

AUTOMATIC TRANSMISSION

Specifications

Engine stall revolution		1,950 ± 150 rpm	
Engine idle speed	N range	650 rpm	
Time day	N range → D range	Less than 0.7 seconds	
	N range → R range	Less than 1.2 seconds	
Line pressure (wheel locked)			
Engine idling	D range	3.7 – 4.3 kg/cm ²	53 – 61 psi 363 – 422 kPa
	R range	4.5 – 5.5 kg/cm ²	64 – 78 psi 441 – 539 kPa
At stall	D range	11.1 – 13.6 kg/cm ²	158 – 193 psi 1,089 – 1,334 kPa
	R range	14.0 – 17.0 kg/cm ²	199 – 242 psi 1,373 – 1,667 kPa
Governor pressure			
Output shaft rpm	(Vehicle speed reference)		
1,000	(approx. 32 km/h, 20 mph)	0.8 – 1.2 kg/cm ²	11 – 17 psi 78 – 118 kPa
1,800	(approx. 57 km/h, 35 mph)	1.9 – 2.3 kg/cm ²	27 – 33 psi 186 – 226 kPa
3,500	(approx. 111 km/h, 69 mph)	5.7 – 6.3 kg/cm ²	81 – 90 psi 559 – 618 kPa
Throttle cable adjustment			
Throttle valve fully closed		Between boot end face and inner cable stopper	
		0.5 – 1.5 mm	0.020 – 0.059 in.
Torque converter installation		16.5 mm or more	0.650 in. or more
Torque converter runout	Limit	0.30 mm	0.0118 in.
Drive plate runout	Limit	0.20 mm	0.0079 in.
A/T fluid temperature sensor			
Resistance	at 25°C (77°F)	3.38 kΩ	
	at 120°C (248°F)	0.55 kΩ	

Shift point schedule km/h (mph)	0 range (throttle valve fully open)						i (fully closed)		2 range	L range
	1 → 2	2 → 3	3 → O/D	O/D → 3	3 → 2	2 → 1	Lock-up ON	Lock-up OFF	3 → 2	2 → 1
	28–41 (17–25)	72–85 (45–53)	109–122 (68–76)	101–114 (63–71)	63–75 (39–47)	23–36 (14–22)	77–90 (48–56)	73–86 (45–53)	80–92 (50–57)	32–45 (2–28)

Oil pump	Body clearance	STD	0.07 – 0.15 mm	0.0028 – 0.0059 in.
		Limit	0.3 mm	0.012 in.
	Tip clearance	STD	0.14 – 0.24 mm	0.0055 – 0.0094 in.
		Limit	0.3 mm	0.012 in.
	Side clearance	STD	0.02 – 0.05 mm	0.0008 – 0.0020 in.
		Limit	0.1 mm	0.004 in.
	Drive and driven gear thickness		18.435 – 18.450 mm	0.7258 – 0.7264 in.
	Pump body bushing inside diameter		18.451 – 18.486 mm	0.7264 – 0.7278 in.
		STD	42.050 – 42.075 mm	1.6555 – 1.6565 in.
		Limit	42.13 mm	1.6587 in.
		Front	24.000 mm	24.021 in.
		Rear	26.500 – 26.521 mm	1.0433 – 1.0441 in.
		Front	24.07 mm	0.9476 in.
		Rear	26.57 mm	1.0461 in.

Specifications (Cont'd)

Oil pump (Cont'd)	Pump cover bushing inside diameter STD Limit Front Rear	24.000 mm	24.021 in.
		26.500 – 26.521 mm	1.0433 – 1.0441 in.
		24.07 mm	0.9476 in.
		26.57 mm	1.0461 in.
O / D planetary gear and O/D direct clutch	O/D input shaft (O/D planetary gear) thrust clearance	STD Limit	0.40 – 0.90 mm 0.0157 – 0.0354 in.
	O/D input shaft thrust bearing race thickness	Limit	0.90 mm 0.0354 in.
			0.8 mm 0.031 in.
			1.0 mm 0.039 in.
			1.4 mm 0.055 in.
	Piston stroke		1.10 – 1.70 mm 0.0433 – 0.0669 in.
	O/D direct clutch drum bushing inside diameter	STD Limit	26.500 – 26.521 mm 1.0433 – 1.0441 in.
	O/D planetary gear bushing inside diameter	STD Limit	26.57 mm 1.0461 in.
	Planetary pinion gear thrust clearance	STD Limit	12.000 – 12.018 mm 0.4752 in.
			12.07 mm 0.0079 – 0.0232 in.
			0.20 – 0.59 mm 0.315 in.
			0.80 mm
O / D brake	Piston stroke		1.25 – 1.85 mm 0.0492 – 0.0728 in.
	O/D case bushing inside diameter	STD	33.100 – 33.150 mm 1.3031 – 1.3051 in.
		Limit	33.20 mm 1.3071 in.
Front clutch	Input shaft (forward clutch hub) thrust clearance	STD	0.30 – 0.70 mm 0.0118 – 0.0276 in.
		Limit	0.70 mm 0.0276 in.
	Input shaft spacer thickness		0.9 mm 0.035 in.
			1.2 mm 0.047 in.
			1.5 mm 0.059 in.
			1.8 mm 0.071 in.
			2.1 mm 0.083 in.
			3.93 – 4.23 mm 0.1547 – 0.1665 in.
	Piston stroke		1.8 mm 0.071 in.
	Front clutch plate thickness		2.0 mm 0.079 in.
			2.2 mm 0.087 in.
			2.4 mm 0.094 in.
Rear clutch	Piston stroke		1.70 – 1.90 mm 0.0669 – 0.748 in.
	Rear clutch flange thickness		5.0 mm 0.197 in.
			5.2 mm 0.205 in.
			5.4 mm 0.213 in.
			5.6 mm 0.220 in.
Second brake	Center support thrust clearance	STD	0.30 – 0.70 mm 0.0118 – 0.0276 in.
		Limit	0.90 mm
	Center support thrust washer thickness		1.8 mm 0.071 in.
			2.1 mm 0.083 in.
			2.4 mm 0.094 in.
			2.6 mm 0.102 in.
	Piston stroke		1.60 – 1.80 mm 0.0630 – 0.0709 in.

Specifications (Cont'd)

Second brake (Cont'd)	Center support bushing inside diameter	STD	35.000 – 35.025 mm	1.3780 – 1.3789 in.	
	Front planetary sun gear bushing inside diameter	Limit	35.08 mm	1.3811 in.	
	Second brake flange thickness	STD	24.000 – 24.021 mm	0.9449 – 0.9457 in.	
		Limit	24.07 mm	0.9476 in.	
			5.0 mm	0.197 in.	
			5.2 mm	0.205 in.	
			5.4 mm	0.213 in.	
		5.6 mm	0.220 in.		
Planetary gears and output shaft	Output shaft bushing inside diameter	STD	17.000 – 17.018 mm	0.6693 – 0.6700 in.	
	Planetary pinion gear thrust clearance	Limit	17.07 mm	0.6720 in.	
		STD	0.20 – 0.50 mm	0.0079 – 0.0197 in.	
		Limit	0.75 mm	0.0295 in.	
1 st and reverse brake	Piston stroke		1.5 – 3.0 mm	0.059 – 0.118 in.	
	1 st and reverse brake flange thickness		6.65 mm	0.2618 in.	
			7.05 mm	0.2776 in.	
			7.45 mm	0.2933 in.	
Transmission case	Bushing inside diameter	STD	64.000 – 64.050 mm	2.5197 – 2.5216 in.	
		Limit	64.10 mm	2.5236 in.	
Valve body spring	Spring	Free length mm (in.)	Coil outer diameter mm (in.)	Total No. of coils	Color
	(Front upper valve body)				
	Check ball	13.0 (0.512)	8.4 (0.331)	8.0	None
	Primary throttle valve	25.3 (0.996)	9.2 (0.362)	9.5	White
	Primary down–shift plug	26.9 (1.059)	9.0 (0.354)	10.5	Blue
	Secondary regulator valve	46.0 (1.811)	13.3 (0.524)	15.0	None
	Secondary throttle valve	25.3 (0.996)	9.2 (0.362)	9.5	White
	Secondary down–shift plug	32.6 (1.283)	9.7 (0.382)	13.0	White
	Throttle valve sleeve	10.8 (0.425)	18.2 (0.717)	4.0	None
	(Rear upper valve body)				
	2–3 shift valve	43.3 (1.705)	8.9 (0.350)	22.0	Brown
	2–3 shift timing valve	39.2 (1.543)	9.2 (0.362)	18.0	Pink
	3–4 shift valve	38.3 (1.508)	9.7 (0.382)	17.0	None
	Detent regulator valve	30.4 (1.197)	7.4 (0.291)	16.0	White
	Lock–up signal valve	53.4 (2.102)	13.7 (0.539)	16.0	Green
	O/D clutch exhaust valve	33.3 (1.311)	8.2 (0.323)	14.0	Yellow
	Intermediate modulator valve	22.5 (0.886)	7.7 (0.303)	12.0	Pink
	(Lower valve body)				
	Check valve	27.7 (1.091)	8.2 (0.323)	13.0	None
	Check ball	13.0 (0.512)	8.4 (0.331)	8.0	None
	1–2 shift valve	26.6 (1.047)	6.9 (0.272)	16.0	None
	3–2 kick–down orifice control valve	32.5 (1.280)	8.3 (0.327)	14.0	Blue
	2nd lock valve	29.4 (1.158)	8.3 (0.327)	14.0	Brown

Specifications (Cont'd)

Valve body spring (Cont'd)	Spring	Free Length mm (in.)	Coil outer diameter mm (in.)	Total No. of coils	Color
	Lock-up relay valve	32.4 (1.278)	9.3 (0.366)	15.0	Pink
	Primary regulator valve	58.2 (2.291)	20.9 (0.823)	11.0	None
	Accumulator control valve	25.1 (0.988)	12.5 (0.492)	8.5	Red
	Low coast modulator valve	30.0 (1.181)	7.3 (0.287)	16.0	Yellow
	1-2 relay valve	22.9 (0.902)	5.2 (0.205)	15	None
Accumulator spring	B0	64.1 (2.524)	21.1 (0.831)	13.0	None
	B2	65.0 (2.559)	25.1 (0.988)	8.5	Yellow
	C1	92.3 (3.634)	17.9 (0.708)	20.0	None
	C2	87.3 (3.437)	21.8 (0.858)	15.0	Red

Torque Specifications

Part tightened		kg-cm	ft-lb	N-m
Engine x Transmission	14 mm head bolt	380	27	37
	17 mm head bolt	730	53	72
Torque converter x Drive plate		290	21	28
Frame crossmember set bolt		400	29	39
Frame crossmember set nut		600	43	59
Oil cooler pipe union nut		350	25	34
Exhaust front pipe x Exhaust manifold		630	46	62
Exhaust front pipe x Exhaust tail pipe		400	29	39
Propeller shaft x Transfer		900	65	88
Propeller shaft x Differential		900	65	88
Oil pump cover x Oil pump body		900	65	88
	10 mm head bolt	90	78 in.-lb	8.8
	12 mm head bolt	210	15	21
Lower valve body cover x Lower valve body		55	48 in.-lb	5.4
Front upper valve body x Lower valve body		55	48 in.-lb	5.4
Rear upper valve body x Lower valve body		55	48 in.-lb	5.4
Manual detent spring x Lower valve body		55	48 in.-lb	5.4
Parking lock pawl x Transfer adaptor		195	14	19
Transmission rear cover x Transmission case		80	69 in.-lb	7.8
Front accumulator cover x Transmission case		80	69 in.-lb	7.8
Governor cover x Governor valve body support		100	7	10
Transfer adaptor x Transmission case		380	27	37
Center support set bolt		250	18	25
O/D case set bolt		250	18	25
Oil pump x Transmission case		210	16	21
Valve body x Transmission case oil strainer x Valve body		100	7	10
	8 mm head bolt	55	48 in.-lb	5.4
	10 mm head bolt	100	7	10
Lock-up relay valve body plate x Valve body		55	48 in.-lb	5.4
	10 mm head bolt	100	7	10

Torque Specifications (Cont'd)

Part tightened	kg-cm	ft-lb	N·m
Oil pan x Transmission case	70	61 in.-lb	6.9
Transmission housing x Transmission case	650	47	64
A/T fluid temperature sensor x Transmission case	350	25	34
Oil cooler union x Transmission case	300	22	29
Neutral start switch x Transmission case	130	9	13
Neutral start switch x Manual valve shaft	70	61 in.-lb	6.9
Oil cooler pipe x Oil cooler union	350	25	34
Control shaft x Transmission case	130	9	13

TRANSFER Specifications

Idler gear thrust clearance	STD	0.275 – 0.625 mm	0.0110 – 0.0246 in.
	Limit	0.625 mm	0.0246 in.
High and low gear thrust clearance	STD	0.10 – 0.25 mm	0.0039 – 0.0098 in.
	Limit	0.25 mm	0.0098 in.
Rear output shaft			
High gear journal diameter	Limit	40.009 mm	1.5752 in.
Low gear journal diameter	Limit	40.009 mm	1.5752 in.
Runout	Limit	0.03 mm	0.0012 in.
High and low gear oil clearance	STD	0.019 – 0.068 mm	0.0007 – 0.0027 in.
	Limit	0.068 mm	0.0027 in.
Shift fork to hub sleeve clearance	Limit	1.0 mm	0.039 in.
Rear output shaft snap ring thickness	Mark		
	11	2.30 – 2.35 mm	0.0906 – 0.0925 in.
	17	2.60 – 2.65 mm	0.1024 – 0.1043 in.
Idler gear thrust washer thickness	STD	1.95 – 2.05 mm	0.077 – 0.081 in.
	Limit	1.65 mm	0.065 in.
Speedometer driven gear			
Oil seal drive in depth		20 mm	0.787 in.
Diaphragm push rod stroke		21 mm	0.82 in.
Clearance between transfer adapter and front case		0.4 – 0.5 mm	0.016 – 0.020 in.
Transfer front case adjusting shim thickness		2.28 – 2.32 mm	0.0898 – 0.0913 in.
		2.38 – 2.42 mm	0.0937 – 0.0952 in.
		2.48 – 2.52 mm	0.0976 – 0.0992 in.
Rear output shaft preload			
New bearing		15 – 24.7 kg-cm	13.0 – 21.4 in.-lb 1.5 – 2.4 N·m
Reused bearing		7 – 12 kg-cm	6.1 – 10.4 in.-lb 0.7 – 1.2 N·m
Rear output shaft preload adjusting shim	Mark		
	0	0.15 mm	0.0059 in.
	4	0.4 mm	0.016 in.
	5	0.5 mm	0.020 in.
	6	0.6 mm	0.024 in.
	7	0.7 mm	0.028 in.
	8	0.8 mm	0.031 in.
	9	0.9 mm	0.035 in.