

## APPENDIX

### CRANKSHAFT

Item	CB-23 & CE-61 engines		CB-80 engine		Remarks
	Specified value	Allowable limit	Specified value	Allowable limit	
Crankshaft runout mm (inch)	—	0.06 (0.024)	—	0.06 (0.024)	If runout exceeds limit, replace.
Out-of-roundness of main bearing and crankpin journals mm (inch)	—	0.01 (0.0004)	—	0.01 (0.0004)	If out-of-roundness exceeds limit, replace.
Main bearing journal outer diameter mm (inch)	41.976 - 42.000 (1.6526 - 1.6535)	—	47.976 - 48.000 (1.8888 - 1.8898)	—	
Crankpin journal outer diameter mm (inch)	39.976 - 40.000 (1.5739 - 1.5748)	—	42.976 - 43.000 (1.6920 - 1.6929)	—	
Main bearing journal oil clearance mm (inch)	0.020 - 0.044 (0.00079 - 0.00173)	0.07 (0.00276)	0.020 - 0.044 (0.00079 - 0.00173)	0.07 (0.00276)	If limit is exceeded, crankshaft can be reconditioned.
Thrust clearance mm (inch)	0.02 - 0.22 (0.00079 - 0.0087)	0.30 (0.0118)	0.02 - 0.22 (0.00079 - 0.0087)	0.30 (0.0118)	If clearance exceeds limit, replace thrust washer, as required.

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### BALANCE SHAFT

Item	CB-23 & CE-61 engines		CB-80 engine		Remarks
	Specified value	Allowable limit	Specified value	Allowable limit	
Thrust clearance mm (inch)	0.03 - 0.13 (0.0012 - 0.0051)	0.20 (0.0079)	0.03 - 0.13 (0.0012 - 0.0051)	0.20 (0.0079)	If clearance exceeds limit, replace thrust washer.
Bearing bore diameter mm (inch)	Front bearing	45.000 - 45.025 (1.772 - 1.773)	—	45.000 - 45.025 (1.772 - 1.773)	—
	Rear bearing	34.000 - 34.025 (1.339 - 1.340)	—	34.000 - 34.025 (1.339 - 1.340)	—
Shaft outer diameter mm (inch)	Front section	44.959 - 44.975 (1.770 - 1.771)	—	44.959 - 44.975 (1.770 - 1.771)	—
	Rear section	33.959 - 33.975 (1.337 - 1.338)	—	33.959 - 33.975 (1.337 - 1.338)	—
Oil clearance mm (inch)	0.025 - 0.066 (0.0010 - 0.0026)	0.1 (0.0039)	0.025 - 0.066 (0.0010 - 0.0026)	0.1 (0.0039)	If clearance exceeds limit, replace bearing.

WM-13014

### FLYWHEEL

Item	CB-23 & CE-61 engines		CB-80 engine		Remarks
	Specified value	Allowable limit	Specified value	Allowable limit	
Flywheel runout limit mm (inch)	—	0.10 (0.0039)	—	0.10 (0.0039)	If runout exceeds limit, replace flywheel.

WM-13015

**MANIFOLD**

Item		CB-23 & CB-61 engines		CB-80 engine		Remarks
		Specified value	Allowable limit	Specified value	Allowable limit	
Gasket surface warpage mm (inch)	Intake side	—	0.10 (0.0039)	—	0.10 (0.0039)	If warpage exceeds limit, recondition can be made, provided that grinding limit of 0.3 mm (0.012 inch) is not exceeded.
	Exhaust side	—	0.10 (0.0039)	—	0.10 (0.0039)	

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**CAMSHAFT**

Item		CB-23 & CB-61 engines		CB-80 engine		Remarks
		Specified value	Allowable limit	Specified value	Allowable limit	
Cam lobe height mm (inch)	Intake side	[CB-23] 39.987 - 40.187 (1.574 - 1.582) [CB-61] 39.937 - 40.137 (1.572 - 1.580)	39.8 (1.567)	39.55 - 39.65 (1.557 - 1.561)	39.4 (1.551)	If lobe height becomes less than limit, replace camshaft.
	Exhaust side	[CB-23] 39.987 - 40.187 (1.574 - 1.582) [CB-61] 39.937 - 40.137 (1.572 - 1.580)	39.8 (1.567)	39.15 - 39.25 (1.541 - 1.545)	39.0 (1.535)	
Runout	mm (inch)	—	0.03 (0.0012)	—	0.03 (0.0012)	If runout exceeds limit, replace camshaft.
Oil clearance mm (inch)	Front section	0.04 - 0.09 (0.0016 - 0.0035)	0.14 (0.0055)	—	—	If clearance exceeds limit, replace camshaft or cylinder head.
	Center section	0.09 - 0.14 (0.0035 - 0.0055)	0.19 (0.0075)	—	—	
	Rear section	0.06 - 0.11 (0.0024 - 0.0043)	0.16 (0.0063)	—	—	
	No.1 - No.8	—	—	0.025 - 0.066 (0.0010 - 0.0026)	0.16 (0.0063)	
Clearance in axial direction	mm (inch)	—	—	—	0.20 (0.0078)	If clearance exceeds limit, replace camshaft.

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**TIMING BELT PULLEY**

Item		CB-23 & CB-61 engines		CB-80 engine		Remarks
		Specified value	Allowable limit	Specified value	Allowable limit	
Camshaft timing pulley outer diameter	mm (inch)	119.86 - 120.40 (4.7189 - 4.7401)	119.8 (4.7165)	110.637 - 110.757 (4.3558 - 4.3605)	110.6 (4.3543)	If diameter becomes less than limit, replace pulley.
Crankshaft timing pulley outer diameter	mm (inch)	59.26 (2.3331)	59.2 (2.3307)	54.651 - 54.751 (2.1516 - 2.1555)	54.6 (2.1496)	

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## APPENDIX


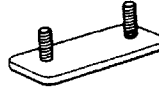






### TIGHTENING TORQUE SPECIFICATIONS FOR MAIN COMPONENTS

1. When you want to find out suitable tightening torque for a bolt, first determine the strength division of the said bolt, using the table below. Then, locate suitable tightening torque in the tightening torque table described in the following pages.
2. As for the tightening torque for a nut, find out suitable tightening torque in the same way as with Paragraph 1 above, based on the mating bolt.
3. Tightening torque specifications posted in the workshop manual are standard values for steel fasteners. It is, therefore, necessary to modify these tightening torque specifications when you tighten fasteners made of materials other than steel. This rule also applies to such instances where bolts are undergoing heat or other stress, such as vibratory loads and so forth.

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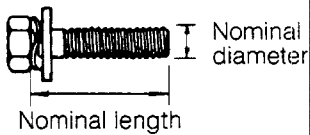
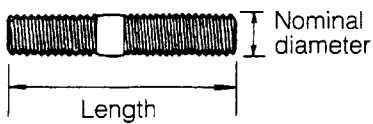
### METHOD TO IDENTIFY STRENGTH DIVISION OF BOLTS

#### 1. Identification Method by Checking Bolts Themselves

	Configuration and how to determine strength division		Strength division		Configuration and how to determine strength division		Strength division
<b>Hexagon bolt</b>		Bolt having an embossed or stamped figure at its head section	4 = 4T 5 = 5T 6 = 6T 7 = 7T	<b>Welded bolt</b>			4T
		No mark	4T			No mark	4T
		Bolt having two embossed lines at its head section	5T 6T	<b>Stud bolt</b>		Bolt having about 2 mm deep recess at one end or both ends	6T
		Bolt having three embossed lines at its head section	7T				

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#### 2. Identification Method by Part Numbers

<p><b>Hexagon Bolt</b></p> <p>Part number example 9 1 1 1 1 - 4 0 6 2 0</p> <p>Nominal length (mm) Nominal diameter (mm) Strength division</p> 	<p><b>Stud Bolt</b></p> <p>Part number example 9 2 1 3 2 - 4 0 6 2 0</p> <p>Nominal length (mm) Nominal diameter (mm) Strength division</p> 
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Tightening Torque Table for General Standard Bolts

Category	Nominal diameter	Pitch	Standard tightening torque kg-m (ft-lb)	
			Standard torque	Tightening range
<p>4T (Bolt having a mark of "4" at its head section) Example of part number (910000 - 400000)</p>	6	1	0.47 ( 3.4)	0.4 - 0.7 ( 2.9 - 5.1)
	8	1.25	1.11 ( 8.0)	1.0 - 1.6 ( 7.2 - 11.6)
	10	1.25	2.25 ( 16.3)	1.9 - 3.1 ( 14 - 22.5)
	10	1.5	2.14 ( 15.5)	1.8 - 3.0 ( 13 - 22 )
	12	1.25 (ISO)	4.40 ( 31.8)	3.5 - 5.5 ( 25 - 40 )
	12	1.5	3.89 ( 28.1)	3.5 - 5.5 ( 25 - 40 )
	12	1.75	3.74 ( 27.1)	3.0 - 5.0 ( 22 - 36 )
	13	1.5	5.08 ( 36.7)	4.5 - 7.0 ( 33 - 51 )
	14	1.5	6.33 ( 45.8)	5.0 - 8.0 ( 36 - 58 )
	14	2	5.93 ( 42.9)	4.7 - 7.7 ( 34 - 56 )
	16	1.5	9.57 ( 69.2)	7.5 - 11.0 ( 54 - 80 )
16	2	9.10 ( 65.8)	7.1 - 10.6 ( 51 - 77.5)	
<p>5T (Bolt having a mark of "5" at its head section) Example of part number (910000 - 500000)</p>	6	1	0.71 ( 5.1)	0.6 - 0.9 ( 4.3 - 6.5)
	8	1.25	1.66 ( 12.0)	1.5 - 2.2 ( 11 - 16 )
	10	1.25	3.37 ( 24.4)	3.0 - 4.5 ( 22 - 33 )
	10	1.5	3.20 ( 23.1)	2.7 - 4.2 ( 19.5 - 30.5)
	12	1.25 (ISO)	5.84 ( 42.2)	5.0 - 7.0 ( 36 - 51 )
	12	1.5	5.84 ( 42.2)	5.0 - 7.0 ( 36 - 51 )
	12	1.75	5.60 ( 40.5)	4.8 - 6.8 ( 34 - 49 )
	13	1.5	7.63 ( 55.2)	6.5 - 9.0 ( 47 - 65 )
	14	1.5	9.50 ( 68.7)	7.5 - 11.0 ( 54 - 79.5)
	14	2	8.90 ( 64.4)	7.0 - 10.5 ( 51 - 76 )
	16	1.5	14.36 ( 103.9)	12.0 - 17.0 ( 87 - 123 )
16	2	13.58 ( 98.2)	11.5 - 16.5 ( 83 - 119 )	
<p>6T (Bolt having a mark of "6" at its head section) Example of part number (910000 - 600000)</p>	6	1	0.71 ( 5.1)	0.6 - 0.9 ( 4.3 - 6.5)
	8	1.25	1.66 ( 12.0)	1.5 - 2.2 ( 11 - 16 )
	10	1.25	3.37 ( 24.4)	3.0 - 4.5 ( 22 - 33 )
	10	1.5	3.20 ( 23.1)	2.7 - 4.2 ( 19.5 - 30.5)
	12	1.25 (ISO)	5.84 ( 42.2)	5.0 - 7.0 ( 36 - 51 )
	12	1.5	5.84 ( 42.2)	5.0 - 7.0 ( 36 - 51 )
	12	1.75	5.61 ( 40.6)	4.8 - 6.8 ( 35 - 49 )
<p>7T (Bolt having a mark of "7" at its head section) Example of part number (910000 - 700000)</p>	6	1	0.95 ( 6.87)	0.8 - 1.2 ( 5.8 - 8.7)
	8	1.25	2.20 ( 15.9)	2.0 - 3.0 ( 14.5 - 22 )
	10	1.25	4.50 ( 32.5)	4.0 - 5.5 ( 29 - 40 )
	10	1.5	4.30 ( 31.1)	3.7 - 5.2 ( 27 - 38 )
	12	1.25 (ISO)	7.78 ( 56.3)	7.0 - 9.0 ( 51 - 65 )
	12	1.5	7.78 ( 56.3)	7.0 - 9.0 ( 51 - 65 )
	12	1.75	7.48 ( 54.1)	6.0 - 8.5 ( 43 - 61.5)
	13	1.5	10.17 ( 73.6)	8.0 - 12.0 ( 58 - 88 )
	14	1.5	12.67 ( 91.6)	10.0 - 15.0 ( 72 - 108 )
	14	2	11.86 ( 85.8)	9.5 - 14.0 ( 69 - 101 )
	16	1.5	19.15 ( 138.5)	15.0 - 23.0 ( 108 - 166 )
16	2	18.11 ( 131.0)	14.9 - 22.0 ( 108 - 159 )	

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## APPENDIX

Unit: kg-m (ft-l)

Tightening component	Tightening torque	
	CB-23 & CB-61 engines	CB-80 engine
Cylinder block × Cylinder head	5.5 - 6.5 (40 - 47 )	6.0 - 7.0 (43 - 51 )
Cylinder block × Crankshaft bearing cap	5.4 - 6.6 (40 - 48 )	6.4 - 7.6 (46 - 55 )
Spark plug × Cylinder head	1.5 - 2.2 (11 - 16 )	1.5 - 2.2 (11 - 16 )
Flywheel × Crankshaft	4.0 - 5.0 (29 - 36 )	6.0 - 7.0 (43 - 51 )
Crankshaft pulley × Crankshaft	9.0 - 10.0 (65 - 72 )	9.0 - 10.0 (65 - 72 )
Connecting rod × Connecting rod cap	2.1 - 2.9 (15 - 21 )	4.2 - 5.2 (30 - 38 )
Balance shaft thrust plate × Cylinder block	1.0 - 1.5 ( 7 - 11 )	1.0 - 1.5 ( 7 - 11 )
Cylinder head cover × Cylinder head	0.8 - 1.2 ( 6 - 9 )	0.3 - 0.5 ( 2 - 4 )
Fuel pipe × Carburetor	1.5 - 2.0 (11 - 14 )	—
Oil pan drain plug × Oil pan	2.5 - 3.5 (18 - 25 )	2.5 - 3.5 (18 - 25 )
Fuel pump drive cam × Camshaft (CB-23 engine only)	1.0 - 1.5 ( 7 - 11 )	—
Timing belt cover × Balance shaft gear cover	0.2 - 0.4 ( 1.4 - 3.0)	0.2 - 0.4 ( 1.4 - 3.0)
Fuel pipe × Fuel pump (CB-23 engine only)	1.5 - 2.2 (11 - 16 )	—
Oil cooler × Oil filter bracket	3.0 - 4.0 (22 - 29 )	3.0 - 4.0 (22 - 29 )
Camshaft bearing cap × Cylinder head	—	1.15 - 1.45 ( 8.3 - 10.5)
Camshaft timing belt pulley × Camshaft	3.0 - 4.5 (22 - 32 )	3.0 - 4.5 (22 - 32 )
Timing belt idler No.2 × Cylinder head	—	4.0 - 5.0 (29 - 36 )
Cylinder block × Oil pan	0.4 - 0.7 ( 3.0 - 5.0)	0.4 - 0.7 ( 3.0 - 5.0)
Valve adjusting screw × Lock nut	1.3 - 1.8 ( 9 - 13 )	—
Exhaust manifold case No.1 × Exhaust manifold case No.2	2.0 - 3.0 (14 - 22 )	2.0 - 3.0 (14 - 22 )
Turbocharger × Exhaust manifold	2.5 - 3.3 (18 - 24 )	2.5 - 3.3 (18 - 24 )
Turbocharger × Exhaust manifold case No.1	3.0 - 4.0 (22 - 29 )	2.5 - 3.3 (18 - 24 )
Turbo oil inlet pipe S/A × Turbocharger	1.0 - 1.6 ( 7 - 12 )	1.0 - 1.6 ( 7 - 12 )
Cylinder head × Exhaust manifold	1.0 - 1.6 ( 7 - 12 )	4.0 - 5.0 (29 - 36 )
Cylinder head × Intake manifold	1.0 - 1.6 ( 7 - 12 )	1.7 - 2.5 (12 - 18 )
Intake manifold × Surge tank	—	3.5 - 4.5 (25 - 33 )
Oil nozzle Ay × Oil pump Ay	—	3.0 - 3.5 (22 - 25 )
Carburetor × Surge tank stud bolt (CB-61 engine only)	0.8 - 1.2 ( 6 - 9 )	—
Carburetor × Surge tank cap nut (CB-61 engine only)	0.8 - 1.0 ( 6 - 7 )	—

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## APPENDIX

Unit: kg-m (ft-lb)

Tightening component	Tightening torque	
	CB-23 & CB-61 engines	CB-80 engine
EGR pipe No.1 × EGR valve (Swiss specifications only)	4.8 - 7.2 (35 - 52)	—
EGR pipe No.2 × EGR valve (Swiss specifications only)	3.6 - 5.4 (26 - 39)	—
EGR pipe No.2 × Intake manifold	4.4 - 6.6 (32 - 48)	—
Fuel pipe No.2 × Delivery pipe	—	1.2 - 1.8 ( 9 - 13)
Fuel pipe No.2 × Sage tank	—	1.2 - 1.8 ( 9 - 13)
Fuel hose No.1 × Delivery pipe	—	3.5 - 4.5 (25 - 33)
Heat insulator No.2 × Exhaust manifold case No.2		1.5 - 2.2 (11 - 16)
Engine mounting rear right bracket × Cylinder block	4.5 - 6.5 (33 - 47)	4.5 - 6.5 (33 - 47)
Engine lower mounting member S/A × Cylinder block	5.0 - 7.0 (36 - 51)	5.0 - 7.0 (36 - 51)
Engine lower member S/A × Engine mounting front stopper	7.5 - 10.5 (54 - 76)	7.5 - 10.5 (54 - 76)
Engine mounting upper right insulator × Engine mounting front bracket	4.0 - 5.5 (29 - 40)	4.0 - 5.5 (29 - 40)
Engine mounting upper right insulator × Body	7.5 - 10.5 (54 - 76)	7.5 - 10.5 (54 - 76)
Engine mounting lower left bracket × Engine mounting lower left	7.5 - 10.5 (54 - 76)	7.5 - 10.5 (54 - 76)

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