

[3] TIGHTENING TORQUES

Screws, bolts and nuts must be tightened to the specified torque using a torque wrench, several screws, bolts and nuts such as those used on the cylinder head must be tightened in proper sequence and at the proper torque.

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(1) Tightening torques for special use screws, bolts and nuts

NOTE

- In removing and applying the bolts and nuts marked with "*", a pneumatic wrench or similar pneumatic tool, if employed, must be used with enough care not to get them seized.
- For "*" marked screws, bolts and nuts on the table, apply engine oil to their threads and seats before tightening.
- The letter "M" in Size × Pitch means that the screw, bolt or nut dimension stands for metric. The size is the nominal outside diameter in mm of the threads. The pitch is the nominal distance in mm between two threads.

Item	Size × Pitch	N·m	kgf·m	ft-lbs
* Cylinder head cover cap nuts	M7 × 1.0	6.9 to 8.8	0.7 to 0.9	5.1 to 6.5
* Cylinder head screws	M10 × 1.25	63.7 to 68.6	6.5 to 7.0	47.0 to 50.6
* Main bearing case screws 1	M8 × 1.25	29.4 to 34.3	3.0 to 3.5	21.7 to 25.3
* Main bearing case screws 2	M9 × 1.25	49.0 to 53.9	5.0 to 5.5	36.2 to 39.8
* Flywheel screws	M10 × 1.25	53.9 to 58.8	5.5 to 6.0	39.8 to 43.4
* Connecting rod screws	M8 × 1.0	41.2 to 46.1	4.2 to 4.7	30.4 to 34.0
* Rocker arm bracket nuts	M7 × 1.0	21.6 to 26.5	2.2 to 2.7	15.9 to 19.5
* Idle gear shaft screws	M6 × 1.0	9.8 to 11.3	1.00 to 1.15	7.2 to 8.3
* Fan drive (Serial No. ~ 604086)	M14 × 1.5	142.2 to 152.0	14.5 to 15.5	104.9 to 112.1
pulley screw (Serial No: 604087 ~)	M14 × 1.5	235.4 to 245.2	24.0 to 25.0	173.6 to 180.8
* Bearing case cover screws	M10 × 1.25	19.6 to 24.5	2.0 to 2.5	14.5 to 18.1
Glow plugs (Serial No: ~ 489290)	M10 × 1.25	19.6 to 24.5	2.0 to 2.5	14.5 to 18.1
(Serial No: 489291 ~)	M8 × 1.0	7.8 to 14.7	0.8 to 1.5	5.8 to 10.8
Nozzle holder assembly	M20 × 1.5	49.0 to 68.6	5.0 to 7.0	36.2 to 50.6
Oil switch taper screw	PT 1/8	14.7 to 19.6	1.5 to 2.0	10.8 to 14.5
Injection pipe retaining nuts	M12 × 1.5	24.5 to 34.3	2.5 to 3.5	18.1 to 25.3
Overflow pipe assembly retaining nuts	M12 × 1.5	19.6 to 24.5	2.0 to 2.5	14.5 to 18.1
Starter's terminal B mounting nut	M8	8.8 to 11.8	0.9 to 1.2	6.5 to 8.7

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(2) Tightening torques for general use screws, bolts and nuts

When the tightening torques are not specified, tighten the screws, bolts and nuts according to the table below.

Nominal Diameter \ Grade	Standard Screw and Bolt			Special Screw and Bolt		
	④			⑦		
Unit	N·m	kgf·m	ft-lbs	N·m	kgf·m	ft-lbs
M6	7.9 to 9.3	0.80 to 0.95	5.8 to 6.9	9.8 to 11.3	1.00 to 1.15	7.23 to 8.32
M8	17.7 to 20.6	1.8 to 2.1	13.0 to 15.2	23.5 to 27.5	2.4 to 2.8	17.4 to 20.3
M10	39.2 to 45.1	4.0 to 4.6	28.9 to 33.3	48.1 to 55.9	4.9 to 5.7	35.4 to 41.2
M12	62.8 to 72.6	6.4 to 7.4	46.3 to 53.5	77.5 to 90.2	7.9 to 9.2	57.1 to 66.5

Screw and bolt material grades are shown by numbers punched on the screw and bolt heads. Prior to tightening, be sure to check out the numbers as shown below.

Punched number	Screw and bolt material grade
None or 4	Standard screw and bolt SS41, S20C
7	Special screw and bolt S43C, S48C (Refined)

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