ENGINE MECHANICAL

SERVICE DATA

0321E–01

Camshaft		
Maximum circle runout		0.06 mm (0.0024 in.)
Specified cam lobe height	STD Intake	43.132 to 43.232 mm (1.6981 to 1.7020 in.)
	Exhaust	43.010 to 43.110 mm (1.6933 to 1.6972 in.)
	Minimum Intake	42.98 mm (1.6921 in.)
	Exhaust	42.86 mm (1.6874 in.)
Camshaft Journal diameter		26.959 to 26.975 mm (1.0614 to 1.0620 in.)
Gear backlash	STD	0.020 to 0.200 mm (0.0008 to 0.0079 in.)
	Maximum	0.30 mm (0.0118 in.)
Journal thrust clearance	STD	0.040 to 0.090 mm (0.0016 to 0.0035 in.)
	Maximum	0.12 mm (0.0047 in.)
Journal oil clearance	Intake #4, #5	0.025 to 0.057 mm (0.0010 to 0.0022 in.)
	Other	0.025 to 0.062 mm (0.0010 to 0.0024 in.)
	Maximum	0.10 mm (0.0039 in.)
Cylinder head set bolt		
Specified outside diameter at tension portion		8.75 to 9.05 mm (0.3445 to 0.3563 in.)
Cylinder head		
Maximum warpage	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.)
Valve clearance	at cold Intake	0.15 to 0.25 mm (0.006 to 0.010 in.)
	Exhaust	0.25 to 0.35 mm (0.010 to 0.014 in.)
Intake valve		
Valve overall length	STD Intake	95.45 mm (3.7579 in.)
	Exhaust	95.40 mm (3.7559 in.)
	Minimum Intake	94.95 mm (3.7382 in.)
	Exhaust	94.90 mm (3.7362 in.)
Valve stem diameter	Intake	5.470 to 5.485 mm (0.2154 to 0.2159 in.)
	Exhaust	5.465 to 5.480 mm (0.2152 to 0.2157 in.)
Margin thickness	STD Intake	1.0 mm (0.039 in.)
	Exhaust	0.5 mm (0.020 in.)
	Minimum Intake	1.0 mm (0.039 in.)
	Exhaust	0.5 mm (0.020 in.)
Valve spring		
Uncompressed length		45.50 mm (1.7913 in.)
Maximum deviation		2.0 mm (0.079 in.)
Installed tension	at 33.8 mm (1.331 in.)	186 to 206 N (19.0 to 21.0 kgf, 41.9 to 46.3 lbf)
Valve guide bush		
Bush inside diameter		5.510 to 5.530 mm (0.2169 to 0.2177 in.)
Specified bush oil clearance	Intake	0.025 to 0.060 mm (0.0010 to 0.0024 in.)
	Exhaust	0.030 to 0.065 mm (0.0012 to 0.0026 in.)
	Maximum Intake	0.08 mm (0.0031 in.)
	Exhaust	0.10 mm (0.0039 in.)
Cylinder head valve guide bush bore diameter	STD	10.295 to 10.313 mm (0.4053 to 0.4060 in.)
	O/S 0.05	10.345 to 10.363 mm (0.4073 to 0.4080 in.)
Bush diameter	STD	10.333 to 10.344 mm (0.4068 to 0.4072 in.)
	O/S 0.05	10.383 to 10.394 mm (0.4088 to 0.4092 in.)
Bush length	Intake	34.5 mm (1.358 in.)
	Exhaust	40.5 mm (1.594 in.)
Valve lifter		
Lifter diameter		30.966 to 30.976 mm (1.2191 to 1.2195 in.)
Lifter bore diameter		31.009 to 31.025 mm (1.2208 to 1.2215 in.)
Specified oil clearance	STD	0.033 to 0.059 mm (0.0013 to 0.0023 in.)
	Maximum	0.07 mm (0.0028 in.)

Connecting rod		
Thrust clearance	STD	0.15 to 0.30 mm (0.0059 to 0.0118 in.)
	Maximum	0.35 mm (0.0138 in.)
Connecting rod thickness		20.80 to 20.85 mm (0.8189 to 0.8209 in.)
Connecting rod oil clearance	STD	0.038 to 0.066 mm (0.0015 to 0.0026 in.)
	Maximum	0.08 mm (0.0031 in.)
Connecting rod bearing center wall thickness	Mark 1	1.484 to 1.486 mm (0.0584 to 0.0585 in.)
	Mark 2	1.487 to 1.489 mm (0.0585 to 0.0586 in.)
	Mark 3	1.490 to 1.492 mm (0.0587 to 0.0587 in.)
	Mark 4	1.493 to 1.495 mm (0.0588 to 0.0588 in.)
Crankshaft		
Crankshaft thrust clearance	STD	0.04 to 0.24 mm (0.0016 to 0.0094 in.)
	Maximum	0.30 mm (0.0118 in.)
Thrust washer thickness		1.93 to 1.98 mm (0.0760 to 0.0780 in.)
Specified main journal oil clearance	No. 1 and No. 4 journals (STD)	0.014 to 0.034 mm (0.0006 to 0.0013 in.)
	Maximum	0.05 mm (0.0020 in.)
	No. 2 and No. 3 journals (STD)	0.026 to 0.046 mm (0.0010 to 0.0018 in.)
	Maximum	0.06 mm (0.024 in.)
Cylinder block main journal bore diameter (Reference)	Mark 00	66.000 mm (2.5984 in.)
	Mark 01	66.001 mm (2.5985 in.)
	Mark 02	66.002 mm (2.5985 in.)
	Mark 03	66.003 mm (2.5985 in.)
	Mark 04	66.004 mm (2.5986 in.)
	Mark 05	66.005 mm (2.5986 in.)
	Mark 06	66.006 mm (2.5987 in.)
	Mark 07	66.007 mm (2.5987 in.)
	Mark 08	66.008 mm (2.5987 in.)
	Mark 09	66.009 mm (2.5988 in.)
	Mark 10	66.010 mm (2.5988 in.)
	Mark 11	66.011 mm (2.5989 in.)
	Mark 12	66.012 mm (2.5989 in.)
	Mark 13	66.013 mm (2.5989 in.)
	Mark 14	66.014 mm (2.5990 in.)
	Mark 15	66.015 mm (2.5990 in.)
	Mark 16	66.016 mm (2.5990 in.)
Main journal diameter		61.000 mm (4.1016 in.)
Main journal diameter (Reference)	Mark 00	60.999 mm (4.4015 in.)
	Mark 01	60.998 mm (4.4015 in.)
	Mark 02	60.997 mm (4.4015 in.)
	Mark 03	60.996 mm (4.4014 in.)
	Mark 04	60.995 mm (4.4014 in.)
	Mark 05	60.994 mm (4.4013 in.)
	Mark 06	60.993 mm (4.4012 in.)
	Mark 07	60.992 mm (4.4012 in.)
	Mark 08	60.991 mm (4.4012 in.)
	Mark 09	60.990 mm (4.4012 in.)
	Mark 10	60.989 mm (4.4011 in.)
	Mark 11	60.988 mm (4.4011 in.)
	Mark 12	2.486 to 2.489 mm (0.0979 to 0.0980 in.)
Standard main bearing center wall thickness (Reference)	Mark 1	2.489 to 2.492 mm (0.0980 to 0.0981 in.)
	Mark 2	2.492 to 2.495 mm (0.0981 to 0.0982 in.)
	Mark 3	2.495 to 2.498 mm (0.0982 to 0.0983 in.)
	Mark 4	2.498 to 2.501 mm (0.0983 to 0.0985 in.)
	Mark 5	2.501 to 2.504 mm (0.0985 to 0.0986 in.)
	Mark 6	2.504 to 2.507 mm (0.0986 to 0.0987 in.)
	Mark 7	0.06 mm (0.0024 in.)
Maximum circle runout		60.988 to 61.000 mm (2.4011 to 2.4016 in.)
Main journal taper and out–of–round		0.02 mm (0.0008 in.)
Crank pin diameter		52.992 to 53.000 mm (2.0863 to 2.0866 in.)
Maximum crank pin taper and out–of–round		0.02 mm (0.0008 in.)
Cylinder block		
Maximum warpage		0.05 mm (0.0020 in.)
Specified cylinder bore diameter		92.000 to 92.132 mm (3.6220 to 3.6272 in.)

Piston		
Piston diameter		91.953 to 91.967 mm (3.6202 to 3.6207 in.)
Oil clearance	STD	0.033 to 0.059 mm (0.0013 to 0.0023 in.)
	Maximum	0.13 mm (0.0051 in.)
Connecting rod		
Maximum misalignment per 100 mm (3.94 in.)		0.05 mm (0.0020 in.) per 100 mm (3.94 in.)
Maximum rod twist per 100 mm (3.94 in.)		0.15 mm (0.0059 in.) per 100 mm (3.94 in.)
Bush inside diameter		22.005 to 22.014 mm (0.8663 to 0.8667 in.)
Piston pin		
Piston pin diameter		21.997 to 22.006 mm (0.8660 to 0.8664 in.)
Oil clearance	STD	0.005 to 0.011 mm (0.0002 to 0.0004 in.)
	Maximum	0.05 mm (0.0020 in.)
Piston ring		
Piston ring groove clearance	No. 1	0.03 to 0.08 mm (0.0012 to 0.0031 in.)
	No. 2	0.02 to 0.06 mm (0.0008 to 0.0024 in.)
	Oil	0.03 to 0.11 mm (0.0011 to 0.0043 in.)
End gap	No. 1	0.30 to 0.40 mm (0.0118 to 0.0157 in.)
	Maximum	0.95 mm (0.0374 in.)
	No. 2	0.50 to 0.60 mm (0.0197 to 0.0236 in.)
	Maximum	1.05 mm (0.0413 in.)
	Oil (Side rail)	0.15 to 0.40 mm (0.0059 to 0.0157 in.)
	Maximum	1.00 mm (0.0394 in.)
Connecting rod bolt		
Specified diameter	STD	7.2 to 7.3 mm (0.283 to 0.287 in.)
	Minimum	7.0 mm (0.276 in.)
Crankshaft bearing cap set bolt		
Specified diameter	STD	7.5 to 7.6 mm (0.295 to 0.299 in.)
	Minimum	7.2 mm (0.283 in.)