

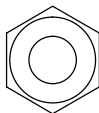
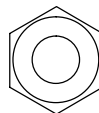
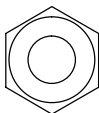


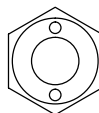
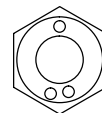
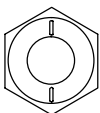
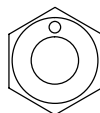
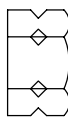
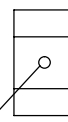
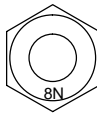
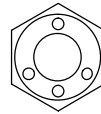

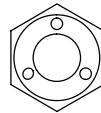
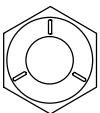
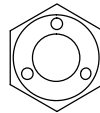

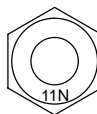
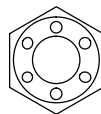

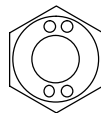
SS0ZS-01

B06431

SPECIFIED TORQUE FOR STANDARD BOLTS

Class	Diameter mm	Pitch mm	Specified torque					
			Hexagon head bolt			Hexagon flange bolt		
			N-m	kgf-cm	ft-lbf	N-m	kgf-cm	ft-lbf
4T	6	1	5	55	48 in.-lbf	6	60	52 in.-lbf
	8	1.25	12.5	130	9	14	145	10
	10	1.25	26	260	19	29	290	21
	12	1.25	47	480	35	53	540	39
	14	1.5	74	760	55	84	850	61
	16	1.5	115	1,150	83	–	–	–
5T	6	1	6.5	65	56 in.-lbf	7.5	75	65 in.-lbf
	8	1.25	15.5	160	12	17.5	175	13
	10	1.25	32	330	24	36	360	26
	12	1.25	59	600	43	65	670	48
	14	1.5	91	930	67	100	1,050	76
	16	1.5	140	1,400	101	–	–	–
6T	6	1	8	80	69 in.-lbf	9	90	78 in.-lbf
	8	1.25	19	195	14	21	210	15
	10	1.25	39	400	29	44	440	32
	12	1.25	71	730	53	80	810	59
	14	1.5	110	1,100	80	125	1,250	90
	16	1.5	170	1,750	127	–	–	–
7T	6	1	10.5	110	8	12	120	9
	8	1.25	25	260	19	28	290	21
	10	1.25	52	530	38	58	590	43
	12	1.25	95	970	70	105	1,050	76
	14	1.5	145	1,500	108	165	1,700	123
	16	1.5	230	2,300	166	–	–	–
8T	8	1.25	29	300	22	33	330	24
	10	1.25	61	620	45	68	690	50
	12	1.25	110	1,100	80	120	1,250	90
9T	8	1.25	34	340	25	37	380	27
	10	1.25	70	710	51	78	790	57
	12	1.25	125	1,300	94	140	1,450	105
10T	8	1.25	38	390	28	42	430	31
	10	1.25	78	800	58	88	890	64
	12	1.25	140	1,450	105	155	1,600	116
11T	8	1.25	42	430	31	47	480	35
	10	1.25	87	890	64	97	990	72
	12	1.25	155	1,600	116	175	1,800	130

HOW TO DETERMINE NUT STRENGTH

Nut Type			Class
Present Standard Hexagon Nut	Old Standard Hexagon Nut		
	Cold Forging Nut	Cutting Processed Nut	
 No Mark			4N
 No Mark (w/ Washer)	 No Mark (w/ Washer)	 No Mark	5N (4T)
  			6N
	 	 	7N (5T)
 			8N
 	 	 No Mark	10N (7T)
 			11N
 			12N

*: Nut with 1 or more marks on one side surface of the nut.

B06432

HINT:

Use the nut with the same number of the nut strength classification or the greater than the bolt strength classification number when tightening parts with a bolt and nut.

Example: Bolt = 4T

Nut = 4N or more

SS074-01

Author : Date : 167

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
Front seat mount bolts	37	375	27
Front suspension member x Body	181	1,850	134
Rear suspension member x Body	51	520	38

ENGINE MECHANICAL (5S-FE)

SS0AD-03

SERVICE DATA

Compression pressure	at 250 rpm STD Minimum Difference of pressure between each cylinder	1,226 kPa (12.5 kgf/cm ² , 178 psi) or more 981 kPa (10.0 kgf/cm ² , 142 psi) 98 kPa (1.0 kgf/cm ² , 14 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	0.19 – 0.29 mm (0.007 – 0.011 in.) 0.28 – 0.38 mm (0.011 – 0.015 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
Idler pulley tension spring	Free length Installed load at 50.5 mm (1.988 in.)	42.0 mm (1.654 in.) 32 – 37 N (3.25 – 3.75 kgf, 7.2 – 8.3 lbf)
Cylinder head	Warpage Cylinder block side Manifold side Valve seat Refacing angle Contacting angle Contacting width	Maximum Maximum 0.05 mm (0.0020 in.) 0.08 mm (0.0031 in.) 30°, 45°, 75° 45° 1.0 – 1.4 mm (0.039 – 0.055 in.)
Valve guide bushing	Inside diameter Outside diameter (for repair part) STD O/S 0.05	6.010 – 6.030 mm (0.2366 – 0.2374 in.) 11.048 – 11.059 mm (0.4331 – 0.4342 in.) 11.050 – 11.077 mm (0.4350 – 0.4361 in.)
Valve	Valve overall length STD Intake Exhaust Minimum Intake Exhaust Vale face angle Stem diameter Intake Exhaust Stem oil clearance STD Intake Exhaust Maximum Intake Exhaust Margin thickness STD Minimum	97.40 – 97.80 mm (3.8346 – 3.8504 in.) 98.25 – 98.65 mm (3.8681 – 3.8839 in.) 97.1 mm (3.823 in.) 98.0 mm (3.858 in.) 44.5° 5.970 – 5.985 mm (0.2350 – 0.2356 in.) 5.965 – 5.980 mm (0.2348 – 0.2354 in.) 0.025 – 0.060 mm (0.0010 – 0.0024 in.) 0.030 – 0.065 mm (0.0012 – 0.0026 in.) 0.08 mm (0.0031 in.) 0.10 mm (0.0039 in.) 0.8 – 1.2 mm (0.031 – 0.047 in.) 0.5 mm (0.020 in.)
Valve spring	Deviation Free length Installed tension at 34.7 mm (1.366 in.)	Maximum 2.0 mm (0.079 in.) 40.95 – 42.80 mm (1.6122 – 1.6850 in.) 164 – 189 N (16.7 – 19.3 kgf, 36.8 – 42.5 lbf)

SERVICE SPECIFICATIONS – ENGINE MECHANICAL (5S-FE)

Valve lifter	Lifter diameter		30.966 – 30.976 mm (1.2191 – 1.2195 in.)
	Lifter bore diameter		31.000 – 31.018 mm (1.2205 – 1.2212 in.)
	Oil clearance	STD	0.024 – 0.052 mm (0.0009 – 0.0020 in.)
		Maximum	0.07 mm (0.0028 in.)
Manifold	Warpage	Maximum	0.30 mm (0.0118 in.)
Camshaft	Thrust clearance	STD Intake	0.045 – 0.100 mm (0.0018 – 0.0039 in.)
		Exhaust	0.030 – 0.085 mm (0.0012 – 0.0033 in.)
		Maximum Intake	0.12 mm (0.0047 in.)
		Exhaust	0.10 mm (0.0039 in.)
	Journal oil clearance	STD	0.025 – 0.062 mm (0.0010 – 0.0024 in.)
		Maximum	0.10 mm (0.0039 in.)
	Journal diameter		26.959 – 26.975 mm (1.0614 – 1.0620 in.)
	Circle runout	Maximum	0.04 mm (0.0016 in.)
	Cam lobe height	STD Intake	42.01 – 42.11 mm (1.6539 – 1.6579 in.)
		Exhaust	40.06 – 40.16 mm (1.5772 – 1.5811 in.)
		Minimum Intake	41.90 mm (1.6496 in.)
		Exhaust	39.95 mm (1.5728 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		22.5 – 22.9 mm (0.886 – 0.902 in.)
Cylinder block	Cylinder head surface warpage	Maximum	0.05 mm (0.0020 in.)
	Cylinder bore diameter	STD Mark 1	87.000 – 87.010 mm (3.4252 – 3.4256 in.)
		Mark 2	87.010 – 87.020 mm (3.4256 – 3.4260 in.)
		Mark 3	87.020 – 87.030 mm (3.4260 – 3.4264 in.)
		Maximum STD	87.23 mm (3.4342 in.)
		O/S 0.50	87.73 mm (3.4350 in.)
Piston and piston ring	Piston diameter	STD Mark 1	86.815 – 86.825 mm (3.4179 – 3.4183 in.)
		Mark 2	86.825 – 86.835 mm (3.4183 – 3.4186 in.)
		Mark 3	86.835 – 86.845 mm (3.4201 – 3.4205 in.)
		O/S 0.50	87.350 – 87.380 mm (3.4375 – 3.4387 in.)
	Piston oil clearance	STD	0.175 – 0.195 mm (0.0068 – 0.0076 in.)
		Maximum	0.215 mm (0.0085 in.)
	Piston ring groove clearance	No.1, No.2	0.030 – 0.070 mm (0.0012 – 0.0028 in.)
	Piston ring end gap	STD No.1	0.270 – 0.490 mm (0.0106 – 0.0192 in.)
		No.2	0.450 – 0.670 mm (0.0177 – 0.0263 in.)
		Oil (side rail)	0.100 – 0.470 mm (0.0039 – 0.0185 in.)
		Maximum No.1	1.09 mm (0.0429 in.)
		No.2	1.27 mm (0.0499 in.)
		Oil (side rail)	1.07 mm (0.0421 in.)
Connecting rod	Thrust clearance	STD	0.160 – 0.312 mm (0.0063 – 0.0123 in.)
		Maximum	0.35 mm (0.0138 in.)
	Connecting rod bearing center wall thickness Reference	STD Mark 1	1.484 – 1.488 mm (0.0584 – 0.0586 in.)
		Mark 2	1.488 – 1.492 mm (0.0586 – 0.0587 in.)
		Mark 3	1.492 – 1.496 mm (0.0587 – 0.0589 in.)
	Connecting rod oil clearance	STD STD	0.024 – 0.055 mm (0.0009 – 0.0022 in.)
		U/S 0.25	0.023 – 0.069 mm (0.0009 – 0.0027 in.)
		Maximum	0.08 mm (0.0031 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.)
	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.)
		Maximum	0.05 mm (0.0020 in.)
	Connecting rod bolt outside diameter	STD	7.860 – 8.000 mm (0.3094 – 0.3150 in.)
		Minimum	7.60 mm (0.2992 in.)

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	STD No.3 STD	0.025 – 0.044 mm (0.0010 – 0.0017 in.)
		U/S 0.25	0.027 – 0.067 mm (0.0011 – 0.0026 in.)
		Others STD	0.015 – 0.034 mm (0.0006 – 0.0013 in.)
		U/S 0.25	0.019 – 0.059 mm (0.0007 – 0.0023 in.)
		Maximum	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 (Reference)		
		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.)
Balance shaft	Crank pin diameter	STD	51.985 – 52.000 mm (2.0466 – 2.0472 in.)
		U/S 0.25	51.745 – 51.755 mm (2.0372 – 2.0376 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.)
	Thrust clearance	STD	0.060 – 0.110 mm (0.0024 – 0.0043 in.)
		Maximum	0.11 mm (0.0043 in.)
	Backlash		
	Crankshaft to No.1 Balance shaft		
	Off-vehicle	STD at punch mark A	0.005 – 0.040 mm (0.002 – 0.0016 in.)
		at punch mark B	0.005 – 0.060 mm (0.002 – 0.0024 in.)
	On-vehicle	STD at punch mark A	0.025 – 0.065 mm (0.0010 – 0.0026 in.)
		at punch mark B	0.025 – 0.085 mm (0.0010 – 0.0033 in.)
	Adjusting spacer thickness	No.01	1.74 mm (0.0685 in.)
		No.03	1.76 mm (0.0693 in.)
		No.05	1.78 mm (0.0701 in.)
		No.07	1.80 mm (0.0709 in.)
		No.09	1.82 mm (0.0717 in.)
		No.11	1.84 mm (0.0724 in.)
		No.13	1.86 mm (0.0732 in.)
		No.15	1.88 mm (0.0740 in.)
		No.17	1.90 mm (0.0748 in.)
		No.19	1.92 mm (0.0756 in.)
		No.21	1.94 mm (0.0764 in.)
		No.23	1.96 mm (0.0772 in.)
		No.25	1.98 mm (0.0780 in.)
		No.27	2.00 mm (0.0787 in.)
		No.29	2.02 mm (0.0795 in.)
		No.31	2.04 mm (0.0803 in.)
		No.33	2.06 mm (0.0811 in.)
		No.35	2.08 mm (0.0819 in.)
		No.37	2.10 mm (0.0827 in.)
		No.39	2.12 mm (0.0835 in.)

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
Oil pump pulley x Oil pump drive shaft	24	245	18
No.2 idler pulley x Oil pump	42	425	31
Crankshaft pulley x Crankshaft	108	1,100	80
Camshaft timing pulley x Camshaft	54	550	40
for use with SST	37	380	27
No.1 idler pulley x Cylinder head	42	425	31
Cylinder head x Cylinder block	49	500	36
1st	Turn 90°	Turn 90°	Turn 90°
2nd			
Water bypass pipe x Cylinder head	19	195	14
Spark plug tube x Cylinder head	49	500	36
Camshaft bearing cap x Cylinder head	19	190	14
Cylinder head cover x Cylinder head	44	450	33
RH engine hanger x Generator bracket	25	250	18
Generator bracket x Cylinder head	42	425	31
LH engine hanger x Cylinder head	25	250	18
No.3 timing belt cover x Cylinder head	7.8	80	69 in.·lbf
Delivery pipe x Cylinder head	13	130	9
Intake manifold x Cylinder head	19	195	14
Fuel inlet hose x Delivery pipe	34	350	25
for use with SST	29	300	21
EGR valve x intake manifold	13.3	130	10
EGR pipe x Cylinder head	61.2	600	45
Intake manifold stay x Intake manifold	39	398	29
Intake manifold stay x Stiffening plate	39	398	29
Water outlet x Cylinder head	15	150	11
No.2 intake manifold stay x Cylinder head	21	214	15
No.2 intake manifold stay x Intake manifold	42	428	31
Exhaust manifold x Cylinder head	49	500	36
No.1 exhaust manifold stay x Exhaust manifold	42	425	31
No.1 exhaust manifold stay x Transaxle	42	425	31
No.2 exhaust manifold stay x Exhaust manifold	42	425	31
No.2 exhaust manifold stay, LH stiffener plate x Cylinder block	58	591	43
TMC made	42	425	31
TMMK made			
No.1 rear end plate x Cylinder block	9.3	95	82 in.·lbf
Flywheel (M/T) x Crankshaft	88	900	65
Drive plate (A/T) x Crankshaft	83	850	61
Transaxle (M/T) x Cylinder block	46	470	34
14 mm head	64	650	47
17 mm head			
Transaxle (A/T) x Cylinder block	66	670	48
Drive plate x Torque converter clutch	27	280	20
No.2 rear end plate x Cylinder block	9.3	95	82 in.·lbf
Exhaust pipe bracket, No.2 rear end plate x Transaxle	19	195	14
RH stiffener plate x Cylinder block	39	398	29
RH stiffener plate x Transaxle	39	398	29

LH stiffener plate x Transaxle	M/T	37	380	27
	A/T	42	430	31
No.2 RH engine mounting bracket x Cylinder block		52	530	38
No.2 RH engine mounting bracket x Generator bracket		52	530	38
Rear engine mounting insulator x Cylinder block		64	650	47
Front engine mounting insulator x Cylinder block		64	650	47
Engine moving control rod x No.2 RH engine mounting bracket		64	650	47
Engine moving control rod x Body		64	650	47
Front engine mounting insulator x Front frame	TMC made	80	820	59
	TMMK made for silver color	44	450	32
	for green color	66	670	49
Rear engine mounting insulator x Front frame		66	670	49
LH engine mounting insulator x Front frame		80	820	59
LH engine mounting insulator x Transaxle		64	650	47
PS pump x PS pump bracket		43	440	32
A/C compressor x Cylinder block		25.5	260	19
Fuel inlet hose x Fuel filter		29	300	21
Main bearing cap x Cylinder block		59	600	43
Connecting rod cap x Connecting rod	1st	25	250	18
	2nd	Turn 90°	Turn 90°	Turn 90°
Engine balancer x Cylinder block		49	500	36
Rear oil seal retainer x Cylinder block		13	130	9
Water pump x Cylinder block		8.8	90	78 in.-lbf
Generator drive belt adjusting bar x Cylinder block		22	224	16
PS pump bracket x Cylinder block		43	440	32
Front exhaust pipe x Exhaust manifold		62	630	46
Front exhaust pipe x Center pipe		56	570	41
Center exhaust pipe x Tailpipe		56	570	41
Support bracket for front exhaust pipe x Exhaust pipe bracket on No.2 rear end plate		33	330	24
Support stay for front exhaust pipe x Support bracket		33	330	24
Support bracket for front exhaust pipe x Front frame		33	330	24
Support bracket for center exhaust pipe x Body		19	195	14
Support bracket for tailpipe x Body		33	330	24

ENGINE MECHANICAL (1MZ-FE)

SERVICE DATA

SS076-02

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 Maximum Valve seat Refacing angle Contacting angle Contacting width Valve guide bushing bore diameter STD O/S 0.05 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 STD O/S 0.05	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.)
Valve	Valve overall length STD Intake Exhaust Minimum Intake Exhaust Valve face angle Stem diameter Intake Exhaust Stem oil clearance STD Intake Exhaust Maximum Intake Exhaust Margin thickness STD Maximum	95.45 mm (3.5779 in.) 95.40 mm (3.7559 in.) 94.95 mm (3.7382 in.) 94.90 mm (3.7362 in.) 44.5° 5.470 – 5.485 mm (0.2154 – 0.2159 in.) 5.465 – 5.480 mm (0.2152 – 0.2157 in.) 0.025 – 0.060 mm (0.0010 – 0.0024 in.) 0.030 – 0.065 mm (0.0012 – 0.0026 in.) 0.08 mm (0.0031 in.) 0.10 mm (0.0039 in.) 1.0 mm (0.039 in.) 0.5 mm (0.020 in.)

Valve spring	Deviation Free length Installed tension at 33.8 mm (1.331 in.)	Maximum	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 – 31.016 mm (1.2205 – 1.2211 in.) 0.024 – 0.050 mm (0.0009 – 0.0020 in.) 0.07 mm (0.0028 in.)
Camshaft	Thrust clearance Journal oil clearance Journal diameter Circle runout Cam lobe height Camshaft gear backlash Camshaft gear spring end free distance	STD Maximum STD Intake Exhaust Maximum Intake Exhaust STD Intake Exhaust Minimum Intake Exhaust STD Maximum	0.040 – 0.090 mm (0.0016 – 0.0035 in.) 0.12 mm (0.0047 in.) 0.035 – 0.072 mm (0.0014 – 0.0028 in.) 0.025 – 0.062 mm (0.0010 – 0.0024 in.) 0.10 mm (0.0039 in.) 0.09 mm (0.0035 in.) 26.959 – 26.975 mm (1.0613 – 1.0620 in.) 0.06 mm (0.0024 in.) 42.11 – 42.21 mm (1.6579 – 1.6618 in.) 41.96 – 42.06 mm (1.6520 – 1.6559 in.) 41.96 mm (1.6520 in.) 41.81 mm (1.6461 in.) 0.020 – 0.200 mm (0.0008 – 0.0079 in.) 0.30 mm (0.0188 in.) 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 Cylinder head side	Maximum Maximum	0.15 mm (0.0059 in.) 0.08 mm (0.0031 in.)
Exhaust manifold	Warpage	Maximum	0.50 mm (0.0196 in.)
Cylinder block	Cylinder head surface warpage Cylinder bore diameter 12 pointed head main bearing cap bolt diameter at tension portion	Maximum Maximum STD Minimum	0.07 mm (0.0028 in.) 87.500 – 87.512 mm (3.4449 – 3.4453 in.) 87.52 mm (3.4457 in.) 7.500 – 7.600 mm (0.2953 – 0.2992 in.) 7.20 mm (0.2835 in.)
Piston and piston ring	Piston diameter AISIN made at 23.2 mm (0.913 in.) from the piston head MAHLE made at 41.2 mm (1.622 in.) from the piston head Piston oil clearance AISIN made MAHLE made Piston ring groove clearance No.1 No.2 Piston ring end gap STD No.1 No.2 Oil Maximum No.1 No.2 Oil	 STD Maximum STD Maximum No.1 No.2 STD No.1 No.2 Oil Maximum No.1 No.2 Oil	 0.084 – 0.106 mm (0.0033 – 0.0042) 0.13 mm (0.0051 in.) 0.033 – 0.059 mm (0.0013 – 0.0023) 0.08 mm (0.0031 in.) 0.020 – 0.070 mm (0.0008 – 0.0028 in.) 0.020 – 0.060 mm (0.0008 – 0.0024 in.) 0.25 – 0.35 mm (0.0098 – 0.0138 in.) 0.35 – 0.45 mm (0.0138 – 0.0177 in.) 0.15 – 0.40 mm (0.0059 – 0.0157 in.) 0.95 mm (0.0374 in.) 1.05 mm (0.0413 in.) 1.00 mm (0.0394 in.)

SERVICE SPECIFICATIONS – ENGINE MECHANICAL (1MZ-FE)

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 – 0.036 mm (0.0006 – 0.0014 in.)
		No.2 and No.3	0.026 – 0.048 mm (0.0010 – 0.0019 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.)

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf	
Timing belt plate x Oil pump	8	80	69 in.·lbf	
No.1 idler pulley x Oil pump	34	350	25	
No.2 idler pulley x No.2 idler pulley bracket	43	440	32	
Camshaft timing pulley x Camshaft	125	1,300	94	
for SST	88	900	65	
Timing belt tensioner x Oil pump	27	280	20	
RH engine mounting bracket x Cylinder block	28	290	21	
No.2 timing belt cover x No.3 timing belt cover	8.5	85	74 in.·lbf	
No.1 timing belt cover x Oil pump	8.5	85	74 in.·lbf	
Crankshaft pulley x Crankshaft	215	2,200	159	
No.2 generator bracket x Engine RH mounting bracket	28	290	21	
Cylinder head x Cylinder block	12 pointed head bolt 1st	54	550	40
	2nd	Turn 90°	Turn 90°	Turn 90°
	Recessed head bolt	18.5	185	13
Camshaft bearing cap x Cylinder head	16	160	12	
Cylinder head cover x Cylinder head	8	80	69 in.·lbf	
Exhaust manifold x Cylinder head	49	500	36	
Exhaust manifold stay x Exhaust manifold				
Except California A/T and all M/T	20	200	15	
California A/T and all M/T	34	350	25	
Exhaust manifold stay x Transmission housing				
Except California A/T	20	200	15	
California A/T	34	350	25	
No.1 EGR pipe x RH exhaust manifold	12	120	9	
No.1 EGR pipe x EGR cooler	12	120	9	
PS pump bracket x RH cylinder head	43	440	32	
Oil dipstick guide x LH cylinder head	8	80	69 in.·lbf	
Water inlet pipe x LH cylinder head	19.5	200	14	
Cylinder head rear plate x LH cylinder head	8	80	69 in.·lbf	
No.3 timing belt cover x Cylinder head	8.5	85	74 in.·lbf	
Water outlet x Intake manifold	15	150	11	
Fuel inlet hose x Fuel filter	29	300	21	
Intake manifold x Cylinder head	15	150	11	
Air intake chamber x Intake manifold	43	440	32	
No.2 EGR pipe x Air intake chamber	12	120	9	
No.2 EGR pipe x EGR cooler	12	120	9	
No.1 engine hanger x Air intake chamber	39	400	29	
No.1 engine hanger x RH cylinder head	39	400	29	
Air intake chamber stay x Air intake chamber	19.5	200	14	
Air intake chamber stay x RH cylinder head	19.5	200	14	
Rear engine mounting insulator x Cylinder block	64	650	47	
Front engine mounting insulator x Cylinder block	64	650	47	
Engine moving control rod x RH engine mounting bracket	64	650	47	
Engine moving control rod x RH fender apron	64	650	47	
No.2 RH engine mounting stay x No.2 RH engine mounting bracket	64	650	47	

SERVICE SPECIFICATIONS – ENGINE MECHANICAL (1MZ-FE)

No.2 RH engine mounting stay x No.2 Generator bracket	64	650	47
RH engine mounting stay x Water outlet	32	320	23
RH engine mounting stay x Engine moving control rod	32	320	23
RH engine mounting stay x No.2 RH engine mounting bracket	32	320	23
Front engine mounting insulator x Front frame			
TMC made	80	820	59
TMMK made			
Silver color bolt	44	450	32
Green color bolt	66	670	48
Engine mounting absorber x Front frame	48	490	35
Engine mounting absorber x Transaxle	48	490	35
Rear engine mounting insulator x Front frame	66	670	48
LH engine mounting insulator x Transaxle	64	650	47
PS pump x PS pump bracket	43	440	31
A/C compressor x Housing bracket	25	250	18
A/C compressor x No.1 oil pan	25	250	18
Generator adjusting bar x Drive belt adjusting bar bracket	18	185	13
Main bearing cap x Cylinder block			
12 pointed head bolt 1st	22	225	16
2nd	Turn 90°	Turn 90°	Turn 90°
6 pointed head bolt	27	275	20
Connecting rod cap x Connecting rod			
1st	24.5	250	18
2nd	Turn 90°	Turn 90°	Turn 90°
Rear oil seal retainer x Cylinder block	8	80	69 in.·lbf
EGR cooler x Cylinder block	9	90	78 in.·lbf
Engine coolant drain union x Cylinder block	39	400	29
Water seal plate x Cylinder block	18	180	13
Oil filter union x Cylinder block	30	310	22
Water inlet housing x Cylinder block	8	80	69 in.·lbf
Knock sensor x Cylinder block	39	400	29
No.2 idler pulley bracket x Cylinder block	28	290	21
A/C compressor housing bracket x Cylinder block	25	250	18
Generator bracket x Cylinder block	43	440	32
Drive plate x Crankshaft	83	850	61
Flywheel x Crankshaft	83	850	61
Front exhaust pipe support bracket x No.1 oil pan	21	210	15
Front exhaust pipe x Exhaust manifold	62	630	46
Front exhaust pipe x Center exhaust pipe	56	570	41
Center exhaust pipe x Tailpipe	56	570	41
Front exhaust pipe bracket x Sub frame	33	330	24
Front exhaust pipe support bracket x Front exhaust pipe stay	33	330	24
Heated oxygen sensor x Center exhaust pipe	44	450	33

EMISSION CONTROL (5S-FE)

TORQUE SPECIFICATION

SS0AF-03

Part tightened	N·m	kgf·cm	ft·lbf
EGR valve x Intake manifold	13.3	136	10
EGR valve x EGR pipe	10	102	7
Exhaust manifold x Cylinder head	49	500	36
Front exhaust pipe x Exhaust manifold	62	630	46
Front exhaust pipe x Center exhaust pipe	56	570	41

EMISSION CONTROL (1MZ-FE)

SS078-01

SERVICE DATA

EGR valve position sensor	Resistance (VC – E2)	1.5 – 4.3 k Ω
	Power source voltage (VC– E2)	4.5 – 5.5 V
	Power output voltage (EGLS – E2) at vacuum (17.3 kPa, 130 mmHg, 5.1 in.Hg)	3.2 – 5.1 V
	at no vacuum	0.4 – 1.6 V

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
EGR valve position sensor x EGR valve	2	20	17 in.·lbf
EGR pipe x EGR valve	12	120	9
EGR pipe x EGR cooler	12	120	9
EGR valve x Air intake chamber	12	120	9
EGR gas temperature sensor x EGR valve	20	200	14
Front exhaust pipe x Exhaust manifold	62	630	46
Front exhaust pipe x Center exhaust pipe	56	570	41
Front exhaust pipe bracket x Sub frame	33	330	24
Front exhaust pipe support bracket x Front exhaust pipe stay	33	330	24

SFI (5S-FE)

SERVICE DATA

SS0AG-03

Fuel pressure regulator	Fuel pressure at no vacuum	301 – 347 kPa (3.1 – 3.5 kgf/cm ² , 44 – 50 psi)
Fuel pump	Resistance at 20°C (68°F)	0.2 – 3.0 Ω
Injector	Resistance at 20°C (68°F) Injection volume Difference between each cylinder Fuel leakage	13.4 – 14.2 Ω 54 – 69 cm ³ (3.3 – 4.2 cu in.) per 15 seconds 7 cm ³ (0.4 cu in.) or less One drop or less per minute
Throttle body	Throttle body fully closed angle Throttle opener setting speed	6° 1,300 – 1,500 rpm (w/ Cooling fan OFF)
Throttle position sensor	Clearance between stop screw and lever 0 mm (0 in.) Throttle valve fully open –	VTA – E2 VTA – E2 VC – E2 0.2 – 5.7 kΩ 2.0 – 10.2 kΩ 2.5 – 5.9 kΩ
IAC valve	Resistance (+B – ISCC or ISCO) at cold at hot	17.0 – 24.5 Ω 21.5 – 28.5 Ω
VSV for EVAP	Resistance at 20°C (68°F)	30 – 34 Ω
VSV for vapor pressure sensor	Resistance at 20°C (68°F)	33 – 39 Ω
VSV for EGR	Resistance at 20°C (68°F)	33 – 39 Ω
ECT sensor	Resistance at –20°C (–4°F) at 0°C (32°F) at 20°C (68°F) at 40°C (104°F) at 60°C (140°F) at 80°C (176°F)	10 – 20 kΩ 4 – 7 kΩ 2 – 3 kΩ 0.9 – 1.3 kΩ 0.4 – 0.7 kΩ 0.2 – 0.4 kΩ
IAT sensor	Resistance at –20°C (–4°F) at 0°C (32°F) at 20°C (68°F) at 40°C (104°F) at 60°C (140°F) at 80°C (176°F)	10 – 20 kΩ 4 – 7 kΩ 2 – 3 kΩ 0.9 – 1.3 kΩ 0.4 – 0.7 kΩ 0.2 – 0.4 kΩ
MAP sensor	Power source voltage	4.5 – 5.5 V
Vapor Pressure Sensor	Power source voltage	4.5 – 5.5 V
A/F sensor	Resistance at 20°C (68°F)	0.8 – 1.4 Ω
Heated oxygen sensor	Resistance at 20°C (68°F)	11 – 16 Ω
Fuel cut rpm	Fuel return rpm	1,500 rpm

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
Oil pump pulley x Oil pump drive shaft	24	245	18
No.2 idler pulley x Oil pump	42	425	31
Crankshaft pulley x Crankshaft	108	1,100	80
Camshaft timing pulley x Camshaft	54	550	40
for use with SST	37	380	27
No.1 idler pulley x Cylinder head	42	425	31
Cylinder head x Cylinder block	49	500	36
1st	Turn 90°	Turn 90°	Turn 90°
2nd			
Water bypass pipe x Cylinder head	19	195	14
Spark plug tube x Cylinder head	49	500	36
Camshaft bearing cap x Cylinder head	19	190	14
Cylinder head cover x Cylinder head	44	450	33
RH engine hanger x Generator bracket	25	250	18
Generator bracket x Cylinder head	42	425	31
LH engine hanger x Cylinder head	25	250	18
No.3 timing belt cover x Cylinder head	7.8	80	69 in.·lbf
Delivery pipe x Cylinder head	13	130	9
Intake manifold x Cylinder head	19	195	14
Fuel inlet hose x Delivery pipe	34	350	25
for use with SST	29	300	21
EGR valve x intake manifold	13.3	130	10
EGR pipe x Cylinder head	61.2	600	45
Intake manifold stay x Intake manifold	39	398	29
Intake manifold stay x Stiffening plate	39	398	29
Water outlet x Cylinder head	15	150	11
No.2 intake manifold stay x Cylinder head	21	214	15
No.2 intake manifold stay x Intake manifold	42	428	31
Exhaust manifold x Cylinder head	49	500	36
No.1 exhaust manifold stay x Exhaust manifold	42	425	31
No.1 exhaust manifold stay x Transaxle	42	425	31
No.2 exhaust manifold stay x Exhaust manifold	42	425	31
No.2 exhaust manifold stay, LH stiffener plate x Cylinder block	58	591	43
TMC made	42	425	31
TMMK made			
No.1 rear end plate x Cylinder block	9.3	95	82 in.·lbf
Flywheel (M/T) x Crankshaft	88	900	65
Drive plate (A/T) x Crankshaft	83	850	61
Transaxle (M/T) x Cylinder block	46	470	34
14 mm head	64	650	47
17 mm head			
Transaxle (A/T) x Cylinder block	66	670	48
Drive plate x Torque converter clutch	27	280	20
No.2 rear end plate x Cylinder block	9.3	95	82 in.·lbf
Exhaust pipe bracket, No.2 rear end plate x Transaxle	19	195	14
RH stiffener plate x Cylinder block	39	398	29
RH stiffener plate x Transaxle	39	398	29

LH stiffener plate x Transaxle	M/T	37	380	27
	A/T	42	430	31
No.2 RH engine mounting bracket x Cylinder block		52	530	38
No.2 RH engine mounting bracket x Generator bracket		52	530	38
Rear engine mounting insulator x Cylinder block		64	650	47
Front engine mounting insulator x Cylinder block		64	650	47
Engine moving control rod x No.2 RH engine mounting bracket		64	650	47
Engine moving control rod x Body		64	650	47
Front engine mounting insulator x Front frame	TMC made	80	820	59
	TMMK made for silver color	44	450	32
	for green color	66	670	49
Rear engine mounting insulator x Front frame		66	670	49
LH engine mounting insulator x Front frame		80	820	59
LH engine mounting insulator x Transaxle		64	650	47
PS pump x PS pump bracket		43	440	32
A/C compressor x Cylinder block		25.5	260	19
Fuel inlet hose x Fuel filter		29	300	21
Main bearing cap x Cylinder block		59	600	43
Connecting rod cap x Connecting rod	1st	25	250	18
	2nd	Turn 90°	Turn 90°	Turn 90°
Engine balancer x Cylinder block		49	500	36
Rear oil seal retainer x Cylinder block		13	130	9
Water pump x Cylinder block		8.8	90	78 in.-lbf
Generator drive belt adjusting bar x Cylinder block		22	224	16
PS pump bracket x Cylinder block		43	440	32
Front exhaust pipe x Exhaust manifold		62	630	46
Front exhaust pipe x Center pipe		56	570	41
Center exhaust pipe x Tailpipe		56	570	41
Support bracket for front exhaust pipe		33	330	24
	x Exhaust pipe bracket on No.2 rear end plate			
Support stay for front exhaust pipe x Support bracket		33	330	24
Support bracket for front exhaust pipe x Front frame		33	330	24
Support bracket for center exhaust pipe x Body		19	195	14
Support bracket for tailpipe x Body		33	330	24

ENGINE MECHANICAL (1MZ-FE)

SERVICE DATA

SS076-02

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 Maximum Valve seat Refacing angle Contacting angle Contacting width Valve guide bushing bore diameter STD O/S 0.05 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 STD O/S 0.05	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.)
Valve	Valve overall length STD Intake Exhaust Minimum Intake Exhaust Valve face angle Stem diameter Intake Exhaust Stem oil clearance STD Intake Exhaust Maximum Intake Exhaust Margin thickness STD Maximum	95.45 mm (3.5779 in.) 95.40 mm (3.7559 in.) 94.95 mm (3.7382 in.) 94.90 mm (3.7362 in.) 44.5° 5.470 – 5.485 mm (0.2154 – 0.2159 in.) 5.465 – 5.480 mm (0.2152 – 0.2157 in.) 0.025 – 0.060 mm (0.0010 – 0.0024 in.) 0.030 – 0.065 mm (0.0012 – 0.0026 in.) 0.08 mm (0.0031 in.) 0.10 mm (0.0039 in.) 1.0 mm (0.039 in.) 0.5 mm (0.020 in.)

Valve spring	Deviation Free length Installed tension at 33.8 mm (1.331 in.)	Maximum	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 – 31.016 mm (1.2205 – 1.2211 in.) 0.024 – 0.050 mm (0.0009 – 0.0020 in.) 0.07 mm (0.0028 in.)
Camshaft	Thrust clearance Journal oil clearance Journal diameter Circle runout Cam lobe height Camshaft gear backlash Camshaft gear spring end free distance	STD Maximum STD Intake Exhaust Maximum Intake Exhaust STD Intake Exhaust Minimum Intake Exhaust STD Maximum	0.040 – 0.090 mm (0.0016 – 0.0035 in.) 0.12 mm (0.0047 in.) 0.035 – 0.072 mm (0.0014 – 0.0028 in.) 0.025 – 0.062 mm (0.0010 – 0.0024 in.) 0.10 mm (0.0039 in.) 0.09 mm (0.0035 in.) 26.959 – 26.975 mm (1.0613 – 1.0620 in.) 0.06 mm (0.0024 in.) 42.11 – 42.21 mm (1.6579 – 1.6618 in.) 41.96 – 42.06 mm (1.6520 – 1.6559 in.) 41.96 mm (1.6520 in.) 41.81 mm (1.6461 in.) 0.020 – 0.200 mm (0.0008 – 0.0079 in.) 0.30 mm (0.0188 in.) 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 Cylinder head side	Maximum Maximum	0.15 mm (0.0059 in.) 0.08 mm (0.0031 in.)
Exhaust manifold	Warpage	Maximum	0.50 mm (0.0196 in.)
Cylinder block	Cylinder head surface warpage Cylinder bore diameter 12 pointed head main bearing cap bolt diameter at tension portion	Maximum Maximum STD Minimum	0.07 mm (0.0028 in.) 87.500 – 87.512 mm (3.4449 – 3.4453 in.) 87.52 mm (3.4457 in.) 7.500 – 7.600 mm (0.2953 – 0.2992 in.) 7.20 mm (0.2835 in.)
Piston and piston ring	Piston diameter AISIN made at 23.2 mm (0.913 in.) from the piston head MAHLE made at 41.2 mm (1.622 in.) from the piston head Piston oil clearance AISIN made MAHLE made Piston ring groove clearance No.1 No.2 Piston ring end gap STD No.1 No.2 Oil Maximum No.1 No.2 Oil	 STD Maximum STD Maximum No.1 No.2 STD No.1 No.2 Oil Maximum No.1 No.2 Oil	 0.084 – 0.106 mm (0.0033 – 0.0042) 0.13 mm (0.0051 in.) 0.033 – 0.059 mm (0.0013 – 0.0023) 0.08 mm (0.0031 in.) 0.020 – 0.070 mm (0.0008 – 0.0028 in.) 0.020 – 0.060 mm (0.0008 – 0.0024 in.) 0.25 – 0.35 mm (0.0098 – 0.0138 in.) 0.35 – 0.45 mm (0.0138 – 0.0177 in.) 0.15 – 0.40 mm (0.0059 – 0.0157 in.) 0.95 mm (0.0374 in.) 1.05 mm (0.0413 in.) 1.00 mm (0.0394 in.)

SERVICE SPECIFICATIONS – ENGINE MECHANICAL (1MZ-FE)

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 – 0.036 mm (0.0006 – 0.0014 in.)
		No.2 and No.3	0.026 – 0.048 mm (0.0010 – 0.0019 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.)

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf	
Timing belt plate x Oil pump	8	80	69 in·lbf	
No.1 idler pulley x Oil pump	34	350	25	
No.2 idler pulley x No.2 idler pulley bracket	43	440	32	
Camshaft timing pulley x Camshaft	125	1,300	94	
for SST	88	900	65	
Timing belt tensioner x Oil pump	27	280	20	
RH engine mounting bracket x Cylinder block	28	290	21	
No.2 timing belt cover x No.3 timing belt cover	8.5	85	74 in·lbf	
No.1 timing belt cover x Oil pump	8.5	85	74 in·lbf	
Crankshaft pulley x Crankshaft	215	2,200	159	
No.2 generator bracket x Engine RH mounting bracket	28	290	21	
Cylinder head x Cylinder block	12 pointed head bolt 1st	54	550	40
	2nd	Turn 90°	Turn 90°	Turn 90°
	Recessed head bolt	18.5	185	13
Camshaft bearing cap x Cylinder head	16	160	12	
Cylinder head cover x Cylinder head	8	80	69 in·lbf	
Exhaust manifold x Cylinder head	49	500	36	
Exhaust manifold stay x Exhaust manifold				
Except California A/T and all M/T	20	200	15	
California A/T and all M/T	34	350	25	
Exhaust manifold stay x Transmission housing				
Except California A/T	20	200	15	
California A/T	34	350	25	
No.1 EGR pipe x RH exhaust manifold	12	120	9	
No.1 EGR pipe x EGR cooler	12	120	9	
PS pump bracket x RH cylinder head	43	440	32	
Oil dipstick guide x LH cylinder head	8	80	69 in·lbf	
Water inlet pipe x LH cylinder head	19.5	200	14	
Cylinder head rear plate x LH cylinder head	8	80	69 in·lbf	
No.3 timing belt cover x Cylinder head	8.5	85	74 in·lbf	
Water outlet x Intake manifold	15	150	11	
Fuel inlet hose x Fuel filter	29	300	21	
Intake manifold x Cylinder head	15	150	11	
Air intake chamber x Intake manifold	43	440	32	
No.2 EGR pipe x Air intake chamber	12	120	9	
No.2 EGR pipe x EGR cooler	12	120	9	
No.1 engine hanger x Air intake chamber	39	400	29	
No.1 engine hanger x RH cylinder head	39	400	29	
Air intake chamber stay x Air intake chamber	19.5	200	14	
Air intake chamber stay x RH cylinder head	19.5	200	14	
Rear engine mounting insulator x Cylinder block	64	650	47	
Front engine mounting insulator x Cylinder block	64	650	47	
Engine moving control rod x RH engine mounting bracket	64	650	47	
Engine moving control rod x RH fender apron	64	650	47	
No.2 RH engine mounting stay x No.2 RH engine mounting bracket	64	650	47	

SERVICE SPECIFICATIONS – ENGINE MECHANICAL (1MZ-FE)

No.2 RH engine mounting stay x No.2 Generator bracket	64	650	47
RH engine mounting stay x Water outlet	32	320	23
RH engine mounting stay x Engine moving control rod	32	320	23
RH engine mounting stay x No.2 RH engine mounting bracket	32	320	23
Front engine mounting insulator x Front frame			
TMC made	80	820	59
TMMK made			
Silver color bolt	44	450	32
Green color bolt	66	670	48
Engine mounting absorber x Front frame	48	490	35
Engine mounting absorber x Transaxle	48	490	35
Rear engine mounting insulator x Front frame	66	670	48
LH engine mounting insulator x Transaxle	64	650	47
PS pump x PS pump bracket	43	440	31
A/C compressor x Housing bracket	25	250	18
A/C compressor x No.1 oil pan	25	250	18
Generator adjusting bar x Drive belt adjusting bar bracket	18	185	13
Main bearing cap x Cylinder block			
12 pointed head bolt 1st	22	225	16
2nd	Turn 90°	Turn 90°	Turn 90°
6 pointed head bolt	27	275	20
Connecting rod cap x Connecting rod			
1st	24.5	250	18
2nd	Turn 90°	Turn 90°	Turn 90°
Rear oil seal retainer x Cylinder block	8	80	69 in.·lbf
EGR cooler x Cylinder block	9	90	78 in.·lbf
Engine coolant drain union x Cylinder block	39	400	29
Water seal plate x Cylinder block	18	180	13
Oil filter union x Cylinder block	30	310	22
Water inlet housing x Cylinder block	8	80	69 in.·lbf
Knock sensor x Cylinder block	39	400	29
No.2 idler pulley bracket x Cylinder block	28	290	21
A/C compressor housing bracket x Cylinder block	25	250	18
Generator bracket x Cylinder block	43	440	32
Drive plate x Crankshaft	83	850	61
Flywheel x Crankshaft	83	850	61
Front exhaust pipe support bracket x No.1 oil pan	21	210	15
Front exhaust pipe x Exhaust manifold	62	630	46
Front exhaust pipe x Center exhaust pipe	56	570	41
Center exhaust pipe x Tailpipe	56	570	41
Front exhaust pipe bracket x Sub frame	33	330	24
Front exhaust pipe support bracket x Front exhaust pipe stay	33	330	24
Heated oxygen sensor x Center exhaust pipe	44	450	33

EMISSION CONTROL (5S-FE)

TORQUE SPECIFICATION

SS0AF-03

Part tightened	N·m	kgf·cm	ft·lbf
EGR valve x Intake manifold	13.3	136	10
EGR valve x EGR pipe	10	102	7
Exhaust manifold x Cylinder head	49	500	36
Front exhaust pipe x Exhaust manifold	62	630	46
Front exhaust pipe x Center exhaust pipe	56	570	41

EMISSION CONTROL (1MZ-FE)

SS078-01

SERVICE DATA

EGR valve position sensor	Resistance (VC – E2)	1.5 – 4.3 k Ω
	Power source voltage (VC– E2)	4.5 – 5.5 V
	Power output voltage (EGLS – E2) at vacuum (17.3 kPa, 130 mmHg, 5.1 in.Hg)	3.2 – 5.1 V
	at no vacuum	0.4 – 1.6 V

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
EGR valve position sensor x EGR valve	2	20	17 in.·lbf
EGR pipe x EGR valve	12	120	9
EGR pipe x EGR cooler	12	120	9
EGR valve x Air intake chamber	12	120	9
EGR gas temperature sensor x EGR valve	20	200	14
Front exhaust pipe x Exhaust manifold	62	630	46
Front exhaust pipe x Center exhaust pipe	56	570	41
Front exhaust pipe bracket x Sub frame	33	330	24
Front exhaust pipe support bracket x Front exhaust pipe stay	33	330	24

SFI (5S-FE)

SERVICE DATA

SS0AG-03

Fuel pressure regulator	Fuel pressure at no vacuum	301 – 347 kPa (3.1 – 3.5 kgf/cm ² , 44 – 50 psi)
Fuel pump	Resistance at 20°C (68°F)	0.2 – 3.0 Ω
Injector	Resistance at 20°C (68°F) Injection volume Difference between each cylinder Fuel leakage	13.4 – 14.2 Ω 54 – 69 cm ³ (3.3 – 4.2 cu in.) per 15 seconds 7 cm ³ (0.4 cu in.) or less One drop or less per minute
Throttle body	Throttle body fully closed angle Throttle opener setting speed	6° 1,300 – 1,500 rpm (w/ Cooling fan OFF)
Throttle position sensor	Clearance between stop screw and lever 0 mm (0 in.) VTA – E2 Throttle valve fully open VTA – E2 – VC – E2	0.2 – 5.7 kΩ 2.0 – 10.2 kΩ 2.5 – 5.9 kΩ
IAC valve	Resistance (+B – ISCC or ISCO) at cold at hot	17.0 – 24.5 Ω 21.5 – 28.5 Ω
VSV for EVAP	Resistance at 20°C (68°F)	30 – 34 Ω
VSV for vapor pressure sensor	Resistance at 20°C (68°F)	33 – 39 Ω
VSV for EGR	Resistance at 20°C (68°F)	33 – 39 Ω
ECT sensor	Resistance at –20°C (–4°F) at 0°C (32°F) at 20°C (68°F) at 40°C (104°F) at 60°C (140°F) at 80°C (176°F)	10 – 20 kΩ 4 – 7 kΩ 2 – 3 kΩ 0.9 – 1.3 kΩ 0.4 – 0.7 kΩ 0.2 – 0.4 kΩ
IAT sensor	Resistance at –20°C (–4°F) at 0°C (32°F) at 20°C (68°F) at 40°C (104°F) at 60°C (140°F) at 80°C (176°F)	10 – 20 kΩ 4 – 7 kΩ 2 – 3 kΩ 0.9 – 1.3 kΩ 0.4 – 0.7 kΩ 0.2 – 0.4 kΩ
MAP sensor	Power source voltage	4.5 – 5.5 V
Vapor Pressure Sensor	Power source voltage	4.5 – 5.5 V
A/F sensor	Resistance at 20°C (68°F)	0.8 – 1.4 Ω
Heated oxygen sensor	Resistance at 20°C (68°F)	11 – 16 Ω
Fuel cut rpm	Fuel return rpm	1,500 rpm

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
Fuel line			
Union bolt type	29	300	21
Flare nut type	28	285	21
Fuel pump assembly x Fuel tank	4	40	35 in.·lbf
Fuel filter x Fuel pump bracket	2	20	17 in.·lbf
Fuel pressure regulator x Fuel pump bracket	2	20	17 in.·lbf
Delivery pipe x Cylinder head	13	130	9
Fuel tank band x Body	39	400	29
Throttle body x Intake manifold	19	195	14
Knock sensor 1 x Cylinder block	44	450	32
A/F sensor x Exhaust manifold	44	450	32
Oxygen sensor (bank 1 sensor 1) x Exhaust manifold	44	450	32
Oxygen sensor (bank 1 sensor 2) x Front exhaust pipe	44	450	32

SFI (1MZ-FE)

SERVICE DATA

SS109-02

Fuel pressure regulator	Fuel pressure at no vacuum	301 – 347 kPa (3.1 – 3.5 kgf/cm ² , 44 – 50 psi)
Fuel pump	Resistance at 20°C (68°F)	0.2 – 3.0 Ω
Injector	Resistance Injection volume Difference between each cylinder Fuel leakage	13.4 – 14.2 Ω 60 – 73 cm ³ (3.4 – 4.5 cu in.) per 15 sec. 13 cm ³ (0.8 cu in.) or less 1 drop or less per 12 minute
MAF meter	Resistance (THA – E2) at –20°C (–4°F) at 20°C (68°F) at 60°C (140°F)	14.6 – 17.8 kΩ 2.21 – 2.69 kΩ 0.29 – 0.35 kΩ
Throttle body	Throttle opener setting speed	900 – 1,950 rpm
Throttle position sensor	Resistance Throttle valve fully closed VTA – E2 Throttle valve fully open VTA – E2 – VC – E2	0.2 – 6.3 kΩ 2.0 – 10.2 kΩ 2.5 – 5.9 kΩ
IAC valve	Resistance (+B – RSO or RSC) at cold at hot	17.0 – 25.0 Ω 21.5 – 29.5 Ω
VSV for EGR	Resistance at 20°C (68°F)	27 – 33 Ω
VSV for EVAP	Resistance at 20°C (68°F)	27 – 33 Ω
VSV for ACIS	Resistance at 20°C (68°F)	33 – 39 Ω
VSV for Vapor Pressure Sensor	Resistance at 20°C (68°F)	33 – 39 Ω
Vapor Pressure Sensor	Power source voltage	4.5 – 5.5 V
ECT sensor	Resistance at –20°C (–4°F) at 0°C (32°F) at 20°C (68°F) at 40°C (104°F) at 60°C (140°F) at 80°C (176°F)	10 – 20 kΩ 4 – 7 kΩ 2 – 3 kΩ 0.9 – 1.3 kΩ 0.4 – 0.7 kΩ 0.2 – 0.4 kΩ
EGR gas temperature sensor	Resistance at 50°C (122°F) at 100°C (212°F) at 150°C (302°F)	64 – 97 kΩ 11 – 16 kΩ 2 – 4 kΩ
A/F sensor	Heater coil resistance at 20°C (68°F) at 800°C (1472°F)	0.8 – 1.4 Ω 1.8 – 3.2 Ω
Heated oxygen sensor	Heater coil resistance at 20°C (68°F) at 800°C (1472°F)	11 – 16 Ω 23 – 32 Ω
Fuel cut rpm	Fuel return rpm	1,200 rpm

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
Fuel line (Union bolt type)	29	300	21
Fuel line (Flare nut type) using SST	28	285	21
Fuel pump assembly x Fuel tank	4	40	35 in.·lbf
Fuel filter x Fuel pump bracket	2	20	17 in.·lbf
Fuel pressure regulator x Fuel pump bracket	2	20	17 in.·lbf
Delivery pipe x Intake manifold	10	100	7
No.1 fuel pipe x Intake manifold	19.5	200	14
Fuel tank band x Body	39	400	29
Throttle body x Air intake chamber	19.5	200	14
Intake air control valve x Air intake chamber	14.5	145	10
ECT sensor x Water outlet	20	200	14
Knock sensor x Cylinder block	39	400	29
A/F sensor x Exhaust manifold	44	450	32
Heated oxygen sensor (Bank 1, 2 sensor 1) x Exhaust manifold	44	450	32
Heated oxygen sensor (Bank 1 sensor 2) x Exhaust pipe	44	450	32

COOLING (5S-FE)

SS0AI-03

SERVICE DATA

Thermostat	Valve opening temperature	80 – 84°C (176 – 183°F)
	Valve lift at 95°C (203°F)	8 mm (0.31 in.) or more
Radiator cap	Relief valve opening pressure	74 – 103 kPa (0.75 – 1.05 kgf/cm ² , 10.7 – 14.9 psi)
	STD Minimum	59 kPa (0.6 kgf/cm ² , 8.5 psi)
Electric cooling fan	Rotating amperage	4.9 – 8.5 A

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
Cylinder block x Drain plug	25	250	18
Water pump x Water pump cover, Cylinder block	8.8	90	78 in·lbf
Water bypass pipe x Water pump cover	9.3	95	82 in·lbf
Generator drive belt adjusting bar x Cylinder block	22	224	16
Water inlet x Water pump cover	8.8	90	78 in·lbf
Oil cooler x Radiator lower tank	8.3	85	74 in·lbf
Oil cooler pipe x Oil cooler	14.7	150	11
Upper radiator support x Body	12.8	130	9
Electric cooling fan x Radiator	5.0	50	44 in·lbf

COOLING (1MZ-FE)

SS07C-01

SERVICE DATA

Thermostat	Valve opening pressure Valve lift at 95°C (203°F)	80 – 84°C (176 – 183°F) 10.0 mm (0.394 in.) or more
Radiator cap	Relief valve opening pressure STD Minimum	83 – 113 kPa (0.85 – 1.15 kgf/cm ² , 12.1 – 16.4 psi) 69 kPa (0.7 kgf/cm ² , 10.0 psi)
Radiator	Plate height	7.4 – 7.8 mm (0.2959 – 0.3119 in.)
Cooling fan	Rotating amperage at 20°C (68°F) No.1 No.2	8.3 – 11.3 A 8.3 – 11.3 A

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
RH engine drain plug x EGR cooler	7	70	61 in·lbf
LH engine drain plug x Union on cylinder block	13	130	9
Water pump x Cylinder block	8	80	69 in·lbf
Water inlet x Water inlet housing	8	80	69 in·lbf
Water inlet pipe x LH cylinder head	19.5	200	14
Radiator support x Body	12.8	130	9
No.1 cooling fan shroud x Radiator	5.0	50	44 in·lbf
No.2 cooling fan shroud x Radiator	5.0	50	44 in·lbf
Radiator oil cooler x Radiator lower tank	8.3	85	74 in·lbf
Radiator inlet pipe x Radiator lower tank	14.7	150	11

LUBRICATION (5S-FE)

SS0AK-03

SERVICE DATA

Oil pressure		at idle speed at 3,000 rpm	29 kPa (0.3 kgf/cm ² , 4.3 psi) or more 245 – 490 kPa (2.5 – 5.0 kgf/cm ² , 36 – 71 psi)
Oil pump	Body clearance	STD	0.10 – 0.16 mm (0.0039 – 0.0063 in.)
		Maximum	0.20 mm (0.0079 in.)
	Tip clearance	STD	0.04 – 0.16 mm (0.0016 – 0.0063 in.)
		Maximum	0.20 mm (0.0079 in.)

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
Oil pan x Drain plug	37	375	27
Oil pump body cover x Oil pump body	8.8	90	78 in·lbf
Oil pump x Cylinder block	8.8	90	78 in·lbf
Oil strainer x Engine balancer	5.4	55	48 in·lbf
Oil strainer x Oil pump	5.4	55	48 in·lbf
Oil pan x Cylinder block	5.4	55	48 in·lbf
Oil pan x Oil pump	5.4	55	48 in·lbf
Oil cooler x Cylinder block	Union bolt	78.5	800
	Nut	9.0	92
			58
			80 in·lbf

LUBRICATION (1MZ-FE)

SS07E-01

SERVICE DATA

Oil pressure		at idle speed at 3,000 rpm	29 kPa (0.3 kgf/cm ² , 43 psi) or more 294 – 539 kPa (3.0 – 5.5 kgf/cm ² , 43 – 78 psi)
Oil pump	Side clearance	STD	0.030 – 0.090 mm (0.0012 – 0.0035 in.)
		Maximum	0.15 mm (0.0059 in.)
	Body clearance	STD	0.100 – 0.175 mm (0.0039 – 0.0069 in.)
		Maximum	0.30 mm (0.0118 in.)
	Tip clearance	STD	0.110 – 0.240 mm (0.0043 – 0.0094 in.)
		Maximum	0.35 mm (0.0138 in.)

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
Oil pressure switch x Cylinder block	13	130	9
No.2 oil pan x Drain plug	45	460	33
Oil pump x Relief valve plug	36.8	375	37
Oil pump x Cylinder block	10 mm head	8	69 in.·lbf
	12 mm head	19.5	14
Crankshaft position sensor x Oil pump	8	80	69 in.·lbf
Oil pan baffle plate x No.1 oil pan	8	80	69 in.·lbf
No.1 oil pan x Cylinder block	19.5	200	14
No.1 oil pan x Oil pump	10 mm head	8	69 in.·lbf
	12 mm head	19.5	14
No.1 oil pan x Rear oil seal retainer	8	80	69 in.·lbf
No.1 oil pan x Transaxle	37.2	380	27
Oil strainer x Main bearing cap	8	80	69 in.·lbf
Oil strainer x Oil pump	8	80	69 in.·lbf
No.2 oil pan x No.1 oil pan	8	80	69 in.·lbf
Flywheel housing under cover x Transaxle	7.8	80	69 in.·lbf
A/C compressor x A/C compressor housing bracket	25	250	18
PS pump x PS pump bracket	43	440	32
PS pump drive belt adjusting strut x PS pump	43	440	32
PS pump drive belt adjusting strut x Oil pump	43	440	32
Exhaust pipe bracket x No.1 oil pan	21	210	15

IGNITION (5S-FE)

SS0AM-03

SERVICE DATA

Firing order	–	1 – 3 – 4 – 2
High-tension cord	Resistance Maximum	25 kΩ per cord
Spark plug	Recommended spark plug Correct electrode gap for new spark plug Maximum electrode gap for used spark plug	DENSO made NGK made PK20TR11 BKR6EKP11 1.1 mm (0.043 in.) 1.3 mm (0.051 in.)
Ignition coil	Secondary coil resistance at cold at hot	9.7 – 16.7 kΩ 12.4 – 19.6 kΩ
Camshaft position sensor	Resistance at cold at hot	835 – 1,400 Ω 1,060 – 1,645 Ω
Crankshaft position sensor	Resistance at cold at hot	985 – 1,600 Ω 1,265 – 1,890 Ω

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
Spark plug x Cylinder head	18	180	13
Ignition coil x No.2 intake manifold stay	9.8	100	87 in.·lbf
No.2 intake manifold stay x Cylinder head	21	214	15
No.2 intake manifold stay x Intake manifold	42	428	31
Camshaft position sensor assembly x Cylinder head	9.5	97	84 in.·lbf
Crankshaft position sensor x Oil pump	9.5	97	84 in.·lbf

IGNITION (1MZ-FE)

SS07G-02

SERVICE DATA

Firing order	–	1 – 2 – 3 – 4 – 5 – 6
High-tension cord	Resistance Maximum	25 kΩ per cord
Spark plug	Recommended spark plug Correct electrode gap for new plug Maximum electrode gap for used plug	DENSO made NGK made PK20TR11 BKR6EKP11 1.1 mm (0.043 in.) 1.3 mm (0.051 in.)
Ignition coil	Primary coil resistance Secondary coil resistance AISAN made Diamond made	at cold at hot 0.70 – 0.94 Ω 0.85 – 1.10 Ω at cold at hot 10.8 – 14.9 kΩ 13.1 – 17.5 kΩ at cold at hot 6.8 – 11.7 kΩ 8.6 – 13.7 kΩ
Camshaft position sensor	Resistance DENSO made Wabash made	at cold at hot 835 – 1,400 Ω 1,060 – 1,645 Ω at cold at hot 1,690 – 2,560 Ω 2,145 – 3,010 Ω
Crankshaft position sensor	Resistance	at cold at hot 1,630 – 2,740 Ω 2,065 – 3,225 Ω

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
Spark plug x Cylinder head	18	180	13
Ignition coil x Cylinder head	8	80	69 in.·lbf
Camshaft position sensor x Cylinder head	8	80	69 in.·lbf
Crankshaft position sensor x Oil pump	8	80	69 in.·lbf

STARTING(5S-FE)

SS0AO-01

SERVICE DATA

Starter	Rated voltage and output power		12 V 1.2 kW, 1.4 kW
	No-load characteristics	Current	90 A or less at 11.5 V
		rpm	3,000 rpm or more
	Brush length	STD	15.5 mm (0.610 in.)
		Minimum	10.0 mm (0.394 in.)
	Spring installed load	STD 1.2 kW	13.7 – 19.6 N (1.4 – 2.0 kgf, 3.0 – 4.4 lbf)
		1.4 kW	17.6 – 23.5 N (1.8 – 2.4 kgf, 3.9 – 5.3 lbf)
		Minimum 1.2 kW	9.8 N (1.0 kgf, 2.2 lbf)
		1.4 kW	11.8 N (1.2 kgf, 2.6 lbf)
	Commutator		
	Diameter	STD	30.0 mm (1.181 in.)
		Minimum	29.0 mm (1.142 in.)
	Undercut depth	STD	0.6 mm (0.024 in.)
		Minimum	0.2 mm (0.008 in.)
	Circle runout	Maximum	0.05 mm (0.0020 in.)
	Magnetic switch		
	Contact plate for wear	Maximum	0.9 mm (0.035 in.)

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
Starter mounting bolt	37	380	27
End cover x Field frame	1.5	15	13 in.·lbf
Starter housing x Magnetic switch	5.9	60	52 in.·lbf
Field frame x Armature assembly	5.9	60	52 in.·lbf
Lead wire x Terminal C of starter	5.9	60	52 in.·lbf
Terminal nut x Terminal C of starter	17	173	13
Terminal nut x Terminal 30 of starter	17	173	13
Magnetic switch end cover x Magnetic switch housing	2.5	26	23 in.·lbf

STARTING (1MZ-FE)
SERVICE DATA

SS071-01

Starter	Rated voltage and output power		12 V 1.4 kW
	No-load characteristics	Current	90 A or less at 11.5 V
		rpm	3,000 rpm or more
	Brush length	STD	15.5 mm (0.610 in.)
		Minimum	10.0 mm (0.394 in.)
	Spring installed load	STD	17.6 – 23.5 N (1.8 – 2.4 kgf, 3.9 – 5.3 lbf)
		Minimum	11.8 N (1.2 kgf, 2.6 lbf)
	Commutator		
	Diameter	STD	30.0 mm (1.181 in.)
		Minimum	29.0 mm (1.142 in.)
	Undercut depth	STD	0.6 mm (0.024 in.)
		Minimum	0.2 mm (0.008 in.)
	Circle runout	Maximum	0.05 mm (0.0020 in.)
	Magnetic switch		
	Contact plate for wear	Maximum	0.9 mm (0.035 in.)

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
Starter mounting bolt	37	380	27
End cover x Field frame	1.5	15	13 in·lbf
Starter housing x Magnetic switch	5.9	60	52 in·lbf
Field frame x Armature assembly	5.9	60	52 in·lbf
Lead wire x Terminal C of starter	5.9	60	52 in·lbf
Terminal nut x Terminal C of starter	17	170	12
Terminal nut x Terminal 30 of starter	17	170	12
Magnetic switch end cover x Magnetic switch housing	2.5	26	23 in·lbf

CHARGING(5S-FE)

SERVICE DATA

SS0AQ-01

Battery	Specific gravity (Except maintenance-free battery) at 20° C (68° F)	1.25 – 1.29
	Voltage (Maintenance-free battery) at 20° C (68° F)	12.5 – 12.9 V
Drive belt	Tension w/ A/C New belt	165 ± 25 lbf
	Used belt	110 ± 10 lbf
	w/o A/C New belt	125 ± 25 lbf
	Used belt	95 ± 20 lbf
Generator	Rated output	12 V 80 A
	Rotor coil resistance at 20° C (68° F)	2.7 – 3.1 Ω
	Slip ring diameter STD	14.2 – 14.4 mm (0.559 – 0.567 in.)
	Minimum	12.8 mm (0.504 in.)
	Brush exposed length STD	10.5 mm (0.413 in.)
	Minimum	1.5 mm (0.059 in.)
Voltage regulator	Regulating voltage	13.5 – 15.1 V

TORQUE SPECIFICATION

Part tightened		N·m	kgf·cm	ft·lbf
Bearing retainer x Drive end frame		3.0	31	27 in·lbf
Rectifier end frame x Drive end frame		4.5	46	40 in·lbf
Wire clip x Rectifier end frame		5.4	55	48 in·lbf
Generator pulley x Rotor		110.5	1,125	81
Rectifier holder x Coil lead on rectifier end frame		2.9	30	26 in·lbf
Voltage regulator x Rectifier end frame		2.0	20	18 in·lbf
Voltage regulator x Rectifier holder		2.0	20	18 in·lbf
Brush holder x Rectifier holder		2.0	20	18 in·lbf
Brush holder x Voltage regulator		2.0	20	18 in·lbf
Rear end cover x Rectifier holder		4.4	45	39 in·lbf
Plate terminal x Rectifier holder	Nut	4.4	45	39 in·lbf
	Bolt	3.9	39	35 in·lbf
Terminal insulator x Rectifier holder		4.1	42	36 in·lbf
Generator x Generator bracket		52	530	38
Generator x Adjusting bar		18	185	13

CHARGING (1MZ-FE)

SS07K-01

SERVICE DATA

Battery	Voltage at 20° C (68° F)	12.5 – 12.9 V
Drive belt	Tension New belt Used belt	175 ± 5 lbf 115 ± 20 lbf
Generator	Rated output Rotor coil resistance Slip ring diameter STD Limit Brush exposed length STD Limit	12 V 80 A 2.1 – 2.5 Ω 14.2 – 14.4 mm (0.559 – 0.567 in.) 12.8 mm (0.504 in.) 10.5 mm (0.413 in.) 1.5 mm (0.059 in.)
Voltage regulator	Regulating voltage	13.5 – 15.1 V

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
Bearing retainer x Drive end frame	3.0	31	27 in·lbf
Rectifier end frame x Drive end frame	4.5	46	40 in·lbf
Cord clip x Rectifier end frame	5.4	55	48 in·lbf
Generator pulley x Rotor	110.5	1,125	81
Rectifier holder x Coil lead on rectifier end frame	2.9	30	26 in·lbf
Voltage regulator and brush holder x Rectifier end frame	2.0	20	18 in·lbf
Plate terminal x Rectifier holder	Nut	4.4	39 in·lbf
	Screw	3.9	35 in·lbf
Rear end cover x Rectifier holder	4.4	45	39 in·lbf
Terminal insulator x Rectifier holder	4.1	42	36 in·lbf
Generator x Generator bracket	56	570	41
Generator x Adjusting bar	18	180	13

CLUTCH

SERVICE DATA

SS09Q-01

Pedal height from asphalt sheet	1MZ-FE	161.8 – 171.8 mm (6.370 – 6.764 in.)
Pedal height from asphalt sheet	5S-FE	156.8 – 166.8 mm (6.173 – 6.567 in.)
Push rod play at pedal top		1.0 – 5.0 mm (0.039 – 0.197 in.)
Pedal freeplay		5.0 – 15.0 mm (0.197 – 0.591 in.)
Clutch start switch ON-OFF Stroke		5.0 ± 0.5 mm (0.197 ± 0.020 in.)
Clutch release point from pedal full stroke end position		25 mm (0.98 in.) or more
Disc rivet head depth	Min.	0.3 mm (0.012 in.)
Disc runout	Max.	0.8 mm (0.031 in.)
Flywheel runout	Max.	0.1 mm (0.004 in.)
Diaphragm spring finger wear	Max. depth	0.6 mm (0.024 in.)
Diaphragm spring finger wear	Max. width	5.0 mm (0.197 in.)
Diaphragm spring tip non-alignment	Max.	0.5 mm (0.020 in.)

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
Master cylinder installation nut	12	120	9
Clutch line	15	155	11
Release cylinder installation bolt	12	120	9
Bleeder plug	8.4	85	74 in.·lbf
Cruise control actuator bracket x Body	13	130	9
Starter x Transaxle	39	400	29
Clutch accumulator installation bolt	21	210	15
Clutch accumulator installation nut	27	270	20
Release fork support 1MZ-FE	47	480	35
Release fork support 5S-FE	39	400	29
Clutch cover x Flywheel	19	195	14

MANUAL TRANSAXLE (E153)

SERVICE DATA

SS090-01

Input shaft		
3rd & 4th gears journal diameter	Min.	35.950 mm (1.4154 in.)
5th gear journal diameter	Min.	27.950 mm (1.1004 in.)
Runout	Max.	0.05 mm (0.0020 in.)
Output shaft		
1st & 2nd gears journal diameter	Min.	38.950 mm (1.5335 in.)
Runout	Max.	0.06 mm (0.0024 in.)
Oil pump clearance		
Rotor body	STD	0.10 – 0.16 mm (0.0039 – 0.0063 in.)
	Max.	0.30 mm (0.0118 in.)
Rotor tip	STD	0.08 – 0.15 mm (0.0031 – 0.0059 in.)
	Max.	0.30 mm (0.0118 in.)
Rotor side	STD	0.03 – 0.08 mm (0.0012 – 0.0031 in.)
	Max.	0.15 mm (0.0059 in.)
Gear thrust clearance		
1st & 3rd	STD	0.10 – 0.35 mm (0.0039 – 0.0138 in.)
	Max.	0.40 mm (0.0157 in.)
2nd	STD	0.10 – 0.45 mm (0.0039 – 0.0177 in.)
	Max.	0.50 mm (0.0197 in.)
4th	STD	0.10 – 0.55 mm (0.0039 – 0.0217 in.)
	Max.	0.60 mm (0.0236 in.)
5th	STD	0.10 – 0.57 mm (0.0039 – 0.0224 in.)
	Max.	0.65 mm (0.0256 in.)
Gear radial clearance		
1st & 4th	STD	0.009 – 0.051 mm (0.0004 – 0.0020 in.)
2nd & 3rd	STD	0.009 – 0.053 mm (0.0004 – 0.0021 in.)
5th	STD	0.009 – 0.050 mm (0.0004 – 0.0020 in.)
1st, 2nd, 3rd, 4th & 5th	Max.	0.070 mm (0.0028 in.)
Shift fork to hub sleeve clearance	Max.	1.0 mm (0.039 in.)
Synchronizer ring to gear clearance		
1st, 4th & 5th	Min.	0.8 mm (0.031 in.)
2nd & 3rd	Min.	0.7 mm (0.028 in.)
Drive in depth		
Control shaft cover oil seal		0 – 1.0 mm (0 – 0.039 in.)
Select inner lever slotted spring pin		0 ± 0.5 mm (0 ± 0.020 in.)
No.1 shift inner lever slotted spring pin		0 ± 0.5 mm (0 ± 0.020 in.)
No.2 shift inner lever slotted spring pin		0 ± 0.5 mm (0 ± 0.020 in.)
Input shaft snap ring thickness	Mark	
No.2 clutch hub	H	2.30 mm (0.0906 in.)
	J	2.35 mm (0.0925 in.)
	K	2.40 mm (0.0945 in.)
	L	2.45 mm (0.0965 in.)
	M	2.50 mm (0.0984 in.)
	N	2.55 mm (0.1004 in.)
	P	2.60 mm (0.1024 in.)

Input shaft snap ring thickness No.3 clutch hub	Mark	
	a	1.75 mm (0.0689 in.)
	b	1.80 mm (0.0709 in.)
	c	1.85 mm (0.0729 in.)
	d	1.90 mm (0.0748 in.)
	e	1.95 mm (0.0768 in.)
	f	2.00 mm (0.0787 in.)
	g	2.05 mm (0.0807 in.)
	h	2.10 mm (0.0827 in.)
	j	2.15 mm (0.0847 in.)
	1	2.35 mm (0.0925 in.)
	2	2.40 mm (0.0945 in.)
	3	2.45 mm (0.0965 in.)
	4	2.50 mm (0.0984 in.)
	5	2.55 mm (0.1004 in.)
	6	2.60 mm (0.1024 in.)
	7	2.65 mm (0.1043 in.)
	8	2.70 mm (0.1063 in.)
Output shaft snap ring thickness No.1 clutch hub	Mark	
	A	2.80 mm (0.1102 in.)
	B	2.85 mm (0.1122 in.)
	C	2.90 mm (0.1142 in.)
	D	2.95 mm (0.1161 in.)
	E	3.00 mm (0.1181 in.)
	F	3.05 mm (0.1201 in.)
	G	3.10 mm (0.1220 in.)
Differential pinion to side gear backlash	STD	0.05–0.20 mm (0.0020–0.0079 in.)
Differential side gear thrust washer thickness		0.80 mm (0.0315 in.) 0.90 mm (0.0354 in.) 1.00 mm (0.0394 in.) 1.10 mm (0.0433 in.) 1.20 mm (0.0472 in.) 1.30 mm (0.0512 in.) 1.40 mm (0.0551 in.)
Differential case side bearing preload (at starting) New bearing (Output shaft preload plus) Reused bearing (Output shaft preload plus)		0.2 – 0.3 N·m (1.8 – 3.5 kgf·cm, 1.6 – 3.0 in.-lbf) 0.1 – 0.2 N·m (1.1 – 2.2 kgf·cm, 1.0 – 1.9 in.-lbf)
Differential side bearing adjusting shim thickness	Mark	
	0	2.00 mm (0.0787 in.)
	1	2.05 mm (0.0807 in.)
	2	2.10 mm (0.0827 in.)
	3	2.15 mm (0.0846 in.)
	4	2.20 mm (0.0866 in.)
	5	2.25 mm (0.0886 in.)
	6	2.30 mm (0.0906 in.)
	7	2.35 mm (0.0925 in.)
	8	2.40 mm (0.0945 in.)
	9	2.45 mm (0.0965 in.)
	A	2.50 mm (0.0984 in.)
	B	2.55 mm (0.1004 in.)
	C	2.60 mm (0.1024 in.)
	D	2.65 mm (0.1043 in.)
	E	2.70 mm (0.1063 in.)
	F	2.75 mm (0.1083 in.)
	G	2.80 mm (0.1102 in.)
	H	2.85 mm (0.1122 in.)

Output shaft bearing preload (at starting)		
New bearing		0.8 – 1.6 N·m (8 – 16 kgf·cm, 6.9 – 13.9 in.-lbf)
Reused bearing		0.5 – 1.0 N·m (5 – 10 kgf·cm, 4.3 – 8.7 in.-lbf)
Output shaft rear bearing adjusting shim thickness	Mark	
	0	1.30 mm (0.0512 in.)
	1	1.35 mm (0.0531 in.)
	2	1.40 mm (0.0551 in.)
	3	1.45 mm (0.0571 in.)
	4	1.50 mm (0.0591 in.)
	5	1.55 mm (0.0610 in.)
	6	1.60 mm (0.0630 in.)
	7	1.65 mm (0.0650 in.)
	8	1.70 mm (0.0669 in.)
	9	1.75 mm (0.0689 in.)
	A	1.80 mm (0.0709 in.)
	B	1.85 mm (0.0728 in.)
	C	1.90 mm (0.0748 in.)
	D	1.95 mm (0.0768 in.)
	E	2.00 mm (0.0787 in.)
	F	2.05 mm (0.0807 in.)
	G	2.10 mm (0.0827 in.)
	H	2.15 mm (0.0846 in.)
	J	2.20 mm (0.0866 in.)
	K	2.25 mm (0.0886 in.)
	L	2.30 mm (0.0906 in.)
	M	2.35 mm (0.0925 in.)
	N	2.40 mm (0.0945 in.)
	P	2.45 mm (0.0965 in.)
	Q	2.50 mm (0.0984 in.)

TORQUE SPECIFICATION

Part tightened		N·m	kgf·cm	ft·lbf
Transaxle x Engine (See page MX-4)	17 mm head	64	650	47
	14 mm head A	46	470	34
	14 mm head B	37	380	27
Cruise control actuator x Body (w/ Cruise control)		13	130	9
Starter x Transaxle		39	400	29
Clutch release cylinder x Transaxle		12	120	9
Clutch accumulator x Transaxle	Bolt	21	210	15
	Nut	26	270	20
Clutch line bracket x Transaxle		12	120	9
Front wheel		103	1,050	76
Exhaust pipe support stay		33	330	24
Front exhaust pipe x Exhaust manifold		62	630	46
Front exhaust pipe x Center exhaust pipe		56	570	41
No.1 exhaust pipe support bracket x Front suspension member		33	330	24
Stabilizer bar link x Stabilizer bar		39	400	29
Stabilizer bar bracket x Front suspension member		19	195	14
PS gear assembly x Front suspension member		181	1,850	134
Front engine absorber x Transaxle		48	490	35
RH exhaust manifold stay		20	200	14
Front engine mounting insulator x Front suspension member	Silver bolt	44	450	33
	Green bolt	66	670	48
LH engine mounting insulator x Front suspension member		80	820	59
LH engine mounting bracket x Transaxle		64	650	47
Rear engine mounting insulator x Front suspension member		66	670	48
Steering return pipe x Front suspension member		10	100	7
Front suspension member with lower suspension arm (See page MX-4)	Bolt A	181	1,850	134
	Bolt B	32	330	24
	Nut C	36	370	27
Flywheel housing under cover x Transaxle		7.8	80	69 in.·lbf
Shift cable grommet retainer x Body		4.9	50	43 in.·lbf
Shift lever assembly x Body		12	120	9
No.2 selecting bellcrank with selecting bellcrank support		20	200	14
Shift and select lever shaft lock bolt		49	500	36
Shift and select lever shaft assembly x Transmission case		20	200	14
Transmission case cover x Transmission case		29	300	22
Breather plug		49	500	36
Output shaft lock nut		123	1,250	90
Shift fork and shift head set bolt		24	240	17
Rear bearing retainer x Transmission case		42	430	31
Straight screw plug		25	250	18
Straight screw plug (Reverse restrict pin)		13	130	9
Reverse idler gear shaft lock bolt		29	300	22
Transmission case x Transaxle case		29	300	22
Transmission oil pipe x Transaxle case		17	175	13
Reverse shift arm bracket assembly x Transaxle case		17	175	13

SERVICE SPECIFICATIONS – MANUAL TRANSAXLE (E153)

Transmission oil pump assembly x Transaxle case	17	175	13
Transaxle case receiver x Transaxle case	7.4	75	65 in.-lbf
Clutch release fork support	47	480	35
Control lever housing support bracket x Transaxle case	17	175	13
Vehicle speed sensor	17	175	13
Clutch release line bracket x Transaxle case	17	175	13
Back-up light switch	40	410	30
Filler and drain plug	49	500	36
No.1 and No.2 oil receiver pipe x Transmission case	17	175	13
Transmission oil cooler sub-assembly x Elbow	34	350	25
Elbow x Transaxle case	27	275	20
Transmission oil pump case x Oil pump cover	10	105	8
Transaxle case cover x Transaxle case	54	550	40
Differential left case x Differential right case	63	640	46
Ring gear set bolt	124	1,260	91

MANUAL TRANSAXLE (S51)

SS09M-01

SERVICE DATA

Input shaft roller bearing journal diameter	Min.	29.970 mm (1.799 in.)
Input shaft 3rd gear journal diameter	Min.	33.090 mm (1.3028 in.)
Input shaft 4th gear journal diameter	Min.	32.470 mm (1.2783 in.)
Input shaft 5th gear journal diameter	Min.	26.970 mm (1.0618 in.)
Input shaft runout	Max.	0.05 mm (0.0020 in.)
Output shaft roller bearing journal diameter	Min.	31.970 mm (1.2587 in.)
Output shaft 1st gear journal diameter	Min.	37.970 mm (1.4949 in.)
Output shaft 2nd gear journal diameter	Min.	31.990 mm (1.2594 in.)
Output shaft runout	Max.	0.05 mm (0.0020 in.)
Gear thrust clearance 1st	STD Max.	0.10 – 0.29 mm (0.0039 – 0.0114 in.) 0.35 mm (0.0138 in.)
Gear thrust clearance 2nd	STD Max.	0.20 – 0.44 mm (0.0079 – 0.0173 in.) 0.50 mm (0.0197 in.)
Gear thrust clearance 3rd	STD Max.	0.10 – 0.25 mm (0.0039 – 0.0098 in.) 0.30 mm (0.0118 in.)
Gear thrust clearance 4th	STD Max.	0.20 – 0.45 mm (0.0079 – 0.0177 in.) 0.50 mm (0.0197 in.)
Gear thrust clearance 5th	STD Max.	0.20 – 0.40 mm (0.0079 – 0.0157 in.) 0.45 mm (0.0177 in.)
Gear radial clearance 1st, 2nd, 3rd, and 4th	STD Max.	0.009 – 0.053 mm (0.0004 – 0.0021 in.) 0.070 mm (0.0028 in.)
Gear radial clearance 5th	STD Max.	0.009 – 0.050 mm (0.0004 – 0.0020 in.) 0.070 mm (0.0028 in.)
Shift fork to hub sleeve clearance	Max.	1.0 mm (0.039 in.)
Synchronizer ring to gear clearance 1st, 3rd and 4th	Min.	0.6 mm (0.024 in.)
Synchronizer ring to gear clearance 2nd	Min.	0.7 mm (0.028 in.)
Differential case side bearing preload (at starting)(For use with SST)		0.8 – 1.6 N·m (8 – 16 kgf·cm, 6.9 – 13.9 in.-lbf)
Differential pinion to side gear backlash		0.05 – 0.20 mm (0.0020 – 0.0079 in.)
Drive in depth Input shaft front oil seal Reverse restrict pin slotted spring pin Shift and select lever shaft slotted spring pin		0 – 0.5 mm (0 – 0.020 in.) 13.5 ± 0.5 mm (0.531 ± 0.020 in.) 23.5 ± 1.0 mm (0.925 ± 0.039 in.)
Differential side gear thrust washer thickness		0.95 mm (0.0374 in.) 1.00 mm (0.0394 in.) 1.05 mm (0.0413 in.) 1.10 mm (0.0433 in.) 1.15 mm (0.0453 in.) 1.20 mm (0.0472 in.)

SERVICE SPECIFICATIONS – MANUAL TRANSAXLE (S51)

Input shaft snap ring thickness		
No.2 clutch hub	Mark 1	1.95 – 2.00 mm (0.0768 – 0.0787 in.)
	Mark 2	2.00 – 2.05 mm (0.0787 – 0.0807 in.)
	Mark 3	2.05 – 2.10 mm (0.0807 – 0.0827 in.)
	Mark 4	2.10 – 2.15 mm (0.0827 – 0.0846 in.)
	Mark 5	2.15 – 2.20 mm (0.0846 – 0.0866 in.)
	Mark 6	2.20 – 2.25 mm (0.0866 – 0.0886 in.)
No.3 clutch hub	Mark 13	2.20 – 2.25 mm (0.0866 – 0.0886 in.)
	Mark 14	2.25 – 2.30 mm (0.0886 – 0.0906 in.)
	Mark 15	2.30 – 2.35 mm (0.0906 – 0.0925 in.)
	Mark 16	2.35 – 2.40 mm (0.0925 – 0.0945 in.)
	Mark 17	2.40 – 2.45 mm (0.0945 – 0.0965 in.)
	Mark 18	2.45 – 2.50 mm (0.0965 – 0.0984 in.)
	Mark 19	2.50 – 2.55 mm (0.0984 – 0.01004 in.)
	Mark 20	2.55 – 2.60 mm (0.1004 – 0.01024 in.)
	Mark 21	2.60 – 2.65 mm (0.1024 – 0.01043 in.)
	Mark 22	2.65 – 2.70 mm (0.1043 – 0.01063 in.)
	Mark 23	2.70 – 2.75 mm (0.1063 – 0.01083 in.)
	Mark 24	2.75 – 2.80 mm (0.1083 – 0.01102 in.)
Rear bearing	Mark 25	2.80 – 2.85 mm (0.1102 – 0.01122 in.)
	Mark 26	2.85 – 2.90 mm (0.1122 – 0.01142 in.)
	Mark 27	2.90 – 2.95 mm (0.1142 – 0.01161 in.)
	Mark A	2.15 – 2.20 mm (0.0846 – 0.0866 in.)
	Mark B	2.20 – 2.25 mm (0.0866 – 0.0886 in.)
	Mark C	2.25 – 2.30 mm (0.0886 – 0.0906 in.)
	Mark D	2.30 – 2.35 mm (0.0906 – 0.0925 in.)
	Mark E	2.35 – 2.40 mm (0.0925 – 0.0945 in.)
Differential side bearing adjusting shim thickness		
	Mark 1	1.90 mm (0.0748 in.)
	Mark 2	1.95 mm (0.0768 in.)
	Mark 3	2.00 mm (0.0787 in.)
	Mark 4	2.05 mm (0.0807 in.)
	Mark 5	2.10 mm (0.0827 in.)
	Mark 6	2.15 mm (0.0846 in.)
	Mark 7	2.20 mm (0.0866 in.)
	Mark 8	2.25 mm (0.0886 in.)
	Mark 9	2.30 mm (0.0906 in.)
	Mark 10	2.35 mm (0.0925 in.)
	Mark 11	2.40 mm (0.0945 in.)
	Mark 12	2.45 mm (0.0965 in.)
	Mark 13	2.50 mm (0.0984 in.)
	Mark 14	2.55 mm (0.1004 in.)
	Mark 15	2.60 mm (0.1024 in.)
	Mark 16	2.65 mm (0.1043 in.)
	Mark 17	2.70 mm (0.1063 in.)
	Mark 18	2.75 mm (0.1083 in.)
	Mark 19	2.80 mm (0.1102 in.)

TORQUE SPECIFICATION

Part tightened		N·m	kgf·cm	ft·lbf
Transaxle x Engine	17 mm head	64	650	47
	14 mm head	46	470	34
Cruise control actuator x Body (w/ Cruise control)		13	130	9
Starter x Transaxle		37	378	28
Clutch release cylinder x Transaxle		12	120	9
Clutch line bracket x Transaxle (See page MX-4)	Bolt A	12	120	9
	Bolt B	6.9	70	61 in.·lbf
Manifold stay	Front side	42	425	31
Manifold stay	Rear side	39	400	29
Front wheel		103	1,050	76
Exhaust pipe bracket	Bolt	19	195	14
	Nut	33	330	24
Front exhaust pipe x Exhaust manifold		62	630	46
Front exhaust pipe x Center exhaust pipe		56	570	41
No.1 exhaust pipe support bracket x Front suspension member		33	330	24
Stabilizer bar link x Stabilizer bar		39	400	29
Stabilizer bar bracket x Front suspension member		19	195	14
PS gear assembly x Front suspension member		181	1,850	134
Front engine mounting insulator x Front suspension member	Silver bolt	44	450	33
	Green bolt	66	670	48
LH engine mounting insulator x Front suspension member		80	820	59
LH engine mounting bracket x Transaxle		64	650	47
Rear engine mounting insulator x Front suspension member		66	670	48
Steering return pipe x Front suspension member		10	100	7
Front suspension member with lower suspension arm (See page MX-4)	Bolt A	181	1,850	134
	Bolt B	32	330	24
	Nut C	36	370	27
LH stiffener plate		37	380	27
RH stiffener plate		39	400	29
Rear end plate		9.3	95	82 in.·lbf
Shift cable grommet retainer x Body		4.9	50	43 in.·lbf
Shift lever assembly x Body		12	120	9
Transmission case x Transaxle case		29	300	22
Transmission case x Case cover		29	300	22
Transmission case protector		18	185	13
Rear bearing retainer		42	430	31
Output shaft front bearing lock plate		18	185	13
Transaxle case receiver set bolt		7.4	75	65 in.·lbf
5th driven gear lock nut		123	1,250	90
Reverse idler shaft lock bolt		29	300	22
Control shaft cover		37	375	27
Control shift lever x Lever shaft		6.4	65	56 in.·lbf
Ring gear x Differential case		83	850	61
Selecting bellcrank x Transmission case		37	380	27

SERVICE SPECIFICATIONS – MANUAL TRANSAXLE (S51)

Engine mount bracket x Transaxle	52	530	38
Reverse shift arm bracket	18	185	13
No.3 shift fork x Shift fork shaft	18	185	13
Lock ball assembly	29	300	22
Filler and Drain plugs	49	500	36
Back-up light switch	44	450	33
Differential side bearing retainer	18	185	13
Release bearing retainer	7.4	75	65 in.·lbf
Straight screw plug	13	130	9
Vehicle speed sensor driven gear	5.4	55	48 in.·lbf
Clutch release fork support	39	400	29

AUTOMATIC TRANSAXLE (A140E)

SS0AS-01

SERVICE DATA

Line pressure (Wheel locked)	Engine idling	
	D position	363 – 422 kPa (3.7 – 4.3 kgf/cm ² , 53 – 61 psi)
	R position	618 – 794 kPa (6.3 – 8.1 kgf/cm ² , 90 – 115 psi)
at stall (Throttle valve fully opened)	D position	735 – 862 kPa (7.5 – 8.8 kgf/cm ² , 107 – 125 psi)
	R position	1,373 – 1,608 kPa (14.0 – 16.4 kgf/cm ² , 199 – 233 psi)
Engine stall revolution	D and R positions	2,450 ± 150 rpm
Time lag	N → D position	Less than 1.2 seconds
	N → R position	Less than 1.5 seconds
Engine idle speed	A/C OFF and N range	750 ± 50 rpm
Throttle cable adjustment (Throttle valve fully opened)		Between boot end face and inner cable stopper 0 – 1 mm (0 – 0.04 in.)
Drive plate runout	Max.	0.20 mm (0.0079 in.)
Torque converter runout	Max.	0.30 mm (0.0118 in.)
Torque converter installation distance		More than 13.0 mm (0.512 in.)
Differential oil seal drive in depth	LH side	2.7 ± 0.5 mm (0.106 ± 0.020 in.)
	RH side	0 ± 0.5 mm (0 ± 0.020 in.)
Shift point		
D position		
(Throttle valve fully opened)	1 → 2	58 – 63 km/h (36 – 39 mph)
	2 → 3	109 – 117 km/h (68 – 73 mph)
	3 → O/D	145 – 151 km/h (90 – 94 mph)
	O/D → 3	138 – 146 km/h (86 – 91 mph)
	3 → 2	100 – 108 km/h (62 – 67 mph)
	2 → 1	51 – 56 km/h (32 – 35 mph)
(Throttle valve fully closed)	O/D → 3	38 – 43 km/h (24 – 27 mph)
	3 → O/D	18 – 22 km/h (11 – 14 mph)
2 position		
(Throttle valve fully opened)	1 → 2	58 – 63 km/h (36 – 39 mph)
	3 → 2	106 – 114 km/h (66 – 71 mph)
	2 → 1	51 – 56 km/h (32 – 35 mph)
L position		
(Throttle valve fully opened)	2 → 1	47 – 51 km/h (29 – 32 mph)
*1: The maximum vehicle speed for manual shift down when shifting down from D to 2.		
*2: The maximum vehicle speed for manual shift down when shifting down from 2 to L.		
Lock-up point (Throttle valve fully opened)		
D position		
3rd Gear (O/D main switch OFF)	Lock-up ON	67 – 72 km/h (42 – 45 mph)
	Lock-up OFF	64 – 69 km/h (40 – 43 mph)
O/D gear	Lock-up ON	67 – 72 km/h (42 – 45 mph)
	Lock-up OFF	64 – 69 km/h (40 – 43 mph)

TORQUE SPECIFICATION

Part tightened		N·m	kgf·cm	ft·lbf
Transaxle x Starter		42	430	31
Transaxle x Rear end plate		25	250	18
Transaxle x No.1 exhaust pipe support bracket		19	195	14
Transaxle x Engine		66	670	48
Torque converter clutch x Drive plate		27	280	20
Body x Front lower brace	Bolt	181	1,850	134
	Nut	36	370	27
Body x Rear lower brace	19 mm head bolt	181	1,850	134
	14 mm head bolt	32	330	24
	Nut	36	370	27
Front suspension member x FR engine mounting	TMC made	80	820	59
	TMMK made: Green color bolt	66	670	48
	TMMK made: Silver color bolt	44	450	32
Front suspension member x RR engine mounting		66	670	48
Front suspension member x LH engine mounting		80	820	59
Transaxle x LH engine mounting		64	650	47
Front suspension member x Steering return pipe mounting bracket		10	100	7
Front suspension member x Stabilizer bar bracket		19	195	14
Stabilizer bar x Stabilizer bar link		39	400	29
Ball joint x Lower suspension arm		127	1,300	94
Steering gear housing set bolt x Nut		181	1,850	134
Exhaust manifold x Front exhaust pipe		62	630	46
Front suspension member x Exhaust pipe No.1 support bracket		33	330	24
Front exhaust pipe x Center exhaust pipe		56	570	41
No.1 exhaust pipe support bracket x Exhaust pipe clamp		33	330	24
Axle hub nut		294	3,000	217
Steering knuckle x Tie rod end		49	500	36
Vehicle speed sensor x Transaxle		16	160	12
Park/neutral position switch x Transaxle	Bolt	5.4	55	48 in.-lbf
	Nut	6.9	70	61 in.-lbf
Park/neutral position switch x Control shaft lever		13	130	9
Control shaft lever x Control cable		15	150	11
Oil pan x Drain plug		49	500	36
Oil pan x Transaxle		4.9	50	43 in.-lbf
Valve body x Manual valve body		10	100	7
Valve body x Transaxle		10	100	7
Drive shaft center bearing lock bolt		32	330	24
Stiffener plate	Front side	42	430	31
	Rear side	39	400	29
Exhaust manifold stay	Front side	42	430	31
	Rear side	39	400	29

AUTOMATIC TRANSAXLE (A541E)

SS0BL-01

SERVICE DATA

Line pressure (wheel locked)	Engine idling	
	D position	401 – 461 kPa (4.1 – 4.7 kgf/cm ² , 58 – 66 psi)
	R position	804 – 882 kPa (8.2 – 9.0 kgf/cm ² , 117 – 128 psi)
at stall (Throttle valve fully opened)	D position	1,138 – 1,236 kPa (11.6 – 12.6 kgf/cm ² , 165 – 179 psi)
	R position	1,716 – 1,854 kPa (17.5 – 18.9 kgf/cm ² , 249 – 269 psi)
Engine stall revolution		2,600 ± 150 rpm
Time lag	N → D position	Less than 1.2 seconds
	N → R position	Less than 1.5 seconds
Engine idle speed (A/C OFF)	N position	700 ± 50 rpm
Throttle cable adjustment (Throttle valve fully opened)		Between boot and face and inner cable stopper 0 – 1 mm (0 – 0.04 in.)
Drive plate runout	Max.	0.3 mm (0.0118 in.)
Torque converter clutch runout	Max.	0.20 mm (0.0079 in.)
Torque converter clutch installation distance		More than 13.7 mm (0.539 in.)
Lock-up point (Throttle valve opening 5%)		
3rd gear (O/D main switch OFF)	Lock-up ON	60 – 65 km/h (37 – 40 mph)
	Lock-up OFF	53 – 58 km/h (33 – 36 mph)
O/D gear	Lock-up ON	60 – 64 km/h (37 – 40 mph)
	Lock-up OFF	53 – 58 km/h (33 – 36 mph)
Shift schedule		
D position		
(Throttle valve fully opened)	1 → 2	60 – 66 km/h (37 – 41 mph)
	2 → 3	112 – 121 km/h (70 – 75 mph)
	3 → O/D	174 – 183 km/h (108 – 114 mph)
	O/D → 3	167 – 176 km/h (104 – 109 mph)
	3 → 2	104 – 112 km/h (65 – 70 mph)
	2 → 1	50 – 55 km/h (31 – 34 mph)
(Throttle valve fully closed)	3 → O/D	35 – 40 km/h (22 – 25 mph)
	O/D → 3	20 – 25 km/h (12 – 16 mph)
2 position		
(Throttle valve fully opened)	1 → 2	60 – 66 km/h (37 – 41 mph)
	3 → 2	122 – 130 km/h (76 – 81 mph)
	2 → 1	50 – 55 km/h (31 – 34 mph)
L position		
(Throttle valve fully opened)	3 → 2	106 – 115 km/h (66 – 71 mph)
	2 → 1	54 – 59 km/h (34 – 37 mph)

TORQUE SPECIFICATION

Part tightened		N·m	kgf·cm	ft·lbf
Front engine front mounting insulator x Front frame assembly	TMC:	80	820	59
	TMMK:			
	Green color bolt	66	670	48
	Silver color bolt	44	450	32
Rear engine mounting insulator x Front frame assembly		80	820	59
LH transaxle mounting insulator x Transaxle		64	650	47
Engine mounting absorber x Front frame assembly		48	490	35
Transaxle x Engine	17 mm bolt	66	670	48
Transaxle x Engine	12 mm bolt	48	490	35
Torque converter clutch x Drive plate		41	420	30
Valve body x Transaxle case		11	110	8
Oil strainer x Valve body		11	110	8
Oil pan x Transaxle case		7.8	80	69 in·lbf
Oil pan drain plug		49	500	36
Park/Neutral position switch x Transaxle case (bolt)		5.4	55	48 in·lbf
Park/Neutral position switch (nut)		6.9	70	61 in·lbf
B ₃ apply pipe retainer		11	110	8
Connector clamp		11	110	8
Manual valve body x Transaxle case		11	110	8
Detent spring x Manual valve body		11	110	8
Oil pipe bracket		10	100	7
Steering gear housing x Front suspension member		181	1,850	134
Stabilizer bar bracket		19	195	14
Vehicle speed sensor x Transaxle case		4.9	50	43 in·lbf
Direct clutch speed sensor x Transaxle case		11	110	8
Transfer lubrication apply pipe retainer		11	110	8
Exhaust manifold bracket x Transaxle case	Except California	20	200	14
	California	34	350	25
Exhaust manifold plate	Except California	20	200	14
	California	34	350	25
Front frame x Body	19 mm	181	1,850	134
Front frame x Body	14 mm	32	330	24
Front frame x Body	Nut	36	370	27
Exhaust front pipe x Exhaust center pipe		56	570	41
Exhaust manifold x Exhaust front pipe		62	630	46
Exhaust front pipe support stay x Exhaust front pipe support bracket		33	330	24
Exhaust pipe support x Front frame		33	330	24
Starter x Torque converter clutch housing		39	400	29
Transaxle control shaft lever x Park/neutral position switch		15	150	11
Throttle cable adjusting nut		15	150	11
Drive plate x Crankshaft		83	850	61
Shift control cable x Transaxle control shaft lever		15	150	11
Throttle cable retaining plate set bolt		5.4	55	48 in·lbf
Shift solenoid valve No.1, No.2, SL, SLN x Valve body		6.6	67	58 in·lbf

Front wheel nut	103	1,050	76
Exhaust front pipe support bracket x Body	21	210	15
PS reseroir pipe x Front frame	10	100	7
Engine hood x Hood hinge	26	265	19

SUSPENSION AND AXLE

SERVICE DATA

SS04W-01

Cold tire inflation pressure (Normal driving)	P195/70R14 90S	Front, Rear*1	210 kPa (2.1 kgf/cm ² , 30 psi)
		Front, Rear*2	210 kPa (2.1 kgf/cm ² , 30 psi)
	P205/65R15 92H	Front, Rear*1	220 kPa (2.2 kgf/cm ² , 32 psi)
		Front, Rear*2	200 kPa (2.0 kgf/cm ² , 29 psi)
Cold tire inflation pressure (Trailer towing)	P195/70R14 90S	Front, Rear*3	210 kPa (2.1 kgf/cm ² , 30 psi)
		Front, Rear*4	240 kPa (2.4 kgf/cm ² , 35 psi)
	P205/65R15 92H	Front, Rear*3	220 kPa (2.2 kgf/cm ² , 32 psi)
		Front, Rear*4	240 kPa (2.4 kgf/cm ² , 35 psi)
Front wheel alignment	Vehicle height	195/70R14	Front*5 212 mm (8.35 in.)
			Rear*6 264 mm (10.39 in.)
		205/65R15	Front*5 215 mm (8.46 in.)
			Rear*6 266 mm (10.49 in.)
	Camber	5S – FE	–0° 36' ± 45' (0.6° ± 0.75°)
		1MZ – FE	–0° 37' ± 45' (0.62° ± 0.75°)
		Left – right error	45' (0.75°) or less
	Caster	5S – FE	2° 10' ± 45' (2.17° ± 0.75°)
		1MZ – FE	2° 11' ± 45' (2.18° ± 0.75°)
		Left – right error	45' (0.75°) or less
	Steering axis inclination	5S – FE	13° 01' ± 45' (13.02° ± 0.75°)
		1MZ – FE	13° 04' ± 45' (13.07° ± 0.75°)
		Left – right error	45' (0.75°) or less
	Toe-in (Total)		0° ± 12' (0° ± 0.2°) 0 ± 2 mm (0 ± 0.08 in.)
	Rack end length difference		1.5 mm (0.059 in.) or less
Rear wheel alignment	Wheel angle	195/70R14	Inside wheel 37° 12' ± 2° (37.2° ± 2°)
			Outside wheel 32° 21' (32.45°)
		205/65R15	Inside wheel 35° 47' ± 2° (35.78° ± 2°)
			Outside wheel 31° 25' (31.42°)
Rear wheel alignment	Camber	5S – FE	–0° 42' ± 45' (–0.7° ± 0.75°)
		1MZ – FE	–0° 45' ± 45' (–0.75° ± 0.75°)
		Left – right error	45' (0.75°) or less
Rear wheel alignment	Toe-in (Total)		0° 24' ± 12' (0.4° ± 0.2°) 4 ± 2 mm (0.16 ± 0.08 in.)
	No.2 lower suspension arm length difference		1 mm (0.04 in.) or less

*1: For all loads including rated loads

*2: For reduced loads (1 to 4 passengers)

*3: For driving under 160 km/h (100 mph)

*4: For driving at 160 km/h (100 mph) or over

*5: Front measuring point

Measure from the ground to the center of the front side lower suspension arm mounting bolt.

*6: Rear measuring point

Measure from the ground to the center of the strut rod mounting bolt.

Front axle	Axle bearing backlash	0.05 mm (0.0020 in.)
	Axle hub deviation	0.05 mm (0.0020 in.)
Front drive shaft	Drive shaft standard length	
	5S – FE	LH 609.2 ± 2.0 mm (23.984 ± 0.079 in.) RH 867.3 ± 2.0 mm (34.146 ± 0.079 in.)
	1MZ – FE (M/T)	LH 601.5 ± 2.0 mm (23.681 ± 0.079 in.) RH 871.6 ± 2.0 mm (34.315 ± 0.079 in.)
	1MZ – FE (A/T)	LH 586.0 ± 2.0 mm (23.071 ± 0.079 in.) RH 881.6 ± 2.0 mm (34.709 ± 0.079 in.)
Front suspension	Lower ball joint turning torque	1.0 – 3.4 N·m (10 – 35 kgf·cm, 8.7 – 30 in.-lbf)
	Stabilizer bar link turning torque	0.05 – 1.0 N·m (0.5 – 10 kgf·cm, 0.4 – 8.7 in.-lbf)
Rear axle	Axle bearing backlash	0.05 mm (0.0020 in.)
	Axle hub deviation	0.07 mm (0.0028 in.)
Rear suspension	No.2 lower suspension arm length	512.3 mm (20.169 in.)
	Stabilizer bar link turning torque	0.05 – 1.0 N·m (0.5 – 10 kgf·cm, 0.4 – 8.7 in.-lbf)

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
FRONT:			
Hub nut	103	1,050	76
Tie rod end lock nut	74	750	54
Steering knuckle x Shock absorber	211	2,150	156
Steering knuckle x Brake caliper	107	1,090	79
Steering knuckle x Tie rod end	49	500	36
Axle hub x Drive shaft	294	3,000	217
Lower ball joint x Lower suspension arm	127	1,300	94
Lower ball joint x Steering knuckle	123	1,250	90
Steering knuckle x Disc brake dust cover	8.3	85	74 in.·lbf
Drive shaft center bearing lock bolt	32	330	24
Suspension support x Body	80	820	59
Suspension support x Piston rod	49	500	36
ABS speed sensor set bolt	8.0	82	71 in.·lbf
Flexible hose and ABS speed sensor wire harness x Shock absorber	29	300	22
Lower suspension arm set bolt	206	2,100	152
Stabilizer bar bracket x Suspension member	19	195	14
Stabilizer bar link set bolt	39	400	29
REAR:			
Hub nut	103	1,050	76
No.2 lower suspension arm lock nut	56	570	41
Brake caliper x Rear axle carrier	47	475	34
Axle hub bearing set bolt	80	820	59
Shock absorber x Rear axle carrier	New nut	255	2,600
	Reused nut (apply engine oil the threads)	196	2,000
Flexible hose x Shock absorber	29	300	22
ABS speed sensor set bolt	8.0	82	71 in.·lbf
ABS speed sensor wire harness x Shock absorber	5.5	56	49 in.·lbf
Rear side seatback set bolt	18	185	13
Suspension support x Body	39	400	29
Suspension support x Piston rod	49	500	36
Exhaust center pipe set nut	56	570	41
Parking brake cable set bolt	5.4	55	48 in.·lbf
Lower suspension arm x Suspension member	181	1,850	134
Lower suspension arm x Rear axle carrier	181	1,850	134
Strut rod x Body	113	1,150	83
Strut rod x Rear axle carrier	113	1,150	83
Suspension member x Body	51	520	38
Suspension member lower stopper sub-assembly x Body	38	390	28
Stabilizer bar bracket x Suspension member	19	195	14
Stabiliser bar link set nut	39	400	29

BRAKE

SERVICE DATA

SS09X-01

Brake pedal height (from asphalt sheet)		152.0 – 162.0 mm (5.984 – 6.378 in.)
Brake pedal freeplay		1 – 6 mm (0.04 – 0.24 in.)
Brake pedal reserve distance at 490 N (50 kgf, 110.2 lbf)		More than 70 mm (2.76 in.)
Brake booster push rod to piston clearance (w/SST)		0 mm (0 in.)
Front brake pad thickness (5S-FE engine)	STD	12.0 mm (0.472 in.)
Front brake pad thickness (1MZ-FE engine)	STD	11.0 mm (0.433 in.)
Front brake pad thickness	Minimum	1.0 mm (0.039 in.)
Front brake disc thickness	STD	28.0 mm (1.102 in.)
Front brake disc thickness	Minimum	26.0 mm (1.024 in.)
Front brake disc runout	Maximum	0.05 mm (0.0020 in.)
Rear brake drum inside diameter	STD	228.6 mm (9.000 in.)
Rear brake drum inside diameter	Maximum	230.6 mm (9.079 in.)
Rear brake shoe lining thickness	STD	5.0 mm (0.197 in.)
Rear brake shoe lining thickness	Minimum	1.0 mm (0.039 in.)
Rear brake drum to shoe clearance		0.6 mm (0.024 in.)
Rear brake pad thickness	STD	10.0 mm (0.394 in.)
Rear brake pad thickness	Minimum	1.0 mm (0.039 in.)
Rear brake disc thickness	STD	10.0 mm (0.394 in.)
Rear brake disc thickness	Minimum	9.0 mm (0.354 in.)
Rear brake disc runout	Maximum	0.15 mm (0.0059 in.)
Rear brake disc inside diameter	STD	170 mm (6.69 in.)
Rear brake disc inside diameter	Maximum	171 mm (6.73 in.)
Parking brake lining thickness for rear disc brake	STD	2.0 mm (0.079 in.)
Parking brake lining thickness for rear disc brake	Minimum	1.0 mm (0.039 in.)
Parking brake lever travel at 196 N (20 kgf, 44 lbf)		5 – 8 clicks
Parking brake clearance between rear shoe and lever		Less than 0.35 mm (0.0138 in.)
Parking brake adjusting shim thickness for rear disc brake		0.3 mm (0.012 in.) 0.6 mm (0.024 in.) 0.9 mm (0.035 in.)

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
Master cylinder x Piston stopper bolt	10	100	7
Master cylinder x Reservoir	1.7	18	16 in·lbf
Master cylinder x Brake booster	13	130	9
Brake line union nut	10 mm nut	15	11
	12 mm nut	20	14
Brake booster clevis lock nut	25	260	19
Brake booster x Pedal bracket	13	130	9
Brake pedal x Pedal bracket	39	400	29
Pedal bracket x Instrument panel reinforcement	13	130	9
Front brake caliper installation bolt	34	350	25
Bleeder plug	8.3	85	74 in·lbf
Front brake torque plate x Steering knuckle	107	1,090	79
Front brake caliper x Flexible hose	29	300	21
Flexible hose x Shock absorber bracket	29	300	21
Rear drum brake wheel cylinder x Backing plate	10	100	7
Parking brake cable bracket x Backing plate	7.8	80	69 in·lbf
Rear brake caliper installation bolt	20	200	14
Rear disc brake caliper main pin installation bolt	26	270	20
Rear brake caliper x Flexible hose	29	300	21
Rear brake torque plate x Rear axle carrier	47	475	34
Proportioning valve installation bolt	8.8	90	78 in·lbf
ABS actuator x Actuator bracket	DENSO type	5.4	55
	BOSCH type	9.0	92
ABS actuator x ECU	BOSCH type	2.6	27
ABS & TRAC actuator x Actuator bracket		5.4	55
ABS (& TRAC) actuator bracket x Body		19	195
Front speed sensor installation bolt		7.8	80
Front speed sensor harness clamp bolt		5.4	55
Rear speed sensor installation bolt		7.8	80
Rear speed sensor harness clamp bolt		5.4	55

STEERING

SERVICE DATA

SS06L-03

ON-VEHICLE INSPECTION		
Steering wheel freeplay	Maximum	30 mm (1.18 in.)
5S-FE Engine :		
Drive belt tension	New belt	95 – 145 lbf
Drive belt tension	Used belt	60 – 100 lbf
1MZ-FE Engine :		
Drive belt tension	New belt	150 – 185 lbf
Drive belt tension	Used belt	95 – 135 lbf
Fluid level rise	Maximum	5 mm (0.20 in.)
Fluid pressure at idle speed with valve closed	Minimum	7,845 kPa (80 kgf/cm ² , 1,138 psi)
Steering effort at idle speed	Maximum	5.9 N·m (60 kgf·cm, 52 in.-lbf)
PS VANE PUMP		
5S-FE and 1MZ-FE Engines:		
Vane pump rotating torque	Maximum	0.3 N·m (2.8 kgf·cm, 2.4 in.-lbf)
Oil clearance between pump shaft and bushing	STD	0.03 – 0.05 mm (0.0012 – 0.0020 in.)
Oil clearance between pump shaft and bushing	Maximum	0.07 mm (0.0028 in.)
Vane plate height	Minimum	8.6 mm (0.339 in.)
Vane plate thickness	Minimum	1.397 mm (0.0550 in.)
Vane plate length	Minimum	14.991 mm (0.5902 in.)
Clearance between the rotor groove and plate	Maximum	0.035 mm (0.0014 in.)
Vane plate length	Pump rotor and cam ring mark	
	NONE	14.999 – 15.001 mm (0.59051 – 0.59059 in.)
	1	14.997 – 14.999 mm (0.59043 – 0.59051 in.)
	2	14.995 – 14.997 mm (0.59035 – 0.59043 in.)
	3	14.993 – 14.995 mm (0.59027 – 0.59035 in.)
	4	14.991 – 14.993 mm (0.59020 – 0.59027 in.)
Spring free length	Minimum	32.3 mm (1.272 in.)
PS GEAR		
Steering rack runout	Maximum	0.30 mm (0.0118 in.)
Total preload (Control valve rotating torque)		0.8 – 1.4 N·m (8 – 14 kgf·cm, 6.9 – 12.2 in.-lbf)

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
STEERING COLUMN			
Steering wheel pad set screw (Torx screw)	7.1	72	63 in.-lbf
Steering wheel set nut	35	360	26
Intermediate shaft assembly x Control valve shaft	35	360	26
Steering column assembly x Intermediate shaft assembly	35	360	26
Steering column assembly set nut	25	260	19
Turn signal bracket x Column tube	7	70	61 in.-lbf
Lower column tube attachment x Column tube	19	195	14
PS VANE PUMP			
5S-FE and 1MZ-FE Engines:			
Pressure feed tube x Control valve housing 5S-FE Engine	32 (25)	326 (250)	24 (18)
Pressure feed tube x Pressure feed tube 1MZ-FE Engine	20 (25)	203 (250)	15 (18)
Clamp plate set nut 5S-FE Engine	10	100	7
Clamp plate set nut 1MZ-FE Engine	7.8	80	69 in.-lbf
PS vane pump set bolt A bolt	29 (43)	293 (440)	21 (32)
PS vane pump set bolt B bolt	43	440	32
Oil pressure switch x Union bolt	21	210	15
Union bolt x Pressure feed tube	52	525	38
Vane pump pulley set nut	43	440	32
Front bracket x Rear bracket	43	440	32
Suction port union set bolt	13	130	9
Pressure port union	83	850	62
Rear housing set bolt	24	240	17
PS GEAR			
Pressure feed tube clamp plate set nut	10	100	7
Pressure feed and return tubes x Control valve housing	32 (25)	326 (250)	24 (18)
Stabilizer bar set bolt	19	195	14
PS gear assembly set bolt and nut	181	1,850	134
Turn pressure tube union nut	10 (13)	102 (130)	7 (9)
Tie rod end lock nut	74	750	54
Rack x Rack end	60 (83)	615 (850)	45 (62)
Rack guide spring cap lock nut	50 (69)	513 (700)	37 (51)
Rack housing cap	59	600	43
Self-locking nut	25	250	18
Control valve housing set bolt	18	185	13

(): For use without SST

SUPPLEMENTAL RESTRAINT SYSTEM

TORQUE SPECIFICATION

SS061-17

Part tightened		N·m	kgf·cm	ft·lbf
Steering wheel		35	360	26
Steering wheel pad		7.1	72	63 in·lbf
Front passenger airbag assembly x Instrument panel reinforcement		20	205	15
Front seat installation bolt		37	375	27
Seatback frame set bolt (See page RS-49)	Bolt A	18	185	13
	Bolt B	15	150	11
Airbag sensor assembly		20	205	15
Front airbag sensor		20	205	15
Side airbag sensor assembly		20	205	15
Front seat outer belt retractor	Upper bolt	7.5	76	66 in·lbf
	Lower bolt	42	430	31

BODY ELECTRICAL

SERVICE DATA

SS080-05

TURN SIGNAL FLASHER	
Flashes/ Minute	60 – 120
SPEEDOMETER (ON-VEHICLE)	
USA:	
Standard indication (mph)	Allowable range (mph)
20	18 – 24
40	38 – 44
60	56 – 66
80	78 – 88
100	98 – 110
120	118 – 132
CANADA:	
Standard indication (km/h)	Allowable range (km/h)
20	17 – 24
40	38 – 46
60	57.5 – 67
80	77 – 88
100	96 – 109
120	115 – 130
140	134 – 151.5
160	153 – 173
TACHOMETER (ON-VEHICLE)/ DC 13.5 V 25 °C at (77 °F)	
Standard indication	Allowable range
700	630 – 770
1,000	900 – 1,100
2,000	1,850 – 2,150
3,000	2,800 – 3,200
4,000	3,800 – 4,200
5,000	4,800 – 5,200
6,000	5,750 – 6,250
7,000	6,700 – 7,300
FUEL RECEIVER GAUGE	
A – B	Approx. 126.2 Ω
A – C	Approx. 280.5 Ω
B – C	Approx. 154.3 Ω
FUEL SENDER GAUGE	
Float position mm (in.)	Resistance (Ω)
F: Approx. –91.1 (–3.587)	Approx. 3.0
1/2: Approx. –34.2 (–1.346)	Approx. 31.7
E: Approx. 30.8 (1.213)	Approx. 110.0
ENGINE COOLANT TEMPERATURE RECEIVER GAUGE (Resistance)	
A – B	Approx. 175.7 Ω
A – C	Approx. 54.0 Ω

B – C	Approx. 229.7 Ω
ENGINE COOLANT TEMPERATURE SENDER GAUGE (Resistance)	
Temperature °C (°F)	Resistance (Ω)
50 (122.0)	274
120 (248.0)	26.4

BODY

TORQUE SPECIFICATION

SS0BY-01

Part tightened	N·m	kgf·cm	ft·lbf
FRONT BUMPER	–	–	–
Front bumper cover x Body	5.5	55	49 in·lbf
Front bumper reinforcement x Body	34	350	25
REAR BUMPER	–	–	–
Rear bumper cover x Body	5.0	50	43 in·lbf
Rear bumper reinforcement x Body	34	350	25
HOOD	–	–	–
Hood hinge x Hood	26	260	19
Hood lock x Body	8.0	80	71 in·lbf
FRONT AND REAR DOOR	–	–	–
Front door hinge x Body	31	310	22
Rear door hinge x Body	26	260	19
Door hinge x Door panel	26	260	19
Door lock striker x Body	26	260	19
Outside rear view mirror x Front door panel	5.5	55	49
Door inside handle x Door panel	3.5	35	31 in·lbf
Door glass x Window regulator	8.0	80	71 in·lbf
Window regulator x Door panel	5.5	55	49 in·lbf
Door lock x Door panel	5.0	50	43 in·lbf
Door outside handle x Door panel	7.0	70	61 in·lbf
Door check x Body	30	300	22
Door check x Door panel	8.0	80	71 in·lbf
LUGGAGE COMPARTMENT DOOR AND HINGE	–	–	–
Luggage door hinge x Luggage door	8.0	80	71 in·lbf
Luggage door lock striker x Body	5.5	55	49 in·lbf
Luggage door lock x Luggage door	5.5	55	49 in·lbf
FRONT WIPER AND WASHER	–	–	–
Wiper motor assembly x Body	24	245	18
Wiper arm x Wiper pivot	5.5	55	49 in·lbf
SLIDING ROOF	–	–	–
Sliding roof assembly x Body	5.5	55	49 in·lbf
INSTRUMENT PANEL	–	–	–
Front passenger airbag assembly x Reinforcement	20	200	14
Steering wheel lock nut	35	360	26
SEAT	–	–	–
Front Seat (Power Seat for TMC Made)	–	–	–
Hinge cover x Seatback frame	18	185	13
Seatback frame x Power seat adjuster	15	150	11
Seatback frame x Side airbag assembly	6.0	61	53 in·lbf
Front Seat (Manual Seat for TMC Made)	–	–	–
Front seat adjuster x Body	37	375	27

Front seat inner upper track x Seat cushion	18	185	13
Side Airbag assembly x Seatback frame	18	185	13
Seatback assembly x Seat cushion frame	6.0	61	53 in.-lbf
Front Seat (Power Seat for TMMK Made)	–	–	–
Side airbag assembly x Seat cushion frame	6.0	61	53 in.-lbf
Front Seat (Manual Seat for TMC Made)	–	–	–
Side airbag assembly x Seat cushion frame	6.0	61	53 in.-lbf
Rear Seat (TMC Made)	–	–	–
Seatback hinge x Body	18	185	13
Rear seatback lock control x Rear seatback frame	17.5	178	12.5
Rear Seat (TMMK Made)	–	–	–
Seatback pad (RH bolt) x Body	7.8	79	69 in.-lbf
Seatback pad (center bolt) x Body	42	428	31
Child restraint seat x Body	13	130	9
Seatback hinge x Body	18	185	13
Rear seatback lock control x Rear seatback frame	17.5	178	12.5
SEAT BELT	–	–	–
Front Seat belt	–	–	–
Shoulder anchor x Adjustable anchor	42	420	31
Adjustable anchor x Body	42	420	31
Inner belt x Seat	42	420	31
Retractor x Body	7.8	79	69 in.-lbf
Floor anchor x Body	42	420	31
Rear Seat Belt	–	–	–
Lap outer belt anchor x Body	42	420	31
ELR x Body	42	420	31
Inner belt x Body	42	420	31
Center belt x Body	42	420	31

AIR CONDITIONING

SERVICE DATA

SS05V-02

Refrigerant charge volume	800 ± 50 g (28.22 ± 1.76 oz.)
Drive belt tension	–
New belt	165 ± 26 lbf
Used belt	110 ± 11 lbf
Idle-up speed	–
Magnetic clutch not engaged	700 ± 50 rpm
Magnetic clutch engaged	700 ± 50 rpm
Magnetic clutch clearance	0.5 ± 0.15 mm (0.020 ± 0.0059 in.)


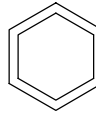
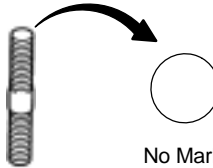
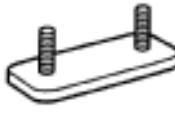

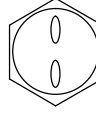
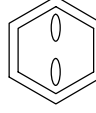

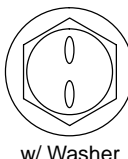
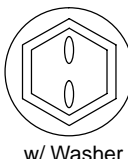










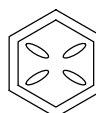





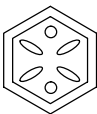
TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
Compressor x Discharge hose	10	100	7
Compressor x Suction hose	10	100	7
Condenser x Discharge hose	10	100	7
Condenser x Liquid tube	14	140	10
Receiver x Liquid tube	5.4	55	48 in.·lbf
Expansion valve x Evaporator	5.4	55	48 in.·lbf
Compressor x Engine	25	250	18
Compressor x Compressor bracket (1MZ-FE Only)	25	250	18
Drive belt adjusting bar bracket x Compressor	25	250	18
Drive belt adjusting bar bracket x Adjusting bar	18	185	13
Pivot bolt	5S-FE	52	38
	1MZ-FE	56	41
Adjusting lock bolt	18	185	13
Pressure switch x Liquid tube	10	100	7
Pressure plate x Compressor	13.2	135	9
Suction line (Piping joint)	32	330	24
Suction line (Block joint)	10	100	7

STANDARD BOLT

HOW TO DETERMINE BOLT STRENGTH

SS02S-01

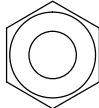
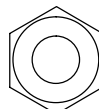
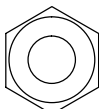
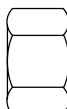
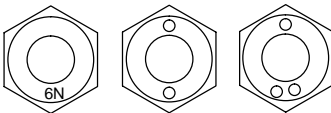
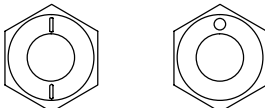
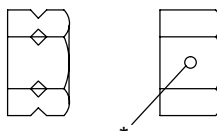
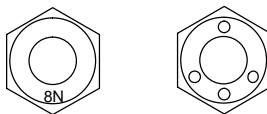
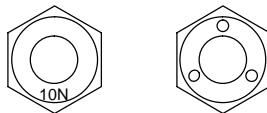
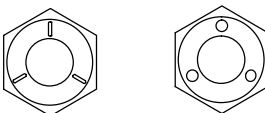

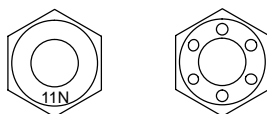
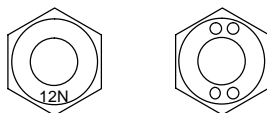
Bolt Type				Class
Hexagon Head Bolt		Stud Bolt	Weld Bolt	
Normal Recess Bolt	Deep Recess Bolt			
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<div><div>5</div><div></div><div></div></div>	<div><div></div></div>			5T
<div><div>6</div><div></div><div></div><div>w/ Washer</div></div>	<div><div></div><div>w/ Washer</div></div>	<div><div></div></div>		6T
<div><div>7</div><div></div><div></div></div>	<div><div></div><div></div></div>			7T
<div><div>8</div><div></div></div>	<div><div></div></div>	<div><div></div><div></div></div>		8T
<div><div>9</div><div></div></div>	<div><div></div></div>			9T
<div><div>10</div><div></div></div>	<div><div></div><div></div></div>			10T
<div><div>11</div><div></div></div>	<div><div></div><div></div></div>			11T

B06431

SPECIFIED TORQUE FOR STANDARD BOLTS

Class	Diameter mm	Pitch mm	Specified torque					
			Hexagon head bolt			Hexagon flange bolt		
			N-m	kgf-cm	ft-lbf	N-m	kgf-cm	ft-lbf
4T	6	1	5	55	48 in.-lbf	6	60	52 in.-lbf
	8	1.25	12.5	130	9	14	145	10
	10	1.25	26	260	19	29	290	21
	12	1.25	47	480	35	53	540	39
	14	1.5	74	760	55	84	850	61
	16	1.5	115	1,150	83	–	–	–
5T	6	1	6.5	65	56 in.-lbf	7.5	75	65 in.-lbf
	8	1.25	15.5	160	12	17.5	175	13
	10	1.25	32	330	24	36	360	26
	12	1.25	59	600	43	65	670	48
	14	1.5	91	930	67	100	1,050	76
	16	1.5	140	1,400	101	–	–	–
6T	6	1	8	80	69 in.-lbf	9	90	78 in.-lbf
	8	1.25	19	195	14	21	210	15
	10	1.25	39	400	29	44	440	32
	12	1.25	71	730	53	80	810	59
	14	1.5	110	1,100	80	125	1,250	90
	16	1.5	170	1,750	127	–	–	–
7T	6	1	10.5	110	8	12	120	9
	8	1.25	25	260	19	28	290	21
	10	1.25	52	530	38	58	590	43
	12	1.25	95	970	70	105	1,050	76
	14	1.5	145	1,500	108	165	1,700	123
	16	1.5	230	2,300	166	–	–	–
8T	8	1.25	29	300	22	33	330	24
	10	1.25	61	620	45	68	690	50
	12	1.25	110	1,100	80	120	1,250	90
9T	8	1.25	34	340	25	37	380	27
	10	1.25	70	710	51	78	790	57
	12	1.25	125	1,300	94	140	1,450	105
10T	8	1.25	38	390	28	42	430	31
	10	1.25	78	800	58	88	890	64
	12	1.25	140	1,450	105	155	1,600	116
11T	8	1.25	42	430	31	47	480	35
	10	1.25	87	890	64	97	990	72
	12	1.25	155	1,600	116	175	1,800	130

HOW TO DETERMINE NUT STRENGTH

Nut Type			Class
Present Standard Hexagon Nut	Old Standard Hexagon Nut		
	Cold Forging Nut	Cutting Processed Nut	
 No Mark			4N
 No Mark (w/ Washer)	 No Mark (w/ Washer)	 No Mark	5N (4T)
			6N
			7N (5T)
			8N
		 No Mark	10N (7T)
			11N
			12N

*: Nut with 1 or more marks on one side surface of the nut.

HINT:

Use the nut with the same number of the nut strength classification or the greater than the bolt strength classification number when tightening parts with a bolt and nut.

Example: Bolt = 4T

Nut = 4N or more

ENGINE MECHANICAL

SERVICE DATA

SS0AD-04

Compression pressure	at 250 rpm STD Minimum Difference of pressure between each cylinder	1,736 kPa (17.7 kgf/cm ² , 252 psi) or more 1,393 kPa (14.2 kgf/cm ² , 202 psi) 98 kPa (1.0 kgf/cm ² , 14 psi) or less
Valve clearance	at cold Intake Exhaust Adjusting shim (for repair part) Shim No.00 Shim No.04 Shim No.08 Shim No.02 Shim No.16 Shim No.20 Shim No.24 Shim No.28 Shim No.32 Shim No.36 Shim No.40 Shim No.44 Shim No.48 Shim No.52 Shim No.56 Shim No.60 Shim No.64 Shim No.68 Shim No.72 Shim No.76 Shim No.80	0.19 – 0.29 mm (0.007 – 0.011 in.) 0.28 – 0.38 mm (0.011 – 0.015 in.) 2.000 mm (0.0787 in.) 2.040 mm (0.0803 in.) 2.080 mm (0.0819 in.) 2.120 mm (0.0835 in.) 2.160 mm (0.0850 in.) 2.200 mm (0.0866 in.) 2.240 mm (0.0882 in.) 2.280 mm (0.0898 in.) 2.320 mm (0.0913 in.) 2.360 mm (0.0929 in.) 2.400 mm (0.0945 in.) 2.440 mm (0.0961 in.) 2.480 mm (0.0976 in.) 2.520 mm (0.0992 in.) 2.560 mm (0.1008 in.) 2.600 mm (0.1024 in.) 2.640 mm (0.1039 in.) 2.680 mm (0.1055 in.) 2.720 mm (0.1071 in.) 2.760 mm (0.1087 in.) 2.800 mm (0.1102 in.)
Valve spring	Deviation Free length Installed tension at 35 mm (1.378 in.)	Maximum 2.0 mm (0.079 in.) 45.9 – 47.9 mm (1.8071 – 1.8858 in.) 169 – 184 N (17.2 – 18.8 kgf, 37.9 – 41.4 lbf)
Camshaft	Cam lobe height STD Intake Exhaust Minimum Intake Exhaust	42.21 – 42.31 mm (1.6618 – 1.6657 in.) 40.62 – 40.72 mm (1.5992 – 1.6031 in.) 42.10 mm (1.6575 in.) 40.51 mm (1.5949 in.)
Piston and piston ring	Piston diameter STD Mark 1 Mark 2 Mark 3 O/S 0.50 Piston oil clearance STD Maximum Piston ring groove clearance No.1 No.2 Piston ring end gap STD No.1 No.2 Oil (side rail) Maximum No.1 No.2 Oil (side rail)	86.815 – 86.825 mm (3.4179 – 3.4183 in.) 86.825 – 86.835 mm (3.4183 – 3.4186 in.) 86.835 – 86.845 mm (3.4201 – 3.4205 in.) 87.350 – 87.380 mm (3.4375 – 3.4387 in.) 0.175 – 0.195 mm (0.0068 – 0.0076 in.) 0.215 mm (0.0085 in.) 0.020 – 0.070 mm (0.0008 – 0.0003 in.) 0.020 – 0.055 mm (0.0008 – 0.0022 in.) 0.220 – 0.440 mm (0.0087 – 0.0173 in.) 0.600 – 0.820 mm (0.0177 – 0.0322 in.) 0.100 – 0.470 mm (0.0039 – 0.0185 in.) 1.04 mm (0.0409 in.) 1.42 mm (0.0559 in.) 1.07 mm (0.0421 in.)

SFI

SERVICE DATA

SS0AG-04

Fuel pressure	Fuel pressure between fuel tank and pressure regulator at 20°C (68°F) between pressure regulator and injector	24,800 kPa (250 kgf/cm ² , 3,600 psi) 834 – 932 kPa (8.5 – 9.5 kgf/cm ² , 121 – 135 psi)
Injector	Resistance at 20°C (68°F)	2.65 – 3.0 Ω
Fuel shutoff valve for delivery pipe	Resistance at 20°C (68°F)	1.8 – 2.2 Ω
Fuel shutoff valve for fuel pressure regulator	Resistance at 20°C (68°F)	1.4 – 1.8 Ω
Fuel shutoff valve for fuel tank	Resistance at 20°C (68°F)	Approx 19 Ω
Fuel temperature sensor for delivery pipe	Resistance at –20°C (–4°F) at 20°C (68°F) at 80°C (176°F)	13.9 – 16.3 kΩ 2.32 – 2.59 kΩ 0.31 – 0.326 kΩ
Fuel temperature sensor for fuel tank	Resistance at –30°C (–22°F) at 25°C (77°F) at 40°C (104°F) at 100°C (212°F)	80 – 100 kΩ 4.80 – 5.20 kΩ 2.51 – 2.81 kΩ 0.30 – 0.37 kΩ
Fuel pressure sensor for delivery pipe	Power source voltage at 20°C (68°F) Power output voltage at 20°C (68°F)	4.5 – 5.5 V 3.1 – 3.6 V
Fuel pressure sensor for fuel pipe	Power source voltage at 20°C (68°F) Power output voltage at 20°C (68°F) Needle position of fuel level gauge at 4/4 at 3/4 at 2/4 at 1/4	4.5 – 5.5 V Approx. 2.8 V Approx. 2.4 V Approx. 1.8 V Approx. 1.3 V
Fuel cut rpm	Fuel return rpm A/C OFF	1,400 rpm

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
Fuel line for union	42	428	31
for fuel inlet coupler	28	286	21
for others			
Fuel filter x Drain plug	10.8	110	8
Fuel filter x Fuel filter bracket	21.5	219	16
Fuel filter x Union	31	316	23
Oil separator x Fuel pressure regulator	24.5	250	18
Fuel pressure regulator x Bracket	20	200	15
Fuel pressure regulator bracket x Body	9.9	100	88 in.·lbf
for 10 mm head bolt	19.6	200	14
for 12 mm head bolt			
Fuel relief pipe x Fuel pressure regulator	42	428	31
Delivery pipe x cylinder head	13	130	10
Fuel tank band x Fuel tank frame	52	530	38
Rear side plate x Front side plate	100	1,020	74
Union x Fuel shutoff valve	31	316	23
for fuel pipe filter pipe	18	184	13
for others			
Fuel tank bracket x Fuel tank valve case	8.2	84	73 in.·lbf
Fuel tank valve cover x Fuel tank valve case	8.2	84	73 in.·lbf
Fuel tank frame x Body	60.2	614	44
Performance rod x Body	39.2	400	29
Performance rod x Fuel tank band	18.1	185	13
Fuel shutoff valve core x Delivery pipe	35	357	26
Fuel shutoff valve coil x Core	15	153	11
Fuel temperature sensor x Delivery pipe	20.4	208	15
Fuel pressure sensor x Delivery pipe	24.6	251	18
Fuel pressure sensor x Fuel main pipe	68.6	700	51
Fuel inlet hose x Fuel pressure regulator	9.9	100	88 in.·lbf

IGNITION

SERVICE DATA

SS0AM-04

Spark plug	Recommended spark plug	DENSO made	SK20R11-G
	Correct electrode gap for new spark plug		1.1 mm (0.043 in.)
	Maximum electrode gap for used spark plug		1.2 mm (0.047 in.)

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
Spark plug x Cylinder head	18	180	13

SUSPENSION AND AXLE

SERVICE DATA

SS04W-03

Front wheel alignment	Vehicle height	Front*5	218 mm (8.58 in.)
	Tire size: 205/65R15	Rear*6	270 mm (10.63 in.)
	Camber	Right-left error	$-0^{\circ}36' \pm 45'$ ($0.6^{\circ} \pm 0.75^{\circ}$) 45' (0.75°) or less
	Caster	Right-left error	$2^{\circ}10' \pm 45'$ ($2.17^{\circ} \pm 0.75^{\circ}$) 45' (0.75°) or less
	Steering axis inclination	Right-left error	$13^{\circ}01' \pm 45'$ ($13.02^{\circ} \pm 0.75^{\circ}$) 45' (0.75°) or less
	Toe-in (Total)		$0^{\circ} \pm 12'$ ($0^{\circ} \pm 0.2^{\circ}$ 0 \pm 2 mm 0 \pm 0.08 in.)
	Rack end length difference		1.5 mm (0.059 in.) or less
Rear wheel alignment	Wheel angle	Inside wheel	$35^{\circ}50' \pm 2^{\circ}$ ($35.84^{\circ} \pm 2^{\circ}$)
		Outside wheel	$31^{\circ}28'$ (31.47°)
	Camber	Right-left error	$-0^{\circ}45' \pm 45'$ ($-0.75^{\circ} \pm 0.75^{\circ}$) 45' (0.75°) or less
Rear wheel alignment	Toe-in (total)		$0^{\circ}24' \pm 12'$ ($0.4^{\circ} \pm 0.2^{\circ}$) 4 \pm 2 mm (0.16 \pm 0.08 in.)
	No. 2 lower suspension arm length difference		1 mm (0.04 in.) or less

*1: Front measuring point

Measure the distance from the ground to the center of the front side lower suspension arm mounting bolt.

*2: Rear measuring point

Measure the distance from the ground to the center of the front side strut rod mounting bolt.

Front axle	Axle bearing backlash	Maximum	0.05 mm (0.0020 in.)
	Axle hub deviation	Maximum	0.05 mm (0.0020 in.)
Front drive shaft	Drive shaft standard length	LH	609.2 ± 2.0 mm (23.984 \pm 0.079 in.)
		RH	842.9 ± 2.0 mm (33.185 \pm 0.079 in.)
Front suspension	Lower ball joint turning torque		1.0 – 3.4 N·m (10 – 35 kgf·cm, 8.7 – 30 in.-lbf)
	Stabilizer bar link turning torque		0.05 – 1.0 N·m (0.5 – 10 kgf·cm, 0.4 – 8.7 in.-lbf)
Rear axle	Axle bearing backlash		0.05 mm (0.0020 in.)
	Axle hub deviation		0.07 mm (0.0028 in.)
Rear suspension	No. 2 lower suspension arm length		512.3 mm (20.169 in.)
	Stabilizer bar link turning torque		0.05 – 1.0 N·m (0.5 – 10 kgf·cm, 0.4 – 8.7 in.-lbf)

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
FRONT AXLE			
Hub nut	103	1,050	76
Steering knuckle x Shock absorber	211	2,150	156
Steering knuckle x Brake caliper	107	1,090	79
Steering knuckle x Tie rod end	49	500	36
Axle hub x Drive shaft	294	3,000	217
Lower ball joint x Lower suspension arm	127	1,300	94
Lower ball joint x Steering knuckle	123	1,250	90
ABS speed sensor set bolt	8.0	82	71 in.·lbf
Tie rod end lock nut	74	750	54
FRONT DRIVE SHAFT			
Drive shaft center bearing lock bolt	32	330	24
FRONT SUSPENSION			
Suspension support x Body	80	820	59
Suspension support x Piston rod	49	500	36
Flexible hose and ABS speed sensor wire harness x Shock absorber	29	300	22
Lower suspension arm set bolt	206	2,100	152
Stabilizer bar link set bolt	39	400	29
REAR AXLE			
Hub nut	103	1,050	76
Axle hub set bolt	80	820	59
Shock absorber x Rear axle carrier	New nut	255	2,600
	Reused nut (Apply engine oil to the threads.)	196	2,000
No. 1, No. 2 lower suspension arm x Rear axle carrier	181	1,850	134
Strut rod x Rear axle carrier	113	1,150	83
Flexible hose x Shock absorber	29	300	22
ABS speed sensor set bolt	8.0	82	71 in.·lbf
REAR SUSPENSION			
ABS speed sensor wire harness x Shock absorber	5.4	55	48 in.·lbf
Rear seat outer belt lower side set bolt	42	430	31
Suspension support x Body	39	400	29
Suspension support x Piston rod	49	500	36
Parking brake cable set bolt	5.4	55	48 in.·lbf
No. 2 lower suspension arm lock nut	56	570	41
No. 1, No. 2 lower suspension arm x Suspension member	181	1,850	134
Strut rod x Body	113	1,150	83
Stabilizer bar bracket x Suspension member	19	195	14
Stabilizer bar link set nut	39	400	29

BODY ELECTRICAL

SERVICE DATA

SS080-06

FUEL RECEIVER GAUGE	
A – B	Approx. 270.1 Ω
A – C	Approx. 141.3 Ω
B – C	Approx. 128.8 Ω
ENGINE COOLANT TEMPERATURE RECEIVER GAUGE (Resistance)	
A – B	Approx. 175.7 Ω
A – C	Approx. 54.0 Ω
B – C	Approx. 229.7 Ω
ENGINE COOLANT TEMPERATURE SENDER GAUGE (Resistance)	
Temperature °C (°F)	Resistance (Ω)
50 (122.0)	160 – 240
120 (248.0)	17.1 – 21.2

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
REAR BUMPER	—	—	—
Rear bumper cover x Body	4.9	51	43 in.·lbf
Rear bumper reinforcement x Body	34	350	25
Rear bumper side retainer x Body	4.9	51	43 in.·lbf
LUGGAGE COMPARTMENT DOOR AND HINGE	—	—	—
Door lock striker x Body	5.4	55	49 in.·lbf
Door lock x Door panel	5.4	55	49 in.·lbf
Luggage compartment door hinge x Door panel	7.8	80	69 in.·lbf
REAR SEAT	—	—	—
Rear seatback x Body	18	185	13
SEAT BELT	—	—	—
Front seat belt	—	—	—
Retractor x Body Upper:	7.8	80	69 in.·lbf
Lower:	41	420	30
Inner belt x Seat	41	420	30
Shoulder anchor x Body	41	420	30
Floor anchor x Body	41	420	30
Rear seat belt	—	—	—
Retractor x Body	41	420	30
Floor anchor x Body	41	420	30
RH center belt x Body	41	420	30
LH center belt x Body	41	420	30