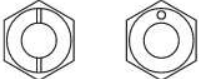
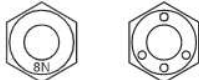
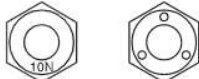
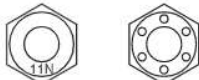
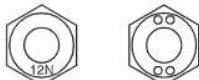


SERVICE SPECIFICATIONS – STANDARD BOLT

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 – 1NZ-FE ENGINE MECHANICAL

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TORQUE SPECIFICATIONS

Part tightened	N ^m	kgf ^{cm}	ft. ^{lbf}
Generator x Engine : for bolt A	18.5	189	14
Generator x Engine : for bolt B	54	550	40
Vane pump x Engine	44	449	33
No. 2 camshaft bearing cap x Cylinder head	13	1339	9
No. 1 camshaft bearing cap x Cylinder head	23	235	17
Camshaft timing sprocket x No. 2 camshaft	64	653	47
Screw plug x Timing chain cover	15	153	11
Cylinder head cover x Cylinder head	10	102	7
Ignition coil x Cylinder head cover	9.0	92	80 in. ^{lbf}
No. 2 cylinder head cover x Cylinder head	7.0	71	62 in. ^{lbf}
No. 1 chain vibration damper x Cylinder block	9.0	92	80 in. ^{lbf}
Chain tensioner slipper x Cylinder block	9.0	92	80 in. ^{lbf}
No. 1 chain tensioner x Cylinder block	9.0	92	80 in. ^{lbf}
Engine mounting insulator RH x Engine and body : for bolt A	45	459	33
Engine mounting insulator RH x Engine and body : for bolt B	52	530	38
Liquid tube x Body	9.8	100	7 in. ^{lbf}
Camshaft timing oil control valve x Cylinder head	7.5	76	66 in. ^{lbf}
Crankshaft pulley x Crankshaft	128	1,305	95
Oil pan drain plug x No. 2 oil pan	37.5	383	28
Stud bolt x Cylinder head : for bolt A	10	102	7.4 in. ^{lbf}
Stud bolt x Cylinder head : for bolt B	4.0	41	35 in. ^{lbf}
Stud bolt x Cylinder head : for bolt C	10	102	7.4
Stud bolt x Cylinder head : for bolt D	9.0	92	80 in. ^{lbf}
Oil control valve filter x Cylinder head	30	306	22
No. 1 taper screw plug x Cylinder head	44	449	33
Cylinder head x Cylinder block	1st: 29 2nd: 90° 3rd: 90°	1st: 300 2nd: 90° 3rd: 90°	1st: 22 2nd: 90° 3rd: 90°
Camshaft timing gear x No. 1 camshaft	64	653	47
Oil dipstick guide x Cylinder head	9.0	92	80 in. ^{lbf}
Intake manifold x Cylinder head	30	306	22
Exhaust manifold support bracket x Cylinder block and exhaust manifold	44	449	32
No. 1 exhaust manifold heat insulator x Exhaust manifold	8.0	82	71 in. ^{lbf}
Front exhaust pipe x Exhaust manifold	43	438	32
Water filler x Body	7.5	76	66 in. ^{lbf}
No. 1 water by-pass pipe x Engine	9.0	92	80 in. ^{lbf}
Engine hanger x Cylinder block	40	408	30
Engine coolant temperature sensor x Cylinder head	20	204	15
Exhaust manifold x Cylinder head	27	275	20
Booster vacuum tube x Cylinder head	9.0	92	80 in. ^{lbf}
Drive plate x Crankshaft	88	900	65

SS

SS-10

SERVICE SPECIFICATIONS – 1NZ-FE ENGINE MECHANICAL

Part tightened	N*m	kgf*cm	ft.*lbf
Flywheel x Crankshaft	1st: 49 2nd: 90°	1st: 500 2nd: 90°	1st: 36 2nd: 90°
Engine and transaxle assembly x Suspension crossmember	64	653	47
Engine mounting bracket LH x Engine mounting insulator LH	49	500	36
Front suspension crossmember x Body : for bolt A	116	1,183	86
Front suspension crossmember x Body : for bolt B	70	714	52
Front suspension member reinforcement LH x Front suspension crossmember and body	47	479	35
Front suspension member reinforcement RH x Front suspension crossmember and body	47	479	35
Front suspension arm lower LH x Steering knuckle	98	999	72
Tie rod end LH x Steering knuckle	49	500	36
Speed sensor frond LH x Steering knuckle	8.0	82	71
Front axle hub LH nut x Drive shaft	216	2,203	160
Cylinder block water drain cock x Cylinder block	35	357	26
Stud bolt x Cylinder block	5.0	51	44
Crankshaft bearing cap x Cylinder block	1st: 22 2nd: 90°	1st: 224 2nd: 90°	1st: 16 2nd: 90°
Connecting rod cap x Connecting rod	1st: 15 2nd: 90°	1st: 153 2nd: 90°	1st: 11 2nd: 90°
Oil pan x Cylinder block	24	245	18
Oil strainer x Cylinder block	11	112	8.1
No. 2 oil pan x Oil pan	9.0	92	80 in.*lbf
Oil filter union x No. 2 oil pan	30	306	22
Oil filter x Oil filter union	17.5	178	13
Camshaft position sensor x Cylinder head	8.0	82	71 in.*lbf
Timing chain cover x Cylinder head and cylinder block : for bolt A	24	245	18 in.*lbf
Timing chain cover x Cylinder head and cylinder block : for bolt B	11	112	8.1 in.*lbf
Timing chain cover x Cylinder head and cylinder block : for bolt C	11	112	8.1 in.*lbf
Timing chain cover x Cylinder head and cylinder block : for bolt D	24	245	18
Timing chain cover x Cylinder head and cylinder block : for nut E	24	245	18
Water pump x Timing chain cover	11	112	8
Engine mounting bracket RH x Timing chain cover	55	561	41
Water pump pulley x Water pump	15	153	11
Fuel delivery pipe x Cylinder head : for bolt A	19	194	14
Fuel delivery pipe x Cylinder head : for bolt B	9.0	92	80 in.*lbf
Camshaft timing oil control valve x Cylinder block	7.5	76	66 in.*lbf
Ventilation valve x Cylinder head cover	27	275	20
Water inlet x Cylinder block	9.0	92	80 in.*lbf
Spark plug x Cylinder head cover	18	184	13

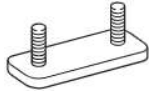
SERVICE SPECIFICATIONS – STANDARD BOLT

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

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SERVICE SPECIFICATIONS – 1NZ-FE ENGINE CONTROL SYSTEM

1NZ-FE ENGINE CONTROL SYSTEM

SERVICE DATA

Camshaft timing oil control valve

Camshaft Timing Oil Control Valve	Condition	Specified Condition
Standard resistance	20°C (68°F)	6.9 to 7.9 Ω

SS

Camshaft position sensor

Camshaft Position Sensor	Coolant Temperature	Specified Condition
Standard resistance	Hot	1.630 to 2.740 Ω
	Cold	2.065 to 3.225 Ω

Engine coolant temperature sensor

Engine Coolant Temperature Sensor	Condition	Specified Condition
Standard resistance	20°C (68°F)	2.29 to 2.60 Ω
	80°C (176°F)	0.301 to 0.327 Ω

Knock sensor

Knock Sensor	Condition	Specified Condition
Standard resistance	20°C (68°F)	120 to 280 Ω

Throttle position sensor

Throttle Position Sensor	Tester Connection	Throttle Valve Position	Specified Condition
Standard resistance	1 (VC) - 2 (E2)	-	2.5 to 6.0 Ω
	3 (VTA) - 2 (E2)	Fully close	0.2 to 11.0 Ω
	3 (VTA) - 2 (E2)	Fully open	2.0 to 16.0 Ω

EFI relay

EFI Relay	Tester Connection	Specified Condition
Standard resistance	3 - 5	10 kΩ or higher
	3 - 5	Below 1 Ω (when battery voltage is applied to terminal 1 and 2)

Circuit opening relay

Circuit Opening Relay	Tester Connection	Specified Condition
Standard resistance	3 - 5	10 kΩ or higher
	3 - 5	Below 1 Ω (when battery voltage is applied to terminal 1 and 2)

SERVICE SPECIFICATIONS – 1NZ-FE ENGINE CONTROL SYSTEM

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TORQUE SPECIFICATIONS

Camshaft timing oil control valve

Part Tightened	N*m	kgf*cm	ft.*lbf
Camshaft timing oil control valve x Cylinder head	7.5	76	66 in.*lbf

Camshaft position sensor

Part Tightened	N*m	kgf*cm	ft.*lbf
Camshaft position sensor x Cylinder head	8.0	82	71 in.*lbf

SS

Crankshaft position sensor

Part Tightened	N*m	kgf*cm	ft.*lbf
Crankshaft position sensor x Cylinder block	7.5	76	66 in.*lbf

Engine coolant temperature sensor

Part Tightened	N*m	kgf*cm	ft.*lbf
Engine coolant temperature sensor x Cylinder block	20	204	15

Throttle body

Part Tightened	N*m	kgf*cm	ft.*lbf
Throttle body x Cylinder block	30	306	22
Transmission oil filter tube sub-assembly x Cylinder head	5.5	56	49 in.*lbf
Oil cooler tube x Transmission oil filter tube sub-assembly	5.5	56	49 in.*lbf
Accelerator control cable x Throttle body	13	133	10
Air cleaner assembly x Body	7.8	80	69 in.*lbf
Air cleaner inlet x Body	7.5	76	66 in.*lbf

Knock sensor

Part Tightened	N*m	kgf*cm	ft.*lbf
Knock sensor x Cylinder block	20	204	15

Idle air control valve

Part Tightened	N*m	kgf*cm	ft.*lbf
Idle air control valve x Throttle body	3.4	35	30 in.*lbf

Throttle position sensor

Part Tightened	N*m	kgf*cm	ft.*lbf
Throttle position sensor x Throttle body	2.0	20	18 in.*lbf

ECM

Part Tightened	N*m	kgf*cm	ft.*lbf
Idle air control valve x Throttle body	3.0	31	27 in.*lbf

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SERVICE SPECIFICATIONS – 1NZ-FE ENGINE MECHANICAL

1NZ-FE ENGINE MECHANICAL

SERVICE DATA

Ignition timing	-	8 to 12° BTDC
Engine idle speed	M/T	600 to 700 rpm
	A/T	650 to 750 rpm
Compression	Standard compression pressure	1,471 kPa (15.0 kgf/cm ² , 213 psi)
	Minimum pressure	1,079 kPa (11.0 kgf/cm ² , 156 psi)
	Difference between each cylinder	98 kPa (1.0 kgf/cm ² , 14 psi)
Generator V belt tension	New belt	121 to 143 lbf
	Used belt	55 to 88 lbf
Vane pump V belt tension	New belt	99 to 121 lbf
	Used belt	55 to 77 lbf
Generator V belt deflection	New belt	7.0 to 8.5 mm (0.28 to 0.33 in.)
	Used belt	11.0 to 13.0 mm (0.43 to 0.51 in.)
Vane pump V belt deflection : Pressing force 98 N (10 kgf, 22 lbf)	New belt	8.0 to 10.0 mm (0.31 to 0.39 in.)
	Used belt	11.0 to 13.0 mm (0.43 to 0.51 in.)
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.)
Chain	Maximum chain elongation	123.2 mm (4.850 in.)
Chain tensioner slipper	Maximum wear	1.0 mm (0.039 in.)
No. 1 chain vibration damper	Maximum wear	1.0 mm (0.039 in.)
Cylinder head for flatness	Maximum warpage : Cylinder block side	0.05 mm (0.0020 in.)
	Maximum warpage : Intake manifold side	0.10 mm (0.0039 in.)
	Maximum warpage : Exhaust manifold side	0.10 mm (0.0039 in.)
Cylinder head set bolt	Standard length	142.8 to 144.2 mm (5.622 to 5.677 in.)
	Maximum length	147.1 mm (5.791 in.)
Cylinder block for flatness	Maximum warpage	0.05 mm (0.0020 in.)
Intake valve	Standard overall length	89.25 mm (3.5138 in.)
	Minimum overall length	88.75 mm (3.4941 in.)
	Standard valve stem diameter	4.970 to 4.985 mm (0.1957 to 0.1963 in.)
	Standard margin thickness	1.0 mm (0.039 in.)
	Minimum margin thickness	0.7 mm (0.028 in.)
Exhaust valve	Standard overall length	87.90 mm (3.4606 in.)
	Minimum overall length	87.40 mm (3.4409 in.)
	Standard valve stem diameter	4.965 to 4.980 mm (0.1955 to 0.1961 in.)
	Standard margin thickness	1.15 mm (0.045 in.)
	Minimum margin thickness	0.7 mm (0.028 in.)
Valve spring	Standard free length	45.05 to 45.15 mm (1.774 to 1.778 in.)
	Maximum deviation	1.6 mm (0.063 in.)
	Maximum angle (reference)	2°
	Standard installed tension	149 to 165 N (15.2 to 16.8 kgf, 33.5 to 37.1 lbf) at 32.5 mm (1.280 in.)
	Maximum workin	286 to 316 N (29.1 to 32.2 kgf, 64.2 to 71.0 lbf) at 23.9 mm (0.941 in.)

SERVICE SPECIFICATIONS – 1NZ-FE ENGINE MECHANICAL

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Intake valve guide bush	Bush inside diameter	5.010 to 5.030 mm (0.1972 to 0.1980 in.)
	Standard oil clearance : bush and valve	0.025 to 0.060 mm (0.0010 to 0.0024 in.)
	Maximum oil clearance : bush and valve	0.08 mm (0.0032 in.)
	Standard bore diameter (STD) : bush bore diameter of cylinder head	9.685 to 9.706 mm (0.3813 to 0.3821 in.)
	Standard bore diameter (O/S 0.05) : bush bore diameter of cylinder head	9.7355 to 9.756 mm (0.3833 to 0.3841 in.)
	Standard protrusion height	9.0 to 9.4 mm (0.354 to 0.370 in.)
	Standard oil clearance : bush and cylinder head	0.025 to 0.060 mm (0.0010 to 0.0024 in.)
Exhaust valve guide bush	Bush inside diameter	5.010 to 5.030 mm (0.1972 to 0.1980 in.)
	Standard oil clearance	0.030 to 0.065 mm (0.0012 to 0.0026 in.)
	Maximum oil clearance	0.10 mm (0.0039 in.)
	Standard bore diameter (STD) : bush bore diameter of cylinder head	9.685 to 9.706 mm (0.3813 to 0.3821 in.)
	Standard bore diameter (O/S 0.05) : bush bore diameter of cylinder head	9.7355 to 9.756 mm (0.3833 to 0.3841 in.)
	Standard protrusion height	9.0 to 9.4 mm (0.354 to 0.370 in.)
	Standard oil clearance : bush and cylinder head	0.030 to 0.065 mm (0.0012 to 0.0026 in.)
Valve lifter	Standard lifter diameter	30.966 to 30.976 mm (1.2191 to 1.2195 in.)
	Standard lifter bore diameter	31.000 to 31.025 mm (1.2205 to 1.2215 in.)
	Standard oil clearance	0.024 to 0.059 mm (0.0009 to 0.0023 in.)
	Maximum oil clearance	0.1 mm (0.0039 mm)
Camshaft timing gear	Minimum gear diameter (w/ chain)	96.2 mm (3.787 in.)
Camshaft timing sprocket	Minimum gear diameter (w/ chain)	96.2 mm (3.787 in.)
Camshaft	Maximum circle runout	0.03 mm (0.0012 in.)
	Standard cam lobe height	44.617 to 44.717 mm (1.7566 to 1.7605 in.)
	Minimum cam lobe height	44.47 mm (1.7508 in.)
	Standard journal diameter : No. 1 journal	34.449 to 34.465 mm (1.3563 to 1.3569 in.)
	Standard journal diameter : Other journals	22.949 to 22.965 mm (0.9035 to 0.9041 in.)
No. 2 camshaft	Maximum circle runout	0.03 mm (0.0012 in.)
	Standard cam lobe height	44.666 to 44.766 mm (1.7585 to 1.7624 in.)
	Minimum cam lobe height	44.52 mm (1.7528 in.)
	Standard journal diameter : No. 1 journal	34.449 to 34.465 mm (1.3563 to 1.3569 in.)
	Standard journal diameter : Other journals	22.949 to 22.965 mm (0.9035 to 0.9041 in.)
Camshaft thrust clearance	Standard thrust clearance	0.040 to 0.095 mm (0.0016 to 0.0037 in.)
	Maximum thrust clearance	0.11 mm (0.0043 in.)
Camshaft oil clearance	Standard oil clearance	0.040 to 0.095 mm (0.0016 to 0.0037)
	Maximum oil clearance	0.115 mm (0.0045 in.)
Camshaft bearing cap setting ring pin	Standard protrusion height	8.5 to 9.5 mm (0.335 to 0.374 in.)
Union	Standard protrusion : A	29 mm (1.14 in.)
	Standard protrusion : B	44 mm (1.73 in.)
Intake manifold	Maximum warpage	0.10 mm (0.004 in.)
Exhaust manifold	Maximum warpage	0.70 mm (0.028 in.)

SS

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SERVICE SPECIFICATIONS – 1NZ-FE ENGINE MECHANICAL

Connecting rod thrust clearance	Standard thrust clearance	0.16 to 0.36 mm (0.0063 to 0.0142 in.)
	Maximum thrust clearance	0.36 mm (0.0142 in.)
Connecting rod oil clearance	Standard oil clearance	0.016 to 0.040 mm (0.0006 to 0.0016 in.)
	Maximum oil clearance	0.06 mm (0.0024 in.)
Crankshaft oil clearance	Standard oil clearance	0.010 to 0.023 mm (0.0004 to 0.0009 in.)
	Maximum oil clearance	0.07 mm (0.0028 in.)
Cylinder bore	Standard diameter	75.000 to 75.013 mm (2.9528 to 2.9533 in.)
Piston with pin	Standard piston diameter	74.945 to 74.955 mm (2.9506 to 2.9510 in.)
	Standard piston hole diameter at 20° (68°F)	18.013 to 18.016 mm (0.7092 to 0.7093 in.)
	Standard piston pin diameter	18.001 to 18.004 mm (0.7087 to 0.7088 in.)
	Standard oil clearance : piston and piston pin	0.009 to 0.015 mm (0.0004 to 0.0006 in.)
	Maximum oil clearance : piston and piston pin	0.050 mm (0.0020 in.)
Piston clearance	Standard oil clearance	0.055 to 0.078 mm (0.0022 to 0.0031 in.)
	Maximum oil clearance	0.08 mm (0.0032 in.)
Connecting rod	Standard connecting rod inside diameter	17.965 to 17.985 mm (0.7073 to 0.7081 in.)
	Maximum misalignment	0.05 mm (0.0020 in.) per 100 mm (3.94 in.)
	Maximum twist	0.05 mm (0.0020 in.) per 100 mm (3.94 in.)
Piston ring	Standard ring groove clearance : No. 1 ring	0.02 to 0.04 mm (0.0008 to 0.0016 in.)
	Standard ring groove clearance : No. 1 ring	0.02 to 0.04 mm (0.0008 to 0.0016 in.)
	Standard ring groove clearance : No. 2 ring	0.01 to 0.03 mm (0.0004 to 0.0012 in.)
	Standard ring groove clearance : Oil ring	0.01 to 0.03 mm (0.0004 to 0.0012 in.)
	Standard end gap : No. 1 ring	0.25 to 0.35 mm (0.0098 to 0.0138 in.)
	Maximum end gap : No. 1 ring	0.91 mm (0.0358 in.)
	Standard end gap : No. 2 ring	0.35 to 0.50 mm (0.0138 to 0.0197 in.)
	Maximum end gap : No. 1 ring	1.06 mm (0.0417 in.)
	Standard end gap : Oil ring	0.10 to 0.35 mm (0.039 to 0.0138 in.)
	Maximum end gap : Oil ring	0.82 mm (0.0323 in.)
Connecting rod bolt	Standard diameter	6.6 to 6.7 mm (0.260 to 0.264 in.)
	Maximum diameter	6.4 mm (0.252 in.)
Crankshaft	Maximum circle runout	0.03 mm (0.0012 in.)
	Standard diameter : main journal	45.988 to 46.000 mm (1.8106 to 1.8110 in.)
	Maximum taper and distortion : main journal	0.02 mm (0.0008 in.)
	Standard diameter : crank pin	39.992 to 40.000 mm (1.5745 to 1.5748 in.)
	Maximum taper and distortion : crank pin	0.2 mm (0.0008 in.)
	Standard sprocket diameter (w/ chain)	51.72 mm (2.0362 in.)
	Minimum sprocket diameter (w/ chain)	50.5 mm (1.988 in.)
Crankshaft bearing cap set bolt	Standard diameter	7.3 to 7.5 mm (0.287 to 0.295 in.)
	Minimum diameter	7.2 mm (0.283 in.)

SERVICE SPECIFICATIONS – 1NZ-FE FUEL

SS-11

1NZ-FE FUEL**SERVICE DATA****Fuel**

Fuel	Condition	Specified Condition
Standard fuel pressure	at Idle	304 to 343 kPa 3.1 to 3.5 kgf/cm ² , 44 to 50 psi)
	Remains as specified for 5 minutes after engine stopped	147 kPa (1.5 kgf/cm ² , 21 psi)

SS

Fuel injector

Fuel Injector	Condition		Specified Condition
Standard injection volume	Fuel pressure	298 to 301.5 kPa (3.0 to 3.1 kgf/cm ² , 43 to 44 psi)	196.49 to 204.51 cm ³ /min., (12.0 to 12.4 in ³ /min.)
	Fuel temperature	21°C (70°F)	
	Ambient temperature	21°C (70°F)	
Standard resistance	21°C (70°F)		13.5 to 14.2 Ω

Fuel pump

Fuel Pump	Condition	Specified Condition
Standard resistance	20°C (68°F)	0.2 to 3.0 Ω

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SERVICE SPECIFICATIONS – 1NZ-FE FUEL

TORQUE SPECIFICATIONS

Fuel injector

Part Tightened		N ^m	kgf ^{cm}	ft. ^{lbf}
Fuel delivery pipe x Cylinder head	Bolt A (delivery pipe)	19	194	14
	Bolt B (fuel tube)	9.0	92	80 in. ^{lbf}
No. 2 cylinder head cover x Cylinder head		7.0	71	62 in. ^{lbf}

Fuel pump

SS

Part Tightened		N ^m	kgf ^{cm}	ft. ^{lbf}
Fuel tank vent tube set plate x Fuel tank		3.5	6136	31 in. ^{lbf}
Rear seat cushion support bracket x Body		5.0	51	44 in. ^{lbf}

Fuel tank

Part Tightened		N ^m	kgf ^{cm}	ft. ^{lbf}
Check valve support x Fuel tank		3.5	36	31 in. ^{lbf}
Check valve protector x Fuel tank		3.5	36	31 in. ^{lbf}
Fuel tank assembly x Body		14.3	146	11
Fuel tank filler pipe x Fuel tank	for clamp	7.5	76	66 in. ^{lbf}
No. 3 parking brake cable x Body		5.4	55	48 in. ^{lbf}
No. 2 parking brake cable x Body		5.4	55	48 in. ^{lbf}

1NZ-FE EMISSION CONTROL

SERVICE DATA

Vacuum switching valve (Purge VSV)	Standard resistance		23 to 26 Ω at 20°C (68°F)
Heated oxygen sensor (for Bank 1 Sensor 1)	Standard resistance	1 (HT1A) - 2 (+B)	11 to 16 Ω at 20°C (68°F)
		1 (HT1A) - 4 (E2)	10 kΩ or higher
Heated oxygen sensor (for Bank 1 Sensor 2)	Standard resistance	1 (HT1B) - 2 (+B)	11 to 16 Ω at 20°C (68°F)
		1 (HT1B) - 4 (E2)	10 kΩ or higher

SS

SERVICE SPECIFICATIONS – 1NZ-FE EMISSION CONTROL**SS-13****TORQUE SPECIFICATIONS**

Part Tightened	N*m	kgf*cm	ft.*lbf
Charcoal canister x Body	19	194	14
Ventilation valve x Cylinder head cover	27	275	20
Heated oxygen sensor (for bank 1 sensor 1) x Front exhaust pipe : for use with SST	44	449	32
Heated oxygen sensor (for bank 1 sensor 1) x Front exhaust pipe : for use without SST	40	408	30
Heated oxygen sensor (for bank 1 sensor 2) x Front exhaust pipe : for use with SST	44	449	32
Heated oxygen sensor (for bank 1 sensor 2) x Front exhaust pipe : for use without SST	40	408	30

SS

1NZ-FE EXHAUST
SERVICE DATA

Compression spring minimum length	40.5 mm (1.594 in.)
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SS

SS-14

SERVICE SPECIFICATIONS – 1NZ-FE EXHAUST

TORQUE SPECIFICATIONS

Part tightened	N²m	kgf²cm	ft.²lbf
Heated oxygen sensor (for Bank 1 Sensor 2) x Front exhaust pipe : for use with SST	40	408	30
Heated oxygen sensor (for Bank 1 Sensor 2) x Front exhaust pipe : for use without SST	44	449	32
Tail pipe x Front exhaust pipe	32	326	24
Front panel brace x Body	20	204	14

SS

SS-14**SERVICE SPECIFICATIONS – 1NZ-FE COOLING****1NZ-FE COOLING****SERVICE DATA**

Thermostat	Valve opening temperature		80 to 84°C (176 to 183°F)
	Valve lift	at 95°C (203°F)	8.5 mm (0.33 in.) or more
Radiator cap	Standard opening pressure		93 to 123 kPa (0.95 to 1.25 kgf*cm ² , 13.5 to 17.8 psi)
	Minimum opening pressure		78 kPa (0.8 kgf*cm ² , 11.4 psi)
Fan	Standard amperage	at 20°C (68°F)	11.7 to 14.7 A
Cooling Fan Resister	Resistance	at 20°C (68°F)	1.17 to 1.43 Ω
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)

SERVICE SPECIFICATIONS – 1NZ-FE COOLING

SS-15

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Radiator Drain Plug sub-assembly x Radiator	13	129	9.4
Water pump x Cylinder block	11	112	8
Water pump pulley x Water pump	15	153	11
Water Inlet x Cylinder block	9.0	92	80 in.*lbf
Water filler x Radiator	7.5	76	66 in.*lbf
Fan shroud x Radiator	7.5	76	66 in.*lbf
Radiator support upper x body	5.0	51	44 in.*lbf
Hood Lock Support x Body	5.0	51	44 in.*lbf

SS

1NZ-FE LUBRICATION

SERVICE DATA

Oil pressure : at idle	29 kPa (0.3 kgf/cm ² , 4.2 psi) or more
Oil pressure : at 3,000 rpm	150 to 550 kPa (1.5 to 5.6 kgf/cm ² , 22 to 80 psi) or more
Oil pump : Tip clearance	Standard: 0.060 to 0.180 mm (0.0024 to 0.0071 in.) Maximum: 0.28 mm (0.0110 in.)
Oil pump : Body clearance	Standard: 0.250 to 0.325 mm (0.0098 to 0.0128 in.) Maximum: 0.425 mm (0.0167 in.)
Oil pump : Side clearance	Standard: 0.03 to 0.09 mm (0.0012 to 0.0035 in.) Maximum: 0.15 mm (0.0059 in.)

SS

SS-16

SERVICE SPECIFICATIONS – 1NZ-FE LUBRICATION

TORQUE SPECIFICATIONS

Part tightened	N*m	kgf*cm	ft.*lbf
Oil pressure switch x Cylinder block	15	153	11
Oil filter x Oil filter union	17.2	175	13
Oil pump cover x Timing chain cover : for bolt	8.8	90	78 in.*lbf
Oil pump cover x Timing chain cover : for nut	10	102	7.6
Oil pump relief valve plug x Timing chain cover	25	255	18
Timing chain cover x Cylinder head and cylinder block : for bolt A	24	245	18
Timing chain cover x Cylinder head and cylinder block : for bolt B	11	112	8.1
Timing chain cover x Cylinder head and cylinder block : for bolt C	11	112	8.1
Timing chain cover x Cylinder head and cylinder block : for bolt D	24	245	18
Timing chain cover x Cylinder head and cylinder block : for nut E	24	245	18
Oil pan drain plug x No. 2 oil pan	37.5	382	28

SS

SS-16

SERVICE SPECIFICATIONS – 1NZ-FE IGNITION

1NZ-FE IGNITION

SERVICE DATA

Spark plug	Standard electrode gap	0.7 to 0.8 mm (0.028 to 0.031 in.) for new spark plug
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SS

SERVICE SPECIFICATIONS – 1NZ-FE IGNITION

SS-17

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Spark plug x Cylinder head sub-assembly	18	184	13
Ignition coil assembly x Cylinder head cover	9.0	92	80 in.*lbf

SS

SERVICE SPECIFICATIONS – U340E AUTOMATIC TRANSMISSION

SS-23

TORQUE SPECIFICATIONS

Automatic Transaxle Assembly

Part tightened	N*m	kgf*cm	ft.*lbf
Park/neutral position switch assembly (for bolt)	5.4	55	48 in.*lbf
Park/neutral position switch assembly (for nut)	6.9	70	61 in.*lbf
Automatic transaxle housing x Engine block	30	301	22
Torque converter clutch assembly x Drive plate	27	280	20
Oil cooler tube clamp x Automatic transaxle	5.5	56	49 in.*lbf
Oil cooler inlet tube sub-assembly No.1 x Automatic transaxle	34	347	25
Oil cooler outlet tube sub-assembly No.1 x Automatic transaxle	34	347	25
Transmission control cable bracket x Automatic transaxle	12	122	9
Transmission revolution sensor x Automatic transaxle	5.4	55	48 in.*lbf
Transmission oil filler tube sub-assembly x Automatic transaxle	5.5	56	49 in.*lbf
Wheel nut	103	1,050	76
Starter assembly x Automatic transaxle	37	380	27
Starter assembly x Starter wire	9.8	100	87 in.*lbf
Engine mounting bracket LH x Automatic transaxle	64	653	47
Engine mounting bracket rear x Automatic transaxle	49	500	36
Engine mounting bracket LH x Ground cable	26	260	19
Engine mounting bracket rear x Automatic transaxle	49	500	36
Engine mounting bracket LH x Ground cable	26	260	19
Engine mounting bracket LH x Engine mounting insulator LH	49	500	36
Engine mounting bracket rear x Engine mounting insulator rear	64	653	47
Hood sub-assembly	13	132	10
Drain plug x Automatic transaxle oil pan	49	500	36
Automatic transaxle case x Transmission wire	5.4	55	48 in.*lbf
Automatic transaxle oil pan x Automatic transaxle case	7.8	80	69 in.*lbf
Oil strainer sub-assembly x Transmission valve body assembly	11	110	8
Transmission valve body assembly x Automatic transaxle	11	110	8
Transmission valve body assembly x Manual detent spring sub-assembly	11	110	8
Transmission valve body assembly x Shift solenoid valves	11	110	8
Transmission control cable assembly x Body	5.0	51	44 in.*lbf
Engine hanger x Engine	40	408	30
Control shaft lever x Park/neutral position switch assembly	13	130	9
Engine mounting bracket rear x Heat insulator	18	180	13
Engine block x Heat insulator	18	180	13
Air cleaner bracket x Automatic transaxle	19	195	14
Wire harness clamp bracket x Automatic transaxle	5.0	51	44 in.*lbf
Transmission control cable support x Automatic transaxle	12	122	9
Floor shift assembly x Body	12	122	9
Floor shift assembly x Transmission control cable assembly	12	122	9
Transaxle revolution sensor x Transaxle case	5.4	55	48 in.*lbf
Union x Transaxle case	27	275	20
Elbow x Transaxle case	27	275	20
Manual valve lever shaft x Control lever	13	130	10
Manual valve lever shaft x Park/neutral position switch	6.9	70	61 in.*lbf
Park/neutral position switch x Transaxle case	5.4	55	48 in.*lbf
Screw plug	7.4	75	65 in.*lbf
Drain plug	49	500	36
Transaxle case x Oil pan	7.8	80	71 in.*lbf

SS

SS-24**SERVICE SPECIFICATIONS – U340E AUTOMATIC TRANSMISSION**

Part tightened	N*m	kgf*cm	ft.*lbf
Oil strainer x Valve body assembly	11	110	8
ATF temperature sensor lock plate x Valve body assembly	11	110	8
Transaxle wire x Transaxle case	5.4	55	48 in.*lbf
Valve body assembly x Transaxle case	11	110	8
Detent spring x Valve body assembly	11	110	8
Parking lock pawl bracket x Transaxle case	20	205	15
Transaxle housing x Transaxle case Bolt A	29	300	21
Transaxle housing x Transaxle case Bolt B	22	220	16
Transaxle housing x Oil separator	9.8	100	87 in.*lbf
Transaxle rear cover x Screw plug	7.4	75	65 in.*lbf
Transaxle rear cover x Transaxle case	25	250	18
Oil pump x Transaxle case	22	220	16
Counter drive gear lock nut	280	2,855	207
Oil pump body x Stator shaft	9.8	100	7
Valve body assembly x Shift solenoid valve	11	110	8
Accumulator piston cover x Valve body assembly	11	110	8
Pressure relief ball cover x Upper valve body	6.5	66	57 in.*lbf
Upper valve body x Lower valve body	11	110	8
Lower valve body x Lower valve body cover Bolt A	6.6	67	58 in.*lbf
Lower valve body x Lower valve body cover Bolt B	11	110	8
Bearing lock plate x Transaxle housing	11	110	8
Differential case x Differential ring gear	88	900	65

SERVICE SPECIFICATIONS – C50 MANUAL TRANSMISSION

SS-29

TORQUE SPECIFICATIONS

Part Tightened		N*m	kgf*cm	ft.*lbf
Transmission control cable assembly x Body		5.0	51	44 in.*lbf
Floor shift shift lever assembly x Floor		12	122	9
Wire harness clamp x Manual transaxle		5.0	51	44 in.*lbf
Ground cable x Engine mounting bracket LH		26	260	19
Air cleaner bracket x Manual transaxle		19	195	14
Clutch release cylinder x Flexible hose tube		15	155	11
No. 1 engine hanger x Engine		40	408	408
Front suspension member reinforcement set bolt		47	479	35
Front suspension crossmember x body	Bolt A	70	714	52
	Bolt B	116	1,183	86
Engine mounting bracket LH x Manual transaxle		64	653	47
Rear engine mounting bracket x Manual transaxle	Bolt A	64	653	47
	Bolt B	18	180	13
Engine mounting insulator LH x Engine mounting bracket LH		49	500	36
Rear engine mounting insulator x Rear engine mounting bracket		64	653	47
Starter assembly x Manual transaxle		37	380	27
Starter assembly x Starter wire		9.8	100	87 in.*lbf
Manual transaxle x Engine		33	340	24
Filler plug x Manual transaxle		39	400	29
Drain plug x Manual transaxle		39	400	29
Bearing lock plate x Front transaxle case		11	115	8.3
No. 1 oil receiver pipe x Manual transmission case		17	175	13
No. 2 oil receiver pipe x Manual transmission case		17	17	13
Reverse restrict pin plug x Manual transmission case		13	130	9.3
Manual transaxle case receiver x Manual transmission case		11	115	8.3
No. 1 gear shift fork x No. 1 gear shift fork shaft		16	160	12
No. 2 gear shift fork x No. 2 gear shift fork shaft		16	160	12
No. 1 gear shift head x No. 2 gear shift fork shaft		16	160	12
Reverse shift arm bracket assembly x Front transaxle case		17	175	13
Manual transmission case x Front transaxle case	bolt	29	300	22
	nut	29	300	22
Reverse idler gear shaft bolt x Manual transmission case		29	300	22
No. 2 lock ball assembly x Manual transmission case		39	400	29
Shift detent ball x Manual transmission case		22	224	16
Shift detent ball x Front transaxle case		22	224	16
Bearing retainer rear x Manual transmission case		27	280	20
No. 3 gear shift fork x Gear shift fork shaft		16	160	12
Manual transmission output shaft rear set nut x output shaft		118	1200	87
Manual transmission case cover x Manual transmission case		18	185	14
Control shaft cover x Manual transmission case		20	200	14
No. 1 lock ball assembly x Manual transmission case		29	300	22
Selecting bell crank assembly x Manual transmission case		25	250	18

SS

SS-30**SERVICE SPECIFICATIONS – C50 MANUAL TRANSMISSION**

Part Tightened	N*m	kgf*cm	ft.*lbf
Floor shift control lever housing support bracket x Front transaxle case	18	188	14
Back-up light switch assembly x Manual transmission case	40	410	30
Speedometer driven hole cover sub-assembly x Manual transaxle	11	115	8.3
Release fork support x Front transaxle case	37	375	25
Clutch release cylinder assembly x Manual transaxle	12	120	9
Manual transmission filler plug x Manual transaxle	39	29	29
Drain plug sub-assembly x Manual transmission case	39	29	29
No. 2 electing bell crank plate washer x Selecting bell crank	12	120	9
Front defferential ring gear x Front differential case	77	790	57

SS

SERVICE SPECIFICATIONS – 1NZ-FE STARTING

SS-17

1NZ-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	All terminals	10 kΩ or higher
		2 (AM1) - 3 (ACC)	Below 1 Ω at ACC
		1 (AM1) - 2 (IG1)	Below 1 Ω at ON
		1 (AM1) - 3 (ACC)	Below 1 Ω at ON
		5 (AM2) - 6 (IG2)	Below 1 Ω at ON
		1 (AM1) - 2 (IG1)	Below 1 Ω at START
		4 (ST2) - 5 (AM2)	Below 1 Ω at START
		5 (AM2) - 6 (IG2)	Below 1 Ω at START
Starter magnet 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

SS

SS-18

SERVICE SPECIFICATIONS – 1NZ-FE STARTING

TORQUE SPECIFICATIONS

Part Tightened	N ^o m	kgf ^o cm	ft. ^o lbf
Starter wire x Terminal C	9.8	100	7
Starter assembly x Cylinder block sub-assembly	37	377	27

SS

SS-18

SERVICE SPECIFICATIONS – 1NZ-FE CHARGING

1NZ-FE CHARGING
SERVICE DATA

Battery	Standard voltage		12.5 to 12.9 V at 20°C (68°F)
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	2.1 to 2.5 Ω at 20°C (68°F)
		Slip ring - Rotor core	10 kΩ or higher
	Slip ring diameter	Standard diameter	14.2 to 14.4 mm (0.559 to 0.567 in.)
		Minimum diameter	12.8 mm (0.504 in.)

SS

SERVICE SPECIFICATIONS – 1NZ-FE CHARGING

SS-19

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Adjusting Bar x Cylinder Head	11	112	8
Generator Assembly x Adjusting Bar	18.5	189	14
Generator Assembly x Cylinder Head	54	551	40
Generator Wire x Generator Assembly	9.8	100	7

SS

SERVICE SPECIFICATIONS – U340E AUTOMATIC TRANSMISSION

SS-19

U340E AUTOMATIC TRANSMISSION

SERVICE DATA

AUTOMATIC TRANSMISSION ASSEMBLY

Line pressure (Wheel locked) AT stall (Throttle valve fully opened)	D position	1,107 to 1,225 kPa (11.3 to 12.5 kgf/cm ² , 161 to 178 psi)
	R position	1,695 to 1,813 kPa (17.3 to 18.5 kgf/cm ² , 246 to 263 psi)
Engine stall revolution	D positions	2,050 to 2,550 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 750 rpm
Drive plate runout	Maximum	0.20 mm (0.0079 in.)
Differential oil seal drive in depth	LH side	5.4 to 6.4 mm (0.213 to 0.252 in.)
	RH side	1.5 to 2.5 mm (0.059 to 0.098 in.)
Shift point		
D position (Throttle valve fully opened)	1 → 2	50 to 55 km/h (31 to 34 mph)
	2 → 3	94 to 102 km/h (58 to 63 mph)
	3 → 4	147 to 156 km/h (91 to 97 mph)
	4 → 3	142 to 151 km/h (88 to 94 mph)
	3 → 2	89 to 96 km/h (55 to 60 mph)
	2 → 1	41 to 46 km/h (25 to 29 mph)
D position (Throttle valve fully closed)	3 → 4	40 to 44 km/h (25 to 27 mph)
	4 → 3	30 to 34 km/h (19 to 21 mph)
2 position (Throttle valve fully opened)	1 → 2	50 to 55 km/h (31 to 34 mph)
	3 → 2	89 to 96 km/h (55 to 60 mph)
	2 → 1	41 to 46 km/h (25 to 29 mph)
L position (Throttle valve fully opened)	3 → 2	89 to 96 km/h (55 to 60 mph)
	2 → 1	44 to 48 km/h (27 to 30 mph)
Lock-up point		
D position (Throttle valve opening 5 %)	Lock-up ON 3 → 3L	94 to 102 km/h (58 to 63 mph)
	Lock-up ON 4 → 4L	54 to 59 km/h (34 to 37 mph)
	Lock-up OFF 4L → 4	66 to 75 km/h (41 to 47 mph)
	Lock-up OFF 3L → 3	89 to 96 km/h (55 to 60 mph)

OIL PUMP

Body clearance	STD	0.10 to 0.15 mm (0.0039 to 0.0059 in.)
	Max.	0.15 mm (0.0059 in.)
Tip clearance	STD	0.07 to 0.15 mm (0.0028 to 0.0059 in.)
	Max.	0.15 mm (0.0059 in.)
Side clearance	STD	0.02 to 0.05 mm (0.0008 to 0.0020 in.)
	Max.	0.05 mm (0.0020 in.)

SS

SS-20**SERVICE SPECIFICATIONS – U340E AUTOMATIC TRANSMISSION**

Drive gear thickness	Mark 1	9.44 to 9.45 mm (0.3709 to 0.3713 in.)
	Mark 2	9.45 to 9.46 mm (0.3713 to 0.3717 in.)
	Mark 3	9.46 to 9.47 mm (0.3717 to 0.3721 in.)
	Mark 4	9.47 to 9.48 mm (0.3721 to 0.3725 in.)
	Mark 5	9.48 to 9.49 mm (0.3725 to 0.3729 in.)
Driven gear thickness	Mark 1	9.44 to 9.45 mm (0.3709 to 0.3713 in.)
	Mark 2	9.45 to 9.46 mm (0.3713 to 0.3717 in.)
	Mark 3	9.46 to 9.47 mm (0.3717 to 0.3721 in.)
	Mark 4	9.47 to 9.48 mm (0.3721 to 0.3725 in.)
	Mark 5	9.48 to 9.49 mm (0.3725 to 0.3729 in.)
Pump body bushing inside diameter	STD	38.113 to 38.138 mm (1.50050 to 1.50149 in.)
	Max.	38.138 mm (1.50149 in.)
Oil seal in depth	STD	0 +– 0.5 mm (0 +– 0.020 in.)
Stator shaft bushing inside diameter	STD	21.500 to 21.526 mm (0.84646 to 0.84748 in.)
	Max	21.526 mm (0.84748 in.)

FORWARD CLUTCH

Pack clearance		1.406 to 1.806 mm (0.0553 to 0.0711 in.)
Piston return spring free length		21.69 mm (0.8540 in.)
Flange thickness	Mark -	3.00 mm (0.1181 in.)
	Mark 1	3.20 mm (0.1260 in.)
	Mark 2	3.40 mm (0.1339 in.)
	Mark 3	3.60 mm (0.1417 in.)

DIRECT AND REVERSE CLUTCH

Pack clearance	Direct clutch	0.62 to 1.02 mm (0.0244 to 0.0402 in.)
	Reverse clutch	0.86 to 1.26 mm (0.0339 to 0.0496 in.)
Piston return spring free length (Direct clutch)		32.9 mm (1.2953 in.)
Flange thickness (Direct clutch)	Mark -	3.0 mm (0.118 in.)
	Mark 1	3.2 mm (0.126 in.)
	Mark 2	3.4 mm (0.134 in.)
	Mark 3	3.6 mm (0.142 in.)
Flange thickness (Reverse clutch)	Mark -	3.0 mm (0.118 in.)
	Mark 1	3.2 mm (0.126 in.)
	Mark 2	3.4 mm (0.134 in.)
	Mark 3	3.6 mm (0.142 in.)

1ST AND REVERSE BRAKE

Pack clearance		0.8 to 1.206 mm (0.0317 to 0.0475 in.)
Piston return spring free length		13.96 mm (0.5496 in.)
Flange thickness	Mark -	3.4 mm (0.134 in.)
	Mark 1	3.6 mm (0.142 in.)
	Mark 2	3.8 mm (0.150 in.)
	Mark 3	4.0 mm (0.157 in.)

2ND COAST AND O/D BRAKE

Pack clearance		2.091 to 2.491 mm (0.0823 to 0.0981 in.)
Piston return spring free length (O/D brake)		18.99 mm (0.7476 in.)

SERVICE SPECIFICATIONS – U340E AUTOMATIC TRANSMISSION**SS-21**

Flange thickness	Mark 4	4.0 mm (0.157 in.)
	Mark 5	4.2 mm (0.165 in.)
	Mark 6	4.4 mm (0.173 in.)
	Mark 7	4.6 mm (0.181 in.)

2ND BRAKE

Pack clearance		0.847 to 1.247 mm (0.033 to 0.049 in.)
Piston return spring free length		14.65 mm (0.5768 in.)
Flange thickness	Mark -	3.0 mm (0.118 in.)
	Mark 1	3.2 mm (0.126 in.)
	Mark 2	3.4 mm (0.134 in.)
	Mark 3	3.6 mm (0.142 in.)

SS**MANUAL VALVE LEVER SHAFT**

Manual valve lever shaft oil seal in depth	0 +/- 0.5 mm (0 +/- 0.020 in.)
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INTERMEDIATE SHAFT

Intermediate shaft clearance	0.204 to 0.966 mm (0.008 to 0.038 in.)
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INPUT SHAFT

End play	0.37 to 1.29 mm (0.0146 to 0.0508 in.)
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ACCUMULATOR

Spring	Free length / Outer diameter	Color
B2	66.90 mm (2.634 in.) / 15.50 mm (0.610 in.)	Green
C2	66.90 mm (2.6339 in.) / 15.50 mm (0.6102 in.)	-
C3	80.20 mm (3.158 in.) / 18.70 mm (0.736 in.)	-

TRANSAXLE REAR COVER ASSEMBLY

Needle roller bearing clearance	25.2 mm (0.992 in.)
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TRANSMISSION VALVE BODY ASSEMBLY

Valve body assembly installation bolt length	32 mm (1.26 in.) for bolt A
	22 mm (0.87 in.) for bolt B
	55 mm (2.17 in.) for bolt C
	45 mm (1.77 in.) for bolt D
Detente spring installation bolt length	14 mm (0.55 in.) for bolt A
	45 mm (1.77 in.) for bolt B

COUNTER DRIVE GEAR

Rotating torque	0.20 to 0.49 N*m (2 to 5 kgf*cm, ² to 4 in*lb)
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DIFFERENTIAL

Differential drive pinion plug drive in depth		2.5 to 2.6 mm (0.098 to 0.102 in.)
Side gear backlash		0.05 to 0.20 mm (0.002 to 0.008 in.)
Thrust washer thickness	Mark -	0.95 mm (0.0374 in.)
	Mark -	1.00 mm (0.0394 in.)
	Mark -	1.05 mm (0.0413 in.)
	Mark -	1.10 mm (0.0433 in.)
	Mark -	1.15 mm (0.0453 in.)
	Mark -	1.20 mm (0.0472 in.)
Preload (at starting)	New bearing	0.78 to 1.37 N*m (8.0 to 14.0 kgf*cm, 6.9 to 12.2 in*lb)
	Using bearing	0.39 to 0.69 N*m (4.0 to 7.0 kgf*cm, 3.5 to 6.1 in*lb)

SS-22**SERVICE SPECIFICATIONS – U340E AUTOMATIC TRANSMISSION****SS**

Shim thickness	Mark 01	1.90 mm (0.0748 in.)
	Mark 02	1.95 mm (0.0768 in.)
	Mark 03	2.00 mm (0.0787 in.)
	Mark 04	2.05 mm (0.0807 in.)
	Mark 05	2.10 mm (0.0827 in.)
	Mark 06	2.15 mm (0.0846 in.)
	Mark 07	2.20 mm (0.0866 in.)
	Mark 08	2.25 mm (0.0885 in.)
	Mark 09	2.30 mm (0.0906 in.)
	Mark 10	2.35 mm (0.0925 in.)
	Mark 11	2.40 mm (0.0945 in.)
	Mark 12	2.45 mm (0.0965 in.)
	Mark 13	2.50 mm (0.0984 in.)
	Mark 14	2.55 mm (0.1004 in.)
	Mark 15	2.60 mm (0.1024 in.)
	Mark 16	2.65 mm (0.1043 in.)
	Mark 17	2.70 mm (0.1063 in.)
	Mark 18	2.75 mm (0.1082 in.)
	Mark 19	2.80 mm (0.1102 in.)
Transaxle housing side oil seal drive in depth		2 +- 0.5 mm (0.079 +- 0.020 in.)
Transaxle case side oil seal drive in depth		5.9 +- 0.5 mm (0.232 +- 0.020 in.)

SS-24

SERVICE SPECIFICATIONS – CLUTCH

CLUTCH
SERVICE DATA

Pedal height from dash panel		134.3 - 144.3 mm (5.287 - 5.681 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		1.5 - 3.5 mm (0.059 - 0.138 in.)
Clutch release point from pedal full stroke end position		25 mm (0.98 in.) or more
Clutch disc rivet head depth	Maximum	0.3 mm (0.012 in.)
Clutch disc assembly 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-assembly runout	Maximum	0.1 mm (0.004 in.)
Diaphragm spring tip non-alignment	Maximum depth	0.5 mm (0.020 in.)

SS

SERVICE SPECIFICATIONS – CLUTCH

SS-25

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Clutch pedal sub-assembly x Clutch pedal support	37	375	27
Clutch pedal stopper bolt x Clutch pedal support	18	186	13
Clutch pedal support x Body	12	120	9
Clutch master cylinder push rod clevis lock nut	12	120	9
Clutch master cylinder x Flexible hose tube	15	155	11
Clutch master cylinder x Body	12	120	9
Clutch release cylinder bleeder plug	8.4	86	74 in.*lbf
Clutch release cylinder x Transaxle housing	12	120	9
Clutch release cylinder x Flexible hose tube	15	155	11
Clutch release cylinder x Clutch release union	25	250	18
Clutch cover assembly x Flywheel sub-assembly	19	195	14
Release fork support x Transaxle assembly	37	375	27

SS

SERVICE SPECIFICATIONS – C50 MANUAL TRANSMISSION

SS-25

C50 MANUAL TRANSMISSION

SERVICE DATA

Manual transaxle assembly			
5th gear thrust clearance		STD	0.10 to 0.57 mm (0.0039 to 0.02244 in.)
		Max	0.57 mm (0.02244 in.)
5th gear radial clearance	KOYO made	STD	0.015 to 0.058 mm (0.0006 to 0.0023 in.)
		Max	0.058 mm (0.0023 in.)
	NSK made	STD	0.015 to 0.056 mm (0.0006 to 0.0022 in.)
		Max	0.056 mm (0.0022 in.)
No. 3 synchronizer ring back and 5th gear spline end clearance		STD	0.75 to 1.65 mm (0.0295 to 0.0650 in.)
		Max	0.75 mm (0.0295 in.)
No. 3 transmission hub sleeve and No. 3 gear shift fork clearance		STD	0.3 to 0.5 mm (0.012 to 0.020 in.)
5th gear inner diameter		STD	29.915 to 29.931mm (1.1778 to 1.1784 in.)
		Max	29.931mm (1.1784 in.)
Reverse idler gear sub-assembly inner diameter		STD	18.040 to 18.058 mm (0.7102 to 0.7109 in.)
		Max	18.058 mm (0.7109 in.)
Reverse idler gear shaft outer diameter		STD	17.966 to 17.984 mm (0.7073 to 0.7080 in.)
		Min	17.966 mm (0.7073 in.)
Front transaxle case oil seal drive in depth			15.6 to 16.0 mm (0.6142 to 0.6299 in.)
Input shaft front bearing drive in depth			0 to 0.3 mm (0 to 0.012 in.)
Shift & Select lever shaft bimetal formed bush drive in depth			0 to 0.5 mm (0 to 0.020 in.)
Front differential case tapered roller bearing preload		New bearing	0.78 to 1.57 NVm (8 to 16 kgfVcm, 6.9 to 13.9 in.Vlbf)
Front differential case shim thickness		AA	2.10 mm (0.0827 in.)
		BB	2.15 mm (0.0846 in.)
		CC	2.20 mm (0.0866 in.)
		DD	2.25 mm (0.0886 in.)
		EE	2.30 mm (0.0906 in.)
		FF	2.35 mm (0.0925 in.)
		GG	2.40 mm (0.0945 in.)
		HH	2.45 mm (0.0965 in.)
		JJ	2.50 mm (0.0984 in.)
		KK	2.55 mm (0.1004 in.)
		LL	2.60 mm (0.1024 in.)
		MM	2.65 mm (0.1043 in.)
		NN	2.70 mm (0.1063 in.)
		PP	2.75 mm (0.1083 in.)
		QQ	2.80 mm (0.1102 in.)
		RR	2.85 mm (0.1122 in.)
		SS	2.90 mm (0.1142 in.)
		TT	2.95 mm (0.1161 in.)
		UU	3.00 mm (0.1181 in.)

SS

SS-26

SERVICE SPECIFICATIONS – C50 MANUAL TRANSMISSION

Transmission case oil seal drive in depth		2.1 +- 2.7 mm (0.0827 +- 0.1063 in.)
Transaxle case oil seal drive in depth		1.6 +- 2.2 mm (0.0630 +- 0.0866 in.)
Reverse restrict pin slotted pin drive in depth		16.0 +- 17.0 mm (0.630 +- 0.670 in.)
No. 3 transmission clutch hub snap ring thickness	A	2.25 mm (0.0886 in.)
	B	2.31 mm (0.0909 in.)
	C	2.37 mm (0.0933 in.)
	D	2.43 mm (0.0957 in.)
	E	2.49 mm (0.0980 in.)
	F	2.55 mm (0.1004 in.)
	G	2.61 mm (0.1028 in.)

Input shaft assembly			
4th gear thrust clearance		STD	0.1 to 0.55 mm (0.0039 to 0.0217 in.)
		Max	0.55 mm (0.0217 in.)
3rd gear thrust clearance		STD	0.1 to 0.35 mm (0.0039 to 0.0138 in.)
		Max	0.35 mm (0.0138 in.)
4th gear radial clearance		STD	0.009 to 0.050 mm (0.0004 to 0.0020 in.)
		Max	0.050 mm (0.0023 in.)
3rd gear radial clearance	KOYO made	STD	0.015 to 0.058 mm (0.0006 to 0.0023 in.)
		Max	0.058 mm (0.0023 in.)
	NSK made	STD	0.015 to 0.056 mm (0.0006 to 0.0022 in.)
		Max	0.056 mm (0.0022 in.)
Input shaft run out		Max	0.015 mm (0.0006 in.)
Input shaft outer diameter	STD	Part A	24.885 to 24.900 mm (0.9797 to 0.9803 in.)
		Part B	28.991 to 29.006 mm (1.1413 to 1.1419 in.)
		Part C	30.985 to 31.000 mm (1.2198 to 1.2204 in.)
		Part D	24.985 to 25.000 mm (0.9836 to 0.9842 in.)
	Max	Part A	24.885 mm (0.9797 in.)
		Part B	28.991 mm (1.1413 in.)
		Part C	30.985 mm (1.2198 in.)
		Part D	24.985 mm (0.9836 in.)
4th gear inside diameter		STD	34.015 to 34.031 mm (1.3391 to 1.3398 in.)
		Max	34.031 mm (1.3398 in.)
3rd gear inside diameter		STD	36.015 to 36.031 mm (1.4179 to 1.4185 in.)
		Max	36.031 mm (1.4185 in.)
3rd gear synchronizer ring back and 3rd gear spline end clearance		Min	0.75 mm (0.0295 in.)
4th gear synchronizer ring back and 3rd gear spline end clearance		Min	0.75 mm (0.0295 in.)
No. 2 gear shift fork claw and glove of the No. 2 transmission hub sleeve clearance			0.15 to 0.35 mm (0.0059 to 0.0137 in.)
No. 2 transmission hub sleeve clearance			0.15 to 0.35 mm (0.0059 to 0.0137 in.)

SERVICE SPECIFICATIONS – C50 MANUAL TRANSMISSION**SS-27**

No. 2 transmission clutch hub snap ring thickness	0	2.30 mm (0.0906 in.)
	1	2.36 mm (0.0929 in.)
	2	2.42 mm (0.0953 in.)
	3	2.42 mm (0.0953 in.)
	4	2.54 mm (0.1000 in.)
	5	2.60 mm (0.1024 in.)
Input shaft rear bearing shaft snap ring clearance		0.1 mm (0.0039 in.) or less
Input shaft rear bearing shaft snap ring thickness	A	2.29 mm (0.0901 in.)
	B	2.35 mm (0.0925 in.)
	C	2.41 mm (0.0948 in.)
	D	2.47 mm (0.0972 in.)
	E	2.53 mm (0.0996 in.)
	F	2.59 mm (0.1019 in.)

SS

Output shaft assembly		
1st gear thrust clearance	STD	0.10 to 0.40 mm (0.0039 to 0.0157 in.)
2nd gear thrust clearance	STD	0.10 to 0.45 mm (0.0039 to 0.0177 in.)
1st gear radial clearance	KOYO made	0.015 to 0.058 mm (0.0006 to 0.0023 in.)
	NSK made	0.015 to 0.056 mm (0.0006 to 0.0022 in.)
2nd gear radial clearance	KOYO made	0.015 to 0.058 mm (0.0006 to 0.0023 in.)
	NSK made	0.015 to 0.056 mm (0.0006 to 0.0022 in.)
Output shaft maximum run out		0.015 mm (0.0006 in.)
Output shaft outer diameter	Part A	31.985 mm (1.2592 in.)
	Part B	37.985 mm (1.4955 in.)
	Part C	32.985 mm (1.2986 in.)
2nd gear inside diameter	New	38.015 to 38.031 mm (1.4967 to 1.4972 in.)
	Max	38.031 mm (1.4972 in.)
1st gear inside diameter	New	44.015 to 44.031 mm (1.7329 to 1.7335 in.)
	Max	44.031 mm (1.7335 in.)
1st gear thrust washer thickness	New	5.975 to 6.025 mm (0.2352 to 0.2372 in.)
	Min	5.975 mm (0.2352 in.)
No. 2 synchronizer ring set back and 2nd gear spline end clearance		0.75 to 1.65 mm (0.0295 to 0.065 in.)
No. 1 synchronizer ring set back and 2nd gear spline end clearance		0.75 to 1.65 mm (0.0295 to 0.065 in.)
Reverse gear glove and reverse gear shift fork claw clearance		0.15 to 0.35 mm (0.0059 to 0.014 in.)
No. 1 clutch hub shaft snap ring clearance		0.1 mm (0.039 in.) or less
No. 1 clutch hub shaft snap ring thickness	A	2.50 mm (0.0984 in.)
	B	2.56 mm (0.1008 in.)
	C	2.62 mm (0.1031 in.)
	D	2.68 mm (0.1055 in.)
	E	2.74 mm (0.1079 in.)
	F	2.80 mm (0.1102 in.)

SS-28

SERVICE SPECIFICATIONS – C50 MANUAL TRANSMISSION

Shift & Select lever shaft assembly		
Control shaft cover oil seal drive in depth		0.2 to 1.2 mm (0.079 to 0.0472 in.)
Shift lever slotted pin (for select inner lever) drive in depth		3.0 to 4.0 mm (0.1181 to 0.1575 in.)
Shift lever slotted pin (for No. 1 shift lever inner) drive in depth		-0.5 to 0.5 mm (-0.0197 to 0.0197 in.)
Shift lever slotted pin (for No. 2 shift lever inner) drive in depth		-0.5 to 0.5 mm (-0.0197 to 0.0197 in.)

SS

Differential case assembly		
Front differential side gear backlash		0.05 to 0.20 mm (0.0020 to 0.0079 in.)
Front differential pinion thrust washer	Min	0.94 mm (0.03701 in.)
No. 1 front differential pinion shaft outer diameter	Min	16.982 mm (0.6685 in.)

SS-30

SERVICE SPECIFICATIONS – DRIVE SHAFT

DRIVE SHAFT
TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Front wheel set nut	103	1,050	76
Tie rod end sub-assembly x Steering knuckle	49	500	36
Suspension arm sub-assembly lower No.1 x Steering knuckle	98	1,000	72
Stabilizer bar front x Suspension arm sub-assembly lower No.1	18	184	13
Flexible hose and speed sensor front x Shock absorber assembly front	29	300	22
Speed sensor front x Steering knuckle	8.0	82	71 in.*lbf
Front axle hub nut	216	2,200	159

SS

AXLE
SERVICE DATA

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



SS-32

SERVICE SPECIFICATIONS – AXLE

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Front wheel set nut	103	1,050	76
Rear wheel set nut	103	1,050	76
Tie rod end sub-assembly x Steering knuckle	49	500	36
Suspension arm sub-assembly lower No.1 x Steering knuckle	98	1,000	72
Stabilizer bar front x Suspension arm sub-assembly lower No.1	18	184	13
Flexible hose and speed sensor front x Shock absorber assembly front	29	300	22
Speed sensor front x Steering knuckle	8.0	82	71 in.*lbf
Front axle hub nut	216	2,200	159
Disc brake dust cover front x Steering knuckle	8.3	85	73 in.*lbf
Front axle assembly x Front shock absorber assembly	132	1,350	97
Front disc brake cylinder assembly x Steering knuckle	88	900	65
Rear axle hub and bearing assembly x Rear axle beam	61	622	45

SS

SS-32

SERVICE SPECIFICATIONS – SUSPENSION

SUSPENSION

SERVICE DATA

Front suspension

Front wheel alignment	Vehicle height	A - B: D - C:	91 mm (3.58 in.) 19 mm (0.75 in.)
	Toe-in (total) Rack end length difference		0°+11' (0°+0.19°), 0 +2 mm (0 +0.08 in.) 1.5 mm (0.0059 in.) or less
	Wheel angle	Inside wheel	33°37' (31°37' to 35°37') 33.62° (31.62° to 35.62°)
		Outside wheel: Reference	29°55' 29.92°
	Camber Right-left error		-0°39' +45' (-0.65° +0.75°) 45' (0.75°) or less
	Caster Right-left error		1°47' +45' (1.78° +0.75°) 45' (0.75°) or less
	Steering axis inclination Right-left error		10°13' +45' (10.22° +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

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°21' +20' (0.35°+0.33°), 3.4 +3.0 mm (0.13 +0.12 in.)
	Camber Right-left error	-0°57' +45' (-0.95° +0.75°) 30' (0.5°) or less

SERVICE SPECIFICATIONS – SUSPENSION

SS-33

TORQUE SPECIFICATIONS

Front suspension

Part Tightened		N*m	kgf*cm	ft.*lbf
Tie rod end lock nut		74	750	54
Steering knuckle x Shock absorber		132	1,350	97
Front wheel hub nut		103	1,050	76
Suspension support x Piston rod		33	340	25
Suspension support x Body		39	400	29
ABS speed sensor wire harness bracket set bolt		29	300	22
Cowl top panel outer x Body		5.0	51	44 in.*lbf
Suspension crossmember x Body	Bolt A:	70	715	52
	Bolt B:	116	1,180	86
Suspension cross member x Transverse engine mounting insulator		80	816	59
Suspension cross member x Pressure feed tube		7.8	80	69 in.*lbf
Power steering link assembly x Suspension crossmember		74	755	55
Stabilizer bolt set nut		18	180	13
Steering knuckle x Lower ball joint		98	1,000	72
Lower suspension arm x Suspension crossmember	Bolt A:	88	900	65
	Bolt B:	132	1,350	97
Stabilizer bracket No. 1 x Suspension cross member		37	375	27

Rear suspension

Part Tightened		N*m	kgf*cm	ft.*lbf
Rear wheel hub nut		103	1,050	76
Shock absorber x Body		25	250	18
Shock absorber x Rear axle beam		49	500	36
Parking brake cable set bolt		5.4	55	48 in.*lbf
Rear axle hub set bolt		61	622	45
Skid control sensor wire harness bracket set bolt		8.0	82	71 in.*lbf
Rear axle beam x Body		82	836	60
Flexible hose x Brake tube		15	155	11

SS-34

SERVICE SPECIFICATIONS – TIRE AND WHEEL

TIRE AND WHEEL
SERVICE DATA

Cold tire inflation pressure	215/45ZR 17	Front: Rear:	200 kPa (2.0 kgf/cm ² , 29 psi)
Tire runout	3.0 mm (0.118 in.) or less		
Imbalance after adjustment	8.0 g (0.018 lb) or less		

SS

SERVICE SPECIFICATIONS – BRAKE CONTROL

SS-35

BRAKE CONTROL

TORQUE SPECIFICATIONS

Brake actuator:

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

SS

Front speed sensor:

Part Tightened	N*m	kgf*cm	ft. *lbf
Front speed sensor	8.0	82	71 in. *lbf

Skid control sensor:

Part Tightened	N*m	kgf*cm	ft. *lbf
Rear axle hub and bearing assembly (skid control sensor) x Body	61	622	45

Yaw rate sensor:

Part Tightened	N*m	kgf*cm	ft. *lbf
Yaw rate sensor x Body	14	143	10

Steering sensor:

Part Tightened	N*m	kgf*cm	ft. *lbf
Steering pad assembly x Steering wheel assembly	8.8	90	78 in. *lbf
Steering wheel assembly x Steering column shaft	50	510	37

SS-36

SERVICE SPECIFICATIONS – BRAKE

BRAKE

SERVICE DATA

Brake pedal height from dash panel		124.5 to 134.5 mm (4.902 to 5.293 in.)
Brake pedal free play		1.0 to 6.0 mm (0.04 to 0.24 in.)
Stop light switch clearance		0.5 to 2.4 mm (0.020 to 0.094 in.)
Pedal reserve distance from dash panel at 490 N (50 kgf, 110 lbf)	w/ VSC	More than 55 mm (2.17 in.)
	w/o VSC	More than 50 mm (1.97 in.)
Brake booster push rod to piston clearance (w/ Tool)		0 mm (0 in.)
Front brake pad thickness	Standard	11.0 mm (0.433 in.)
	Minimum	1.0 mm (0.039 in.)
Front brake disc thickness	Standard	22.0 mm (0.866 in.)
	Minimum	20.0 mm (0.787 in.)
Front brake disc runout	Maximum	0.05 mm (0.0020 in.)
Rear brake drum inside diameter	Standard	200.0 mm (7.874 in.)
	Maximum	201.0 mm (7.913 in.)
Rear drum brake shoe lining thickness	Standard	4.0 mm (0.157 in.)
	Minimum	1.0 mm (0.039 in.)
Rear brake shoe lining to drum clearance		0.6 mm (0.024 in.)

SS

SERVICE SPECIFICATIONS – BRAKE

SS-37

TORQUE SPECIFICATIONS

Brake pedal

Part Tightened	N*m	kgf*cm	ft. *lbf
Brake pedal support sub-assembly x Brake booster	13	127	9
Brake pedal support sub-assembly x Instrument panel reinforcement	21	214	15
Brake pedal support sub-assembly x Brake pedal sub-assembly	37	375	27
Stop light switch lock nut	26	265	19

Brake master cylinder

Part Tightened	N*m	kgf*cm	ft. *lbf
Brake master cylinder sub-assembly x Brake booster	13	127	9
Brake line union nut	without SST	15	11
	with SST	14	10

Brake booster

Part Tightened	N*m	kgf*cm	ft. *lbf
Brake booster assembly x Body	13	127	9
Brake booster clevis lock nut	26	265	19
Brake actuator assembly with bracket x body	19	194	14
Brake line union nut	without SST	15	11
	with SST	14	10

Front brake

Part Tightened	N*m	kgf*cm	ft. *lbf
Front disc brake cylinder mounting x Steering knuckle	88	900	65
Front disc brake cylinder sub-assembly x Front disc brake cylinder mounting	34	347	25
Front disc brake cylinder sub-assembly x Flexible hose	30	310	22
Bleeder plug	8.3	85	73 in. *lbf
Wheel nut	103	1,050	76

Rear brake

Part Tightened	N*m	kgf*cm	ft. *lbf
Rear wheel brake cylinder assembly x Backing plate	9.8	100	87 in. *lbf
Bleeder plug	8.3	85	73 in. *lbf

SS

SS-38

SERVICE SPECIFICATIONS – PARKING BRAKE

PARKING BRAKE
SERVICE DATA

Parking brake lever travel at 196 N (20 kgf, 44 lbf):	6 to 9 clicks
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SERVICE SPECIFICATIONS – PARKING BRAKE

SS–39

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft. *lbf
Wheel nut	103	1,050	76
Parking brake lever sub-assembly x Body	13	127	9
Front floor heat insulator No. 2 x Body	5.5	55	48 in. *lbf
Floor panel brace front x Body	20	204	18
Parking brake cable assembly No. 3 x Body	5.4	55	48 in. *lbf
Parking brake cable assembly No. 3 x Backing plate	7.8	80	69 in. *lbf

SS

STEERING COLUMN
SERVICE DATA

Steering wheel freeplay	Maximum	30 mm (1.18 in)
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SS-40

SERVICE SPECIFICATIONS – STEERING COLUMN

TORQUE SPECIFICATIONS

Part tightened	N*m	kgf*cm	ft.*lbf
Tie rod x Rack end	74	755	55
Steering column assembly set bolt	21	210	15
Intermediate shaft assembly x Main shaft	28	286	21
Intermediate shaft assembly x Sliding yoke	28	286	21
Steering wheel set nut	50	510	37
Steering wheel pad set screw ("Torx" screw)	8.8	90	78 in.*lbf

SS

SS-40**SERVICE SPECIFICATIONS – POWER STEERING**

POWER STEERING

SERVICE DATA

POWER STEERING SYSTEM		
fluid level rise	Maximum	5 mm (0.20 in)
Fluid pressure at idle speed with valve closed		5,900 kPa (60 kgf/cm ² , 852 psi)
Steering effort at idle speed (Reference)	(Reference)	6 N*m (60 kgf*cm, 53 in.*lbf)
VANE PUMP ASSEMBLY		
Vane pump shaft and vane pump housing oil clearance	Maximum	0.07 mm (0.0028 in)
Clearance between the rotor groove and plate	Minimum	1.404 to 1.411 mm(0.05531 to 0.05555 in.)
Spring free length	Maximum	0.03 mm (0.0012 in.)
Vane pump rotating torque	Minimum	29.2 mm (1.150 in.)
Vane pump rotating torque		0.27 N*m (2.8 kgf*cm, 2.4 in.*lbf)
POWER STEERING LINK ASSEMBLY		
Power steering rack runout	Maximum	0.1 mm (0.004 in.)
Tie rod rotating torque	(Turning)	0.8-34.7 kgf*cm, 7.1 - 30.1 in.*lbf
Total preload (Control valve rotating torque)	(Turning)	1.2 - 1.5 N*m (12 - 15 kgf*cm, 10.6 - 13.3in.*lbf)

SS

SERVICE SPECIFICATIONS – POWER STEERING

SS-41

TORQUE SPECIFICATIONS

Part tightened	N*m	kgf*cm	ft.*lbf
VANE PUMP ASSEMBLY			
Vane pump housing rear x Vane pump housing front	22	224	16
Power steering oil pressure sensor	21	214	15
Pressure port union	69	704	51
Pump bracket front x Vane pump bracket rear	44	449	32
Oil reservoir set bolt	9.0	92	80 in.*lbf
Vane pump assembly set bolt	44	449	32
Vane pump housing rear x Power steering pump heat insulator	44	449	32
Pressure feed tube assembly x Vane pump assembly	44.1 (41)	450 (414)	33 (30)
POWER STEERING LINK ASSEMBLY			
Control vane housing x Rack housing	21	214	15
Rack guide spring cap lock nut	28 (39)	286 (398)	21 (29)
Power steering rack x Steering rack end sub-assembly	60 (83.4)	614 (850)	44 (61)
Tie rod end sub-assembly lock nut	74	750	54
Steering right and left turn pressure tubes	12 (13)	118 (133)	9 (10)
Power steering link assembly set bolt	74	749	54
Steering intermediate shaft set bolt	28	290	21
Power steering rack housing heat insulator set bolt	(a):	18	178
	(b):	35	360
Front suspension crossmember sub-assembly set bolt	A:	116	1,183
	B:	70	714
Engine mounting insulator RR x Front suspension crossmember sub-assembly	72	734	53
Front suspension member reinforcement LH and RH set bolt	47	479	35
Pressure feed tube assembly x Power steering link assembly	27 (25)	273 (255)	20 (18)
Pressure feed assembly clamp set bolt	7.8	80	69 in.*lbf
Steering sliding yoke sub-assembly x Steering intermediate shaft	28	290	21

(): For use without SST

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SS-42

SERVICE SPECIFICATIONS – AIR CONDITIONING

AIR CONDITIONING
SERVICE DATA

Refrigerant charge volume	Standard	460 +-30 g (16.2 +-1.1 oz.)
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SS

SERVICE SPECIFICATIONS – AIR CONDITIONING**SS-43****TORQUE SPECIFICATIONS**

Part tightened	N*m	kgf*cm	ft.*lbf
Suction hose sub-assembly x Body	9.8	100	7
Suction hose sub-assembly x Condenser with receiver assembly	5.4	55	47 in.*lbf
Suction hose sub-assembly x Compressor with pulley assembly	9.8	100	7
Liquid tube sub-assembly x Condenser with receiver assembly	5.4	55	47 in.*lbf
No. 1 cooler refrigerant discharge hose x Compressor with pulley assembly	9.8	100	7
Air conditioning tube assembly x Body	5.4	55	47 in.*lbf
No. 1 condenser bracket collar x Condenser with receiver assembly	3.9	40	35 in.*lbf
Condenser with receiver assembly x Body	9.8	100	7

SS

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
Steering wheel assembly x Steering column assembly	50	510	37
Front passenger airbag x Instrument panel reinforcement	18	190	15
Curtain shield airbag assembly x Body	14	143	10
Center airbag sensor assembly x Body	20	204	15
Front airbag sensor x Body	17.5	178	13
Side airbag sensor x Body	9.0	92	80 in.*lbf
Rear airbag sensor x Body	9.0	92	80 in.*lbf
Seat position airbag sensor x Front seat	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	5.0	51	44
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
Front shoulder belt anchor adjuster assembly x Body	42	428	31

REAR SEAT BELT

Part Tightened	N [•] m	kgf [•] cm	ft. [•] lbf
Child restraint seat tether anchor bracket x Body	42	428	31
Rear seat inner with center belt assembly RH x Body	42	428	31
Rear seat inner with center belt assembly LH x Body	42	428	31
Rear seat outer belt assembly center (floor anchor) 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
Wiper motor x Wiper link	7.5	76	66 in lbf
Wiper motor x Wiper arm LH	26	265	228 in lbf
Wiper motor x Wiper arm RH	26	265	228 in lbf
Rear wiper motor x Body	5.5	56	49 in lbf
Rear wiper motor x Rear wiper arm	5.5	56	49 in lbf

SS

SS-46

SERVICE SPECIFICATIONS – AUDIO / VISUAL

AUDIO / VISUAL
TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft*lbf
Front No. 2 speaker assembly x Front door	8.0	82	71
Amplifier assembly x Body	5.0	51	44 in lbf

SS

HORN

TORQUE SPECIFICATIONS

HORN

Part Tightened	N*m	kgf*cm	ft.*lbf
Low pitched horn x Body	19.5	199	14
High pitched horn x Body	19.5	199	14

SS

SS-48

SERVICE SPECIFICATIONS – WINDSHIELD / WINDOWGLASS

WINDSHIELD / WINDOWGLASS
TORQUE SPECIFICATIONS

MIRROR

Part Tightened	N [•] m	kgf [•] cm	ft. [•] lbf
Wiper arm x Body	20	204	15

SS

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

SS-50

SERVICE SPECIFICATIONS – INSTRUMENT PANEL

INSTRUMENT PANEL
TORQUE SPECIFICATIONS

Part tightened	N·m	kgf·cm	ft.·lbf
Front passenger airbag x Instrument panel reinforcement	18	184	13

SS

SERVICE SPECIFICATIONS – SEAT

SS-51

SEAT**TORQUE SPECIFICATIONS****FRONT SEAT**

Part Tightened	N*m	kgf*cm	ft.*lbf
Inner belt x Seat adjuster	41	418	30
Front seatback x Seat adjuster	43	440	32
Front seat x Body	37	375	27

REAR SEAT

Part Tightened	N*m	kgf*cm	ft.*lbf
Rear seatback hinge x Rear seatback	37	377	27
Rear seatback hinge x Body	42	428	31
Child restraint seat anchor bracket x Rear seatback	37	377	27
Child restraint seat anchor bracket x Body	42	428	31
Rear seatback lock striker x Body	21	214	15
Rear seat belt assembly outer center x Rear seatback frame	42	428	31

SS

SS-52

SERVICE SPECIFICATIONS – ENGINE HOOD / DOOR

ENGINE HOOD / DOOR

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	in.*lbf
HOOD			
Hood x Hood hinge	13	133	10
Hood x Hood lock	8.0	82	71 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 front lower x Door panel	6.2	63	55 in.*lbf
Door frame sub-assembly rear lower x Door panel	6.2	63	55 in.*lbf
Door glass x Front door regulator sub-assembly	8.0	82	72 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	40	41	35 in.*lbf
Outer rear view mirror x Door panel	8.0	82	71 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
REAR DOOR			
Door check x Body	30	306	22
Door check x Door panel	5.5	56	49 in.*lbf
Door window frame sub-assembly rear lower x Door panel	6.2	63	55 in.*lbf
Door glass x Front door regulator sub-assembly	8.0	82	72 in.*lbf
Door hinge x Body	26	265	19
Door hinge x Door panel	26	265	19
Door lockx 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	40	41	35 in.*lbf
Power window regulator motor x Window regulator	5.4	55	48 in.*lbf
Window regulator motor x Door panel	8.0	82	71 in.*lbf
BACK DOOR			
Back door hinge assembly x Body	26	265	19
Back door hinge assembly x Door panel	11.5	117	8
Back door lock assembly x Door panel	7.0	71	62 in.*lbf

SERVICE SPECIFICATIONS – ENGINE HOOD / DOOR

SS–53

Part Tightened	N*m	kgf*cm	in.*lbf
Back door stay sub-assembly x Body	19.5	200	14
Back door stay sub-assembly x Body	8.0	82	71 in.*lbf
Back door stay sub-assembly x Door panel	8.0	82	71 in.*lbf
Rear wiper arm x Wiper motor	5.5	56	49 in.*lbf

SS

SS-54

SERVICE SPECIFICATIONS – EXTERIOR

EXTERIOR
TORQUE SPECIFICATIONS

FRONT BUMPER

Part Tightened	N [•] m	kgf [•] cm	ft. [•] lbf
Front bumper reinforcement x Body	20	204	15

REAR BUMPER

Part Tightened	N [•] m	kgf [•] cm	ft. [•] lbf
Rear bumper reinforcement x Body	20	204	15

BACK DOOR OUTSIDE GARNISH

Part Tightened	N [•] m	kgf [•] cm	ft. [•] lbf
Back door garnish x Body	8.0	82	71

SS

SLIDING ROOF
TORQUE SPECIFICATIONS

Part tightened		N*m	kgf*cm	ft.*lbf
Sliding roof housing assembly x Sliding roof drive gear		5.4	55	48 in.*lbf
Sliding roof housing assembly x Frame	Bolt	5.5	56	49 in.*lbf
	Nut	4.0	41	35 in.*lbf

