

General Description

MECHANICAL

1. General Description

A: SPECIFICATION

Engine	Model	2.5 L			
	Cylinder arrangement	Horizontally opposed, liquid cooled, 4-cylinder, 4-stroke gasoline engine			
	Valve system mechanism	Belt driven, single overhead camshaft, 4 valve/cylinder			
	Bore x Stroke	mm (in)		99.5 x 79.0 (3.92 x 3.11)	
	Displacement	cm ³ (cu in)		2,457 (149.94)	
	Compression ratio	10.0			
	Compression pressure (at 200 — 300 rpm)	kPa (kg/cm ² , psi)	Standard	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 -10°	
		High speed	Open	BTDC 14°	
			Close	ABDC 62°	
	Exhaust valve timing	Open		BBDC30°	
		Close		ATDC14°	
	Valve clearance	mm (in)	Intake	0.20±0.04 (0.0079±0.0016)	
			Exhaust	0.25±0.04 (0.0098±0.0016)	
	Idle speed (For CVT model, select lever in "P" or "N" range. For MT model, gear shift lever in neutral position.)	rpm	No load	Standard	CVT model: 675±100 MT model: 650±100
			A/C ON	Standard	700 — 850
	Ignition order	1 → 3 → 2 → 4			
	Ignition timing	BTDC/rpm	Standard	CVT model: 15°±10°/675 MT model: 10°±10°/650	

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NOTE:

US: Undersize OS: Oversize

Belt tension adjuster	Adjuster rod protrusion amount mm (in)			5.2 — 6.2 (0.205 — 0.244)	
Valve rocker arm	Clearance between arm and shaft mm (in)	Standard	0.020 — 0.054 (0.0008 — 0.0021)		
	Rocker arm inside diameter mm (in)	Standard	22.020 — 22.041 (0.8669 — 0.8678)		
	Rocker shaft diameter mm (in)	Standard	21.987 — 22.000 (0.8656 — 0.8661)		
Camshaft	Bending limit mm (in)		0.025 (0.00098)		
	Cam lobe height mm (in)	Intake	Constant Standard	40.075 — 40.175 (1.5778 — 1.5817)	
			Low speed Standard	35.496 — 35.596 (1.3975 — 1.4014)	
			High speed Standard	40.315 — 40.415 (1.5872 — 1.5911)	
	Exhaust Standard		39.289 — 39.389 (1.5468 — 1.5507)		
Cylinder head	Cam base circle diameter mm (in)		34.00 (1.3386)		
	Base circle step of adjacent intake cams (low speed and high speed) mm (in)		0.03 (0.001) or less		
	Oil clearance mm (in)		0.055 — 0.090 (0.0022 — 0.0035)		
	Journal O.D. mm (in)		31.928 — 31.945 (1.2570 — 1.2577)		
	Cylinder head journal I.D. mm (in)		32.000 — 32.018 (1.2598 — 1.2605)		
	Thrust clearance mm (in)		0.030 — 0.090 (0.0012 — 0.0035)		
	Warping limit (mating surface with cylinder block) mm (in)		0.035 (0.0014)		
Valve seat	Grinding limit mm (in)		0.1 (0.004)		
	Standard height mm (in)		97.5 (3.84)		
Valve guide	Seating angle between valve and valve seat			90°	
	Contacting width between valve and valve seat mm (in)	Intake	Standard	0.8 — 1.4 (0.03 — 0.055)	
		Exhaust	Standard	1.2 — 1.8 (0.047 — 0.071)	
	Clearance between the valve guide and valve stem mm (in)	Intake	Standard	0.035 — 0.062 (0.0014 — 0.0024)	
		Exhaust	Standard	0.040 — 0.067 (0.0016 — 0.0026)	
Valve	Inside diameter mm (in)		6.000 — 6.012 (0.2362 — 0.2367)		
	Valve stem outer diameters mm (in)	Intake	Standard	5.950 — 5.965 (0.2343 — 0.2348)	
		Exhaust	Standard	5.945 — 5.960 (0.2341 — 0.2346)	
	Valve guide protrusion amount mm (in)	Intake	Standard	20.3 — 20.7 (0.799 — 0.815)	
		Exhaust	Standard	16.8 — 17.2 (0.661 — 0.677)	
Valve spring	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)	
	Overall length mm (in)	Intake	Standard	120.6 (4.75)	
		Exhaust	Standard	121.7 (4.79)	
Cylinder block	Free length mm (in)		55.2 (2.173)		
	Tension/spring height N (kgf, lb)/mm (in)	Set	Standard	235.3 — 270.7 (24 — 27.6, 52.9 — 60.8)/ 45.0 (1.772)	
		Lift	Standard	578.9 — 639.9 (59.1 — 65.3, 130.3 — 143.9)/ 34.7 (1.366)	
	Squareness		2.5°, 2.4 mm (0.094 in) or less		
	Warping limit (mating surface 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)		
	Cylindricality mm (in)		0.015 (0.0006)		
	Out-of-roundness mm (in)		0.010 (0.0004)		
	Clearance between cylinder and piston at 20°C (68°F) mm (in)		-0.015 — 0.005 (-0.00059 — 0.00020)		
	Cylinder inner diameter boring limit (diameter) mm (in)		To 100.005 (3.9372)		

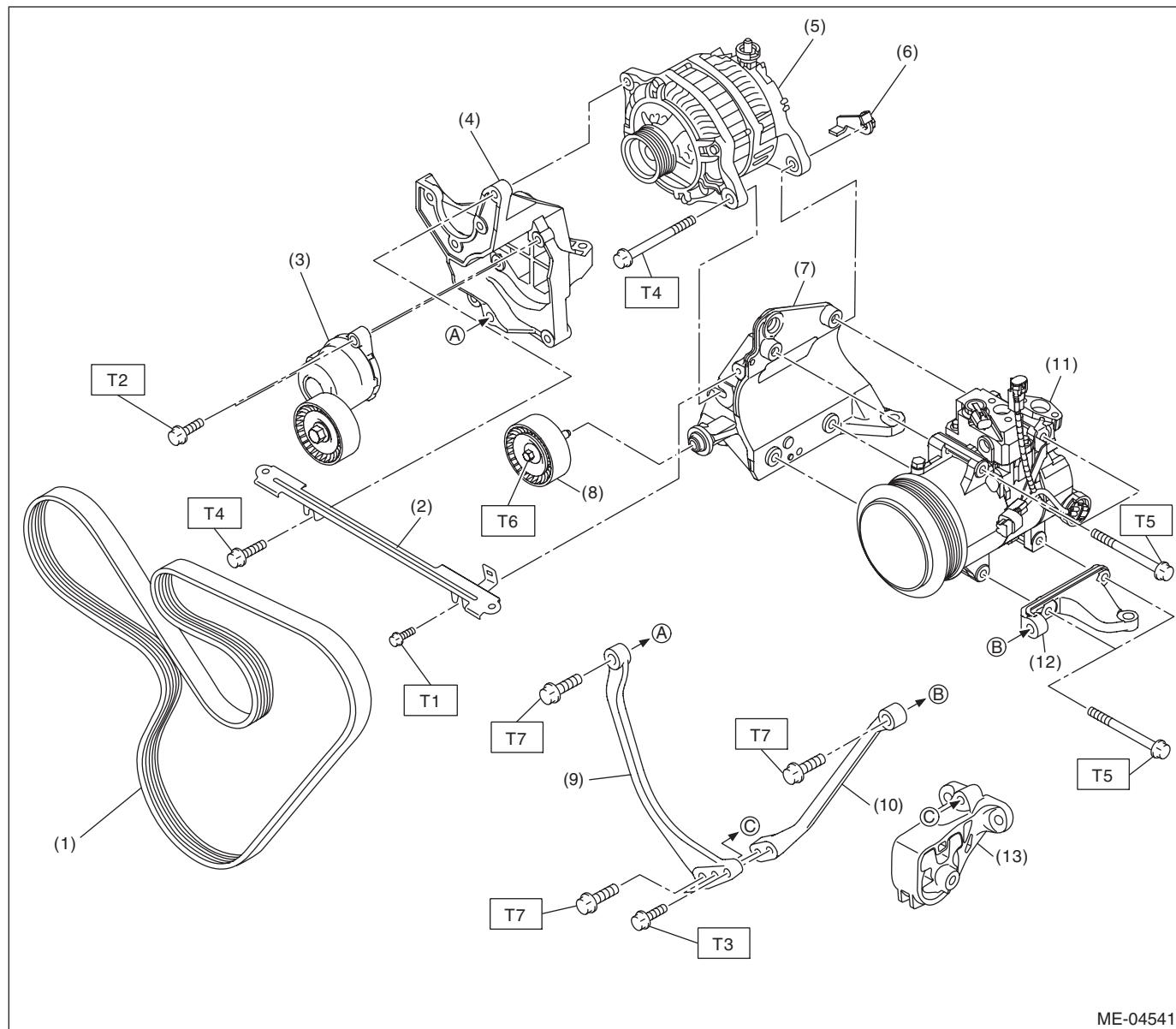
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Piston	Piston grade point			mm (in)	38.2 (1.504)	
	Outer diameter	mm (in)	Standard	A	99.510 — 99.520 (3.9177 — 3.9181)	
			B		99.500 — 99.510 (3.9173 — 3.9177)	
		0.25 (0.0098) OS			99.750 — 99.770 (3.9272 — 3.9280)	
		0.50 (0.0197) OS			100.000 — 100.020 (3.9370 — 3.9378)	
Piston pin	Degree of fit			Piston pin must be fitted into position with thumb at 20°C (68°F).		
	Clearance between piston pin hole and piston pin			mm (in)	Standard	
Piston ring	Piston ring gap	mm (in)	Top ring	Standard	0.20 — 0.35 (0.0079 — 0.0138)	
			Second ring	Standard	0.37 — 0.52 (0.0146 — 0.0205)	
			Oil ring	Standard	0.20 — 0.50 (0.0079 — 0.0197)	
	Clearance between piston ring and piston ring groove	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 and connecting rod bearing	Bend or twist per 100 mm (3.94 in) in length			mm (in)	Limit	
	Thrust clearance			mm (in)	Standard	
	Oil clearance			mm (in)	Standard	
	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	
Crankshaft and crank-shaft bearing	Bending limit			mm (in)	0.035 (0.0014)	
	Crank pin	Out-of-roundness	mm (in)	Standard	0.003 (0.0001)	
		Cylindricality	mm (in)	Standard	0.004 (0.0002)	
		Grinding limit (dia.)		mm (in)	To 51.750 (2.0374)	
	Crank journal	Out-of-roundness	mm (in)	Standard	0.005 (0.0002)	
		Cylindricality	mm (in)	Standard	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)	
	Bearing size (Thickness at center)	#1, #3	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	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)	
	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)		

B: COMPONENT

1. V-BELT



ME-04541

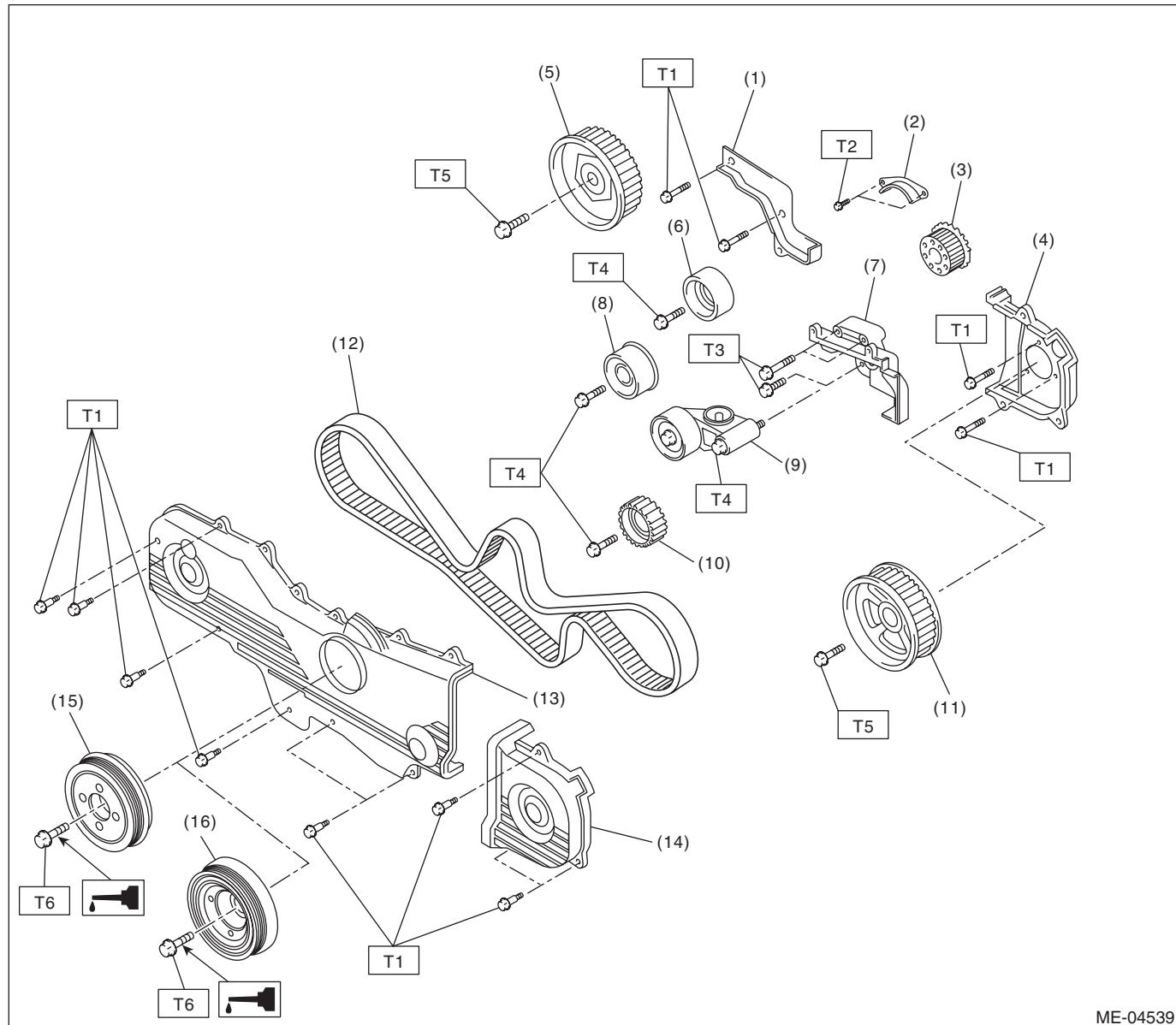
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|---------------------------------|-------------------------------|
| (1) V-belt | (8) Idler pulley ASSY |
| (2) V-belt cover bracket | (9) Stopper rod RH |
| (3) V-belt tensioner ASSY | (10) Stopper rod LH |
| (4) Power steering pump bracket | (11) A/C compressor |
| (5) Generator | (12) A/C compressor bracket B |
| (6) Generator plate | (13) Front cushion rubber |
| (7) A/C compressor bracket A | |

- Tightening torque: N·m (kgf·m, ft·lb)**
- | |
|----------------------|
| T1: 6.4 (0.7, 4.7) |
| T2: 20 (2.0, 14.8) |
| T3: 22 (2.2, 16.2) |
| T4: 25 (2.5, 18.4) |
| T5: 26.5 (2.7, 19.5) |
| T6: 33 (3.4, 24.3) |
| T7: 36 (3.7, 26.6) |

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2. TIMING BELT



ME-04539

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|----------------------------------|--|
| (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 (A) | (14) Timing belt cover LH |
| (7) Tensioner bracket | (15) Crank pulley (MT model) |
| (8) Belt idler (B) | (16) Crank pulley (CVT model) |

Tightening torque:N·m (kgf·m, ft·lb)

T1: 5 (0.5, 3.7)

T2: 9.75 (1.0, 7.2)

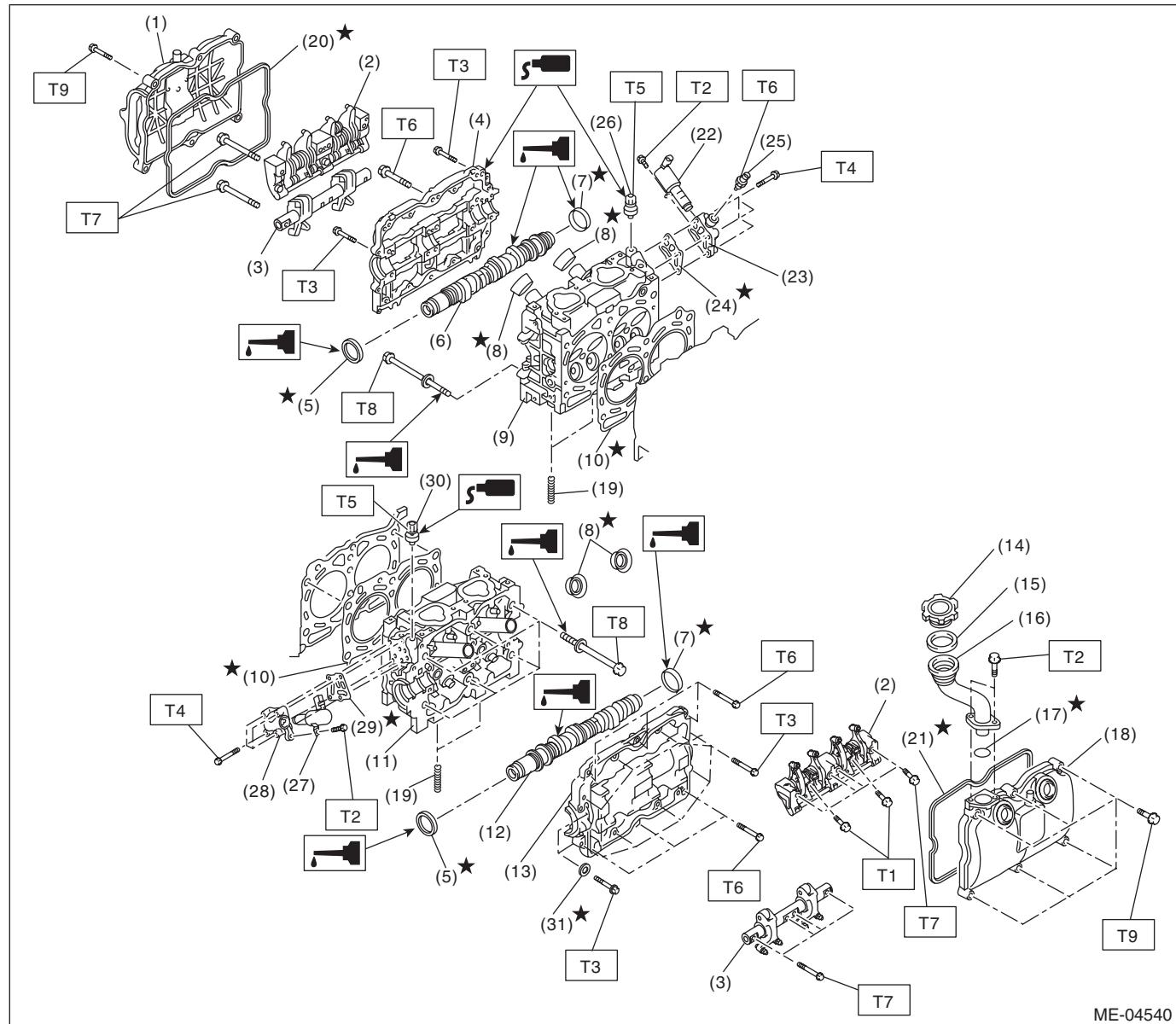
T3: 24.5 (2.5, 18.1)

T4: 39 (4.0, 28.8)

T5: 78 (8.0, 57.5)

T6: <Ref. to ME(H4SO)-44, INSTALLATION, Crank Pulley.>

3. CYLINDER HEAD AND CAMSHAFT



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(1) Rocker cover RH	(16) Oil filler duct	(31) Seal washer
(2) Intake valve rocker ASSY	(17) O-ring	
(3) Exhaust valve rocker ASSY	(18) Rocker cover LH	
(4) Camshaft cap RH	(19) Stud bolt	
(5) Oil seal	(20) Rocker cover gasket RH	
(6) Camshaft RH	(21) Rocker cover gasket LH	
(7) PLUG	(22) Oil switching solenoid valve RH	
(8) Spark plug pipe gasket	(23) Oil switching solenoid valve holder RH	
(9) Cylinder head RH	(24) Gasket	
(10) Cylinder head gasket	(25) Oil temperature sensor	
(11) Cylinder head LH	(26) Variable valve lift diagnosis oil pressure switch RH	
(12) Camshaft LH	(27) Oil switching solenoid valve LH	
(13) Camshaft cap LH	(28) Oil switching solenoid valve holder LH	
(14) Oil filler cap	(29) Gasket	
(15) Gasket	(30) Variable valve lift diagnosis oil pressure switch LH	

Tightening torque:N·m (kgf·m, ft·lb)

T1: 6 (0.6, 4.4)

T2: 6.4 (0.7, 4.7)

T3: 9.75 (1.0, 7.2)

T4: 10 (1.0, 7.4)

T5: 17 (1.7, 12.5)

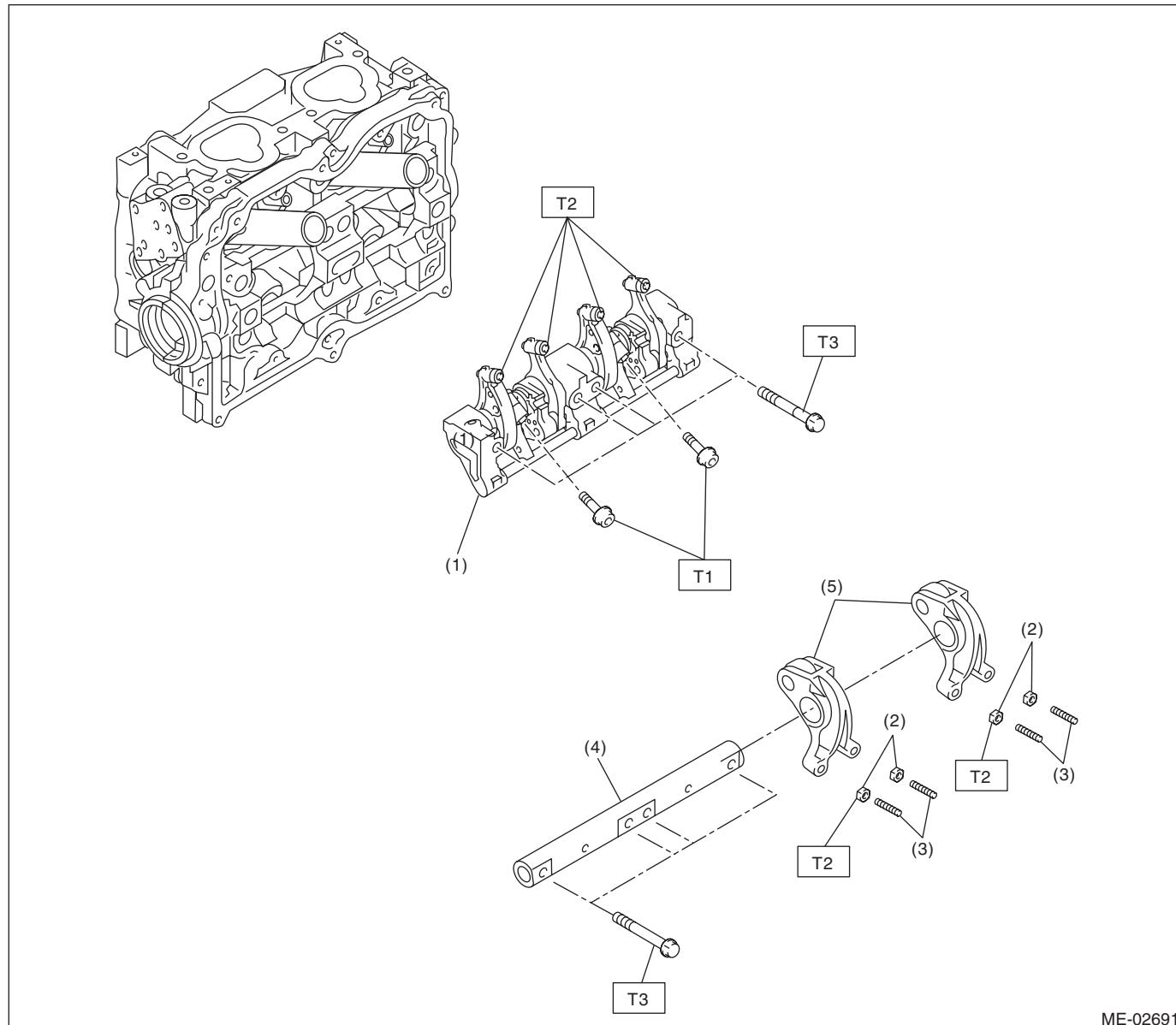
T6: 18 (1.8, 13.3)

T7: 25 (2.5, 18.4)

T8: <Ref. to ME(H4SO)-61, INSTALLATION, Cylinder Head.>

T9: <Ref. to ME(H4SO)-54, INSTALLATION, Valve Rocker Assembly.>

4. VALVE ROCKER ASSY



- (1) Intake valve rocker ASSY
(2) Valve rocker nut
(3) Valve rocker adjusting screw

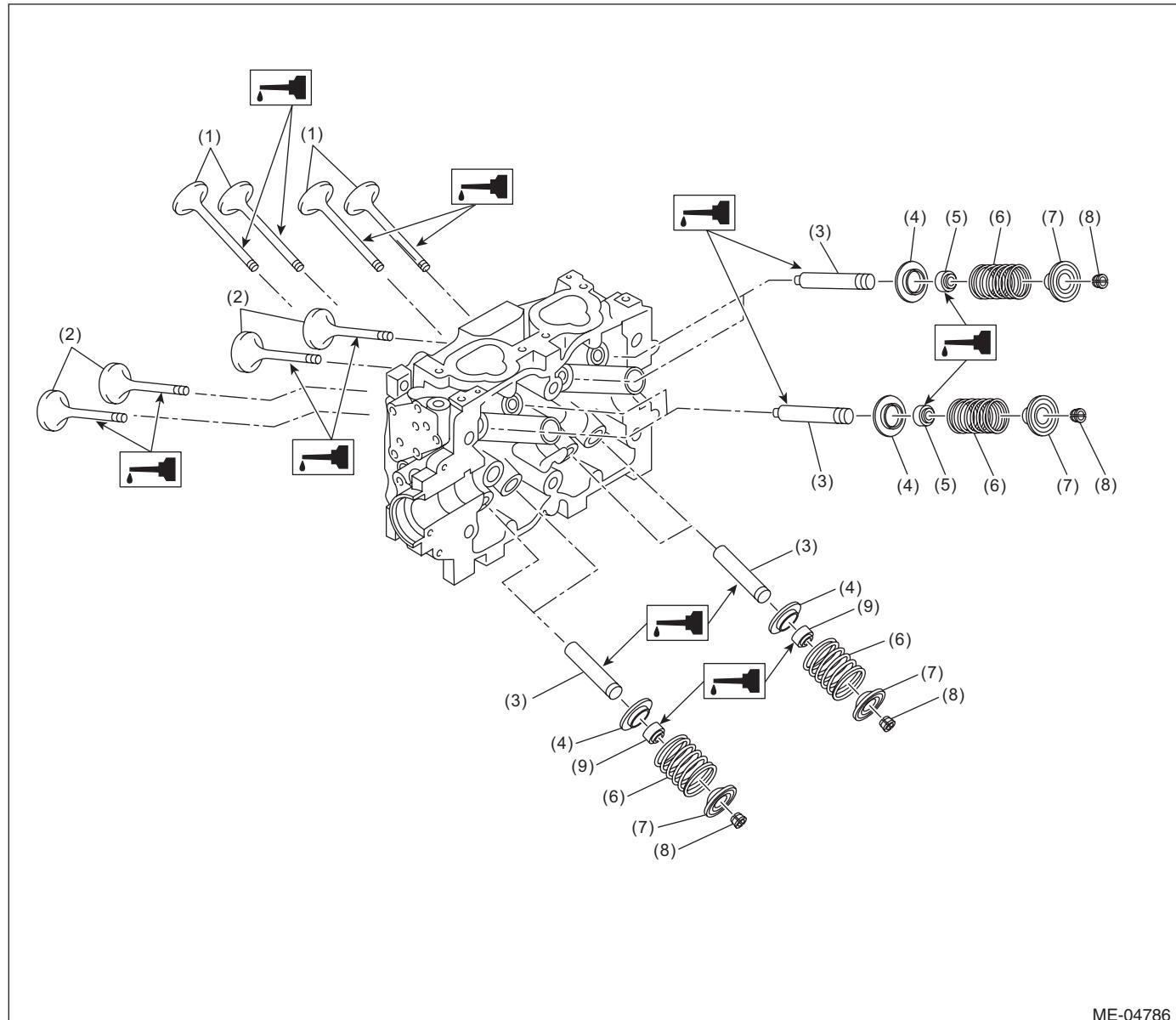
- (4) Exhaust rocker shaft
(5) Exhaust valve rocker arm

Tightening torque:N·m (kgf·m, ft·lb)
T1: 6 (0.6, 4.4)
T2: 9.75 (1.0, 7.2)
T3: 25 (2.5, 18.4)

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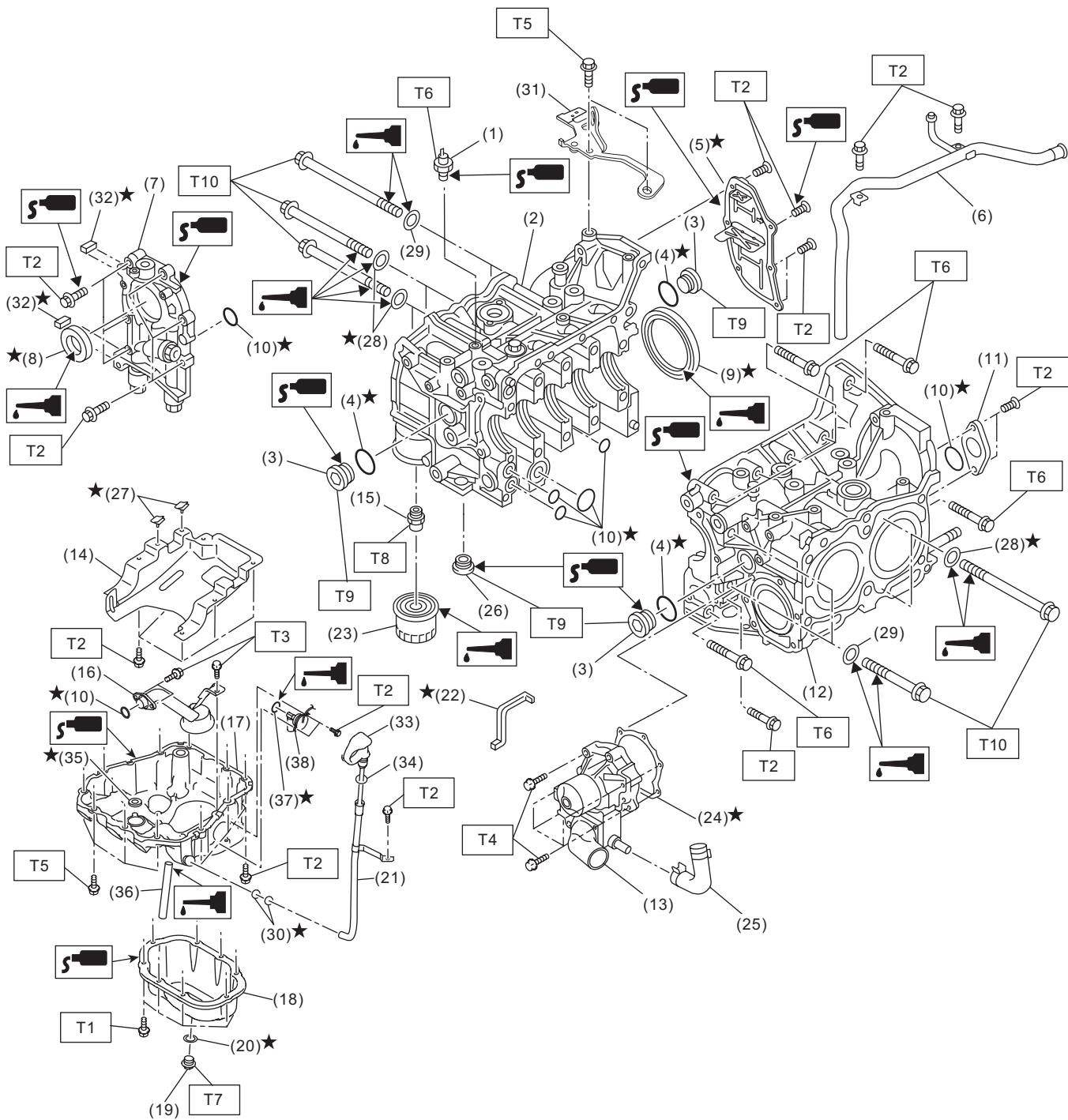
5. CYLINDER HEAD AND VALVE ASSEMBLY



ME-04786

- | | | |
|-------------------|---------------------------|----------------------------|
| (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 |

6. CYLINDER BLOCK



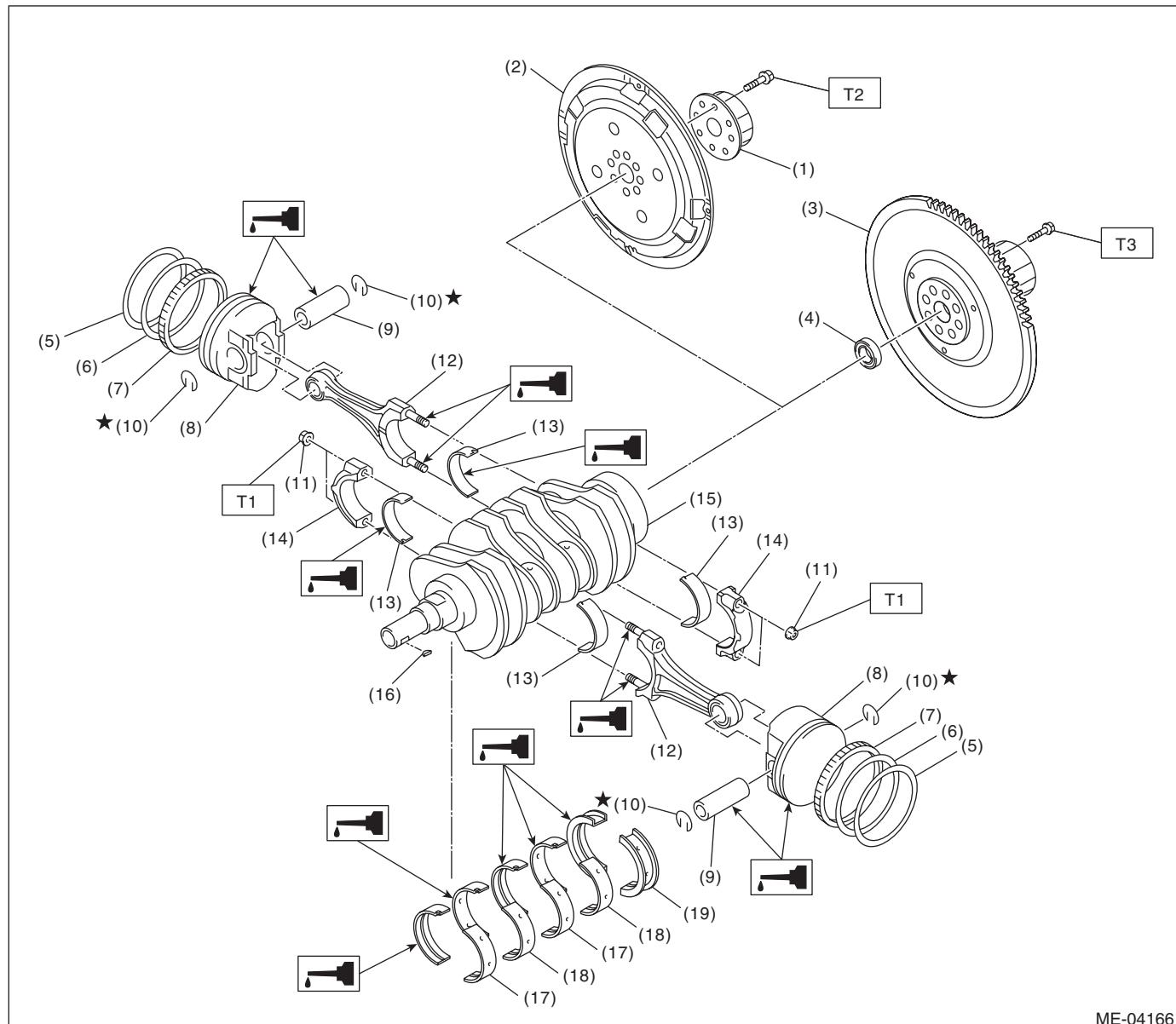
ME-04941

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(1) Oil pressure switch	(18) Oil pan	(35) O-ring
(2) Cylinder block RH	(19) Drain plug	(36) Oil drain pipe
(3) Service hole plug	(20) Drain plug gasket	(37) O-ring
(4) Gasket	(21) Oil level gauge guide	(38) Oil level switch
(5) Oil separator cover	(22) Water pump sealing	
(6) Water by-pass pipe	(23) Oil filter	Tightening torque:N·m (kgf·m, ft-lb)
(7) Oil pump	(24) Gasket	T1: 5 (0.5, 3.7)
(8) Front oil seal	(25) Water pump hose	T2: 6.4 (0.7, 4.7)
(9) Rear oil seal	(26) Plug	T3: 10 (1.0, 7.4)
(10) O-ring	(27) Seal	T4: First 12 (1.2, 8.9) Second 12 (1.2, 8.9)
(11) Service hole cover	(28) Seal washer	T5: 16 (1.6, 11.8)
(12) Cylinder block LH	(29) Washer	T6: 25 (2.5, 18.4)
(13) Water pump	(30) O-ring	T7: 41.7 (4.3, 30.8)
(14) Baffle plate	(31) Engine rear hanger	T8: 45 (4.6, 33.2)
(15) Oil filter connector	(32) Oil pump seal	T9: 70 (7.1, 51.6)
(16) Oil strainer	(33) Oil level gauge	T10: <Ref. to ME(H4SO)-72, INSTALLATION, Cylinder Block.>
(17) Cylinder block lower	(34) O-ring	

7. CRANKSHAFT AND PISTON



ME-04166

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

Tightening torque:N·m (kgf·m, ft·lb)

T1: 45 (4.6, 33.2)

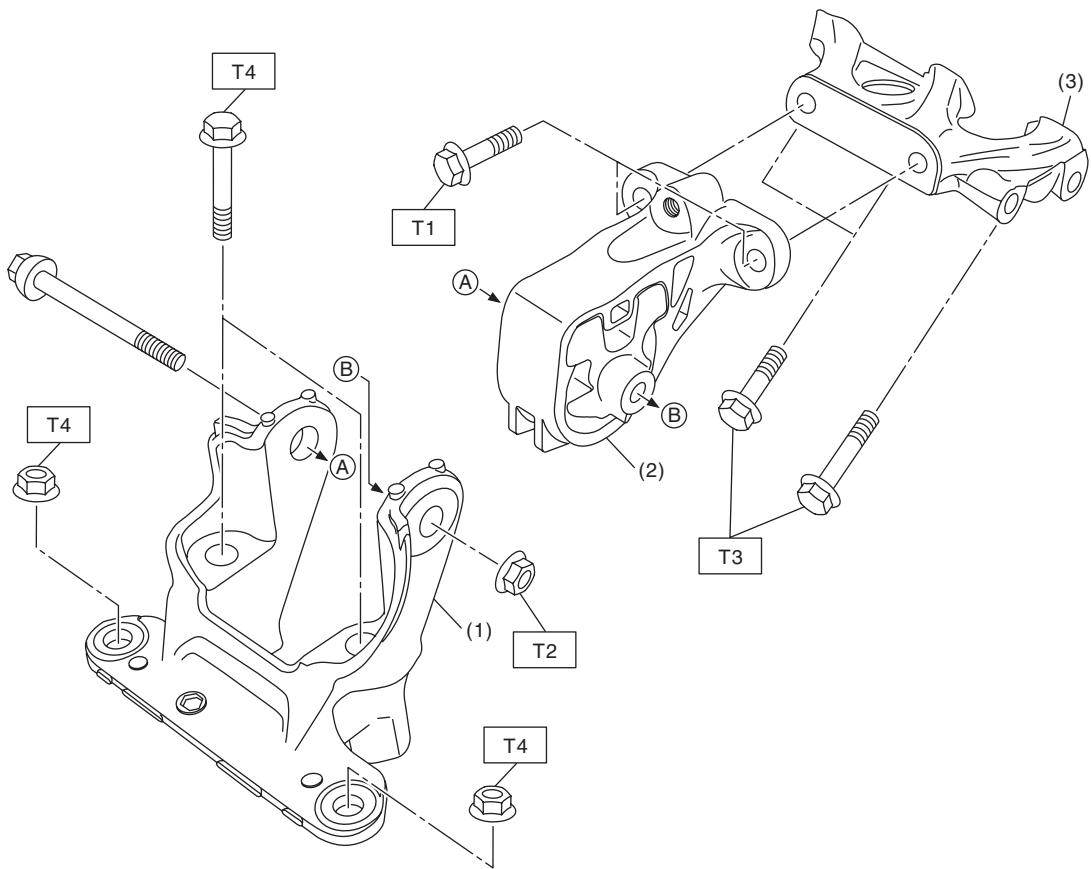
T2: <Ref. to CVT-132, INSTALLATION, Drive Plate.>

T3: <Ref. to CL-14, INSTALLATION, Flywheel.>

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8. ENGINE MOUNTING



ME-04465

(1) Front mounting bracket
(2) Front cushion rubber

(3) Engine mounting bracket

Tightening torque:N·m (kgf·m, ft·lb)

T1: 25 (2.5, 18.4)

T2: 45 (4.6, 33.2)

T3: 58 (5.9, 42.8)

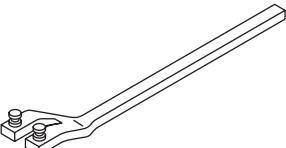
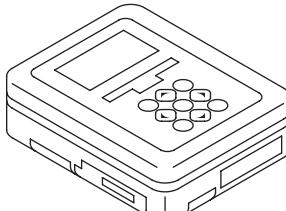
T4: 60 (6.1, 44.3)

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 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 re-checks.
- 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.

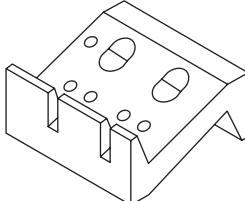
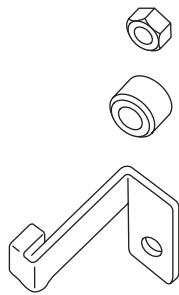
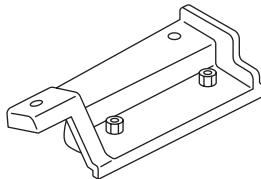
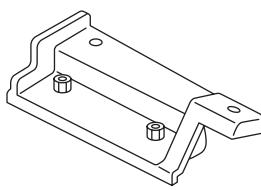
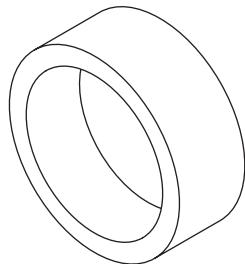
D: PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST18231AA010	18231AA010	CAM SPROCKET WRENCH	Used for removing and installing cam sprocket (LH side) NOTE: CAM SPROCKET WRENCH (499207100) can also be used.
 ST1B022XU0	1B022XU0	SUBARU SELECT MONITOR III KIT	Used for various inspections.

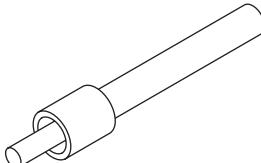
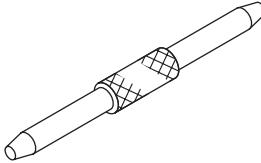
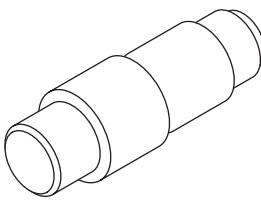
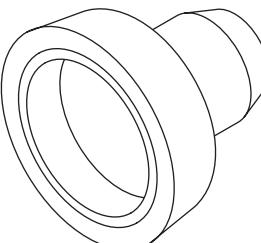
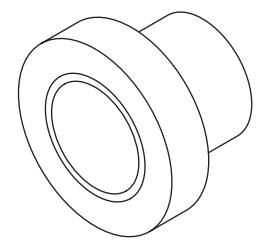
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ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-498267800	498267800	CYLINDER HEAD TABLE	<ul style="list-style-type: none"> Used for replacing valve guides. Used for removing and installing valve spring.
 ST-498277200	498277200	STOPPER SET	Used for installing automatic transmission assembly to engine.
 ST-498457000	498457000	ENGINE STAND ADAPTER RH	Used together with ENGINE STAND (499817100).
 ST-498457100	498457100	ENGINE STAND ADAPTER LH	Used together with ENGINE STAND (499817100).
 ST-498747300	498747300	PISTON GUIDE	Used for installing piston in cylinder.

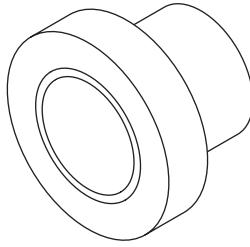
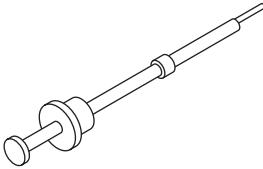
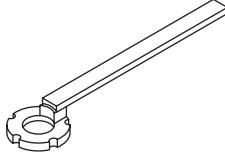
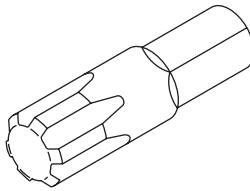
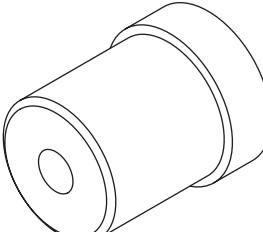
General Description

MECHANICAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-498857100	498857100	VALVE OIL SEAL GUIDE	Used for press-fitting of intake and exhaust valve guide oil seals.
 ST-499017100	499017100	PISTON PIN GUIDE	Used for installing piston pin, piston and connecting rod.
 ST-499037100	499037100	CONNECTING ROD BUSHING REMOVER AND INSTALLER	Used for removing and installing connecting rod bushing.
 ST-499587200	499587200	CRANKSHAFT OIL SEAL INSTALLER	<ul style="list-style-type: none"> Used for installing crankshaft oil seal. Used together with CRANKSHAFT OIL SEAL GUIDE (499597100).
 ST-499587500	499587500	OIL SEAL INSTALLER	<ul style="list-style-type: none"> Used for installing the camshaft oil seal. Used together with OIL SEAL GUIDE (499597000).

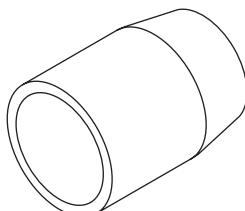
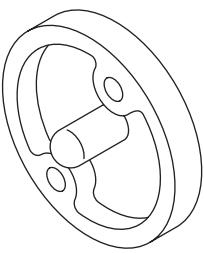
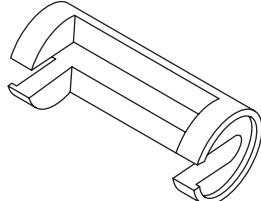
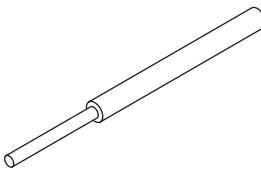
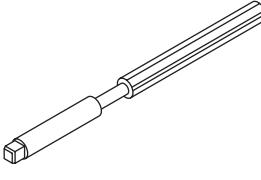
General Description

MECHANICAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-499587700	499587700	CAMSHAFT OIL SEAL INSTALLER	Used for installing cylinder head plug.
 ST18320AA010	18320AA010	PISTON PIN REMOVER ASSY	<ul style="list-style-type: none"> • Used for removing piston pin. • PISTON PIN REMOVER ASSY (499097700) can also be used.
 ST-499207400	499207400	CAM SPROCKET WRENCH	Used for removing and installing cam sprocket. (RH side)
 ST-499497000	499497000	TORX® PLUS	Used for removing and installing camshaft cap.
 ST-499587100	499587100	OIL SEAL INSTALLER	Used for installing oil pump oil seal.

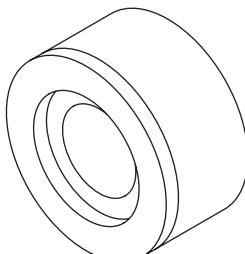
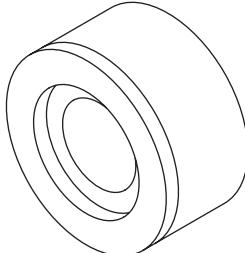
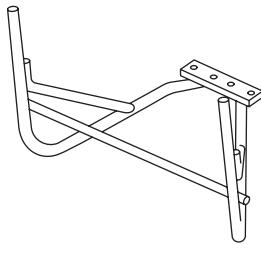
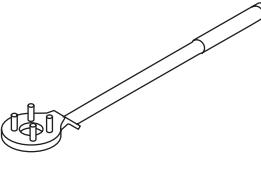
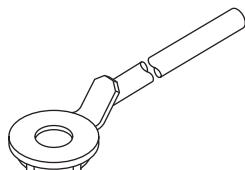
General Description

MECHANICAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-499597000	499597000	OIL SEAL GUIDE	<ul style="list-style-type: none">Used for installing the camshaft oil seal.Used together with CAMSHAFT OIL SEAL INSTALLER (499587500).
 ST-499597100	499597100	CRANKSHAFT OIL SEAL GUIDE	<ul style="list-style-type: none">Used for installing crankshaft oil seal.Used together with CRANKSHAFT OIL SEAL INSTALLER (499587200).
 ST-499718000	499718000	VALVE SPRING REMOVER	Used for removing and installing valve spring.
 ST-499767200	499767200	VALVE GUIDE REMOVER	Used for removing valve guides.
 ST-499767400	499767400	VALVE GUIDE REAMER	Used for reaming valve guides.

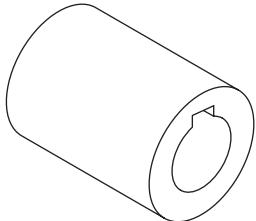
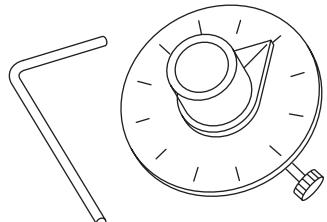
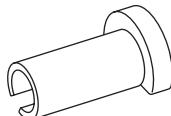
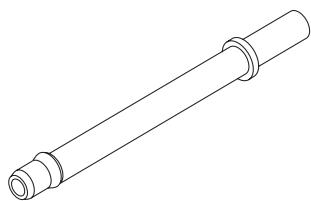
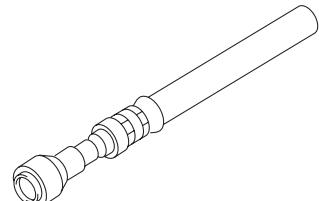
General Description

MECHANICAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-499767700	499767700	VALVE GUIDE ADJUSTER	Used for installing valve guides. (Intake side)
 ST-499767800	499767800	VALVE GUIDE ADJUSTER	Used for installing valve guides. (Exhaust side)
 ST-499817100	499817100	ENGINE STAND	<ul style="list-style-type: none"> • Stand used for engine disassembly and assembly. • Used together with ENGINE STAND ADAPTER RH (498457000) & LH (498457100).
 ST-499977100	499977100	CRANK PULLEY WRENCH	Used for removing and installing the crank pulley. (MT model)
 ST-499977400	499977400	CRANK PULLEY WRENCH	Used for removing and installing the crank pulley. (CVT model)

General Description

MECHANICAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-499987500	499987500	CRANKSHAFT SOCKET	Used for rotating crankshaft.
 ST18854AA000	18854AA000	ANGLE GAUGE	Used for installing the crank pulley.
 ST42099AE000	42099AE000	QUICK CONNECTOR RELEASE	Used for disconnecting quick connector of the engine compartment.
 ST18471AA000	18471AA000	FUEL PIPE ADAPTER	Used for inspecting the fuel pressure.
 ST42075AG690	42075AG690	Fuel hose	Used for inspecting the fuel pressure. NOTE: This is the SUBARU genuine part.

General Description

MECHANICAL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
ST18354AA000	18354AA000	VALVE ROCKER HOLDER	Used for installing the valve rocker assembly (intake). (2-piece set)
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 measuring intake manifold vacuum.
Oil pressure gauge	Used for measuring engine oil pressure.
Fuel pressure gauge	Used for measuring fuel pressure.
Timing light	Used for measuring ignition timing.