

# GENERAL DESCRIPTION

## POWER ASSISTED SYSTEM (POWER STEERING)

### 1. General Description

#### A: SPECIFICATIONS

Model		Pick-up	
		TURBO model	NON-TURBO model
Whole system	Minimum turning radius m (ft)	5.6±0.5 (18.4±1.6)	5.6±0.5 (18.4±1.6)
	Steering angle (Inside — Outside)	34.5°±1.5° — 30.3°±1.5°	34.5°±1.5° — 30.3°±1.5°
	Steering wheel diameter mm (in)	385 (15.16)	
	Overall gear ratio	19.0	
	Turns lock to lock	3.4	3.4
Gearbox	Type	Rack and pinion, Integral	
	Backlash	0 (Automatically adjustable)	
	Valve (Power steering system)	Rotary valve	
Pump (Power steering system)	Type	Vane pump	
	Oil tank	Installed on body	
	Output cm <sup>3</sup> (cu in)/rev.	8.5 — 0.6 (0.582 — 0.037)	7.2 (0.439)
	Relief pressure kPa (kg/cm <sup>2</sup> , psi)	7,846 (80, 1,138)	9,807 (100, 1,422)
	Hydraulic fluid control	Dropping in response to increased engine revolutions	
	Hydraulic fluid ℓ (US qt, Imp qt)	1,000 rpm: 7 (7.4, 6.2) 3,000 rpm: 5 (5.3, 4.4)	1,000 rpm: 7 (7.4, 6.2) 3,000 rpm: 5 (5.3, 4.4)
	Range of revolution	500 — 9,000	
	Revolving direction	Clockwise	
Working fluid (Power steering system)	Name	ATF DEXRON IIE or III	
	Capacity	Oil tank ℓ (US qt, Imp qt)	0.3 (0.3, 0.3)
		Total ℓ (US qt, Imp qt)	0.7 (0.7, 0.6)

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Steering wheel	Free play	mm (in)	17 (0.67)	
Turning angle	Inner tire & wheel		34.5°±1.5°	
	Outer tire & wheel		30.3°±1.5°	
Steering shaft	Clearance between steering wheel and column cover	mm (in)	3.0 (0.118)	
Steering gearbox (Power steering system)	Sliding resistance	N (kgf, lb)	304.0 (31.0, 68.4) or less	
	Rack shaft play in radial direction	Right-turn steering	mm (in)	0.15 (0.0059) or less
		Left-turn steering	mm (in)	Horizontal movement: 0.3 (0.012) or less Vertical movement: 0.15 (0.0059) or less
	Input shaft play	In radial direction	mm (in)	0.18 (0.0071) or less
		In axial direction	mm (in)	0.1 (0.004) or less
	Turning resistance	N (kgf, lb)	Within 30 mm (1.18 in) from rack center in straight ahead position: Less than 11.18 (1.14, 2.51) Maximum allowable value: 12.7 (1.3, 2.9)	

Oil pump (Power steering system)	Pulley shaft	Radial play	mm (in)	0.4 (0.016) or less
		Axial play	mm (in)	0.6 (0.024) or less
	Pulley	Ditch deflection	mm (in)	1.0 (0.039) or less
		Resistance to rotation	N (kgf, lb)	9.22 (0.94, 2.07) or less
	Regular pressure	kPa (kg/cm <sup>2</sup> , psi)	981 (10, 142) or less	
	Relief pressure	kPa (kg/cm <sup>2</sup> , psi)	9,807 (100, 1,422)	

Steering wheel effort (Power steering system)	At standstill with engine idling on a concrete road	N (kgf, lb)	29.4 (3.0, 6.6) or less
	At standstill with engine stalled on a concrete 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

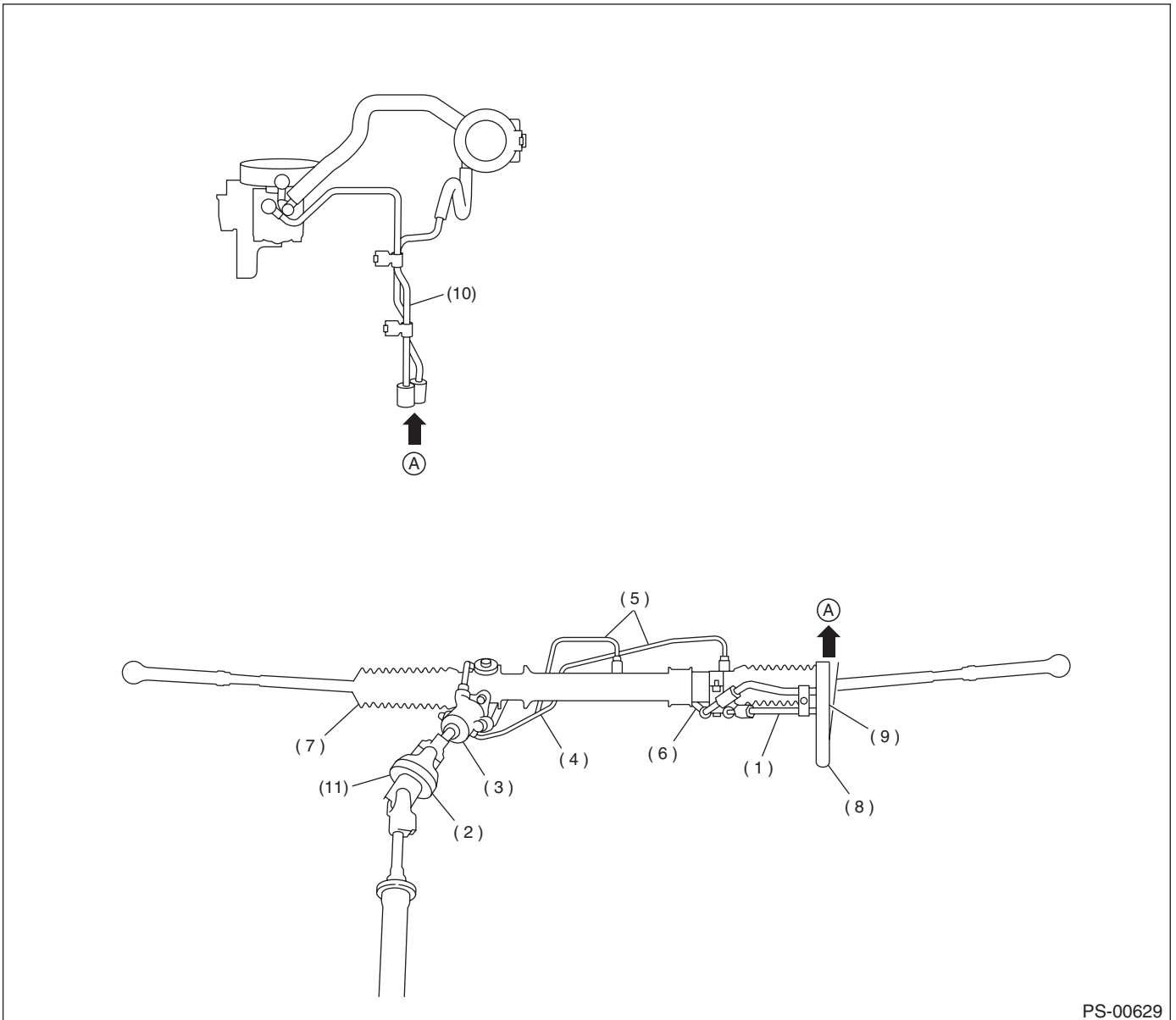
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### CAUTION:

This table lists various clearances that must be correctly adjusted to ensure normal vehicle driving without interfering noise, or any other faults.

Location	Minimum allowance
(1) Crossmember — Pipe	5 mm (0.20 in)
(2) DOJ — Shaft or joint	14 mm (0.55 in)
(3) DOJ — Valve housing	11 mm (0.43 in)
(4) Pipe — Pipe	2 mm (0.08 in)
(5) Stabilizer — Pipe	5 mm (0.20 in)
(6) Exhaust pipe — Pipe	15 mm (0.59 in)
(7) Exhaust pipe — Gearbox boot	15 mm (0.59 in)
(8) Side frame — Hose A and B	15 mm (0.59 in)
(9) Cruise control pump — Hose A and B	15 mm (0.59 in)
(10) Pipe portion of hose A — Pipe portion of hose B	1.5 mm (0.059 in)
(11) AT cooling hose — Joint	20 mm (0.79 in)



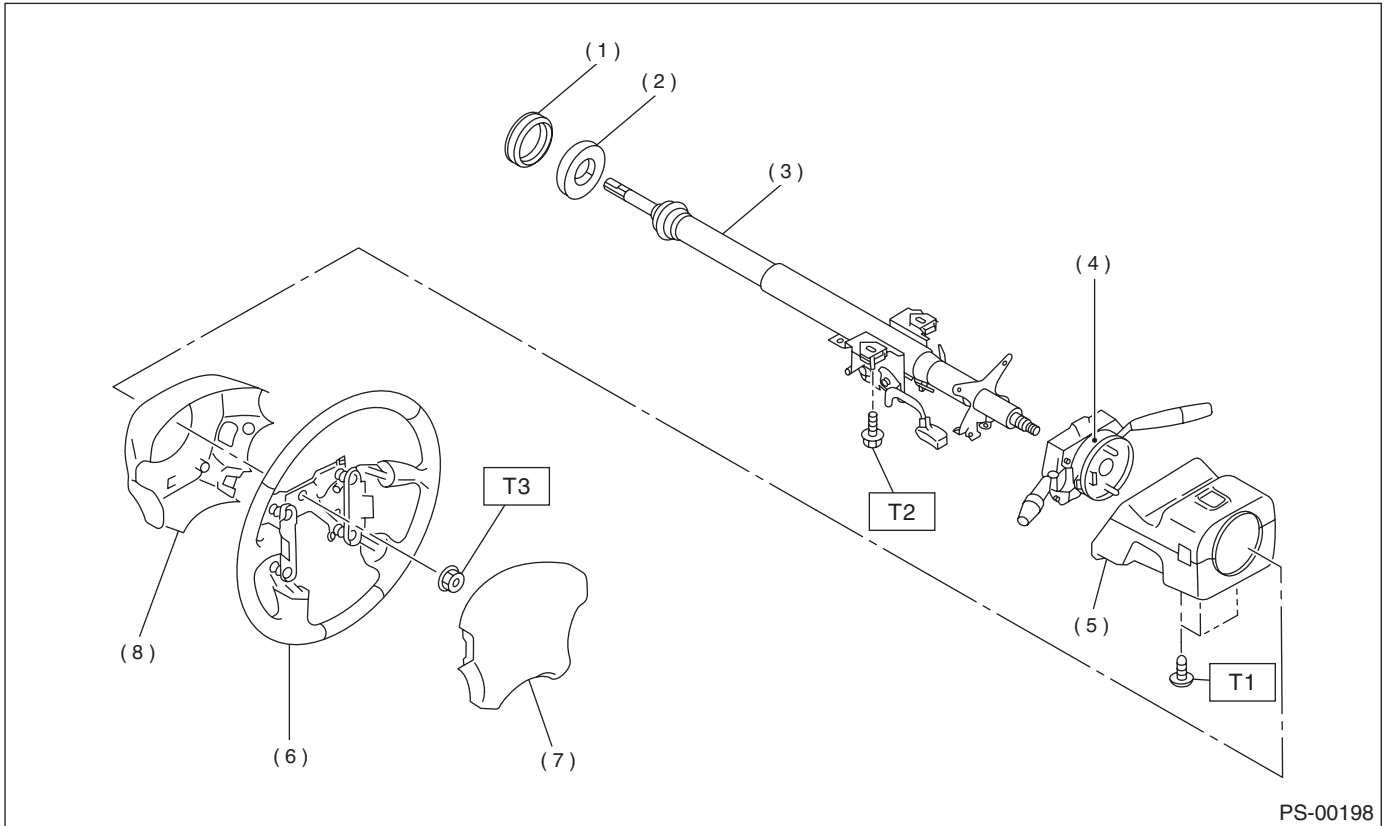
PS-00629

# GENERAL DESCRIPTION

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## B: COMPONENT

### 1. STEERING WHEEL AND COLUMN



PS-00198

- |                             |                                |
|-----------------------------|--------------------------------|
| (1) Bushing                 | (6) Steering wheel             |
| (2) Seal                    | (7) Airbag module              |
| (3) Steering shaft          | (8) Lower steering wheel cover |
| (4) Steering roll connector |                                |
| (5) Column cover            |                                |

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

**T1: 1.2 (0.12, 0.9)**

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

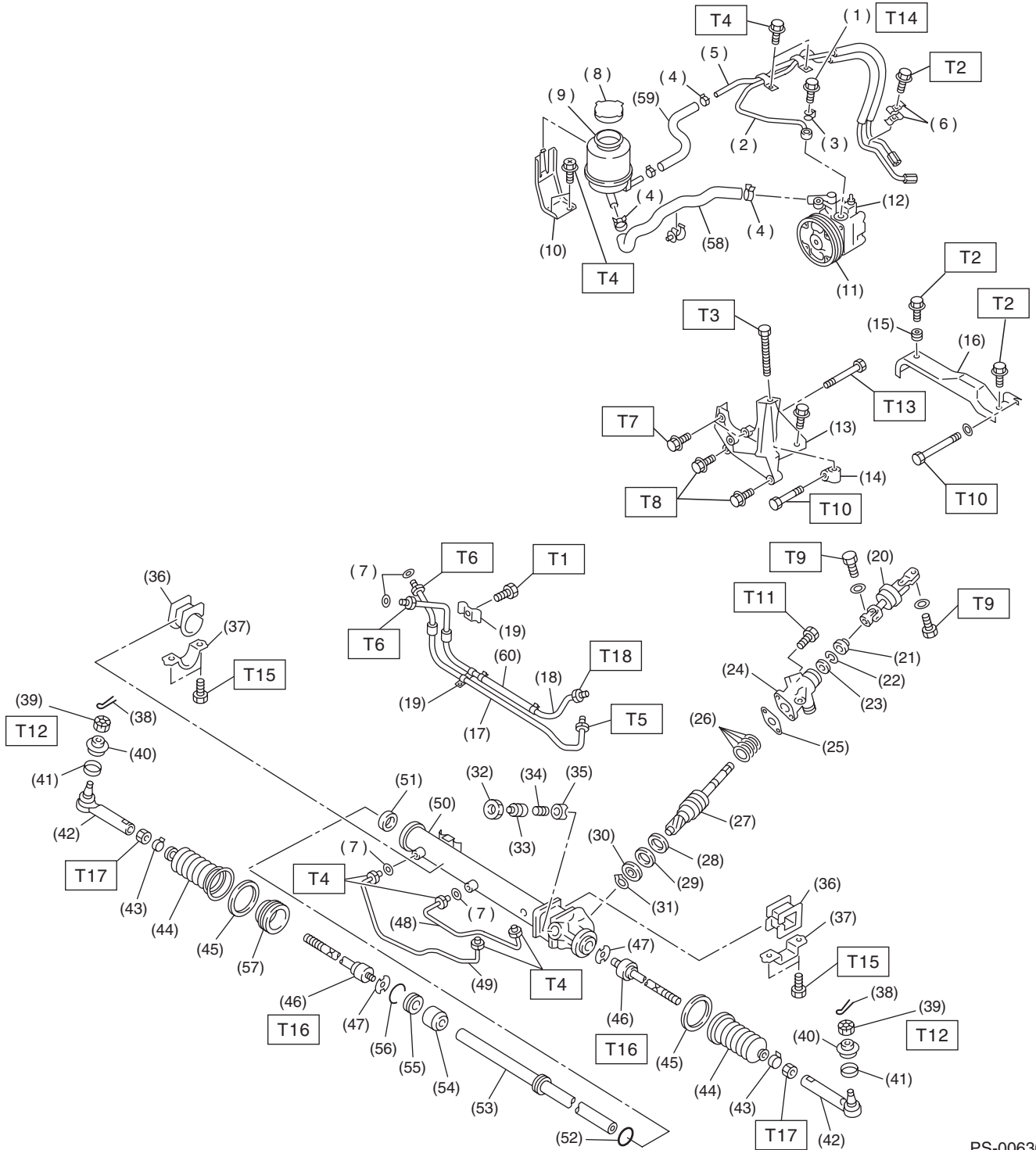
**T3: 44 (4.5, 32.5)**

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## 2. POWER ASSISTED SYSTEM

• Except TURBO model

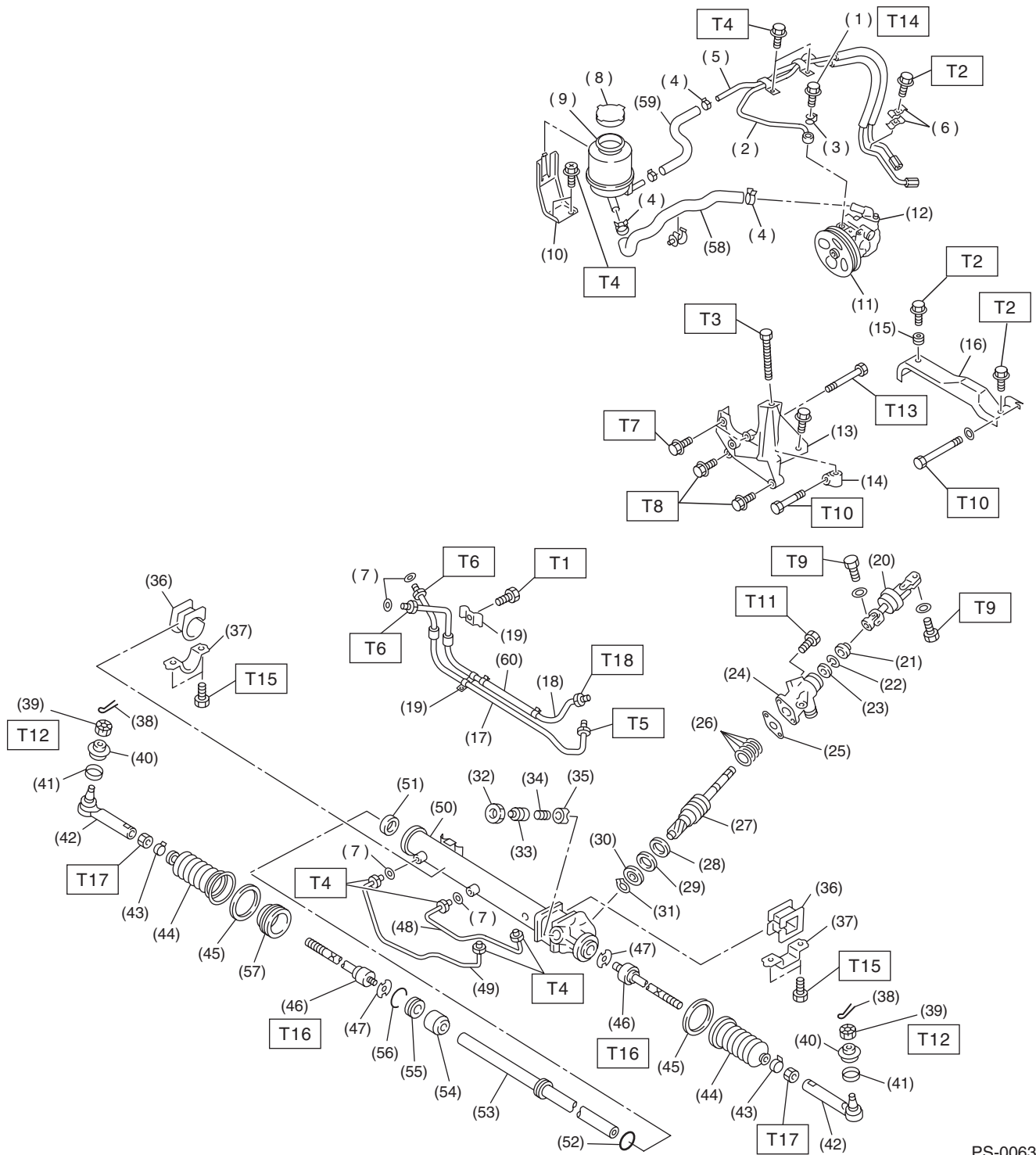


PS-00630

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## POWER ASSISTED SYSTEM (POWER STEERING)

### • TURBO model



PS-00631

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(1) Eye bolt	(29) Back-up washer	(57) Spacer
(2) Pipe C	(30) Ball bearing	(58) Suction hose
(3) Gasket	(31) Snap ring	(59) Return hose
(4) Clip	(32) Lock nut	(60) Hose
(5) Pipe D	(33) Adjusting screw	
(6) Clamp E	(34) Spring	
(7) O-ring	(35) Sleeve	
(8) Cap	(36) Adapter	
(9) Reservoir tank	(37) Clamp	
(10) Reservoir tank bracket	(38) Cotter pin	
(11) Pulley	(39) Castle nut	
(12) Oil pump	(40) Dust cover	
(13) Bracket	(41) Clip	
(14) Belt tension nut	(42) Tie-rod end	
(15) Bushing	(43) Clip	
(16) Belt cover	(44) Boot	
(17) Pipe E	(45) Band	
(18) Pipe F	(46) Tie-rod	
(19) Clamp plate	(47) Lock washer	
(20) Universal joint	(48) Pipe B	
(21) Dust seal	(49) Pipe A	
(22) C-ring	(50) Steering body	
(23) Oil seal	(51) Oil seal	
(24) Valve housing	(52) Piston ring	
(25) Gasket	(53) Rack	
(26) Seal ring	(54) Rack bushing	
(27) Pinion and valve ASSY	(55) Rack stopper	
(28) Oil seal	(56) Circlip	

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**Tightening torque: N·m (kgf·m, ft·lb)****T1: 6 (0.6, 4.3)****T2: 7.4 (0.75, 5.4)****T3: 8 (0.8, 5.8)****T4: 13 (1.3, 9.4)****T5: 15 (1.5, 10.8)****T6: 15 (1.5, 10.8)****T7: 15.7 (1.6, 11.6)****T8: 22 (2.2, 15.9)****T9: 24 (2.4, 17.4)****T10: 24.5 (2.5, 18.1)****T11: 25 (2.5, 18.1)****T12: 27 (2.75, 19.9)****T13: 37.3 (3.8, 27.5)****T14: 39 (4.0, 28.9)****T15: 59 (6.0, 43)****T16: 78 (8.0, 58)****T17: 83 (8.5, 61.5)****T18: 25 (2.5, 18.1)**

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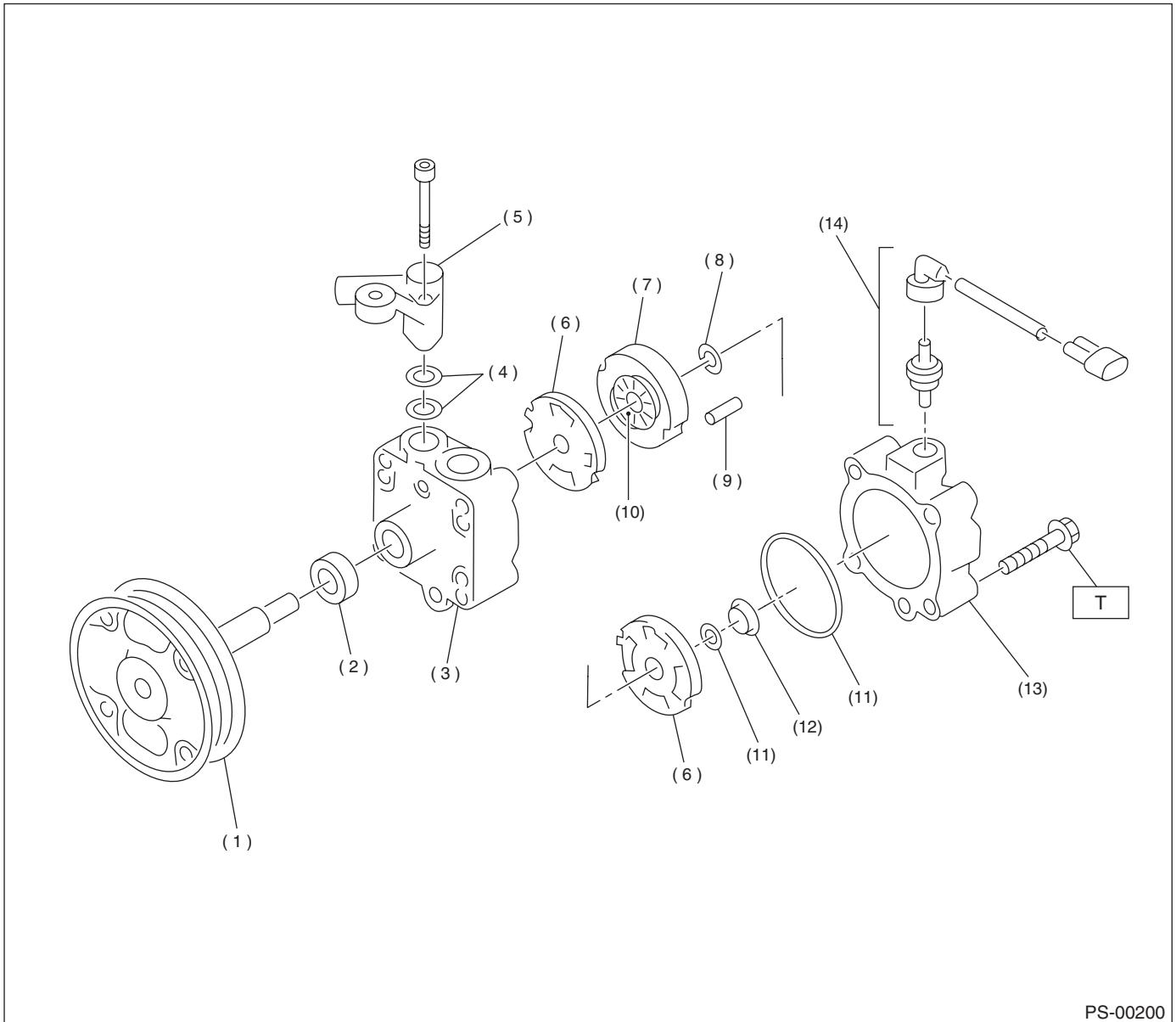
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## 3. OIL PUMP

### NOTE:

The illustration for Non-TURBO model is shown below. (Not shown for TURBO model because it cannot be disassembled.)



PS-00200

- (1) Pulley
- (2) Oil seal
- (3) Front casing
- (4) O-ring
- (5) Socket
- (6) Pressure plate

- (7) Cam ring
- (8) Circlip
- (9) Straight pin
- (10) Rotor
- (11) O-ring
- (12) Seal ring

- (13) Rear body
- (14) Connector

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

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



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#### **C: CAUTION**

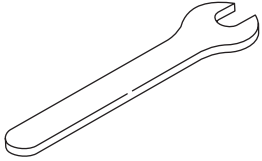
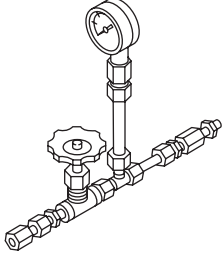
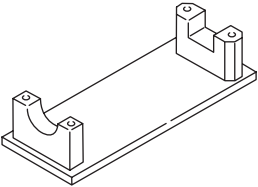
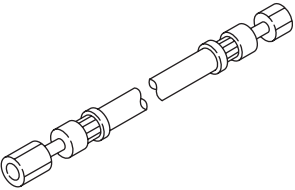
- This section includes Airbag related repair works. For those corresponding to the repair procedures, read carefully CAUTION items in AB section before working and be sure to follow the instructions.
- Wear working clothing, including a cap, protective goggles, and protective shoes during operation.
- Remove contamination including dirt and corrosion before removal, installation or disassembly.
- Keep the disassembled parts in order and protect them from dust or dirt.
- Before removal, installation or disassembly, be sure to clarify the failure. Avoid unnecessary removal, installation, disassembly and replacement.
- Be careful not to burn your hands, because each part on the vehicle is hot after running.
- Use SUBARU genuine steering fluid, grease etc. or the equivalent. Do not mix steering fluid, grease etc. with that of another grade or from other manufacturers.
- Be sure to tighten fasteners including bolts and nuts to the specified torque.
- Place shop jacks or safety stands at the specified points.
- Apply steering fluid onto sliding or revolution surfaces before installation.
- Before installing O-rings or snap rings, apply sufficient amount of steering fluid to avoid damage and deformation.
- Before securing a part on a vise, place cushioning material such as wood blocks, aluminum plate, or shop cloth between the part and the vise.

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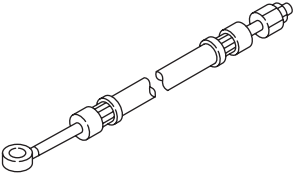
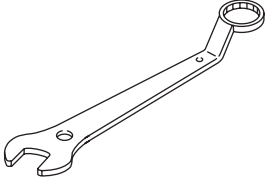
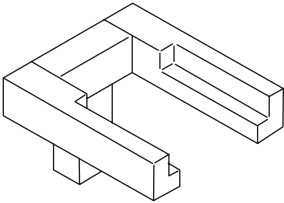
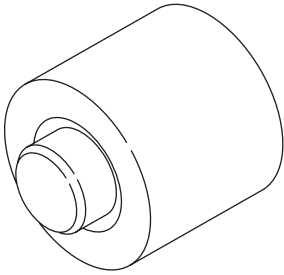
## D: PREPARATION TOOL

### 1. SPECIAL TOOLS

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST-925700000</p>	925700000	WRENCH	<ul style="list-style-type: none"> <li>Used for removing and installing tie-rod.</li> <li>Apply this tool to rack.</li> </ul>
 <p>ST-925711000</p>	925711000	PRESSURE GAUGE	Used for measuring oil pump pressure.
 <p>ST-926200000</p>	926200000	STAND	Used when inspecting characteristic of gearbox assembly and disassembling it.
 <p>ST34099AC010</p>	34099AC010	ADAPTER HOSE A	Used with PRESSURE GAUGE (925711000).

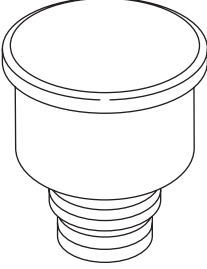
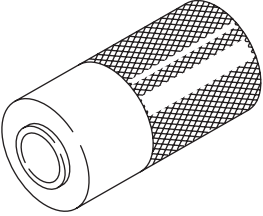
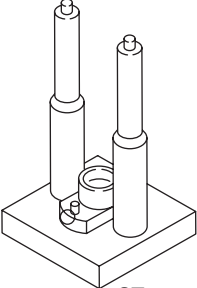
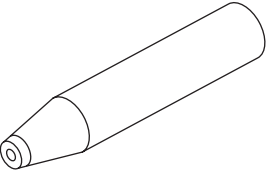
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ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST34099AC020</p>	34099AC020	ADAPTER HOSE B	Used with PRESSURE GAUGE (925711000).
 <p style="text-align: center;">ST-926230000</p>	926230000	SPANNER	<ul style="list-style-type: none"> <li>• For the lock nut when adjusting backlash of gearbox.</li> <li>• Measurement of rotating resistance of gearbox assembly.</li> </ul>
 <p style="text-align: center;">ST34199AE020</p>	34199AE020	MOUNT	Used for disassembling oil pump.
 <p style="text-align: center;">ST34199AE030</p>	34199AE030	INSTALLER	Used for installing oil seal into oil pump.

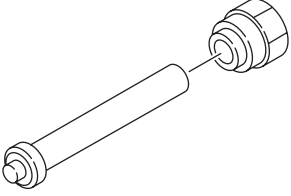
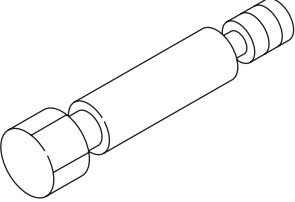
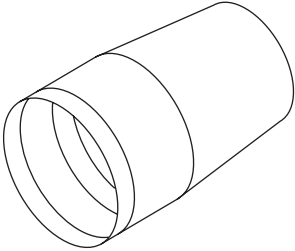
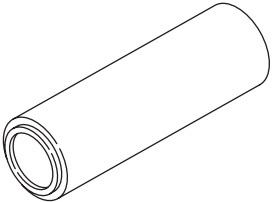
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ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST34199AE040</p>	34199AE040	OIL CHARGE GUIDE	Used for charging power steering oil.
 <p style="text-align: center;">ST-927640000</p>	927640000	INSTALLER B	Used for installing ball bearing into housing.
 <p style="text-align: center;">ST-926370000</p>	926370000	INSTALLER A	<ul style="list-style-type: none"> <li>• Used for installing valve assembly into valve housing assembly.</li> <li>• Used with STAND BASE (927630000).</li> </ul>
 <p style="text-align: center;">ST-926390001</p>	926390001	COVER & REMOVER ASSY	Used for assembling rack assembly.

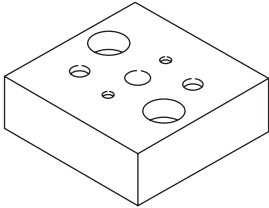
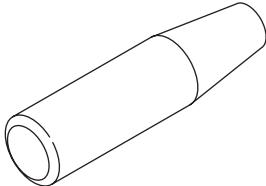
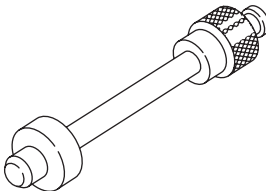
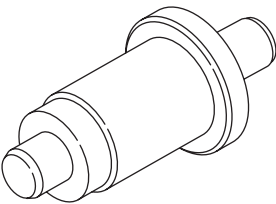
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ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-926420000</p>	926420000	PLUG	<p>When oil leaks from pinion side of gearbox assembly, remove pipe B from valve housing, attach this tool and check oil leaking points.</p>
 <p style="text-align: center;">ST-926400000</p>	926400000	GUIDE	<ul style="list-style-type: none"> <li>• Right side of rack when installing rack bushing.</li> <li>• Used with GUIDE (927660000).</li> </ul>
 <p style="text-align: center;">ST-927660000</p>	927660000	GUIDE	<ul style="list-style-type: none"> <li>• Right side of rack when installing rack bushing.</li> <li>• Used with GUIDE (926400000).</li> </ul>
 <p style="text-align: center;">ST-927620000</p>	927620000	INSTALLER B	<ul style="list-style-type: none"> <li>• Used for installing oil seal of valve housing.</li> <li>• Used with INSTALLER A (926360000).</li> </ul>

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ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p data-bbox="334 570 474 595">ST-927630000</p>	927630000	STAND BASE	Used for assembling power steering gearbox.
 <p data-bbox="334 974 474 1000">ST-926360000</p>	926360000	INSTALLER A	<ul data-bbox="974 638 1409 693" style="list-style-type: none"> <li>• Used as a guide to install oil seal.</li> <li>• Used with INSTALLER B (927620000).</li> </ul>
 <p data-bbox="324 1383 474 1408">ST34199AE060</p>	34199AE060	INSTALLER	Used for installing oil seal.
 <p data-bbox="334 1791 474 1817">ST-927610000</p>	927610000	INSTALLER & REMOVER SEAL	Used for installing valve housing oil seal.

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### 2. GENERAL PURPOSE TOOLS

TOOL NAME	REMARKS
Spring scale	Used for measuring tightening torque.
Snap ring pliers	Used for removing and installing snap ring.
Dial gauge	Used for measuring steering gearbox.