

ENGINE MECHANICAL

SERVICE DATA

SS03K-06

Compression pressure	at 250 rpm STD Minimum Difference of pressure between each cylinder	1,500 kPa (15.3 kgf/cm ² , 218 psi) 1,000 kPa (10.2 kgf/cm ² , 145 psi) 100 kPa (1.0 kgf/cm ² , 15 psi) or less
Valve clearance	at cold Intake Exhaust Adjusting shim for repair part Mark 2.500 Mark 2.550 Mark 2.600 Mark 2.650 Mark 2.700 Mark 2.750 Mark 2.800 Mark 2.850 Mark 2.900 Mark 2.950 Mark 3.000 Mark 3.050 Mark 3.100 Mark 3.150 Mark 3.200 Mark 3.250 Mark 3.300	0.15 - 0.25 mm (0.006 - 0.010 in.) 0.25 - 0.35 mm (0.010 - 0.014 in.) 2.500 mm (0.0984 in.) 2.550 mm (0.1004 in.) 2.600 mm (0.1024 in.) 2.650 mm (0.1043 in.) 2.700 mm (0.1063 in.) 2.750 mm (0.1083 in.) 2.800 mm (0.1102 in.) 2.850 mm (0.1122 in.) 2.900 mm (0.1142 in.) 2.950 mm (0.1161 in.) 3.000 mm (0.1181 in.) 3.050 mm (0.1201 in.) 3.100 mm (0.1220 in.) 3.150 mm (0.1240 in.) 3.200 mm (0.1260 in.) 3.250 mm (0.1280 in.) 3.300 mm (0.1299 in.)
Ignition timing	w/ Terminals TE1 and E1 connected of DLC1	8 - 12° BTDC @ idle
Idle speed	-	700 ± 50 rpm
Timing belt tensioner	Protrusion from housing side	10.0 - 10.8 mm (0.394 - 0.425 in.)
Cylinder head	Warpage Valve seat Refacing angle Contacting angle Contacting width Valve guide bushing bore diameter 12 pointed head cylinder head bolt diameter at tension portion STD Minimum	0.10 mm (0.039 in.) 30°, 45°, 75° 45° 1.0 - 1.4 mm (0.039 - 0.055 in.) 10.295 - 10.313 mm (0.4053 - 0.4080 in.) 10.345 - 10.363 mm (0.4073 - 0.4080 in.) 8.95 - 9.05 mm (0.3524 - 0.3563 in.) 8.75 mm (0.3445 in.)
Valve guide bushing	Inside diameter Outside diameter for repair part Protrusion height Intake Exhaust	5.510 - 5.530 mm (0.2169 - 0.2177 in.) 10.333 - 10.344 mm (0.4068 - 0.4072 in.) 10.383 - 10.394 mm (0.4088 - 0.4092 in.) 11.1 - 11.5 mm (0.437 - 0.453 in.) 8.9 - 9.3 mm (0.350 - 0.366 in.)
Valve spring	Deviation Free length Installed tension at 33.8 mm (1.331 in.)	2.0 mm (0.079 in.) 45.50 mm (1.7913 in.) 186 - 206 N (19.0 - 21.0 kgf, 41.9 - 46.3 lbf)
Valve lifter	Lifter diameter Lifter bore diameter Oil clearance STD Maximum	30.966 - 30.976 mm (1.2191 - 2.2195 in.) 31.000 - 31.018 mm (1.2205 - 1.2212 in.) 0.024 - 0.050 mm (0.0009 - 0.0020 in.) 0.07 mm (0.0028 in.)

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Valve	Valve overall length	STD Intake	95.45 mm (3.5779 in.)
		Exhaust	95.40 mm (3.7559 in.)
	Minimum	Intake	94.95 mm (3.7382 in.)
		Exhaust	94.90 mm (3.7362 in.)
	Valve face angle		44.5°
	Stem diameter	Intake	5.470 - 5.485 mm (0.2154 - 0.2159 in.)
		Exhaust	5.465 - 5.480 mm (0.2152 - 0.2157 in.)
	Stem oil clearance	STD Intake	0.025 - 0.060 mm (0.0010 - 0.0024 in.)
		Exhaust	0.030 - 0.065 mm (0.0012 - 0.0026 in.)
		Maximum Intake	0.08 mm (0.0031 in.)
		Exhaust	0.10 mm (0.0039 in.)
Camshaft	Thrust clearance	STD	0.040 - 0.090 mm (0.0016 - 0.0035 in.)
		Maximum	0.12 mm (0.0047 in.)
	Journal oil clearance	STD Intake	0.035 - 0.072 mm (0.0014 - 0.0028 in.)
		Exhaust	0.025 - 0.062 mm (0.0010 - 0.0024 in.)
		Maximum Intake	0.10 mm (0.0039 in.)
		Exhaust	0.09 mm (0.0035 in.)
	Journal diameter		26.959 - 26.975 mm (1.0614 - 1.0620 in.)
	Circle runout	Maximum	0.06 mm (0.0024 in.)
	Cam lobe height	STD Intake	42.932 - 43.032 mm (1.6902 - 1.6942 in.)
		Exhaust	42.764 - 42.864 mm (1.6836 - 1.6876 in.)
		Minimum Intake	42.78 mm (1.6842 in.)
		Exhaust	42.61 mm (1.6776 in.)
	Camshaft gear backlash	STD	0.020 - 0.200 mm (0.0008 - 0.0079 in.)
		Maximum	0.30 mm (0.0188 in.)
	Camshaft gear spring end free distance		18.2 - 18.8 mm (0.712 - 0.740 in.)
Air intake chamber	Warpage	Maximum	0.10 mm (0.0039 in.)
Intake manifold	Warpage		
	Air intake chamber side	Maximum	0.15 mm (0.0059 in.)
	Cylinder head side	Maximum	0.08 mm (0.0031 in.)
Exhaust manifold	Warpage	Maximum	0.50 mm (0.0196 in.)
Cylinder block	Cylinder head surface warpage	Maximum	0.07 mm (0.0028 in.)
	Cylinder bore diameter		87.500 - 87.512 mm (3.4449 - 3.4453 in.)
		Maximum	87.52 mm (3.4457 in.)
	12 pointed head main bearing cap bolt diameter at tension portion	STD	7.500 - 7.600 mm (0.2953 - 0.2992 in.)
		Minimum	7.20 mm (0.2835 in.)

Piston and piston ring	Piston diameter		
	AISIN piston		
		at 23.2 mm (0.913 in.) from the piston head	87.406 - 87.416 mm (3.4412 - 3.4416 in.)
	MAHLE piston		
		at 41.2 mm (1.622 in.) from the piston head	87.453 - 87.467 mm (3.4430 - 3.4436 in.)
	Piston oil clearance		
	AISIN piston	STD	0.084 - 0.106 mm (0.0033 - 0.0042)
		Maximum	0.13 mm (0.0051 in.)
	MAHLE piston	STD	0.033 - 0.059 mm (0.0013 - 0.0023)
		Maximum	0.008 mm (0.0031 in.)
	Piston ring groove clearance	No.1	0.020 - 0.070 mm (0.0008 - 0.0028 in.)
		No.2	0.020 - 0.060 mm (0.0008 - 0.0024 in.)
Piston ring end gap	STD	No.1	0.25 - 0.35 mm (0.0098 - 0.0138 in.)
		No.2	0.35 - 0.45 mm (0.0138 - 0.0177 in.)
		Oil	0.15 - 0.40 mm (0.0059 - 0.0157 in.)
	Maximum	No.1	0.95 mm (0.0374 in.)
		No.2	1.05 mm (0.0413 in.)
		Oil	1.00 mm (0.0394 in.)

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Connecting rod	Thrust clearance	STD	0.15 - 0.30 mm (0.0059 - 0.0118 in.)
		Maximum	0.35 mm (0.0138 in.)
	Connecting rod thickness		20.80 - 20.85 mm (0.8189 - 0.8209 in.)
	Connecting rod bearing center wall thickness		
	Reference	Mark 1	1.484 - 1.487 mm (0.0584 - 0.0585 in.)
		Mark 2	1.487 - 1.490 mm (0.0585 - 0.0587 in.)
		Mark 3	1.490 - 1.493 mm (0.0587 - 0.0588 in.)
		Mark 4	1.493 - 1.496 mm (0.0588 - 0.0589 in.)
	Connecting rod oil clearance	STD	0.038 - 0.064 mm (0.0015 - 0.0025 in.)
		Maximum	0.08 mm (0.0031 in.)
	Rod out-of-alignment	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.)
	Bushing inside diameter		22.005 - 22.014 mm (0.8663 - 0.8667 in.)
	Piston pin diameter		21.997 - 22.006 mm (0.8660 - 0.8664 in.)
Crankshaft	Bushing oil clearance	STD	0.005 - 0.011 mm (0.0002 - 0.0004 in.)
		Maximum	0.05 mm (0.0020 in.)
	Connecting rod bolt diameter		
		at tension portion STD	7.2 - 7.3 mm (0.284 - 0.287 in.)
		Minimum	7.0 mm (0.276 in.)
	Thrust clearance	STD	0.04 - 0.24 mm (0.0016 - 0.0095 in.)
		Maximum	0.30 mm (0.0118 in.)
	Thrust washer thickness		1.930 - 1.980 mm (0.0760 - 0.0780 in.)
	Main journal oil clearance	STD No.1 and No.4	0.014 - 0.034 mm (0.0006 - 0.0013 in.)
		No.2 and No.3	0.026 - 0.046 mm (0.0010 - 0.0018 in.)
		Maximum No.1 and No.4	0.05 mm (0.0020 in.)
		No.2 and No.3	0.06 mm (0.0024 in.)
	Main journal diameter		60.988 - 61.000 mm (2.4011 - 2.4016 in.)
	Main bearing center wall thickness		
	Reference (TMC made)	Mark 1	2.486 - 2.489 mm (0.0979 - 0.0980 in.)
		Mark 2	2.489 - 2.492 mm (0.0980 - 0.0981 in.)
		Mark 3	2.492 - 2.495 mm (0.0981 - 0.0982 in.)
		Mark 4	2.495 - 2.498 mm (0.0982 - 0.0983 in.)
		Mark 5	2.498 - 2.501 mm (0.0983 - 0.0985 in.)
		Mark 6	2.501 - 2.504 mm (0.0985 - 0.0986 in.)
		Mark 7	2.504 - 2.507 mm (0.0986 - 0.0987 in.)
	Reference (TMMK made)	Mark 1	2.485 - 2.488 mm (0.0978 - 0.0980 in.)
		Mark 2	2.488 - 2.491 mm (0.0980 - 0.0981 in.)
		Mark 3	2.491 - 2.494 mm (0.0981 - 0.0982 in.)
		Mark 4	2.494 - 2.497 mm (0.0982 - 0.0983 in.)
		Mark 5	2.497 - 2.500 mm (0.0983 - 0.0984 in.)
		Mark 6	2.500 - 2.503 mm (0.0984 - 0.0985 in.)
		Mark 7	2.503 - 2.506 mm (0.0985 - 0.0987 in.)
	Crank pin diameter		52.992 - 53.000 mm (2.0863 - 2.0866 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.)