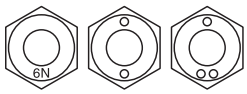
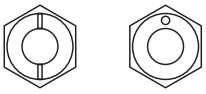
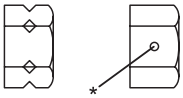
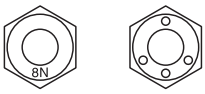
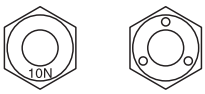
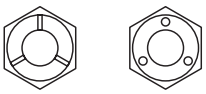
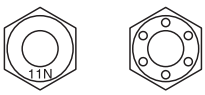
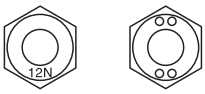
HOW TO DETERMINE NUT STRENGTH

Nut Type

Present Standard Hexagon Nut	Old Standard Hexagon Nut		Class
	Cold Forging Nut	Cutting Processed Nut	
No Mark			4N
No Mark (w/ Washer)	No Mark (w/ Washer)	No Mark	5N (4T)
			6N
			7N (5T)
			8N
		No Mark	10N (7T)
			11N
			12N

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

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

SS

TORQUE SPECIFICATIONS

Automatic Transaxle Assembly

Part Tightened		N*m	kgf*cm	ft*lbf
Park/neutral position switch	Nut	6.9	70	61 in.*lbf
	Bolt	5.4	55	48 in.*lbf
Control shaft lever x Control shaft		13	133	10
Shift control cable x Control shaft lever		15	153	11
Transaxle housing x Engine block	Upper side bolt	64	653	47
	Lower side bolt A	37	377	27
	Lower side bolt B	46	470	34
Torque converter clutch x Drive plate		41	418	30
Flywheel housing under cover x Automatic transaxle		7.8	80	69 in.*lbf
Front engine mounting bracket x Transaxle		64	653	47
Rear engine mounting bracket x Transaxle		45	459	33
Engine mounting bracket LH x Transaxle		64	653	47
Oil filler tube x Transaxle Oil filler tube x Front engine mounting bracket		5.5	56	49 in.*lbf
Control cable bracket No. 1 x Transaxle		12	122	9
Control cable bracket No. 2 x Transaxle		12	122	9
Oil cooler inlet elbow x Transaxle		27	276	20
Oil cooler outlet elbow x Transaxle		27	276	20
Starter x Transaxle		37	377	27
Starter wire x Starter		9.8	100	88 in.*lbf
Speed sensor (NC) x Transaxle		11	112	8
Speed sensor (NT) x Transaxle		11	112	8
Drain plug x Oil pan		47	479	35
Transmission wire x Transaxle		5.4	55	48 in.*lbf
ATF temperature sensor x Valve body		6.6	67	58 in.*lbf
Oil pan x Transaxle		7.8	80	69 in.*lbf
Solenoid valve x Valve body	SL2, DSL, S4	11	110	8
	SL1, SL3	6.6	67	58 in.*lbf
Valve body x Transaxle		11	112	8
Oil strainer x Valve body		11	112	8
Floor shift assembly x Body		12	122	9
Control cable clamp x Engine mounting insulator		12	122	9
Differential gear lube apply tube x Transaxle housing		9.8	100	87 in.*lbf
Front planetary gear lock nut		280	3,355	207
Brake apply tube clamp x Transaxle case		5.4	55	48 in.*lbf
Transaxle case No. 1 plug x Transaxle rear cover		7.4	75	65 in.*lbf
Transaxle rear cover x Transaxle case	Bolt A	19	194	14
	Other bolt	25	255	18
Parking lock pawl shaft x Transaxle case		9.8	100	87 in.*lbf
Oil pump assembly x Transaxle case		22	226	16
Transaxle housing x Transaxle case	Bolt A	22	254	16
	Bolt B	29	295	21
	Bolt C	29	295	21
	Bolt D	22	254	16
Automatic transmission case plug x Transaxle housing		7.4	75	65 in.*lbf
Automatic transmission case plug x Transaxle case		7.4	75	65 in.*lbf

Part Tightened		N*m	kgf*cm	ft*lbf
Parking lock pawl bracket x Transaxle case		20	205	15
Manual detent spring x Transaxle case	Bolt A	20	205	15
	Bolt B	12	120	9
Automatic transaxle oil pan sub-assembly x Transaxle case		7.6	77	67 in.*lbf
Speed sensor x Transaxle case		11	112	8
Park/neutral start switch x Control shaft lever		13	130	9
Speedometer driven hole cover sub-assembly x Transaxle case		5.5	56	49 in.*lbf
Oil pump body x Stator shaft assembly		9.8	100	87 in.*lbf
Front differential case x Front differential ring gear		95	969	70

TORQUE SPECIFICATIONS

Differential

Part Tightened	N*m	kgf*cm	ft.*lbf
Rear differential No. 2 support x Rear suspension member	86	877	63
Rear differential support x Rear suspension member	140	1,428	103
Rear differential No. 2 support x Rear differential Rear differential No. 1 support x Rear differential	55	561	41
Rear differential support x Rear differential	98	999	72
Drain plug x Differential carrier Filler plug x Differential carrier	39	398	29
Electromagnetic coupling x Stud bolt	8.0	82	71 in.*lbf
Electromagnetic coupling x Differential carrier	19.6	200	14
Yoke x Differential carrier	5.0	51	44 in.*lbf
Drive pinion nut x Differential drive pinion	245 or less	2,498 or less	181 or less
Differential side bearing retainer x Differential carrier	34.3	350	25
Differential carrier x Differential breather plug oil deflector	5.0	51	44 in.*lbf
Differential ring gear x Differential case	90	918	66

TORQUE SPECIFICATIONS

DRIVE BELT

Part Tightened	N*m	kgf*cm	ft.*lbf
Front suspension member reinforcement RH x Front cross member, Front suspension crossmember	96	979	71

VALVE CLEARANCE

SS

Part Tightened	N*m	kgf*cm	ft.*lbf
No. 1 camshaft bearing cap x Cylinder head	29.5	301	22
No. 2 camshaft bearing cap x Cylinder head	29.5	301	22
No. 3 camshaft bearing cap x Cylinder head	9.0	92	80 in.*lbf
No. 1 chain tensioner x Timing chain cover	9.0	92	80 in.*lbf

TIMING CHAIN

Part Tightened		N*m	kgf*cm	ft.*lbf
Chain tensioner plate x Crankshaft bearing cap		12	122	9
Oil pump drive shaft sprocket x Oil pump		29.5	301	22
No. 1 chain vibration damper x Cylinder head, Cylinder block		9.0	92	80 in.*lbf
Chain tensioner slipper x Cylinder head, Cylinder block		19	194	14
Timing chain guide x Crankshaft bearing cap		9.0	92	80 in.*lbf
Timing chain cover x Cylinder head, Cylinder block	Bolt A (Head: 10 mm)	9.0	92	80 in.*lbf
	Bolt B (Head: 12 mm)	25	255	18
	Bolt C (Head: 14 mm)	55	561	41
	Nut	11	112	8
V-ribbed belt tensioner x Timing chain cover		59.5	607	44
Engine mounting bracket RH x Timing chain cover		55	561	41
Crankshaft pulley x Crankshaft		180	1,835	133
Oil pan x Stiffening crankcase	Bolt, Nut	9.0	92	80 in.*lbf
Cylinder head cover x Cylinder head	Bolt A	11	112	8
	Bolt B	14	143	10
	Nut	11	112	8
Engine wire x Cylinder head cover		8.4	86	74 in.*lbf
Idler pulley bracket x Cylinder block		60	612	44
Engine mounting insulator FR x Front cross member		95	969	70
Engine mounting insulator FR	Through bolt x Nut	145	1,479	107
Engine mounting insulator RH x Body		95	969	70
Engine mounting insulator RH x Engine mounting bracket	Nut A	95	969	70
	Nut B	52	530	38
Radiator reservoir x Radiator support RH, Engine mounting insulator RH		5.0	51	44 in.*lbf
No. 1 engine cover x Cylinder head		7.0	71	62 in.*lbf

CYLINDER HEAD

Part Tightened		N*m	kgf*cm	ft.*lbf
Camshaft position sensor x Cylinder head		9.0	92	80 in.*lbf
Oil pressure switch x Cylinder head		13	133	10
Radio setting condenser x Cylinder head		10	102	7
Cylinder head set bolt Cylinder head x Cylinder block	1 st	70	714	52
	2 nd	Turn 90°	Turn 90°	Turn 90°
Camshaft timing gear x Camshaft		54	551	40
No. 2 camshaft timing sprocket x No. 2 camshaft		54	551	40
No. 1 and No. 2 camshaft bearing cap x Cylinder head		29.5	301	22
No. 3 camshaft bearing cap x Cylinder head		9.0	92	80 in.*lbf
Exhaust manifold x Cylinder head		37	377	27
No. 1 exhaust manifold heat insulator x Exhaust manifold		12	122	9
No. 1 and No. 2 manifold stay x Cylinder block, Exhaust manifold		44	449	32
Oil dipstick guide x Cylinder block		9.0	92	80 in.*lbf

ENGINE ASSEMBLY

Part Tightened		N*m	kgf*cm	ft.*lbf
Drive plate x Crankshaft		98	1,000	72
Drive shaft bearing bracket x Cylinder block		64	653	47
No. 1 and No. 2 engine hanger x Cylinder head		38	387	28
Engine mounting insulator LH x Body		95	969	70
Engine mounting insulator LH	Through bolt	56	571	41
Engine mounting insulator RH x Body		95	969	70
Engine mounting insulator RH x Engine mounting bracket	Nut A	95	969	70
	Nut B	52	530	38
Engine mounting insulator RR x Front suspension crossmember	Bolt and Nut	95	969	70
Engine mounting insulator RR x Engine mounting bracket	Though bolt	95	969	70
Engine mounting insulator FR x Front cross member		95	969	70
Engine mounting insulator FR	Though bolt	145	1,479	107
Battery carrier bracket x Body		20	204	15
Battery bracket reinforcement x Battery carrier		20	204	15
Front battery carrier x Battery bracket reinforcement		20	204	15
Air cleaner filter element x Body		5.0	51	44 in.*lbf
Radiator reservoir x Radiator support RH, Engine mounting insulator RH		5.0	51	44 in.*lbf
Battery clamp x Upper Radiator support	For bolt	8.5	87	75 in.*lbf
Battery clamp x Battery clamp bolt	For nut	5.0	51	44 in.*lbf

ENGINE UNIT

Part Tightened		N*m	kgf*cm	ft.*lbf
Balance shaft housing x Stiffening crankcase	1 st	21.6	220	16
	2 nd	Turn 90°	Turn 90°	Turn 90°
Connecting rod bolt Connecting rod cap x connecting rod	1 st	24.5	250	18
	2 nd	Turn 90°	Turn 90°	Turn 90°
Crankshaft bearing cap set bolt Crankshaft bearing cap x Cylinder block	1 st	40	408	30
	2 nd	Turn 90°	Turn 90°	Turn 90°
Stud bolt x Cylinder block	Bolt A, C and D	5.0	51	44 in.*lbf
	Bolt B	21.5	219	16
No. 1 oil nozzle x Cylinder block		7.0	71	62 in.*lbf
Connecting rod cap x Connecting rod	1 st	24.5	250	18
	2 nd	Turn 90°	Turn 90°	Turn 90°
Stiffening crankcase x Cylinder block		24	245	18
Oil control valve filter x Cylinder block		30	306	22
Cylinder block water drain cock x Cylinder block		25	255	18
Camshaft timing oil control valve x Cylinder head		9.0	92	80 in.*lbf
Oil pan drain plug x Oil pan		40	408	30
Oil filter union x Stiffening crankcase		29.5	301	22
Oil filler cap x Cylinder head cover		3.0	31	26 in.*lbf
Spark plug x Cylinder head		25	254	18
Ventilation valve x Cylinder head cover		19	194	14
No. 3 water by-pass hose x Cylinder head		9.0	92	80 in.*lbf
No. 1 water by-pass pipe x Cylinder head		9.0	92	80 in.*lbf
Idler pulley bracket x Cylinder block		60	612	44
Union bolt	With oil cooler	25	255	18
Oil cooler pipe x Cylinder head		9.0	92	80 in.*lbf

TORQUE SPECIFICATIONS

Part Tightened		N*m	kgf*cm	ft.*lbf
Front suspension member reinforcement RH x Front crossmember		95	969	70
Front suspension member reinforcement RH x Front suspension crossmember		95	969	70
Radiator reservoir tank x Bract		5.0	51	44 in.*lbf
Engine coolant temperature sensor x Water outlet		20	204	14
Engine oil pressure sensor x Oil pan		21	214	15
No. 1 front engine mounting bracket LH x Timing chain cover		54	551	40
No. 2 idler pulley x Timing chain cover		43	438	32
No. 2 timing gear cover x Timing chain cover		6.0	61	53 in.*lbf
V-ribbed belt tensioner x Timing chain cover		43	438	32
V-ribbed belt tensioner x Cylinder block		43	438	32
Drive shaft bearing bracket x Cylinder block		64	653	47
Exhaust manifold LH x Cylinder head		21	214	15
No. 2 exhaust heat insulator x Exhaust manifold		8.5	87	75 in.*lbf
No. 2 manifold stay x Exhaust manifold		34	347	25
No. 2 manifold stay x Cylinder block		34	347	25
No. 1 oil dipstick guide x Cylinder block		21	214	15
No. 2 oil dipstick guide x Cylinder head		21	214	15
Exhaust manifold RH x Cylinder head		21	214	15
Intake manifold x Cylinder head		21	214	15
No. 2 engine mounting stay RH x Intake manifold		21	214	15
No. 2 engine mounting stay RH x Timing chain cover		21	214	15
Ignition coil x Cylinder head cover		10	102	7
Intake air surge tank x Intake manifold	5 mm hexagon wrench	18	184	13
	for Bolt	21	214	15
	for Nut	16	163	12
Vacuum hose clamp x Intake air surge tank		5.4	55	48 in.*lbf
Drive plate and ring gear x Crankshaft		178	1,815	132
Engine mounting bracket RR x Engine mounting insulator RR		95	969	70
Engine mounting bracket FR x Engine mounting insulator FR		145	1,479	107
Engine mounting bracket LH x Engine mounting insulator LH		56	571	41
Engine mounting insulator RH x Front No. 1 engine mounting bracket	for Bolt and nut A	95	969	70
	for Nut B	52	530	38
Front crossmember x Body	for Bolt A	96	979	71
Front suspension member x Body	for Bolt B	145	1,478	107
Front suspension member brace rear x Body	for Bolt C	145	1,478	107
	for Bolt D	93	948	69
Air cleaner case x Engine mounting insulator LH		5.0	51	44 in.*lbf
Battery bracket reinforcement x Body		19	194	14
Front battery bracket x Body		19	194	14
Front battery bracket x Battery bracket reinforcement		19	194	14
Battery clamp x Body		5.0	51	44 in.*lbf

SS

Part Tightened		N*m	kgf*cm	ft.*lbf
Connecting rod x Connecting cap	1st	25	255	18
	2nd	Turn 90°	Turn 90°	Turn 90°
Cylinder block x Crankshaft bearing cap	1st	61	622	45
	2nd	Turn 90°	Turn 90°	Turn 90°
	Main bearing cap bolt	52	530	38
Camshaft timing gear x Intake camshaft		100	1,020	74
Camshaft timing exhaust gear x Exhaust camshaft		100	1,020	74
Stud bolt x Cylinder block		10	102	7
Stud bolt x Cylinder head	for Stud bolt A and B	10	102	7
	for Stud bolt C	4.0	41	35 in.*lbf
No. 1 oil nozzle x Cylinder block		9.0	92	80
Cylinder block water drain cock x Cylinder block	1st	25	255	18
	Adjusting position	45 or less	459 or less	33 or less
Water drain cock plug x Water drain cock		13	130	9
Crankshaft position sensor x Cylinder block		10	102	7
No. 2 straight screw plug x Cylinder head		80	816	59
No. 1 straight screw plug x Cylinder head		44	449	32
Water inlet pipe x Cylinder block		10	102	7
Cylinder head (for Bank 1) x Cylinder block	1st	36	367	27
	2nd	Turn 90°	Turn 90°	Turn 90°
	3rd	Turn 90°	Turn 90°	Turn 90°
Cylinder head (for Bank2) x Cylinder block	1st	36	367	27
	2nd	Turn 90°	Turn 90°	Turn 90°
	3rd	Turn 90°	Turn 90°	Turn 90°
	Except bolt	30	306	22
Camshaft bearing cap x Camshaft housing (for Bank 1)	1st	10	102	7
Camshaft housing x Cylinder head (for Bank 1)		28	286	21
Camshaft bearing cap x Camshaft housing (for Bank 1)	2nd	16	163	12
Camshaft bearing cap x Camshaft housing (for Bank 2)	1st	10	102	7
Camshaft housing x Cylinder head (for Bank 2)		28	286	21
Camshaft bearing cap x Camshaft housing (for Bank 2)	2nd	16	163	12
No. 2 chain tensioner x Camshaft housing (for Bank 1)		21	214	15
No. 3 chain tensioner x Camshaft housing (for Bank 2)		21	214	15
No. 1 chain vibration damper x Cylinder block		23	235	17
Idle sprocket x Cylinder block		60	612	44
No. 1 chain tensioner x Cylinder block		10	102	7
Engine rear oil seal retainer x Cylinder block		10	102	7
Crankshaft pulley x Crankshaft		250	2,549	184
Oil pan baffle plate x Cylinder block		10	102	7
Front No. 1 engine mounting bracket x Timing chain cover		54	551	40

Part Tightened		N*m	kgf*cm	ft.*lbf
Cylinder head cover x Cylinder head (for Bank 1)	for Bolt A	21	214	15
	for Except bolt A	10	102	7
Oil pipe bracket x Cylinder head (for Bank 1)		10	102	7
Oil pipe union bolt x Cylinder head cover (for Bank 1)		65	663	48
Oil pipe union bolt x Cylinder head (for Bank 1)		65	663	48
Cylinder head cover x Cylinder head	for Bolt A	21	214	15
	for Except bolt A	10	102	7
No. 1 oil pipe union bolt x Cylinder head cover (for Bank 2)		65	663	48
No. 1 oil pipe union bolt x Cylinder head (for Bank 2)		65	663	48
Water outlet x Cylinder head		10	102	7
Camshaft timing oil control valve x Cylinder head cover		10	102	7
VVT sensor x Cylinder head cover		10	102	7
Spark plug x Cylinder head		18	184	13

TORQUE SPECIFICATIONS

Automatic Transaxle Assembly

Part Tightened		N*m	kgf*cm	ft*lbf
Park/neutral position switch	Nut	6.9	70	61 in.*lbf
	Bolt	5.4	55	48 in.*lbf
Control shaft lever x Control shaft		13	133	10
Shift control cable x Control shaft lever		15	153	11
Transaxle housing x Engine block	Upper side bolt	64	653	47
	Lower side bolt A	37	377	27
	Lower side bolt B	46	470	34
Torque converter clutch x Drive plate		41	418	30
Flywheel housing under cover x Automatic transaxle		7.8	80	69 in.*lbf
Front engine mounting bracket x Transaxle		64	653	47
Rear engine mounting bracket x Transaxle		45	459	33
Engine mounting bracket LH x Transaxle		64	653	47
Oil filler tube x Transaxle Oil filler tube x Front engine mounting bracket		5.5	56	49 in.*lbf
Control cable bracket No. 1 x Transaxle		12	122	9
Control cable bracket No. 2 x Transaxle		12	122	9
Oil cooler inlet elbow x Transaxle		27	276	20
Oil cooler outlet elbow x Transaxle		27	276	20
Starter x Transaxle		37	377	27
Starter wire x Starter		9.8	100	88 in.*lbf
Speed sensor (NC) x Transaxle		11	112	8
Speed sensor (NT) x Transaxle		11	112	8
Drain plug x Oil pan		47	479	35
Transmission wire x Transaxle		5.4	55	48 in.*lbf
ATF temperature sensor x Valve body		6.6	67	58 in.*lbf
Oil pan x Transaxle		7.8	80	69 in.*lbf
Solenoid valve x Valve body	SL2, DSL, S4	11	110	8
	SL1, SL3	6.6	67	58 in.*lbf
Valve body x Transaxle		11	112	8
Oil strainer x Valve body		11	112	8
Floor shift assembly x Body		12	122	9
Control cable clamp x Engine mounting insulator		12	122	9
Differential gear lube apply tube x Transaxle housing		9.8	100	87 in.*lbf
Front planetary gear lock nut		280	3,355	207
Brake apply tube clamp x Transaxle case		5.4	55	48 in.*lbf
Transaxle case No. 1 plug x Transaxle rear cover		7.4	75	65 in.*lbf
Transaxle rear cover x Transaxle case	Bolt A	19	194	14
	Other bolt	25	255	18
Parking lock pawl shaft x Transaxle case		9.8	100	87 in.*lbf
Oil pump assembly x Transaxle case		22	226	16
Transaxle housing x Transaxle case	Bolt A	22	254	16
	Bolt B	29	295	21
	Bolt C	29	295	21
	Bolt D	22	254	16
Automatic transmission case plug x Transaxle housing		7.4	75	65 in.*lbf

Part Tightened		N*m	kgf*cm	ft*lbf
Automatic transmission case plug x Transaxle case		7.4	75	65 in.*lbf
Parking lock pawl bracket x Transaxle case		20	205	15
Manual detent spring x Transaxle case	Bolt A	20	205	15
	Bolt B	12	120	9
Automatic transaxle oil pan sub-assembly x Transaxle case		7.6	77	67 in.*lbf
Speed sensor x Transaxle case		11	112	8
Park/neutral start switch x Control shaft lever		13	130	9
Speedometer driven hole cover sub-assembly x Transaxle case		5.5	56	49 in.*lbf
Oil pump body x Stator shaft assembly		9.8	100	87 in.*lbf
Front differential case x Front differential ring gear		95	969	70

TORQUE SPECIFICATIONS

Automatic Transaxle Assembly

Part Tightened		N*m	kgf*cm	ft.*lbf
Park/neutral position switch	Nut	6.9	70	61 in.*lbf
	Bolt	5.4	55	48 in.*lbf
Control shaft lever x Control shaft		12.7	130	9
Shift control cable x Control shaft lever		15	153	11
Transaxle housing x Engine block	A bolt	64	653	47
	B bolt	46	470	34
	Lower side bolt	37	377	27
Torque converter clutch x Drive plate		41	418	30
Engine mounting bracket FR x Transaxle		64	653	47
Oil filler tube x Transaxle		5.5	56	49 in.*lbf
Control cable bracket No.1 x Transaxle		12	122	9
Oil cooler tube clamp x Control cable bracket		5.4	55	48 in.*lbf
Oil cooler inlet tube x Transaxle		34	347	25
Oil cooler outlet tube x Transaxle		34	347	25
Starter x Transaxle		37	377	27
Wire harness x Transaxle		13	133	10
Speed sensor (NC) x Transaxle		11	115	8
Speed sensor (NT) x Transaxle		11	112	8
Air cleaner x No. 1 air cleaner inlet		5.0	51	44 in.*lbf
Drain plug x Oil pan		47	479	35
Transmission wire x Transaxle		5.4	55	48 in.*lbf
ATF temperature sensor x Valve body		6.6	67	58 in.*lbf
Oil pan x Transaxle		7.6	77	67 in.*lbf
Solenoid valve x Valve body	Bolt A	6.6	67	58 in.*lbf
	Bolt B	11	110	8
Valve body x Transaxle		10.8	110	8
Oil strainer x Valve body		11	110	8
Floor shift assembly x Body		12	120	9
Control cable x Body		5.0	51	44 in.*lbf
Transfer x Transaxle		69	704	51
Engine mount bracket RR x Transfer stiffener, plate RH		45	459	34

Automatic Transaxle Unit

Part Tightened		N*m	kgf*cm	ft.*lbf
Differential gear lube apply tube x Transaxle housing		9.8	100	7
Front planetary gear lock nut		268	2,732	198
Brake apply tube clamp x Transaxle case		5.4	55	48 in.*lbf
Transaxle case No. 1 plug x Transaxle rear cover		7.4	75	65 in.*lbf
Transaxle rear cover plate x transaxle rear cover sub-assembly		7.5	76	66 in.*lbf
Transaxle rear cover x Transaxle case	Bolt A	18.6	190	14
	Other bolt	24.5	250	18
Pawl shaft clamp x Transaxle case		9.8	100	7
Oil pump assembly x Transaxle case		22	226	16
Transaxle housing x Transaxle case	Bolt A	22.1	225	16.3
	Bolt B, C	29.4	300	21.7
Transaxle case No. 1 plug x Transaxle housing		7.4	75	65 in.*lbf
Parking lock pawl bracket x Transaxle case		20	205	15

Part Tightened		N*m	kgf*cm	ft.*lbf
Detent spring x Transaxle case	Bolt A	20	205	15
	Bolt B	12	120	9
Solenoid wire retaining bolt x Transaxle housing		5.4	55	48 in.*lbf
Transmission valve body x Transaxle case		11	110	8
ATF temperature sensor clamp x Valve body		6.6	67	58 in.*lbf
Valve body oil strainer x Transmission valve		11	110	8
Automatic transaxle oil pan sub-assembly x Transaxle case		7.8	80	69 in.*lbf
Speed sensor x Transaxle case		11.3	115	8
Transmission revolution sensor x Transaxle case		11.3	115	8
Oil cooler tube union x Transaxle case		27	276	20
Oil cooler tube union x Transaxle case		27	280	20
Speedometer driven hole cover sub-assembly x Transaxle case		7.0	70	61
Oil pump body x Stator shaft assembly		9.8	100	7
Under drive planetary gear x Lock nut		280	2,855	207
Line pressure control solenoid assembly x Transmission valve body assembly		11	110	8
No. 1 clutch control solenoid assembly x Transmission valve body assembly		11	110	8
Automatic transmission 3 way solenoid assembly x Transmission valve body assembly		11	110	8
No. 2 clutch control solenoid assembly x Transmission valve body assembly		11	110	8
No. 2 transmission 3 way solenoid assembly x Transmission valve body assembly		11	110	8
Front differential case x Front differential ring gear		95.1	970	70

TORQUE SPECIFICATIONS

Automatic Transaxle Assembly

Part Tightened		N*m	kgf*cm	ft.*lbf
Park/neutral position switch	Nut	6.9	70	61 in.*lbf
	Bolt	5.4	55	48 in.*lbf
Control shaft lever x Control shaft		12.7	130	9
Shift control cable x Control shaft lever		15	153	11
Transaxle housing x Engine block	A bolt	64	653	47
	B bolt	46	470	34
	Lower side bolt	37	377	27
Torque converter clutch x Drive plate		41	418	30
Engine mounting bracket FR x Transaxle		64	653	47
Oil filler tube x Transaxle		5.5	56	49 in.*lbf
Control cable bracket No.1 x Transaxle		12	122	9
Oil cooler tube clamp x Control cable bracket		5.4	55	48 in.*lbf
Oil cooler inlet tube x Transaxle		34	347	25
Oil cooler outlet tube x Transaxle		34	347	25
Starter x Transaxle		37	377	27
Wire harness x Transaxle		13	133	10
Speed sensor (NC) x Transaxle		11	115	8
Speed sensor (NT) x Transaxle		11	112	8
Air cleaner x No. 1 air cleaner inlet		5.0	51	44 in.*lbf
Drain plug x Oil pan		47	479	35
Transmission wire x Transaxle		5.4	55	48 in.*lbf
ATF temperature sensor x Valve body		6.6	67	58 in.*lbf
Oil pan x Transaxle		7.6	77	67 in.*lbf
Solenoid valve x Valve body	Bolt A	6.6	67	58 in.*lbf
	Bolt B	11	110	8
Valve body x Transaxle		10.8	110	8
Oil strainer x Valve body		11	110	8
Floor shift assembly x Body		12	120	9
Control cable x Body		5.0	51	44 in.*lbf
Engine mount bracket RR x Transfer stiffener, plate RH		45	459	34

Automatic Transaxle Unit

Part Tightened		N*m	kgf*cm	ft.*lbf
Differential gear lube apply tube x Transaxle housing		9.8	100	7
Front planetary gear lock nut		268	2,732	198
Brake apply tube clamp x Transaxle case		5.4	55	48 in.*lbf
Transaxle case No. 1 plug x Transaxle rear cover		7.4	75	65 in.*lbf
Transaxle rear cover plate x transaxle rear cover sub-assembly		7.5	76	66 in.*lbf
Transaxle rear cover x Transaxle case	Bolt A	18.6	190	14
	Other bolt	24.5	250	18
Pawl shaft clamp x Transaxle case		9.8	100	7
Oil pump assembly x Transaxle case		22	226	16
Transaxle housing x Transaxle case	Bolt A	22.1	225	16.3
	Bolt B, C	29.4	300	21.7
Transaxle case No. 1 plug x Transaxle housing		7.4	75	65 in.*lbf
Parking lock pawl bracket x Transaxle case		20	205	15
Detent spring x Transaxle case	Bolt A	20	205	15
	Bolt B	12	120	9

Part Tightened	N*m	kgf*cm	ft.*lbf
Solenoid wire retaining bolt x Transaxle housing	5.4	55	48 in.*lbf
Transmission valve body x Transaxle case	11	110	8
ATF temperature sensor clamp x Valve body	6.6	67	58 in.*lbf
Valve body oil strainer x Transmission valve	11	110	8
Automatic transaxle oil pan sub-assembly x Transaxle case	7.8	80	69 in.*lbf
Speed sensor x Transaxle case	11.3	115	8
Transmission revolution sensor x Transaxle case	11.3	115	8
Oil cooler tube union x Transaxle case	27	276	20
Oil cooler tube union x Transaxle case	27	280	20
Speedometer driven hole cover sub-assembly x Transaxle case	7.0	70	61
Oil pump body x Stator shaft assembly	9.8	100	7
Under drive planetary gear x Lock nut	280	2,855	207
Line pressure control solenoid assembly x Transmission valve body assembly	11	110	8
No. 1 clutch control solenoid assembly x Transmission valve body assembly	11	110	8
Automatic transmission 3 way solenoid assembly x Transmission valve body assembly	11	110	8
No. 2 clutch control solenoid assembly x Transmission valve body assembly	11	110	8
No. 2 transmission 3 way solenoid assembly x Transmission valve body assembly	11	110	8
Front differential case x Front differential ring gear	95.1	970	70

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Breather oil deflector x transfer case	6.5	66	58
Output shaft x Transfer gear nut	360	3700	266
Driven pinion front bearing x Transfer case	38	390	28
No. 1 transfer case cover x transfer case	47	480	35
Transfer drain plug x transfer case	49	500	36
Transfer drain plug x transfer case	49	500	36
Transfer & Transaxle setting stud bolt x transfer case	39	400	29
Transfer assembly x transaxle	69	700	51
4WD Control ECU x Body	4.5	46	40

TORQUE SPECIFICATIONS

(2005/11-2006/01)

Drive shaft

Part Tightened		N*m	kgf*cm	ft.*lbf
Front wheel Rear wheel		103	1,050	76
front suspension lower arm x Lower ball joint		92	938	68
Front axle hub nut		216	2,203	159
Drive shaft bearing bracket x Engine		63.7	650	47
Drive shaft bearing case bolt	2WD	63.7	650	47
Drive shaft bearing bracket x Drive shaft	4WD	32.4	330	24

TORQUE SPECIFICATIONS

(2006/01-)

Drive shaft

Part Tightened		N*m	kgf*cm	ft.*lbf
Front wheel Rear wheel		103	1,050	76
front suspension lower arm x Lower ball joint		92	938	68
Front axle hub nut	ϕ 26	216	2,203	159
	ϕ 30	292	2,978	215
Drive shaft bearing bracket x Engine		63.7	650	47
Drive shaft bearing case bolt	2WD	63.7	650	47
Drive shaft bearing bracket x Drive shaft	4WD	32.4	330	24

TORQUE SPECIFICATIONS

Brake Pedal

Part tightened	N*m	kgf*cm	ft.*lbf
Brake pedal support x Body	12.7	130	9
Brake pedal support x Instrument panel reinforcement	25	255	18
Stop light switch	1.5 or less	15 or less	13 in.*lbf or less

Brake Master Cylinder

Part tightened	N*m	kgf*cm	ft.*lbf
Brake master cylinder x Brake booster	12.5	127	9
Brake master cylinder x Brake tube (without SST)	15.2	155	11
Brake master cylinder x Brake tube (with SST)	14	144	10

Brake Booster

Part tightened	N*m	kgf*cm	ft.*lbf
Brake booster x Brake pedal support	12.7	130	9
Push rod clevis lock nut	26	265	19

Front Brake

Part tightened	N*m	kgf*cm	ft.*lbf
Bleeder plug	8.3	85	73 in.*lbf
Cylinder mounting x Knuckle	98	999	72
Cylinder x Cylinder mounting	34.3	350	25
Flexible hose x Cylinder	29.4	300	22

Front Brake Flexible Hose

Part tightened	N*m	kgf*cm	ft.*lbf
Flexible hose x Brake cylinder	29.4	300	22
Flexible hose clamp bolt	18.5	189	14
Flexible hose x Brake tube (without SST)	15.2	155	11
Flexible hose x Brake tube (with SST)	14	144	10

Rear Brake

Part tightened	N*m	kgf*cm	ft.*lbf
Bleeder plug	8.3	85	73 in.*lbf
Cylinder mounting x Carrier	88	897	65
Cylinder x Cylinder mounting	26.5	270	20
Flexible hose x Cylinder	30.4	310	22

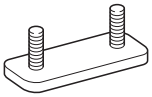
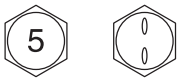
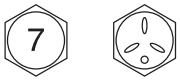
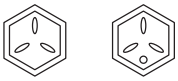
Rear Brake Flexible Hose

Part tightened	N*m	kgf*cm	ft.*lbf
Flexible hose x Brake cylinder	30.4	310	22
Flexible hose x Brake tube (without SST)	15.2	155	11
Flexible hose x Brake tube (with SST)	14	144	10

STANDARD BOLT

HOW TO DETERMINE BOLT STRENGTH

Bolt Type

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

SS

SS

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

2AZ-FE ENGINE CONTROL SYSTEM

SERVICE DATA

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

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Camshaft timing oil control valve x Timing chain cover	9.0	92	80 in.*lbf
Engine coolant temperature sensor x Cylinder head	19.6	200	14
Camshaft position sensor x Cylinder head	9.0	92	80 in.*lbf
Crankshaft position sensor x Timing chain cover	9.0	92	80 in.*lbf
Throttle body x Intake manifold	30	305	22
No. 1 engine cover x Cylinder head cover	7.0	71	62 in.*lbf
Knock sensor x Cylinder block	20	205	15
Intake manifold x Cylinder head	30	305	22
No. 2 ECM bracket x ECM	3.0	30	27 in.*lbf
No. 1 ECM bracket x ECM	3.0	30	27 in.*lbf
ECM with bracket x Body	6.5	66	57 in.*lbf
Air cleaner case x Body	5.0	51	44 in.*lbf
Accelerator pedal x Body	5.4	55	48 in.*lbf

2GR-FE ENGINE CONTROL SYSTEM

SERVICE DATA

Camshaft timing oil control valve : Standard resistance (1 (+B) - 2 (GND))	6.9 to 7.9 kΩ at 20 °C (68°F)
Camshaft position sensor : Standard resistance (1 (G+) - 2 (G-))	835 to 1,400 Ω at cold 1,060 to 1,645 Ω at hot
Crankshaft position sensor : Standard resistance (1 (Ne+) - 2 (Ne-))	1,630 to 2,740 Ω at cold 2,065 to 3,225 Ω at hot
Engine coolant temperature sensor : Standard resistance (1 (E2) - 2 (THW))	2.32 to 2.59 kΩ at 20 °C (68°F) 0.310 to 0.326 kΩ at 80°C (176°F)
Throttle body : Standard resistance (1 (M-) - 2 (M+)	0.3 to 100 kΩ at 20 °C (68°F)
Knock sensor : Standard resistance (1 (Ground) - 2 (Output)	120 to 280 kΩ at 20 °C (68°F)
Accelerator pedal (ACCEL POS #1) : Standard voltage	0.5 to 1.1 V (accelerator pedal released) 2.5 to 4.5 V (accelerator pedal depressed)
Accelerator pedal (ACCEL POS #2) : Standard voltage	1.2 to 2.0 V (accelerator pedal released) 3.4 to 5.0 V (accelerator pedal depressed)

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Intake air surge tank assembly x Intake manifold	18	184	13
Intake air surge tank assembly x Intake manifold	18	184	13
No. 1 surge tank stay x Intake air surge tank assembly	21	214	15
Camshaft timing oil control valve assembly x Cylinder head cover	10	102	7
Camshaft timing oil control valve assembly x Cylinder head cover	10	102	7
VVT sensor x Cylinder head cover	10	102	7
Crankshaft position sensor x Cylinder block	10	102	7
Engine coolant temperature sensor x Water pipe	19.6	200	14
Throttle body x Intake air surge tank assembly	10	102	7
Intake manifold x Cylinder head sub-assembly	21	214	15
Knock sensor x Cylinder block sub-assembly	20	204	15
Water outlet x Cylinder head sub-assembly	15	153	11
ECM x Body	6.5	66	57 in.*lbf
Accelerator pedal rod x Body	5.4	55	48 in.*lbf

2AZ-FE ENGINE MECHANICAL

SERVICE DATA

ENGINE

Item	Condition	Specified Condition
Standard ignition timing	When using intelligent tester	5 to 15° BTDC @ idle
Standard ignition timing	When not using intelligent tester (Connect SST)	8 to 12° BTDC @ idle
Standard ignition timing	When not using intelligent tester (Disconnect SST)	5 to 15° BTDC @ idle
Standard idle speed	-	600 to 700 rpm
Compression	Standard pressure	1,300 kPa (13.8 kgf/cm^2, 196 psi)
	Minimum pressure	1,000 kPa (10 kgf/cm^2, 142 psi)
	Difference between each cylinder	100 kPa (1.0 kgf/cm^2, 14 psi)

VALVE CLEARANCE

Item	Condition	Specified Condition
Intake	Cold	0.19 to 0.29 mm (0.0075 to 0.0114 in.)
Exhaust	Cold	0.38 to 0.48 mm (0.0150 to 0.0189 in.)

TIMING CHAIN

Item	Condition	Specified Condition
Chain sub-assembly	Maximum wear	122.6 mm (4.827 in.)
Chain tensioner slipper	Maximum wear	1.0 mm (0.039 in.)
No. 1 chain vibration damper	Maximum wear	1.0 mm (0.039 in.)
Crankshaft timing sprocket	Minimum gear diameter (with chain)	51.6 mm (2.031 in.)
Oil pump drive sprocket	Minimum gear diameter (with chain)	48.2 mm (1.898 in.)
Oil pump drive shaft sprocket	Minimum gear diameter (with chain)	48.2 mm (1.898 in.)

CYLINDER HEAD

Item	Condition	Position	Specified Condition
Cylinder head	Maximum warpage	-	0.08 mm (0.0032 in.)
Camshaft (Intake)	Maximum circle runout	-	0.03 mm (0.0012 in.)
	Standard cam lobe height	-	47.306 to 47.406 mm (1.8624 to 1.8664 in.)
	Minimum cam lobe height	-	47.196 mm (1.8581 in.)
	Standard journal diameter	No. 1 journal	35.971 to 35.985 mm (1.4162 to 1.4167 in.)
	Standard journal diameter	Other journal	22.959 to 22.975 mm (0.9039 to 0.9045 in.)
	Standard oil clearance	No. 1 journal	0.007 to 0.038 mm (0.0003 to 0.0015 in.)
	Maximum oil clearance		0.07 mm (0.0028 in.)
	Standard oil clearance	Other journal	0.025 to 0.062 mm (0.0010 to 0.062 in.)
	Maximum oil clearance		0.10 mm (0.0039 in.)
	Standard thrust clearance	-	0.040 to 0.095 mm (0.0016 to 0.0037 in.)
	Maximum thrust clearance	-	0.11 mm (0.0043 in.)

Item	Condition	Position	Specified Condition
No. 2 camshaft (Exhaust)	Maximum circle runout	-	0.03 mm (0.0012 in.)
	Standard cam lobe height	-	45.983 to 46.083 mm (1.8104 to 1.8143 in.)
	Minimum cam lobe height	-	45.873 mm (1.8060 in.)
	Standard journal diameter	No. 1 journal	35.971 to 35.985 mm (1.4162 to 1.4167 in.)
	Standard journal diameter	Other journal	22.959 to 22.975 mm (0.9039 to 0.9045 in.)
	Standard oil clearance	No. 1 journal	0.040 to 0.079 mm (0.0016 to 0.0031 in.)
	Maximum oil clearance		0.10 mm (0.0039 in.)
	Standard oil clearance	Other journal	0.025 to 0.062 mm (0.0010 to 0.062 in.)
	Maximum oil clearance		0.10 mm (0.0039 in.)
	Standard thrust clearance	-	0.080 to 0.135 mm (0.0032 to 0.0053 in.)
	Maximum thrust clearance	-	0.15 mm (0.0059 in.)
Valve lifter	Standard lifter diameter	-	30.966 to 30.976 mm (1.2191 to 1.2195 in.)
	Standard lifer bore diameter	-	31.009 to 31.025 mm (1.2208 to 1.2215 in.)
	Standard oil clearance	-	0.033 to 0.059 mm (0.0013 to 0.0023 in.)
	Maximum oil clearance	-	0.079 mm (0.0031 in.)
Inner compression spring	Standard free length	-	47.43 mm (1.8673 in.)
	Maximum deviation	-	1.6 mm (0.063 in.)
	Maximum angle (Reference)	-	2°
Intake valve	Standard overall length	-	101.71 mm (4.0043 in.)
	Minimum overall length	-	101.21 mm (3.9846 in.)
	Standard valve stem diameter	-	5.470 to 5.485 mm (0.2154 to 0.2159 in.)
	Standard valve head margin thickness	-	1.25 mm (0.0492 in.)
	Minimum valve head margin thickness	-	1.05 mm (0.0413 in.)
Exhaust valve	Standard overall length	-	101.15 mm (3.9823 in.)
	Minimum overall length	-	100.70 mm (3.9646 in.)
	Standard valve stem diameter	-	5.465 to 5.480 mm (0.2152 to 0.2158 in.)
	Standard valve head margin thickness	-	1.40 mm (0.0551 in.)
	Minimum valve head margin thickness	-	1.20 mm (0.0472 in.)

Item	Condition	Position	Specified Condition
Intake valve guide bush	Standard bush bore diameter (For cylinder head)	-	10.285 to 10.306 mm (0.4049 to 0.4058 in.)
	Standard valve guide bush diameter	STD	10.333 to 10.344 mm (0.4068 to0.4072 in.)
		O/S (0.05 mm)	10.383 to 10.394 mm (0.4088 to 0.4092 in.)
	Standard bush inside diameter	-	5.510 to 5.530 mm (0.2169 to 0.2177 in.)
	Standard oil clearance	-	0.025 to 0.060 mm (0.0010 to 0.0024 in.)
	Maximum oil clearance	-	0.08 mm (0.0032 in.)
	Standard protrusion height	-	9.6 to 10.0 mm (0.378 to 0.394 in.)
Exhaust valve guide bush	Standard bush bore diameter (For cylinder head)	-	10.285 to 10.306 mm (0.4049 to 0.4058 in.)
	Standard valve guide bush diameter	STD	10.333 to 10.344 mm (0.4068 to 0.4072 in.)
		O/S (0.05 mm)	10.383 to 10.394 mm (0.4088 to 0.4092 in.)
	Standard bush inside diameter	-	5.510 to 5.530 mm (0.2169 to 0.2177 in.)
	Standard oil clearance	-	0.030 to 0.065 mm (0.0012 to 0.0026 in.)
	Maximum oil clearance	-	0.10 mm (0.004 in.)
	Standard protrusion height	-	9.6 to 10.0 mm (0.378 to 0.394 in.)
Cylinder head set bolt	Standard bolt length	-	141.3 to 142.7 mm (5.563 to 5.618 in.)
	Maximum bolt length	-	144.2 mm (5.677 in.)
Exhaust manifold	Maximum warpage	-	0.70 mm (0.028 in.)
Ring pin	Protrusion height	-	3.0 mm (0.12 in.)

ENGINE UNIT

Item	Condition	Mark	Specified Condition
Balance shaft	Standard thrust clearance	-	0.05 to 0.09 mm (0.0020 to 0.0035 in.)
	Maximum thrust clearance	-	0.09 mm (0.0035 in.)
	Standard oil clearance	-	0.004 to 0.049 mm (0.0002 to 0.0019 in.)
	Maximum oil clearance	-	0.049 mm (0.0019 in.)
	Standard journal diameter	-	22.985 to 23.000 mm (0.9049 to 0.9055 in.)
	Standard balance shaft housing journal bore diameter	Mark 1	6.000 to 26.006 mm (1.0236 to 1.0239 in.)
		Mark 2	26.007 to 26.012 in.)
		Mark 3	26.013 to 26.018 in.)
	Standard bearing center wall thickness	Mark 1	1.486 to 1.489 mm (0.05850 to 0.05862 in.)
		Mark 2	1.490 to 1.492 mm (0.05866 to 0.05874 in.)
		Mark 3	1.493 to 1.495 mm (0.0585 to 0.0586 in.)

Item	Condition	Mark	Specified Condition
Connecting rod	Standard thrust clearance	-	0.160 to 0.362 mm (0.0063 to 0.0143 in.)
	Maximum thrust clearance	-	0.362 mm (0.0143 in.)
	Standard oil clearance	-	0.024 to 0.048 mm (0.0009 to 0.0019 in.)
	Maximum oil clearance	-	0.08 mm (0.0032 in.)
	Standard large end bore diameter	Mark 1	51.000 to 51.007 mm (2.0079 to 2.0082 in.)
		Mark 2	51.008 to 51.013 mm (2.0082 to 2.0084 in.)
		Mark 3	51.014 to 51.020 mm (2.0084 to 2.0087 in.)
	Standard bearing thickness	Mark 1	1.485 to 1.488 mm (0.0585 to 0.0586 in.)
		Mark 2	1.489 to 1.491 mm (0.0586 to 0.0587 in.)
		Mark 3	1.492 to 1.494 mm (0.0587 to 0.0588 in.)
	Standard crankshaft pin diameter	-	47.990 to 48.000 mm (1.8894 to 1.8898 in.)
Crankshaft	Standard thrust clearance	-	0.04 to 0.24 mm (0.0016 to 0.0095 in.)
	Maximum thrust clearance	-	0.30 mm (0.0118 in.)
	Standard oil clearance	-	0.008 to 0.024 mm (0.0003 to 0.0010 in.)
	Maximum oil clearance	-	0.050 mm (0.0020 in.)
Crankshaft	Standard cylinder block journal bore diameter	Mark 0	59.000 to 59.002 mm (2.3228 to 2.3229 in.)
		Mark 1	59.003 to 59.004 mm (2.3230 to 2.3230 in.)
		Mark 2	59.005 to 59.006 mm(2.3230 to 2.3231 in.)
		Mark 3	59.007 to 59.009 mm (2.3231 to 2.3232 in.)
		Mark 4	59.010 to 59.011 mm(2.3232 to 2.3233 in.)
		Mark 5	59.012 to 59.013 mm (2.3233 to 2.3234 in.)
		Mark 6	59.014 to 59.016 mm (2.3234 to 2.3235 in.)
Crankshaft	Standard crankshaft journal diameter	Mark 0	54.999 to 55.000 mm (2.1653 to 2.1654 in.)
		Mark 1	54.997 to 54.998 mm (2.1652 to 2.1653 in.)
		Mark 2	54.995 to 54.996 mm (2.1652 to 2.1652 in.)
		Mark 3	54.993 to 54.994 mm (2.1651 to 2.1651 in.)
		Mark 4	54.991 to 54.992 mm (2.1650 to 2.1650 in.)
		Mark 5	54.988 to 54.990 mm (2.1649 to 2.1650 in.)

Item	Condition	Mark	Specified Condition
Crankshaft	Standard bearing center wall thickness	Mark 1	1.993 to 1.996 mm (0.0785 to 0.0786 in.)
		Mark 2	1.997 to 1.999 mm (0.0786 to 0.0787 in.)
		Mark 3	2.000 to 2.002 mm (0.0787 to 0.0788 in.)
		Mark 4	2.003 to 2.005 mm (0.0789 to 0.0789 in.)
Crankshaft	Standard main journal diameter	-	54.988 to 55.000 mm (2.1830 to 2.1654 in.)
	Standard main journal diameter (Reference)	Mark 0	54.999 to 55.000 mm (2.1653 to 2.1654 in.)
		Mark 1	54.997 to 54.998 mm (2.1652 to 2.1653 in.)
		Mark 2	54.995 to 54.996 mm (2.1652 to 2.1652 in.)
		Mark 3	54.993 to 54.994 mm (2.1651 to 2.1651 in.)
		Mark 4	54.991 to 54.992 mm (2.1650 to 2.1650 in.)
		Mark 5	54.998 to 54.990 mm (2.1649 to 2.1650 in.)
Crankshaft	Maximum taper and distortion (Main journal)	-	0.003 mm (0.0001 in.)
	Standard crank pin diameter	-	47.990 to 48.000 mm (1.8894 to 1.8898 in.)
	Maximum taper and distortion (Crank pin)	-	0.003 mm (0.0001 in.)
Cylinder block	Maximum warpage (Measure the warpage of the surface that is in contact with the cylinder head gasket.)	-	0.05 mm (0.0020 in.)
	Standard cylinder bore diameter	-	88.500 to 88.513 mm (3.4843 to 3.4847 in.)
	Maximum cylinder bore diameter	-	88.633 mm (3.4849 in.)
Piston	Standard diameter (Measure the position diameter at right angles to the piston pin hole, and at the piston 44.3 mm (1.7587 in.) from the piston head.)	-	88.477 to 88.487 mm (3.5125 to 3.5129 in.)
	Standard oil clearance	-	0.021 to 0.044 mm (0.0008 to 0.0017 in.)
	Maximum oil clearance	-	0.10 mm (0.0039 in.)
	Standard piston pin bore diameter	-	22.001 to 22.010 mm (0.8662 to 0.8665 in.)
	-	Mark A	22.001 to 22.004 mm (0.8662 to 0.8663 in.)
		Mark B	22.005 to 22.007 mm (0.8663 to 0.8664 in.)
		Mark C	22.008 to 22.010 mm (0.8665 to 0.8665 in.)
	Standard piston pin bore oil clearance	-	0.001 to 0.007 mm (0.00004 to 0.0003 in.)
	Maximum piston pin bore oil clearance	-	0.013 mm (0.0005 in.)

Item	Condition	Mark	Specified Condition
Piston ring	Standard ring groove clearance	No. 1 ring	0.020 to 0.070 mm (0.0008 to 0.0028 in.)
		No. 2 ring	0.020 to 0.060 mm (0.0008 to 0.0024 in.)
		Oil ring	0.020 to 0.070 mm (0.0008 to 0.0028 in.)
	Standard end gap (Measure the piston ring a little beyond the bottom of the ring travel, 110 mm (4.33 in.) from the top of the cylinder block.)	No. 1 ring	0.24 to 0.31 mm (0.0094 to 0.0122 in.)
		No. 2 ring	0.33 to 0.43 mm (0.0130 to 0.0169 in.)
		Oil ring	0.10 to 0.30 mm (0.0040 to 0.0119 in.)
	Maximum end gap	No. 1 ring	0.89 mm (0.0350 in.)
		No. 2 ring	1.37 mm (0.0539 in.)
		Oil ring	0.73 mm (0.0287 in.)
Piston pin	Standard piston pin diameter	-	21.997 to 22.006 mm (0.8660 to 0.8664 in.)
	-	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.)
Connecting rod	Standard small end bore diameter	-	22.005 to 22.014 mm (0.8663 to 0.8667 in.)
	-	Mark A	22.005 to 22.008 mm (0.8663 to 0.8665 in.)
		Mark B	22.009 to 22.011 mm (0.8665 to 0.8666 in.)
		Mark C	22.012 to 22.014 mm (0.8666 to 0.8667 in.)
	Standard small end bore oil clearance	-	0.005 to 0.011 mm (0.0002 to 0.0004 in.)
	Maximum small end bore oil clearance	-	0.017 mm (0.0007 in.)
	Maximum misalignment	-	0.05 mm (0.0020 in.) per 100 mm (3.94 in.)
	Maximum twist	-	0.15 mm (0.0059 in.) per 100 mm (3.94 in.)
Connecting rod bolt	Standard diameter (Measure the tension portion diameter of the bolt.)	-	7.2 to 7.3 mm (0.283 to 0.287 in.)
	Minimum diameter	-	7.0 mm (0.276 in.)

2GR-FE ENGINE MECHANICAL

SERVICE DATA

Engine	Ignition timing	When using the intelligent tester		8 to 12° BTDC @ idle
		When not using the intelligent tester	Connect SST	8 to 12° BTDC @ idle
			Disconnect SST	5 to 15° BTDC @ idle
	Idle speed	When using the intelligent tester		600 to 700 rpm
		When not using the intelligent tester		600 to 700 rpm
	Compression	Compression pressure		1,400 kPa (14 kgf/cm^2, 199 psi) or more
		Minimum pressure		980 kPa (10.0 kgf/cm^2, 142 psi)
		Difference between each cylinder		100 kPa (1.0 kgf/cm^2, 15 psi) or less
Intake manifold	Warpage	Maximum	Intake manifold side	0.8 mm (0.031 in.)
			Cylinder head side	0.2 mm (0.008 in.)
Exhaust manifold	Warpage	Maximum		0.70 mm (0.0028 in.)
Connecting rod	Thrust clearance	Standard		0.15 to 0.40 mm (0.0059 to 0.0157 in.)
		Maximum		0.50 mm (0.0197 in.)
	Oil clearance	Standard		0.045 to 0.067 mm (0.0018 to 0.0026 in.)
		Maximum		0.070 mm (0.0028 in.)
	Big end inside diameter	Mark 1		56.000 to 56.006 mm (2.2047 to 2.2050 in.)
		Mark 2		56.007 to 56.012 mm (2.2050 to 2.2052 in.)
		Mark 3		56.013 to 56.018 mm (2.2052 to 2.2054 in.)
		Mark 4		56.019 to 56.024 mm (2.2055 to 2.2057 in.)
	Standard sized bearing center wall thickness	Mark 1		1.481 to 1.484 mm (0.0583 to 0.0584 in.)
		Mark 2		1.484 to 1.497 mm (0.0584 to 0.0585 in.)
		Mark 3		1.487 to 1.490 mm (0.0585 to 0.0587 in.)
		Mark 4		1.490 to 1.493 mm (0.0587 to 0.0588 in.)
	Bend	Maximum		0.05 mm (0.0020 in.) per 100 mm (3.94 in.)
	Twist	Maximum		0.15 mm (0.0059 in.) per 100 mm (3.94 in.)

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Crankshaft	Pin diameter	Standard		52.992 to 53.000 mm (2.0863 to 2.0866 in.)
	Thrust clearance	Standard		0.04 to 0.24 mm (0.0016 to 0.0094 in.)
		Maximum		0.30 mm (0.0118 in.)
	Thrust washer thickness	Standard		2.43 to 2.48 mm (0.0957 to 0.0976 in.)
	Main journal diameter	Standard	Mark 00	60.999 to 61.000 mm (2.4015 to 2.4016 in.)
			Mark 01	60.998 to 60.999 mm (2.4015 to 2.4015 in.)
			Mark 02	60.997 to 60.998 mm (2.4015 to 2.4015 in.)
			Mark 03	60.996 to 60.997 mm (2.4014 to 2.4015 in.)
			Mark 04	60.995 to 60.996 mm (2.4014 to 2.4014 in.)
			Mark 05	60.994 to 60.995 mm (2.4013 to 2.4014 in.)
			Mark 06	60.93 to 60.994 mm (2.4013 to 2.4013 in.)
			Mark 07	60.992 to 60.993 mm (2.4013 to 2.4013 in.)
			Mark 08	60.991 to 60.992 mm (2.4012 to 2.4013 in.)
			Mark 09	60.990 to 60.991 mm (2.4012 to 2.4012 in.)
			Mark 10	60.989 to 60.990 mm (2.4011 to 2.4012 in.)
			Mark 11	60.988 to 60.989 mm (2.4.11 to 2.4011 in.)
Crankshaft	Upper bearing center wall thickness	Standard No. 1 and No. 4 journal	Mark 1	2.500 to 2.503 mm (0.0984 to 0.0985 in.)
			Mark 2	2.503 to 2.506 mm (0.0985 to 0.0987 in.)
			Mark 3	2.506 to 2.509 mm (0.0987 to 0.0988 in.)
			Mark 4	2.509 to 2.512 mm (0.0988 to 0.0989 in.)
			Mark 5	2.512 to 2.515 mm (0.0989 to 0.0990 in.)
		Standard No. 2 and No. 3 journal	Mark 1	2.478 to 2.481 mm (0.0976 to 0.0977 in.)
			Mark 2	2.481 to 2.484 mm (0.0977 to 0.0978 in.)
			Mark 3	2.484 to 2.487 mm (0.0978 to 0.0979 in.)
			Mark 4	2.487to 2.490 mm (0.0979 to 0.0980 in.)
			Mark 5	2.490 to 2.493 mm (0.0980 to 0.0981 in.)

Crankshaft	Lower bearing center wall thickness	Standard No. 1 and No. 4 journal	Mark 1	2.478 to 2.481 mm (0.0976 to 0.0977 in.)
			Mark 2	2.481 to 2.484 mm (0.0977 to 0.0780 in.)
			Mark 3	2.484 to 2.487 mm (0.0978 to 0.0979 in.)
			Mark 4	2.487 to 2.490 mm (0.0979 to 0.0980 in.)
			Mark 5	2.490 to 2.493 mm (0.0980 to 0.0981 in.)
		Standard No. 2 and No. 3 journal	Mark 1	2.500 to 2.503 mm (0.0984 to 0.0985 in.)
			Mark 2	2.503 to 2.506 mm (0.0985 to 0.0987 in.)
			Mark 3	2.506 to 2.509 mm (0.0987 to 0.0988 in.)
			Mark 4	2.509 to 2.512 mm (0.0988 to 0.0989 in.)
			Mark 5	2.512 to 2.515 mm (0.0989 to 0.0990 in.)
	Circle runout	Maximum		0.06 mm (0.0024 in.)
	Journal diameter	Standard		60.988 to 61.00 mm (2.4011 to 2.4016 in.)
	Taper and out-of-round	Maximum		0.02 mm (0.0008 in.)
	Crank pin diameter	Standard		52.992 to 53.000 mm (2.0863 to 2.0866 in.)
	Taper and out-of-round	Maximum		Taper and out-of-round0.02 mm (0.0008 in.)
Camshaft	Circle runout	Maximum		0.04 mm (0.0016 in.)
	Cam lobe height	Standard	Intake	44.316 to 44.416 mm (1.7447 to 1.7487 in.)
			Exhaust	44.262 to 44.362 mm (1.7426 to 1.7465 in.)
		Maximum	Intake	44.166 mm (1.7388 in.)
			Exhaust	44.112 mm (1.7367 in.)
	Journal diameter	Standard	No. 1 journal	35.946 to 35.960 mm (1.4152 to 1.4157 in.)
			Other journal	25.959 to 25.975 mm (1.0220 to 1.0226 in.)
	Thrust clearance (bank 1)	Standard		0.08 to 0.13 mm (0.0031 to 0.0051 in.)
		Maximum		0.15 mm (0.006 in.)
	Thrust clearance (bank 2)	Standard		0.08 to 0.13 mm (0.0031 to 0.0051 in.)
		Maximum		0.15 mm (0.006 in.)
	Oil clearance	Standard	No. 1 journal	0.040 to 0.079 mm (0.0016 to 0.0031 in.)
			Other journal	0.025 to 0.062 mm (0.0010 to 0.0024 in.)
		Maximum	No. 1 Journal	0.10 mm (0.0039 in.)
			Other journal	0.09 mm (0.0035 in.)
Timing chain	Chain elongation	Maximum		136.9 mm (5.389 in.)
No. 2 timing chain	Chain elongation	Maximum		137.6 mm (5.417 in.)
Crankshaft timing gear or sprocket	Sprocket diameter (w/ chain)	Minimum		61.4 mm (2.417 in.)

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Idle sprocket	Sprocket diameter (w/ chain)	Minimum		61.4 mm (2.417 in.)
Idle gear shaft	Idle gear shaft diameter	Standard		22.987 to 23.000 mm (0.9050 to 0.9055 in.)
	Idle gear inside diameter	Standard		23.02 to 23.03 mm (0.9062 to 0.9067 in.)
	Oil clearance	Standard		0.02 to 0.043 mm (0.0001 to 0.0017 in.)
		Maximum		0.043 mm (0.0017 in.)
No. 2 chain tensioner	Depth	Maximum		0.9 mm (0.035 in.)
No. 3 chain tensioner	Depth	Maximum		0.9 mm (0.035 in.)
Chain tensioner slipper	Depth	Maximum		1.0 mm (0.039 in.)
No. 1 chain vibration damper	Depth	Maximum		1.0 mm (0.039 in.)
No. 2 chain vibration damper	Depth	Maximum		1.0 mm (0.039 in.)
Cylinder head	Warpage	Standard	Cylinder head lower side	0.05 mm (0.0020 in.)
			Intake side	0.08 mm (0.0031 in.)
			Exhaust side	0.08 mm (0.0031 in.)
		Maximum		0.10 mm (0.0039 in.)
	Protrusion height	Standard		18.0 to 19.0 mm (0.71 to 0.75 in.)
Intake valve guide bush	Cylinder bore diameter	Standard		10.285 to 10.306 mm (0.4049 to0.4057 in.)
	Bush bore diameter	Standard	Use STD	10.335 to 10.356 mm (0.4069 to 0.4077 in.)
			Use O/S	0.05 10.285 to 10.306 mm (0.4049 to 0.4057 in.)
	Protrusion height	Standard		9.1 to 9.9 mm (0.3582 to 0.3900 in.)
Exhaust valve guide bush	Cylinder bore diameter	Standard		10.285 to 10.306 mm (0.4049 to 0.4057 in.)
	Bush bore diameter	Standard	Use STD	10.335 to 10.356 mm (0.4069 to 0.4077 in.)
			Use O/S 0.05	10.285 to 10.306 mm (0.4049 to 0.4057 in.)
	Protrusion height	Standard		9.30 to 9.70 mm (0.3661 to 0.3819 in.)
Intake valve	Valve stem diameter	Standard		5.470 to 5.485 mm (0.2154 to 0.2159 in.)
	Margin thickness	Standard		1.0 mm (0.0394 in.)
		Minimum		0.50 mm (0.0197 in.)
	Overall length	Standard		105.85 mm (4.1673 in.)
		Minimum		105.35 mm (4.1476 in.)
Exhaust valve	Valve stem diameter	Standard		5.465 to 5.480 mm (0.2151 to 0.2157 in.)
	Margin thickness	Standard		1.0 mm (0.0394 in.)
		Minimum		0.50 mm (0.0197 in.)
	Overall length	Standard		110.40 mm (4.3464 in.)
		Minimum		109.90 mm (4.3268 in.)
Inner compression spring	Free length	Standard		45.46 mm (1.7898 in.)
	Deviation	Maximum		1.0 mm (0.039 in.)
	Angle (reference)	Maximum		2°

Valve guide bush	Bush inside diameter	Standard		5.51 to 5.53 mm (0.2169 to 0.2177 in.)
	Clearance	Standard	Intake	0.025 to 0.060 m (0.0010 to 0.0024 in.)
			Exhaust	0.030 to 0.065 mm (0.0012 to 0.0026 in.)
		Maximum	Intake	0.08 mm (0.0031 in.)
			Exhaust	0.10 mm (0.0039 in.)
Cylinder block	Warpage	Maximum		0.07 mm (0.0028 in.)
	Bore diameter	Standard		94.000 to 94.012 mm (3.7008 to 3.7013 in.)
		Maximum		94.200 mm (3.7087 in.)

SS

Piston	Diameter	Standard		93.960 to 93.980 mm (3.6992 to 3.6999 in.)
		Maximum		93.830 mm (3.6941 in.)
		Distance		9.8 mm (0.3858 in.)
	Oil clearance	Standard		0.020 to 0.052 mm (0.0007 to 0.0020 in.)
		Maximum		0.06 mm (0.0024 in.)
	Ring groove clearance	Standard	No. 1	0.020 to 0.070 mm (0.0008 to 0.0028 in.)
			No. 2	0.020 to 0.060 mm (0.0008 to 0.0024 in.)
			Oil	0.070 to 0.150 mm (0.0028 to 0.0059 in.)
	Ring end gap	Standard	No. 1	0.25 to 0.35 mm (0.0098 to 0.0138 in.)
			No. 2	0.50 to 0.60 mm (0.0197 to 0.0236 in.)
			Oil	0.10 to 0.40 mm (0.0039 to 0.0157 in.)
		Maximum	No. 1	0.50 mm (0.0197 in.)
			No. 2	0.85 mm (0.0335 in.)
			Oil	0.60 mm (0.0236 in.)
	Piston pin hole inside diameter	Standard	Mark A	22.001 to 22.004 mm (0.8662 to 0.8663 in.)
			Mark B	22.005 to 22.007 mm (0.8663 to 0.8664 in.)
			Mark C	22.008 to 22.010 mm (0.8665 to 0.8665 in.)
	piston pin diameter	Standard	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.)
	Oil clearance	Standard		0.001 to 0.007 mm (0.00004 to 0.0003 in.)
		Maximum		0.015 mm (0.0006 in.)
	Bush inside diameter	Standard	Mark A	22.005 to 22.008 mm (0.8663 to 0.8665 in.)
			Mark B	22.009 to 22.011 mm (0.8665 to 0.8666 in.)
			Mark C	22.012 to 22.014 mm (0.8666 to 0.8667 in.)
	Oil clearance	Standard		0.005 to 0.011 mm (0.0002 to 0.0004 in.)
		Maximum		0.03 mm (0.0012 in.)
Crankshaft bearing cap set bolt	Diameter	Standard		10.8 to 11.0 mm (0.4252 to 0.4331 in.)
		Minimum		10.70 mm (0.4213 in.)
Cylinder head set bolt	Outside diameter	Minimum		10.70 mm (0.4213 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.)

2AZ-FE FUEL

SERVICE DATA

Fuel pressure			304 to 343 kPa (3.1 to 3.5 kgf/cm^2, 44 to 50 psi)
Fuel injector	Resistance	at 20°C (68°F)	11.6 to 12.4 Ω
	Injection volume		76 to 92 cm^3 (4.6 to 5.6 cu in.) per 15 seconds
	Difference between each cylinder		16 cm^3 (1.0 cu in.) or less
	Fuel leakage		1 drop or less per 12 minutes
Fuel pump	Resistance	at 20°C (68°F)	0.2 to 3.0 Ω

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Fuel delivery pipe x Cylinder head	20	204	15
Fuel tank vent tube set plate x Fuel tank	4.0	41	35 in.*lbf
No. 1 engine cover x Cylinder head cover sub-assembly	7.0	70	62 in.*lbf
Fuel pressure pulsation damper x Fuel delivery pipe	9.0	90	80 in.*lbf
Fuel tank filler pipe x Body	23.5	240	17
Filler pipe protector x Body	5.4	55	48 in.*lbf
Fuel tank band x Body	40	408	30
Fuel sender gauge assembly x Fuel tank	1.5	15	13 in.*lbf

2GR-FE FUEL

SERVICE DATA

Fuel pressure			304 to 343 kPa (3.1 to 3.5 kgf/cm^2, 44 to 50 psi)
Fuel injector	Resistance	at 20°C (68°F)	11.6 to 12.4 Ω
	Injection volume		84 to 100 cm^3 (5.1 to 6.0 cu in.) per 15 seconds
	Difference between each cylinder		16 cm^3 (1.0 cu in.) or less
	Fuel leakage		1 drop or less per 12 minutes
Fuel pump	Resistance	at 20°C (68°F)	0.2 to 3.0 Ω
Fuel pump resistor	Resistance	at 20°C (68°F)	0.53 to 0.57 Ω

TORQUE SPECIFICATIONS

Part Tightened		N*m	kgf*cm	ft.*lbf
Fuel delivery pipe sub-assembly x Intake manifold		21	214	15
Intake air surge tank x Intake manifold	Bolt	18	184	13
	Nut	16	163	12
Fuel tank bent tube set plate x Fuel tank assembly		4.0	41	35 in.*lbf
Fuel pump resistor x Body		7.0	71.4	62 in.*lbf
Fuel filler pipe x Body		23.5	240	17
Fuel sender gauge assembly x Fuel tank		1.5	15	13 in.*lbf
Fuel tank band x Body		40	408	30
Parking brake cable assembly No. 2 x Body	Bolt	6.0	61	53 in.*lbf
	Nut	8.5	87	75 in.*lbf

2AZ-FE EMISSION CONTROL

SERVICE DATA

Purge VSV

Tester Connection	Specified Condition
1 - 2	23 to 26 Ω at 20°C (68°F)
1 - Body ground 2 - Body ground	10 MΩ or higher

Air fuel ratio sensor

Tester Connection	Specified Condition
1 (HA1A) - 2 (+B)	1.8 to 3.4 Ω at 20°C (68°F)
1 (HA1A) - 4 (A1A-)	10 kΩ or higher

Heated oxygen sensor

Tester Connection	Specified Condition
1 (HT1B) - 2 (+B)	11 to 16 Ω at 20°C (68°F)
1 (HT1B) - 4 (E2)	10 kΩ or higher

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
No. 1 engine cover x Engine	7.0	70	62 in.*lbf
Ventilation valve sub-assembly x Cylinder head	19	194	14
Air fuel ratio sensor x Exhaust manifold : for use with SST	40	408	30
Air fuel ratio sensor x Exhaust manifold : for use without SST	44	449	32
Heated oxygen sensor x Exhaust manifold : for use with SST	40	408	30
Heated oxygen sensor x Exhaust manifold : for use without SST	44	449	32
Canister x Body	20	204	15

2GR-FE EMISSION CONTROL

SERVICE DATA

Purge VSV

Tester Connection	Specified Condition
1 - 2	23 to 26 Ω at 20°C (68°F)
1 - Body ground 2 - Body ground	10 MΩ or higher

Air fuel ratio sensor

Tester Connection	Specified Condition
1 (HA1A) - 2 (+B)	1.8 to 3.4 Ω at 20°C (68°F)
1 (HA1A) - 4 (A1A-)	10 kΩ or higher

Heated oxygen sensor

Tester Connection	Specified Condition
1 (HT1B) - 2 (+B)	11 to 16 Ω at 20°C (68°F)
1 (HT1B) - 4 (E2)	10 kΩ or higher

TORQUE SPECIFICATIONS

Part Tightened		N*m	kgf*cm	ft.*lbf
Canister x Body		20	204	15
Purge VSV x Cylinder head cover		10	102	7
Ventilation valve sub-assembly x Cylinder head cover		27	275	20
Air fuel ratio sensor x Exhaust manifold sub-assembly		44	449	32
	with SST	40	408	30
Oxygen sensor x Front pipe assembly		44	449	32
	with SST	40	408	30

2GR-FE INTAKE

SERVICE DATA

Vacuum switching valve	Resistance	1 - 2	37 to 44 Ω at 20°C (68°F)
		1 - Body ground	10 kΩ or higher
		2 - Body ground	

2AZ-FE EXHAUST

SERVICE DATA

Compression spring (Front exhaust pipe assembly x Exhaust manifold)	Minimum length: 41.5 mm (1.634 in)
Compression spring (Center exhaust pipe assembly x Tailpipe assembly)	Minimum length: 38.5 mm (1.515 in.)

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Front exhaust pipe assembly x Exhaust manifold	43	440	32
Center exhaust pipe assembly x Front exhaust pipe assembly	43	440	32
Tailpipe assembly x Center exhaust pipe assembly	43	440	32
Heated oxygen sensor (for bank1 sensor 2)	44	449	33

2GR-FE EXHAUST

SERVICE DATA

Compression spring (Center exhaust pipe assembly x Tailpipe assembly)	Minimum length 38.5 mm (1.516 in.)

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Exhaust manifold LH x Front exhaust pipe assembly	62	632	46
No. 1 front exhaust pipe support bracket x No. 1 exhaust pipe support bracket stay	21	214	16
Front exhaust pipe assembly x Center exhaust pipe assembly	43	440	32
Exhaust manifold RH x Center exhaust pipe assembly	62	632	46
Center exhaust pipe assembly x Tailpipe assembly	43	440	32

2AZ-FE COOLING

SERVICE DATA

THERMOSTAT

Condition	Specified Condition
Standard valve opening temperature	80 to 84 °C (176 to 183 °F)
Standard valve lift	10 mm (0.39 in.) or more at 95 °C (203 °F)

COOLING FAN MOTOR

Item	Indication Mark	Motor Type	Condition	Specified Condition
No. 1 cooling fan motor	B, C	160 W	at 20°C (68 °F)	11.7 to 14.7 A
No. 2 cooling fan motor	B	120 W	at 20°C (68 °F)	8.4 to 10.4 A
	C	160 W	at 20°C (68 °F)	11.7 to 14.7 A

COOLING FAN RELAY

Item	Tester Connection	Specified Condition
No. 1 fan relay	3 - 5	10 Ωor higher
	3 - 5	Below 1 Ω (when battery voltage is applied to terminals 1 and 2)
No. 2 fan relay	3 - 4	Below 1 Ω
	3 - 5	10 Ωor higher
	3 - 4	10 Ωor higher (when battery voltage is applied to terminals 1 and 2)
	3 - 5	Below 1 Ω (when battery voltage is applied to terminals 1 and 2)
No. 3 fan relay	3 - 5	10 Ωor higher
	3 - 5	Below 1 Ω (when battery voltage is applied to terminals 1 and 2)

RADIATOR

Item	Condition	Specified Condition
Radiator reservoir cap	For brand-new cap	93.3 to 122.7 kPa (0.95 to 1.25 kgf/cm^2, 13.5 to 17.8 psi)
	After using cap	78.5 kPa (0.8 kgf/cm^2, 11.4 psi)

SS

TORQUE SPECIFICATIONS

COOLANT

Part Tightened	N*m	kgf*cm	ft.*lbf
Cylinder block drain cock plug x Cylinder block	12.7	130	10

WATER PUMP

Part Tightened	N*m	kgf*cm	ft.*lbf
Water pump x Cylinder block	9.0	92	80 in.*lbf
Water pump pulley x Water pump	26	265	19

THERMOSTAT

Part Tightened	N*m	kgf*cm	ft.*lbf
Water inlet x Cylinder block	9.0	92	80 in.*lbf

COOLING FAN MOTOR

Part Tightened	N*m	kgf*cm	ft.*lbf
No. 1 and No. 2 cooling fan motor x Fan shroud	3.9	40	35 in.*lbf
Fan x No. 1 and No. 2 cooling fan motor	6.3	64	55 in.*lbf

RADIATOR

Part Tightened		N*m	kgf*cm	ft.*lbf
Fan shroud with cooling fan x Radiator		10.5	107	8
Upper radiator support x Radiator support LH and RH		29	296	21
No. 2 fan shroud x Radiator		10.5	107	8
Upper radiator support bracket x Upper radiator support		19	194	14
No. 1 water by-pass pipe x Upper radiator support		9.0	92	80 in.*lbf
Battery clamp x Upper radiator support	Bolt	8.5	87	75 in.*lbf
Battery clamp x Battery clamp bolt	Nut	5.0	51	44 in.*lbf

2GR-FE COOLING

SERVICE DATA

THERMOSTAT

Condition	Specified Condition
Standard valve opening temperature	80 to 84°C (176 to 183°F)
Standard valve lift	10 mm (0.39 in.) or more at 95°C (203°F)

COOLING FAN MOTOR

Item	Indication Mark	Motor Type	Condition	Specified Condition
No. 1 cooling fan motor (w/o Trailer towing system)	E	160 W	at 20°C (68°F)	11.8 to 14.8 A
No. 1 cooling fan motor (w/ Trailer towing system)	H	240 W	at 20°C (68°F)	18.0 to 22.0 A
No. 2 cooling fan motor (w/o Trailer towing system)	E	160 W	at 20°C (68°F)	11.8 to 14.8 A
No. 2 cooling fan motor (w/ Trailer towing system)	H	240 W	at 20°C (68°F)	18.0 to 22.0 A

COOLING FAN ECU

Item	Tester Connection	Condition	Specified Condition
Cooling fan ECU (w/o Trailer towing system)	B12-3 - Body ground	Ignition switch ON	9 to 14 V
	B12-1 - Body ground	Always	Below 1 Ω
Cooling fan ECU (w/ Trailer towing system)	B10-1 - Body ground	Ignition switch ON	9 to 14 V
	B11-1 - Body ground	Ignition switch ON	9 to 14 V
	B10-3 - Body ground	Always	Below 1 Ω
	B11-3 - Body ground	Always	Below 1 Ω

COOLING FAN RELAY

Item	Tester Connection	Specified Condition
No. 1 fan relay	3 - 5	10 Ω or higher
	3 - 5	Below 1 Ω (when battery voltage is applied to terminals 1 and 2)
No. 2 fan relay	3 - 5	10 Ω or higher
	3 - 5	Below 1 Ω (when battery voltage is applied to terminals 1 and 2)

RADIATOR

Item	Tester Connection	Specified Condition
Radiator reservoir cap	For brand-new cap	93.3 to 122.7 kPa (0.95 to 1.25 kgf/cm^2, 13.5 to 17.8 psi)
	After using cap	78.5 kPa (0.8 kgf/cm^2, 11.4 psi)

SS

TORQUE SPECIFICATIONS

COOLANT

Part Tightened	N*m	kgf*cm	ft.*lbf
Cylinder block drain cock plug x Cylinder block	12.7	130	10

WATER PUMP

Part Tightened		N*m	kgf*cm	ft.*lbf
Water pump x Cylinder block	for bolt A	21	214	15
	for bolt B	9.0	92	80 in.*lbf
	for bolt C	9.0	92	80 in.*lbf
V-ribbed belt tensioner assembly x Cylinder block		43	438	32
No. 2 idler pulley sub-assembly x Cylinder block		43	438	32
Water pump pulley x Water pump		21	214	15
Water inlet housing x Cylinder block		10	102	7
Radiator reservoir tank x Body		5.0	51	44 in.*lbf

THERMOSTAT

Part Tightened	N*m	kgf*cm	ft.*lbf
Water inlet x Water inlet housing	10	102	7

COOLING FAN MOTOR

Part Tightened	N*m	kgf*cm	ft.*lbf
No. 1 and No. 2 cooling fan motor x Fan shroud	3.9	40	35 in.*lbf
Fan x No. 1 and No. 2 cooling fan motor	6.3	64	55 in.*lbf

RADIATOR

Part Tightened	N*m	kgf*cm	ft.*lbf
Fan shroud with cooling fan x Radiator	10.5	107	8
Upper radiator support x Radiator support LH and RH	29	296	21
No. 2 fan shroud x Radiator	10.5	107	8
Upper radiator support bracket x Upper radiator support	19	194	14
No. 1 water by-pass pipe x Upper radiator support	9.0	92	80 in.*lbf

2AZ-FE LUBRICATION

SERVICE DATA

OIL PRESSURE

Condition	Specified Condition
Idle	29 kPa (0.3 kgf/cm^2, 4.3 psi) or more
3,000 rpm	160 to 539 kPa (1.6 to 5.5 kgf/cm^2, 23 to 78 psi)

OIL PUMP

Item	Condition	Specified Condition
Oil pump rotor	Standard side clearance	0.100 to 0.170 mm (0.0039 to 0.0067 in.)
	Maximum side clearance	0.325 mm (0.0128 in.)
	Standard tip clearance	0.080 to 0.160 mm (0.0031 to 0.0063 in.)
	Maximum tip clearance	0.35 mm (0.0138 in.)
	Standard body clearance	0.100 to 0.170 mm (0.0039 to 0.0067 in.)
	Maximum body clearance	0.325 mm (0.01128 in.)
Oil pump drive chain	Maximum chain elongation	52.4 mm (2.063 in.)
Oil pump sprocket	Minimum crankshaft sprocket diameter (with chain)	48.2 mm (1.898 in.)
	Minimum oil pump drive shaft sprocket	48.2 mm (1.898 in.)
Chain tensioner plate	Maximum wear	0.5 mm (0.020 in.)

TORQUE SPECIFICATIONS

OIL FILTER

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

OIL PUMP

Part Tightened	N*m	kgf*cm	ft.*lbf
Oil pump cover x Oil pump	8.8	90	78 in.*lbf
Oil pump relief valve x Oil pump	49	500	36
Oil pump strainer x Oil pump	8.8	90	78 in.*lbf
Oil pump X Cylinder block	19	194	14

2GR-FE LUBRICATION

SERVICE DATA

Oil pressure		Idle	80 kPa (0.8 kgf/cm^2, 11.6 psi) or more
		6,000 rpm	380 kPa (3.9 kgf/cm^2, 55.5 psi) or more
Oil pump	Tip clearance	Standard	0.060 to 0.160 mm (0.0024 to 0.0063 in.)
		Maximum	0.16 mm (0.0063 in.)
	Body clearance	Standard	0.250 to 0.325 mm (0.0098 to 0.0128 in.)
		Maximum	0.325 mm (0.0128 in.)
	Side clearance	Standard	0.030 to 0.090 mm (0.0012 to 0.0035 in.)
		Maximum	0.090 mm (0.0035 in.)

TORQUE SPECIFICATIONS

Part Tightened		N*m	kgf*cm	ft.*lbf
Oil pressure switch x Oil pan		15	153	11
Oil filter cap x Oil pan		25	255	18
Oil filter drain plug x Oil filter cap		12.5	127	9
Oil pan drain plug x No. 2 oil pan		40	408	30
Oil pump cover x Timing chain cover		9.0	92	80 in.*lbf
Plug x Oil pump cover		49	500	36
Timing chain cover x Cylinder block	Area 1, 2 bolt	21	214	15
	Area 3 bolt, nut	21	214	15
	Area 4 bolt A	43	438	32
	Area 4 except bolt A	21	214	15
Oil pan x Cylinder block	Bolt A	10	102	7
	Except bolt A, nut	21	214	15
Oil strainer x Cylinder block		10	102	7
No. 2 oil pan x Oil pan		10	102	7
Oil dipstick guide x Cylinder block		21	214	15
No. 2 oil dipstick guide x Cylinder head		21	214	15

2AZ-FE IGNITION

SERVICE DATA

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

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Spark plug x Cylinder head sub-assembly	25	254	18
Ignition coil assembly x Cylinder head cover	9.0	92	80 in.*lbf

2GR-FE IGNITION

SERVICE DATA

Spark plug	Standard electrode gap	1.0 to 1.1 mm (0.039 to 0.043 in.) for new spark plug
	Maximum electrode gap	1.4 mm (0.055 in.) for used spark plug

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Spark plug x Cylinder head sub-assembly	25	254	18
Ignition coil assembly x Cylinder head cover	10	102	7

2AZ-FE STARTING

SERVICE DATA

Starter assembly	Standard current: 90 A or less at 11.5 V
Starter magnetic switch assembly	Standard resistance 50 - C: Below 1 Ω 50 - Body: Below 2 Ω
Starter armature assembly	Standard resistance Segment: Below 1 Ω Segment - Coil core: 10 kΩ or higher
	Standard length: 3.1 to 3.8 mm (0.122 to 0.150 in.)
Starter commutator end frame	Standard length: 4.0 to 9.0 mm (0.158 to 0.359 in.)
	Standard resistance Positive (+) - Negative (-): 10 kΩ or higher
Snap ring	Maximum length: 5.0 mm (0.197 in.)
Starter relay	3 - 5: 10 kΩ or higher 3 - 5: Below 1 Ω (when battery voltage is applied to terminals 1 and 2)
Ignition switch	LOCK: Between all terminals 10 kΩ or higher ACC: 2 (AM1) - 3 (ACC) Below 1 Ω ON: 2 (AM1) - 3 (ACC) Below 1 Ω ON: 2 (AM1) - 4 (IG1) Below 1 Ω ON: 6 (IG2) - 7 (AM2) Below 1 Ω START: 1 (ST1) - 2 (AM1) Below 1 Ω START: 1 (ST1) - 4 (IG1) Below 1 Ω START: 6 (IG2) - 7 (AM2) Below 1 Ω START: 6 (IG2) - 8 (ST2) Below 1 Ω

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Lead wire x Terminal C	10	102	7
Starter assembly x Cylinder block sub-assembly	37	377	27
Starter wire x Starter assembly	9.8	100	7
Starter commutator end frame assembly x Starter drive housing assembly	5.9	60	52 in.*lbf
Magnetic switch assembly x Starter drive housing assembly	7.5	76	66 in.*lbf
Battery clamp x Body : for bolt	5.0	51	44 in.*lbf
Battery clamp x Front battery bracket : for nut	5.0	51	44 in.*lbf
Front battery bracket x Body	19	194	14
Battery bracket reinforcement x Battery carrier bracket	19	194	14

2GR-FE STARTING

SERVICE DATA

Starter assembly	Standard current		90 A or less at 11.5 V
Starter relay	Standard resistance	3 - 5	10 kΩ or higher
		3 - 5	Below 1 Ω (when battery voltage is applied to terminals 1 and 2)
Ignition switch	Standard resistance	-	10 kΩ or higher at LOCK
		2 (AM1) - 3 (ACC)	Below 1 Ω at ACC
		2 (AM1) - 3 (ACC)	Below 1 Ω at ON
		3 (ACC) - 4 (IG1)	Below 1 Ω at ON
		6 (IG2) - 7 (AM2)	Below 1 Ω at ON
		1 (ST1) - 2 (AM1)	Below 1 Ω at START
		1 (ST1) - 4 (IG1)	Below 1 Ω at START
		6 (IG2) - 7 (AM2)	Below 1 Ω at START
		6 (IG2) - 8 (ST2)	Below 1 Ω at START
Starter magnetic switch assembly	Standard resistance	50 - C	1 Ω or lower
		50 - Body	2 Ω or lower
Starter armature assembly	Standard resistance	Segment	1 Ω or lower
		Segment - Coil core	10 kΩ or higher
Starter armature assembly	Commutator depth	Standard	3.1 mm (0.122 in.)
		Maximum	3.8 mm (0.150 in.)
Starter commutator end frame	Brush length	Standard length	9.0 mm (0.354 in.)
		Minimum length	4.0 mm (0.158 in.)
	Standard resistance	Positive (+) - Negative (-)	10 kΩ or higher
Snap ring	Maximum length		5.0 mm (0.197 in.)

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Lead wire x Terminal C	10	102	7
Starter assembly x Cylinder block sub-assembly	37	377	27
Starter wire x Starter assembly	9.8	100	88 in.*lbf
Starter commutator end frame x Starter drive housing assembly	6.0	61	53 in.*lbf
Starter magnetic switch assembly x Starter drive housing assembly	7.5	76	66 in.*lbf

2AZ-FE CHARGING

SERVICE DATA

Battery	Standard voltage		12.5 to 12.9 V at 20°C (68°F)
Charging circuit with load	Standard amperage		30 A or more
Generator brush holder assembly	Brush length	Standard length	9.5 to 11.5 mm (0.374 to 0.453 in.)
		Minimum length	4.5 mm (0.177 in.)
Generator rotor assembly	Standard resistance	Slip ring	2.1 to 2.5 Ω at 20°C (68°F)
		Slip ring - Rotor core	10 kΩ or higher
	Slip ring diameter	Standard diameter	14.2 to 14.4 mm (0.559 to 0.567 in.)
		Minimum diameter	12.8 mm (0.504 in.)

TORQUE SPECIFICATIONS

Part Tightened		N*m	kgf*cm	ft.*lbf
Generator assembly x Cylinder block	bolt A	21	215	16
	bolt B	52	530	38
Generator wire harness bracket x Generator assembly		8.4	85	74 in.*lbf
Generator Wire x Generator Assembly		9.8	100	7
Generator pulley with clutch x Generator rotor assembly		110	1122	82
Bearing retainer plate x Generator drive end frame		2.3	23	20 in.*lbf
Generator brush holder assembly x Generator rectifier end frame		1.8	18	16 in.*lbf
Generator rectifier end frame x Generator drive end frame		5.8	59	51 in.*lbf
Cord clip x Generator rectifier end frame		4.6	47	41 in.*lbf
Generator rear end cover x Generator rectifier end frame		4.6	47	41 in.*lbf

2GR-FE CHARGING

SERVICE DATA

Battery	Standard specific gravity		1.25 to 1.29 at 20°C (68°F)
Charging circuit with load	Standard amperage		30 A or more
Generator brush holder assembly	Brush length	Standard length	9.5 to 11.5 mm (0.374 to 0.453 in.)
		Minimum length	4.5 mm (0.177 in.)
Generator rotor assembly	Standard resistance	Slip ring	2.3 to 2.7 Ω at 20°C (68°F)
		Slip ring - Rotor core	1 MΩ or higher
	Slip ring diameter	Standard diameter	14.2 to 14.4 mm (0.559 to 0.567 in.)
		Minimum diameter	14.0 mm (0.551 in.)

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Generator assembly x Cylinder block	43	438	32
Bracket x Cylinder block	20	204	15
Wire harness clamp stay x Generator assembly	8.4	85	74 in.*lbf
Generator wire x Generator assembly	9.8	100	88 in.*lbf
Generator pulley with clutch x Generator rotor assembly	110	1122	82
Bearing retainer plate x Generator drive end frame	2.3	23	20 in.*lbf
Generator brush holder assembly x Generator rectifier end frame	1.8	18	16 in.*lbf
Generator rectifier end frame x Generator drive end frame	5.8	59	51 in.*lbf
Generator rear end cover x Generator rectifier end frame	4.6	47	41 in.*lbf

U151E AUTOMATIC TRANSMISSION

SERVICE DATA

Automatic Transaxle Assembly

Line pressure (Wheel locked) AT stall (Throttle valve fully opened)	D position	931 to 1,031 kPa (9.1 to 10.5 kgf*cm^2, 129 to 149 psi)
	R position	1,768 to 1,968 kPa (18.0 to 20.0 kgf/cm^2, 284 to 256 psi)
Engine stall revolution	D positions	2,030 to 2,330 rpm
Time lag	N → D position	Less than 1.2 seconds
	N → R position	Less than 1.5 seconds
Engine idle speed (A/C OFF)	N position	600 to 700 rpm
Drive plate runout	Maximum.	0.20 mm (0.0079 in.)
Differential side oil seal depth		0 +-0.5 mm (0 +-0.020 in.)
Shift point		
D position (Throttle valve fully opened)	1 → 2	50 to 58 km/h (31 to 36 mph)
	2 → 3	99 to 108 km/h (62 to 67 mph)
	3 → 4	161 to 176 km/h (100 to 109 mph)
	4 → 5	239 to 257 km/h (149 to 160 mph)
	5 → 4	230 to 247 km/h (143 to 153 mph)
	4 → 3	154 to 169 km/h (96 to 105 mph)
	3 → 2	94 to 102 km/h (58 to 63 mph)
	2 → 1	35 to 42 km/h (22 to 26 mph)
D position (Throttle valve fully closed)	4 → 5	68 to 75 km/h (42 to 47 mph)
	5 → 4	40 to 47 km/h (25 to 29 mph)
3 position (Throttle valve fully opened)	1 → 2	50 to 58 km/h (31 to 36 mph)
	2 → 3	99 to 108 km/h (62 to 67 mph)
	4 → 3	154 to 169 km/h (96 to 105 mph)
	3 → 2	94 to 102 km/h (58 to 63 mph)
	2 → 1	35 to 42 km/h (22 to 26 mph)
2 position (Throttle valve fully opened)	1 → 2	50 to 58 km/h (31 to 36 mph)
	3 → 2	94 to 102 km/h (58 to 63 mph)
	2 → 1	35 to 42 km/h (22 to 26 mph)
L position (Throttle valve fully opened)	2 → 1	35 to 42 km/h (22 to 26 mph)
Lock-up point		
D position (Throttle valve opening 5 %)	Lock-up ON 5 → 5L	66 to 74 km/h (41 to 46 mph)
	Lock-up OFF 5L → 5	64 to 72 km/h (40 to 45 mph)
	Lock-up ON 4 → 4L	106 to 116 km/h (66 to 72 mph)
	Lock-up OFF 4L → 4	103 to 112 km/h (64 to 70 mph)
	Lock-up ON 3 → 3L	64 to 73 km/h (40 to 45 mph)
	Lock-up OFF 3L → 3	62 to 70 km/h (39 to 43 mph)
Input shaft		
End play	0.262 to 1.244 mm (0.0103 to 0.0490 in.)	

SS

Multiple disc clutch clutch hub		
Inside diameter	STD	23.03 to 23.05 mm (0.9067 to 0.9075 in.)
	Max.	23.09 mm (0.9091 in.)
Underdrive brake		
Return spring free length	13.24 mm (0.5213 in.)	
Pack clearance	1.81 to 2.20 mm (0.0713 to 0.0866 in.)	
Flange thickness	Mark 1	3.0 mm (0.118 in.)
	Mark 2	3.2 mm (0.126 in.)
	Mark 3	3.4 mm (0.134 in.)
	Mark 4	3.1 mm (0.122 in.)
	Mark 5	3.3 mm (0.130 in.)
2nd brake		
Pack clearance	0.62 to 0.91 mm (0.0244 to 0.0358 in.)	
Return spring free length	16.61 mm (0.6539 in.)	
Flange thickness	Mark 1	3.0 mm (0.118 in.)
	Mark 2	3.1 mm (0.122 in.)
	Mark 3	3.2 mm (0.126 in.)
	Mark 4	3.3 mm (0.130 in.)
	Mark 5	3.4 mm (0.134 in.)
	Mark 6	3.5 mm (0.138 in.)
	Mark 7	3.6 mm (0.142 in.)
1st and reverse brake		
Pack clearance	1.16 to 1.35 mm (0.0457 to 0.0531 in.)	
Return spring free length	17.61 mm (0.6933 in.)	
Flange thickness	Mark 1	1.8 mm (0.071 in.)
	Mark 2	1.9 mm (0.075 in.)
	Mark 3	2.0 mm (0.079 in.)
	Mark 4	2.1 mm (0.083 in.)
	Mark 5	2.2 mm (0.087 in.)
	Mark 6	2.3 mm (0.091 in.)
	Mark 7	2.4 mm (0.094 in.)
	Mark 8	2.5 mm (0.098 in.)

OIL PUMP

Body clearance	STD	0.10 to 0.17 mm (0.0039 to 0.0067 in.)
	Max.	0.17 mm (0.0067 in.)
Tip clearance	STD	0.07 to 0.15 mm (0.0028 to 0.0059 in.)
	Max.	0.15 mm (0.0059 in.)
Side clearance	STD	0.02 to 0.05 mm (0.0008 to 0.0020 in.)
	Max.	0.05 mm (0.0020 in.)
Drive gear thickness	Mark A	11.690 to 11.699 mm (0.4602 to 0.4606 in.)
	Mark B	11.700 to 11.709 mm (0.4606 to 0.4610 in.)
	Mark C	11.710 to 11.720 mm (0.4610 to 0.4614 in.)
	Mark D	11.721 to 11.730 mm (0.4615 to 0.4618 in.)
	Mark E	11.731 to 11.740 mm (0.4619 to 0.4622 in.)

Driven gear thickness	Mark A	11.690 to 11.699 mm (0.4602 to 0.4606 in.)
	Mark B	11.700 to 11.709 mm (0.4606 to 0.4610 in.)
	Mark C	11.710 to 11.720 mm (0.4610 to 0.4614 in.)
	Mark D	11.721 to 11.730 mm (0.4615 to 0.4618 in.)
	Mark E	11.731 to 11.740 mm (0.4619 to 0.4622 in.)
Pump body bushing inside diameter	STD	38.113 to 38.138 mm (1.5005 to 1.5015 in.)
	Max.	38.188 mm (1.5035 in.)
Stator shaft bushing inside diameter	STD	21.500 to 21.526 mm (0.8465 to 0.8475 in.)
	Max	21.57 mm (0.8492 in.)

SECOND BRAKE PISTON

Piston return spring free length	16.61 mm (0.6539 in.)

FORWARD CLUTCH

Pack clearance		1.00 to 1.25 mm (0.0394 to 0.4921 in.)
Piston return spring free length		26.74 mm (1.0528 in.)
Flange thickness	No. 1	3.00 mm (0.1181 in.)
	No. 2	3.15 mm (0.1240 in.)
	No. 3	3.30 mm (0.1299 in.)
	No. 4	3.45 mm (0.1358 in.)
	No. 5	3.60 mm (0.1417 in.)

DIRECT CLUTCH

Pack clearance		0.61 to 0.83 mm (0.0240 to 0.0327 in.)
Piston return spring free length		25.91 mm (1.0201 in.)
Flange thickness (Direct clutch)	Mark 1	3.0 mm (0.118 in.)
	Mark 2	3.1 mm (0.122 in.)
	Mark 3	3.2 mm (0.126 in.)
	Mark 4	3.3 mm (0.130 in.)
	Mark 5	3.4 mm (0.134 in.)
	Mark 6	3.5 mm (0.138 in.)
	Mark 7	3.6 mm (0.142 in.)

UNDERDRIVE PLANETARY GEAR

Turning torque (at 60 rpm)	0.50 to 1.42 N*m (5.1 to 14.5 kgf*cm, 4.4 to 12.6 in.*lbf)

UNDERDRIVE CLUTCH

Pack clearance		1.51 to 1.71 mm (0.0594 to 0.0673 in.)
Piston return spring free length		17.14 mm (0.6752 in.)
Flange thickness (Underdrive clutch))	Mark 1	3.0 mm (0.118 in.)
	Mark 2	3.2 mm (0.126 in.)
	Mark 3	3.4 mm (0.134 in.)
	Mark 3	3.6 mm (0.122 in.)
	Mark 3	3.8 mm (0.130 in.)
Underdrive clutch drum bushing inside diameter	STD	37.06 to 37.08 mm (1.4591 to 1.4598 in.)
	Max.	37.13 mm (1.4618 in.)

TRANSMISSION VALVE BODY ASSEMBLY

Valve body assembly installation bolt length	25 mm (0.984 in.) for bolt A
	57.0 mm (2.244 in.) for bolt B
	41 mm (1.614 in.) for bolt C
Detente spring installation bolt length	27 mm (1.063 in.) for bolt A
	16 mm (0.630 in.) for bolt B

DIFFERENTIAL

Side gear backlash		0.05 to 0.20 mm (0.0020 to 0.0079 in.)
Thrust washer thickness	Mark -	1.625 mm (0.0640 in.)
	Mark -	1.725 mm (0.0679 in.)
	Mark -	1.825 mm (0.0719 in.)
Preload (turning torque at 60 rpm))	New bearing	0.20 to 0.69 N*m (2.0 to 7.0 kgf*cm, 1.8 to 6.1 in.*lbf)
	Using bearing	0.10 to 0.35 N*m (1.0 to 3.6 kgf*cm, 0.9 to 3.1 in.*lbf)
Shim thickness	Mark 0	2.00 mm (0.0787 in.)
	Mark 1	2.05 mm (0.0807 in.)
	Mark 2	2.10 mm (0.0827 in.)
	Mark 3	2.15 mm (0.0846 in.)
	Mark 4	2.20 mm (0.0866 in.)
	Mark 5	2.25 mm (0.0886 in.)
	Mark 6	2.30 mm (0.0906 in.)
	Mark 7	2.35 mm (0.0925 in.)
	Mark 8	2.40 mm (0.0945 in.)
	Mark 9	2.45 mm (0.0965 in.)
	Mark A	2.50 mm (0.0984 in.)
	Mark B	2.55 mm (0.1004 in.)
	Mark C	2.60 mm (0.1024 in.)
	Mark D	2.65 mm (0.1043 in.)
	Mark E	2.70 mm (0.1063 in.)
	Mark F	2.75 mm (0.1083 in.)
	Mark G	2.80 mm (0.1102 in.)
	Mark H	2.85 mm (0.1122 in.)
	Mark J	2.025 mm (0.07972 in.)
	Mark K	2.075 mm (0.08169 in.)
	Mark L	2.125 mm (0.08366 in.)
	Mark M	2.175 mm (0.08563 in.)
	Mark N	2.225 mm (0.08760 in.)
	Mark P	2.275 mm (0.08957 in.)
	Mark Q	2.325 mm (0.09154 in.)
	Mark R	2.375 mm (0.09350 in.)
	Mark S	2.425 mm (0.09547 in.)
	Mark T	2.475 mm (0.09744 in.)
	Mark U	2.525 mm (0.09941 in.)
	Mark V	2.575 mm (0.10138 in.)
	Mark W	2.625 mm (0.10335 in.)
	Mark X	2.675 mm (0.10531 in.)
	Mark Y	2.725 mm (0.10728 in.)
	Mark AA	2.775 mm (0.10925 in.)
	Mark AB	2.825 mm (0.11122 in.)

U151F AUTOMATIC TRANSMISSION

SERVICE DATA

Automatic Transaxle Assembly

Line pressure (Wheel locked) AT stall (Throttle valve fully opened)	D position	931 to 1,031 kPa (9.1 to 10.5 kgf*cm^2, 129 to 149 psi)
	R position	1,768 to 1,968 kPa (18.0 to 20.0 kgf/cm^2, 284 to 256 psi)
Engine stall revolution	D positions	2,030 to 2,330 rpm
Time lag	N → D position	Less than 1.2 seconds
	N → R position	Less than 1.5 seconds
Engine idle speed (A/C OFF)	N position	600 to 700 rpm
Drive plate runout	Maximum.	0.20 mm (0.0079 in.)
Differential side oil seal depth		0 +-0.5 mm (0 +-0.020 in.)
Shift point		
D position (Throttle valve fully opened)	1 → 2	50 to 58 km/h (31 to 36 mph)
	2 → 3	99 to 108 km/h (62 to 67 mph)
	3 → 4	161 to 176 km/h (100 to 109 mph)
	4 → 5	239 to 257 km/h (149 to 160 mph)
	5 → 4	230 to 247 km/h (143 to 153 mph)
	4 → 3	154 to 169 km/h (96 to 105 mph)
	3 → 2	94 to 102 km/h (58 to 63 mph)
	2 → 1	35 to 42 km/h (22 to 26 mph)
D position (Throttle valve fully closed)	4 → 5	68 to 75 km/h (42 to 47 mph)
	5 → 4	40 to 47 km/h (25 to 29 mph)
3 position (Throttle valve fully opened)	1 → 2	50 to 58 km/h (31 to 36 mph)
	2 → 3	99 to 108 km/h (62 to 67 mph)
	4 → 3	154 to 169 km/h (96 to 105 mph)
	3 → 2	94 to 102 km/h (58 to 63 mph)
	2 → 1	35 to 42 km/h (22 to 26 mph)
2 position (Throttle valve fully opened)	1 → 2	50 to 58 km/h (31 to 36 mph)
	3 → 2	94 to 102 km/h (58 to 63 mph)
	2 → 1	35 to 42 km/h (22 to 26 mph)
L position (Throttle valve fully opened)	2 → 1	35 to 42 km/h (22 to 26 mph)
Lock-up point		
D position (Throttle valve opening 5 %)	Lock-up ON 5 → 5L	66 to 74 km/h (41 to 46 mph)
	Lock-up OFF 5L → 5	64 to 72 km/h (40 to 45 mph)
	Lock-up ON 4 → 4L	106 to 116 km/h (66 to 72 mph)
	Lock-up OFF 4L → 4	103 to 112 km/h (64 to 70 mph)
	Lock-up ON 3 → 3L	64 to 73 km/h (40 to 45 mph)
	Lock-up OFF 3L → 3	62 to 70 km/h (39 to 43 mph)
Input shaft		
End play	0.262 to 1.244 mm (0.0103 to 0.0490 in.)	

SS

Multiple disc clutch clutch hub		
Inside diameter	STD	23.03 to 23.05 mm (0.9067 to 0.9075 in.)
	Max.	23.09 mm (0.9091 in.)
Underdrive brake		
Return spring free length	13.24 mm (0.5213 in.)	
Pack clearance	1.81 to 2.20 mm (0.0713 to 0.0866 in.)	
Flange thickness	Mark 1	3.0 mm (0.118 in.)
	Mark 2	3.2 mm (0.126 in.)
	Mark 3	3.4 mm (0.134 in.)
	Mark 4	3.1 mm (0.122 in.)
	Mark 5	3.3 mm (0.130 in.)
2nd brake		
Pack clearance	0.62 to 0.91 mm (0.0244 to 0.0358 in.)	
Return spring free length	16.61 mm (0.6539 in.)	
Flange thickness	Mark 1	3.0 mm (0.118 in.)
	Mark 2	3.1 mm (0.122 in.)
	Mark 3	3.2 mm (0.126 in.)
	Mark 4	3.3 mm (0.130 in.)
	Mark 5	3.4 mm (0.134 in.)
	Mark 6	3.5 mm (0.138 in.)
	Mark 7	3.6 mm (0.142 in.)
1st and reverse brake		
Pack clearance	1.16 to 1.35 mm (0.0457 to 0.0531 in.)	
Return spring free length	17.61 mm (0.6933 in.)	
Flange thickness	Mark 1	1.8 mm (0.071 in.)
	Mark 2	1.9 mm (0.075 in.)
	Mark 3	2.0 mm (0.079 in.)
	Mark 4	2.1 mm (0.083 in.)
	Mark 5	2.2 mm (0.087 in.)
	Mark 6	2.3 mm (0.091 in.)
	Mark 7	2.4 mm (0.094 in.)
	Mark 8	2.5 mm (0.098 in.)

OIL PUMP

Body clearance	STD	0.10 to 0.17 mm (0.0039 to 0.0067 in.)
	Max.	0.17 mm (0.0067 in.)
Tip clearance	STD	0.07 to 0.15 mm (0.0028 to 0.0059 in.)
	Max.	0.15 mm (0.0059 in.)
Side clearance	STD	0.02 to 0.05 mm (0.0008 to 0.0020 in.)
	Max.	0.05 mm (0.0020 in.)
Drive gear thickness	Mark A	11.690 to 11.699 mm (0.4602 to 0.4606 in.)
	Mark B	11.700 to 11.709 mm (0.4606 to 0.4610 in.)
	Mark C	11.710 to 11.720 mm (0.4610 to 0.4614 in.)
	Mark D	11.721 to 11.730 mm (0.4615 to 0.4618 in.)
	Mark E	11.731 to 11.740 mm (0.4619 to 0.4622 in.)

Driven gear thickness	Mark A	11.690 to 11.699 mm (0.4602 to 0.4606 in.)
	Mark B	11.700 to 11.709 mm (0.4606 to 0.4610 in.)
	Mark C	11.710 to 11.720 mm (0.4610 to 0.4614 in.)
	Mark D	11.721 to 11.730 mm (0.4615 to 0.4618 in.)
	Mark E	11.731 to 11.740 mm (0.4619 to 0.4622 in.)
Pump body bushing inside diameter	STD	38.113 to 38.138 mm (1.5005 to 1.5015 in.)
	Max.	38.188 mm (1.5035 in.)
Stator shaft bushing inside diameter	STD	21.500 to 21.526 mm (0.8465 to 0.8475 in.)
	Max	21.57 mm (0.8492 in.)

SECOND BRAKE PISTON

Piston return spring free length	16.61 mm (0.6539 in.)

FORWARD CLUTCH

Pack clearance		1.00 to 1.25 mm (0.0394 to 0.4921 in.)
Piston return spring free length		26.74 mm (1.0528 in.)
Flange thickness	No. 1	3.00 mm (0.1181 in.)
	No. 2	3.15 mm (0.1240 in.)
	No. 3	3.30 mm (0.1299 in.)
	No. 4	3.45 mm (0.1358 in.)
	No. 5	3.60 mm (0.1417 in.)

DIRECT CLUTCH

Pack clearance		0.61 to 0.83 mm (0.0240 to 0.0327 in.)
Piston return spring free length		25.91 mm (1.0201 in.)
Flange thickness (Direct clutch)	Mark 1	3.0 mm (0.118 in.)
	Mark 2	3.1 mm (0.122 in.)
	Mark 3	3.2 mm (0.126 in.)
	Mark 4	3.3 mm (0.130 in.)
	Mark 5	3.4 mm (0.134 in.)
	Mark 6	3.5 mm (0.138 in.)
	Mark 7	3.6 mm (0.142 in.)

UNDERDRIVE PLANETARY GEAR

Turning torque (at 60 rpm)	0.50 to 1.42 N*m (5.1 to 14.5 kgf*cm, 4.4 to 12.6 in.*lbf)

UNDERDRIVE CLUTCH

Pack clearance		1.51 to 1.71 mm (0.0594 to 0.0673 in.)
Piston return spring free length		17.14 mm (0.6752 in.)
Flange thickness (Underdrive clutch))	Mark 1	3.0 mm (0.118 in.)
	Mark 2	3.2 mm (0.126 in.)
	Mark 3	3.4 mm (0.134 in.)
	Mark 3	3.6 mm (0.122 in.)
	Mark 3	3.8 mm (0.130 in.)
Underdrive clutch drum bushing inside diameter	STD	37.06 to 37.08 mm (1.4591 to 1.4598 in.)
	Max.	37.13 mm (1.4618 in.)

TRANSMISSION VALVE BODY ASSEMBLY

Valve body assembly installation bolt length	25 mm (0.984 in.) for bolt A
	57.0 mm (2.244 in.) for bolt B
	41 mm (1.614 in.) for bolt C
Detente spring installation bolt length	27 mm (1.063 in.) for bolt A
	16 mm (0.630 in.) for bolt B

DIFFERENTIAL

Side gear backlash		0.05 to 0.20 mm (0.0020 to 0.0079 in.)
Thrust washer thickness	Mark -	1.625 mm (0.0640 in.)
	Mark -	1.725 mm (0.0679 in.)
	Mark -	1.825 mm (0.0719 in.)
Preload (turning torque at 60 rpm))	New bearing	0.20 to 0.69 N*m (2.0 to 7.0 kgf*cm, 1.8 to 6.1 in.*lbf)
	Using bearing	0.10 to 0.35 N*m (1.0 to 3.6 kgf*cm, 0.9 to 3.1 in.*lbf)
Shim thickness	Mark 0	2.00 mm (0.0787 in.)
	Mark 1	2.05 mm (0.0807 in.)
	Mark 2	2.10 mm (0.0827 in.)
	Mark 3	2.15 mm (0.0846 in.)
	Mark 4	2.20 mm (0.0866 in.)
	Mark 5	2.25 mm (0.0886 in.)
	Mark 6	2.30 mm (0.0906 in.)
	Mark 7	2.35 mm (0.0925 in.)
	Mark 8	2.40 mm (0.0945 in.)
	Mark 9	2.45 mm (0.0965 in.)
	Mark A	2.50 mm (0.0984 in.)
	Mark B	2.55 mm (0.1004 in.)
	Mark C	2.60 mm (0.1024 in.)
	Mark D	2.65 mm (0.1043 in.)
	Mark E	2.70 mm (0.1063 in.)
	Mark F	2.75 mm (0.1083 in.)
	Mark G	2.80 mm (0.1102 in.)
	Mark H	2.85 mm (0.1122 in.)
	Mark J	2.025 mm (0.07972 in.)
	Mark K	2.075 mm (0.08169 in.)
	Mark L	2.125 mm (0.08366 in.)
	Mark M	2.175 mm (0.08563 in.)
	Mark N	2.225 mm (0.08760 in.)
	Mark P	2.275 mm (0.08957 in.)
	Mark Q	2.325 mm (0.09154 in.)
	Mark R	2.375 mm (0.09350 in.)
	Mark S	2.425 mm (0.09547 in.)
	Mark T	2.475 mm (0.09744 in.)
	Mark U	2.525 mm (0.09941 in.)
	Mark V	2.575 mm (0.10138 in.)
	Mark W	2.625 mm (0.10335 in.)
	Mark X	2.675 mm (0.10531 in.)
	Mark Y	2.725 mm (0.10728 in.)
	Mark AA	2.775 mm (0.10925 in.)
	Mark AB	2.825 mm (0.11122 in.)

U140F AUTOMATIC TRANSAXLE

SERVICE DATA

AUTOMATIC TRANSMISSION ASSEMBLY

Line pressure (Wheel locked) AT stall (Throttle valve fully opened)	D position	931 to 1,031 kPa (9.1 to 10.5 kgf*cm^2, 129 to 149 psi)
	R position	1,768 to 1,968 kPa (18.0 to 20.0 kgf/cm^2, 284 to 256 psi)
Engine stall revolution	D positions	2,400 to 2,700 rpm
Time lag	N → D position	Less than 1.2 seconds
	N → R position	Less than 1.2 seconds
Engine idle speed (A/C OFF)	N position	610 to 710 rpm
Drive plate runout	Maximum.	0.20 mm (0.0079 in.)
Differential oil seal drive in depth	LH side	5.4 to 6.4 mm (0.213 to 0.252 in.)
	RH side	1.5 to 2.5 mm (0.059 to 0.098 in.)
Shift point		
D position (Throttle valve fully opened)	1 → 2	55 to 63 km/h (34 to 39 mph)
	2 → 3	102 to 112 km/h (63 to 70 mph)
	3 → 4	156 to 171 km/h (97 to 106 mph)
	4 → 3	148 to 163 km/h (92 to 101 mph)
	3 → 2	94 to 104 km/h (58 to 65 mph)
	2 → 1	44 to 51 km/h (27 to 32 mph)
D position (Throttle valve fully closed)	3 → 4	40 to 47 km/h (25 to 29 mph)
	4 → 3	16 to 22 km/h (10 to 14 mph)
2 position (Throttle valve fully opened)	1 → 2	55 to 63 km/h (34 to 39 mph)
	3 → 2	102 to 112 km/h (63 to 70 mph)
	2 → 1	32 to 39 km/h (20 to 24 mph)
L position (Throttle valve fully opened)	3 → 2	102 to 112 km/h (63 to 70 mph)
	2 → 1	48 to 55 km/h (30 to 34 mph)
Lock-up point		
D position (Throttle valve opening 5 %)	Lock-up ON 4 → 4L	53 to 60 km/h (33 to 37 mph)
	Lock-up OFF 4L → 4	51 to 58 km/h (32 to 36 mph)
Input shaft		
End play	0.262 to 1.249 mm (0.0103 to 0.0492 in.)	
Multiple disc clutch clutch hub		
Inside diameter	STD	23.025 to 23.045 mm (0.9065 to 0.9073 in.)
	Max.	23.09 mm (0.9091 in.)
Underdrive brake		
Return spring free length	14.04 mm (0.5528 in.)	
Pack clearance	1.81 to 2.20 mm (0.0713 to 0.0866 in.)	
Flange thickness	Mark 1	3.0 mm (0.118 in.)
	Mark 2	3.2 mm (0.126 in.)
	Mark 3	3.4 mm (0.134 in.)
2nd brake		
Pack clearance	0.62 to 0.91 mm (0.0244 to 0.0358 in.)	
Return spring free length	16.61 mm (0.6539 in.)	

Flange thickness	Mark 1	3.0 mm (0.118 in.)
	Mark 2	3.1 mm (0.122 in.)
	Mark 3	3.2 mm (0.126 in.)
	Mark 4	3.3 mm (0.130 in.)
	Mark 5	3.4 mm (0.134 in.)
	Mark 6	3.5 mm (0.138 in.)
	Mark 7	3.6 mm (0.142 in.)
1st and reverse brake		
Pack clearance	1.10 to 1.29 mm (0.0433 to 0.0508 in.)	
Return spring free length	15.51 mm (0.6106 in.)	
Flange thickness	Mark 1	1.8 mm (0.071 in.)
	Mark 2	1.9 mm (0.075 in.)
	Mark 3	2.0 mm (0.079 in.)
	Mark 4	2.1 mm (0.083 in.)
	Mark 5	2.2 mm (0.087 in.)
	Mark 6	2.3 mm (0.091 in.)
	Mark 7	2.4 mm (0.094 in.)
	Mark 8	2.5 mm (0.098 in.)

OIL PUMP

Body clearance	STD	0.10 to 0.17 mm (0.0039 to 0.0067 in.)
	Max.	0.17 mm (0.0067 in.)
Tip clearance	STD	0.07 to 0.15 mm (0.0028 to 0.0059 in.)
	Max.	0.15 mm (0.0059 in.)
Side clearance	STD	0.02 to 0.05 mm (0.0008 to 0.0020 in.)
	Max.	0.05 mm (0.0020 in.)
Drive gear thickness	Mark 1	10.690 to 10.699 mm (0.4209 to 0.4212 in.)
	Mark 2	10.700 to 10.709 mm (0.4213 to 0.4216 in.)
	Mark 3	10.710 to 10.720 mm (0.4217 to 0.4220 in.)
	Mark 4	10.721 to 10.730 mm (0.4221 to 0.4224 in.)
	Mark 5	10.731 to 10.740 mm (0.4225 to 0.4228 in.)
Driven gear thickness	Mark 1	10.690 to 10.699 mm (0.4209 to 0.4212 in.)
	Mark 2	10.700 to 10.709 mm (0.4213 to 0.4216 in.)
	Mark 3	10.710 to 10.720 mm (0.4217 to 0.4220 in.)
	Mark 4	10.721 to 10.730 mm (0.4221 to 0.4224 in.)
	Mark 5	10.731 to 10.740 mm (0.4225 to 0.4228 in.)
Pump body bushing inside diameter	STD	38.113 to 38.138 mm (1.50050 to 1.50149 in.)
	Max.	38.138 mm (1.50149 in.)
Oil seal in depth	STD	0 +- 0.5 mm (0 +- 0.020 in.)
Stator shaft bushing inside diameter	STD	21.500 to 21.526 mm (0.84646 to 0.84748 in.)
	Max	21.526 mm (0.84748 in.)

SECOND BRAKE PISTON

Piston return spring free length	18.99 mm (0.7476 in.)

FORWARD CLUTCH

Pack clearance		1.74 to 2.08 mm (0.0685 to 0.0819 in.)
Piston return spring free length		28.23 mm (1.1102 in.)
Flange thickness	No. 1	3.00 mm (0.1181 in.)
	No. 2	3.15 mm (0.1240 in.)
	No. 3	3.30 mm (0.1299 in.)
	No. 4	3.45 mm (0.1358 in.)
	No. 5	3.60 mm (0.1417 in.)

SS

DIRECT CLUTCH

Pack clearance		0.605 to 0.825 mm (0.02382 to 0.03248 in.)
Piston return spring free length		22.58 mm (0.8898 in.)
Flange thickness (Direct clutch)	Mark 1	3.0 mm (0.118 in.)
	Mark 2	3.1 mm (0.122 in.)
	Mark 3	3.2 mm (0.126 in.)
	Mark 4	3.3 mm (0.130 in.)
	Mark 5	3.4 mm (0.134 in.)
	Mark 6	3.5 mm (0.138 in.)

UNDERDRIVE PLANETARY GEAR

Turning torque (at 60 rpm)	0.10 to 4.41 N*m (1.0 to 45 kgf*cm, 0.9 to 39 in*lbf)

UNDERDRIVE CLUTCH

Pack clearance		1.51 to 1.90 mm (0.0594 to 0.0748 in.)
Piston return spring free length		17.14 mm (0.6752 in.)
	Mark 1	3.0 mm (0.118 in.)
	Mark 2	3.2 mm (0.126 in.)
	Mark 3	3.4 mm (0.134 in.)
U/D clutch drum bushing inside diameter	STD	37.06 to 37.08 mm (1.4591 to 1.4598 in.)
	Max.	37.13 mm (1.4618 in.)

TRANSMISSION VALVE BODY ASSEMBLY

Valve body assembly installation bolt length	25 mm (0.984 in.) for bolt A
	41 mm (1.614 in.) for bolt B
	45 mm (1.771 in.) for bolt C
Detente spring installation bolt length	27 mm (1.063 in.) for bolt A
	16 mm (0.630 in.) for bolt B

DIFFERENTIAL

Side gear backlash		0.05 to 0.20 mm (0.0020 to 0.0070 in.)
Thrust washer thickness	Mark -	1.625 mm (0.0640 in.)
	Mark -	1.725 mm (0.0679 in.)
	Mark -	1.825 mm (0.0719 in.)
Preload (turning torque at 60 rpm))	New bearing	0.20 to 0.69 N*m (2.0 to 7.0 kgf*cm, 1.8 to 6.1 in.*lbf)
	Using bearing	0.10 to 0.35 N*m (1.0 to 3.6 kgf*cm, 0.9 to 3.1 in.*lbf)

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

U241E AUTOMATIC TRANSAXLE

SERVICE DATA

AUTOMATIC TRANSMISSION ASSEMBLY

Line pressure (Wheel locked) AT stall (Throttle valve fully opened)	D position	931 to 1,031 kPa (9.1 to 10.5 kgf*cm^2, 129 to 149 psi)
	R position	1,768 to 1,968 kPa (18.0 to 20.0 kgf/cm^2, 284 to 256 psi)
Engine stall revolution	D positions	2,150 to 2,450 rpm
Time lag	N → D position	Less than 1.2 seconds
	N → R position	Less than 1.2 seconds
Engine idle speed (A/C OFF)	N position	610 to 710 rpm
Drive plate runout	Maximum.	0.20 mm (0.0079 in.)
Differential oil seal drive in depth	LH side	5.4 to 6.4 mm (0.213 to 0.252 in.)
	RH side	1.5 to 2.5 mm (0.059 to 0.098 in.)
Shift point		
D position (Throttle valve fully opened)	1 → 2	62 to 70 km/h (39 to 43 mph)
	2 → 3	116 to 124 km/h (72 to 77 mph)
	3 → 4	187 to 200 km/h (114 to 124 mph)
	4 → 3	178 to 190 km/h (111 to 118 mph)
	3 → 2	107 to 114 km/h (66 to 71 mph)
	2 → 1	52 to 59 km/h (32 to 37 mph)
D position (Throttle valve fully closed)	3 → 4	42 to 48 km/h (26 to 30 mph)
	4 → 3	19 to 24 km/h (12 to 15 mph)
2 position (Throttle valve fully opened)	1 → 2	62 to 70 km/h (39 to 43 mph)
	3 → 2	116 to 123 km/h (72 to 76 mph)
	2 → 1	34 to 40 km/h (21 to 25 mph)
L position (Throttle valve fully opened)	3 → 2	116 to 123 km/h (72 to 76 mph)
	2 → 1	58 to 64 km/h (36 to 40 mph)
Lock-up point		
D position (Throttle valve opening 5 %)	Lock-up ON 4 → 4L	53 to 60 km/h (33 to 37 mph)
	Lock-up OFF 4L → 4	51 to 58 km/h (32 to 36 mph)
Input shaft		
End play	0.262 to 1.249 mm (0.0103 to 0.0492 in.)	
Multiple disc clutch clutch hub		
Inside diameter	STD	23.025 to 23.045 mm (0.9065 to 0.9073 in.)
	Max.	23.09 mm (0.9091 in.)
Underdrive brake		
Return spring free length	14.04 mm (0.5528 in.)	
Pack clearance	1.81 to 2.20 mm (0.0713 to 0.0866 in.)	
Flange thickness	Mark 1	3.0 mm (0.118 in.)
	Mark 2	3.2 mm (0.126 in.)
	Mark 3	3.4 mm (0.134 in.)
2nd brake		
Pack clearance	0.62 to 0.91 mm (0.0244 to 0.0358 in.)	
Return spring free length	16.61 mm (0.6539 in.)	

Flange thickness	Mark 1	3.0 mm (0.118 in.)
	Mark 2	3.1 mm (0.122 in.)
	Mark 3	3.2 mm (0.126 in.)
	Mark 4	3.3 mm (0.130 in.)
	Mark 5	3.4 mm (0.134 in.)
	Mark 6	3.5 mm (0.138 in.)
	Mark 7	3.6 mm (0.142 in.)
1st and reverse brake		
Pack clearance	1.10 to 1.29 mm (0.0433 to 0.0508 in.)	
Return spring free length	15.51 mm (0.6106 in.)	
Flange thickness	Mark 1	1.8 mm (0.071 in.)
	Mark 2	1.9 mm (0.075 in.)
	Mark 3	2.0 mm (0.079 in.)
	Mark 4	2.1 mm (0.083 in.)
	Mark 5	2.2 mm (0.087 in.)
	Mark 6	2.3 mm (0.091 in.)
	Mark 7	2.4 mm (0.094 in.)
	Mark 8	2.5 mm (0.098 in.)

SS

OIL PUMP

Body clearance	STD	0.10 to 0.17 mm (0.0039 to 0.0067 in.)
	Max.	0.17 mm (0.0067 in.)
Tip clearance	STD	0.07 to 0.15 mm (0.0028 to 0.0059 in.)
	Max.	0.15 mm (0.0059 in.)
Side clearance	STD	0.02 to 0.05 mm (0.0008 to 0.0020 in.)
	Max.	0.05 mm (0.0020 in.)
Drive gear thickness	Mark 1	10.690 to 10.699 mm (0.4209 to 0.4212 in.)
	Mark 2	10.700 to 10.709 mm (0.4213 to 0.4216 in.)
	Mark 3	10.710 to 10.720 mm (0.4217 to 0.4220 in.)
	Mark 4	10.721 to 10.730 mm (0.4221 to 0.4224 in.)
	Mark 5	10.731 to 10.740 mm (0.4225 to 0.4228 in.)
Driven gear thickness	Mark 1	10.690 to 10.699 mm (0.4209 to 0.4212 in.)
	Mark 2	10.700 to 10.709 mm (0.4213 to 0.4216 in.)
	Mark 3	10.710 to 10.720 mm (0.4217 to 0.4220 in.)
	Mark 4	10.721 to 10.730 mm (0.4221 to 0.4224 in.)
	Mark 5	10.731 to 10.740 mm (0.4225 to 0.4228 in.)
Pump body bushing inside diameter	STD	38.113 to 38.138 mm (1.50050 to 1.50149 in.)
	Max.	38.138 mm (1.50149 in.)
Oil seal in depth	STD	0 +- 0.5 mm (0 +- 0.020 in.)
Stator shaft bushing inside diameter	STD	21.500 to 21.526 mm (0.84646 to 0.84748 in.)
	Max	21.526 mm (0.84748 in.)

SECOND BRAKE PISTON

Piston return spring free length	18.99 mm (0.7476 in.)

FORWARD CLUTCH

Pack clearance		1.74 to 2.08 mm (0.0685 to 0.0819 in.)
Piston return spring free length		28.23 mm (1.1102 in.)
Flange thickness	No. 1	3.00 mm (0.1181 in.)
	No. 2	3.15 mm (0.1240 in.)
	No. 3	3.30 mm (0.1299 in.)
	No. 4	3.45 mm (0.1358 in.)
	No. 5	3.60 mm (0.1417 in.)

SS

DIRECT CLUTCH

Pack clearance		0.605 to 0.825 mm (0.02382 to 0.03248 in.)
Piston return spring free length		22.58 mm (0.8898 in.)
Flange thickness (Direct clutch)	Mark 1	3.0 mm (0.118 in.)
	Mark 2	3.1 mm (0.122 in.)
	Mark 3	3.2 mm (0.126 in.)
	Mark 4	3.3 mm (0.130 in.)
	Mark 5	3.4 mm (0.134 in.)
	Mark 6	3.5 mm (0.138 in.)

UNDERDRIVE PLANETARY GEAR

Turning torque (at 60 rpm)	0.10 to 4.41 N*m (1.0 to 45 kgf*cm, 0.9 to 39 in*lbf)

UNDERDRIVE CLUTCH

Pack clearance		1.51 to 1.90 mm (0.0594 to 0.0748 in.)
Piston return spring free length		17.14 mm (0.6752 in.)
	Mark 1	3.0 mm (0.118 in.)
	Mark 2	3.2 mm (0.126 in.)
	Mark 3	3.4 mm (0.134 in.)
U/D clutch drum bushing inside diameter	STD	37.06 to 37.08 mm (1.4591 to 1.4598 in.)
	Max.	37.13 mm (1.4618 in.)

TRANSMISSION VALVE BODY ASSEMBLY

Valve body assembly installation bolt length	25 mm (0.984 in.) for bolt A
	41 mm (1.614 in.) for bolt B
	45 mm (1.771 in.) for bolt C
Detente spring installation bolt length	27 mm (1.063 in.) for bolt A
	16 mm (0.630 in.) for bolt B

DIFFERENTIAL

Side gear backlash		0.05 to 0.20 mm (0.0020 to 0.0070 in.)
Thrust washer thickness	Mark -	1.625 mm (0.0640 in.)
	Mark -	1.725 mm (0.0679 in.)
	Mark -	1.825 mm (0.0719 in.)
Preload (turning torque at 60 rpm))	New bearing	0.20 to 0.69 N*m (2.0 to 7.0 kgf*cm, 1.8 to 6.1 in.*lbf)
	Using bearing	0.10 to 0.35 N*m (1.0 to 3.6 kgf*cm, 0.9 to 3.1 in.*lbf)

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

GF1A TRANSFER

SERVICE DATA

Transfer case oil seal drive in depth for LH side		0 to 0.5 mm (0 to 0.020 in.)
Transfer case oil seal drive in depth for RH side		0 to 0.5 mm (0 to 0.020 in.)
Transfer assembly		
Output rear shaft preload	Standard preload (turning)	0.77 to 2.13 N*m (7.9 to 21.7 kgf*cm, 6.82 to 18.85 in.*lbf)
Ring gear backlash	Standard backlash	0.10 to 0.20 mm (0.0039 to 0.0079 in.)
Driven pinion preload	Standard preload (turning)	0.29 to 1.49 N*m (3.0 to 15.2 kgf*cm, 2.57 to 13.19 in.*lbf)

Washer thickness LH side	A0	1.97 mm (0.0776 in.)
	A1	1.99 mm (0.0783 in.)
	A2	2.01 mm (0.0791 in.)
	A3	2.03 mm (0.0799 in.)
	A4	2.05 mm (0.0807 in.)
	A5	2.07 mm (0.0815 in.)
	A6	2.09 mm (0.0823 in.)
	A7	2.11 mm (0.0831 in.)
	A8	2.13 mm (0.0839 in.)
	A9	2.15 mm (0.0846 in.)
	B0	2.17 mm (0.0854 in.)
	B1	2.19 mm (0.0862 in.)
	B2	2.21 mm (0.087 in.)
	B3	2.23 mm (0.0878 in.)
	B4	2.25 mm (0.0886 in.)
	B5	2.27 mm (0.0894 in.)
	B6	2.29 mm (0.0902 in.)
	B7	2.31 mm (0.0909 in.)
	B8	2.33 mm (0.0917 in.)
	B9	2.35 mm (0.0925 in.)
	C0	2.37 mm (0.0933 in.)
	C1	2.39 mm (0.0941 in.)
	C2	2.41 mm (0.0949 in.)
	C3	2.43 mm (0.0957 in.)
	C4	2.45 mm (0.0965 in.)
	C5	2.47 mm (0.0972 in.)
	C6	2.49 mm (0.098 in.)
	C7	2.51 mm (0.0988 in.)
	C8	2.53 mm (0.0996 in.)
	C9	2.55 mm (0.1004 in.)
	D0	2.57 mm (0.1012 in.)
	D1	2.59 mm (0.102 in.)
	D2	2.61 mm (0.1028 in.)
	D3	2.63 mm (0.1035 in.)
	D4	2.65 mm (0.1043 in.)
	D5	2.67 mm (0.1051 in.)
	D6	2.39 mm (0.0941 in.)
	D7	2.71 mm (0.1067 in.)
	D8	2.73 mm (0.1075 in.)
	D9	2.75 mm (0.1083 in.)

Driven pinion bearing washer thickness front side	A0	1.18 mm (0.0465 in.)
	A1	1.20 mm (0.0472 in.)
	A2	1.22 mm (0.048 in.)
	A3	1.24 mm (0.0488 in.)
	A4	1.26 mm (0.0496 in.)
	A5	1.28 mm (0.0504 in.)
	A6	1.30 mm (0.0512 in.)
	A7	1.32 mm (0.052 in.)
	A8	1.34 mm (0.0528 in.)
	A9	1.36 mm (0.535 in.)
	B0	1.38 mm (0.0543 in.)
	B1	1.40 mm (0.0551 in.)
	B2	1.42 mm (0.0559 in.)
	B3	1.44 mm (0.0567 in.)
	B4	1.46 mm (0.0575 in.)
	B5	1.48 mm (0.0583 in.)
	B6	1.50 mm (0.0591 in.)
	B7	1.52 mm (0.0598 in.)
	B8	1.54 mm (0.0606 in.)
	B9	1.56 mm (0.0614 in.)
	C0	1.58 mm (0.0622 in.)
	C1	1.60 mm (0.063 in.)
	C2	1.62 mm (0.0638 in.)
	C3	1.64 mm (0.0646 in.)
	C4	1.66 mm (0.0654 in.)
	C5	1.68 mm (0.0661 in.)
	C6	1.70 mm (0.067 in.)
	C7	1.72 mm (0.0677 in.)
	C8	1.74 mm (0.0685 in.)
	C9	1.76 mm (0.0693 in.)
	D0	1.78 mm (0.0701 in.)
	D1	1.80 mm (0.0709 in.)
	D2	1.82 mm (0.0717 in.)
	D3	1.84 mm (0.0724 in.)
	D4	1.86 mm (0.0732 in.)
	D5	1.88 mm (0.074 in.)
	D6	1.90 mm (0.0748 in.)
	D7	1.92 mm (0.0756 in.)
	D8	1.94 mm (0.0764 in.)
	D9	1.96 mm (0.0772 in.)
	E0	1.98 mm (0.0781 in.)
	E1	2.00 mm (0.0787 in.)
	E2	2.02 mm (0.0795 in.)

Washer thickness RH side	01	1.02 mm (0.0402 in.)
	02	1.04 mm (0.0409 in.)
	03	1.06 mm (0.0417 in.)
	04	1.08 mm (0.0425 in.)
	05	1.10 mm (0.0433 in.)
	06	1.12 mm (0.0441 in.)
	07	1.14 mm (0.0449 in.)
	08	1.16 mm (0.0457 in.)
	09	1.18 mm (0.0465 in.)
	10	1.20 mm (0.0472 in.)
	11	1.22 mm (0.0480 in.)
	12	1.24 mm (0.0488 in.)
	13	1.26 mm (0.0496 in.)
	14	1.28 mm (0.0504 in.)
	15	1.30 mm (0.0512 in.)
	16	1.32 mm (0.0520 in.)
	17	1.34 mm (0.0528 in.)
	18	1.36 mm (0.0535 in.)
	19	1.38 mm (0.0543 in.)
	20	1.40 mm (0.0551 in.)
	21	1.42 mm (0.0559 in.)
	22	1.44 mm (0.0567 in.)
	23	1.46 mm (0.0575 in.)
	24	1.48 mm (0.0583 in.)
	25	1.50 mm (0.0591 in.)
	26	1.52 mm (0.0598 in.)
	27	1.54 mm (0.0606 in.)
	28	1.56 mm (0.0614 in.)

PROPELLER SHAFT

SERVICE DATA

Propeller shaft

Propeller shaft runout	Maximum: 0.4 mm (0.02 in.)

Joint angle	Angle A	Angle A- B	Angle B-C
	w/ 3rd seat:-2°49'	1°35'	2°04'
	w/o 3rd seat: -3°01'		

Adjusting washer Thickness mm (in.)	2.0 (0.08) 4.5 (0.18) 6.5 (0.26) 9.0 (0.35) 11.0 (0.43)

TORQUE SPECIFICATIONS

Propeller shaft

Part Tightened	N*m	kgf*cm	ft.*lbf
Propeller shaft x Transaxle companion flange	35	357	26
Propeller shaft x Differential companion flange	35	357	26
Propeller shaft center bearing x Body	36.8	375	27

DRIVE SHAFT

SERVICE DATA

(2005/11-2006/01)

Drive shaft

Front drive shaft standard length for 2WD	LH	585.2 mm (23.039 in.)
	RH	902 mm (35.512 in.)
Front drive shaft standard length for 4WD	LH	572.5 mm (22.539 in.)
	RH	918 mm (36.142 in.)
Rear drive shaft standard length		733.8 mm (28.890 in.)

SERVICE DATA

(2006/01-)

Drive shaft

Front drive shaft standard length for 2WD	2AZ-FE	LH	585.2 mm (23.039 in.)
		RH	902 mm (35.512 in.)
	2GR-FE	LH	570.9 mm (22.476 in.)
		RH	914.4 mm (36.000 in.)
Front drive shaft standard length for 4WD	2AZ-FE	LH	572.5 mm (22.539 in.)
		RH	918 mm (36.142 in.)
	2GR-FE	LH	570.9 mm (22.476 in.)
		RH	922.4 mm (36.315 in.)
Rear drive shaft standard length			733.8 mm (28.890 in.)

DIFFERENTIAL

SERVICE DATA

Differential

Rear differential carrier oil seal drive in depth	7.0 +-0.5 mm (0.28 +-0.02 in.)
Rear differential side gear shaft oil seal drive in depth	7.2 +-0.5 mm (0.28 +-0.02 in.)
Differential ring gear backlash	0.09 to 0.16 mm (0.0034 to 0.0063 in.)
Companion flange runout	Maximum vertical runout: 0.06 mm (0.0023 in.) Maximum lateral runout: 0.07 mm (0.0028 in.)
Drive pinion preload (start torque)	New bearing: 1.31 to 2.18 N*m (13 to 22 kgf*cm, 12 to 19 in.*lbf) Reused bearing: 0.24 to 0.37 N*m (2 to 4 kgf*cm, 2 to 3 in.*lbf)
Total preload (Drive pinion preload plus)	New bearing: 1.18 to 1.90 N*m (12 to 19 kgf*cm, 10 to 17 in.*lbf) Reused bearing: 0.99 to 1.63 N*m (10 to 17 kgf*cm, 9 to 14 in.*lbf)
Side gear shaft plate washer thickness mm (in.)	1.59 to 1.61 (0.0625 to 0.0633) 1.62 to 1.64 (0.0637 to 0.0649) 1.65 to 1.67 (0.0650 to 0.0657) 1.68 to 1.70 (0.0661 to 0.0669) 1.71 to 1.73 (0.0673 to 0.0681) 1.74 to 1.76 (0.0685 to 0.0693) 1.77 to 1.79 (0.0697 to 0.0705) 1.80 to 1.82 (0.0709 to 0.0717) 1.83 to 1.85 (0.0720 to 0.0728) 1.86 to 1.88 (0.0732 to 0.0740) 1.89 to 1.91 (0.0744 to 0.0752) 1.92 to 1.94 (0.0756 to 0.0764) 1.95 to 1.97 (0.0768 to 0.0776) 1.98 to 2.00 (0.0780 to 0.0787) 2.02 to 2.04 (0.0795 to 0.0803) 2.04 to 2.06 (0.0803 to 0.0811) 2.07 to 2.09 (0.0815 to 0.0823) 2.10 to 2.12 (0.0827 to 0.0835) 2.13 to 2.15 (0.0839 to 0.0846) 2.16 to 2.18 (0.0850 to 0.0858) 2.19 to 2.21 (0.0862 to 0.0870) 2.22 to 2.24 (0.0874 to 0.0882) 2.25 to 2.27 (0.0886 to 0.0894) 2.28 to 2.30 (0.0898 to 0.0906) 2.31 to 2.33 (0.0909 to 0.0917) 2.34 to 2.36 (0.0921 to 0.0929) 2.37 to 2.39 (0.0930 to 0.0941) 2.40 to 2.42 (0.0945 to 0.0953) 2.43 to 2.45 (0.0957 to 0.0965) 2.46 to 2.48 (0.0969 to 0.0976) 2.49 to 2.51 (0.0980 to 0.0988) 2.52 to 2.54 (0.0992 to 0.1000) 2.55 to 2.57 (0.1004 to 0.1012) 2.58 to 2.60 (0.1016 to 0.1024) 2.61 to 2.63 (0.1028 to 0.1035) 2.64 to 2.66 (0.1039 to 0.1047)

Rear differential drive pinion washer thickness mm (in.)	1.695 to 1.705 (0.0667 to 0.0671) 1.705 to 1.715 (0.0671 to 0.0675) 1.715 to 1.725 (0.0675 to 0.0679) 1.725 to 1.735 (0.0679 to 0.0683) 1.735 to 1.745 (0.0683 to 0.0687) 1.745 to 1.755 (0.0687 to 0.0690) 1.755 to 1.765 (0.0690 to 0.0695) 1.765 to 1.775 (0.0695 to 0.0699) 1.775 to 1.785 (0.0699 to 0.0703) 1.785 to 1.795 (0.0703 to 0.0707) 1.795 to 1.805 (0.0707 to 0.0711) 1.805 to 1.815 (0.0711 to 0.0715) 1.815 to 1.825 (0.0715 to 0.0719) 1.825 to 1.835 (0.0719 to 0.0720) 1.835 to 1.845 (0.0720 to 0.0726) 1.845 to 1.855 (0.0726 to 0.0730) 1.855 to 1.865 (0.0730 to 0.0734) 1.865 to 1.875 (0.0734 to 0.0738) 1.875 to 1.885 (0.0738 to 0.0742) 1.885 to 1.895 (0.0742 to 0.0746) 1.895 to 1.905 (0.0746 to 0.0750) 1.905 to 1.915 (0.0750 to 0.0754) 1.915 to 1.925 (0.0754 to 0.0758) 1.925 to 1.935 (0.0758 to 0.0762) 1.935 to 1.945 (0.0762 to 0.0766) 1.945 to 1.955 (0.0766 to 0.0770) 1.955 to 1.965 (0.0770 to 0.0774) 1.965 to 1.975 (0.0774 to 0.0778) 1.975 to 1.985 (0.0778 to 0.0781) 1.985 to 1.995 (0.0781 to 0.0785) 1.995 to 2.005 (0.0785 to 0.0789) 2.005 to 2.015 (0.0789 to 0.0793) 2.015 to 2.025 (0.0793 to 0.0797) 2.025 to 2.035 (0.0797 to 0.0801) 2.035 to 2.045 (0.0801 to 0.0805) 2.045 to 2.055 (0.0805 to 0.0809) 2.055 to 2.065 (0.0809 to 0.0813) 2.065 to 2.075 (0.0813 to 0.0817) 2.075 to 2.085 (0.0817 to 0.0821) 2.085 to 2.095 (0.0821 to 0.0825) 2.095 to 2.105 (0.0825 to 0.0829) 2.105 to 2.115 (0.0829 to 0.0833) 2.115 to 2.125 (0.0833 to 0.0837) 2.125 to 2.135 (0.0837 to 0.0841) 2.135 to 2.145 (0.0841 to 0.0844) 2.145 to 2.155 (0.0844 to 0.0848) 2.155 to 2.165 (0.0848 to 0.0852) 2.165 to 2.175 (0.0852 to 0.0856) 2.175 to 2.185 (0.0856 to 0.0860) 2.185 to 2.195 (0.0860 to 0.0864) 2.195 to 2.205 (0.0864 to 0.0868)

SS

Difference of dimension A and B mm (in.): Transmission coupling shim thickness mm (in.)	3.96 to 4.01 (0.148 to 0.154): 1.98 to 2.02 (0.078 to 0.080) 4.26 to 4.31 (0.161 to 0.168): 2.28 to 2.32 (0.090 to 0.091) 4.56 to 4.61 (0.174 to 0.181): 2.58 to 2.62 (0.102 to 0.103) 3.81 to 3.86 (0.141 to 0.148): 1.83 to 1.87 (0.072 to 0.074) 4.11 to 4.16 (0.154 to 0.161): 2.13 to 2.17 (0.084 to 0.085) 4.41 to 4.46 (0.168 to 0.174): 2.43 to 2.47 (0.096 to 0.097) 3.71 to 3.76 (0.146 to 0.148): 1.73 to 1.77 (0.068 to 0.70) 3.76 to 3.81 (0.148 to 0.150): 1.78 to 1.82 (0.070 to 0.072) 3.86 to 3.91 (0.151 to 0.154): 1.88 to 1.92 (0.074 to 0.076) 3.91 to 3.96 (0.154 to 0.156): 1.93 to 1.97 (0.076 to 0.078) 4.01 to 4.06 (0.158 to 0.160): 2.03 to 2.07 (0.080 to 0.081) 4.06 to 4.11 (0.160 to 0.162): 2.08 to 2.12 (0.082 to 0.083) 4.16 to 4.21 (0.164 to 0.166): 2.18 to 2.22 (0.086 to 0.087) 4.21 to 4.26 (0.166 to 0.168): 2.23 to 2.27 (0.088 to 0.089) 4.31 to 4.36 (0.170 to 0.172): 2.33 to 2.37 (0.092 to 0.093) 4.36 to 4.41 (0.172 to 0.174): 2.38 to 2.42 (0.094 to 0.095) 4.46 to 4.51 (0.176 to 0.178): 2.48 to 2.52 (0.098 to 0.099) 4.51 to 4.56 (0.178 to 0.180): 2.53 to 2.57 (0.100 to 0.101) 4.61 to 4.66 (0.181 to 0.183): 2.63 to 2.67 (0.104 to 0.105) 4.66 to 4.71 (0.183 to 0.185): 2.68 to 2.72 (0.106 to 0.107)

AXLE

SERVICE DATA

Axle

Front axle hub backlash	Maximum: 0.05 mm (0.0020 in.)
Front axle hub deviation	Maximum: 0.05 mm (0.0020 in.)
Rear axle hub backlash	Maximum: 0.05 mm (0.0020 in.)
Rear axle hub deviation	Maximum for 2WD: 0.08 mm (0.0031 in.) Maximum for 4WD: 0.06 mm (0.0024 in.)

TORQUE SPECIFICATIONS

Axle

Part Tightened		N*m	kgf*cm	ft.*lbf
Front wheel		103	1,050	76
Rear wheel		103	1,050	76
Steering knuckle x Lower ball joint		133	1,356	98
Steering knuckle x Suspension Lower No. 1 arm		92	938	68
Steering knuckle x Front axle hub		96	976	71
Steering knuckle x Front disc brake cylinder		98	999	72
Steering knuckle x Front speed sensor bolt		8.5	87	75 in.*lbf
Front drive shaft x Front axle hub nut	ϕ26	216	2,203	159
	ϕ30	292	2,978	215
Front shock absorber x Steering knuckle		240	2,447	177
Rear drive shaft x Rear axle shaft nut	4WD	216	2,203	159
Rear shock absorber x Rear Axle carrier		80	816	59
Rear axle carrier x Rear disc brake cylinder		88	897	65
Rear axle carrier x Rear axle hub and bearing		90	918	66
Rear suspension member x Rear suspension No. 1 arm		90	918	66
Rear axle carrier x Rear suspension No. 1 arm		100	1,020	74
Rear axle carrier x Skid control sensor wire: for 2WD	Bolt	8.5	87	75
	Nut	5.0	51	44
Rear axle carrier x Rear speed sensor: for 4WD		8.5	87	75

SUSPENSION

SERVICE DATA

Front wheel alignment	Vehicle height		C-A: D-B:
	Tire size	215/70R16	89 mm (3.50 in.) 57 mm (2.24 in.)
		225/65R17 235/55R18	97 mm (3.82 in.) 65 mm (2.56 in.)
		225/65R17*	97 mm (3.82 in.) 54 mm (2.13 in.)
	Toe-in (total)	A + B: C - D:	0°05' +-10' (0.08°+-0.16°) 1.0 +-2.0 mm (0.04 +-0.08 in.)
	Wheel angle	Tire size: 215/70R16	Inside wheel: 38°55' (36°55' to 40°55') 38.9°(36.9° to 40.9°) Outside wheel: Reference 32°20' 32.3°
		Tire size: 225/65R17 235/55R18	Inside wheel: 35°50' (33°55' to 37°55') 35.8°(33.8° to 37.9°) Outside wheel: Reference 30°29' 30.5°
	Camber	Tire size: 215/70R16	-0°08' +-45' (-0.13°+-0.75°)
		Tire size: 225/65R17 235/55R18	-0°11' +-45' (-0.18°+-0.75°)
	Caster	Tire size: 215/70R16	5°43' +-45' (5.72°+-0.75°)
		Tire size: 225/65R17 235/55R18	5°50' +-45' (5.83°+-0.75°)
		Tire size: 225/65R17*	5°37' +-45' (5.62°+-0.75°)
	Steering axis inclination	Tire size: 215/70R16	11°16' +-30' (11.27°+-0.50°)
		Tire size: 225/65R17 235/55R18	11°26' +-30' (11.43°+-0.50°)
Rear wheel alignment	Toe-in (total)	A + B: C - D:	0°11' +-10' (0.18° +-0.17°) 2.3 +-1 mm (0.09 +-0.04 in.)
	Camber Right-left error	Tire size: 215/70R16	0°55' +-45' (-0.92 +-0.75°) 45' (0.75°) or less
		Tire size: 225/65R17 235/55R18	-1°04' +-45' (-1.07 +-0.75°) 45' (0.75°) or less
		Tire size: 225/65R17*	-0°52' +-45' (-0.87 +-0.75°) 45' (0.75°) or less
Front suspension	Lower ball joint turning torque		0.98 to 3.43 N*m (10 to 35 kgf*cm, 9 to 30 in.*lbf) or less
	Stabilizer link turning torque		0.05 to 1.96 N*m, (0.5 to 20 kgf*cm, 0.4 to 17 in.*lbf) or less
Rear suspension	No. 1 suspension arm turning torque		3.4 N*m (35 kgf*cm, 30 in.*lbf)
	Stabilizer link turning torque		0.05 to 1.96 N*m, (0.5 to 20 kgf*cm, 0.4 to 17 in.*lbf) or less

*: w/ 3rd seat.

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Front shock absorber nut x Piston rod	47	479	35
Front shock absorber with coil spring x Body	50	510	37
Front shock absorber x Stabilizer link	74	755	55
Front shock absorber x Steering knuckle	240	2,447	177
Front shock absorber x Front speed sensor wire	18.5	189	14
Hood bolt	13	133	10
Tie rod end x Steering knuckle	49	500	36
Front suspension crossmember x Lower No. 1 arm	233	2,376	172
Front suspension member brace rear (front side) x Body	145	1,479	107
Front suspension member brace rear (rear side) x Body	93	948	69
Front suspension lower No. 1 arm x Lower ball joint	92	938	68
Rear engine mounting insulator x Front suspension crossmember	95	969	70
Steering knuckle x Lower ball joint	133	1,356	98
Front axle hub nut	216	2,203	159
Front brake cylinder x steering knuckle	98	999	72
Front suspension crossmember x Front suspension member brace front	87	887	64
No. 2 parking brake cable x Trailing arm	6.0	61	53 in.*lbf
Skid control sensor wire (for nut)	5.0	51	44
Skid control sensor wire (for bolt)	8.5	87	75 in.*lbf
Rear speed sensor x Rear axle carrier	8.5	87	75 in.*lbf
Rear suspension No. 2 arm x Rear stabilizer link	30	306	22
Rear stabilizer bar x Rear stabilizer link	74	755	55
Rear suspension member x Rear suspension No. 2 arm	90	918	66
Rear axle carrier x Rear suspension No. 2 arm	90	918	66
Rear shock absorber x Rear suspension member	80	816	59
Bracket x Rear axle carrier	80	816	59
Rear upper control arm x Rear suspension member	90	918	66
Rear upper control arm x Rear axle carrier	90	918	66
Rear suspension No. 1 arm x Rear axle carrier	100	1,020	74
Rear suspension No. 1 arm x Rear suspension member	90	918	66

Part Tightened	N*m	kgf*cm	ft.*lbf
Rear stabilizer bracket x Rear suspension member	60	612	44
Rear trailing arm x Body (front side)	150	1,530	111
Rear trailing arm x Body (Rear side)	200	2,039	148

TIRE AND WHEEL

SERVICE DATA

Cold tire inflation pressure	Tire size: 215/70R16 99H	Front, Rear	220kPa (2.2 kgf/cm^2, 32 psi)
	Tire size: 225/65R17 101H	Front, Rear	220kPa (2.2 kgf/cm^2, 32 psi)
	Tire size: 235/55R18 99H	Front, Rear	220kPa (2.2 kgf/cm^2, 32 psi)

Tire runout	1.0 mm (0.039 in.) or less
Imbalance after adjustment	8.0 g (0.018 lb) or less

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft*lbf
Tire pressure warning antenna and receiver set bolt	7.5	76	66 in.*ibf
Tire pressure warning valve sub-assembly set nut	4.0	41	35 in.*ibf
Tire pressure warning ECU set bolt	4.5	46	40 in.*ibf

BRAKE CONTROL

SERVICE DATA

Brake pedal load sensing switch BC-216	Resistance 1 - 2	Brake pedal depressed	Approx. 1 kΩ
		Brake pedal released	Approx. 213 Ω
Downhill assist control switch BC-218	Resistance 1 - 4	Switch pushed in	Bellow 25 Ω
		Switch released	10 kΩ or higher
Traction control switch (Auto LSD switch) BC-220	Resistance 3 - 6	Switch pushed in	Bellow 25 Ω
		Switch released	10 kΩ or higher

TORQUE SPECIFICATIONS

ABS and Traction Actuator

Part tightened	N*m	kgf*cm	ft.*lbf
ABS and traction actuator x Brake actuator bracket	5.4	55	48 in.*lbf
ABS and traction actuator with bracket x Body	19	194	14
ABS and traction actuator x Brake tube (without SST)	15.2	155	11
ABS and traction actuator x Brake tube (with SST)	14	144	10

Front Speed Sensor

Part tightened	N*m	kgf*cm	ft.*lbf
Front speed sensor body x Knuckle	8.5	87	75 in.*lbf
Front speed sensor clamp/ Flexible hose clamp x Flexible hose bracket	18.5	189	14
Front speed sensor clamp x Side member	8.5	87	75 in.*lbf

Skid Control Sensor (for 2WD)

Part tightened	N*m	kgf*cm	ft.*lbf
Skid control sensor clamp bolt	8.5	87	75 in.*lbf
Skid control sensor clamp nut	5.0	51	44 in.*lbf

Rear Speed Sensor (for 4WD)

Part tightened	N*m	kgf*cm	ft.*lbf
Rear speed sensor body x Carrier	8.5	87	75 in.*lbf
Rear speed sensor clamp bolt	8.5	87	75 in.*lbf
Rear speed sensor clamp nut	5.0	51	44 in.*lbf

Yaw Rate Sensor

Part tightened	N*m	kgf*cm	ft.*lbf
Yaw rate sensor assembly x Body	14.5	148	11
Yaw rate sensor bracket x Body	14.5	148	11

BRAKE CONTROL

SERVICE DATA

Brake pedal load sensing switch BC-216	Resistance 1 - 2	Brake pedal depressed	Approx. 1 kΩ
		Brake pedal released	Approx. 213 Ω
Downhill assist control switch BC-218	Resistance 1 - 4	Switch pushed in	Bellow 25 Ω
		Switch released	10 kΩ or higher
Traction control switch (Auto LSD switch) BC-220	Resistance 3 - 6	Switch pushed in	Bellow 25 Ω
		Switch released	10 kΩ or higher

TORQUE SPECIFICATIONS

ABS and Traction Actuator

Part tightened	N*m	kgf*cm	ft.*lbf
ABS and traction actuator x Brake actuator bracket	5.4	55	48 in.*lbf
ABS and traction actuator with bracket x Body	19	194	14
ABS and traction actuator x Brake tube (without SST)	15.2	155	11
ABS and traction actuator x Brake tube (with SST)	14	144	10

Front Speed Sensor

Part tightened	N*m	kgf*cm	ft.*lbf
Front speed sensor body x Knuckle	8.5	87	75 in.*lbf
Front speed sensor clamp/ Flexible hose clamp x Flexible hose bracket	18.5	189	14
Front speed sensor clamp x Side member	8.5	87	75 in.*lbf

Skid Control Sensor (for 2WD)

Part tightened	N*m	kgf*cm	ft.*lbf
Skid control sensor clamp bolt	8.5	87	75 in.*lbf
Skid control sensor clamp nut	5.0	51	44 in.*lbf

Rear Speed Sensor (for 4WD)

Part tightened	N*m	kgf*cm	ft.*lbf
Rear speed sensor body x Carrier	8.5	87	75 in.*lbf
Rear speed sensor clamp bolt	8.5	87	75 in.*lbf
Rear speed sensor clamp nut	5.0	51	44 in.*lbf

Yaw Rate Sensor

Part tightened	N*m	kgf*cm	ft.*lbf
Yaw rate sensor assembly x Body	14.5	148	11
Yaw rate sensor bracket x Body	14.5	148	11

BRAKE

SERVICE DATA

(2005/11-2006/01)

Stop Light Switch

Stop light switch BR-13	Resistance 1 - 2	Switch pin released	Below 1 Ω
	Resistance 1 - 2	Switch pin pushed in	10 kΩ or higher

Brake Pedal Load Sensing Switch

Brake pedal load sensing switch BC-216	Resistance 1 - 2	Brake pedal depressed	Approx. 1 kΩ
	Resistance 1 - 2	Brake pedal released	Approx. 213 Ω

SS

Brake Pedal

Brake pedal height from dash panel BR-13	184.2 to 194.2 mm (7.252 to 7.646 in.)
Stop light switch clearance BR-13	1.5 to 2.5 mm (0.059 to 0.098 in.)
Brake pedal free play BR-14	1.0 to 6.0 mm (0.039 to 0.236 in.)
Brake pedal reserve distance from dash panel BR-14	See the table below.

Brake Pedal Reserve Distance from Dash Panel

Engine	Seat Type	Specified Condition
2AZ-FE	w/o 3rd seat	More than 95 mm (3.74 in.)
	w/ 3rd seat	More than 120 mm (4.72 in.)

Brake Fluid Level Warning Switch

Brake fluid level warning switch BR-20	Resistance 1 - 2	Float up (Switch OFF)	10 kΩ or higher
	Resistance 1 - 2	Float down (Switch ON)	Below 1 Ω

Brake Booster

Booster push rod and pin head (SST) clearance BR-24	-0.21 to 0 mm (-0.0083 to 0 in.)

Front Brake

Pad lining thickness BR-42		Standard	12.0 mm (0.472 in.)
		Minimum	1.0 mm (0.039 in.)
Disc thickness BR-43	15-inch disc	Standard	25.0 mm (0.984 in.)
		Minimum	22.0 mm (0.866 in.)
	16-inch disc	Standard	28.0 mm (1.102 in.)
		Minimum	25.0 mm (0.984 in.)
Disc runout BR-43		Maximum	0.05 mm (0.0020 in.)

Rear Brake

Pad lining thickness BR-57	Standard	10.5 mm (0.413 in.)
	Minimum	1.0 mm (0.039 in.)
Disc thickness BR-58	Standard	12.0 mm (0.472 in.)
	Minimum	10.5 mm (0.413 in.)
Disc runout BR-58	Maximum	0.15 mm (0.0059 in.)

SERVICE DATA

(2006/01-)

Stop Light Switch

Stop light switch BR-13	Resistance 1 - 2	Switch pin released	Below 1 Ω
	Resistance 1 - 2	Switch pin pushed in	10 kΩ or higher

Brake Pedal Load Sensing Switch

Brake pedal load sensing switch BC-216	Resistance 1 - 2	Brake pedal depressed	Approx. 1 kΩ
	Resistance 1 - 2	Brake pedal released	Approx. 213 Ω

SS

Brake Pedal

Brake pedal height from dash panel BR-15	184.2 to 194.2 mm (7.252 to 7.646 in.)
Stop light switch clearance BR-15	1.5 to 2.5 mm (0.059 to 0.098 in.)
Brake pedal free play BR-15	1.0 to 6.0 mm (0.039 to 0.236 in.)
Brake pedal reserve distance from dash panel BR-16	See the table below.

Brake Pedal Reserve Distance from Dash Panel

Engine	Specified Condition
2AZ-FE (w/o 3rd seat)	More than 95 mm (3.74 in.)
2AZ-FE (w/ 3rd seat)	More than 120 mm (4.72 in.)
2GR-FE	More than 120 mm (4.72 in.)

Brake Fluid Level Warning Switch

Brake fluid level warning switch BR-20	Resistance 1 - 2	Float up (Switch OFF)	10 kΩ or higher
	Resistance 1 - 2	Float down (Switch ON)	Below 1 Ω

Brake Booster

Booster push rod and pin head (SST) clearance BR-24	-0.21 to 0 mm (-0.0083 to 0 in.)

Front Brake

Pad lining thickness BR-42		Standard	12.0 mm (0.472 in.)
		Minimum	1.0 mm (0.039 in.)
Disc thickness BR-43	15-inch disc	Standard	25.0 mm (0.984 in.)
		Minimum	22.0 mm (0.866 in.)
	16-inch disc	Standard	28.0 mm (1.102 in.)
		Minimum	25.0 mm (0.984 in.)
Disc runout BR-43		Maximum	0.05 mm (0.0020 in.)

Rear Brake

Pad lining thickness BR-57	Standard	10.5 mm (0.413 in.)
	Minimum	1.0 mm (0.039 in.)
Disc thickness BR-58	Standard	12.0 mm (0.472 in.)
	Minimum	10.5 mm (0.413 in.)
Disc runout BR-58	Maximum	0.15 mm (0.0059 in.)

PARKING BRAKE

SERVICE DATA

Parking brake lever travel PB-2	Pull the lever upward with a force of approximately 200 N (20 kgf, 44 lbf) and count the number of clicks.		7 to 9 clicks (without rear brake dragging)
Parking brake switch PB-4	Resistance 1 - Body ground	Parking brake switch ON (Switch pin released)	Below 1 Ω
	Resistance 1 - Body ground	Parking brake switch OFF (Switch pin pushed in))	10 kΩ or higher
Brake disc inside diameter PB-14		Standard	172 mm (6.77 in.)
		Maximum	173 mm (6.81 in.)
Parking brake shoe lining thickness PB-14		Standard	3.5 mm (0.138 in.)
		Minimum	1.0 mm (0.039 in.)
Parking brake shoe clearance adjustment PB-17	Standard shoe adjuster return notch		8 notches

TORQUE SPECIFICATIONS

Parking Brake Lever

Part tightened	N*m	kgf*cm	ft.*lbf
Parking brake switch mounting screw	0.88	9.0	7.8 in.*lbf
Parking brake lever x Body	14.5	148	11
No. 1 parking brake cable lock nut	6.0	61	53 in.*lbf

Parking Brake Cable

Part tightened	N*m	kgf*cm	ft.*lbf
Parking brake cable x Backing plate	8.0	82	71 in.*lbf
Parking brake cable clamp bolt	6.0	61	53 in.*lbf

PARKING BRAKE

SERVICE DATA

Parking brake lever travel PB-2	Pull the lever upward with a force of approximately 200 N (20 kgf, 44 lbf) and count the number of clicks.		7 to 9 clicks (without rear brake dragging)
Parking brake switch PB-4	Resistance 1 - Body ground	Parking brake switch ON (Switch pin released)	Below 1 Ω
	Resistance 1 - Body ground	Parking brake switch OFF (Switch pin pushed in))	10 kΩ or higher
Brake disc inside diameter PB-14		Standard	172 mm (6.77 in.)
		Maximum	173 mm (6.81 in.)
Parking brake shoe lining thickness PB-14		Standard	3.5 mm (0.138 in.)
		Minimum	1.0 mm (0.039 in.)
Parking brake shoe clearance adjustment PB-17	Standard shoe adjuster return notch		8 notches

TORQUE SPECIFICATIONS

Parking Brake Lever

Part tightened	N*m	kgf*cm	ft.*lbf
Parking brake switch mounting screw	0.88	9.0	7.8 in.*lbf
Parking brake lever x Body	14.5	148	11
No. 1 parking brake cable lock nut	6.0	61	53 in.*lbf

Parking Brake Cable

Part tightened	N*m	kgf*cm	ft.*lbf
Parking brake cable x Backing plate	8.0	82	71 in.*lbf
Parking brake cable clamp bolt	6.0	61	53 in.*lbf

STEERING COLUMN

SERVICE DATA

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

TORQUE SPECIFICATIONS

Part tightened	N*m	kgf*cm	ft.*lbf
Steering wheel assembly x Steering column assembly	50	510	37
Steering sliding yoke sub-assembly x Steering gear assembly	35	360	26
Steering intermediate shaft assembly No. 2 x Steering column assembly	35	360	26
Steering column x Instrument panel reinforcement assembly	25	255	18

POWER STEERING

SERVICE DATA

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

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Steering sliding yoke sub-assembly x Steering intermediate shaft assembly No, 2	35	360	26
Steering intermediate shaft assembly No, 2 x Power steering gear	35	360	26
Power steering gear x Front suspension crossmember sub-assembly	138	1407	102
Power steering ECU x Instrument panel reinforcement assembly	5.0	51	44 in.*lbf

AIR CONDITIONING

SERVICE DATA

Refrigerant charge volume	Standard: 430 +- 30 g (15.2 +- 1.1 oz.)

TORQUE SPECIFICATIONS

REFRIGERANT LINE

Part Tightened	N*m	kgf*cm	ft.*lbf
Discharge hose sub-assembly x Cooler compressor assembly	9.8	100	7
Suction hose sub-assembly x Cooler compressor assembly	9.8	100	7
Discharge hose sub-assembly x Cooler condenser assembly	9.8	100	7
Suction hose sub-assembly x Cooler condenser assembly	9.8	100	7
Suction tube sub-assembly x Suction hose sub-assembly	9.8	100	7
Plate x Body	9.8	100	7

AIR CONDITIONING UNIT

Part Tightened	N*m	kgf*cm	ft.*lbf
Instrument panel reinforcement assembly x Body	20	204	15
No. 2 instrument panel brace sub-assembly x Instrument panel reinforcement	9.8	100	7
No. 2 instrument panel brace sub-assembly x Body	9.8	100	7
Air conditioning unit assembly x Instrument panel reinforcement	9.8	100	7
Air conditioning unit assembly x Body	9.8	100	7
Cooler expansion valve x No. 1cooler evaporator sub-assembly	3.5	35	30 in.*lbf

COMPRESSOR AND PULLEY

Part Tightened	N*m	kgf*cm	ft.*lbf
No. 1 cooler refrigerant suction hose x Cooler compressor assembly	9.8	100	7
No. 1 cooler refrigerant discharge hose x Cooler compressor assembly	9.8	100	7
Cooler compressor assembly x Engine	24.5	250	18

CONDENSER

Part Tightened	N*m	kgf*cm	ft.*lbf
No. 1 cooler refrigerant discharge hose x Cooler condenser assembly	9.8	100	7
Cooler refrigerant liquid pipe x Cooler condenser assembly	9.8	100	7
Cap x Cooler condenser assembly	5.4	55	48 in.*lbf
No. 2 fan shroud x Cooler condenser	10.5	107	8
Upper radiator support bracket x Upper radiator support	45	459	33

SUPPLEMENTAL RESTRAINT SYSTEM

TORQUE SPECIFICATIONS

Part tightened	N*m	kgf*cm	ft.*lbf
Steering pad assembly x Steering wheel assembly	8.8	90	78 in.*lbf
Steering wheel assembly x Steering column assembly	50	510	37
Front passenger airbag x Instrument panel reinforcement	20	203	14
Curtain shield airbag assembly x Body	14	143	10
Center airbag sensor assembly x Body	17.5	179	13
Front airbag sensor x Body	9.0	92	80 in.*lbf
Side airbag sensor x Body	9.0	92	80 in.*lbf
Rear airbag sensor x Body	9.0	92	80 in.*lbf

SEAT BELT

TORQUE SPECIFICATIONS

FRONT SEAT BELT

Part Tightened	N*m	kgf*cm	ft.*lbf
Front seat inner belt assembly x Front seat	42	428	31
Front shoulder belt anchor adjuster assembly x Body	42	428	31
Front seat outer belt assembly (Upper part of retractor) x Body	5.0	51	44 in.*lbf
Front seat outer belt assembly (shoulder anchor) x Body	42	428	31
Front seat outer belt assembly (floor anchor) x Body	42	428	31

REAR SEAT BELT

Part Tightened	N*m	kgf*cm	ft.*lbf
Rear NO. 2 Seat Inner Belt Assembly x Seat	42	428	31
Rear Seat Inner Belt Assembly RH (for 60/40 split Seat Type RH Side) x Seat	42	428	31
Rear Seat Inner Belt Assembly LH (for 60/40 split Seat Type LH Side) x Seat	42	428	31
Rear Seat Lap Type Belt Assembly Center LH x Seat	42	428	31
Rear Seat Lap Type Belt Assembly Center RH (w/o Rear No. 2 Seat) x Seat	42	428	31
Rear Seat Lap Type Belt Assembly Center RH (w/ Rear No. 2 Seat) x Seat	42	428	31
Rear NO. 1 seat outer belt assembly (Upper part of retractor) x Body	8.5	87	75
Rear NO. 1 seat outer belt assembly (Lower part of retractor) x Body	42	428	31 in.*lbf
Rear NO. 1 seat outer belt assembly (shoulder anchor) x Body	42	428	31
Rear NO. 1 seat outer belt assembly (floor anchor) x Body	42	428	31
Rear NO. 2 seat outer belt assembly (Upper part of retractor) (w/ Rear No. 2 Seat) x Body	8.5	87	75
Rear NO. 2 seat outer belt assembly (Lower part of retractor) (w/ Rear No. 2 Seat) x Body	42	428	31 in.*lbf
Rear NO. 2 seat outer belt assembly (shoulder anchor) (w/ Rear No. 2 Seat) x Body	42	428	31
Rear NO. 2 seat outer belt assembly (floor anchor) (w/ Rear No. 2 Seat) x Body	42	428	31

Part Tightened	N*m	kgf*cm	ft.*lbf
Rear center seat outer belt assembly x Body	42	428	31
Child restraint seat tether anchor bracket x Body	42	428	31

SEAT BELT

TORQUE SPECIFICATIONS

FRONT SEAT BELT

Part Tightened	N*m	kgf*cm	ft.*lbf
Front seat inner belt assembly x Front seat	42	428	31
Front shoulder belt anchor adjuster assembly x Body	42	428	31
Front seat outer belt assembly (Upper part of retractor) x Body	5.0	51	44 in.*lbf
Front seat outer belt assembly (shoulder anchor) x Body	42	428	31
Front seat outer belt assembly (floor anchor) x Body	42	428	31

REAR SEAT BELT

Part Tightened	N*m	kgf*cm	ft.*lbf
Rear NO. 2 Seat Inner Belt Assembly x Seat	42	428	31
Rear Seat Inner Belt Assembly RH (for 60/40 split Seat Type RH Side) x Seat	42	428	31
Rear Seat Inner Belt Assembly LH (for 60/40 split Seat Type LH Side) x Seat	42	428	31
Rear Seat Lap Type Belt Assembly Center LH x Seat	42	428	31
Rear Seat Lap Type Belt Assembly Center RH (w/o Rear No. 2 Seat) x Seat	42	428	31
Rear Seat Lap Type Belt Assembly Center RH (w/ Rear No. 2 Seat) x Seat	42	428	31
Rear NO. 1 seat outer belt assembly (Upper part of retractor) x Body	8.5	87	75
Rear NO. 1 seat outer belt assembly (Lower part of retractor) x Body	42	428	31 in.*lbf
Rear NO. 1 seat outer belt assembly (shoulder anchor) x Body	42	428	31
Rear NO. 1 seat outer belt assembly (floor anchor) x Body	42	428	31
Rear NO. 2 seat outer belt assembly (Upper part of retractor) (w/ Rear No. 2 Seat) x Body	8.5	87	75
Rear NO. 2 seat outer belt assembly (Lower part of retractor) (w/ Rear No. 2 Seat) x Body	42	428	31 in.*lbf
Rear NO. 2 seat outer belt assembly (shoulder anchor) (w/ Rear No. 2 Seat) x Body	42	428	31
Rear NO. 2 seat outer belt assembly (floor anchor) (w/ Rear No. 2 Seat) x Body	42	428	31

Part Tightened	N*m	kgf*cm	ft.*lbf
Rear center seat outer belt assembly x Body	42	428	31
Child restraint seat tether anchor bracket x Body	42	428	31

CRUISE CONTROL

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Cruise control main switch assembly x Steering wheel assembly	1.7 to 3.0	17.34 to 30.60	15.04 to 26.55 in.*lbf

WIPER AND WASHER

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft* lbf
Wiper motor x Wiper link	5.4	55	48 in* lbf
Wiper link x Body	5.5	56	49 in* lbf
Wiper arm x Wiper link	21	214	23
Rear wiper motor x Body	5.5	56	49 in* lbf
Rear wiper motor x Rare wiper arm	5.5	56	49 in* lbf

HORN

TORQUE SPECIFICATIONS

HORN

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

MIRROR

TORQUE SPECIFICATIONS

MIRROR

Part Tightened	N*m	kgf*cm	ft.*lbf
Inner rear view mirror assembly (w/EC Mirror) x Body	1.8	18	16 in.*lbf
Outer rear view mirror assembly x Door panel	9.0	92	80 in.*lbf

SEAT

TORQUE SPECIFICATIONS

Front Seat Assembly (for Manual Seat)

Part Tightened	N*m	kgf*cm	ft.*lbf
Airbag sensor x Seat adjuster frame	8.0	82	71 in.*lbf
Seatback cover bracket x Seat frame with adjuster (w/ front seat side airbag)	5.5	56	49 in.*lbf
Inner belt x Seat adjuster frame	42	428	31
Front seat x Body	37	377	27

Front Seat Assembly (for Power Seat)

Part Tightened	N*m	kgf*cm	ft.*lbf
Airbag sensor x Seat adjuster frame	8.0	82	71 in.*lbf
Seatback cover bracket x Seat frame with adjuster (w/ front seat side airbag)	5.5	56	49 in.*lbf
Inner belt x Seat adjuster frame	42	428	31
Front seat x Body	37	377	27

Rear No. 1 Seat Assembly (for LH Side)

Part Tightened	N*m	kgf*cm	ft.*lbf
Reclining remote control lever x Body	18	184	13
lap type belt center RH x Body	42	428	31
Inner belt x Reclining adjuster	42	428	31
Rear seat cushion frame x Seatback frame	21	214	15
Rear seat cushion frame x Reclining adjuster	21	214	15
Center armrest x Seatback frame	32	326	24
Rear No. 1 seat armrest x Seatback frame	32	326	24
Seatback frame x Reclining adjuster	42	428	31
Lap type belt center LH x Seatback frame	42	428	31
Rear No. 1 seat x Body	42	428	31

Rear No. 1 Seat Assembly (for RH Side)

Part Tightened	N*m	kgf*cm	ft.*lbf
Reclining remote control lever x Body	18	184	13
Inner belt x Reclining adjuster	42	428	31
Rear seat cushion frame x Seatback frame	21	214	15
Rear seat cushion frame x Reclining adjuster	21	214	15
Seatback frame x Reclining adjuster	42	428	31
Rear No. 1 seat x Body	42	428	31

Rear No. 2 Seat Assembly

Part Tightened	N*m	kgf*cm	ft.*lbf
Rear No. 2 seat link x Body	18	184	13
Rear No. 2 seat x Rear No. 2 seat link	18	184	13
Rear seat cushion wire x Rear No. 2 seat link	18	184	13
Rear seat cushion wire x Rear No. 2 seat cushion spring	18	184	13
Inner belt x Rear No. 2 seat cushion spring	42	428	31
Rear No. 2 seatback frame x Rear No. 2 seat cushion spring	42	428	31

EXTERIOR

TORQUE SPECIFICATIONS

Front Bumper

Part tightened	N*m	kgf*cm	ft.*lbf
Front bumper reinforcement x Body	70	713	51
Front bumper side retainer x Body	6.0	61	53 in.*lbf

Rear Bumper

Part tightened	N*m	kgf*cm	ft.*lbf
Rear bumper reinforcement x Body	37	377	27

Rear Spoiler

Part tightened	N*m	kgf*cm	ft.*lbf
Rear spoiler x Body	7.5	76	66 in.*lbf

Roof Rack

Part tightened	N*m	kgf*cm	ft.*lbf
Roof rack bar x Roof rack bar joint	1.96 to 2.94	20 to 30	17 to 26 in.*lbf
Roof rack leg x Body	38	387	28
Roof rack x Roof rack leg	2.8 to 5.0	29 to 51	25 to 43 in.*lbf

SLIDING ROOF

TORQUE SPECIFICATIONS

SLIDING ROOF HOUSING

Part Tightened		N*m	kgf*cm	ft.*lbf
Sliding roof glass X Sliding roof housing		5.5	56	49 in.*lbf
Sliding roof drive gear X Sliding roof housing		5.4	55	48 in.*lbf
Sliding roof housing X Bracket		5.5	56	49 in.*lbf
Sliding roof housing X Body	for Bolt	8.0	82	71 in.*lbf
	for Nut	5.5	56	49 in.*lbf