

ENGINE MECHANICAL

Specifications

Idle speed			650 rpm	
Intake manifold vacuum	at Idle speed		420 mmHg (16.54 in.Hg, 56.0 kPa) or more	
Compression pressure	at 250 rpm	STD Limit	10.5 kg/cm ² (149 psi, 1,030 kPa) or more 8.0 kg/cm ² 114 psi 785 kPa	
	Difference of pressure between each cylinder		0.5kg/cm ² (7 psi, 49 kPa) or less	
Cylinder head	Cylinder block surface warpage	Limit	0.15 mm	0.0059 in.
	Manifold surface warpage	Limit	0.10 mm	0.0039 in.
	Valve seat Refacing angle	Intake	25°, 45°, 70°	
		Exhaust	45°, 65°	
	Contacting angle		45°	
	Contacting width	Intake	1.1 – 1.7 mm	0.043 – 0.067 in.
		Exhaust	1.4 – 2.0 mm	0.055 – 0.079 in.
Valve guide bushing	Inside diameter		8.010 – 8.030 mm	0.3154 – 0.3161 in.
	Outside diameter	STD	14.028 – 14.041 mm	0.5523 – 0.5528 in.
		O/S 0.05	14.078 – 14.091 mm	0.5543 – 0.5548 in.
Valve	Overall length	STD	Intake Exhaust	124.8 mm 4.913 in. 128.0 mm 5.039 in.
		Limit	Intake Exhaust	124.3 mm 4.894 in. 127.5 mm 5.020 in.
	Face angle		IN & EX	44.5°
	Stem diameter		Intake Exhaust	7.970 – 7.985 mm 0.3138 – 0.3144 in. 7.960 – 7.975 mm 0.3134 – 0.3140 in.
	Stem oil clearance	STD	Intake Exhaust	0.025 – 0.060 mm 0.0010 – 0.0024 in. 0.035 – 0.070 mm 0.0014 – 0.0028 in.
		Limit	Intake Exhaust	0.10 mm 0.0039 in. 0.12 mm 0.0047 in.
	Margin thickness	STD	Intake Exhaust	1.5 – 2.1 mm 0.059 – 0.083 in. 1.7 – 2.3 mm 0.067 – 0.091 in.
		Limit	Intake Exhaust	1.0 mm 0.039 in. 1.2 mm 0.047 in.
Valve spring	Squareness	Limit	1.8 mm	0.071 in.
	Free length	STD	51.5 mm	2.028 in.
		Limit	50.0 mm	1.967 in.
	Installed tension at 43.0 mm (1.693 in.)			
		STD	32.5 kg 71.6 lb 319 N	
		Limit	27 kg 59.5 lb 265 N	
Valve rocker arm and shaft	Rocker arm inside diameter	STD	18.49 – 18.515 mm	0.7281 – 0.7289 in.
	Shaft diameter	STD	18.464 – 18.485 mm	0.7269 – 0.7278 in.
	Rocker arm oil clearance	STD	0.009 – 0.051 mm	0.0004 – 0.0020 in.
		Limit	0.08 mm	0.0031 in.
Push rod	Circle runout	Limit	1.0 mm	0.039 in.

Specifications (Cont'd)

Manifold	Warpage	Limit	0.50 mm	0.0197 in.
Air intake chamber	Warpage		0.2 mm	0.008 in.
Timing gear	Backlash	STD Limit	0.100 – 0.183 mm 0.25 mm	0.0039 – 0.0072 in. 0.0098 in.
Camshaft and bearing	Circle runout	Limit	0.30 mm	0.0118 in.
	Cam lobe height	STD	IN	38.36 – 38.46 mm 1.5102 – 1.5142 in.
		Limit	IN	38.25 – 38.35 mm 1.5059 – 1.5098 in.
	Journal diameter	STD	No.1	47.955 – 47.975 mm 1.8880 – 1.888 in.
			No.2	46.455 – 46.475 mm 1.8289 – 1.8297 in.
			No.3	44.955 – 44.975 mm 1.7699 – 1.7707 in.
			No.4	43.455 – 43.475 mm 1.7108 – 1.7116 in.
		U/S 0.25	No.1	47.715 – 47.725 mm 1.8785 – 1.8789 in.
			No.2	46.215 – 46.225 mm 1.8195 – 1.8199 in.
			No.3	44.715 – 44.725 mm 1.7604 – 1.7608 in.
			No.4	43.215 – 43.225 mm 1.7014 – 1.7018 in.
		U/S 0.50	No.1	47.465 – 47.475 mm 1.8687 – 1.8691 in.
			No.2	45.965 – 45.975 mm 1.8096 – 1.8888 in.
			No.3	44.465 – 44.475 mm 1.7506 – 1.7510 in.
			No.4	42.965 – 42.975 mm 1.6915 – 1.6919 in.
	Bearing inside diameter	STD	No.1	48.000 – 48.030 mm 1.8898 – 1.8909 in.
			No.2	46.500 – 46.530 mm 1.8307 – 1.8319 in.
			No.3	45.000 – 45.030 mm 1.7717 – 1.7728 in.
			No.4	43.500 – 43.530 mm 1.7126 – 1.7138 in.
		U/S 0.25	No.1	47.750 – 47.825 mm 1.8799 – 1.8829 in.
			No.2	46.250 – 46.325 mm 1.8209 – 1.8238 in.
			No.3	44.750 – 44.820 mm 1.7618 – 1.7646 in.
			No.4	43.250 – 43.320 mm 1.7028 – 1.7055 in.
		U/S 0.50	No.1	47.500 – 47.575 mm 1.8701 – 1.8730 in.
			No.2	46.000 – 46.075 mm 1.8110 – 1.8140 in.
			No.3	44.500 – 44.570 mm 1.7520 – 1.7547 in.
			No.4	43.000 – 43.070 mm 1.6929 – 1.6957 in.
	Journal oil clearance	STD	STD	0.025 – 0.075 mm 0.0010 – 0.0030 in.
			U/S 0.25 and 0.50	
		Limit	No.1 and No.2	0.025 – 0.110 mm 0.0010 – 0.0043 in.
			No.3 and No.4	0.025 – 0.105 mm 0.0010 – 0.0041 in.
	Thrust clearance	STD	STD	0.10 mm 0.0039 in.
			U/S 0.25 and 0.50	0.15 mm 0.0059 in.
		Limit	STD	0.200 – 0.290 mm 0.0079 – 0.0114 in.
			Limit	0.33 mm 0.0130 in.

Specifications (Cont'd)

Valve lifter	Lifter diameter	STD		21.387 – 21.404 mm	0.8420 – 0.8427 in.
		O/S 0.05		21.437 – 21.454 mm	0.8440 – 0.8446 in.
	Cylinder block lifter bore diameter			21.417 – 21.443 mm	0.8432 – 0.8442 in.
	Lifter oil clearance	STD	Limit	0.013 – 0.056 mm	0.0005 – 0.0022 in.
				0.10 mm	0.0039 in.
Cylinder block	Warpage		Limit	0.15 mm	0.0059 in.
	Cylinder bore diameter	STD	Mark "1"	94.000 – 94.010 mm	3.7008 – 3.7012 in.
			Mark "2"	94.010 – 94.020 mm	3.7012 – 3.7016 in.
			Mark "3"	94.020 – 94.030 mm	3.7016 – 3.7020 in.
			Limit	94.23 mm	3.7098 in.
		O/S 0.50	Limit	94.73 mm	3.7295 in.
		O/S 1.00	Limit	95.23 mm	3.7492 in.
		O/S 1.50	Limit	95.73 mm	3.7689 in.
Piston and piston ring	Piston diameter	STD	Mark "1"	93.963 – 93.973 mm	3.6993 – 3.6997 in.
			Mark "2"	93.973 – 93.983 mm	3.6997 – 3.7001 in.
			Mark "3"	93.983 – 93.993 mm	3.7001 – 3.7005 in.
		O/S 0.50		94.463 – 94.493 mm	3.7190 – 3.7202 in.
		O/S 1.00		94.963 – 94.993 mm	3.7387 – 3.7399 in.
		O/S 1.50		95.463 – 95.493 mm	3.7584 – 3.7596 in.
	Piston oil clearance			0.027 – 0.047 mm	0.0011 – 0.0019 in.
	Piston ring groove clearance				
		No.1		0.030 – 0.070 mm	0.0012 – 0.0028 in.
		No.2		0.050 – 0.090 mm	0.0020 – 0.0035 in.
	Piston ring end gap	STD	No.1	0.200 – 0.420 mm	0.0079 – 0.0165 in.
			No.2	0.500 – 0.720 mm	0.0197 – 0.0283 in.
			Oil	0.200 – 0.820 mm	0.0079 – 0.0323 in.
		Limit	No.1	1.02 mm	0.0402 in.
			No.2	1.32 mm	0.0520 in.
			Oil	1.42 mm	0.0559 in.
Connecting rod and piston pin	Thrust clearance	STD		0.160 – 0.300 mm	0.0063 – 0.0118 in.
		Limit		0.40 mm	0.0156 in.
	Connecting rod bearing center wall thickness				
		STD	Mark A	1.484 – 1.488 mm	0.0584 – 0.0586 in.
			Mark B	1.488 – 1.492 mm	0.0586 – 0.0587 in.
			Mark C	1.492 – 1.496 mm	0.0587 – 0.0589 in.
	Connecting rod oil clearance				
		STD	STD	0.020 – 0.050 mm	0.0008 – 0.0020 in.
			U/S 0.25 and 0.50	0.019 – 0.063 mm	0.0007 – 0.0025 in.
		Limit		0.10 mm	0.0039 in.
	Bend per 100 mm (3.94 in.)				
		Limit		0.05 mm	0.0020 in.
	Twist per 100 mm (3.94 in.)				
		Limit		0.15 mm	0.0059 in.
	Bushing inside diameter			22.012 – 22.27 mm	0.8666 – 0.8672 in.
	Piston pin diameter			22.004 – 22.019 mm	0.8663 – 0.8669 in.

Specifications (Cont'd)

Connecting rod and piston pin (Cont'd)	Piston pin to bushing oil clearance			0.005 – 0.011 mm	0.0002 – 0.0004 in.
	STD				
	Limit			0.03 mm	0.0012 in.
Crankshaft and bearing	Thrust clearance	STD		0.015 – 0.204 mm	0.0006 – 0.0080 in.
		Limit		0.30 mm	0.0118 in.
	Thrust washer thickness	STD		2.430 – 2.480 mm	0.0957 – 0.0976 in.
		O/S 0.125		2.493 – 2.543 mm	0.0981 – 0.1001 in.
		O/S 0.250		2.555 – 2.605 mm	0.1006 – 0.1026 in.
	Main journal oil clearance				
	STD	STD		0.020 – 0.044 mm	0.0008 – 0.0017 in.
		U/S 0.25 and 0.50		0.021 – 0.067 mm	0.0008 – 0.0026 in.
	Limit			0.10 mm	0.0039 in.
	Main journal diameter	STD	No.1	66.972 – 66.996 mm	2.6367 – 2.6376 in.
			No.2	68.472 – 68.496 mm	2.6957 – 2.6967 in.
			No.3	69.972 – 69.996 mm	2.7548 – 2.7557 in.
			No.4	71.472 – 71.496 mm	2.8139 – 2.8148 in.
		U/S 0.25	No.1	66.745 – 66.755 mm	2.6278 – 2.6281 in.
			No.2	68.245 – 68.255 mm	2.6868 – 2.6872 in.
			No.3	69.745 – 69.755 mm	2.7459 – 2.7463 in.
			No.4	71.245 – 71.255 mm	2.8049 – 2.8053 in.
		U/S 0.50	No.1	66.495 – 66.505 mm	2.6179 – 2.6183 in.
			No.2	67.995 – 68.005 mm	2.6770 – 2.6774 in.
			No.3	69.495 – 69.505 mm	2.7360 – 2.7364 in.
			No.4	70.995 – 71.005 mm	2.7951 – 2.7955 in.
	Main bearing center wall thickness				
	STD	Mark T1	2.493 – 2.497 mm	0.0981 – 0.0983 in.	
		Mark T2	2.497 – 2.501 mm	0.0983 – 0.0985 in.	
		Mark T3	2.501 – 2.505 mm	0.0985 – 0.0986 in.	
		Mark T4	2.505 – 2.509 mm	0.0986 – 0.0988 in.	
		Mark T5	2.509 – 2.513 mm	0.0988 – 0.0989 in.	
	Crank pin diameter	STD	52.988 – 53.000 mm	2.0861 – 2.0866 in.	
		U/S 0.25	52.701 – 52.711 mm	2.0748 – 2.0752 in.	
		U/S 0.50	52.451 – 52.461 mm	2.0650 – 2.0654 in.	
	Circle runout	Limit	0.12 mm	0.0048 in.	
	Taper and out-of-round				
	Main journal and crank pin		Limit	0.02 mm	0.0008 in.

Torque Specifications

Part tightened	kg-cm	ft-lb	N-m
Cylinder head x Cylinder block	1,250	90	123
Valve rocker support x Cylinder head			
12 mm bolt head	240	17	24
14 mm bolt head and nut	340	25	33
Manifold x Cylinder head			
14 mm bolt head	510	37	50
17 mm bolt head	700	51	69
Nut	570	41	56
Cylinder head cover x Cylinder head	90	78 in.-lb	8.8
Intake manifold x Intake manifold stay	300	22	29
Cylinder block x Intake manifold stay	300	22	29
Air injection manifold x Cylinder head	210	15	21
Exhaust manifold x Exhaust pipe	630	46	62
Water outlet housing x Cylinder head	250	18	25
Camshaft thrust washer x Cylinder block	120	9	12
Timing gear cover x Front end plate or cylinder block			
10 mm bolt head	50	43 in.-lb	4.9
14 mm bolt head	250	18	25
Crankshaft pulley x Crankshaft	3,500	253	343
PS pulley x Crankshaft pulley	185	13	18
Push rod cover x Cylinder block	40	35 in.-lb	3.9
Main bearing cap x Cylinder block			
19 mm bolt head	1,375	99	135
17 mm bolt head	1,175	85	115
Connecting rod cap x Connecting rod	600	43	59
Front end plate x Cylinder block			
Screw	250	18	25
Bolt	310	22	30
Drive plate x Crankshaft	890	64	87

EFI SYSTEM

Specifications

Fuel pressure regulator	Fuel pressure at No vacuum	2.6 – 3.2 kg/cm ² (37 – 46 psi, 255 – 314 kPa)
Cold start injector	Resistance Fuel leakage	2 – 4 Ω One drop or less per minute
Injector	Resistance Injection volume Difference between each injector Fuel leakage	Approx. 13.8 Ω 47 – 59 cc (2.9 – 3.6 cu in.) per 15 sec. 5 cc (0.31 cu in.) or less One drop or less per minute