

2008 Scion xD

2008 GENERAL INFORMATION Service Specifications - xD

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Service Specifications - xD

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

Fig. 1: Bolt Specification Chart
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

SPECIFIED TORQUE FOR STANDARD BOLTS

BOLT TORQUE SPECIFICATION

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

HOW TO DETERMINE NUT STRENGTH

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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

Fig. 2: Bolt Specification Chart

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

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2ZR-FE ENGINE CONTROL SYSTEM**SERVICE DATA****SERVICE DATA SPECIFICATION**

MASS Air flow meter	Standard		Less than 0.19 g/sec
Camshaft timing oil control valve assembly	Standard resistance		6.9 to 7.9 ohms at 20°C (68°F)
Crankshaft position sensor	Standard resistance		985 to 1600 ohms at cold 1265 to 1890 flat hot
Throttle with motor body assembly	Standard resistance	1 (M-) - 2 (M+)	0.3 to 100 ohms at 20°C (68°F)
EFI (20A) fuse	Standard resistance		Below 1 ohms
Knock sensor	Standard resistance		120 to 280 kohms at 20°C(68°F)
Integration relay	Standard resistance	A1 - C1	Below 1 ohms
		B5-B8	10 kohms or higher
			Below 1 ohms (Apply battery voltage between terminals B6 and B7)
		B1-B4	10 kohms or higher
			Below 1 ohms (Apply battery voltage between terminals B2 and B3)
		A4-C1	10 kohms or higher
Accelerator position No. 1	Standard voltage	Accelerator pedal released	0.5 to 1.1 V
		Accelerator pedal depressed	2.6 to 4.5 V
Accelerator position No. 2	Standard voltage	Accelerator pedal released	1.2 to 2.0 V
		Accelerator pedal depressed	3.4 to 5.0 V
Engine coolant temperature sensor	Standard resistance	1 - 2	2.32 to 2.59 kohms at 20°C (68°F)
			0.310 to 0.326 kohms at 80°C (176°F)
No. 1 ignition relay	Standard resistance	3 - 5	10 kohms or higher
			Below 1 ohms (When battery voltage applied to terminals 1 and 2)
Air fuel ratio sensor	Standard resistance	2 (+B) - 1 (HT)	1.8 ohms to 3.4 ohms at 20°C(68°F)
		1 (HT) - 4 (E)	10 kohms or higher
	Standard	2 (HT) - 4 (+B)	11 ohms to 16ohms at 20°C(68°F)

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Heated oxygen sensor	resistance	2 (HT) - 3 (E)	10 kohms or higher
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TORQUE SPECIFICATIONS**TORQUE SPECIFICATIONS CHART**

Part Tightened		N*m	kgf*cm	ft.*lbf
Air fuel ratio sensor x Exhaust manifold converter	without SST	44	449	32
	with SST	40	408	30
Heated oxygen sensor x Front exhaust pipe assembly	without SST	44	449	32
	with SST	40	408	30
Camshaft timing oil control valve assembly x Cylinder head assembly		10	102	7
Wire harness bracket x Cylinder head cover sub-assembly		8.4	85	74 in.*lbf
Camshaft position sensor x Cylinder head cover sub-assembly		10	102	7
Cowl body mounting reinforcement LH x Outer cowl top panel x Body		6.0	61	53 in.*lbf
Crankshaft position sensor x Timing chain or belt cover sub-assembly		10	102	7
Engine coolant temperature sensor x Cylinder head assembly		20	204	15
Throttle body assembly x Intake manifold		10	102	7
Knock sensor x Cylinder block assembly		21	214	16
Intake manifold x Cylinder block assembly		28	286	21
ECM bracket x Body		8.0	82	71
No. 2 ECM bracket x Body		8.0	82	71
Accelerator pedal assembly x Body		5.4	55	48 in.*lbf
Front wiper arm and blade assembly LH x Front wiper motor and link		26	265	19
Front wiper arm and blade assembly RH x Front wiper motor and link		26	265	19
Front wiper motor and link x Outer cowl top panel		5.5	56	49 in.*lbf
Outer cowl top panel x Body		6.5	65	58 in.*lbf
Engine under cover RH x Body		5.0	51	44 in.*lbf
Engine under cover LH x Body		5.0	51	44 in.*lbf
Oil cooler tube clamp x Automatic transaxle assembly		5.5	56	49 in.*lbf
Inlet No. 1 oil cooler tube x Automatic transaxle assembly	with union nut wrench	32	327	24
	without union nut wrench	34	347	25
Outlet No. 1 oil cooler tube x Automatic transaxle assembly	with union nut wrench	32	327	24
	without union nut	34	347	25

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	wrench		
Transmission oil level gauge sub-assembly x Automatic transaxle assembly	5.5	56	49 in.*lbf
Fuel delivery pipe sub-assembly x Cylinder head assembly	21	214	16

2ZR-FE ENGINE MECHANICAL**SERVICE DATA****ENGINE MECHANICAL SERVICE DATA**

V belt deflection	New belt	7.5 to 8.6 mm (0.296 to 0.338 in.)
	Used belt	8.0 to 10.0 mm (0.315 to 0.397 in.)
V belt tension	New belt	637 to 735 N (65 to 75 kg, 143 to 165 lb)
	Used belt	392 to 588 N (40 to 60 kg, 88 to 132 lb)
Ignition timing	with Terminals TC and CG of DLC3 connected	8 to 12° BTC at idle
Idle speed		650 to 750 rpm
Compression	Compression pressure	1471 kPa (14.0 kgf/cm ² , 213 psi)
	Minimum pressure	1079 kPa (11.0 kgf/cm ² , 156 psi)
	Difference between each cylinder	98 kPa (1.0 kgf/cm ² , 14 psi)
Cylinder head for flatness	Maximum warpage	Cylinder block side 0.05 mm (0.0020 in.)
		Intake manifold side 0.10 mm (0.0039 in.)
		Exhaust manifold side 0.10 mm (0.0039 in.)
Camshaft thrust clearance	Standard thrust clearance	Intake 0.06 to 0.155 mm (0.0024 to 0.0061 in.)
		Exhaust 0.06 to 0.155 mm (0.0024 to 0.0061 in.)
	Maximum thrust clearance	Intake 0.17 mm (0.0067 in.)
		Exhaust 0.17 mm (0.0067 in.)
Standard oil clearance	Camshaft No. 1 journals	0.030 to 0.063 mm (0.0012 to 0.0024 in.)
	Camshaft other journals	0.035 to 0.072 mm (0.0014 to 0.0028 in.)

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Camshaft oil clearance	Maximum oil clearance	Camshaft No. 1 journals	0.085 mm (0.0033 in.)
		Camshaft other journals	0.09 mm (0.0035 in.)
Compression spring	Free length		53.36 mm (2.1008 in.)
	Maximum deviation		1.0 mm (0.0394 in.)
Intake valve	Standard overall length		109.34 mm (4.3047 in.)
	Minimum overall length		108.84 mm (4.2850 in.)
	Valve stem diameter		5.470 to 5.485 mm (0.2154 to 0.2159 in.)
	Standard margin thickness		1.0 mm (0.0571 in.)
	Minimum margin thickness		0.5 mm (0.0197 in.)
Exhaust valve	Standard overall length		108.25 mm (4.2618 in.)
	Minimum overall length		107.75 mm (4.2421 in.)
	Valve stem diameter		5.465 to 5.480 mm (0.2152 to 0.2157 in.)
	Standard margin thickness		1.01 mm (0.0398 in.)
	Minimum margin thickness		0.5 mm (0.0197 in.)
Valve guide bush oil clearance	Bushing inside diameter		5.510 to 5.530 mm (0.2169 to 0.2177 in.)
	Standard oil clearance	Intake	0.025 to 0.060 mm (0.0010 to 0.0024 in.)
		Exhaust	0.030 to 0.065 mm (0.0012 to 0.0026 in.)
	Maximum oil clearance	Intake	0.080 mm (0.0031 in.)
		Exhaust	0.085 mm (0.0035 in.)
Intake valve guide bush diameter	STD		10.285 to 10.306 mm (0.4049 to 0.4057 in.)
	O/S 0.05		10.355 to 10.356 mm (0.46069 to 0.4077 in.)
Intake valve guide bush	Protrusion height		9.9 to 10.3 mm (0.3898 to 0.4055 in.)
	Standard oil clearance		0.025 to 0.060 mm (0.0010 to 0.0024 in.)
Exhaust valve guide bush diameter	STD		10.285 to 10.306 mm (0.4049 to 0.4057 in.)
	O/S 0.05		10.355 to 10.356 mm (0.46069 to 0.4077 in.)
Exhaust valve guide bush	Protrusion height		11.15 to 11.55 mm (0.4390 to 0.4547 in.)
	Standard oil clearance		0.030 to 0.065 mm (0.0012 to 0.0026 in.)
			6.5 to 7.5 mm (0.26 to

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Cylinder head ring pin	Protrusion height		0.30 in.)
Valve seats	Valve seat width	Intake side	1.0 to 1.4 mm (0.039 to 0.055 in.)
		Exhaust side	1.0 to 1.4 mm (0.039 to 0.055 in.)
Connecting rod thrust clearance	Standard thrust clearance		0.160 to 0.342 mm (0.0063 to 0.0135 in.)
	Maximum thrust clearance		0.342 mm (0.0135 in.)
Connecting rod oil clearance	Standard oil clearance		0.030 to 0.062 mm (0.0012 to 0.0024 in.)
	Maximum oil clearance		0.07 mm (0.0028 in.)
Connecting rod large end bore diameter	Mark 1		47.000 to 47.008 mm (1.8504 to 1.8507 in.)
	Mark 2		47.009 to 47.016 mm (1.8507 to 1.8510 in.)
	Mark 3		47.017 to 47.024 mm (1.8511 to 1.8513 in.)
Connecting rod bearing thickness	Mark 1		1.489 to 1.493 mm (0.0586 to 0.0588 in.)
	Mark 2		1.494 to 1.497 mm (0.0588 to 0.0589 in.)
	Mark 3		1.498 to 1.501 mm (0.0590 to 0.0591 in.)
Crankshaft pin diameter	Mark 1, 2, 3		43.992 to 44.000 mm (1.7320 to 1.7323 in.)
Cylinder block for warpage	Maximum warpage		0.05 mm (0.0020 in.)
Cylinder bore	Standard diameter		80.500 to 80.513 mm (3.1693 to 3.1698 in.)
	Maximum diameter		80.633 mm (3.1745 in.)
Piston sub-assembly	Standard piston diameter		80.471 to 80.491 mm (3.1681 to 3.1689 in.)
Piston oil clearance	Standard oil clearance		0.009 to 0.042 mm (0.0004 to 0.0017 in.)
	Maximum oil clearance		0.09 mm (0.0035 in.)
Piston ring groove clearance	Standard ring groove clearance	No. 1 ring	0.02 to 0.07 mm (0.0008 to 0.0028 in.)
		No. 2 ring	0.02 to 0.06 mm (0.0008 to 0.0024 in.)
		Oil ring	0.02 to 0.065 mm (0.0008 to 0.0026 in.)
	Standard end gap	No. 1 ring	0.2 to 0.3 mm (0.0079 to 0.0118 in.)
		No. 2 ring	0.35 to 0.5 mm (0.0138

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Piston ring end gap	Maximum end gap		to 0.0197 in.)
		Oil ring	0.1 to 0.4 mm (0.0039 to 0.0157 in.)
		No. 1 ring	0.5 mm (0.0197 in.)
		No. 2 ring	0.7 mm (0.0276 in.)
Piston pin bore diameter	Mark A	Oil ring	0.7 mm (0.0276 in.)
			20.006 to 20.009 mm (0.7876 to 0.7878 in.)
			20.010 to 20.012 mm (0.7878 to 0.7879 in.)
			20.013 to 20.015 mm (0.7879 to 0.7880 in.)
Piston pin diameter	Mark B		20.004 to 20.007 mm (0.7876 to 0.7877 in.)
			20.008 to 20.010 mm (0.7877 to 0.7878 in.)
			20.011 to 20.013 mm (0.7878 to 0.7879 in.)
			20.012 to 20.015 mm (0.7879 to 0.7880 in.)
Connecting rod small end bore diameter	Mark C		20.016 to 20.018 mm (0.7880 to 0.7881 in.)
			20.019 to 20.021 mm (0.7881 to 0.7882 in.)
			-0.001 to 0.005 mm (-0.00004 to 0.0002 in.)
			0.008 mm (0.0003 in.)
Piston pin oil clearance (Piston pin diameter to piston pin bore diameter)	Standard oil clearance		0.005 to 0.011 mm (0.0002 to 0.0004 in.)
			0.014 mm (0.0006 in.)
			6.6 mm to 6.7 mm (0.2598 to 0.2638 in.)
			6.4 mm (0.2520 in.)
Piston pin oil clearance (Piston pin diameter to connecting rod small end bore diameter)	Maximum misalignment		0.05 mm (0.0020 in.) per 100 mm (3.94 in.)
			0.15 mm (0.0059 in.) per 100 mm (3.94 in.)
			0.03 mm (0.0012 in.)
			47.988 to 48.000 mm (1.8893 to 1.8898 in.)
Connecting rod bolt	Maximum taper and distortion		0.004 mm (0.0002 in.)
			47.999 to 48.000 mm (1.8897 to 1.8898 in.)

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Crankshaft	Standard diameter (Reference)	Mark 1	47.997 to 47.998 mm (1.8896 to 1.8897 in.)
		Mark 2	47.995 to 47.996 mm (1.8896 to 1.8896 in.)
		Mark 3	47.993 to 47.994 mm (1.8895 to 1.8895 in.)
		Mark 4	47.991 to 47.992 mm (1.8894 to 1.8894 in.)
		Mark 5	47.988 to 47.990 mm (1.8893 to 1.8894 in.)
	Standard diameter		43.992 to 44.000 mm (1.7320 to 1.7323 in.)
	Maximum taper and distortion		0.004 mm (0.0002 in.)
Crankshaft thrust clearance	Standard thrust clearance		0.04 to 0.14 mm (0.0016 to 0.0055 in.)
	Maximum thrust clearance		0.18 mm (0.0070 in.)
Crankshaft oil clearance	Standard oil clearance		0.016 to 0.039 mm (0.0006 to 0.0015 in.)
	Maximum oil clearance		0.050 mm (0.0020 in.)
Cylinder block journal bore diameter	Mark 0		52.000 to 53.003 mm (2.0472 to 2.0474 in.)
	Mark 1		52.003 to 52.005 mm (2.0474 to 2.0474 in.)
	Mark 2		52.005 to 52.007 mm (2.0474 to 2.0475 in.)
	Mark 3		52.007 to 52.010 mm (2.0475 to 2.0476 in.)
	Mark 4		52.010 to 52.012 mm (2.0476 to 2.0477 in.)
	Mark 5		52.012 to 52.014 mm (2.0477 to 2.0478 in.)
	Mark 6		52.014 to 52.016 mm (2.0478 to 2.0479 in.)
Crankshaft journal diameter	Mark 0		47.999 to 48.000 mm (1.8897 to 1.8898 in.)
	Mark 1		47.997 to 47.998 mm (1.8896 to 1.8897 in.)
	Mark 2		47.995 to 47.996 mm (1.8896 to 1.8896 in.)
	Mark 3		47.993 to 47.994 mm (1.8895 to 1.8895 in.)
	Mark 4		47.991 to 47.992 mm (1.8894 to 1.8894 in.)
			47.988 to 47.990 mm

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	Mark 5	(1.8893 to 1.8894 in.)
Crankshaft bearing center wall thickness	Mark 1	1.994 to 1.997 mm (0.0785 to 0.0786 in.)
	Mark 2	1.998 to 2.000 mm (0.0787 to 0.0787 in.)
	Mark 3	2.001 to 2.003 mm (0.0788 to 0.0789 in.)
	Mark 4	2.004 to 2.006 mm (0.0789 to 0.0790 in.)
Crankshaft bearing cap set bolt	Standard bolt length	84.3 to 85.7 mm (3.3189 to 3.3740 in.)
	Maximum bolt length	86.7 mm (3.4134 in.)
	Standard outside diameter	9.77 to 9.96 mm (0.3846 to 0.3921 in.)
	Minimum outside diameter	9.1 mm (0.3583 in.)
Cylinder block ring pin	Standard protrusion	7.5 to 8.5 mm (0.295 to 0.335 in.)
Cylinder block straight pin	Pin A	18.5 to 19.5 mm (0.729 to 0.768 in.)
	Pin B	5.0 mm to 7.0 mm (0.197 to 0.276 in.)
	Pin C	11.0 to 13.0 mm (0.433 to 0.512 in.)
	Pin D	5.0 to 7.0 mm (0.197 to 0.276 in.)
	Pin E	5.0 to 6.0 mm (0.197 to 0.236 in.)
Crankcase ring pin	Standard protrusion	3 mm (0.1181 in.)
Chain sub-assembly	Maximum chain elongation	115.2 mm (4.535 in.)
No. 2 chain sub-assembly	Maximum chain elongation	102.1 mm (4.019 in.)
Oil pump drive gear	Minimum gear diameter (with chain)	48.2 mm (1.898 in.)
Oil pump drive shaft gear	Minimum gear diameter (with chain)	48.8 mm (1.922 in.)
Camshaft timing gear assembly	Minimum gear diameter (with chain)	96.8 mm (3.811 in.)
Camshaft timing exhaust gear assembly	Minimum sprocket diameter (with chain)	96.8 mm (3.811 in.)
Crankshaft timing gear	Minimum gear diameter (with chain)	51.1 mm (2.012 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.)
No. 2 chain vibration damper	Maximum wear	1.0 mm (0.039 in.)

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Chain tensioner plate	Maximum wear	1.0 mm (0.039 in.)
Camshaft	Maximum circle runout	0.04 mm (0.0016 in.)
	Standard cam lobe height	42.816 to 42.916 mm (1.6857 to 1.6896 in.)
	Minimum cam lobe height	42.666 mm (1.6798 in.)
	Standard journal diameter	No. 1 34.449 to 34.465 mm (1.3563 to 1.3569 in.)
		Other 22.949 to 22.965 mm (0.9035 to 0.9041 in.)
No. 2 camshaft	Maximum circle runout	0.04 mm (0.0016 in.)
	Standard cam lobe height	44.336 to 44.436 mm (1.7455 to 1.7494 in.)
	Minimum cam lobe height	44.186 mm (1.7396 in.)
	Standard journal diameter	No. 1 34.449 to 34.465 mm (1.3563 to 1.3569 in.)
		Other 22.949 to 22.965 mm (0.9035 to 0.9041 in.)
Cylinder head set bolt	Standard bolt length	146.8 to 148.2 mm (5.7795 to 5.8346 in.)
	Maximum bolt length	149.2 mm (5.874 in.)
	Standard outside diameter	9.77 to 9.96 mm (0.3846 to 0.3921 in.)
	Minimum outside diameter	9.4 mm (0.3701 in.)
Exhaust manifold	Maximum warpage	0.7 mm (0.028 in.)

TORQUE SPECIFICATIONS**TORQUE SPECIFICATIONS CHART**

Part Tightened		N*m	kgf*cm	ft.*lbf
Generator assembly x Cylinder head sub-assembly x Fan belt adjusting bar	Bolt A	19	189	14
	Bolt B	43	438	32
Stud bolt x Cylinder head sub-assembly		9.5	97	84 in.*lbf
No. 1 straight screw plug x Cylinder head sub-assembly		44	449	33
Stud bolt x Cylinder block		5.0	51	44 in.*lbf
No. 1 oil nozzle sub-assembly x Cylinder block		10	102	7
Crankshaft bearing cap x Cylinder block	1st	40	408	30
	2nd	Turn 90°	Turn 90°	Turn 90°
Connecting rod cap x Connecting rod	1st	20	204	15
	2nd	Turn 90°	Turn 90°	Turn 90°

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No. 1 ventilation case x Cylinder block		10	102	7
Wire harness clamp bracket x Cylinder head cover sub-assembly x Cylinder head sub-assembly	Bolt A	10	102	7
	Bolt B	13	130	9
Exhaust manifold x Cylinder head sub-assembly		21	214	16
Manifold stay x Exhaust manifold x Cylinder block		43	438	32
No. 1 exhaust manifold heat insulator x Exhaust manifold		12	122	9
Air tube assembly x Cylinder head cover sub-assembly		10	102	7
No. 1 water by-pass pipe x Cylinder block		21	214	16
Oil level gage guide x No. 1 generator bracket		21	214	16
Fan belt adjusting bar x Cylinder head sub-assembly		19	189	14
Fuel delivery pipe sub-assembly x Cylinder head sub-assembly		21	214	16
Intake manifold x Cylinder head sub-assembly x Cylinder block		28	286	21
Radio setting condenser x Cylinder head cover sub-assembly		10	102	7
Ignition coil assembly x Cylinder head cover sub-assembly		10	102	7
Drive plate and ring gear sub-assembly (for Automatic Transaxle) x Crankshaft		88	897	65
Flywheel sub-assembly x Crankshaft (for Manual Transaxle)	1st	49	500	38
	2nd	Turn 90°	Turn 90°	Turn 90°
No. 1 transmission control cable bracket (for Manual Transaxle) x Manual transaxle assembly (for Manual Transaxle)		25	255	18
Front suspension crossmember sub-assembly x Engine moving control rod bracket		120	1224	89
Transverse engine mounting insulator x Body		52	530	38
Engine mounting insulator LH x Engine mounting bracket LH		52	530	38
Engine mounting insulator RH x Engine mounting bracket RH x Body	Bolt A	88	897	65
	Bolt B	45	459	33
	Bolt C	52	530	38
Engine mounting stay RH x Engine mounting insulator RH x Cylinder head sub-assembly		26	265	19
Front suspension crossmember sub-assembly x Body	Bolt A	70	714	52
	Bolt B	160	1631	118
	Bolt C	95	969	70
Front exhaust pipe assembly x Exhaust manifold x Rear exhaust pipe assembly		43	439	32
Clutch release cylinder assembly (for Manual Transaxle) x Manual transaxle assembly (for Manual Transaxle)	Bolt A	12	120	9
	Bolt B	12	122	9
Transaxle earth wire x Manual transaxle assembly		26	260	19
Transaxle earth wire x Automatic transaxle		8.4	85	71 in.*lbf
Battery carrier x Body		17	173	13
Air cleaner bracket x Body		19	194	14
Air cleaner case x Air cleaner bracket		7.8	80	69

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			in.*lbf
Air cleaner hose clamp x Air cleaner hose	3.0	31	27 in.*lbf
Cowl top panel outer x Body	6.5	66	58 in.*lbf
Battery terminal x Cable	5.4	55	48 in.*lbf
Stud bolt x Stiffening crankcase	5.0	51	44 in.*lbf
Stud bolt x Water inlet housing	5.0	51	44 in.*lbf
Stiffening crankcase assembly x Cylinder block	21	214	16
Oil pump assembly x Stiffening crankcase assembly	21	214	16
No. 2 oil pan sub-assembly x Stiffening crankcase assembly	10	102	7
Oil pan drain plug x No. 2 oil pan sub-assembly	37	377	27
Cylinder block water drain cock assembly x Cylinder block	20	204	15
Water drain cock plug x Cylinder block water drain cock assembly	13	130	9
Ventilation valve sub-assembly x No. 1 ventilation case	20	204	15
Cylinder head sub-assembly x Cylinder block	1st	49	500
	2nd	Turn 90°	Turn 90°
	3rd	Turn 45°	Turn 45°
Camshaft bearing cap x Camshaft housing sub-assembly	16	163	12
Camshaft bearing cap x Cylinder head sub-assembly	27	275	20
Camshaft timing gear assembly x Camshaft	54	551	40
Camshaft timing exhaust gear assembly x No. 2 camshaft	54	551	40
Chain tensioner plate x Cylinder block	10	102	7
oil pump drive shaft gear x Oil pump	28	286	21
No. 1 chain vibration damper x Cylinder head sub-assembly x Cylinder block	21	214	16
No. 2 chain vibration damper x Cylinder head sub-assembly	10	102	7
No. 1 generator bracket x Cylinder block	21	214	16
Water inlet housing x Timing chain or belt cover sub-assembly	21	214	16
Water pump assembly x Timing chain or belt cover sub-assembly	24	245	18
Timing chain or belt cover sub-assembly x Cylinder head sub-assembly x Cylinder block x Stiffening crankcase assembly	Bolt A and C	26	260
	Bolt B and D	51	520
	Bolt E	10	102
Water inlet x Water inlet housing	10	102	7
Crankshaft pulley x Crankshaft	190	1940	140
Oil pressure switch assembly x Timing chain or belt cover sub-assembly	15	153	11

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Engine water temperature sensor x Cylinder head sub-assembly	20	204	15
knock sensor x Cylinder block	21	214	16
No. 1 taper screw plug x Cylinder block	43	439	32
Crankshaft position sensor x Cylinder block	10	102	7
No. 1 chain tensioner assembly x Timing chain or belt cover sub-assembly	10	102	7
Oil filter cap x Oil filter bracket	25	255	18
Cylinder head cover sub-assembly x Camshaft housing sub-assembly	10	102	7
Camshaft timing oil control valve assembly x Cylinder head cover sub-assembly	10	102	7
Camshaft position sensor x Cylinder head cover sub-assembly	10	102	7
Spark plug x Cylinder head sub-assembly	20	204	15
Engine hanger x Cylinder head sub-assembly	43	439	32

2ZR-FE FUEL**SERVICE DATA****SERVICE DATA SPECIFICATION**

Battery	Voltage	Standard	11 to 14 V
Fuel pump operation	Fuel pressure	Standard	304 to 343 kPa (3.1 to 3.5 kgf/cm ² , 44 to 50 psi)
Fuel injector assembly	Resistance	Standard	11.6 to 12.4 ohms at 20°C(68°F)
	Injection volume	Standard	60 to 73 cm ³ (3.7 to 4.5 cu in.) per 15 seconds
	Difference between each injector		13 cm ³ (0.8 cu in.) or less
	Fuel drop		1 drop or less every 12 minutes
Fuel pump	Resistance	Standard	1 - 2 0.2 to 3.0 ohms at 20°C (68°F)
Fuel sender gauge assembly	Resistance	Standard	1 - 2 12.0 to 18.0 ohms F (Upper end)
			1 - 2 405.5 to 414.5 ohms E (Lower end)

TORQUE SPECIFICATIONS**TORQUE SPECIFICATIONS CHART**

Part Tightened	N*m	kgf*cm	ft.*lbf
Fuel delivery pipe sub-assembly x Cylinder head sub-assembly	21	214	16
Harness bracket x Cylinder head sub-assembly	13	130	9
Fuel tank vent tube set plate x Fuel tank	4.0	41	35 in.*lbf
No. 1 engine cover sub-assembly x Cylinder head cover sub-assembly	9.0	92	80 in.*lbf
Fuel tank x Body	14	146	10
Rear seat assembly x Body	37	377	27
Fuel tank protector sub-assembly x Body	5.4	55	48 in.*lbf

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No. 4 front floor heat insulator x Body	5.4	55	48 in.*lbf
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2ZR-FE EMISSION CONTROL**SERVICE DATA****SERVICE DATA SPECIFICATION**

VSV	Standard resistance	1 - 2	23 to 26 ohms at 20°C (68°F)
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TORQUE SPECIFICATIONS**TORQUE SPECIFICATIONS CHART**

Part Tightened	N*m	kgf*cm	ft.*lbf
Canister x Body	19	194	14
Ventilation valve sub-assembly x Cylinder head cover sub-assembly	20	204	15
Engine under cover RH x Body	5.0	51	44
Engine under cover LH x Body	5.0	51	44

2ZR-FE INTAKE**TORQUE SPECIFICATIONS****TORQUE SPECIFICATIONS CHART**

Part Tightened		N*m	kgf*cm	ft.*lbf
Air cleaner case sub-assembly x Air cleaner bracket		7.8	80	69 in.*lbf
Throttle body assembly x Intake manifold		10	102	7
Intake manifold x Cylinder head sub-assembly	Bolt	28	286	21
	Nut	28	286	21
Fuel delivery pipe sub-assembly x Cylinder head sub-assembly		20	204	15
Intake air resonator x No. 1 air cleaner hose		3.0	31	27 in.*lbf
No. 1 air cleaner hose x Throttle body assembly		3.0	31	27 in.*lbf
Engine under cover RH x Body		5.0	51	44 in.*lbf
Engine under cover LH x Body		5.0	51	44 in.*lbf
Transmission oil level gauge sub-assembly x Automatic transaxle assembly		5.5	56	49 in.*lbf
Oil cooler tube clamp x Automatic transaxle assembly		5.5	56	49 in.*lbf
	with union nut wrench	32	327	24

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Inlet No. 1 oil cooler tube x Automatic transaxle assembly	without union nut wrench	34	347	25
Outlet No. 1 oil cooler tube x Automatic transaxle assembly	with union nut wrench	32	327	24
	without union nut wrench	34	347	25

2ZR-FE EXHAUST**SERVICE DATA****SERVICE DATA SPECIFICATION**

Compression spring	Minimum length Front side	40.5 mm (1.594 in)
	Minimum length Rear side	38.5 mm (1.516 in.)

TORQUE SPECIFICATIONS**TORQUE SPECIFICATIONS CHART**

Part Tightened		N*m	kgf*cm	ft.*lbf
Front exhaust pipe assembly x Exhaust manifold		43	438	32
Heated oxygen sensor x Front exhaust pipe assembly	without SST	44	449	33
	with SST	40	408	30
Front floor center brace x Body		30	307	22
Rear exhaust pipe assembly x Front exhaust pipe assembly		43	438	32
No. 1 exhaust manifold heat insulator x Exhaust manifold		12	122	9
Exhaust manifold x Cylinder head sub-assembly		21	214	16
No. 2 exhaust manifold heat insulator x Exhaust manifold		12	122	9
Manifold support bracket x Exhaust manifold x Cylinder block sub-assembly		43	438	32
Air fuel ratio sensor x Exhaust manifold	without SST	44	449	33
	with SST	40	408	30

2ZR-FE COOLING**SERVICE DATA****SERVICE DATA SPECIFICATION**

Thermostat	Valve opening temperature	Standard	80 to 84°C (176 to 183°F)	
	Valve lift	Standard	10 mm (0.39 in.) or more at 95°C (203°F)	
Cooling fan motor	Current	Standard	1(+) - 2(-)	11.8 to 14.8 A at 20°C (68°F)
			3 - 4	Below 1 ohms (When battery voltage absent)
			3 - 5	10 ohms or higher (When battery voltage

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No. 2 cooling fan relay	Resistance	Standard	absent)
			10 ohms or higher (When battery voltage is applied to terminal 1 and 2)
Cooling fan resistor	Resistance	Standard	3 - 4
			3 - 5
Radiator cap sub-assembly	Standard valve (for brand new cap)	Standard	Below 1 ohms (When battery voltage is applied to terminal 1 and 2)
			1.17 to 1.43 ohms at 20°C (68°F)
Radiator cap sub-assembly	Standard valve (for brand new cap)	Standard	93.3 to 122.7 kPa (0.95 to 1.25 kgf/cm ² , 13.5 to 17.8 psi)
			78.5 kPa (0.8 kgf/cm ² , 11.4 psi)

TORQUE SPECIFICATIONS**TORQUE SPECIFICATIONS CHART**

Part Tightened		N*m	kgf*cm	ft.*lbf
Water pump assembly x Timing chain or belt cover sub-assembly	Bolt A	26	260	19
	Bolt B	24	240	17
Water inlet x Water inlet housing		10	102	7
Hood lock assembly x Body		7.5	76	66 in.*lbf
No. 1 water hose clamp bracket x Hood lock support sub-assembly		5.0	51	44 in.*lbf
Upper radiator support sub-assembly x Body		5.5	56	49 in.*lbf
Air cleaner case x Air cleaner case bracket		7.8	80	69 in.*lbf
Water filler sub-assembly x Fan shroud		7.5	76	66 in.*lbf
Fan x Cooling fan motor		6.3	64	56 in.*lbf
Cooling fan resistor x Body		5.1	52	45 in.*lbf

2ZR-FE LUBRICATION**SERVICE DATA****SERVICE DATA SPECIFICATION**

Oil pressure switch	Oil pressure	Standard	Idling	25 kPa (0.3 kgf/cm ² , 4.3 psi) or more
			3000 rpm	150 to 400 kPa (1.6 to 4.1 kgf/cm ² , 21.8 to 58.0 psi)
Oil pump rotor	Side clearance	Standard	0.030 to 0.080 mm (0.0012 to 0.0031 in.)	
		Maximum	0.16 mm (0.0063 in.)	
	Tip clearance	Standard	0.08 to 0.16 mm (0.0032 to 0.0063 in.)	
		Maximum	0.35 mm (0.0138 in.)	
		Standard	0.12 to 0.19 mm (0.0048 to 0.0074 in.)	

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	Body clearance		in.)
		Maximum	0.325 mm (0.0128 in.)
Engine oil pressure switch assembly	Standard resistance	1 - switch body	Idling Engine stopped
			10 ohms or higher Below 3 ohms

TORQUE SPECIFICATIONS**TORQUE SPECIFICATIONS CHART**

Part Tightened	N*m	kgf*cm	ft.*lbf
Oil pan drain plug x No. 2 oil pan sub-assembly	37	377	27
Oil pump cover x Oil pump body	8.8	90	78 in.*lbf
Oil pump relief valve x Oil pump body	49	500	36
Oil filter cap x Oil filter bracket	25	255	18
Engine oil pressure switch assembly x Timing chain or belt cover sub-assembly	15	153	11
Front wheel RH	103	1050	76
Oil pump assembly x Stiffening crankcase assembly	21	214	16

2ZR-FE IGNITION**SERVICE DATA****SERVICE DATA SPECIFICATION**

for Used Spark plug	Electrode gap	Maximum	1.3 mm (0.051 in.)
for New Spark plug	Electrode gap	Standard	1.0 to 1.1 mm (0.039 to 0.043 in.)

TORQUE SPECIFICATIONS**TORQUE SPECIFICATIONS CHART**

Part Tightened	N*m	kgf*cm	ft.*lbf
Spark plug x Cylinder head sub-assembly	20	204	15
Ignition coil assembly x Cylinder head cover sub-assembly	10	102	7

2ZR-FE STARTING**SERVICE DATA****SERVICE DATA SPECIFICATION**

Starter assembly	Specified current	90 A
Magnet switch body	Standard resistance	Terminal 50 - Terminal C
	Standard	Terminal 50 - Switch body
		Below 1 ohms Below 2 ohms

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	resistance		
Starter armature assembly	Standard resistance	Segment - Segment	Below 1 ohms
	Standard resistance	Commutator - Armature coil core	10 kohms or higher
	Commutator depth	Specified depth	3.1 mm (0.122 in.)
		Maximum depth	3.8 mm (0.150 in.)
Starter commutator end frame assembly	Brush length	Specified length	9.0 mm (0.354 in.)
		Maximum length	4.0 mm (0.157 in.)
	Standard resistance		10 kohms or higher
Starter relay	Standard resistance	3 - 5 (When battery voltage absent)	10 kohms or higher
		3 - 5 (When battery voltage applied to terminals 1 and 2)	Below 1 ohms
ACC	Standard resistance	3 - 4	Below 1 ohms
			10 kohms or higher (when battery voltage applied to terminals 1 and 2)
		3 - 5	Below 1 ohms (when battery voltage applied to terminals 1 and 2)
			10 kohms or higher
Ignition switch assembly	Standard resistance	LOCK: Between all terminals	10 kohms or higher
		ACC: 2 - 4	Below 1 ohms
		ON: 1 - 2 - 4	
		ON: 5 - 6	
		START: 1 - 3 - 4	
		START: 5 - 6 - 7	

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS CHART

Part Tightened		N*m	kgf*cm	ft.*lbf
Starter assembly x Transaxle housing		37	377	27
	Terminal 30	9.8	100	87 in.*lbf
Negative battery terminal x Battery		5.4	55	47 in.*lbf
Starter commutator end frame assembly x Starter drive housing assembly		6.0	61	53 in.*lbf
Magnet switch body x Starter drive housing assembly		7.5	76	66 in.*lbf
Terminal C x Magnet switch body		10	102	7
Engine under cover RH x Body		5.0	51	44 in.*lbf
Engine under cover LH x Body		5.0	51	44 in.*lbf

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2ZR-FE CHARGING**SERVICE DATA****SERVICE DATA SPECIFICATION**

Battery	Standard specific gravity		1.25 to 1.29 V at 20°C (68°F)
Fuse	Standard resistance		Below 1 ohms
Charging circuit without load	Standard current		10 A or less
	Standard voltage		13.2 to 14.8 V
Charging circuit with load	Standard current		30 A or more
Generator brush holder assembly	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	Between the slip rings	2.3 to 2.7 ohms at 20°C (68°F)
		Slip ring - Rotor core	1 Mohms or higher
	Standard diameter		14.2 to 14.4 mm (0.559 to 0.567 in.)
	Minimum diameter		14 mm (0.551 in.)

TORQUE SPECIFICATIONS**TORQUE SPECIFICATIONS CHART**

Part Tightened		N*m	kgf*cm	ft.*lbf
Fan belt adjusting bar x Generator assembly		19	189	14
Wire harness clamp bracket x Generator assembly		8.4	86	74 in.*lbf
Generator assembly x Cylinder block		43	438	32
Wire harness x Terminal B		9.8	100	87 in.*lbf
Negative battery terminal x Battery		5.4	55	47 in.*lbf
Generator drive end frame x Bearing retainer plate		2.3	23	20 in.*lbf
Generator coil assembly x Generator drive end frame		5.9	60	52 in.*lbf
Generator brush holder assembly x Generator coil assembly		1.8	18	16 in.*lbf
Generator rear end cover x Generator coil assembly		4.6	47	41 in.*lbf
Generator clutch pulley x Generator rotor assembly	with SST	111	1127	82
	without SST	84	857	62

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Engine under cover RH x Body		5.0	51	44
Engine mounting insulator sub-assembly RH x Body	Bolt A	45	459	33
	Bolt B	88	898	65
	Nut	52	530	38
Engine mounting stay RH x Engine mounting insulator sub-assembly RH		26	265	19
Transverse engine engine mounting bracket x Timing chain or belt cover sub-assembly		51	520	38

U341E AUTOMATIC TRANSAXLE**SERVICE DATA****AUTOMATIC TRANSAXLE SYSTEM****SERVICE DATA SPECIFICATION**

Line pressure (Wheel locked)		
Engine idling	D position	372 to 412 kPa (3.8 to 4.2 kgf*cm ² , 54 to 60 psi)
	R position	553 to 623 kPa (5.6 to 6.4 kgf*cm ² , 80 to 91 psi)
AT stall (Throttle valve fully opened)	D position	1,120 to 1,230 kPa (11.4 to 12.5 kgf*cm ² , 162 to 178 psi)
	R position	1,660 to 1,870 kPa (17.0 to 19.0 kgf/cm ² , 241 to 270 psi)
Engine stall revolution	D positions	2,110 to 2,710 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	650 to 750 rpm
Shift schedule		
D positions		
Throttle valve fully opened	1 --> 2	55 to 61 km/h (34 to 38 mph)
	2 --> 3	104 to 113 km/h (65 to 70 mph)
	3 --> 4	166 to 176 km/h (103 to 109 mph)
	4 --> 3	160 to 170 km/h (99 to 106 mph)
	3 --> 2	98 to 107 km/h (61 to 66 mph)
	2 --> 1	46 to 51 km/h (29 to 32 mph)
	3 --> 4	37 to 41 km/h (23 to 25 mph)
Throttle valve fully closed	4 --> 3	32 to 37 km/h (20 to 23 mph)
2 position		
Throttle valve fully opened	1 --> 2	55 to 61 km/h (34 to 38 mph)
	3 --> 2	97 to 106 km/h (60 to 66 mph)
	2 --> 1	46 to 51 km/h (29 to 32 mph)
L position		

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Throttle valve fully opened	3 --> 2	97 to 106 km/h (60 to 66 mph)
	2 --> 1	47 to 52 km/h (29 to 32 mph)
Lock-up point (Throttle valve opening 5 %)		
D position		
4th gear	Lock-up ON 4 --> 4L	66 to 71 km/h (41 to 44 mph)
	Lock-up OFF 4L --> 4	62 to 67 km/h (39 to 42 mph)
3 position		
3th gear	Lock-up ON 3 --> 3L	73 to 79 km/h (45 to 49 mph)
	Lock-up OFF 3L --> 3	65 to 71 km/h (40 to 44 mph)

SPEED SENSOR**SPEED SENSOR SERVICE DATA SPECIFICATION**

Speed sensor NT resistance		
1 - 2	20°C (68°F)	560 to 680 ohms

PARK / NEUTRAL POSITION SWITCH**PARK / NEUTRAL POSITION SWITCH SERVICE DATA SPECIFICATION**

Park/neutral position switch resistance		
4(B) - 5(L)	P or N	Below 1 ohms
	Except P and N	10 kohms or higher
2(RB) - 6(PL)	P	Below 1 ohms
	Except P	10 kohms or higher
1 (RL) - 2 (RB)	R	Below 1 ohms
	Except R	10 kohms or higher
2 (RB) - 9 (NL)	N	Below 1 ohms
	Except N	10 kohms or higher
2 (RB) - 7 (DL)	D or 3	Below 1 ohms
	Except D and 3	10 kohms or higher
2 (RB) - 3 (2L)	D or 2	Below 1 ohms
	Except D and 2	10 kohms or higher
2 (RB) - 8 (LL)	D or L	Below 1 ohms
	Except D and L	10 kohms or higher

TRANSMISSION WIRE**TRANSMISSION WIRE SERVICE DATA SPECIFICATION**

Transmission wire resistance

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1 (THO) - 6 (E2)	10°C (50°F)	5 to 8 kohms
	25°C (77°F)	2.5 to 4.5 kohms
	110°C (230°F)	0.22 to 0.28 kohms

SHIFT LEVER**SHIFT LEVER SERVICE DATA SPECIFICATION**

Shift lock control ECU voltage		
12 (KLS+) - 8 (E)	1. Ignition switch ACC and shift lever P position	Below 1 V
	2. Ignition switch ACC and shift lever except P position	7.5 to 11 V
	3. Ignition switch ACC and shift lever P position (After approx. 1 second)	6 to 9 V
6 (ACC) - 8 (E)	Ignition switch ON	11 to 14 V
	Ignition switch ACC	11 to 14 V
	Ignition switch OFF	Below 1 V
7 (STP) - 8 (E)	Brake pedal depressed	11 to 14 V
	Brake pedal released	Below 1 V
1(E)-8(IG)	Ignition switch ON	11 to 14 V
	Ignition switch OFF	Below 1 V
Shift lock control ECU resistance		
8 (E) - Body ground	When battery voltage absent	Below 1 ohms

DIFFERENTIAL OIL SEAL**DIFFERENTIAL OIL SEAL SERVICE DATA SPECIFICATION**

Transaxle case oil seal drive in depth	Standard	2.2 to 3.2 mm (0.087 to 0.126 in.)
front transaxle case oil seal drive in depth	Standard	-0.5 to 0.5 mm (-0.0197 to 0.0197 in.)

TORQUE CONVERTER AND DRIVE PLATE**TORQUE CONVERTER AND DRIVE PLATE SERVICE DATA SPECIFICATION**

Drive plate runout	Maximum.	0.20 mm (0.0079 in.)
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AUTOMATIC TRANSAXLE UNIT**AUTOMATIC TRANSAXLE UNIT SERVICE DATA SPECIFICATION**

Input shaft end play	Standard	0.374 to 1.292 mm (0.0147 to 0.0509 in.)
1st and reverse brake return spring free length	Standard	13.96 mm (0.5496 in.)
Differential gear preload	New	0.98 to 1.57 N*m (10.0 to 16.0 kgf*cm, 8.7 to 13.9 in.*lbf)
	Used	0.49 to 1.57 N*m (5.0 to 8.0 kgf*cm, 4.3 to

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		6.9 in.*lbf)
Transaxle case side adjusting shim thickness	Mark 01	1.90 mm (0.074 in.)
	Mark 02	1.95 mm (0.077 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 (0.0886 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 (0.1083 in.)
	Mark 19	2.80 mm (0.1102 in.)
Manual valve lever shaft oil seal drive in depth	Standard	-0.5 to 0.5 mm (-0.020 to 0.020 in.)
Differential drive pinion plug drive in depth	Standard	2.5 to 3.5 mm (0.0984 to 0.1378 in.)
Counter drive gear bearing turning torque (At 60 rpm)	Standard	0.20 to 0.49 N*m (2.0 to 5.0 kgf*cm, 1.8 to 4.3 in.*lbf)
1st and reverse brake pack clearance	Standard	0.806 to 1.206 mm (0.0317 to 0.0475 in.)
1st and reverse brake 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 brake pack clearance	Standard	0.847 to 1.247 mm (0.0333 to 0.0491 in.)
2nd brake 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.)
2nd coast and overdrive brake clearance	Standard	2.091 to 2.491 mm (0.0823 to 0.0981 in.)
2nd coast and overdrive brake flange thickness	Mark 4	4.0 mm (0.1575 in.)
	Mark 5	4.2 mm (0.1654 in.)
	Mark 6	4.4 mm (0.1732 in.)
	Mark 7	4.6 mm (0.1811 in.)
Intermediate shaft end play	Standard	0.204 to 0.966 mm (0.008 to 0.083 in.)

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Needle roller bearing thicknesses	Brown	0.785 (0.0309)
	Black	1.1 (0.0433)
Input shaft end play	Standard	0.374 to 1.292 mm (0.0147 to 0.0509 in.)
C-2 accumulator piston spring	Free length	66.2 to 67.6 mm (2.606 to 2.661 in.)
	Outer diameter	17.20 mm (0.6772 in.)
C-3 accumulator piston spring	Free length	87.30 mm (3.4370 in.)
	Outer diameter	18.70 mm (0.7362 in.)
B-2 accumulator piston spring	Free length	66.90 mm (2.6339 in.)
	Outer diameter	15.50 mm (0.6102 in.)

OIL PUMP**OIL PUMP SERVICE DATA SPECIFICATION**

Stator shaft bushing inside diameter	Standard	21.500 to 21.526 mm (0.84646 to 0.84748 in.)
	Maximum	21.256 mm (0.84748 in.)
Tip clearance	Standard	0.07 to 0.15 mm (0.0028 to 0.0059 in.)
	Maximum	0.15 mm (0.0059 in.)
Body clearance	Standard	0.07 to 0.15 mm (0.0028 to 0.0059 in.)
	Maximum	0.15 mm (0.0059 in.)
Side clearance	Standard	0.02 to 0.05 mm (0.0008 to 0.0020 in.)
	Maximum	0.05 mm (0.0020 in.)
Drive gear thickness	Mark 1	9.44 to 9.45 mm (0.3717 to 0.3720 in.)
	Mark 2	9.45 to 9.46 mm (0.3720 to 0.3724 in.)
	Mark 3	9.46 to 9.47 mm (0.3724 to 0.3728 in.)
	Mark 4	9.47 to 9.48 mm (0.3728 to 0.3732 in.)
	Mark 5	9.48 to 9.49 mm (0.3732 to 0.3736 in.)
Driven gear thickness	Mark 1	9.44 to 9.45 mm (0.3717 to 0.3720 in.)
	Mark 2	9.45 to 9.46 mm (0.3720 to 0.3724 in.)
	Mark 3	9.46 to 9.47 mm (0.3724 to 0.3728 in.)
	Mark 4	9.47 to 9.48 mm (0.3728 to 0.3732 in.)
	Mark 5	9.48 to 9.49 mm (0.3732 to 0.3736 in.)
Oil pump body bushing inside diameter	Standard	38.113 to 38.138 mm (1.0050 to 1.50149 in.)
	Maximum	21.57 mm (0.8492 in.)
Oil seal drive in depth	Standard	-0.15 to 0.15 mm (-0.006 to 0.006 in.)

INPUT SHAFT**INPUT SHAFT SERVICE DATA SPECIFICATION**

Forward clutch piston return spring free length	Standard	21.69 mm (0.8540 in.)
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Forward clutch pack clearance	Standard	1.406 to 1.806 mm (0.05535 to 0.07110 in.)
Forward clutch 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.)

SECOND BRAKE PISTON**SECOND BRAKE PISTON SERVICE DATA SPECIFICATION**

2nd brake piston return spring free length	Standard	14.65 mm (0.5768 in.)
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INTERMEDIATE SHAFT**INTERMEDIATE SHAFT SERVICE DATA SPECIFICATION**

Direct clutch piston return spring free length	Standard	31.7 mm (1.2480 in.)
Reverse clutch pack clearance	Standard	0.862 to 1.262 mm (0.339 to 0.0497 in.)
Reverse clutch 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.)
Direct clutch pack clearance	Standard	0.62 to 1.02 mm (0.0244 to 0.0402 in.)
Direct clutch 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.)

TRANSAXLE REAR COVER**TRANSAXLE REAR COVER SERVICE DATA SPECIFICATION**

Overdrive brake return spring free length	Standard	17.88 mm (0.7039 in.)
Transaxle rear cover needle roller bearing depth	Standard	25.1 mm (0.988 in.)

VALVE BODY**VALVE BODY SERVICE DATA SPECIFICATION**

Shift solenoid valve SL1 resistance		
1-2	20°C (68°F)	5.0 to 5.6 ohms
Shift solenoid valve SL2 resistance		
1-2	20°C (68°F)	5.0 to 5.6 ohms
Shift solenoid valve SLT resistance		
1-2	20°C (68°F)	5.0 to 5.6 ohms
Shift solenoid valve DSL resistance		

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Solenoid Connector - Solenoid Body	20°C (68°F)	11 to 13 ohms
Shift solenoid valve S4 resistance		
Solenoid Connector - Solenoid Body	20°C (68°F)	11 to 15 ohms

DIFFERENTIAL CASE**DIFFERENTIAL CASE SERVICE DATA SPECIFICATION**

Differential side gear backlash	Standard	0.05 to 0.02 mm (0.002 to 0.0079 in.)
Thrust washer thickness	-	0.95 mm (0.0374 in.)
	-	1.00 mm (0.0394 in.)
	-	1.05 mm (0.0413 in.)
	-	1.10 mm (0.0433 in.)
	-	1.15 mm (0.0453 in.)
	-	1.20 mm (0.0472 in.)

TORQUE SPECIFICATIONS**SPEED SENSOR****TORQUE SPECIFICATIONS CHART**

Part Tightened	N*m	kgf*cm	ft.*lbf
Speed sensor NC x Automatic transaxle	5.4	55	48 in.*lbf

PARK / NEUTRAL POSITION SWITCH**PARK / NEUTRAL POSITION SWITCH TORQUE SPECIFICATIONS**

Part Tightened	N*m	kgf*cm	ft.*lbf
Park/neutral position switch assembly x Automatic transaxle	5.4	55	48 in.*lbf
Manual valve shaft nut	6.9	70	61 in.*lbf
Control shaft lever x Park/neutral position switch assembly	13	130	9
Transmission control cable assembly x Control shaft lever	12	122	9

TRANSMISSION WIRE**TRANSMISSION WIRE TORQUE SPECIFICATIONS**

Part Tightened	N*m	kgf*cm	ft.*lbf
Transmission wire x Automatic transaxle case	5.4	55	48 in.*lbf

VALVE BODY ASSEMBLY**VALVE BODY ASSEMBLY TORQUE SPECIFICATIONS**

Part Tightened	N*m	kgf*cm	ft.*lbf
Transmission valve body x Automatic transaxle	11	110	8

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ATF temperature sensor x Lock plate	11	110	8
Oil strainer x Valve body	11	110	8
Automatic transaxle oil pan sub-assembly x Automatic transaxle case	7.8	80	69 in.*lbf

SHIFT LEVER**SHIFT LEVER TORQUE SPECIFICATIONS**

Part Tightened	N*m	kgf*cm	ft.*lbf
Shift lever assembly x Body	12	122	9

TRANSMISSION CONTROL CABLE ASSEMBLY**TRANSMISSION CONTROL CABLE ASSEMBLY TORQUE SPECIFICATIONS**

Part Tightened	N*m	kgf*cm	ft.*lbf
Transmission control cable assembly x Control shaft lever	12	122	9
Transmission control cable assembly x Body	5.0	51	44 in.*lbf
Front upper No. 1 floor heat insulator x Body	5.5	56	49 in.*lbf

DIFFERENTIAL OIL SEAL**DIFFERENTIAL OIL SEAL TORQUE SPECIFICATIONS**

Part Tightened	N*m	kgf*cm	ft.*lbf
Drain plug	49	500	36

AUTOMATIC TRANSAXLE ASSEMBLY**AUTOMATIC TRANSAXLE ASSEMBLY TORQUE SPECIFICATIONS**

Part Tightened	N*m	kgf*cm	ft.*lbf
Transaxle housing x Engine block	29	296	21
No. 1 transmission control cable bracket x Automatic transaxle	12	122	9
Transmission control cable support x Automatic transaxle	5.0	51	44 in.*lbf
Engine mounting bracket LH x Automatic transaxle	64	653	47
Transmission oil filler tube x Automatic transaxle	12	122	9
No. 2 oil cooler tube clamp x Transmission oil filler tube	5.5	56	49 in.*lbf
Outlet No. 1 oil cooler tube x Oil cooler tube elbow (Without union nut wrench)	34	347	25
Outlet No. 1 oil cooler tube x Oil cooler tube elbow (With union nut wrench)	32	327	24
Inlet No. 1 oil cooler tube x Oil cooler tube elbow (Without union nut wrench)	34	347	25
Inlet No. 1 oil cooler tube x Oil cooler tube elbow (With union nut wrench)	32	327	24
Torque converter clutch x Drive plate	28	286	21
Lateral control rod x Automatic transaxle	64	653	47

AUTOMATIC TRANSAXLE UNIT

2008 Scion xD**2008 GENERAL INFORMATION Service Specifications - xD****AUTOMATIC TRANSAXLE UNIT TORQUE SPECIFICATIONS**

Part Tightened	N*m	kgf*cm	ft.*lbf
Bearing lock plate x Transaxle housing	11	110	8
Parking lock pawl bracket x Transaxle case	20	205	15
Counter driven gear nut	280	2855	206
Transaxle rear cover x Transaxle case	25	255	18
Oil pump assembly x Transaxle case	22	226	16
Transaxle housing x Transaxle case (Bolt A)	29	300	21
Transaxle housing x Transaxle case (Bolt B)	22	220	16
No. 1 transaxle case plugs	7.4	75	65 in.*lbf
Oil cooler tube elbow x Transaxle case	27	275	20

TRANSAXLE REAR COVER**TRANSAXLE REAR COVER TORQUE SPECIFICATIONS**

Part Tightened	N*m	kgf*cm	ft.*lbf
Transaxle cover plug	7.4	75	65 in.*lbf

VALVE BODY ASSEMBLY**VALVE BODY ASSEMBLY TORQUE SPECIFICATIONS**

Part Tightened	N*m	kgf*cm	ft.*lbf
Shift solenoid valve SLT x Transmission valve body assembly	11	110	8
Shift solenoid valve ST x Transmission valve body assembly	11	110	8
Shift solenoid valve SL x Transmission valve body assembly	11	110	8
Shift solenoid valve S2 x Transmission valve body assembly	11	110	8
Shift solenoid valve S1 x Transmission valve body assembly	11	110	8

DIFFERENTIAL CASE**DIFFERENTIAL CASE TORQUE SPECIFICATIONS**

Part Tightened	N*m	kgf*cm	ft.*lbf
Front differential case x Front differential ring gear	88	898	65

CLUTCH**SERVICE DATA****SERVICE DATA SPECIFICATION**

Pedal height from floor to center of pedal	133 to 143 mm (5.236 to 5.630 in.)
Pedal free play	5.0 to 15.0 mm (0.197 to 0.591 in.)

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Push rod play at pedal top		1.0 to 5.0 mm (0.039 to 0.197 in.)
Clutch release point from pedal full stroke end position		25 mm (0.98 in.) or more
Clutch disc rivet depth	Maximum	0.3 mm (0.012 in.)
Clutch disc runout	Minimum	0.8 mm (0.031 in.)
Diaphragm spring wear	Maximum depth Maximum width	0.5 mm (0.020 in.) 6.0 mm (0.236 in.)
Flywheel runout	Maximum	0.1 mm (0.004 in.)
Diaphragm spring tip non-alignment	Maximum depth	0.5 mm (0.020 in.)

TORQUE SPECIFICATIONS**TORQUE SPECIFICATIONS CHART**

Part tightened	N*m	kgf*cm	ft.*lbf
Clutch switch x Lock nut	16	160	12
Clutch master cylinder push rod clevis lock nut	12	120	9
Clutch pedal sub-assembly x Clutch pedal support	37	375	27
Clutch start switch assembly x Clutch pedal support	16	160	12
Clutch pedal support x Body	24	241	17
Clutch master cylinder x Clutch pedal support	9.0	92	80 in.*lbf
Clutch master cylinder to flexible hose tube x Clutch master cylinder	14(15)	144(155)	10(11)
Release cylinder bleeder plug x Clutch release cylinder	8.3	85	73 in.*lbf
Clutch release cylinder x Manual transaxle case	12	120	9
Clutch release cylinder to flexible hose tube x Clutch release cylinder	14(15)	144(155)	10(11)
Clutch cover assembly x Flywheel sub-assembly	19	195	14
Release fork support x Manual transaxle	37	375	27
(): for use without SST			

C50 MANUAL TRANSAXLE**SERVICE DATA****SERVICE DATA SPECIFICATION**

5th gear thrust clearance	Standard Maximum	0.10 to 0.55 mm (0.0039 to 0.0217 in.) 0.55 mm (0.0217 in.)
5th gear radial clearance	KOYO made Standard Maximum NSK made Standard	0.015 to 0.058 mm (0.0006 to 0.0023 in.) 0.058 mm (0.0023 in.) 0.015 to 0.056 mm (0.0006 to 0.0022 in.)

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	Maximum	0.056 mm (0.0022 in.)
No. 3 synchronizer ring back and 5th gear spline end clearance	Minimum	0.75 mm (0.0295 in.)
No. 3 transmission hub sleeve and No. 3 gear shift fork clearance	Standard	0.3 to 0.5 mm (0.012 to 0.020 in.)
5th gear inner diameter	Standard	29.915 to 29.931 mm (1.1778 to 1.1783 in.)
	Maximum	29.931 mm (1.1783 in.)
Reverse idler gear inner diameter	Standard	18.040 to 18.058 mm (0.7102 to 0.7109 in.)
	Maximum	18.058 mm (0.7109 in.)
Reverse idler gear outer diameter	Standard	17.966 to 17.984 mm (0.7073 to 0.7080 in.)
	Minimum	17.966 mm (0.7073 in.)
Front transaxle case oil seal drive in depth	-	15.6 mm to 16.0 mm (0.6141 to 0.6299 in.)
Input shaft front bearing drive in depth	-	0 to 0.3 mm (0 to 0.0118 in.)
Shift and select lever shaft needle roller bearing drive in depth	-	0 to 0.5 mm (0 to 0.020 in.)
Shift and select lever shaft oil seal drive in depth	-	9.7 to 10.3 mm (0.382 to 0.406 in.)
Front differential case tapered roller bearing preload	New bearing	0.78 to 1.57 N*m (7.95 to 16.0 kgf*cm, 6.9 to 13.89 in.*lbf)
	Used bearing	0.49 to 0.98 N*m (5.0 to 10.0 kgf*cm, 4.34 to 8.67 in.*lbf)
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.)

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Transmission case oil seal drive in depth		-9.6 to 10.2 mm (0.378 to 0.402 in.)
Transaxle case oil seal drive in depth		-1.6 to 2.2 mm (0.063 to 0.087 in.)
Reverse restrict pin slotted pin drive in depth		15.5 to 16.5 mm (0.6102 to 0.6496 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.)
Control shaft cover oil seal drive in depth		-0.2 to 1.2 mm (0.0079 to 0.0472 in.)
4th gear thrust clearance	Standard Maximum	0.1 to 0.55 mm (0.0039 to 0.0217 in.) 0.55 mm (0.0217 in.)
3rd gear thrust clearance	Standard Maximum	0.1 to 0.35 mm (0.0039 to 0.0138 in.) 0.35 mm (0.0138 in.)
4th gear radial clearance	Standard Maximum	0.009 to .050 mm (0.0004 to 0.0020 in.) 0.050 mm (0.0023 in.)
3rd gear radial clearance	KOYO made Standard Maximum NSK made Standard Maximum	0.015 to 0.058 mm (0.0006 to 0.0023 in.) 0.0023 in.) 0.058 mm (0.0023 in.) 0.015 to 0.056 mm (0.0006 to 0.0022 in.) 0.0022 in.) 0.056 mm (0.0022 in.)
Input shaft runout	Maximum	0.015 mm (0.0006 in.)
Input shaft outer diameter	Standard Part A Part B Part C Part D Minimum Part A Part B Part C Part D	24.885 to 24.900 mm (0.9797 to 0.9803 in.) 28.991 to 29.006 mm (1.1414 to 1.1420 in.) 30.985 to 31.000 mm (1.2198 to 1.2204 in.) 24.985 to 25.000 mm (0.9836 to 0.9842 in.) 24.885 mm (0.9797 in.) 28.991 mm (1.1414 in.) 30.985 mm (1.2198 in.) 24.985 mm (0.9836 in.)
4th gear inside diameter	Standard Maximum	34.015 to 34.031 mm (1.3391 to 1.3398 in.) 34.031 mm (1.3398 in.)

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2008 GENERAL INFORMATION Service Specifications - xD

3rd gear inside diameter	Standard	36.015 to 36.031 mm (1.4179 to 1.4185 in.)
	Maximum	36.031 mm (1.4185 in.)
3rd gear synchronizer ring back and 3rd gear spline end clearance	Standard	0.75 to 1.65 mm (0.0295 to 0.0650 in.)
	Minimum	0.75 mm (0.0295 in.)
4th gear synchronizer ring back and 4th gear spline end clearance	Standard	0.75 to 1.65 mm (0.0295 to 0.0650 in.)
	Minimum	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.)
Transmission clutch hub No. 2 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	2.48 mm (0.0976 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.)
1st gear thrust clearance	Standard	0.10 to 0.40 mm (0.0039 to 0.0157 in.)
	Maximum	0.40 mm (0.0157 in.)
2nd gear thrust clearance	Standard	0.10 to 0.55 mm (0.0039 to 0.0217 in.)
	Maximum	0.55 mm (0.0217 in.)
1st gear radial clearance	KOYO made Standard	0.015 to 0.058 mm (0.0006 to 0.0023 in.)
	Maximum	0.058 mm (0.0023 in.)
	NSK made Standard	0.015 to 0.056 mm (0.0006 to 0.0022 in.)
	Maximum	0.056 mm (0.0022 in.)
2nd gear radial clearance	KOYO made Standard	0.015 to 0.058 mm (0.0006 to 0.0023 in.)
	Maximum	0.058 mm (0.0023 in.)
	NSK made Standard	0.015 to 0.056 mm (0.0006 to 0.0022 in.)
	Maximum	0.056 mm (0.0022 in.)
Output shaft runout	Maximum	0.015 mm (0.0006 in.)

2008 Scion xD**2008 GENERAL INFORMATION Service Specifications - xD**

Output shaft outer diameter	Part A	31.985 to 32.000 mm (1.2592 to 1.2598 in.)
	Part B	37.985 to 38.000 mm (1.4955 to 1.4961 in.)
	Part C	32.985 to 33.000 mm (1.2986 to 1.2992 in.)
2nd gear inside diameter	Standard	38.015 to 38.031 mm (1.4967 to 1.4972 in.)
	Maximum	38.031 mm (1.4972 in.)
1st gear inside diameter	Standard	44.015 to 44.031 mm (1.7328 to 1.7335 in.)
	Maximum	44.031 mm (1.7335 in.)
1st gear thrust washer thickness	Standard	5.975 to 6.025 mm (0.2352 to 0.2372 in.)
	Minimum	5.975 mm (0.2352 in.)
No. 2 synchronizer ring set back and 2nd gear spline end clearance	Standard	0.70 to 1.3 mm (0.0276 to 0.0512 in.)
	Minimum	0.70 mm (0.0276 in.)
No. 1 synchronizer ring set back and 1st gear spline end clearance	Standard	0.75 to 1.65 mm (0.0295 to 0.0650 in.)
	Minimum	0.75 mm (0.0295 in.)
Reverse gear glove and reverse gear shift fork claw clearance	-	0.15 to 0.35 mm (0.0059 to 0.0138 in.)
Clutch hub No. 1 shaft snap ring clearance	-	0.1 mm (0.039 in.) or less
Clutch hub No. 1 shaft snap ring thickness	A B C D E F	2.50 mm (0.0984 in.) 2.56 mm (0.1008 in.) 2.62 mm (0.1031 in.) 2.68 mm (0.1055 in.) 2.74 mm (0.1079 in.) 2.80 mm (0.1102 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 shift lever inner No. 1) drive in depth	-	0.5 to 0.5 mm (- 0.0197 to 0.0197 in.)
Shift lever slotted pin (for shift lever inner No. 2) drive in depth	-	1.0 to 2.0 mm (0.0394 to 0.0787 in.)
Front differential side gear backlash	-	0.05 to 0.20 mm (0.0020 to 0.0079 in.)
Front differential pinion thrust washer	Minimum	0.92 mm (0.0362 in.)
Front differential pinion shaft No. 1 outer diameter	Minimum	16.982 mm (0.6685 in.)

TORQUE SPECIFICATIONS**TORQUE SPECIFICATIONS CHART**

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Part tightened	N*m	kgf*cm	ft.*lbf
Filler plug x Manual transmission case	39	400	29
Floor shift lever assembly x Body	12	122	9
Transmission control cable x Body	5.0	51	44 in.*lbf
Front floor heat insulator x Body	5.5	56	49 in.*lbf
Manual transaxle assembly x Engine	33	336	24
Engine mounting bracket LH x Transmission case cover	64	653	47
Engine moving control bracket x Transaxle case	64	653	47
Control cable bracket x Transaxle case	25	255	18
Bearing lock plate x Transaxle case	11	115	8
No. 1 oil receiver pipe x Transmission case	17	175	13
No. 2 oil receiver pipe x Transmission case	17	175	13
Reverse restrict pin plug x Transmission case	13	130	9
Transaxle case receiver x Transaxle case	11	115	8
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 x Transaxle case	17	175	13
Transmission case x Transaxle case	29	300	22
Reverse idler gear shaft bolt x Transmission case	29	300	22
No. 2 lock ball assembly x Transmission case	29	296	21
Shift detent ball plug x Transmission case	22	224	16
Shift detent ball plug x Transaxle case	22	224	16
Bearing retainer rear x Transmission case	27	279	20
No. 3 gear shift fork x No. 3 gear shift fork shaft	16	160	12
Transmission output shaft rear set nut x Output shaft	118	1199	87
Transmission case cover x Transmission case	21	214	16
Control shaft cover x Transmission case	20	200	14
Shift gate pin x Transmission case	11	112	8
No. 1 lock ball assembly x Transmission case	29	300	22
Shift lever damper x Shift and select lever shaft assembly	12	120	9
Floor shift control shift lever x Shift and select lever shaft assembly	12	120	9
Selecting bell crank assembly x Transmission case for bolt	25	250	18
Selecting bell crank assembly x Transmission case for nut	12	120	9
Back-up light switch x Transmission case	40	410	30
Speedometer driven hole cover x Transaxle case	11	115	8
Front differential ring gear x Front differential case	77	789	57

DRIVE SHAFT**SERVICE DATA**

2008 Scion xD

2008 GENERAL INFORMATION Service Specifications - xD

FRONT DRIVE SHAFT ASSEMBLY

SERVICE DATA SPECIFICATION

Outboard joint boot grease capacity	Standard	135 to 145 g (4.8 to 5.1 oz.)
Inboard joint boot grease capacity	Standard	175 to 185 g (6.2 to 6.5 oz.)
Drive shaft damper RH distance	Standard	436.5 to 440.5 mm (17.26 to 17.34 in.)
Inboard joint boot distance	Standard	69.1 to 77.1 mm (2.72 to 3.03 in.)
Front drive shaft standard length	LH	565.9 mm (22.28 in.)
	RH	840.9 mm (33.11 in.)

TORQUE SPECIFICATIONS

FRONT DRIVE SHAFT ASSEMBLY

TORQUE SPECIFICATIONS CHART

Part Tightened	N*m	kgf*cm	ft.*lbf
Front wheel	103	1050	76
Rear wheel	103	1050	76
Front axle assembly x Front lower suspension arm	98	1000	72
Front axle assembly x Front shock absorber	164	1672	121
Front axle assembly x Tie rod end sub-assembly	49	500	36
Front axle assembly x Front disc brake caliper assembly	107	1089	79
Front axle assembly x Front speed sensor	8.5	87	75 in.*lbf
Front axle hub nut x Front drive shaft assembly	216	2203	160
Front speed sensor bracket x Front shock absorber	29	300	22
Rear axle hub and bearing assembly x Rear axle beam assembly	90	918	67

AXLE

SERVICE DATA

Axle

SERVICE DATA SPECIFICATION

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

TORQUE SPECIFICATIONS

Axle

2008 Scion xD

2008 GENERAL INFORMATION Service Specifications - xD

TORQUE SPECIFICATIONS CHART

Part Tightened	N*m	kgf*cm	ft.*lbf
Front wheel	103	1050	76
Rear wheel	103	1050	76
Front axle assembly x Front lower suspension arm	98	1000	72
Front axle assembly x Front shock absorber	164	1672	121
Front axle assembly x Tie rod end sub-assembly	49	500	36
Front axle assembly x Front disc brake caliper assembly	107	1089	79
Front axle assembly x Front speed sensor	8.5	87	75 in.*lbf
Front axle hub nut x Front drive shaft assembly	216	2203	160
Front speed sensor bracket x Front shock absorber	29	300	22
Rear axle hub and bearing assembly x Rear axle beam assembly	90	918	67

SUSPENSION**SERVICE DATA****SERVICE DATA SPECIFICATION**

Front suspension		
Vehicle height	A-B	91 mm (3.58 in.)
	C-D	26 mm (1.02 in.)
Toe-in	B-A	1.4 +/- 2.0 mm (0.06 +/- 0.08 in.)
	Rack end length difference	1.5 mm (0.059 in.) or less
Wheel turning angle	Inside wheel	32°38' +/- 2° (32.63° +/- 2°)
	Outside wheel (Reference)	29°37' (29.62°)
Camber	-	-0°11' +/- 45' (-0.18° +/- 0.75°)
Caster	-	4°51' +/- 45' (4.85° +/- 0.75°)
Steering Axis Inclination (Reference)	-	11°22' (11.37°)
Front lower suspension arm	Lower ball joint turning torque	0.78 to 3.43 N*m (8 to 35 kgf*cm, 6.9 to 30 in.*lbf)
Front stabilizer link	Front stabilizer link turning torque	0.05 to 1.96 N*m (0.51 to 19.99 kgf*cm, 0.44 to 17.35 in.*lbf)
Rear suspension		
Toe-in	B-A	3.4 +/- 3.0 mm (0.13 +/- 0.11 in.)
Camber	-	-0°57' +/- 30' (-0.95° +/- 0.5°)

TORQUE SPECIFICATIONS**TORQUE SPECIFICATIONS CHART**

Part Tightened	N*m	kgf*cm	ft.*lbf
Tie rod end lock nut	75	760	55

2008 Scion xD**2008 GENERAL INFORMATION Service Specifications - xD**

Front shock absorber x Steering knuckle	164	1672	121
Front speed sensor x Front flexible hose	29	300	22
Front wheel	103	1050	76
Front support to front shock absorber nut x Front shock absorber	33	340	25
Front stabilizer link assembly x Front shock absorber	74	755	55
Front shock absorber with coil spring x Body	55	561	41
Front suspension lower arm x Steering knuckle	98	999	72
Front suspension lower arm x Front suspension crossmember sub-assembly	137	1397	101
Front suspension lower arm x Body	160	1631	118
Front stabilizer No. 1 bracket x Front suspension crossmember sub-assembly	47	479	35
Rear flexible hose x Rear brake tube	14(15)	144(155)	10(11)
Skid control sensor wire x Rear axle beam	6.0	61	53 in.*lbf
Rear wheel	103	1050	76
Rear support to rear shock absorber nut x Rear shock absorber	25	250	18
Rear shock absorber x Rear axle beam	49	500	36
Parking brake cable x Rear axle beam	6.0	61	53 in.*lbf
Rear brake tube x Rear axle beam	5.0	51	44 in.*lbf
Rear axle beam x Body	90	918	67
Front suspension member damper weight x Front suspension crossmember	32	326	24
Engine moving control rod x Front suspension crossmember	100	1020	74
Power steering gear x Front suspension crossmember	96	979	71
Front suspension crossmember x Body bolt A	70	714	52
bolt B	160	1631	118
bolt C	95	969	70
Engine moving control rod x Engine moving control bracket	120	1224	89
Steering sliding yoke x Intermediate shaft	35	360	26
(): for use without SST			

TIRE AND WHEEL**SERVICE DATA****SERVICE DATA SPECIFICATION**

Tire pressure 195/60R16 89H	Front	230 kPa (2.3 kgf/cm ² , 33 psi)
	Rear	230 kPa (2.3 kgf/cm ² , 33 psi)
Tire runout		1.4 mm (0.055 in.) or less
Imbalance after adjustment		8.0 g (0.018 lb) or less
Tire pressure warning switch resistance	1 -2 ON	Below 1 ohms
	OFF	10 kohms or higher

TORQUE SPECIFICATIONS

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TORQUE SPECIFICATIONS CHART

Part Tightened	N*m	kgf*cm	ft.*lbf
Tire pressure warning receiver x Body	7.5	76	66 in.*lbf
Valve nut	4.0	41	35 in.*lbf
Front wheel	103	1050	76
Rear wheel	103	1050	76

BRAKE CONTROL**TORQUE SPECIFICATIONS****TORQUE SPECIFICATIONS CHART**

Part Tightened	N*m	kgf*cm	ft.*lbf
Brake actuator bracket assembly x Brake actuator assembly	5.4	55	48 in.*lbf
Brake actuator assembly x Body	19	194	14
Brake tube x Brake actuator assembly	14(15)	144(155)	10(11)
Front speed sensor x Steering knuckle	8.5	87	75 in.*lbf
Front speed sensor x Front shock absorber	29	300	22
Front speed sensor x Body	6.0	61	53 in.*lbf
Front wheel	103	1050	76
Rear wheel	103	1050	76
Deceleration sensor x Body	14	143	10
Deceleration sensor protector x Deceleration sensor	5.0	51	44 in.*lbf
Yaw rate and acceleration sensor x Body	14	143	10
Yaw rate and acceleration sensor protector x Yaw rate and acceleration sensor	9.0	92	80 in.*lbf
Negative battery terminal x Battery	5.4	55	48 in.*lbf
(): For use without union nut wrench			

BRAKE**SERVICE DATA****SERVICE DATA SPECIFICATION**

Brake pedal height (from floor)	107.3 to 117.3 mm (4.22 to 4.62 in.)
Stop light switch clearance	0.5 to 2.6 mm (0.020 to 0.102 in.)
Brake pedal free play	1.0 to 6.0 mm (0.039 to 0.236 in.)
Brake pedal reserve distance (from floor) at 300 N (31 kgf, 67.4 lbf)	More than 81 mm (3.19 in.)
Brake booster push rod to piston clearance	0 mm (0 in.)

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Front disc brake pad lining thickness	Standard	12.0 mm (0.472 in.)
	Minimum	1.0 mm (0.039 in.)
Front disc thickness	Standard	22.0 mm (0.866 in.)
	Minimum	19.0 mm (0.748 in.)
Front disc runout	Maximum	0.05 mm (0.0020 in.)
Rear brake drum inside diameter	Standard	228.6 mm (9.000 in.)
	Maximum	229.6 mm (9.039 in.)
Rear drum brake shoe lining thickness	Standard	5.0 mm (0.197 in.)
	Minimum	1.0 mm (0.039 in.)
Rear brake shoe and drum clearance		0.6 mm (0.024 in.)

TORQUE SPECIFICATIONS**TORQUE SPECIFICATIONS CHART**

Part Tightened	N*m	kgf*cm	ft.*lbf
Brake tube x Brake master cylinder sub-assembly	14(15)	144(155)	10(11)
Front disc brake bleeder plug x Disc brake cylinder assembly	8.3	85	73 in.*lbf
Rear drum brake bleeder plug x Rear wheel brake cylinder assembly	8.5	87	75 in.*lbf
Push rod lock nut x Brake booster push rod	26	265	19
Brake pedal sub-assembly x Brake pedal support sub-assembly	37	375	27
Brake pedal support sub-assembly x Instrument panel reinforcement assembly	24	241	17
Brake pedal support sub-assembly x Brake booster assembly	9.0	92	80 in.*lbf
Negative battery terminal x Battery	5.4	55	48 in.*lbf
Brake master cylinder sub-assembly x Brake booster assembly	13	127	9
Brake tube x Brake tube way	14(15)	144(155)	10(11)
Brake tube x Front flexible hose	14(15)	144(155)	10(11)
Front wheel	103	1050	76
Front disc brake cylinder mounting x Steering knuckle	107	1089	79
Disc brake cylinder assembly x Front disc brake cylinder mounting	34	350	25
Front flexible hose x Disc brake cylinder assembly	30	310	22
Front flexible hose x Front shock absorber	29	300	22
Rear wheel brake cylinder assembly x Backing plate	9.8	100	87 in.*lbf
Brake tube x Rear wheel brake cylinder assembly	14(15)	144(155)	10(11)
Rear wheel	103	1050	76
Rear brake flexible hose x Brake tube	14(15)	144(155)	10(11)
(): For use without union nut wrench			

PARKING BRAKE**SERVICE DATA****SERVICE DATA SPECIFICATION**

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Parking brake lever travel at 200 N (20 kgf, 45 lbf)

6 to 9 clicks

TORQUE SPECIFICATIONS**TORQUE SPECIFICATIONS CHART**

Part Tightened	N*m	kgf*cm	ft.*lbf
Lock nut x No. 1 parking brake pull rod sub-assembly	5.4	55	48 in.*lbf
Parking brake switch assembly x Parking brake lever sub-assembly	0.9	9	8 in.*lbf
Parking brake lever sub-assembly x Body	13	127	9
Parking brake cable assembly x Backing plate	8.0	82	71 in.*lbf
Parking brake cable assembly set bolts	6.0	61	53 in.*lbf
Rear wheel	103	1050	76

STEERING COLUMN**SERVICE DATA****SERVICE DATA SPECIFICATION**

Steering wheel free play	Maximum	30 mm (1.18 in.)
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TORQUE SPECIFICATIONS**Steering Column Assembly****TORQUE SPECIFICATIONS CHART**

Part tightened	N*m	kgf*cm	ft.*lbf
Steering wheel assembly x Steering column assembly	50	510	37
No. 2 Steering intermediate shaft assembly x Steering intermediate shaft assembly	35	360	26
No. 2 Steering intermediate shaft assembly x Steering column assembly	35	360	26
Steering column x Instrument panel reinforcement assembly	25	255	18
Battery x Negative battery terminal	5.4	55	48 in.*lbf

Steering Wheel**STEERING WHEEL TORQUE SPECIFICATIONS**

Part tightened	N*m	kgf*cm	ft.*lbf
Steering wheel assembly x Steering column assembly	50	510	37

POWER STEERING**SERVICE DATA**

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Tie rod assembly stud bolt torque	Turning	0.29 to 1.96 N*m (2.96 to 20.0 kgf*cm, 2.57 to 17.3 in.*lbf)
Total preload	Turning	0.6 to 1.2 N*m (6.1 to 12.2 kgf*cm, 5.3 to 10.6 in.*lbf)

TORQUE SPECIFICATIONS

Power Steering Gear:

TORQUE SPECIFICATIONS CHART

Part Tightened		N*m	kgf*cm	ft.*lbf
Steering intermediate shaft assembly x Power steering gear		35	357	26
Power steering gear x Front suspension crossmember sub-assembly		96	979	71
Power steering gear x Front suspension crossmember sub-assembly	Bolt A	70	714	52
	Bolt B	160	1631	118
	Bolt C	95	969	70
Front wheels x Front axle hub sub-assembly		103	1050	76

Power Steering ECU:

POWER STEERING ECU TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Power steering ECU x Instrument panel reinforcement assembly	5.0	51	44 in.*lbf

AIR CONDITIONING**SERVICE DATA****SERVICE DATA SPECIFICATION**

Refrigerant charge volume	330 to 390 g (11.6 to 13.8 oz.)
Blower resistor	1 - 4 : 3.12 to 3.60 ohms 3 - 4 : 1.45 to 1.67 ohms 2 - 4 : 0.52 to 0.60 ohms
PTC heater assembly	1 - Ground terminal : Below 1ohms 2 - Ground terminal: Below 1ohms 3 - Ground terminal : Below 1ohms
Compressor assembly	1 - 2 : 10 to 11 ohms
Heater blower motor relay	3 - 4 : Below 1ohms (When battery voltage is absent) 3 - 4 : 10 kohms or higher (When battery voltage applied to terminals 1 and 2) 3 - 5 : 10 kohms or higher (When battery voltage is absent) 3 - 5 : Below 1ohms (When battery voltage applied to terminals 1 and 2)
PTC heater relay	3 - 5 : 10 kohms or higher (When battery voltage is absent) 3 - 5 : Below 1ohms (When battery voltage applied to terminals 1 and 2)

for Manual transaxle

2008 Scion xD**2008 GENERAL INFORMATION Service Specifications - xD****MANUAL TRANSAXLE SERVICE DATA SPECIFICATION**

Idling speed Switch A/C OFF	650 to 750 rpm
Idling speed Switch A/C ON (A/C Lo --> Hi)	750 --> 850 rpm

for Automatic transaxle

AUTOMATIC TRANSAXLE SERVICE DATA SPECIFICATION

Idling speed Switch A/C OFF	650 to 750 rpm
Idling speed Switch A/C ON (A/C Lo --> Hi)	700 --> 850 rpm

TORQUE SPECIFICATIONS**TORQUE SPECIFICATIONS CHART**

Part Tightened	N*m	kgf*cm	ft.*lbf
Negative battery terminal x Battery	5.4	55	48 in.*lbf

AIR CONDITIONING UNIT**AIR CONDITIONING UNIT TORQUE SPECIFICATIONS**

Part Tightened	N*m	kgf*cm	ft.*lbf
Cooler expansion valve x NO. 1 Cooler evaporator sub-assembly	3.5	36	31 in.*lbf
Instrument panel reinforcement x Clutch pedal support	24	241	17
Air conditioning unit x Instrument panel reinforcement	4.0	41	35 in.*lbf
Air conditioning unit x Body	9.8	100	87 in.*lbf
Ground wire x Instrument panel reinforcement	8.4	87	74 in.*lbf
Connector holder x Instrument panel reinforcement	3.2	33	28 in.*lbf
Main body ECU x Instrument panel reinforcement	3.2	33	28 in.*lbf
Instrument panel brace sub-assembly x Instrument panel reinforcement : for nut	9.8	100	87 in.*lbf
Instrument panel brace sub-assembly x Air conditioning unit : for screw	9.8	100	87 in.*lbf
Instrument panel brace sub-assembly x Body : for bolt	9.8	100	87 in.*lbf
PTC heater wire x Instrument panel brace sub-assembly	8.0	82	71 in.*lbf
Steering sliding yoke sub-assembly x No. 2 steering intermediate shaft assembly	35	360	26 in.*lbf
Steering sliding yoke sub-assembly x Steering gear assembly	35	360	26 in.*lbf

COMPRESSOR**COMPRESSOR SERVICE DATA SPECIFICATION**

Part Tightened	N*m	kgf*cm	ft.*lbf
Stud bolt x Oil pan sub-assembly	9.8	100	87 in.*lbf

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Compressor x Oil pan sub-assembly	25	255	18
No. 1 cooler refrigerant suction hose x Compressor	9.8	100	87 in.*lbf
No. 1 cooler refrigerant discharge hose x Compressor	9.8	100	87 in.*lbf

CONDENSER**CONDENSER TORQUE SPECIFICATIONS**

Part Tightened	N*m	kgf*cm	ft.*lbf
Cooler dryer x Condenser	2.9	30	26 in.*lbf
Liquid tube sub-assembly A x Condenser	5.4	55	48 in.*lbf
No. 1 cooler refrigerant discharge hose x Condenser	5.4	55	48 in.*lbf

SUPPLEMENTAL RESTRAINT SYSTEM**SERVICE DATA****SERVICE DATA SPECIFICATION**

Tester connection	Condition	Specified condition
A1(D-) - D2(D-)	Center	Below 1 ohms
	2.5 rotation to the left	
	2.5 rotation to the right	
A2(D+) - D1(D+)	Center	Below 1 ohms
	2.5 rotation to the left	
	2.5 rotation to the right	
B1(D2-) - D3(2-)	Center	Below 1 ohms
	2.5 rotation to the left	
	2.5 rotation to the right	
B2(D2+) - D4(D2+)	Center	Below 1 ohms
	2.5 rotation to the left	
	2.5 rotation to the right	

TORQUE SPECIFICATIONS**TORQUE SPECIFICATIONS CHART**

Part tightened		N*m	kgf*cm	ft.*lbf
Steering pad assembly x Steering wheel assembly		8.8	90	78 in.*lbf
Front passenger airbag x Instrument panel reinforcement		20	203	14
Curtain shield airbag bracket x Body		9.8	100	87 in.*lbf
Roof side rail bracket x Body		9.8	100	87 in.*lbf
Curtain shield airbag assembly x Body	Bolt A	9.8	100	87 in.*lbf
	Bolt B	14	143	10
Center airbag sensor assembly x Body		17.5	178	13

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Front airbag sensor x Body	9.0	92	80 in.*lbf
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 Seat frame	8.0	82	71 in.*lbf

SEAT BELT**SERVICE DATA****FRONT SEAT INNER BELT ASSEMBLY (for Driver Side):****SERVICE DATA SPECIFICATION**

Item	Tester Connection	Condition	Specified Condition
Standard resistance	3 - 4	Tongue plate fastened	10 kohms or higher
		Tongue plate released	Below 1 ohms

FRONT SEAT INNER BELT ASSEMBLY (for Front Passenger Side):**FRONT SEAT INNER BELT ASSEMBLY SERVICE DATA SPECIFICATION**

Item	Tester Connection	Condition	Specified Condition
Standard resistance	1 - 2	Tongue plate fastened	10 kohms or higher
		Tongue plate released	Below 1 ohms

TORQUE SPECIFICATIONS**FRONT SEAT INNER BELT ASSEMBLY:****TORQUE SPECIFICATIONS CHART**

Part Tightened	N*m	kgf*cm	ft.*lbf
Front seat inner belt assembly x Front seat frame adjuster assembly	42	428	31
Negative battery terminal x Battery	5.4	55	48 in.*lbf

FRONT SEAT OUTER BELT ASSEMBLY:**FRONT SEAT OUTER BELT ASSEMBLY TORQUE SPECIFICATIONS**

Part Tightened	N*m	kgf*cm	ft.*lbf
Front shoulder belt anchor adjuster assembly x Body	42	428	31
Front seat outer belt assembly (for Retractor Upper) x Body	4.9	50	43 in.*lbf
Front seat outer belt assembly (for Retractor Lower) x Body	42	428	31
Front seat outer belt assembly (for Through Anchor) x Body	42	428	31
Front seat outer belt assembly (for Anchor Plate) x Body	42	428	31
Negative battery terminal x Battery	5.4	55	48 in.*lbf

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REAR SEAT INNER BELT ASSEMBLY (for LH Side):**REAR SEAT INNER BELT ASSEMBLY TORQUE SPECIFICATIONS**

Part Tightened	N*m	kgf*cm	ft.*lbf
Rear seat inner belt assembly x Rear seat back frame sub-assembly	42	428	31
Rear seat cushion assembly x Body	37	375	27

REAR SEAT INNER BELT ASSEMBLY (for RH Side):**REAR SEAT INNER BELT ASSEMBLY TORQUE SPECIFICATIONS**

Part Tightened	N*m	kgf*cm	ft.*lbf
Rear seat inner belt assembly x Rear seat back frame sub-assembly	42	428	31

REAR SEAT OUTER BELT ASSEMBLY:**REAR SEAT OUTER BELT ASSEMBLY TORQUE SPECIFICATIONS**

Part Tightened	N*m	kgf*cm	ft.*lbf
Rear seat outer belt assembly (for Retractor) x Body	42	428	31
Rear seat outer belt assembly (for Through Anchor) x Body	42	428	31
Rear seat outer belt assembly (for Anchor Plate) x Body	42	428	31
Negative battery terminal x Battery (for LH Side)	5.4	55	48 in.*lbf

REAR CENTER SEAT INNER BELT ASSEMBLY (for LH Side):**REAR CENTER SEAT INNER BELT ASSEMBLY TORQUE SPECIFICATIONS**

Part Tightened	N*m	kgf*cm	ft.*lbf
Rear center seat inner belt assembly x Rear seat back frame sub-assembly	42	428	31
Rear seat cushion assembly x Body	37	375	27

REAR CENTER SEAT INNER BELT ASSEMBLY (for RH Side):**REAR CENTER SEAT INNER BELT ASSEMBLY TORQUE SPECIFICATIONS**

Part Tightened	N*m	kgf*cm	ft.*lbf
Rear center seat inner belt assembly x Rear seat back frame sub-assembly	42	428	31

REAR CENTER SEAT OUTER BELT ASSEMBLY:**REAR CENTER SEAT OUTER BELT ASSEMBLY TORQUE SPECIFICATIONS**

Part Tightened	N*m	kgf*cm	ft.*lbf
Rear center seat outer belt assembly (for Retractor) x Body	42	428	31
Rear center seat outer belt assembly (for Bracket) x Body	42	428	31
Rear center seat outer belt assembly (for Through Anchor) x Body	42	428	31
Negative battery terminal x Battery	5.4	55	48 in.*lbf

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CRUISE CONTROL**TORQUE SPECIFICATIONS****TORQUE SPECIFICATIONS CHART**

Part Tightened	N*m	kgf*cm	ft.*lbf
Cruise control main switch x Steering wheel assembly	2.4	24	21 in.*lbf
Clutch switch assembly x Clutch pedal	16	160	12
Negative battery terminal x Battery	5.4	55	48 in.*lbf

LIGHTING**TORQUE SPECIFICATIONS****TORQUE SPECIFICATIONS CHART**

Part Tightened	N*m	kgf*cm	ft.*lbf
Rear combination light assembly x Body	3.2	32	28 in.*lbf
Front door courtesy switch x Body	3.7	38	33 in.*lbf
Rear door courtesy switch x Body	3.7	38	33 in.*lbf
Back door lock assembly x Back door panel	13	127	9
Negative battery terminal x Battery	5.4	55	48 in.*lbf

WIPER AND WASHER**TORQUE SPECIFICATIONS****TORQUE SPECIFICATIONS CHART**

Part Tightened	N*m	kgf*cm	ft.*lbf
Front wiper motor x Windshield wiper link assembly	5.5	56	49 in.*lbf
Front wiper motor x crank arm	5.5	56	49 in.*lbf
Front wiper motor and link x Cowl top panel outer	5.5	56	49 in.*lbf
Front wiper arm and blade assembly LH x Windshield wiper link assembly	26	265	19
Front wiper arm and blade assembly RH x Windshield wiper link assembly	26	265	19
Rear wiper motor x Back door panel	5.5	56	49 in.*lbf
Rear wiper arm and blade x Rear wiper motor	5.5	56	49 in.*lbf
Windshield washer jar assembly x Body	5.5	56	49 in.*lbf
Negative battery terminal x Battery	5.4	55	48 in.*lbf

DOOR LOCK**TORQUE SPECIFICATIONS**

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FRONT DOOR LOCK**TORQUE SPECIFICATIONS CHART**

Part Tightened	N*m	kgf*cm	ft.*lbf
Door lock assembly x Door panel	5.0	51	44 in.*lbf

REAR DOOR LOCK**REAR DOOR LOCK TORQUE SPECIFICATIONS**

Part Tightened	N*m	kgf*cm	ft.*lbf
Door lock assembly x Door panel	5.0	51	44 in.*lbf

BACK DOOR LOCK**BACK DOOR LOCK TORQUE SPECIFICATIONS**

Part Tightened	N*m	kgf*cm	ft.*lbf
Door lock assembly x Door panel	7.5	76	66 in.*lbf

DOOR CONTROL RECEIVER**DOOR CONTROL RECEIVER TORQUE SPECIFICATIONS**

Part Tightened	N*m	kgf*cm	ft.*lbf
Door lock control receiver x Body	7.5	75	65 in.*lbf

METER**TORQUE SPECIFICATIONS****TORQUE SPECIFICATIONS CHART**

Part Tightened	N*m	kgf*cm	ft.*lbf
Negative battery terminal x Battery	5.5	55	48 in.*lbf

AUDIO / VISUAL**SERVICE DATA****FRONT NO. 1 SPEAKER:****SERVICE DATA SPECIFICATION**

Item	Tester Connection	Specified Condition
Standard resistance	1 - 2	Approximately 4 ohms

REAR SPEAKER:

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REAR SPEAKER SERVICE DATA SPECIFICATION

Item	Tester Connection	Specified Condition
Standard resistance	1 - 2	Approximately 4 ohms

TORQUE SPECIFICATIONS**TORQUE SPECIFICATIONS CHART**

Part Tightened	N*m	kgf*cm	ft.*lbf
Amplifier antenna assembly x Body	4.5	46	40 in.*lbf
Antenna cord sub-assembly x Body	7.0	71	62 in.*lbf
Negative battery terminal x Battery	5.5	55	48 in.*lbf
Radio setting condenser x Body	7.0	71	62 in.*lbf
Radio setting condenser x Engine	10	102	7

HORN**SERVICE DATA****SERVICE DATA SPECIFICATION**

Item	Tester Connection	Specified Condition
Standard resistance	A8-T6	10 kohms or higher
		Below 1 ohms (When battery voltage applied to terminals A7 and T6)

TORQUE SPECIFICATIONS**TORQUE SPECIFICATIONS CHART**

Part Tightened	N*m	kgf*cm	ft.*lbf
Low pitched horn x Body	20	199	14
High pitched horn x Body	20	199	14

WINDSHIELD / WINDOWGLASS**TORQUE SPECIFICATIONS****TORQUE SPECIFICATIONS CHART**

Part Tightened	N*m	kgf*cm	ft.*lbf
Rear power window regulator motor assembly x Rear door window regulator assembly	5.4	55	48 in.*lbf
Rear door window division bar x Rear door panel	6.2	63	54 in.*lbf
Front power window regulator motor assembly x Front door window regulator			48

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assembly	5.4	55	in.*lbf
Negative battery terminal x Battery	5.4	55	48 in.*lbf

MIRROR**TORQUE SPECIFICATIONS****MIRROR****TORQUE SPECIFICATIONS CHART**

Part Tightened	N*m	kgf*cm	ft.*lbf
Outer rear view mirror assembly x Door panel	9.0	92	80 in.*lbf

INSTRUMENT PANEL**TORQUE SPECIFICATIONS****TORQUE SPECIFICATIONS CHART**

Part Tightened	N*m	kgf*cm	ft.*lbf
Instrument panel reinforcement x Passenger airbag	20	204	15
Negative battery terminal x Battery	5.4	55	48 in.*lbf

SEAT**TORQUE SPECIFICATIONS****FRONT SEAT ASSEMBLY:****TORQUE SPECIFICATIONS CHART**

Part Tightened	N*m	kgf*cm	ft.*lbf
Seat position sensor x Seat rail	8.0	70	71 in.*lbf
Lower active headrest unit x Front seat frame adjuster assembly	5.0	51	44 in.*lbf
Upper active headrest unit x Front seat frame adjuster assembly	Bolt A	5.0	51
	Bolt B	14	142
Front seat side airbag assembly x Front seat frame adjuster assembly	5.5	55	49 in.*lbf
Front seat assembly LH x Body	37	377	27
Front seat assembly RH x Body	37	377	27

REAR SEAT ASSEMBLY (for LH Side):**REAR SEAT ASSEMBLY TORQUE SPECIFICATIONS**

Part Tightened	N*m	kgf*cm	ft.*lbf
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Rear seat track assembly LH x Rear seat back frame sub-assembly	33	335	24
Rear seat track assembly RH x Rear seat back frame sub-assembly	33	335	24
Rear side seat cushion leg sub-assembly x Rear seat back frame sub-assembly	14	138	10
Rear seat belt hook x Rear seat back frame sub-assembly	5.0	50	44 in.*lbf
Rear seat cushion assembly x Rear seat back frame sub-assembly (for Nut)	20	205	15
Rear seat cushion assembly x Rear seat back frame sub-assembly (for Bolt)	21	215	16
Rear seat inner belt assembly x Rear seat back adjuster sub-assembly	42	430	31
Rear center seat inner belt assembly x Rear seat back adjuster sub-assembly	42	430	31
Rear seat assembly x Body	37	375	27

REAR SEAT ASSEMBLY (for RH Side):**REAR SEAT ASSEMBLY TORQUE SPECIFICATIONS**

Part Tightened	N*m	kgf*cm	ft.*lbf
Rear seat track assembly LH x Rear seat back frame sub-assembly	33	335	24
Rear seat track assembly RH x Rear seat back frame sub-assembly	33	335	24
Rear side seat cushion leg sub-assembly x Rear seat back frame sub-assembly	14	138	10
Rear seat cushion assembly x Rear seat back frame sub-assembly	21	215	16
Rear seat assembly x Body	37	375	27

ENGINE HOOD / DOOR**TORQUE SPECIFICATIONS****HOOD****TORQUE SPECIFICATIONS CHART**

Part Tightened	N*m	kgf*cm	ft.*lbf
Hood x Hood hinge	13	133	10
Hood lock assembly x Body	7.5	76	66 in.*lbf

HOOD LOCK CONTROL CABLE ASSEMBLY**HOOD LOCK CONTROL CABLE ASSEMBLY TORQUE SPECIFICATIONS**

Part Tightened	N*m	kgf*cm	ft.*lbf
Hood lock assembly x Body	7.5	76	66 in.*lbf

FRONT DOOR**FRONT DOOR TORQUE SPECIFICATIONS**

Part Tightened	N*m	kgf*cm	ft.*lbf
Door check x Body	30	306	22
Door check x Door panel	5.5	56	49 in.*lbf

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Door lower rear frame x Door panel	6.2	63	55 in.*lbf
Door glass x Door window regulator	8.0	82	71 in.*lbf
Door window regulator x Door panel	8.0	82	71 in.*lbf
Door upper hinge x Body	26	265	19
Door upper hinge x Door panel	26	265	19
Door lower hinge x Body	26	265	19
Door lower hinge x Door panel	26	265	19
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
No. 1 door stiffener cushion x Door panel	10	102	7

REAR DOOR**REAR DOOR TORQUE SPECIFICATIONS**

Part Tightened	N*m	kgf*cm	kgf*cm
Door check x Body	30	306	22
Door check x Door panel	5.5	56	49 in.*lbf
Door window division bar x Door panel	8.0	82	71 in.*lbf
Door upper hinge x Body	26	265	19
Door upper hinge x Door panel	26	265	19
Door lower hinge x Body	26	265	19
Door lower hinge x Door panel	26	265	19
Door window division bar x Door panel	6.2	63	55 in.*lbf
Door lock striker x Body	23	235	14
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
Window regulator x Door panel	8.0	82	71 in.*lbf

BACK DOOR**BACK DOOR TORQUE SPECIFICATIONS**

Part Tightened	N*m	kgf*cm	ft.*lbf
Back door hinge x Door panel	20	199	14
Back door hinge x Body	20	199	14
Door lock striker x Body	12	17	9

BACK DOOR SUPPORT**BACK DOOR SUPPORT TORQUE SPECIFICATIONS**

Part Tightened	N*m	kgf*cm	ft.*lbf
Back door damper stay upper bracket x Body	8.0	82	71 in.*lbf

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Back door stay bolt x Back door panel	22	224	16
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EXTERIOR**TORQUE SPECIFICATIONS****TORQUE SPECIFICATIONS CHART**

Part Tightened	N*m	kgf*cm	ft.*lbf
Front bumper stone deflector bracket LH x Body	5.5	56	49 in.*lbf
Front bumper arm sub-assembly LH x Body	40	408	30
Front bumper reinforcement x Front bumper arm sub-assembly	40	408	30
Front bumper reinforcement x Front bumper stone deflector bracket	5.5	56	49 in.*lbf
Rear bumper arm LH x Body	19	194	14
Rear center bumper sub-assembly x Rear bumper arm	19	194	14
Rear bumper cover x Body	5.5	56	49 in.*lbf
Rear spoiler x Back door panel	9.0	90	78 in.*lbf
Back door outside garnish x Back door panel	4.9	50	43 in.*lbf

INTERIOR**TORQUE SPECIFICATIONS****TORQUE SPECIFICATIONS CHART**

Part Tightened	N*m	kgf*cm	ft.*lbf
Luggage hold belt striker assembly x Body	18	184	13
Front seat outer belt assembly (for Through Anchor) x Front shoulder belt anchor adjuster assembly	42	428	31
Rear seat outer belt assembly (for Floor Anchor) x Body	42	428	31
Negative battery terminal x Battery	5.4	55	48 in.*lbf