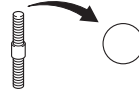
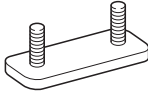
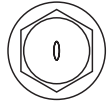


STANDARD BOLT

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 	w/ Washer 		6T
 	 			7T
		 		8T
				9T
	 			10T
	 			11T

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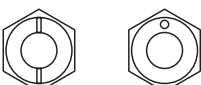
SPECIFIED TORQUE FOR STANDARD BOLTS

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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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

1GR-FE ENGINE CONTROL SYSTEM

SERVICE DATA

Camshaft timing oil control valve assembly		VVT system is OFF (OCV is OFF)	Normal engine speed
		VVT system is ON (OCV is ON)	Rough idle or engine stalled
Throttle body		Standard throttle valve opening percentage	60 % or more
Accelerator pedal position sensor	Voltage (ACCEL POS#1)	Accelerator pedal released	0.5 to 1.1 V
		Accelerator pedal depress	2.5 to 4.5 V
	Voltage (ACCEL POS#2)	Accelerator pedal released	1.2 to 2.0 V
		Accelerator pedal depress	3.4 to 5.0 V
Camshaft timing oil control valve assembly	Resistance	at 20°C (68°F)	6.9 to 7.9 Ω
Mass air flow meter	Resistance	at -20°C (-4°F)	13.6 to 18.4 k Ω
		at 20°C (68°F)	2.21 to 2.69 k Ω
		at 60°C (140°F)	0.493 to 0.667 k Ω
Engine coolant temperature sensor	Resistance	at 20°C (68°F)	2.32 to 2.59 k Ω
		at 80°C (176°F)	0.310 to 0.326 k Ω
Throttle With Motor body	Resistance	1 (M-) - 2 (M+)	0.3 to 100 Ω at 20 °C (68 °F)
Knock sensor	Resistance	at 20°C (68°F)	120 to 180 k Ω
Circuit opening relay	Resistance (3 - 5)	Standard	10 k Ω or higher
			Below 1 Ω (Apply battery voltage to terminals 1 and 2)
EFI relay	Specified condition	Standard	10 k Ω or higher
	Resistance (3 - 5)		Below 1 Ω (Apply battery voltage to terminals 1 and 2)

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Throttle with motor body assembly x Intake air surge tank	11	112	9
Air cleaner assembly x Cylinder head cover sub-assembly	8.0	82	71 in.*lbf
Air cleaner assembly x Intake air surge tank	8.0	82	71 in.*lbf
V-bank cover x Air cleaner assembly	7.5	76	66 in.*lbf
V-bank cover x Intake air surge tank	7.5	76	66 in.*lbf
Knock sensor x Cylinder block sub-assembly	20	204	15
Water outlet pipe No. 1 x Cylinder block sub-assembly	9.0	92	80 in.*lbf
Camshaft timing oil control valve x Cylinder head	9.0	92	80 in.*lbf
E.F.I. engine coolant temperature sensor x Cylinder block	20	204	15
Manifold stay x Exhaust manifold	40	408	30
Manifold stay x Transmission	40	408	30
Cool air inlet No. 1 x Body	12	122	9.0
ECM bracket x ECM	3	32	28 in.*lbf
ECM bracket No. 2 x ECM	3	32	28 in.*lbf
ECM x Body	13	133	10
Accelerator pedal rod assembly x Body	5.0	51	44 in.*lbf
Negative battery terminal	3.9	40	35 in.*lbf

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2TR-FE ENGINE CONTROL SYSTEM

SERVICE DATA

Intake air flow meter sub-assembly	Resistance 4 (THA) - 5 (E2)	Standard	12.5 to 16.9 k Ω at -20°C (-4°F)
			2.19 to 2.67 k Ω at 20°C (68°F)
			0.50 to 0.68 k Ω at 60°C (140°F)
Camshaft timing oil control valve assembly	Resistance 1 (+B) - 2 (GND)	Standard	6.9 to 7.9 k Ω at 20°C (68°F)
Throttle with motor body assembly	Resistance	1 (M-) - 2 (M+)	0.3 to 100 Ω at 20°C (68°F)
		3 (E2) - 5 (VC)	2.0 to 4.0 k Ω at 20°C (68°F)
Accelerator pedal rod assembly	Resistance	5 (EP1) - 4 (VCP1)	1 M Ω or higher
		2 (EP2) - 1 (VCP2)	1 M Ω or higher
E.F.I. Engine coolant temperature sensor	Resistance	1 (E2) - 2 (THW)	2.23 to 2.59 k Ω at 20°C (68°F)
		1 (E2) - 2 (THW)	0.310 to 0.326 k Ω at 80°C (176°F)
Knock sensor	Resistance 1 (Ground) - 2 (Output)	Standard	120 to 280 k Ω at 20°C (68°F)
E.F.I. Circuit opening relay assembly	Resistance (3 - 5)	Standard	10 k Ω or higher
			Below 1 Ω (Apply battery voltage to terminal 1 and 2)
E.F.I. Relay	Resistance (3 - 5)	Standard	10 k Ω or higher
			Below 1 Ω (Apply battery voltage to terminal 1 and 2)

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Throttle body assembly x Intake manifold	9	92	80 in.*lbf
Intake air connector x Cylinder head cover sub-assembly	8	82	71 in.*lbf
Intake air connector x Throttle body assembly	5	51	44 in.*lbf
Intake air connector x Air cleaner hose	5	51	44 in.*lbf
Battery x Battery negative terminal	3.9	40	35 in.*lbf
Knock control sensor x Cylinder block sub-assembly	20	204	15
Intake manifold x Cylinder head sub-assembly	25	255	18
Intake manifold x Cylinder block sub-assembly	25	255	18
Intake manifold x Wire harness clamp bracket	8.2	84	73 in.*lbf
Accelerator pedal rod assembly x Body	5	51	44 in.*lbf
ECM x ECM bracket	3	32	28 in.*lbf
ECM x ECM bracket No. 2	3	32	28 in.*lbf
ECM x Blower assembly	5	51	44 in.*lbf

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1GR-FE ENGINE MECHANICAL

SERVICE DATA

Ignition timing		Terminals TC and CG of DLC3 connected	8 to 12° BTDC @ idle (Transmission in neutral position)
		Terminals TC and CG of DLC3 disconnected	7 to 24° BTDC @ idle (Transmission in neutral position)
Idle speed			650 to 750 rpm (Transmission in neutral position)
Compression		Compression pressure	1,300 kPa (13.3 kgf/cm ² , 189 psi) or more
		Minimum pressure	1,000 kPa (10.2 kgf/cm ² , 145 psi)
		Difference between each cylinder	100 kPa (1.0 kgf/cm ² , 15 psi) or less
Valve clearance	Intake	(cold)	0.15 to 0.25 mm (0.006 to 0.010 in.)
	Exhaust		0.29 to 0.39 mm (0.011 to 0.015 in.)
Intake manifold	Intake air surge tank side warpage	Maximum	0.8 mm (0.031 in.)
	Cylinder head side warpage		0.2 mm (0.008 in.)
Exhaust manifold	Warpage	Maximum	0.7 mm (0.028 in.)
Camshaft timing gear assembly	Diameter (with chain)	Large gear	115.5 mm (4.547 in.)
		Small gear	73.1 mm (2.878 in.)
Camshaft timing gear or sprocket	Diameter (with chain)		73.1 mm (2.878 in.)
Crankshaft timing gear or sprocket	Diameter (with chain)		61.0 mm (2.402 in.)
Idle sprocket	Diameter (with chain)		61.0 mm (2.402 in.)
Cylinder head set bolt	Outer diameter	Standard	10.85 to 11.00 mm (0.4272 to 0.4331 in.)
		Minimum	10.7 mm (0.421 in.)
Chain	Length	Maximum	146.8 mm (5.780 in.)
No. 2 chain	Length	Maximum	146.8 mm (5.780 in.)
Idle gear shaft	Idle gear shaft diameter		22.987 to 23.000 mm (0.9050 to 0.9055 in.)
	Idle gear internal diameter		23.02 to 23.03 mm (0.9063 to 0.9067 in.)
	Oil clearance	Standard	0.020 to 0.043 mm (0.0008 to 0.0017 in.)
		Maximum	0.093 mm (0.0037 in.)
Chain tensioner assembly No. 2	Wear	Maximum	1.0 mm (0.039 in.)
Chain tensioner assembly No. 3	Wear	Maximum	1.0 mm (0.039 in.)
Chain tensioner slipper	Wear	Maximum	1.0 mm (0.039 in.)
Chain vibration damper No. 1	Wear	Maximum	1.0 mm (0.039 in.)
Chain vibration damper No. 2	Wear	Maximum	1.0 mm (0.039 in.)
Cylinder head sub-assembly	Warpage	Maximum	0.10 mm (0.0039 in.)
Intake valve	Valve stem diameter		5.470 to 5.485 mm (0.2154 to 0.2159 in.)
	Valve face angle		44.5°
	Margin thickness	Standard	1.0 mm (0.039 in.)
		Minimum	0.5 mm (0.020 in.)
	Overall length	Standard	106.95 mm (4.2106 in.)
		Minimum	106.70 mm (4.2008 in.)

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Exhaust valve	Valve stem diameter		5.465 to 5.480 mm (0.2152 to 0.2158 in.)
	Valve face angle		44.5°
	Margin thickness	Standard	1.0 mm (0.039 in.)
		Minimum	0.5 mm (0.020 in.)
	Overall length	Standard	105.80 mm (4.1654 in.)
		Minimum	105.55 mm (4.1555 in.)
Inner compression spring	Deviation	Maximum	2.0 mm (0.079 in.)
	Free length	Maximum	47.80 mm (1.8819 in.)
	Tension	at 33.3 mm (1.311 in.)	186.2 to 205.8 N (19.0 to 21.0 kgf, 41.9 to 46.3 lbf)
Intake valve guide bush	Inside diameter		5.51 to 5.53 mm (0.2169 to 0.2177 in.)
	Oil clearance	Standard	0.025 to 0.060 mm (0.0010 to 0.0024 in.)
		Maximum	0.08 mm (0.0031 in.)
	Bush bore diameter		10.295 to 10.315 mm (0.4053 to 0.4061 in.)
	Protrusion height		9.3 to 9.7 mm (0.366 to 0.382 in.)
Exhaust valve guide bush	Inside diameter		5.51 to 5.53 mm (0.2169 to 0.2177 in.)
	Oil clearance	Standard	0.030 to 0.065 mm (0.0012 to 0.0026 in.)
		Maximum	0.10 mm (0.0039 in.)
	Bush bore diameter		10.295 to 10.315 mm (0.4053 to 0.4061 in.)
	Protrusion height		9.3 to 9.7 mm (0.366 to 0.382 in.)
Valve lifter	Diameter		30.966 to 30.976 mm (1.2191 to 1.2195 in.)
	Lifter bore diameter		31.009 to 31.025 mm (1.2208 to 1.2215 in.)
	Oil clearance	Standard	0.033 to 0.059 mm (0.0013 to 0.0023 in.)
		Maximum	0.08 mm (0.0031 in.)
No. 1 camshaft	Journal diameter	No. 1 journal	35.971 to 35.985 mm (1.4162 to 1.4167 in.)
		Other journals	22.959 to 22.975 mm (0.9039 to 0.9045 in.)
	Circle runout	Maximum	0.06 mm (0.0024 in.)
	Cam lobe height	Standard	44.168 to 44.268 mm (1.7389 to 1.7428 in.)
		Minimum	44.018 mm (1.7330 in.)
	Oil clearance	Standard No. 1 journal	0.008 to 0.038 mm (0.0003 to 0.0015 in.)
		Other journals	0.025 to 0.062 mm (0.0010 to 0.0024 in.)
		Maximum No. 1 journal	0.07 mm (0.0028 in.)
		Other journals	0.10 mm (0.0039 in.)
	Thrust clearance	Standard	0.04 to 0.09 mm (0.016 to 0.035 in.)
		Maximum	0.11 mm (0.0043 in.)
No. 2 camshaft	Journal diameter	No. 1 journal	35.971 to 35.985 mm (1.4162 to 1.4167 in.)
		Other journals	22.959 to 22.975 mm (0.9039 to 0.9045 in.)
	Circle runout	Maximum	0.06 mm (0.0024 in.)
	Cam lobe height	Standard	44.580 to 44.680 mm (1.7551 to 1.7591 in.)
		Minimum	44.430 mm (1.7492 in.)
	Oil clearance	Standard No. 1 journal	0.040 to 0.079 mm (0.0016 to 0.0031 in.)
		Other journals	0.025 to 0.062 mm (0.0010 to 0.0024 in.)
		Maximum	0.10 mm (0.0039 in.)
	Thrust clearance	Standard	0.04 to 0.09 mm (0.016 to 0.035 in.)
		Maximum	0.11 mm (0.0043 in.)

No. 3 camshaft sub-assembly	Journal diameter	No. 1 journal	35.971 to 35.985 mm (1.4162 to 1.4167 in.)
		Other journals	22.959 to 22.975 mm (0.9039 to 0.9045 in.)
	Circle runout	Maximum	0.06 mm (0.0024 in.)
	Cam lobe height	Standard	44.168 to 44.268 mm (1.7389 to 1.7428 in.)
		Minimum	44.018 mm (1.7330 in.)
	Oil clearance	Standard No. 1 journal	0.040 to 0.079 mm (0.0016 to 0.0031 in.)
		Other journals	0.025 to 0.062 mm (0.0010 to 0.0024 in.)
		Maximum	0.10 mm (0.0039 in.)
Thrust clearance	Standard	0.04 to 0.09 mm (0.016 to 0.035 in.)	
	Maximum	0.11 mm (0.0043 in.)	
No. 4 camshaft sub-assembly	Journal diameter	No. 1 journal	35.971 to 35.985 mm (1.4162 to 1.4167 in.)
		Other journals	22.959 to 22.975 mm (0.9039 to 0.9045 in.)
	Circle runout	Maximum	0.06 mm (0.0024 in.)
	Cam lobe height	Standard	44.580 to 44.680 mm (1.7551 to 1.7591 in.)
		Minimum	44.430 mm (1.7492 in.)
	Oil clearance	Standard No. 1 journal	0.040 to 0.079 mm (0.0016 to 0.0031 in.)
		Other journals	0.025 to 0.062 mm (0.0010 to 0.0024 in.)
		Maximum	0.10 mm (0.0039 in.)
	Thrust clearance	Standard	0.04 to 0.09 mm (0.016 to 0.035 in.)
Maximum		0.11 mm (0.0043 in.)	
Ring pin for cylinder head sub-assembly and cylinder head LH	Protrusion height		2.7 to 3.3 mm (0.106 to 0.130 in.)
Straight pin for cylinder head sub-assembly and cylinder head LH	Protrusion height	A	17.5 to 19.5 mm (0.689 to 0.768 in.)
		B	7.5 to 8.5 mm (0.295 to 0.335 in.)
		C	7.0 to 9.0 mm (0.276 to 0.354 in.)
Tight plug for cylinder head sub-assembly and cylinder head LH	Depth		1.5 mm (0.059 in.)
Connecting rod	Thrust clearance	Standard	0.15 to 0.30 mm (0.0059 to 0.0118 in.)
		Maximum	0.35 mm (0.0138 in.)
	Oil clearance	Standard	0.026 to 0.046 mm (0.0010 to 0.0018 in.)
		Maximum	0.066 mm (0.0025 in.)
Crankshaft thrust clearance		Standard	0.04 to 0.24 mm (0.0016 to 0.0094 in.)
		Maximum	0.30 mm (0.0118 in.)
Cylinder block warpage		Maximum	0.05 mm (0.0020 in.)
Cylinder bore diameter		Standard	94.000 to 94.012 mm (3.7008 to 3.7013 in.)
		Maximum	94.132 mm (3.7060 in.)
Piston	Diameter		93.910 to 93.940 mm (3.6972 to 3.6984 in.)
	Oil clearance	Standard	0.060 to 0.102 mm (0.0031 to 0.0040 in.)
		Maximum	0.13 mm (0.0051 in.)
Connecting rod out-of alignment		Maximum	0.05 mm (0.0020 in.) per 100 mm (3.94 in.)
Connecting rod twist		Maximum	0.15 mm (0.0059 in.) per 100 mm (3.94 in.)
Connecting rod bushing inside diameter			22.001 to 22.010 mm (0.8662 to 0.8665 in.)
Piston pin diameter			21.997 to 22.006 mm (0.8660 to 0.8664 in.)
Oil clearance		Standard	0.005 to 0.011 mm (0.0002 to 0.0004 in.)
		Maximum	0.050 mm (0.0020 in.)
Piston ring groove clearance		No. 1	0.02 to 0.07 mm (0.0008 to 0.0028 in.)
		No. 2	0.02 to 0.06 mm (0.0008 to 0.0024 in.)
		Oil	0.07 to 0.15 mm (0.0028 to 0.0060 in.)

Piston ring end gap	Standard	No. 1	0.30 to 0.40 mm (0.0118 to 0.0157 in.)
		No. 2	0.40 to 0.50 mm (0.0157 to 0.0197 in.)
		Oil (Side rail)	0.10 to 0.40 mm (0.0039 to 0.0157 in.)
	Maximum	No. 1	1.0 mm (0.039 in.)
		No. 2	1.1 mm (0.043 in.)
		Oil (Side rail)	1.0 mm (0.039 in.)
Connecting rod bolt diameter		Standard	7.2 to 7.3 mm (0.283 to 0.287 in.)
		Minimum	7.0 mm (0.276 in.)
Crankshaft bearing cap set bolt diameter		Standard	10.0 to 10.2 mm (0.393 to 0.402 in.)
Crankshaft circle runout		Maximum	0.06 mm (0.0024 in.)
Main journal diameter			71.988 to 72.000 mm (2.8342 to 2.8346 in.)
Main journal taper and out-of-round		Maximum	0.02 mm (0.0008 in.)
Crank pin diameter			55.992 to 56.000 mm (2.2044 to 2.2047 in.)
Crank pin taper and out-of-round		Maximum	0.02 mm (0.0008 in.)
Crankshaft oil clearance		Standard	0.018 to 0.030 mm (0.0007 to 0.0012 in.)
		Maximum	0.046 mm (0.0018 in.)
Straight pin	Standard protrusion	Pin A	22.5 to 23.5 mm (0.886 to 0.925 in.)
		Pin B	10.5 to 11.5 mm (0.413 to 0.453 in.)
		Pin C	8.5 to 9.5 mm (0.335 to 0.374 in.)
		Pin D	5.5 to 6.5 mm (0.217 to 0.256 in.)

TORQUE SPECIFICATIONS

Part Tightened		N*m	kgf*cm	ft.*lbf
Engine under cover sub-assembly No. 1 x Frame assembly		29	296	21
Camshaft bearing cap x Cylinder head sub-assembly	10 mm (0.39 in.) head	9.0	92	80 in.*lbf
	12 mm (0.47 in.) head	24	245	18
Chain tensioner No. 1 x Cylinder head sub-assembly		10	102	7
Chain tensioner No. 2 x Cylinder head sub-assembly		19	194	14
Chain tensioner No. 3 x Cylinder head sub-assembly		19	194	14
Camshaft timing gear assembly x Camshaft		100	1,020	74
Camshaft timing gear or sprocket x Camshaft		100	1,020	74
Timing chain cover plate x Timing chain or belt cover sub-assembly		9.0	92	80 in.*lbf
Ignition coil assembly x Cylinder head cover sub-assembly		10	102	7
V-bank cover x Intake air surge tank		7.5	76	66 in.*lbf
Engine hanger No. 1 x Cylinder head sub-assembly RH		33	336	24
Engine hanger No. 2 x Cylinder head sub-assembly LH		33	336	24
Spark plug x Cylinder head sub-assembly		20	204	15
Oil filler cap housing x Cylinder head cover sub-assembly LH		9.0	92	80 in.*lbf
Camshaft timing oil control valve assembly x Cylinder head cover sub-assembly		9.0	92	80 in.*lbf
Oil filter bracket sub-assembly x Timing chain or belt cover sub-assembly		19	194	14
Engine mounting bracket front No. 1 RH x Cylinder block sub-assembly		43	435	31
Engine mounting bracket front No. 1 LH x Cylinder block sub-assembly		43	435	31
Engine mounting insulator front No. 1 RH x Frame assembly		38	387	28
Engine mounting insulator front No. 1 LH x Frame assembly		38	387	28
Engine wire No. 2 (ground cable) x Cylinder block sub-assembly		13	133	9
Hood sub-assembly x Hood hinge assembly RH & LH		13	133	10
Hood support RH & LH x Body		18	184	13
Engine rear oil seal retainer x Cylinder block sub-assembly		9.0	92	80 in.*lbf
Knock sensor x Cylinder block sub-assembly		20	204	15
Water outlet pipe No. 1 x Cylinder block sub-assembly		10	102	7
Cylinder head sub-assembly RH x Cylinder block sub-assembly	1st	36	367	27
	2nd	Turn 180°	Turn 180°	Turn 180°
Cylinder head sub-assembly LH x Cylinder block sub-assembly	Recessed head 1st	36	367	27
	2nd	Turn 180°	Turn 180°	Turn 180°
	14 mm (0.55 in.) head	30	306	22
Chain vibration damper No. 1 x Cylinder block sub-assembly		19	194	14
Idle gear No. 1 x Cylinder block sub-assembly		60	612	44
Timing chain or belt cover sub-assembly x Cylinder head and block		23	235	17
Water pump assembly x Timing chain or belt cover sub-assembly	10 mm (0.39 in.) head	9.0	92	80 in.*lbf
	12 mm (0.47 in.) head	23	235	17
Oil pan stud bolt x Oil pan sub-assembly		4.0	41	35 in.*lbf

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Part Tightened		N*m	kgf*cm	ft.*lbf
Oil pan sub-assembly x Cylinder block and timing chain or belt cover	10 mm (0.39 in.) head	10	102	7
	12 mm (0.47 in.) head	21	214	16
Oil strainer sub-assembly x Oil pan sub-assembly		9.0	92	80 in.*lbf
Oil pan sub-assembly No. 2 x Oil pan sub-assembly	Nut	1.0	102	7
	Bolt	9.0	92	80 in.*lbf
Oil pan drain plug x Oil pan sub-assembly No. 2		40	408	30
Crankshaft pulley x Crankshaft		250	2,549	185
Cylinder head cover sub-assembly x Cylinder head sub-assembly RH	Nut	9.0	92	80 in.*lbf
	Bolt A	10	102	7
	Bolt B	9.0	92	80 in.*lbf
Cylinder head cover sub-assembly LH x Cylinder head sub-assembly LH	Nut	9.0	92	80 in.*lbf
	Bolt A	10	102	7
	Bolt B	9.0	92	80 in.*lbf
Ventilation valve x Cylinder head cover sub-assembly LH		27	275	20
Oil control valve filter plug x Cylinder head sub-assembly		62	632	46
Crankshaft position sensor x Cylinder block sub-assembly		9.0	92	80 in.*lbf
VVT sensor x Timing chain or belt cover sub-assembly		8.0	82	71 in.*lbf
Cylinder block water drain cock sub-assembly x Cylinder block sub-assembly		25	255	18
Oil level gauge guide x Cylinder head sub-assembly		9.0	92	80 in.*lbf
Oil pan sub-assembly x Transmission		37	377	27
Idle pulley sub-assembly No. 1 x Timing chain or belt cover sub-assembly		54	551	40
Idle pulley sub-assembly No. 2 x Timing chain or belt cover sub-assembly		39	398	29
V-ribbed belt tensioner assembly x Cylinder block sub-assembly		36	367	27
Vane pump assembly x Cylinder block sub-assembly		43	438	32
Intake air surge tank x Intake manifold		28	286	21
Surge tank stay x Intake air surge tank and cylinder head		21	214	15
Throttle body bracket x Throttle body with motor and cylinder head		21	214	15
Oil baffle plate x Surge tank stay No. 1		9.0	92	80 in.*lbf
Ground cable x Cylinder head sub-assembly		8.0	82	71 in.*lbf
Water by-pass joint RR x Cylinder head sub-assembly		9.0	92	80 in.*lbf
Intake manifold x Cylinder head sub-assembly		26	265	19
Exhaust manifold sub-assembly RH x Cylinder head sub-assembly RH		21	214	16
Exhaust manifold sub-assembly LH x Cylinder head sub-assembly LH		21	214	16
Manifold stay x Exhaust manifold sub-assembly RH and transmission		40	408	30
Manifold stay No. 2 x Exhaust manifold sub-assembly LH and transmission		40	408	30
Cool air inlet No. 1 x Body		12	122	9
Drive plate & ring gear sub-assembly x Crankshaft		83	846	61
Flywheel x Crankshaft		83	846	61
Stud bolt x Cylinder head sub-assembly and cylinder head LH (See page)	A	4.0	41	35 in.*lbf
	B	9.0	92	80 in.*lbf
	C	4.0	41	35 in.*lbf
Union x Cylinder head sub-assembly and cylinder head LH		15	150	11
With Head taper screw plug x Cylinder head sub-assembly and cylinder head LH		80	816	59
Connecting rod cap x Connecting rod	1st	25	250	18
	2nd	Turn 90°	Turn 90°	Turn 90°

Part Tightened		N*m	kgf*cm	ft.*lbf
Main bearing cap x Cylinder block sub-assembly	12 pointed head 1st	61	622	45
	2nd	Turn 90°	Turn 90°	Turn 90°
	12 mm head	25	255	18
Stud bolt x Cylinder block sub-assembly	A	11	112	8.1
	B	4.5	46	40 in.*lbf
Sub-assembly oil nozzle No. 1 x Cylinder block sub-assembly		9.0	92	80 in.*lbf
Negative battery terminal		3.9	40	35 in.*lbf

2TR-FE ENGINE MECHANICAL

SERVICE DATA

Idling speed			600 to 700 rpm
Compression		Compression pressure	1,230 kPa (12.5 kgf/cm ² , 178 psi)
		Minimum pressure	880 kPa (9.0 kgf/cm ² , 128 psi) or more
		Difference between each cylinder	68 kPa (0.7 kgf/cm ² , 10 psi) or less
Ignition timing		Terminals TC and CG of DLC3 connected	3 to 7° BTDC idle
Cylinder head set bolt outside diameter		Standard	10.76 to 10.97 mm (0.4236 to 0.4319 in.)
		Minimum	10.40 mm (0.4094 in.)
Timing chain	Chain elongation	Maximum	147.5 mm (5.807 in.)
	Camshaft sprocket diameter (with chain)	Maximum	113.8 mm (4.480 in.)
	Crankshaft sprocket diameter (with chain)	Maximum	59.4 mm (2.339 in.)
	Sprocket worn distance	Minimum	1.0 mm (0.039 in.)
	Tensioner slipper wear	Maximum	2.0 mm (0.079 in.)
	Vibration damper wear	Maximum	2.0 mm (0.079 in.)
	Guide wear	Maximum	0.5 mm (0.020 in.)
Timing chain No. 2	Chain elongation No. 2	Maximum	123.6 mm (4.866 in.)
	Camshaft sprocket No. 2 diameter (with chain)	Maximum	96.7 mm (3.807 in.)
	Balanceshaft drive gear No. 2 diameter (with chain)	Maximum	75.9 mm (2.988 in.)
	Vibration damper No. 2 wear	Minimum	1.0 mm (0.039 in.)
	Vibration damper No. 3 wear	Maximum	1.0 mm (0.039 in.)
	Vibration damper No. 4 wear	Maximum	1.0 mm (0.039 in.)

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Cylinder head	Cylinder block surface warpage	Maximum	0.05 mm (0.0020 in.)
	Intake manifold surface warpage	Maximum	0.05 mm (0.0020 in.)
	Exhaust manifold surface warpage	Maximum	0.05 mm (0.0020 in.)
	Valve seat	Refacing angle	30°, 45°, 60°
		Contacting angle	45°
		Contacting width	1.0 to 1.4 mm (0.039 to 0.055 in.)
	Valve guide bush bore diameter	STD	10.285 to 10.306 mm (0.4049 to 0.4057 in.)
		O/S 0.05	10.335 to 10.356 mm (0.4069 to 0.4077 in.)
	Cylinder head set bolt outside diameter	STD	10.76 to 10.97 mm (0.4236 to 0.4319 in.)
		Minimum	10.40 mm (0.4094 in.)
Valve guide bush	Inside diameter		5.510 to 5.530 mm (0.2169 to 0.2177 in.)
	Outside diameter (for repair part)	STD	10.285 to 10.306 mm (0.4049 to 0.4057 in.)
		O/S 0.05	10.335 to 10.356 mm (0.4069 to 0.4077 in.)
Valve	Valve overall length	STD Intake	106.26 mm (4.1835 in.)
		STD Exhaust	106.74 mm (4.2024 in.)
		Minimum Intake	105.96 mm (4.1716 in.)
		Minimum Exhaust	106.44 mm (4.1905 in.)
	Stem diameter	Intake	5.470 to 5.485 mm (0.2154 to 0.2159 in.)
		Exhaust	5.465 to 5.480 mm (0.2151 to 0.2157 in.)
	Stem oil clearance	STD Intake	0.025 to 0.060 mm (0.0010 to 0.0024 in.)
		STD Exhaust	0.030 to 0.065 mm (0.0012 to 0.0026 in.)
		Maximum Intake	0.08 mm (0.0032 in.)
		Maximum Exhaust	0.10 mm (0.0039 in.)
	Margin thickness	STD Intake	1.05 to 1.45 mm (0.0413 to 0.0571 in.)
		STD Exhaust	1.2 to 1.6 mm (0.0472 to 0.0630 in.)
		Minimum Intake	0.50 mm (0.0197 in.)
		Minimum Exhaust	0.50 mm (0.0197 in.)
Valve compression spring	Deviation	Maximum	1.5 mm (0.059 in.)
	Free length		48.53 mm (1.9106 in.)
Camshaft	Thrust clearance	STD	0.10 to 0.24 mm (0.0039 to 0.009 in.)
		Maximum	0.26 mm (0.010 in.)
	Journal oil clearance	STD No. 1	0.035 to 0.072 mm (0.0014 to 0.0029 in.)
		Others	0.025 to 0.062 mm (0.0010 to 0.0024 in.)
		Maximum	0.08 mm (0.003 in.)
	Journal diameter	STD No. 1	35.949 to 35.965 mm (1.4153 to 1.4159 in.)
		Others	26.959 to 26.975 mm (1.0614 to 1.0620 in.)
	Circle runout	Maximum	0.03 mm (0.0012 in.)
	Cam lobe height	STD Intake	42.855 to 42.955 mm (1.6872 to 1.6911 in.)
		STD Exhaust	42.854 to 42.954 mm (1.6872 to 1.6911 in.)
		Minimum Intake	42.855 mm (1.6872 in.)
		Minimum Exhaust	42.854 mm (1.6872 in.)
Cylinder block	Cylinder head surface warpage	Maximum	0.05 mm (0.0020 in.)
	Cylinder bore diameter	STD	94.990 to 95.003 mm (3.7398 to 3.7403 in.)
	Crankshaft bearing cap bolt outside diameter	STD	10.76 to 10.97 mm (0.4236 to 0.4319 in.)
		Minimum	10.66 mm (0.4197 in.)

Piston and piston ring	Piston diameter	STD	94.941 to 94.971 mm (3.7378 to 3.7390 in.)
		O/S 0.50	95.441 to 95.471 mm (3.7575 to 3.7587 in.)
	Piston oil clearance		0.019 to 0.052 mm (0.0007 to 0.0020 in.)
	Piston ring groove clearance	No. 1	0.020 to 0.075 mm (0.0008 to 0.0030 in.)
		No. 2	0.020 to 0.065 mm (0.0008 to 0.0026 in.)
		Oil	0.020 to 0.070 mm (0.0008 to 0.0028 in.)
	Piston ring end gap	STD No. 1	0.22 to 0.034 mm (0.0087 to 0.0134 in.)
		No. 2	0.45 to 0.57 mm (0.0177 to 0.0224 in.)
		Oil	0.10 to 0.40 mm (0.0039 to 0.0157 in.)
No. 1 balancshaft	Thrust clearance	Standard	0.07 to 0.13 mm (0.0027 to 0.0051 in.)
		Maximum	0.20 mm (0.0079 in.)
	Main journal diameter	A	37.969 to 37.985 mm (1.4948 to 1.4955 in.)
		B	37.449 to 37.465 mm (1.4744 to 1.4750 in.)
	Bearing inside diameter	A	38.025 to 38.045 mm (1.4970 to 1.4978 in.)
		B	37.525 to 37.545 mm (1.4774 to 1.4781 in.)
	Oil clearance	Standard A	0.040 to 0.076 mm (0.0016 to 0.0031 in.)
		B	0.060 to 0.096 mm (0.0024 to 0.0038 in.)
		Maximum	0.15 mm (0.0059 in.)
No. 2 balancshaft	Thrust clearance	Standard	0.07 to 0.13 mm (0.0027 to 0.0051 in.)
		Maximum	0.20 mm (0.0079 in.)
	Main journal diameter	A	37.969 to 37.985 mm (1.4948 to 1.4955 in.)
		B	37.449 to 37.465 mm (1.4744 to 1.4750 in.)
	Bearing inside diameter	A	38.025 to 38.045 mm (1.4970 to 1.4978 in.)
		B	37.525 to 37.545 mm (1.4774 to 1.4781 in.)
	Oil clearance	Standard A	0.040 to 0.076 mm (0.0016 to 0.0031 in.)
		B	0.060 to 0.096 mm (0.0024 to 0.0038 in.)
		Maximum	0.15 mm (0.0059 in.)
Crankshaft bearing	Lower bearing dimension	No. 1, 5	3.75 mm (0.1476 in.)
		No. 3	1.75 mm (0.0689 in.)
		No. 2, 4	2.75 mm (0.1083 in.)
Connecting rod	Thrust clearance	STD	0.150 to 0.350 mm (0.0059 to 0.0138 in.)
		Maximum	0.4 mm (0.016 in.)
	Connecting rod oil clearance	STD	0.024 to 0.049 mm (0.0009 to 0.0019 in.)
	Connecting rod bearing center wall thickness (Reference)	Mark 4	1.484 to 1.487 mm (0.0584 to 0.0585 in.)
		5	1.488 to 1.490 mm (0.0586 to 0.0587 in.)
		6	1.491 to 1.493 mm (0.0587 to 0.0588 in.)
	Rod bend	Maximum per 100 mm (3.94 in.)	0.03 mm (0.0012 in.)
	Rod twist	Maximum per 100 mm (3.94 in.)	0.15 mm (0.0059 in.)
	Bush inside diameter		22.005 to 22.014 mm (0.8663 to 0.8667 in.)
	Piston pin diameter	Mark A	21.997 to 22.000 mm (0.8660 to 0.8661 in.)
		Mark B	22.001 to 22.003 mm (0.8662 to 0.8663 in.)
		Mark C	22.004 to 22.006 mm (0.8663 to 0.8664 in.)
		Mark D	22.007 to 22.009 mm (0.8664 to 0.8665 in.)
	Bush oil clearance	STD	0.001 to 0.007 mm (0.00004 to 0.00028 in.)
		Maximum	0.010 mm (0.0039 in.)
	Connecting rod bolt tension portion diameter	STD	7.2 to 7.3 mm (0.283 to 0.287 in.)
		Maximum	7.0 mm (0.276 in.)

Crankshaft	Thrust clearance	STD	0.020 to 0.220 mm (0.0008 to 0.0087 in.)
		Maximum	0.30 mm (0.0118 in.)
	Thrust washer thickness		2.440 to 2.490 mm (0.0961 to 0.0980 in.)
	Crankshaft journal bore diameter on cylinder block with bearing (Reference)	Mark 1	64.004 to 64.010 mm (2.5198 to 2.5201 in.)
		Mark 2	64.011 to 64.016 mm (2.5201 to 2.5203 in.)
		Mark 3	64.017 to 64.022 mm (2.5203 to 2.5206 in.)
	Crankshaft journal oil clearance	STD No. 3	0.030 to 0.055 mm (0.0012 to 0.0022 in.)
		STD Others	0.024 to 0.049 mm (0.0009 to 0.0019 in.)
		Maximum	0.10 mm (0.0039 in.)
	Crankshaft journal diameter	No. 3	59.981 to 59.994 mm (2.3615 to 2.3620 in.)
		Others	59.987 to 60.000 mm (2.3619 to 2.3622 in.)
	Crankshaft bearing center wall thickness (Reference)	Mark 1	1.987 to 1.990 mm (0.0782 to 0.0783 in.)
		Mark 2	1.990 to 1.993 mm (0.0784 to 0.0785 in.)
		Mark 3	1.943 to 1.996 mm (0.0785 to 0.0786 in.)
	Crank pin diameter		52.989 to 53.002 mm (2.0862 to 2.0867 in.)
	Circle runout	Maximum	0.03 mm (0.0012 in.)
	Crankshaft journal taper and out-of-round	Maximum	0.005 mm (0.0002 in.)
	Crank pin taper and out-of-round	Maximum	0.003 mm (0.0001 in.)

TORQUE SPECIFICATIONS

Part Tightened		N*m	kgf*cm	ft.*lbf
Engine mounting bracket front No. 1 RH x Cylinder block sub-assembly		51	520	38
Spark plug x Cylinder head cover sub-assembly		18	184	13
Ventilation pipe x Cylinder head cover sub-assembly		18	184	13
Water by - pass pipe No. 1 x Timing chain cover		18	178	13
Engine coolant temperature sensor x Cylinder block sub-assembly		20	204	15
Engine mounting bracket front No. 1 LH x Cylinder block sub-assembly		51	520	38
Oil level gage guide x Engine mounting bracket front No. 1 LH		20	204	15
Engine mounting insulator front x Body		38	387	28
Air cleaner case x Body		12	122	9
Engine under cover No. 1 x Body		30	306	22
Engine under cover No. 2 x Body		30	306	22
Balanceshaft drive gear sub-assembly x Cylinder block sub-assembly		25	250	18
Chain tensioner assembly No. 2 x Cylinder block sub-assembly		18	185	13
Chain vibration damper No. 3 x Cylinder block sub-assembly		18	185	13
Chain vibration damper No. 2 x Cylinder block sub-assembly		27	270	20
Chain vibration damper No. 1 x Cylinder head sub-assembly	Bolt	21	214	15
Chain vibration damper No. 1 x Cylinder block sub-assembly	Nut	21	214	15
Chain tensioner slipper x Cylinder block sub-assembly		21	214	15
Chain tensioner assembly No. 1 x Cylinder head sub-assembly		10	102	7
Oil pan sub-assembly x Cylinder block sub-assembly		26	265	19
Oil pan sub-assembly x Oil strainer sub-assembly		26	265	19
Oil pan sub-assembly No. 2 x Oil pan sub-assembly		9	92	80 in.*lbf
Idle pulley sub-assembly x Timing chain cover		43	438	32
Compressor and magnetic clutch x Idle pulley assembly with bracket		21	214	16
Vane pump assembly x Timing chain cover		21	214	16
Camshaft timing gear assembly x Camshaft		78	795	58
Camshaft oil delivery pipe x Cylinder head sub-assembly	Bolt A	12	122	9
	Except Bolt A	16	158	11
Camshaft timing gear x No. 2 camshaft		78	795	58
Timing chain cover x Head straight screw plug		17	170	12
Timing chain guide x Cylinder head sub-assembly		10	102	7
Cylinder head cover sub-assembly x Cylinder head sub-assembly		9	92	80 in.*lbf
Ignition coil x Cylinder head cover sub-assembly		9	92	80 in.*lbf
Cylinder head sub-assembly x Cylinder block sub-assembly	1st	39	398	29
	2nd	Turn 90°	Turn 90°	Turn 90°
	3rd	Turn 90°	Turn 90°	Turn 90°
Exhaust manifold x Cylinder head sub-assembly		36	367	27
Crankshaft pulley x Crankshaft		260	2651	192
Flywheel sub-assembly x Crankshaft	1st	27	270	20
	2nd	Turn 90°	Turn 90°	Turn 90°
Drive plate & ring gear sub-assembly		74	755	55
Battery x Battery negative terminal		3.9	40	35 in.*lbf
Engine rear oil seal retainer x Cylinder block		13	133	10
Oil filter bracket union x Oil filter bracket sub-assembly		25	255	18
Oil filter union x Oil filter bracket sub-assembly		43	439	32
Oil filter bracket union x Cylinder block		25	255	18
Oil filter bracket sub-assembly x Cylinder block		25	255	18

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Part Tightened		N*m	kgf*cm	ft.*lbf
Oil filter bracket sub-assembly x Screw plug		49	500	36
Oil filter x Oil filter bracket sub-assembly		17	175	13
Teper screw plug No. 1 x Cylinder block		25	250	18
Cylinder head x Cylinder block	1st	39	398	29
	2nd	Turn 90°	Turn 90°	Turn 90°
	3rd	Turn 90°	Turn 90°	Turn 90°
Camshaft Timing gear assembly x Camshaft		78	795	58
Camshaft Timing gear or sprocket x Camshaft No. 2		78	795	58
Camshaft bearing cap x Cylinder head	Bolt A	12	122	9
	Others	16	160	11
Chain vibration damper No. 1 x Cylinder block		21	214	15
Chain tensioner slipper x Cylinder block		21	214	15
Chain tensioner No. 1 x Cylinder block		10	102	7
Timing chain guide x Cylinder head		10	102	7
Water pump assembly x Timing chain cover		9.0	92	80 in.*lbf
Timing chain cover x Cylinder block	Bolt A	46	469	34
	Others	21	214	15
Oil pan sub-assembly x Cylinder block		26	265	19
Oil strainer sub-assembly x Oil pan sub-assembly		26	265	19
Oil pan sub-assembly No. 2 x Oil pan sub-assembly		9.0	92	80 in.*lbf
Drain plug x Oil pan sub-assembly No. 2		38	382	28
Crankshaft pulley x crankshaft		260	2,650	192
Cylinder head cover x Cylinder head		9.0	92	80 in.*lbf
Ventilation valve sub-assembly x Cylinder head cover		5.0	51	44 in.*lbf
Camshaft position sensor x Timing chain cover		8.5	87	75 in.*lbf
Crankshaft position sensor x Timing chain cover		8.5	87	75 in.*lbf
Camshaft timing control valve x Timing chain cover		8.0	82	71 in.*lbf
Chain vibration damper No. 2 x Cylinder block		27	270	20
Chain vibration damper No. 3 x Cylinder block		18	185	13
Chain vibration damper No. 4 x Cylinder block		18	185	13
Chain tensioner No. 2 x Cylinder block		18	185	13
Balanceshaft drive gear sub-assembly x Cylinder block		25	255	18
Stud bolt x Oil pan sub-assembly	Bolt A	7.5	76	66 in.*lbf
	Bolt B	3.0	31	27 in.*lbf
Straight screw plug No. 1 x Cylinder head		44	449	32
Straight screw plug No. 2 x Cylinder head		90	918	66
Stud bolt x Cylinder head	Bolt A	3.0	31	27 in.*lbf
	Bolt B	7.5	76	66 in.*lbf
	Bolt C	9.5	97	84 in.*lbf
Screw plug x Cylinder head		30	306	22
Oil nozzle No. 1 sub-assembly x Cylinder block		7.0	71	62 in.*lbf
Water drain cock sub-assembly x Cylinder block		25	250	18
Water Drain cook sub-assembly x Water Drain cook plug		13	130	9
Crankshaft bearing cap x Cylinder block	1st	39	398	29
	2nd	Turn 90°	Turn 90°	Turn 90°
Connecting rod cap x Connecting rod	1st	25	255	18
	2nd	Turn 90°	Turn 90°	Turn 90°
Balanceshaft driven gear No. 1 x No. 1 balanceshaft		36	365	26
Balanceshaft driven gear No. 2 x No. 2 balanceshaft		36	365	26

Part Tightened	N*m	kgf*cm	ft.*lbf
Balanceshaft thrust washer No. 1 x Cylinder block	18	184	13
Balanceshaft thrust washer No. 2 x Cylinder block	18	184	13

1GR-FE FUEL

SERVICE DATA

Fuel pressure			281 to 287 kPa (2.87 to 2.93 kgf*cm ² , 40.8 to 41.7 psi)
Fuel pressure			147 kPa (1.5 kgf*cm ² , 21 psi) or more
Fuel injector	Resistance	at 20°C (68°F)	11.6 to 12.4 Ω
	Injection volume		76 to 91 cm ³ (4.6 to 5.5 cu in.) per 15 seconds
	Difference between each cylinder		15 cm ³ (0.9 cu in.) or less
	Fuel leakage		1 drop or less every 12 minutes
Fuel pump resistor	Resistance	at 20°C (68°F)	0.71 to 0.75 Ω
Fuel Pump	Resistance	at 20°C (68°F)	0.2 to 3.0 Ω
Fuel pump relay assembly	Resistance		
	3 - 4	Apply battery voltage to terminal 1 and 2	Below 1 Ω
			10 kΩ or higher
	3 - 5	Apply battery voltage to terminal 1 and 2	10 kΩ or higher
			Below 1 Ω

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TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Fuel tank x Body	62	632	46
Fuel tank protector sub-assembly No. 1 x Body (with OFF ROAD PACKAGE)	20	204	15
Fuel delivery pipe sub-assembly x Intake manifold	15	153	11
Intake air surge tank x Intake manifold	28	286	21
Intake air surge tank x Throttle body bracket	21	214	16
Intake air surge tank x Surge tank stay No. 1	21	214	16
Intake air surge tank x Surge tank stay No. 2	21	214	16
Fuel pressure regulator assembly x Fuel delivery pipe sub-assembly	9.0	92	80 in.*lbf
Negative battery terminal	3.9	40	35 in.*lbf

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2TR-FE FUEL

SERVICE DATA

Fuel pressure		Standard	281 to 287 kPa (2.87 to 2.93 kgf*cm ² , 40.8 to 41.7 psi)
Fuel injector assembly	Resistance (1 - 2)		11.6 to 12.4 Ω at 20°C (68°F)
	Injection volume		71 to 86 cm ³ (4.3 to 5.2 cu in.) per 15 seconds
	Difference between each injector		15 cm ³ (0.9 cu in.) or less
	Leakage		1 drop or less in 12 minutes
Fuel pump assembly	Resistance		0.2 to 3.0 kΩ at 20°C (68°F)

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Fuel tank x Body	62	632	46
Fuel tank protector sub-assembly No. 1 x Body (with OFF ROAD PACKAGE)	20	204	15
Fuel delivery pipe x Cylinder head cover sub-assembly	12	122	9
Intake manifold x Wire harness clamp bracket	8.2	84	73 in.*lbf
Fuel delivery pipe x Fuel pressure pulsation damper assembly	8.5	87	75 in.*lbf
Fuel delivery pipe x Fuel pressure regulator assembly	8.5	87	75 in.*lbf
Battery x Battery negative terminal	3.9	40	35 in.*lbf

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1GR-FE EMISSION CONTROL

SERVICE DATA

Air-fuel ratio compensation system	Voltage	B22 (A1A+) - A28 (E2)	3.3 V
		B23 (A2A+) - A28 (E2)	3.3 V
		B30 (A1A-) - A28 (E2)	2.9 V
		B31 (A2A-) - A28 (E2)	2.9 V
Fuel cut off rpm	Cut off		2,500 rpm
	Return		1,400 rpm
Lead detection pump	Voltage	A23 (VC) - A28 (E2)	4.5 to 5.5 V
		E22 (PPMP) - A28 (E2)	1.425 to 4.150 V
Vacuum Switching Valve No. 1	Resistance	at 20 °C (68 °F)	26 to 30 Ω
Air fuel ratio sensor (Bank 1, Bank 2)	Resistance	1 (HT) - 2 (+B)	1.8 to 3.4 Ω at 20°C (68°F)
		1 (HT) - 4 (E1)	10 k Ω or higher
Heated oxygen sensor No. 2 (Bank 1, Bank 2)	Resistance	1 (HT) - 2 (+B)	11 to 16 Ω at 20°C (68°F)
	Resistance	1 (HT) - 4 (E1)	10 k Ω or higher

SS

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Duty vacuum switching valve x Intake air surge tank	9.0	92	80 in.*lbf
Ventilation valve x Cylinder head cover	27	275	20
Heated oxygen sensor x Exhaust pipe	3.9	40	35 in.*lbf
Air fuel ratio sensor x Exhaust manifold	44	449	33
Negative battery terminal	3.9	40	35 in.*lbf
Charcoal canister x Body	20	204	15
Charcoal canister filter No. 2 x Body	20	204	15



2TR-FE EMISSION CONTROL

SERVICE DATA

Duty vacuum switching valve	Resistance	1 - 2	26 to 30 Ω at 20°C (68°F)
		1 - Body	10 MΩ or higher
		2 - Body	10 MΩ or higher
Air fuel ratio sensor	Resistance	1 (HT) - 2 (+B)	1.8 to 3.4 Ω at 20°C (68°F)
		1 (HT) - 4 (AF-)	10 kΩ or higher
Heated oxygen sensor	Resistance	1 (HT) - 2 (+B)	11 to 16 Ω at 20°C (68°F)
		1 (HT) - 4 (E)	10 kΩ or higher
Pressure sensor	Voltage	VC - E2	4.5 to 5.5 V
Air switching valve assembly	Resistance	1 - 2	4.5 to 5.5 Ω at 20°C (68°F)
Air pump assembly	Resistance	1 - 2	0.4 to 1.0 Ω at 20°C (68°F)

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Air fuel ratio sensor x Exhaust pipe assembly front	44	449	33
Battery x Battery negative terminal	3.9	40	35 in.*lbf
Heated oxygen sensor x Exhaust pipe assembly tail	44	449	33
Air pump assembly x Body	18	184	13
Washer jar assembly x Body	6	56	49 in.*lbf
Air switching valve assembly x Cylinder head sub-assembly	20	204	15
Intake pipe insulator x Air switching valve assembly	20	204	15
Intake pipe insulator x Cylinder head sub-assembly	20	204	15
Exhaust manifold heat insulator No. 1 x Exhaust manifold	12	122	9
Charcoal canister x Body	20	204	15
Charcoal canister filter No. 2 x Body	20	204	15

SS

1GR-FE INTAKE

SERVICE DATA

VSV for ACIS	Resistance	at 20 °C (68 °F)	37 to 44 Ω
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1GR-FE EXHAUST

SERVICE DATA

Compression spring	Length	Minimum	40.5 mm (1.594 in.)
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TORQUE SPECIFICATIONS

Part Tightened		N*m	kgf*cm	ft.*lbf
Exhaust pipe assembly front x Exhaust manifold		62	632	46
Exhaust front pipe assembly No. 2 x Exhaust pipe assembly center	Bolt	48	489	35
	Nut	62	632	46
Exhaust pipe assembly center x Tail pipe		48	490	35
Heated oxygen sensor x Exhaust pipe assembly front		43	438	32
Heated oxygen sensor x Exhaust front pipe assembly No. 2		43	438	32
Negative battery terminal		3.9	40	35 in.*lbf

SS

2TR-FE EXHAUST

SERVICE DATA

Compression spring (Exhaust pipe assembly front x Exhaust manifold)	Free length	Minimum	40.5 mm (1.594 in.)
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TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Exhaust pipe assembly front x Exhaust manifold	43	438	32
Exhaust pipe assembly front x Exhaust pipe assembly tail	48	489	35
Battery x Battery negative terminal	3.9	40	35 in.*lbf

1GR-FE COOLING

SERVICE DATA

Water inlet w/ thermostat	Valve opening temperature		80 to 84 °C (176 to 183 °F)
	Valve lift	at 95 °C (203 °F)	8 mm (0.31 in.) or more
Radiator cap	Relief valve opening pressure	Standard	93 to 123 kPa (0.95 to 1.25 kgf/cm ² , 13.5 to 17.8 psi)
		Minimum	78 kPa (0.8 kgf/cm ² , 11.4 psi)

TORQUE SPECIFICATIONS

Part Tightened		N*m	kgf*cm	ft.*lbf
Cylinder block water drain cock plug x Cylinder block water drain cock		13	130	9
Water pump assembly x Timing chain or belt cover sub-assembly	10 mm (0.39 in.) head	9.0	92	80 in.*lbf
	12 mm (0.47 in.) head	23	235	17
Idler pulley sub-assembly No. 2 x Timing chain or belt cover sub-assembly		39	398	29
Water inlet x Timing chain or belt cover sub-assembly		9.0	92	80 in.*lbf
Fan shroud x Radiator		5.0	51	44 in.*lbf
Fan w/ fluid coupling x Water pump		21	214	15
V-bank cover x Intake air surge tank		7.5	76	66 in.*lbf
Engine under cover sub-assembly No. 1 x Frame assembly		30	306	22
Water inlet w/ thermostat x Water inlet		9.0	92	80 in.*lbf
Radiator x Radiator support		18	184	13
Negative battery terminal		3.9	40	35 in.*lbf

SS

2TR-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 (0.355 in.) or more
Radiator cap sub-assembly	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)

TORQUE SPECIFICATIONS

Part Tightened		N*m	kgf*cm	ft.*lbf
Cylinder block water drain cock plug x Cylinder block water drain cock sub-assembly		13	130	9
Engine under cover No. 1 x Body		30	306	22
Water pump assembly x Timing chain cover	Bolt A	21	214	15
	Bolt B	9	92	80 in.*lbf
V-ribbed belt tensioner assembly x Cylinder block sub-assembly	Bolt A	21	214	16
	Bolt B	40	408	30
	Bolt C	43	434	32
Battery x Battery negative terminal		3.9	40	35 in.*lbf
Timing chain cover x Water inlet		20	204	15
Radiator assembly x Body		18	184	13
Radiator assembly x Fan shroud		5	51	44 in.*lbf
Fan w/ Fluid coupling x Water pump assembly		25	255	18

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1GR-FE LUBRICATION

SERVICE DATA

Oil pressure		at idle speed	29 kPa (0.3 kgf/cm ² , 4.2 psi) or more
		at 3,000 rpm	294 to 588 kPa (3.0 to 6.0 kgf/cm ² , 43 to 85 psi)
Oil pump	Tip clearance	Standard	0.06 to 0.16 mm (0.0024 to 0.0063 in.)
		Maximum	0.16 mm (0.0063 in.)
	Side clearance	Standard	0.03 to 0.09 mm (0.0012 to 0.0035 in.)
		Maximum	0.09 mm (0.0035 in.)
	Body clearance	Standard	0.250 to 0.325 mm (0.0098 to 0.0128 in.)
		Maximum	0.325 mm (0.0128 in.)

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TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Oil pressure switch x Oil filter bracket sub-assembly	15	153	11
Oil pan drain plug x Oil pan sub-assembly No. 2	40	408	30
Timing chain or belt cover sub-assembly x Cylinder head and block	23	235	17
Oil filter bracket sub-assembly x Timing chain or belt cover sub-assembly	19	194	14
V-bank cover x Intake air surge tank	7.5	76	66 in.*lbf
Oil pump relief valve x Oil pump cover	49	500	36
Oil pump cover x Timing chain or belt cover sub-assembly	9.0	92	80 in.*lbf
Oil cooler assembly x Oil filter bracket sub-assembly	68	693	50

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2TR-FE LUBRICATION

SERVICE DATA

Oil pressure		at idle speed	29 kPa (0.3 kgf/cm ² , 4.3 psi) or more
		at 3,000 rpm	160 to 490 kPa (1.6 to 5.3 kgf/cm ² , 23 to 75 psi)
Oil pump	Tip clearance	STD	0.040 to 0.160 mm (0.0016 to 0.0063 in.)
		Minimum	0.26 mm (0.0102 in.)
	Side clearance	STD	0.025 to 0.075 mm (0.0010 to 0.0030 in.)
		Minimum	0.130 mm (0.0051 in.)
	Body clearance	STD	0.250 to 0.325 mm (0.0098 to 0.0128 in.)
		Minimum	0.425 mm (0.0167 in.)

SS

TORQUE SPECIFICATIONS

Part Tightened		N*m	kgf*cm	ft.*lbf
Oil pressure switch x Cylinder block sub-assembly		15	153	11
Oil pan drain plug x Oil pan sub-assembly No. 2		38	382	28
Timing chain cover x Head straight screw plug		17	170	12
Timing chain cover x Cylinder head sub-assembly and Cylinder block sub-assembly	Bolt A	46	469	34
	Bolt B	21	214	15
	Bolt C	21	214	15
	Bolt D	21	214	15
	Bolt E	21	214	15
	Nut	21	214	15
Air cleaner case x Body		12	122	9
Engine under cover No. 1 x Body		30	306	22
Engine under cover No. 2 x Body		30	306	22
Oil pump cover x Timing chain cover		9.0	92	80 in.*lbf
Oil pump relief valve x Timing chain cover		49	500	36

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1GR-FE IGNITION

SERVICE DATA

Spark plug	Recommended spark plug	DENSO made	K20HR-U11
		NGK made	LFR6C-11
	Electrode gap		1.0 to 1.1 mm (0.039 to 0.043 in.)
	Maximum electrode gap		1.46 mm (0.057 in.)
Crankshaft position sensor	Resistance	at 20°C (68°F)	1,850 to 2,450 Ω

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Ignition coil x Cylinder head cover	10	102	7.4
VVT sensor x Cylinder head sub-assembly	8.0	82	71 in.*lbf
V-bank cover x Intake air surge tank sub-assembly and Air cleaner assembly	7.5	76	66 in.*lbf
Crankshaft position sensor x Cylinder block	10	102	7.4
V-ribbed belt tensioner and Cooler compressor assembly	25	255	18
Negative battery terminal	3.9	40	35 in.*lbf

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2TR-FE IGNITION

SERVICE DATA

Spark plug	Recommended spark plug	DENSO made	SK20HR11
		NGK made	ILFR6C11
	Electrode gap	standard	1.0 to 1.1 mm (0.039 to 0.043 in.)
Camshaft position sensor	Resistance	at cold	835 to 1,400 Ω
		at hot	1,060 to 1,645 Ω
Crankshaft position sensor	Resistance	at cold	1,630 to 2,740 Ω
		at hot	2,065 to 3,225 Ω

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TORQUE SPECIFICATIONS

Part Tightened		N*m	kgf*cm	ft.*lbf
Spark plug x Cylinder head cover sub-assembly		18	184	13
Ignition coil x Cylinder head cover sub-assembly		9	92	80 in.*lbf
Camshaft position sensor x Timing chain cover		8.5	87	75 in.*lbf
Crankshaft position sensor x Timing chain cover		8.5	87	75 in.*lbf
Idle pulley assembly with bracket x Cylinder block sub-assembly	Bolt A	21	214	16
	Bolt B, C	43	438	32
Battery x Battery negative terminal		3.9	40	35 in.*lbf



1GR-FE STARTING

SERVICE DATA

Starter	No-load characteristics		Current	100 A or less at 11.5 V
	Starter armature assembly	Circle runout	Maximum	0.05 mm (0.0020 in.)
		Commutator diameter	Standard	35.0 mm (1.378 in.)
			Minimum	34.0 mm (1.339 in.)
		Undercut depth	Standard	0.7 mm (0.028 in.)
			Minimum	0.2 mm (0.008 in.)
	Starter yoke	Shunt coil resistance	at 20°C (68°F)	1.5 to 1.9 Ω
	Brush	Brush length	Standard	15.0 mm (0.591 in.)
			Minimum	9.0 mm (0.354 in.)
	Starter brush holder assembly	Brush spring load	Standard	21.5 to 27.5 N (2.2 to 2.8 kgf, 4.8 to 6.2 lbf)
			Minimum	12.7 N (1.3 kgf, 2.9 lbf)
Starter relay assembly	Resistance (3 - 5)		Apply battery voltage to terminal 1 and 2	10 kΩ or higher
				Below 1 Ω
Ignition or starter switch	Standard			10 kΩ or higher
	LOCK		1 (AM1) - 3 (ACC)	Below 1 Ω
	ACC		1 (AM1) - 3 (ACC) - 4 (IG1)	Below 1 Ω
	ON		7 (IG2) - 8 (AM2)	Below 1 Ω
	START		1 (AM1) - 2 (ST1) - 4 (IG1)	Below 1 Ω
			6 (ST2) - 7 (IG2) - 8 (AM2)	Below 1 Ω

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Starter assembly x Transmission housing	37	377	27
Starter assembly x Terminal 30	9.8	100	7
Commutator end frame x Brush holder	3.8	39	34 in.*lbf
Starter drive housing assembly x Magnetic Starter Switch	9.3	95	82 in.*lbf
Commutator end frame x Starter drive housing assembly	9.3	95	82 in.*lbf
Lead wire x Terminal C of starter	5.9	60	52 in.*lbf
Engine wire x Cylinder block	13	133	10
Manifold stay x Transmission housing and Exhaust manifold	40	408	30
Steering sliding yoke x Steering intermediate shaft No. 2	36	370	27

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2TR-FE STARTING

SERVICE DATA

Starter assembly	Specified current		100 A or less at 11.5 V
Starter relay assembly	Resistance (3-5)	Standard	10 k Ω or higher
			Below 1 Ω (Apply battery voltage to terminal 1 and 2)
Ignition or starter switch assembly	Resistance	LOCK	10 k Ω or higher
		ACC	Below 1 Ω
		ON	Below 1 Ω
		START	Below 1 Ω
Magnetic switch resistance	Terminal 50 - C		1 Ω or lower
	Terminal 50 - Switch body		2 Ω or lower
Starter armature	Resistance	Segments	1 Ω or lower
		Commutator-Armature coil	10 k Ω or higher
	Diameter	Standard	35.0 mm (1.378 in.)
		Minimum	34.0 mm (1.339 in.)
	Undercut depth	Standard	0.7 mm (0.028 in.)
		Minimum	0.2 mm (0.008 in.)
Starter yoke assembly	Brush length		Standard 15.0 mm (0.591 in.)
			Minimum 9.0 mm (0.354 in.)
	Resistance	Lead wire - brush	Standard 1 Ω or lower
		Shunt coil	Standard 1.5 to 1.9 Ω at 20°C (68°F)
Starter brush holder	Resistance		Standard 10 k Ω or higher
	Spring load		Standard 21.5 to 27.5 N (2.2 to kgf, 4.8 to 6.2 lbf)
			Minimum 12.7 N (1.3 kgf, 2.9)

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TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Lead wire x Terminal C	5.9	60	52 in.*lbf
Starter assembly x Transmission housing assembly	37	377	27
Starter wire x Starter assembly	9.8	100	7
Lead wire x Terminal C	5.9	60	52
Starter commutator end frame assembly x Starter brush holder	3.8	39	34 in.*lbf
Starter commutator end frame assembly x Starter drive housing assembly	9.3	95	82 in.*lbf
Magnet switch x Starter drive housing assembly	9.3	95	82 in.*lbf



1GR-FE CHARGING

SERVICE DATA

Battery	Voltage	at 20°C (68°F)	12.6 to 12.9 V
Voltage regulator	Regulating voltage		13.2 to 14.8 V
Generator (DENSO made)	Generator brush holder assembly	Brush length	Standard 10.5 mm (0.413 in.)
			Minimum 4.5 mm (0.177 in.)
	Generator rotor assembly	Resistance	at 20°C (68°F) 2.3 to 2.7 Ω
		Slip ring diameter	Standard 14.2 to 14.4 mm (0.559 to 0.567 in.)
			Minimum 14.0 mm (0.551 in.)
Generator (BOSCH made)	Generator rotor assembly	Rotor coil resistance	at 20°C (68°F) 2.27 to 2.53 Ω
		Slip ring diameter	Standard 15.3 to 15.5 mm (0.602 to 0.610 in.)
			Minimum 14.9 mm (0.587 in.)
	Starter sub-assembly generator with rectifier	Positive rectifier	Positive (+) tester probe - Positive (+) terminal
			Negative (-) tester probe - Rectifier terminal
			Negative (-) tester probe - Positive (+) terminal
			Positive (+) tester probe - Rectifier terminal
		Negative rectifier	Positive (+) tester probe - Negative (-) terminal
			Negative () tester probe Rectifier terminal
			Negative (-) tester probe - Negative (-) terminal
			Positive (+) tester probe - Rectifier terminal
		Starter for open circuit	Between rectifier terminals
			Below 1 Ω
	Generator brush holder assembly	Brush exposed length	Minimum 6.0 mm (0.236 in.)

TORQUE SPECIFICATIONS

Part Tightened		N*m	kgf*cm	ft.*lbf
Generator assembly x V-ribbed belt tensioner and cylinder head		43	438	32
Generator assembly x Wire harness clamp bracket		8.0	82	71 in.*lbf
Generator assembly x Terminal B		9.8	100	7
Wire harness stay x Body		8.0	82	71 in.*lbf
V-bank cover x Intake air surge tank sub-assembly and Air cleaner assembly		7.5	76	66 in.*lbf
Engine under cover sub-assembly No. 1 x Frame assembly		30	306	22
Engine under cover assembly rear x Frame assembly		30	306	22
Retainer plate x Drive end frame assembly generator (Denso made)		2.2	22	19 in.*lbf
Generator coil assembly x Drive frame assembly generator (Denso made)		5.8	59	51 in.*lbf
Generator brush holder assembly x Generator coil assembly (Denso made)		1.8	18	16 in.*lbf
Generator rear end cover x Generator coil assembly (Denso made)		4.6	47	41 in.*lbf
Generator pulley x Generator rotor assembly (Denso made)		111	1,125	81
Pulley x Generator rotor assembly (BOSCH made)		65	663	48
Starter sub-assembly generator w/ rectifier x Drive end frame assembly (BOSCH made)		4.3	44	38 in.*lbf
Regulator sub-assembly generator w/ brush x Starter sub-assembly generator w/ rectifier (BOSCH made)	Screw A	2.5	25	22 in.*lbf
	Screw B	1.2	12	11 in.*lbf
Generator rear end cover x Starter sub-assembly generator w/ rectifier (BOSCH made)	Nut A	19	194	14
	Nut B	12	122	9.0
	Screw	2.8	29	25 in.*lbf

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2TR-FE CHARGING

SERVICE DATA

Battery	Voltage		Standard	12.5 to 12.9 V at 20°C (68°F)
Charging circuit without load	Amperage		Standard	10 A or less
	Voltage		Standard	13.2 to 14.8
Charging circuit with load	Amperage		Standard	30 A or more
Generator assembly	Generator brush holder assembly	Brush length	Standard	9.5 to 11.5 mm (0.374 to 0.453 in.)
			Minimum	4.5 mm (0.177 in.)
	Generator rotor assembly	Resistance	at 20°C (68°F)	1.7 to 2.1 Ω
	Slip ring diameter		Standard	14.2 to 14.4 mm (0.559 to 0.567 in.)
			Minimum	14.0 mm (0.551 in.)

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TORQUE SPECIFICATIONS

Part Tightened		N*m	kgf*cm	ft.*lbf
Generator assembly x Generator wire		9.8	100	7
Generator assembly x Timing chain cover		43	438	32
Generator assembly x V-ribbed belt tensioner assembly		43	438	32
Battery x Battery negative terminal		3.9	40	35 in.*lbf
Generator drive end frame assembly x Generator rectifier end frame		4.5	46	40 in.*lbf
Generator holder w/ rectifier x Generator drive end frame assembly		2.0	20	17 in.*lbf
Generator regulator assembly x Generator rectifier end frame		2.0	20	17 in.*lbf
Generator brush holder assembly x Generator rectifier end frame		2.0	20	17 in.*lbf
Generator rear end cover x Generator regulator end frame		4.4	45	39 in.*lbf
Terminal plate x Generator rectifier end frame assembly	Bolt	3.9	40	34 in.*lbf
	Nut	4.4	45	39 in.*lbf
Generator pulley x Generator rotor assembly		137	1,397	101

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A340E AUTOMATIC TRANSMISSION

SERVICE DATA

Line pressure (Wheel locked)		
Engine idling	D position	363 to 422 kPa (3.7 to 4.3 kgf/cm ² , 53 to 61 psi)
	R position	608 to 708 kPa (6.2 to 7.2 kgf/cm ² , 88 to 102 psi)
At stall (Throttle valve fully opened)	D position	932 to 1,177 kPa (9.5 to 12.0 kgf/cm ² , 135 to 171 psi)
	R position	1,569 to 1,912 kPa (16.0 to 19.0 kgf/cm ² , 228 to 277 psi)
Engine stall revolution	D and R positions	1,850 to 2,150 rpm
Time lag	N → D position	Less than 1.2 seconds
	N → R position	Less than 1.5 seconds
Engine idle speed	A/C OFF and N position	650 to 750 rpm
Drive plate runout	Max	0.20 mm (0.0079 in.)
Torque converter runout	Max	0.30 mm (0.0118 in.)
Torque converter installation distance	-	More than 17.1 mm (0.673 in.)
Lock-up point		
D position (Throttle valve opening 5%)	Lock-up ON	71 to 76 km/h (44 to 47 mph)
	Lock-up OFF	64 to 69 km/h (40 to 43 mph)
3 position (Throttle valve opening 5%)	Lock-up ON	71 to 76 km/h (44 to 47 mph)
	Lock-up OFF	64 to 69 km/h (40 to 43 mph)
Shift point		
D position (Throttle valve fully opened)	1 → 2	60 to 71 km/h (37 to 44 mph)
	2 → 3	119 to 129 km/h (74 to 80 mph)
	3 → O/D	154 to 167 km/h (95 to 103 mph)
	O/D → 3	142 to 152 km/h (88 to 94 mph)
	3 → 2	107 to 113 km/h (66 to 70 mph)
	2 → 1	43 to 48 km/h (27 to 30 mph)
D position (Throttle valve fully closed)	3 → O/D	59 to 68 km/h (37 to 42 mph)
	O/D → 3	27 to 31 km/h (17 to 19 mph)
2 position (Throttle valve fully opened)	1 → 2	60 to 71 km/h (37 to 44 mph)
	3 → 2	119 to 125 km/h (74 to 77 mph)
	2 → 1	43 to 48 km/h (27 to 30 mph)
L position (Throttle valve fully opened)	2 → 1	57 to 62 km/h (35 to 38 mph)

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TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Transmission control cable x Automatic transmission	14	143	10
Transmission control cable bracket No.1 x Automatic transmission	28	286	21
Engine mounting insulator rear No.1 x Automatic transmission	65	663	48
Automatic transmission x Engine (For bolt A)	71	724	52
Automatic transmission x Engine (For bolt B)	37	377	27
Torque converter clutch x Drive plate	48	489	35
Oil cooler tube clamp x Cylinder block (For bolt A)	12	122	8.9
Oil cooler tube clamp x Cylinder block (For bolt B)	5.0	51	44 in. *lbf
Oil cooler outlet tube No.1 x Automatic transmission	34	350	25
Oil cooler inlet tube No.1 x Automatic transmission	34	350	25
Oil filler tube x Automatic transmission	12	122	8.9
Front suspension member bracket x Body	33	336	24
Manifold stay x Automatic transmission (For bolt A)	71	724	52
Manifold stay x Automatic transmission (For bolt B)	44	449	33
Manifold stay x Exhaust manifold	30	306	22
Speed sensor x Automatic transmission	5.4	55	48 in. *lbf
Drain plug x Oil pan	20	204	15
Transmission wire set bolt x Automatic transmission	5.4	55	48 in. *lbf
Oil strainer x Valve body	10	100	7.0
Oil pan x Transmission case	7.4	75	65 in. *lbf
Shift solenoid valve SLU x Valve body	6.4	65	56 in. *lbf
Shift solenoid valve S1 x Valve body	6.4	65	56 in. *lbf
Shift solenoid valve S2 x Valve body	6.4	65	56 in. *lbf
Shift solenoid valve SLT x Valve body	6.4	65	56 in. *lbf
Valve body x Transmission case	11	110	8.0
Frame crossmember sub-assembly No. 3 x Engine mounting insulator rear No. 1	19	189	14
Frame crossmember sub-assembly No. 3 x Body	40	408	30
Park/neutral position switch x Automatic transmission (For nut)	6.9	70	61 in. *lbf
Park/neutral position switch x Automatic transmission (For bolt)	13	130	9.0
Battery x Negative battery terminal	3.9	40	35 in. *lbf
Temperature sensor x Automatic transmission	29	300	22
Floor shift assembly x Body	14	143	10
Floor shift gear shifting rod sub-assembly x Floor shift assembly	5.5	56	49 in. *lbf
Transmission control cable x Body	5.5	56	49 in. *lbf

A750E AUTOMATIC TRANSMISSION

SERVICE DATA

Line pressure (Wheel locked)		
Engine idling	D position	363 to 423 kPa (3.7 to 4.3 kgf/cm ² , 53 to 61 psi)
	R position	484 to 564 kPa (4.9 to 5.8 kgf/cm ² , 70 to 82 psi)
AT stall (Throttle valve fully opened)	D position	1,282 to 1,381 kPa (13.0 to 14.0 kgf/cm ² , 186 to 200 psi)
	R position	1,218 to 1,338 kPa (12.0 to 14.0 kgf/cm ² , 177 to 194 psi)
Engine stall revolution	D and R positions	2,250 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	650 to 750 rpm
Drive plate runout	Max	0.20 mm (0.0079 in.)
Torque converter runout	Max	0.30 mm (0.0118 in.)
Torque converter clutch installation distance	-	More than 17.1 mm (0.673 in.)
Shift schedule		
D position (Throttle valve fully opened)	1 → 2	49 to 61 km/h (30 to 38 mph)
	2 → 3	96 to 107 km/h (59 to 66 mph)
	3 → 4	139 to 155 km/h (86 to 96 mph)
	4 → 5	177 to 190 km/h (110 to 118 mph)
	5 → 4	183 to 170 km/h (113 to 105 mph)
	4 → 3	135 to 124 km/h (84 to 77 mph)
	3 → 2	90 to 83 km/h (56 to 51 mph)
	2 → 1	44 to 38 km/h (27 to 24 mph)
D position (Throttle valve fully closed)	4 → 5	46 to 52 km/h (28 to 32 mph)
	5 → 4	27 to 33 km/h (17 to 20 mph)
4 position (Throttle valve fully opened)	1 → 2	49 to 61 km/h (30 to 38 mph)
	2 → 3	96 to 107 km/h (59 to 66 mph)
	3 → 4	139 to 155 km/h (86 to 96 mph)
	5 → 4	190 to 203 km/h (117 to 125 mph)
	4 → 3	124 to 135 km/h (77 to 84 mph)
	3 → 2	90 to 83 km/h (56 to 51 mph)
	2 → 1	44 to 38 km/h (27 to 24 mph)
3 position (Throttle valve fully opened)	1 → 2	49 to 61 km/h (30 to 38 mph)
	2 → 3	96 to 107 km/h (59 to 66 mph)
	4 → 3	133 to 145 km/h (82 to 90 mph)
	3 → 2	90 to 83 km/h (56 to 51 mph)
	2 → 1	44 to 38 km/h (27 to 24 mph)
2 position (Throttle valve fully opened)	1 → 2	49 to 61 km/h (30 to 38 mph)
	3 → 2	99 to 88 km/h (61 to 54 mph)
	2 → 1	44 to 38 km/h (27 to 24 mph)
L position (Throttle valve fully opened)	2 → 1	48 to 42 km/h (30 to 26 mph)
Lock-up point		

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D position (Throttle valve opening 5 %)	5th gear (Lock-up ON)	57 to 63 km/h (35 to 39 mph)
	5th gear (Lock-up OFF)	56 to 49 km/h (35 to 30 mph)
4 position (Throttle valve opening 5 %)	4th gear (Lock-up ON)	59 to 53 km/h (37 to 33 mph)
	4th gear (Lock-up OFF)	46 to 52 km/h (28 to 32 mph)

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Park/neutral position switch x Automatic transmission (For nut)	6.9	70	61 in.*lbf
Park/neutral position switch x Automatic transmission (For bolt)	13	130	9.0
Transmission control cable x Automatic transmission	14	143	10
Engine mounting insulator rear No.1 x Automatic transmission	65	663	48
Automatic transmission x Engine (For bolt A)	71	720	53
Automatic transmission x Engine (For bolt B)	37	380	27
Torque converter clutch x Drive plate	48	489	35
Oil cooler tube clamp x Engine (For bolt A)	12	122	9.0
Oil cooler tube clamp x Engine (For bolt B)	5.0	50	43 in.*lbf
Oil cooler outlet tube No.1 x Automatic transmission	34	350	25
Oil cooler inlet tube No.1 x Automatic transmission	34	350	25
Transmission revolution sensor x Automatic transmission	5.4	55	48 in.*lbf
Drain plug x Oil pan	28	285	21
Transmission wire set bolt x Automatic transmission	5.4	55	48 in.*lbf
Transmission wire clamp x Valve body (A)	11	110	8.0
Transmission wire clamp x Valve body (B)	10	100	7.0
Oil strainer x Valve body	10	100	7.0
Oil pan x Transmission case	4.4	45	39 in.*lbf
Shift solenoid valve S1 x Valve body	6.4	65	56 in.*lbf
Shift solenoid valve S2 x Valve body	10	100	7.0
Shift solenoid valve SR x Valve body	6.4	65	56 in.*lbf
Shift solenoid valve SLU, SL2 x Valve body	6.4	65	56 in.*lbf
Shift solenoid valve SLT, SL1 x Valve body	6.4	65	56 in.*lbf
Valve body x Transmission case	11	110	8.0
Floor shift assembly x Body	14	143	10
Overflow plug x Automatic transmission	20	204	15
Refill plug x Automatic transmission	39	400	29
Frame crossmember sub-assembly No.3 x Body	40	408	30
Frame crossmember sub-assembly No.3 x Engine mounting insulator No. 1	19	189	14
Battery x Negative battery terminal	3.9	40	35 in.*lbf
Transmission control cable bracket No. 1 x Automatic transmission	28	286	21
Manifold stay No. 2 x Automatic transmission	40	408	30
Manifold stay x Automatic transmission	40	408	30
Oil with hose cooler x Body	5.0	51	44 in.*lbf
Transmission control cable x Body	5.5	56	49 in.*lbf

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A750F AUTOMATIC TRANSMISSION

SERVICE DATA

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Line pressure (Wheel locked)		
Engine idling	D position	363 to 423 kPa (3.7 to 4.3 kgf/cm ² , 53 to 61 psi)
	R position	484 to 564 kPa (4.9 to 5.8 kgf/cm ² , 70 to 82 psi)
AT stall (Throttle valve fully opened)	D position	1,282 to 1,381 kPa (13.0 to 14.0 kgf/cm ² , 186 to 200 psi)
	R position	1,218 to 1,338 kPa (12.0 to 14.0 kgf/cm ² , 177 to 194 psi)
Engine stall revolution	D and R positions	2,250 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	650 to 750 rpm
Drive plate runout	Max	0.20 mm (0.0079 in.)
Torque converter runout	Max	0.30 mm (0.0118 in.)
Torque converter clutch installation distance	-	More than 17.1 mm (0.673 in.)
Shift schedule		
D position (Throttle valve fully opened)	1 → 2	49 to 61 km/h (30 to 38 mph)
	2 → 3	96 to 107 km/h (59 to 66 mph)
	3 → 4	139 to 155 km/h (86 to 96 mph)
	4 → 5	177 to 190 km/h (110 to 118 mph)
	5 → 4	183 to 170 km/h (113 to 105 mph)
	4 → 3	135 to 124 km/h (84 to 77 mph)
	3 → 2	90 to 83 km/h (56 to 51 mph)
	2 → 1	44 to 38 km/h (27 to 24 mph)
D position (Throttle valve fully closed)	4 → 5	46 to 52 km/h (28 to 32 mph)
	5 → 4	27 to 33 km/h (17 to 20 mph)
4 position (Throttle valve fully opened)	1 → 2	49 to 61 km/h (30 to 38 mph)
	2 → 3	96 to 107 km/h (59 to 66 mph)
	3 → 4	139 to 155 km/h (86 to 96 mph)
	5 → 4	190 to 203 km/h (117 to 125 mph)
	4 → 3	124 to 135 km/h (77 to 84 mph)
	3 → 2	90 to 83 km/h (56 to 51 mph)
	2 → 1	44 to 38 km/h (27 to 24 mph)
3 position (Throttle valve fully opened)	1 → 2	49 to 61 km/h (30 to 38 mph)
	2 → 3	96 to 107 km/h (59 to 66 mph)
	4 → 3	133 to 145 km/h (82 to 90 mph)
	3 → 2	90 to 83 km/h (56 to 51 mph)
	2 → 1	44 to 38 km/h (27 to 24 mph)
2 position (Throttle valve fully opened)	1 → 2	49 to 61 km/h (30 to 38 mph)
	3 → 2	99 to 88 km/h (61 to 54 mph)
	2 → 1	44 to 38 km/h (27 to 24 mph)
L position (Throttle valve fully opened)	2 → 1	48 to 42 km/h (30 to 26 mph)
Lock-up point		

D position (Throttle valve opening 5 %)	5th gear (Lock-up ON)	57 to 63 km/h (35 to 39 mph)
	5th gear (Lock-up OFF)	56 to 49 km/h (35 to 30 mph)
4 position (Throttle valve opening 5 %)	4th gear (Lock-up ON)	59 to 53 km/h (37 to 33 mph)
	4th gear (Lock-up OFF)	46 to 52 km/h (28 to 32 mph)

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Park/neutral position switch x Automatic transmission (For nut)	6.9	70	61 in.*lbf
Park/neutral position switch x Automatic transmission (For bolt)	13	130	9.0
Transmission control cable x Automatic transmission	14	143	10
Engine mounting insulator rear No. 1 x Automatic transmission	65	663	48
Automatic transmission x Engine (For bolt A)	71	720	53
Automatic transmission x Engine (For bolt B)	37	380	27
Torque converter clutch x Drive plate	48	489	35
Oil cooler tube clamp x Engine (For bolt A)	12	122	9.0
Oil cooler tube clamp x Engine (For bolt B)	5.0	50	43 in.*lbf
Oil cooler outlet tube No. 1 x Automatic transmission	34	350	25
Oil cooler inlet tube No. 1 x Automatic transmission	34	350	25
Transmission revolution sensor x Automatic transmission	5.4	55	48 in.*lbf
Drain plug x Oil pan	28	285	21
Transmission wire set bolt x Automatic transmission	5.4	55	48 in.*lbf
Transmission wire clamp x Valve body (A)	11	110	8.0
Transmission wire clamp x Valve body (B)	10	100	7.0
Oil strainer x Valve body	10	100	7.0
Oil pan x Transmission case	4.4	45	39 in.*lbf
Shift solenoid valve S1 x Valve body	6.4	65	56 in.*lbf
Shift solenoid valve S2 x Valve body	10	100	7.0
Shift solenoid valve SR x Valve body	6.4	65	56 in.*lbf
Shift solenoid valve SLU, SL2 x Valve body	6.4	65	56 in.*lbf
Shift solenoid valve SLT, SL1 x Valve body	6.4	65	56 in.*lbf
Valve body x Transmission case	11	110	8.0
Floor shift assembly x Body	14	143	10
Overflow plug x Automatic transmission	20	204	15
Refill plug x Automatic transmission	39	400	29
Frame crossmember sub-assembly No. 3 x Body	40	408	30
Frame crossmember sub-assembly No. 3 x Engine mounting insulator No. 1	19	189	14
Battery x Negative battery terminal	3.9	40	35 in.*lbf
Transmission control cable bracket No. 1 x Automatic transmission	28	286	21
Manifold stay No. 2 x Automatic transmission	40	408	30
Manifold stay x Automatic transmission	40	408	30
Oil with hose cooler x Body	5.0	51	44 in.*lbf
Transmission control cable x Body	5.5	56	49 in.*lbf

CLUTCH

SERVICE DATA

Pedal height from asphalt sheet	-	168.5 to 178.5 mm (6.634 to 7.028 in.)
Clutch pedal free play	-	5.0 to 15.0 mm (0.197 to 0.591 in.)
Clutch pedal push rod play at pedal top	-	1.0 to 5.0 mm (0.039 to 0.197 in.)
Disc rivet head depth	Maximum	0.3 mm (0.012 in.)
Flywheel sub-assembly runout	Maximum	0.1 mm (0.004 in.)
Clutch release point from pedal full stroke end position	-	25 mm (0.984 in.) or more
Clutch cover	Minimum depth	0.5 mm (0.020 in.)
	Minimum width	6.0 mm (0.236 in.)
Clutch disc runout	Minimum	1.0 mm (0.039 in.)
Clutch start cancel switch Resistance	S/W OFF 2 - 4 2 - 4 (Apply battery voltage to terminals 1 and 3) S/W ON 2 - 4 (Apply battery voltage to terminals 1 and 3)	10 k Ω or higher 10 k Ω or higher Below 1 Ω

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TORQUE SPECIFICATIONS

Part tightened	N*m	kgf*cm	ft.*lbf
Clutch pedal sub-assembly x Clutch pedal support	34	347	25
Clutch pedal support set bolt x Body for bolt	24	245	18
Clutch pedal support set bolt x Body for nut	14	145	10
Clutch master cylinder assembly x Clutch pedal support	16	158	11
Clutch master cylinder assembly x Clutch master cylinder to 2 way tube	15	155	11
Release cylinder bleeder plug x Clutch release cylinder assembly	11	110	8.0
Clutch release cylinder assembly x Transmission housing	12	120	8.7
Clutch release cylinder assembly x Clutch master cylinder to 2 way tube	15	155	11
Clutch release cylinder assembly x Clutch master cylinder to 2 way tube bracket	12	120	8.7
Clutch cover assembly x Flywheel sub-assembly	19	195	14
Release fork support x Transmission assembly	47	479	35
Clutch start switch assembly x Clutch pedal support	16	160	12
Clutch housing cover No. 1 x Transmission housing	12	120	8.7
Flywheel x Crankshaft 1st 2nd	27 Turn 90 °	270 Turn 90°	20 Turn 90 °
Clutch accumulator x Transmission housing	12	120	8.7
Clutch accumulator x Flexible hose tube	15	155	11

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R155 MANUAL TRANSMISSION

SERVICE DATA

Synchronizer ring outer No. 3 to gear spline piece No. 5 clearance	STD	0.68 to 1.32 mm (0.0267 to 0.0610 in.)
Hub sleeve No. 3 to shift fork No. 3 clearance	STD	0.62 to 0.84 mm (0.0102 to 0.0331 in.)
Counter 5th gear inner diameter	STD Max.	38.015 to 38.040 mm (1.4967 to 1.4976 in.) 38.040 mm (1.4976 in.)
Reverse idler gear inner diameter	STD Max.	24.040 to 24.061 mm (0.9465 to 0.9473 in.) 24.061 mm (0.9473 in.)
Reverse idler gear shaft outer diameter	STD Min.	23.979 to 24.000 mm (0.9441 to 0.9449 in.) 23.979 mm (0.9441 in.)
Reverse idler gear to reverse idler gear shaft clearance	STD	0.040 to 0.082 mm (0.0016 to 0.0032 in.)
Reverse idler gear to reverse shift arm	STD	0.05 to 0.35 mm (0.0020 to 0.0138 in.)
Counter gear snap ring thickness Rear	STD Mark A Mark B Mark C Mark D Mark E Mark F Mark G	0.1 mm (0.0039 in.) or less 2.80 to 2.85 mm (0.1102 to 0.1122 in.) 2.85 to 2.90 mm (0.1122 to 0.1142 in.) 2.90 to 2.95 mm (0.1142 to 0.1161 in.) 2.95 to 3.00 mm (0.1161 to 0.1181 in.) 3.00 to 3.05 mm (0.1181 to 0.1201 in.) 3.05 to 3.10 mm (0.1201 to 0.1220 in.) 3.10 to 3.15 mm (0.1220 to 0.1240 in.)
Counter 5th gear thrust clearance	STD	0.10 to 0.35 mm (0.0039 to 0.0138 in.)
Counter 5th gear radial clearance	STD	0.015 to 0.068 mm (0.0006 to 0.0027 in.)
Output shaft snap ring thickness Snap ring	STD Mark A Mark B Mark C Mark D Mark E Mark F Mark G Mark H Mark J Mark K Mark L Mark M Mark N Mark P Mark Q Mark R Mark S	0.10 mm (0.0039 in.) or less 2.65 to 2.70 mm (0.1043 to 0.1063 in.) 2.70 to 2.75 mm (0.1063 to 0.1083 in.) 2.75 to 2.80 mm (0.1083 to 0.1102 in.) 2.80 to 2.85 mm (0.1102 to 0.1122 in.) 2.85 to 2.90 mm (0.1122 to 0.1142 in.) 2.90 to 2.95 mm (0.1142 to 0.1161 in.) 2.95 to 3.00 mm (0.1161 to 0.1181 in.) 3.00 to 3.05 mm (0.1181 to 0.1201 in.) 3.05 to 3.10 mm (0.1201 to 0.1220 in.) 3.10 to 3.15 mm (0.1220 to 0.1240 in.) 3.15 to 3.20 mm (0.1240 to 0.1260 in.) 3.20 to 3.25 mm (0.1260 to 0.1280 in.) 3.25 to 3.30 mm (0.1280 to 0.1299 in.) 3.30 to 3.35 mm (0.1299 to 0.1319 in.) 3.35 to 3.40 mm (0.1319 to 0.1339 in.) 3.40 to 3.45 mm (0.1339 to 0.1358 in.) 3.45 to 3.50 mm (0.1358 to 0.1378 in.)
Front bearing retainer oil seal drive in depth	-	11.2 to 12.2 mm (0.4409 to 0.4803 in.)
Extension housing oil seal drive in depth	-	- 0.5 to 0.5 mm (- 0.020 to 0.020 in.)
Transfer adapter oil sea drive in depth	-	45.4 to 46.4 mm (1.7874 to 1.8268 in.)
Synchronizer ring No. 2 to input shaft clearance	STD	0.70 to 1.70 mm (0.0276 to 0.0669 in.)
Input shaft snap ring thickness Snap ring	STD Mark A Mark B Mark C Mark D Mark E Mark F Mark G	0.1 mm (0.0039 in.) or less 2.10 to 2.15 mm (0.0827 to 0.0846 in.) 2.15 to 2.20 mm (0.0846 to 0.0866 in.) 2.20 to 2.25 mm (0.0866 to 0.0886 in.) 2.25 to 2.30 mm (0.0886 to 0.0906 in.) 2.30 to 2.35 mm (0.0906 to 0.0925 in.) 2.35 to 2.40 mm (0.0925 to 0.0945 in.) 2.40 to 2.45 mm (0.0945 to 0.0965 in.)
1st gear thrust clearance	STD	0.20 to 0.45 mm (0.0079 to 0.0177 in.)
2nd gear thrust clearance	STD	0.10 to 0.25 mm (0.0039 to 0.0098 in.)
3rd gear thrust clearance	STD	0.10 to 0.25 mm (0.0039 to 0.0098 in.)
1st gear radial clearance	STD	0.020 to 0.073 mm (0.0008 to 0.0029 in.)
2nd gear radial clearance	STD	0.015 to 0.068 mm (0.0006 to 0.0027 in.)

3rd gear radial clearance	STD	0.015 to 0.068 mm (0.0006 to 0.0027 in.)
Output shaft circle runout	Max.	0.03 mm (0.0012 in.)
Output shaft outer diameter	(A) STD (B) STD (C) STD (A) Min. (B) Min. (C) Min.	38.979 to 38.995 mm (1.5334 to 1.5352 in.) 46.984 to 47.000 mm (1.8498 to 1.8504 in.) 37.984 to 38.000 mm (1.4954 to 1.4961 in.) 38.979 mm (1.5334 in.) 46.984 mm (1.8498 in.) 37.984 mm (1.4954 in.)
Output shaft flange	STD	4.8 to 5.2 mm (0.1890 to 0.2047 in.)
3rd gear inner diameter	STD Max.	44.015 to 44.040 mm (1.7329 to 1.7339 in.) 44.040 mm (1.7339 in.)
2nd gear inner diameter	STD Max.	53.015 to 53.040 mm (2.0872 to 2.0881 in.) 53.040 mm (2.0881 in.)
1st gear inner diameter	STD Max.	46.015 to 46.046 mm (1.812 to 1.8126 in.) 46.040 mm (1.8126 in.)
1st gear thrust washer thickness	STD	5.95 to 6.05 mm (0.2346 to 0.2382 in.)
Synchronizer ring set No. 1 to 1st gear clearance	STD	0.75 to 1.65 mm (0.0295 to 0.0649 in.)
Synchronizer ring set No. 1 to 2nd gear clearance	STD	0.65 to 1.75 mm (0.0256 to 0.0689 in.)
Synchronizer ring No. 2 to 3rd gear clearance	STD	0.75 to 1.65 mm (0.0295 to 0.0649 in.)
Reverse gear to shift fork No. 1	STD	0.15 to 0.41 mm (0.0060 to 0.0161 in.)
Hub sleeve No. 2 to shift fork No. 2 clearance	STD	0.15 to 0.35 mm (0.0059 to 0.0138 in.)
Output shaft snap ring thickness (clutch hub No. 2) Snap ring	STD Mark A Mark B Mark C Mark D Mark E Mark F Mark G	0.1 mm (0.0039 in.) or less 1.80 to 1.85 mm (0.0709 to 0.0728 in.) 1.85 to 1.90 mm (0.0728 to 0.0748 in.) 1.90 to 1.95 mm (0.0748 to 0.0768 in.) 1.95 to 2.00 mm (0.0768 to 0.0787 in.) 2.00 to 2.05 mm (0.0787 to 0.0807 in.) 2.05 to 2.10 mm (0.0807 to 0.0827 in.) 2.10 to 2.15 mm (0.0827 to 0.0846 in.)
Output shaft snap ring thickness Clutch hub No. 1	STD Mark A Mark B Mark C Mark D Mark E Mark F Mark G	0.1 mm (0.0039 in.) or less 2.30 to 2.35 mm (0.0906 to 0.0925 in.) 2.35 to 2.40 mm (0.0925 to 0.0945 in.) 2.40 to 2.45 mm (0.0945 to 0.0965 in.) 2.45 to 2.50 mm (0.0965 to 0.0984 in.) 2.50 to 2.55 mm (0.0984 to 0.1004 in.) 2.55 to 2.60 mm (0.1004 to 0.1024 in.) 2.60 to 2.65 mm (0.1024 to 0.1043 in.)

TORQUE SPECIFICATIONS

Part tightened	N*m	kgf*cm	ft.*lbf
Manual transmission unit assembly x Engine Bolt A	72	730	53
Manual transmission unit assembly x Engine Bolt B and C	37	379	27
Engine mount insulator rear No. 1 x Manual transmission unit assembly	65	663	48
Frame crossmember No. 3 x Engine mount insulator rear No. 1	19	189	14
Frame crossmember No. 3 x Frame	40	408	30
Starter assembly x Manual transmission unit assembly	37	377	27
Clutch release cylinder assembly x Manual transmission unit assembly	12	122	9
Manifold stay x Manual transmission unit assembly Bolt A	72	730	53
Manifold stay x Manual transmission unit assembly Bolt B	44	449	33
Manifold stay x Exhaust manifold	30	306	22
Exhaust pipe assembly front x Exhaust manifold	43	438	32
Exhaust pipe assembly front x Exhaust tail pipe	48	489	35
Propeller shaft x Rear differential	88	899	65
Propeller shaft center bearing x Frame	36	369	27
Engine under cover sub-assembly No. 2 x Frame	30	306	22
Manual transmission filler plug x Manual transmission case	37	380	27
Manual transmission drain plug x Manual transmission case	37	380	27
Release fork support x Clutch housing	47	480	35
Clutch housing x Manual transmission case	36	370	27
Back up light switch x Manual transmission case	44	450	32
Speedometer sensor x Extension housing	11	112	8
Reverse restrict pin assembly x Extension housing	37	380	27
Floor shift control shift lever retainer x Extension housing	18	185	13
Shift lever housing x Shift and select lever shaft	33	340	25
Manual transmission case x Extension housing	37	380	27
Reverse restrict pin plug x Extension housing	18.5	189	14
Oil receiver pipe x Extension housing	11	112	8
Front bearing retainer x Manual transmission case	46.5	168	12
Shift detent ball spring seat x Intermediate plate	18.5	189	14
Shift fork set bolt x Shift fork shaft	195	199	14
Reverse shift arm bracket x Intermediate plate	18	185	13
Output shaft rear bearing retainer x Intermediate plate	18	185	13

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SERVICE DATA

Synchronizer ring outer No. 3 to gear spline piece No. 5 clearance	STD	0.68 to 1.32 mm (0.0267 to 0.0610 in.)
Hub sleeve No. 3 to shift fork No. 3 clearance	STD	0.62 to 0.84 mm (0.0102 to 0.0331 in.)
Counter 5th gear inner diameter	STD Max.	38.015 to 38.040 mm (1.4967 to 1.4976 in.) 38.040 mm (1.4976 in.)
Reverse idler gear inner diameter	STD Max.	24.040 to 24.061 mm (0.9465 to 0.9473 in.) 24.061 mm (0.9473 in.)
Reverse idler gear shaft outer diameter	STD Min.	23.979 to 24.000 mm (0.9441 to 0.9449 in.) 23.979 mm (0.9441 in.)
Reverse idler gear to reverse idler gear shaft clearance	STD	0.040 to 0.082 mm (0.0016 to 0.0032 in.)
Reverse idler gear to reverse shift arm	STD	0.05 to 0.35 mm (0.0020 to 0.0138 in.)
Counter gear snap ring thickness Rear	STD Mark A Mark B Mark C Mark D Mark E Mark F Mark G	0.1 mm (0.0039 in.) or less 2.80 to 2.85 mm (0.1102 to 0.1122 in.) 2.85 to 2.90 mm (0.1122 to 0.1142 in.) 2.90 to 2.95 mm (0.1142 to 0.1161 in.) 2.95 to 3.00 mm (0.1161 to 0.1181 in.) 3.00 to 3.05 mm (0.1181 to 0.1201 in.) 3.05 to 3.10 mm (0.1201 to 0.1220 in.) 3.10 to 3.15 mm (0.1220 to 0.1240 in.)
Counter 5th gear thrust clearance	STD	0.10 to 0.35 mm (0.0039 to 0.0138 in.)
Counter 5th gear radial clearance	STD	0.015 to 0.068 mm (0.0006 to 0.0027 in.)
Output shaft snap ring thickness Snap ring	STD Mark A Mark B Mark C Mark D Mark E Mark F Mark G Mark H Mark J Mark K Mark L Mark M Mark N Mark P Mark Q Mark R Mark S	0.1 mm (0.0039 in.) or less 2.65 to 2.70 mm (0.1043 to 0.1063 in.) 2.70 to 2.75 mm (0.1063 to 0.1083 in.) 2.75 to 2.80 mm (0.1083 to 0.1102 in.) 2.80 to 2.85 mm (0.1102 to 0.1122 in.) 2.85 to 2.90 mm (0.1122 to 0.1142 in.) 2.90 to 2.95 mm (0.1142 to 0.1161 in.) 2.95 to 3.00 mm (0.1161 to 0.1181 in.) 3.00 to 3.05 mm (0.1181 to 0.1201 in.) 3.05 to 3.10 mm (0.1201 to 0.1220 in.) 3.10 to 3.15 mm (0.1220 to 0.1240 in.) 3.15 to 3.20 mm (0.1240 to 0.1260 in.) 3.20 to 3.25 mm (0.1260 to 0.1280 in.) 3.25 to 3.30 mm (0.1280 to 0.1299 in.) 3.30 to 3.35 mm (0.1299 to 0.1319 in.) 3.35 to 3.40 mm (0.1319 to 0.1339 in.) 3.40 to 3.45 mm (0.1339 to 0.1358 in.) 3.45 to 3.50 mm (0.1358 to 0.1378 in.)
Front bearing retainer oil seal drive in depth	-	11.2 to 12.2 mm (0.4409 to 0.4803 in.)
Extension housing oil seal drive in depth	-	- 0.5 to 0.5 mm (- 0.020 to 0.020 in.)
Transfer adapter oil sea drive in depth	-	45.4 to 46.4 mm (1.7874 to 1.8268 in.)
Synchronizer ring No. 2 to input shaft clearance	STD	0.70 to 1.70 mm (0.0276 to 0.0669 in.)
Input shaft snap ring thickness Snap ring	STD Mark A Mark B Mark C Mark D Mark E Mark F Mark G	0.1 mm (0.0039 in.) or less 2.10 to 2.15 mm (0.0827 to 0.0846 in.) 2.15 to 2.20 mm (0.0846 to 0.0866 in.) 2.20 to 2.25 mm (0.0866 to 0.0886 in.) 2.25 to 2.30 mm (0.0886 to 0.0906 in.) 2.30 to 2.35 mm (0.0906 to 0.0925 in.) 2.35 to 2.40 mm (0.0925 to 0.0945 in.) 2.40 to 2.45 mm (0.0945 to 0.0965 in.)
1st gear thrust clearance	STD	0.20 to 0.45 mm (0.0079 to 0.0177 in.)
2nd gear thrust clearance	STD	0.10 to 0.25 mm (0.0039 to 0.0098 in.)
3rd gear thrust clearance	STD	0.10 to 0.25 mm (0.0039 to 0.0098 in.)
1st gear radial clearance	STD	0.020 to 0.073 mm (0.0008 to 0.0029 in.)
2nd gear radial clearance	STD	0.015 to 0.068 mm (0.0006 to 0.0027 in.)
3rd gear radial clearance	STD	0.015 to 0.068 mm (0.0006 to 0.0027 in.)

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Output shaft circle runout	Max.	0.03 mm (0.0012 in.)
Output shaft outer diameter	(A) STD (B) STD (C) STD (A) Min. (B) Min. (C) Min.	38.979 to 38.995 mm (1.5334 to 1.5352 in.) 46.984 to 47.000 mm (1.8498 to 1.8504 in.) 37.984 to 38.000 mm (1.4954 to 1.4961 in.) 38.979 mm (1.5334 in.) 46.984 mm (1.8498 in.) 37.984 mm (1.4954 in.)
Output shaft flange	STD	4.8 to 5.2 mm (0.1890 to 0.2047 in.)
3rd gear inner diameter	STD Max.	44.015 to 44.040 mm (1.7329 to 1.7339 in.) 44.040 mm (1.7339 in.)
2nd gear inner diameter	STD Max.	53.015 to 53.040 mm (2.0872 to 2.0881 in.) 53.040 mm (2.0881 in.)
1st gear inner diameter	STD Max.	46.015 to 46.046 mm (1.812 to 1.8126 in.) 46.040 mm (1.8126 in.)
1st gear thrust washer thickness	STD	5.95 to 6.05 mm (0.2346 to 0.2382 in.)
Synchronizer ring set No. 1 to 1st gear clearance	STD	0.75 to 1.65 mm (0.0295 to 0.0649 in.)
Synchronizer ring set No. 1 to 2nd gear clearance	STD	0.65 to 1.75 mm (0.0256 to 0.0689 in.)
Synchronizer ring No. 2 to 3rd gear clearance	STD	0.75 to 1.65 mm (0.0295 to 0.0649 in.)
Reverse gear to shift fork No. 1	STD	0.15 to 0.41 mm (0.0060 to 0.0161 in.)
Hub sleeve No. 2 to shift fork No. 2 clearance	STD	0.15 to 0.35 mm (0.0059 to 0.0138 in.)
Output shaft snap ring thickness (clutch hub No. 2) Snap ring	STD Mark A Mark B Mark C Mark D Mark E Mark F Mark G	0.1 mm (0.0039 in.) or less 1.80 to 1.85 mm (0.0709 to 0.0728 in.) 1.85 to 1.90 mm (0.0728 to 0.0748 in.) 1.90 to 1.95 mm (0.0748 to 0.0768 in.) 1.95 to 2.00 mm (0.0768 to 0.0787 in.) 2.00 to 2.05 mm (0.0787 to 0.0807 in.) 2.05 to 2.10 mm (0.0807 to 0.0827 in.) 2.10 to 2.15 mm (0.0827 to 0.0846 in.)
Output shaft snap ring thickness (clutch hub No. 1)	STD Mark A Mark B Mark C Mark D Mark E Mark F Mark G	0.1 mm (0.0039 in.) or less 2.30 to 2.35 mm (0.0906 to 0.0925 in.) 2.35 to 2.40 mm (0.0925 to 0.0945 in.) 2.40 to 2.45 mm (0.0945 to 0.0965 in.) 2.45 to 2.50 mm (0.0965 to 0.0984 in.) 2.50 to 2.55 mm (0.0984 to 0.1004 in.) 2.55 to 2.60 mm (0.1004 to 0.1024 in.) 2.60 to 2.65 mm (0.1024 to 0.1043 in.)

TORQUE SPECIFICATIONS

Part tightened	N*m	kgf*cm	ft.*lbf
Manual transmission unit assembly x Engine Bolt A	72	730	53
Manual transmission unit assembly x Engine Bolt B and C	37	379	27
Engine mount insulator rear No. 1 x Manual transmission unit assembly	65	663	48
Frame crossmember No. 3 x Engine mount insulator rear No. 1	19	189	14
Frame crossmember No. 3 x Frame	40	408	30
Starter assembly x Manual transmission unit assembly	37	377	27
Clutch release cylinder assembly x Manual transmission unit assembly	12	122	9
Manifold stay x Manual transmission unit assembly Bolt A	72	730	53
Manifold stay x Manual transmission unit assembly Bolt B	44	449	33
Manifold stay x Exhaust manifold	30	306	22
Exhaust pipe assembly front x Exhaust manifold	43	438	32
Exhaust pipe assembly front x Exhaust tail pipe	48	489	35
Propeller shaft x Rear differential	88	899	65
Propeller shaft center bearing x Frame	36	369	27
Propeller shaft assembly front x Front differential	88	899	65
Engine under cover sub-assembly No. 2 x Frame	30	306	22
Manual transmission unit assembly x Transfer	24	240	17
Manual transmission filler plug x Manual transmission case	37	380	27
Manual transmission drain plug x Manual transmission case	37	380	27
Release fork support x Clutch housing	47	480	35
Clutch housing x Manual transmission case	36	370	27
Back up light switch x Manual transmission case	44	450	32
Reverse restrict pin assembly x Transfer adaptor	37	380	27
Floor shift control shift lever retainer x Transfer adaptor	18	185	13
Shift lever housing x Shift and select lever shaft	33	340	25
Manual transmission case x Transfer adaptor	37	380	27
Reverse restrict pin plug x Transfer adaptor	18.5	189	14
Front bearing retainer x Manual transmission case	46.5	168	12
Shift detent ball spring seat x Intermediate plate	18.5	189	14
Shift fork set bolt x Shift fork shaft	195	199	14
Reverse shift arm bracket x Intermediate plate	18	185	13
Output shaft rear bearing retainer x Intermediate plate	18	185	13

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RA60 MANUAL TRANSMISSION

SERVICE DATA

Reverse idler gear thrust clearance	STD: MAX:	0.10 to 0.55 mm (0.0039 to 0.0217 in.) 0.55 mm (0.0217 in.)
Reverse idler gear radial clearance	STD: MAX:	0.015 to 0.050 mm (0.0006 to 0.0020 in.) 0.050 mm (0.0020 in.)
Slotted pin drive in depth	-	0 to 0.5 mm (0 to 0.050 in.)
Transmission case oil seal dimension A	-	60.0 to 60.8 mm (2.362 to 2.394 in.)
Preload	-	0.45 to 1.35 N*m (4.59 to 13.77 kgf*cm, 3.98 to 11.95 in.*lbf)
Manual Transmission extension housing oil seal dimension A	-	- 0.5 to 0.5 mm (- 0.197 to 0.197 in.)
6th gear thrust clearance	-	0.20 to 0.49 mm (0.0079 to 0.0193 in.)
3rd gear thrust clearance	-	0.09 to 0.52 mm (0.0035 to 0.0205 in.)
4th gear thrust clearance	-	0.12 to 0.38 mm (0.0047 to 0.0150 in.)
6th gear radial clearance	-	0.015 to 0.065 mm (0.0006 to 0.0026 in.)
3rd gear radial clearance	-	0.015 to 0.067 mm (0.0006 to 0.0026 in.)
4th gear radial clearance	-	0.015 to 0.067 mm (0.0006 to 0.0026 in.)
Input shaft runout	MAX:	0.03 mm (0.0012 in.)
Input shaft outer diameter	STD: A B C D E MIN: A B C D E	34.002 to 34.015 mm (1.3387 to 1.3392 in.) 44.985 to 45.000 mm (1.7711 to 1.7717 in.) 44.985 to 45.000 mm (1.7711 to 1.7717 in.) 41.985 to 42.000 mm (1.6530 to 1.6535 in.) 32.967 to 32.980 mm (1.2979 to 1.2984 in.) 34.002 mm (1.3387 in.) 44.985 mm (1.7711 in.) 44.985 mm (1.7711 in.) 41.985 mm (1.6530 in.) 32.967 mm (1.2979 in.)
6th gear inside diameter	STD: MAX:	51.015 to 51.040 mm (2.0085 to 2.0095 in.) 51.015 to 51.040 mm (2.0085 to 2.0095 in.)
3rd gear inside diameter	STD: MAX:	51.015 to 51.040 mm (2.0085 to 2.0095 in.) 51.040 mm (2.0095 in.)
4th gear inside diameter	STD: MAX:	51.015 to 51.040 mm (2.0085 to 2.0095 in.) 51.040 mm (2.0095 in.)
Gear shift fork No. 2 or No. 3 claw and glove of the transmission hub sleeve No. 2 clearance	-	0.26 to 0.84 mm (0.0102 to 0.0331 in.)
6th gear synchronizer ring back and 6th gear spline end clearance	STD: MIN:	0.70 to 1.50 mm (0.0276 to 0.0591 in.) 0.70 mm (0.0276 in.)
3rd gear synchronizer ring back and 3rd gear spline end clearance	STD: Inner Middle Outer MIN: Inner Middle Outer	1.20 to 2.20 mm (0.0472 to 0.0866 in.) 0.60 to 1.80 mm (0.0236 to 0.0709 in.) 0.80 to 1.80 mm (0.0315 to 0.0709 in.) 1.20 mm (0.0472 in.) 0.60 mm (0.0236 in.) 0.80 mm (0.0315 in.)
6th gear synchronizer ring back and 6th gear spline end clearance	STD: MIN:	0.70 to 1.50 mm (0.0276 to 0.0591 in.) 0.70 mm (0.0276 in.)
3rd gear thrust washer thickness	STD: MIN:	7.12 to 7.18 mm (0.2803 to 0.2827 in.) 7.12 mm (0.2803 in.)
Input shaft front bearing snap ring	Mark A B C D E F	2.65 to 2.70 mm (0.1043 to 0.1063 in.) 2.70 to 2.75 mm (0.1063 to 0.1083 in.) 2.75 to 2.80 mm (0.1083 to 0.1102 in.) 2.80 to 2.85 mm (0.1102 to 0.1122 in.) 2.85 to 2.90 mm (0.1122 to 0.1142 in.) 2.90 to 2.95 mm (0.1142 to 0.1161 in.)

Clutch hub No. 2 setting shaft snap ring	Mark A B C D E F G	1.77 to 1.82 mm (0.0697 to 0.0717 in.) 1.82 to 1.87 mm (0.0717 to 0.0736 in.) 1.87 to 1.92 mm (0.0736 to 0.0756 in.) 1.92 to 1.97 mm (0.0756 to 0.0776 in.) 1.97 to 2.02 mm (0.0776 to 0.0795 in.) 2.02 to 2.07 mm (0.0795 to 0.0815 in.) 2.07 to 2.12 mm (0.0815 to 0.0835 in.)
Gear thrust washer shaft snap ring	Mark A B C D E F	2.07 to 2.12 mm (0.0815 to 0.0835 in.) 2.12 to 2.17 mm (0.0835 to 0.0854 in.) 2.17 to 2.22 mm (0.0854 to 0.0874 in.) 2.22 to 2.27 mm (0.0874 to 0.0894 in.) 2.27 to 2.32 mm (0.0894 to 0.0913 in.) 2.32 to 2.37 mm (0.0913 to 0.0933 in.)
Transmission clutch hub No. 3 shaft snap ring	Mark A B C D E F G	2.10 to 2.15 mm (0.0827 to 0.0847 in.) 2.15 to 2.20 mm (0.0847 to 0.0866 in.) 2.20 to 2.25 mm (0.0866 to 0.0886 in.) 2.25 to 2.30 mm (0.0886 to 0.0906 in.) 2.30 to 2.35 mm (0.0906 to 0.0925 in.) 2.35 to 2.40 mm (0.0925 to 0.0945 in.) 2.40 to 2.45 mm (0.0945 to 0.0965 in.)
Output shaft inside diameter	STD: MAX:	45.009 to 45.025 mm (1.7720 to 1.7726 in.) 45.025 mm (1.7726 in.)
Synchronizer ring back and gear spline end clearance	STD: MIN:	0.70 to 1.50 mm (0.0276 to 0.0591 in.) 0.70 mm (0.0276 in.)
Reverse gear thrust clearance	-	0.12 to 0.37 mm (0.0047 to 0.0146 in.)
1st gear thrust clearance	-	0.10 to 0.43 mm (0.0039 to 0.0169 in.)
2nd gear thrust clearance	-	0.10 to 0.43 mm (0.0039 to 0.0169 in.)
Reverse gear radial clearance	-	0.015 to 0.065 mm (0.0006 to 0.0026 in.)
1st gear radial clearance	-	0.015 to 0.067 mm (0.0006 to 0.0026 in.)
2nd gear radial clearance	-	0.015 to 0.067 mm (0.0006 to 0.0026 in.)
Counter gear runout	MAX:	0.03 mm (0.0012 in.)
Counter gear outer diameter	STD: A B C D E MIN: A B C D E	34.002 to 34.015 mm (1.3387 to 1.3392 in.) 36.985 to 37.000 mm (1.4561 to 1.4567 in.) 47.985 to 48.000 mm (1.8892 to 1.8898 in.) 53.985 to 54.000 mm (2.1254 to 2.1260 in.) 34.002 to 34.015 mm (1.3387 to 1.3392 in.) 34.002 mm (1.3387 in.) 36.985 mm (1.4561 in.) 47.985 mm (1.8892 in.) 53.985 mm (2.1254 in.) 34.002 mm (1.3387 in.)
Reverse gear inside diameter	STD: MAX:	51.015 to 51.040 mm (2.0085 to 2.0095 in.) 51.040 mm (2.0095 in.)
1st gear inside diameter	STD: MAX:	54.015 to 54.040 mm (2.1266 to 2.1276 in.) 54.040 mm (2.1276 in.)
2nd gear inside diameter	STD: MAX:	60.015 to 60.040 mm (2.3628 to 2.3638 in.) 60.040 mm (2.3638 in.)
Gear shift fork No. 4 claw and glove of the transmission hub sleeve No. 3 clearance	-	0.26 to 0.84 mm (0.0102 to 0.0331 in.)
Gear shift fork No. 1 claw and glove of the transmission hub sleeve No. 1 clearance	-	0.15 to 0.35 mm (0.0059 to 0.0138 in.)
Reverse gear synchronizer ring back and reverse gear spline end clearance	STD: MIN:	0.70 to 1.30 mm (0.0276 to 0.0512 in.) 0.70 mm (0.0276 in.)
1st gear synchronizer ring back and 1st gear spline end clearance	STD: Inner Middle Outer MIN: Inner Middle Outer	1.48 to 2.12 mm (0.0583 to 0.0835 in.) 0.68 to 1.92 mm (0.0268 to 0.0756 in.) 0.88 to 1.72 mm (0.0346 to 0.0677 in.) 1.48 mm (0.0583 in.) 0.68 mm (0.0268 in.) 0.88 mm (0.0346 in.)

2nd gear synchronizer ring back and 2nd gear spline end clearance	STD: Inner Middle Outer MIN: Inner Middle Outer	1.48 to 2.12 mm (0.0583 to 0.0835 in.) 0.68 to 1.92 mm (0.0268 to 0.0756 in.) 0.88 to 1.72 mm (0.0346 to 0.0677 in.) 1.48 mm (0.0583 in.) 0.68 mm (0.0268 in.) 0.88 mm (0.0346 in.)
Counter gear rear bearing snap ring	Mark A B C D E F G H J K L M	2.35 to 2.40 mm (0.0925 to 0.0945 in.) 2.40 to 2.45 mm (0.0945 to 0.0965 in.) 2.45 to 2.50 mm (0.0965 to 0.0984 in.) 2.50 to 2.55 mm (0.0984 to 0.1004 in.) 2.55 to 2.60 mm (0.1004 to 0.1024 in.) 2.60 to 2.65 mm (0.1024 to 0.1043 in.) 2.65 to 2.70 mm (0.1043 to 0.1063 in.) 2.70 to 2.75 mm (0.1063 to 0.1083 in.) 2.75 to 2.80 mm (0.1083 to 0.1102 in.) 2.80 to 2.85 mm (0.1102 to 0.1122 in.) 2.85 to 2.90 mm (0.1122 to 0.1142 in.) 2.90 to 2.95 mm (0.1142 to 0.1161 in.)
Clutch hub No. 1 shaft snap ring	Mark A B C D E F G	2.28 to 2.33 mm (0.0898 to 0.0917 in.) 2.33 to 2.38 mm (0.0917 to 0.0937 in.) 2.38 to 2.43 mm (0.0937 to 0.0957 in.) 2.43 to 2.48 mm (0.0957 to 0.0976 in.) 2.48 to 2.53 mm (0.0976 to 0.0996 in.) 2.53 to 2.58 mm (0.0996 to 0.1016 in.) 2.58 to 2.63 mm (0.1016 to 0.1035 in.)
Counter gear front bearing snap ring	Mark A B C D E F G H J K L M	2.35 to 2.40 mm (0.0925 to 0.0945 in.) 2.40 to 2.45 mm (0.0945 to 0.0965 in.) 2.45 to 2.50 mm (0.0965 to 0.0984 in.) 2.50 to 2.55 mm (0.0984 to 0.1004 in.) 2.55 to 2.60 mm (0.1004 to 0.1024 in.) 2.60 to 2.65 mm (0.1024 to 0.1043 in.) 2.65 to 2.70 mm (0.1043 to 0.1063 in.) 2.70 to 2.75 mm (0.1063 to 0.1083 in.) 2.75 to 2.80 mm (0.1083 to 0.1102 in.) 2.80 to 2.85 mm (0.1102 to 0.1122 in.) 2.85 to 2.90 mm (0.1122 to 0.1142 in.) 2.90 to 2.95 mm (0.1142 to 0.1161 in.)

TORQUE SPECIFICATIONS

Part tightened	N*m	kgf*cm	ft.*lbf
Transmission filler plug x Manual transmission	37	377	27
Manual transmission case cover x Manual transmission	12	117	8.5
Manual transmission x Engine for bolt A	72	730	53
Manual transmission x Engine for bolt B	37	380	28
Manual transmission x Engine mounting insulator rear No. 1	65	663	48
Frame crossmember sub-assembly No. 3 x Body	40	408	30
Frame crossmember sub-assembly No. 3 x Manual transmission	19	189	14
Manifold stay x Manual transmission	40	408	30
Manifold stay No. 2 x Manual transmission	40	408	30
Battery x Negative battery terminal cable	3.9	40	35 in.*lbf
Gear shift fork No. 2 x Gear shift fork shaft No. 2	20	199	14
Gear shift fork No. 3 x Gear shift fork shaft No. 3	20	199	14
Transmission front case x Plug	39	400	29
Transmission front case x Interlock bracket	21	214	15
Transmission front case x Back up light switch	44	449	33
Shift & select lever x Shift & select lever shaft	33	340	25
Transmission middle case x Drain plug	37	377	27
Transmission front case x Transmission middle case	40	408	30
Reverse idler gear shaft bolt x Reverse idler gear shaft	28	286	21
Transmission oil separator x Transmission middle case	8.5	87	75 in.*lbf
Bearing lock plate x Transmission rear case	11	115	8.3
Transmission rear case x Filler plug	37	377	27
Transmission rear case x Transmission middle case	40	408	30
Transmission rear case x Shift detent ball plug	25	250	18
Transmission rear case x Transmission extension housing	29	296	21
Speedometer x Transmission extension housing	13	133	10
Shift lever housing x Shift & select lever shaft	33	340	25
Floor shift control shift lever retainer sub-assembly x Transmission rear case	20	204	15

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RA60F MANUAL TRANSMISSION

SERVICE DATA

Reverse idler gear thrust clearance	STD: MAX:	0.10 to 0.55 mm (0.0039 to 0.0217 in.) 0.55 mm (0.0217 in.)
Reverse idler gear radial clearance	STD: MAX:	0.015 to 0.050 mm (0.0006 to 0.0020 in.) 0.050 mm (0.0020 in.)
Slotted pin drive in depth	-	0 to 0.5 mm (0 to 0.050 in.)
Transmission case oil seal dimension A	-	60.0 to 60.8 mm (2.362 to 2.394 in.)
Preload	-	0.45 to 1.35 N*m (4.59 to 13.77 kgf*cm, 3.98 to 11.95 in.*lbf)
Manual Transmission extension housing oil seal dimension A	-	- 0.5 to 0.5 mm (- 0.197 to 0.197 in.)
6th gear thrust clearance	-	0.20 to 0.49 mm (0.0079 to 0.0193 in.)
3rd gear thrust clearance	-	0.09 to 0.52 mm (0.0035 to 0.0205 in.)
4th gear thrust clearance	-	0.12 to 0.38 mm (0.0047 to 0.0150 in.)
6th gear radial clearance	-	0.015 to 0.065 mm (0.0006 to 0.0026 in.)
3rd gear radial clearance	-	0.015 to 0.067 mm (0.0006 to 0.0026 in.)
4th gear radial clearance	-	0.015 to 0.067 mm (0.0006 to 0.0026 in.)
Input shaft runout	MAX:	0.03 mm (0.0012 in.)
Input shaft outer diameter	STD: A B C D E MIN: A B C D E	34.002 to 34.015 mm (1.3387 to 1.3392 in.) 44.985 to 45.000 mm (1.7711 to 1.7717 in.) 44.985 to 45.000 mm (1.7711 to 1.7717 in.) 41.985 to 42.000 mm (1.6530 to 1.6535 in.) 32.967 to 32.980 mm (1.2979 to 1.2984 in.) 34.002 mm (1.3387 in.) 44.985 mm (1.7711 in.) 44.985 mm (1.7711 in.) 41.985 mm (1.6530 in.) 32.967 mm (1.2979 in.)
6th gear inside diameter	STD: MAX:	51.015 to 51.040 mm (2.0085 to 2.0095 in.) 51.040 mm (2.0095 in.)
3rd gear inside diameter	STD: MAX:	51.015 to 51.040 mm (2.0085 to 2.0095 in.) 51.040 mm (2.0095 in.)
4th gear inside diameter	STD: MAX:	51.015 to 51.040 mm (2.0085 to 2.0095 in.) 51.040 mm (2.0095 in.)
Gear shift fork No. 2 or No. 3 claw and glove of the transmission hub sleeve No. 2 clearance	-	0.26 to 0.84 mm (0.0102 to 0.0331 in.)
6th gear synchronizer ring back and 6th gear spline end clearance	STD: MIN:	0.70 to 1.50 mm (0.0276 to 0.0591 in.) 0.70 mm (0.0276 in.)
3rd gear synchronizer ring back and 3rd gear spline end clearance	STD: Inner Middle Outer MIN: Inner Middle Outer	1.20 to 2.20 mm (0.0472 to 0.0866 in.) 0.60 to 1.80 mm (0.0236 to 0.0709 in.) 0.80 to 1.80 mm (0.0315 to 0.0709 in.) 1.20 mm (0.0472 in.) 0.60 mm (0.0236 in.) 0.80 mm (0.0315 in.)
6th gear synchronizer ring back and 6th gear spline end clearance	STD: MIN:	0.70 to 1.50 mm (0.0276 to 0.0591 in.) 0.70 mm (0.0276 in.)
3rd gear thrust washer thickness	STD: MIN:	7.12 to 7.18 mm (0.2803 to 0.2827 in.) 7.12 mm (0.2803 in.)
Input shaft front bearing snap ring	Mark A B C D E F	2.65 to 2.70 mm (0.1043 to 0.1063 in.) 2.70 to 2.75 mm (0.1063 to 0.1083 in.) 2.75 to 2.80 mm (0.1083 to 0.1102 in.) 2.80 to 2.85 mm (0.1102 to 0.1122 in.) 2.85 to 2.90 mm (0.1122 to 0.1142 in.) 2.90 to 2.95 mm (0.1142 to 0.1161 in.)

Clutch hub No. 2 setting shaft snap ring	Mark A B C D E F G	1.77 to 1.82 mm (0.0697 to 0.0717 in.) 1.82 to 1.87 mm (0.0717 to 0.0736 in.) 1.87 to 1.92 mm (0.0736 to 0.0756 in.) 1.92 to 1.97 mm (0.0756 to 0.0776 in.) 1.97 to 2.02 mm (0.0776 to 0.0795 in.) 2.02 to 2.07 mm (0.0795 to 0.0815 in.) 2.07 to 2.12 mm (0.0815 to 0.0835 in.)
Gear thrust washer shaft snap ring	Mark A B C D E F	2.07 to 2.12 mm (0.0815 to 0.0835 in.) 2.12 to 2.17 mm (0.0835 to 0.0854 in.) 2.17 to 2.22 mm (0.0854 to 0.0874 in.) 2.22 to 2.27 mm (0.0874 to 0.0894 in.) 2.27 to 2.32 mm (0.0894 to 0.0913 in.) 2.32 to 2.37 mm (0.0913 to 0.0933 in.)
Transmission clutch hub No. 3 shaft snap ring	Mark A B C D E F G	2.10 to 2.15 mm (0.0827 to 0.0847 in.) 2.15 to 2.20 mm (0.0847 to 0.0866 in.) 2.20 to 2.25 mm (0.0866 to 0.0886 in.) 2.25 to 2.30 mm (0.0886 to 0.0906 in.) 2.30 to 2.35 mm (0.0906 to 0.0925 in.) 2.35 to 2.40 mm (0.0925 to 0.0945 in.) 2.40 to 2.45 mm (0.0945 to 0.0965 in.)
Output shaft inside diameter	STD: MAX:	45.009 to 45.025 mm (1.7720 to 1.7726 in.) 45.025 mm (1.7726 in.)
Synchronizer ring back and gear spline end clearance	STD: MIN:	0.70 to 1.50 mm (0.0276 to 0.0591 in.) 0.70 mm (0.0276 in.)
Reverse gear thrust clearance	-	0.12 to 0.37 mm (0.0047 to 0.0146 in.)
1st gear thrust clearance	-	0.10 to 0.43 mm (0.0039 to 0.0169 in.)
2nd gear thrust clearance	-	0.10 to 0.43 mm (0.0039 to 0.0169 in.)
Reverse gear radial clearance	-	0.015 to 0.065 mm (0.0006 to 0.0026 in.)
1st gear radial clearance	-	0.015 to 0.067 mm (0.0006 to 0.0026 in.)
2nd gear radial clearance	-	0.015 to 0.067 mm (0.0006 to 0.0026 in.)
Counter gear runout	MAX:	0.03 mm (0.0012 in.)
Counter gear outer diameter	STD: A B C D E MIN: A B C D E	34.002 to 34.015 mm (1.3387 to 1.3392 in.) 36.985 to 37.000 mm (1.4561 to 1.4567 in.) 47.985 to 48.000 mm (1.8892 to 1.8898 in.) 53.985 to 54.000 mm (2.1254 to 2.1260 in.) 34.002 to 34.015 mm (1.3387 to 1.3392 in.) 34.002 mm (1.3387 in.) 36.985 mm (1.4561 in.) 47.985 mm (1.8892 in.) 53.985 mm (2.1254 in.) 34.002 mm (1.3387 in.)
Reverse gear inside diameter	STD: MAX:	51.015 to 51.040 mm (2.0085 to 2.0095 in.) 51.040 mm (2.0095 in.)
1st gear inside diameter	STD: MAX:	54.015 to 54.040 mm (2.1266 to 2.1276 in.) 54.040 mm (2.1276 in.)
2nd gear inside diameter	STD: MAX:	60.015 to 60.040 mm (2.3628 to 2.3638 in.) 60.040 mm (2.3638 in.)
Gear shift fork No. 4 claw and glove of the transmission hub sleeve No. 3 clearance	-	0.26 to 0.84 mm (0.0102 to 0.0331 in.)
Gear shift fork No. 1 claw and glove of the transmission hub sleeve No. 1 clearance	-	0.15 to 0.35 mm (0.0059 to 0.0138 in.)
Reverse gear synchronizer ring back and reverse gear spline end clearance	STD: MIN:	0.70 to 1.30 mm (0.0276 to 0.0512 in.) 0.70 mm (0.0276 in.)
1st gear synchronizer ring back and 1st gear spline end clearance	STD: Inner Middle Outer MIN: Inner Middle Outer	1.48 to 2.12 mm (0.0583 to 0.0835 in.) 0.68 to 1.92 mm (0.0268 to 0.0756 in.) 0.88 to 1.72 mm (0.0346 to 0.0677 in.) 1.48 mm (0.0583 in.) 0.68 mm (0.0268 in.) 0.88 mm (0.0346 in.)

2nd gear synchronizer ring back and 2nd gear spline end clearance	STD: Inner Middle Outer MIN: Inner Middle Outer	1.48 to 2.12 mm (0.0583 to 0.0835 in.) 0.68 to 1.92 mm (0.0268 to 0.0756 in.) 0.88 to 1.72 mm (0.0346 to 0.0677 in.) 1.48 mm (0.0583 in.) 0.68 mm (0.0268 in.) 0.88 mm (0.0346 in.)
Counter gear rear bearing snap ring	Mark A B C D E F G H J K L M	2.35 to 2.40 mm (0.0925 to 0.0945 in.) 2.40 to 2.45 mm (0.0945 to 0.0965 in.) 2.45 to 2.50 mm (0.0965 to 0.0984 in.) 2.50 to 2.55 mm (0.0984 to 0.1004 in.) 2.55 to 2.60 mm (0.1004 to 0.1024 in.) 2.60 to 2.65 mm (0.1024 to 0.1043 in.) 2.65 to 2.70 mm (0.1043 to 0.1063 in.) 2.70 to 2.75 mm (0.1063 to 0.1083 in.) 2.75 to 2.80 mm (0.1083 to 0.1102 in.) 2.80 to 2.85 mm (0.1102 to 0.1122 in.) 2.85 to 2.90 mm (0.1122 to 0.1142 in.) 2.90 to 2.95 mm (0.1142 to 0.1161 in.)
Clutch hub No. 1 shaft snap ring	Mark A B C D E F G	2.28 to 2.33 mm (0.0898 to 0.0917 in.) 2.33 to 2.38 mm (0.0917 to 0.0937 in.) 2.38 to 2.43 mm (0.0937 to 0.0957 in.) 2.43 to 2.48 mm (0.0957 to 0.0976 in.) 2.48 to 2.53 mm (0.0976 to 0.0996 in.) 2.53 to 2.58 mm (0.0996 to 0.1016 in.) 2.58 to 2.63 mm (0.1016 to 0.1035 in.)
Counter gear front bearing snap ring	Mark A B C D E F G H J K L M	2.35 to 2.40 mm (0.0925 to 0.0945 in.) 2.40 to 2.45 mm (0.0945 to 0.0965 in.) 2.45 to 2.50 mm (0.0965 to 0.0984 in.) 2.50 to 2.55 mm (0.0984 to 0.1004 in.) 2.55 to 2.60 mm (0.1004 to 0.1024 in.) 2.60 to 2.65 mm (0.1024 to 0.1043 in.) 2.65 to 2.70 mm (0.1043 to 0.1063 in.) 2.70 to 2.75 mm (0.1063 to 0.1083 in.) 2.75 to 2.80 mm (0.1083 to 0.1102 in.) 2.80 to 2.85 mm (0.1102 to 0.1122 in.) 2.85 to 2.90 mm (0.1122 to 0.1142 in.) 2.90 to 2.95 mm (0.1142 to 0.1161 in.)

TORQUE SPECIFICATIONS

Part tightened	N*m	kgf*cm	ft.*lbf
Transmission filler plug x Manual transmission	37	377	27
Manual transmission case cover x Manual transmission	12	117	8.5
Manual transmission x Engine for bolt A	72	730	53
Manual transmission x Engine for bolt B	37	380	28
Manual transmission x Engine mounting insulator rear No. 1	65	663	48
Frame crossmember sub-assembly No. 3 x Body	40	408	30
Frame crossmember sub-assembly No. 3 x Manual transmission	19	189	14
Manifold stay x Manual transmission	40	408	30
Manifold stay x Manual transmission	40	408	30
Battery x Negative battery terminal cable	3.9	40	35 in.*lbf
Gear shift fork No. 2 x Gear shift fork shaft No. 2	20	199	14
Gear shift fork No. 3 x Gear shift fork shaft No. 3	20	199	14
Transmission front case x Plug	39	400	29
Transmission front case x Interlock bracket	21	214	15
Transmission front case x Back up lamp switch	44	449	33
Shift & select lever x Shift & select lever shaft	33	340	25
Transmission middle case x Drain plug	37	377	27
Transmission front case x Transmission middle case	40	408	30
Reverse idler gear shaft bolt x Reverse idler gear shaft	28	286	21
Transmission oil separator x Transmission middle case	8.5	87	75 in.*lbf
Bearing lock plate x Transmission rear case	11	115	8.3
Transmission rear case x Filler plug	37	377	27
Transmission rear case x Transmission middle case	40	408	30
Transmission rear case x Shift detent ball plug	25	250	18
Transmission rear case x Transmission case cover	18	184	13
Shift lever housing x Shift & select lever shaft	33	340	25
Floor shift control shift lever retainer sub-assembly x Transmission rear case	20	204	15

SS

VF2BM TRANSFER

SERVICE DATA

Rear output shaft		
Drive sprocket thrust clearance	Standard	0.10 to 0.25 mm (0.0039 to 0.0098 in.)
	Maximum	0.25 mm (0.0098 in.)
Rear output shaft journal outer diameter (Part A)	Minimum	27.98 mm (1.1016 in.)
Rear output shaft journal outer diameter (Part B)	Minimum	36.98 mm (1.4561 in.)
Drive sprocket radial clearance	Standard	0.010 to 0.055 mm (0.0004 to 0.0022 in.)
	Maximum	0.055 mm (0.0022 in.)
Shift fork No. 1 to drive clutch sleeve clearance	Maximum	1.0 mm (0.039 in.)
Shift fork No. 2 to high and low clutch sleeve clearance	Maximum	1.0 mm (0.039 in.)
Rear output shaft snap ring thickness	Mark A	2.10 to 2.15 mm (0.0827 to 0.0846 in.)
	Mark B	2.15 to 2.20 mm (0.0846 to 0.0866 in.)
	Mark C	2.20 to 2.25 mm (0.0866 to 0.0886 in.)
	Mark D	2.25 to 2.30 mm (0.0886 to 0.0906 in.)
	Mark E	2.30 to 2.35 mm (0.0906 to 0.0925 in.)
	Mark F	2.35 to 2.40 mm (0.0925 to 0.0945 in.)
	Mark G	2.40 to 2.45 mm (0.0945 to 0.0965 in.)
	Mark H	2.45 to 2.50 mm (0.0965 to 0.0984 in.)
	Mark J	2.50 to 2.55 mm (0.0984 to 0.1004 in.)
	Mark K	2.00 to 2.05 mm (0.0787 to 0.0807 in.)
	Mark L	2.05 to 2.10 mm (0.0807 to 0.0827 in.)
Input shaft		
Input shaft journal outer diameter	Minimum	47.59 mm (1.8736 in.)
Input shaft bushing diameter	Maximum	39.14 mm (1.5409 in.)
Input gear stopper shaft snap ring thickness	Mark A	2.10 to 2.15 mm (0.0827 to 0.0846 in.)
	Mark B	2.15 to 2.20 mm (0.0846 to 0.0866 in.)
	Mark C	2.20 to 2.25 mm (0.0866 to 0.0886 in.)
	Mark D	2.25 to 2.30 mm (0.0886 to 0.0906 in.)
	Mark E	2.30 to 2.35 mm (0.0906 to 0.0925 in.)
	Mark F	2.35 to 2.40 mm (0.0925 to 0.0945 in.)
	Mark G	2.40 to 2.45 mm (0.0945 to 0.0965 in.)
	Mark H	2.45 to 2.50 mm (0.0965 to 0.0984 in.)
	Mark J	2.50 to 2.55 mm (0.0984 to 0.1004 in.)
	Mark K	2.55 to 2.60 mm (0.1004 to 0.1024 in.)
	Mark L	2.60 to 2.65 mm (0.1024 to 0.1043 in.)
	Mark M	2.65 to 2.70 mm (0.1043 to 0.1063 in.)
	Mark N	2.70 to 2.75 mm (0.1063 to 0.1083 in.)
	Mark P	2.75 to 2.80 mm (0.1083 to 0.1102 in.)
	Mark Q	2.80 to 2.85 mm (0.1102 to 0.1122 in.)
	Mark R	2.85 to 2.90 mm (0.1122 to 0.1142 in.)
	Mark S	2.90 to 2.95 mm (0.1142 to 0.1161 in.)
	Mark T	2.95 to 3.00 mm (0.1161 to 0.1181 in.)
	Mark U	3.00 to 3.05 mm (0.1181 to 0.1201 in.)
Transfer RH bearing retainer oil seal drive in depth (RA60F transmission)	Oil seal A	10.5 to 11.5 mm (0.413 to 0.453 in.)
	Oil seal B	0.5 to 1.0 mm (0.020 to 0.039 in.)
Planetary gear		

Pinion gear thrust clearance	Standard	0.11 to 0.84 mm (0.0043 to 0.0331 in.)
	Maximum	0.84 mm (0.0331 in.)
Pinion gear radial clearance	Standard	0.009 to 0.038 mm (0.0004 to 0.0015 in.)
	Maximum	0.038 mm (0.0015 in.)
Outer bearing snap ring thickness	Mark 1	1.45 to 1.50 mm (0.0571 to 0.0591 in.)
	Mark 2	1.50 to 1.55 mm (0.0591 to 0.0610 in.)
	Mark 3	1.55 to 1.60 mm (0.0610 to 0.0630 in.)
	Mark 4	1.60 to 1.65 mm (0.0630 to 0.0650 in.)
	Mark 5	1.65 to 1.70 mm (0.0650 to 0.0669 in.)
Low planetary gear bearing press in depth	-	7.7 to 8.3 mm (0.303 to 0.327 in.)

TORQUE SPECIFICATIONS

Part tightened	N*m	kgf*cm	ft.*lbf
Transfer x Automatic transmission assembly	24	240	17
Transfer case plug x Transfer case front	18.6	190	14
Oil pump body x Case front	7.5	76	66 in.*lbf
Oil separator x Case front	7.5	76	66 in.*lbf
Transfer indicator switch No.1	37	377	27
Shift actuator assembly x Case rear	20	204	15
Shift shaft stopper set bolt x Transfer case rear	19	194	14
Shift detent ball spring plug x Transfer gear shift fork	18.6	190	14
Case front x Case rear	28	286	21
Extension housing x Case rear	12	112	9.0
Speedometer driven gear assembly w/ sensor set bolt x Extension housing	11.5	117	8.0
Front and rear companion flange lock nut	118	1,203	87
Front bearing retainer x Case front	11.5	117	8.0
Case cover x Case front	18	184	13
Case lower protector x Case front	18	184	13
Transfer case plug Transfer case rear	37	377	27

SS

PROPELLER SHAFT

SERVICE DATA

Universal joint spider bearing axial play	Maximum	0 to 0.05 mm (0 to 0.002 in.)
Propeller shaft runout	Maximum	0.6 mm (0.024 in.)

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Propeller shaft assembly x Rear differential carrier assembly	88	899	65
Universal joint yoke x Propeller with center bearing shaft assembly (1st)	182	1,850	134
Universal joint yoke x Propeller with center bearing shaft assembly (2nd)	69	700	51
Center support bearing No. 2 x Body	36	369	27
Front propeller shaft assembly x Transfer assembly	88	899	65
Front propeller shaft assembly x Front differential carrier assembly	88	899	65
Propeller shaft heat insulator bracket sub-assembly x Front crossmember sub-assembly No. 3	16	160	12
Rear propeller shaft assembly x Transfer assembly	88	899	65
Rear propeller shaft assembly x Rear differential carrier assembly	88	899	65

SS

DRIVE SHAFT

SERVICE DATA

Front axle outboard joint boot clamp clearance	1.0 to 5.0 mm (0.039 to 0.197 in.)
Front drive inboard joint boot clamp clearance	1.0 to 4.0 mm (0.039 to 0.157 in.)
Front drive shaft standard length	484.4 to 488.4 mm (19.071 to 19.266 in.)

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Front lower ball joint attachment x Steering knuckle	160	1,631	118
Front axle hub nut x Front drive shaft	235	2,396	173
Tie rod end sub-assembly x Steering knuckle	91	928	67
Front speed sensor harness bracket x Steering knuckle	13	133	10
Front speed sensor x Steering knuckle	8.3	85	73 in.*lbf
Front wheel	113	1,152	83
Battery negative terminal x Battery	3.9	40	35 in.*lbf



DIFFERENTIAL

SERVICE DATA

SS

Front differential carrier assembly (1GR-FE (4WD))	Differential drive pinion preload (at starting)	New bearing Reused bearing	0.98 to 1.57 N*m (10 to 16 kgf*cm, 8.7 to 13.9 in.*lbf) 0.49 to 0.78 N*m (5.0 to 8.0 kgf*cm, 4.3 to 6.9 in.*lbf)
	Total preload (at starting)		Drive pinion preload plus 0.22 to 0.88 N*m (2.2 to 8.8 kgf*cm, 2.0 to 7.8 in.*lbf)
	Differential ring gear backlash		0.11 to 0.21 mm (0.0043 to 0.0083 in.)
	Differential side gear backlash		0 to 0.15 mm (0 to 0.0059 in.)
	Front differential carrier oil seal	Oil seal drive in depth	3.9 to 4.8 mm (0.153 to 0.189 in.)
	Front differential side oil seal	Oil seal drive in depth	-0.45 to 0.45 mm (-0.0177 to 0.0177 in.)
	Front differential side tube oil seal	Oil seal drive in depth	4.8 to 5.8 mm (0.189 to 0.2284 in.)
	Front differential side gear needle roller bearing	Bearing press in depth	1.4 to 2.0 mm (0.055 to 0.079 in.)
	Differential clutch sleeve and clutch sleeve fork clearance	Max.	0.35 mm (0.0138 in.)
Front differential carrier assembly (4WD)	Front differential side gear thrust washer thickness		1.50 mm (0.0591 in.) 1.55 mm (0.0610 in.) 1.60 mm (0.0630 in.) 1.65 mm (0.0650 in.) 1.70 mm (0.0669 in.) 1.75 mm (0.0689 in.) 1.80 mm (0.0709 in.) 1.85 mm (0.0728 in.) 1.90 mm (0.0748 in.)
	Front differential ring gear thrust washer thickness		1.58 mm (0.0622 in.) 1.60 mm (0.0630 in.) 1.62 mm (0.0638 in.) 1.64 mm (0.0646 in.) 1.66 mm (0.0654 in.) 1.68 mm (0.0661 in.) 1.70 mm (0.0669 in.) 1.72 mm (0.0677 in.) 1.74 mm (0.0685 in.) 1.76 mm (0.0693 in.) 1.78 mm (0.0701 in.) 1.80 mm (0.0709 in.) 1.82 mm (0.0717 in.) 1.84 mm (0.0724 in.) 1.86 mm (0.0732 in.) 1.88 mm (0.0740 in.) 1.90 mm (0.0748 in.) 1.92 mm (0.0756 in.) 1.94 mm (0.0764 in.) 1.96 mm (0.0772 in.) 1.98 mm (0.0780 in.) 2.00 mm (0.0787 in.) 2.02 mm (0.0800 in.) 2.04 mm (0.0803 in.) 2.06 mm (0.0811 in.) 2.08 mm (0.0819 in.) 2.10 mm (0.0827 in.) 2.12 mm (0.0835 in.) 2.14 mm (0.0843 in.) 2.16 mm (0.0850 in.)

Front differential carrier assembly (4WD)	Rear differential drive pinion plate washer thickness		1.70 mm (0.0669 in.) 1.73 mm (0.0681 in.) 1.76 mm (0.0693 in.) 1.79 mm (0.0705 in.) 1.82 mm (0.0717 in.) 1.85 mm (0.0728 in.) 1.88 mm (0.0740 in.) 1.91 mm (0.0752 in.) 1.94 mm (0.0764 in.) 1.97 mm (0.0776 in.) 2.00 mm (0.0787 in.) 2.03 mm (0.0799 in.) 2.06 mm (0.0811 in.) 2.09 mm (0.0823 in.) 2.12 mm (0.0835 in.) 2.15 mm (0.0847 in.) 2.18 mm (0.0858 in.) 2.21 mm (0.0870 in.) 2.24 mm (0.0882 in.) 2.27 mm (0.0894 in.) 2.30 mm (0.0906 in.) 2.33 mm (0.0917 in.)
Rear differential carrier assembly (w/ differential lock)	Companion flange vertical runout	Max	0.10 mm (0.0039 in.)
	Companion flange lateral runout	Max	0.10 mm (0.0039 in.)
	Differential ring gear runout	Max	0.07 mm (0.0028 in.)
	Rear differential case runout	Max	0.07 mm (0.0028 in.)
	Differential drive pinion preload (at starting)	New bearing Reused bearing	1.05 to 1.64 N*m (10.7 to 16.7 kgf*cm, 9.3 to 14.5 in.*lbf) 0.56 to 0.85 N*m (5.7 to 8.7 kgf*cm, 5.0 to 7.5 in.*lbf)
	Total preload (at starting)		Drive pinion preload plus 0.39 to 0.59 N*m (4.0 to 6.0 kgf*cm, 3.5 to 5.2 in.*lbf)
	Differential ring gear backlash		0.13 to 0.18 mm (0.0051 to 0.0071 in.)
	Rear differential case side gear backlash LH		0.05 to 0.20 mm (0.0002 to 0.008 in.)
	Rear differential case side gear backlash RH		0.05 to 0.20 mm (0.0002 to 0.008 in.)
	Rear differential carrier oil seal	Oil seal drive in depth	0.55 to 1.45 mm (0.021 to 0.057 in)
	Rear differential side gear thrust washer thickness		0.9 mm (0.0354 in.) 1.0 mm (0.0394 in.) 1.1 mm (0.0433 in.) 1.2 mm (0.0472 in.) 1.3 mm (0.0512 in.)
	Rear differential lock sleeve clearance		0.15 to 0.35 mm (0.0059 to 0.0138 in.)
Rear differential carrier assembly (w/ differential lock)	Rear differential drive pinion plate washer thickness		1.70 mm (0.0669 in.) 1.73 mm (0.0681 in.) 1.76 mm (0.0693 in.) 1.79 mm (0.0705 in.) 1.82 mm (0.0717 in.) 1.85 mm (0.0728 in.) 1.88 mm (0.0740 in.) 1.91 mm (0.0752 in.) 1.94 mm (0.0764 in.) 1.97 mm (0.0776 in.) 2.00 mm (0.0787 in.) 2.03 mm (0.0799 in.) 2.06 mm (0.0811 in.) 2.09 mm (0.0823 in.) 2.12 mm (0.0835 in.) 2.15 mm (0.0847 in.) 2.18 mm (0.0853 in.) 2.21 mm (0.0870 in.) 2.24 mm (0.0882 in.) 2.27 mm (0.0894 in.) 2.30 mm (0.0906 in.) 2.33 mm (0.0917 in.)

SS Rear differential carrier assembly	Companion flange vertical runout	Max	0.10 mm (0.0039 in.)
	Companion flange lateral runout	Max	0.10 mm (0.0039 in.)
	Differential ring gear runout	Max	0.05 mm (0.002 in.)
	Rear differential case runout	Max	0.05 mm (0.002 in.)
	Differential drive pinion preload (at starting)	New bearing Reused bearing	1.27 to 1.86 N*m (113 to 20 kgf*cm, 11 to 16 in.*lbf) 0.786 to 1.07 N*m (8.0 to 11 kgf*cm, 6.9 to 9.3 in.*lbf)
	Total preload (at starting)		Drive pinion preload plus 0.39 to 0.59 N*m (4.0 to 6.0 kgf*cm, 3.5 to 5.2 in.*lbf)
	Differential ring gear backlash		0.13 to 0.18 mm (0.0051 to 0.0071 in.)
	Rear differential case side gear backlash LH		0.05 to 0.20 mm (0.0020 to 0.0079 in.)
	Rear differential case side gear backlash RH		0.05 to 0.20 mm (0.0020 to 0.0079 in.)
	Rear differential carrier oil seal	Oil seal drive in depth	-0.5 to 0.5 mm (-0.0197 to 0.0197 in.)
	Rear differential side gear thrust washer thickness		1.50 mm (0.0590 in.) 1.55 mm (0.0610 in.) 1.60 mm (0.0630 in.) 1.65 mm (0.0650 in.) 1.70 mm (0.0669 in.) 1.75 mm (0.0689 in.) 1.80 mm (0.0709 in.) 1.85 mm (0.0728 in.) 1.90 mm (0.0748 in.)
	Rear differential side gear thrust No. 1 washer standard thickness (LSD)		1.77 to 1.86 mm (0.0697 to 0.0732 in.)
	Rear differential clutch plate standard thickness (LSD)		1.57 to 1.63 mm (0.0618 to 0.0642 in.)
	Rear differential lock retainer compression spring free length (LSD)		26.35 mm (1.037in.)
Rear differential carrier assembly	Rear differential side gear thrust washer thickness (LSD)		0.13 to 0.17 mm (0.0051 to 0.0067 in.) 0.18 to 0.22 mm (0.0071 to 0.0087 in.) 0.23 to 0.27 mm (0.0091 to 0.0106 in.) 0.28 to 0.32 mm (0.0110 to 0.0126 in.) 0.33 to 0.37 mm (0.0130 to 0.0146 in.)
	Rear differential ring gear		0.05 mm (0.0020 in.)

Rear differential carrier assembly	Rear differential side bearing preload washer thickness	Mark58	2.58 mm (0.1016 in.)
		60	2.60 mm (0.1024 in.)
		62	2.62 mm (0.1032 in.)
		64	2.64 mm (0.1039 in.)
		66	2.66 mm (0.1047 in.)
		68	2.68 mm (0.1055 in.)
		70	2.70 mm (0.1063 in.)
		72	2.72 mm (0.1071 in.)
		74	2.74 mm (0.1079 in.)
		76	2.76 mm (0.1087 in.)
		78	2.78 mm (0.1095 in.)
		80	2.80 mm (0.1102 in.)
		82	2.82 mm (0.1110 in.)
		84	2.84 mm (0.1118 in.)
		86	2.86 mm (0.1126 in.)
		88	2.88 mm (0.1134 in.)
		90	2.90 mm (0.1142 in.)
		92	2.92 mm (0.1150 in.)
		94	2.94 mm (0.1158 in.)
		96	2.96 mm (0.1165 in.)
		98	2.98 mm (0.1173 in.)
		00	3.00 mm (0.1181 in.)
		02	3.02 mm (0.1189 in.)
		04	3.04 mm (0.1197 in.)
		06	3.06 mm (0.1205 in.)
		08	3.08 mm (0.1213 in.)
		10	3.10 mm (0.1221 in.)
		12	3.12 mm (0.1228 in.)
		14	3.14 mm (0.1236 in.)
		16	3.16 mm (0.1244 in.)
		18	3.18 mm (0.1257 in.)
		20	3.20 mm (0.1260 in.)
		22	3.22 mm (0.1268 in.)
		24	3.24 mm (0.1276 in.)
		26	3.26 mm (0.1284 in.)
		28	3.28 mm (0.1291 in.)
		30	3.30 mm (0.1299 in.)
		32	3.32 mm (0.1307 in.)
		34	3.34 mm (0.1315 in.)
		36	3.36 mm (0.1323 in.)
		38	3.38 mm (0.1331 in.)
		40	3.40 mm (0.1339 in.)
		42	3.42 mm (0.1347 in.)
		44	3.44 mm (0.1354 in.)
		46	3.46 mm (0.1362 in.)
		48	3.48 mm (0.1370 in.)

SS

Rear differential carrier assembly	Rear differential drive pinion thrust washer thickness	Mark 87	1.87 mm (0.0736 in.)
		88	1.88 mm (0.0740 in.)
		89	1.89 mm (0.0744 in.)
		90	1.90 mm (0.0748 in.)
		91	1.91 mm (0.0752 in.)
		92	1.92 mm (0.0756 in.)
		93	1.93 mm (0.0760 in.)
		94	1.94 mm (0.0764 in.)
		95	1.95 mm (0.0768 in.)
		96	1.96 mm (0.0772 in.)
		97	1.97 mm (0.0776 in.)
		98	1.98 mm (0.0780 in.)
		99	1.99 mm (0.0784 in.)
		00	2.00 mm (0.0787 in.)
		01	2.01 mm (0.0791 in.)
		02	2.02 mm (0.0795 in.)
		03	2.03 mm (0.0799 in.)
		04	2.04 mm (0.0803 in.)
		05	2.05 mm (0.0807 in.)
		06	2.06 mm (0.0811 in.)
		07	2.07 mm (0.0815 in.)
		08	2.08 mm (0.0819 in.)
		09	2.09 mm (0.0823 in.)
		10	2.10 mm (0.0827 in.)
		11	2.11 mm (0.0831 in.)
		12	2.12 mm (0.0835 in.)
		13	2.13 mm (0.0839 in.)
		14	2.14 mm (0.0843 in.)
		15	2.15 mm (0.0847 in.)
		16	2.16 mm (0.0850 in.)
		17	2.17 mm (0.0854 in.)
		18	2.18 mm (0.0858 in.)
		19	2.19 mm (0.0862 in.)
		20	2.20 mm (0.0866 in.)
		21	2.21 mm (0.0870 in.)
		22	2.22 mm (0.0874 in.)
		23	2.23 mm (0.0878 in.)
		24	2.24 mm (0.0882 in.)
		25	2.25 mm (0.0886 in.)
		26	2.26 mm (0.0890 in.)
		27	2.27 mm (0.0894 in.)
		28	2.28 mm (0.0898 in.)

TORQUE SPECIFICATIONS

Part tightened	N*m	kgf*cm	ft.*lbf
Front differential carrier assembly (4WD)			
Drive pinion x Companion flange	370	3,773	273
No, 1 Differential front mounting support x Frame	137	1,400	101
No, 2 Differential front mounting support x Frame	137	1,400	101
Differential carrier assembly front x Differential vacuum actuator assembly	21	210	15
No, 2 Differential front mounting support x Front differential tube assembly	110	1,122	81
No, 1 Differential front mounting support x Front differential carrier assembly	186	1,899	138
No, 2 Differential front mounting support x Front differential carrier assembly	160	1,631	118
No, 3 Differential front mounting support x Front differential carrier assembly	108	1,100	80
No. 1 Front differential mount nut	87	889	64
Ring gear x Differential case	97	984	71
Front differential carrier assembly x Breather tube	13	129	8
Front differential carrier assembly x Side bearing retainer	50	510	37
Front differential carrier assembly x Differential case	110	1,121	81
No.1 Engine under cover x frame	30	306	22
No. 2 Engine under cover x frame	30	306	22
Negative battery terminal	3.9	40	35 in.*lbf
Front wheel	113	1,152	83
Rear Differential			
Differential carrier	(w/ differential lock)		
Drive pinion x Companion flange	370	3,773	273
Differential carrier x Axle housing	45	459	33
Differential case x Ring gear	97	985	71
Bearing cap x Differential carrier	85	870	63
Adjusting nut lock x Bearing cap	13	130	9
RH differential case x LH differential case	47	480	35
Screw x Differential carrier	22	220	16
Actuator x Differential carrier	27	270	20
Indicator switch	40	410	30
Shaft retainer x Differential case	24	240	17
Differential carrier			
Differential case x Ring gear	451	4,600	333
Differential carrier x Axle housing	45	459	33
Bearing cap x Differential carrier	1st 113	1,152	83
RH differential case x LH differential case (LSD)	47	480	35
Differential case x differential ring gear	125	1,270	92
Negative battery terminal	3.9	40	35 in.*lbf

SS

AXLE

SERVICE DATA

Front axle hub bearing deviation	Maximum	0.05 mm (0.0020 in.)
Front axle hub bearing runout	Maximum	0.05 mm (0.0020 in.)
Rear axle hub bearing deviation	Maximum	0.05 mm (0.0020 in.)
Rear axle hub and bearing runout	Maximum	0.05 mm (0.0020 in.)
Rear axle shaft runout	Maximum	1.5 mm (0.0591 in.)
Rear axle shaft flange runout	Maximum	0.05 mm (0.0020 in.)



TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Front wheel	113	1,152	83
Battery negative terminal x Battery	3.9	40	35 in.*lbf
Steering knuckle x Front disc dust cover	8.3	85	73 in.*lbf
Steering knuckle x Front axle hub	199	2,029	147
Front suspension upper arm x Steering knuckle	110	1,122	81
Front lower ball joint attachment x Steering knuckle	160	1,631	118
Tie rod end sub-assembly x Steering knuckle (2WD)	49	500	36
Front disc brake caliper assembly x Steering knuckle (2WD)	108	1,101	80
Front flexible hose x Front disc brake caliper assembly	30	306	22
Front flexible hose x Shock absorber assembly front	32	326	24
Front speed sensor x Steering knuckle	8.3	85	73 in.*lbf
Skid control sensor wire x Steering knuckle	5.0	51	44 in.*lbf
Skid control sensor wire x Front suspension upper arm	5.0	51	44 in.*lbf
Front axle hub x Steering knuckle	80	816	59
Front wheel adjusting nut x Steering knuckle	275	2,804	203
Tie rod end sub-assembly x Steering knuckle (4WD and Pre-Runner)	91	928	67
Front stabilizer link assembly x Steering knuckle	70	714	52
Front axle hub nut x Front drive shaft	235	2,396	173
Front disc brake caliper assembly x Steering knuckle (4WD and Pre-Runner)	123	1,254	91
Brake tube bracket x Steering knuckle	29	296	21
Brake tube x Front disc brake caliper assembly	15	155	11
Front speed sensor harness bracket x Steering knuckle	13	133	10
Front speed sensor x Steering knuckle	8.3	85	73 in.*lbf
Rear wheel	113	1,152	83
Rear axle shaft with backing plate x Rear axle housing	36	367	27
Rear brake tube No. 8 x Rear wheel brake cylinder	15	155	11
Parking brake cable assembly No. 3 x Backing plate	8.0	82	71 in.*lbf

SS

SUSPENSION

SERVICE DATA

2WD

Vehicle height	TRN220L-TRMDKA (P215/70R15)	A-B C-D	87 mm (3.43 in.) 48 mm (1.89 in.)
	TRN220L-TRPDKA (P215/70R15)	A-B C-D	88 mm (3.46 in.) 48 mm (1.89 in.)
	TRN225L-CRMDKA (P215/70R15)	A-B C-D	86 mm (3.39 in.) 50 mm (1.97 in.)
	TRN225L-CRPDKA (P215/70R15)	A-B C-D	87 mm (3.43 in.) 50 mm (1.97 in.)
	GRN225L-CRFDKA (P255/45R18)	A-B C-D	118 mm (4.65 in.) 85 mm (3.35 in.)
Toe-in	TRN220L-TRMDKA (P215/70R15)	A+B C-D	4.8' +/- 6.5' (0.081° +/- 0.108°) 0.96 +/- 2 mm (0.038 +/- 0.08 in.)
	TRN220L-TRPDKA (P215/70R15)	A+B C-D	4.3' +/- 6.5' (0.072° +/- 0.108°) 0.86 +/- 2 mm (0.034 +/- 0.08 in.)
	TRN225L-CRMDKA (P215/70R15)	A+B C-D	5.3' +/- 6.5' (0.089° +/- 0.108°) 1.06 +/- 2 mm (0.042 +/- 0.08 in.)
	TRN225L-CRPDKA (P215/70R15)	A+B C-D	4.8' +/- 6.5' (0.081° +/- 0.108°) 0.96 +/- 2 mm (0.038 +/- 0.08 in.)
	GRN225L-CRFDKA (P255/45R18)	A+B C-D	1.8' +/- 6.5' (0.030° +/- 0.108°) 0.36 +/- 2 mm (0.014 +/- 0.08 in.)
Wheel turning angle		Inside wheel	38°48' (36°48' to 39°48') 38.80° (36.80° to 39.80°)
		Outside wheel (Reference)	32°30' (30°30' to 33°30') 32.50° (30.50° to 33.50°)
Camber	TRN220L-TRMDKA (P215/70R15)		0°13' +/- 45' (0.22° +/- 0.75°)
	TRN220L-TRPDKA (P215/70R15)		0°12' +/- 45' (0.20° +/- 0.75°)
	TRN225L-CRMDKA (P215/70R15)		0°14' +/- 45' (0.24° +/- 0.75°)
	TRN225L-CRPDKA (P215/70R15)		0°13' +/- 45' (0.22° +/- 0.75°)
	GRN225L-CRFDKA (P255/45R18)		-0°40' +/- 45' (-0.66° +/- 0.75°)
		Right-left error	30' (0.50°) or less
Caster	TRN220L-TRMDKA (P215/70R15)		3°52' +/- 45' (3.86° +/- 0.75°)
	TRN220L-TRPDKA (P215/70R15)		3°52' +/- 45' (3.86° +/- 0.75°)
	TRN225L-CRMDKA (P215/70R15)		4°01' +/- 45' (4.01° +/- 0.75°)
	TRN225L-CRPDKA (P215/70R15)		4°01' +/- 45' (4.02° +/- 0.75°)
	GRN225L-CRFDKA (P255/45R18)		5°09' +/- 45' (5.15° +/- 0.75°)
		Right-left error	30' (0.50°) or less

SS

Steering axis inclination	TRN220L-TRMDKA (P215/70R15)		10°42' +- 45' (10.70° +- 0.75°)
	TRN220L-TRPDKA (P215/70R15)		10°44' +- 45' (10.73° +- 0.75°)
	TRN225L-CRMDKA (P215/70R15)		10°41' +- 45' (10.69° +- 0.75°)
	TRN225L-CRPDKA (P215/70R15)		10°42' +- 45' (10.70° +- 0.75°)
	GRN225L-CRFDKA (P255/45R18)		11°34' +- 45' (11.56° +- 0.75°)
Upper arm ball joint turning torque			4.5 N*m (46 kgf*cm, 40 in.*lbf) or less
Lower arm ball joint turning torque			3.0 N*m (31 kgf*cm, 27 in.*lbf) or less
Stabilizer link ball joint turning torque			2.0 N*m (20 kgf*cm, 18 in.*lbf) or less

Pre-Runner (North America)

Vehicle height	TRN260L-TRMDKA (P245/75R16)	A-B C-D	62 mm (2.44 in.) -47 mm (-1.85 in.)
	TRN265L-CRMDKA (P245/75R16)	A-B C-D	60 mm (2.36 in.) -47 mm (-1.85 in.)
	GRN265L-CRFDKA (P245/75R16)	A-B C-D	66 mm (2.60 in.) -44 mm (-1.73 in.)
	GRN265L-CRFDKA (P265/70R16)	A-B C-D	69 mm (2.72 in.) -46 mm (-1.81 in.)
	GRN265L-CRFDKA (P265/65R17)	A-B C-D	66 mm (2.60 in.) -44 mm (-1.73 in.)
	GRN265L-CRADKA (P245/75R16)	A-B C-D	63 mm (2.48 in.) -44 mm (-1.73 in.)
	GRN265L-CRADKA (P265/70R16)	A-B C-D	70 mm (2.76 in.) -45 mm (-1.77 in.)
	GRN265L-CRADKA (P265/65R17)	A-B C-D	63 mm (2.48 in.) -44 mm (-1.73 in.)
	GRN265L-PRADKA (P245/75R16)	A-B C-D	64 mm (2.52 in.) -39 mm (-1.54 in.)
	GRN265L-PRADKA (P265/70R16)	A-B C-D	62 mm (2.44 in.) -43 mm (-1.69 in.)
	GRN265L-PRADKA (P265/65R17)	A-B C-D	64 mm (2.52 in.) -39 mm (-1.54 in.)
	GRN270L-PRADKA (P245/75R16)	A-B C-D	65 mm (2.56 in.) -38 mm (-1.50 in.)
	GRN270L-PRADKA (P265/65R17)	A-B C-D	65 mm (2.56 in.) -38 mm (-1.50 in.)

Toe-in	TRN260L-TRMDKA (P245/75R16)	A+B C-D	7.3' +- 6.5' (0.121° +- 0.108°) 1.64 +- 2 mm (0.065 +- 0.08 in.)
	TRN265L-CRMDKA (P245/75R16)	A+B C-D	8.6' +- 6.5' (0.144° +- 0.108°) 1.94 +- 2 mm (0.076 +- 0.08 in.)
	GRN265L-CRFDKA (P245/75R16)	A+B C-D	4.6' +- 6.5' (0.077° +- 0.108°) 1.04 +- 2 mm (0.041 +- 0.08 in.)
	GRN265L-CRFDKA (P265/70R16)	A+B C-D	2.7' +- 6.5' (0.044° +- 0.108°) 0.60 +- 2 mm (0.024 +- 0.08 in.)
	GRN265L-CRFDKA (P265/65R17)	A+B C-D	4.6' +- 6.5' (0.077° +- 0.108°) 1.05 +- 2 mm (0.041 +- 0.08 in.)
	GRN265L-CRADKA (P245/75R16)	A+B C-D	6.6' +- 6.5' (0.110° +- 0.108°) 1.48 +- 2 mm (0.058 +- 0.08 in.)
	GRN265L-CRADKA (P265/70R16)	A+B C-D	2.0' +- 6.5' (0.033° +- 0.108°) 0.45 +- 2 mm (0.018 +- 0.08 in.)
	GRN265L-CRADKA (P265/65R17)	A+B C-D	6.6' +- 6.5' (0.111° +- 0.108°) 1.50 +- 2 mm (0.059 +- 0.08 in.)
	GRN265L-PRADKA (P245/75R16)	A+B C-D	5.2' +- 6.5' (0.087° +- 0.108°) 1.18 +- 2 mm (0.046 +- 0.08 in.)
	GRN265L-PRADKA (P265/70R16)	A+B C-D	6.6' +- 6.5' (0.110° +- 0.108°) 1.49 +- 2 mm (0.059 +- 0.08 in.)
	GRN265L-PRADKA (P265/65R17)	A+B C-D	5.3' +- 6.5' (0.089° +- 0.108°) 1.20 +- 2 mm (0.047 +- 0.08 in.)
	GRN270L-PRADKA (P245/75R16)	A+B C-D	4.6' +- 6.5' (0.077° +- 0.108°) 1.04 +- 2 mm (0.041 +- 0.08 in.)
	GRN270L-PRADKA (P265/65R17)	A+B C-D	4.6' +- 6.5' (0.077° +- 0.108°) 1.05 +- 2 mm (0.041 +- 0.08 in.)
Wheel turning angle		Inside wheel	40°18' (38°18' to 41°18') 40.30° (38.30° to 41.30°)
		Outside wheel (Reference)	35°54' (33°54' to 36°54') 35.90° (33.90° to 36.90°)
Camber	TRN260L-TRMDKA (P245/75R16)		0°35' +- 45' (0.59° +- 0.75°)
	TRN265L-CRMDKA (P245/75R16)		0°37' +- 45' (0.62° +- 0.75°)
	GRN265L-CRFDKA (P245/75R16)		0°31' +- 45' (0.52° +- 0.75°)
	GRN265L-CRFDKA (P265/70R16)		0°28' +- 45' (0.47° +- 0.75°)
	GRN265L-CRFDKA (P265/65R17)		0°31' +- 45' (0.52° +- 0.75°)
	GRN265L-CRADKA (P245/75R16)		0°35' +- 45' (0.58° +- 0.75°)
	GRN265L-CRADKA (P265/70R16)		0°27' +- 45' (0.45° +- 0.75°)
	GRN265L-CRADKA (P265/65R17)		0°35' +- 45' (0.58° +- 0.75°)
	GRN265L-PRADKA (P245/75R16)		0°32' +- 45' (0.54° +- 0.75°)
	GRN265L-PRADKA (P265/70R16)		0°35' +- 45' (0.58° +- 0.75°)
	GRN265L-PRADKA (P265/65R17)		0°32' +- 45' (0.54° +- 0.75°)
	GRN270L-PRADKA (P245/75R16)		0°31' +- 45' (0.52° +- 0.75°)
	GRN270L-PRADKA (P265/65R17)		0°31' +- 45' (0.52° +- 0.75°)
		Right-left error	30' (0.50°) or less

Caster	TRN260L-TRMDKA (P245/75R16)		1°41' +- 45' (1.68° +- 0.75°)
	TRN265L-CRMDKA (P245/75R16)		1°46' +- 45' (1.77° +- 0.75°)
	GRN265L-CRFDKA (P245/75R16)		1°55' +- 45' (1.92° +- 0.75°)
	GRN265L-CRFDKA (P265/70R16)		1°56' +- 45' (1.93° +- 0.75°)
	GRN265L-CRFDKA (P265/65R17)		1°56' +- 45' (1.94° +- 0.75°)
	GRN265L-CRADKA (P245/75R16)		1°53' +- 45' (1.89° +- 0.75°)
	GRN265L-CRADKA (P265/70R16)		1°59' +- 45' (1.98° +- 0.75°)
	GRN265L-CRADKA (P265/65R17)		1°53' +- 45' (1.89° +- 0.75°)
	GRN265L-PRADKA (P245/75R16)		2°01' +- 45' (2.01° +- 0.75°)
	GRN265L-PRADKA (P265/70R16)		1°58' +- 45' (1.96° +- 0.75°)
	GRN265L-PRADKA (P265/65R17)		2°01' +- 45' (2.01° +- 0.75°)
	GRN270L-PRADKA (P245/75R16)		2°07' +- 45' (2.11° +- 0.75°)
	GRN270L-PRADKA (P265/65R17)		2°08' +- 45' (2.13° +- 0.75°)
		Right-left error	30' (0.50°) or less
Steering axis inclination	TRN260L-TRMDKA (P245/75R16)		11°52' +- 45' (11.86° +- 0.75°)
	TRN265L-CRMDKA (P245/75R16)		11°50' +- 45' (11.83° +- 0.75°)
	GRN265L-CRFDKA (P245/75R16)		11°56' +- 45' (11.93° +- 0.75°)
	GRN265L-CRFDKA (P265/70R16)		11°59' +- 45' (11.99° +- 0.75°)
	GRN265L-CRFDKA (P265/65R17)		11°56' +- 45' (11.93° +- 0.75°)
	GRN265L-CRADKA (P245/75R16)		11°53' +- 45' (11.88° +- 0.75°)
	GRN265L-CRADKA (P265/70R16)		12°00' +- 45' (12.00° +- 0.75°)
	GRN265L-CRADKA (P265/65R17)		11°53' +- 45' (11.88° +- 0.75°)
	GRN265L-PRADKA (P245/75R16)		11°55' +- 45' (11.91° +- 0.75°)
	GRN265L-PRADKA (P265/70R16)		11°53' +- 45' (11.88° +- 0.75°)
	GRN265L-PRADKA (P265/65R17)		11°55' +- 45' (11.91° +- 0.75°)
	GRN270L-PRADKA (P245/75R16)		11°56' +- 45' (11.93° +- 0.75°)
	GRN270L-PRADKA (P265/65R17)		11°56' +- 45' (11.93° +- 0.75°)
Upper arm ball joint turning torque			4.5 N*m (46 kgf*cm, 40 in.*lbf) or less
Lower arm ball joint turning torque			3.0 N*m (31 kgf*cm, 27 in.*lbf) or less
Stabilizer link ball joint turning torque			2.0 N*m (20 kgf*cm, 18 in.*lbf) or less

Pre-Runner (Mexico)

Vehicle height	GRN265L-PRADKA (P245/75R16)	A-B C-D	53 mm (2.09 in.) -51 mm (-2.01 in.)
	GRN265L-PRADKA (P265/65R17)	A-B C-D	53 mm (2.09 in.) -51 mm (-2.01 in.)
Toe-in	GRN265L-PRADKA (P245/75R16)	A+B C-D	12.7' +- 6.5' (0.212° +- 0.108°) 2.87 +- 2 mm (0.113 +- 0.08 in.)
	GRN265L-PRADKA (P265/65R17)	A+B C-D	12.9' +- 6.5' (0.215° +- 0.108°) 2.91 +- 2 mm (0.115 +- 0.08 in.)
Wheel turning angle		Inside wheel	40°18' (38°18' to 41°18') 40.30° (38.30° to 41.30°)
		Outside wheel (Reference)	35°54' (33°54' to 36°54') 35.90° (33.90° to 36.90°)
Camber	GRN265L-PRADKA (P245/75R16)		0°43' +- 45' (0.71° +- 0.75°)
	GRN265L-PRADKA (P265/65R17)		0°43' +- 45' (0.71° +- 0.75°)
		Right-left error	30' (0.50°) or less
Caster	GRN265L-PRADKA (P245/75R16)		1°38' +- 45' (1.64° +- 0.75°)
	GRN265L-PRADKA (P265/65R17)		1°38' +- 45' (1.64° +- 0.75°)
		Right-left error	30' (0.50°) or less
Steering axis inclination	GRN265L-PRADKA (P245/75R16)		11°44' +- 45' (11.74° +- 0.75°)
	GRN265L-PRADKA (P265/65R17)		11°44' +- 45' (11.74° +- 0.75°)
Upper arm ball joint turning torque			4.5 N*m (46 kgf*cm, 40 in.*lbf) or less
Lower arm ball joint turning torque			3.0 N*m (31 kgf*cm, 27 in.*lbf) or less
Stabilizer link ball joint turning torque			2.0 N*m (20 kgf*cm, 18 in.*lbf) or less

4WD**SS**

Vehicle height	TRN240L-TRMDKA (P245/75R16)	A-B C-D	63 mm (2.48 in.) -45 mm (-1.77 in.)
	TRN245L-CRMDKA (P245/75R16)	A-B C-D	63 mm (2.48 in.) -44 mm (-1.73 in.)
	GRN245L-CRFDKA (P245/75R16)	A-B C-D	69 mm (2.72 in.) -40 mm (-1.57 in.)
	GRN245L-CRFDKA (P265/70R16)	A-B C-D	71 mm (2.80 in.) -43 mm (-1.69 in.)
	GRN245L-CRFDKA (P265/65R17)	A-B C-D	69 mm (2.72 in.) -41 mm (-1.61 in.)
	GRN245L-CRADKA (P245/75R16)	A-B C-D	65 mm (2.56 in.) -41 mm (-1.61 in.)
	GRN245L-CRADKA (P265/70R16)	A-B C-D	71 mm (2.80 in.) -43 mm (-1.69 in.)
	GRN245L-CRADKA (P265/65R17)	A-B C-D	65 mm (2.56 in.) -41 mm (-1.61 in.)
	GRN245L-PRFDKA (P245/75R16)	A-B C-D	64 mm (2.52 in.) -38 mm (-1.50 in.)
	GRN245L-PRFDKA (P265/70R16)	A-B C-D	69 mm (2.72 in.) -39 mm (-1.54 in.)
	GRN245L-PRFDKA (P265/65R17)	A-B C-D	64 mm (2.52 in.) -38 mm (-1.50 in.)
	GRN245L-PRADKA (P245/75R16)	A-B C-D	65 mm (2.56 in.) -37 mm (-1.46 in.)
	GRN245L-PRADKA (P265/70R16)	A-B C-D	70 mm (2.76 in.) -38 mm (-1.50 in.)
	GRN245L-PRADKA (P265/65R17)	A-B C-D	65 mm (2.56 in.) -37 mm (-1.46 in.)
	GRN250L-PRADKA (P245/75R16)	A-B C-D	66 mm (2.60 in.) -35 mm (-1.38 in.)
	GRN250L-PRADKA (P265/65R17)	A-B C-D	66 mm (2.60 in.) -35 mm (-1.38 in.)

Toe-in	TRN240L-TRMDKA (P245/75R16)	A+B C-D	6.6' +- 6.5' (0.110° +- 0.108°) 1.48 +- 2 mm (0.058 +- 0.08 in.)
	TRN245L-CRMDKA (P245/75R16)	A+B C-D	6.6' +- 6.5' (0.110° +- 0.108°) 1.48 +- 2 mm (0.058 +- 0.08 in.)
	GRN245L-CRFDKA (P245/75R16)	A+B C-D	2.6' +- 6.5' (0.044° +- 0.108°) 0.59 +- 2 mm (0.023 +- 0.08 in.)
	GRN245L-CRFDKA (P265/70R16)	A+B C-D	1.3' +- 6.5' (0.022° +- 0.108°) 0.30 +- 2 mm (0.012 +- 0.08 in.)
	GRN245L-CRFDKA (P265/65R17)	A+B C-D	2.7' +- 6.5' (0.044° +- 0.108°) 0.60 +- 2 mm (0.024 +- 0.08 in.)
	GRN245L-CRADKA (P245/75R16)	A+B C-D	5.2' +- 6.5' (0.087° +- 0.108°) 1.18 +- 2 mm (0.046 +- 0.08 in.)
	GRN245L-CRADKA (P265/70R16)	A+B C-D	1.3' +- 6.5' (0.022° +- 0.108°) 0.30 +- 2 mm (0.012 +- 0.08 in.)
	GRN245L-CRADKA (P265/65R17)	A+B C-D	5.3' +- 6.5' (0.089° +- 0.108°) 1.20 +- 2 mm (0.047 +- 0.08 in.)
	GRN245L-PRFDKA (P245/75R16)	A+B C-D	5.2' +- 6.5' (0.087° +- 0.108°) 1.18 +- 2 mm (0.046 +- 0.08 in.)
	GRN245L-PRFDKA (P265/70R16)	A+B C-D	2.7' +- 6.5' (0.044° +- 0.108°) 0.60 +- 2 mm (0.024 +- 0.08 in.)
	GRN245L-PRFDKA (P265/65R17)	A+B C-D	5.3' +- 6.5' (0.089° +- 0.108°) 1.20 +- 2 mm (0.047 +- 0.08 in.)
	GRN245L-PRADKA (P245/75R16)	A+B C-D	4.6' +- 6.5' (0.077° +- 0.108°) 1.04 +- 2 mm (0.041 +- 0.08 in.)
	GRN245L-PRADKA (P265/70R16)	A+B C-D	2.0' +- 6.5' (0.033° +- 0.108°) 0.45 +- 2 mm (0.018 +- 0.08 in.)
	GRN245L-PRADKA (P265/65R17)	A+B C-D	4.6' +- 6.5' (0.077° +- 0.108°) 1.05 +- 2 mm (0.041 +- 0.08 in.)
	GRN250L-PRADKA (P245/75R16)	A+B C-D	4.0' +- 6.5' (0.066° +- 0.108°) 0.89 +- 2 mm (0.035 +- 0.08 in.)
	GRN250L-PRADKA (P265/65R17)	A+B C-D	4.0' +- 6.5' (0.066° +- 0.108°) 0.90 +- 2 mm (0.035 +- 0.08 in.)
Wheel turning angle		Inside wheel	40°18' (38°18' to 41°18') 40.30° (38.30° to 41.30°)
		Outside wheel (Reference)	35°54' (33°54' to 36°54') 35.90° (33.90° to 36.90°)

Camber	TRN240L-TRMDKA (P245/75R16)		0°35' +- 45' (0.58° +- 0.75°)
	TRN245L-CRMDKA (P245/75R16)		0°35' +- 45' (0.58° +- 0.75°)
	GRN245L-CRFDKA (P245/75R16)		0°28' +- 45' (0.47° +- 0.75°)
	GRN245L-CRFDKA (P265/70R16)		0°26' +- 45' (0.43° +- 0.75°)
	GRN245L-CRFDKA (P265/65R17)		0°28' +- 45' (0.47° +- 0.75°)
	GRN245L-CRADKA (P245/75R16)		0°32' +- 45' (0.54° +- 0.75°)
	GRN245L-CRADKA (P265/70R16)		0°26' +- 45' (0.43° +- 0.75°)
	GRN245L-CRADKA (P265/65R17)		0°32' +- 45' (0.54° +- 0.75°)
	GRN245L-PRFDKA (P245/75R16)		0°32' +- 45' (0.54° +- 0.75°)
	GRN245L-PRFDKA (P265/70R16)		0°28' +- 45' (0.47° +- 0.75°)
	GRN245L-PRFDKA (P265/65R17)		0°32' +- 45' (0.54° +- 0.75°)
	GRN245L-PRADKA (P245/75R16)		0°31' +- 45' (0.52° +- 0.75°)
	GRN245L-PRADKA (P265/70R16)		0°27' +- 45' (0.45° +- 0.75°)
	GRN245L-PRADKA (P265/65R17)		0°31' +- 45' (0.52° +- 0.75°)
	GRN250L-PRADKA (P245/75R16)		0°30' +- 45' (0.50° +- 0.75°)
	GRN250L-PRADKA (P265/65R17)		0°30' +- 45' (0.50° +- 0.75°)
		Right-left error	30' (0.50°) or less

SS

Caster	TRN240L-TRMDKA (P245/75R16)		1°44' +- 45' (1.73° +- 0.75°)
	TRN245L-CRMDKA (P245/75R16)		1°51' +- 45' (1.85° +- 0.75°)
	GRN245L-CRFDKA (P245/75R16)		1°59' +- 45' (1.99° +- 0.75°)
	GRN245L-CRFDKA (P265/70R16)		2°00' +- 45' (2.00° +- 0.75°)
	GRN245L-CRFDKA (P265/65R17)		2°00' +- 45' (2.00° +- 0.75°)
	GRN245L-CRADKA (P245/75R16)		1°55' +- 45' (1.92° +- 0.75°)
	GRN245L-CRADKA (P265/70R16)		2°00' +- 45' (2.00° +- 0.75°)
	GRN245L-CRADKA (P265/65R17)		1°55' +- 45' (1.92° +- 0.75°)
	GRN245L-PRFDKA (P245/75R16)		2°02' +- 45' (2.03° +- 0.75°)
	GRN245L-PRFDKA (P265/70R16)		2°04' +- 45' (2.06° +- 0.75°)
	GRN245L-PRFDKA (P265/65R17)		2°02' +- 45' (2.03° +- 0.75°)
	GRN245L-PRADKA (P245/75R16)		2°04' +- 45' (2.06° +- 0.75°)
	GRN245L-PRADKA (P265/70R16)		2°05' +- 45' (2.09° +- 0.75°)
	GRN245L-PRADKA (P265/65R17)		2°04' +- 45' (2.06° +- 0.75°)
	GRN250L-PRADKA (P245/75R16)		2°08' +- 45' (2.14° +- 0.75°)
	GRN250L-PRADKA (P265/65R17)		2°10' +- 45' (2.16° +- 0.75°)
		Right-left error	30' (0.50°) or less

SS

Steering axis inclination	TRN240L-TRMDKA (P245/75R16)		11°52' +- 45' (11.86° +- 0.75°)
	TRN245L-CRMDKA (P245/75R16)		11°53' +- 45' (11.88° +- 0.75°)
	GRN245L-CRFDKA (P245/75R16)		11°59' +- 45' (11.99° +- 0.75°)
	GRN245L-CRFDKA (P265/70R16)		12°01' +- 45' (12.02° +- 0.75°)
	GRN245L-CRFDKA (P265/65R17)		11°59' +- 45' (11.99° +- 0.75°)
	GRN245L-CRADKA (P245/75R16)		11°55' +- 45' (11.91° +- 0.75°)
	GRN245L-CRADKA (P265/70R16)		12°01' +- 45' (12.02° +- 0.75°)
	GRN245L-CRADKA (P265/65R17)		11°55' +- 45' (11.91° +- 0.75°)
	GRN245L-PRFDKA (P245/75R16)		11°55' +- 45' (11.91° +- 0.75°)
	GRN245L-PRFDKA (P265/70R16)		11°59' +- 45' (11.99° +- 0.75°)
	GRN245L-PRFDKA (P265/65R17)		11°55' +- 45' (11.91° +- 0.75°)
	GRN245L-PRADKA (P245/75R16)		11°56' +- 45' (11.93° +- 0.75°)
	GRN245L-PRADKA (P265/70R16)		12°00' +- 45' (12.00° +- 0.75°)
	GRN245L-PRADKA (P265/65R17)		11°56' +- 45' (11.93° +- 0.75°)
	GRN250L-PRADKA (P245/75R16)		11°57' +- 45' (11.95° +- 0.75°)
	GRN250L-PRADKA (P265/65R17)		11°57' +- 45' (11.95° +- 0.75°)
Upper arm ball joint turning torque			4.5 N*m (46 kgf*cm, 40 in.*lbf) or less
Lower arm ball joint turning torque			3.0 N*m (31 kgf*cm, 27 in.*lbf) or less
Stabilizer link ball joint turning torque			2.0 N*m (20 kgf*cm, 18 in.*lbf) or less

TORQUE SPECIFICATIONS

2WD

Part Tightened	N*m	kgf*cm	ft.*lbf
Tie rod end lock nut	55.5	566	41
Front suspension support sub-assembly x Shock absorber assembly front	27	275	20
Front shock absorber with coil spring x Frame	64	653	47
Front Wheel	113	1,152	83
Shock absorber assembly front x Front suspension lower arm	83	846	61
Battery negative terminal x Battery	3.9	40	35 in.*lbf
Front suspension upper arm x Steering knuckle	110	1,122	81
Front flexible hose x Shock absorber assembly front	32	326	24
Skid control sensor wire x Front suspension upper arm	5.0	51	44 in.*lbf
Skid control sensor wire x Steering knuckle	5.0	51	44 in.*lbf
Front suspension upper arm x Frame	82	836	60
Front spring bumper x Front suspension lower arm	31	316	23
Front suspension lower arm x Front lower ball joint attachment	140	1,428	103
Front lower ball joint attachment x Steering knuckle	160	1,631	118
Front suspension lower arm x Suspension cross member	210	2,141	155
Front stabilizer bracket No. 1 x Frame	21	214	16
Front stabilizer link assembly x Front stabilizer bar	19	194	14
Front stabilizer link assembly x Front suspension lower arm	69	704	51
Rear spring u bolt x Spring u bolt seat sub-assembly	50	510	37
Rear spring bumper No. 1 x Frame	15	153	11
Parking brake cable assembly No. 3 x Rear leaf spring	12.5	127	9
Rear Wheel	113	1,152	83
Rear leaf spring x Rear spring shackle sub-assembly No. 2	120	1,224	89
Rear leaf spring x Frame	120	1,224	89
Rear spring shackle sub-assembly No. 2 x Frame	120	1,224	89
Rear shock absorber x Spring u bolt seat sub-assembly	100	1,020	74
Rear shock absorber x Frame	20	204	15
Rear stabilizer bracket cover x Rear axle housing	27	275	20
Rear stabilizer link assembly x Rear stabilizer bar	69	704	51
Rear stabilizer link assembly x Frame	69	704	51

4WD and Pre-Runner

Part Tightened	N*m	kgf*cm	ft.*lbf
Tie rod end lock nut	55.5	566	41
Front suspension support sub-assembly x Shock absorber assembly front	27	275	20
Front shock absorber with coil spring x Frame	64	653	47
Front stabilizer link assembly x Steering knuckle	70	714	52
Engine under cover sub-assembly No. 1 x Frame	30	306	22
Front Wheel	113	1,152	83
Shock absorber assembly front x Front suspension lower arm	83	846	61
Front suspension upper arm x Steering knuckle	110	1,122	81
Skid control sensor wire x Front suspension upper arm	12.5	127	9
Skid control sensor wire x Steering knuckle	12.5	127	9
Front suspension upper arm x Frame	115	1,173	85
Front suspension lower arm x Front lower ball joint attachment	140	1,428	103
Front lower ball joint attachment x Steering knuckle	160	1,631	118

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Part Tightened	N*m	kgf*cm	ft.*lbf
Front suspension lower arm x Suspension cross member	135	1,377	100
Front stabilizer bracket No. 1 x Frame	40	408	30
Front stabilizer link assembly x Front stabilizer bar	70	714	52
Rear spring u bolt x Spring u bolt seat sub-assembly	50	510	37
Parking brake cable assembly No. 3 x Rear leaf spring	12.5	127	9
Rear Wheel	113	1,152	83
Rear leaf spring x Rear spring shackle sub-assembly No. 2	120	1,224	89
Rear leaf spring x Frame	120	1,224	89
Rear spring shackle sub-assembly No. 2 x Frame	120	1,224	89
Rear shock absorber x Rear axle housing	100	1,020	74
Rear shock absorber x Frame	20	204	15

TIRE AND WHEEL
SERVICE DATA

Cold tire inflation pressure	P215/70R15 97S	Front wheel	200 kPa (2.0 kgf/cm ² , 29 psi)
		Rear wheel	220 kPa (2.2 kgf/cm ² , 32 psi)
		Spare wheel	220 kPa (2.2 kgf/cm ² , 32 psi)
	P255/45R18 99V	Front wheel	240 kPa (2.4 kgf/cm ² , 35psi)
		Rear wheel	240 kPa (2.4 kgf/cm ² , 35psi)
		Spare wheel	240 kPa (2.4 kgf/cm ² , 35psi)
	P245/75R16 109S	Front wheel	200 kPa (2.0 kgf/cm ² , 29 psi)
		Rear wheel	200 kPa (2.0 kgf/cm ² , 29 psi)
		Spare wheel	200 kPa (2.0 kgf/cm ² , 29 psi)
	P265/70R16 111T	Front wheel	200 kPa (2.0 kgf/cm ² , 29 psi)
		Rear wheel	220 kPa (2.2 kgf/cm ² , 32 psi)
		Spare wheel	220 kPa (2.2 kgf/cm ² , 32 psi)
	P265/65R17 110S	Front wheel	200 kPa (2.0 kgf/cm ² , 29 psi)
		Rear wheel	200 kPa (2.0 kgf/cm ² , 29 psi)
		Spare wheel	200 kPa (2.0 kgf/cm ² , 29 psi)
Tire runout			3.0 mm (0118 in.) or less
Imbalance after adjustment			8 g (0.018 lb) or less

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TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Tire pressure warning antenna and receiver x Body	5.0	51	44 in.*lbf
Battery negative terminal x Battery	3.9	40	35 in.*lbf
Tire pressure warning valve and transmitter x Wheel	4.0	41	35 in.*lbf
Front wheel	113	1,152	83
Rear wheel	113	1,152	83
Tire pressure warning ECU x Body	5.5	56	49 in.*lbf

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BRAKE CONTROL**TORQUE SPECIFICATIONS**

Part Tightened	N*m	kgf*cm	ft.*lbf
Brake actuator bracket assembly x Brake actuator	5.4	55	48 in.*lbf
Brake actuator x Body	19	194	14
Brake tube x Brake actuator	15.2	155	11
Air injection control driver x Body	10	102	7
Battery negative terminal x Battery	3.9	40	35 in.*lbf
Front speed sensor x Steering knuckle	8.3	85	73 in.*lbf
Front wheel	113	1,152	83
Rear speed sensor x Steering knuckle	8.0	82	71 in.*lbf
Deceleration sensor x Body	12.5	127	9
Sensor bracket x Body	12.5	127	9
Yaw rate and deceleration sensor x Body	12.5	127	9

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BRAKE**SERVICE DATA**

Brake pedal height (from dash panel)		158.1 to 168.1 mm (6.224 to 6.618 in.)
Rod operating adapter length	w/ VSC w/o VSC	214 to 224 mm (8.425 to 8.818 in.) 212 to 222 mm (8.346 to 8.740 in.)
Stop light switch clearance		1.5 to 2.5 mm (0.059 to 0.098 in.)
Brake pedal free play		1 to 6 mm (0.04 to 0.24 in.)
Brake pedal reserve distance (from asphalt sheet) at 490 N (50 kgf, 110.2 lbf)		More than 55 mm (2.17 in.)
Brake booster push rod to piston clearance		0 mm (0 in.)
Front disc thickness (2WD)	Standard Minimum	25.0 mm (0.984 in.) 23.0 mm (0.906 in.)
Front disc brake pad lining thickness (2WD)	Standard Minimum	12.0 mm (0.472 in.) 1.0 mm (0.039 in.)
Front disc runout	Maximum	0.05 mm (0.0020 in.)
Front disc thickness (4WD and Pre-Runner)	Standard Minimum	28.0 mm (1.102 in.) 26.0 mm (1.024 in.)
Front disc brake pad lining thickness (4WD and Pre-Runner)	Standard Minimum	11.5 mm (0.453 in.) 1.0 mm (0.039 in.)
Rear brake drum inside diameter	Standard Maximum	254 mm (10.00 in.) 256 mm (10.08 in.)
Rear drum brake shoe lining thickness	Standard Minimum	5.0 mm (0.197 in.) 1.0 mm (0.039 in.)
Rear brake shoe clearance		0.5 mm (0.020 in.)

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Bleeder plug	11	112	8
Brake booster clevis lock nut	25.5	260	19
Brake pedal x Brake pedal support sub-assembly	34.3	350	25
Brake pedal support sub-assembly x Brake booster	14.2	145	10
Brake pedal support sub-assembly x Hydraulic brake booster	14.2	145	10
Brake pedal support reinforcement x Reinforcement	34.3	350	25
Driver side junction block x Reinforcement	8.0	82	71 in.*lbf
Battery negative terminal x Battery	3.9	40	35 in.*lbf
Brake master cylinder x Brake booster	12.5	127	9
Brake tube x Brake master cylinder	15	153	11
Brake booster accumulator assembly x Brake booster pump assembly	57.4	585	42
Master cylinder solenoid x Master cylinder body	31.9	325	24
Brake booster pump bracket x Master cylinder solenoid	7.8	80	69 in.*lbf
Brake actuator bracket x Master cylinder body	7.8	80	69 in.*lbf
Pin x Brake booster pump assembly	7.8	80	69 in.*lbf
Brake booster pump wire harness x Master cylinder solenoid	2.9	30	26 in.*lbf
Brake actuator tube No. 1 x Brake booster pump assembly	14 (15.2)	143 (155)	10 (11)
Brake actuator tube No. 1 x Master cylinder body	14 (15.2)	143 (155)	10 (11)
Brake master cylinder reservoir sub-assembly x Master cylinder body	1.7	17	15 in.*lbf
Brake actuator bracket No. 1 x Master cylinder solenoid	7.8	80	69 in.*lbf
Brake tube x Hydraulic brake booster	15.2	155	11
Front Wheel	113	1,152	83
Front disc brake cylinder mounting x Steering knuckle (2WD)	108	1,101	80
Disc brake cylinder assembly x Front disc brake cylinder mounting (2WD)	36.3	370	27
Front flexible hose x Disc brake cylinder assembly (2WD)	30	306	22
Disc brake cylinder assembly x Steering knuckle (4WD and Pre-Runner)	123	1,254	91
Brake tube x Disc brake cylinder assembly (4WD and Pre-Runner)	15.2	155	11
Rear wheel brake cylinder x Backing plate	9.5	97	84 in.*lbf
Brake tube x Rear wheel brake cylinder	15.2	155	11
Rear Wheel	113	1,152	83

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SS

PARKING BRAKE

SERVICE DATA

Parking brake pedal travel at 300 N (31 kgf, 67 lbf)	7 to 10 clicks
Parking brake lever travel at 200 N (20 kgf, 45 lbf)	7 to 10 clicks

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Rear wheel	113	1,152	83
Wire adjusting nut x Lock nut	13	127	9
Parking brake cable joint protector x Body	13	127	9
Parking brake lever x Instrument panel reinforcement	6.0	61	53 in.*lbf
Battery negative terminal x Battery	3.9	40	35 in.*lbf
Parking brake pedal x Body	13	127	9
Parking brake cable assembly No. 3 x Frame	13	127	9
Parking brake cable assembly No. 3 x Backing plate	8.0	82	71 in.*lbf
Parking brake cable assembly No. 1 x Body (Bolt)	13	127	9
Parking brake cable assembly No. 1 x Body (Nut)	6.0	61	53 in.*lbf

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STEERING COLUMN

SERVICE DATA

Steering wheel free play	Maximum	30 mm (1.18 in.)
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TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Steering wheel set nut	50	510	37
Steering column assembly set nut and bolt	21	210	16
Main shaft assembly x Steering intermediate shaft	36	270	20
Steering sliding yoke x No. 2 Intermediate shaft	35	357	26
Power steering gear box x No. 2 intermediate shaft	35	357	26
Steering sliding yoke x intermediate shaft	35	357	26



POWER STEERING

SERVICE DATA

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Power steering fluid		
Fluid level rise	Maximum	5 mm (0.20 in.)
Fluid pressure at idle speed with valve closed		8,300 to 8,800 kPa (85 to 90 kgf/cm ² , 1,209 to 1280 psi)
Steering Wheel		
Steering effort at idle speed	(Reference)	6.0 N*m (60 kgf*cm, 53 in.*lbf) or less
Vane pump assembly		
Pulley shaft and vane pump housing front oil clearance	Standard Maximum	0.021 to 0.043 mm (0.0008 to 0.0017 in.) 0.07 mm (0.0028 in.)
Vane plate height	Minimum	7.7 mm (0.303 in.)
Vane plate thickness	Minimum	1.408 mm (0.0554 in.)
Vane plate length	Minimum	11.993 mm (0.4722 in.)
Vane pump rotor and vane plate clearance	Maximum	0.025 mm (0.0012 in.)
Compression spring free length	Minimum	36.9 mm (1.453 in.)
Vane pump rotating torque		0.27 N*m (2.8 kgf*cm, 2.4 in.*lbf) or less
Power steering link assembly (2WD)		
Tie rod end turning torque		0.83 to 3.43 N*m (8.5 to 35.0 kgf*cm, 7.35 to 30.36 in.*lbf)
Power steering rack runout	Maximum	0.3 mm (0.012 in.)
Power steering control valve turning torque		0.8 to 1.1 N*m (8.2 to 11.2 kgf*cm, 7.1 to 9.7 in.*lbf)
Steering rack boot No. 1 clamp clearance		3.0 mm (0.118 in.) or less
Power steering link assembly (4WD and Pre-Runner)		
Tie rod end turning torque		0.49 to 3.43 N*m (5.0 to 35.0 kgf*cm, 4.34 to 30.36 in.*lbf)
Power steering rack runout	Maximum	0.3 mm (0.012 in.)
Power steering control valve turning torque		0.9 to 1.5 N*m (9.2 to 15.3 kgf*cm, 8.0 to 13.3 in.*lbf)
Steering rack boot No. 1 clamp clearance		3.0 mm (0.118 in.) or less

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Steering wheel assembly x Steering column assembly	50	510	37
Vane pump housing rear x Vane pump housing front	22	224	16
Power steering oil pressure switch x Vane pump housing front	21	214	15
Pressure port union sub-assembly x Vane pump housing front	69	704	51
Vane pump oil reservoir sub-assembly x Vane pump housing front (2TR-FE)	9.0	92	80 in.*lbf
Vane pump assembly x Engine	21	214	15
Pressure feed tube assembly x Vane pump assembly	51	520	38
Battery negative terminal x Battery	3.9	40	35 in.*lbf
Engine under cover sub-assembly No. 1 x Frame	30	306	22
Power steering suction port union x Vane pump housing front (1GR-FE)	12	122	9
Wire harness clamp bracket x Vane pump assembly (1GR-FE)	8.0	82	71 in.*lbf
Control valve housing x Rack housing	18	184	13
Steering rack guide spring cap nut x Steering rack guide spring cap	43 (59)	440 (601)	32 (44)
Steering rack end sub-assembly x Power steering rack	61 (84)	619 (851)	45 (62)
Tie rod end lock nut x Steering rack end sub-assembly	55.5	566	41
Steering turn pressure tube x Control valve housing	14 (15)	141 (153)	10 (11)
Steering turn pressure tube x Rack housing	14 (15)	141 (153)	10 (11)
Steering gear outlet return tube x Control valve housing	22 (24)	222 (245)	16 (18)
Power steering link assembly x Suspension cross member	92	938	68
Pressure feed tube assembly union nut x Power steering link assembly	22 (24)	222 (245)	16 (18)
Pressure feed tube assembly bracket x Power steering link assembly	28	286	21
Tie rod end sub-assembly x Steering knuckle (2WD)	49	500	36
Steering intermediate shaft No. 2 x Power steering link assembly	35	357	26
Steering sliding yoke x Steering intermediate shaft No. 2	35	357	26
Steering sliding yoke x Steering intermediate shaft	35	357	26
Front wheel	113	1,152	83
Tie rod end sub-assembly x Steering knuckle (4WD and Pre-Runner)	91	928	67

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AIR CONDITIONING

SERVICE DATA

Refrigerant charge volume	570 to 630 g (20.10 to 22.22 oz.)
Magnetic clutch clearance	0.30 to 0.60 mm (0.012 to 0.024 in.)
Magnetic clutch relay	3 - 5 : 10kΩ or higher 3 - 5 : Below 1Ω(Apply battery voltage to terminals 1 and 2)
Heater relay	3 - 4 : Below 1Ω 3 - 4 : 10kΩ or higher (Apply battery voltage to terminals 1 and 2) 3 - 5 : 10kΩ or higher 3 - 5 : Below 1Ω(Apply battery voltage to terminals 1 and 2)

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Negative battery terminal x Battery	3.9	40	35 in.*lbf

AIR CONDITIONING UNIT

Part Tightened	N*m	kgf*cm	ft.*lbf
Expansion valve x Evaporator core	7.0	71	62 in.*lbf
Valve to connector tube x Expansion valve	25	255	18
Mode case x Main case	2.0	20	18 in.*lbf
Heater pivot x Main case	2.0	20	18 in.*lbf
Mode mounting plate x Main case	2.0	20	18 in.*lbf
Mode mounting plate x Mode case	2.0	20	18 in.*lbf
Blower motor x Main case	2.0	20	18 in.*lbf
Blower resistor x Main case	2.0	20	18 in.*lbf
Heater radiator assembly x Main case	2.0	20	18 in.*lbf
Temperature mounting plate x Main case	2.0	20	18 in.*lbf
Temperature mounting plate x Heater radiator	2.0	20	18 in.*lbf
Air inlet control servo motor x Main case	2.0	20	18 in.*lbf
Air mix control servo motor x Temperature mounting plate	2.0	20	18 in.*lbf
Mode control servo motor x Mode mounting plate	2.0	20	18 in.*lbf
No. 1 air duct x Mode case	2.0	20	18 in.*lbf
Heater to register center duct x Mode case	2.0	20	18 in.*lbf
Defroster nozzle assembly lower x Mode case	2.0	20	18 in.*lbf
Air conditioning unit assembly x Body	5.0	51	44 in.*lbf
Air conditioning unit assembly x Instrument panel reinforcement	5.0	51	44 in.*lbf
Air conditioning amplifier assembly x Instrument panel reinforcement	7.0	71	62 in.*lbf
Driver side junction block x Instrument panel reinforcement	8.0	82	71 in.*lbf
Bracket x Driver side junction block	8.0	82	71 in.*lbf
Air conditioning tube assembly x Body	7.5	76	66 in.*lbf
Suction hose sub-assembly x Body	7.5	76	66 in.*lbf

COMPRESSOR AND MAGNETIC CLUTCH

Part Tightened	N*m	kgf*cm	ft.*lbf
Magnet clutch hub x Cooler compressor assembly	13.5	138	10
Pressure relief valve x Cooler compressor assembly	8.0	82	71 in.*lbf
Compressor pick up sensor x Cooler compressor assembly	4.0	41	35 in.*lbf
Compressor and magnetic clutch x Compressor bracket	21	214	16
Discharge hose sub-assembly x Compressor and magnetic clutch	19	194	14
Suction hose sub-assembly x Compressor and magnetic clutch	19	194	14
Suction hose sub-assembly x Timing chain cover	7.5	76	66

CONDENSER

Part Tightened	N*m	kgf*cm	ft.*lbf
Condenser assembly x Body	7.5	76	66 in.*lbf
Air conditioning tube assembly x Condenser assembly	7.5	76	66 in.*lbf
Discharge hose sub-assembly x Condenser assembly	7.5	76	66 in.*lbf

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SUPPLEMENTAL RESTRAINT
SYSTEM
TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Steering pad x Steering wheel assembly	8.8	90	78 in.*lbf
Steering wheel assembly x Steering column assembly	50	510	37
Front passenger airbag assembly x Instrument panel reinforcement	20	200	14
Curtain shield airbag x Body	9.8	100	7
Center airbag sensor x Body	18	179	13
Front airbag sensor set bolt	7.5	76	66 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 sensor x Front seat	8.0	82	71 in.*lbf
Occupant classification ECU (Bench seat type) x Seat	3.0	30	27 in.*lbf

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SEAT BELT

SERVICE DATA

FRONT SEAT INNER BELT ASSEMBLY (for Separate Seat Type LH Side):

Item	Tester Connection	Condition	Specified Condition
Standard resistance	1 - 2	Fasten seat belt	10 k Ω or higher
		Release seat belt	Below 1 Ω

FRONT SEAT INNER BELT ASSEMBLY (for Separate Seat Type RH Side):

Item	Tester Connection	Condition	Specified Condition
Standard resistance	1 - 2	Fasten seat belt	10 k Ω or higher
		Release seat belt	Below 1 Ω

FRONT SEAT INNER BELT ASSEMBLY (for Bench Seat Type LH Side):

Item	Tester Connection	Condition	Specified Condition
Standard resistance	1 - 2	Fasten seat belt	10 k Ω or higher
		Release seat belt	Below 1 Ω

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TORQUE SPECIFICATIONS

FRONT SEAT INNER BELT ASSEMBLY (for Separate Seat Type):

Part Tightened	N*m	kgf*cm	ft.*lbf
Front seat inner belt assembly x Front seat frame adjuster assembly	42	430	31
Negative battery terminal x Battery	3.9	40	35 in.*lbf

FRONT SEAT INNER BELT ASSEMBLY (for Bench Seat Type):

Part Tightened	N*m	kgf*cm	ft.*lbf
Front seat inner belt assembly x Body	42	430	31
Negative battery terminal x Battery	3.9	40	35 in.*lbf

FRONT SEAT OUTER BELT ASSEMBLY (for Double Cab):

Part Tightened	N*m	kgf*cm	ft.*lbf
Front shoulder belt anchor adjuster assembly x Body	42	430	31
Front seat outer belt assembly x Body (for Retractor Upper)	8.5	85	75 in.*lbf
Front seat outer belt assembly x Front shoulder belt anchor adjuster assembly (for Shoulder Anchor)	42	430	31
Front seat outer belt assembly x Body (for Floor Anchor)	42	430	31
Negative battery terminal x Battery	3.9	40	35 in.*lbf

FRONT SEAT OUTER BELT ASSEMBLY (for Regular Cab):

Part Tightened	N*m	kgf*cm	ft.*lbf
Front shoulder belt anchor adjuster assembly x Body	42	430	31
Front seat outer belt assembly x Body (for Retractor Upper)	8.5	85	75 in.*lbf
Front seat outer belt assembly x Body (for Retractor Lower)	42	430	31
Front seat outer belt assembly x Front shoulder belt anchor adjuster assembly (for Shoulder Anchor)	42	430	31
Negative battery terminal x Battery	3.9	40	35 in.*lbf

FRONT SEAT OUTER BELT ASSEMBLY (for Access Cab):

Part Tightened	N*m	kgf*cm	ft.*lbf
Front shoulder belt anchor adjuster assembly x Rear door panel sub-assembly	42	430	31
Front seat outer belt assembly x Body (for Retractor Upper)	8.5	85	75 in.*lbf
Front seat outer belt assembly x Body (for Retractor Lower)	42	430	31
Front seat outer belt assembly x Front shoulder belt anchor adjuster assembly (for shoulder anchor)	42	430	31
Negative battery terminal x Battery	3.9	40	35 in.*lbf

REAR SEAT INNER ASSEMBLY (for Double Cab):

Part Tightened	N*m	kgf*cm	ft.*lbf
Rear seat inner belt assembly x Body	42	430	31

REAR SEAT INNER ASSEMBLY (for Access Cab):

Part Tightened	N*m	kgf*cm	ft.*lbf
Rear seat inner belt assembly x Body	42	430	31

FRONT CENTER SEAT OUTER ASSEMBLY (for Bench Seat Type):

Part Tightened	N*m	kgf*cm	ft.*lbf
Tether anchor bracket sub-assembly x Body	20	205	15
Seat belt bracket x Body	20	205	15
Front center seat outer belt assembly x Seat belt bracket (for Retractor Upper)	8.5	85	75 in.*lbf
Front center seat outer belt assembly x Seat belt bracket (for Retractor Lower)	42	430	31

Part Tightened	N*m	kgf*cm	ft.*lbf
Front center seat outer belt assembly x Body (for Shoulder Anchor)	42	430	31

REAR SEAT OUTER BELT ASSEMBLY (for Double Cab):

Part Tightened	N*m	kgf*cm	ft.*lbf
Rear seat outer belt assembly x Body (for Retractor Upper)	8.5	85	75 in.*lbf
Rear seat outer belt assembly x Body (for Retractor Lower)	42	430	31
Rear seat outer belt assembly x Body (for Shoulder Anchor)	42	430	31
Rear seat outer belt assembly x Body (for Floor Anchor)	42	430	31

REAR SEAT OUTER BELT ASSEMBLY (for Access Cab):

Part Tightened	N*m	kgf*cm	ft.*lbf
Tether anchor bracket sub-assembly x Body	20	205	15
Rear seat outer belt assembly x Body (for Retractor Upper)	8.5	85	75 in.*lbf
Rear seat outer belt assembly x Body (for Shoulder Anchor)	42	430	31
Rear seat outer belt assembly x Body (for Floor Anchor)	42	430	31

SS

CRUISE CONTROL

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Driver side junction block assembly x Body	8.0	82	71 in.*lbf
Bracket x Driver side junction block assembly	8.0	82	71 in.*lbf
Bracket x Body	8.0	82	71 in.*lbf
Negative battery terminal x Battery	3.9	40	35 in.*lbf

SS

LIGHTING

SERVICE DATA

Headlight relay	3 - 5: 10 kΩ or higher 3 - 5: Below 1 Ω (Battery voltage applied to terminals 1 and 2)
Headlight dimmer relay	3 - 4: Below 1 Ω 3 - 4: 10 kΩ or higher (Battery voltage applied to terminals 1 and 2) 3 - 5: 10 kΩ or higher 3 - 5: Below 1 Ω (Battery voltage applied to terminals 1 and 2)
Taillight relay	3 - 5: 10 kΩ or higher 3 - 5: Below 1 Ω (Battery voltage applied to terminals 1 and 2)
Fog light relay	3 - 5: 10 kΩ or higher 3 - 5: Below 1 Ω (Battery voltage applied to terminals 1 and 2)
Towing tail relay	3 - 5: 10 kΩ or higher 3 - 5: Below 1 Ω (Battery voltage applied to terminals 1 and 2)

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Headlight assembly x Front fender panel	2.0	20	17 in.*lbf
Rear combination light assembly x Rear body side panel	5.4	55	48 in.*lbf
Towing converter relay x Body	7.0	71	62 in.*lbf
Wiring harness clamp bracket x Trailer socket	8.3	85	75 in.*lbf
Negative battery terminal x Battery	3.9	40	35 in.*lbf

WIPER AND WASHER

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Front wiper motor x Windshield wiper motor and link	7.5	76	66 in.*lbf
Windshield wiper motor and link x Body	5.5	56	49 in.*lbf
Front wiper arm RH x Windshield wiper motor and link	21	209	15
Front wiper arm LH x Windshield wiper motor and link	21	209	15
Negative battery terminal x Battery	3.9	40	35 in.*lbf

SS

METER

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Combination meter assembly x Instrument panel assembly	7.0	71	66 in.*lbf
Negative battery terminal x Battery	3.9	40	35 in.*lbf

AUDIO / VISUAL**SERVICE DATA**

Acc relay Resistance (3 - 5)	Standard	10 k Ω or higher Below 1 Ω (When battery voltage applied to terminal 1 and 2)
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TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft*lbf
Radio receiver assembly X Radio receiver bracket	2.5	25	22 in*lbf
Radio receiver with bracket X Body	2.5	25	22 in*lbf
Front No. 2 speaker assembly X Body	8.4	85	74 in*lbf
No. 1 speaker assembly with box X Body	8.4	85	74 in*lbf
Voltage inverter assembly X Body	15	153	11
Voltage inverter assembly X Body	7.5	76	66 in*lbf
Battery negative terminal X Battery	3.9	40	35 in*lbf



HORN

SERVICE DATA

Fuse (HORN)	Standard	Below 1 Ω
Relay (HORN) Resistance (3 - 5)	Standard	10 kΩ or higher Below 1 Ω (When battery applied to terminals 1 and 2)

OTHER SYSTEM

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft*lbf
Power outlet socket assembly X Deck side trim box RH	5.0	51	66 in*lbf
Battery negative terminal X Battery	3.9	40	35 in*lbf

WINDSHIELD / WINDOWGLASS

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Back window assembly x Body	7.8	80	69 in.*lbf
Negative battery terminal x Battery	3.9	40	35 in.*lbf

MIRROR

SERVICE DATA

Outer mirror switch assembly	Resistance: L position 4 - 8: Below 1 Ω at switch position UP 6 - 7: Below 1 Ω at switch position UP 4 - 7: Below 1 Ω at switch position DOWN 6 - 8: Below 1 Ω at switch position DOWN 5 - 8: Below 1 Ω at switch position LEFT 6 - 7: Below 1 Ω at switch position LEFT 5 - 7: Below 1 Ω at switch position RIGHT 6 - 8: Below 1 Ω at switch position RIGHT Resistance: R position 3 - 8: Below 1 Ω at switch position UP 6 - 7: Below 1 Ω at switch position UP 3 - 7: Below 1 Ω at switch position DOWN 6 - 8: Below 1 Ω at switch position DOWN 2 - 8: Below 1 Ω at switch position LEFT 6 - 7: Below 1 Ω at switch position LEFT 2 - 7: Below 1 Ω at switch position RIGHT 6 - 8: Below 1 Ω at switch position RIGHT
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TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Outer rear view mirror assembly x Front door panel sub-assembly	8.0	80	71 in.*lbf
Negative battery terminal x Battery	3.9	40	35 in.*lbf

INSTRUMENT PANEL

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Front passenger airbag assembly x Instrument panel reinforcement	20	205	15
Combination meter assembly x Instrument panel assembly	7.0	76	66 in.*lbf
Negative battery terminal x Battery	3.9	40	35 in.*lbf

SEAT

TORQUE SPECIFICATIONS

FRONT SEAT ASSEMBLY (for Separate Seat Type Driver Side):

Part Tightened	N*m	kgf*cm	ft.*lbf
Seat position sensor x Front seat frame adjuster assembly	8.0	80	71 in.*lbf
Front seat back cover x Front seat frame adjuster assembly (for Front Seat Side Airbag)	5.5	55	49
Front seat inner belt assembly x Front seat frame adjuster assembly	42	430	31
Front seat assembly x Body	37	375	27
Negative battery terminal x Battery	3.9	40	35 in.*lbf

SS

FRONT SEAT ASSEMBLY (for Separate Seat Type Front Passenger Side):

Part Tightened	N*m	kgf*cm	ft.*lbf
Front seat back cover x Front seat frame adjuster assembly (for Front Seat Side Airbag)	5.5	55	49
Front seat inner belt assembly x Front seat frame adjuster assembly	42	430	31
Front seat assembly x Body	37	375	27
Negative battery terminal x Battery	3.9	40	35 in.*lbf

FRONT SEAT ASSEMBLY (for Separate Folding Seat Type):

Part Tightened	N*m	kgf*cm	ft.*lbf
Front seat back cover x Front seat back spring assembly (for Front Seat Side Airbag)	5.5	55	49
Front seat back lock sub-assembly x Front seat back spring assembly	43	440	32
Front seat back assembly x Front seat frame adjuster assembly	43	440	32
Front seat assembly x Body	37	375	27
Negative battery terminal x Battery	3.9	40	35 in.*lbf

FRONT SEAT ASSEMBLY (for Bench Seat Type):

Part Tightened	N*m	kgf*cm	ft.*lbf
Seat track handle sub-assembly x Front seat cushion spring assembly	14	145	10
Front seat outer track assembly x Front seat cushion spring assembly	20	205	15
Front seat track rear bracket x Front seat outer track assembly	32	325	24
Front seat track front bracket x Front seat outer track assembly	32	325	24
Front seat back assembly x Front seat cushion spring assembly	42	430	31
Front seat assembly x Body	37	375	27
Negative battery terminal x Battery	3.9	40	35 in.*lbf

REAR SEAT ASSEMBLY (for Double Cab LH Side):

Part Tightened	N*m	kgf*cm	ft.*lbf
Rear seat back lock assembly x Rear seat back frame sub-assembly	30	305	22
Rear seat cushion hinge sub-assembly x Rear seat cushion frame sub-assembly	21	215	16
Rear seat back center hinge sub-assembly x Body	18	185	14
Rear seat back hinge sub-assembly x Body	18	185	14
Rear seat back assembly x Rear seat back center hinge sub-assembly	37	375	27
Rear seat back assembly x Rear seat back hinge sub-assembly	37	375	27
Rear seat cushion assembly x Body	37	375	27

REAR SEAT ASSEMBLY (for Double Cab RH Side):

Part Tightened	N*m	kgf*cm	ft.*lbf
Rear seat back lock assembly x Rear seat back frame sub-assembly	30	305	22
Rear center seat outer belt assembly x Rear seat back frame sub-assembly	44	450	33

Part Tightened	N*m	kgf*cm	ft.*lbf
Rear seat cushion hinge sub-assembly x Rear seat cushion frame sub-assembly	21	215	16
Rear seat back hinge sub-assembly x Body	18	185	14
Rear seat back assembly x Rear seat back center hinge sub-assembly	37	375	27
Rear seat back assembly x Rear seat back hinge sub-assembly	37	375	27
Rear center seat outer belt x Body	42	430	31
Rear seat cushion assembly x Body	37	375	27

SS

REAR SEAT ASSEMBLY (for Access Cab):

Part Tightened	N*m	kgf*cm	ft.*lbf
Rear seat back lock sub-assembly x Rear seat cushion frame sub-assembly	7.0	70	62 in.*lbf
Child restraint seat anchor bracket sub-assembly x Body	18	185	13
Rear seat back lock striker sub-assembly x Body	18	185	13
Rear seat assembly x Body	18	185	14

ENGINE HOOD / DOOR

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Hood hinge x Hood sub-assembly	30	306	22
Hood lock assembly x Radiator support sub-assembly	12	122	9
Hood lock release lever protector No. 2 x Radiator support sub-assembly	12	122	9
Hood lock control cable protector sub-assembly x Radiator support sub-assembly	5.5	56	49 in.*lbf
Front door hinge assembly upper LH x Body	26	265	19
Front door hinge assembly upper LH x Door	26	265	19
Front door lock striker plate x Body	23	235	17
Front door check assembly LH x Door	5.5	56	49 in.*lbf
Front door check assembly LH x Body	30	306	22
Front door outside handle frame sub-assembly LH x Door	7.0	71	62 in.*lbf
Front door lock assembly LH x Door	12	122	9
Front door outside cover x Door	7.0	71	62 in.*lbf
Front door frame sub-assembly front lower LH x Door	5.5	56	49 in.*lbf
Front door frame sub-assembly rear lower LH x Door	8.0	82	70 in.*lbf
Power window regulator motor assembly LH x Front door window regulator sub-assembly LH	5.4	55	49 in.*lbf
Front door window regulator sub-assembly LH x Door	11	112	8
Front door glass sub-assembly LH x Front door window regulator sub-assembly LH	8.0	82	71 in.*lbf
Rear door hinge assembly upper LH x Body	26	265	19
Rear door hinge assembly upper LH x Door	26	265	19
Access panel upper lock striker assembly LH x Body	23	235	17
Rear door lock striker plate x Body	23	235	17
Rear door check assembly LH x Door	5.5	56	49 in.*lbf
Rear door check assembly LH x Body	30	306	22
Front door courtesy light switch assembly LH x Door	9.0	92	80 in.*lbf
Rear door inside locking LH cable assembly x Door	5.0	51	44 in.*lbf
Access panel lock remote control assembly LH x Door	12	122	9
Access panel lock assembly lower LH x Door	12	122	9
Access panel lock assembly upper LH x Door	12	122	9
Front seat belt assembly outer LH (floor side) x Door	42	428	31
Rear door lock striker plate assembly x Body	23	235	17
Rear door outside handle frame sub-assembly LH x Door	7.0	71	62 in.*lbf
Rear door outside handle cover LH x Door	7.0	71	62 in.*lbf
Rear door lock assembly LH x Door	12	122	9
Power window regulator motor assembly LH front x Rear door window regulator sub-assembly LH	5.4	55	49 in.*lbf
Rear door window regulator sub-assembly LH x Door	11	112	8
Rear door window guide sub-assembly front LH x Door	8.0	82	70 in.*lbf
Rear door window frame sub-assembly rear lower LH x Door	8.0	82	70 in.*lbf
Rear door glass sub-assembly LH x Rear door window regulator sub-assembly LH	8.0	82	70 in.*lbf
Tail gate hinge assembly LH x Tail gate	18	178	13
Tail gate stay assembly x Tail gate	14	143	10
Tail gate stay stopper x Rear body side panel LH	14	143	10
Tail gate lock striker x Rear body side panel LH	29	296	21

SS

Part Tightened	N*m	kgf*cm	ft.*lbf
Tail gate hinge assembly x Tail gate	13	127	9
Tail gate lock assembly LH x Tail gate	29	296	21
Negative battery terminal x Battery	3.9	40	35 in.*lbf

EXTERIOR**TORQUE SPECIFICATIONS****FRONT BUMPER:**

Part Tightened	N*m	kgf*cm	ft.*lbf
Front bumper extension sub-assembly x Body	58	590	43
Front bumper reinforcement sub-assembly x Front bumper extension sub-assembly	58	590	43
Front bumper arm mounting bracket x Body	13	135	10
Front bumper reinforcement extension x Body	13	135	10
Front bumper upper center retainer x Body	13	135	10
Front bumper upper center retainer x Front bumper arm mounting bracket	13	135	10
Negative battery terminal x Body	3.9	40	35 in.*lbf

SS**REAR BUMPER:**

Part Tightened	N*m	kgf*cm	ft.*lbf
Rear bumper bar corner reinforcement x Rear bumper bar	19	195	14
Rear bumper plate x Rear bumper bar	7.0	70	62 in.*lbf
Rear bumper arm sub-assembly x Rear bumper bar reinforcement sub-assembly (w/o Towing Hitch)	65	665	48
Rear bumper bar reinforcement sub-assembly x Rear bumper bar (w/o Towing Hitch)	19	195	14
No. 3 frame wire x Receiver hitch bracket sub-assembly (w/ Towing Hitch)	19	195	14
Receiver hitch bracket sub-assembly x Rear bumper bar (w/ Towing Hitch)	19	195	14
Rear bumper bar x Body	90	920	67
Negative battery terminal x Body	3.9	40	35 in.*lbf

FRONT DOOR BELT MOULDING:

Part Tightened	N*m	kgf*cm	ft.*lbf
Negative battery terminal x Body	3.9	40	35 in.*lbf

REAR DOOR BELT MOULDING:

Part Tightened	N*m	kgf*cm	ft.*lbf
Negative battery terminal x Body	3.9	40	35 in.*lbf

INTERIOR
TORQUE SPECIFICATIONS

ROOF HEADLINING (for Double Cab):

Part Tightened	N*m	kgf*cm	ft.*lbf
Rear seat outer belt assembly x Body	42	430	31
Front seat outer belt assembly x Body	42	430	31
Negative battery terminal x Battery	3.9	40	35 in.*lbf

SS

ROOF HEADLINING (for Regular Cab):

Part Tightened	N*m	kgf*cm	ft.*lbf
Front seat outer belt assembly x Body	42	430	31
Negative battery terminal x Battery	3.9	40	35 in.*lbf

ROOF HEADLINING (for Access Cab):

Part Tightened	N*m	kgf*cm	ft.*lbf
Rear seat outer belt assembly x Body	42	430	31
Negative battery terminal x Battery	3.9	40	35 in.*lbf