

# 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 (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 (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) 3,000 rpm: 6.0 (6.3, 5.3)
	RPM Range		rpm	500 — 8,600
	Direction of rotation			Clockwise
Hydraulic oil (Power steering system)	Description			ATF DEXRON III or equivalent
	Capacity ℓ (US qt, Imp qt)	Oil tank		0.2 (0.2, 0.2)
		Whole system		0.9 (1.0, 0.8)

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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 (Power steering system)	Sliding resistance		N (kgf, lb)	400 (41, 90) or less Difference between right and left sliding resistance: Less than 20%
	Rack shaft play in the radial direction	Right-turn steering	mm (in)	0.19 (0.0075) or less
		Left-turn steering	mm (in)	Horizontal movement: 0.6 (0.024) or less Vertical movement: 0.4 (0.016) or less
	Input shaft play	In radial direction	mm (in)	0.18 (0.0071) or less
		In axial direction	mm (in)	0.5 (0.0197) or less
	Rotation resistance		N (kgf, lb)	Maximum allowable value: 10.5 (1.07, 2.36) or less Difference between right and left sliding resistance: Less than 20%
Oil pump (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 (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

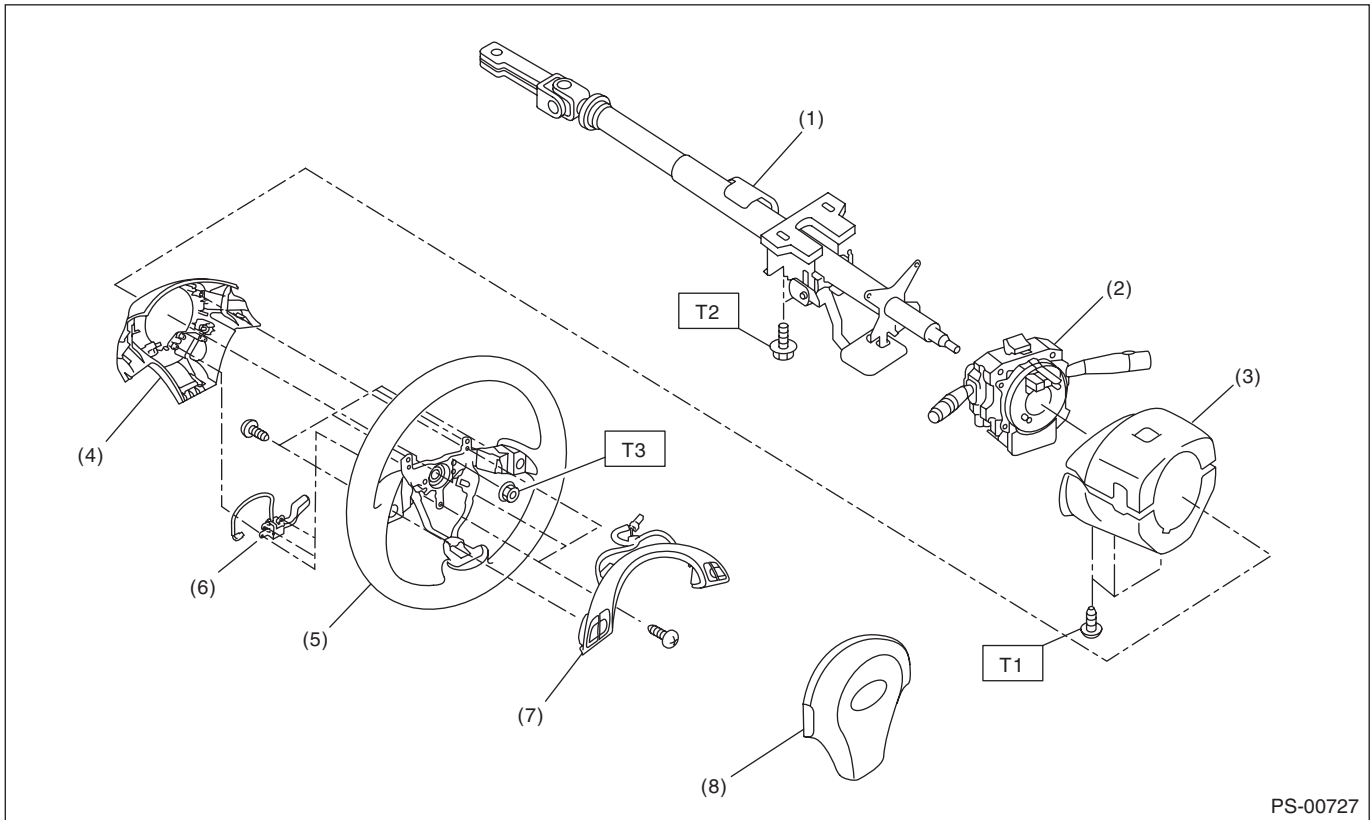
Recommended power steering fluid	Manufacturer
ATF DEXRON III or equivalent	B.P.
	CALTEX
	CASTROL
	MOBIL
	SHELL
	TEXACO

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## POWER ASSISTED SYSTEM (POWER STEERING)

### B: COMPONENT

#### 1. STEERING WHEEL AND COLUMN



- |                                |                           |
|--------------------------------|---------------------------|
| (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, 0.9)**

**T2: 25 (2.5, 18.1)**

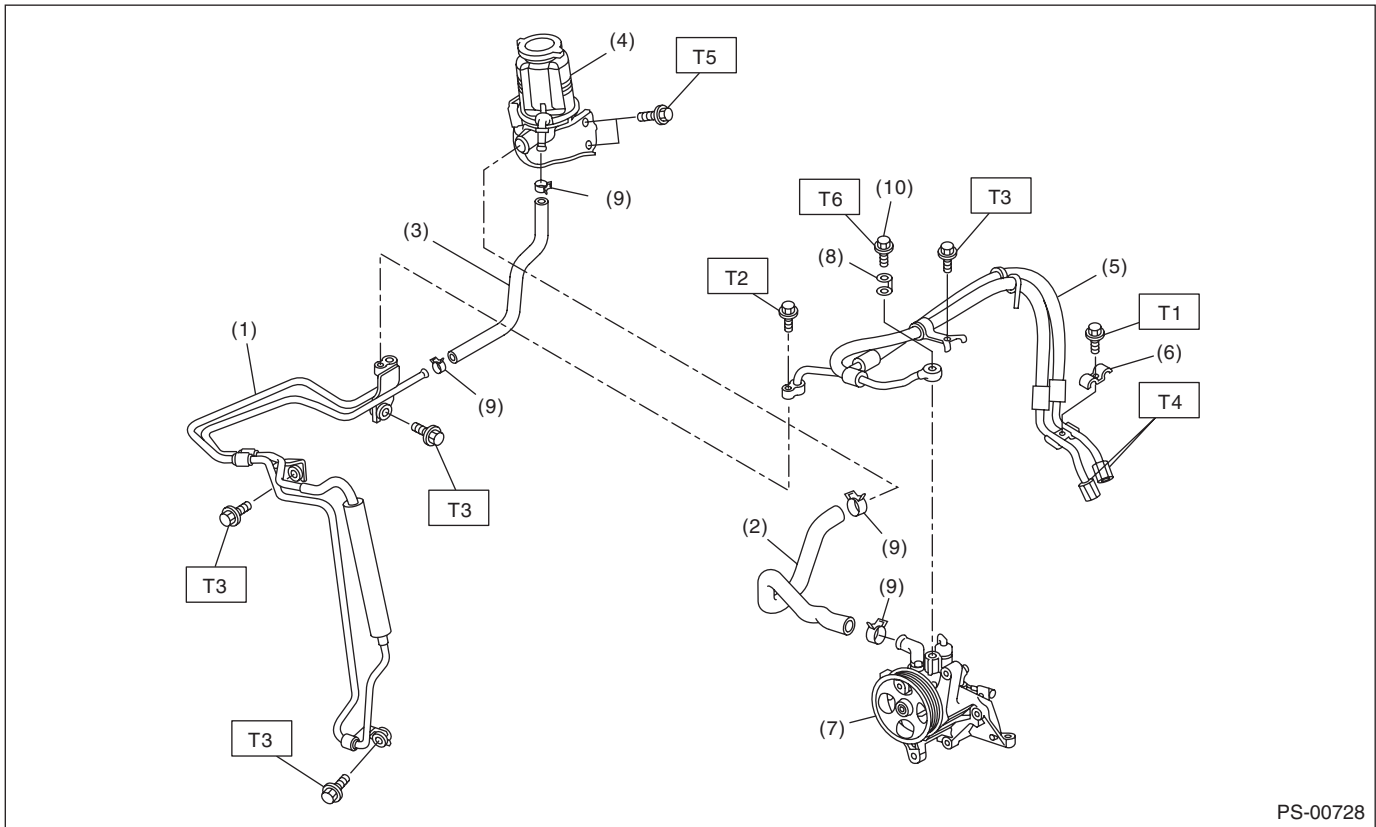
**T3: 45 (4.6, 33.2)**

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### 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 (0.82, 5.9)***

***T2: 10 (1.02, 7.4)***

***T3: 13 (1.32, 9.6)***

***T4: 15 (1.5, 10.8)***

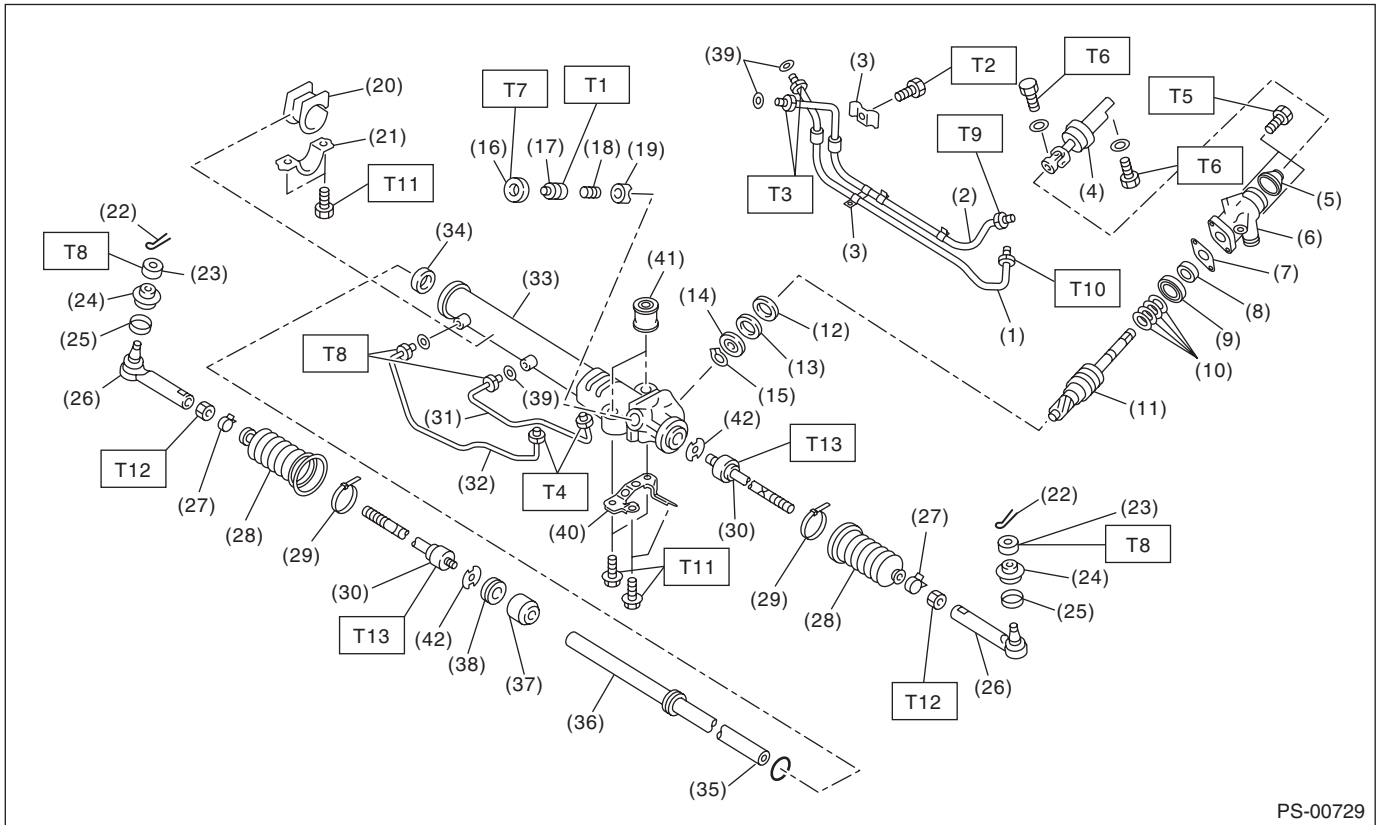
***T5: 33 (3.37, 24.3)***

***T6: 40 (4.08, 29.5)***

# General Description

## POWER ASSISTED SYSTEM (POWER STEERING)

### • Gearbox



PS-00729

(1) Pipe C	(20) Adapter	(39) O-ring
(2) Pipe D	(21) Clamp	(40) Bracket
(3) Clamp plate	(22) Cotter pin	(41) Bushing
(4) Universal joint	(23) Castle nut	(42) Lock washer
(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	

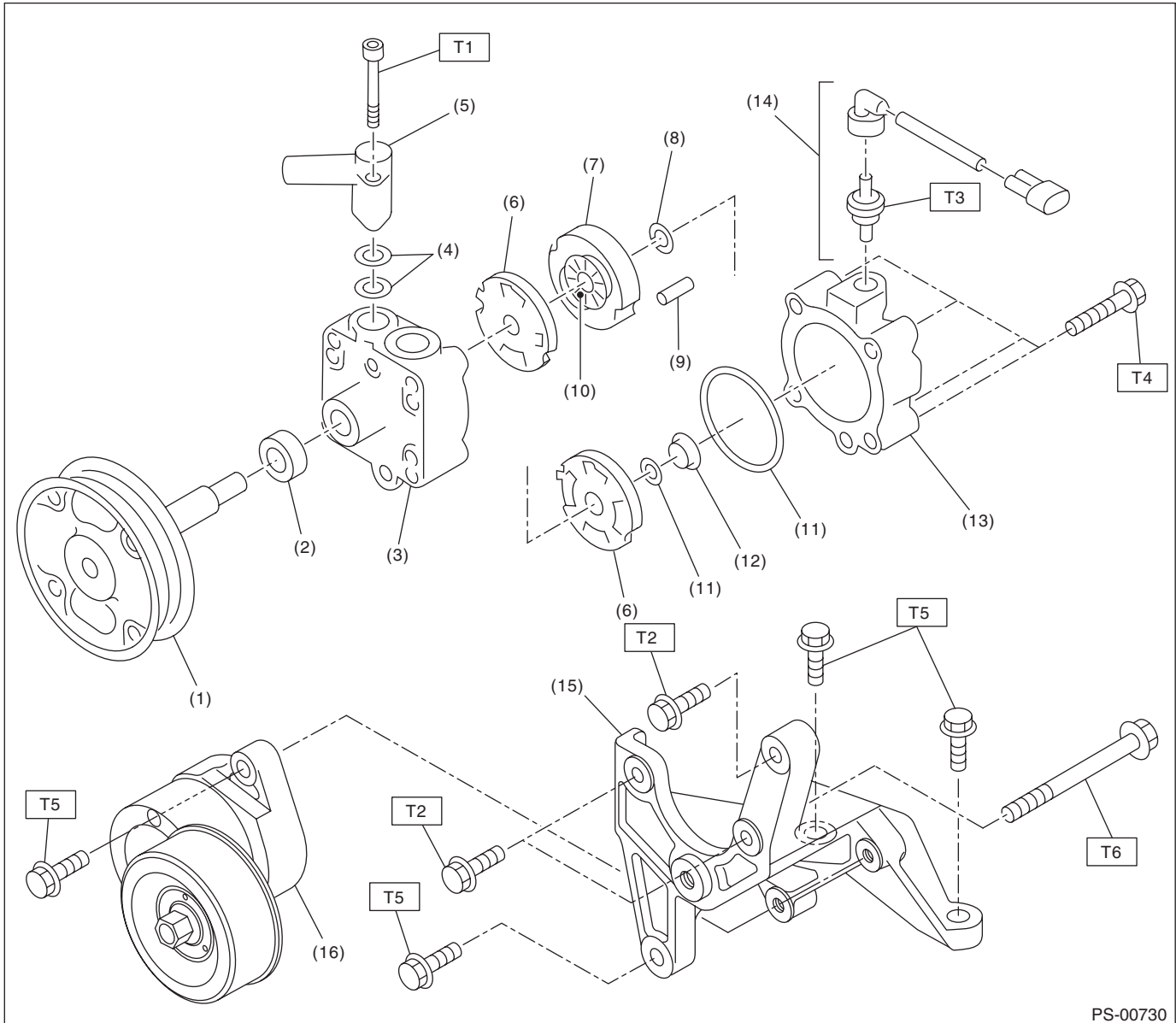
#### **Tightening torque: N·m (kgf-m, ft-lb)**

<b>T1:</b>	<b>3.9 (0.4, 2.9)</b>
<b>T2:</b>	<b>9 (0.9, 6.6)</b>
<b>T3:</b>	<b>15 (1.5, 10.8)</b>
<b>T4:</b>	<b>17 (1.7, 12.5)</b>
<b>T5:</b>	<b>20 (2.0, 14.8)</b>
<b>T6:</b>	<b>24 (2.4, 17.4)</b>
<b>T7:</b>	<b>25 (2.5, 18.1)</b>
<b>T8:</b>	<b>27 (2.75, 19.9)</b>
<b>T9:</b>	<b>29 (3.0, 21.4)</b>
<b>T10:</b>	<b>37 (3.8, 27.3)</b>
<b>T11:</b>	<b>60 (6.1, 44.1)</b>
<b>T12:</b>	<b>85 (8.7, 62.7)</b>
<b>T13:</b>	<b>128 (13.1, 94.4)</b>

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## 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 (3.37, 24.3)**

**T6: 36.8 (3.75, 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.

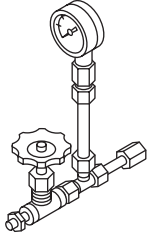
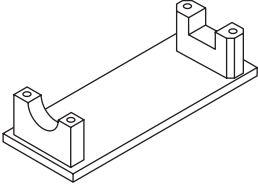
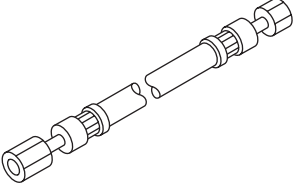
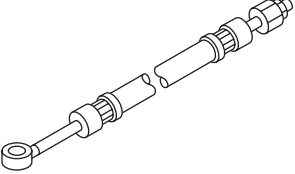
- Prepare container and waste cloths when performing work which oil could possibly spill. If oil spills, wipe it off immediately to prevent from penetrating into floor or flowing outside, for environmental protection.
- Follow all government and local regulations concerning waste disposal.

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## D: PREPARATION TOOL

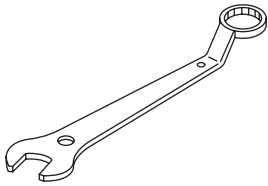
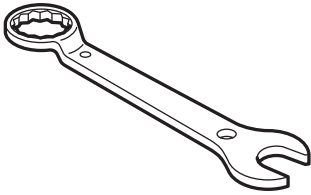
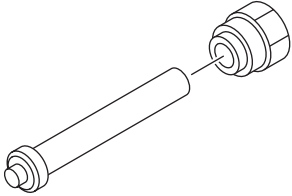
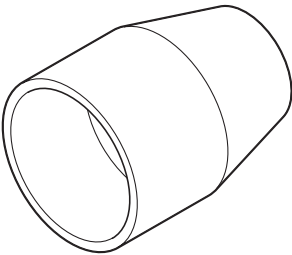
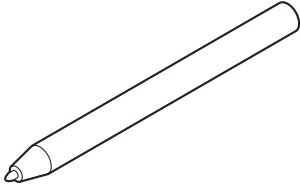
### 1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-925711000	925711000	PRESSURE GAUGE	Used for measuring oil pressure.
 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>
 ST34099AC010	34099AC010	ADAPTER HOSE A	Used together with PRESSURE GAUGE (925711000).
 ST34099AC020	34099AC020	ADAPTER HOSE B	Used together with PRESSURE GAUGE (925711000).



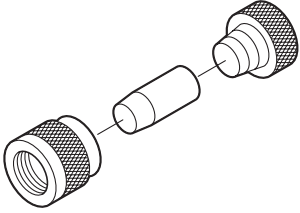
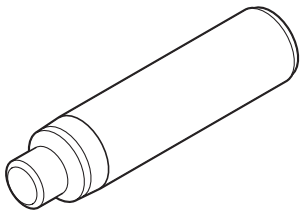
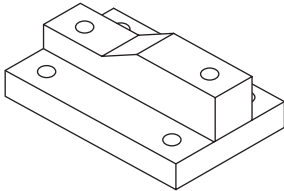
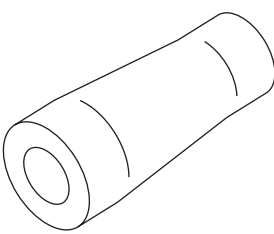
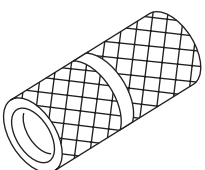
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ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-926230000</p>	926230000	SPANNER	For the lock nut when adjusting backlash of gearbox.
 <p style="text-align: center;">ST34099PA100</p>	34099PA100	SPANNER	Used when measuring 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.
 <p style="text-align: center;">ST-926250000</p>	926250000	GUIDE	Used for installing the holder assembly into the rack housing.
 <p style="text-align: center;">ST34099FA060</p>	34099FA060	PUNCH HOLDER	Used for crimping.

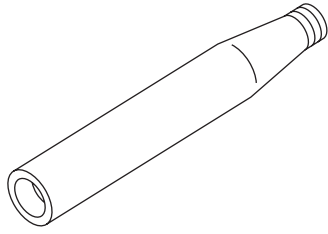
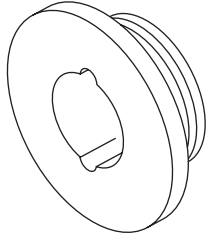
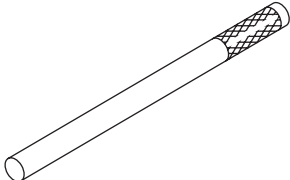
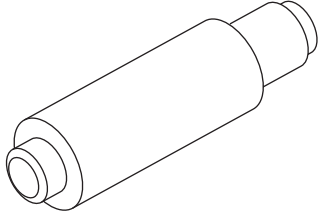
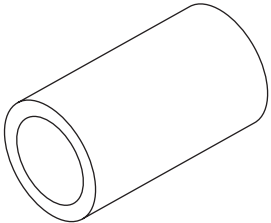
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ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST34199FE040</p>	34199FE040	INSTALLER A, B, C	Used for installing the oil seal to the rack assembly.
 <p>ST34199XA030</p>	34199XA030	INSTALLER & REMOVER 44	Used for removing and installing the rack oil seal (outer & 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.
 <p>ST34199AG070</p>	34199AG070	FORMER	Used for forming seal ring of pinion.

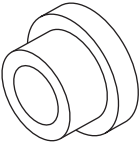
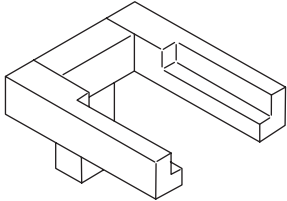
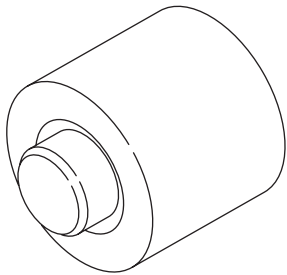
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ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST34199AG020</p>	34199AG020	GUIDE	Used for installing seal ring of pinion.
 <p style="text-align: center;">ST34199AG060</p>	34199AG060	GUIDE G (26)	<ul style="list-style-type: none"> <li>• Used for forming seal ring of rack.</li> <li>• Used together with FORMER PISTON (34199XA020).</li> </ul>
 <p style="text-align: center;">ST34199AE050</p>	34199AE050	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>
 <p style="text-align: center;">ST34199XA020</p>	34199XA020	FORMER PISTON 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>

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 <p>ST34199XA000</p>	34199XA000	INSTALLER 44	Used for pressing-fit oil seal of gearbox cylinder.
 <p>ST34199AE020</p>	34199AE020	MOUNT	Used for removing oil pump.
 <p>ST34199AE030</p>	34199AE030	INSTALLER	Used for installing the oil seal to the oil pump.