ENGINE MECHANICAL

SERVICE DATA

SS0JM–10

Compression pressure		at 250 rpm	2,700 kPa (27.5 kgf/cm^2, 391 psi) or more
		Minimum	2,200 kPa (22.5 kgf/cm^2, 320 psi)
	Difference of pressure between each cylinder		500 kPa (5.0 kgf/cm^2, 71 psi) or less
Valve clearance		at cold Intake	0.20 – 0.30 mm (0.008 – 0.012 in.)
		Exhaust	0.35 – 0.45 mm (0.014 – 0.018 in.)
	Adjusting shim thickness	Mark 2525	2.525 mm (0.0994 in.)
		2550	2.550 mm (0.1004 in.)
		2575	2.575 mm (0.1014 in.)
		2600	2.600 mm (0.1024 in.)
		2625	2.625 mm (0.1033 in.)
		2650	2.650 mm (0.1043 in.)
		2675	2.675 mm (0.1053 in.)
		2700	2.700 mm (0.1063 in.)
		2725	2.725 mm (0.1073 in.)
		2725	2.750 mm (0.1083 in.)
		2750	2.775 mm (0.1093 in.)
		2775	2.800 mm (0.1102 in.)
		2800	2.825 mm (0.1112 in.)
		2825	2.850 mm (0.1122 in.)
		2850	2.875 mm (0.1132 in.)
		2875	2.900 mm (0.1142 in.)
		2900	2.925 mm (0.1152 in.)
		2925	2.950 mm (0.1161 in.)
		2950	2.975 mm (0.1171 in.)
		2975	2.975 mm (0.1171 in.)
		3000	3.000 mm (0.1181 in.)
		3025	3.025 mm (0.1191 in.)
		3050	3.050 mm (0.1201 in.)
		3075	3.075 mm (0.1211 in.)
		3100	3.100 mm (0.1220 in.)
		3125	3.125 mm (0.1230 in.)
		3150	3.150 mm (0.1240 in.)
		3175	3.175 mm (0.1250 in.)
		3200	3.200 mm (0.1260 in.)
		3225	3.225 mm (0.1270 in.)
		3250	3.250 mm (0.1280 in.)
		3275	3.275 mm (0.1289 in.)
		3300	3.300 mm (0.1299 in.)
Idle speed	KDN series		750 ± 50 rpm
	KLH series	Engine Lo	700 ± 50 rpm
		Hi M/T	700 ± 50 rpm
		A/T	750 ± 50 rpm
Maximum speed		Engine Lo	4,800 ± 150 rpm
		Hi	4,600 ± 150 rpm
Timing belt tensioner	Protrusion from housing end		9.8 – 10.6 mm (0.386 – 0.417 in.)
Timing gear	Idler gear thrust clearance	STD	0.06 – 0.11 mm (0.0024 – 0.0043 in.)
		Maximum	0.30 mm (0.0118 in.)
	Idler gear shaft diameter		43.955 – 43.990 mm (1.7305 – 1.7319 in.)
	Idler gear inside diameter		44.000 – 44.025 mm (1.7323 – 1.7333 in.)
	Idler gear oil clearance	STD	0.010 – 0.070 mm (0.0004 – 0.0028 in.)
		Maximum	0.20 mm (0.0079 in.)
	Gear backlash	STD	0.02 – 0.15 mm (0.0008 – 0.0060 in.)
		Maximum	0.20 mm (0.0079 in.)

Cylinder head	Warpage		0.15 mm (0.0059 in.)
	Valve seat		
	Refacing angle	Intake	25°, 45°, 70°
		Exhaust	25°, 45°, 75°
	Contacting angle		45°
	Contacting width	Intake	1.2 – 1.6 mm (0.047 – 0.063 in.)
		Exhaust	1.6 – 2.0 mm (0.063 – 0.079 in.)
	Valve guide bushing bore diameter	STD	10.985 – 11.006 mm (0.4325 – 0.4333 in.)
		O/S 0.05	11.035 – 11.056 mm (0.4344 – 0.4353 in.)
Cylinder head bolt	Cylinder head bolt outer diameter	STD	11.8 – 12.0 mm (0.465 – 0.472 in.)
		Minimum	11.6 mm (0.457 in.)
Valve	Valve overall length	STD Intake	105.38 – 105.78 mm (4.1488 – 4.1646 in.)
		Exhaust	105.57 – 105.97 mm (4.1563 – 4.1720 in.)
		Minimum Intake	104.88 mm (4.1291 in.)
		Exhaust	105.07 mm (4.1366 in.)
	Stem diameter	Intake	5.970 – 5.985 mm (0.2350 – 0.2356 in.)
		Exhaust	5.960 – 5.975 mm (0.2346 – 0.2352 in.)
	Stem oil clearance	STD Intake	0.025 – 0.060 mm (0.0010 – 0.0024 in.)
		Exhaust	0.035 – 0.070 mm (0.0014 – 0.0028 in.)
		Maximum Intake	0.08 mm (0.0031 in.)
		Exhaust	0.10 mm (0.0039 in.)
	Margin thickness	STD	1.1 mm (0.043 in.)
		Minimum	0.6 mm (0.024 in.)
Valve guide bushing	Inside diameter		6.010 – 6.030 mm (0.2366 – 0.2374 in.)
	Outside diameter for repair part	STD	11.033 – 11.044 mm (0.4344 – 0.4110 in.)
		O/S 0.05	11.083 – 11.094 mm (0.4363 – 0.4368 in.)
Valve spring	Deviation	Maximum	2.0 mm (0.079 in.)
	Free length	Blue mark	46.8 mm (1.843 in.)
		None	46.5 mm (1.831 in.)
	Installed tension at 33.1 mm (1.303 in.)	Blue mark	149.9 – 166.1 N (15.3 – 16.9 kgf, 33.7 – 37.3 lbf)
		None	150.2 – 165.8 N (15.3 – 16.9 kgf, 33.7 – 37.3 lbf)
Camshaft	Circle runout	Maximum	0.06 mm (0.0024 in.)
	Cam lobe height	STD Intake	46.830 – 46.930 mm (1.8437 – 1.8476 in.)
		Exhaust	46.870 – 46.970 mm (1.8453 – 1.8492 in.)
		Minimum Intake	46.68 mm (1.8378 in.)
		Exhaust	46.72 mm (1.8394 in.)
	Journal diameter		27.969 – 27.985 mm (1.1011 – 1.1018 in.)
	Journal oil clearance	STD	0.025 – 0.062 mm (0.0010 – 0.0024 in.)
		Maximum	0.10 mm (0.0039 in.)
	Thrust clearance	STD	0.035 – 0.185 mm (0.0014 – 0.0073 in.)
		Maximum	0.25 mm (0.0098 in.)
	Gear backlash	STD	0.035 – 0.145 mm (0.0014 – 0.0057 in.)
		Maximum	0.35 mm (0.0074 in.)
Valve lifter	Cylinder head lifter bore diameter		31.000 – 31.021 mm (1.2205 – 1.2213 in.)
	Lifter diameter		30.966 – 30.976 mm (1.2191 – 1.2195 in.)
	Oil clearance	STD	0.024 – 0.055 mm (0.0009 – 0.0022 in.)
		Maximum	0.075 mm (0.0030 in.)
Cylinder head gasket	New cylinder head gasket thickness	A	0.80 – 0.90 mm (0.0315 – 0.0354 in.)
		B	0.85 – 0.95 mm (0.0335 – 0.0374 in.)
		C	0.90 – 1.00 mm (0.0354 – 0.0394 in.)
		D	0.95 – 1.05 mm (0.0374 – 0.0413 in.)
		E	1.00 – 1.10 mm (0.0394 – 0.0443 in.)
Cylinder block	Cylinder head surface warpage Warpage	Maximum	0.10 mm (0.0039 in.)
	Cylinder bore diameter	STD Mark 1	92.000 – 92.010 mm (3.6220 – 3.6224 in.)
		2	92.010 – 92.020 mm (3.6224 – 3.6228 in.)
		3	92.020 – 92.030 mm (3.6228 – 3.6232 in.)
		Maximum STD	92.23 mm (3.6311 in.)
		O/S 0.50	92.73 mm (3.6508 in.)

Piston and piston ring	Piston diameter	STD Mark 1	91.92 – 91.93 mm (3.6189 – 3.6193 in.)
		2	91.93 – 91.94 mm (3.6193 – 3.6197 in.)
		3	91.94 – 91.95 mm (3.6197 – 3.6201 in.)
		O/S 0.50	92.42 – 92.45 mm (3.6386 – 3.6398 in.)
	Piston oil clearance	STD	0.070 – 0.090 mm (0.0028 – 0.0035 in.)
		Maximum	0.16 mm (0.0063 in.)
	Piston ring groove clearance	STD No. 1	0.060 – 0.100 mm (0.0024 – 0.0039 in.)
		No. 2	0.050 – 0.090 mm (0.0020 – 0.0035 in.)
		Oil	0.030 – 0.075 mm (0.0012 – 0.0030 in.)
		Maximum	0.20 mm (0.0079 in.)
	Piston ring end gap	STD No. 1	0.270 – 0.510 mm (0.0106 – 0.0201 in.)
		No. 2	0.470 – 0.740 mm (0.0185 – 0.0291 in.)
		Oil	0.200 – 0.520 mm (0.0079 – 0.0205 in.)
		Maximum No. 1	1.21 mm (0.0476 in.)
		No. 2	1.44 mm (0.0567 in.)
		Oil	1.22 mm (0.0480 in.)
	Piston protrusion from cylinder block		0.005 – 0.254 mm (0.0002 – 0.0100 in.)
Connecting rod	Thrust clearance	STD	0.100 – 0.300 mm (0.0039 – 0.0118 in.)
		Maximum	0.40 mm (0.0157 in.)
	Connecting rod oil clearance	STD STD	0.036 – 0.054 mm (0.0014 – 0.0021 in.)
		U/S 0.25, U/S 0.50	0.037 – 0.077 mm (0.0015 – 0.0030 in.)
		Maximum	0.10 mm (0.0039 in.)
	Connecting rod bearing center wall thickness (Reference)		
		STD Mark 2	1.486 – 1.489 mm (0.0585 – 0.0586 in.)
		3	1.489 – 1.492 mm (0.0586 – 0.0587 in.)
		4	1.492 – 1.495 mm (0.0587 – 0.0589 in.)
		5	1.495 – 1.498 mm (0.0589 – 0.0590 in.)
		6	1.498 – 1.501 mm (0.0590 – 0.0591 in.)
	Rod bend	Maximum per 100 mm (3.94 in.)	0.03 mm (0.0012 in.)
	Rod twist	Maximum per 100 mm (3.94 in.)	0.15 mm (0.0059 in.)
	Bushing inside diameter		34.012 – 34.024 mm (1.3391 – 1.3395 in.)
	Piston pin diameter		33.996 – 34.008 mm (1.3384 – 1.3389 in.)
	Piston pin oil clearance	STD	0.012 – 0.020 mm (0.0005 – 0.0008 in.)
		Maximum	0.03 mm (0.0012 in.)
	Connecting rod bolt tension portion diameter	STD	8.500 – 8.600 (0.3346 – 0.3385 in.)
		Minimum	8.30 mm (0.3268 in.)
Crankshaft	Thrust clearance	STD	0.040 – 0.240 mm (0.0016 – 0.0094 in.)
		Maximum	0.30 mm (0.0118 in.)
	Thrust washer thickness	STD	2.430 – 2.480 mm (0.0957 – 0.0976 in.)
		U/S 0.125	2.493 – 2.543 mm (0.0981 – 0.1001 in.)
		0.25	2.555 – 2.605 mm (0.1006 – 0.1026 in.)
	Main journal oil clearance	STD STD	0.030 – 0.048 mm (0.0012 – 0.0019 in.)
		U/S 0.25, U/S 0.50	0.037 – 0.077 mm (0.0015 – 0.0030 in.)
		Maximum	0.10 mm (0.0039 in.)
	Main journal diameter	STD	69.982 – 70.000 mm (2.7552 – 2.7559 in.)
		U/S 0.25	69.745 – 69.755 mm (2.7459 – 2.7463 in.)
		0.50	69.495 – 69.505 mm (2.7360 – 2.7364 in.)
	Main bearing center wall thickness (Reference)		
		STD Mark 2	2.482 – 2.485 mm (0.0977 – 0.0978 in.)
		3	2.485 – 2.488 mm (0.0978 – 0.0980 in.)
		4	2.488 – 2.491 mm (0.0980 – 0.0981 in.)
		5	2.491 – 2.494 mm (0.0981 – 0.0982 in.)
		6	2.494 – 2.497 mm (0.0982 – 0.0983 in.)
	Crank pin diameter	STD	58.982 – 59.000 mm (2.3221 – 2.3228 in.)
		U/S 0.25	58.745 – 58.755 mm (2.3128 – 2.3132 in.)
		0.50	58.495 – 58.505 mm (2.3029 – 2.3033 in.)
	Circle runout	Maximum	0.06 mm (0.0024 in.)
	Main journal taper and out–of–round	Maximum	0.02 mm (0.0008 in.)
	Crank pin taper and out–of–round	Maximum	0.02 mm (0.0008 in.)
	Main bearing cap bolt outer diameter	STD	13.500 – 14.000 mm (0.5315 – 0.5512 in.)
		Maximum	12.60 mm (0.4961 in.)

Connecting rod	Thrust clearance	STD	0.10 – 0.30 mm (0.0039 – 0.0118 in.)
		Maximum	0.40 mm (0.0157 in.)
	Connecting rod oil clearance	STD	0.036 – 0.054 mm (0.0014 – 0.0021 in.)
		Maximum	0.10 mm (0.0039 in.)
	Connecting rod bearing center wall thickness (Reference)	STD Mark 2	1.486 – 1.489 mm (0.0585 – 0.0586 in.)
		Mark 3	1.489 – 1.492 mm (0.0586 – 0.0587 in.)
		Mark 4	1.492 – 1.495 mm (0.0587 – 0.0589 in.)
		Mark 5	1.495 – 1.498 mm (0.0589 – 0.0590 in.)
		Mark 6	1.498 – 1.501 mm (0.0590 – 0.0591 in.)
	Rod bend	Maximum per 100 mm (3.94 in.)	0.03 mm (0.0012 in.)
	Rod twist	Maximum per 100 mm (3.94 in.)	0.15 mm (0.0059 in.)
	Bushing inside diameter		34.012 – 34.024 mm (1.33905 – 1.33952 in.)
	Piston pin diameter		33.996 – 34.008 mm (1.33842 – 1.33889 in.)
	Piston pin oil clearance	STD	0.012 – 0.020 mm (0.00047 – 0.00079 in.)
		Maximum	0.03 mm (0.0012 in.)
	Connecting rod bolt tension portion diameter	STD	8.500 – 8.600 (0.3346 – 0.3385 in.)
		Minimum	8.30 mm (0.3268 in.)
Crankshaft	Thrust clearance	STD	0.040 – 0.240 mm (0.0016 – 0.0094 in.)
		Maximum	0.30 mm (0.0118 in.)
	Thrust washer thickness		
		STD (STD)	2.430 – 2.480 mm (0.0957 – 0.0976 in.)
		(U/S 0.25)	2.555 – 2.605 mm (0.1006 – 0.1026 in.)
		(U/S 1.125)	2.493 – 2.543 mm (0.0981 – 0.1001 in.)
	Main journal oil clearance	STD (STD)	0.036–0.054 mm (0.0014 – 0.0021 in.)
		(U/S 0.25 and U/S 0.50)	0.037 – 0.077 mm (0.0015 – 0.0030 in.)
		Maximum	0.10 mm (0.0039 in.)
	Main journal diameter	STD Mark 1	69.994 – 70.000 mm (2.7557 – 2.7559 in.)
		Mark 2	69.988 – 69.994 mm (2.7554 – 2.7557 in.)
		Mark 3	69.982 – 69.988 mm (2.7552 – 2.7554 in.)
	Main bearing center wall thickness (Reference)		
		STD Mark 2	2.482 – 2.485 mm (0.09772 – 0.09783 in.)
		Mark 3	2.485 – 2.488 mm (0.09783 – 0.09795 in.)
		Mark 4	2.488 – 2.491 mm (0.09795 – 0.09807 in.)
		Mark 5	2.491 – 2.494 mm (0.09807 – 0.09819 in.)
		Mark 6	2.494 – 2.497 mm (0.09819 – 0.09831 in.)
	Crank pin diameter	STD Mark 1	58.994 – 59.000 mm (2.3226 – 2.3228 in.)
		Mark 2	58.988 – 58.994 mm (2.3224 – 2.3226 in.)
		Mark 3	58.982 – 58.988 mm (2.3221 – 2.3224 in.)
	Circle runout	Maximum	0.06 mm (0.0024 in.)
	Main journal taper and out–of–round	Maximum	0.002 mm (0.0008 in.)
	Crank pin taper and out–of–round	Maximum	0.002 mm (0.0008 in.)
	Main bearing cap bolt outer diameter	STD	13.500 – 14.000 mm (0.5315 – 0.5512 in.)
		Maximum	12.60 mm (0.4961 in.)