
SERVICE SPECIFICATIONS

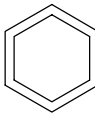
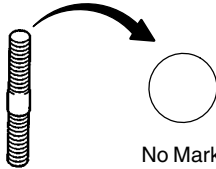
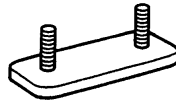
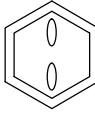
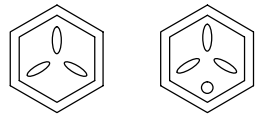
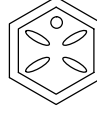
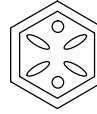
STANDARD BOLT	SS-1
AUTOMATIC TRANSAXLE	SS-4



STANDARD BOLT

HOW TO DETERMINE BOLT STRENGTH

SS02S-01

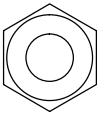
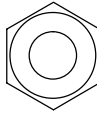
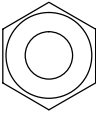
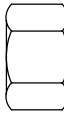
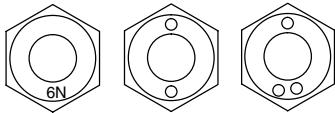
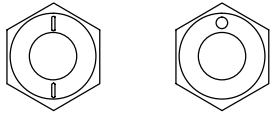
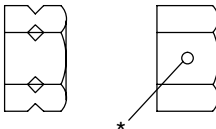
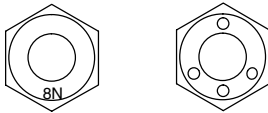
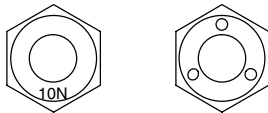
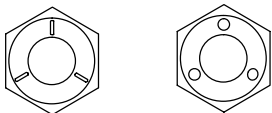
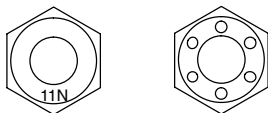
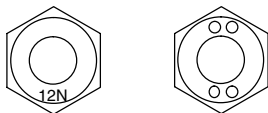
Bolt Type				Class
Hexagon Head Bolt		Stud Bolt	Weld Bolt	
Normal Recess Bolt	Deep Recess Bolt			
 No Mark	 No Mark	 No Mark		4T
 No Mark	 No Mark			5T
 w/ Washer	 w/ Washer			6T
 No Mark	 No Mark			7T
 No Mark	 No Mark	 		8T
 No Mark	 No Mark			9T
 No Mark	  No Mark			10T
 No Mark	  No Mark			11T

B06431

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

HOW TO DETERMINE NUT STRENGTH

Nut Type			Class
Present Standard Hexagon Nut	Old Standard Hexagon Nut		
	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

*: Nut with 1 or more marks on one side surface of the nut.

B06432

HINT:

Use the nut with the same number of the nut strength classification or the greater than the bolt strength classification number when tightening parts with a bolt and nut.

Example: Bolt = 4T

Nut = 4N or more

U140F AX (RM848E)

AUTOMATIC TRANSAXLE

SERVICE DATA

SS0YR-03

Oil pump		
Body clearance	STD	0.07 – 0.15 mm (0.0028 – 0.0059 in.)
	Max.	0.17 mm (0.0066 in.)
Tip clearance	STD	0.11 – 0.14 mm (0.0043 – 0.0055 in.)
	Max.	0.30 mm (0.0118 in.)
Side clearance	STD	0.02 – 0.04 mm (0.0008 – 0.0016 in.)
	Max.	0.05 mm (0.0020 in.)
Pump body bushing inside diameter	STD	38.12 – 38.13 mm (1.5008 – 1.5012 in.)
	Max.	38.18 mm (1.5031 in.)
Stator shaft bushing inside diameter	STD	21.50 – 21.52 mm (0.8465 – 0.8472 in.)
	Max.	21.57 mm (0.8492 in.)
Direct clutch		
Piston stroke		0.605 – 0.825 mm (0.02382 – 0.03248 in.)
Piston return spring free length		22.58 mm (0.8890 in.)
Flange thickness	Mark	
	1	3.0 mm (0.118 in.)
	2	3.1 mm (0.122 in.)
	3	3.2 mm (0.126 in.)
	4	3.3 mm (0.130 in.)
	5	3.4 mm (0.134 in.)
	6	3.5 mm (0.138 in.)
Forward clutch		
Piston stroke		2.09 – 2.33 mm (0.0823 – 0.0917 in.)
Piston return spring free length		28.23 mm (1.1114 in.)
Multiple disc clutch hub bushing inside diameter	STD	23.03 – 23.04 mm (0.9067 – 0.9071 in.)
	Max.	23.09 mm (0.9091 in.)
Flange thickness	Mark	
	1	3.00 mm (0.1181 in.)
	2	3.15 mm (0.1240 in.)
	3	3.30 mm (0.1299 in.)
	4	3.45 mm (0.1358 in.)
	5	3.60 mm (0.1417 in.)
2nd brake		
Piston stroke		0.65 – 0.75 mm (0.0256 – 0.0295 in.)
Piston return spring free length		16.61 mm (0.6539 in.)
Flange thickness	Mark	
	1	3.0 mm (0.118 in.)
	2	3.1 mm (0.122 in.)
	3	3.2 mm (0.126 in.)
	4	3.3 mm (0.130 in.)
	5	3.4 mm (0.134 in.)
	6	3.5 mm (0.138 in.)
	7	3.6 mm (0.142 in.)
Input shaft		
End play		0.27 – 1.24 mm (0.0106 – 0.0417 in.)
U/D clutch		
Piston stroke		1.51 – 1.77 mm (0.0594 – 0.0697 in.)

SERVICE SPECIFICATIONS – AUTOMATIC TRANSAXLE

U/D clutch drum bushing inside diameter		37.06 – 37.08 mm (1.4591 – 1.4598 in.) 37.13 mm (1.4618 in.)	
	STD Max.		
Piston return spring free length		17.14 mm (0.6748 in.)	
Flange thickness		3.0 mm (0.118 in.) 3.2 mm (0.126 in.) 3.4 mm (0.134 in.)	
	Mark 1 2 3		
U/D brake			
Piston stroke		1.81 – 2.07 mm (0.0713 – 0.0815 in.)	
Piston return spring free length		13.24 mm (0.521 in.)	
Flange thickness		3.0 mm (0.118 in.) 3.2 mm (0.126 in.) 3.4 mm (0.134 in.)	
	Mark 1 2 3		
1st & reverse brake			
Piston stroke		1.10 – 1.24 mm (0.0433 – 0.0488 in.)	
Piston return spring free length		17.61 mm (0.6933 in.)	
Flange thickness		1.8 mm (0.071 in.) 1.9 mm (0.075 in.) 2.0 mm (0.079 in.) 2.1 mm (0.083 in.) 2.2 mm (0.087 in.) 2.3 mm (0.091 in.) 2.4 mm (0.094 in.) 2.5 mm (0.098 in.)	
	Mark 1 2 3 4 5 6 7 8		
Valve body spring			
Spring (Color)		Free length	Coil outer diameter Total No. of coils
Upper valve body			
Rock-up relay valve (None)		29.25 mm (1.1516 in.)	9.7 mm (0.382 in.) 10.50
Rock-up control valve (Green)		23.95 mm (0.9429 in.)	5.4 mm (0.213 in.) 14.94
Secondary regulator valve (Blue)		58.35 mm (2.2972 in.)	8.7 mm (0.343 in.) 20.58
C-2 lock valve (Yellow)		33.65 mm (1.3248 in.)	7.4 mm (0.291 in.) 11.82
Solenoid modulator valve (Red)		62.40 mm (2.4567 in.)	9.8 mm (0.386 in.) 22.31
B-3 orifice control valve (Grey)		62.65 mm (2.4665 in.)	7.8 mm (0.307 in.) 19.60
B-1 lock valve (White)		37.40 mm (1.4724 in.)	9.8 mm (0.386 in.) 8.84
Clutch apply control valve (Purple)		40.25 mm (1.5846 in.)	9.0 mm (0.354 in.) 13.00
C-2 exhaust check valve (Orange)		40.25 mm (1.5846 in.)	7.4 mm (0.291 in.) 17.10

Lower valve body			
3-4 shift valve (None)	29.25 mm (1.1516 in.)	9.7 mm (0.382 in.)	10.5
B-1 control valve (Green)	48.55 mm (1.9114 in.)	9.8 mm (0.386 in.)	13.43
B-2 control valve (Pink)	57.05 mm (2.2461 in.)	9.8 mm (0.386 in.)	15.34
Primary regulator valve (Orange)	57.55 mm (2.2657 in.)	19.9 mm (0.783 in.)	7.87
C-2 control valve (Brown)	34.20 mm (1.3465 in.)	9.9 mm (0.390 in.)	8.79

Valve body key			
Key	Height	Width	Thickness
Upper valve body			
Lock-up relay valve	10.0 mm (0.394 in.)	5.0 mm (0.197 in.)	3.2 mm (0.126 in.)
Lock-up control valve	10.0 mm (0.394 in.)	5.0 mm (0.197 in.)	3.2 mm (0.126 in.)
Secondary regulator valve	8.0 mm (0.315 in.)	5.0 mm (0.197 in.)	3.2 mm (0.126 in.)
C-2 lock valve	10.0 mm (0.394 in.)	5.0 mm (0.197 in.)	3.2 mm (0.126 in.)
Solenoid modulator valve	8.0 mm (0.315 in.)	5.0 mm (0.197 in.)	3.2 mm (0.126 in.)
B-3 orifice control valve	18.5 mm (0.728 in.)	–	2.3 mm (0.091 in.)
B-1 lock valve	8.0 mm (0.315 in.)	5.0 mm (0.197 in.)	3.2 mm (0.126 in.)
C-2 exhaust check valve	8.0 mm (0.315 in.)	5.0 mm (0.197 in.)	3.2 mm (0.126 in.)
3-way check valve	8.0 mm (0.315 in.)	5.0 mm (0.197 in.)	3.2 mm (0.126 in.)
Lower valve body			
3-4 shift valve	25.5 mm (1.004 in.)	–	2.3 mm (0.091 in.)
B-1 control valve	14.5 mm (0.571 in.)	5.0 mm (0.197 in.)	3.2 mm (0.126 in.)
B-2 control valve	14.5 mm (0.571 in.)	5.0 mm (0.197 in.)	3.2 mm (0.126 in.)
C-2 control valve	14.5 mm (0.571 in.)	5.0 mm (0.197 in.)	3.2 mm (0.126 in.)

Accumulator			
Spring		Free length/Outer diameter	Color
B ₃	Inner	60.24 mm (2.3716 in.) / 15.9 mm (0.626 in.)	Green
	Outer	72.61 mm (2.8587 in.) / 16.7 mm (0.626 in.)	Blue
C ₃		86.66 mm (3.4118 in.) / 19.2 mm (0.756 in.)	Yellow
C ₁		90.53 mm (3.5642 in.) / 18.5 mm (0.728 in.)	Red
C ₂	Inner	47.58 mm (1.8732 in.) / 11.2 mm (0.441 in.)	Brown
	Outer	47.61 mm (1.8744 in.) / 12.0 mm (0.472 in.)	Brown
B ₁	Inner	43.88 mm (1.7276 in.) / 11.0 mm (0.433 in.)	Purple
	Outer	45.12 mm (1.7764 in.) / 11.8 mm (0.465 in.)	White

Transfer	
Drive pinion preload (at starting) (For use with SST)	
New bearing	1.0 – 1.5 N·m (10 – 15 kgf·cm, 8.7 – 13.0 in.-lbf)
Reused bearing	0.9 – 1.3 N·m (9 – 13 kgf·cm, 7.8 – 11.3 in.-lbf)
Drive pinion total preload (at starting) (For use with SST)	
(Drive pinion preload plus)	
New bearing	0.2 – 0.3 N·m (2 – 3 kgf·cm, 1.7 – 2.6 in.-lbf)
Reused bearing	0.1 – 0.3 N·m (1 – 3 kgf·cm, 0.9 – 2.6 in.-lbf)
Ring gear backlash	0.10 – 0.15 mm (0.0039 – 0.0059 in.)

SERVICE SPECIFICATIONS – AUTOMATIC TRANSAXLE

Ring gear runout		0.1 mm (0.004 in.)
Center differential control coupling runout		0.07 mm (0.0028 in.)
Backlash adjust washer thickness	Mark	
	AA	2.07 mm (0.0815 in.)
	AB	2.10 mm (0.0827 in.)
	AC	2.13 mm (0.0839 in.)
	BA	2.16 mm (0.0850 in.)
	BB	2.19 mm (0.0862 in.)
	BC	2.22 mm (0.0874 in.)
	CA	2.25 mm (0.0886 in.)
	CB	2.28 mm (0.0898 in.)
	CC	2.31 mm (0.0909 in.)
	DA	2.34 mm (0.0921 in.)
	DB	2.37 mm (0.0933 in.)
	DC	2.40 mm (0.0945 in.)
	EA	2.43 mm (0.0957 in.)
	EB	2.46 mm (0.0969 in.)
	EC	2.49 mm (0.0980 in.)
	FA	2.52 mm (0.0992 in.)
	FB	2.55 mm (0.1004 in.)
	FC	2.58 mm (0.1016 in.)
	GA	2.61 mm (0.1028 in.)
	GB	2.64 mm (0.1039 in.)
	GC	2.67 mm (0.1051 in.)
	HA	2.70 mm (0.1063 in.)
	HB	2.73 mm (0.1075 in.)
	HC	2.76 mm (0.1087 in.)
	JA	2.79 mm (0.1098 in.)
	JB	2.82 mm (0.1110 in.)
	JC	2.85 mm (0.1122 in.)
	KA	2.88 mm (0.1134 in.)
	KB	2.91 mm (0.1146 in.)
	KC	2.94 mm (0.1157 in.)
	LA	2.97 mm (0.1169 in.)
	LB	3.00 mm (0.1181 in.)

Tooth contact adjust washer thickness	Mark	
	AA	1.20 mm (0.0472 in.)
	AB	1.21 mm (0.0476 in.)
	AC	1.22 mm (0.0480 in.)
	BA	1.23 mm (0.0484 in.)
	BB	1.24 mm (0.0488 in.)
	BC	1.25 mm (0.0492 in.)
	CA	1.26 mm (0.0496 in.)
	CB	1.27 mm (0.0500 in.)
	CC	1.28 mm (0.0504 in.)
	DA	1.29 mm (0.0508 in.)
	DB	1.30 mm (0.0512 in.)
	DC	1.31 mm (0.0516 in.)
	EA	1.32 mm (0.0520 in.)
	EB	1.33 mm (0.0524 in.)
	EC	1.34 mm (0.0528 in.)
	FA	1.35 mm (0.0531 in.)
	FB	1.36 mm (0.0535 in.)
	FC	1.37 mm (0.0539 in.)
	GA	1.38 mm (0.0543 in.)
	GB	1.39 mm (0.0547 in.)
	GC	1.40 mm (0.0551 in.)
	HA	1.41 mm (0.0555 in.)
	HB	1.42 mm (0.0559 in.)
	HC	1.43 mm (0.0563 in.)
	JA	1.44 mm (0.0567 in.)
	JB	1.45 mm (0.0571 in.)
	JC	1.46 mm (0.0575 in.)
	KA	1.47 mm (0.0579 in.)
	KB	1.48 mm (0.0583 in.)
	KC	1.49 mm (0.0587 in.)
	LA	1.50 mm (0.0591 in.)
	LB	1.51 mm (0.0594 in.)
	LC	1.52 mm (0.0598 in.)
	MA	1.53 mm (0.0602 in.)
	MB	1.54 mm (0.0606 in.)
	MC	1.55 mm (0.0610 in.)
	NA	1.56 mm (0.0614 in.)
	NB	1.57 mm (0.0618 in.)
	NC	1.58 mm (0.0622 in.)
	PA	1.59 mm (0.0626 in.)
	PB	1.60 mm (0.0630 in.)
	PC	1.61 mm (0.0634 in.)
	QA	1.62 mm (0.0638 in.)
	QB	1.63 mm (0.0642 in.)
	QC	1.64 mm (0.0646 in.)
	RA	1.65 mm (0.0650 in.)

SERVICE SPECIFICATIONS – AUTOMATIC TRANSAXLE

Preload adjust washer thickness	Mark	
	AA	1.47 mm (0.0579 in.)
	AB	1.50 mm (0.0591 in.)
	AC	1.53 mm (0.0602 in.)
	BA	1.56 mm (0.0614 in.)
	BB	1.59 mm (0.0626 in.)
	BC	1.62 mm (0.0638 in.)
	CA	1.65 mm (0.0650 in.)
	CB	1.68 mm (0.0661 in.)
	CC	1.71 mm (0.0673 in.)
	DA	1.74 mm (0.0685 in.)
	DB	1.77 mm (0.0697 in.)
	DC	1.80 mm (0.0709 in.)
	EA	1.83 mm (0.0720 in.)
	EB	1.86 mm (0.0732 in.)
	EC	1.89 mm (0.0744 in.)
	FA	1.92 mm (0.0756 in.)
	FB	1.95 mm (0.0768 in.)
	FC	1.98 mm (0.0780 in.)
	GA	2.01 mm (0.0791 in.)
	GB	2.04 mm (0.0803 in.)
	GC	2.07 mm (0.0815 in.)
	HA	2.10 mm (0.0827 in.)
	HB	2.13 mm (0.0839 in.)
	HC	2.16 mm (0.0850 in.)
	JA	2.19 mm (0.0862 in.)
	JB	2.22 mm (0.0874 in.)
	JC	2.25 mm (0.0886 in.)
	KA	2.28 mm (0.0898 in.)
	KB	2.31 mm (0.0909 in.)
	KC	2.34 mm (0.0921 in.)
	LA	2.37 mm (0.0933 in.)
	LB	2.40 mm (0.0945 in.)
	LC	2.43 mm (0.0957 in.)
	MA	2.46 mm (0.0969 in.)
	MB	2.49 mm (0.0980 in.)
	MC	2.52 mm (0.0992 in.)
	NA	2.55 mm (0.1004 in.)
	NB	2.58 mm (0.1016 in.)

Differential case		
Front differential side gear backlash		0.05 – 0.20 mm (0.0020 – 0.0079 in.)
Front differential side gear thrust washer thickness	Mark	
	A	0.95 mm (0.0374 in.)
	B	1.00 mm (0.0394 in.)
	C	1.05 mm (0.0413 in.)
	D	1.10 mm (0.0433 in.)
	E	1.15 mm (0.0453 in.)
	F	1.20 mm (0.0472 in.)
	G	1.25 mm (0.0492 in.)
	H	1.30 mm (0.0511 in.)
	J	1.35 mm (0.0531 in.)
	K	1.40 mm (0.0551 in.)
Center differential side gear backlash		0.05 – 0.20 mm (0.0020 – 0.0079 in.)

Center differential side gear thrust washer No.1 thickness	Mark	
	0	0.80 mm (0.0315 in.)
	1	0.85 mm (0.0335 in.)
	2	0.90 mm (0.0354 in.)
	3	0.95 mm (0.0374 in.)
	4	1.00 mm (0.0394 in.)
	5	1.05 mm (0.0413 in.)
	6	1.10 mm (0.0433 in.)
	7	1.15 mm (0.0453 in.)
	8	1.20 mm (0.0472 in.)
	9	1.25 mm (0.0492 in.)
	A	1.30 mm (0.0512 in.)
	B	1.35 mm (0.0531 in.)
	C	1.40 mm (0.0551 in.)
Center differential side gear thrust washer No.2 thickness	Mark	
	MA	0.80 mm (0.0315 in.)
	MB	0.85 mm (0.0335 in.)
	MC	0.90 mm (0.0354 in.)
	MD	0.95 mm (0.0374 in.)
	ME	1.00 mm (0.0394 in.)
	MF	1.05 mm (0.0413 in.)
	MG	1.10 mm (0.0433 in.)
	MH	1.15 mm (0.0453 in.)
	MJ	1.20 mm (0.0472 in.)
	MK	1.25 mm (0.0492 in.)
	MM	1.30 mm (0.0512 in.)
	MN	1.35 mm (0.0531 in.)
	ML	1.40 mm (0.0551 in.)
Preload (at starting)		
New bearing		0.8 – 1.3 N·m (8.0 – 13.4 kgf·cm, 7.1 – 11.5 in.-lbf)
Reused bearing		0.4 – 0.6 N·m (4.1 – 6.7 kgf·cm, 3.5 – 5.3 in.-lbf)
Plate washer thickness	Mark	
	0	2.00 mm (0.0787 in.)
	1	2.05 mm (0.0807 in.)
	2	2.10 mm (0.0827 in.)
	3	2.15 mm (0.0846 in.)
	4	2.20 mm (0.0866 in.)
	5	2.25 mm (0.0886 in.)
	6	2.30 mm (0.0906 in.)
	7	2.35 mm (0.0925 in.)
	8	2.40 mm (0.0945 in.)
	9	2.45 mm (0.0965 in.)
	A	2.50 mm (0.0984 in.)
	B	2.55 mm (0.1004 in.)
	C	2.60 mm (0.1024 in.)
	D	2.65 mm (0.1043 in.)
	E	2.70 mm (0.1063 in.)
	F	2.75 mm (0.1083 in.)
	G	2.80 mm (0.1102 in.)
	H	2.85 mm (0.1122 in.)

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
Separator x Transaxle housing	9.8	100	7
Apply pipe clamp x Transaxle housing	9.8	100	7
Apply pipe clamp x Transaxle case	5.4	55	48 in.·lbf
Transaxle rear cover x Transaxle case	Bolt A: 18.65 Other bolt: 24.5	190 250	14 18
Parking pawl shaft clamp x Transaxle case	9.8	100	7
Oil pump x Transaxle case	22	226	16
Transaxle housing x Transaxle case	Bolt A: 22 Bolt B and C: 29	225 300	16 22
Parking bracket x Transaxle case	20	205	15
Detent spring x Transaxle case	10.3	105	8
Valve body x Transaxle case	10.8	110	8
Oil strainer x Valve body	11	110	8
Transaxle solenoid wire x Transaxle case	5.4	55	48 in.·lbf
ATF temperature sensor clamp x Valve body	6.6	67	58 in.·lbf
Oil pan x Transaxle case	7.8	80	69 in.·lbf
Counter gear speed sensor x Transaxle case	11.3	115	8
Input turbin speed sensor x Transaxle case	11.3	115	8
Union	24.5	250	18
Elbow	27	276	20
Park/neutral start switch	Bolt: 5.4 Nut: 6.9	55 70	48 in.·lbf 61 in.·lbf
Control shaft lever x Manual valve lever shaft	12.7	130	9
Transfer x Transaxle	69	700	51
Counter drive gear lock nut	280	2855	207
U/D output shaft lock nut	262 (280)	2,672 (2,855)	194 (207)
Differential ring gear x Differential case	95.1	970	70
Center differential control coupling x Ring gear	77.5	791	57
Bearing retainer RH x Transfer case	28	286	21
Drive pinion lock nut	295 (333)	3,010 (3,400)	218 (246)
Case cover No.1 x Transfer case	19.6	200	14
Extension housing x Transfer case	25.5	260	19
Drain plug	47	480	35
Solenoid valve x Valve body	10.8	110	8
Upper valve body x Cover	10.8	110	8