

ENGINE MECHANICAL

HEAD COVER

EN01F02127010701006001

TIGHTENING TORQUE

Unit: N·m {kgf·cm, lbf·ft}

Tightening part	Tightening torque	Remarks
Head cover mounting bolt	28.5 {291, 21}	

ROCKER ARM ASSEMBLY

EN01F02127010701006002

STANDARD VALUE, LIMIT AND ACTION

Unit: mm {in.}

Inspection item		Standard value	Permissible limit	Action
Rocker arm shaft outer diameter		22 {0.866}	21.92 {0.863}	Replace
Rocker arm bushing inner diameter		22 {0.866}	22.08 {0.869}	Replace
Oil clearance between rocker arm shaft outer diameter and rocker arm bushing inner diameter		0.030-0.101 {0.0012-0.0040}	0.15 {0.0059}	Replace
Valve clearance	Intake	0.30 {0.0118}	–	Adjustment
	Exhaust	0.45 {0.0177}	–	Adjustment

TIGHTENING TORQUE

Unit: N·m {kgf·cm, lbf·ft}

Tightening part	Tightening torque	Remarks
Rocker arm support mounting bolt	36 {367, 27}	Refer to this document.
Rocker arm adjust screw lock nut	25 {255, 18}	
Crosshead lock nut	25 {255, 18}	

Engine Parts:

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Phone: 269 673 1638

CAMSHAFT ASSEMBLY

EN01F02127010701006003

STANDARD VALUE, LIMIT AND ACTION

Unit: mm {in.}

Inspection item		Standard value	Permissible limit	Action
Cam height	Intake	50.067 {1.971}	49.987 {1.968}	Replace
	Exhaust	52.104 {2.051}	52.024 {2.048}	Replace
Cam lift	Intake	8.067 {0.318}	(7.987 {0.3144})	Replace
	Exhaust	10.104 {0.398}	(10.024 {0.395})	Replace
Outer diameter of camshaft journal		40 {1.575}	39.85 {1.569}	Replace
Inner diameter of camshaft bearing		40 {1.575}	40.15 {1.581}	Replace
Camshaft bearing oil clearance		0.020-0.063 {0.0008-0.0025}	—	Replace
Runout of camshaft		0.04 {0.0016}	0.1 {0.0039}	Replace
Under head length of camshaft gear mounting bolt		30.0 {1.181}	30.5 {1.201}	Replace

TIGHTENING TORQUE

Unit: N·m {kgf·cm, lbf·ft}

Tightening part	Tightening torque	Remarks
Camshaft gear mounting bolt	59 {602, 44} + 90°	Refer to this document.
Mounting bolt of camshaft bearing cap	36 {367, 27}	

CYLINDER HEAD ASSEMBLY

EN01F02127010701006004

STANDARD VALUE, LIMIT AND ACTION

Unit: mm {in.}

Inspection item		Standard value	Permissible limit	Action
Head bolt under head length (M12)		126.0 {4.961}	126.5 {4.980}	Replace
		156.0 {6.142}	156.5 {6.161}	Replace
		187.0 {7.362}	187.5 {7.382}	Replace
Strain of the bottom surface of the cylinder head	Longitudinal direction	0.06 {0.0024}	0.20 {0.0079}	Replace
	Right angle direction	0.03 {0.0012}	0.20 {0.0079}	Replace

TIGHTENING TORQUE

Unit: N·m {kgf·cm, lbf·ft}

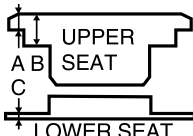
Tightening part	Tightening torque	Remarks
Cylinder head mounting head bolt (M12)	59 {602, 44}	Refer to this document.
Cylinder head mounting head bolt (M10)	59 {602, 44}	Refer to this document.

VALVE SYSTEM

EN01F02127010701006005

STANDARD VALUE, LIMIT AND ACTION

Unit: mm {in.}

Inspection item			Standard value	Permissible limit	Action	
Valve sink		Intake	0.55-0.85 {0.0217-0.0335}	1.1 {0.0433}	Replace	
		Exhaust	1.15-1.45 {0.0452-0.0571}	1.7 {0.0669}	Replace	
Valve seat		Intake	30°	30°-30°35'	Correction	
		Exhaust	45°	45°-45°30'	Correction	
Valve face		Intake	30°	29°30'-30°	Correction	
		Exhaust	45°	44°30'-45°	Correction	
Valve spring seat thickness 			A	3.2 {0.1260}	If the wear of A or B added to the wear of C exceeds 1 mm {0.0393 in.}.	Replace
			B	5.5 {0.2165}		
			C	1.0 {0.0393}		
Squareness of valve spring		Inner	—	2.0 {0.0787}	Replace	
		Outer	—	2.0 {0.0787}	Replace	
Valve spring [Referential values in brackets ()]	Inner	Set length	44.8 {1.764}	—	Replace	
		Set load	128.5 N {13.1 kgf}	118.2 N {12 kgf}	Replace	
		Free length	(64.6 {2.543})	61.6 {2.425}	Replace	
	Outer	Set length	46.8 {1.843}	—	Replace	
		Set load	313.8 N {32 kgf}	288.7 N {29.4 kgf}	Replace	
		Free length	(75.7 {2.980})	72.7 {2.862}	Replace	
Valve stem outer diameter		Intake	7 {0.276}	—		
		Exhaust	7 {0.276}	—		
Valve guide inner diameter		Intake	7 {0.276}	—		
		Exhaust	7 {0.276}	—		
Oil clearance of valve stem and valve guide		Intake	0.023-0.058 {0.0009-0.0023}	—	Replace	
		Exhaust	0.050-0.083 {0.0020-0.0033}	—	Replace	
Dimension of tapping in the valve stem seal			22.5-23.0 {0.886-0.906}	—	Adjustment	

CRANKSHAFT PULLEY

EN01F02127010701006006

TIGHTENING TORQUE

Unit: N·m {kgf·cm, lbf·ft}

Tightening part	Tightening torque	Remarks
Crankshaft pulley mounting bolt	118 {1,203, 87}	

FRONT OIL SEAL RETAINER

EN01F02127010701006007

TIGHTENING TORQUE

Unit: N·m {kgf·cm, lbf·ft}

Tightening part	Tightening torque	Remarks
Front oil seal retainer mounting bolt	30 {306, 22}	

FLYWHEEL ASSEMBLY

EN01F02127010701006008

TIGHTENING TORQUE

Unit: N·m {kgf·cm, lbf·ft}

Tightening part	Tightening torque	Remarks
Flywheel assembly mounting bolt	186 {1,897, 137}	Refer to this document.

FLYWHEEL HOUSING

EN01F02127010701006009

TIGHTENING TORQUE

Unit: N·m {kgf·cm, lbf·ft}

Tightening part		Tightening torque	Remarks
Flywheel housing mounting bolt	M8	28.5 {291, 21}	
	M10	55 {561, 41}	
	M16	196 {1,999, 145}	
Housing stay mounting bolt	M12	97 {989, 72}	
	M14	171.5 {1,749, 126}	

TIMING GEAR & CAM IDLE GEAR

EN01F02127010701006010

STANDARD VALUE, LIMIT AND ACTION

Unit: mm {in.}

Inspection item		Standard value	Permissible limit	Action
Main idle gear	Shaft outer diameter	57 {2.244}	—	
	Bushing inner diameter	57 {2.244}	—	
Sub idle gear	Shaft outer diameter	50 {1.969}	—	
	Bushing inner diameter	50 {1.969}	—	
Cam idle gear	Shaft outer diameter	34 {1.339}	—	
	Bushing inner diameter	34 {1.339}	—	
Idle gear oil clearance	Main idle gear	0.030-0.090 {0.0012-0.0035}	0.20 {0.0079}	Replace
	Sub idle gear	0.025-0.075 {0.0010-0.0030}	0.20 {0.0079}	Replace
	Cam idle gear	0.025-0.075 {0.0010-0.0030}	0.20 {0.0079}	Replace
Injection pump drive idle gear	Shaft outer diameter	34 {1.339}	—	
	Bushing inner diameter	34 {1.339}	—	
	Oil clearance	0.025-0.057 {0.0010-0.0022}	0.10 {0.0039}	Replace
Camshaft end play		0.100-0.178 {0.0039-0.0070}	—	Replace
Idle gear backlash	Between camshaft drive gear and cam idle gear	0.084-0.175 {0.0033-0.0069}	0.30 {0.0118}	Replace
	Between main idle gear and injection pump drive idle gear	0.030-0.218 {0.0012-0.0086}	0.30 {0.0118}	Replace
	Between main idle gear and sub idle gear	0.030-0.162 {0.0012-0.0064}	0.30 {0.0118}	Replace
	Between sub idle gear and oil pump drive gear	0.030-0.131 {0.0012-0.0052}	0.30 {0.0118}	Replace
	Between cam idle gear and sub idle gear	0.084 -0.235 {0.0033-0.0093}	0.30 {0.0118}	Replace
Idle gear end play	Main idle gear	0.114-0.160 {0.0045-0.0063}	0.30 {0.0118}	Replace
	Sub idle gear	0.040-0.120 {0.0016-0.0047}	0.30 {0.0118}	Replace
	Cam idle gear	0.040-0.120 {0.0016-0.0047}	0.30 {0.0118}	Replace

TIGHTENING TORQUE

Unit: N·m {kgf·cm, lbf·ft}

Tightening part	Tightening torque	Remarks
Sub idle gear shaft mounting bolt	108 {1,101, 80}	
Main idle gear shaft mounting bolt	172 {1,754, 127}	
Injection pump drive idle gear shaft mounting bolt	108 {1,101, 80}	
Bearing case assembly mounting bolt	28.5 {291, 21}	

PISTON & CONNECTING ROD

EN01F02127010701006011

STANDARD VALUE, LIMIT AND ACTION

Unit: mm {in.}

Inspection item		Standard value	Permissible limit	Action
Cylinder liner inner diameter		112 {4.409}	112.15 {4.415}	
Piston outer diameter (17mm in axial direction to the upper pin from the lower end of the skirt)		111.927-111.943 {4.406-4.407}	—	
Clearance between cylinder liner inner diameter and piston outer diameter		0.053-0.077 {0.0021-0.0030}	—	Replace
Piston ring thickness	Top	2.999 {0.1181}	2.899 {0.1141}	Replace
	Second	2.0 {0.0787}	1.9 {0.0748}	Replace
	Oil	4.0 {0.1575}	3.9 {0.1535}	Replace
Piston ring groove width	Top	Taper	—	Replace
	Second	2.0 {0.0787}	2.2 {0.0866}	Replace
	Oil	4.0 {0.1575}	4.1 {0.1614}	Replace
Piston ring closed gap clearance	Top	0.30-0.40 {0.0118-0.0157}	1.5 {0.0590}	Replace
	Second	0.75-0.90 {0.0295-0.0354}	1.5 {0.0590}	Replace
	Oil	0.15-0.30 {0.0059-0.0118}	1.2 {0.0472}	Replace
Outer diameter of contact surface between piston pin and piston boss		37 {1.457}	36.96 {1.455}	Replace
Piston boss inner diameter		37 {1.457}	37.05 {1.459}	Replace
Clearance between outer diameter of contact surface between piston pin and piston boss and piston boss inner diameter		0.011-0.032 {0.0004-0.0013}	0.05 {0.0020}	Replace
Outer diameter of piston center		37 {1.457}	36.96 {1.455}	Replace
Inner diameter of connecting rod bush		37 {1.457}	37.1 {1.461}	Replace
Clearance between outer diameter of piston center and inner diameter of connecting rod bush		0.035-0.056 {0.0014-0.0022}	0.08 {0.0032}	Replace

Inspection item	Standard value	Permissible limit	Action
Crankshaft crank pin outer diameter	65 {2.560}	64.3 {2.531}	Replace (Note)
Oil clearance between crankshaft crank pin and connecting rod bearing	0.031-0.082 {0.0012-0.0032}	0.2 {0.0079}	Replace
Under head length of connecting rod bolt	67.0 {2.638}	68.0 {2.677}	Replace
Connecting rod end play	0.20-0.52 {0.0079-0.0205}	1.0 {0.0394}	

(Note) Readjust by grinding for uneven wear 0.1 mm {0.0039 in.} or more, regrind for wear 0.2 mm {0.0079 in.} or more, and replace the crankshaft for wear 0.7 mm {0.0276 in.} or more.

TIGHTENING TORQUE

Unit: N·m {kgf·cm, lbf·ft}

Tightening part	Tightening torque	Remarks
Connecting rod bolt	69 {704, 51} + 90° + 45°	Refer to this document.

CRANKSHAFT

EN01F02127010701006012

STANDARD VALUE, LIMIT AND ACTION

Unit: mm {in.}

Inspection item	Standard value	Repair limit	Permissible limit	Action
Crankshaft end play	0.050-0.270 {0.0020-0.0106}	0.500 {0.0197}	1.270 {0.05}	Replace
Rotational runout of crankshaft	0-0.1 {0-0.0039}	0.15 {0.0059}	—	Replace
Outer diameter of crankshaft journal	80.0 {3.150}	—	79.3 {3.122}	Replace (Note)
Width of crankshaft center journal	36.0 {1.417}	—	37.0 {1.457}	Replace
Oil clearance between crankshaft journal outer diameter and crankshaft bearing inner diameter	0.051-0.102 {0.0020-0.0040}	0.2 {0.0079}	—	Replace
Crankshaft crank pin outer diameter	65.0 {2.560}	—	64.3 {2.531}	Replace (Note)
Under head length of main bearing cap bolt	106.8 {4.205}	—	108.0 {4.252}	Replace

(Note) Readjust by grinding for uneven wear 0.1 mm {0.0039 in.} or more, regrind for wear 0.2 mm {0.0079 in.} or more, and replace the crankshaft for wear 0.7 mm {0.0276 in.} or more.

TIGHTENING TORQUE

Unit: N·m {kgf·cm, lbf·ft}

Tightening part	Tightening torque	Remarks
Bearing cap bolt	69 {704, 51} + 90° + 45°	Refer to this document.

CYLINDER LINER

EN01F02127010701006013

STANDARD VALUE, LIMIT AND ACTION

Unit: mm {in.}

Inspection item	Standard value	Action
Cylinder liner collar projection	0.01-0.08 {0.0004-0.0032}	

CYLINDER BLOCK

EN01F02127010701006014

STANDARD VALUE, LIMIT AND ACTION

Unit: mm {in.}

Inspection item	Standard value	Repair limit	Permissible limit	Action
Strain of upper surface of cylinder block	0.05 {0.0020}	—	0.20 {0.0079}	Replace

Tightening torque

Unit: N·m {kgf·cm, lbf·ft}

Tightening part	Tightening torque	Remarks
Cooling jet mounting bolt	22 {224, 16}	

ENGINE MOUNTING AND BRACKET

EN01F02127010701006015

TIGHTENING TORQUE

Unit: N·m {kgf·cm, lbf·ft}

Tightening part	Tightening torque	Remarks
Rear engine mounting bracket mounting bolt	103 {1,050, 76}	
Rear engine mounting nut	64 {653, 47}	
Front engine mounting bracket mounting bolt	125 {1,275, 92}	
Front engine mounting nut	98 {999, 72}	

GLOW PLUG

EN01F02127010701006016

STANDARD VALUE, LIMIT AND ACTION

Inspection item	Standard value	Action
Resistance between body and terminal	0.55-0.75 Ω (at 20°C {68°F})	Replace

TIGHTENING TORQUE

Unit: N·m {kgf·cm, lbf·ft}

Tightening part	Tightening torque	Remarks
Glow plug	20-25 {204-254, 15-18}	
Glow plug wire mounting nut	1.0-1.5 {11-15, 0.8-1.1}	

ADJUSTING THE VALVE CLEARANCE

EN01F02121040706004003

⚠ CAUTION

- Before adjustment, make sure that the tightening bolts of the cylinder head, rocker arm support, nozzle clamp, and camshaft bearing cap are tightened with their specified torque.
- Make sure that there is no dirt in the crosshead and valve stem head.

1. VALVE CLEARANCE ADJUSTMENT

- Turn the crankshaft forward to align the cylinder for adjustment with the compression stroke top dead center.

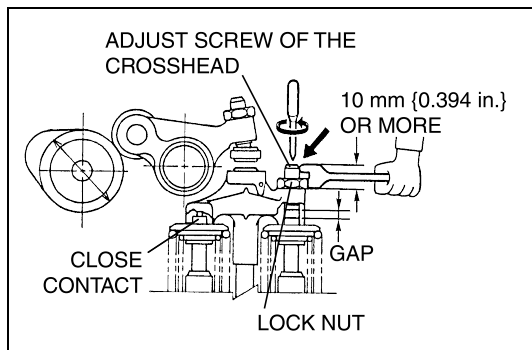
⚠ CAUTION

Check that the rocker arm to be adjusted is not lifted to the cam of the camshaft.

NOTICE

If the No.1 cylinder is at the compression stroke top dead center, the valve clearance with ○ mark in the table can be adjusted. If the No.4 cylinder is at the compression stroke top dead center, the cylinder with Δ mark can be adjusted.

Cylinder number	1		2		3		4	
Valve arrangement	Intake	Exhaust	Intake	Exhaust	Intake	Exhaust	Intake	Exhaust
No.1 cylinder at the compression stroke top dead center	○	○	○			○		
No.4 cylinder at the compression stroke top dead center				Δ	Δ		Δ	Δ

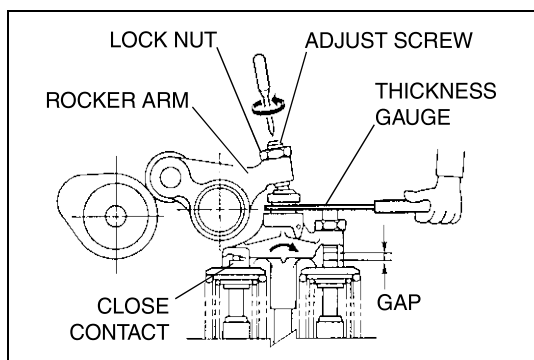


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- Fully loosen the adjust screw and lock nut of the crosshead.

⚠ CAUTION

Make the adjust screw projecting beyond the upper surface of the crosshead by at least 10 mm {0.394 in.}. Correct adjustment cannot be made unless the adjust screw is completely separated from the valve stem.



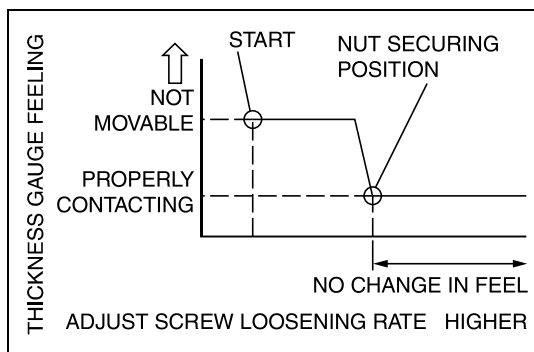
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- (3) Insert a thickness gauge in between the rocker arm and the crosshead and turn the rocker arm adjust screw to adjust a clearance before tightening the lock nut.

Tightening Torque:**25 N·m {255 kgf·cm, 18 lbf·ft}****NOTICE**

It is deemed appropriate if the thickness gauge goes in with some unsmoothness during insertion and then moves smoothly with slight binding feel after insertion.

Standard value (During cooling)	Intake	0.30 mm {0.012 in.}
	Exhaust	0.45 mm {0.018 in.}

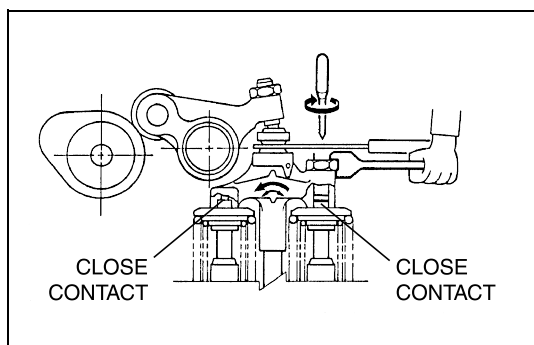


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- (4) With the thickness gauge inserted, loosen the adjust screw of the crosshead and check that you do not feel the thickness gauge light.

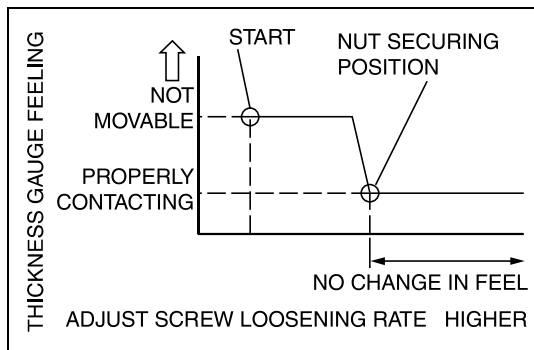
CAUTION

If you feel it light, repeat the procedure.



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- (5) Tighten the adjust screw of the crosshead until the thickness gauge does not move.



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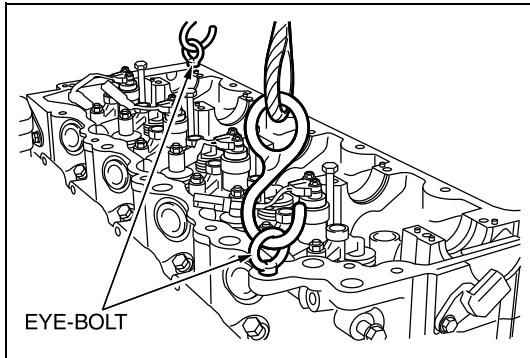
- (6) While gradually loosening the adjust screw of the crosshead, tighten the lock nut of the crosshead at a position where your feel of the thickness gauge becomes proper.

Tightening Torque:**25 N·m {255 kgf·cm, 18 lbf·ft}****CAUTION**

Do not loosen the adjust screw too much. If the adjust screw is made too loose, the former state will be restored. Although you may get proper feel with the thickness gauge, a gap will be produced between the adjust screw of the crosshead and the valve and you cannot make correct adjustment.

NOTICE

It is deemed appropriate if the thickness gauge goes in with some unsmoothness during insertion and then moves smoothly with slight binding feel after insertion.



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⚠ CAUTION

When using SST, use the washer not to damage the upper surface of cylinder block.

- (4) Set the wire to SST and use the hoist to lift the cylinder head to remove it.
- (5) Before placing the cylinder head assembly on the workbench, prepare a foundation or a base by assembling the bench to protect peripheral parts against any load.

⚠ CAUTION

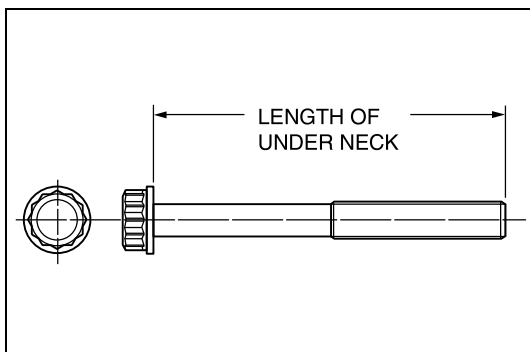
If the injector is mounted, be careful not to damage the nozzle end.

- (6) Remove the head gasket from the cylinder head or cylinder block.

INSPECTING THE COMPONENTS

1. INSPECTING LENGTH OF HEAD BOLTS

- (1) Use the vernier calipers to measure the head bolt under head (M12 only). If the measurement reading exceeds the permissible limit, replace the head bolt.



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Standard value (mm {in.})	Permissible limit (mm {in.})	Bolt No.
126.0 {4.961}	126.5 {4.980}	5, 6, 7, 12, 13, 14, 15, 20, 21
156.0 {6.142}	156.5 {6.161}	9, 10, 17, 18
187.0 {7.362}	187.5 {7.382}	4, 8, 11, 16, 19

Engine Parts:

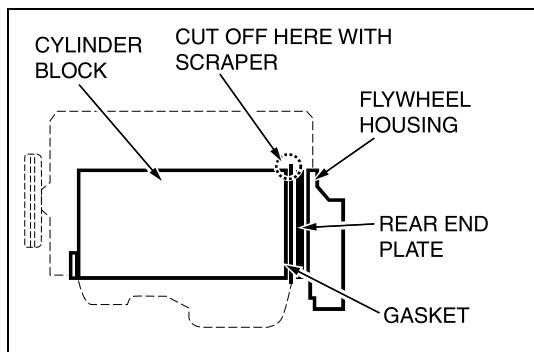
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MOUNTING THE CYLINDER HEAD ASSEMBLY

1. MOUNTING THE HEAD GASKET

- (1) Use the scraper to cut off an excessive protruding portion of the gasket for the rear end plate so that the gasket will be flush with the upper surface of the cylinder block.

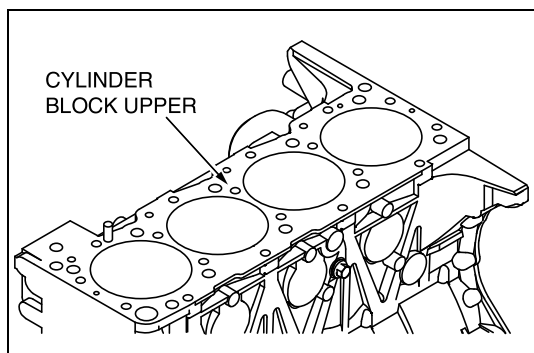


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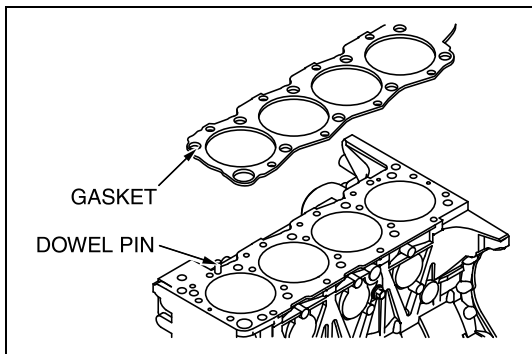
- (2) Clean the upper surface of cylinder block.

CAUTION

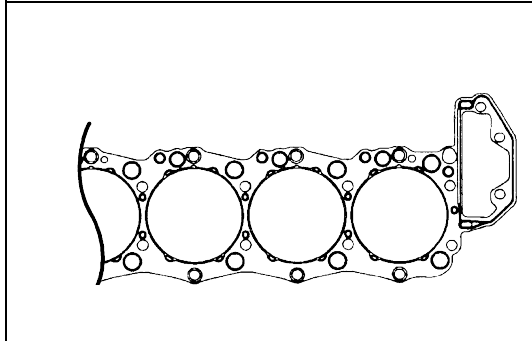
Before working, remove dirt, water or oil on the cylinder head and cylinder block.



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- (3) Set the new head gasket to the dowel pin and place the gasket on the upper surface of cylinder block.

CAUTION

- Never reuse the gasket, or the engine will be broken.
- Avoid any physical contact of hands and materials with the seal rings around the bores.

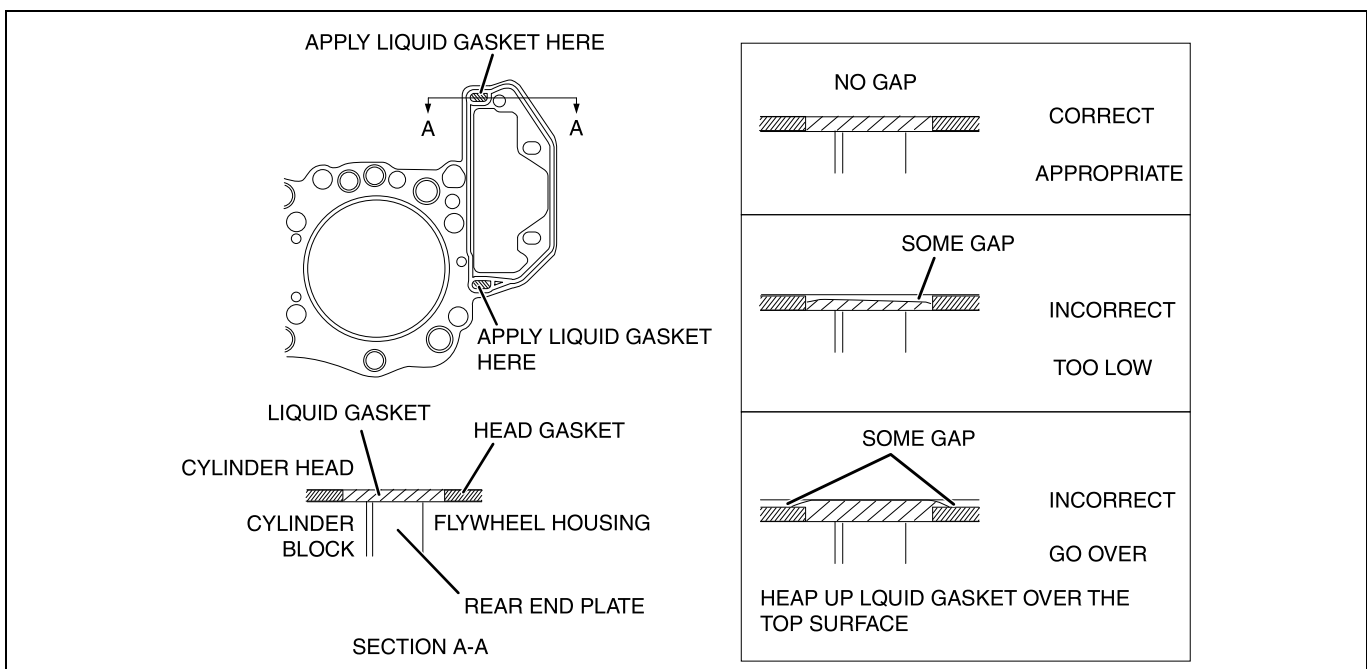
NOTICE

Before mounting the head gasket, check the seal ring for falling or damage.

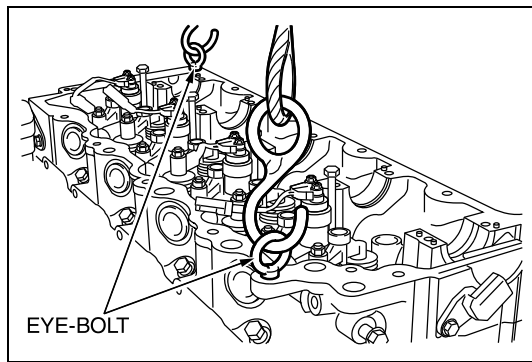
- (4) Apply liquid gasket (ThreeBond TB1211: White or equivalent) to the cylinder block upper surface rear end and head gasket mating area of the flywheel housing (2 places).

NOTICE

- When applying liquid gasket, use care not to allow the surface of liquid gasket to go over the upper surface of the head gasket.
- Install the case within 20 minutes after applying the liquid gasket.



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2. MOUNTING THE CYLINDER HEAD ASSEMBLY

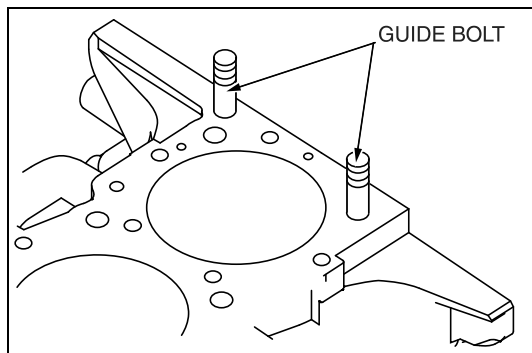
- (1) Clean the head bolt seat surface on the upper surface of the cylinder head and the bottom surface of cylinder head.
- (2) After mounting the SST, use the hoist to lift the cylinder head assembly.

SST: S0943-31070

Eye bolt

⚠ CAUTION

When the SST are used, mount the SST via washers and use care not to cause a potential risk of damaging the upper surface of the cylinder head.



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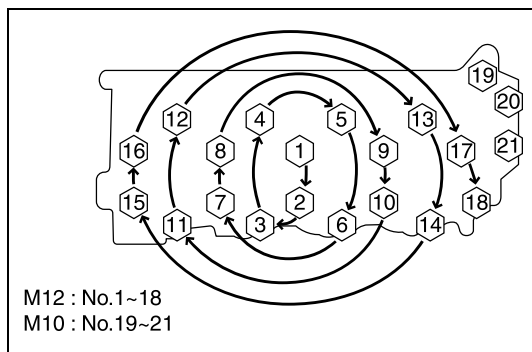
- (3) Insert some guide bolts into the bolt holes in the cylinder block and align dowel pins before setting on the cylinder block.

⚠ CAUTION

- Before placing on the cylinder block, check that the cylinder is free from foreign matter.
- When setting the cylinder head in place, use care to avoid improper engagement of a cam idle gear with a sub idle gear. (Forced engagement of gear teeth may cause dent or chipping, resulting in troubles such as abnormal noise or chipped teeth.)

NOTICE

When setting the cylinder head in place, use of guide bolts can prevent off-position of liquid gasket.



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- (4) Apply engine oil to the bolt seat surface and threaded part of head bolts.
- (5) Tighten the 18 head bolts (M12 only) (cylinder head to cylinder block) in the order as shown in the figure.

Tightening Torque:

59 N·m {602 kgf·cm, 44 lbf·ft}

⚠ CAUTION

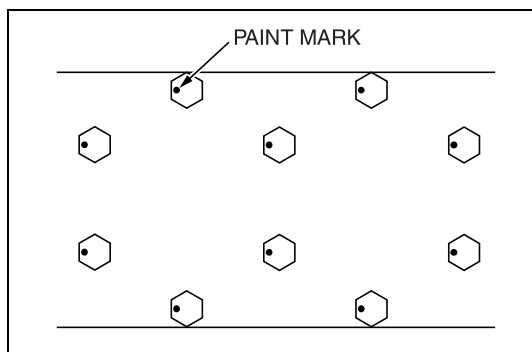
Do not tighten the bolts No. 19, 20, 21.

- (6) Tighten the 18 head bolts (M12 only) again (cylinder head to cylinder block) in the order as shown in the figure.

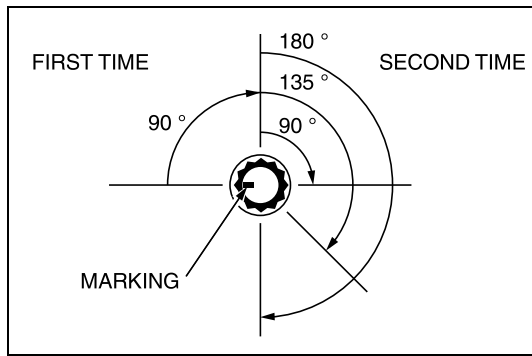
Tightening Torque:

59 N·m {602 kgf·cm, 44 lbf·ft}

- (7) Paint marks on the heads of the 18 head bolts (M12 only) in the same direction as shown in the figure.



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- (8) Tighten the 18 head bolts (M12 only) by 90° (1/4 turns) in the rotational direction in the same order as in Step (5), and check that all paint marks face to the same direction.
- (9) Retighten the head bolts (M12 only) in the same order following the angles in the table.

Tightening angle	Head bolt No.
90°	1, 2, 7, 8, 9, 10, 15, 16, 17
135°	4, 5, 12, 13
180°	3, 6, 11, 14, 18

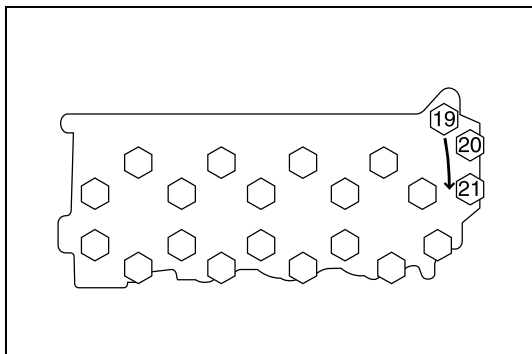
⚠ CAUTION

Do not loosen the bolt even when it is over tightened during retightening.

- (10) After tightening the 18 head bolts (M12 only) (cylinder head to cylinder block), tighten the remaining head bolts No. 19, 20, 21.

Tightening Torque:

59 N·m {602 kgf·cm, 44 lbf·ft}



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LUBRICATION

OIL COOLER

EN01F02127010701009001

TIGHTENING TORQUE

Unit: N·m {kgf·cm, lbf·ft}

Tightening part	Tightening torque	Remarks
Oil pressure switch	24.5 {250, 18}	
Plug (safety valve)	24.5-34.3 {250-349, 19-25}	
Oil cooler element mounting nut	19.6-29.4 {200-299, 15-21}	
Oil cooler assembly mounting bolt	28.5 {291, 21}	

OIL PUMP

EN01F02127010701009002

STANDARD VALUE, LIMIT AND ACTION

Unit: mm {in.}

Inspection item	Standard value	Permissible limit	Action
Width of drive gear	28.5 {1.122}	—	Replace
Depth of cylinder block side pump housing	28.5 {1.122}	—	Replace
Difference between width of drive gear and depth of cylinder block side pump housing	0.047-0.150 {0.0019-0.0060}	0.15 {0.0060}	Replace
Outer diameter of drive gear shaft	18.0 {0.709}	—	Replace
Inner diameter of cylinder block side bush	18.0 {0.709}	—	Replace
Difference between drive gear shaft outer diameter and cylinder block side bush inner diameter	0.040-0.099 {0.0016-0.0039}	—	Replace
Drive gear outer diameter	54.0 {2.126}	—	Replace
Inner diameter of cylinder block side pump housing	54.0 {2.126}	—	Replace
Difference between drive gear outer diameter and cylinder block pump housing inner diameter	0.093-0.252 {0.0037-0.0099}	0.30 {0.012}	Replace
Outer diameter of driven gear shaft	18.0 {0.709}	—	Replace
Inner diameter of driven gear bush	18.0 {0.709}	—	Replace
Difference between driven gear shaft outer diameter and driven gear bush inner diameter	0.040-0.083 {0.0016-0.0033}	0.15 {0.0060}	Replace
Outer diameter of driven gear shaft	18.0 {0.709}	—	Replace
Cylinder block side hole diameter	18.0 {0.709}	—	Replace
Difference between driven gear shaft outer diameter and cylinder block side hole diameter	0.030-0.075 {0.0012-0.0030}	—	Replace

Inspection item	Standard value	Permissible limit	Action
Backlash between drive gear and driven gear	0.073-0.207 {0.0029-0.0082}	0.30 {0.012}	Replace
Backlash between oil pump drive gear and sub idle gear	0.030-0.131 {0.0012-0.0052}	0.30 {0.012}	Adjustment

TIGHTENING TORQUE

Unit: N·m {kgf·cm, lbf·ft}

Tightening part	Tightening torque	Remarks
Oil pump mounting bolt	28.5 {291, 21}	

OIL PAN

EN01F02127010701009003

TIGHTENING TORQUE

Unit: N·m {kgf·cm, lbf·ft}

Tightening part	Tightening torque	Remarks
Oil pan mounting bolt	30 {306, 22}	Refer to this document.

OIL STRAINER

EN01F02127010701009004

TIGHTENING TORQUE

Unit: N·m {kgf·cm, lbf·ft}

Tightening part	Tightening torque	Remarks
Oil strainer mounting bolt	30 {306, 22}	

OIL PRESSURE SWITCH

EN01F02127010701009005

TIGHTENING TORQUE

Unit: N·m {kgf·cm, lbf·ft}

Tightening part	Tightening torque	Remarks
Oil pressure switch	24.5 {250, 18}	