

## ENGINE MECHANICAL

## SERVICE DATA

SS12I-01

Compression Pressure	at 250 rpm	STD	1,324 kPa (13.5 kgf/cm <sup>2</sup> , 192 psi) or more
	Differential of pressure between each cylinder	Minimum	981 kPa (10 kgf/cm <sup>2</sup> , 142 psi) 98 kPa (1.0 kgf/cm <sup>2</sup> , 14 psi)
Valve Clearance	at cold	Intake	0.20 - 0.26 mm (0.0078 - 0.0102 in.)
	Valve clearance adjusting shim	Exhaust	0.21 - 0.33 mm (0.0106 - 0.0130 in.)
		13753-32020	2.500 mm (0.09843 in.)
		13753-32030	2.520 mm (0.09921 in.)
		13753-32040	2.540 mm (0.10000 in.)
		13753-32050	2.560 mm (0.10079 in.)
		13753-32060	2.580 mm (0.10157 in.)
		13753-32070	2.600 mm (0.10236 in.)
		13753-32080	2.620 mm (0.10315 in.)
		13753-32090	2.640 mm (0.10394 in.)
		13753-32100	2.660 mm (0.10472 in.)
		13753-32110	2.680 mm (0.10551 in.)
		13753-32120	2.700 mm (0.10630 in.)
		13753-32130	2.720 mm (0.10709 in.)
		13753-32140	2.740 mm (0.10787 in.)
		13753-32150	2.760 mm (0.10866 in.)
		13753-32160	2.780 mm (0.10945 in.)
		13753-32170	2.800 mm (0.11024 in.)
		13753-32180	2.820 mm (0.11102 in.)
		13753-32190	2.840 mm (0.11181 in.)
		13753-32200	2.860 mm (0.11260 in.)
		13753-32210	2.880 mm (0.11339 in.)
		13753-32220	2.900 mm (0.11417 in.)
		13753-32230	2.920 mm (0.11496 in.)
		13753-32240	2.940 mm (0.11575 in.)
		13753-32250	2.960 mm (0.11654 in.)
		13753-32260	2.980 mm (0.11732 in.)
		13753-32270	3.000 mm (0.11811 in.)
		13753-32280	3.020 mm (0.11900 in.)
		13753-32290	3.040 mm (0.11968 in.)
		13753-32300	3.060 mm (0.12047 in.)
		13753-32310	3.080 mm (0.12126 in.)
		13753-32320	3.100 mm (0.12205 in.)
13753-32330	3.120 mm (0.12283 in.)		
13753-32340	3.140 mm (0.12362 in.)		
13753-32350	3.160 mm (0.12441 in.)		
13753-32360	3.180 mm (0.12520 in.)		
13753-32370	3.200 mm (0.12598 in.)		
13753-32380	3.220 mm (0.12677 in.)		
13753-32390	3.240 mm (0.12756 in.)		
13753-32400	3.260 mm (0.12835 in.)		
13753-32410	3.280 mm (0.12913 in.)		
13753-32420	3.300 mm (0.12992 in.)		
Ignition timing	w/ Terminal TC and E1 connected of check connector		8 - 12 BTDC @ idle
Idle speed			600 - 700 rpm

## SERVICE SPECIFICATIONS - ENGINE MECHANICAL

Timing chain and sprocket	Timing chain (Length at 15 links)	Maximum	137.8 mm (5.425 in.)
	Chain No.2 (Length at 20 links)	Maximum	137.9 mm (5.406 in.)
	Crankshaft timing sprocket wear	Minimum	68.1 mm (2.681 in.)
	Oil pump drive gear wear	Minimum	63.0 mm (2.677 in.)
	Oil pump drive shaft gear wear	Minimum	71.8 mm (2.827 in.)
	Chain tensioner slipper wear	Maximum	1.0 mm (0.039 in.)
	Chain vibration damper No.1 wear	Maximum	1.0 mm (0.039 in.)
	Tensioner plate	Maximum	1.0 mm (0.039 in.)
Cylinder head	Warpage	Maximum	0.10 mm (0.3937 in.)
	Valve seat		
	Refacing angle		30°, 45°, 60°
	Contacting angle		45°
	Contacting width		1.0 - 1.4 mm (0.039 - 0.055 in.)
Cylinder head bolt thread outside diameter	STD		8.95 - 9.05 mm (0.3524 - 0.3563 in.)
	Minimum		8.75 mm (0.3445 in.)
Valve guide bushing	Inside diameter		5.510 - 5.530 mm (0.2169 - 0.2177 in.)
	Outside diameter (for repair part)	STD	10.285 - 10.306 mm (0.4049 - 0.4057 in.)
		Minimum	10.335 - 10.356 mm (0.4069 - 0.4077 in.)
Valve	Valve overall length	Intake	
		Exhaust	
	Intake	STD	91.75 mm (3.6122 in.)
		Minimum	91.25 mm (3.5925 in.)
	Exhaust	STD	91.50 mm (3.6024 in.)
		Minimum	91.51 mm (3.5827 in.)
	Stem diameter	Intake	5.470 - 5.485 mm (0.2154 - 0.2159 in.)
		Exhaust	5.471 - 5.480 mm (0.2152 - 0.2157 in.)
	Stem oil clearance	Intake	
		Exhaust	
	Intake	STD	0.25 - 0.060 mm (0.0010 - 0.0024 in.)
		Minimum	0.08 mm (0.0031 in.)
	Exhaust	STD	0.30 - 0.065 mm (0.0012 - 0.0026 in.)
		Minimum	0.31 mm (0.0039 in.)
Margin thickness	Intake		
	Exhaust		
Intake	STD	1.175 - 1.325 mm (0.04626 - 0.05217 in.)	
	Minimum	0.75 mm (0.0295 in.)	
Exhaust	STD	1.325 - 1.475 mm (0.05217 - 0.05807 in.)	
	Minimum	0.90 mm (0.0354 in.)	
Valve spring	Deviation		2.0 mm (0.079 in.)
	Free length		52.1 mm (2.051 in.)
Camshaft	Thrust clearance	Intake	
		Exhaust	
	Intake	STD	0.040 - 0.090 mm (0.0016 - 0.0035 in.)
		Maximum	0.12 mm (0.0047 in.)
	Exhaust	STD	0.50 - 0.045 mm (0.0020 - 0.0018 in.)
		Maximum	0.51 mm (0.0047 in.)
	Journal oil clearance	STD	0.03 - 0.067 mm (0.00118 - 0.00264 in.)
		Maximum	0.10 mm (0.0039 in.)
	Journal diameter		26.954 - 26.970 mm (1.0612 - 1.0618 in.)
	Circle runout		0.6 mm (0.0024 in.)
	Cam lobe height	Intake	
		Exhaust	
	Intake	STD	48.80 - 48.90 mm (1.9213 - 1.9252 in.)
		Minimum	48.81 mm (1.9154 in.)
Exhaust	STD	48.82 - 48.68 mm (1.9126 - 1.9165 in.)	
	Minimum	48.83 mm (1.9067 in.)	
Camshaft gear backlash	STD	0.20 - 0.200 mm (0.0008 - 0.0079 in.)	
	Maximum	0.21 mm (0.0188 in.)	
Camshaft gear spring end free distance		22.5 - 22.9 mm (0.886 - 0.902 in.)	

Valve lifter	Lifter diameter		30.966 – 30.976 mm (1.2191 – 1.2195 in.)
	Lifter bore diameter		31.0 – 31.016 mm (1.2205 – 1.2211 in.)
	Oil clearance	STD	0.24 – 0.050 mm (0.0009 – 0.0020 in.)
		Maximum	0.07 mm (0.0028 in.)
Manifold	Warpage		
	Intake	Maximum	0.15 mm (0.0059 in.)
	Exhaust	Maximum	0.50 mm (0.0197 in.)
Cylinder block	Cylinder head surface warpage	Maximum	0.7 mm (0.0028 in.)
	Cylinder bore diameter		
	STD	Mark 1	81.000 – 81.010 mm (3.18897 – 3.18936 in.)
		Mark 2	81.011 – 81.020 mm (3.18940 – 3.18976 in.)
		Mark 3	81.21 – 81.030 mm (3.18980 – 3.19015 in.)
	Maximum		81.22 mm (3.1980 in.)
Main bearing cap bolt tension portion diameter			
		STD	7.5 – 7.6 mm (0.295 – 0.299 in.)
		Minimum	7.2 mm (0.283 in.)
Piston and piston ring	Piston diameter	Mark 1	80.940 – 80.950 mm (3.18661 – 3.18700 in.)
		Mark 2	80.941 – 80.960 mm (3.18704 – 3.18740 in.)
		Mark 3	80.942 – 80.970 mm (3.18743 – 3.18779 in.)
	Piston oil clearance	STD	0.50 – 0.070 mm (0.00197 – 0.00276 in.)
		Maximum	0.51 mm (0.0035 in.)
	Piston ring groove clearance	No.1	0.030 – 0.070 mm (0.00118 – 0.00276 in.)
		No.2	0.30 – 0.070 mm (0.00118 – 0.00276 in.)
	Piston ring end gap	No.1	
			STD
			Maximum
	No.2		
		STD	0.350 – 0.450 mm (0.01378 – 0.01772 in.)
		Maximum	0.85 mm (0.0335 in.)
	Oil (Side rail)		
		STD	0.100 – 0.350 mm (0.00394 – 0.01378 in.)
		Maximum	0.75 mm (0.0295 in.)
Connecting rod	Thrust clearance	STD	0.160 – 0.290 mm (0.0063 – 0.01142 in.)
		Maximum	0.35 mm (0.0138 in.)
	Connecting rod oil clearance	STD	0.024 – 0.042 mm (0.00094 – 0.00165 in.)
		Maximum	0.0052 mm (0.00205 in.)
	Connecting rod bearing center wall thickness (Reference)		
		Mark 2	1.485 – 1.488 mm (0.05846 – 0.05858 in.)
		Mark 3	1.488 – 1.491 mm (0.05858 – 0.05870 in.)
		Mark 4	1.491 – 1.494 mm (0.05870 – 0.05882 in.)
		Mark 5	1.494 – 1.497 mm (0.05882 – 0.05894 in.)
		Mark 6	1.497 – 1.500 mm (0.05894 – 0.05906 in.)
Mark 7		1.500 – 1.503 mm (0.05906 – 0.05917 in.)	
Rod bend	Maximum per 100 mm (3.94 in.)	0.05 mm (0.0020 in.)	
Rod twist	Maximum per 100 mm (3.94 in.)	0.15 mm (0.0059 in.)	

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Crankshaft	Thrust clearance	STD	0.020 - 0.220 mm (0.0008 - 0.0087 in.)
		Maximum	0.30 mm (0.0118 in.)
	Thrust washer thickness		2.440 - 2.490 mm (0.0961 - 0.0980 in.)
	Main journal oil clearance		
	No.1 and No.7	STD	0.0020 - 0.0036 mm (0.00079 - 0.00142 in.)
		Maximum	0.046 mm (0.00181 in.)
	Others	STD	0.026 - 0.045 mm (0.00102 - 0.00177 in.)
		Maximum	0.055 mm (0.00217 in.)
	Main journal diameter		66.988 - 67.000 mm (2.63732 - 2.63779 in.)
	Main bearing center wall thickness (Reference)		
		Mark 1	2.486 - 2.489 mm (0.09787 - 0.09799 in.)
		Mark 2	2.489 - 2.495 mm (0.09799 - 0.09811 in.)
		Mark 3	2.492 - 2.495 mm (0.09811 - 0.09823 in.)
		Mark 4	2.495 - 2.498 mm (0.09823 - 0.09835 in.)
		Mark 5	2.498 - 2.501 mm (0.09835 - 0.09846 in.)
		Mark 6	2.501 - 2.504 mm (0.09846 - 0.09585 in.)
	Crank pin diameter		47.988 - 48.000 mm (1.88929 - 1.88976 in.)
Circle runout		0.08 mm (0.0031 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.)	