

Specifications

Lubricants, Fluids, Sealers and Adhesives

	Specifications
Motorcraft® MERCON® ULV Automatic Transmission Fluid / XT-12-QULV	MERCON® ULV / WSS-M2C949-A

Capacities

NOTE: The transmission fluid amount listed is for a completely dry transmission and torque converter. When draining the transmission fluid from the transmission for maintenance or repairs, the fluid fill amounts will vary.

	Liters
Transmission fluid (Gas Engines)	18.2 qt (17.2 L)
Transmission fluid (Diesel Engines)	18.1 qt (17.1 L)

General Specification

NOTICE: Transmission fluids are not interchangeable. The use of any other fluid or cleaning agents will cause internal transmission damage.

Item	Specification
Transmission fluid	Transmission fluid should be checked with the vehicle on a level surface and at normal operating temperature. (Normal operating temperature 90°C (195°F) to 101°C (215°F)).
Fluid Filter	Internal to the transmission

General Specification

Transmission Average Weight	Specification
RWD vehicles	346.6 lb (157.2 kg)
Four-Wheel Drive (4WD) vehicles	339.3 lb (153.9 kg)

Clutch Application Chart

Gear	A Clutch (1, 2, 3, 4, 5, 6, M1, M2, R)	B Clutch (2, 8, 9, 10, M1, M2, R)	C Clutch (2, 3, 4, 5, 7, 9, 10, M2)	D Clutch (2, 3, 4, 6, 7, 8, 10, M2, R)	E Clutch (1, 3, 5, 6, 7, 8, 9, M1)	F Clutch (4, 5, 6, 7, 8, 9, 10, R)	Low - OWC
Park	H	H	-	H	-	-	-
Reverse	H	H	-	D	-	D	-
Neutral	H	H	-	H	-	-	-
1st Gear D	H	-	-	-a	D	-	H
2nd Gear D	H	-	D	D	-	-	H
3rd Gear D	H	-	D	D	D	-	O/R
4th Gear D	H	-	D	D	-	D	O/R
5th Gear D	H	-	D	-	D	D	O/R
6th Gear D	H	-	-	D	D	D	O/R
7th Gear D	-	-	D	D	D	D	O/R
8th Gear D	-	H	-	D	D	D	-
9th Gear D	-	H	D	-	D	D	-
10th Gear D	-	H	D	D	-	D	-
1st Gear Manual	H	H	-	-a	D	-	H
2nd Gear Manual	H	H	D	D	-	-	H
Planetary Component	Ring Gear No. 1	Sun Gear No. 1 and Sun Gear No. 2	Ring Gear No. 2 and Sun Gear No. 3	Planetary No. 3	Ring Gear No. 3 and Sun Gear No. 4	Ring Gear No. 4 and Planetary No. 1	Sun Gear No. 1 and Sun Gear No. 2 in CW direction

- H = Holding
- D = Driven
- O/R = Overrunning
- Applied to reduce frictional losses from a released clutch, but does not contribute to powerflow.

Solenoid Operation Chart

Selector Lever Position	Commanded Gear	SSA (1, 2, 3, 4, 5, 6, M1, M2, R)	SSB (2, 8, 9, 10, M1, M2, R)	SSC (2, 3, 4, 5, 7, 9, 10, M2)	SSD (2, 3, 4, 6, 7, 8, 10, M2, R)	SSE (1, 3, 5, 6, 7, 8, 9, M1)	SSF (4, 5, 6, 7, 8, 9, 10, R)	TCC Solenoid
P	P	On	On	Off	On	Off	Off	Off
R	R	On	On	Off	On	Off	On	Off
N	N	On	On	Off	On	Off	Off	Off
D	1	On	Off	Off	On ^a	On	Off	Off
	2	On	Off	On	On	Off	Off	On/Off
	3	On	Off	On	On	On	Off	On/Off
	4	On	Off	On	On	Off	On	On/Off
	5	On	Off	On	Off	On	On	On/Off
	6	On	Off	Off	On	On	On	On/Off

	7	Off	Off	On	On	On	On	On/Off
	8	Off	On	Off	On	On	On	On/Off
	9	Off	On	On	Off	On	On	On/Off
	10	Off	On	On	On	Off	On	On/Off
M1	1	On	On	Off	On ^a	On	Off	Off
M2	2	On	On	On	On	Off	Off	Off

- On to reduce frictional losses from a released clutch, but does not contribute to powerflow.

Clutch Plate Quantity - Gas Engines

Clutch	Number of Friction Plates	Number of Steel Plates	Number of Separating Springs	Number of Apply Plates	Number of Pressure Plates
A clutch (1, 2, 3, 4, 5, 6, M1, M2, R)	4	3	4	1	1
B clutch (2, 8, 9, 10, M1, M2, R)	5	4	5	1	1
C clutch (2, 3, 4, 5, 7, 9, 10, M2)	5	5	-	-	1
D clutch (2, 3, 4, 6, 7, 8, 10, M2, R)	5	5	-	-	1
E clutch (1, 3, 5, 6, 7, 8, 9, M1)	4	3	-	1	1
F clutch (4, 5, 6, 7, 8, 9, 10, R)	4	4	-	-	1

Clutch Plate Quantity - Diesel Engines

Clutch	Number of Friction Plates	Number of Steel Plates	Number of Separating Springs	Number of Apply Plates	Number of Pressure Plates
A clutch (1, 2, 3, 4, 5, 6, M1, M2, R)	4	3	4	1	1
B clutch (2, 8, 9, 10, M1, M2, R)	5	4	5	1	1
C clutch (2, 3, 4, 5, 7, 9, 10, M2)	6	6	-	-	1
D clutch (2, 3, 4, 6, 7, 8, 10, M2, R)	6	6	-	-	1
E clutch (1, 3, 5, 6, 7, 8, 9, M1)	4	3	-	1	1
F clutch (4, 5, 6, 7, 8, 9, 10, R)	4	4	-	-	1

Clutch Clearance - Gas Engines

Clutch	Specifications
A clutch	0.048 â€”0.074 in (1.22 â€”1.88 mm)
B clutch	0.066 â€”0.083 in (1.67 â€”2.1 mm)
C clutch	0.066 â€”0.078 in (1.68 â€”1.98 mm)
D clutch	0.067 â€”0.079 in (1.7 â€”2 mm)
E clutch	0.047 â€”0.081 in (1.2 â€”2.05 mm)
F clutch	0.044 â€”0.056 in (1.12 â€”1.42 mm)

Clutch Clearance - Diesel Engines

Clutch	Specifications
A clutch	0.048 â€”0.074 in (1.22 â€”1.88 mm)
B clutch	0.066 â€”0.083 in (1.67 â€”2.1 mm)
C clutch	0.062 â€”0.074 in (1.58 â€”1.88 mm)
D clutch	0.068 â€”0.080 in (1.72 â€”2.02 mm)
E clutch	0.047 â€”0.081 in (1.2 â€”2.05 mm)
F clutch	0.044 â€”0.056 in (1.12 â€”1.42 mm)

Transmission Front End Clearance

Transmission	Specifications
RWD vehicles	0.024 â€”0.035 in (.61 â€”.89 mm)
Four-Wheel Drive (4WD) vehicles	0.008 â€”0.020 in (.2 â€”.5 mm)

A Clutch Selective Apply Plate Chart

Part Number	Apply Plate Thickness
7A406	0.157 â€”0.165 in (4 â€”4.2 mm)
7A406	0.165 â€”0.173 in (4.2 â€”4.4 mm)
7A406	0.173 â€”0.181 in (4.4 â€”4.6 mm)
7A406	0.181 â€”0.189 in (4.6 â€”4.8 mm)
7A406	0.189 â€”0.217 in (4.8 â€”5.5 mm)
7A406	0.217 â€”0.205 in (5.5 â€”5.2 mm)
7A406	0.205 â€”0.213 in (5.2 â€”5.4 mm)

B Clutch Selective Snap Ring Chart

Part Number	Snap Ring Thickness
7M157	0.089 â€”0.093 in (2.25 â€”2.35 mm)
7M157	0.100 â€”0.104 in (2.55 â€”2.65 mm)
7M157	0.112 â€”0.116 in (2.85 â€”2.95 mm)
7M157	0.124 â€”0.128 in (3.15 â€”3.25 mm)
7M157	0.136 â€”0.140 in (3.45 â€”3.55 mm)
7M157	0.148 â€”0.152 in (3.75 â€”3.85 mm)

C Clutch Selective Snap Ring Chart

Part Number	Snap Ring Thickness
7H076	0.059 in (1.5 mm)
7H076	0.067 in (1.7 mm)
7H076	0.075 in (1.9 mm)
7H076	0.083 in (2.1 mm)
7H076	0.091 in (2.3 mm)

D Clutch Selective Snap Ring Chart

Part Number	Snap Ring Thickness
7B421	0.071 in (1.8 mm)
7B421	0.079 in (2 mm)
7B421	0.087 in (2.2 mm)
7B421	0.094 in (2.4 mm)
7B421	0.102 in (2.6 mm)
7B421	0.110 in (2.8 mm)

E Clutch Selective Pressure Plate Chart

Part Number	Pressure Plate Thickness
7B066	0.083 â€”0.087 in (2.1 â€”2.2 mm)
7B066	0.091 â€”0.094 in (2.3 â€”2.4 mm)
7B066	0.098 â€”0.102 in (2.5 â€”2.6 mm)
7B066	0.106 â€”0.110 in (2.7 â€”2.8 mm)
7B066a	0.114 â€”0.118 in (2.9 â€”3 mm)
7B066	0.122 â€”0.126 in (3.1 â€”3.2 mm)
7B066	0.130 â€”0.134 in (3.3 â€”3.4 mm)

7B066	0.138 â€”0.142 in (3.5 â€”3.6 mm)
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- Also used for the E clutch apply plate

F Clutch Selective Snap Ring Chart

Part Number	Snap Ring Thickness
7P174	0.059 in (1.5 mm)
7P174	0.067 in (1.7 mm)
7P174	0.075 in (1.9 mm)
7P174	0.083 in (2.1 mm)
7P174	0.091 in (2.3 mm)
7P174	0.098 in (2.5 mm)

Selective Fit Shim Chart RWD Vehicles

Selective Fit Shim Part Number	Selective Fit Shim Thickness
7A527	0.102 â€”0.106 in (2.6 â€”2.7 mm)
7A527	0.106 â€”0.110 in (2.7 â€”2.8 mm)
7A527	0.110 â€”0.114 in (2.8 â€”2.9 mm)
7A527	0.114 â€”0.118 in (2.9 â€”3 mm)
7A527	0.118 â€”0.122 in (3 â€”3.1 mm)
7A527	0.122 â€”0.126 in (3.1 â€”3.2 mm)
7A527	0.126 â€”0.130 in (3.2 â€”3.3 mm)
7A527	0.130 â€”0.134 in (3.3 â€”3.4 mm)
7A527	0.134 â€”0.138 in (3.4 â€”3.5 mm)

Selective Fit Shim Chart Four-Wheel Drive (4WD) Vehicles

Selective Fit Shim Part Number	Selective Fit Shim Thickness
7A527	0.118 â€”0.122 in (3 â€”3.1 mm)
7A527	0.122 â€”0.126 in (3.1 â€”3.2 mm)
7A527	0.126 â€”0.130 in (3.2 â€”3.3 mm)
7A527	0.130 â€”0.134 in (3.3 â€”3.4 mm)
7A527	0.134 â€”0.138 in (3.4 â€”3.5 mm)
7A527	0.138 â€”0.142 in (3.5 â€”3.6 mm)
7A527	0.142 â€”0.146 in (3.6 â€”3.7 mm)
7A527	0.146 â€”0.150 in (3.7 â€”3.8 mm)

Gear Ratio Chart

Gear	Ratio
1st	4.61:1
2nd	2.91:1
3rd	2.13:1
4th	1.77:1
5th	1.51:1
6th	1.27:1
7th	1:1
8th	0.85:1
9th	0.68:1
10th	0.63:1
Reverse	4.69:1

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