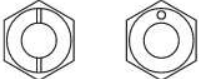
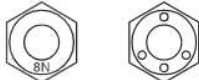
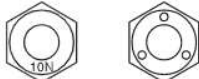
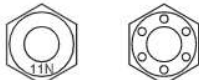
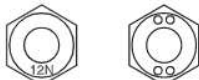


SERVICE SPECIFICATIONS – STANDARD BOLT

SS-3

HOW TO DETERMINE NUT STRENGTH

Nut Type

Present Standard Hexagon Nut	Old Standard Hexagon Nut		Class
	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

HINT:

- *: Nut with 1 or more marks on one side surface of the nut.
- Use the nut with the same number of the nut strength classification or greater than the bolt strength classification number when tightening parts with a bolt and nut.

Example:

- Bolt = 4T
- Nut = 4N or more

SS

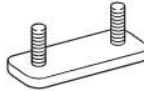
SERVICE SPECIFICATIONS – STANDARD BOLT

SS-1

STANDARD BOLT

HOW TO DETERMINE BOLT
STRENGTH

Bolt Type

Hexagon Head Bolt		Stud Bolt	Weld Bolt	Class
Normal Recess Bolt	Deep Recess Bolt			
	No Mark 	No Mark 		4T
 				5T
	w/ Washer 			6T
 	 			7T
		 		8T
				9T
	 			10T
	 			11T

SS

SS-2

SERVICE SPECIFICATIONS – STANDARD BOLT

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

SS-4**SERVICE SPECIFICATIONS – 2AZ-FE ENGINE CONTROL SYSTEM****2AZ-FE ENGINE CONTROL SYSTEM****SERVICE DATA****SS**

Throttle body		
	Standard throttle valve opening percentage	60 % or more
Accelerator pedal position sensor		
	Standard voltage	0.6 to 1.0 V
Intake air flow meter assembly		
Resistance	4 (THA) - 5 (E2)	
	at -20 °C (-4 °F)	13.6 to 18.4 kΩ
	at 20 °C (68 °F)	2.21 to 2.69 kΩ
	at 60 °C (140 °F)	0.493 to 0.667 kΩ
Camshaft timing oil control valve assembly		
Resistance	at 20 °C (68 °F)	6.9 to 7.9 Ω
Accelerator pedal rod assembly		
Resistance	2 (VPA2) - 3 (EP1)	5.0 kΩ or less
	5 (VPA1) - 1 (EP2)	5.0 kΩ or less
	6 (VCP1) - 3 (EP1)	2.25 to 4.75 kΩ
	4 (VCP2) - 1 (EP2)	2.25 to 4.75 kΩ
Throttle body assembly		
Resistance	at 20 °C (68 °F)	
	2 (M+) - 1 (M-)	0.3 to 100 kΩ
	5 (VC) - 1 (E2)	1.2 to 3.2 kΩ
E.F.I. engine coolant temperature sensor		
Resistance	Approx. 20 °C (68 °F)	2.32 to 2.59 kΩ
	Approx. 80 °C (176 °F)	0.310 to 0.326 kΩ
Knock sensor		
Resistance	at 20 °C (68 °F)	120 to 280 kΩ
EFI relay		
Specified condition	3 - 5	10 kΩ or higher
	3 - 5	Below 1 Ω (when battery voltage is applied to terminals 1 and 2)
C/OPN relay		
Specified condition	3 - 5	10 kΩ or higher
	3 - 5	Below 1 Ω (when battery voltage is applied to terminals 1 and 2)

SERVICE SPECIFICATIONS – 2AZ-FE ENGINE CONTROL SYSTEM**SS-5****TORQUE SPECIFICATIONS**

Part Tightened	N*m	kgf*cm	ft.*lbf
Throttle body assembly x Intake manifold	30	305	22
Knock sensor x Cylinder block sub-assembly	20	199	14
Intake manifold x Cylinder head sub-assembly	30	306	22
ECM x Instrument panel reinforcement	5.5	56	49 in.*lbf
ECM x Blower assembly	5.5	56	49 in.*lbf
Accelerator pedal rod assembly x Body	7.5	76	66 in.*lbf

SS

SERVICE SPECIFICATIONS – 3MZ-FE ENGINE CONTROL SYSTEM

SS-5

3MZ-FE ENGINE CONTROL SYSTEM

SERVICE DATA

Throttle body		
	Standard throttle valve opening percentage	60 % or more
Accelerator pedal position sensor		
	Standard voltage	0.6 to 1.0 V
Intake air flow meter assembly		
Resistance	4 (THA) - 5 (E2)	
	at -20 °C (-4 °F)	13.6 to 18.4 kΩ
	at 20 °C (68 °F)	2.21 to 2.69 kΩ
	at 60 °C (140 °F)	0.493 to 0.667 kΩ
Camshaft timing oil control valve assembly		
Resistance	at 20 °C (68 °F)	6.9 to 7.9 Ω
Accelerator pedal rod assembly		
Resistance	2 (VPA2) - 3 (EP1)	5.0 kΩ or less
	5 (VPA1) - 1 (EP2)	5.0 kΩ or less
	6 (VCP1) - 3 (EP1)	2.25 to 4.75 kΩ
	4 (VCP2) - 1 (EP2)	2.25 to 4.75 kΩ
Throttle body assembly		
Resistance	at 20 °C (68 °F)	
	2 (M+) - 1 (M-)	0.3 to 100 kΩ
	5 (VC) - 3 (E2)	1.2 to 3.2 kΩ
E.F.I. engine coolant temperature sensor		
Resistance	Approx. 20 °C (68 °F)	2.32 to 2.59 kΩ
	Approx. 80 °C (176 °F)	0.310 to 0.326 kΩ
Knock sensor		
Resistance	at 20 °C (68 °F)	120 to 280 kΩ
EFI relay		
Specified condition	3 - 5	10 kΩ or higher
	3 - 5	Below 1 Ω (when battery voltage is applied to terminals 1 and 2)
C/OPN relay		
Specified condition	3 - 5	10 kΩ or higher
	3 - 5	Below 1 Ω (when battery voltage is applied to terminals 1 and 2)

SS

SS-6**SERVICE SPECIFICATIONS – 3MZ-FE ENGINE CONTROL SYSTEM****TORQUE SPECIFICATIONS**

Part Tightened	N ^m	kgf ^{cm}	ft. ^{lbf}
Front suspension upper brace center x Body (w/ Performance Rod)	80	815	59
V-bank cover sub-assembly x Cylinder head cover sub-assembly LH	7.9	81	70 in. ^{lbf}
Throttle body assembly x Intake air connector	11	112	8
Air cleaner cap sub-assembly x Air cleaner case sub-assembly	5.0	51	44 in. ^{lbf}
Knock sensor x Cylinder block sub-assembly	20	199	14
Water outlet x Cylinder head sub-assembly	15	153	11
Water outlet x Cylinder head LH	15	153	11
Intake manifold x Cylinder head sub-assembly	15	153	11
Intake manifold x Cylinder head LH	15	153	11
Ground cable x Intake manifold	8.4	86	74 in. ^{lbf}
ECM x Instrument panel reinforcement	5.5	56	49 in. ^{lbf}
ECM x Blower assembly	5.5	56	49 in. ^{lbf}
Accelerator pedal rod assembly x Body	7.5	76	66 in. ^{lbf}

SS

SS-10

SERVICE SPECIFICATIONS – 2AZ-FE ENGINE MECHANICAL

TORQUE SPECIFICATIONS

Part Tightened		N ^m	kgf ^{cm}	ft. ^{lbf}
Engine mounting bracket No.2 RH x Timing chain cover		52	531	38
Engine moving control rod w/ bracket x Engine mounting bracket No.2 RH		64	653	47
Engine moving control rod w/ bracket x Fender apron RH		64	653	47
Engine mounting stay No.2 RH x Cylinder head		64	653	47
Engine mounting stay No.2 RH x Engine mounting bracket No.2 RH		64	653	47
Drain plug (A/T)		49	500	36
Drain plug (M/T)		49	500	36
Engine hanger No.1 x Cylinder head		38	387	28
Engine hanger No.2 x Cylinder head		38	387	28
ECT sensor x Cylinder head		20	204	15
Knock sensor x Cylinder block		39	398	29
Engine oil pressure switch assembly x Cylinder head		15	153	11
Water by-pass pipe No.1 x Cylinder block		9.0	92	80 in. ^{lbf}
Transverse engine engine mounting bracket x Cylinder block		54	551	40
Drive shaft bearing bracket x Cylinder block		64	653	47
V-ribbed belt tensioner assembly x Timing chain cover		59.5	607	44
Ignition coil assembly x Cylinder head		9.0	92	80 in. ^{lbf}
Water inlet x Cylinder block		9.0	92	80 in. ^{lbf}
Exhaust manifold converter x Cylinder head		37	378	27
Exhaust manifold stay x Exhaust manifold converter		44	449	32
Manifold converter insulator No.1 x Exhaust manifold converter		12	122	9
Oil level gage guide x Water by-pass pipe No.1		9.0	92	80 in. ^{lbf}
Intake manifold x Cylinder head		30	306	22
Drive plate and ring gear (A/T) x Crankshaft		98	1,000	72
Flywheel sub-assembly (M/T) x Crankshaft		130	1,330	96
Starter assembly x Automatic transaxle assembly		39	398	29
Starter assembly x Manual transaxle assembly		39	398	29
Engine mounting insulator LH x Automatic transaxle assembly		95	969	70
Engine mounting insulator LH x Manual transaxle assembly		143	1,459	105
Engine mounting insulator RH x Engine mounting bracket RH		95	969	70
Engine mounting insulator FR x Engine mounting bracket FR		87	888	64
Engine mounting bracket rear No.2 x Engine lateral control rod (M/T)		89	910	66
Vane pump assembly x Timing chain cover		43	439	32
Frame side plate x Front frame assembly	Bolt A	85	867	63
Frame side plate x Body	Bolt B	32	326	24
Front suspension member brace rear x Front frame assembly	Bolt C	85	867	63
Front suspension member brace rear x Body	Bolt D	32	326	24
Steering intermediate shaft		35	357	26
Drive plate and ring gear x Torque converter		41	418	30
Front suspension arm sub-assembly lower No.1 x Lower ball joint		75	764	55
Tie rod assembly x Steering knuckle		49	500	36
Speed sensor front LH (w/ ABS) x Steering knuckle		8.0	82	71 in. ^{lbf}
Speed sensor front RH (w/ ABS) x Steering knuckle		8.0	82	71 in. ^{lbf}
Front axle hub LH nut x Front drive shaft		294	3,000	217
Front stabilizer link assembly x Front suspension		74	755	55
Air cleaner assembly x Body		5.0	51	44 in. ^{lbf}
Balanceshaft housing x Stiffening crankcase assembly	1st	22	220	16
	2nd	Turn 90 °	Turn 90 °	Turn 90 °

SERVICE SPECIFICATIONS – 2AZ-FE ENGINE MECHANICAL

SS-11

Part Tightened		N*m	kgf*cm	ft.*lbf
Stiffening crankcase assembly x Cylinder block		33	332	24
w/ head taper screw plug No.1 x Cylinder block		26	265	19
Oil control valve filter x Cylinder block		30	306	22
Cylinder block water drain cock x Stiffening crankcase assembly		25	255	18
Cylinder head x Cylinder block	1st	79	806	58
	2nd	Turn 90 °	Turn 90 °	Turn 90 °
Camshaft timing gear assembly x Camshaft		54	551	40
Camshaft timing sprocket x Camshaft		54	551	40
Camshaft bearing cap No.1 x Cylinder head		30	301	22
Camshaft bearing cap No.2 x Cylinder head		30	301	22
Camshaft bearing cap No.3 x Cylinder head		9.0	92	80 in.*lbf
Oil pump assembly x Stiffening crankcase assembly		19	194	14
Chain tensioner plate x Stiffening crankcase assembly		12	122	9
Oil pump drive sprocket x Oil pump		30	301	22
Chain vibration damper No.1 x Cylinder head		9.0	92	80 in.*lbf
Chain vibration damper No.1 x Cylinder block		9.0	92	80 in.*lbf
Chain tensioner slipper x Cylinder block		19	194	14
Timing chain guide x Crankshaft bearing cap No.1		9.0	92	80 in.*lbf
Timing chain cover	Bolt A	9.0	92	80 in.*lbf
	Bolt B	21	214	15
	Bolt C	43	438	32
	Nut	9.0	92	80 in.*lbf
Oil pan x Stiffening crankcase assembly		9.0	92	80 in.*lbf
Oil pan drain plug x Oil pan		25	250	18
Water pump assembly x Cylinder block		9.0	92	80 in.*lbf
Water pump pulley x Water pump assembly		26	265	19
Crankshaft position sensor x Timing chain cover		9.0	92	80 in.*lbf
Crankshaft pulley x Crankshaft		170	1,733	125
Chain tensioner assembly No.1 x Timing chain cover		9.0	92	80 in.*lbf
Camshaft position sensor x Cylinder head		9.0	92	80 in.*lbf
Cylinder head cover x Cylinder head		11	110	8
Oil filter union x Stiffening crankcase assembly		30	306	22
Spark plug x Cylinder head		19	194	14
Ventilation valve x Cylinder head cover		19	194	14
Front suspension brace x Body		80	816	59
Stud bolt	Bolt A	5	51	44 in.*lbf
	Bolt B	5	51	44 in.*lbf
	Bolt C	10	97	84 in.*lbf
	Bolt D	10	97	84 in.*lbf
Stud bolt	Stud bolt A	5.0	51	44 in.*lbf
	Stud bolt B	10	97	84 in.*lbf
	Stud bolt C	5.0	51	44 in.*lbf
Crankshaft bearing cap x Cylinder block	1st	20	204	15
	2nd	40	408	29
Connecting rod cap x Connecting rod	1st	25	250	18
	2nd	Turn 90 °	Turn 90 °	Turn 90 °

SS

SERVICE SPECIFICATIONS – 2AZ-FE ENGINE MECHANICAL

SS-7

2AZ-FE ENGINE MECHANICAL

SERVICE DATA

Ignition timing	w/ Terminals TC and CG of DLC3 connected	8 to 12°BTC at idle
	w/ Terminals TC and CG of DLC3 disconnected	5 to 15°BTC at idle
Idle speed	M/T	650 to 750 rpm
	A/T	610 to 710 rpm
Compression	Compression pressure	1,360 MPa (13.9 kgf/cm ² , 198 psi)
	Minimum pressure	0.98 MPa (10 kgf/cm ² , 142 psi)
	Difference between each cylinder	100 kPa (1.0 kgf/cm ² , 14 psi)
Valve clearance (cold)	Intake	0.19 to 0.29 mm (0.008 to 0.011 in.)
	Exhaust	0.30 to 0.40 mm (0.012 to 0.016 in.)
Balance shaft		
Specified thrust clearance		0.050 to 0.090 mm (0.0020 to 0.0035 in.)
Specified oil clearance		0.004 to 0.031 mm (0.0002 to 0.0012 in.)
Housing journal bore diameter	Mark 1	26.000 to 26.006 mm (1.0236 to 1.0239 in.)
	Mark 2	26.006 to 26.012 mm (1.0239 to 1.0241 in.)
	Mark 3	26.012 to 26.018 mm (1.0241 to 1.0243 in.)
Journal diameter		22.985 to 23.000 mm (0.9049 to 0.9055 in.)
Bearing center wall thickness	Mark 1	1.486 to 1.489 mm (0.0585 to 0.0586 in.)
	Mark 2	1.489 to 1.492 mm (0.0586 to 0.0587 in.)
	Mark 3	1.492 to 1.495 mm (0.0587 to 0.0589 in.)
Oil pump drive sprocket	Minimum sprocket diameter (w/ chain)	48.2 mm (1.898 in.)
Oil pump drive shaft sprocket	Minimum sprocket diameter (w/ chain)	48.2 mm (1.898 in.)
Crankshaft timing sprocket	Minimum sprocket diameter (w/ chain)	51.6 mm (2.031 in.)
Chain tensioner slipper	Maximum wear	1.0 mm (0.039 in.)
Chain vibration damper No.1	Maximum wear	1.0 mm (0.039 in.)
Cylinder head set bolt	Specified bolt length	161.3 to 164.2 mm (6.350 to 6.465 in.)
Chain sub-assembly	Maximum chain elongation	115.4 mm (4.543 in.)
Camshaft timing gear or sprocket	Minimum gear or sprocket diameter (w/ chain)	97.3 mm (3.831 in.)
Camshaft (Intake)		
Maximum circle runout		0.03 mm (0.0012 in.)
Specified cam lobe height		46.599 to 46.809 mm (1.8346 to 1.8429 in.)
No.1 journal diameter		35.971 to 35.985 mm (1.4162 to 1.4167 in.)
Outer journal diameter		22.959 to 22.975 mm (0.9039 to 0.9045 in.)
Specified journal thrust clearance		0.040 to 0.110 mm (0.0016 to 0.0043 in.)
Specified journal oil clearance	No.1 journal bearing mark 1	0.007 to 0.070 mm (0.0003 to 0.0028 in.)
	No.1 journal bearing mark 2	0.008 to 0.070 mm (0.0003 to 0.0028 in.)
	No.1 journal bearing mark 3	0.008 to 0.070 mm (0.0003 to 0.0028 in.)
	Other journals	0.025 to 0.100 mm (0.0010 to 0.0039 in.)
Cylinder head journal bore diameter	Mark 1	40.000 to 40.009 mm (1.5748 to 1.5752 in.)
	Mark 2	40.009 to 40.017 mm (1.5752 to 1.5755 in.)
	Mark 3	40.017 to 40.025 mm (1.5755 to 1.5758 in.)
Standard bearing center wall thickness	Mark 1	2.000 to 2.004 mm (0.0787 to 0.0789 in.)
	Mark 2	2.004 to 2.008 mm (0.0789 to 0.0791 in.)
	Mark 3	2.008 to 2.012 mm (0.0791 to 0.0792 in.)
Camshaft journal diameter		35.971 to 35.985 mm (1.4162 to 1.4167 in.)
Camshaft No.2 (Exhaust)		

SS

SS-8**SERVICE SPECIFICATIONS – 2AZ-FE ENGINE MECHANICAL**

Maximum circle runout		0.03 mm (0.0012 in.)
Specified cam lobe height		46.599 to 46.809 mm (1.8346 to 1.8429 in.)
No.1 journal diameter		35.971 to 35.985 mm (1.4162 to 1.4167 in.)
Other journal diameter		22.959 to 22.975 mm (0.9039 to 0.9045 in.)
Specified thrust clearance		0.080 to 0.150 mm (0.0032 to 0.0059 in.)
Specified journal oil clearance	No.1 journal	0.040 to 0.100 mm (0.0016 to 0.0039 in.)
	Other journals	0.025 to 0.100 mm (0.0010 to 0.0039 in.)
Cylinder head journal bore diameter	Mark 1	40.000 to 40.009 mm (1.5748 to 1.5752 in.)
	Mark 2	40.009 to 40.017 mm (1.5752 to 1.5755 in.)
	Mark 3	40.017 to 40.025 mm (1.5755 to 1.5758 in.)
Standard bearing center wall thickness	Mark 1	2.000 to 2.004 mm (0.00787 to 0.0789 in.)
	Mark 2	2.004 to 2.008 mm (0.0789 to 0.0791 in.)
	Mark 3	2.008 to 2.012 mm (0.0791 to 0.0792 in.)
Camshaft journal diameter		35.971 to 35.985 mm (1.4162 to 1.4167 in.)
Intake manifold	Maximum warpage	0.20 mm (0.0079 in.)
Exhaust manifold	Maximum warpage	0.70 mm (0.0276 in.)
Cylinder head		
Maximum warpage	Cylinder block side	0.05 mm (0.0020 in.)
	Intake manifold side	0.08 mm (0.0031 in.)
	Exhaust manifold side	0.08 mm (0.0031 in.)
Inner compression spring	Free length	45.7 mm (1.799 in.)
	Maximum deviation	1.6 mm (0.063 in.)
Intake valve	Specified overall length	101.21 to 101.71 mm (3.9846 to 4.0043 in.)
	Valve stem diameter	5.470 to 5.485 mm (0.2154 to 0.2159 in.)
	Minimum margin thickness	0.50 to 1.45 mm (0.0197 to 0.0571 in.)
Exhaust valve	Specified overall length	100.70 to 101.15 mm (3.9646 to 3.9823 in.)
	Valve stem diameter	5.465 to 5.480 mm (0.2152 to 0.2157 in.)
	Minimum margin thickness	0.50 to 1.60 mm (0.0197 to 0.0630 in.)
Intake valve guide bush	Bush inside diameter	5.510 to 5.530 mm (0.2169 to 0.2177 in.)
	Specified bush oil clearance	0.025 to 0.080 mm (0.0010 to 0.0031 in.)
Exhaust valve guide bush	Bush inside diameter	5.510 to 5.530 mm (0.2169 to 0.2177 in.)
	Specified bush oil clearance	0.030 to 0.100 mm (0.0012 to 0.0039 in.)
Valve lifter	Lifter diameter	30.966 to 30.976 mm (1.2191 to 1.2195 in.)
	Lifter bore diameter	31.009 to 31.025 mm (1.2208 to 1.2215 in.)
	Specified oil clearance	0.033 to 0.070 mm (0.0013 to 0.0028 in.)
Connecting rod		
Specified thrust clearance		0.160 to 0.362 mm (0.0063 to 0.0143 in.)
Specified oil clearance		0.024 to 0.080 mm (0.0009 to 0.0031 in.)
Connecting rod bearing center wall thickness (Reference)	Mark 1	1.485 to 1.488 mm (0.0585 to 0.0586 in.)
	Mark 2	1.488 to 1.491 mm (0.0586 to 0.0587 in.)
	Mark 3	1.491 to 1.494 mm (0.0587 to 0.0588 in.)
Bush inside diameter		22.005 to 22.014 mm (0.8663 to 0.8667 in.)
Bush inside diameter (Reference)	Mark A	22.005 to 22.008 mm (0.8663 to 0.8665 in.)
	Mark B	22.008 to 22.011 mm (0.8665 to 0.8666 in.)
	Mark C	22.011 to 22.014 mm (0.8666 to 0.8667 in.)
Maximum rod out-of alignment per 100 mm (3.94 in.)		0.05 mm (0.0020 in.)
Maximum rod twist per 100 mm (3.94 in.)		0.15 mm (0.0059 in.)
Cylinder block	Maximum warpage	0.05 mm (0.0020 in.)
	Specified cylinder bore diameter	88.500 to 88.633 mm (3.4843 to 3.4894 in.)
Piston		

SERVICE SPECIFICATIONS – 2AZ-FE ENGINE MECHANICAL

SS-9

Piston diameter		88.439 to 88.449 mm (3.4818 to 3.4822 in.)
Specified piston oil clearance		0.051 to 0.100 mm (0.0020 to 0.0039 in.)
Piston pin hole bush inside diameter		22.001 to 22.010 mm (0.8662 to 0.8665 in.)
Piston pin hole bush inside diameter (Reference)	Mark 1	22.001 to 22.004 mm (0.8662 to 0.8663 in.)
	Mark 2	22.004 to 22.007 mm (0.8663 to 0.8664 in.)
	Mark 3	22.007 to 22.010 mm (0.8664 to 0.8665 in.)
Piston ring		
Ring groove clearance		0.030 to 0.070 mm (0.0012 to 0.0028 in.)
Specified end gap	No.1	0.22 to 0.892 mm (0.0087 to 0.0350 in.)
	No.2	0.50 to 1.35 mm (0.0197 to 0.0531 in.)
	Oil (side rail)	0.10 to 0.73 mm (0.0039 to 0.0287 in.)
Piston pin		
Piston pin diameter		21.997 to 22.009 mm (0.8660 to 0.8665 in.)
Piston pin diameter (Reference)	Mark A	21.997 to 22.000 mm (0.8660 to 0.8661 in.)
	Mark B	22.000 to 22.003 mm (0.8661 to 0.8663 in.)
	Mark C	22.003 to 22.006 mm (0.8663 to 0.8664 in.)
	Mark D	22.006 to 22.009 mm (0.8664 to 0.8665 in.)
Specified oil clearance		0.001 to 0.010 mm (0.00004 to 0.00039 in.)
Connecting rod bolt	Specified diameter	7.0 to 7.3 mm (0.276 to 0.287 in.)
Crankshaft		
Specified thrust clearance		0.040 to 0.300 mm (0.0016 to 0.0118 in.)
Thrust washer thickness		1.930 to 1.980 mm (0.0760 to 0.0780 in.)
Cylinder block main journal bore diameter (Reference)	Mark 0	59.000 to 59.002 mm (2.3228 to 2.3229 in.)
	Mark 1	59.002 to 59.004 mm (2.3229 to 2.3230 in.)
	Mark 2	59.004 to 59.006 mm (2.3230 to 2.3231 in.)
	Mark 3	59.006 to 59.009 mm (2.3231 to 2.3232 in.)
	Mark 4	59.009 to 59.011 mm (2.3232 to 2.3233 in.)
	Mark 5	59.011 to 59.013 mm (2.3233 to 2.3233 in.)
	Mark 6	59.013 to 59.016 mm (2.3233 to 2.3235 in.)
Main journal diameter		54.988 to 55.000 mm (2.1648 to 2.1654 in.)
Main journal diameter (Reference)	Mark 0	54.998 to 55.000 mm (2.1653 to 2.1654 in.)
	Mark 1	54.996 to 54.998 mm (2.1652 to 2.1653 in.)
	Mark 2	54.994 to 54.996 mm (2.1651 to 2.1652 in.)
	Mark 3	54.992 to 54.994 mm (2.1650 to 2.1651 in.)
	Mark 4	54.990 to 54.992 mm (2.1650 to 2.1650 in.)
	Mark 5	54.988 to 54.990 mm (2.1649 to 2.1650 in.)
Standard main bearing center wall thickness (Reference)	Mark 1	1.993 to 1.996 mm (0.0785 to 0.0786 in.)
	Mark 2	1.996 to 1.999 mm (0.0786 to 0.0787 in.)
	Mark 3	1.999 to 2.002 mm (0.0787 to 0.0788 in.)
	Mark 4	2.002 to 2.005 mm (0.0788 to 0.0789 in.)
Maximum circle runout		0.03 mm (0.0012 in.)
Specified main journal oil clearance		0.008 to 0.024 mm (0.0031 to 0.00094 in.)
Maximum main journal taper and out-of-round		0.003 mm (0.0001 in.)
Maximum crank pin taper and out-of round		0.003 mm (0.0001 in.)
Crank pin diameter		47.990 to 48.000 mm (1.8894 to 1.8898 in.)
Crankshaft bearing cap set bolt	Specified diameter	7.2 to 7.6 mm (0.283 to 0.299 in.)

SS

SERVICE SPECIFICATIONS – 3MZ-FE ENGINE MECHANICAL

SS-15

TORQUE SPECIFICATIONS

Part Tightened		N*m	kgf*cm	ft.*lbf
Engine hanger No. 2 x Cylinder head		20	204	15
Knock sensor x Cylinder block		20	204	15
Oil pressure switch assembly x Cylinder block		15	152	11
Compressor mounting bracket No.1 x Cylinder block		25	255	18
Generator bracket No. 1 x Cylinder block		58	591	43
Pump bracket x Cylinder head		32	326	24
Drive shaft bearing bracket x Cylinder block		64	653	47
Exhaust manifold converter sub-assembly No. 2 x Cylinder head		49	500	36
Exhaust manifold heat insulator No. 2 x Cylinder head		8.5	87	75 in.*lbf
Exhaust manifold converter sub-assembly RH x Cylinder head		49	500	36
Intake manifold x Cylinder head		15	153	11
Ignition coil assembly x Cylinder head cover		8.0	82	71 in.*lbf
Intake air surge tank x Intake manifold		28	286	21
Surge tank stay bolt		20	204	15
Engine hanger No. 2 x Cylinder head		39	398	29
Engine hanger No. 1 x Intake air surge tank		39	398	29
Manifold stay No. 2 x Exhaust manifold converter sub-assembly		49	500	36
Manifold stay No. 2 x Automatic transaxle assembly		49	500	36
Engine mounting insulator RH x Engine mounting bracket		95	969	70
Engine mounting insulator LH x Automatic transaxle assembly		95	969	70
Engine mounting insulator FR x Automatic transaxle assembly		87	887	64
Vane pump assembly x Pump bracket		43	439	32
Vane pump assembly x Engine mounting bracket		43	439	32
Frame side rail plate sub-assembly x Front frame assembly	Bolt A	85	867	63
	Bolt B	32	326	24
	Nut	32	326	24
Front suspension member brace rear x Front frame assembly	Bolt C	85	867	63
	Bolt D	32	326	24
	Nut	32	326	24
Compressor and magnetic clutch x Compressor mounting bracket No.1	Bolt	25	250	18
	Nut	26	260	19
Generator belt adjusting bar x Cylinder block	Nut A	43	438	32
	Bolt B	18	184	13
	Bolt C	8.0	82	71 in.*lbf
Generator bracket No. 2 x Transverse engine engine mounting bracket		28	286	21
Intermediate shaft sub-assembly		35	357	26
Drive plate and ring gear x Torque converter		41	418	30
Flywheel housing under cover x Automatic transaxle assembly		7.8	80	69 in.*lbf
Front suspension arm x Lower ball joint		75	764	55
Tie rod end x Steering knuckle		49	500	36
Front axle hub nut x Front drive shaft		294	2,998	217
Front stabilizer link assembly x Front suspension		74	755	55
V-bank cover x Cylinder head cover		7.9	81	70 in.*lbf
Engine mounting stay No. 2 RH x Transverse engine engine mounting bracket		64	653	47
Engine moving control rod (See page)	Bolt A	64	653	47
	Bolt B	23	235	17
Camshaft sub-gear x Main gear		5.4	55	48 in.*lbf

SS

SS-16

SERVICE SPECIFICATIONS – 3MZ-FE ENGINE MECHANICAL

Part Tightened		N•m	kgf•cm	ft.*lbf
Engine rear oil seal retainer x Cylinder block		8.0	82	71 in.*lbf
Oil pump assembly x Cylinder block (See page)	10 mm head	8.0	82	71 in.*lbf
	12 mm head	20	204	15
	14 mm head	43	439	32
Crank position sensor x Oil pump assembly		8.0	82	71 in.*lbf
Oil pan baffle plate x Oil pan sub-assembly		8.0	82	71 in.*lbf
Oil pan sub-assembly x Cylinder block (See page)	10 mm head	8.0	82	71 in.*lbf
	12 mm head	20	204	15
Oil strainer sub-assembly x Oil pan sub-assembly		8.0	82	71 in.*lbf
Oil pan sub-assembly No. 2 x Oil pan sub-assembly		8.0	82	71 in.*lbf
Oil pan drain plug x Oil pan sub-assembly No. 2		45	459	33
Water inlet housing x Cylinder block		8.0	82	71 in.*lbf
Cylinder head x Cylinder block	12 pointed head 1st	54	551	40
	2nd	Turn 90°	Turn 90°	Turn 90°
	Recessed head	19	189	14
Camshaft bearing cap x Cylinder head		16	163	12
Timing belt plate x Oil pump assembly		8.0	82	71 in.*lbf
Water pump assembly x Cylinder block		8.0	82	71 in.*lbf
Oil level gage guide x Cylinder block		8.0	82	71 in.*lbf
Oil filter union x Cylinder block		30	306	22
Timing belt idler bracket x Cylinder block		28	286	21
Timing belt No. 3 cover x Cylinder head		8.5	87	76 in.*lbf
Camshaft timing pulley x Camshaft		125	1,275	92
Timing belt idler sub-assembly No. 2 x Timing belt idler bracket		43	438	32
Timing belt idler sub-assembly No. 1 x Cylinder block		34	347	25
Chain tensioner assembly No. 1 x Oil pump assembly		27	280	20
Transverse engine engine mounting bracket x Cylinder block		28	286	21
Timing belt No. 2 cover x Timing belt No. 3 cover		8.5	87	76 in.*lbf
Timing belt No. 1 cover x Oil pump assembly		8.5	87	76 in.*lbf
Crankshaft pulley x Crankshaft		215	2,192	159
Camshaft position sensor x Cylinder head		8.0	82	71 in.*lbf
Cylinder head cover x Cylinder head		8.0	82	71 in.*lbf
Spark plug x Cylinder head		18	184	13
Vane pump assembly x Adjusting strut		43	439	32
Generator x Generator bracket		58	591	43
Generator x Adjusting bar		18	184	13
Front suspension brace upper x Body		80	816	59
Water outlet x Cylinder head		15	153	11
Exhaust manifold heat insulator No. 2 x Exhaust manifold LH		8.5	87	55 in.*lbf
Exhaust pipe support bracket No. 1 x Automatic transaxle assembly		21	214	15
Drive plate & ring gear sub-assembly x Crankshaft		83	846	61
w/ head straight screw plug No. 1 x Cylinder head		44	449	32
w/ head straight screw plug No. 2 x Cylinder head		44	449	32

SERVICE SPECIFICATIONS – 3MZ-FE ENGINE MECHANICAL**SS-17**

Part Tightened		N*m	kgf*cm	ft.*lbf
Main bearing cap x Cylinder block	12 pointed head 1st	22	224	16
	2nd	Turn 90°	Turn 90°	Turn 90°
	6 pointed head	27	275	20
Connecting rod cap x Connecting rod	1st	25	250	18
	2nd	Turn 90°	Turn 90°	Turn 90°
Cylinder block w/ head straight screw No. 1 plug x Cylinder block		30	306	22
Cylinder block w/ head straight screw No. 2 plug x Cylinder block		50	510	37
Cylinder block w/head straight screw No. 3 plug x Cylinder block		30	306	22
Water seal plate x Cylinder block		18	184	13
Cylinder block water drain cock sub-assembly x Cylinder block		39	398	29

SS

SS-12

SERVICE SPECIFICATIONS – 3MZ-FE ENGINE MECHANICAL

3MZ-FE ENGINE MECHANICAL

SERVICE DATA

V-Ribbed belt		
New drive belt tension	Cooler compressor to crankshaft	143 to 165 lbf
	Vane pump	132 to 154 lbf
Used drive belt tension	Cooler compressor to crankshaft	80 to 132 lbf
	Vane pump	55 to 88 lbf
Ignition timing	w/ Terminals TC and CG of DLC3 connected	8 to 12 °BTDC at idle
	w/ Terminals TC and CG of DLC3 disconnected	7 to 24 °BTDC at idle
Idle speed		630 - 730 rpm
Compression	Compression pressure	1.47 MPa (15 kgf/cm ² , 213 psi)
	Minimum pressure	1.0 MPa (10.2 kgf/cm ² , 145 psi)
	Difference between each cylinder	100 kPa (1.0 kgf/cm ² , 15 psi)
Valve clearance (cold)	Intake	0.15 to 0.25 mm (0.006 to 0.010 in.)
	Exhaust	0.25 to 0.35 mm (0.010 to 0.014 in.)
Intake air surge tank	Maximum warpage	0.10 mm (0.0039 in.)
Intake manifold		
Maximum warpage	Air intake surge tank side	0.15 mm (0.0059 in.)
	Cylinder head side	0.08 mm (0.0031 in.)
Exhaust manifold	Maximum warpage	0.50 mm (0.0196 in.)
Camshaft		
Maximum circle runout		0.06 mm (0.0024 in.)
Specified cam lobe height	Intake	42.980 to 43.232 mm (1.6921 to 1.7020 in.)
	Exhaust	42.960 to 43.110 mm (1.6874 to 1.6972 in.)
Camshaft Journal diameter		26.959 to 26.975 mm (1.0614 to 1.0620 in.)
Specified gear backlash		0.020 to 0.300 mm (0.0008 to 0.0118 in.)
Specified journal thrust clearance		0.040 to 0.120 mm (0.0016 to 0.0047 in.)
Specified journal oil clearance		0.025 to 0.100 mm (0.0010 to 0.0039 in.)
Cylinder head set bolt	Specified outside diameter at tension portion	8.75 to 9.05 mm (0.3445 to 0.3563 in.)
Cylinder head		
Maximum warpage	Cylinder block side	0.05 mm (0.0020 in.)
	Intake manifold side	0.10 mm (0.0039 in.)
	Exhaust manifold side	0.10 mm (0.0039 in.)
Intake valve	Specified overall length	94.95 to 95.45 mm (3.7382 to 3.7579 in.)
	Valve stem diameter	5.470 to 5.485 mm (0.2154 to 0.2159 in.)
	Minimum margin thickness	0.5 to 1.0 mm (0.020 to 0.039 in.)
Exhaust valve	Specified overall length	94.90 to 95.40 mm (3.7362 to 3.7559 in.)
	Valve stem diameter	5.465 to 5.480 mm (0.2152 to 0.2157 in.)
	Minimum margin thickness	0.5 to 1.0 mm (0.020 to 0.039 in.)
Inner compression spring	Free length	45.50 mm (1.7913 in.)
	Maximum deviation	2.0 mm (0.079 in.)
	Installed tension at 33.8 mm (1.331 in.)	186 to 206 N (19.0 to 21.0 kgf, 41.9 to 46.3 lbf)
Valve guide bush		
Bush inside diameter		5.510 to 5.530 mm (0.2169 to 0.2177 in.)
Specified bush oil clearance	Intake	0.025 to 0.080 mm (0.0010 to 0.0031 in.)
	Exhaust	0.030 to 0.100 mm (0.0012 to 0.0039 in.)

SERVICE SPECIFICATIONS – 3MZ-FE ENGINE MECHANICAL**SS-13**

Cylinder head valve guide bush bore diameter	STD	10.295 to 10.313 mm (0.4053 to 0.4060 in.)
	O/S 0.05	10.345 to 10.363 mm (0.4073 to 0.4080 in.)
Bush diameter	STD	10.333 to 10.344 mm (0.4068 to 0.4072 in.)
	O/S 0.05	10.383 to 10.394 mm (0.4088 to 0.4092 in.)
Valve lifter		
Lifter diameter		30.966 to 30.976 mm (1.2191 to 1.2195 in.)
Lifter bore diameter		31.009 to 31.025 mm (1.2208 to 1.2215 in.)
Specified oil clearance	Standard	0.033 to 0.070 mm (0.0013 to 0.0028 in.)
Connecting rod		
Specified thrust clearance		0.15 to 0.35 mm (0.0059 to 0.0138 in.)
Connecting rod thickness		20.80 to 20.85 mm (0.8189 to 0.8209 in.)
Specified connecting rod oil clearance		0.038 to 0.080 mm (0.0015 to 0.0031 in.)
Connecting rod bearing center wall thickness	Mark 1	1.484 to 1.487 mm (0.0584 to 0.0585 in.)
	Mark 2	1.487 to 1.490 mm (0.0585 to 0.0587 in.)
	Mark 3	1.490 to 1.493 mm (0.0587 to 0.0588 in.)
	Mark 4	1.493 to 1.496 mm (0.0588 to 0.0589 in.)
Crankshaft		
Crankshaft thrust clearance		0.04 to 0.30 mm (0.0016 to 0.0118 in.)
Thrust washer thickness		1.93 to 1.98 mm (0.0760 to 0.0780 in.)
Specified main journal oil clearance	No. 1 and No. 4 journals	0.014 to 0.050 mm (0.0006 to 0.0020 in.)
	No. 2 and No. 3 journals	0.026 to 0.060 mm (0.0010 to 0.0024 in.)
Cylinder block main journal bore diameter (Reference)	Mark 00	66.000 mm (2.5984 in.)
	Mark 01	66.001 mm (2.5985 in.)
	Mark 02	66.002 mm (2.5985 in.)
	Mark 03	66.003 mm (2.5985 in.)
	Mark 04	66.004 mm (2.5986 in.)
	Mark 05	66.005 mm (2.5986 in.)
	Mark 06	66.006 mm (2.5987 in.)
	Mark 07	66.007 mm (2.5987 in.)
	Mark 08	66.008 mm (2.5987 in.)
	Mark 09	66.009 mm (2.5988 in.)
	Mark 10	66.010 mm (2.5988 in.)
	Mark 11	66.011 mm (2.5989 in.)
	Mark 12	66.012 mm (2.5989 in.)
	Mark 13	66.013 mm (2.5989 in.)
	Mark 14	66.014 mm (2.5990 in.)
	Mark 15	66.015 mm (2.5990 in.)
	Mark 16	66.016 mm (2.5990 in.)
Main journal diameter		61.000 mm (4.1016 in.)

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SS-14

SERVICE SPECIFICATIONS – 3MZ-FE ENGINE MECHANICAL

Main journal diameter (Reference)	Mark 00	60.999 mm (4.4015 in.)
	Mark 01	60.999 mm (4.4015 in.)
	Mark 02	60.998 mm (4.4015 in.)
	Mark 03	60.997 mm (4.4015 in.)
	Mark 04	60.996 mm (4.4014 in.)
	Mark 05	60.995 mm (4.4014 in.)
	Mark 06	60.994 mm (4.4013 in.)
	Mark 07	60.993 mm (4.4012 in.)
	Mark 08	60.992 mm (4.4012 in.)
	Mark 09	60.991 mm (4.4012 in.)
	Mark 10	60.990 mm (4.4012 in.)
	Mark 11	60.989 mm (4.4011 in.)
	Mark 12	60.988 mm (4.4011 in.)
Standard main bearing center wall thickness (Reference)	Mark 1	2.486 to 2.489 mm (0.0979 to 0.0980 in.)
	Mark 2	2.489 to 2.492 mm (0.0980 to 0.0981 in.)
	Mark 3	2.492 to 2.495 mm (0.0981 to 0.0982 in.)
	Mark 4	2.495 to 2.498 mm (0.0982 to 0.0983 in.)
	Mark 5	2.498 to 2.501 mm (0.0983 to 0.0985 in.)
	Mark 6	2.501 to 2.504 mm (0.0985 to 0.0986 in.)
	Mark 7	2.504 to 2.507 mm (0.0986 to 0.0987 in.)
Maximum circle runout		0.06 mm (0.0024 in.)
Main journal diameter		60.988 to 61.000 mm (2.4011 to 2.4016 in.)
Main journal taper and out-of-round		0.02 mm (0.0008 in.)
Crank pin diameter		52.992 to 53.000 mm (2.0863 to 2.0866 in.)
Maximum crank pin taper and out-of-round		0.02 mm (0.0008 in.)
Cylinder block	Maximum warpage	0.05 mm (0.0020 in.)
	Specified cylinder bore diameter	92.000 to 92.132 mm (3.6220 to 3.6272 in.)
Piston	Piston diameter	91.983 to 91.967 mm (3.6202 to 3.6207 in.)
	Specified oil clearance	0.033 to 0.130 mm (0.0013 to 0.0051 in.)
Connecting rod	Maximum misalignment per 100 mm (3.94 in.)	0.05 mm (0.0020 in.) per 100 mm (3.94 in.)
	Maximum rod twist per 100 mm (3.94 in.)	0.15 mm (0.0059 in.) per 100 mm (3.94 in.)
	Bush inside diameter	22.005 to 22.014 mm (0.8663 to 0.8667 in.)
Piston pin	Piston pin diameter	21.997 to 22.006 mm (0.8660 to 0.8664 in.)
	Specified oil clearance	0.005 to 0.050 mm (0.0002 to 0.0020 in.)
Piston ring		
Piston ring groove clearance	No. 1	0.02 to 0.07 mm (0.0008 to 0.0028 in.)
	No. 2	0.02 to 0.06 mm (0.0008 to 0.0024 in.)
	Oil	0.03 to 0.11 mm (0.0011 to 0.0043 in.)
Specified end gap	No. 1	0.30 to 0.95 mm (0.0118 to 0.0031 in.)
	No. 2	0.50 to 1.05 mm (0.0008 to 0.0024 in.)
	Oil (side rail)	0.15 to 1.00 mm (0.0012 to 0.0043 in.)
Connecting rod bolt	Specified diameter	7.0 to 7.3 mm (0.276 to 0.287 in.)
Crankshaft bearing cap set bolt	Specified diameter	7.2 to 7.6 mm (0.283 to 0.299 in.)

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SERVICE SPECIFICATIONS – 2AZ-FE FUEL

2AZ-FE FUEL
SERVICE DATA

Fuel pressure		304 to 343 kPa (3.1 to 3.5 kgf/cm ² , 44 to 50 psi)
Fuel Pressure		147 kPa (1.5 kgf/cm ³ , 21 psi) or more
Fuel injector		
Resistance	at 20 °C (68 °F)	13.4 to 14.2 Ω
Injection volume		76 to 91 cm ² (4.6 to 5.5 cu in.) per 15 seconds
Difference between each cylinder		15 cm ² (0.9 cu in.) or less
Fuel leakage		1 drop or less per 12 minutes
Fuel pump		
Resistance	at 20 °C (68 °F)	0.2 to 0.3 Ω

SS

SERVICE SPECIFICATIONS – 2AZ-FE FUEL

SS-19

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Fuel delivery pipe x Cylinder head	20	204	15
Fuel tank bent tube set plate x Fuel tank assembly	5.9	60	52 in.*lbf
Fuel main tube support x Fuel tank assembly	5.4	55	48 in.*lbf
Fuel tank band sub-assembly No.1 RH x Body	39	400	29
Fuel tank band sub-assembly No.1 LH x Body	39	400	29
Fuel tank protector lower center x Fuel tank assembly	5.4	55	48 in.*lbf
Packing brake cable assembly No.2 x Body	5.4	55	48 in.*lbf
Packing brake cable assembly No.3 x Body	5.4	55	48 in.*lbf
Exhaust pipe assembly center x Exhaust pipe assembly front	56	571	41
Exhaust pipe assembly center x Exhaust pipe assembly tail	56	571	41
Floor panel brace rear x Body	20	199	14

SS

SERVICE SPECIFICATIONS – 3MZ-FE FUEL

SS-19

3MZ-FE FUEL**SERVICE DATA****3MZ-FE:**

Fuel pressure		304 to 343 kPa (3.1 to 3.5 kgf/cm ² , 44 to 50 psi)
Fuel Pressure		147 kPa (1.5 kgf/cm ² , 21 psi) or more
Fuel injector		
Resistance	at 20 °C (68 °F)	13.4 to 14.2 Ω
Injection volume		60 to 73 cm ³ (3.7 to 4.5 cu in.) per 15 seconds
Difference between each cylinder		13 cm ³ (0.8 cu in.) or less
Fuel leakage		1 drop or less per 12 minutes
Fuel pump		
Resistance	at 20 °C (68 °F)	0.2 to 0.3 Ω

SS

SS-20**SERVICE SPECIFICATIONS – 3MZ-FE FUEL****TORQUE SPECIFICATIONS**

Part Tightened	N ^o m	kgf ^o cm	ft. ^o lbf
Fuel delivery pipe sub-assembly x Intake manifold	10	102	7
Fuel delivery pipe No.2 x Intake manifold	10	102	7
Fuel pipe No.2 union bolt x Fuel delivery pipe No.2	33	331	24
Fuel pressure pulsation damper assembly x Fuel delivery pipe sub-assembly	33	331	24
Fuel pipe sub-assembly No.1 x Intake manifold	20	199	14
Surge tank stay No.2 x Intake air surge tank	20	199	14
Surge tank stay No.2 x Cylinder head	20	199	14
Surge tank stay No.1 x Intake air surge tank	20	199	14
Surge tank stay No.1 x Cylinder head	20	199	14
Engine hunger No.1 x Intake air surge tank	20	199	14
Engine hunger No.1 x Cylinder head	20	199	14
Pressure feed tube assembly x Engine hunger No.1	7.8	80	69 in. ^o lbf
Intake air surge tank x Intake manifold	28	286	21
Emission control valve set x Emission control valve bracket	8.0	80	71 in. ^o lbf
Fuel tank bent tube set plate x Fuel tank assembly	5.9	60	52 in. ^o lbf
Fuel main tube support x Fuel tank assembly	5.4	55	48 in. ^o lbf
Fuel tank band sub-assembly No.1 RH x Body	39	400	29
Fuel tank band sub-assembly No.1 LH x Body	39	400	29
Fuel tank protector lower center x Fuel tank assembly	5.4	55	48 in. ^o lbf
Packing brake cable assembly No.2 x Body	5.4	55	48 in. ^o lbf
Packing brake cable assembly No.3 x Body	5.4	55	48 in. ^o lbf
Exhaust pipe assembly center x Exhaust pipe assembly front	56	571	41
Exhaust pipe assembly center x Exhaust pipe assembly tail	56	571	41
Floor panel brace rear x Body	20	199	14

SS

SS-20**SERVICE SPECIFICATIONS – 2AZ-FE EMISSION CONTROL****2AZ-FE EMISSION CONTROL****SERVICE DATA**

VSV for CCV		
Resistance	at 20 °C (68 °F)	25 to 30 Ω
	at 100 °C (212 °F)	32 to 40 Ω
VSV for EVAP		
Resistance	1 - 2	26 to 30 Ω at 20 °C (68 °F)
	1 - Body ground	10 kΩ or higher
	2 - Body ground	10 kΩ or higher
Air fuel ratio sensor		
Resistance	1 (HT) - 2 (+B)	0.8 to 1.4 Ω at 20 °C (68 °F)
	1 (HT) - 2 (+B)	1.8 to 3.2 Ω at 800 °C (1,472 °F)
Heated oxygen sensor (Bank 1 Sensor 2)		
Resistance	1 (HT) - 2 (+B)	11 to 16 Ω at 20 °C (68 °F)
	1 (HT) - 2 (+B)	23 to 32 Ω at 800 °C (1,472 °F)

SS

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Charcoal canister assembly x Body	39.2	400	29
Ventilation valve sub-assembly x Cylinder head cover	19	193	9

SS

SERVICE SPECIFICATIONS – 3MZ-FE EMISSION CONTROL

SS-21

3MZ-FE EMISSION CONTROL

SERVICE DATA

3MZ-FE:

VSV for CCV		
Resistance	at 20 °C (68 °F)	25 to 30 Ω
	at 100 °C (212 °F)	32 to 40 Ω
VSV for EVAP		
Resistance	1 - 2	26 to 30 Ω at 20 °C (68 °F)
	1 - Body ground	10 kΩ or higher
	2 - Body ground	10 kΩ or higher
Air fuel ratio sensor		
Resistance	1 (HT) - 2 (+B)	0.8 to 1.4 Ω at 20 °C (68 °F)
	1 (HT) - 2 (+B)	1.8 to 3.2 Ω at 800 °C (1,472 °F)
Heated oxygen sensor (Bank 1 Sensor 2)		
Resistance	1 (HT) - 2 (+B)	11 to 16 Ω at 20 °C (68 °F)
	1 (HT) - 2 (+B)	23 to 32 Ω at 800 °C (1,472 °F)
Heated oxygen sensor (Bank 2 Sensor 2)		
Resistance	1 (HT) - 2 (+B)	11 to 16 Ω at 20 °C (68 °F)
	1 (HT) - 2 (+B)	23 to 32 Ω at 800 °C (1,472 °F)

SS

SS-22

SERVICE SPECIFICATIONS – 3MZ-FE EMISSION CONTROL

TORQUE SPECIFICATIONS

3MZ-FE:

Part Tightened	N*m	kgf*cm	ft.*lbf
Charcoal canister assembly x Body	39.2	400	29
Ventilation valve sub-assembly x Cylinder head cover	19	193	9

SS

SS-22**SERVICE SPECIFICATIONS – 3MZ-FE INTAKE****3MZ-FE INTAKE****SERVICE DATA**

Intake air control system	VSV ON	Approx. 27.9 kPa (200 mmHg, 7.9 in.Hg)
	VSV OFF	0 kPa (0 mm Hg, 0 in.Hg)
Vacuum switching valve assembly (for IAC valve assembly No.3)	Resistance at 20 °C (68 °F)	37 to 44 Ω
Vacuum switching valve assembly (for IAC valve assembly No.2)	Resistance at 20 °C (68 °F)	33 to 39 Ω

SS

SERVICE SPECIFICATIONS – 3MZ-FE INTAKE

SS-23

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Intake air control valve assembly No.2 x Intake air surge tank	10	102	7

SS

SERVICE SPECIFICATIONS – 2AZ-FE EXHAUST

SS-23

2AZ-FE EXHAUST

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Exhaust pipe damage (A/T) x Exhaust pipe assembly center	19	194	14
Exhaust pipe assembly center x Tail pipe assembly	56	571	41
Floor panel brace rear x Body	19.5	199	14
Exhaust pipe assembly front x Exhaust pipe assembly center	56	571	41
Exhaust pipe assembly front x Exhaust manifold converter sub-assembly	62	632	46
Exhaust pipe assemble front x Exhaust pipe assembly center	56	571	41
Rear exhaust pipe No.1 support bracket x Body	33	337	24
Exhaust pipe support No.4 x Body	33	337	24
Exhaust pipe No.4 support bracket sub-assembly x Body	39	398	29
Exhaust pip No.4 support bracket sub-assembly x Body	22	224	16
Front exhaust pipe No.1 support bracket x Body	33	337	24
Heated oxygen sensor (Bank 1 Sensor 2) x Exhaust pipe assembly front	44	449	32
Front floor heat insulator No.1 x Body	4.9	50	43 in.*lbf
Parking brake cable heat insulator x Body	5.4	55	48 in.*lbf
Tank protector lower center x Body	5.4	55	48 in.*lbf
Main muffler heat insulator x Body	5.9	60	52 in.*lbf

SS

SS-24**SERVICE SPECIFICATIONS – 3MZ-FE EXHAUST**

3MZ-FE EXHAUST

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Exhaust pipe assembly center x Exhaust pipe assembly tail	56	571	41
Exhaust pipe assembly front x Exhaust manifold RH	62	632	46
Exhaust pipe assembly front x Exhaust manifold converter No.2	62	632	46
Exhaust pipe assembly front x Exhaust pipe assembly center	56	571	41
Exhaust pipe No.1 support bracket x Body	33	337	24
Floor panel brace rear x Body	19.5	199	14
Front exhaust pipe No.1 support bracket x Body	33	337	24
Rear exhaust pipe No.1 support bracket x Body	33	337	24
Exhaust pip support No.4 x Body	33	337	24
Exhaust pipe No.4 support bracket sub-assembly x Body	39	398	29
Exhaust pipe No.4 support bracket sub-assembly x Body	22	224	16
Heated oxygen sensor (Bank 1 Sensor 2) x Exhaust pipe assembly front	44	449	32
Heated oxygen sensor (Bank 2 Sensor 2) x Exhaust pipe assembly front	44	449	32
Front floor heat insulator No.1 x Body	4.9	50	43 in.*lbf
Parking brake cable heat insulator x Body	5.4	55	48 in.*lbf
Tank protector lower center x Body	5.4	55	48 in.*lbf
Main muffler heat insulator x Body	5.9	60	52 in.*lbf

SS

2AZ-FE COOLING
SERVICE DATA

Thermostat		
Valve opening temperature		80 to 84 °C (176 to 183 °F)
Valve lift	at 95 °C (203 °F)	10 mm (0.394 in.) or more
Radiator cap sub-assembly		
Specified opening pressure		78 to 122 kPa (0.80 to 1.25 kgf/cm ² , 11.2 to 17.6 psi)
Cooling fan		
Standard amperage	at 20°C (68 °F)	4.9 to 8.5 A

SS

SS-26**SERVICE SPECIFICATIONS – 2AZ-FE COOLING****TORQUE SPECIFICATIONS**

Part Tightened	N*m	kgf*cm	ft.*lbf
Cylinder block drain cock plug x Drain cock	13	130	10
Water pump x Cylinder block	9.0	92	80 in.*lbf
Water pump pulley x Water pump	26	265	19
Water inlet x Cylinder block	9.0	92	80 in.*lbf
Fan assembly w/ motor x Radiator assembly	5.0	51	44 in.*lbf
Radiator support upper x Body	14	142	10
Air cleaner inlet x Body	5.0	51	44 in.*lbf
Oil cooler assembly x Radiator tank lower	8.3	85	73 in.*lbf
Oil cooler pipe x Oil cooler assembly	14.7	150	11

SS

SS-26**SERVICE SPECIFICATIONS – 3MZ-FE COOLING****3MZ-FE COOLING****SERVICE DATA**

Thermostat		
Valve opening temperature		80 to 84 °C (176 to 183 °F)
Valve lift	at 95 °C (203 °F)	10 mm (0.394 in.) or more
Radiator cap sub-assembly		
Specified opening pressure		78 to 122 kPa (0.80 to 1.25 kgf/cm ² , 11.2 to 17.6 psi)
Cooling fan		
Standard amperage	at 20°C (68 °F)	4.9 to 8.5 A

SS

SERVICE SPECIFICATIONS – 3MZ-FE COOLING**SS-27****TORQUE SPECIFICATIONS**

Part Tightened	N*m	kgf*cm	ft.*lbf
Cylinder block drain cock plug x Drain cock	13	130	10
Water pump assembly x Cylinder block	8	82	71 in.*lbf
Timing belt idler sub-assembly No.2 x Cylinder block	43	438	32
Engine mounting bracket RH x Cylinder block	28	286	21
Generator bracket No.2 x Cylinder block	28	286	21
Water inlet x Cylinder block	8	82	71 in.*lbf
Water inlet pipe x Water inlet	20	204	15
Fan assembly w/ motor x Radiator assembly	5.0	51	44 in.*lbf
Radiator support upper x Body	14	142	10
Air cleaner inlet x Body	5.0	51	44 in.*lbf
Oil cooler assembly x Radiator tank lower	8.3	85	74 in.*lbf
Oil cooler pipe x Oil cooler assembly	14.7	150	11

SS

2AZ-FE LUBRICATION

SERVICE DATA

Oil pressure	at idle speed	29 kPa (0.3 kgf*cm ² , 4.3 psi) or more
	at 3,000 rpm	245 to 539 kPa (2.5 to 5.5 kgf*cm ² , 36 to 78 psi) or more
Oil pump	Specified side clearance	0.030 to 0.160 mm (0.0012 to 0.0063 in.)
	Specified tip clearance	0.080 to 0.350 mm (0.0031 to 0.0138 in.)
	Specified body clearance	0.100 to 0.325 mm (0.0039 to 0.0128 in.)

SS

SS-28

SERVICE SPECIFICATIONS – 2AZ-FE LUBRICATION

TORQUE SPECIFICATIONS

Part Tightened		N*m	kgf*cm	ft.*lbf
Oil pressure switch x Cylinder head		15	152	11
Oil drain plug x Oil pan sub-assembly		25	255	18
Oil pump assembly x Cylinder block		19	194	14
Chain tensioner plate x Stiffening crankcase assembly		12	122	9
Oil pump drive sprocket x Oil pump		30	301	22
Chain vibration damper No.1 x Cylinder block		9.0	92	80 in.*lbf
Chain tensioner slipper x Cylinder block		19	194	14
Timing chain cover	Bolt A	9.0	92	80 in.*lbf
	Bolt B	21	214	15
	Bolt C	43	438	32
	Nut	9.0	92	80 in.*lbf
V-ribbed belt tensioner assembly x Timing chain cover		59.5	607	44
Engine mounting bracket RH x Cylinder block		54	551	40
Engine mounting insulator RH	Bolt A	95	969	70
	Bolt B	87	888	64
Steering gear return hose clamp		8.0	80	69 in.*lbf
Engine mounting insulator FR x Engine mounting bracket FR		87	888	64
Engine lateral control rod x Bracket		89	910	66
Oil pan sub-assembly x Stiffening crankcase assembly		9.0	92	80 in.*lbf
Crankshaft position sensor x Timing chain cover		9.0	92	80 in.*lbf
Crankshaft pulley x Crankshaft		170	1,733	125
Ignition coil assembly x Cylinder head		9.0	92	80 in.*lbf
Engine mounting bracket No.2 RH x Timing chain cover		52	531	38
Engine mounting stay No.2 RH x Cylinder head		64	653	47
Engine moving control rod w/ bracket x Fender apron RH		64	653	47
Oil pump cover x Oil pump		8.8	90	78 in.*lbf
Oil pump strainer x Oil pump		8.8	90	78 in.*lbf

3MZ-FE LUBRICATION
SERVICE DATA

Oil pressure	at idle speed	29 kPa (0.3 kgf*cm ² , 4.3 psi) or more
	at 3,000 rpm	245 to 539 kPa (2.5 to 5.5 kgf*cm ² , 36 to 78 psi) or more
Oil pump	Specified side clearance	0.060 to 0.300 mm (0.0024 to 0.0118 in.)
	Specified tip clearance	0.250 to 0.500 mm (0.0098 to 0.0128 in.)
	Specified body clearance	0.030 to 0.150 mm (0.0012 to 0.0059 in.)

SS

SERVICE SPECIFICATIONS – 3MZ-FE LUBRICATION

SS-29

TORQUE SPECIFICATIONS

Part Tightened		N*m	kgf*cm	ft.*lbf
Oil pressure switch x Cylinder block		15	152	11
Oil drain plug x Oil pump sub-assembly No.2		25	255	18
Oil pump assembly x Cylinder block	Bolt A	8.0	82	71 in.*lbf
	Bolt B	20	199	14
	Bolt C	43	439	32
Crankshaft position sensor x Oil pump assembly		8.0	82	71 in.*lbf
Oil pan sub-assembly x Cylinder block	10 mm head	8.0	82	71 in.*lbf
	12 mm head	20	203	15
	14 mm head	37	379	27
Oil strainer sub-assembly x Main bearing cap		8.0	82	71 in.*lbf
Oil pan sub-assembly No.2 x Oil pan sub-assembly No. 1		8.0	82	71 in.*lbf
Engine engine mounting bracket RH	Bolt A	54	550	40
	Bolt B	54	550	40
	Bolt C	43	439	32
Engine mounting insulator RH	Nut A	95	969	70
	Nut B	87	887	64
Engine mounting insulator FR	Bolt A	87	887	64
	Nut B	52	531	38
Oil level gage guide x Cylinder block		8.0	82	71 in.*lbf
Compressor mounting bracket No.1 x Cylinder block		25	250	18
Timing belt idler sub-assembly No.1 x Cylinder block		34	347	25
Compressor and magnetic clutch x Compressor mounting bracket		25	250	18
Generator bracket No.2 x Transverse engine engine mounting bracket		28	286	21
Front suspension brace upper center x Body		80	816	59
Oil pump cover x Oil pump		10	105	8
Oil pump relief valve x Oil pump		49	500	36

SS

SERVICE SPECIFICATIONS – 2AZ-FE IGNITION**SS-29**

2AZ-FE IGNITION

SERVICE DATA

Spark plug		
Recommended spark plug	DENSO	SK20R11
	NGK	IFR6A11
Electrode gap	Standard	1.0 - 1.1 mm (0.039 - 0.043 in.)
	Maximum	1.3 mm (0.051 in.)
Camshaft position sensor		
Resistance	at cold	835 - 1,400 Ω
	at hot	1,060 - 1,645 Ω
Crank position sensor		
Resistance	at cold	985 - 1,600 Ω
	at hot	1,265 - 1,890 Ω

SS

SS-30

SERVICE SPECIFICATIONS – 2AZ-FE IGNITION

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Spark plug x Cylinder head cover	19	194	14
Ignition coil x Cylinder head cover	9.0	92	80 in.*lbf

SS

SS-30**SERVICE SPECIFICATIONS – 3MZ-FE IGNITION****3MZ-FE IGNITION****SERVICE DATA**

Spark plug		
Recommended spark plug	DENSO	SK20R11
	NGK	IFR6A11
Electrode gap	Standard	1.0 - 1.1 mm (0.039 - 0.043 in.)
	Maximum	1.3 mm (0.051 in.)
Camshaft position sensor		
Resistance	at cold	835 - 1,400 Ω
	at hot	1,060 - 1,645 Ω
Crank position sensor		
Resistance	at cold	1,630 - 2,740 Ω
	at hot	2,065 - 3,225 Ω

SS

SERVICE SPECIFICATIONS – 3MZ-FE IGNITION

SS-31

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Spark plug x Cylinder head cover	25	255	18.5
Ignition coil x Cylinder head cover	8.0	82	71 in.*lbf

SS

SERVICE SPECIFICATIONS – 2AZ-FE STARTING

SS-31

2AZ-FE STARTING

SERVICE DATA

Starter assembly		
Specified current		90 A or less at 11.5 V
Starter relay		
Specified condition	3 - 5	10 k Ω or higher
	3 - 5	Below 1 Ω (when battery voltage is applied to terminals 1 and 2)
Starter armature assembly		
Depth	Standard	3.1 mm (0.122 in.)
	Maximum	3.8 mm (0.150 in.)
Starter commutator end frame assembly		
Brush length	Standard	9.0 mm (0.354 in.)
	Minimum	4.0 mm (0.158 in.)
Magnetic switch resistance	Terminal 50 - C	Below 1 Ω
	Terminal 50 - Switch body	Below 2 Ω
Starter armature resistance	Segments	Below 1 Ω
	Commutator - Coil core	10 k Ω or higher

SS

SS-32**SERVICE SPECIFICATIONS – 2AZ-FE STARTING****TORQUE SPECIFICATIONS**

Part Tightened	N ^o m	kgf ^o cm	ft. ^o lbf
Starter x Transaxle housing	39	398	29
Starter wire x Starter assembly	13	130	9
Air cleaner inlet x Body	7.0	71	62 in. ^o lbf
Air cleaner bracket x Body	12	122	9
Air cleaner case sub-assembly x Air cleaner bracket	5.0	51	44 in. ^o lbf
Air cleaner case sub-assembly x Body	5.0	51	44 in. ^o lbf
Air cleaner cap sub-assembly x Air cleaner case sub-assembly	5.0	51	44 in. ^o lbf
Battery clamp sub-assembly x Body	5.5	56	49 in. ^o lbf
Battery clamp sub-assembly x Battery clamp bolt	5.5	56	49 in. ^o lbf
Terminal x Battery	3.5	36	31 in. ^o lbf
Commutator end frame assembly x Starter drive housing assembly	6.0	61	53 in. ^o lbf
Magnetic switch assembly x Starter drive housing assembly	7.5	76	66 in. ^o lbf
Lead wire x Terminal C	10	102	7

SS

SS-32**SERVICE SPECIFICATIONS – 3MZ-FE STARTING****3MZ-FE STARTING****SERVICE DATA**

Starter assembly		
Specified current		90 A or less at 11.5 V
Starter relay		
Specified condition	3 - 5	10 k Ω or higher
	3 - 5	Below 1 Ω (when battery voltage is applied to terminals 1 and 2)
Starter armature assembly		
Depth	Standard	3.1 mm (0.122 in.)
	Maximum	3.8 mm (0.150 in.)
Starter commutator end frame assembly		
Brush length	Standard	9.0 mm (0.354 in.)
	Minimum	4.0 mm (0.158 in.)
Magnetic switch resistance	Terminal 50 - C	Below 1 Ω
	Terminal 50 - Switch body	Below 2 Ω
Starter armature resistance	Segments	Below 1 Ω
	Commutator - Coil core	10 k Ω or higher

SS

SERVICE SPECIFICATIONS – 3MZ-FE STARTING

SS-33

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Starter assembly x Transaxle housing	37	380	26
Starter wire x Starter assembly	9.8	100	7
Air cleaner inlet No.1 x Body	7.0	71	62 in.*lbf
Air cleaner bracket x Body	12	122	9
Air cleaner case sub-assembly x Air cleaner bracket	5.0	51	44 in.*lbf
Air cleaner case sub-assembly x Body	5.0	51	44 in.*lbf
Air cleaner cap sub-assembly x Air cleaner case sub-assembly	5.0	51	44 in.*lbf
Air cleaner inlet No.2 x Body	7.0	71	62 in.*lbf
Battery clamp sub-assembly x Body	5.5	56	49 in.*lbf
Battery clamp sub-assembly x Battery clamp bolt	5.5	56	49 in.*lbf
Terminal x Battery	3.5	36	31 in.*lbf
Commutator end frame assembly x Starter drive housing assembly	6.0	61	53 in.*lbf
Magnetic switch assembly x Starter drive housing assembly	7.5	76	66 in.*lbf
Lead wire x Terminal C	10	102	7

SS

2AZ-FE CHARGING

SERVICE DATA

Voltage regulator	Regulating voltage	13.2 to 14.8 V
	Standard amperage	10 A or less
Generator brush holder assembly		
Brush length	Standard	10.5 mm (0.413 in.)
	Minimum	4.5 mm (0.177 in.)
Generator rotor assembly		
Open circuit	Resistance	2.3 to 2.7 Ω at 20 °C (68 °F)
Slip ring diameter	Standard	14.2 to 14.4 mm (0.559 to 0.567 in.)
	Minimum	14.0 mm (0.551 in.)

SS

SS-34**SERVICE SPECIFICATIONS – 2AZ-FE CHARGING****TORQUE SPECIFICATIONS**

Part Tightened		N ^o m	kgf ^o cm	ft. ^o lbf
Generator assembly x Engine	M8	21	214	15
	M10	52	530	38
Wiring harness clamp		9	92	80 in. ^o lbf
Generator wire x Generator assembly		9.8	100	7
Retainer plate x Drive end frame assembly generator		2.3	23	20 in. ^o lbf
Generator rectifier end frame x Drive end frame assembly generator		5.8	59	51 in. ^o lbf
Generator brush holder assembly Generator rectifier end frame		1.8	18	16 in. ^o lbf
Generator rear end cover x Generator rectifier end frame		4.6	47	41 in. ^o lbf
Generator pulley x Generator rotor assembly		110	1,122	81

SS

SS-34**SERVICE SPECIFICATIONS – 3MZ-FE CHARGING****3MZ-FE CHARGING****SERVICE DATA**

Voltage regulator	Regulating voltage	13.2 to 14.8 V
	Standard amperage	10 A or less
Generator brush holder assembly		
Brush length	Standard	10.5 mm (0.413 in.)
	Minimum	4.5 mm (0.177 in.)
Generator rotor assembly		
Open circuit	Resistance	2.3 to 2.7 Ω at 20 °C (68 °F)
Slip ring diameter	Standard	14.2 to 14.4 mm (0.559 to 0.567 in.)
	Minimum	14.0 mm (0.551 in.)

SS

SERVICE SPECIFICATIONS – 3MZ-FE CHARGING**SS-35****TORQUE SPECIFICATIONS**

Part Tightened	N*m	kgf*cm	ft.*lbf
Generator assembly x Generator bracket No.1	58	592	43
Generator assembly x Generator belt adjusting bar	18	184	13
Generator wire x Generator assembly	9.8	100	7
Retainer plate x Drive end frame assembly generator	2.3	23	20 in.*lbf
Generator rectifier end frame x Drive end frame assembly generator	5.8	59	51 in.*lbf
Generator brush holder assembly x Generator rectifier end frame	1.8	18	16 in.*lbf
Generator rear end cover x Generator rectifier end frame	4.6	47	41 in.*lbf
Generator pulley x Generator rotor assembly (100A Generator)	111	1,127	82

SS

SERVICE SPECIFICATIONS – U151E AUTOMATIC TRANSAXLE

SS-39

TORQUE SPECIFICATIONS

Part Tightened		N*m	kgf*cm	ft.*lbf
Park/neutral position switch	Bolt	5.4	55	48 in.*lbf
	Nut	6.9	70	61 in.*lbf
Control shaft lever x Control shaft		13	130	9
Shift control cable x Control shaft lever		15	153	11
Transaxle housing x Engine block	Bolt A	64	650	47
	Bolt B	44	449	32
	Bolt C	37	377	27
Torque converter clutch x Drive plate		41	418	30
Engine mounting bracket FR x Tranaxle		64	653	47
Oil Filler tube x Transaxle		5.5	56	49 in.*lbf
Control cable bracket No.1 x Transaxle		12	122	9
Control cable bracket No.2 x Transaxle		12	122	9
Oil cooler tube clamp x Control cable bracket		5.4	55	48 in.*lbf
Oil cooler inlet tube x Transaxle		34	347	25
Oil cooler outlet tube x Transaxle		34	347	25
Starter x Transaxle		37	377	27
Wire harness x Transaxle		13	139	9
Wire harness clamp x Transaxle		8.4	86	74 in.*lbf
Speed sensor (NC) x Transaxle		11	115	8
Speed sensor (NT) x Transaxle		11	115	8
Drain plug x Oil pan		49	500	36
Transmission wire x Transaxle		5.4	55	48 in.*lbf
ATF temperature sensor x Valve body		6.6	67	58 in.*lbf
Oil pan x Transaxle		7.8	80	69 in.*lbf
Solenoid valve x Valve body	A, B bolt	11	110	8
	C, D bolt	6.6	67	58 in.*lbf
Valve body x Transaxle		11	110	8
Oil strainer x Valve body		11	110	8
Floor shift assembly x Body		12	122	9
Control cable x Body		5.0	50	43 in.*lbf
differential gear lube apply tube x Transaxle housing		9.8	100	87 in.*lbf
Front planetary gear lock nut		210 to 350	2,141 to 3,569	155 to 258
Brake apply tube clamp x Transaxle case		5.4	55	48 in.*lbf
Transaxle case No.1 plug x Trasaxle rear cover		7.4	75	65 in.*lbf
Transaxle rear cover x Transaxle case	Bolt A	19	190	14
	Other bolt	25	250	18
Pawl shaft clamp x Tranaxle case		9.8	100	87 in.*lbf
Oil pump assembly x Transaxle case		22	250	16
Transaxle housing x Transaxle case	Bolt A	25	255	18
	Bolt B	33	337	24
	Bolt C	29	295	21
	Bolt D	22	226	16
Automatic transmission case plug x Transaxle housing		7.4	75	65 in.*lbf
Automatic transmission case plug x Transaxle case		7.4	75	65 in.*lbf
Parking lock pawl bracket x Transaxle case		20	205	15
Manual detent spring x Transaxle case	Bolt A	20	205	15
	Bolt B	12	120	9
Transmission wire x Transaxle housing		5.4	55	48 in.*lbf

SS

SS-40**SERVICE SPECIFICATIONS – U151E AUTOMATIC TRANSAXLE**

Part Tightened		N*m	kgf*cm	ft.*lbf
Transmission valve body x Transaxle case		11	110	8
ATF temperature sensor clamp x Transmission valve body		6.6	67	58 in.*lbf
Valve body oil strainer assembly x Transmission valve body		11	110	8
Oil cooler tube union x Transaxle case	Union	25	255	18
	Elbow	27	276	20
Speedometer driven hole cover sub-assembly x Transaxle case		6.9	70	61 in.*lbf
Oil pump body x Stator shaft assembly		9.8	100	87 in.*lbf
Line pressure control solenoid assembly x Transmission valve body assembly		6.6	67	58 in.*lbf
Shift solenoid valve SL1 x Transmission valve body assembly		6.6	67	58 in.*lbf
Shift solenoid valve SL2 x Transmission valve body assembly		10.8	110	8
Shift solenoid valve SL3 x Transmission valve body assembly		6.6	67	58 in.*lbf
Shift solenoid valve S4 x Transmission valve body assembly		10.8	110	8
Shift solenoid valve DSL x Transmission valve body assembly		10.8	110	8
Front differential case x Front differential ring gear		95.1	970	70

SS

SERVICE SPECIFICATIONS – U151E AUTOMATIC TRANSAXLE

SS-35

U151E AUTOMATIC TRANSAXLE

SERVICE DATA

Line pressure (Wheel locked)		
Engine idling	D position	372 to 412 kPa (3.8 to 4.2 kgf*cm ² , 54 to 60 psi)
	R position	672 to 742 kPa (6.9 to 7.6 kgf*cm ² , 97 to 108 psi)
AT stall (Throttle valve fully opened)	D position	931 to 1,031 kPa (9.5 to 10.5 kgf*cm ² , 135 to 150 psi)
	R position	1,768 to 1,968 kPa (18.0 to 20.0 kgf*cm ² , 256 to 285 psi)
Engine stall revolution	D and R position	2,240 +- 150 rpm
Time lag	N → D position	Less than 1.2 second
	N → R position	Less than 1.5 second
Engine idle speed (A/C OFF)	N position	650 +- 50 rpm
Drive plate runout	Maximum	0.20 mm (0.0079 in.)
Torque converter runout	Maximum	0.30 mm (0.0118 in.)
Differential oil seal drive in depth	LH side	0 +- 0.5 mm (0 +- 0.020 in.)
	RH side	0 +- 0.5 mm (0 +- 0.020 in.)
Shift schedule (Shift lever with Multi-mode automatic transmission)		
D position		
(Throttle valve fully opened)	1 → 2	40 to 47 km/h (25 to 29 mph)
	2 → 3	80 to 88 km/h (50 to 55 mph)
	3 → 4	131 to 143 km/h (80 to 88 mph)
	4 → 5	190 to 204 km/h (119 to 128 mph)
	5 → 4	183 to 197 km/h (114 to 123 mph)
	4 → 3	126 to 139 km/h (78 to 86 mph)
	3 → 2	76 to 83 km/h (47 to 52 mph)
	2 → 1	35 to 41 km/h (22 to 26 mph)
(Throttle valve fully closed)	4 → 5	44 to 51 km/h (28 to 32 mph)
	5 → 4	35 to 40 km/h (22 to 25 mph)
Lock-up point (Throttle valve opening 5%)		
D position		
5th gear	Lock-up ON	71 to 78 km/h (44 to 49 mph)
	Lock-up OFF	70 to 76 km/h (43 to 48 mph)
4th gear	Lock-up ON	98 to 106 km/h (61 to 66 mph)
	Lock-up OFF	95 to 102 km/h (59 to 64 mph)
Oil pump		
Body clearance	STD	0.10 to 0.17 (0.0039 to 0.0067 in.)
	Maximum	0.17 mm (0.0067 in.)
Tip clearance	STD	0.07 to 0.15 mm (0.0028 to 0.0059 in.)
	Maximum	0.15 mm (0.0059 in.)
Side clearance	STD	0.02 to 0.05 mm (0.0008 to 0.0020 in.)
	Maximum	0.05 mm (0.0020 in.)
Drive gear thickness	Mark A	11.690 to 11.699 mm (0.4602 to 0.4606 in.)
	Mark B	11.700 to 11.709 mm (0.4606 to 0.4610 in.)
	Mark C	11.710 to 11.720 mm (0.4610 to 0.4614 in.)
	Mark D	11.721 to 11.730 mm (0.4615 to 0.4618 in.)
	Mark E	11.731 to 11.740 mm (0.4619 to 0.4622 in.)

SS

SS-36

SERVICE SPECIFICATIONS – U151E AUTOMATIC TRANSAXLE

Driven gear thickness	Mark A	11.690 to 11.699 mm (0.4602 to 0.4606 in.)
	Mark B	11.700 to 11.709 mm (0.4606 to 0.4610 in.)
	Mark C	11.710 to 11.720 mm (0.4610 to 0.4614 in.)
	Mark D	11.721 to 11.730 mm (0.4615 to 0.4618 in.)
	Mark E	11.731 to 11.740 mm (0.4619 to 0.4622 in.)
Pump body bushing inside diameter	STD	38.113 to 38.138 mm (1.50050 to 1.50149 in.)
	Maximum	38.188 mm (1.50346 in.)
Stator shaft bushing inside diameter	STD	21.500 to 21.526 mm (0.84646 to 0.84748 in.)
	Maximum	21.57 mm (0.8492 in.)
Multiple disc clutch		
Inside diameter	STD	23.025 to 23.045 mm (0.9065 to 0.9073 in.)
	Maximum	23.09 mm (0.9091 in.)
Forward clutch		
Pack clearance		1.00 to 1.25 mm (0.0394 to 0.4921 in.)
Return spring free length		26.74 mm (1.0528 in.)
Flange thickness	Mark 1	3.00 mm (0.1181 in.)
	Mark 2	3.15 mm (0.1240 in.)
	Mark 3	3.30 mm (0.1299 in.)
	Mark 4	3.45 mm (0.1358 in.)
	Mark 5	3.60 mm (0.1417 in.)
Reverse clutch		
Pack clearance		0.60 to 0.82 mm (0.02362 to 0.03228 in.)
Flange thickness	Mark 1	3.0 mm (0.118 in.)
	Mark 2	3.1 mm (0.122 in.)
	Mark 3	3.2 mm (0.126 in.)
	Mark 4	3.3 mm (0.130 in.)
	Mark 5	3.4 mm (0.134 in.)
	Mark 6	3.5 mm (0.138 in.)
	Mark 7	3.6 mm (0.142 in.)
Direct clutch and O/D clutch		
Pack clearance		0.61 to 0.83 mm (0.02401 to 0.03268 in.)
Return spring free length		25.91 mm (1.0201 in.)
Flange thickness	Mark 0	2.5 mm (0.098 in.)
	Mark 1	2.6 mm (0.102 in.)
	Mark 2	2.7 mm (0.106 in.)
	Mark 3	2.8 mm (0.110 in.)
	Mark 4	2.9 mm (0.114 in.)
	Mark 5	3.0 mm (0.118 in.)
	Mark 6	3.1 mm (0.122 in.)
2nd brake		
Pack clearance		0.62 to 0.91 mm (0.0244 to 0.0358 in.)
Return spring free length		16.61 mm (0.6539 in.)
Flange thickness	Mark 1	3.0 mm (0.118 in.)
	Mark 2	3.1 mm (0.122 in.)
	Mark 3	3.2 mm (0.126 in.)
	Mark 4	3.3 mm (0.130 in.)
	Mark 5	3.4 mm (0.134 in.)
	Mark 6	3.5 mm (0.138 in.)
	Mark 7	3.6 mm (0.142 in.)
U/D clutch		

SERVICE SPECIFICATIONS – U151E AUTOMATIC TRANSAXLE**SS-37**

Pack clearance		1.51 to 1.71 mm (0.0594 to 0.0673 in.)
U/D clutch drum bushing inside diameter	STD	37.06 to 37.08 mm (1.4591 to 1.4598 in.)
	Maximum	37.13 mm (1.4618 in.)
Return spring free length		17.14 mm (0.6752 in.)
Flange thickness	Mark 1	3.0 mm (0.118 in.)
	Mark 2	3.1 mm (0.122 in.)
	Mark 3	3.2 mm (0.126 in.)
	Mark 4	3.3 mm (0.130 in.)
	Mark 5	3.4 mm (0.134 in.)
U/D brake		
Pack clearance		1.81 to 2.20 mm (0.0713 to 0.0866 in.)
Return spring free length		14.04 mm (0.5528 in.)
Flange thickness	Mark 1	3.0 mm (0.118 in.)
	Mark 2	3.2 mm (0.126 in.)
	Mark 3	3.4 mm (0.134 in.)
1st and reverse brake		
Pack clearance		1.16 to 1.35 mm (0.0457 to 0.0531 in.)
Return spring free length		15.53 mm (0.6114 in.)
Flange thickness	Mark 1	1.8 mm (0.071 in.)
	Mark 2	1.9 mm (0.075 in.)
	Mark 3	2.0 mm (0.079 in.)
	Mark 4	2.1 mm (0.083 in.)
	Mark 5	2.2 mm (0.087 in.)
	Mark 6	2.3 mm (0.091 in.)
	Mark 7	2.4 mm (0.094 in.)
	Mark 8	2.5 mm (0.098 in.)
U/D planetary gear		
Preload (at 60 rpm)		0.50 to 1.42 N*m (5.1 to 14.5 kgf*cm, 4.4 to 12.6 in.*lbf)
Front planetary gear		
Turning torque (at 60 rpm)	New bearing	0.51 to 1.02 N*m (5.1 to 10.0 kgf*cm, 4.4 to 8.7 in.*lbf)
	Used bearing	0.26 to 0.51 N*m (2.7 to 5.2 kgf*cm, 2.3 to 4.5 in.*lbf)
Input shaft		
End play		0.262 to 1.249 mm (0.01303 to 0.0492 in.)
Transaxle rear cover		
Bearing press fit depth		20.55 to 21.25 mm (0.8091 to 0.8366 in.)
Transmission valve body		
Valve body installation bolt length	A	41 mm (1.614 in.)
	B	57 mm (2.244 in.)
	C	25 mm (0.984 in.)
Front differential		
Backlash		0.05 to 0.220 mm (0.0020 to 0.0079 in.)
Thrust washer thickness	Mark -	16.25 mm (0.0640 in.)
	Mark -	1.725 mm (0.0679 in.)
	Mark -	1.825 mm (0.0719 in.)
Preload (at 60 rpm)	New bearing	0.20 to 0.69 N*m (2.0 to 7.0 kgf*cm, 1.8 to 6.1 in.*lbf)
	Used bearing	0.10 to 0.35 N*m (1.0 to 3.6 kgf*cm, 0.9 to 3.1 in.*lbf)

SS

SS-38**SERVICE SPECIFICATIONS – U151E AUTOMATIC TRANSAXLE**

SS Flange thickness	Mark 0	2.00 mm (0.0787 in.)
	Mark 1	2.05mm (0.0807 in.)
	Mark 2	2.10 mm (0.0827 in.)
	Mark 3	2.15 mm (0.0846 in.)
	Mark 4	2.20 mm (0.0866 in.)
	Mark 5	2.25 mm (0.0886 in.)
	Mark 6	2.30 mm (0.0906 in.)
	Mark 7	2.35 mm (0.0925 in.)
	Mark 8	2.40 mm (0.0945 in.)
	Mark 9	2.45 mm (0.0965 in.)
	Mark A	2.50 mm (0.0984 in.)
	Mark B	2.55 mm (0.1004 in.)
	Mark C	2.60 mm (0.1024 in.)
	Mark D	2.65 mm (0.1043 in.)
	Mark E	2.70 mm (0.1063 in.)
	Mark F	2.75 mm (0.1083 in.)
	Mark G	2.80 mm (0.1102 in.)
	Mark H	2.85 mm (0.1122 in.)

Accumulator			
Spring		Free length/Outer diameter	Color
B-3	Inner	62.00 (2.4409)/15.50 (0.610)	Purple
	Outer	74.23 (2.9224)/16.5 (0.649)	Purple
C-2		60.96 (2.3999)/(14.10 (0.555)	Yellow
C-3		72.20 (2.8425)/19.0 (0.748)	colorless

SERVICE SPECIFICATIONS – U250E AUTOMATIC TRANSAXLE

SS-45

TORQUE SPECIFICATIONS

Part Tightened		N*m	kgf*cm	ft.*lbf
Park/neutral position switch	Bolt	5.4	55	48 in.*lbf
	Nut	6.9	70	61 in.*lbf
Control shaft lever x Control shaft		13	130	9
Shift control cable x Control shaft lever		15	153	11
Transaxle housing x Engine block	Bolt A	64	653	47
	Bolt B	44	449	32
	Bolt C	46	470	34
Torque converter clutch x Drive plate		41	418	30
Engine mounting bracket FR x Transaxle		64	653	47
Oil Filler tube x Transaxle		5.5	56	49 in.*lbf
Control cable bracket No.1 x Transaxle		12	122	9
Control cable bracket No.2 x Transaxle		12	122	9
Oil cooler tube clamp x Control cable bracket		5.4	55	48 in.*lbf
Oil cooler inlet tube x Transaxle		34	350	25
Oil cooler outlet tube x Transaxle		34	350	25
Starter x Transaxle		37	377	27
Starter wire x Starter		9.8	100	87 in.*lbf
Wire harness x Transaxle		13	139	9
Control cable clamp x Transaxle		12	122	9
Wire harness clamp x Transaxle		8.4	86	74 in.*lbf
Revolution sensor NC sensor x Transaxle		5.5	56	49 in.*lbf
Revolution sensor NT sensor x Transaxle		11	110	8
Drain plug x Oil pan		49	500	36
Transmission wire x Transaxle		5.4	55	48 in.*lbf
ATF temperature sensor x Valve body		6.6	67	58 in.*lbf
Oil pan x Transaxle		7.8	80	69 in.*lbf
Solenoid valve x Valve body	Bolt A, B	11	110	8
	Bolt C, D	6.6	67	58 in.*lbf
Valve body x Transaxle		11	110	8
Oil strainer x Valve body		11	110	8
Floor shift assembly x Body		12	122	9
Control cable x Body		5.0	50	43 in.*lbf
Differential gear lube apply tube x Transaxle housing		9.8	100	87 in.*lbf
Front planetary gear lock nut		185 to 350	1,886 to 3,569	136 to 258
Brake apply tube clamp x Transaxle case		5.4	55	48 in.*lbf
Transaxle case No.1 plug x Transaxle rear cover		7.4	75	65 in.*lbf
Transaxle case No.1 plug x Transaxle housing		7.4	75	65 in.*lbf
Transaxle case No.1 plug x Transaxle case		7.4	75	65 in.*lbf
Transaxle rear cover x Transaxle case	Bolt A	19	190	14
	Other bolt	25	250	18
Pawl shaft clamp x Transaxle case		9.8	100	87 in.*lbf
Oil pump assembly x Transaxle case		22	225	16
Transaxle housing x Transaxle case	Bolt A	22	225	16
	Bolt B	29	296	21
	Bolt C	29	296	21
Parking lock pawl bracket x Transaxle case		20	205	15
Manual detent spring x Transaxle case	Bolt A	20	205	15
	Bolt B	12	120	9

SS

SS-46**SERVICE SPECIFICATIONS – U250E AUTOMATIC TRANSAXLE**

Part Tightened		N*m	kgf*cm	ft.*lbf
Transmission wire x Transaxle housing		5.4	55	48 in.*lbf
Transmission valve body x Transaxle case		11	110	8
ATF temperature sensor clamp x Transmission valve body		6.6	67	58 in.*lbf
Valve body oil strainer assembly x Transmission valve body		11	110	8
Speed sensor x Transaxle case	Bolt A	8.8	90	79 in.*lbf
	Bolt B	11	115	8
Oil pump body x Stator shaft assembly		9.8	100	87 in.*lbf
Line pressure control solenoid assembly x Transmission valve body assembly		6.6	67	58 in.*lbf
Shift solenoid valve SL1 x Transmission valve body assembly		6.6	67	58 in.*lbf
Shift solenoid valve SL2 x Transmission valve body assembly		10.8	110	8
Shift solenoid valve SL3 x Transmission valve body assembly		6.6	67	58 in.*lbf
Shift solenoid valve S4 x Transmission valve body assembly		10.8	110	8
Shift solenoid valve DSL x Transmission valve body assembly		10.8	110	8
Front differential case x Front differential ring gear		95.1	970	70
Front planetary gear nut		280	2,855	207

SS

SS-40

SERVICE SPECIFICATIONS – U250E AUTOMATIC TRANSAXLE

U250E AUTOMATIC TRANSAXLE

SERVICE DATA

Line pressure (Wheel locked)		
Engine idling	D position	372 to 412 kPa (3.8 to 4.2 kgf*cm ² , 54 to 60 psi)
	R position	672 to 742 kPa (6.8 to 7.5 kgf*cm ² , 97 to 108 psi)
AT stall (Throttle valve fully opened)	D position	931 to 1,031 kPa (9.5 to 10.5 kgf*cm ² , 135 to 150 psi)
	R position	1,768 to 1,968 kPa (18.0 to 20.0 kgf*cm ² , 256 to 285 psi)
Engine stall revolution	D position	2,350 +/- 150 rpm
Time lag	N → D position	Less than 1.2 second
	N → R position	Less than 1.5 second
Engine idle speed (A/C OFF)	N position	700 +/- 50 rpm
Drive plate runout	Maximum	0.20 mm (0.0079 in.)
Torque converter runout	Maximum	0.30 mm (0.0118 in.)
Differential oil seal drive in depth	LH side	0 +/- 0.5 mm (0 +/- 0.020 in.)
	RH side	0 +/- 0.5 mm (0 +/- 0.020 in.)
Shift schedule		
D position		
Throttle valve fully open	1 → 2	45 to 53 km/h (28 to 33 mph)
	2 → 3	87 to 97 km/h (54 to 60 mph)
	3 → 4	137 to 153 km/h (85 to 95 mph)
	4 → 5	196 to 215 km/h (122 to 134 mph)
	5 → 4	189 to 208 km/h (117 to 129 mph))
	4 → 3	129 to 144 km/h (80 to 89 mph)
	3 → 2	79 to 88 km/h (49 to 55 mph)
	2 → 1	32 to 38 km/h (20 to 24 mph)
Throttle valve fully closed	4 → 5	66 to 74 km/h (41 to 46 mph)
	5 → 4	35 to 42 km/h (22 to 26 mph)
3 position		
Throttle valve fully open	1 → 2	45 to 53 km/h (28 to 33 mph)
	2 → 3	87 to 97 km/h (54 to 60 mph)
	4 → 3	137 to 153 km/h (85 to 95 mph)
	3 → 2	79 to 88 km/h (49 to 55 mph)
	2 → 1	32 to 38 km/h (20 to 24 mph)
2 position		
Throttle valve fully open	1 → 2	45 to 53 km/h (28 to 33 mph)
	3 → 2	87 to 97 km/h (54 to 60 mph)
	2 → 1	32 to 38 km/h (20 to 24 mph)
L position		
Throttle valve fully open	2 → 1	39 to 45 km/h (24 to 28 mph)
Lock-up point (Throttle valve opening 5%)		
D position		
5th gear	Lock-up ON	74 to 83 km/h (46 to 52 mph)
	Lock-up OFF	73 to 81 km/h (45 to 50 mph)
4th gear	Lock-up ON	74 to 83 km/h (46 to 52 mph)
	Lock-up OFF	73 to 81 km/h (45 to 50 mph)
Flex lock-up point (Throttle valve opening 5%)		
D position		

SERVICE SPECIFICATIONS – U250E AUTOMATIC TRANSAXLE**SS-41**

5th gear	Lock-up ON	55 to 62 km/h (34 to 39 mph)
	Lock-up OFF	54 to 62 km/h (32 to 39 mph)
4th gear	Lock-up ON	39 to 47 km/h (24 to 29 mph)
	Lock-up OFF	39 to 45 km/h (24 to 28 mph)
Oil pump		
Body clearance	STD	0.10 to 0.17 mm (0.0039 to 0.0067 in.)
	Maximum	0.17 mm (0.0067 in.)
Tip clearance	STD	0.07 to 0.15 mm (0.0028 to 0.0059 in.)
	Maximum	0.15 mm (0.0059 in.)
Side clearance	STD	0.02 to 0.05 mm (0.0008 to 0.0020 in.)
	Maximum	0.05 mm (0.0020 in.)
Drive gear thickness	Mark A	11.690 to 11.699 mm (0.4602 to 0.4606 in.)
	Mark B	11.700 to 11.709 mm (0.4606 to 0.4610 in.)
	Mark C	11.710 to 11.720 mm (0.4610 to 0.4614 in.)
	Mark D	11.721 to 11.730 mm (0.4615 to 0.4618 in.)
	Mark E	11.731 to 11.740 mm (0.4619 to 0.4622 in.)
Driven gear thickness	Mark A	11.690 to 11.699 mm (0.4602 to 0.4606 in.)
	Mark B	11.700 to 11.709 mm (0.4606 to 0.4610 in.)
	Mark C	11.710 to 11.720 mm (0.4610 to 0.4614 in.)
	Mark D	11.721 to 11.730 mm (0.4615 to 0.4618 in.)
	Mark E	11.731 to 11.740 mm (0.4619 to 0.4622 in.)
Pump body bushing inside diameter	STD	38.113 to 38.138 mm (1.50050 to 1.50149 in.)
	Maximum	38.188 mm (1.50346 in.)
Stator shaft bushing inside diameter	STD	21.500 to 21.526 mm (0.84646 to 0.84748 in.)
	Maximum	21.57 mm (0.8492 in.)
Multiple disc clutch hub		
Inside diameter	STD	23.025 to 23.046 mm (0.9065 to 0.9073 in.)
	Maximum	23.09 mm (0.9091 in.)
Over direct clutch drum sub-assembly		
Inside diameter	STD	23.025 to 23.046 mm (0.9065 to 0.9073 in.)
	Maximum	23.09 mm (0.9091 in.)
Forward clutch		
Pack clearance		0.85 to 1.25 mm (0.0335 to 0.0492 in.)
Return spring free length		26.74 mm (1.0528 in.)
Flange thickness	Mark 0	2.85 mm (0.1122 in.)
	Mark 1	3.00 mm (0.1181 in.)
	Mark 2	3.15 mm (0.1240 in.)
	Mark 3	3.30 mm (0.1299 in.)
	Mark 4	3.45 mm (0.1358 in.)
	Mark 5	3.60 mm (0.1417 in.)
	Mark 6	3.75 mm (0.1476 in.)
Reverse clutch		
Pack clearance		0.60 to 0.82 mm (0.02362 to 0.03228 in.)

SS

SS-42

SERVICE SPECIFICATIONS – U250E AUTOMATIC TRANSAXLE

Flange thickness	Mark 0	2.9 mm (0.114 in.)
	Mark 1	3.0 mm (0.118 in.)
	Mark 2	3.1 mm (0.122 in.)
	Mark 3	3.2 mm (0.126 in.)
	Mark 4	3.3 mm (0.130 in.)
	Mark 5	3.4 mm (0.134 in.)
	Mark 6	3.5 mm (0.138 in.)
	Mark 7	3.6 mm (0.142 in.)
Direct clutch and O/D clutch		
Pack clearance		0.52 mm (0.02047 in.)
Return spring free length		25.91 mm (1.0201 in.)
Flange thickness	Mark 0	2.5 mm (0.098 in.)
	Mark 1	2.6 mm (0.102 in.)
	Mark 2	2.7 mm (0.106 in.)
	Mark 3	2.8 mm (0.110 in.)
	Mark 4	2.9 mm (0.114 in.)
	Mark 5	3.0 mm (0.118 in.)
	Mark 6	3.1 mm (0.122 in.)
2nd brake		
Pack clearance		0.53 to 0.91 mm (0.0209 to 0.0358 in.)
Return spring free length		16.61 mm (0.6539 in.)
Flange thickness	Mark 0	2.9 mm (0.114 in.)
	Mark 1	3.0 mm (0.118 in.)
	Mark 2	3.1 mm (0.122 in.)
	Mark 3	3.2 mm (0.126 in.)
	Mark 4	3.3 mm (0.130 in.)
	Mark 5	3.4 mm (0.134 in.)
	Mark 6	3.5 mm (0.138 in.)
	Mark 7	3.6 mm (0.142 in.)
	Mark 8	3.7 mm (0.146 in.)
2nd brake piston		
Inside diameter		More than 167 mm (6.57 in.)
U/D clutch		
Pack clearance		1.42 to 1.71 mm (0.0559 to 0.0673 in.)
U/D clutch drum bushing inside diameter	STD	32.56 to 32.58 mm (1.2818 to 1.2826 in.)
	Max.	32.68 mm (1.2846 in.)
Return spring free length		17.14 mm (0.6752 in.)
Flange thickness	Mark K	2.9 mm (0.114 in.)
	Mark A	3.0 mm (0.118 in.)
	Mark G	3.1 mm (0.122 in.)
	Mark B	3.2 mm (0.126 in.)
	Mark H	3.3 mm (0.130 in.)
	Mark C	3.4 mm (0.134 in.)
	Mark J	3.5 mm (0.138 in.)
U/D clutch No. 2		
Pack clearance		1.645 to 2.20 mm (0.0648 to 0.0866 in.)
Return spring free length		13.24 mm (0.5213 in.)

SERVICE SPECIFICATIONS – U250E AUTOMATIC TRANSAXLE

SS-43

Flange thickness	Mark Y	2.8 mm (0.110 in.)
	Mark A	3.0 mm (0.118 in.)
	Mark B	3.2 mm (0.126 in.)
	Mark C	3.4 mm (0.134 in.)
	Mark D	3.6 mm (0.142 in.)
1st & reverse brake		
Pack clearance		0.745 to 1.21 mm (0.0293 to 0.0476 in.)
Return spring free length		17.63 mm (0.6941 in.)
Flange thickness	Mark 1	1.8 mm (0.071 in.)
	Mark 2	1.9 mm (0.075 in.)
	Mark 3	2.0 mm (0.079 in.)
	Mark 4	2.1 mm (0.083 in.)
	Mark 5	2.2 mm (0.087 in.)
	Mark 6	2.3 mm (0.091 in.)
	Mark 7	2.4 mm (0.094 in.)
	Mark 8	2.5 mm (0.098 in.)
U/D planetary gear		
Preload (at 60 rpm)		0.28 to 0.89 N*m (2.9 to 9.1 kgf*cm, 2.478 to 7.877 in.*lbf)
Front planetary gear		
Turning torque (at 60 rpm)		0.19 to 0.4 N*m (1.9 to 4.1 kgf*cm, 1.7 to 3.5 in.*lbf)
Input shaft		
End play		0.262 to 1.249 mm (0.0103 to 0.0492 in.)
Direct clutch to transaxle rear cover		
End play		0.199 to 0.970 mm (0.0078 to 0.0382 in.)
U/D planetary gear assembly to U/D cylindrical roller bearing		
End play		0.198 to 0.693 mm (0.00780 to 0.02728 in.)
Race thickness	Less than 7.339 mm (9.2890 in.)	3.5 mm (0.138 in.)
	7.339 mm (0.2890 in.) or more	3.8 mm (0.150 in.)
Transaxle rear cover		
Bearing press fit depth		20.55 to 21.25 mm (0.8091 to 0.8366 in.)
Transmission valve body		
Valve body installation bolt length	A	25 mm (0.984 in.)
	B	57 mm (2.244 in.)
	C	41 mm (1.614 in.)
Manual valve lever shaft oil seal		
Oil seal drive depth		-0.5 to 0.5 mm (-0.0197 to 0.0197 in.)
Front differential		
Backlash		0.05 to 0.20 mm (0.0020 to 0.0079 in.)
Thrust washer thickness	Mark 1	1.000 mm (0.0394 in.)
	Mark 2	1.100 mm (0.0433 in.)
	Mark 3	1.200 mm (0.0472 in.)
	Mark 4	1.3 mm (0.0512 in.)
Preload (at 60 rpm)	New bearing	0.20 to 1.0 N*m (2.0 to 10.2 kgf*cm, 1.8 to 8.9 in.*lbf)
	Used bearing	0.10 to 0.35 N*m (1.0 to 3.6 kgf*cm, 0.9 to 3.1 in.*lbf)

SS

SS-44**SERVICE SPECIFICATIONS – U250E AUTOMATIC TRANSAXLE**

SS Flange thickness	Mark 0	1.90 mm (0.0748 in.)
	Mark 1	1.95 mm (0.0768 in.)
	Mark 2	2.00 mm (0.0787 in.)
	Mark 3	2.05 mm (0.0807 in.)
	Mark 4	2.10 mm (0.0827 in.)
	Mark 5	2.15 mm (0.0846 in.)
	Mark 6	2.20 mm (0.0866 in.)
	Mark 7	2.25 mm (0.0886 in.)
	Mark 8	2.30 mm (0.0906 in.)
	Mark 9	2.35 mm (0.0925 in.)
	Mark A	2.40 mm (0.0945 in.)
	Mark B	2.45 mm (0.0965 in.)
	Mark C	2.50 mm (0.0984 in.)
	Mark D	2.55 mm (0.1004 in.)
	Mark E	2.60 mm (0.1024 in.)
	Mark F	2.65 mm (0.1043 in.)
	Mark G	2.70 mm (0.1063 in.)
	Mark H	2.75 mm (0.1083 in.)
	Mark J	2.80 mm (0.1102 in.)

Accumulator			
Spring		Free length/Outer diameter	Color
B-3	Inner	62.00 (2.4409)/15.50 (0.610)	Purple
	Outer	74.23 (2.9224)/21.70 (0.854)	Purple
Reverse clutch		60.96 (2.3999)/(14.10 (0.555)	Yellow
C-3		72.20 (2.8425)/19.0 (0.748)	colorless

SS-46**SERVICE SPECIFICATIONS – CLUTCH****CLUTCH****SERVICE DATA**

Pedal height from asphalt sheet		159.0 to 169.0 mm (6.260 to 6.654 in.)
Clutch pedal free play		5.0 to 15.0 mm (0.197 to 0.591 in.)
Clutch pedal push rod play at pedal top		1.0 to 5.0 mm (0.039 to 0.197 in.)
Slotted spring pin protrusion	Maximum	1.5 to 3.5 mm (0.059 to 0.138 in.)
Disc rivet head depth	Maximum	0.3 mm (0.012 in.)
Disc runout	Minimum	0.8 mm (0.031 in.)
Diaphragm spring finger wear	Maximum depth:	0.5 mm (0.020 in.)
	Maximum width:	6.0 mm (0.236 in.)
Flywheel runout	Maximum	0.1 mm (0.004 in.)
Diaphragm spring finger wear	Maximum depth:	0.5 mm (0.020 in.)
Clutch release point from pedal full stroke end position		25 mm (0.98 in.) or more

SS

SERVICE SPECIFICATIONS – CLUTCH

SS-47

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Clutch pedal sub-assembly x Clutch pedal support	37	375	27
Clutch pedal support set bolt x Body	19	195	14
Cylinder push rod clevis lock nut	12	120	9
Clutch master cylinder assembly x Clutch pedal support	12	120	9
Clutch master cylinder assembly x Flexible hose tube	15	155	11
Release cylinder bleeder plug	8.4	85	74 in.*lbf
Clutch release cylinder assembly x Transaxle housing	12	120	9
Clutch accumulator assembly set bolt and nut	12	120	9
Clutch release cylinder assembly x Flexible hose tube	15	155	11
Clutch release cylinder assembly x tube clamp bracket	12	120	9
Clutch cover assembly x Flywheel	19	195	14
Release fork support x Transaxle assembly	47	480	35
Clutch start switch assembly set nut	16	160	12
Clutch switch assembly set nut	26	260	14

SS

SERVICE SPECIFICATIONS – E351 MANUAL TRANSAXLE

SS-51

TORQUE SPECIFICATIONS

Part Tightened		N*m	kgf*cm	ft.*lbf
Floor shift lever assembly x Body		12	122	9
Floor shift cable transmission control shift clamp x Body		5.0	51	44 in.*lbf
Floor shift cable transmission control shift retainer x Body		5.0	51	44 in.*lbf
Clutch tube bracket set bolt		17	173	13
Reverse idler gear shaft bolt		30	306	22
Gear shift fork No.3 shift fork bolt		24	244	17
Manual transmission output shaft rear set nut		123	1,250	90
Control shaft cover set bolt		20	204	15
Control shift lever x Shift and select lever shaft		6.4	65	57 in.*lbf
Selecting bellcrank assembly x Manual transmission case		20	200	14
Release fork support x manual transaxle case		47	480	35
Manual transaxle x Engine	Bolt A	64	653	47
	Bolt B	46	470	34
	Bolt C	44	449	32
Engine mounting insulator LH x Manual transaxle		64	653	47
Exhaust pipe support bracket No.1 set bolt		19	194	14
Manual transmission case protector x Manual transaxle		18	184	13
Engine mounting bracket FR x Manual transaxle		64	653	47
Starter assembly x Manual transaxle		39	398	29
Wire harness clamp bracket x Manual transaxle		8.4	86	74 in.*lbf
Engine wire No.3 x Manual transaxle		12	120	9
Transmission case x Manual transaxle case		29	296	21
Manual transaxle case x Transmission case		29	296	21
Bearing retainer rear x Transmission case		43	438	32
Manual transaxle case receiver x Manual transaxle case		7	71	62 in.*lbf
Gear shift head No.1 x Gear shift fork shaft No.2		24	245	18
Gear shift fork No.1 x Gear shift fork shaft No.1		24	245	18
Reverse shift arm bracket x Manual transaxle case		17	173	13
Reverse restrict pin plug x Transmission case		13	133	9.6
Oil receiver pipe No.1 x Transmission case		17	173	13
Oil receiver pipe No.2 x Transmission case		17	173	13
Clutch tube bracket x Transmission case		17	173	13
Reverse idler gear shaft bolt x Transmission case		30	306	22
Transmission clutch hub No.3 gear shift fork shaft x input shaft		24	245	18
Manual transmission output rear set nut x Output shaft		123	1,254	91
Drain plug sub-assembly x Transmission case		49	500	36
Manual transmission filler plug x Transmission case		49	500	36
Back up light switch assembly x Transmission case		40	408	30
Manual Transmission breather plug x Transmission case		49	500	36
Lock ball assembly No.1 x Transmission case		29	296	21
Speedometer driven gear sub-assembly set bolt		5.5	56	48 in.*lbf
Selecting bellcrank support x Selecting bellcrank No.2 plate washer		12	122	9
Front differential ring gear x Front differential case		106	1,081	78

SS

SERVICE SPECIFICATIONS – E351 MANUAL TRANSAXLE

SS-47

E351 MANUAL TRANSAXLE

SERVICE DATA

Transmission case oil seal driven in depth	3.5 +/- 0.5 mm (0.138 +/- 0.020 in.)
Front transaxle case cover oil seal drive in depth	0 +/- 0.5 mm (0 +/- 0.020 in.)

MANUAL TRANSAXLE ASSEMBLY:

5th gear thrust clearance	Standard clearance	0.10 to 0.65 mm (0.0039 to 0.0256 in.)
5th gear radial clearance	Standard clearance	0.009 to 0.050 mm (0.0004 to 0.0020 in.)
Reverse idler gear sub-assembly inside diameter	Standard inside diameter	20.056 to 20.074 mm (0.7896 to 0.7903 in.)
	Maximum inside diameter	20.074 (0.7903 in.)
Reverse idler gear shaft outer diameter	Standard outer diameter	19.984 to 20.000 mm (0.7868 to 0.7874 in.)
	Minimum outer diameter	19.984 mm (0.7868 in.)
Transmission hub sleeve No.3 groove - thickness of the claw part on gear shift fork No.3	Standard clearance	0.15 to 0.35 mm (0.0059 to 0.0138 in.)
5th gear inside diameter	Standard inside diameter	34.981 to 34.997 mm (1.3772 to 1.3778 in.)
	Maximum inside diameter	34.997 mm (1.3778 in.)
Front transaxle case cover oil seal driven in depth		0 +/- 0.5 mm (0 +/- 0.020 in.)
Transmission case oil seal driven in depth		3.5 +/- 0.5 mm (0.138 +/- 0.020 in.)
Output shaft rear bearing clearance		3.8 to 4.4 mm (0.150 to 0.173 in.)
Output shaft bearing preload	New bearing	0.8 to 1.6 N*m (8.16 to 16.32 kgf*cm, 7.1 to 14.2 in.*lbf)
	Used bearing	0.5 to 1.0 N*m (5.10 to 10.20 kgf*cm, 4.4 to 8.9 in.*lbf)
Output shaft rear bearing shim thickness	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.)

SS

SS-48

SERVICE SPECIFICATIONS – E351 MANUAL TRANSAXLE

Front differential case tapered roller bearing preload	New bearing	0.8 to 1.6 N*m (8.16 to 16.32 kgf*cm, 7.1 to 14.2 in.*lbf)
	Used bearing	0.5 to 1.0 N*m (5.10 to 10.20 kgf*cm, 4.4 to 8.9 in.*lbf)
Front differential case shim rear thickness	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.)
Front differential case oil seal clearance		1 to 2 mm (0.0394 to 0.0787 in.)
Input shaft front bearing clearance		4.28 to 4.60 mm (0.1685 to 0.1811 in.)
Reverse restrict ;in clearance		12.5 to 13.5 mm (0.492 to 0.531 in.)
Transmission clutch hub No.3 snap ring clearance		0.1 mm or less (0.0039 in. or less)
Transmission clutch hub No.3 snap ring thickness	a	1.75 to 1.80 mm (0.0689 to 0.0709 in.)
	b	1.80 to 1.85 mm (0.0709 to 0.0728 in.)
	c	1.85 to 1.90 mm (0.0728 to 0.0748 in.)
	d	1.90 to 1.95 mm (0.0748 to 0.0768 in.)
	e	1.95 to 2.00 mm (0.0768 to 0.0787 in.)
	f	2.00 to 2.05 mm (0.0787 to 0.0807 in.)
	g	2.05 to 2.10 mm (0.0807 to 0.0827 in.)
	h	2.10 to 2.15 mm (0.0827 to 0.0846 in.)
	j	2.15 to 2.20 mm (0.0846 to 0.0866 in.)
5th gear radial clearance	Standard clearance	0.009 to 0.050 mm (0.0004 to 0.0020 in.)
5th gear thrust clearance	Standard clearance	0.10 to 0.65 mm (0.0039 to 0.0260 in.)

INPUT SHAFT ASSEMBLY:

4th gear thrust clearance	Standard clearance	0.10 to 0.57 mm (0.0039 to 0.0224 in.)
3rd gear thrust clearance	Standard clearance	0.10 to 0.35 mm (0.0039 to 0.0138 in.)
4th gear radial clearance	KOYO made	0.009 to 0.053 mm (0.0004 to 0.0021 in.)
	NSK made	0.009 to 0.051 mm (0.0004 to 0.0020 in.)
3rd gear radial clearance	KOYO made	0.009 to 0.053 mm (0.0004 to 0.0021 in.)
	NSK made	0.009 to 0.051 mm (0.0004 to 0.0020 in.)
Input shaft run out	Maximum run out	0.03 mm (0.0012 in.)
Input shaft standard outer diameter	A	35.894 to 36.000 mm (1.4167 to 1.4173 in.)
	B	35.984 to 36.000 mm (1.4167 to 1.4173 in.)
	C	27.957 to 27.972 mm (1.1007 to 1.1013 in.)
Input shaft minimum outer diameter	A	35.894 mm (1.4167 in.)
	B	35.984 mm (1.4167 in.)
	C	27.957 mm (1.1007 in.)

SERVICE SPECIFICATIONS – E351 MANUAL TRANSAXLE**SS-49**

4th gear inside diameter	Standard inside diameter	42.009 to 42.025 mm (1.6539 to 1.6545 in.)
	Maximum inside diameter	42.025 mm (1.6545 in.)
3rd gear inside diameter	Standard inside diameter	43.009 to 43.025 mm (1.6933 to 1.6939 in.)
	Maximum inside diameter	43.025 mm (1.6939 in.)
Between the 4th gear spline end and synchronizer outer ring back clearance		0.75 to 1.65 mm (0.0295 to 0.0650 in.)
Between the 3rd gear spline end and synchronizer outer ring back clearance		0.65 to 1.75 mm (0.0256 to 0.0689 in.)
Transmission hub sleeve No.2 groove - thickness of the claw part on gear shift fork No.1	Standard clearance	0.11 to 0.69 mm (0.0043 to 0.0272 in.)
Transmission clutch hub No.2 snap ring clearance	Standard clearance	0.1 mm or less (0.0039 in. or less)
Transmission clutch hub No.2 snap ring thickness	H	2.30 to 2.35 mm (0.0906 to 0.0925 in.)
	J	2.35 to 2.40 mm (0.0925 to 0.0945 in.)
	K	2.40 to 2.45 mm (0.0945 to 0.0965 in.)
	L	2.45 to 2.50 mm (0.0965 to 0.0984 in.)
	M	2.50 to 2.55 mm (0.0984 to 0.1004 in.)
	N	2.55 to 2.60 mm (0.1004 to 0.1024 in.)
	P	2.60 to 2.65 mm (0.1024 to 0.1043 in.)
Input shaft rear radial ball bearing snap ring clearance	Standard clearance	0.1 mm or less (0.0039 in. or less)
Input shaft rear radial ball bearing snap ring thickness	1	2.35 to 2.40 mm (0.0925 to 0.0945 in.)
	2	2.40 to 2.45 mm (0.0945 to 0.0965 in.)
	3	2.45 to 2.50 mm (0.0965 to 0.0984 in.)
	4	2.50 to 2.55 mm (0.0984 to 0.1004 in.)
	5	2.55 to 2.60 mm (0.1004 to 0.1024 in.)
	6	2.60 to 2.65 mm (0.1024 to 0.1043 in.)
	7	2.65 to 2.70 mm (0.1043 to 0.1063 in.)
	8	2.70 to 2.75 mm (0.1063 to 0.1083 in.)
3rd gear radial clearance	KOYO made	0.009 to 0.053 mm (0.0004 to 0.0021 in.)
	NSK made	0.009 to 0.051 mm (0.0004 to 0.0020 in.)
4th gear radial clearance	KOYO made	0.009 to 0.053 mm (0.0004 to 0.0021 in.)
	NSK made	0.009 to 0.051 mm (0.0004 to 0.0020 in.)
3rd gear thrust clearance	Standard clearance	0.10 to 0.35 mm (0.0039 to 0.0138 in.)
4th gear thrust clearance	Standard clearance	0.10 to 0.57 mm (0.0039 to 0.0224 in.)

OUTPUT SHAFT ASSEMBLY:

1st gear thrust clearance	Standard clearance	0.25 to 0.40 mm (0.0098 to 0.0157 in.)
2nd gear thrust clearance	Standard clearance	0.10 to 0.35 mm (0.0039 to 0.0138 in.)
1st gear radial clearance	KOYO made	0.009 to 0.053 mm (0.0004 to 0.0021 in.)
	NSK made	0.009 to 0.051mm (0.0004 to 0.0020in.)
2nd gear radial clearance	KOYO made	0.009 to 0.053 mm (0.0004 to 0.0021 in.)
	NSK made	0.009 to 0.051mm (0.0004 to 0.0020in.)
Output shaft run out	Maximum run out	0.03 mm (0.0012 in.)
Output shaft standard outer diameter	A	37.610 to 37.626 mm (1.4807 to 1.4813 in.)
	B	34.502 to 34.512 mm (1.3583 to 1.3587 in.)
Output shaft minimum outer diameter	A	37.610 mm (1.4807 in.)
	B	34.502 mm (1.3583 in.)
2nd gear inside diameter	Standard inside diameter	50.009 to 50.025 mm (1.9689 to 1.9695 in.)
	Maximum inside diameter	50.025 mm (1.9695 in.)
1st gear inside diameter	Standard inside diameter	51.009 to 51.025 mm (2.0082 to 2.0089 in.)
	Maximum inside diameter	51.025 mm (2.0089 in.)
Between the 2nd gear while and synchronizer ring No.2 back clearance		0.70 to 1.45 mm (0.0276 to 0.0571 in.)

SS

SS-50**SERVICE SPECIFICATIONS – E351 MANUAL TRANSAXLE**

Between the 1st gear while and synchronizer ring set No.1 back clearance		0.70 to 1.45 mm (0.0276 to 0.0571 in.)
Reverse gear groove - thickness of the claw part on gear shift fork No.1 clearance	Standard clearance	0.15 to 0.35 mm (0.0059 to 0.0138 in.)
2nd gear radial clearance	KOYO made	0.009 to 0.053 mm (0.0004 to 0.0021 in.)
	NSK made	0.009 to 0.051 mm (0.0004 to 0.0020 in.)
1st gear radial clearance	KOYO made	0.009 to 0.053 mm (0.0004 to 0.0021 in.)
	NSK made	0.009 to 0.051 mm (0.0004 to 0.0020 in.)
2nd gear thrust clearance	Standard clearance	0.10 to 0.35 mm (0.0039 to 0.0138 in.)
1st gear thrust clearance	Standard clearance	0.25 to 0.40 mm (0.0098 to 0.0157 in.)

SS**SHIFT AND SELECT LEVER SHAFT ASSEMBLY:**

Control shaft cover oil seal drive in depth	28.5 +/- 0.50 mm (1.122 +/- 0.020 in.)
Shift lever slotted pin clearance to the shift lever inner assembly	-.05 to 0.5 mm (-0.0197 to 0.0197 in.)
Shift lever slotted pin clearance to the shift lever inner No.2	5.8 to 6.8 mm (0.228 to 0.268 in.)

DIFFERENTIAL CASE ASSEMBLY:

Front differential side gear backlash	Standard backlash	0.10 to 0.20 mm (0.0039 to 0.0079 in.)
Front differential pinion thrust washer thickness	Minimum thickness	0.9 mm (0.035 in.)
Front differential pinion shaft No.1 thickness	Minimum diameter	17.975 mm (0.70768 in.)
Front differential side gear backlash	Standard backlash	0.05 to 0.20 mm (0.0020 to 0.0079 in.)
Front differential side gear thrust washer thickness	1	1.00 mm (0.0394 in.)
	2	1.10 mm (0.0433 in.)
	3	1.20 mm (0.0472 in.)
	4	1.30 mm (0.0512 in.)

SS-52**SERVICE SPECIFICATIONS – DRIVE SHAFT****DRIVE SHAFT****TORQUE SPECIFICATIONS**

Part Tightened	N*m	kgf*cm	ft.*lbf
Front wheel set nut	103	1,050	76
Lower ball joint x Lower suspension arm	123	1,250	91
Tie rod end x Steering knuckle	49	500	36
Axle hub x Front drive shaft	294	3,000	217
Front drive shaft center bearing set bolt	32	330	24
Front speed sensor set bolt	8.0	82	71 in.*lbf
Front flexible hose and speed sensor wire harness x Shock absorber	19	192	14
Front flexible hose x Shock absorber	19	192	14
Rear wheel set nut	103	1,050	76
Rear flexible hose x Shock absorber	19	192	14
Shock absorber x Rear axle carrier	255	2,600	188
Rear axle hub set bolt	80	816	59
Rear axle carrier x Brake caliper (Rear disc brake)	62	630	46
Manual transaxle drain plug x Oil pan	49	500	36
Automatic transaxle drain plug x Oil pan (U151E)	49	500	36
Automatic transaxle drain plug x Oil pan (U250E)	49	500	36

SS

AXLE
SERVICE DATA

Front axle hub bearing	Backlash	Maximum: 0.05 mm (0.0020 in.)
	Deviation	Maximum: 0.05 mm (0.0020 in.)
Rear axle hub bearing	Backlash	Maximum: 0.05 mm (0.0020 in.)
	Deviation	Maximum: 0.07 mm (0.0027 in.)

SS

SS-54**SERVICE SPECIFICATIONS – AXLE****TORQUE SPECIFICATIONS**

Part Tightened	N ^o m	kgf ^o cm	ft. ^o lbf
Front wheel set nut	103	1,050	76
Lower ball joint x Lower suspension arm	123	1,250	91
Tie rod end x Steering knuckle	49	500	36
Axle hub x Front drive shaft	294	3,000	217
Front drive shaft center bearing set bolt	32	330	24
Front speed sensor set bolt	8.0	82	71 in. ^o lbf
Front flexible hose and speed sensor wire harness x Shock absorber	19	192	14
Front flexible hose x Shock absorber	19	192	14
Rear wheel set nut	103	1,050	76
Rear flexible hose x Shock absorber	19	192	14
Shock absorber x Rear axle carrier	255	2,600	188
Rear axle hub set bolt	80	816	59
Rear axle carrier x Brake caliper (Rear disc brake)	62	630	46
Manual transaxle drain plug x Oil pan	49	500	36
Automatic transaxle drain plug x Oil pan (U151E)	49	500	36
Automatic transaxle drain plug x Oil pan (U250E)	49	500	36

SS

SS-56

SERVICE SPECIFICATIONS – SUSPENSION

TORQUE SPECIFICATIONS

FRONT SUSPENSION:

Part Tightened		N*m	kgf*cm	ft.*lbf
Tie rod end lock nut		74	755	55
Steering knuckle x Shock absorber		210	2,140	155
Hub nut		103	1,050	76
Suspension support x Body		80	816	59
Suspension support x Piston rod		49	500	36
Speed sensor wire harness bracket set bolt (w/ ABS)		19	192	14
Flexible hose x Shock absorber (w/o ABS)		19	192	14
Lower suspension arm set bolt	Front side:	200	2,040	148
	Rear side:	206	2,100	152
Transverse engine engine mounting insulator set nut		87	887	64
Transverse engine engine mounting insulator x Bracket (MT)		143	1,460	105
Stabilizer bar bracket x Suspension member		19	194	14
Stabilizer bar link set nut		74	755	55

REAR SUSPENSION:

Part Tightened		N*m	kgf*cm	ft.*lbf
Shock absorber with coil spring x Body		39	400	29
Shock absorber with coil spring x Rear axle carrier		255	2,600	188
Flexible hose x Shock absorber with coil spring		19	195	14
Skid control sensor wire x Shock absorber with coil spring		5.5	56	49 in.*lbf
Shock absorber piston rod set nut		49	500	36
Shock absorber with coil spring x Stabilizer link		39	400	29
Rear suspension member x Rear suspension arm assembly No.1		100	1,020	74
Rear suspension member x Rear suspension arm assembly No.2		100	1,020	74
Rear suspension member x Body	A, B	55	561	41
	C	38	387	28
Rear suspension arm assembly No.1 x Rear axle carrier		100	1,020	74
Rear suspension arm assembly No.2 x Rear axle carrier		100	1,020	74
Stabilizer bar bracket set bolt		19	195	14
Stabilizer bar x Stabilizer link		39	400	29
Strut rod x Body		113	1,150	83
Strut rod x Rear axle carrier		113	1,150	83
Parking brake cable x Body		5.4	55	48 in.*lbf
Hub nut		103	1,050	76
Center floor panel reinforcement sub-assembly set bolt		56	571	41
Rear suspension member brace rear lower set bolt	Front	51	520	38
	Rear	56	571	41
Floor panel brace rear set bolt		51	520	38

SS-54

SERVICE SPECIFICATIONS – SUSPENSION

SUSPENSION

SERVICE DATA

FRONT SUSPENSION:

SS

Front wheel alignment	Vehicle height		
	2AZ-FE Except SPORT	Front: A - B:	121 mm (4.76 in.)
		Rear: D - C:	55 mm (2.17 in.)
	2AZ-FE SPORT	Front: A - B:	123 mm (4.48 in.)
		Rear: D - C:	55 mm (2.17 in.)
	3MZ-FE Except SPORT 17 inch	Front: A - B:	124 mm (4.88 in.)
		Rear: D - C:	57 mm (2.24 in.)
	3MZ-FE Except SPORT 16 inch	Front: A - B:	124 mm (4.88 in.)
		Rear: D - C:	48 mm (1.89 in.)
	3MZ-FE SPORT	Front: A - B:	125 mm (4.92 in.)
		Rear: D - C:	58 mm (2.28 in.)
	CONVERTIBLE	Front: A - B:	123 mm (4.84 in.)
		Rear: D - C:	55 mm (2.17 in.)
	Toe-in (total)		0 °± 12' (0 °± 0.2 °, 0 ± 2 mm, 0 ± 0.08 in.)
	Wheel angle		
	2AZ-FE Except SPORT	Inside wheel:	36°49' ± 2° (36.82° ± 2°)
		Outside wheel: Reference:	32°10' (32.17°)
	2AZ-FE SPORT	Inside wheel:	36°45' ± 2° (36.75° ± 2°)
		Outside wheel: Reference:	32°08' (32.13°)
	3MZ-FE Except SPORT	Inside wheel:	36°43' ± 2° (36.72° ± 2°)
		Outside wheel: Reference:	32°07' (32.12°)
	3MZ-FE SPORT	Inside wheel:	36°41' ± 2° (36.68° ± 2°)
		Outside wheel: Reference:	32°06' (32.10°)
	CONVERTIBLE	Inside wheel:	36°35' ± 2° (36.58° ± 2°)
		Outside wheel: Reference:	32°08' (32.13°)
	Camber	2AZ-FE Except SPORT:	-0°44' ± 45' (-0.73° ± 0.75°)
		2AZ-FE SPORT:	-0°46' ± 45' (-0.77° ± 0.75°)
		3MZ-FE Except SPORT:	-0°45' ± 45' (-0.75° ± 0.75°)
		3MZ-FE SPORT:	-0°46' ± 45' (-0.77° ± 0.75°)
		CONVERTIBLE:	-0°44' ± 45' (-0.73° ± 0.75°)
		Right-left error:	45' (0.75°) or less
	Caster	2AZ-FE Except SPORT:	2°54' ± 45' (2.90° ± 0.75°)
		2AZ-FE SPORT:	2°56' ± 45' (2.93° ± 0.75°)
		3MZ-FE Except SPORT:	2°50' ± 45' (2.83° ± 0.75°)
		3MZ-FE SPORT:	2°53' ± 45' (2.88° ± 0.75°)
		CONVERTIBLE:	2°51' ± 45' (2.85° ± 0.75°)
		Right-left error:	45' (0.75°) or less
	Steering axis inclination	2AZ-FE Except SPORT:	11°28' ± 45' (11.47° ± 0.75°)
		2AZ-FE SPORT:	11°30' ± 45' (11.50° ± 0.75°)
		3MZ-FE Except SPORT:	11°31' ± 45' (11.52° ± 0.75°)
		3MZ-FE SPORT:	11°33' ± 45' (11.55° ± 0.75°)
		CONVERTIBLE:	11°31' ± 45' (11.52° ± 0.75°)
		Right-left error:	45' (0.75°) or less

SERVICE SPECIFICATIONS – SUSPENSION**SS-55**

Front suspension	Lower ball joint turning torque	0.98 - 3.43 N*m (10 - 35 kgf*cm, 8.7 - 30 in.*lbf)
	Stabilizer bar link ball joint turning torque	0.05 - 1.96 N*m (0.5 - 20 kgf*cm, 0.4 - 17.4 in.*lbf)

A:**Ground clearance of front wheel center****B:****Ground clearance of front suspension arm sub-assembly lower No.2 set bolt head center****C:****Ground clearance of strut rod set bolt center****D:****Ground clearance of rear wheel center****REAR SUSPENSION:**

Rear wheel alignment	Toe-in (total)	Coupe	0°24' ± 12' (0.40° ± 0.20°), 4 ± 2 mm (0.16 ± 0.08 in.)
		Convertible	0°26' ± 12' (0.43° ± 0.20°), 4 ± 2 mm (0.16 ± 0.08 in.)
	No.2 lower suspension arm length difference		1.5 mm (0.06 in.) or less
	Camber	Coupe (sport pack): 2AZ-FE	-1°21' ± 45' (-1.35° ± 0.75°)
		3MZ-FE	-1°23' ± 45' (-1.38° ± 0.75°)
		Coupe (except sport pack): 2AZ-FE	-1°21' ± 45' (-1.35° ± 0.75°)
		3MZ-FE	-1°22' ± 45' (-1.37° ± 0.75°)
		Convertible	-1°20' ± 45' (-1.33° ± 0.75°)
		Right-left error	45' (0.75°) or less
Rear suspension	Stabilizer link ball joint turning torque		1.0 N*m (10 kgf*cm, 9 in.*lbf) or less

SS

TIRE AND WHEEL

SERVICE DATA

Cold tire inflation pressure	P215/60R16 94V	Front:	200 kPa (2.0 kgf/cm ² , 29 psi)
		Rear:	200 kPa (2.0 kgf/cm ² , 29 psi)
	P215/55R17 93V	Front:	200 kPa (2.0 kgf/cm ² , 29 psi)
		Rear:	200 kPa (2.0 kgf/cm ² , 29 psi)
Tire runout			1.0 mm (0.039 in.) or less
Imbalance after adjustment			8.0 g (0.018 lb) or less

SS

SS-58**SERVICE SPECIFICATIONS – BRAKE****BRAKE****SERVICE DATA**

Brake pedal height (from asphalt sheet)		144.1 to 154.1 mm (5.673 to 6.067 in.)
Brake pedal free play	Pedal free play:	1 to 6 mm (0.04 to 0.24 in.)
Stop light switch clearance		0.5 to 2.4 mm (0.020 to 0.095 in.)
Pedal reserve distance from asphalt sheet at 490 N (50 kgf, 110.2 lbf)	w/o VSC: w/ VSC:	More than 68.5 mm (2.7 in.) More than 78.0 mm (3.1 in.)
Brake booster push rod to piston clearance (w/ SST)	Clearance:	0 mm (0 in.)
Front brake pad thickness	Standard thickness: Minimum thickness:	12.0 mm (0.472 in.) 1.0 mm (0.039 in.)
Front brake disc thickness	Standard thickness: Minimum thickness:	28.0 mm (1.102 in.) 26.0 mm (1.024 in.)
Front brake disc runout	Maximum disc runout:	0.05 mm (0.0020 in.)
Rear brake pad thickness	Standard thickness: Minimum thickness:	10.0 mm (0.394 in.) 1.0 mm (0.039 in.)
Rear disc brake thickness	Standard thickness: Minimum thickness:	12.0 mm (0.472 in.) 10.5 mm (0.413 in.)
Rear brake disc runout	Maximum disc runout:	0.15 mm (0.0059 in.)

SS

SERVICE SPECIFICATIONS – BRAKE

SS-59

TORQUE SPECIFICATIONS

Part Tightened		N*m	kgf*cm	ft.*lbf
Bleeder plug		8.3	85	73 in.*lbf
Brake booster clevis lock nut		26	265	19
Brake pedal sub-assembly set bolt		37	375	27
Stop light lock nut		17	173	13
Brake pedal support assembly x Reinforcement		20	204	15
Brake pedal support assembly x Body		13	130	9
Master cylinder piston stopper bolt	w/o VSC:	10	100	7
Brake master cylinder x Brake booster		13	127	9
Brake line union nut		15	155	11
Wheel nut		103	1,050	76
Front brake cylinder mounting x Steering knuckle		107	1,090	79
Front brake cylinder x Front brake cylinder mounting		34	350	25
Front brake cylinder x Flexible hose		29	300	22
Rear disc brake cylinder mounting set bolt		62	630	46
Rear disc brake cylinder slide pin x Rear disc brake cylinder mounting		43	440	32
Rear disc brake cylinder x Flexible hose		29	300	22
Brake actuator assembly x Actuator bracket	w/o VSC:	8.0	82	71 in.*lbf
Brake actuator bracket x Body	w/o VSC:	19	194	14
Brake actuator assembly x Actuator bracket	w/ VSC:	5.4	55	48 in.*lbf
Brake actuator bracket x Body	w/ VSC:	19	194	14
Front speed sensor x Steering knuckle		8.0	82	71 in.*lbf
Front speed sensor wire harness clamp x shock absorber	Bolt A:	5.0	51	44 in.*lbf
	Bolt B:	19	192	14
Rear axle hub set bolt		80	816	59
Yawrate sensor x Body		13	127	9

SS

SERVICE SPECIFICATIONS – PARKING BRAKE**SS-59****PARKING BRAKE****SERVICE DATA**

Parking brake lever travel at 200 N (20 kgf, 44.1 lbf):		6 - 9 clicks
Rear brake disc inside diameter	Standard inside diameter:	170 mm (6.69 in.)
	Maximum inside diameter:	171 mm (6.73 in.)
Parking brake shoe lining thickness	Standard thickness:	2.0 mm (0.079 in.)
	Maximum thickness:	1.0 mm (0.039 in.)
Parking brake shoe clearance between rear shoe and lever		Less than 0.35 mm (0.0138 in.)

SS

SS-60

SERVICE SPECIFICATIONS – PARKING BRAKE

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Wheel nut	103	1,050	76
Parking brake cable lock nut	5.0	51	44 in.*lbf
Parking brake lever set bolt	12.5	128	9
Parking brake cable No.3 x Backing plate	7.8	80	69 in.*lbf
Parking brake cable heart insulator set nut	5.4	55	48 in.*lbf
Parking brake cable No.3 x Body	5.4	55	48 in.*lbf
Rear disc brake caliper assembly LH	62	630	46

SS

SS-60

SERVICE SPECIFICATIONS – STEERING COLUMN

**STEERING COLUMN
SERVICE DATA**

Steering wheel freeplay	Maximum	30 mm (1.18 in.)
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SS

SERVICE SPECIFICATIONS – STEERING COLUMN**SS-61****TORQUE SPECIFICATIONS**

Part Tightened	N*m	kgf*cm	ft.*lbf
Tie rod end lock nut	74	750	54
Steering intermediate shaft sub assembly x Steering column assembly	35	360	26
Steering column assembly set bolt and nut	21	210	15
Intermediate shaft sub-assembly x Control valve shaft	35	360	26
Steering wheel set nut	50	510	37
Steering wheel pad set screw (Torx screw)	8.8	90	78 in.*lbf

SS

SERVICE SPECIFICATIONS – POWER STEERING

SS-61

POWER STEERING

SERVICE DATA

POWER STEERING FLUID:

Fluid level rise	Maximum	5 mm (0.20 in.)
Fluid pressure at idle speed with valve closed		7,800 to 8,300 kPa (80 to 85 kgf/cm ² , 1,131 to 1,204 psi)

STEERING WHEEL:

Steering effort at idle speed	(Reference)	6.0 N*m (61 kgf*cm, 53 in.*lbf)
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SS

VANE PUMP ASSEMBLY (2AZ-FE):

Vane pump rotating torque		0.27 N*m (2.8 kgf*cm, 2.4 in.*lbf) or less
Vane pump shaft and vane pump housing bush clearance	Maximum	0.07 mm (0.0028 in.)
Vane plate thickness	Minimum	1.405 to 1.411 mm (0.05531 to 0.05555 in.)
Vane plate and vane rotor groove clearance	Maximum	0.03 mm (0.0012 in.)
Spring free length	Minimum	36.9 mm (1.453 in.)

VANE PUMP ASSEMBLY (3MZ-FE):

Vane pump rotating torque		0.27 N*m (2.8 kgf*cm, 2.4 in.*lbf) or less
Vane pump shaft and vane pump housing bush clearance	Maximum	0.07 mm (0.0028 in.)
Vane plate thickness	Minimum	1.397 to 1.403 mm (0.0550 to 0.0552 in.)
Clearance between the rotor groove and plate	Maximum	0.03 mm (0.0012 in.)
Spring free length	Minimum	32.24 mm (1.2693 in.)

RACK AND PINION POWER STEERING GEAR ASSEMBLY:

Steering rack runout	Maximum	0.3 mm (0.0118 in.)
Tie rod assembly stud bolt torque	(Turning)	0.98 to 3.92 N*m (10.0 to 40.0 kgf*cm, 8.7 to 34.7 in.*lbf)
Total preload (Control valve rotating torque)	(Turning)	1.2 to 1.5 N*m (12.20 to 15.30 kgf*cm, 10.6 to 13.3 in.*lbf)
Rack boot clamp clearance		3.0 mm (0.118 in.) or less

SS-62

SERVICE SPECIFICATIONS – POWER STEERING

TORQUE SPECIFICATIONS

VANE PUMP ASSEMBLY (2AZ-FE):

Part Tightened		N*m	kgf*cm	ft.*lbf
Housing rear x Housing front		22	224	16
Oil pressure switch		21	214	16
Pressure port union		69	704	51
Suction port union set bolt		12	122	9
Pump assembly set bolt	Bolt A	26 (37)	264 (377)	19 (27)
	Bolt B	37	377	27
Pressure feed tube assembly set union bolt		52	525	38

(): For use without SST

VANE PUMP ASSEMBLY (3MZ-FE):

Part Tightened		N*m	kgf*cm	ft.*lbf
Pump bracket front x Housing front		44	449	32
Housing rear x Housing front		24	245	18
Pump bracket rear x Housing rear		44	449	32
Pressure port union		83	846	61
Suction port union set bolt		13	133	10
Pump assembly set bolt		43	440	32
Pressure feed tube assembly set union bolt		52	525	38
Oil pressure switch		21	214	15

RACK AND PINION POWER STEERING GEAR ASSEMBLY

Part Tightened		N*m	kgf*cm	ft.*lbf
Control valve housing set bolt		20	204	15
Control valve shaft lock nut		25	250	18
Rack housing cap		59	597	43
Rack guide spring cap lock nut		51 (69)	520 (699)	38 (51)
Rack x Rack end sub-assembly		60 (84)	615 (851)	45 (62)
Tie rod assembly lock nut		74	755	55
Turn pressure tube union nut		11 (13)	133 (127)	8 (9)
Steering gear assembly set bolt		70	714	52
Pressure feed tube assembly union nut		22 (25)	227 (250)	16 (18)
Pressure feed tube clamp set bolt		9.8	100	87 in.*lbf
Pressure feed tube clamp set nut		9.8	100	87 in.*lbf
Stabilizer bracket No.1 x Suspension crossmember		19	194	14
Intermediate shaft assembly x Steering gear assembly		35	360	26

(): For use without SST

AIR CONDITIONING
SERVICE DATA

Refrigerant charge volume	Standard:	550 +/- 50 g (19.4 +/- 1.76 oz.)
V (cooler compressor to crankshaft pulley) belt No.1 tension	New belt:	136 to 191 lbf
	Use belt:	66 to 100 lbf
Magnetic clutch clearance (3MZ-FE)		0.35 to 0.60 mm (0.014 to 0.024 in.)
Magnetic clutch clearance (2AZ-FE)		0.35 to 0.60 mm (0.014 to 0.024 in.)

SS

SS-64

SERVICE SPECIFICATIONS – AIR CONDITIONING

TORQUE SPECIFICATIONS

V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1

Part Tightened		N*m	kgf*cm	ft.*lbf
Generator installation bolt	Bolt A	58	591	13
	Bolt B	18	183	43

AIR CONDITIONING RADIATOR ASSEMBLY

Part Tightened		N*m	kgf*cm	ft.*lbf
Air conditioning tube assembly x Cooler evaporator sub-assembly No.1		3.5	35	30 in.*lbf
Air conditioning radiator assembly x Body		1.5	15	12 in.*lbf
Air conditioning radiator assembly x Instrument panel brace sub-assembly No.1		9.8	100	87 in.*lbf

BLOWER ASSEMBLY

Part Tightened		N*m	kgf*cm	ft.*lbf
Blower assembly x Body		1.5	15	12 in.*lbf
Instrument panel brace sub-assembly No.1 x Instrument panel reinforcement	Screw	9.8	100	87 in.*lbf

COOLER COMPRESSOR ASSEMBLY (2AZ-FE)

Part Tightened		N*m	kgf*cm	ft.*lbf
Magnet clutch hub x Cooler compressor assembly		18	184	13
Compressor and magnet clutch x Engine		25	250	18
Cooler refrigerant suction hose No.1 x Compressor and magnet clutch		9.8	100	87 in.*lbf
Cooler refrigerant discharge hose No.1 x Compressor and magnet clutch		9.8	100	87 in.*lbf

COOLER COMPRESSOR ASSEMBLY (3MZ-FE)

Part Tightened		N*m	kgf*cm	ft.*lbf
Magnet clutch hub x Cooler compressor assembly		18	184	13
Compressor and magnet clutch x Engine		25	250	18
Cooler refrigerant suction hose No.1 x Compressor and magnet clutch		9.8	100	87 in.*lbf
Cooler refrigerant discharge hose No.1 x Compressor and magnet clutch		9.8	100	87 in.*lbf

COOLER CONDENSER ASSEMBLY

Part Tightened		N*m	kgf*cm	ft.*lbf
Cooler condenser assembly x Body		9.8	100	85 in.*lbf
Cooler refrigerant liquid pipe A x Cooler condenser assembly		5.4	55	47 in.*lbf
Cooler refrigerant discharge hose No.1 x Cooler condenser assembly		5.4	55	47 in.*lbf

SS-64**SERVICE SPECIFICATIONS – SUPPLEMENTAL RESTRAINT SYSTEM****SUPPLEMENTAL RESTRAINT
SYSTEM****TORQUE SPECIFICATIONS**

Part Tightened	N*m	kgf*cm	ft.*lbf
Horn button assembly x Steering wheel assembly	8.8	90	78 in.*lbf
Steering wheel assembly x Steering column assembly	50	510	37
Front passenger airbag assembly x Instrument panel reinforcement	20	204	15
Curtain shield airbag assembly x Body	9.8	100	87 in.*lbf
Airbag sensor assembly center x Body	17.5	178	13
Airbag front sensor x Body	17.5	178	13
Side airbag sensor assembly LH x Body	17.5	178	13
Airbag sensor rear LH x Body	17.5	178	13
Seat position airbag sensor x Front seat	8.0	82	71 in.*lbf

SS

SERVICE SPECIFICATIONS – SEAT BELT

SS-65

SEAT BELT

TORQUE SPECIFICATIONS

FRONT SEAT BELT (COUPE)

Part Tightened	N*m	kgf*cm	ft.*lbf
Front seat outer belt assembly LH (For upper bolt) x Body	7.5	77	66 in.*lbf
Front seat outer belt assembly LH (For lower bolt) x Body	42	430	31
Front seat outer belt (floor anchor) x Body	42	430	31
Front seat outer belt (shoulder anchor) x Body	42	430	31
Front seat inner belt assembly LH x Front seat	42	430	31

SS

REAR SEAT BELT (COUPE)

Part Tightened	N*m	kgf*cm	ft.*lbf
Rear seat outer belt assembly x Body	42	430	31
Rear seat outer belt assembly (floor anchor) x Body	42	430	31
Rear seat inner w/ center belt assembly RH x Body	42	430	31
Rear seat inner w/ center belt assembly LH x Body	42	430	31
Child restraint anchor bracket x Body	18.1	185	13
Tether anchor bracket x Body	42	430	31

FRONT SEAT BELT (CONVERTIBLE)

Part Tightened	N*m	kgf*cm	ft.*lbf
Front seat outer belt assembly LH (For upper bolt) x Body	7.5	77	66 in.*lbf
Front seat outer belt assembly LH (For lower bolt) x Body	42	430	31
Front seat outer belt (floor anchor) x Body	42	430	31
Front seat outer belt (shoulder anchor) x Body	42	430	31
Front seat inner belt assembly LH x Front seat	42	430	31

REAR SEAT BELT (CONVERTIBLE)

Part Tightened	N*m	kgf*cm	ft.*lbf
Rear seat outer belt assembly x Body	42	430	31
Rear seat outer belt assembly (floor anchor) x Body	42	430	31
Rear seat inner belt assembly LH x Body	42	430	31
CRS anchor bracket x Body	18.1	185	13

SS-66

SERVICE SPECIFICATIONS – LIGHTING

LIGHTING

TORQUE SPECIFICATIONS

CENTER STOP LIGHT ASSEMBLY (CONVERTIBLE)

Part Tightened	N*m	kgf*cm	ft.*lbf
Center stop light assembly - Back belt moulding	5.4	55	48 in.*lbf
Back belt moulding x Body	14	143	10

SS

SERVICE SPECIFICATIONS – WIPER AND WASHER

SS-67

WIPER AND WASHER

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Windshield wiper link assembly x Windshield wiper motor assembly	5.4	55	47 in.*lbf
Windshield wiper motor and link assembly x Body	7.0	71	62 in.*lbf
Front wiper arm and blade assembly LH x Windshield wiper link assembly	20	204	15
Front wiper arm and blade assembly RH x Windshield wiper link assembly	20	204	15

SS

SS-68**SERVICE SPECIFICATIONS – HORN****HORN****TORQUE SPECIFICATIONS****HIGH PITCHED HORN ASSEMBLY:**

Part Tightened	N*m	kgf*cm	ft.*lbf
High pitched horn assembly x Body	20	204	15

LOW PITCHED HORN ASSEMBLY:

Part Tightened	N*m	kgf*cm	ft.*lbf
Low pitched horn assembly x Body	20	204	15

SS

SERVICE SPECIFICATIONS – WINDSHIELD / WINDOWGLASS

SS-69

WINDSHIELD / WINDOWGLASS**TORQUE SPECIFICATIONS**

Part Tightened	N*m	kgf*cm	ft.*lbf
Quarter window regulator (upper side) x Body	8.0	82	71 in.*lbf
Quarter window regulator (lower side) x Body	13.0	133	9.6
Quarter window x Quarter window regulator	8.3	85	73 in.*lbf
Window stopper x Quarter window regulator	8.0	82	71 in.*lbf
Quarter window regulator x Quarter window regulator motor	5.5	56	4.9 in.*lbf

SS

SS-70

SERVICE SPECIFICATIONS – MIRROR

MIRROR
TORQUE SPECIFICATIONS

INNER REAR VIEW MIRROR ASSEMBLY:

Part Tightened	N*m	kgf*cm	ft.*lbf
Inner rear view mirror assembly x Front door	1.2	12.2	11 in.*lbf

OUTER REAR VIEW MIRROR ASSEMBLY:

Part Tightened	N*m	kgf*cm	ft.*lbf
Outer rear view mirror assembly x Front door	4.5	46	40 in.*lbf

SS

INSTRUMENT PANEL
TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Instrument panel reinforcement x Passenger airbag	20	204	14



SS-72

SERVICE SPECIFICATIONS – SEAT

SEAT

TORQUE SPECIFICATIONS

FRONT SEAT ASSEMBLY:

Part Tightened	N*m	kgf*cm	ft.*lbf
Airbag sensor x Seat adjuster assembly	8	82	71 in.*lbf
Seat inner belt assembly x Seat adjuster assembly	42	428	31
Seatback cover bracket x Seat adjuster assembly (w/ Side airbag)	5.5	56	48 in.*lbf
Seat assembly x Body	37	375	27

REAR SEAT ASSEMBLY (COUPE):

Part Tightened	N*m	kgf*cm	ft.*lbf
Seatback hinge sub-assembly x Seatback frame	18	185	13
Seatback hinge sub-assembly center x Seatback frame	13	135	10
Seatback hinge sub-assembly center x Body	18	185	13
Seatback lock assembly x Seatback frame	30	306	22

REAR SEAT ASSEMBLY (CONVERTIBLE):

Part Tightened	N*m	kgf*cm	ft.*lbf
Seatback x Body	18.1	185	13
Seat belt assembly outer (anchor plate) x Body	42	428	31

SS

SERVICE SPECIFICATIONS – ENGINE HOOD / DOOR

SS-73

ENGINE HOOD / DOOR

TORQUE SPECIFICATIONS

HOOD:

Part Tightened	N*m	kgf*cm	ft.*lbf
Hood x Hood hinge	13	133	10
Hood x Hood lock	8.0	82	71 in.*lbf
Hood moulding x Hood	7.0	71	62 in.*lbf

FRONT DOOR:

Part Tightened	N*m	kgf*cm	ft.*lbf
Cover plate x Door panel	5.1	52	45 in.*lbf
Door check x Body	30	306	22
Door check x Door panel	8.0	82	72 in.*lbf
Door frame sub-assembly front lower x Door panel	5.0	51	44 in.*lbf
Door glass x Front door regulator sub-assembly	8.0	82	71 in.*lbf
Door glass female stabilizer x Door panel	8.0	82	71 in.*lbf
Door hinge x Body	26	265	19
Door hinge x Door panel	26	265	19
Door lock x Door panel	5.0	51	44 in.*lbf
Door lock striker x Body	23	235	17
Door outside handle cover x Door panel	4.0	41	35 in.*lbf
Door outside handle frame x Door panel	4.0	41	35 in.*lbf
Outer rear view mirror x Door panel	4.5	46	40 in.*lbf
Power window regulator motor x Window regulator	5.4	55	48 in.*lbf
Window regulator (lower side) x Door panel	13	133	9.6
Window regulator (upper side) x Door panel	8.0	82	71 in.*lbf
Window stop upper x Door panel	8.0	82	71 in.*lbf

LUGGAGE COMPARTMENT DOOR:

Part Tightened	N*m	kgf*cm	ft.*lbf
Door lock x Door panel	26	265	19
Door open lever x Body	5.5	56	49 in.*lbf
Door panel x Door hinge	8.0	82	71 in.*lbf
Door striker x Body	5.5	56	49 in.*lbf

SS

SS-74

SERVICE SPECIFICATIONS – EXTERIOR

EXTERIOR

TORQUE SPECIFICATIONS

FRONT BUMPER:

Part Tightened	N ^o m	kgf ^o cm	ft. ^o lbf
Front bumper reinforcement x Body	55	560	41

REAR BUMPER:

Part Tightened	N ^o m	kgf ^o cm	ft. ^o lbf
Rear bumper reinforcement x Body	55	560	41

HOOD MOULDING ASSEMBLY FRONT:

Part Tightened	N ^o m	kgf ^o cm	ft. ^o lbf
Hood moulding assembly x Body	7.5	75	66 in. ^o lbf

FUEL LID LOCK CONTROL ASSEMBLY:

Part Tightened	N ^o m	kgf ^o cm	ft. ^o lbf
Luggage door lock open lever x Body	5.5	56	49 in. ^o lbf
Luggage opener cancel cylinder x Luggage door lock open lever	5.5	56	49 in. ^o lbf

SS

SERVICE SPECIFICATIONS – SLIDING ROOF

SS-75

SLIDING ROOF

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Sliding roof glass assembly x Drive cable	4.5	46	40 in.*lbf
Sliding roof housing sub-assembly x Bracket	5.5	56	49 in.*lbf
Sliding roof housing sub-assembly x Body	5.5	56	49 in.*lbf

SS

SS-76

SERVICE SPECIFICATIONS – CONVERTIBLE

CONVERTIBLE

TORQUE SPECIFICATIONS

Part Tightened		N*m	kgf*cm	ft.*lbf
Tarpaulin hinge link assembly x Rear tarpaulin rail		30	306	22
Tarpaulin rear rail bow bracket x Tarpaulin rail pivot bracket		26	265	19
Tarpaulin rail balance link x Tarpaulin rail pivot bracket		30	306	22
Tarpaulin latch x No.1 tarpaulin bow		30	306	22
No.1 bow locating pin x No.1 tarpaulin bow		30	306	22
Convertible roof motor assembly x Tarpaulin rail pivot bracket		30	306	22
Tarpaulin assembly x Body	Bolt	30	306	22
	Nut	26	265	19
No.1 tarpaulin bow x Tarpaulin rail assembly		30	306	22
No.4 tarpaulin bow x Tarpaulin rail assembly		30	306	22
No.5 tarpaulin bow x Tarpaulin rail assembly		30	306	22
No.3 tarpaulin bow x Tarpaulin rail assembly		30	306	22
Tarpaulin rail cable x Rear tarpaulin rail		8.0	82	71 in.*lbf
Tarpaulin rail damper x Rear tarpaulin rail		8.0	82	71 in.*lbf
Tarpaulin cover x Rear tarpaulin rail		6.0	61	53 in.*lbf
Tarpaulin headlining sub-assembly x No.1 tarpaulin bow		6.0	61	53 in.*lbf
Tarpaulin roof header garnish x No.1 tarpaulin bow		6.0	61	53 in.*lbf
Tarpaulin rear rail drain trough's stay x Body		8.5	87	75 in.*lbf
Tarpaulin pivot bracket cover x Tarpaulin rail pivot bracket		5.5	56	49 in.*lbf
Tarpaulin front rail retainer x Front tarpaulin rail assembly		10	102	7.0
Tarpaulin center rail retainer x Center tarpaulin rail assembly		10	102	7.0
Tarpaulin rear rail retainer x Rear tarpaulin rail assembly		10	102	7.0
Courtesy light switch x Tarpaulin rail pivot bracket RH		7.0	71	62 in.*lbf