 30.2)***

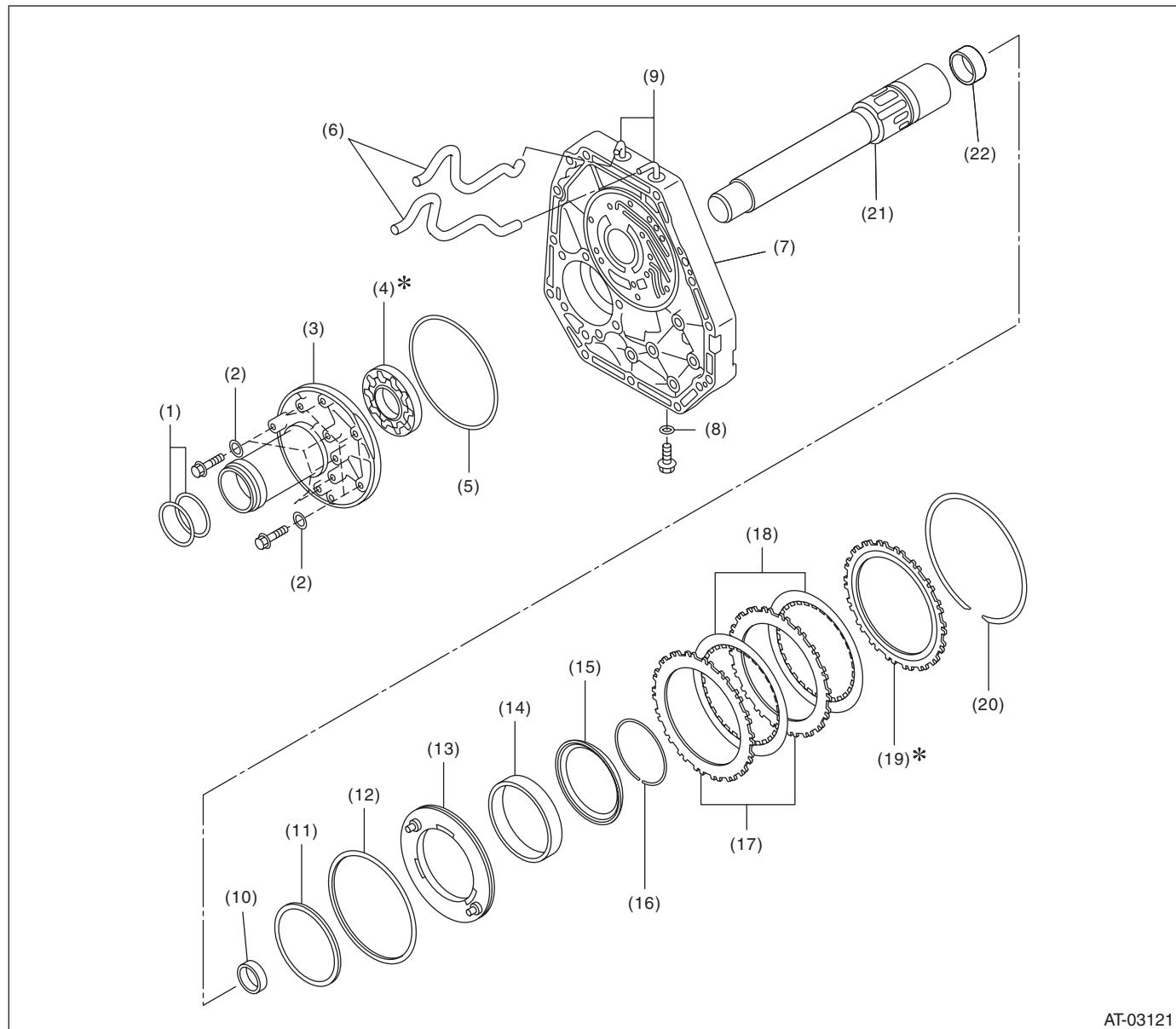
***T6: 45 (4.6, 33.2)***

***T7: 70 (7.1, 51.6)***

# General Description

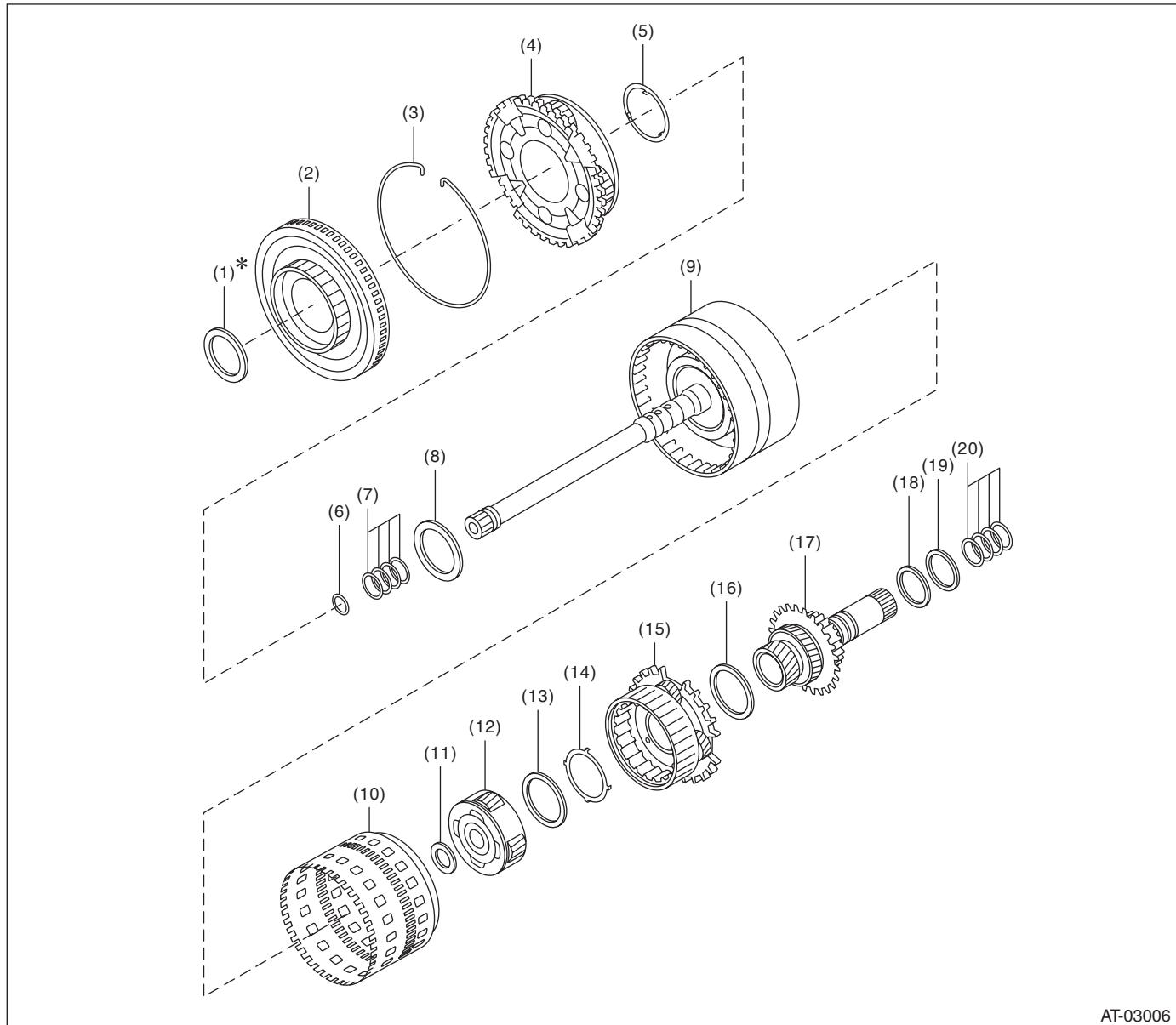
## AUTOMATIC TRANSMISSION

### 2. OIL PUMP & FRONT BRAKE



|                       |                         |                     |
|-----------------------|-------------------------|---------------------|
| (1) O-ring            | (9) Nipple              | (16) Snap ring      |
| (2) Washer            | (10) Needle bearing     | (17) Driven plate   |
| (3) Oil pump housing  | (11) D-ring (Inner)     | (18) Drive plate    |
| (4) Oil pump rotor    | (12) D-ring (Outer)     | (19) Retainer plate |
| (5) O-ring            | (13) Front brake piston | (20) Snap ring      |
| (6) Air breather hose | (14) Return spring      | (21) Stator shaft   |
| (7) Oil pump cover    | (15) Retainer           | (22) Needle bearing |
| (8) O-ring            |                         |                     |

### 3. FRONT PLANETARY CARRIER AND MIDDLE & REAR PLANETARY CARRIER



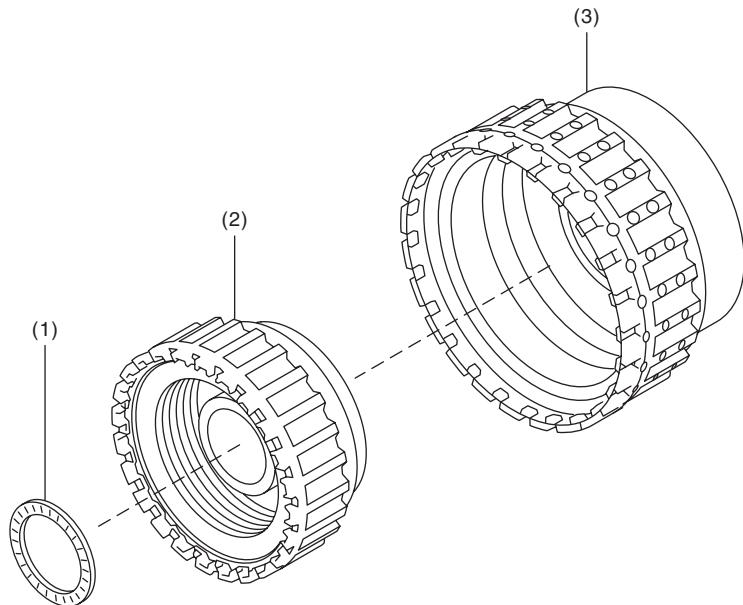
AT-03006

|                         |                              |                                  |
|-------------------------|------------------------------|----------------------------------|
| (1) Thrust bearing      | (8) Thrust bearing           | (15) Rear carrier ASSY           |
| (2) Front sun gear ASSY | (9) Input clutch ASSY        | (16) Thrust bearing              |
| (3) Snap ring           | (10) Rear internal gear ASSY | (17) Middle & rear sun gear ASSY |
| (4) Front carrier ASSY  | (11) Thrust bearing          | (18) Washer                      |
| (5) Race bearing        | (12) Middle carrier ASSY     | (19) Thrust bearing              |
| (6) O-ring              | (13) Thrust bearing          | (20) Seal ring                   |
| (7) Seal ring           | (14) Race bearing            |                                  |

# General Description

## AUTOMATIC TRANSMISSION

### 4. DIRECT CLUTCH AND HIGH & LOW REVERSE CLUTCH



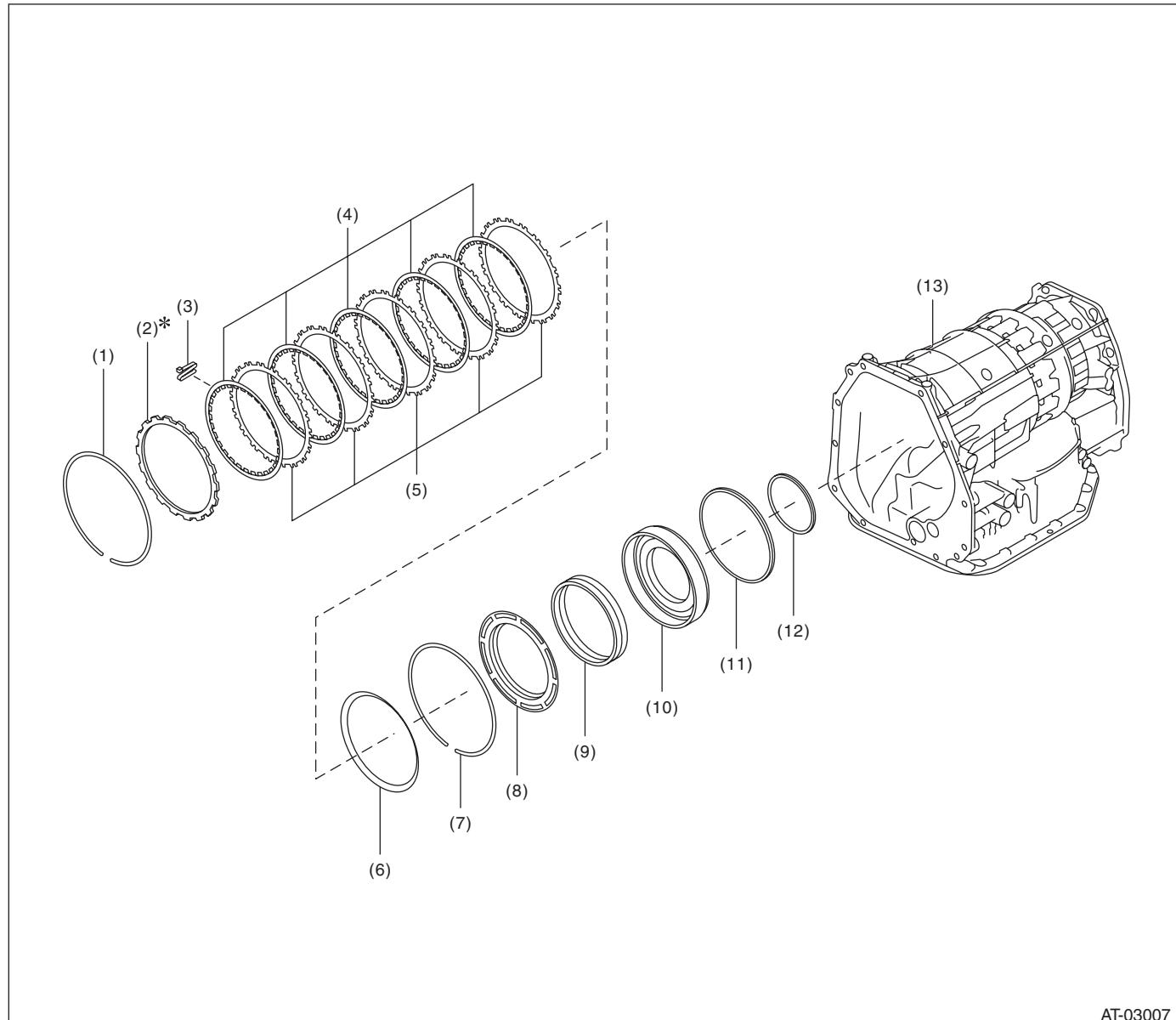
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(1) Thrust bearing

(2) High & low reverse clutch ASSY

(3) Direct clutch ASSY

### 5. REVERSE BRAKE



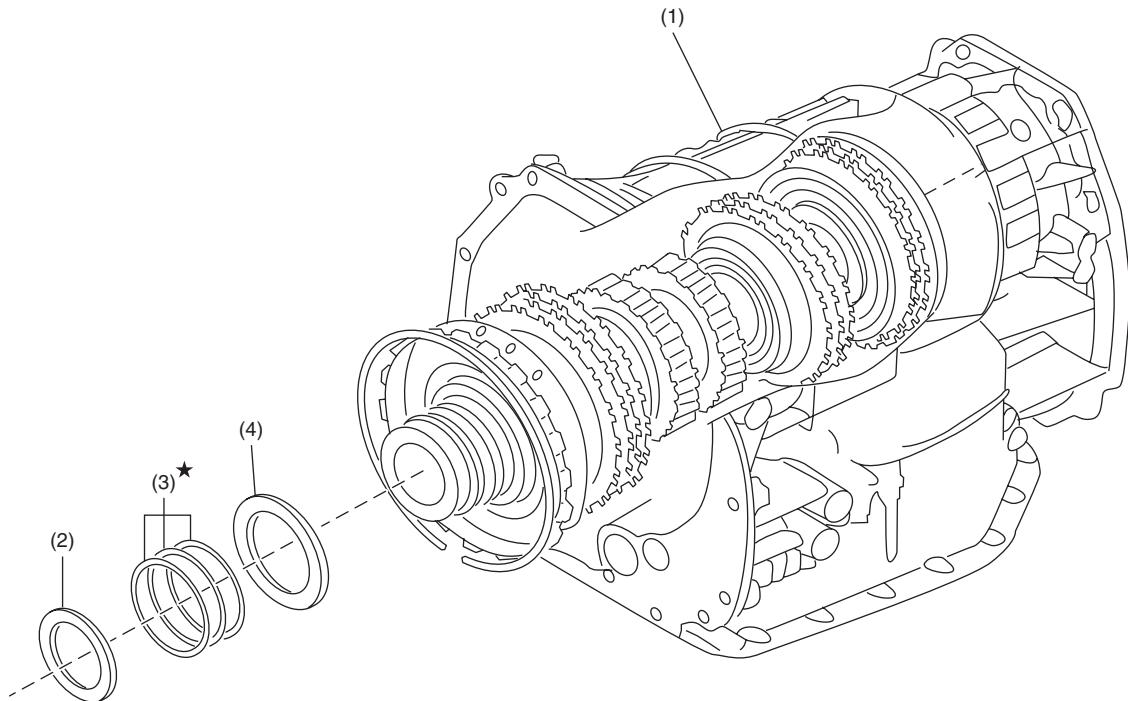
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|                    |                 |                           |
|--------------------|-----------------|---------------------------|
| (1) Snap ring      | (6) Dish plate  | (10) Reverse brake piston |
| (2) Retainer plate | (7) Snap ring   | (11) D-ring (Outer)       |
| (3) Leaf spring    | (8) Retainer    | (12) D-ring (Inner)       |
| (4) Drive plate    | (9) Leaf spring | (13) AT main case         |
| (5) Driven plate   |                 |                           |

# General Description

## AUTOMATIC TRANSMISSION

### 6. SHORT AT ASSEMBLY



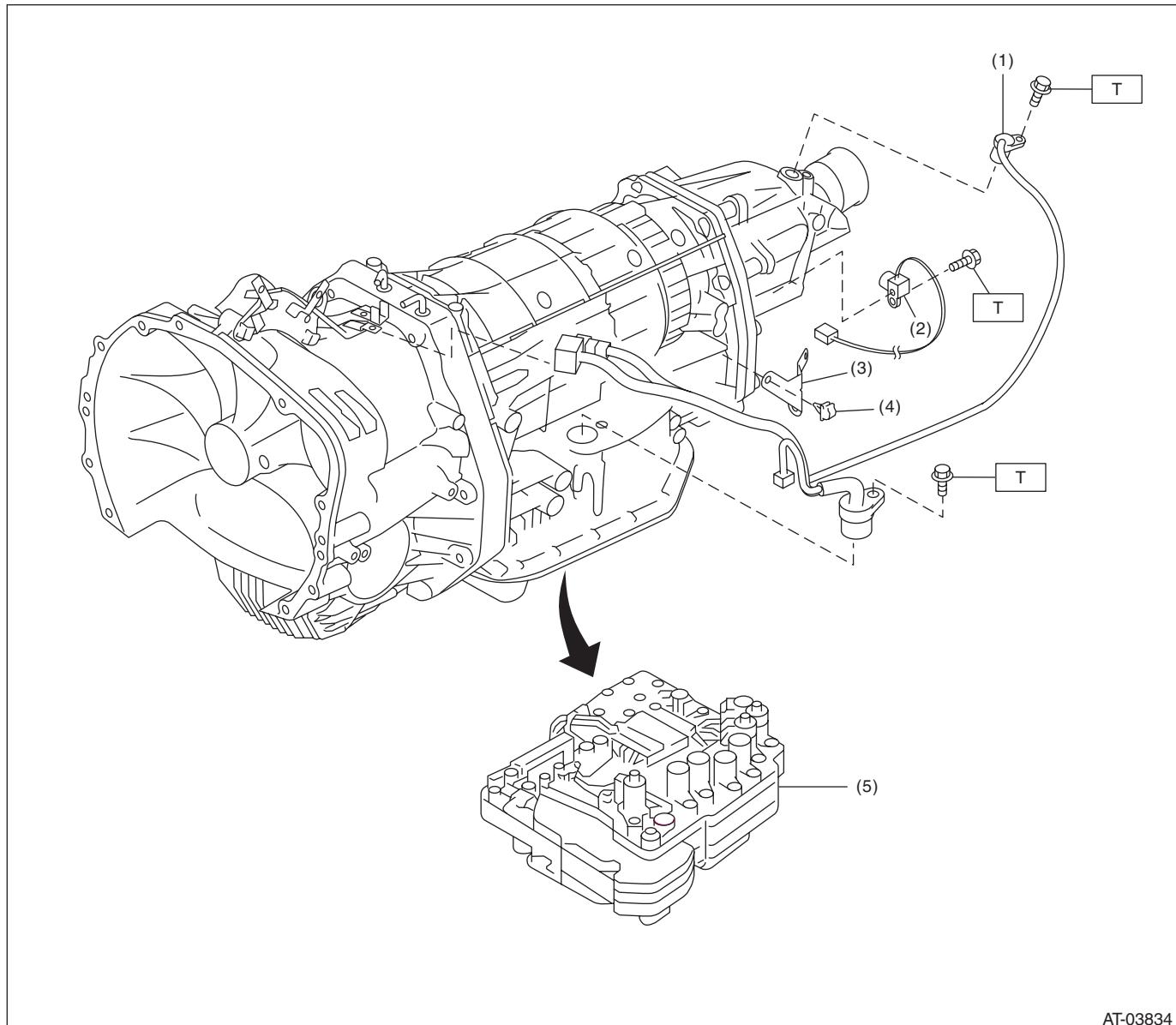
AT-04324

(1) Short AT ASSY  
(non-disassembled)  
(2) Thrust bearing

(3) Seal ring

(4) Thrust bearing

### 7. CONTROL VALVE & TRANSMISSION HARNESS



AT-03834

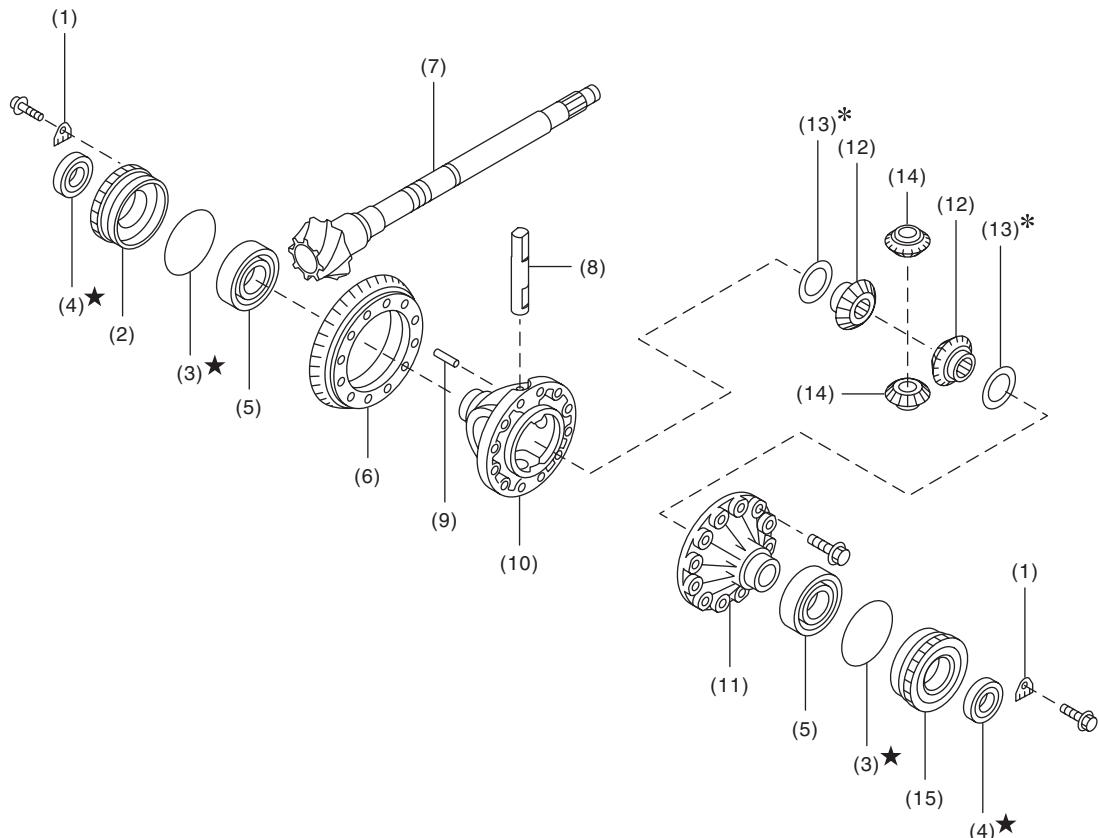
|                                |                        |
|--------------------------------|------------------------|
| (1) Transmission harness ASSY  | (4) Clip               |
| (2) Front vehicle speed sensor | (5) Control valve ASSY |
| (3) Harness bracket            |                        |

**Tightening torque:N·m (kgf·m, ft·lb)**  
**T: 7(0.7, 5.2)**

# General Description

## AUTOMATIC TRANSMISSION

### 8. DIFFERENTIAL GEAR



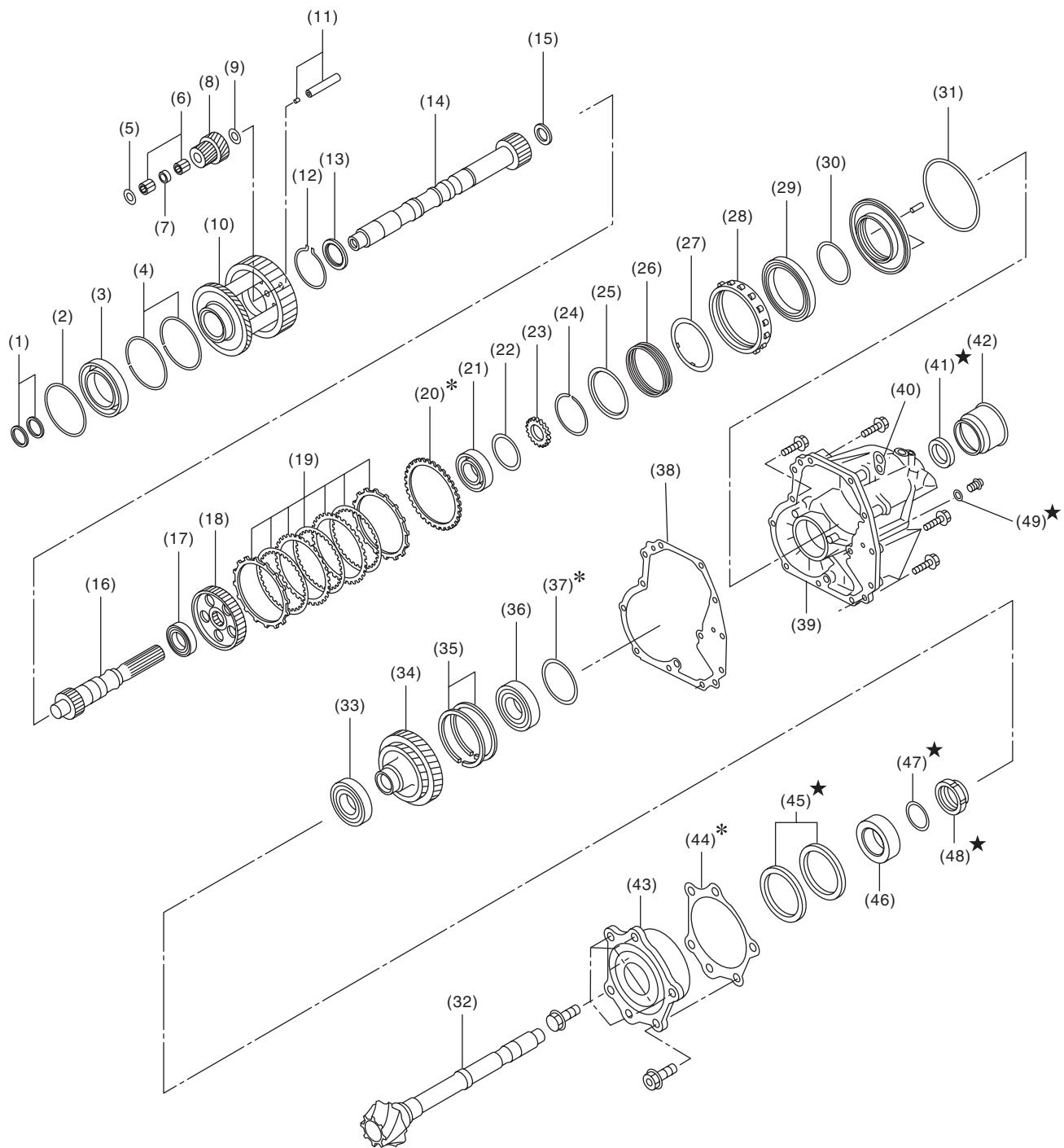
AT-03008

|                                   |                           |                                    |
|-----------------------------------|---------------------------|------------------------------------|
| (1) Lock plate                    | (6) Hypoid driven gear    | (11) Differential case LH          |
| (2) Differential side retainer RH | (7) Drive pinion shaft    | (12) Differential bevel gear       |
| (3) O-ring                        | (8) Pinion shaft          | (13) Washer                        |
| (4) Oil seal                      | (9) Straight pin          | (14) Differential bevel pinion     |
| (5) Taper roller bearing          | (10) Differential case RH | (15) Differential side retainer LH |

## General Description

## AUTOMATIC TRANSMISSION

## 9. TRANSFER CASE, EXTENSION CASE & REDUCTION GEAR



AT-03533

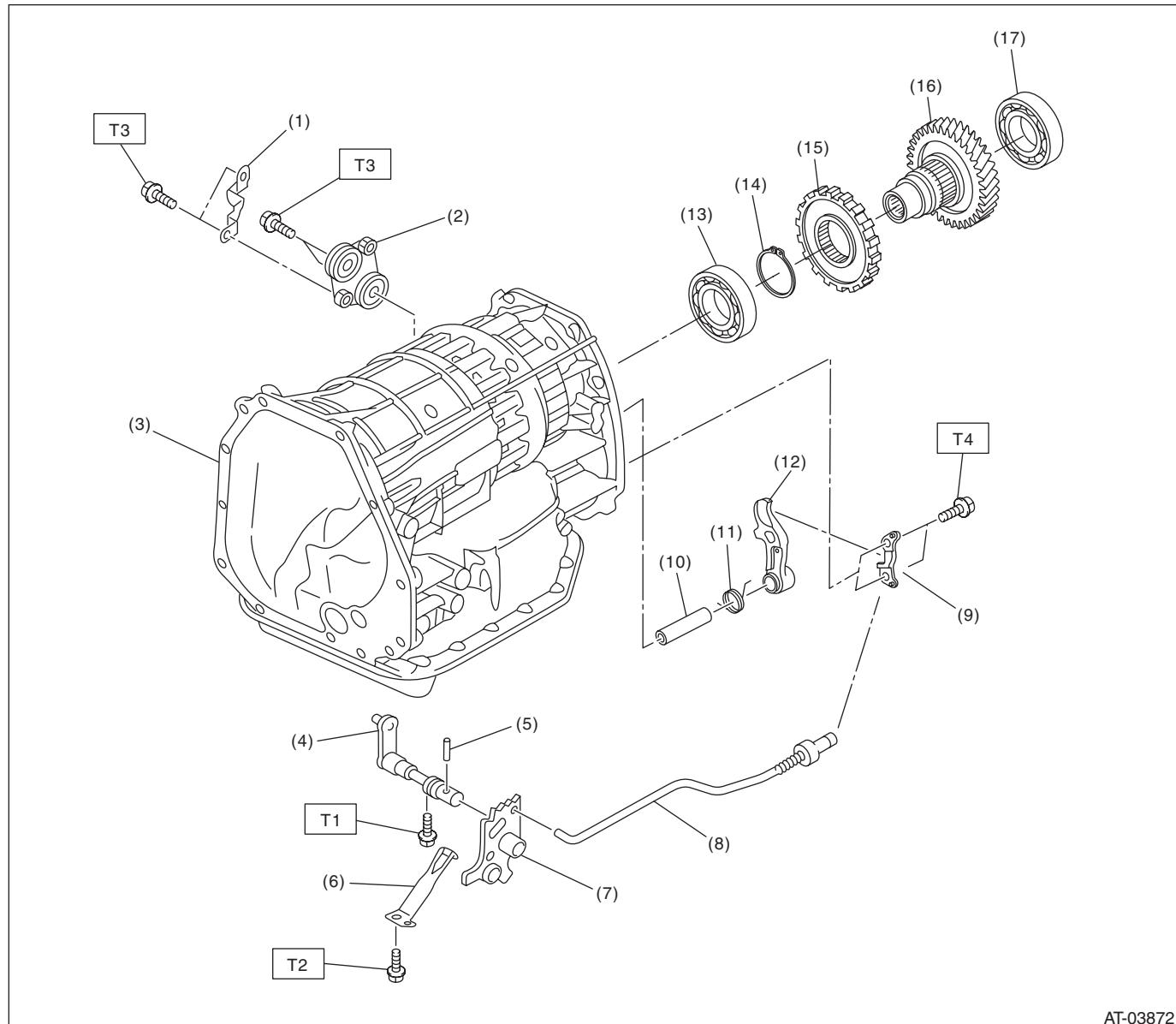
# General Description

## AUTOMATIC TRANSMISSION

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|                                  |                             |                            |
|----------------------------------|-----------------------------|----------------------------|
| (1) Seal ring                    | (18) Transfer clutch hub    | (34) Reduction driven gear |
| (2) Reduction gear shim          | (19) Transfer clutch plate  | (35) Snap ring             |
| (3) Ball bearing                 | (20) Driven plate No. 3     | (36) Ball bearing          |
| (4) Snap ring                    | (21) Ball bearing           | (37) Shim                  |
| (5) Planetary pinion washer      | (22) Rear drive shaft shim  | (38) Shim                  |
| (6) Needle bearing               | (23) Revolution gear        | (39) Extension case        |
| (7) Spacer                       | (24) Snap ring              | (40) Transmission hanger   |
| (8) Pinion gear                  | (25) Clutch spring retainer | (41) Oil seal              |
| (9) Washer                       | (26) Return spring          | (42) Dust cover            |
| (10) Planetary carrier ASSY      | (27) Spring retainer        | (43) Taper roller bearing  |
| (11) Planetary pinion shaft ASSY | (28) Pressure plate         | (44) Drive pinion shim     |
| (12) Snap ring                   | (29) Ball bearing           | (45) Oil seal              |
| (13) Thrust bearing              | (30) O-ring                 | (46) Drive pinion collar   |
| (14) Intermediate shaft          | (31) D-ring                 | (47) O-ring                |
| (15) Thrust washer               | (32) Drive pinion shaft     | (48) Lock nut              |
| (16) Rear drive shaft            | (33) Ball bearing           | (49) O-ring                |
| (17) Ball bearing                |                             |                            |

### 10. TRANSMISSION CONTROL DEVICE & PARKING SUPPORT



AT-03872

|                        |                              |                   |
|------------------------|------------------------------|-------------------|
| (1) Bracket            | (9) Parking support actuator | (17) Ball bearing |
| (2) Floating bracket   | (10) Parking pawl shaft      |                   |
| (3) AT main case       | (11) Return spring           |                   |
| (4) Range select lever | (12) Parking pawl            |                   |
| (5) Straight pin       | (13) Ball bearing            |                   |
| (6) Detent spring      | (14) Snap ring               |                   |
| (7) Manual plate       | (15) Parking gear            |                   |
| (8) Parking rod        | (16) Reduction driven gear   |                   |

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

**T1: 6 (0.6, 4.4)**

**T2: 7 (0.7, 5.2)**

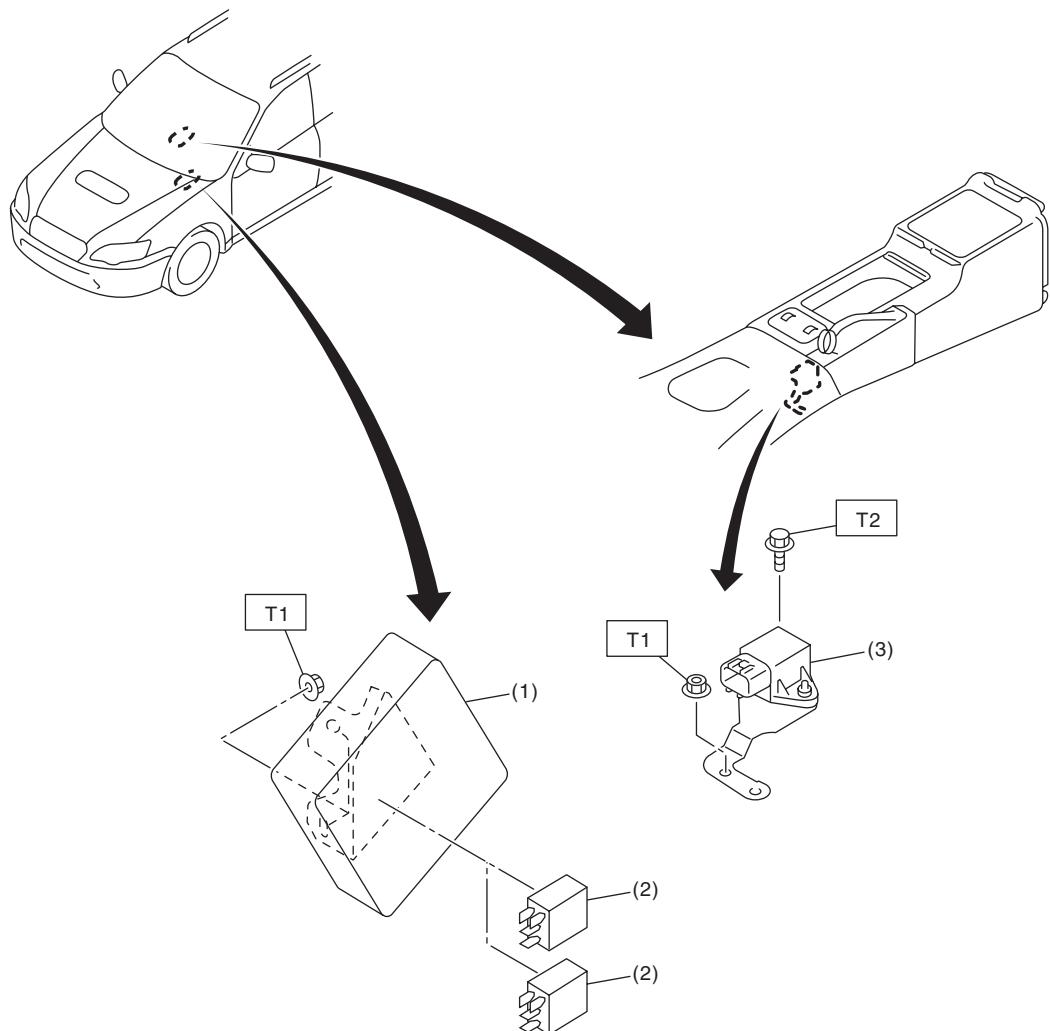
**T3: 25 (2.5, 18)**

**T4: <Ref. to 5AT-75, Parking Pawl. >**

# General Description

## AUTOMATIC TRANSMISSION

### 11. TRANSMISSION CONTROL MODULE



AT-03572

(1) Transmission control module (TCM)

(2) Relay

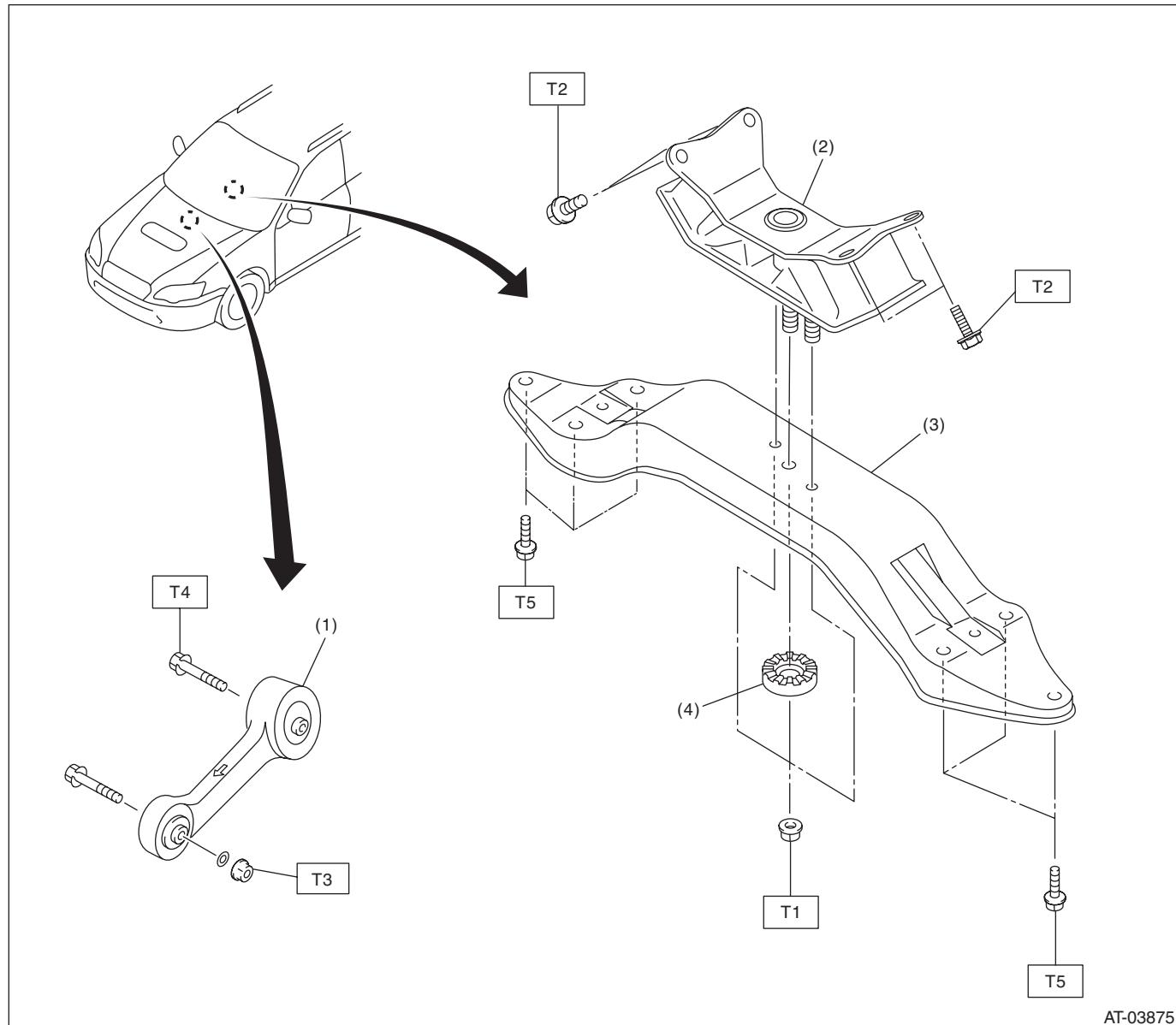
(3) Lateral G sensor

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

T1: 7.5 (0.76, 5.5)

T2: 24.5 (2.5, 18.1)

### 12. TRANSMISSION MOUNTING



AT-03875

- (1) Pitching stopper
- (2) Rear cushion rubber
- (3) Crossmember
- (4) Stopper

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

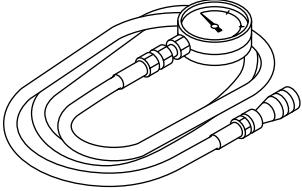
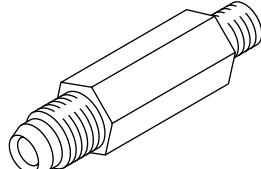
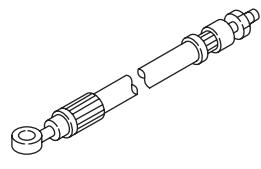
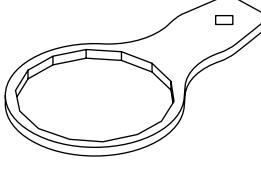
- T1: 35 (3.6, 26)**
- T2: 40 (4.1, 29.5)**
- T3: 50 (5.1, 36.9)**
- T4: 58 (5.9, 42.8)**
- T5: 75 (7.6, 55.3)**

### 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.
- Until the oil pan is removed, do not place with the oil pan side facing up to prevent foreign matter from entering the valve body.
- Before removal, installation or disassembly, be sure to clarify the failure. Avoid unnecessary removal, disassembly and replacement.
- When disassembling the case and other light alloy parts, disassemble them by slightly tapping with 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 gear oil, grease or the equivalent. Do not mix them of different grades or manufacturers.
- Be sure to tighten bolts and nuts to the specified torque.
- Place shop jacks or rigid racks at the specified points.
- Apply gear oil onto sliding or revolving surfaces before installation.
- Replace deformed or damaged snap rings with new parts.
- Before installing O-rings or oil seals, apply sufficient amount of ATF fluid to avoid damage and deformation.
- Be careful not to incorrectly install or fail to install O-rings, snap rings and other such parts.
- Before securing a part on a vise, place cushioning material such as wood blocks, aluminum plate, or cloth between the part and the vise.
- Avoid damaging the mating surface of the case.
- Before applying liquid gasket, completely remove the old seal.

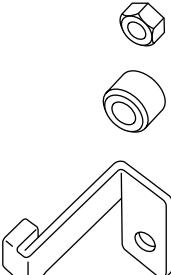
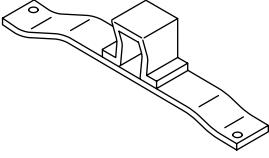
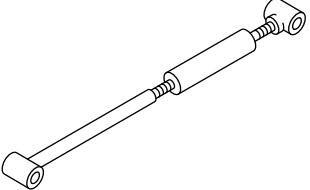
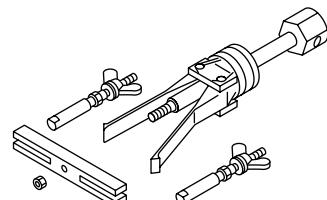
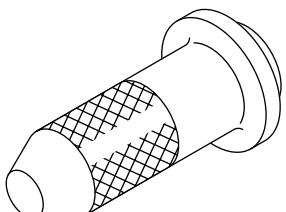
### D: PREPARATION TOOL

#### 1. SPECIAL TOOL

| ILLUSTRATION  | TOOL NUMBER | DESCRIPTION             | REMARKS  |
|---|-------------|-------------------------|--|
| <br>ST-498575400   | 498575400   | OIL PRESSURE GAUGE ASSY | Used for measuring oil pressure.   |
| <br>ST-498897200   | 498897200   | ADAPTER                 | Used together with oil pump cover installed on when measuring line pressure. |
| <br>ST-498897700 | 498897700   | OIL PRESSURE ADAPTER    | Used for measuring transfer clutch pressure.                                 |
| <br>ST-498545400 | 498545400   | FILTER WRENCH           | Used for removing and installing the ATF filter.                             |

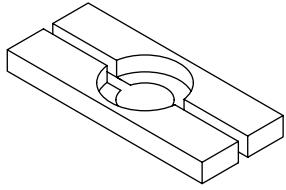
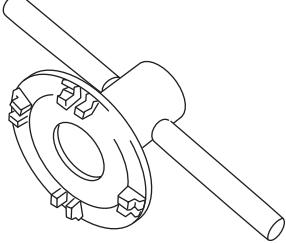
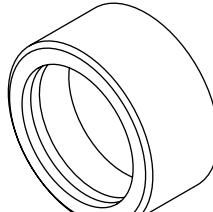
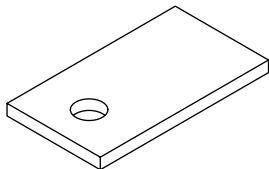
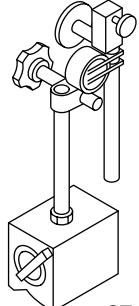
## General Description

### AUTOMATIC TRANSMISSION

| ILLUSTRATION  | TOOL NUMBER | DESCRIPTION            | REMARKS   |
|---|-------------|------------------------|---|
| <br>ST-498277200   | 498277200   | STOPPER SET            | <ul style="list-style-type: none"> <li>Used for removing and installing automatic transmission assembly to engine.</li> <li>Used for preventing the torque converter from falling.</li> </ul>   |
| <br>ST41099AA010   | 41099AA010  | ENGINE SUPPORT BRACKET | Used for supporting engine.   |
| <br>ST41099AA020  | 41099AA020  | ENGINE SUPPORT         | Used for supporting engine.   |
| <br>ST-398527700 | 398527700   | PULLER ASSY            | <ul style="list-style-type: none"> <li>Used for removing the extension case roller bearing.</li> <li>Used for removing the extension oil seal.</li> <li>Used for removing the front differential side retainer bearing outer race.</li> <li>Used for removing the front differential side retainer oil seal.</li> </ul> |
| <br>ST-498057300 | 498057300   | INSTALLER              | Used for installing the extension oil seal.   |

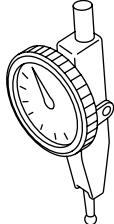
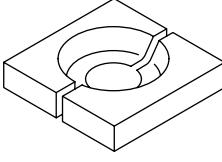
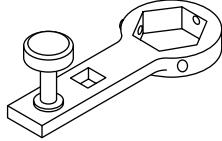
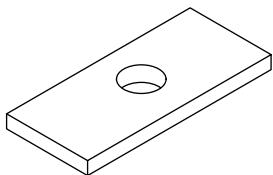
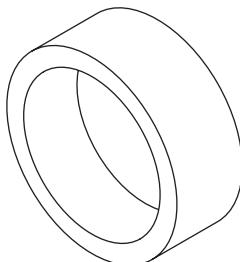
## General Description

AUTOMATIC TRANSMISSION

| ILLUSTRATION  | TOOL NUMBER | DESCRIPTION           | REMARKS   |
|---|-------------|-----------------------|---|
| <br>ST-498077000   | 498077000   | REMOVER               | Used for removing the differential taper roller bearing.  |
| <br>ST18630AA010   | 18630AA010  | WRENCH COMPL RETAINER | Used for removing and installing the differential side retainer.  |
| <br>ST-398487700  | 398487700   | DRIFT                 | Used for installing the front differential taper roller bearing.  |
| <br>ST-498255400 | 498255400   | PLATE                 | Used for measuring the backlash of hypoid gear.   |
| <br>ST-498247001 | 498247001   | MAGNET BASE           | <ul style="list-style-type: none"> <li>Used for measuring the gear backlash.</li> <li>Used together with the DIAL GAUGE (498247100).</li> </ul> |

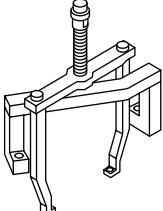
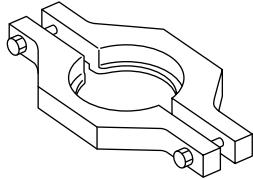
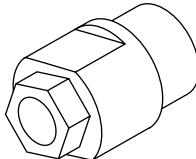
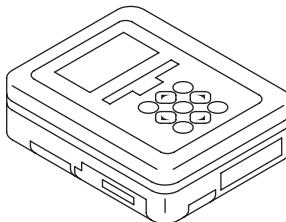
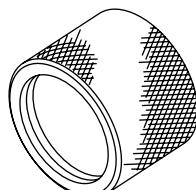
## General Description

### AUTOMATIC TRANSMISSION

| ILLUSTRATION   | TOOL NUMBER | DESCRIPTION  | REMARKS  |
|--|-------------|--------------|--|
|  ST-498247100   | 498247100   | DIAL GAUGE   | <ul style="list-style-type: none"> <li>Used for measuring the gear backlash.</li> <li>Used together with the MAGNET BASE (498247001).</li> </ul> |
|  ST-498517000   | 498517000   | REPLACER     | Used for removing the front roller bearing.  |
|  ST-499787700 | 499787700   | WRENCH       | Used for removing and installing the drive pinion lock nut.  |
|  ST-398643600 | 398643600   | GAUGE        | Used for measuring the total end play, extension end play and drive pinion height.   |
|  ST-398744300 | 398744300   | PISTON GUIDE | Used for measuring height from mating surface of the main case to pressure plate.  |

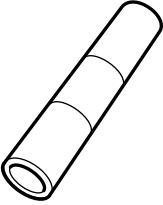
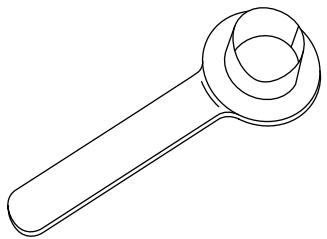
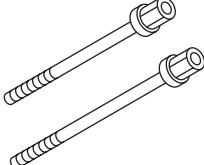
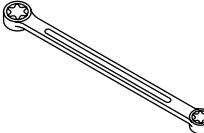
## General Description

AUTOMATIC TRANSMISSION

| ILLUSTRATION  | TOOL NUMBER | DESCRIPTION                          | REMARKS   |
|---|-------------|--------------------------------------|---|
| <br>ST-499737100   | 499737100   | PULLER SET                           | Used for removing the reduction driven gear assembly.   |
| <br>ST-498077600   | 498077600   | REMOVER                              | Used for removing the ball bearing.   |
| <br>ST18667AA010 | 18667AA010  | HOLDER                               | <ul style="list-style-type: none"> <li>Used for removing and installing the drive pinion lock nut.</li> <li>Used as a handle to rotate gear when checking tooth contact.</li> </ul> |
| <br>ST1B020XU0   | 1B020XU0    | SUBARU SELECT MONITOR KIT            | Used for troubleshooting the electrical system.   |
| <br>ST18675AA000 | 18675AA000  | DIFFERENTIAL SIDE OIL SEAL INSTALLER | Used for installing the differential side retainer oil seal.  |

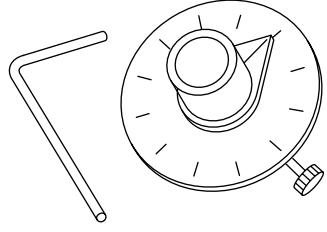
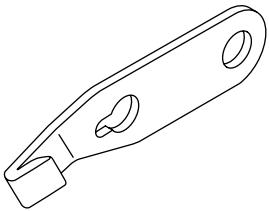
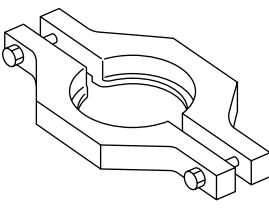
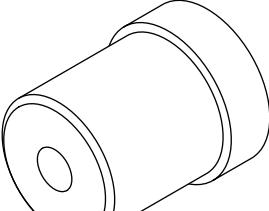
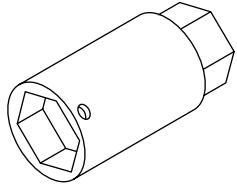
## General Description

### AUTOMATIC TRANSMISSION

| ILLUSTRATION  | TOOL NUMBER | DESCRIPTION        | REMARKS   |
|---|-------------|--------------------|---|
| <br>ST18654AA000   | 18654AA000  | INSTALLER          | Used for removing and installing the ball bearing.                |
| <br>ST28399SA010   | 28399SA010  | OIL SEAL PROTECTOR | Used for protecting oil seal when installing front drive shaft.   |
| <br>ST18763AA000  | 18763AA000  | COMPRESSOR SHAFT   | Used for disassembling multi-plate clutch for shift transmission. |
| <br>ST18765AA000 | 18765AA000  | COMPRESSOR SUPPORT | Used for disassembling multi-plate clutch for shift transmission. |
| <br>ST18676AA020 | 18676AA020  | TORX® WRENCH       | Used for disassembling torque converter case.                     |

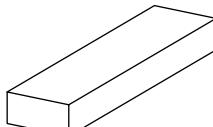
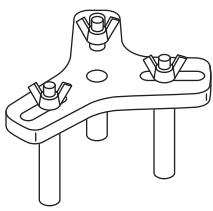
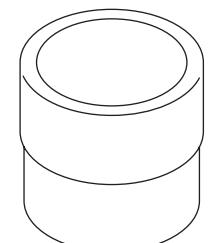
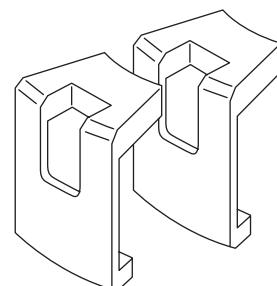
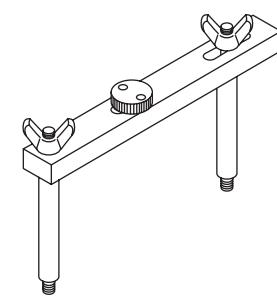
## General Description

AUTOMATIC TRANSMISSION

| ILLUSTRATION  | TOOL NUMBER | DESCRIPTION        | REMARKS  |
|---|-------------|--------------------|--|
| <br>ST18854AA000   | 18854AA000  | ANGLE GAUGE        | <ul style="list-style-type: none"> <li>Used for tightening parking support.</li> <li>Used for installing the drive plate.</li> </ul> |
| <br>ST-498497100   | 498497100   | CRANKSHAFT STOPPER | Used for stopping the drive plate rotation when removing and installing the drive plate.   |
| <br>ST-498077300  | 498077300   | REMOVER            | Used for removing ball bearing of reduction driven gear.   |
| <br>ST-499587100 | 499587100   | OIL SEAL INSTALLER | Used for installing the oil seal.  |
| <br>ST-499787500 | 499787500   | ADAPTER            | Used for removing and installing drive pinion lock nut.  |

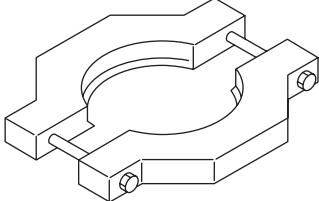
## General Description

### AUTOMATIC TRANSMISSION

| ILLUSTRATION  | TOOL NUMBER | DESCRIPTION             | REMARKS   |
|---|-------------|-------------------------|---|
| <br>ST-499575400   | 499575400   | GAUGE                   | Used for measuring height of total end play.                      |
| <br>ST18762AA000   | 18762AA000  | COMPRESSOR SPECIAL TOOL | Used for disassembling multi-plate clutch for shift transmission. |
| <br>ST-499755602  | 499755602   | PRESS                   | Used for installing the parking gear.                             |
| <br>ST18680AA010 | 18680AA010  | HOLDER GEAR             | Used for removing reduction driven gear assembly. (2-piece set)   |
| <br>ST18766AA000 | 18766AA000  | SUPPORT PULLER          | Used for removing reduction driven gear assembly.                 |

# General Description

AUTOMATIC TRANSMISSION

| ILLUSTRATION  | TOOL NUMBER | DESCRIPTION | REMARKS  |
|---|-------------|-------------|--|
| <br>ST18767AA000 | 18767AA000  | REMOVER     | <ul style="list-style-type: none"><li>Used to pull out the parking gear.</li><li>Used to pull out the bearing from the VTD assembly.</li></ul> |

## 2. GENERAL TOOL

| TOOL NAME        | REMARKS  |
|------------------|--|
| Depth gauge      | Used for measuring the transmission end play.                      |
| Thickness gauge  | Used for measuring clearance of the clutch, brake and oil pump.    |
| Micrometer       | Used for measuring thickness of the drive pinion.                  |
| Spring scale     | Used for measuring the starting torque of the drive pinion.        |
| Circuit tester   | Used for measuring resistance and voltage.                         |
| TORX® T70        | Used for removing and installing differential gear oil drain plug. |
| Snap ring pliers | Used for removing and installing each snap ring.                   |