

General Description

MECHANICAL

1. General Description

A: SPECIFICATION

	Model		2.5 L		
Engine	Cylinder arrangement		Horizontally opposed, liquid cooled, 4-cylinder, 4-stroke gasoline engine		
	Valve system mechanism		Belt driven Single overhead camshaft 4 valve/4 cylinder		
	Bore × Stroke		mm (in)	99.5 × 79.0 (3.917 × 3.110)	
	Piston displacement		cm ³ (cu in)	2,457 (150)	
	Compression ratio		10.0		
	Compression pressure (at 350 rpm)		kPa (kg/cm ² , psi)	1,020 — 1,275 (10.4 — 13.0, 148 — 185)	
	Number of piston rings		Pressure ring: 2, Oil ring: 1		
	Intake valve timing		Constant	Open	BTDC 0°
				Close	ABDC 58°
			Low speed	Open	BTDC 0°
				Close	ABDC -50°
			High speed	Open	BTDC 14°
				Close	ABDC 62°
	Exhaust valve timing		Open	BBDC46°	
			Close	ATDC14°	
Valve clearance		mm (in)	Intake	0.20±0.04 (0.0079±0.0016)	
			Exhaust	0.25±0.04 (0.0098±0.0016)	
Idling speed [at neutral position on MT, or "P" or "N" position on AT]		rpm	MT	650±100 (No load) 850±100 (A/C ON)	
			AT	700±100 (No load) 850±100 (A/C ON)	
Ignition order		1 → 3 → 2 → 4			
Ignition timing		BTDC/ rpm	MT	10°±8°/650	
			AT	15°±8°/700	

NOTE:

US: Undersize OS: Oversize

Belt tension adjuster	Protrusion of adjuster rod		mm (in)	5.2 — 6.2 (0.205 — 0.244)		
Belt tensioner	Spacer O.D.		mm (in)	17.955 — 17.975 (0.7069 — 0.7077)		
	Tensioner bushing I.D.		mm (in)	18.00 — 18.08 (0.7087 — 0.7118)		
	Clearance between spacer and bushing	mm (in)	Standard	0.025 — 0.125 (0.0010 — 0.0049)		
				Side clearance of spacer		
Valve rocker arm	Clearance between shaft and arm	mm (in)	Standard	0.020 — 0.054 (0.0008 — 0.0021)		
				Camshaft		
Camshaft	Bending limit		mm (in)	0.025 (0.00098)		
	Thrust clearance		mm (in)	Standard	0.030 — 0.090 (0.0012 — 0.0035)	
	Cam lobe height	mm (in)	Intake	Constant	Standard	40.075 — 40.175 (1.5778 — 1.5817)
				Low speed	Standard	35.182 — 35.282 (1.3851 — 1.3891)
				High speed	Standard	40.315 — 40.415 (1.5872 — 1.5911)
	Exhaust	mm (in)	Standard	40.088 — 40.188 (1.5783 — 1.5822)		
				Camshaft journal O.D.		
	Camshaft journal O.D.		mm (in)	31.928 — 31.945 (1.2570 — 1.2577)		
Camshaft journal hole I.D.		mm (in)	32.000 — 32.018 (1.2598 — 1.2605)			
Oil clearance		mm (in)	Standard	0.055 — 0.090 (0.0022 — 0.0035)		

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Cylinder head	Surface warpage limit (Mating surface with cylinder block)		mm (in)	0.035 (0.0014)		
	Grinding limit		mm (in)	0.1 (0.004)		
	Standard height		mm (in)	97.5 (3.84)		
Valve seat	Seating angle			90°		
	Contacting width	mm (in)	Intake	Standard	0.8 — 1.4 (0.03 — 0.055)	
			Exhaust	Standard	1.2 — 1.8 (0.047 — 0.071)	
Valve guide	Inside diameter		mm (in)	6.000 — 6.012 (0.2362 — 0.2367)		
	Protrusion above head	mm (in)	Intake	20.0 — 21.0 (0.787 — 0.827)		
			Exhaust	16.5 — 17.5 (0.650 — 0.689)		
Valve	Head edge thickness	mm (in)	Intake	Standard	0.8 — 1.2 (0.03 — 0.047)	
			Exhaust	Standard	1.0 — 1.4 (0.039 — 0.055)	
	Stem outer diameter	mm (in)	Intake	5.950 — 5.965 (0.2343 — 0.2348)		
			Exhaust	5.945 — 5.960 (0.2341 — 0.2346)		
	Valve stem gap	mm (in)	Standard	Intake	0.035 — 0.062 (0.0014 — 0.0024)	
				Exhaust	0.040 — 0.067 (0.0016 — 0.0026)	
	Overall length	mm (in)	Intake	120.6 (4.75)		
Exhaust			121.7 (4.79)			
Valve spring	Free length		mm (in)	55.2 (2.173)		
	Squareness			2.5°, 2.4 (0.094) or less		
	Tension/ spring height	N (kgf, lb)/mm (in)	Set	235.3 — 270.7 (24 — 27.6, 52.9 — 60.8) /45.0 (1.772)		
			Lift	578.9 — 639.9 (59.1 — 65.3, 130.3 — 143.9) /34.7 (1.366)		
Cylinder block	Surface warpage limit (mating with cylinder head)		mm (in)	0.025 (0.00098)		
	Grinding limit		mm (in)	0.1 (0.004)		
	Standard height		mm (in)	201.0 (7.91)		
	Cylinder inner diameter	mm (in)	Standard	A	99.505 — 99.515 (3.9175 — 3.9179)	
				B	99.495 — 99.505 (3.9171 — 3.9175)	
	Taper		mm (in)	Standard	0.015 (0.0006)	
	Out-of-roundness		mm (in)	Standard	0.010 (0.0004)	
	Piston clearance		mm (in)	Standard	-0.010 — 0.010 (-0.00039 — 0.00039)	
Cylinder inner diameter boring limit (diameter)		mm (in)		To 100.005 (3.9372)		
Piston	Outer diameter	mm (in)	Standard	A	99.505 — 99.515 (3.9175 — 3.9179)	
				B	99.495 — 99.505 (3.9171 — 3.9175)	
			0.25 (0.0098) OS			99.745 — 99.765 (3.9270 — 3.9278)
			0.50 (0.0197) OS			99.995 — 100.015 (3.9368 — 3.9376)
Piston pin specified diameter		mm (in)		23.000 — 23.006 (0.9055 — 0.9057)		
Piston pin	Outer diameter		mm (in)	22.994 — 23.000 (0.9053 — 0.9055)		
	Clearance between piston and piston pin:		mm (in)	Standard	0.004 — 0.008 (0.0002 — 0.0003)	
	Degree of fit				Piston pin must be fitted into position with thumb at 20°C (68°F).	
Piston ring	Ring closed gap	mm (in)	Top ring	Standard	0.20 — 0.35 (0.0079 — 0.0138)	
			Second ring	Standard	0.37 — 0.52 (0.0144 — 0.0203)	
			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)	
Connecting rod	Bend or twist per 100 mm (3.94 in) in length		mm (in)	Limit	0.10 (0.0039)	
	Thrust clearance		mm (in)	Standard	0.070 — 0.330 (0.0028 — 0.0130)	

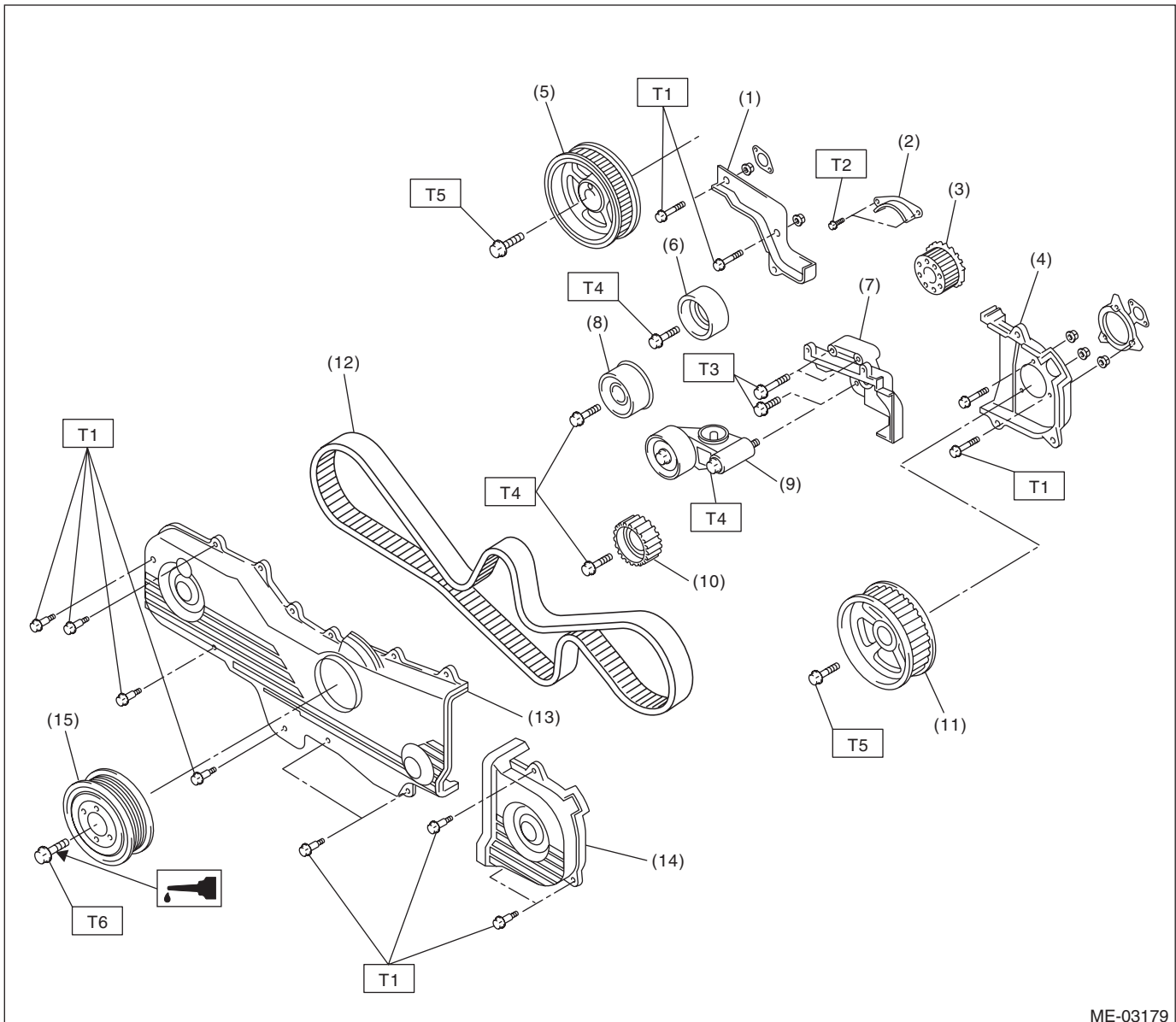
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Bearing of large end	Oil clearance	mm (in)	Standard	0.016 — 0.044 (0.00063 — 0.0017)	
	Bearing size (Thickness at center)	mm (in)	Standard	1.492 — 1.501 (0.0587 — 0.0591)	
			0.03 (0.0012) US	1.510 — 1.513 (0.0594 — 0.0596)	
			0.05 (0.0020) US	1.520 — 1.523 (0.0598 — 0.0600)	
			0.25 (0.0098) US	1.620 — 1.623 (0.0638 — 0.0639)	
Bushing of small end	Clearance between piston pin and bushing mm (in)		Standard	0 — 0.022 (0 — 0.0009)	
Crankshaft	Bend limit		mm (in)	0.035 (0.0014)	
	Crank pin	Out-of-roundness		mm (in)	0.003 (0.0001)
		Cylindricality		mm (in)	0.004 (0.0002)
		Grinding limit (dia.)		mm (in)	To 51.750 (2.0374)
	Crank journal	Out-of-roundness		mm (in)	0.005 (0.0002)
		Cylindricality		mm (in)	0.006 (0.0002)
		Grinding limit (dia.)		mm (in)	To 59.758 (2.3527)
	Crank pin outer diameter	mm (in)	Standard		51.984 — 52.000 (2.0466 — 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)	Standard		59.992 — 60.008 (2.3619 — 2.3625)
			0.03 (0.0012) US		59.962 — 59.978 (2.3607 — 2.3613)
			0.05 (0.0020) US		59.942 — 59.958 (2.3599 — 2.3605)
			0.25 (0.0098) US		59.742 — 59.758 (2.3520 — 2.3527)
Thrust clearance		mm (in)	Standard	0.030 — 0.115 (0.0012 — 0.0045)	
Oil clearance		mm (in)	Standard	0.010 — 0.030 (0.0001 — 0.0012)	
Main bearing	Main bearing	#1, #3	mm (in)	Standard	1.998 — 2.011 (0.0787 — 0.0792)
			0.03 (0.0012) US		2.017 — 2.020 (0.0794 — 0.0795)
			0.05 (0.0020) US		2.027 — 2.030 (0.0798 — 0.0799)
			0.25 (0.0098) US		2.127 — 2.130 (0.0837 — 0.0839)
		#2, #4, #5	mm (in)	Standard	2.000 — 2.013 (0.0787 — 0.0793)
			0.03 (0.0012) US		2.019 — 2.022 (0.0795 — 0.0796)
			0.05 (0.0020) US		2.029 — 2.032 (0.0799 — 0.0800)
			0.25 (0.0098) US		2.129 — 2.132 (0.0838 — 0.0839)

B: COMPONENT

1. TIMING BELT



ME-03179

- | | |
|----------------------------------|--|
| (1) Timing belt cover No. 2 (RH) | (9) Automatic belt tension adjuster ASSY |
| (2) Timing belt guide (MT model) | (10) Belt idler No. 2 |
| (3) Crank sprocket | (11) Cam sprocket No. 2 |
| (4) Timing belt cover No. 2 (LH) | (12) Timing belt |
| (5) Cam sprocket No. 1 | (13) Front timing belt cover |
| (6) Belt idler (No. 1) | (14) Timing belt cover (LH) |
| (7) Tensioner bracket | (15) Crank pulley |
| (8) Belt idler (No. 2) | |

Tightening torque: N·m (kgf·m, ft·lb)

T1: 5 (0.5, 3.6)

T2: 9.75 (1.0, 7.2)

T3: 24.5 (2.5, 18.1)

T4: 39 (4.0, 28.9)

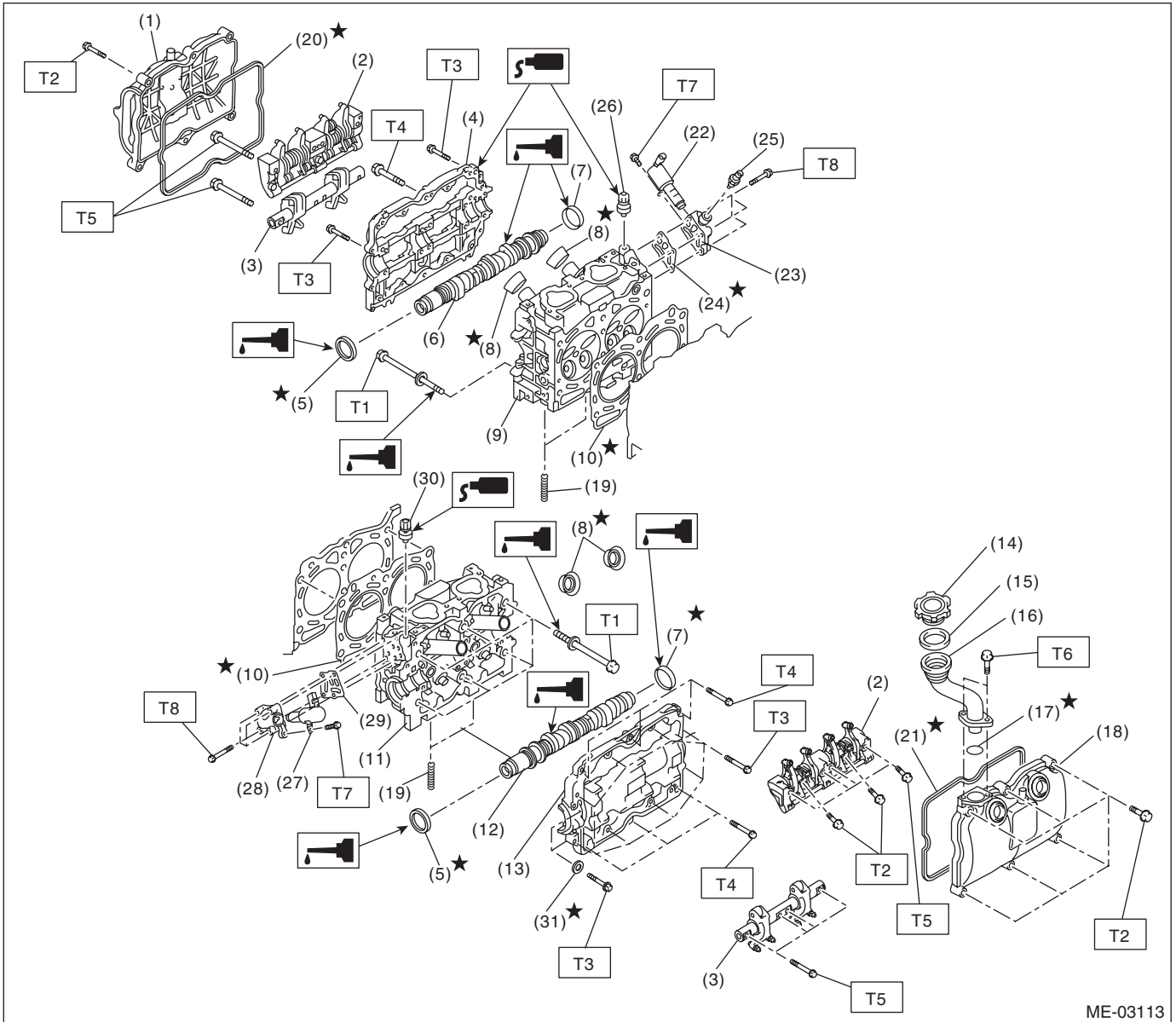
T5: 78 (8.0, 57.9)

T6: <Ref. to ME(H4SO)-39, INSTALLATION, Crank Pulley.>

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2. CYLINDER HEAD AND CAMSHAFT



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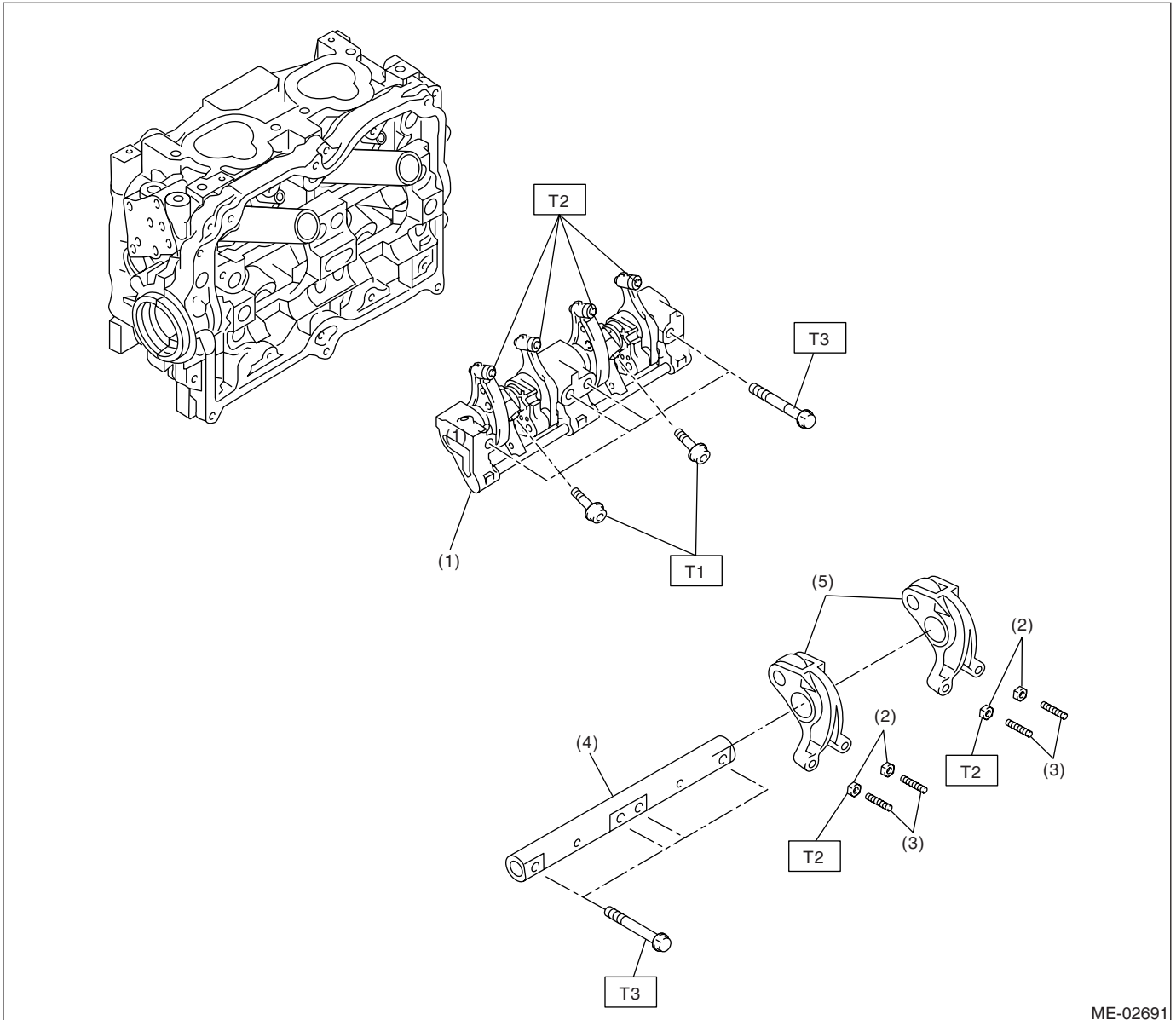
MECHANICAL

(1) Rocker cover (RH)	(17) O-ring	(30) Variable valve lift diagnosis oil pressure switch (LH)
(2) Intake valve rocker assembly	(18) Rocker cover (LH)	(31) Seal washer
(3) Exhaust valve rocker assembly	(19) Stud bolt	
(4) Camshaft cap (RH)	(20) Rocker cover gasket (RH)	
(5) Oil seal	(21) Rocker cover gasket (LH)	<hr/> Tightening torque:N·m (kgf-m, ft-lb)
(6) Camshaft (RH)	(22) Oil switching solenoid valve (RH)	T1: <Ref. to ME(H4SO)-55, INSTAL-
(7) Plug	(23) Oil switching solenoid valve holder (RH)	LATION, Cylinder Head.>
(8) Spark plug pipe gasket	(24) Gasket	T2: <Ref. to ME(H4SO)-48, INSTAL-
(9) Cylinder head (RH)	(25) Oil temperature sensor	LATION, Valve Rocker Assem-
(10) Cylinder head gasket	(26) Variable valve lift diagnosis oil pressure switch (RH)	bly.>
(11) Cylinder head (LH)	(27) Oil switching solenoid valve (LH)	T3: 9.75 (1.0, 7.2)
(12) Camshaft (LH)	(28) Oil switching solenoid valve holder (LH)	T4: 18 (1.8, 13.0)
(13) Camshaft cap (LH)	(29) Gasket	T5: 25 (2.5, 18.1)
(14) Oil filler cap		T6: 6.4 (0.65, 4.7)
(15) Gasket		T7: 8 (0.8, 5.9)
(16) Oil filler duct		T8: 10 (1.0, 7.4)

General Description

MECHANICAL

3. VALVE ROCKER ASSY



ME-02691

- | | |
|----------------------------------|------------------------------|
| (1) Intake valve rocker arm ASSY | (4) Exhaust rocker shaft |
| (2) Valve rocker nut | (5) Exhaust valve rocker arm |
| (3) Valve rocker adjusting screw | |

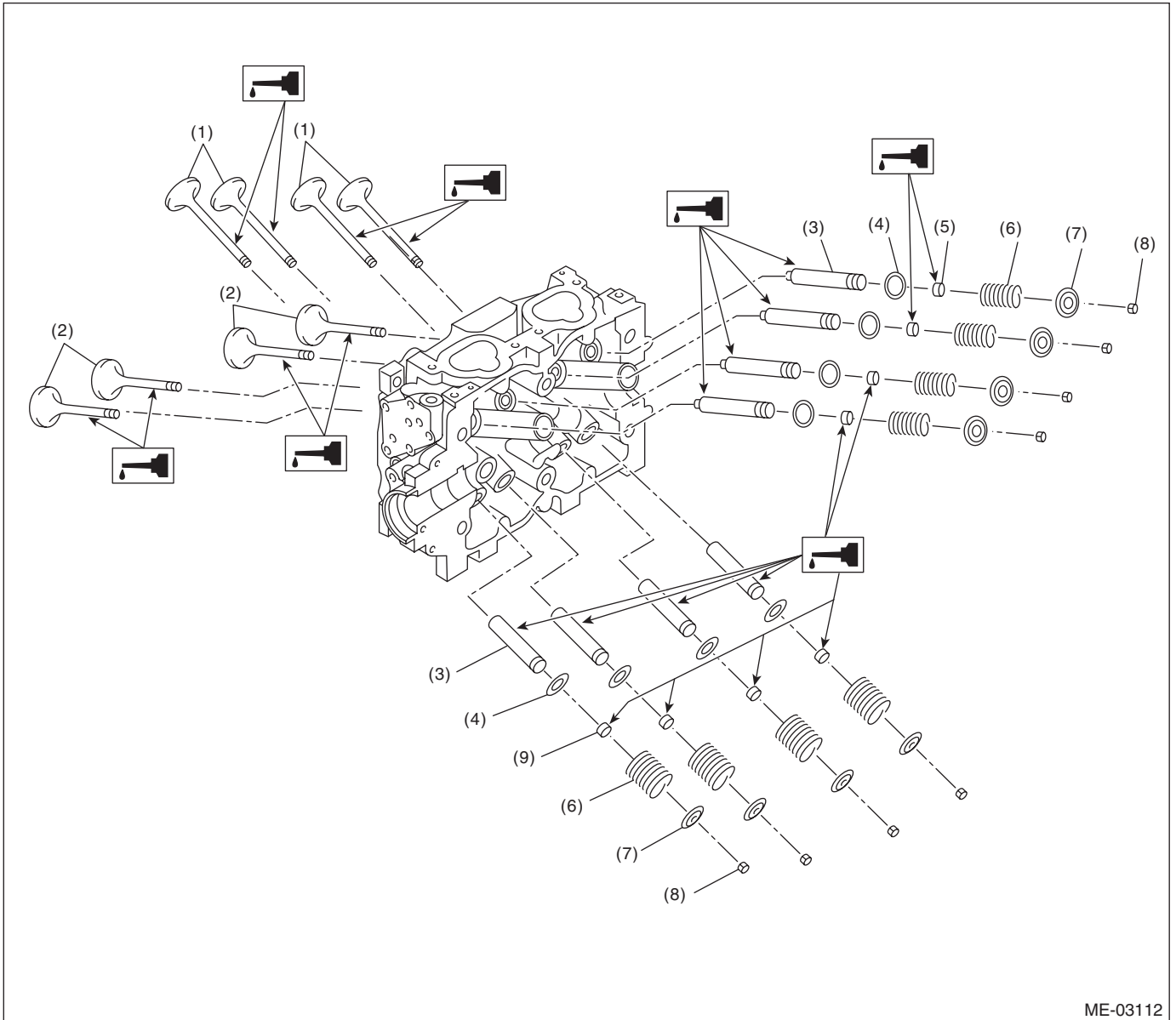
Tightening torque: N·m (kgf·m, ft·lb)

T1: 6 (0.6, 4.3)

T2: 9.75 (1.0, 7.2)

T3: 25 (2.5, 18.1)

4. CYLINDER HEAD AND VALVE ASSEMBLY



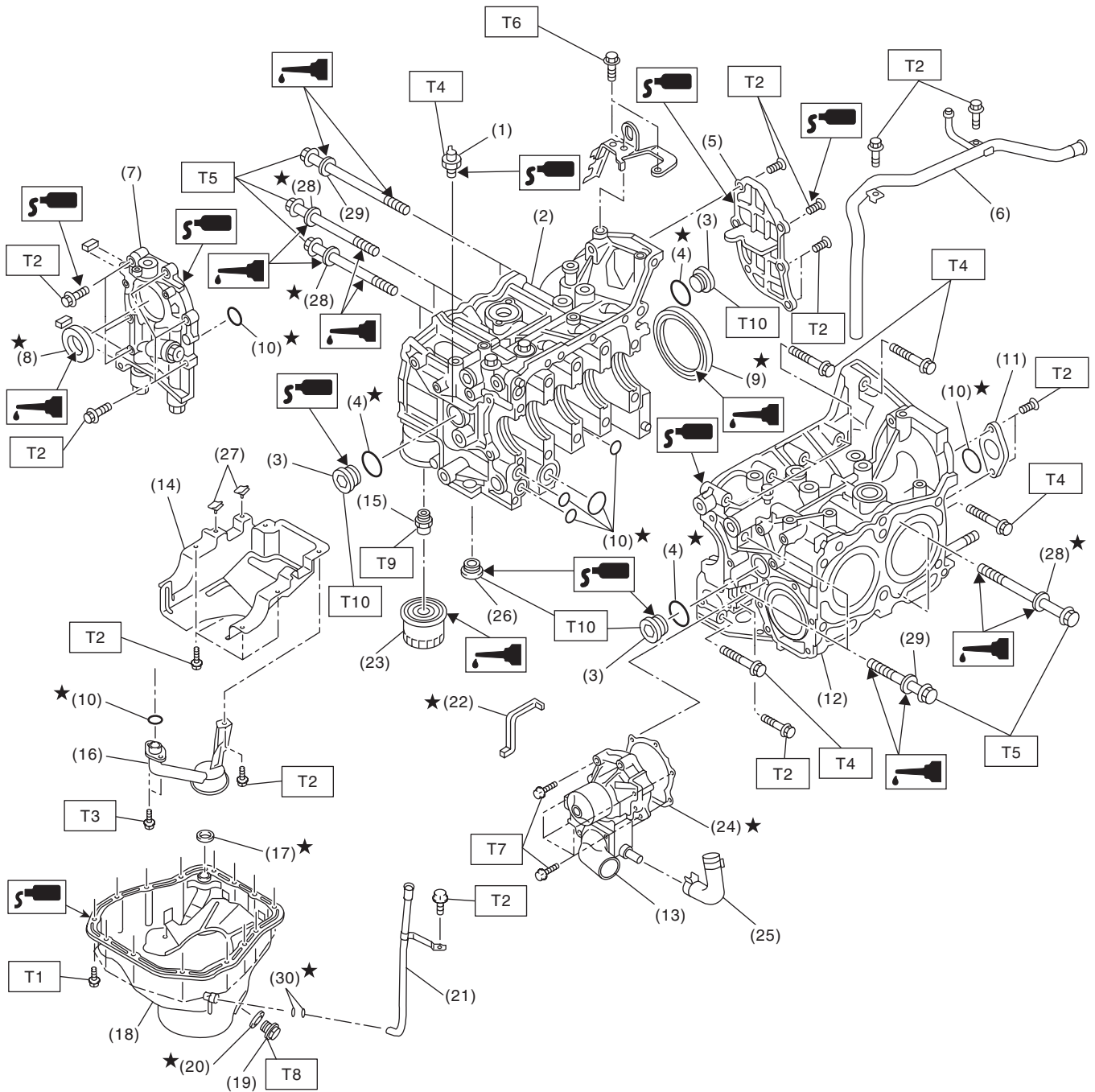
ME-03112

- | | | |
|-------------------|---------------------------|----------------------------|
| (1) Exhaust valve | (4) Valve spring seat | (7) Retainer |
| (2) Intake valve | (5) Intake valve oil seal | (8) Retainer key |
| (3) Valve guide | (6) Valve spring | (9) Exhaust valve oil seal |

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5. CYLINDER BLOCK



ME-03180

ME(H4SO)-10

General Description

MECHANICAL

- (1) Oil pressure switch
- (2) Cylinder block (RH)
- (3) Service hole plug
- (4) Gasket
- (5) Oil separator cover
- (6) Water by-pass pipe
- (7) Oil pump
- (8) Front oil seal
- (9) Rear oil seal
- (10) O-ring
- (11) Service hole cover
- (12) Cylinder block (LH)
- (13) Water pump
- (14) Baffle plate
- (15) Oil filter connector

- (16) Oil strainer
- (17) Gasket
- (18) Oil pan
- (19) Drain plug
- (20) Metal gasket
- (21) Oil level gauge guide
- (22) Water pump sealing
- (23) Oil filter
- (24) Gasket
- (25) Water pump hose
- (26) Plug
- (27) Seal
- (28) Seal washer
- (29) Washer
- (30) O-ring

Tightening torque: N·m (kgf-m, ft-lb)

T1: 5 (0.5, 3.6)

T2: 6.4 (0.65, 4.7)

T3: 10 (1.0, 7.4)

T4: 25 (2.5, 18.1)

T5: <Ref. to ME(H4SO)-66, INSTALLATION, Cylinder Block.>

T6: 16 (1.6, 11.6)

T7: First 12 (1.2, 8.7)

Second 12 (1.2, 8.7)

T8: 44 (4.5, 33)

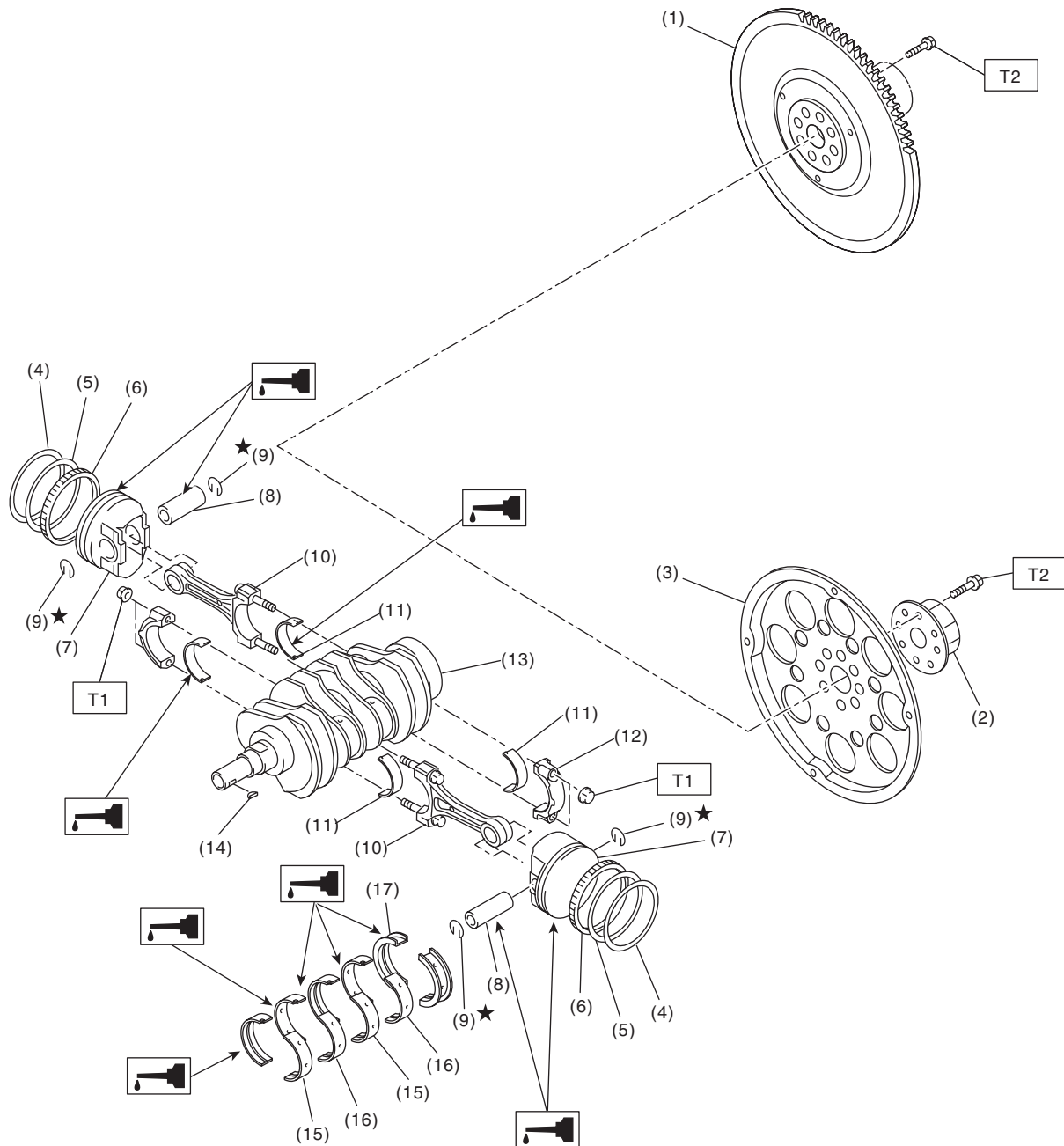
T9: 45 (4.6, 33.3)

T10: 70 (7.1, 50.6)

General Description

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6. CRANKSHAFT AND PISTON



ME-02974

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

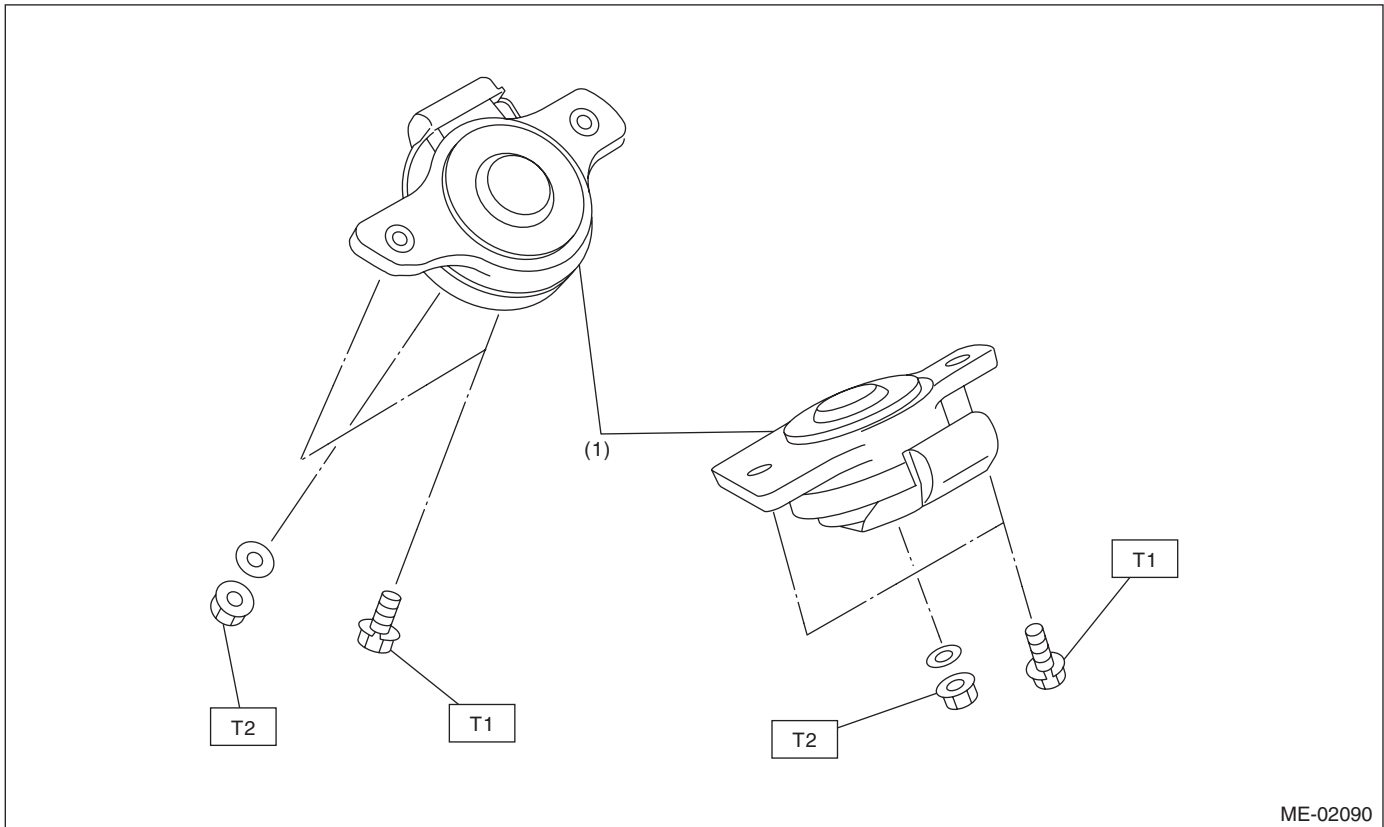
Tightening torque: N·m (kgf·m, ft·lb)

T1: 45 (4.6, 33.3)

T2: 72 (7.3, 52.8)

ME(H4SO)-12

7. ENGINE MOUNTING



ME-02090

(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.

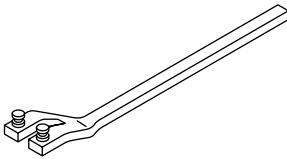
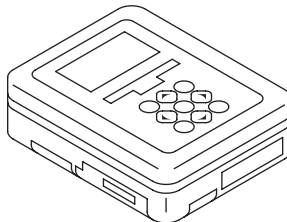
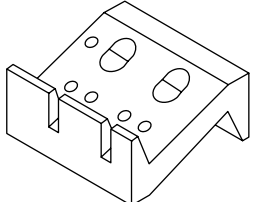
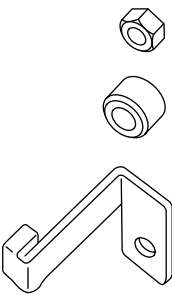
- Rotating parts and sliding parts such as piston, bearing and gear should be coated with oil prior to assembly.
- Be careful not to let oil, grease or coolant contact the timing belt, clutch disc and flywheel.
- All removed parts, if to be reused, should be re-installed in the original positions and 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.

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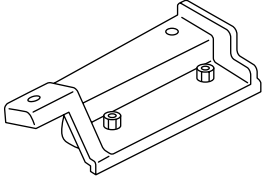
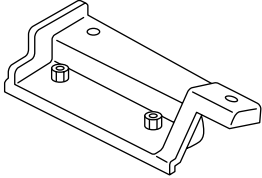
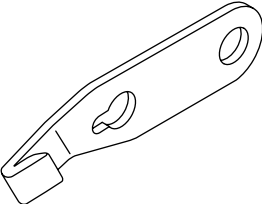
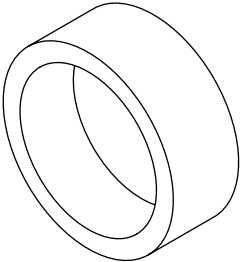
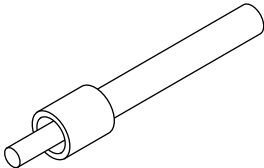
D: PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST18231AA010</p>	18231AA010	CAM SPROCKET WRENCH	<ul style="list-style-type: none"> Used for removing and installing cam sprocket. CAMSHAFT SPROCKET WRENCH (499207100) can also be used.
 <p>ST1B020XU0</p>	1B020XU0	SUBARU SELECT MONITOR KIT	Used for troubleshooting for electrical system.
 <p>ST-498267800</p>	498267800	CYLINDER HEAD TABLE	<ul style="list-style-type: none"> Used for replacing valve guides. Used for removing and installing valve spring.
 <p>ST-498277200</p>	498277200	STOPPER SET	Used for installing automatic transmission assembly to engine.

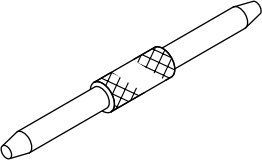
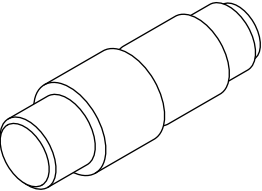
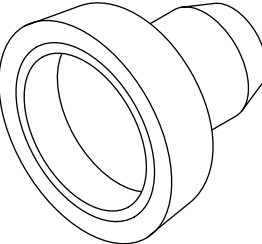
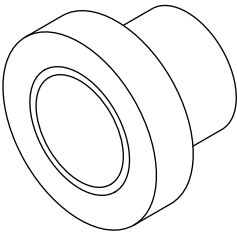
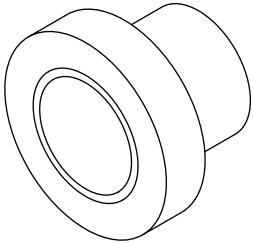
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ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST-498457000</p>	498457000	ENGINE STAND ADAPTER RH	Used together with the ENGINE STAND (499817100).
 <p>ST-498457100</p>	498457100	ENGINE STAND ADAPTER LH	Used together with the ENGINE STAND (499817100).
 <p>ST-498497100</p>	498497100	CRANKSHAFT STOPPER	Used for removing and installing the flywheel and the drive plate.
 <p>ST-498747300</p>	498747300	PISTON GUIDE	Used for installing piston in cylinder.
 <p>ST-498857100</p>	498857100	VALVE OIL SEAL GUIDE	Used for press-fitting of intake and exhaust valve guide oil seals.

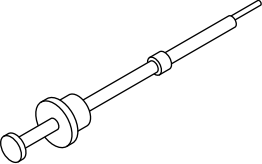
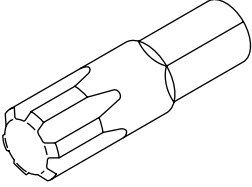
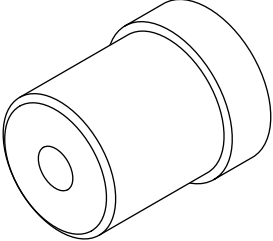
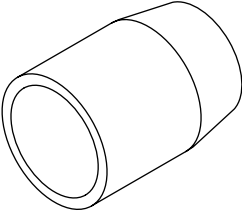
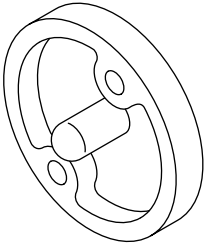
General Description

MECHANICAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-499017100</p>	499017100	PISTON PIN GUIDE	Used for installing piston pin, piston and connecting rod.
 <p style="text-align: center;">ST-499037100</p>	499037100	CONNECTING ROD BUSHING REMOVER & INSTALLER	Used for removing and installing connecting rod bushing.
 <p style="text-align: center;">ST-499587200</p>	499587200	CRANKSHAFT OIL SEAL INSTALLER	<ul style="list-style-type: none"> • Used for installing crankshaft oil seal. • Used together with the CRANKSHAFT OIL SEAL GUIDE (499597100).
 <p style="text-align: center;">ST-499587500</p>	499587500	OIL SEAL INSTALLER	<ul style="list-style-type: none"> • Used for installing the camshaft oil seal. • Used together with the OIL SEAL GUIDE (499597000).
 <p style="text-align: center;">ST-499587700</p>	499587700	CAMSHAFT OIL SEAL INSTALLER	Used for installing cylinder head plug.

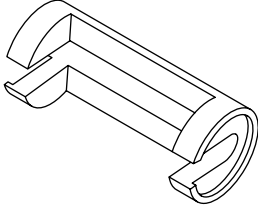
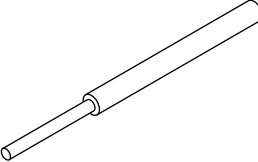
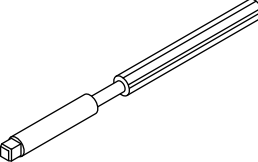
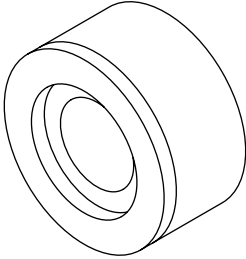
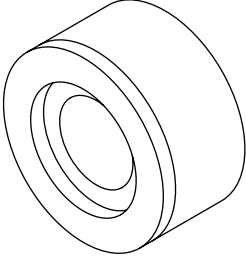
General Description

MECHANICAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p data-bbox="337 520 467 541">ST-499097700</p>	499097700	PISTON PIN REMOVER ASSY	Used for removing piston pin.
 <p data-bbox="337 871 467 892">ST-499497000</p>	499497000	TORX® PLUS	Used for removing and installing camshaft cap.
 <p data-bbox="337 1222 467 1243">ST-499587100</p>	499587100	OIL SEAL INSTALLER	Used for installing oil pump oil seal.
 <p data-bbox="337 1572 467 1593">ST-499597000</p>	499597000	OIL SEAL GUIDE	<ul style="list-style-type: none"> • Used for installing the camshaft oil seal. • Used together with the CAMSHAFT OIL SEAL INSTALLER (499587500).
 <p data-bbox="337 1923 467 1944">ST-499597100</p>	499597100	CRANKSHAFT OIL SEAL GUIDE	<ul style="list-style-type: none"> • Used for installing crankshaft oil seal. • Used together with the CRANKSHAFT OIL SEAL INSTALLER (499587200).

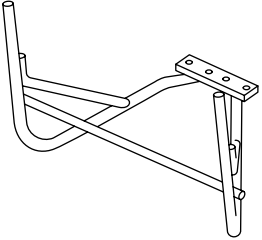
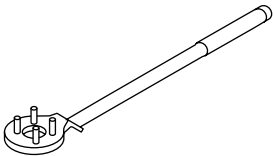
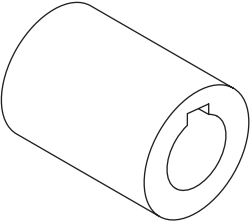
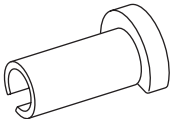
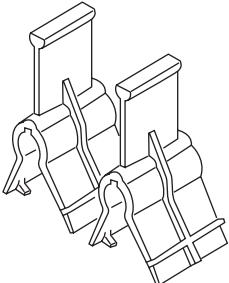
General Description

MECHANICAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-499718000</p>	499718000	VALVE SPRING REMOVER	Used for removing and installing valve spring.
 <p style="text-align: center;">ST-499767200</p>	499767200	VALVE GUIDE REMOVER	Used for removing valve guides.
 <p style="text-align: center;">ST-499767400</p>	499767400	VALVE GUIDE REAMER	Used for reaming valve guides.
 <p style="text-align: center;">ST-499767700</p>	499767700	VALVE GUIDE ADJUSTER	Used for installing valve guides. (Intake side)
 <p style="text-align: center;">ST-499767800</p>	499767800	VALVE GUIDE ADJUSTER	Used for installing valve guides. (Exhaust side)

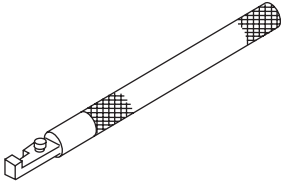
General Description

MECHANICAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-499817100</p>	499817100	ENGINE STAND	<ul style="list-style-type: none"> • Stand used for engine disassembly and assembly. • Used together with the ENGINE STAND ADAPTER RH (498457000) & LH (498457100).
 <p style="text-align: center;">ST-499977100</p>	499977100	CRANK PULLEY WRENCH	Used for stopping rotation of crank pulley when loosening/tightening crank pulley bolt.
 <p style="text-align: center;">ST-499987500</p>	499987500	CRANKSHAFT SOCKET	Used for rotating crankshaft.
 <p style="text-align: center;">ST42099AE000</p>	42099AE000	CONNECTOR REMOVER	Used for removing the quick connector.
 <p style="text-align: center;">ST18354AA000</p>	18354AA000	VALVE ROCKER HOLDER	Used for installing the valve rocker assembly (intake). (2-piece set)

General Description

MECHANICAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST18258AA000	18258AA000	SPRING INSTALLER	Used for installing the valve rocker assembly (intake).

2. GENERAL TOOL

TOOL NAME	REMARKS
Compression gauge	Used for measuring compression.
Vacuum gauge	Used for vacuum measurement of the intake manifold.
Oil pressure gauge	Used for measuring engine oil pressure.
Fuel pressure gauge	Used for measuring fuel pressure.
Timing light	Used for measuring ignition timing.

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 belt
- Valve rocker ASSY
- Camshaft
- Cylinder head