

General Description

MECHANICAL

1. General Description

A: SPECIFICATION

Engine	Cylinder arrangement			Horizontally opposed, liquid cooled, 6-cylinder, 4-stroke gasoline engine
	Valve system mechanism			Chain driven, double overhead camshaft, 4-valve/cylinder
	Inside diameter × stroke mm (in)			92 × 91 (3.622 × 3.583)
	Displacement cm ³ (cu in)			3,630 (222)
	Compression ratio			10.5
	Compression pressure (350 rpm and fully open throttle): kPa (kgf/cm ² , psi)			1,275 — 1,471 (13.0 — 15.0, 185 — 213)
	Number of piston rings			Pressure ring: 2, Oil ring: 1
	Intake valve timing	Min. advance	Open	BTDC 40°
			Close	ABDC 24°
		Max. retard	Open	ATDC 10°
			Close	ABDC 74°
	Exhaust valve timing	Min. advance	Open	BBDC 44°
			Close	ATDC 4°
		Max. retard	Open	BBDC 4°
			Close	ATDC 44°
	Valve clearance mm (in)	Intake		0.20 ^{+0.04} _{-0.06} (0.0079 ^{+0.0016} _{-0.0024})
		Exhaust		0.35±0.05 (0.0138±0.0020)
Idle rpm ["P" or "N" range] rpm	No load		700±100	
	A/C ON		805±100	
Ignition order			1 → 6 → 3 → 2 → 5 → 4	
Ignition timing BTDC/rpm			15°±8°/700	

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NOTE:

OS: Oversize

US: Undersize

Camshaft	Bending limit		mm (in)		0.020 (0.00079)		
	Thrust clearance	mm (in)	Intake	Standard	0.075 — 0.135 (0.0030 — 0.0053)		
			Exhaust	Standard	0.075 — 0.135 (0.0030 — 0.0053)		
	Cam lobe height	mm (in)	Intake	Standard	45.90 — 46.00 (1.8071 — 1.8110)		
			Exhaust	Standard	44.65 — 44.75 (1.7579 — 1.7618)		
	Cam base circle diameter	mm (in)	Intake	Standard	36.00 (1.4173)		
			Exhaust	Standard	36.00 (1.4173)		
	Journal O.D.	mm (in)	Front	Standard	37.946 — 37.963 (1.4939 — 1.4946)		
Except for front			Standard	25.946 — 25.963 (1.0215 — 1.0222)			
Oil clearance			mm (in)		Standard	0.037 — 0.072 (0.0015 — 0.0028)	
Cylinder Head	Surface warping limit (mating with cylinder block)			mm (in)		Standard	0.02 (0.0008)
	Inner diameter of valve lifter hole			mm (in)		32.994 — 33.016 (1.2990 — 1.2998)	
	Standard height			mm (in)		124±0.05 (4.88±0.0020)	
Valve seat	Seating angle					90°	
	Contacting width	mm (in)	Intake	Standard	1.0 (0.039)		
			Exhaust	Standard	1.5 (0.059)		
Valve guide	Inside diameter			mm (in)		5.500 — 5.512 (0.2165 — 0.2170)	
	Protrusion above head		Intake	mm (in)		8.6 — 9.0 (0.3386 — 0.3543)	
			Exhaust	mm (in)		10.7 — 11.1 (0.4213 — 0.4370)	
Valve	Head edge thickness	mm (in)	Intake	Standard	1.0 (0.039)		
			Exhaust	Standard	1.2 (0.047)		
	Stem outer diameter	mm (in)	Intake			5.455 — 5.470 (0.2148 — 0.2154)	
			Exhaust			5.445 — 5.460 (0.2144 — 0.2150)	
	Stem oil clearance	mm (in)	Intake	Standard	0.030 — 0.057 (0.0012 — 0.0022)		
			Exhaust	Standard	0.040 — 0.067 (0.0016 — 0.0026)		
	Overall length	mm (in)	Intake			103.5 (4.075)	
			Exhaust			103.2 (4.063)	
Outer diameter of valve lifter			mm (in)		32.959 — 32.975 (1.2976 — 1.2982)		
Valve spring	Free length	mm (in)	Intake			41.51 (1.6342)	
			Exhaust			41.51 (1.6342)	
	Squareness		Intake			2.5°, 1.8 mm (0.071 in)	
			Exhaust			2.5°, 1.8 mm (0.071 in)	
Cylinder block	Standard height			mm (in)		202 (7.95)	
	Surface warping limit (Mating surface with cylinder head)			mm (in)		Standard	0.02 (0.0008)
	Cylinder inner diameter	mm (in)	Standard	A	92.005 — 92.015 (3.6222 — 3.6226)		
				B	91.995 — 92.005 (3.6218 — 3.6222)		
	Cylindricity			mm (in)		Standard	0.030 (0.0012)
	Out-of-roundness			mm (in)		Standard	0.010 (0.0004)
Piston clearance			mm (in)		Standard	−0.010 — 0.010 (−0.0004 — 0.0004)	
Piston	Outer diameter	mm (in)	Standard	A	92.005 — 92.015 (3.6222 — 3.6226)		
				B	91.995 — 92.005 (3.6218 — 3.6222)		
			0.25 (0.0098) OS			92.245 — 92.265 (3.6317 — 3.6325)	
			0.50 (0.0197) OS			92.495 — 92.515 (3.6415 — 3.6423)	
Inner diameter of piston pin hole			mm (in)		Standard	22.000 — 22.006 (0.8661 — 0.8664)	
Piston pin	Outer diameter			mm (in)		Standard	21.994 — 22.000 (0.8659 — 0.8661)
	Standard clearance between piston and piston pin			mm (in)		Standard	0.004 — 0.008 (0.0002 — 0.0003)

ME(H6DO)-3

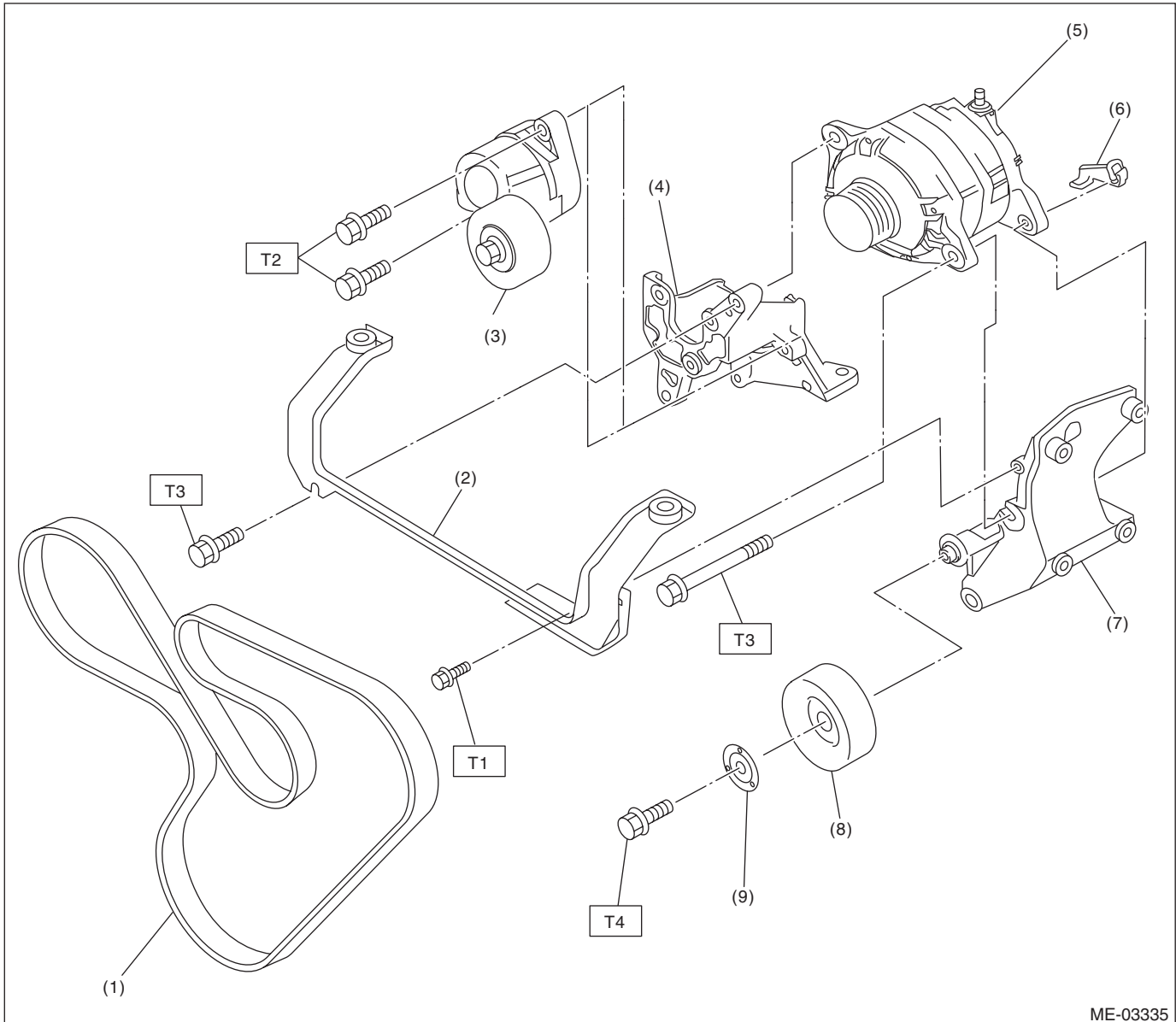
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Piston ring	Ring closed gap	mm (in)	Top ring	Standard	0.20 — 0.25 (0.0079 — 0.0098)	
			Second ring	Standard	0.40 — 0.50 (0.0157 — 0.0197)	
			Oil ring	Standard	0.20 — 0.50 (0.0079 — 0.0197)	
	Ring groove gap	mm (in)	Top ring	Standard	0.040 — 0.080 (0.0016 — 0.0031)	
			Second ring	Standard	0.030 — 0.070 (0.0012 — 0.0028)	
			Oil ring	Standard	0.065 — 0.165 (0.0026 — 0.0065)	
Connecting rod	Thrust clearance			mm (in)	Standard	0.070 — 0.330 (0.0028 — 0.0130)
Bearing of large end	Oil clearance			mm (in)	Standard	0.016 — 0.043 (0.0006 — 0.0017)
	Bearing size (Thickness at center)	mm (in)	Standard		1.489 — 1.505 (0.0586 — 0.0593)	
			0.03 (0.0012) US		1.507 — 1.515 (0.0593 — 0.0596)	
			0.05 (0.0020) US		1.517 — 1.525 (0.0597 — 0.0600)	
			0.25 (0.0098) US		1.617 — 1.625 (0.0637 — 0.0640)	
Bushing of small end	Clearance between piston pin and bushing			mm (in)	Standard	0 — 0.022 (0 — 0.0009)
Crankshaft	Crank pin and crank journal		Out-of-roundness		mm (in)	0.005 (0.0002)
			Cylindricity		mm (in)	0.006 (0.0002)
	Crank pin outer diameter	mm (in)	Standard		51.976 — 52.000 (2.0463 — 2.0472)	
			0.03 (0.0012) US		51.954 — 51.970 (2.0454 — 2.0461)	
			0.05 (0.0020) US		51.934 — 51.950 (2.0446 — 2.0453)	
			0.25 (0.0098) US		51.734 — 51.750 (2.0368 — 2.0374)	
	Crank journal outer diameter	mm (in)	#1, #3, #5, #7	Standard		63.992 — 64.016 (2.5194 — 2.5203)
				0.03 (0.0012) US		63.962 — 63.978 (2.5182 — 2.5188)
				0.05 (0.0020) US		63.942 — 63.958 (2.5174 — 2.5180)
				0.25 (0.0098) US		63.742 — 63.758 (2.5095 — 2.5102)
		#2, #4, #6	Standard		63.992 — 64.016 (2.5194 — 2.5203)	
			0.03 (0.0012) US		63.962 — 63.978 (2.5182 — 2.5188)	
			0.05 (0.0020) US		63.942 — 63.958 (2.5174 — 2.5180)	
			0.25 (0.0098) US		63.742 — 63.758 (2.5095 — 2.5102)	
Thrust clearance		mm (in)	Standard	0.030 — 0.115 (0.0012 — 0.0045)		
Oil clearance		mm (in)	Standard	0.010 — 0.030 (0.0004 — 0.0012)		
Main bearing	Bearing size (Thickness at center)	mm (in)	#1, #3, #5	Standard		1.996 — 2.013 (0.0786 — 0.0793)
				0.03 (0.0012) US		2.011 — 2.014 (0.0792 — 0.0793)
				0.05 (0.0020) US		2.021 — 2.024 (0.0796 — 0.0797)
				0.25 (0.0098) US		2.121 — 2.124 (0.0835 — 0.0836)
			#2, #4, #6	Standard		1.996 — 2.013 (0.0786 — 0.0793)
				0.03 (0.0012) US		2.015 — 2.018 (0.0793 — 0.0794)
				0.05 (0.0020) US		2.025 — 2.028 (0.0797 — 0.0798)
				0.25 (0.0098) US		2.125 — 2.128 (0.0837 — 0.0838)
			#7	Standard		1.992 — 2.009 (0.0784 — 0.0791)
				0.03 (0.0012) US		2.011 — 2.014 (0.0792 — 0.0793)
				0.05 (0.0020) US		2.021 — 2.024 (0.0796 — 0.0797)
				0.25 (0.0098) US		2.121 — 2.124 (0.0835 — 0.0836)

B: COMPONENT

1. V-BELT



- | | |
|---------------------------------|-------------------------|
| (1) V-belt | (6) Generator plate |
| (2) Collector cover bracket | (7) A/C compressor stay |
| (3) Belt tension adjuster ASSY | (8) Idler pulley |
| (4) Power steering pump bracket | (9) Idler pulley cover |
| (5) Generator | |

Tightening torque:N·m (kgf-m, ft-lb)

T1: 6.4 (0.7, 4.7)

T2: 20 (2.0, 14.8)

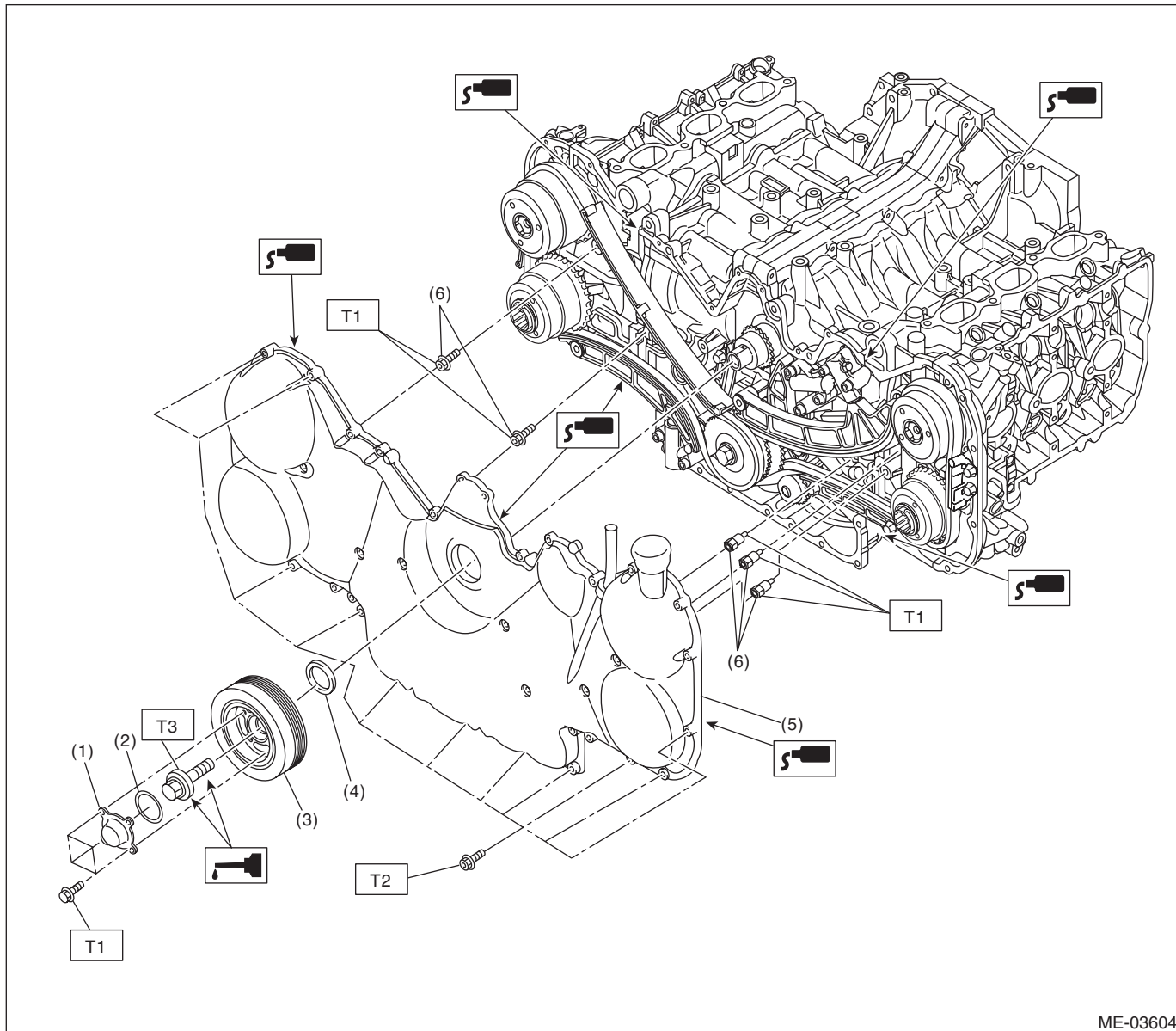
T3: 25 (2.5, 18.4)

T4: 33 (3.4, 24.3)

General Description

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2. TIMING CHAIN COVER



- | | |
|------------------------|-----------------|
| (1) Crank pulley cover | (4) Oil seal |
| (2) O-ring | (5) Chain cover |
| (3) Crank pulley | (6) Bolt |

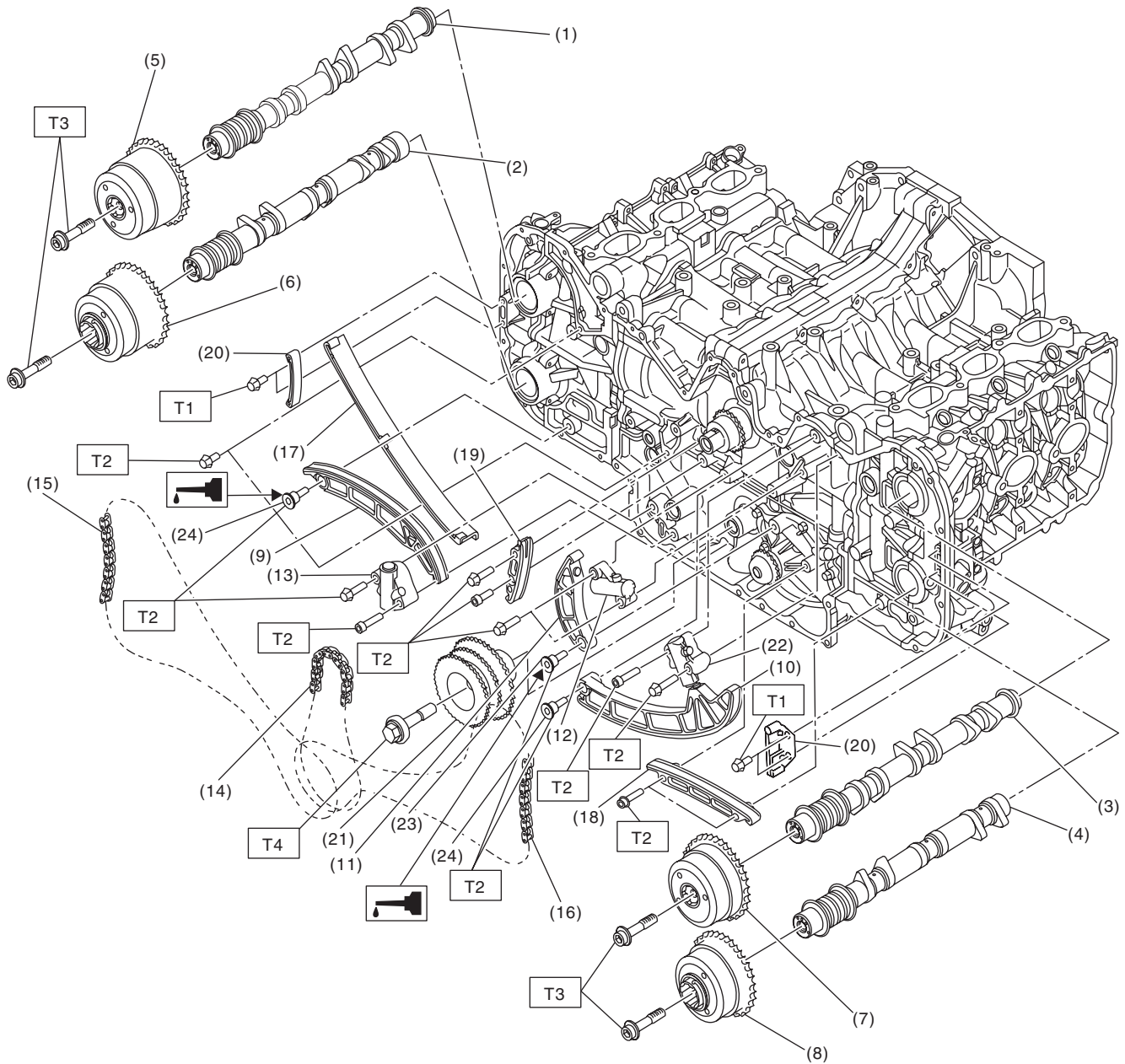
Tightening torque: N·m (kgf-m, ft-lb)

T1: 6.4 (0.7, 4.7)

T2: 10 (1.0, 7.4)

T3: 195 (19.9, 143.8)

3. TIMING CHAIN



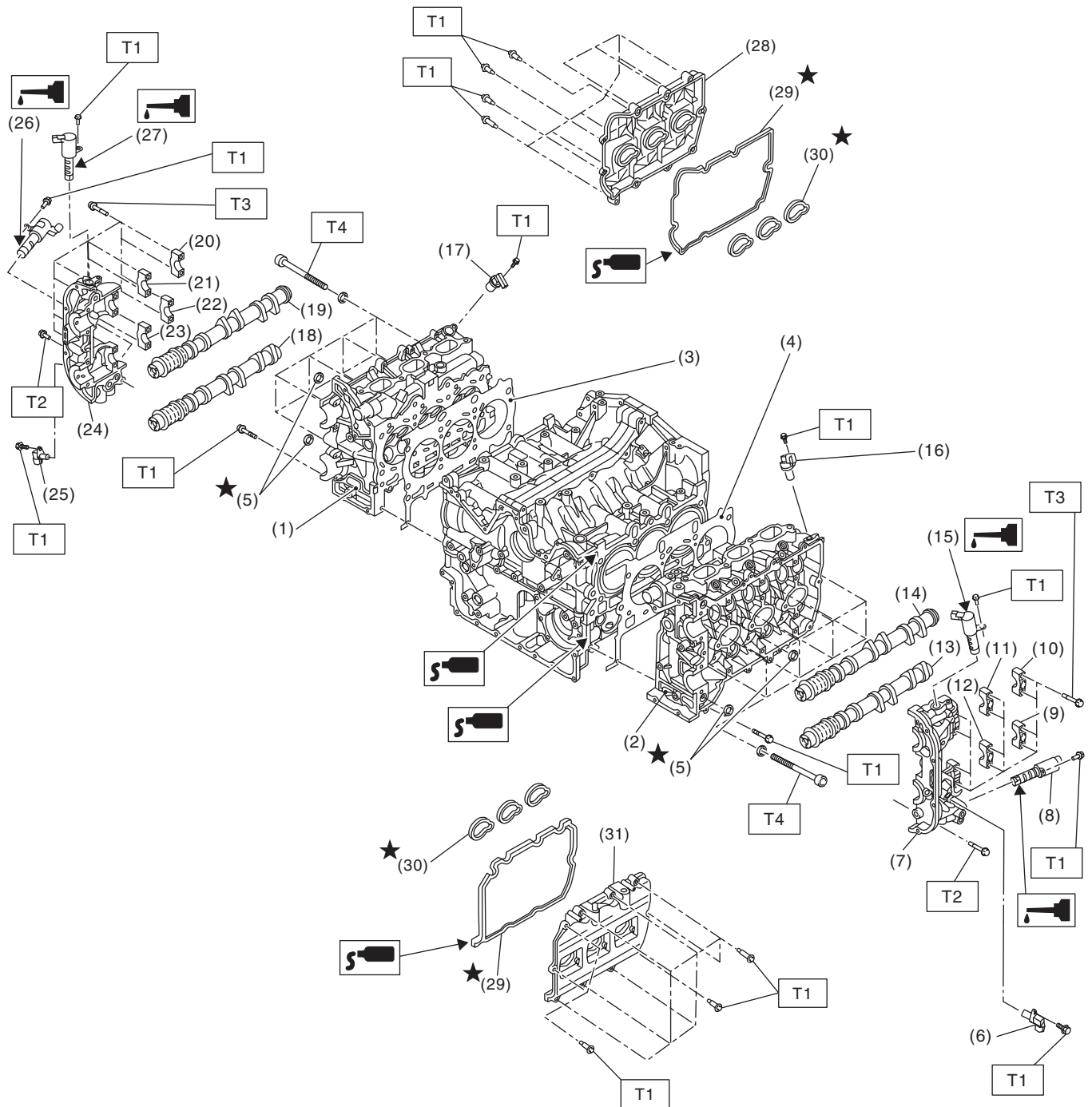
ME-03605

General Description

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(1) Intake camshaft (RH)	(12) Chain tensioner (main)	(22) Chain tensioner (LH)
(2) Exhaust camshaft (RH)	(13) Chain tensioner (RH)	(23) Chain tensioner lever shaft
(3) Intake camshaft (LH)	(14) Timing chain (main)	(24) Chain tensioner lever shaft
(4) Exhaust camshaft (LH)	(15) Timing chain (RH)	
(5) Intake camshaft sprocket (RH)	(16) Timing chain (LH)	
(6) Exhaust camshaft sprocket (RH)	(17) Chain guide (RH)	Tightening torque:N·m (kgf-m, ft-lb)
(7) Intake camshaft sprocket (LH)	(18) Chain guide (LH)	T1: 6.4 (0.7, 4.7)
(8) Exhaust camshaft sprocket (LH)	(19) Chain guide (main)	T2: 16 (1.6, 11.8)
(9) Chain tensioner lever (RH)	(20) Chain guide (between cams)	T3: <Ref. to ME(H6DO)-73,
(10) Chain tensioner lever (LH)	(21) Idler sprocket	Cam Sprocket.>
(11) Chain tensioner lever (main)		T4: 120 (12.2, 88.5)

4. CYLINDER HEAD AND CAMSHAFT



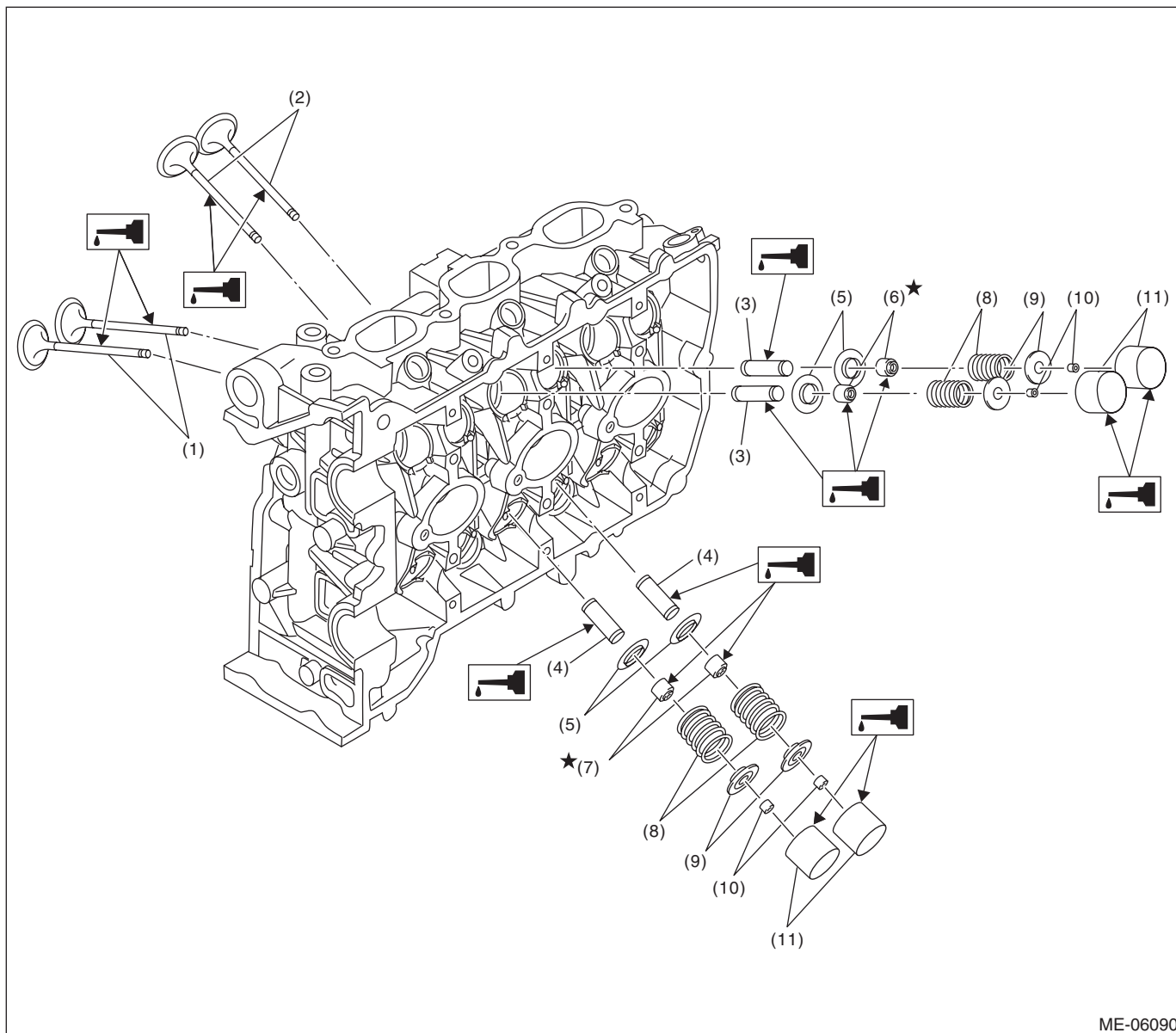
ME-03338

General Description

MECHANICAL

(1) Cylinder head (RH)	(15) Intake oil flow control solenoid valve (LH)	(26) Exhaust oil flow control solenoid valve (RH)
(2) Cylinder head (LH)		
(3) Cylinder head gasket (RH)	(16) Intake camshaft position sensor (LH)	(27) Intake oil flow control solenoid valve (RH)
(4) Cylinder head gasket (LH)		
(5) O-ring	(17) Intake camshaft position sensor (RH)	(28) Rocker cover (RH)
(6) Exhaust camshaft position sensor (LH)	(18) Exhaust camshaft (RH)	(29) Gasket
(7) Front camshaft cap (LH)	(19) Intake camshaft (RH)	(30) Gasket
(8) Exhaust oil flow control solenoid valve (LH)	(20) Intake camshaft cap (Rear RH)	(31) Rocker cover (LH)
(9) Exhaust camshaft cap (Rear LH)	(21) Intake camshaft cap (Center RH)	Tightening torque:N·m (kgf-m, ft-lb) T1: 6.4 (0.7, 4.7) T2: 9.75 (1.0, 7.2) T3: 16 (1.6, 11.8) T4: <Ref. to ME(H6DO)-82, Cylinder Head.>
(10) Intake camshaft cap (Rear LH)	(22) Exhaust camshaft cap (Rear RH)	
(11) Intake camshaft cap (Center LH)	(23) Exhaust camshaft cap (Center RH)	
(12) Exhaust camshaft cap (Center LH)	(24) Front camshaft cap (RH)	
(13) Exhaust camshaft (LH)	(25) Exhaust camshaft position sensor (RH)	
(14) Intake camshaft (LH)		

5. CYLINDER HEAD AND VALVE ASSEMBLY

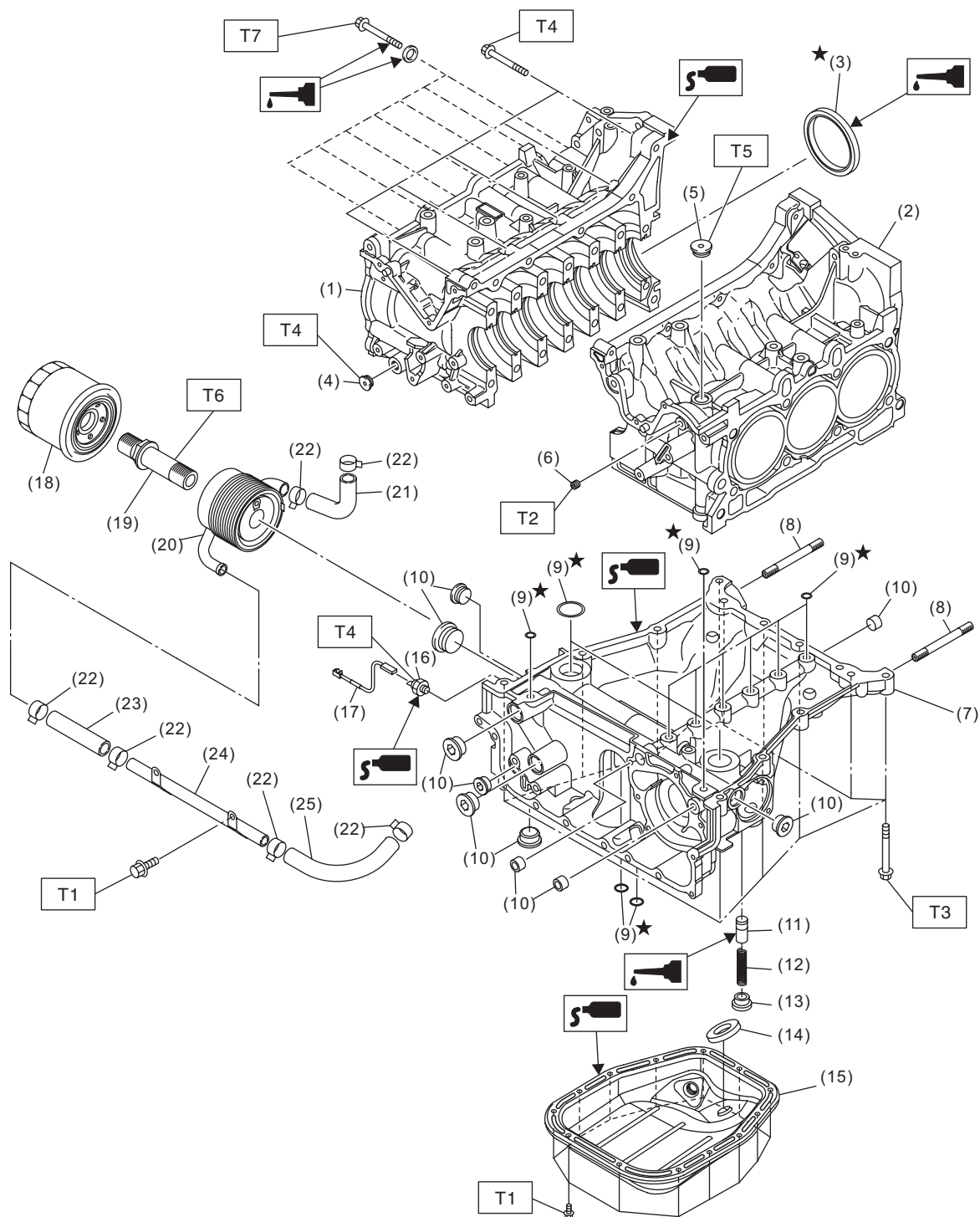


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|---------------------------|-------------------------|---------------------------|
| (1) Intake valve | (5) Valve spring seat | (9) Valve spring retainer |
| (2) Exhaust valve | (6) Stem seal (Intake) | (10) Valve collet |
| (3) Valve guide (Intake) | (7) Stem seal (Exhaust) | (11) Valve lifter |
| (4) Valve guide (Exhaust) | (8) Valve spring | |

General Description

MECHANICAL

6. CYLINDER BLOCK



ME-03957

General Description

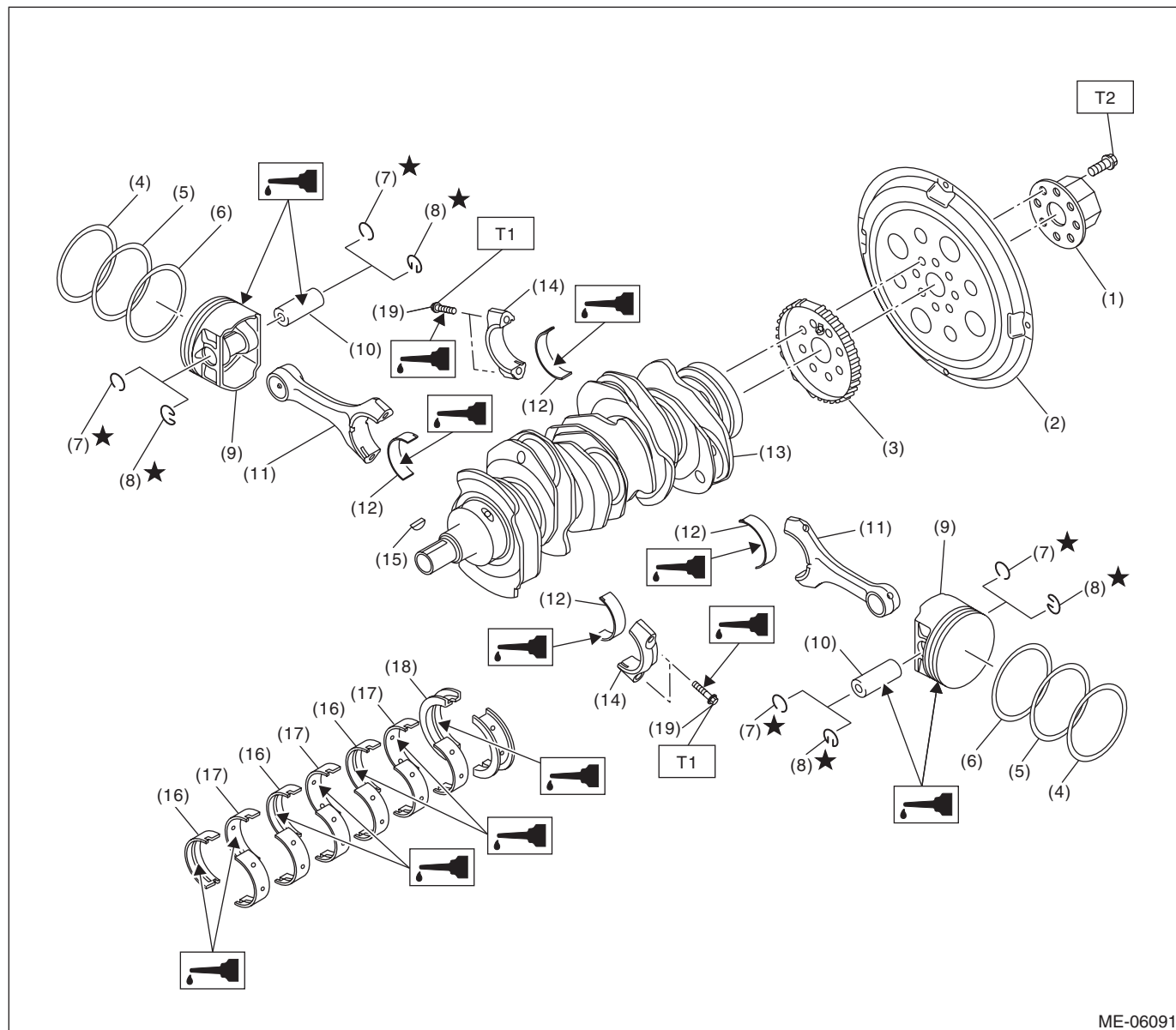
MECHANICAL

(1) Cylinder block (RH)	(13) Relief plug	(25) Hose
(2) Cylinder block (LH)	(14) Magnet	
(3) Oil seal	(15) Oil pan lower	<i>Tightening torque:N·m (kgf-m, ft-lb)</i>
(4) Plug	(16) Oil pressure switch	<i>T1: 6.4 (0.7, 4.7)</i>
(5) Plug	(17) Oil pressure switch harness	<i>T2: 17 (1.7, 12.5)</i>
(6) Orifice	(18) Oil filter	<i>T3: 18 (1.8, 13.3)</i>
(7) Oil pan upper	(19) Oil cooler connector	<i>T4: 25 (2.5, 18.4)</i>
(8) Stud bolt	(20) Oil cooler	<i>T5: 37 (3.8, 27.3)</i>
(9) O-ring	(21) Hose	<i>T6: 54 (5.5, 39.8)</i>
(10) Plug	(22) Clamp	<i>T7: <Ref. to ME(H6DO)-93,</i>
(11) Relief valve	(23) Hose	<i>Cylinder Block.></i>
(12) Relief valve spring	(24) Oil cooler pipe	

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7. CRANKSHAFT AND PISTON



ME-06091

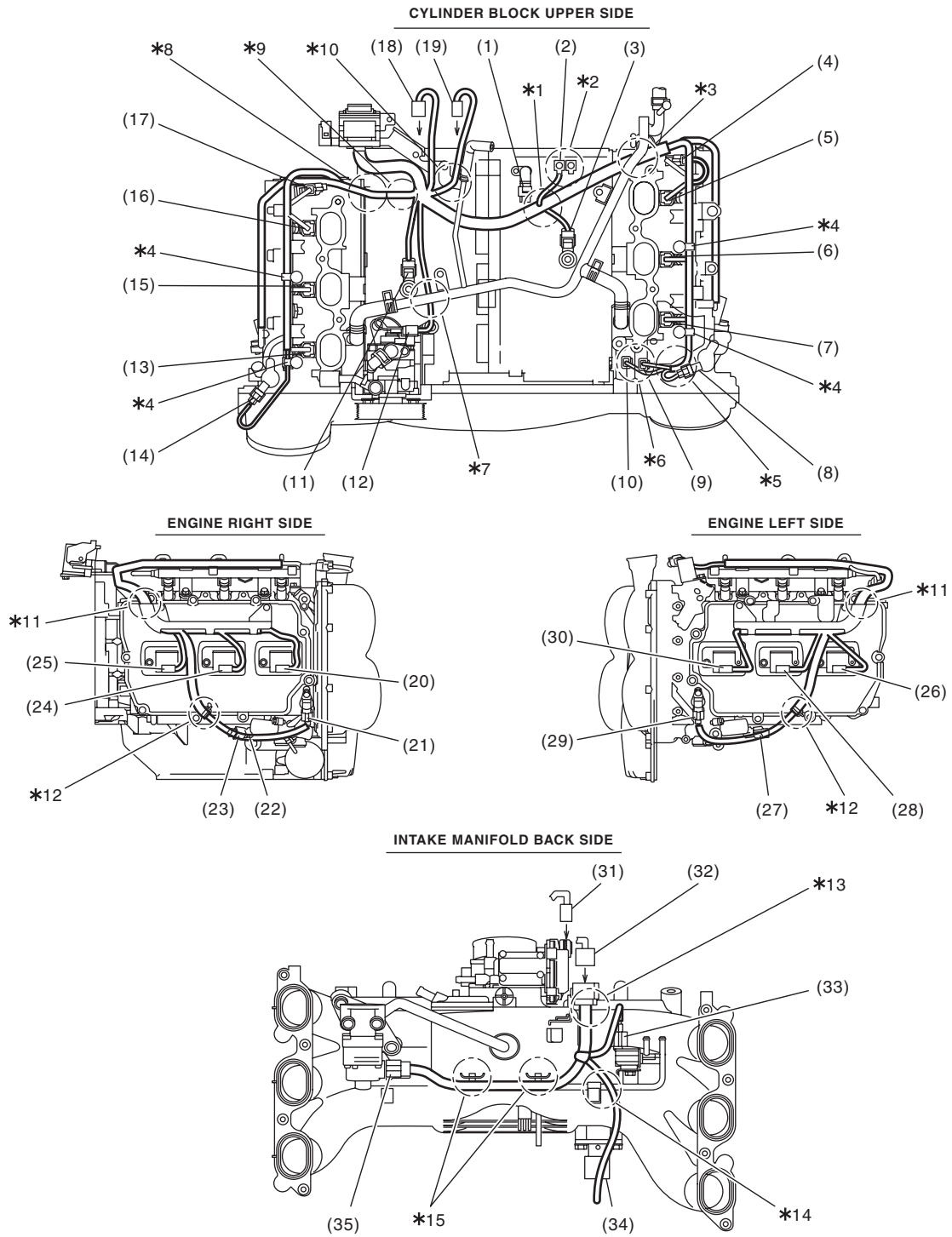
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|-----------------------------|------------------------------------|------------------------------------|
| (1) Reinforcement | (9) Piston | (17) Crankshaft bearing #2, #4, #6 |
| (2) Drive plate | (10) Piston pin | (18) Crankshaft bearing #7 |
| (3) Crankshaft sensor plate | (11) Connecting rod | (19) Connecting rod cap bolt |
| (4) Top ring | (12) Connecting rod bearing | |
| (5) Second ring | (13) Crankshaft | |
| (6) Oil ring | (14) Connecting rod cap | |
| (7) Circlip | (15) Woodruff key | |
| (8) Snap ring | (16) Crankshaft bearing #1, #3, #5 | |

Tightening torque: N·m (kgf-m, ft-lb)

T1: 60 (6.1, 44.3)

T2: 90 (9.2, 66.4)

8. ENGINE HARNESS



ME-03361

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(1) Crankshaft position sensor connector	(14) Intake oil flow control solenoid valve RH connector	(25) #5 ignition coil connector
(2) Engine ground	(15) #3 injector connector	(26) #6 ignition coil connector
(3) Knock sensor LH connector	(16) #5 injector connector	(27) Exhaust oil flow control solenoid valve LH connector
(4) Intake camshaft position sensor LH connector	(17) Intake camshaft position sensor RH connector	(28) #4 ignition coil connector
(5) #6 injector connector	(18) Upper and lower joint connector (to intake manifold)	(29) Exhaust camshaft position sensor LH connector
(6) #4 injector connector	(19) Electronic throttle control connector (to intake manifold)	(30) #2 ignition coil connector
(7) #2 injector connector	(20) #1 ignition coil connector	(31) Electronic throttle control connector (from cylinder block upper part)
(8) Intake oil flow control solenoid valve LH connector	(21) Exhaust camshaft position sensor RH	(32) Upper and lower joint connector (from cylinder block upper part)
(9) Oil temperature sensor connector	(22) Oil pressure switch connector	(33) Purge control solenoid valve connector
(10) Engine coolant temperature sensor connector	(23) Exhaust oil flow control solenoid valve RH connector	(34) Manifold absolute pressure sensor connector
(11) Knock sensor RH connector	(24) #3 ignition coil connector	(35) EGR valve connector
(12) Power steering switch connector		
(13) #1 injector connector		

*1: Route the harness between the crankshaft position sensor and the knock sensor LH.

*2: Install the engine ground terminal so that it faces the rear of the vehicle.

*3: Route the harness under the heater hose pipe.

*4: Install the engine harness fixing clip to the fuel pipe stay.

*5: Route the harness from the cutout portion of the fuel pipe protector LH.

*6: Do not confuse the oil temperature sensor connector and the engine coolant temperature sensor connector.

*7: Route the harness under the heater hose pipe.

*8: Route the harness under the fuel pipe.

*9: Install the engine harness fixing clip to the fixing boss of the cylinder block.

*10: Route the harness over the heater hose pipe stay.

*11: Align the edges of the engine harness stay and the engine harness identification tape.

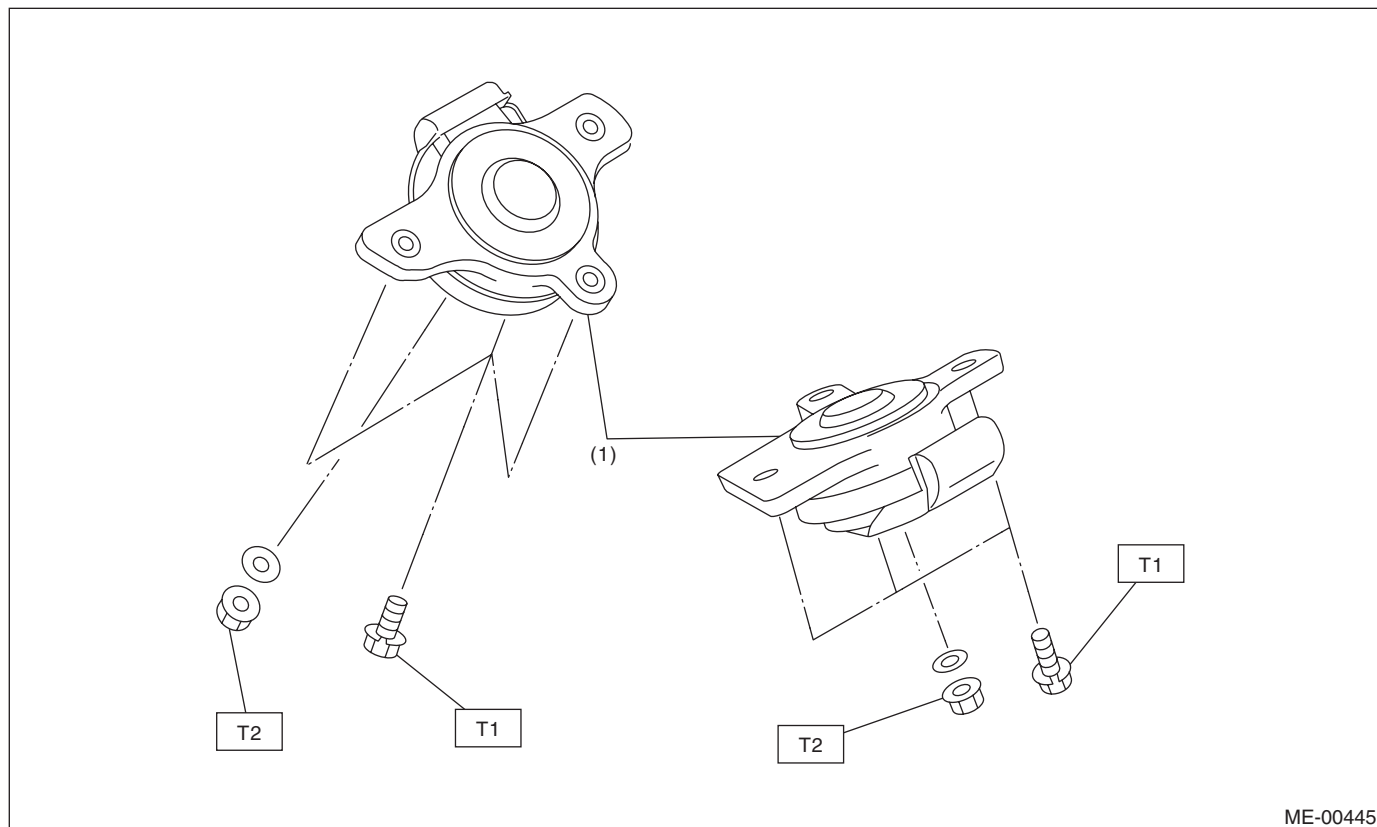
*12: Install the engine harness fixing clip to the fixing boss of the rocker cover.

*13: Install the engine harness fixing stay securely.

*14: Route the harness outside the fuel pipe.

*15: Install the engine harness fixing clip to the fixing stay of the intake manifold.

9. ENGINE MOUNTING



(1) Front cushion rubber

Tightening torque: N·m (kgf-m, ft-lb)

T1: 35 (3.6, 25.8)

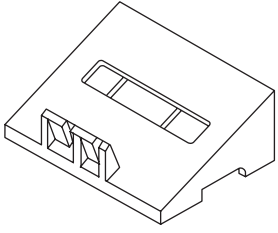
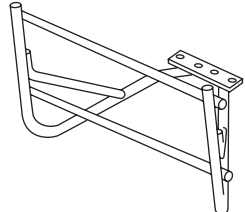
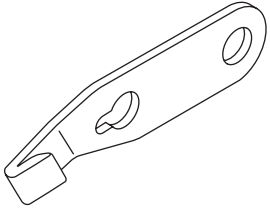
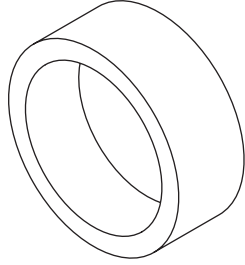
T2: 75 (7.6, 55.3)

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.
- 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 the battery.
- All parts should be thoroughly cleaned, paying special attention to engine oil passages, pistons and bearings.
- Before applying liquid gasket, completely remove the old liquid gasket and degrease it.
- Rotating parts and sliding parts such as piston, bearing and gear should be coated with oil prior to assembly.
- All removed parts, if to be reused, should be reinstalled in the original positions and directions.
- Bolts, nuts and washers should be replaced with new parts as required.
- Even if necessary inspections have been made in advance, proceed with assembly work while making rechecks.
- Remove or install the engine in an area where chain hoists, lifting devices, etc. are available for ready use.
- Be sure not to damage coated surfaces of body panels with tools, or not to stain seats and windows with coolant or oil. Place a cover over fender, as required, for protection.
- Prior to starting work, prepare the following:
Service tools, clean cloth, containers to catch coolant and oil, wire ropes, chain hoist, transmission jacks, etc.
- Lift up or lower the vehicle when necessary. Make sure to support the correct positions.

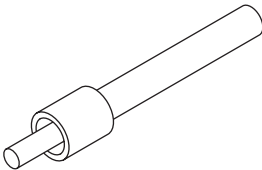
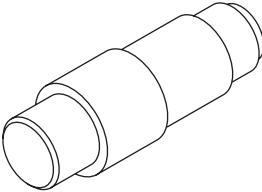
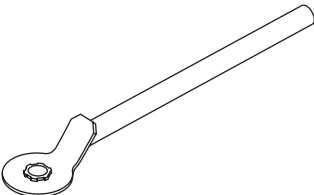
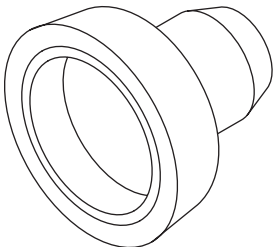
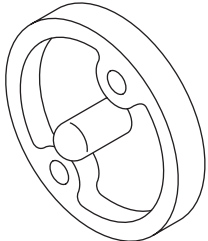
D: PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST18250AA010	18250AA010	CYLINDER HEAD TABLE	- Used for replacing valve guides. - Used for removing and installing valve spring.
 ST18232AA000	18232AA000	ENGINE STAND	Used for disassembling and assembling engine.
 ST-498497100	498497100	CRANKSHAFT STOPPER	Used for stopping rotation of drive plate when loosening / tightening crank pulley bolt.
 ST-398744300	398744300	PISTON GUIDE	Used for installing piston in cylinder.

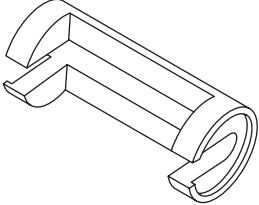
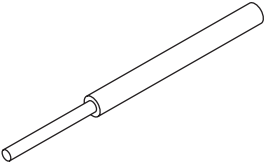
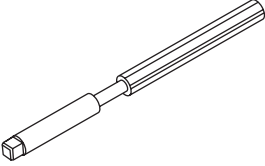
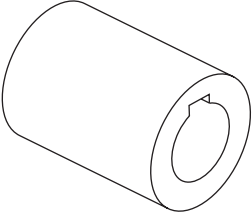
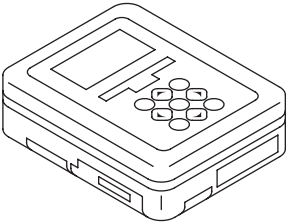
General Description

MECHANICAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-499585500	499585500	VALVE OIL SEAL GUIDE	Used for press-fitting of intake and exhaust valve guide oil seals.
 ST18350AA000	18350AA000	CONNECTING ROD BUSHING REMOVER AND INSTALLER	Used for removing and installing connecting rod bushing.
 ST-499977500	499977500	CAM SPROCKET WRENCH	Used for removing and installing camshaft sprocket.
 ST-499587200	499587200	CRANKSHAFT OIL SEAL INSTALLER	• Used for installing crankshaft oil seal. • Used together with CRANKSHAFT OIL SEAL GUIDE (499597100).
 ST-499597100	499597100	CRANKSHAFT OIL SEAL GUIDE	• Used for installing crankshaft oil seal. • Used together with CRANKSHAFT OIL SEAL INSTALLER (499587200).

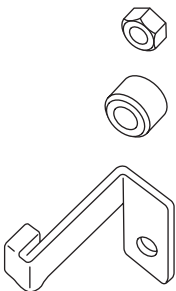
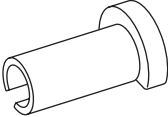
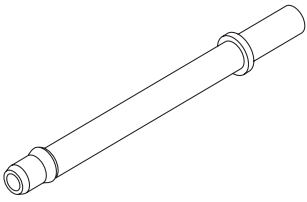
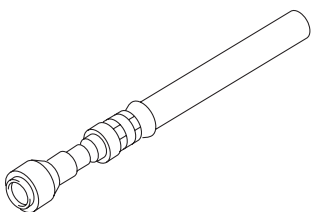
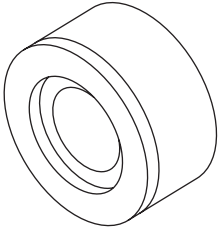
General Description

MECHANICAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-499718000	499718000	VALVE SPRING REMOVER	Used for removing and installing valve spring.
 ST-499765700	499765700	VALVE GUIDE REMOVER	Used for removing valve guides.
 ST-499765900	499765900	VALVE GUIDE REAMER	Used for reaming valve guides.
 ST18252AA000	18252AA000	CRANKSHAFT SOCKET	Used for rotating crankshaft.
 ST1B022XU0	1B022XU0	SUBARU SELECT MONITOR III KIT	Used for troubleshooting for electrical system.

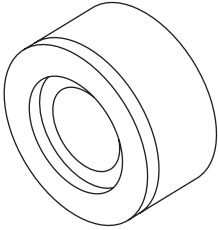
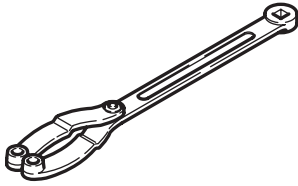
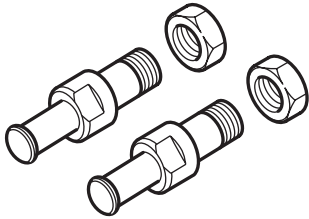
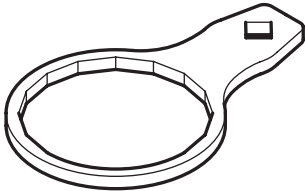
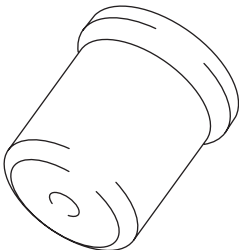
General Description

MECHANICAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-498277200	498277200	STOPPER SET	Used for installing automatic transmission assembly to engine.
 ST42099AE000	42099AE000	QUICK CONNECTOR RELEASE	Used for disconnecting quick connector of the engine compartment.
 ST18471AA000	18471AA000	FUEL PIPE ADAPTER	Used for measuring fuel pressure.
 ST42075AG690	42075AG690	FUEL HOSE	- Used for measuring fuel pressure. - This is a genuine Subaru part.
 ST18251AA050	18251AA050	VALVE GUIDE ADJUSTER	Used for installing intake valve guides.

General Description

MECHANICAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST18251AA060	18251AA060	VALVE GUIDE ADJUSTER	Used for installing exhaust valve guides.
 ST18355AA000	18355AA000	PULLEY WRENCH	- Used for stopping rotation of crank pulley when removing and installing crank pulley bolt. - Used for stopping rotation of idler sprocket when removing and installing idler sprocket bolt.
 ST18334AA000	18334AA000	PULLEY WRENCH PIN SET	- Used for stopping rotation of crank pulley when removing and installing crank pulley bolt. - Used for stopping rotation of idler sprocket when removing and installing idler sprocket bolt.
 ST18332AA020	18332AA020	OIL FILTER WRENCH	Used for removing and installing oil filter.
 ST-499585700	499585700	OIL SEAL GUIDE	Used for installing the chain cover oil seal.

General Description

MECHANICAL

2. GENERAL TOOL

TOOL NAME	REMARKS
Compression gauge	Used for measuring compression.
Vacuum gauge	Used for measuring intake manifold vacuum.
Oil pressure gauge	Used for measuring engine oil pressure.
Fuel pressure gauge	Used for measuring fuel pressure.
TORX® socket (E12)	Used for removing and installing connecting rod cap.

E: PROCEDURE

It is possible to conduct the following service procedures with engine on vehicle, however, the procedures described in this section are based on the condition that the engine is removed from vehicle.

- V-belt
- Timing chain