

# General Description

## POWER ASSISTED SYSTEM (POWER STEERING)

### 1. General Description

#### A: SPECIFICATION

|  |  |              |  |
|--|--|--------------|--|
| Whole system                             | Minimum turning radius m (ft)                  |              | 5.7 (18.7)   |
|  | Steering angle                                 | Inner wheel  | 37.0°±1.5°   |
|  |  | Outer wheel  | 32.0°±1.5  |
|  | Steering wheel diameter mm (in)                |              | 375 (14.76)  |
|  | Lock to lock turn                              |              | 3.44   |
| Gearbox                                  | Type   |              | Rack and Pinion, Integral                              |
|  | Backlash                                       |              | 0 (Automatic adjusting)                                |
|  | Valve (Power steering system)                  |              | Rotary valve   |
| Pump<br>(Power steering system)          | Type   |              | Vane pump  |
|  | Oil tank                                       |              | Installed on body                                      |
|  | Specific output cm <sup>3</sup> (cu in)/rev.   |              | 9.6 (0.586)  |
|  | Relief pressure kPa (kg/cm <sup>2</sup> , psi) |              | 8,800 — 9,400<br>(90 — 96, 1,276 — 1,363)              |
|  | Hydraulic fluid control                        |              | Engine speed sensitive                                 |
|  | Hydraulic fluid ℓ (US qt, Imp qt)              |              | 1,000 rpm: 7.0 (7.4, 6.2)<br>3,000 rpm: 6.0 (6.3, 5.3) |
|  | RPM range rpm                                  |              | 500 — 8,600  |
|  | Direction of rotation                          |              | Clockwise  |
| Hydraulic oil<br>(Power steering system) | Capacity ℓ (US qt, Imp qt)                     | Oil tank     | 0.2 (0.2, 0.2)   |
|  |  | Whole system | 0.9 (1.0, 0.8)   |

|  |   |                                 |  |
|--|---|---------------------------------|--|
| Steering wheel                                   | Free play mm (in)   |                                 | 17 (0.67)  |
| Steering shaft                                   | Clearance between the steering wheel and column cover mm (in) |                                 | 3.0 (0.12)   |
| Steering gearbox<br>(Power steering system)      | Sliding resistance N (kgf, lb)                                |                                 | 343 (35, 77) or less<br>Difference between right and left sliding resistance: 20% or less                                  |
|  | Rack shaft play in the radial direction                       | Right-turn steering mm (in)     | 0.4 (0.016) or less  |
|  |   | Left-turn steering mm (in)      | Play in the horizontal direction:<br>0.6 (0.024) or less<br>Play in the vertical direction:<br>0.4 (0.016) or less         |
|  | Input shaft play  | In radial direction mm (in)     | 0.26 (0.0102) or less  |
|  |   | In axial direction mm (in)      | Without play   |
|  | Rotation resistance N (kgf, lb)                               |                                 | Maximum allowable value:<br>10.5 (1.07, 2.36) or less<br>Difference between right and left sliding resistance: 20% or less |
|  |   |                                 |  |
| Oil pump<br>(Power steering system)              | Pulley shaft  | Radial play mm (in)             | 0.2 (0.008) or less  |
|  |   | Axial play mm (in)              | 0.6 (0.024) or less  |
|  | Pulley  | Ditch deflection mm (in)        | 1.0 (0.039) or less  |
|  |   | Rotation resistance N (kgf, lb) | 9.22 (0.94, 2.07) or less  |
|  | Regular pressure (Unloaded) kPa (kg/cm <sup>2</sup> , psi)    |                                 | 981 (10, 142) or less  |
| Steering wheel effort<br>(Power steering system) | At standstill with engine idling on paved road N (kgf, lb)    |                                 | 29.4 (3.0, 6.6) or less  |
|  | At standstill with engine stalled on paved road N (kgf, lb)   |                                 | 294.2 (30, 66.2) or less   |

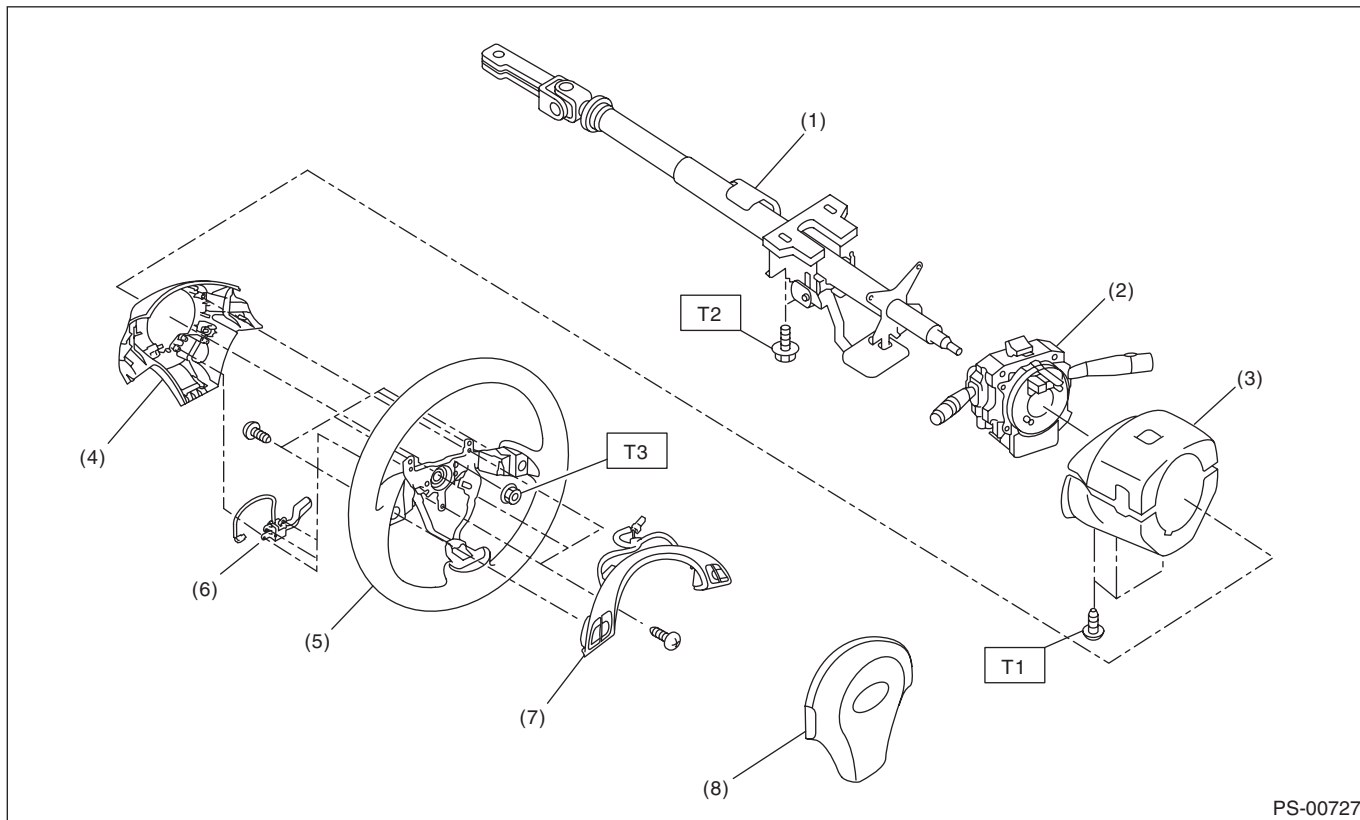
|                                  |
|----------------------------------|
| Recommended power steering fluid |
| SUBARU ATF or ATF DEXRON III     |

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## B: COMPONENT

### 1. STEERING WHEEL AND COLUMN



PS-00727

- |                                |                           |
|--------------------------------|---------------------------|
| (1) Steering shaft             | (5) Steering wheel        |
| (2) Steering roll connector    | (6) Cruise control switch |
| (3) Column cover               | (7) Satellite switch      |
| (4) Steering wheel lower cover | (8) Airbag module         |

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

**T1: 1.2 (0.12, 0.89)**

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

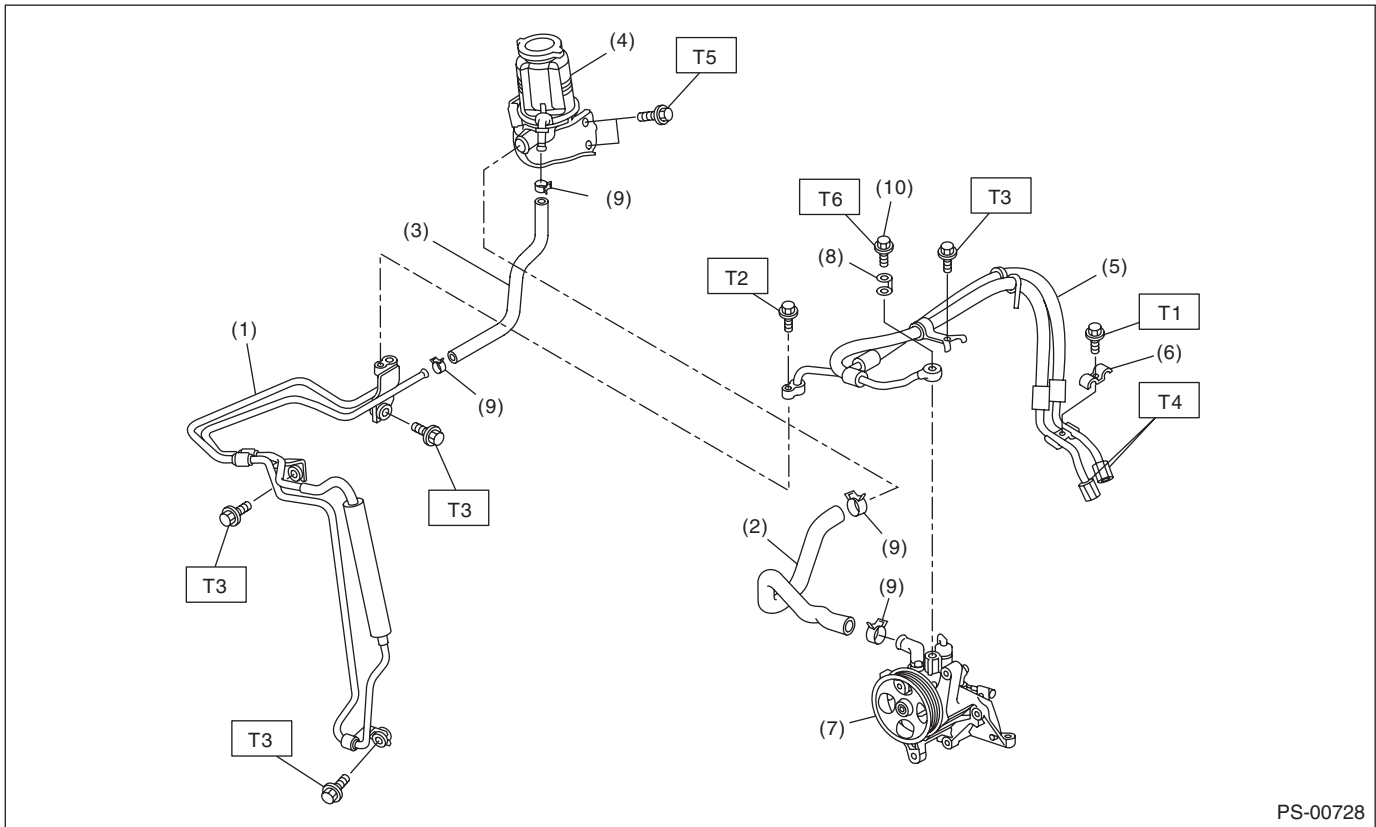
**T3: 45 (4.6, 33.2)**

# General Description

## POWER ASSISTED SYSTEM (POWER STEERING)

### 2. POWER ASSISTED SYSTEM

- Hose and tank



PS-00728

- |                     |                     |
|---------------------|---------------------|
| (1) Oil cooler pipe | (8) Eye bolt gasket |
| (2) Suction hose    | (9) Clip            |
| (3) Return hose     | (10) Eye bolt       |
| (4) Reservoir tank  |                     |
| (5) Hose            |                     |
| (6) Clamp E         |                     |
| (7) Oil pump        |                     |

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

***T1: 8 (0.8, 5.9)***

***T2: 10 (1.0, 7.4)***

***T3: 13 (1.3, 9.6)***

***T4: 15 (1.5, 11.1)***

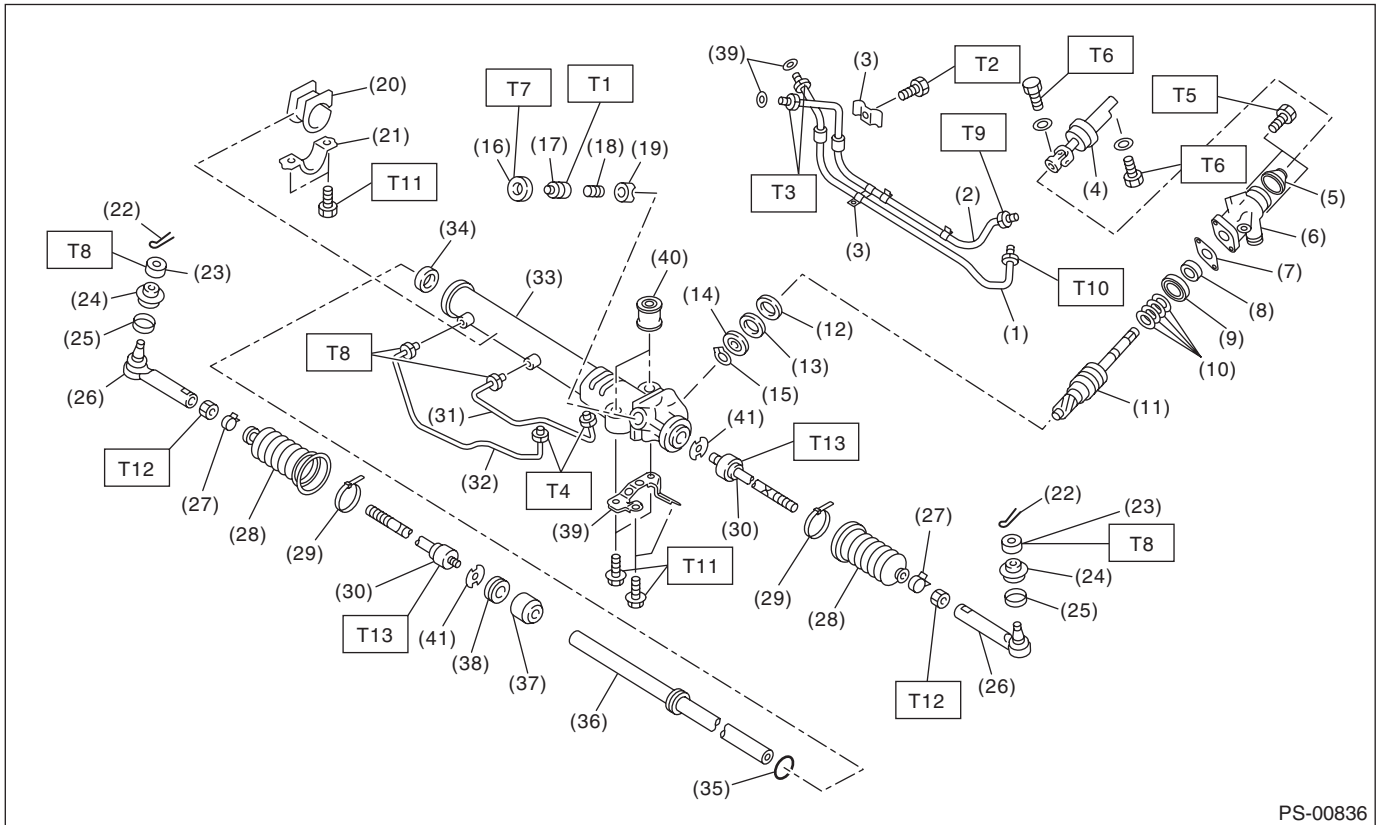
***T5: 33 (3.4, 24.3)***

***T6: 40 (4.1, 29.5)***

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## POWER ASSISTED SYSTEM (POWER STEERING)

### • Gearbox



PS-00836

|                            |                    |                  |
|----------------------------|--------------------|------------------|
| (1) Pipe C                 | (20) Adapter       | (39) Bracket     |
| (2) Pipe D                 | (21) Clamp         | (40) Bushing     |
| (3) Clamp plate            | (22) Cotter pin    | (41) Lock washer |
| (4) Universal joint        | (23) Castle nut    |                  |
| (5) Dust seal              | (24) Dust cover    |                  |
| (6) Valve housing          | (25) Clip          |                  |
| (7) Gasket                 | (26) Tie-rod end   |                  |
| (8) Oil seal               | (27) Clip          |                  |
| (9) Bushing                | (28) Boot          |                  |
| (10) Seal ring             | (29) Band          |                  |
| (11) Pinion and valve ASSY | (30) Tie-rod       |                  |
| (12) Oil seal              | (31) Pipe B        |                  |
| (13) Back-up washer        | (32) Pipe A        |                  |
| (14) Ball bearing          | (33) Steering body |                  |
| (15) Snap ring             | (34) Oil seal      |                  |
| (16) Lock nut              | (35) Piston ring   |                  |
| (17) Adjusting screw       | (36) Rack          |                  |
| (18) Spring                | (37) Rack bushing  |                  |
| (19) Sleeve                | (38) Holder        |                  |

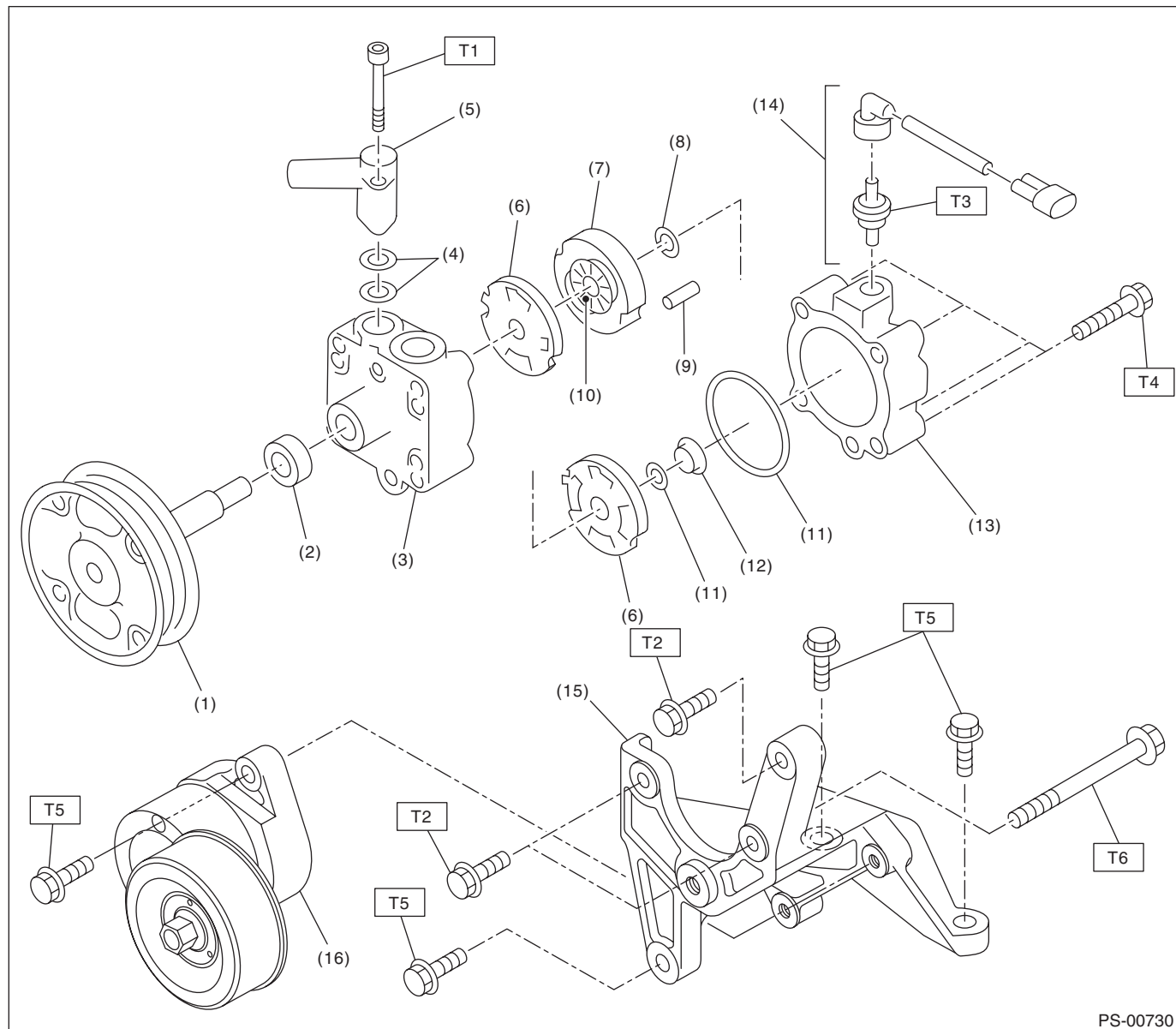
#### **Tightening torque:N·m (kgf-m, ft-lb)**

|                              |
|------------------------------|
| <b>T1: 5.9 (0.6, 4.4)</b>    |
| <b>T2: 9 (0.9, 6.6)</b>      |
| <b>T3: 15 (1.5, 11.1)</b>    |
| <b>T4: 17 (1.7, 12.5)</b>    |
| <b>T5: 20 (2.0, 14.8)</b>    |
| <b>T6: 24 (2.4, 17.7)</b>    |
| <b>T7: 25 (2.5, 18.4)</b>    |
| <b>T8: 27 (2.8, 19.9)</b>    |
| <b>T9: 29 (3.0, 21.4)</b>    |
| <b>T10: 37 (3.8, 27.3)</b>   |
| <b>T11: 60 (6.1, 44.3)</b>   |
| <b>T12: 85 (8.7, 62.7)</b>   |
| <b>T13: 128 (13.1, 94.4)</b> |

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## POWER ASSISTED SYSTEM (POWER STEERING)

### 3. OIL PUMP



PS-00730

- |                    |                     |
|--------------------|---------------------|
| (1) Pulley         | (9) Straight pin    |
| (2) Oil seal       | (10) Rotor          |
| (3) Front casing   | (11) O-ring         |
| (4) O-ring         | (12) Seal ring      |
| (5) Socket         | (13) Rear body      |
| (6) Pressure plate | (14) Connector      |
| (7) Cam ring       | (15) Bracket        |
| (8) Snap ring      | (16) Belt tensioner |

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

***T1: 3.73 (0.38, 2.75)***

***T2: 15.7 (1.6, 11.6)***

***T3: 19.6 (2.0, 14.5)***

***T4: 27.5 (2.8, 20.3)***

***T5: 33 (3.4, 24.3)***

***T6: 36.8 (3.8, 27.1)***

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## C: CAUTION

Please clearly understand and adhere to the following general precautions. They must be strictly followed to avoid any injury to the person doing the work or people in the area.

### 1. OPERATION

- Wear appropriate work clothing, including a cap, protective goggles and protective shoes when performing any work.
- Before removal, installation or disassembly, be sure to clarify the failure. Avoid unnecessary removal, installation, disassembly and replacement.
- Vehicle components are extremely hot after driving. Be wary of receiving burns from heated parts.
- Use SUBARU genuine power steering fluid, grease etc. or the equivalent. Do not mix fluid, 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.
- Before securing a part on a vise, place cushioning material such as wooden blocks, aluminum plate or cloth between the part and the vise.

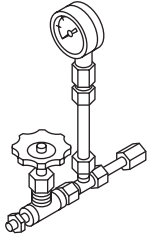
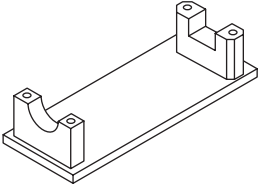
### 2. OIL

When handling oil, follow the rules below to prevent unexpected accidents.

- Prepare container and waste cloths when performing work which oil could possibly spill. If oil spills, wipe it off immediately to prevent from penetrating into floor or flowing outside, for environmental protection.
- Follow all government and local regulations concerning waste disposal.

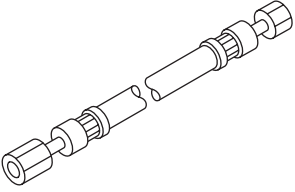
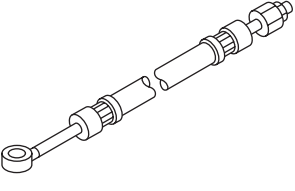
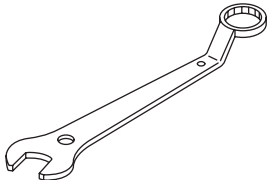
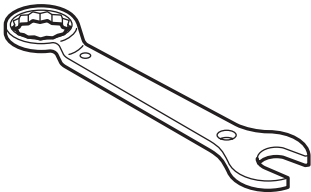
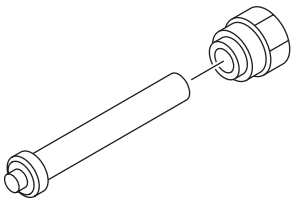
## D: PREPARATION TOOL

### 1. SPECIAL TOOL

| ILLUSTRATION  | TOOL NUMBER | DESCRIPTION    | REMARKS  |
|---|-------------|----------------|--|
| <br>ST-925711000 | 925711000   | PRESSURE GAUGE | Used for measuring oil pressure.   |
| <br>ST-926200000 | 926200000   | STAND          | <ul style="list-style-type: none"><li>• Used when inspecting characteristic of gear-box assembly and disassembling it.</li><li>• Used together with BOSS D (34199AG000).</li></ul> |

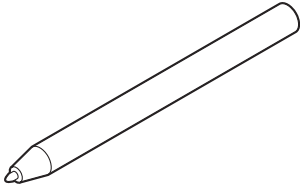
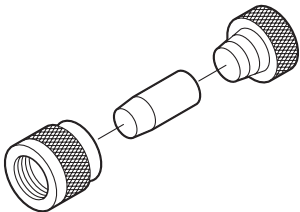
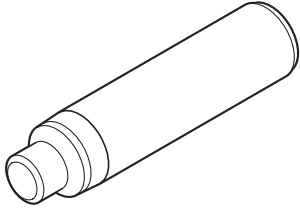
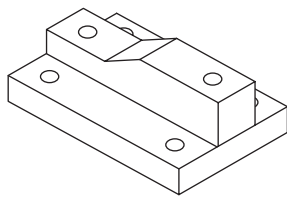
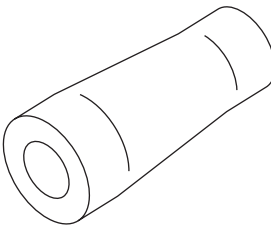
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| ILLUSTRATION  | TOOL NUMBER | DESCRIPTION    | REMARKS   |
|---|-------------|----------------|---|
|  <p style="text-align: center;">ST34099AC010</p>   | 34099AC010  | ADAPTER HOSE A | Used together with PRESSURE GAUGE (925711000).  |
|  <p style="text-align: center;">ST34099AC020</p>   | 34099AC020  | ADAPTER HOSE B | Used together with PRESSURE GAUGE (925711000).  |
|  <p style="text-align: center;">ST-926230000</p>  | 926230000   | SPANNER        | For the lock nut when adjusting backlash of gearbox.  |
|  <p style="text-align: center;">ST34099PA100</p> | 34099PA100  | SPANNER        | Used when measuring the rotating resistance of gearbox assembly.  |
|  <p style="text-align: center;">ST-926420000</p> | 926420000   | PLUG           | When fluid leaks from pinion side of gearbox assembly, remove pipe B from valve housing, attach this tool and check fluid leaking points. |

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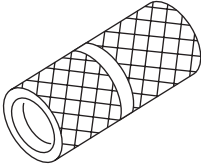
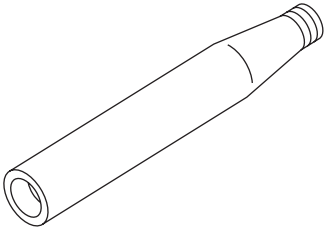
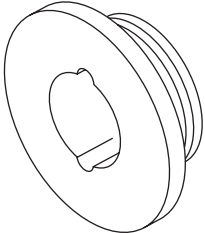
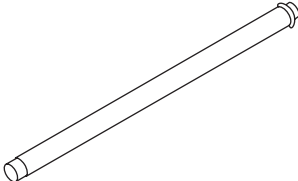
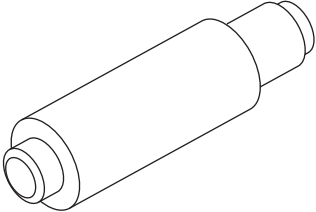
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| ILLUSTRATION  | TOOL NUMBER | DESCRIPTION            | REMARKS   |
|---|-------------|------------------------|---|
|  <p>ST34099FA060</p>   | 34099FA060  | PUNCH HOLDER           | Used for crimping.  |
|  <p>ST34199FE040</p>   | 34199FE040  | INSTALLER A, B, C      | Used for installing the oil seal to the rack assembly.  |
|  <p>ST34199XA030</p>  | 34199XA030  | INSTALLER & REMOVER 44 | Used for removing and installing the rack oil seal (outer and inner).   |
|  <p>ST34199AG000</p> | 34199AG000  | BOSS D                 | <ul style="list-style-type: none"> <li>• Used when inspecting characteristic of gear-box assembly and disassembling it.</li> <li>• Used together with STAND (926200000).</li> </ul> |
|  <p>ST34199XA010</p> | 34199XA010  | GUIDE 44               | Used for installing seal ring of rack.  |



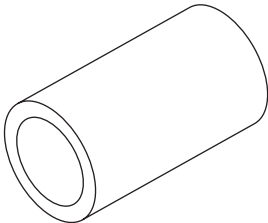
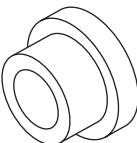
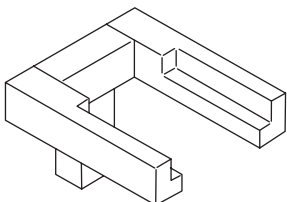
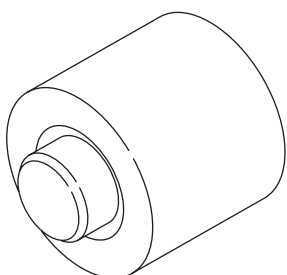
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|---|-------------|---------------------|---|
|  <p style="text-align: center;">ST34199AG070</p>   | 34199AG070  | FORMER              | Used for forming seal ring of pinion.   |
|  <p style="text-align: center;">ST34199AG020</p>   | 34199AG020  | GUIDE               | Used for installing seal ring of pinion.  |
|  <p style="text-align: center;">ST34199AG060</p>  | 34199AG060  | GUIDE G (26)        | <ul style="list-style-type: none"> <li>• Used for forming seal ring of rack.</li> <li>• Used with FORMER PISTON (34199XA020).</li> </ul>  |
|  <p style="text-align: center;">ST34199XA060</p> | 34199XA060  | OIL SEAL REMOVER    | Used for removing oil seal.   |
|  <p style="text-align: center;">ST34199AG090</p> | 34199AG090  | INSTALLER & REMOVER | <ul style="list-style-type: none"> <li>• Used for installing oil seal of valve housing.</li> <li>• Used for installing ball bearing of valve housing.</li> <li>• Used for removing oil seal and ball bearing from valve housing.</li> </ul> |

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| ILLUSTRATION  | TOOL NUMBER | DESCRIPTION         | REMARKS  |
|---|-------------|---------------------|--|
| <br>ST34199XA020   | 34199XA020  | FORMER PISTON<br>44 | <ul style="list-style-type: none"> <li>Used for forming seal ring of rack.</li> <li>Used together with GUIDE G (26) (34199AG060).</li> </ul> |
| <br>ST34199XA000   | 34199XA000  | INSTALLER 44        | Used for pressing-fit oil seal of gearbox cylinder.  |
| <br>ST34199AE020  | 34199AE020  | ATTACHMENT          | Used for removing oil pump.  |
| <br>ST34199AE030 | 34199AE030  | INSTALLER           | Used for installing the oil seal to the oil pump.  |