

Specifications

Procedure revision date:
10/12/2017

Specifications

Lubricants, Fluids, Sealers and Adhesives

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

Capacities

	Liters
Transmission fluid	13 qt (12.3 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 96°C (206°F) to 101°C (215°F)).

Fluid Filter	Internal to the transmission
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General Specification

Transmission Weight	Specification
RWD vehicle	234.06 lb (106.17 kg)
4X4 vehicle	230.87 lb (104.72 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	Low - OWC	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 H 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

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

Clutch Clearance

Clutch	Specifications
A clutch	0.029–0.048 in (.73–1.23 mm)
B clutch	0.052–0.069 in (1.31–1.74 mm)
C clutch	0.062–0.074 in (1.57–1.87 mm)
D clutch	0.069–0.081 in (1.75–2.05 mm)
E clutch	0.044–0.068 in (1.12–1.72 mm)
F clutch	0.048–0.060 in (1.22–1.52 mm)

Transmission Front End Clearance

Transmission	Specifications
RWD Vehicle	0.007–0.016 in (.17–.41 mm)
4X4 Vehicle	0.002–0.011 in (.05–.29 mm)

A Clutch Selective Apply Plate Chart

Clearance ^a	Selective Apply Plate Part Number	Apply Plate Thickness
0.214–0.222 in (5.44–5.64 mm)	7A406-AA	0.177 in (4.5 mm)
0.222–0.230 in (5.65–5.84 mm)	7A406-BA	0.185 in (4.7 mm)
0.230–0.238 in (5.84–6.04 mm)	7A406-CA	0.193 in (4.9 mm)
0.238–0.246 in (6.05–6.24 mm)	7A406-DA	0.201 in (5.1 mm)
0.246–0.254 in (6.25–6.44 mm)	7A406-EA	0.205 in (5.2 mm)

- The target clearance with the correct selective apply plate installed is between 0.026–0.058 in (.67–1.47 mm).

B Clutch Selective Snap Ring Chart

Part Number	Snap Ring Thickness
HL3P-7M157-AA	0.089–0.093 in (2.25–2.35 mm)
HL3P-7M157-BA	0.100–0.104 in (2.55–2.65 mm)
HL3P-7M157-CA	0.112–0.116 in (2.85–2.95 mm)
HL3P-7M157-DA	0.124–0.128 in (3.15–3.25 mm)
HL3P-7M157-EA	0.136–0.140 in (3.45–3.55 mm)
HL3P-7M157-FA	0.148–0.152 in (3.75–3.85 mm)

C Clutch Selective Snap Ring Chart

Part Number	Snap Ring Thickness
HL3P-7H076-AA	0.059 in (1.5 mm)
HL3P-7H076-BA	0.067 in (1.7 mm)
HL3P-7H076-CA	0.075 in (1.9 mm)
HL3P-7H076-DA	0.083 in (2.1 mm)
HL3P-7H076-EA	0.091 in (2.3 mm)

D Clutch Selective Snap Ring Chart

Part Number	Snap Ring Thickness
HL3P-7B421-AA	0.071 in (1.8 mm)
HL3P-7B421-BA	0.079 in (2 mm)
HL3P-7B421-CA	0.087 in (2.2 mm)

HL3P-7B421-DA	0.094 in (2.4 mm)
HL3P-7B421-EA	0.102 in (2.6 mm)
HL3P-7B421-FA	0.110 in (2.8 mm)

E Clutch Selective Pressure Plate Chart

Part Number	Pressure Plate Thickness
HL3P-7B066-AA	0.083–0.087 in (2.1–2.2 mm)
HL3P-7B066-BA	0.094–0.098 in (2.4–2.5 mm)
HL3P-7B066-CA	0.106–0.110 in (2.7–2.8 mm)
HL3P-7B066-DA	0.118–0.122 in (3–3.1 mm)
HL3P-7B066-EA	0.130–0.134 in (3.3–3.4 mm)
HL3P-7B066-FA	0.142–0.146 in (3.6–3.7 mm)

F Clutch Selective Snap Ring Chart

Part Number	Snap Ring Thickness
HL3P-7P174-AA	0.059 in (1.5 mm)
HL3P-7P174-BA	0.067 in (1.7 mm)
HL3P-7P174-CA	0.075 in (1.9 mm)
HL3P-7P174-DA	0.083 in (2.1 mm)
HL3P-7P174-EA	0.091 in (2.3 mm)
HL3P-7P174-FA	0.098 in (2.5 mm)

Selective Fit Shim Chart RWD Vehicles

Clearance ^a	Selective Fit Shim Part Number	Selective Fit Shim Thickness
0.150–0.155 in (3.8–3.94 mm)	7J300-BA	0.120–0.124 in (3.05–3.15 mm)
0.156–0.161 in (3.95–4.09 mm)	7J300-CA	0.126–0.130 in (3.2–3.3 mm)
0.161–0.167 in (4.1–4.24 mm)	7J300-DA	0.132–0.136 in (3.35–3.45 mm)
0.167–0.173 in (4.25–4.39 mm)	7J300-EA	0.138–0.142 in (3.5–3.6 mm)
0.173–0.179 in (4.4–4.54 mm)	7J300-FA	0.144–0.148 in (3.65–3.75 mm)
0.179–0.185 in (4.55–4.69 mm)	7J300-GA	0.150–0.154 in (3.8–3.9 mm)

- The target clearance with the correct selective fit shim installed is between 0.026–0.035 in (.65–.89 mm).

Selective Fit Shim Chart 4X4 Vehicles

Clearance ^a	Selective Fit Shim Part Number	Selective Fit Shim Thickness
0.144–0.149 in (3.65–3.79 mm)	7J300-DA	0.132–0.136 in (3.35–3.45 mm)
0.150–0.155 in (3.8–3.94 mm)	7J300-EA	0.138–0.142 in (3.5–3.6 mm)
0.156–0.161 in (3.95–4.09 mm)	7J300-FA	0.144–0.148 in (3.65–3.75 mm)
0.161–0.167 in (4.1–4.24 mm)	7J300-GA	0.150–0.154 in (3.8–3.9 mm)
0.167–0.173 in (4.25–4.39 mm)	7J300-HA	0.156–0.159 in (3.95–4.05 mm)
0.173–0.179 in (4.4–4.54 mm)	7J300-JA	0.161–0.165 in (4.1–4.2 mm)
0.179–0.185 in (4.55–4.69 mm)	7J300-KA	0.167–0.171 in (4.25–4.35 mm)

- The target clearance with the correct selective fit shim installed is between 0.008–0.017 in (.2–.44 mm).

Gear Ratio Chart

Gear	Ratio
1st	4.69:1
2nd	2.98:1
3rd	2.14:1
4th	1.76:1
5th	1.52:1
6th	1.27:1
7th	1:1
8th	0.85:1
9th	0.68:1
10th	0.63:1
Reverse	4.86:1

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