

## Torque Specifications (Cont'd)

Part tightened	N-m	kgf-cm	ft-lbf
PS pump x Bracket	39	400	29
A/C compressor x Bracket	25	250	18
Suspension lower crossmember x Body	152	1,550	112

## ENGINE MECHANICAL (3S-GTE)

### Specifications

Idle speed				800 ± 50 rpm
Intake manifold vacuum	at idle speed			60 kPa      450 mmHg      17.7 in.Hg
Compression	at 250 rpm	STD Limit		1,128 kPa (11.5 kgf/cm <sup>2</sup> , 164 psi) or more 883 kPa 9.0 kgf/cm <sup>2</sup> 128 psi 98 kPa (1.0 kgf/cm <sup>2</sup> , 14 psi) or less
	Difference of pressure between each cylinder			
Timing belt tensioner	Protrusion			8.5 – 9.5 m m      0.335 – 0.374 in.
Cylinder head	warpage	Cylinder block side	Limit	0.20 mm      0.0079 in.
		Intake manifold side	Limit	0.20 mm      0.0079 in.
		Exhaust manifold side	Limit	0.30 mm      0.0118 in.
	Valve seat	Refacing angle		30°, 45°, 75°
		Contacting angle		45°
	Contacting width			1.0 – 1.4 mm      0.039 – 0.055 in.
Valve guide bushing	Inside diameter			6.000 – 6.018 mm      0.2362 – 0.2369 in.
	Outside diameter (for repair part)	STD		11.030 – 11.041 mm      0.4343 – 0.4347 in.
		O/S 0.05		11.080 – 11.091 mm      0.4362 – 0.4367 in.
Valve	Valve overall length	STD	Intake	100.50 m m      3.9567 in.
			Exhaust	99.55 mm      3.9193 in.
		Limit	Intake	99.80 m m      3.9291 in.
			Exhaust	98.85 mm      3.8917 in.
	Valve face angle			44.5°
	Stem diameter		Intake	5.960 – 5.975 mm      0.2346 – 0.2352 in.
			Exhaust	5.955 – 5.970 mm      0.2344 – 0.2350 in.
	Stem oil clearance	STD	Intake	0.025 – 0.058 mm      0.0010 – 0.0023 in.
			Exhaust	0.030 – 0.063 mm      0.0012 – 0.0025 in.
		Limit	Intake	0.08 mm      0.0031 in.
		Exhaust	0.10 mm      0.0039 in.	
Margin thickness	STD		0.8 – 1.2 mm      0.031 – 0.047 in.	
	Limit		0.5 mm      0.020 in.	
Valve spring	Squareness	Limit		2.0 mm      0.079 in.
	Free length			44.43 mm      1.7492 in.
	Installed tension at 34.4 mm (1.354 in.)			201 – 236 N (20.5 – 24.1 kgf, 45.2 – 53.1 lbf)

## Specifications (Cont'd)

Valve lifter	Lifter diameter Lifter bore diameter Oil clearance	STD Limit	30.975 – 30.985 mm 1.2195 – 1.2199 in. 31.000 – 31.021 mm 1.2205 – 1.2213 in. 0.015 – 0.046 mm 0.0006 – 0.0018 in. 0.07 mm 0.0028 in.
Manifold	Warpage	Limit	0.20 mm 0.0079 in.
Camshaft	Thrust clearance Journal oil clearance Journal diameter Circle runout Cam lobe height	STD Limit STD Limit STD Limit	0.120 – 0.240 mm 0.0047 – 0.0094 in. 0.30 mm 0.0118 in. 0.025 – 0.062 mm 0.0010 – 0.0024 in. 0.08 mm 0.0031 in. 26.959 – 26.975 mm 1.0614 – 1.0620 in. 0.06 mm 0.0024 in. 41.010–41.110mm 1.6146–1.6185 in. 41.090 – 41.190 mm 1.6177 –1.6217 in. 39.90 mm 1.5709 in. 39.98 mm 1.5740 in.
T-VIS valve	Warpage	Limit	0.20 mm 0.0079 in.
Cylinder block	Cylinder head surface warpage Cylinder bore diameter	Limit STD	0.05 mm 0.0020 in. 86.000 – 86.010 mm 3.3858 – 3.3862 in. 86.010 – 86.020 mm 3.3862 – 3.3866 in. 86.020 – 86.030 mm 3.3866 – 3.3870 in. 86.23 mm 3.3949 in.
Piston and piston ring	Piston diameter Piston oil clearance Piston ring groove clearance Piston ring end gap	Mark 1 Mark 2 Mark 3 STD Limit No.1 No.2 STD No.1 No.2 Oil Limit No.1 No.2 Oil	85.920 – 85.930 mm 3.3827 – 3.3831 in. 85.930 – 85.940 mm 3.3831 – 3.3835 in. 85.940 – 85.950 mm 3.3835 – 3.3839 in. 0.070 – 0.090 mm 0.0028 – 0.0035 in. 0.110 mm 0.0043 in. 0.040 – 0.080 mm 0.0016 – 0.0031 in. 0.030 – 0.070 mm 0.0012 – 0.0028 in. 0.330 – 0.550 mm 0.0130 – 0.0217 in. 0.450 – 0.670 mm 0.0177 – 0.0264 in. 0.200 – 0.600 mm 0.0079 – 0.0236 in. 0.85 mm 0.0335 in. 0.97 mm 0.0382 in. 0.90 mm 0.0354 in.
Connecting rod	Thrust clearance Limit Connecting rod bearing center wall thickness Connecting rod oil clearance Rod bending Limit per 100 mm (3.94 in.) Rod twist Limit per 100 mm (3.94 in.)	STD Limit STD STD Limit	0.160 – 0.312 mm 0.0063 – 0.0123 in. 0.35 mm 0.0138 in. 1.484 – 1.488 mm 0.0584 – 0.0586 in. 1.488 – 1.492 mm 0.0586 – 0.0587 in. 1.492 – 1.496 mm 0.0587 – 0.0589 in. 0.024 – 0.055 mm 0.0009 – 0.0022 in. 0.023 – 0.069 mm 0.0009 – 0.0027 in. 0.08 mm 0.0031 in. 0.05 mm 0.0020 in. 0.15 mm 0.0059 in.

## Specifications (Cont'd)

Connecting rod (cont'd)	Bushing inside diameter		22.005 – 22.017 mm	0.8663 – 0.8668 in.
	Piston pin diameter		21.997 – 22.009 mm	0.8660 – 0.8665 in.
	Piston pin oil clearance	STD	0.005 – 0.011 mm	0.0002 – 0.0004 in.
		Limit	0.05 mm	0.0020 in.
Crankshaft	Thrust clearance	STD	0.020 – 0.220 mm	0.0008 – 0.0087 in.
		Limit	0.30 mm	0.0118 in.
	Thrust washer thickness		2.440 – 2.490 mm	0.0961 – 0.0980 in.
	Main journal oil clearance			
	STD	No-3 STD	0.025 – 0.044 mm	0.0010 – 0.0017 in.
		U/S 0.25	0.021 – 0.061 mm	0.0008 – 0.0024 in.
		Others STD	0.015 – 0.034 mm	0.0006 – 0.0013 in.
		U/S 0.25	0.029 – 0.069 mm	0.0011 – 0.0027 in.
	Limit		0.08 mm	0.0031 in.
	Main journal diameter	STD	54.988 – 55.003 mm	2.1653 – 2.1655 in.
		U/S 0.25	54.745 – 54.755 mm	2.1553 – 2.1557 in.
	Main bearing center wall thickness			
		STD No.3		
		Mark 1	1.992 – 1.995 mm	0.0784 – 0.0785 in.
		Mark 2	1.995 – 1.998 mm	0.0785 – 0.0787 in.
		Mark 3	1.998 – 2.001 mm	0.0787 – 0.0788 in.
		Mark 4	2.001 – 2.004 mm	0.0788 – 0.0789 in.
		Mark 5	2.004 – 2.007 mm	0.0789 – 0.0790 in.
		Others		
		Mark 1	1.997 – 2.000 mm	0.0786 – 0.0787 in.
	Mark 2	2.000 – 2.003 mm	0.0787 – 0.0789 in.	
	Mark 3	2.003 – 2.006 mm	0.0789 – 0.0790 in.	
	Mark 4	2.006 – 2.009 mm	0.0790 – 0.0791 in.	
	Mark 5	2.009 – 2.012 mm	0.0791 – 0.0792 in.	
Crank pin diameter	STD	47.985 – 48.000 mm	1.8892 – 1.8898 in.	
	U/S 0.25	47.745 – 47.755 mm	1.8797 – 1.8801 in.	
	Limit	0.06 mm	0.0024 in.	
Circle runout	Limit	0.02 mm	0.0008 in.	
Main journal taper and out-of-round	Limit	0.02 mm	0.0008 in.	
Crank pin taper and out-of-round	Limit	0.02 mm	0.0008 in.	

## Torque Specifications

Part tightened		N·m	kgf-cm	ft-lbf
Oil pump pulley x Oil pump drive shaft		35	355	26
No.2 idler pulley x Cylinder block		43	440	32
No.1 idler pulley bracket x Cylinder head		52	530	38
Crankshaft pulley x Crankshaft		108	1,100	80
Camshaft timing pulley x Camshaft		59	600	43
	For SST	41	420	30
Timing belt tensioner x Cylinder head		21	210	15
Cylinder head x Cylinder block	1st	49	500	36
	2nd	Turn 90°		
Camshaft bearing cap x Cylinder head		19	190	14
No.3 timing belt cover x Cylinder head		8.8	90	78 in.-lbf

## Torque Specifications (Cont'd)

Part tightened	N·m	kgf-cm	ft-lbf	
Cylinder head cover x Cylinder head	2.5	25	21 in-lbf	
Intake manifold x Cylinder head	19	195	14	
Intake manifold stay x Intake manifold	25	260	19	
Intake manifold stay x Cylinder block	25	260	19	
Water by-pass pipe x Water pump cover	7.8	80	69 in-lbf	
Water outlet x Cylinder head	39	400	29	
EGR valve x Intake manifold	19	195	14	
EGR pipe x Cylinder head	25	260	19	
LH engine hanger x Cylinder head	12 mm head bolt	19	195	14
	14 mm head bolt	39	400	29
Exhaust manifold x Cylinder head	52	530	38	
Catalytic converter x Turbine outlet elbow	29	300	22	
Catalytic converter stay x Catalytic converter	59	600	43	
No.1 alternator bracket x Cylinder head	39	400	29	
Main bearing cap x Cylinder block	59	600	43	
Connecting rod cap x Connecting rod	67	680	49	
Rear oil seal retainer x Cylinder block	9.3	95	82 in-lbf	
Knock sensor x Cylinder block	44	450	33	
RH engine mounting bracket x Cylinder block	52	530	38	
PS pump bracket x Cylinder block	43	440	32	
Rear end plate x Cylinder block	9.3	95	82 in-lbf	
Flywheel x Crankshaft	108	1,100	80	
LH engine mounting bracket x Transaxle	52	530	38	
LH engine mounting insulator x LH mounting bracket	63	650	47	
LH engine mounting insulator x Body	87	890	64	
RH engine mounting insulator x RH mounting bracket	52	530	38	
RH engine mounting insulator x Body	87	890	64	
RH engine mounting stay x RH mounting insulator	73	740	54	
RH engine mounting stay x No.1 alternator bracket	73	740	54	
LH engine mounting stay x LH mounting insulator	21	210	15	
LH engine mounting stay x Transaxle	21	210	15	
Front engine mounting bracket x Transaxle	77	790	57	
Rear engine mounting bracket x Transaxle	77	790	57	
Engine mounting center member x Body	52	530	38	
Engine mounting center member x Front mounting insulator	73	740	54	
Engine mounting center member x Rear mounting insulator	73	740	54	
Front engine mounting insulator x Front mounting insulator	87	890	64	
Rear engine mounting insulator x Rear mounting insulator	87	890	64	
PS pump x PS pump bracket	Adjusting bolt	39	400	29
	Others	43	440	32
A/C compressor x Cylinder block	27	280	20	
Suspension lower crossmember x Body	152	1,550	112	
Transaxle oil cooler tube x Oil cooler hose	34	350	25	
Suspension upper brace x Body	Bolt	21	210	15
	Nut	64	650	47