

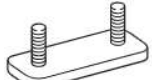
SERVICE SPECIFICATIONS – STANDARD BOLT

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 	No Mark 		4T
					5T
	w/ Washer 	w/ Washer 			6T
					7T
			 		8T
					9T
					10T
					11T

SS

SS-2

SERVICE SPECIFICATIONS – STANDARD BOLT

SPECIFIED TORQUE FOR STANDARD BOLTS

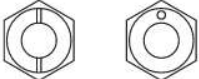
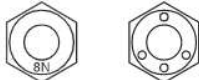
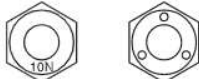
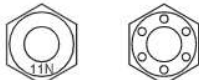
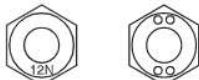
Class	Diameter (mm)	Pitch (mm)	Specified torque					
			Hexagon head bolt			Hexagon flange bolt		
			N*m	kgf*cm	ft.*lbf	N*m	kgf*cm	ft.*lbf
4T	6	1	5	55	48 in.*lbf	6	60	52 in.*lbf
	8	1.25	12.5	130	9	14	145	10
	10	1.25	26	260	19	29	290	21
	12	1.25	47	480	35	53	540	39
	14	1.5	74	760	55	84	850	61
	16	1.5	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

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 a nut with the same nut strength classification number (or greater) as the bolt strength classification number when tightening parts with a bolt and nut.

Example:

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

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

Mass air flow meter : Standard resistance (4 (THA) - 5 (E2))	13.6 to 18.4 kΩ at -20 °C (-4°F) 2.21 to 2.69 kΩ at 20 °C (68°F) 0.493 to 0.667 kΩ at 60°C (140°F)
Camshaft timing oil control valve : Standard resistance (1 (+B) - 2 (GND))	6.9 to 7.9 kΩ at 20 °C (68°F)
Camshaft position sensor : Standard resistance (1 (G+) - 2 (G-))	835 to 1,400 Ω at cold 1,060 to 1,645 Ω at hot
Crankshaft position sensor : Standard resistance (1 (Ne+) - 2 (Ne-))	985 to 1,600 Ω at cold 1,265 to 1,890 Ω at hot
Engine coolant temperature sensor : Standard resistance (1 (E2) - 2 (THW))	2.32 to 2.59 kΩ at 20 °C (68°F) 0.310 to 0.326 kΩ at 80°C (176°F)
Throttle body : Standard resistance (1 (M-) - 2 (M+))	0.3 to 100 kΩ at 20 °C (68°F)
Knock sensor : Standard resistance (1 (Ground) - 2 (Output))	120 to 280 kΩ at 20 °C (68°F)
Accelerator pedal (ACCEL POS #1) : Standard voltage	0.5 to 1.1 V (accelerator pedal released) 2.5 to 4.5 V (accelerator pedal depressed)
Accelerator pedal (ACCEL POS #2) : Standard voltage	1.2 to 2.0 V (accelerator pedal released) 3.4 to 5.0 V (accelerator pedal depressed)

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

Part Tightened	N*m	kgf*cm	ft.*lbf
Camshaft timing oil control valve x Timing chain cover	9.0	92	80 in.*lbf
Engine coolant temperature sensor x Cylinder head	19.6	200	14
Camshaft position sensor x Cylinder head	9.0	92	80 in.*lbf
Crankshaft position sensor x Timing chain cover	9.0	92	80 in.*lbf
Throttle body x Intake manifold	30	305	22
Engine cover x Cylinder head cover	7.0	71	62 in.*lbf
Knock sensor x Cylinder block	20	205	15
Intake manifold x Cylinder head	30	305	22
Cowl top panel outer x Body	13	135	10
No. 2 ECM bracket x ECM	3.0	30	27 in.*lbf
No. 1 ECM bracket x ECM	3.0	30	27 in.*lbf
No. 1 ECM bracket x Heater case	3.0	30	27 in.*lbf
No. 2 ECM bracket x Instrument panel reinforcement	5.0	50	44 in.*lbf
Accelerator pedal x Body	5.4	55	48 in.*lbf

SS

SERVICE SPECIFICATIONS – 2AZ-FE ENGINE MECHANICAL

SS-5

2AZ-FE ENGINE MECHANICAL

SERVICE DATA

Standard ignition timing				5 to 15° BTDC at idle
Standard idle speed		A/T		610 to 710 rpm
		M/T		650 to 750 rpm
Compression		Standard pressure		1,300 kPa (13.3 kgf/cm ² , 189 psi)
		Minimum pressure		1,000 kPa (10.2 kgf/cm ² , 145 psi)
		Difference between each cylinder		100 kPa (1.0 kgf/cm ² , 14 psi)
Valve clearance (cold condition)	No. 1 cylinder TDC/Compression	Intake	-	0.19 to 0.29 mm (0.0075 to 0.0114 in.)
		Exhaust	-	0.30 to 0.40 mm (0.0118 to 0.0158 in.)
	No. 4 cylinder TDC/Compression	Intake	-	0.19 to 0.29 mm (0.0075 to 0.0114 in.)
		Exhaust	-	0.30 to 0.40 mm (0.0118 to 0.0158 in.)
Chain sub-assembly	Chain elongation		Minimum chain elongation	122.6 mm (4.827 in.)
Chain tensioner slipper	Wear		Minimum	1.0 mm (0.039 in.)
No. 1 chain vibration damper	Wear		Minimum	1.0 mm (0.039 in.)
Crankshaft timing sprocket	Minimum gear diameter (with chain)		Minimum	51.6 mm (2.031 in.)
Oil pump drive gear	Gear diameter (with chain)		Minimum	48.2 mm (1.898 in.)
Oil pump drive shaft gear	Gear diameter (with chain)		Minimum	48.2 mm (1.898 in.)
Cylinder head	Warpage		Maximum	0.08 mm (0.0032 in.)
No. 1 camshaft (intake)	Circle runout		Maximum	0.03 mm (0.0012 in.)
	Cam lobes height		Standard	46.495 to 46.595 mm (1.8305 to 1.8345 in.)
			Minimum	46.385 mm (1.8262 in.)
	Camshaft journal diameter	No. 1 journal	-	35.971 to 35.985 mm (1.4162 to 1.4167 in.)
		Other journal	-	22.959 to 22.975 mm (0.9039 to 0.9045 in.)
	Thrust clearance		Standard	0.040 to 0.095 mm (0.0016 to 0.0037 in.)
			Maximum	0.11 mm (0.0043 in.)
	Oil clearance	No. 1 journal	Standard	0.007 to 0.038 mm (0.0003 to 0.0015 in.)
			Maximum	0.07 mm (0.0028 in.)
		Other journal	Standard	0.025 to 0.062 mm (0.0010 to 0.0024 in.)
			Maximum	0.10 mm (0.0039 in.)

SS

SS-6

SERVICE SPECIFICATIONS – 2AZ-FE ENGINE MECHANICAL

No. 2 camshaft (exhaust)	Circle runout		Maximum	0.03 mm (0.0012 in.)
	Cam lobes		Standard	45.983 to 46.083 mm (1.8104 to 1.8143 in.)
			Minimum	45.873 mm (1.8060 in.)
	Camshaft journal diameter	No. 1 journal	-	5.971 to 35.985 mm (1.4162 to 1.4167 in.)
		Other journal	-	22.959 to 22.975 mm (0.9039 to 0.9045 in.)
	Thrust clearance		Standard	0.080 to 0.135 mm (0.0032 to 0.0053 in.)
			Maximum	0.15 mm (0.0059 in.)
	Oil clearance	No. 1 journal	Standard	.040 to 0.079 mm (0.0016 to 0.0031 in.)
			Maximum	0.10 mm (0.0039 in.)
		Other journal	Standard	0.025 to 0.062 mm (0.0010 to 0.0024 in.)
			Maximum	0.10 mm (0.0039 in.)
Valve lifter	Diameter			30.966 to 30.976 mm (1.2191 to 1.2195 in.)
	Bore diameter (cylinder head)			31.009 to 31.025 mm (1.2208 to 1.2215 in.)
	Oil clearance	Standard	0.033 to 0.059 mm (0.0013 to 0.0023 in.)	
		Maximum	0.079 mm (0.0031 in.)	
Inner compression spring	Free length			4.7 mm (1.799 in.)
	Deviation		Maximum	1.6 mm (0.063 in.)
	Angle (reference)		Maximum	2°
Intake valve	Overall length		Standard	101.71 mm (4.0043 in.)
			Minimum	101.21 mm (3.9846 in.)
	Valve stem diameter			5.470 to 5.485 mm (0.2154 to 0.2159 in.)
	Valve head margin thickness	Standard	1.0 mm (0.039 in.)	
		Minimum	0.50 mm (0.0197 in.)	
Exhaust valve	Overall length		Standard	101.15 mm (3.9823 in.)
			Minimum	100.70 mm (3.9646 in.)
	Valve stem diameter			5.465 to 5.480 mm (0.2152 to 0.2158 in.)
	Valve head margin thickness	Standard	1.0 mm (0.039 in.)	
		Minimum	0.50 mm (0.0197 in.)	
Intake valve guide bush	Bush inside diameter			5.510 to 5.530 mm (0.2169 to 0.2177 in.)
	Oil clearance	Standard	0.025 to 0.060 mm (0.0010 to 0.0024 in.)	
		Maximum	0.08 mm (0.0032 in.)	
Exhaust valve guide bush	Bush inside diameter			5.510 to 5.530 mm (0.2169 to 0.2177 in.)
	Oil clearance	Standard	0.030 to 0.065 mm (0.0012 to 0.0026 in.)	
		Maximum	0.10 mm (0.0039 in.)	
Cylinder head set bolt	Bolt length		Standard	161.3 to 162.7 mm (6.350 to 6.406 in.)
			Maximum	164.2 mm (6.465 in.)

SERVICE SPECIFICATIONS – 2AZ-FE ENGINE MECHANICAL**SS-7**

Intake valve guide bush	Bush bore diameter (cylinder head)		Standard	10.285 to 10.306 mm (0.4049 to 0.4058 in.)
	Protrusion height		Standard	9.6 to 10 mm (0.3780 to 0.3937 in.)
	Oil clearance		Standard	0.025 to 0.060 mm (0.0010 to 0.0024 in.)
Exhaust valve guide bush	Bush bore diameter (cylinder head)		Standard	10.285 to 10.306 mm (0.4049 to 0.4058 in.)
	Protrusion height		Standard	9.6 to 10.0 mm (0.3780 to 0.3937 in.)
	Oil clearance		Standard	0.030 to 0.065 mm (0.3780 to 0.3937 in.)
Ring pin	Protrusion height			3.0 mm (0.12 in.)
Balanceshaft	Thrust clearance		Standard	0.05 to 0.09 mm (0.0020 to 0.0035 in.)
			Maximum	0.09 mm (0.0035 in.)
	Oil clearance		Standard	0.004 to 0.049 mm (0.0002 to 0.0019 in.)
			Maximum	0.049 mm (0.0019 in.)
Connecting rod	Thrust clearance		Standard	0.160 to 0.362 mm (0.0063 to 0.0143 in.)
			Maximum	0.362 mm (0.0143 in.)
	Oil clearance		Standard	0.024 to 0.048 mm (0.0009 to 0.0019 in.)
			Maximum	0.08 mm (0.0032 in.)
	Large end bore diameter	Mark 1	-	51.000 to 51.007 mm (2.0079 to 2.0082 in.)
		Mark 2	-	51.008 to 51.013 mm (2.0082 to 2.0084 in.)
		Mark 3	-	51.014 to 51.020 mm (2.0084 to 2.0087 in.)
	Bearing thickness	Mark 1	-	1.485 to 1.488 mm (0.0585 to 0.0586 in.)
		Mark 2	-	1.489 to 1.419 mm (0.0586 to 0.0587 in.)
		Mark 3	-	1.492 to 1.494 mm (0.0587 to 0.0588 in.)
Crankshaft	Thrust clearance		Standard	0.04 to 0.24 mm (0.0016 to 0.0095 in.)
			Maximum	0.30 mm (0.0118 in.)
Cylinder block	Warpage		Maximum	0.05 mm (0.0020 in.)
	Bore diameter		Standard	88.500 to 88.513 mm (3.4843 to 3.4848 in.)
			Maximum	8.633 mm (3.4895 in.)
Piston	Diameter		Standard	88.439 to 88.449 mm (3.4819 to 3.4822 in.)
	Oil clearance		Standard	0.051 to 0.074 mm (0.0020 to 0.0029 in.)
			Maximum	0.10 mm (0.0039 in.)

SS

SS-8

SERVICE SPECIFICATIONS – 2AZ-FE ENGINE MECHANICAL

Piston ring	Groove clearance	No. 1 ring	-	0.17 to 0.22 mm (0.0067 to 0.0087 in.)
		No. 2 ring	-	0.17 to 0.21 mm (0.0067 to 0.0083 in.)
		Oil ring	-	0.21 to 0.29 mm (0.0083 to 0.0114 in.)
	End gap	No. 1 ring	Standard	0.22 to 0.32 mm (0.0087 to 0.0126 in.)
		No. 2 ring		0.50 to 0.60 mm (0.0197 to 0.0236 in.)
		Oil ring		0.10 to 0.35 mm (0.0039 to 0.0138 in.)
		No. 1 ring	Maximum	0.89 mm (0.0350 in.)
		No. 2 ring		1.35 mm (0.0531 in.)
		Oil ring		0.73 mm (0.0287 in.)
Piston pin	Bore diameter		Standard	22.001 to 22.010 mm (0.8662 to 0.8665 in.)
	Piston pin diameter		Standard	21.997 to 22.006 mm (0.8660 to 0.8664 in.)
	Connecting rod small end diameter		Standard	22.005 to 22.014 mm (0.8663 to 0.8667 in.)
Connecting rod	Bend		Maximum	0.05 mm (0.0020 in.) per 100 mm (3.94 in.)
	Twist		Maximum	0.15 mm (0.0059 in.) per 100 mm (3.94 in.)
Connecting rod bolt	Tension portion diameter		Standard	7.2 to 7.3 mm (0.283 to 0.287 in.)
			Maximum	7.0 mm (0.276 in.)
Crankshaft	Diameter (main journal)		Standard	54.998 to 55.000 mm (2.1649 to 2.1654 in.)
	Taper and distortion (main journal)		Maximum	0.003 mm (0.0001 in.)
	Diameter (crank pin)		Standard	47.990 to 48.000 mm (1.8894 to 1.8898 in.)
	Taper and distortion (crank pin)		Maximum	0.003 mm (0.0001 in.)
	Oil clearance		Standard	0.017 to 0.040 mm (0.0007 to 0.0016 in.)
			Maximum	0.050 mm (0.0020 in.)
Crankshaft bearing cap set bolt	Tension portion diameter		Standard	7.5 to 7.6 mm (0.295 to 0.299 in.)
			Maximum	7.5 mm (0.295 in.)

SERVICE SPECIFICATIONS – 2AZ-FE ENGINE MECHANICAL

SS-9

TORQUE SPECIFICATIONS

Valve clearance

Part Tightened	N·m	kgf·cm	ft.·lbf
No. 1 camshaft bearing cap x Cylinder head sub-assembly	29.5	301	22
No. 2 camshaft bearing cap x Cylinder head sub-assembly	29.5	301	22
No. 3 camshaft bearing cap x Cylinder head sub-assembly	9.0	92	80 in.·lbf
No. 2 camshaft timing sprocket x No. 2 camshaft	54	551	40
No. 1 chain tensioner assembly x Timing chain cover sub-assembly	9.0	92	80 in.·lbf

SS

Timing chain

Part Tightened	N·m	kgf·cm	ft.·lbf
No. 1 and No. 2 engine hanger x Cylinder head sub-assembly	38	387	28
Chain tensioner plate x Cylinder block	12	122	9
Oil pump drive shaft gear x Cylinder block	29.5	301	22
No.1 chain vibration damper x Cylinder block	9.0	92	80 in.·lbf
Chain tensioner slipper x Cylinder block	19	194	14
Timing chain guide x Cylinder block	9.0	92	80 in.·lbf
Timing chain cover sub-assembly x Cylinder block	Bolt A = 10 mm head	9.0	92
	Bolt B= 12 mm head	25	255
	Bolt C= 14 mm head, 40 mm (1.57 in.) underhead length	55	561
	Nut	11	122
Stud bolt (for V-ribbed belt) x Cylinder block	21.5	219	16
No. 1 chain tensioner x Timing chain tensioner sub-assembly	9.0	92	80 in.·lbf
Crankshaft pulley x Crankshaft	80	1,835	133
Oil pan sub-assembly x	9.0	92	80 in.·lbf
V-ribbed belt tensioner assembly x Cylinder block	59.5	607	44
Cylinder head cover sub-assembly x Cylinder head	Bolt A	11	112
	Bolt = B (ignition coil side)	14	143
	Nut	11	112
Engine mounting insulator RH X Cylinder head, Body panel	52	530	38
Front engine mounting insulator x Front engine mounting bracket	52	530	38
No. 1 oil reservoir bracket x Body panel	7.8	80	69 in.·lbf
Radiator reservoir x Body panel	5.0	51	44 in.·lbf
No. 1 engine cover sub-assembly x Cylinder head cover sub-assembly	7.0	71	62 in.·lbf

SS-10

SERVICE SPECIFICATIONS – 2AZ-FE ENGINE MECHANICAL

Cylinder head

Part Tightened		N*m	kgf*cm	ft.*lbf
Stud bolt x Cylinder head	Front side Bolt A = 33.3 mm (1.31 in.) length	5.0	51	44 in.*lbf
	Upper side Bolt B = 46.5 mm (1.95 in.) length	5.0	51	44 in.*lbf
	Intake side Bolt C = 49.5 in.) mm (1.9.5 in.) length	9.5	97	84 in.*lbf
	Exhaust side Bolt D = 37.5 mm (1.48in.) length	9.5	97	84 in.*lbf
Cylinder head x Cylinder block	1 st	78.5	800	58
	2 nd	Turn 90°	Turn 90°	Turn 90°
Camshaft timing gear assembly x Camshaft		54	551	40
No. 2 camshaft timing sprocket x No. 2 camshaft		54	551	40
No. 1 and No. 2 camshaft bearing cap x Cylinder head		29.5	301	22
No. 1 camshaft bearing cap x Cylinder head		9.0	92	80 in.*lbf
Exhaust manifold converter sub-assembly x Cylinder head		37	377	27
No. 1 exhaust manifold heat insulator x Exhaust manifold converter sub-assembly		12	122	9
No. 2 manifold stay x Exhaust manifold converter sub-assembly, Cylinder block		44	449	32
Manifold stay x Exhaust manifold converter sub-assembly, Cylinder block		44	449	32
Oil dipstick guide x No. 1 water by-pass pipe		9.0	92	80 in.*lbf

Engine assembly

Part Tightened		N*m	kgf*cm	ft.*lbf
Radio setting condenser x Cylinder head		10	102	7
No. 1 water by-pass pipe x Cylinder block		9.0	92	80 in.*lbf
Drive shaft bearing bracket x Cylinder block		64	653	47
Flywheel sub-assembly x Crankshaft		130	1,326	96
Drive plate sub-assembly x Crankshaft		98	1,000	72
Rear engine mounting insulator x Rear engine mounting bracket		87	887	64
Front engine mounting insulator x Front engine mounting bracket		52	530	38
Engine mounting insulator LH x Engine mounting bracket LH		87	887	64
Engine mounting insulator RH x Cylinder head		52	530	38
Engine mounting insulator RH x Engine mounting bracket RH		113	1,152	83
Center member x Body		45	459	33
Front suspension crossmember sub-assembly x Body		133	1,356	98
Front suspension member brace rear RH and LH x Body	Bolt A	133	1,356	98
	Bolt B	80	816	59
Battery carrier X Body		12.8	131	9
Air cleaner case sub-assembly x Body		5.0	51	44 in.*lbf

SERVICE SPECIFICATIONS – 2AZ-FE ENGINE MECHANICAL**SS-11****Engine unit**

Part Tightened		N*m	kgf*cm	ft.*lbf
Connecting rod cap x Connecting rod		24.5	250	18
Crankshaft bearing cap x Cylinder block		40	408	30
Stud bolt x Cylinder block	Bolt A (Bolt length = 84 mm (3.31 in.))	5.0	51	44 in.*lbf
	Bolt B (Bolt length = 33.3 mm (1.31 in.))	21.5	219	16
	Bolt C (Bolt length = 52.5 mm (2.07 in.))	5.0	51	44 in.*lbf
	Bolt D (Bolt length = 27.5 mm (1.08 in.))	9.5	97	84 in.*lbf
Crankshaft bearing cap x Cylinder block		40	408	30
Baranceshaft housing x Stiffening crankcase assembly		21.6	224	16
Stiffening crankcase assembly x Cylinder block		32.5	331	24
No. 1 taper screw plug x Cylinder block		26	265	19
Plug (oil control valve filter) x Cylinder block		30	306	22
Water drain cock plug x Cylinder block		25	255	18
Cylinder head sub-assembly x Cylinder block	1 st	78.5	800	58
	2 nd	Turn 90°	Turn 90°	Turn 90°
Camshaft timing oil control valve assembly x Cylinder head		9.0	92	80 in.*lbf
Oil drain plug x Oil pan sub-assembly		40	408	30
Oil filer union x Stiffening crankcase assembly		29.5	301	22
Cylinder head cover sub-assembly x Cylinder head	Bolt A	11	112	8
	Bolt B (ignition coil side)	14	143	10
Ventilation valve sub-assembly x Cylinder head cover sub-assembly		19	194	14
Oil filer cap sub-assembly x Cylinder head cover sub-assembly		19	194	14

SS

SS-12

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 injector	Resistance	at 20°C (68°F)	11.6 to 12.4 Ω
	Injection volume		76 to 92 cm ³ (4.6 to 5.6 cu in.) per 15 seconds
	Difference between each cylinder		16 cm ³ (1.0 cu in.) or less
	Fuel leakage		1 drop or less per 12 minutes
Fuel pump	Resistance	at 20°C (68°F)	0.2 to 3.0 Ω

SS

SERVICE SPECIFICATIONS – 2AZ-FE FUEL

SS-13

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Fuel delivery pipe x Cylinder head	20	205	15
Fuel pressure pulsation damper x Fuel delivery pipe	9.0	90	80 kgf*cm
Fuel tank vent tube set plate x Fuel tank assembly	6.0	60	53 kgf*cm
Fuel tank protector x Fuel tank assembly	6.0	60	53 kgf*cm
No. 4 fuel tube clamp x Fuel tank assembly	6.0	60	53 kgf*cm
Fuel tank band x Body	39	400	29
Rear suspension brace lower RH x Body	63.5	645	47
Rear suspension brace lower LH x Body	63.5	645	47
No. 1 fuel tank protector x Body	5.4	55	48 in.*lbf

SS

2AZ-FE EMISSION CONTROL

SERVICE DATA

Purge VSV

Tester Connection	Specified Condition
1 - 2	30 to 34 Ω at 20°C (68°F)
1 - Body ground 2 - Body ground	10 M Ω or higher

Air fuel ratio sensor

Tester Connection	Specified Condition
1 (HT) - 2 (+B)	1.8 to 3.4 Ω at 20°C (68°F)
1 (HT) - 4 (AF-)	10 k Ω or higher

SS

Heated oxygen sensor

Tester Connection	Specified Condition
1 (HT) - 2 (+B)	11 to 16 Ω at 20°C (68°F)
1 (HT) - 4 (E)	10 k Ω or higher

SS-14

SERVICE SPECIFICATIONS – 2AZ-FE EMISSION CONTROL

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Canister assembly x Body	19	194	14
No. 1 fuel tank protector x Fuel tank	5.4	55	48 in.*lbf
Center exhaust pipe assembly x Front exhaust pipe assembly	43	440	32
Center exhaust pipe assembly x Rear exhaust pipe assembly	43	440	32
Front floor panel brace x Body	29.6	300	22
Canister filter sub-assembly x Body	8.0	82	71 in.*lbf
No. 1 engine cover sub-assembly x Engine	7.0	70	62 in.*lbf
Ventilation valve sub-assembly x Cylinder head	19	194	14
Air fuel ratio sensor (for bank 1 sensor 1) x Exhaust manifold : for use with SST	40	408	30
Air fuel ratio sensor (for bank 1 sensor 1) x Exhaust manifold : for use without SST	44	449	32
Heated oxygen sensor (for bank 1 sensor 2) x Exhaust manifold : for use with SST	40	408	30
Heated oxygen sensor (for bank 1 sensor 2) x Exhaust manifold : for use without SST	44	449	32

SS

SS-14

SERVICE SPECIFICATIONS – 2AZ-FE EXHAUST

2AZ-FE EXHAUST
SERVICE DATA

Compression spring	
Front exhaust pipe side	40 mm (1.57 in.)
Center exhaust pipe side	38.5 mm (1.516 in.)

SS

SERVICE SPECIFICATIONS – 2AZ-FE EXHAUST

SS-15

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Front exhaust pipe assembly x Exhaust manifold	43	440	32
Center exhaust pipe assembly x Front exhaust pipe assembly	43	440	32
Tailpipe assembly x Center exhaust pipe assembly	43	440	32
Front floor panel brace x Body	29.6	300	22

SS

SERVICE SPECIFICATIONS – 2AZ-FE COOLING

SS-15

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 (0.39 in.) or more
Radiator cap	Standard opening pressure		74 to 103 kPa (0.75 to 1.05 kgf*cm ² , 10.7 to 14.9 psi)
	Minimum opening pressure		59 kPa (0.6 kgf*cm ² , 8.6 psi)
Fan	Standard amperage	at 20°C (68°F)	5.2 to 8.2 A
No. 2 fan	Standard amperage	at 20°C (68°F)	5.2 to 8.2 A
No. 1 Cooling fan relay	Resistance	3 - 5	10 kΩ or higher
		3 - 5	Below 1 Ω (when battery voltage is applied to terminals 1 and 2)
No. 2 cooling fan relay	Resistance	3 - 4	Below 1 Ω
		3 - 5	10 kΩ or higher
		3 - 4	10 kΩ or higher (when battery voltage is applied to terminals 1 and 2)
		3 - 5	Below 1 Ω (when battery voltage is applied to terminals 1 and 2)

SS

SS-16

SERVICE SPECIFICATIONS – 2AZ-FE COOLING

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Cylinder block water drain cock plug x Cylinder block water drain cock	12.7	129	9
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 shroud x Radiator	5.0	51	44 in.*lbf
Radiator support upper x body	19	194	14

SS

SS-16

SERVICE SPECIFICATIONS – 2AZ-FE LUBRICATION

2AZ-FE LUBRICATION

SERVICE DATA

Oil pressure	Idling		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)
Add new oil	Standard capacity	Drain and refill with oil filter change	3.8 liters (4.0 US qts, 3.3 Imp. qts)
		Drain and refill without oil filter change	3.6 liters (3.8 US qts, 3.2 Imp. qts)
		Dry fill	4.5 liters (4.88 US qts, 4.0 Imp. qts)
Oil pump rotor	Side clearance	Standard	0.100 to 0.170 mm (0.0039 to 0.0067 in.)
		Maximum	0.325 mm (0.0128 in.)
	Tip clearance	Standard	0.080 to 0.160 mm (0.0031 to 0.0063 in.)
		Maximum	0.35 mm (0.0138 in.)
	Body clearance	Standard	0.100 to 0.170 mm (0.0039 to 0.0067 in.)
		Maximum	0.325 mm (0.0128 in.)

SS

SERVICE SPECIFICATIONS – 2AZ-FE LUBRICATION

SS-17

TORQUE SPECIFICATIONS

Lubrication system

Part Tightened	N·m	kgf·cm	ft.·lbf
Oil pressure switch x Cylinder head	15	153	11

Oil filter

Part Tightened	N·m	kgf·cm	ft.·lbf
Oil filter x Stiffening crankcase	17.2	175	13
Oil pan drain plug x Oil pan	40	408	30

SS

Oil pump

Part Tightened	N·m	kgf·cm	ft.·lbf
Oil pump cover x Oil pump	8.8	90	78 in.·lbf
Oil pump relief valve x Oil pump	49	500	36
Oil pump strainer set x Oil pump	8.8	90	78 in.·lbf
Oil pump x Stiffening crankcase	19	194	14

2AZ-FE IGNITION
SERVICE DATA

Spark plug	Standard electrode gap	1.0 to 1.1 mm (0.039 to 0.043 in.) for new spark plug
	Maximum electrode gap	1.3 mm (0.051 in.) for used spark plug



SS-18

SERVICE SPECIFICATIONS – 2AZ-FE IGNITION

TORQUE SPECIFICATIONS

Part Tightened	N ^o m	kgf ^o cm	ft. ^o lbf
Spark plug x Cylinder head sub-assembly	19	195	14
Ignition coil assembly x Cylinder head cover	9.0	92	80 in. ^o lbf

SS

SS-18

SERVICE SPECIFICATIONS – 2AZ-FE STARTING

2AZ-FE STARTING

SERVICE DATA

Starter assembly	Standard current		90 A or less at 11.5 V
Starter relay	Standard resistance	3 - 5	10 kΩ or higher
		3 - 5	Below 1 Ω (When battery voltage is applied to terminals 1 and 2)
Ignition switch	Standard resistance	-	10 kΩ or higher
		2 (AM1) - 3 (ACC)	Below 1 Ω at ACC
		2 (AM1) - 3 (ACC)	Below 1 Ω at ON
		3 (ACC) - 4 (IG1)	Below 1 Ω at ON
		7 (AM2) - 6 (IG2)	Below 1 Ω at ON
		2 (AM1) - 4 (IG1)	Below 1 Ω at START
		4 (IG1) - 1 (ST1)	Below 1 Ω at START
		7 (AM2) - 6 (IG2) - 8 (ST2)	Below 1 Ω at START
Starter magnetic switch assembly	Standard resistance	50 - C	Below 1 Ω
		50 - Body	Below 2 Ω
Starter armature assembly	Standard resistance	Segment	Below 1 Ω
		Segment - Coil core	10 kΩ or higher
Starter armature assembly	Commutator depth	Standard	3.1 mm (0.354 in.)
		Maximum	3.8 mm (0.150 in.)
Starter commutator end frame	Brush length	Standard length	9.0 mm (0.354 in.)
		Maximum length	4.0 mm (0.158 in.)
	Standard resistance	Positive (+) - Negative (-)	10 kΩ or higher
Snap ring	Maximum length		4.0 mm (0.158 in.)

SERVICE SPECIFICATIONS – 2AZ-FE STARTING

SS-19

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Lead wire x Terminal C	10	100	7
Starter assembly x Cylinder block sub-assembly	37	380	27
Starter wire x Starter assembly x Engine mounting bracket LH	9.8	100	7
Starter commutator end frame x Starter drive housing assembly	6.0	60	53 in.*lbf
Starter magnetic switch assembly x Starter drive housing assembly	7.5	76	66 in.*lbf

SS

SERVICE SPECIFICATIONS – 2AZ-FE CHARGING

SS-19

2AZ-FE CHARGING**SERVICE DATA**

Battery	Standard voltage		12.5 to 12.9 V at 20°C (68°F)
Charging circuit without load	Standard amperage		10 A or less at 2,000 rpm
	Standard voltage		13.2 to 14.8 V at 2,000 rpm
Charging circuit with load	Standard amperage		30 A or more
Generator brush holder assembly	Brush length	Standard length	9.5 to 11.5 mm (0.374 to 0.453 in.)
		Minimum length	4.5 mm (0.177 in.)
Generator rotor assembly	Standard resistance	Slip ring	2.3 to 2.7 Ω at 20°C (68°F)
		Slip ring - Rotor core	10 k Ω or higher
	Slip ring diameter	Standard diameter	14.2 to 14.4 mm (0.559 to 0.567 in.)
		Minimum diameter	14.0 mm (0.551 in.)

SS

SS-20

SERVICE SPECIFICATIONS – 2AZ-FE CHARGING

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Wire harness clamp bracket x Generator assembly	8.4	85	74 in.*lbf
Generator wire x Generator assembly : for bolt A	21	215	16
Generator wire x Generator assembly : for bolt B	52	530	38
Generator wire x Generator assembly	9.8	100	7
Generator rectifier end frame x Generator drive end frame	5.8	60	51 in.*lbf
Cord clip x Generator rectifier end frame	4.56	45	40 in.*lbf
Generator brush holder assembly x Generator rectifier end frame	1.76	15	16 in.*lbf
Generator rear end cover x Generator rectifier end frame	4.6	45	41 in.*lbf
Generator pulley x Generator rotor assembly	110.3	1,125	82

SS

SS-20

SERVICE SPECIFICATIONS – U241E AUTOMATIC TRANSAXLE

U241E AUTOMATIC TRANSAXLE

SERVICE DATA

Line pressure 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)
Line pressure AT stall (Throttle valve fully opened)	D position	931 to 1031 kPa (9.5 to 10.5 kgf*cm ² , 135 to 150 psi)
	R position	1768 to 1968 kPa (18.0 to 20.1 kgf*cm ² , 256 to 285 psi)
Engine stall revolution	D and R positions	2420 to 2720 rpm
Time lag	N → D position	Less than 1.2 seconds
	N → R position	Less than 1.5 seconds
Engine idle speed (A/C OFF)	N position	600 to 700 rpm
Drive plate runout	Max.	0.20 mm (0.0079 in.)
Torque converter clutch runout	Max.	0.30 mm (0.0118 in.)
Differential oil seal drive in depth	LH side	- 0.5 to 0.5 mm (- 0.020 to 0.020 in.)
	RH side	- 0.5 to 0.5 mm (- 0.020 to 0.020 in.)
Shift schedule		
D position		
(Throttle valve fully opened)	1 → 2	58 to 65 km/h (36 to 40 mph)
	2 → 3	108 to 115 km/h (67 to 71 mph)
	3 → 4	173 to 185 km/h (108 to 115 mph)
	4 → 3	165 to 176 km/h (103 to 109 mph)
	3 → 2	99 to 106 km/h (62 to 66 mph)
	2 → 1	48 to 54 km/h (30 to 34 mph)
(Throttle valve fully closed)	3 → 4	39 to 45 km/h (24 to 28 mph)
	4 → 3	17 to 23 km/h (11 to 14 mph)
2 position		
(Throttle valve fully opened)	1 → 2	58 to 65 km/h (36 to 40 mph)
	3 → 2	108 to 114 km/h (67 to 71 mph)
	2 → 1	48 to 54 km/h (30 to 34 mph)
L position		
(Throttle valve fully opened)	3 → 2	108 to 114 km/h (67 to 71 mph)
	2 → 1	54 to 59 km/h (34 to 37 mph)
Lock-up point Throttle valve opening 5%		
D position	Lock-up ON 3 → 3L	189 to 201 km/h (117 to 125 mph)
	Lock-up ON 4 → 4L	63 to 69 km/h (39 to 43 mph)
	Lock-up OFF 4L → 4	61 to 67 km/h (38 to 42 mph)
	Lock-up OFF 3L → 3	180 to 192 km/h (112 to 119 mph)
Flex lock-up point Throttle valve opening 5%		

SERVICE SPECIFICATIONS – U241E AUTOMATIC TRANSAXLE

SS-21

D position	Lock-up ON 3 → 3L	33 to 39 km/h (21 to 24 mph)
	Lock-up ON 4 → 4L	46 to 52 km/h (29 to 32 mph)
	Lock-up OFF 4L → 4	39 to 45 km/h (24 to 28 mph)
	Lock-up OFF 3L → 3	32 to 37 km/h (20 to 23 mph)

SS

SS-22

SERVICE SPECIFICATIONS – U241E AUTOMATIC TRANSAXLE

TORQUE SPECIFICATIONS

Part tightened		N*m	kgf*cm	ft.*lbf
Park/Neutral position switch x Transaxle	Bolt	5.4	55	48 in.*lbf
	Nut	6.9	70	61 in.*lbf
Control shaft lever x Park/Neutral position switch		13	132	10
Engine hanger x Engine		38	387	28
Drain plug x Oil pan		49	500	36
Transaxle x Engine	Bolt A:	64	653	47
	Bolt B:	46	469	34
	Bolt C:	44	449	32
Torque converter clutch x Drive plate		41	418	30
Engine mounting bracket RR x Transaxle		64	653	47
Engine mounting bracket FR x Transaxle		64	653	47
Center member x Body	Bolt A:	45	459	33
Center member x Suspension member	Bolt B:	65	663	48
Engine mounting insulator RR x Engine mounting bracket RR		87	887	64
Engine mounting insulator RR x Suspension member		65	663	48
Engine mounting insulator FR x Engine mounting bracket FR		52	530	38
Engine mounting bracket LH x Transaxle		64	653	47
Engine mounting insulator LH x Body	Bolt A:	52	530	38
	Nut B:	87	887	64
Starter x Transaxle		64	653	47
Starter wire x Starter		9.8	100	87 in.*lbf
Oil filter tube x Transaxle		5.5	56	49 in.*lbf
Oil cooler tube clamp x Transaxle	Bolt A:	5.5	56	49 in.*lbf
	Bolt B:	12	122	9
Oil cooler outlet tube x Transaxle		34	347	25
Oil cooler inlet tube x Transaxle		34	347	25
Wire harness x Transaxle	Bolt A:	5.0	51	44 in.*lbf
	Bolt B:	8.4	86	74 in.*lbf
No. 1 control cable bracket x Transaxle		12	122	9
Control cable clamp x Transaxle		12	122	9
Air cleaner assembly x Body		5.0	51	44 in.*lbf
No. 1 engine cover sub-assembly x Engine		7.0	71	62 in.*lbf
Transmission wire x Transaxle		5.4	55	48 in.*lbf
Solenoid valve x Valve body	Bolt A:	6.6	67	58 in.*lbf
	Bolt B:	11	112	8
Valve body x Transaxle		11	110	8
Temperature sensor lock plate x Valve body		6.6	67	58 in.*lbf
Oil strainer x Valve body		11	112	8
Oil pan x Transaxle		7.8	80	69 in.*lbf
Shift lever assembly x Body		12	122	9
Control cable x Control shaft lever		12	122	9
Control cable x Body	Bolt:	5.0	51	44 in.*lbf
Speed sensor (NC sensor) x Transaxle		11	112	8
Speed sensor (NT sensor) x Transaxle		11	112	8

SERVICE SPECIFICATIONS – CLUTCH

SS-23

CLUTCH**SERVICE DATA**

Pedal height from dash panel		137.6 to 147.6 mm (5.417 to 5.811 in.)
Clutch pedal free play		5.0 - 15.0 mm (0.197 - 0.591 in.)
Clutch pedal push rod play at pedal top		1.0 - 5.0 mm (0.039 - 0.197 in.)
Slotted spring pin protrusion	Maximum	1.5 - 3.5 mm (0.059 - 0.138 in.)
Clutch disc rivet head depth	Maximum	0.3 mm (0.012 in.)
Clutch disc assy 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 sub-assy runout	Maximum	0.1 mm (0.004 in.)
Diaphragm spring tip non-alignment	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

SS-24**SERVICE SPECIFICATIONS – CLUTCH****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	24	241	17
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 line clamp x Clutch release cylinder assembly	18	184	13
Clutch release cylinder assembly x Flexible hose tube	15	155	11
Clutch cover assembly x Flywheel sub-assembly	19	195	14
Release fork support x Transaxle assembly	47	480	35
Clutch switch assembly set nut	16	160	12
Clutch start switch assembly set nut	16	160	12

SS

SS-24

SERVICE SPECIFICATIONS – E350 MANUAL TRANSAXLE

E350 MANUAL TRANSAXLE

SERVICE DATA

Transmission case oil seal driven in depth		3.0 to 0.5 mm (0.118 to 0.020 in.)
Front transaxle case cover oil seal drive in depth		-0.5 to 0.5 mm (-0.020 to 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 mm (0.7903 in.)
Reverse idler gear shaft outside diameter	Standard outside diameter	19.984 to 20.000 mm (0.7868 to 0.7874 in.)
	Minimum outside diameter	19.984 mm (0.7868 in.)
No. 3 transmission hub sleeve groove - thickness of the claw part on No. 3 gear shift fork	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		-0.5 to 0.5 mm (-0.020 to 0.020 in.)
Transmission case oil seal driven in depth		3.0 to 0.5 mm (0.118 to 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 NVm (8.16 to 16.32 kgfVcm, 7.1 to 14.2 in.Vlbft)
	Used bearing	0.5 to 1.0 NVm (5.10 to 10.20 kgfVcm, 4.4 to 8.9 in.Vlbft)
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.)

SERVICE SPECIFICATIONS – E350 MANUAL TRANSAXLE

SS-25

Front differential case tapered roller bearing preload	New bearing	0.8 to 1.6 NVm (8.16 to 16.32 kgfVcm, 7.1 to 14.2 in.Vlbf)
	Used bearing	0.5 to 1.0 NVm (5.10 to 10.20 kgfVcm, 4.4 to 8.9 in.Vlbf)
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 pin clearance		12.5 to 13.5 mm (0.492 to 0.531 in.)
No. 3 transmission clutch hub snap ring clearance		0.1 mm or less (0.0039 in. or less)
No. 3 transmission clutch hub 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 outside diameter	A	35.984 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 outside diameter	A	35.984 mm (1.4167 in.)
	B	35.984 mm (1.4167 in.)
	C	27.957 mm (1.1007 in.)

SS

SS-26

SERVICE SPECIFICATIONS – E350 MANUAL TRANSAXLE

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.)
No. 2 transmission hub sleeve groove - thickness of the claw part on No. 2 gear shift fork	Standard clearance	0.11 to 0.69 mm (0.0043 to 0.0272 in.)
No. 2 transmission clutch hub 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.)
4rd 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 0.051 mm (0.0004 to 0.0020 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.)
Output shaft run out	Maximum run out	0.03 mm (0.0012 in.)
Output shaft standard outside 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 outside 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 (2.0082 to 2.0089 in.)
	Maximum inside diameter	51.025 mm (2.0089 in.)
Between the 2nd gear and No. 2 synchronizer ring back clearance		0.70 to 1.45 mm (0.0276 to 0.0571 in.)
Between the 1st gear and No. 1 synchronizer ring set back clearance		0.70 to 1.45 mm (0.0276 to 0.0571 in.)

SERVICE SPECIFICATIONS – E350 MANUAL TRANSAXLE**SS-27**

Reverse gear groove - thickness of the claw part on No. 1 gear shift fork clearance	Standard clearance	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.)
Shift & 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 No. 1 shift lever inner		-0.5 to 0.5 mm (- 0.0197 to 0.0197 in.)
Shift lever slotted pin clearance to the No. 2 shift lever inner		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 No. 1 shaft 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

SS-28

SERVICE SPECIFICATIONS – E350 MANUAL TRANSAXLE

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Floor shift shift lever assembly x Body	12	122	9
Transmission control cable assembly x Body	5.0	51	44 in.*lbf
Control cable clamp x Body	5.0	51	44 in.*lbf
Engine hanger set bolt	38	387	28
Engine mounting bracket REAR x Transaxle	64	653	47
Engine mounting bracket REAR x Engine mounting insulator REAR	87	887	64
Engine mounting bracket FRONT x Transaxle	64	653	47
Engine mounting bracket FRONT x Engine mounting insulator FRONT	52	530	38
Manual transmission case protector x Manual transaxle	18	184	13
Manual transaxle x Engine	Bolt A	64	47
	Bolt B	46	34
	Bolt C	44	32
Engine mounting bracket LH x Transaxle	64	653	47
Engine mounting insulator LH set bolt	Bolt A	52	38
	Bolt B	87	64
Clutch release cylinder assembly x Transaxle	Bolt A	7.8	69 in.*lbf
	Bolt B	12	9
Manual transaxle assembly x Wire harness clamp	Bolt A	26	19
	Bolt B	8.4	74 in.*lbf
	Bolt C	13	9.6
Clutch tube bracket set bolt	17	173	13
Reverse idler gear shaft bolt	30	306	22
No. 3 Gear shift fork 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 & select lever shaft	6.4	65	57 in.*lbf
Selecting ballcrank assembly x Manual transmission case	20	200	14
Release fork support x Manual transaxle case	47	480	35
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
No. 1 gear shift head x No. 2 gear shift fork shaft	24	245	18
No. 1 gear shift fork x No. 1 gear shift fork shaft	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
No. 1 oil receiver pipe x Transmission case	17	173	13
No. 2 oil receiver pipe 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
No. 3 transmission clutch hub 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

SERVICE SPECIFICATIONS – E350 MANUAL TRANSAXLE**SS-29**

Part Tightened	N*m	kgf*cm	ft.*lbf
Back up lamp switch assembly x Transmission case	40	408	30
Manual transmission breather plug x Transmission case	49	500	36
No. 1 lock ball assembly x Transmission case	29	296	21
Speedometer driven hole cover sub-assembly set bolt	5.5	56	48 in.*lbf
Selecting bellcrank support x No .2 selecting bellcrank plate washer	12	122	9
Front differential ring gear x Front differential case	106	1,081	78

SS

DRIVE SHAFT
SERVICE DATA

Front drive shaft standard length	RH	873.0 to 883.0 mm (34.370 to 34.764 in.)
	LH	556.2 to 566.2 mm (21.898 to 22.291 in.)



SS-30

SERVICE SPECIFICATIONS – DRIVE SHAFT

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Front wheel	103	1,050	76
front suspension lower arm x lower ball joint.	89	908	66
Tie rod end x Steering knuckle	49	500	36
Front axle hub nut	216	2,200	159
Drive shaft bearing case mounting bolt	64	650	47
Front speed sensor set bolt	8.0	82	71 in.*lbf
Front stabilizer Link assembly x Shock absorber	74	755	55
Flexible hose and speed sensor wire harness x Shock absorber	19	194	14

SS

SS-30

SERVICE SPECIFICATIONS – AXLE

AXLE

SERVICE DATA

Front axle hub bearing axle backlash.	Maximum: 0.05 mm (0.0020 in.)
Front axle hub bearing deviation	Maximum: 0.05 mm (0.0020 in.)
Rear axle hub bearing backlash.	Maximum: 0.05 mm (0.0020 in.)
Rear axle hub bearing deviation	Maximum: 0.07 mm (0.0028 in.)

SS

SERVICE SPECIFICATIONS – AXLE

SS-31

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Front wheel	103	1,050	76
front suspension lower arm x lower ball joint.	89	908	66
Lower ball joint assembly front x Steering knuckle	103	1,050	76
Tie rod end x Steering knuckle	49	500	36
Front axle hub nut	216	2,200	159
Front disc brake cylinder assembly x Steering knuckle	107	1,090	79
Drive shaft bearing case mounting bolt	64	650	47
Front speed sensor set bolt	8.0	82	71 in.*lbf
Front stabilizer Link assembly x Shock absorber	74	755	55
Shock absorber x Steering knuckle	240	2,447	177
Disc brake dust cover front x Steering knuckle	8.3	85	73 in.*lbf
Flexible hose and speed sensor wire harness x Shock absorber	19	194	14
Rear wheel	103	1,050	76
Skid control sensor wire bracket x No. 1 rear suspension arm assembly	5.0	51	44 in.*lbf
Parking No 3 brake cable assembly set bolt	8.0	82	71 in.*lbf
No. 1 rear suspension arm assembly x Rear axle carrier	74	755	55
Upper control arm x Rear axle carrier	74	755	55
Lower control arm x Rear axle carrier	105	1,071	77
No. 1 rear suspension arm assembly (ball joint side) x Rear axle carrier	105	1,071	77
Rear axle carrier sub-assembly x Rear disc brake cylinder	47	475	35
Rear axle carrier sub-assembly x Rear axle hub & bearing assembly Bolt:	56	571	41
Rear axle carrier sub-assembly x Rear axle hub & bearing assembly Nut:	140	1,428	103

SS

SERVICE SPECIFICATIONS – SUSPENSION

SS-31

SUSPENSION

SERVICE DATA

Front suspension

Front wheel alignment	Vehicle height	A - B: D - C:	92 mm (3.62 in.) 63 mm (2.48 in.)
	Toe-in (total) Rack end length difference		0°± 12' (0°± 0.2°), 0 ± 2 mm (0 ± 0.08 in.) 1.5 mm (0.0059 in.) or less
	Wheel angle	Inside wheel	38°12' (36°12' to 40°12') 38.20° (36.20° to 40.20°)
		Outside wheel: Reference	32°49' 32.82°
	Camber Right-left error		-0°31' ± 45' (-0.52° ± 0.75°) 45' (0.75°) or less
	Caster Right-left error		3°02' ± 45' (3.03° ± 0.75°) 45' (0.75°) or less
	Steering axis inclination Right-left error		12°31' ± 45' (12.52° ± 0.75°) 45' (0.75°) or less
Front suspension	Lower ball joint turning torque		5.0 N*m (51 kgf*cm, 44 in.*lbf) or less
	Front stabilizer link turning torque		1.0 N*m (10 kgf*cm, 8.9 in.*lbf) or less

A:

Ground clearance of front wheel center

B:

Ground clearance of lower suspension arm front bolt center

C:

Ground clearance of tire rod set bolt center

D:

Ground of rear wheel center

Rear suspension

Rear wheel alignment	Toe-in (total)	0°18' ± 12' (0.3°± 0.2°), 3.0 ± 2.0 mm (0.12 ± 0.08 in.)
	Camber Right-left error	-0°56' ± 45' (-0.90° ± 0.75°) 30' (0.5°) or less

SS

SS-32

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	240	2,450	177
Hub nut	103	1,050	76
Suspension support x Piston rod	47	480	35
Suspension support x Body	52	530	38
Suspension crossmember sub-assembly x Body	133	1,360	98
Suspension crossmember sub-assembly x Engine mounting insulator	65	663	48
Crossmember member bracket x Body	Bolt A:	80	816
	Bolt B:	133	1,356
Speed sensor wire harness bracket set bolt	19	194	14
No. 1 stabilizer bracket x Suspension crossmember	19	194	14
Stabilizer bar link set nut	74	755	55
Lower suspension arm x Lower ball joint	89	908	66
Lower ball joint x Steering knuckle	103	1,050	76
Lower suspension arm x Suspension crossmember	137	1,400	101

Rear suspension

Part Tightened	N*m	kgf*cm	ft.*lbf
Hub nut	103	1,050	76
Piston rod set nut	56	571	41
Shock absorber x Body	80	816	59
Shock absorber x Rear suspension arm	140	1,430	103
Parking brake cable set bolt	6.0	61	53 in.*lbf
Skid control sensor wire harness bracket set bolt	5.0	51	44 in.*lbf
Rear suspension arm bracket x Body	65	663	48
Rear suspension arm x Rear suspension member	115	1,170	85
Rear suspension arm bracket x Rear suspension arm	110	1,120	81
Rear suspension lower brace x Body	64	653	47
Rear axle carrier (front side) x Rear suspension arm	105	1,070	77
Rear axle carrier (rear side) x Rear suspension arm	74	755	55
Upper control arm x Rear axle carrier	74	755	55
Upper control arm x Suspension member	74	755	55
Lower control arm x Rear axle carrier	105	1,070	77
Lower control arm x Suspension member	115	1,170	85
Stabilizer bar x Stabilizer link	44	449	32
Stabilizer x Suspension arm	44	449	32
Stabilizer bar bracket x Suspension member	35	357	26

SERVICE SPECIFICATIONS – TIRE AND WHEEL

SS-33

TIRE AND WHEEL

SERVICE DATA

Cold tire inflation pressure	215/45ZR 17	Front:	220 kPa (2.2 kgf/cm ² , 32 psi)
		Rear:	200 kPa (2.0 kgf/cm ² , 29 psi)
	205/55R 16	Front:	220 kPa (2.2 kgf/cm ² , 32 psi)
		Rear:	200 kPa (2.0 kgf/cm ² , 29 psi)

Tire runout		1.4 mm (0.055 in.) or less
Imbalance after adjustment	Steel wheel	8.0 g (0.018 lb) or less
	non-steel wheel	8.0 g (0.018 lb) or less

SS

SS-34**SERVICE SPECIFICATIONS – TIRE AND WHEEL****TORQUE SPECIFICATIONS****TIRE PRESSURE WARNING RECEIVER**

Part tightened	N*m	kgf*cm	ft.*lbf
Tire pressure warning receiver set bolt	8.0	82	71 in.*lbf

TIRE PRESSURE WARNING VALVE AND TRANSMITTER

Part tightened	N*m	kgf*cm	ft.*lbf
Tire pressure warning valve and transmitter set nut	4.0	41	35 in.*lbf
Front wheel set nuts	103	1,050	76
Rear wheel set nuts	103	1,050	76

TIRE PRESSURE WARNING ECU

Part tightened	N*m	kgf*cm	ft.*lbf
Tire pressure warning ECU set nut	4.5	46	40 in.*lbf

SS

SS-34

SERVICE SPECIFICATIONS – BRAKE CONTROL

BRAKE CONTROL

TORQUE SPECIFICATIONS

Brake actuator

Part tightened	N*m	kgf*cm	ft.*lbf
Brake actuator assembly x Bracket	5.4	55	48 in.*lbf
Brake actuator assembly with bracket	19	194	14
Brake tube x Brake actuator assembly (without SST)	15	155	11
Brake tube x Brake actuator assembly (with SST)	14	143	10

Front speed sensor

Part tightened	N*m	kgf*cm	ft.*lbf
Front speed sensor LH x Steering knuckle	9.0	92	80 in.*lbf
Front speed sensor x Body (for bolt A)	9.0	92	80 in.*lbf
Front speed sensor LH x Body (for bolt B)	29	296	21

Skid control sensor

Part tightened	N*m	kgf*cm	ft.*lbf
Skid control sensor wire	5.0	51	44 in.*lbf

SERVICE SPECIFICATIONS – BRAKE

SS-35

BRAKE

SERVICE DATA

Brake pedal height from asphalt sheet	M/T	146.1 to 156.1 mm (5.752 to 6.146 in.)
	A/T	146.9 to 156.9 mm (5.784 to 6.177 in.)
Stop light switch clearance	Standard	1.5 to 2.5 mm (0.059 to 0.098 in.)
Pedal free play	Standard	1.0 to 6.0 mm (0.039 to .236 in.)
Pedal reserve distance from asphalt sheet	Standard	More than 90 mm (3.54 in.)
Brake booster push rod to piston clearance (w/ SST)	Standard	0 mm (0 in.)
Front disc brake pad thickness	Standard	11.5 mm (0.453 in.)
	Minimum	1.0 mm (0.039 in.)
Front disc thickness	Standard	25.0 mm (0.984 in.)
	Minimum	23.0 mm (0.906 in.)
Front disc runout	Maximum	0.05 mm (0.0020 in.)
Rear disc brake pad thickness	Standard	10.0 mm (0.394 in.)
	Minimum	1.0 mm (0.039 in.)
Rear disc thickness	Standard	9.0 mm (0.354 in.)
	Minimum	7.5 mm (0.295 in.)
Rear disc runout	Maximum	0.15 mm (0.0059 in.)

SS

SS-36

SERVICE SPECIFICATIONS – BRAKE

TORQUE SPECIFICATIONS

Brake fluid

Part tightened	N [*] m	kgf [^] cm	ft. [*] lbf
Brake line x Brake master cylinder (without SST)	15	155	11
Brake line x Brake master cylinder (with SST)	14	143	10
Bleeder plug	8.3	85	74 in. [*] lbf

SS

Brake pedal

Part tightened	N [*] m	kgf [^] cm	ft. [*] lbf
Clevis lock nut	26	265	19
Stop light switch assembly x Stop light switch mounting adjuster	1.5	15	13 in. [*] lbf
Brake pedal sub-assembly x Brake pedal support sub-assembly	37	375	27
Brake pedal support sub-assembly	12.7	130	9
Brake pedal support sub-assembly	24	241	17

Brake master cylinder

Part tightened	N [*] m	kgf [^] cm	ft. [*] lbf
Brake master cylinder sub-assembly x Brake booster assembly	12.5	127	9
Brake tube x No. 1 way (without SST)	15	155	11
Brake tube x No. 1 way (with SST)	14	143	10
Brake tube x Brake master cylinder sub-assembly (without SST)	15	155	11
Brake tube x Brake master cylinder sub-assembly (with SST)	14	143	10
Lower cowl body mounting bracket LH	13	133	10
Outer cowl top panel sub-assembly	13	133	10

Brake booster

Part tightened	N [*] m	kgf [^] cm	ft. [*] lbf
Brake booster assembly	12.7	130	9
No. 5 front brake tube (without SST)	15	155	11
No. 5 front brake tube (with SST)	14	143	10

Front brake

Part tightened	N [*] m	kgf [^] cm	ft. [*] lbf
Front disc brake cylinder mounting LH x Steering knuckle	107	1,090	79

SERVICE SPECIFICATIONS – BRAKE**SS-37**

Part tightened	N*m	kgf*cm	ft.*lbf
Front disc brake cylinder assembly LH x Front disc brake cylinder mounting LH	34	350	25
Front flexible hose LH x Front disc brake cylinder assembly LH	30	310	22

Rear brake

Part tightened	N*m	kgf*cm	ft.*lbf
Rear disc brake cylinder mounting LH	47	475	34
Rear disc brake cylinder slide pin (upper) x Rear disc brake cylinder mounting LH	39	400	29
Rear disc brake cylinder slide pin (lower) x Rear disc brake cylinder mounting LH	34	350	25
Rear flexible hose LH x Rear disc brake cylinder assembly LH	30	310	22

SS

PARKING BRAKE
SERVICE DATA

Paring brake lever travel at 196 N (20 kgf, 44.1 lbf)	Standard	6 to 9 clicks
Rear disc inside diameter	Standard	173 mm (6.81 in.)
	Maximum	174 mm (6.85 in.)
Parking brake shoe lining thickness	Standard	3.2 mm (0.126 in.)
	Minimum	1.0 mm (0.039 in.)

SS

SS-38

SERVICE SPECIFICATIONS – PARKING BRAKE

TORQUE SPECIFICATIONS

Parking brake system

Part tightened	N*m	kgf*cm	ft.*lbf
Lock nut	5.	51	44 in.*lbf

Parking brake lever

Part tightened	N*m	kgf*cm	ft.*lbf
Parking brake lever sub-assembly	12.5	128	9

Parking brake cable

Part tightened	N*m	kgf*cm	ft.*lbf
No. 3 parking brake cable assembly x Body (for bolt A)	6.0	61	53 in.*lbf
No. 3 parking brake cable assembly x Body (for bolt B)	5.4	55	48 in.*lbf
No. 1 fuel tank protector	5.4	55	48 in.*lbf
No. 3 parking brake cable assembly x Backing plate	8.0	82	71
No. 1 parking brake cable assembly	12.5	128	9
Parking brake cable heat insulator	5.4	55	48

SS

SS-38

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-39

TORQUE SPECIFICATIONS

Part tightened	N*m	kgf*cm	in.*lbf
Tie rod x Rack end	74	750	54
Steering column assembly set bolt	21	214	15
Steering Intermediate shaft assembly No. 2 x Steering main shaft assembly	35	360	26
Steering Intermediate shaft assembly No. 2 x Steering Intermediate 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-39

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	5.5 N*m (56 kgf*cm, 49 in.*lbf)
VANE PUMP ASSEMBLY		
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 oil clearance	Maximum	0.07 mm (0.0028 in.)
Vane plate thickness	Standard	1.405 to 1.411 mm (0.05531 to 0.05555 in.)
Clearance between the rotor groove and plate	Maximum	0.03 mm (0.0012 in.)
Spring free length	Minimum	36.9 mm (1.453 in.)
POWER STEERING LINK ASSEMBLY		
Steering rack runout	Maximum	0.1 mm (0.004 in.)
Tie rod assembly stud bolt torque	Turning	0.49 to 3.43 N*m (5.0 to 35.0 kgf*cm, 4.3 to 30.4 in.*lbf) or less
Total preload (Control valve rotating torque)	Turning	0.9 to 1.6 N*m (9.2 to 16.3 kgf*cm, 8.0 to 14.2 in.*lbf) or less

SS

SS-40

SERVICE SPECIFICATIONS – POWER STEERING

TORQUE SPECIFICATIONS

Part tightened		N*m	kgf*cm	in.*lbf
VANE PUMP ASSEMBLY				
Vane pump housing rear x Vane pump housing front		22	224	16
Power steering oil pressure switch		21	214	15
Pressure port union sub-assembly		69	704	51
Power steering suction port union set bolt		12	122	9
Vane pump assembly x Pump bracket rear		37	377	27
Vane pump assembly set bolt		34 (50)	347 (510)	25 (37)
Pressure feed tube assembly x Vane pump assembly		50	510	37
Pressure feed tube assembly clamp set bolt		7.8	80	69 in.*lbf
POWER STEERING LINK ASSEMBLY				
Control valve housing set bolt		18	185	13
Rack x Rack end sub-assembly		73 (103)	744 (1,050)	54 (76)
Tie rod assembly lock nut		74	750	54
Cylinder end stopper x Rack housing		122	1,244	90
Turn pressure tube union nut		22 (25)	224 (250)	16 (18)
Steering link assembly set bolt		49	500	36
Pressure feed tube assembly union nut		41 (44)	414 (450)	30 (33)
Pressure feed tube clamp set bolt		7.8	80	69 in.*lbf
Steering intermediate shaft x Steering link assembly		35	357	26
Tie rod end sub-assembly lock nut		74	755	55
Front suspension crossmember sub-assembly x Frame		133	1,356	98
Crossmember bracket x Frame	Bolt A:	133	1,356	98
	Bolt B:	80	816	59
Crossmember x Engine mounting insulator rear		65	663	48
Center member x Frame		45	459	33
No. 1 hook x Center member		39	398	29
Center member x Engine mounting insulator front		72	734	53
Front suspension arm sub-assembly lower No. 1 x Lower ball joint		89	908	66
Front stabilizer link assembly set nut		74	755	55
Tie rod sub-assembly x Steering knuckle		49	500	36
Steering intermediate shaft assembly No.2 x Steering intermediate shaft		35	357	26
Front wheel set nut		103	1,050	76

(): For use without SST

AIR CONDITIONING
SERVICE DATA

Refrigerant charge volume	Standard: 430 +/- 30 g (15.2 +/- 1.1 oz.)
Magnetic clutch clearance	0.35 to 0.60 mm (0.014 to 0.023 in.)



SS-42

SERVICE SPECIFICATIONS – AIR CONDITIONING

TORQUE SPECIFICATIONS

REFRIGERANT LINE

Part Tightened		N*m	kgf*cm	ft.*lbf
No. 1 cooler refrigerant discharge hose x Cooler condenser assembly		5.4	55	48 in.*lbf
Cooler refrigerant liquid pipe x Cooler condenser assembly		5.4	55	48 in.*lbf
Cooler refrigerant liquid pipe x vehicle body		9.8	100	7
No. 1 cooler refrigerant suction hose x Cooler compressor assembly		9.8	100	7
No. 1 cooler refrigerant suction hose x vehicle body	Bolt	9.8	100	7
	Nut	9.8	100	7
No. 1 cooler refrigerant discharge hose x Cooler compressor assembly		9.8	100	7

AIR CONDITIONING UNIT

Part Tightened		N*m	kgf*cm	ft.*lbf
Air conditioner unit assembly x vehicle body	Bolt	9.8	100	7
	Nut	9.8	100	7
Air conditioning tube assembly x Evaporator sub-assembly		3.5	35	30 in.*lbf

BLOWER UNIT

Part Tightened	N*m	kgf*cm	ft.*lbf
Blower assembly x vehicle body	9.8	100	7

COMPRESSOR AND MAGNETIC CLUTCH

Part Tightened	N*m	kgf*cm	ft.*lbf
Magnet clutch hub x Cooler compressor assembly	18	184	13
Cooler compressor assembly x Engine	25	255	18
No. 1 cooler refrigerant discharge hose x Cooler compressor assembly	9.8	100	7
No. 1 cooler refrigerant suction hose x Cooler compressor assembly	9.8	100	7

CONDENSER

Part Tightened	N*m	kgf*cm	ft.*lbf
Radiator support upper x Cooler condenser assembly	9.8	100	7
Radiator support upper bracket x Radiator support upper	19	194	14
Cooler refrigerant liquid pipe x Cooler condenser assembly	5.4	55	48 in.*lbf
No. 1 cooler refrigerant discharge hose x Cooler condenser assembly	5.4	55	48 in.*lbf

SERVICE SPECIFICATIONS – SUPPLEMENTAL RESTRAINT SYSTEM**SS-43****SUPPLEMENTAL RESTRAINT
SYSTEM****TORQUE SPECIFICATIONS**

Part Tightened	N*m	kgf*cm	ft.*lbf
Steering pad assembly x Steering wheel assembly	8.8	90	78 in.*lbf
Front passenger airbag assembly x Instrument panel reinforcement	18	184	13
Driver side knee airbag assembly x Instrument panel reinforcement	18	184	13
Curtain shield airbag assembly set bolt	9.8	100	7
Center airbag sensor x Body	17.5	179	13
Front airbag sensor x Body	9.0	92	82 in.*lbf
Side airbag sensor x Body	9.0	92	82 in.*lbf
Rear airbag sensor x Body	8.0	82	71 in.*lbf
Seat position sensor x Front seat assembly	8.0	82	71 in.*lbf

SS

SS-44

SERVICE SPECIFICATIONS – SEAT BELT

SEAT BELT

TORQUE SPECIFICATIONS

FRONT SEAT BELT

Part Tightened	N [•] m	kgf [•] cm	ft. [•] lbf
Front seat inner belt assembly x Front seat	42	428	31
Front seat outer belt assembly (Upper part of retractor) x Body	4.9	50	43
Front seat outer belt assembly (Lower part of retractor) x Body	42	428	31
Front seat outer belt assembly (shoulder anchor) x Body	42	428	31
Front seat outer belt assembly (floor anchor) x Body	42	428	31

REAR SEAT BELT

Part Tightened	N [•] m	kgf [•] cm	ft. [•] lbf
Child restraint seat tether anchor bracket x Body	19.6	200	14
Rear seat inner belt assembly RH x Body	42	428	31
Rear seat outer belt assembly center (floor anchor) x Body	42	428	31
Rear seat inner belt assembly LH x Body	42	428	31
Rear seat outer belt assembly center (retractor) x Body	42	428	31
Rear seat outer belt assembly (retractor) x Body	42	428	31
Rear seat outer belt assembly (shoulder anchor) x Body	42	428	31
Rear seat outer belt assembly (floor anchor) x Body	42	428	31

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 & link assembly X Body	5.4	55	47 in.*lbf
FR Wiper arm & blade assembly LH X Windshield wiper link assembly	34.3	350	25
FR Wiper arm & blade assembly RH X Windshield wiper link assembly	34.3	350	25

SS

SS-46

SERVICE SPECIFICATIONS – HORN

HORN
TORQUE SPECIFICATIONS

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

SS

WINDSHIELD / WINDOWGLASS
TORQUE SPECIFICATIONS

WINDSHIELD / WINDOWGLASS

Part Tightened	N*m	kgf*cm	ft.*lbf
Roof window fix glass x Body	5.4	55	48 in.*lbf

SS

SS-48

SERVICE SPECIFICATIONS – MIRROR

MIRROR
TORQUE SPECIFICATIONS

MIRROR

Part Tightened	N·m	kgf·cm	ft.·lbf
Outer rear view mirror assembly x Door panel	8.0	82	71 in.·lbf

SS

INSTRUMENT PANEL
TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Front passenger airbag assembly x Instrument panel reinforcement	18	184	13

SS

SS-50

SERVICE SPECIFICATIONS – SEAT

SEAT

TORQUE SPECIFICATIONS

FRONT SEAT

Part Tightened	N ^m	kgf ^{cm}	ft. ^{lbf}
Seat position airbag sensor x Seat adjuster	8.0	82	71 in. ^{lbf}
Inner belt x Seat adjuster	42	428	31
Seatback cover bracket x Seat adjuster (w/ front seat side airbag)	5.5	56	49 in. ^{lbf}
Seat x Body	40	408	30

REAR SEAT

Part Tightened	N ^m	kgf ^{cm}	ft. ^{lbf}
Tether anchor bracket x Body	19.6	200	14
Seat leg x Body	40	408	30
Outer belt center (floor anchor) x Body	42	428	31
Outer belt center (floor anchor) x Body	42	428	31
Seatback x Body	40	408	30

SERVICE SPECIFICATIONS – ENGINE HOOD / DOOR

SS-51

ENGINE HOOD / DOOR

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	in.*lbf
HOOD			
Hood x Hood hinge	13	133	10
Hood lock x Body panel	7.0	71	62 in.*lbf
FRONT DOOR			
Door check x Body	30	306	22
Door check x Door panel	5.5	56	49 in.*lbf
Door frame sub-assembly rear lower x Door panel	8.5	87	75 in.*lbf
Door glass x Front door regulator sub-assembly	5.5	56	49 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
Power window regulator motor x Window regulator	5.4	55	48 in.*lbf
Window regulator x Door panel	8.0	82	71 in.*lbf
BACK DOOR			
Back door hinge x Door panel	19.5	199	14
Back door lock x Door panel	8.0	82	71 in.*lbf
Back door lock striker x Door panel	23	234	17 in.*lbf
Back door stay bolt x Body	27	275	20 in.*lbf
Back door stay bracket x Body	7.5	77	66 in.*lbf
Back Door Weight x Back Door	8.0	82	71 in.*lbf

SS

EXTERIOR
TORQUE SPECIFICATIONS

FRONT BUMPER

Part Tightened	N ^o m	kgf ^o cm	ft. ^o lbf
Front bumper x Body (for bolt)	12	122	9
Front bumper x Body (for screw)	6.0	61	53 in. ^o lbf
Front bumper x Fender liner	6.0	61	53 in. ^o lbf
Front bumper side support x Body (for bolt)	12	122	9
Front bumper side support x Body (for screw)	6.0	61	53 in. ^o lbf

REAR BUMPER

Part Tightened	N ^o m	kgf ^o cm	ft. ^o lbf
Rear bumper x Body	6.0	61	53 in. ^o lbf
Rear bumper side retainer x Body	6.0	61	53 in. ^o lbf

SLIDING ROOF
TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Sliding roof housing sub-assembly x Drive gear	5.4	55	48 in.*lbf
Sliding roof housing sub-assembly x Sunshade x Trim	5.4	55	48 in.*lbf

SS