ENGINE MECHANICAL

SERVICE DATA

030F4–01

Camshaft circle runout	Maximum	0.06 mm (0.0024 in.)
Camshaft cam lobe height	Standard Intake	42.11 – 42.21 mm (1.6579 – 1.6618 in.)
	Exhaust	41.96 – 42.06 mm (1.6520 – 1.6559 in.)
	Minimum Intake	41.96 mm (1.6520 in.)
	Exhaust	41.81 mm (1.6461 in.)
Camshaft Journal diameter		26.959 – 26.975 mm (1.0614 – 1.0620 in.)
12 pointed head cylinder head set bolt diameter at tension portion		
	Standard	8.95 – 9.05 mm (0.3524 – 0.3563 in.)
	Minimum	8.75 mm (0.3775 in.)
Valve clearance at cold	Intake	0.15 – 0.25 mm (0.006 – 0.010 in.)
	Exhaust	0.25 – 0.35 mm (0.010 – 0.014 in.)
Cylinder head warpage	Maximum Cylinder block side	0.05 mm (0.0020 in.)
	Intake manifold side	0.10 mm (0.0039 in.)
	Exhaust manifold side	0.10 mm (0.0039 in.)
Intake valve overall length	Standard	95.45 mm (3.7579 in.)
	Minimum	94.95 mm (3.7382 in.)
Intake valve stem diameter	Standard	5.470 – 5.485 mm (0.2154 – 0.2159 in.)
Intake valve margin thickness	Standard	1.0 mm (0.039 in.)
	Minimum	0.5 mm (0.020 in.)
Exhaust valve overall length	Standard	95.40 mm (3.7559 in.)
	Minimum	94.90 mm (3.7362 in.)
Exhaust valve stem diameter	Standard	5.465 – 5.480 mm (0.2152 – 0.2157 in.)
Exhaust valve margin thickness	Standard	1.0 mm (0.039 in.)
	Minimum	0.5 mm (0.020 in.)
Valve spring free length		45.50 mm (1.7913 in.)
Valve spring deviation	Maximum	2.0 mm (0.079 in.)
Valve spring installed tension at 33.8 mm (1.331 in.)		186 – 206 N (19.0 – 21.0 kgf, 41.9 – 46.3 lbf)
Bushing inside diameter		5.510 – 5.530 mm (0.2169 – 0.2177 in.)
Valve guide bushing oil clearance	Standard 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.)
Cylinder head valve guide bushing bore diameter	STD	10.295 – 10.313 mm (0.4053 – 0.4060 in.)
	O/S 0.05	10.345 – 10.363 mm (0.4073 – 0.4080 in.)
Bushing diameter	STD	10.333 – 10.344 mm (0.4068 – 0.4072 in.)
	O/S 0.05	10.383 – 10.394 mm (0.4088 – 0.4092 in.)
Bushing length	Intake	34.5 mm (1.358 in.)
	Exhaust	40.5 mm (1.594 in.)
Bushing protrusion height	Intake	11.1 – 11.5 mm (0.437 – 0.453 in.)
	Exhaust	8.9 – 9.3 mm (0.350 – 0.366 in.)
Lifter diameter		30.966 – 30.976 mm (1.2191 – 1.2195 in.)
Lifter bore diameter		31.000 – 31. 016 mm (1.2205 – 1.2211 in.)
Oil clearance	Standard	0.024 – 0.050 mm (0.0009 – 0.0021 in.)
	Maximum	0.07 mm (0.0028 in.)
Camshaft gear backlash	Standard	0.020 – 0.200 mm (0.0008 – 0.0079 in.)
	Maximum	0.30 mm (0.0118 in.)
Camshaft thrust clearance	Standard	0.040 – 0.090 mm (0.0016 – 0.0035 in.)
	Maximum	0.12 mm (0.0047 in.)
Camshaft oil clearance	Standard Intake #4, #5 journals	0.025 – 0.057 mm (0.0010 – 0.0022 in.)
	Other journals	0.025 – 0.062 mm (0.0010 – 0.0024 in.)
	Maximum	0.10 mm (0.0039 in.)
Connecting rod thrust clearance	Standard	0.15 – 0.30 mm (0.0059 – 0.0118 in.)
	Maximum	0.35 mm (0.0138 in.)
Connecting rod oil clearance	Standard	0.038 – 0.066 mm (0.0015 – 0.0026 in.)
	Maximum	0.08 mm (0.0031 in.)

Crankshaft thrust clearance	Standard	0.04 – 0.24 mm (0.0016 – 0.0094 in.)
	Maximum	0.30 mm (0.0118 in.)
Cylinder block warpage	Maximum	0.05 mm (0.0020 in.)
Cylinder bore diameter	Standard	87.500 – 87.512 mm (3.4449 – 3.4453 in.)
	Maximum	87.52 mm (3.4457 in.)
Piston diameter		87.406 – 87.416 mm (3.4412 – 3.4416 in.)
Oil clearance	Standard	0.084 – 0.106 mm (0.0033 – 0.0042 in.)
	Maximum	0.13 mm (0.0051 in.)
Connecting rod out–of alignment	Maximum	0.05 mm (0.0020 in.) per 100 mm (3.94 in.)
Connecting rod twist	Maximum	0.15 mm (0.0059 in.) per 100 mm (3.94 in.)
Connecting rod 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.)
Oil clearance	Standard	0.005 – 0.011 mm (0.0002 – 0.0004 in.)
	Maximum	0.05 mm (0.0020 in.)
Piston ring groove clearance	No.1	0.02 – 0.07 mm (0.0008 – 0.0028 in.)
	No.2	0.02 – 0.06 mm (0.0008 – 0.0024 in.)
	Oil	0.03 – 0.11 mm (0.0011 – 0.0043 in.)
Piston ring end gap	Standard 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 (Side rail)	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 (Side rail)	1.00 mm (0.0394 in.)
Connecting rod bolt diameter	Standard	7.2 – 7.3 mm (0.283 – 0.287 in.)
	Minimum	7.0 mm (0.276 in.)
Crankshaft bearing cap set bolt diameter	Standard	7.5 – 7.6 mm (0.295 – 0.299 in.)
	Minimum	7.2 mm (0.283 in.)
Crankshaft circle runout	Maximum	0.06 mm (0.0024 in.)
Main journal diameter		60.988 – 61.000 mm (2.4011 – 2.4016 in.)
Main journal taper and out–of–round	Maximum	0.02 mm (0.0008 in.)
Crank pin diameter		52.992 – 53.000 mm (2.0863 – 2.0866 in.)
Crank pin taper and out–of–round	Maximum	0.02 mm (0.0008 in.)
Crankshaft oil clearance	Standard No. 1 and No. 4 journals	0.014 – 0.034 mm (0.0006 – 0.0013 in.)
	No. 2 and No. 3 journals	0.026 – 0.046 mm (0.0010 – 0.0018 in.)
	Maximum No. 1 and No. 4 journals	0.05 mm (0.0020 in.)
	No. 2 and No. 3 journals	0.06 mm (0.0024 in.)