

General Description

LUBRICATION

1. General Description

A: SPECIFICATION

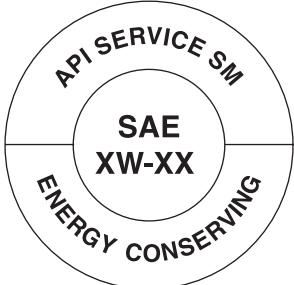
- Non-turbo model

Lubrication method				Forced lubrication	
Oil pump	Pump type				
	Number of teeth	Inner rotor		9	
		Outer rotor		10	
	Outer rotor diameter × thickness			mm (in) 76 × 10 (2.99 × 0.39)	
	Tip clearance between inner and outer rotors		mm (in)	0.04 — 0.14 (0.0016 — 0.0055)	
	Case clearance between outer rotor and pump case		mm (in)	0.10 — 0.175 (0.0039 — 0.0069)	
	Side clearance between inner rotor and pump case		mm (in)	0.02 — 0.07 (0.0008 — 0.0028)	
	Relief valve spring	Free length		mm (in) 73.7 (2.902)	
		Installed length		mm (in) 54.7 (2.154)	
		Load when installed		N (kgf, lbf) 93.1 (9.49, 20.93)	
Oil filter	Performance (Oil temperature 80°C (176°F))	600 rpm	Discharge pressure	kPa (kgf/cm ² , psi) 98 (1.0, 14)	
			Discharge rate ℓ (US qt, Imp qt)/min.	4.6 (4.9, 4.0) or more	
		5,000 rpm	Discharge pressure	kPa (kgf/cm ² , psi) 294 (3.0, 43)	
			Discharge rate ℓ (US qt, Imp qt)/min.	47.0 (49.7, 41.4) or more	
	Relief valve working pressure				
			kPa (kgf/cm ² , psi) 588 (6.0, 85)		
			Filter type		
	Filtration area	cm ² (sq in)	Outer diameter: 68 mm (2.68 in) (Black)		
			Outer diameter: 67.4 mm (2.65 in) (Blue)		
Oil pressure switch	By-pass valve opening pressure				
	Outer diameter × width	mm (in)	Outer diameter: 68 mm (2.68 in) (Black)	68 × 65 (2.68 × 2.56)	
			Outer diameter: 67.4 mm (2.65 in) (Blue)	67.4 × 65.3 (2.65 × 2.57)	
	Installation screw specifications				
	Type				
	Operating voltage — power consumption				
Engine oil	Warning light operating pressure		kPa (kgf/cm ² , psi)	14.7 (0.15, 2.1)	
	Proof pressure		kPa (kgf/cm ² , psi)	981 (10, 142) or more	
	Total capacity (at overhaul)		ℓ (US qt, Imp qt)	4.8 (5.1, 4.2)	
	When replacing engine oil and oil filter		ℓ (US qt, Imp qt)	4.2 (4.4, 3.7)	
	When replacing engine oil only		ℓ (US qt, Imp qt)	4.0 (4.2, 3.5)	

Recommended oil:

CAUTION:

It is acceptable to fill an engine with oil of another brand when replacing the oil, but make sure to use following oil specified by Subaru.

Engine oil standard	SAE viscosity No.
 RM-00076 For API standard, oil with SM "Energy Conserving" or SN "Resource Conserving" logo.	5W-30 (synthetic oil)

NOTE:

The proper viscosity oil helps the engine maintain its ideal temperature, and cranking speed increased by reducing viscosity friction in hot condition.

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- Turbo model

Lubrication method				Forced lubrication	
Oil pump	Pump type				
	Number of teeth	Inner rotor		9	
		Outer rotor		10	
	Outer rotor diameter × thickness			mm (in) 78 × 11 (3.07 × 0.43)	
	Tip clearance between inner and outer rotors		mm (in)	Standard 0.04 — 0.14 (0.0016 — 0.0055)	
	Case clearance between outer rotor and pump case		mm (in)	Standard 0.10 — 0.175 (0.0039 — 0.0069)	
	Side clearance between inner rotor and pump case		mm (in)	Standard 0.02 — 0.07 (0.0008 — 0.0028)	
	Relief valve spring	Free length		mm (in) 73.7 (2.902)	
		Installed length		mm (in) 54.7 (2.154)	
		Load when installed		N (kgf, lbf) 93.1 (9.49, 20.93)	
	Performance (Oil temperature 80°C (176°F))	600 rpm	Discharge pressure	kPa (kg/cm ² , psi) 98 (1.0, 14)	
			Discharge rate	ℓ (US qt, Imp qt)/min. 6.4 (6.8, 5.6) or more	
		6,000 rpm	Discharge pressure	kPa (kg/cm ² , psi) 392 (4.0, 56.8)	
			Discharge rate	ℓ (US qt, Imp qt)/min. 63.0 (66.6, 55.4) or more	
	Relief valve working pressure			kPa (kg/cm ² , psi) 538 (5.5, 78)	
Oil filter	Filter type				
	Filtration area	cm ² (sq in)	Outer diameter: 68 mm (2.68 in) (Black)		
			Outer diameter: 67.4 mm (2.65 in) (Blue)		
	By-pass valve opening pressure			kPa (kg/cm ² , psi) 160 (1.63, 23.2)	
	Outer diameter × width	mm (in)	Outer diameter: 68 mm (2.68 in) (Black)		
			Outer diameter: 67.4 mm (2.65 in) (Blue)		
	Installation screw specifications				
Oil pressure switch	Type			Immersed contact point type	
	Operating voltage — power consumption			12 V — 3.4 W or less	
	Warning light operating pressure			kPa (kg/cm ² , psi) 14.7 (0.15, 2.1)	
	Proof pressure			kPa (kg/cm ² , psi) 981 (10, 142) or more	
Engine oil	Total capacity (at overhaul)			ℓ (US qt, Imp qt) 5.2 (5.5, 4.6)	
	When replacing engine oil and oil filter			ℓ (US qt, Imp qt) 4.3 (4.5, 3.8)	
	When replacing engine oil only			ℓ (US qt, Imp qt) 4.0 (4.2, 3.5)	

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Required oil:

CAUTION:

- Use 5W-30 (synthetic oil).
- It is acceptable to fill an engine with oil of another brand when replacing the oil, but make sure to use following oil specified by Subaru.

NOTE:

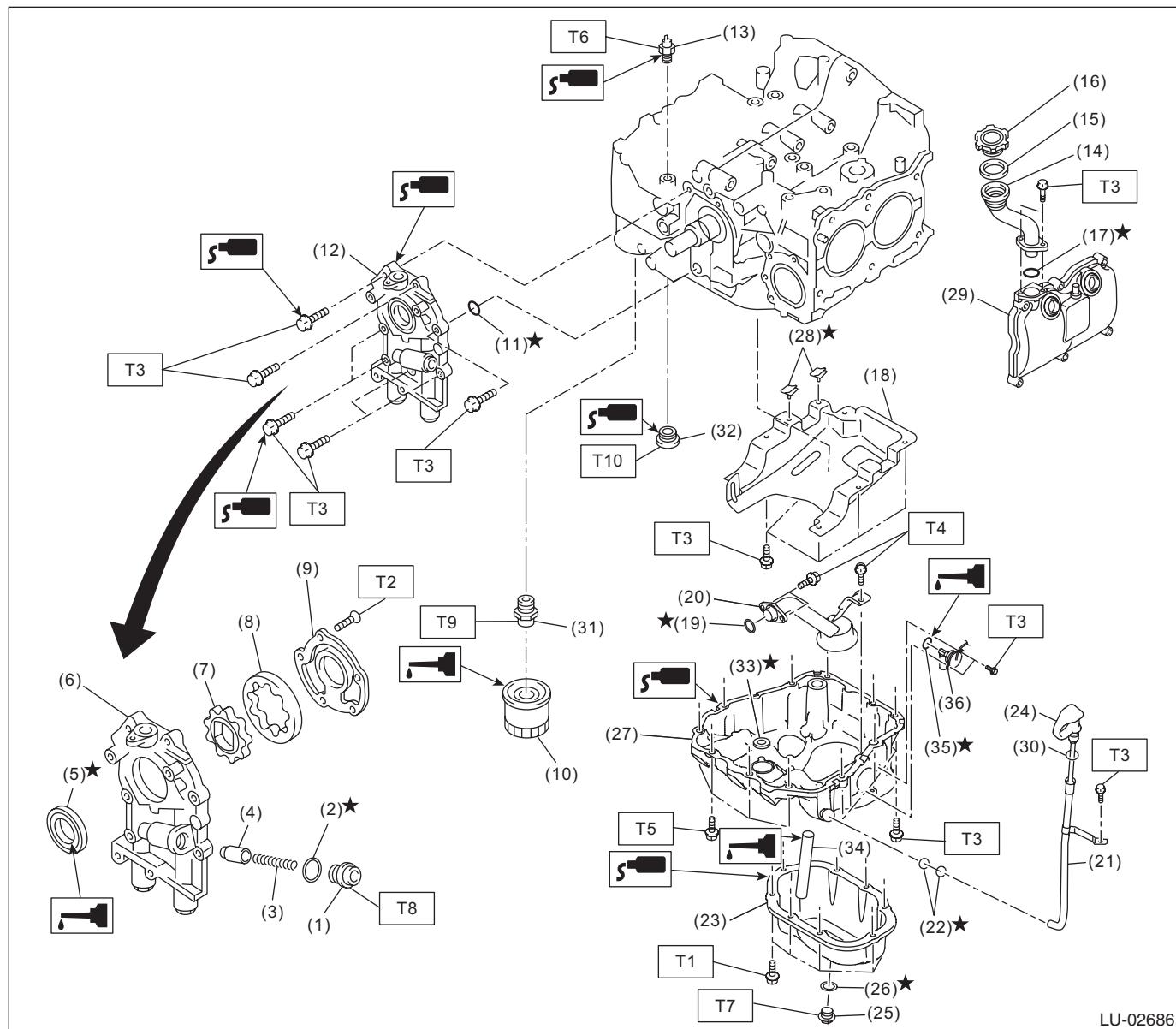
The proper viscosity oil helps the engine maintain its ideal temperature, and cranking speed increased by reducing viscosity friction in hot condition.

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B: COMPONENT

- Non-turbo model



General Description

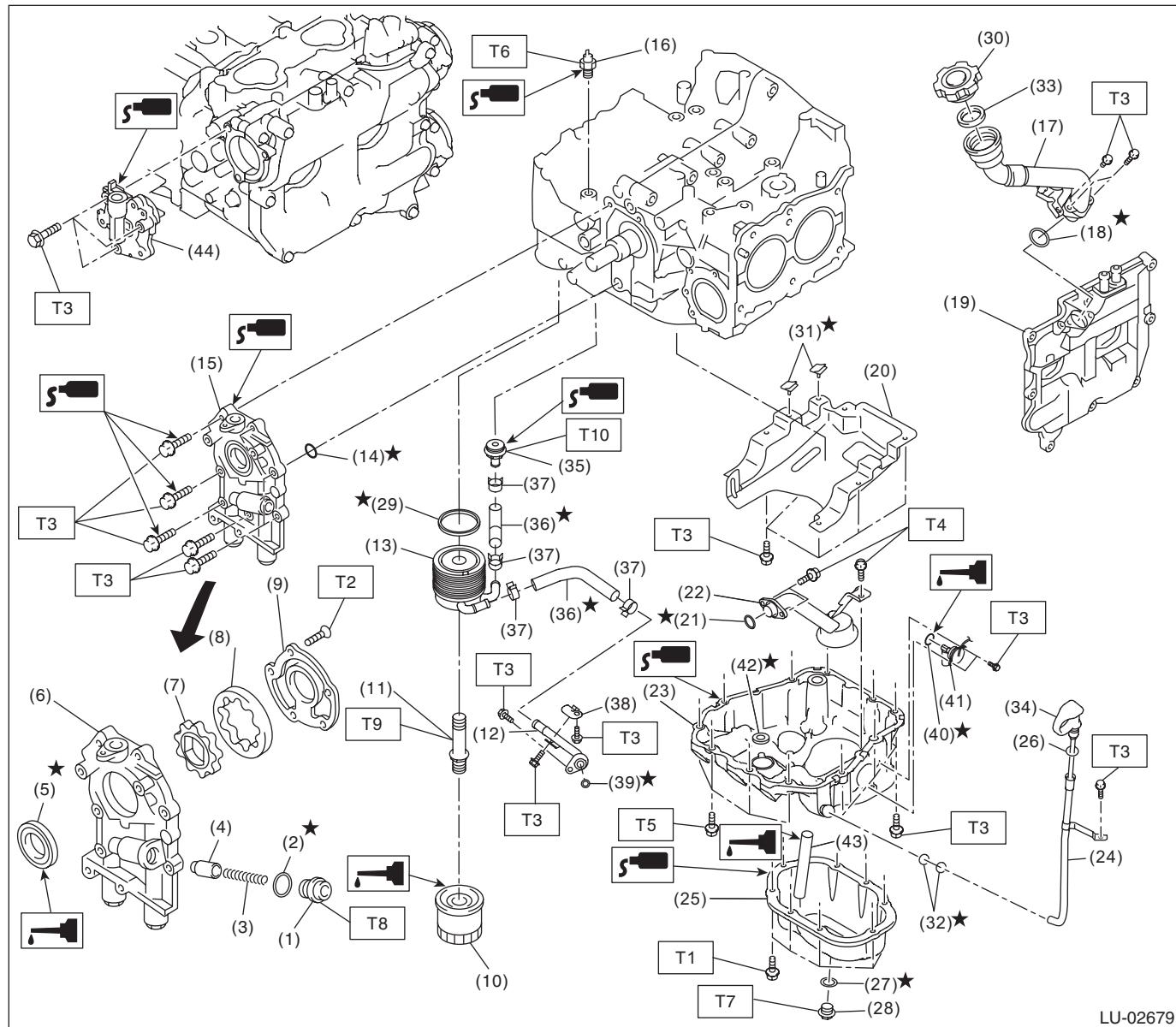
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(1) Plug	(17) O-ring	(33) O-ring
(2) Gasket	(18) Baffle plate	(34) Oil drain pipe
(3) Relief valve spring	(19) O-ring	(35) O-ring
(4) Relief valve	(20) Oil strainer	(36) Oil level switch
(5) Front oil seal	(21) Oil level gauge guide	
(6) Oil pump case	(22) O-ring	
(7) Inner rotor	(23) Oil pan	Tightening torque:N·m (kgf·m, ft-lb)
(8) Outer rotor	(24) Oil level gauge	T1: 5 (0.5, 3.7)
(9) Oil pump cover	(25) Drain plug	T2: 5.4 (0.6, 4.0)
(10) Oil filter	(26) Drain plug gasket	T3: 6.4 (0.7, 4.7)
(11) O-ring	(27) Cylinder block lower	T4: 10 (1.0, 7.4)
(12) Oil pump ASSY	(28) Seal	T5: 16 (1.6, 11.8)
(13) Oil pressure switch	(29) Rocker cover	T6: 25 (2.5, 18.4)
(14) Oil filler duct	(30) O-ring	T7: 41.7 (4.3, 30.8)
(15) Gasket	(31) Oil filter connector	T8: 44 (4.5, 32.5)
(16) Oil filler cap	(32) Plug	T9: 45 (4.6, 33.2)
		T10: 70 (7.1, 51.6)

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- Turbo model



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(1) Plug	(21) O-ring	(41) Oil level switch
(2) Gasket	(22) Oil strainer	(42) O-ring
(3) Relief valve spring	(23) Cylinder block lower	(43) Oil drain pipe
(4) Relief valve	(24) Oil level gauge guide	(44) Scavenge pump
(5) Front oil seal	(25) Oil pan	
(6) Oil pump case	(26) O-ring	
(7) Inner rotor	(27) Drain plug gasket	Tightening torque:N·m (kgf·m, ft·lb)
(8) Outer rotor	(28) Drain plug	T1: 5 (0.5, 3.7)
(9) Oil pump cover	(29) Gasket	T2: 5.4 (0.6, 4.0)
(10) Oil filter	(30) Oil filler cap	T3: 6.4 (0.7, 4.7)
(11) Oil cooler connector	(31) Seal	T4: 10 (1.0, 7.4)
(12) Oil cooler pipe	(32) O-ring	T5: 16 (1.6, 11.8)
(13) Oil cooler	(33) Gasket	T6: 25 (2.5, 18.4)
(14) O-ring	(34) Oil level gauge	T7: 41.7 (4.3, 30.8)
(15) Oil pump ASSY	(35) Plug	T8: 44 (4.5, 32.5)
(16) Oil pressure switch	(36) Oil cooler hose	T9: 54 (5.5, 39.8)
(17) Oil filler duct	(37) Clip	T10: 69 (7.0, 50.9)
(18) O-ring	(38) Oil cooler pipe stay	
(19) Rocker cover	(39) O-ring	
(20) Baffle plate	(40) O-ring	

C: CAUTION

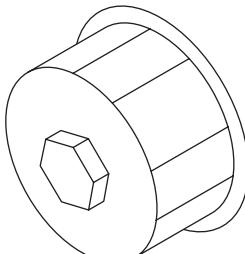
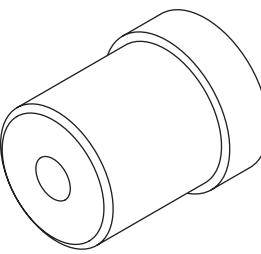
- Wear appropriate work clothing, including a cap, protective goggles and protective shoes when performing any work.
- Remove contamination including dirt and corrosion before removal, installation or disassembly.
- Keep the disassembled parts in order and protect them from dust and dirt.
- Before removal, installation or disassembly, be sure to clarify the failure. Avoid unnecessary removal, installation, disassembly and replacement.
- Vehicle components are extremely hot after driving. Be wary of receiving burns from heated parts.
- Be sure to tighten fasteners including bolts and nuts to the specified torque.
- Place shop jacks or rigid racks at the specified points.
- Before disconnecting connectors of sensors or units, be sure to disconnect the ground cable from battery.
- If the engine oil is spilt over exhaust pipe or the under cover, wipe it off with cloth to avoid emitting smoke or causing a fire.
- Prepare a container and cloth when performing work which oil possibly spills. If oil spills, wipe it off immediately to prevent from penetrating into floor or flowing out for environmental protection.
- Follow all government and local regulations concerning disposal of refuse when disposing of oil.

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D: PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST18332AA000	18332AA000	OIL FILTER WRENCH	Used for removing and installing black oil filter (outer diameter: 68 mm (2.68 in)).
 ST-499587100	499587100	OIL SEAL INSTALLER	Used for installing oil pump oil seal.

2. GENERAL TOOL

TOOL NAME	REMARKS
Oil filter wrench (65/67 mm 14 flutes)	Used for removing and installing blue oil filter (outer diameter: 67.4 mm (2.65 in)).
Circuit tester	Used for measuring resistance and voltage.