Harsh/Delayed Engagement And/Or Harsh/Delayed Shift

This bulletin supersedes 26-2226. Reason for update: update the Service procedure for 2021-2022 F-150 3.5L EcoBoost vehicles with new Ford Diagnosis and Repair System (FDRS) C clutch data anomaly detection test.

Model:

Ford 2022 Expedition	Built on or before 15-Aug-2022 Transmission: 10R80
2020-2022 Explorer	Built on or before 15-Aug-2022 Transmission: 10R80 (does not apply to 10R80 MHT)
2021-2022 F-150	Built on or before 15-Aug-2022 Transmission: 10R80 (does not apply to 10R80 MHT)
2021-2022 Mustang	Built on or before 15-Aug-2022 Transmission: 10R80
2020-2023 Transit	Built on or before 15-Aug-2022 Transmission: 10R80
Lincoln 2022 Navigator	Built on or before 15-Aug-2022 Transmission: 10R80

Markets: North American markets only

Issue: Some of the vehicles listed in the Model statement above may exhibit at least one of the following conditions:

- Harsh engagement
- Delayed engagement
- Harsh shift
- Delayed shift
- Illuminated MIL with DTCs P0751, P0752, P0756, P0757, P0761, P0762, P0766, P0767, P0771, P0772, P2700, P2701, P2702, P2703, P2704, P2705, P2707, P2708, P0729, P0731, P0732, P0733, P0734, P0735, P0736, P076F, P07D9, P07F6 and/or P07F7 stored in the PCM or TCM

This may be due to PCM software and/or axial movement of the CDF clutch cylinder (7H351) sleeve causing hydraulic circuit leaks.

NOTE: If internal transmission service is required to address a concern detected with the CDF clutch cylinder following this article, technicians should carefully inspect and replace other transmission components and flush transmission fluid cooler only as necessary to confirm proper function. Add a new line to the repair order to document any additional repairs needed. M-time can be claimed on the additional repair line to cover labor. Refer to Warranty and Policy Manual for additional information. A thorough understanding of transmission description and operation will assist the technician with proper diagnosis, inspection, and successful repair of the customer concern.

NOTE: The Pressure Vacuum Transducer (PVT) Kit (Rotunda 164-R9833) and VCMM Transmission Extension Kit (Rotunda 164-R9534) recommended to perform this article are no longer included with the VCMM Advanced Kit (Rotunda 164-R9823) since July 2023. Supply of the PVT Kit (Rotunda 164-R9833) and VCMM Transmission Extension Kit (Rotunda 164-R9534) have been sold out. Ford has confirmed a high percentage (80%) of Dealers have this equipment available. Alternatively, Ford has tested suitable transmission fluid pressure gauges and developed procedures which reliably enable the capability to perform this article. Refer to Table 1 in the Service Procedure. In addition, VCMM Universal Probe Tip Adapter (Rotunda 164-R9834, or equivalent) is needed to perform this article. The Probe Tip Adapters are included in VCMM Advanced Kit (Rotunda 164-R9823).

Action: For vehicles that meet all of the criteria in the Issue and Model statements, follow the Service Procedure to reprogram the PCM, verify hydraulic circuit leakage and, if instructed, replace the CDF clutch cylinder and the planetary container cylinder.

Parts - CDF Cylinder Replacement

Service Part Number	Claim Quantity	Description
HL3Z-7G199-A	1	Auxiliary Pump Tube Seal (If Equipped With Stop/Start)
HL3Z-7A248-A	1	Torque Converter Seal
JL3Z-7N134-AA	12	Front Support Bolts
LC3Z-7H223-AA	12	Front Support Bolt Seals
HL3Z-7A248-G	1	Front Support To Case Seal
HL3Z-7G091-F	5	Input Shaft Seals (F2)
HL3Z-7B399-C	4	Sun Gear No. 3 Shaft Seals (F7)
HL3Z-7C099-A	1	C And D Clutch Balance Dam Inner Seal
HL3Z-7A548-B	2	C Clutch Balance Dam And Piston Outer Seal
HL3Z-7D404-A	2	C And D Clutch Piston Inner Seals
HL3Z-7A262-C	1	D Clutch Balance Dam
HL3Z-7D403-A	1	D Clutch Piston Outer Seal
HL3Z-7A548-G	2	F Clutch Balance Dam And Piston Outer Seal
HL3Z-7A548-A	2	F Clutch Balance Dam And Piston Inner Seal
HL3Z-7G091-G	5	Input Shaft To Sun Gear No. 3 Shaft Seals (F8)
HL3Z-7G091-C	1	Input Shaft Seal (F9)
JL3Z-7H351-B	1	CDF Cylinder (5.0L Mustang, Transit, 3.0L Explorer)
JR3Z-7H351-B	1	CDF Cylinder (3.3L Explorer, 2.3L Mustang)
ML3Z-7H351-B	1	CDF Cylinder (F-150/Expedition/Navigator)
PC3Z-7B177-A	1	Clutch And Planetary Container Cylinder

Parts - 10R80 CDF Cylinder Replacement - Select One Of The Following If Needed

Service Part Number	Claim Quantity	Description
HL3Z-7B066-AA	1	A Clutch Apply Plate 4.1-4.3 mm Selective
HL3Z-7B066-Z	1	A Clutch Apply Plate 4.4-4.6 mm Selective
HL3Z-7B066-Y	1	A Clutch Apply Plate 4.7-4.9 mm Selective
HL3Z-7B066-X	1	A Clutch Apply Plate 5.0-5.2 mm Selective
HL3Z-7B066-W	1	A Clutch Apply Plate 5.3-5.5 mm Selective
HL3Z-7H032-C	1	T-3 Bearing (Replace If T-3 Shim Is Replaced)
HL3Z-7A527-Q	1	T-3 Shim 3.05-3.15 mm Selective
HL3Z-7A527-P	1	T-3 Shim 3.2-3.3 mm Selective
HL3Z-7A527-R	1	T-3 Shim 3.35-3.45 mm Selective
HL3Z-7A527-K	1	T-3 Shim 3.5-3.6 mm Selective
HL3Z-7A527-L	1	T-3 Shim 3.65-3.75 mm Selective
HL3Z-7A527-M	1	T-3 Shim 3.8-3.9 mm Selective
HL3Z-7A527-S	1	T-3 Shim 3.95-4.05 mm Selective
HL3Z-7A527-T	1	T-3 Shim 4.1-4.2 mm Selective
HL3Z-7A527-N	1	T-3 Shim 4.25-4.35 mm Selective
HL3Z-7D483-A	1	D Clutch Snap Ring 1.8 mm Selective
HL3Z-7D483-B	1	D Clutch Snap Ring 2.0 mm Selective
HL3Z-7D483-C	1	D Clutch Snap Ring 2.2 mm Selective
HL3Z-7D483-D	1	D Clutch Snap Ring 2.4 mm Selective
HL3Z-7D483-E	1	D Clutch Snap Ring 2.6 mm Selective
HL3Z-7D483-F	1	D Clutch Snap Ring 2.8 mm Selective
HL3Z-7C122-A	1	C Clutch Snap Ring 1.5 mm Selective
HL3Z-7C122-B	1	C Clutch Snap Ring 1.7 mm Selective
HL3Z-7C122-C	1	C Clutch Snap Ring 1.9 mm Selective
HL3Z-7C122-D	1	C Clutch Snap Ring 2.1 mm Selective
HL3Z-7C122-E	1	C Clutch Snap Ring 2.3 mm Selective
HL3Z-7C122-F	1	C Clutch Snap Ring 2.5 mm Selective
HL3Z-7H365-C	1	F Clutch Snap Ring 1.5 mm Selective
HL3Z-7H365-D	1	F Clutch Snap Ring 1.7 mm Selective
HL3Z-7H365-E	1	F Clutch Snap Ring 1.9 mm Selective
HL3Z-7H365-F	1	F Clutch Snap Ring 2.1 mm Selective
HL3Z-7H365-G	1	F Clutch Snap Ring 2.3 mm Selective

Parts - CDF Cylinder Replacement - Parts To Inspect And Replace Only If Necessary

Service Part Number	Claim Quantity	Description
HL3Z-7A191-B	Only If Necessary (1 Possible)	Fluid Pan Gasket
HL3Z-7A098-A	Only If Necessary (1 Possible)	Fluid Filter (F-150/Expedition/Navigator/Mustang/Explorer)
LK4Z-7G186-B	Only If Necessary (1 Possible)	Fluid Filter (Transit)
7T4Z-7Z302-A	Only If Necessary (1 Possible)	Fluid Filter Seal
HL3Z-7J227-A	Only If Necessary (1 Possible)	Auxiliary Pump Tube O-ring (If Equipped)
HL3Z-7B066-AB	Only If Necessary (1 Possible)	A Pressure Plate
HL3Z-7B164-E	Only If Necessary (3 Possible)	A Clutch Friction Plates
HL3Z-7F220-A	Only If Necessary (2 Possible)	A Clutch Steel Plates
HL3Z-7B442-F	Only If Necessary (5 Possible)	C Clutch Steel Plates
HL3Z-7B164-A	Only If Necessary (5 Possible)	C Clutch Friction Plates (Explorer/Transit/Mustang)
ML3Z-7H095-A	Only If Necessary (5 Possible)	C Clutch Friction Plates (F-150/Expedition/Navigator)
ML3Z-7B477-A	Only If Necessary (1 Possible)	C Clutch Pressure Plate
HL3Z-7B442-D	Only If Necessary (6 Possible)	D Clutch Steel Plates
HL3Z-7B164-C	Only If Necessary (6 Possible)	D Clutch Friction Plates (Explorer/Transit/Mustang)
ML3Z-7B164-A	Only If Necessary (6 Possible)	D Clutch Friction Plates (F-150/Expedition/Navigator)
HL3Z-7B066-E	Only If Necessary (1 Possible)	D Clutch Pressure Plate
HL3Z-7B164-G	Only If Necessary (4 Possible)	F Clutch Steel Plates
HL3Z-7B164-D	Only If Necessary (4 Possible)	F Clutch Friction Plates
HL3Z-7B066-A	Only If Necessary (1 Possible)	F Clutch Pressure Plate

Parts - F-150/Expedition/Navigator Transmission Removal And Installation

Service Part Number	Claim Quantity	Description	Note
7L1Z-4B496-C	2	CV Joint-To-Pinion Flange Cup Bolts And Retaining Straps (4WD)	
7L1Z-4B496-D	3	CV Joint-To-Transfer Case Flange Cup Bolts And Retaining Straps (4WD Expedition/Navigator)	
FL3Z-6775-D	1	Self-Adhesive Heat Shield	
JL1Z-7N134-A	1	Park Override Lever Bolt (Non-Column Shift Expedition/Navigator)	
ML3Z-3B478-B	1	Front Driveshaft Boot Clamp	
PL3Z-5C226-A	2	Left And Right Catalytic Converter Gasket (F-150 2.7L/3.5L, Expedition/Navigator)	
N800594-S100	4 Or 8 (Flange Dependent)	Driveshaft Flange To Flange Bolts (F-150)	
N811880-S100	4 Or 8 (Flange Dependent)	Driveshaft Flange To Flange Bolts (Expedition/Navigator)	
W520113-S440	4	Stabilizer Bar Bracket Nuts	
W520114-S442	4	Transmission Support Crossmember Nuts	
W520514-S440	4	Left And Right Catalytic Converter Nuts (All Gas Engines)	
W704980-S439	1	Park Manual Release Cable Bracket Bolt (2.7L/3.3L/3.5L/5.0L)	
W709771-S440	2	Transmission Mount Nuts	
W711140-S901	3	Transmission Insulator Bolts And Washers (RWD Gas)	
W714418-S439	4	Transmission Support Crossmember Bolts	
W714682-S442	1	Driveshaft Center Bearing Bolt (Expedition/Navigator)	
W720882-S442	1	Transmission Fluid Heat Exchanger Bolt (Expedition/Navigator)	
W715579-S439	2	Driveshaft Center Bearing Bolt (If Equipped With Two Piece Driveshaft) (F-150)	
W715618-S437	F-150 2.7L/3.3L/3.5L/5.0L/Expedition/Navigator Require 4 Pieces, F-150 3.0L Require 6 Pieces	Torque Converter Nuts	
W715798-S442	1	Fluid Cooler Tube Studbolt 3.0L (Park Manual Release Cable Bracket Bolt 3.5L)	
W716375-S900	9	Transfer Case Bolts (4WD)	
W718353-S900	4	Transmission Insulator Bolts (F-150 2.7L/3.3L/3.5L/5.0L 4WD, F-150 3.0L RWD, Expedition/Navigator 4WD)	
W718772-S439	1	Driveshaft Center Bearing Nut (Expedition/Navigator)	
W718926-S900	4	Transmission Insulator Bolts (F-150 3.0L 4WD)	
W719738-S439	1	Driveshaft Center Bearing Bracket Mounting Stud (If Equipped With Two Piece Driveshaft)	
TA-24-B	As Needed	Motorcraft® Thread Sealant With PTFE (4WD)	
VC-13DL-G	As Needed	Motorcraft® Yellow Prediluted Antifreeze/Coolant (All Markets Except Canada)	
CVC-13DL-G	As Needed	Motorcraft® Yellow Prediluted Antifreeze/Coolant (Canada Only)	
XG-1-E1	As Needed	Motorcraft® Premium Long-Life Grease	
XL-5-A	As Needed	Motorcraft® Multi-Purpose Grease Spray	
XT-10-QLVC	As Needed	Motorcraft® MERCON® LV Automatic Transmission Fluid	Transfer Case Fluid (4WD Only), All Markets Except Canada
CXT-10-LV6	As Needed	Motorcraft® MERCON® LV Automatic Transmission Fluid	Transfer Case Fluid (4WD Only), Canada Only
XT-12-QULV	As Needed	Motorcraft® MERCON® ULV Automatic Transmission Fluid	All Markets

Parts - F-150/Expedition/Navigator Transmission Removal And Installation - Parts To Inspect And Replace Only If Necessary

Service Part Number	Claim Quantity	Description
4W9Z-6397-A	Only If Necessary (2 Possible)	Engine Block Dowel Pins (F-150 3.0L)
5L7Z-7D285-A	Only If Necessary (2 Possible)	Transmission Fluid Cooler Tube Seals (3.0L/3.5L)
5L7Z-7J324-A	Only If Necessary (2 Possible)	Fluid Cooler Tube Backing Rings
ML3Z-4421-A	Only If Necessary (1 Possible)	Front Driveshaft Boot
W701228-S300	Only If Necessary (2 Possible)	Engine Block Dowel Pins (5.0L)
W718758-S300	Only If Necessary (2 Possible)	Engine Block Dowel Pins (2.7L/3.3L/3.5L)

Parts - Mustang Transmission Removal And Installation

Service Part Number	Claim Quantity	Description
BR3Z-5B266-A	1	Exhaust Gasket (5.0L)
W705443-S900	2	Catalytic Converter Flange Nuts (5.0L)
W710726-S437	2	Selector Lever Cable Bracket Bolts
W715131-S437	1	Transmission Fluid Cooler Tube Bracket Bolt
W715618-S437	5.0L Requires 4 Pieces, 2.3L Requires 6 Pieces	Torque Converter Nuts
FR3Z-4B496-B	3	Driveshaft To Pinion Flange Bolts
W719298-S439	3	Driveshaft To Transmission Flange Bolts (If Equipped) (2.3L)
N800594-S101	4	Driveshaft To Transmission Flange Bolts (If Equipped) (5.0L)
W500545-S439	3	Driveshaft To Transmission Flange Bolts
W717822-S439	2	Driveshaft Center Bearing Bolts (If Equipped)
TA-25-B	As Needed	Motorcraft® Threadlock and Sealer (Convertible)
XL-1	As Needed	Motorcraft® Penetrating and Lock Lubricant
XL-2	As Needed	Motorcraft® High Temperature Nickel Anti-Seize Lubricant
XL-5-A	As Needed	Motorcraft® Multi-Purpose Grease Spray
XT-12-QULV	As Needed	Motorcraft® MERCON® ULV Automatic Transmission Fluid

Parts - Mustang Transmission Removal And Installation - Parts To Inspect And Replace Only If Necessary

Service Part Number	Claim Quantity	Description
5L7Z-7D285-A	Only If Necessary (2 Possible)	Transmission Fluid Cooler Tube Seals
5L7Z-7J324-A	Only If Necessary (2 Possible)	Fluid Cooler Tube Backing Rings
4782	Only If Necessary (1 Possible)	Flex Coupling Driveshaft - Refer To The Parts Catalog For The VIN Specific Application

Parts - Transit Transmission Removal And Installation

Service Part Number	Claim Quantity	Description	Note
LK4Z-3B498-A	1	Halfshaft Circlip (AWD)	
LK4Z-4B496-A	3	Front Driveshaft Flange CV Joint-to-Pinion Flange Cup Bolts And Retaining Straps (AWD)	
LK4Z-4B496-B	2	Rear Driveshaft Flange CV Joint-To-Pinion Flange Cup Bolts And Retaining Straps (AWD)	
N800594-S100	4 Or 8 (Flange Dependent)	Driveshaft Flange To Flange Bolts - Refer To The Parts Catalog For The VIN Specific Application	
W505434-S439	4	Lower Load Push Bar Retainers	
W506434-S439	8	Lower Load Push Bar Retainers	
W520215-S442	4	Tie Rod End Nut / Front Subframe Forward Nuts (2 Per Application)	
W520514-S440	4	Left And Right Catalytic Converter Nuts	
W709176-S300	2	Splash Shield Push Pins	
W710660-S441	2	Transmission Support Insulator Nuts	
W711076-S442	2	Lower Ball Joint Nut	
W711137-S442	1	Steering Column Shaft Bolt	
W712503-S440	2	Front Stabilizer Bar Link Rod Nuts	
W713078-S439	2 Or 4	Driveshaft Center Bearing Bolts - Refer To The Parts Catalog For The VIN Specific Application	
W715618-S437	4	Torque Converter Nuts	
W716331-S439	4	Transmission Crossmember Bolts	
W718943-S439	2	Front Subframe Rearward Bolts	
W719972-S439	5	Front Axle Bolts (AWD)	
W720688-S439	1	Front Axle To Transmission Bolt (AWD)	
W709653-S303	2	Front Floor Heat Shield - Pop Rivets	
W505264-S442	2	Driveshaft Safety Strap Bolts (If Equipped)	
KK2Z-00811-A	2	Wheel Hub Nut	
W500463-S442	4	Brake Caliper Anchor Plate Bolt	
W719976-S439	2	Front Axle Tube Bolt	
XY-75W140-QL	As Needed	Motorcraft® SAE 75W-140 Synthetic Rear Axle Lubricant	4WD Only, Front Axle Usage
VC-13DL-G	As Needed	Motorcraft® Yellow Prediluted Antifreeze/Coolant (All Markets Except Canada)	
CVC-13DL-G	As Needed	Motorcraft® Yellow Prediluted Antifreeze/Coolant (Canada Only)	
XG-1-E1	As Needed	Motorcraft® Premium Long-Life Grease	
XL-5-A	As Needed	Motorcraft® Multi-Purpose Grease Spray	
XT-10-QLVC	As Needed	Motorcraft® MERCON® LV Automatic Transmission Fluid	Transfer Case Fluid (4WD Only), All Markets Except Canada
CXT-10-LV6	As Needed	Motorcraft® MERCON® LV Automatic Transmission Fluid	Transfer Case Fluid (4WD Only), Canada Only
XT-12-QULV	As Needed	Motorcraft® MERCON® ULV Automatic Transmission Fluid	All Markets

Parts - Transit Transmission Removal And Installation - Parts To Inspect And Replace Only If Necessary

Service Part Number	Claim Quantity	Description
LJ9Z-7J227-A	Only If Necessary (4 Possible)	Transmission Fluid Cooler Tube Seals
LK4Z-3A427-A	Only If Necessary (1 Possible)	Left Inner CV Joint Halfshaft (AWD)
LK4Z-3A428-A	Only If Necessary (1 Possible)	Right Outer CV Joint Halfshaft (AWD)
W718758-S300	Only If Necessary (2 Possible)	Engine Block Dowel Pins (3.5L)
W719583-S900	Only If Necessary (2 Possible For 3.5L EcoBoost, 4 Possible For 3.5L Duratec)	Catalytic Converter Studs (3.5L) (AWD)
W720627-S900	Only If Necessary (2 Possible)	Left Catalytic Converter Studs (3.5L EcoBoost) (AWD)

Parts - Explorer Transmission Removal And Installation

Service Part Number	Claim Quantity	Description	Note
W715131-S442	2	Transmission Fluid Cooler Tube Bracket Bolts	
W700714-S437	2	Selector Lever Cable Bracket Bolts	
W715618-S437	3.3L Requires 4 Pieces, All Others Require 6 Pieces	Torque Converter Nuts	
LB5Z-3B498-A	1	Axle Pinion Stem Circlip	
L1MZ-4A015-B	1	Front Axle Pinion Stem O-ring	
L1MZ-3B478-A	1	Front Driveshaft Boot Clamp	
L1MZ-4421-A	1	Front Driveshaft Boot	
W719511-S439	3 Pieces Required If Driveshaft Is Disconnected At Only One End, 6 Pieces Required If Coupler Or Driveshaft Alignment Bushing Are Replaced	Driveshaft Flex Coupling Bolts	
W716375-S900	8	Transfer Case Bolts (4WD)	
W719431-S439	RWD Requires 2 Pieces, AWD Requires 3 Pieces	Transmission Mount Bolts	
W520214-S440	1	Transmission Mount Nut	
W721083-S439	4	Transmission Crossmember Bolts	
W719413-S439	2	Middle Subframe Bolts (3.0L)	
W716979-S439	2	Rear Subframe Bolts (3.0L)	
W719699-S442	3.0L Requires 2 Pieces, 3.3L Requires 4 Pieces	Catalytic Converter Nuts	
L1MZ-6L612-B	1	Left Catalytic Converter Gasket (3.0L)	
W719698-S900	3.0L Require 2 Pieces, 2.3L Require 3 Pieces	Catalytic Converter Studs	
W714265-S442	4	Catalytic Converter Nuts (3.3L)	
XL-5-A	As Needed	Motorcraft® Multi-Purpose Grease Spray	
XT-12-QULV	As Needed	Motorcraft® MERCON® ULV Automatic Transmission Fluid	All Markets
5L3Z-19A506-A	As Needed	Slip Yoke Grease (Grease - Chassis Lubrication)	
XG-11	As Needed	Motorcraft® High Temperature 4x4 Front Axle and Wheel Bearing Grease	
XT-10-QLVC	As Needed	Motorcraft® MERCON® LV Automatic Transmission Fluid	Transfer Case Fluid (4WD Only), All Markets Except Canada
CXT-10-LV6	As Needed	Motorcraft® MERCON® LV Automatic Transmission Fluid	Transfer Case Fluid (4WD Only), Canada Only
XG-1-E1	As Needed	Motorcraft® Premium Long-Life Grease	

Parts - Explorer Transmission Removal And Installation - Parts To Inspect And Replace Only If Necessary

Service Part Number	Claim Quantity	Description
5L7Z-7D285-A	Only If Necessary (2 Possible)	Transmission Fluid Cooler Tube Seals
5L7Z-7J324-A	Only If Necessary (2 Possible)	Transmission Fluid Cooler Tube Backing Rings
W525585-S300	Only If Necessary (2 Possible)	Engine Block Dowel Pins (3.0L)
W718758-S300	Only If Necessary (2 Possible)	Engine Block Dowel Pins (3.3L)
W716963-S900	Only If Necessary (4 Possible)	Left And Right Catalytic Converter Studs (3.3L)
L1MZ-4650-A	Only If Necessary (1 Possible)	Driveshaft Alignment Bushing
L1MZ-4782-A	Only If Necessary (1 Possible)	Flex Coupling
W717822-S439	Only If Necessary (2 Possible)	Driveshaft Center Bearing Bracket Bolts
L1MZ-3B498-F	Only If Necessary (1 Possible)	Rear Axle Pinion Stem Circlip

NOTE: All other parts/lubricants/fluids required by the WSM or instructed by the WSM to inspect and replace as necessary should be claimed outside of this article.

Claim Quantity refers to the total number of individual pieces required to repair the vehicle. This may differ from the number of service part number packages due to the unit of issue (UOI).

As Needed indicates the part is necessary but amount of the part may vary and/or is not a whole number. Parts can be billed out as non-whole numbers, including less than 1.

Only If Necessary indicates the part is not mandatory. Refer to the Service Procedure to determine the inspection/inclusion criteria.

Warranty Status: Warranty coverage limits and policies are not altered by a TSB. Warranty coverage limits are determined by the identified causal part.

Labor Times

Description	Operation No.	Time
2021-2022 Mustang 2.3L/5.0L Coupe/Convertible: Run CDF Test (Pass) (Do Not Use With Any Other Labor Operations)	262431A	0.7 Hrs
2021-2022 Mustang 5.0L Coupe: Run CDF Test (Fail),Replace CDF Cylinder (Do Not Use With Any Other Labor Operations)	262431B	11.3 Hrs
2021-2022 Mustang 5.0L Convertible: Run CDF test (Fail), Replace CDF Cylinder (Do Not Use With Any Other Labor Operations)	262431C	12.0 Hrs
2021-2022 Mustang 2.3L Coupe: Run CDF test (Fail), Replace CDF Cylinder (Do Not Use With Any Other Labor Operations)	262431D	10.4 Hrs
2021-2022 Mustang 2.3L Convertible: Run CDF test (Fail), Replace CDF Cylinder (Do Not Use With Any Other Labor Operations)	262431E	11.0 Hrs
2020-2022 Explorer 3.3L/3.0L: Run CDF Test (Pass) (Do Not Use With Any Other Labor Operations)	262431F	0.8 Hrs
2020-2022 Explorer 4WD 3.3L TiVCT: Run CDF Test (Fail), Replace CDF Cylinder (Do Not Use With Any Other Labor Operations)	262431G	12.4 Hrs
2020-2022 Explorer 4WD 3.0L EcoBoost: Run CDF Test (Fail), Replace CDF Cylinder (Do Not Use With Any Other Labor Operations)	262431H	11.3 Hrs
2020-2023 Transit 3.5L TiVCT/3.5L EcoBoost: Run CDF Test (Pass) (Do Not Use With Any Other Labor Operations Outside Of This Article) (Can Be Claimed With Operation P)	262431J	0.7 Hrs
2020-2023 Transit RWD 3.5L TiVCT: Run CDF Test (Fail), Replace CDF Cylinder (Do Not Use With Any Other Labor Operations Outside Of This Article) (Can Be Claimed With Operation(s) P, Q Or R)	262431K	11.4 Hrs
2020-2023 Transit RWD 3.5L EcoBoost: Run CDF Test (Fail), Replace CDF Cylinder (Do Not Use With Any Other Labor Operations Outside Of This Article) (Can Be Claimed With Operation(s) P, Q Or R)	262431L	11.4 Hrs
2020-2023 Transit AWD 3.5L TiVCT: Run CDF Test (Fail), Replace CDF Cylinder (Do Not Use With Any Other Labor Operations Outside Of This Article) (Can Be Claimed With Operation(s) P, Q Or R)	262431M	14.2 Hrs
2020-2023 Transit AWD 3.5L EcoBoost: Run CDF Test (Fail), Replace CDF Cylinder (Do Not Use With Any Other Labor Operations Outside Of This Article) (Can Be Claimed With Operation(s) P, Q Or R)	262431N	14.2 Hrs
2020-2023 Transit AWD/RWD: Additional Time To Remove And Install Running Boards If Equipped (Can Be Claimed With Operations J-N)	262431P	0.3 Hrs
2020-2023 Transit AWD/RWD: Additional Time To Check And Correct Front Toe (Can Be Claimed With Operations K-N)	262431Q	1.0 Hrs
2020-2023 Transit AWD/RWD With Lane Departure Warning: Additional Time To Check And Correct Front Toe Includes Extra Time To Align LDW Camera System (Can Be Claimed With Operations K-N)	262431R	1.4 Hrs
2022 Expedition/Navigator 4X2/4X4: Run CDF Test (Pass) (Do Not Use With Any Other Labor Operations)	262431S	0.8 Hrs
2022 Navigator 4X2: Run CDF Test (Fail) Replace CDF Cylinder (Do Not Use With Any Other Labor Operations)	262431T	11.7 Hrs
2022 Navigator 4X4: Run CDF Test (Fail) Replace CDF Cylinder (Do Not Use With Any Other Labor Operations)	262431U	12.7 Hrs
2022 Expedition 4X2: Run CDF Test (Fail) Replace CDF Cylinder (Do Not Use With Any Other Labor Operations)	262431V	11.4 Hrs
2022 Expedition 4X4: Run CDF Test (Fail) Replace CDF Cylinder (Do Not Use With Any Other Labor Operations)	262431W	12.4 Hrs
2021-2022 F-150 4X2/4X4: Run CDF Test (Pass) (Do Not Use With Any Other Labor Operations)	262431X	0.8 Hrs
2021-2022 F-150 4X2 2.7L EcoBoost: Run CDF Test (Fail), Replace CDF Cylinder (Do Not Use With Any Other Labor Operations)	262431Y	12.3 Hrs
2021-2022 F-150 4X4 2.7L EcoBoost: Run CDF Test (Fail), Replace CDF Cylinder (Do Not Use With Any Other Labor Operations)	262431Z	13.1 Hrs
2021-2022 F-150 4X2 3.5L EcoBoost: Run CDF Test (Fail), Replace CDF Cylinder (Do Not Use With Any Other Labor Operations)	262431AA	11.7 Hrs
2021-2022 F-150 4X4 3.5L EcoBoost: Run CDF Test (Fail), Replace CDF Cylinder (Do Not Use With Any Other Labor Operations)	262431BB	13.0 Hrs
2021-2022 F-150 4X4 5.0L TiVCT: Run CDF Test (Fail), Replace CDF Cylinder (Do Not Use With Any Other Labor Operations)	262431CC	12.9 Hrs
2021-2022 F-150 4X2 5.0L TiVCT: Run CDF Test (Fail), Replace CDF Cylinder (Do Not Use With Any Other Labor Operations)	262431DD	11.6 Hrs
2021-2022 F-150 4X4 3.3L TiVCT: Run CDF Test (Fail), Replace CDF Cylinder (Do Not Use With Any Other Labor Operations)	262431EE	12.0 Hrs
2021-2022 F-150 4X2 3.3L TiVCT: Run CDF Test (Fail), Replace CDF Cylinder (Do Not Use With Any Other Labor Operations)	262431FF	11.0 Hrs
2021-2022 F-150 3.5L EcoBoost: Reprogram The PCM and Perform Adaptive Learning Drive Cycle	262431GG	0.9 Hrs
2021 F-150 3.0L Diesel: Run CDF Test (Fail) Replace CDF Cylinder (Do Not Use With Any Other Labor Operations)	262431HH	11.5 Hrs

Repair/Claim Coding

Causal Part:	7H351
Condition Code:	42

Service Procedure

Example of performing the gauge connection on F-150



1. Is the vehicle a 2021-2022 F-150 3.5L EcoBoost?
   (1). Yes - using the latest software level of the FDRS scan tool, perform the C Clutch Data Anomaly Detection test. Record Pass/Fail results for future Steps.

NOTE: This test must be performed prior to clearing the KAM, DTCs and/or transmission adaptive tables.

NOTE: For vehicles with KAM, DTCs and/or transmission adaptive tables cleared, the Clutch Data Anomaly Detection test will abort.

   (2). No - proceed to Step 5.
2. Did the test complete with results?
   (1). Yes, Pass - reprogram the PCM using the latest software level of FDRS. Proceed to Step 3.
   (2). Yes, Fail - proceed to "Repair Procedure" section of this article.
   (3). No, Abort - proceed to Step 5.
3. Perform the adaptive learning drive cycle. Refer to WSM, Section 307-01.
4. Does the vehicle still exhibit the condition after reprogramming the PCM to the latest software and performing the adaptive learning drive cycle?
   (1). Yes - this article does not apply. Refer to WSM, Section 307-01 for normal diagnostics and repair as necessary outside of this article.
   (2). No - repair is complete.

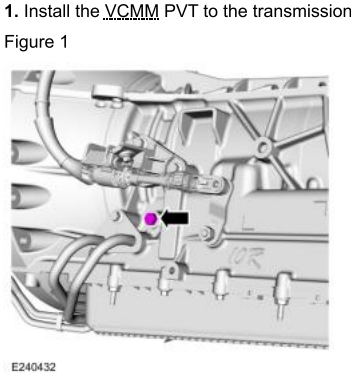
NOTE: Advise the customer that this vehicle is equipped with an adaptive transmission shift strategy which allows the vehicle's computer to learn the transmission's unique parameters and improve shift quality. When the adaptive strategy is reset, the computer will begin a relearning process. This relearning process may result in firmer than normal upshifts and downshifts for several days.

5. Is a VCMM PVT available?
   (1). Yes - proceed to "Diagnostic Procedure A - VCMM PVT Is Available".
   (2). No - proceed to "Diagnostic Procedure B - No VCMM PVT Available".

Diagnostic Procedure A - VCMM PVT Is Available

1. Install the VCMM PVT to the transmission line pressure port. (Figure 1)

Figure 1



E240432

NOTE: Some vehicle models may require the removal of the transmission park manual release cable and bracket to gain access to the line pressure port through the transmission fluid heat exchanger access hole. Refer to the video link above and WSM, Section 307-01 > Transmission Line Pressure Test.

NOTE: The line pressure port is an M10X1.0 thread. Do not use a National Pipe Thread (NPT) fitting when installing pressure reading equipment. If an NPT fitting is used, damage to the transmission case will occur.

NOTE: The transmission extension hose kit requires a 1/4 in. Joint Industry Council (JIC) male adapter.

NOTE: All NPT fittings must be assembled with polytetrafluoroethylene (PTFE) tape or paste to prevent leaks.

   (1). For Explorer, F-150, Mustang, Expedition and Navigator vehicles:
   - VCMM Transmission Extension Kit
   - Locally obtain the necessary adapter fittings to connect the VCMM PVT to the transmission line pressure port (Figure 2)

Figure 2 - Explorer/F-150/Mustang/Expedition/Navigator

E441751

Item	Description
1	M10X1.0 male to 1/8 in. FNPT female
2	1/8 in. NPT male to 1/4 in. JIC male
3	Extension hose

   (2). For Transit vehicles:
   - VCMM Transmission Extension Kit
   - Locally obtain the necessary adapter fittings to connect the VCMM PVT to the transmission line pressure port (Figure 3)

Figure 3 - Transit only



E441595

Item	Description
1	M10X1.0 male to 1/8 in. FNPT female (Adapter #1)
2	1/8 in. NPT male to 1/4 in. JIC male. (Adapter #2)
3	1.5 in. length extension: 1/8 in. NPT male to 1/8 in. NPT male nipple (Adapter #3)
4	90 degree elbow: 1/8 in. NPT male to 1/8 in. NPT female (Adapter #4)
5	1/8 in. NPT female to 1/8 in. NPT female (Adapter #5)

2. Using the latest software level of the FDRS and VCMM, start a session.
3. Select and run the FDRS Transmission Clutch Circuit Leak Test. Follow FDRS screen prompts and directions to proceed. Does the vehicle exhibit harsh/delayed engagement and/or harsh/delayed shift symptoms only when TFT is at 49°C (121°F) or below?
   (1). Yes - when prompted, choose the FDRS option for the transmission shift concern occurs when the TFT is at or below 49°C (121°F).
   (2). No - when prompted, choose the FDRS option for the transmission shift concern occurs when the TFT is at or above 50°C (122°F).
4. Test is complete. Release control of all parameters then turn ignition off.
5. Did the transmission test results pass?
   (1). Yes - this article does not apply. Refer to WSM, Section 307-01 for normal diagnostics.
   (2). No - (field displays red) - proceed to "Repair Procedure" in this article.

Diagnostic Procedure B - No VCMM PVT Available

1. Install a suitable transmission fluid pressure gauge that measures at least 300 PSI (2,000 kPa) with vibration dampening to the line pressure port. (Figure 1) Refer to Table 1.

NOTE: Some vehicle models may require the removal of the transmission park manual release cable and bracket to gain access to the line pressure port through the transmission fluid heat exchanger access hole. Refer to the video link above and WSM, Section 307-01 > Transmission Line Pressure Test.

NOTE: The line pressure port is an M10X1.0 thread. Do not use a National Pipe Thread (NPT) fitting when installing pressure reading equipment. If an NPT fitting is used, damage to the transmission case will occur.

NOTE: All NPT fittings must be assembled with polytetrafluoroethylene (PTFE) tape or paste to prevent leaks.

Table 1 - Ford tested suitable transmission fluid pressure gauges, other suitable gauges may be used

Description	Source	Part Number
Ashcroft 0-300PSI Vibration Dampened	Grainger	351009SW02LXLL300
Lang Instruments Model 5TUL8 (requires piston-type pressure gauge snubber)	• Rotunda RTTP • Grainger	• Gauge: STATU16A • Snubber: 5TUL8
Snap-On 0-500PSI Gauge and Boot	Snap-On	EEPV5-500G
Waekon Digital Pressure Gauge	Rotunda RTTP	WAE48165
Pressure Pro PC 5000	Rotunda RTTP	300-WAE48365

2. Using the latest software level of the FDRS and VCMM, start a session.
3. Using FDRS select the following PIDs.
   - RPM_DSD #
   - PVT Pressure (set scale to +/- 3447 kPa)
   - TFT
   - SSA_AMP #
   - SSB_AMP #
   - SSC_AMP #
   - SSD_AMP #
   - SSE_AMP #
   - SSF_AMP #
4. Does the vehicle exhibit harsh/delayed engagement and/or harsh/delayed shift symptoms only when TFT is at 49°C (121°F) or below?
   (1). Yes - perform Step 5 while TFT is at or below 49°C (121°F).
   (2). No - perform Step 5 with TFT at or above 50°C (122°F).
5. Enter Live Display mode. Verify the vehicle is in P, emergency brake applied and TFT is at the appropriate temperature range identified in Step 4.
   (1). For each step below, highlight the PID to enable it and select #. Then control the PID with up/down arrows.
   (2). Command SSA_AMP # / SSB_AMP # / SSC_AMP # / SSD_AMP # / SSE_AMP # / SSF_AMP # to 0mA.
   (3). Decrease RPM_DSD # between 500-600 rpm.
   (4). Increase LINEDSD # to 1900-2000kPa (275-290 PSI) or maximum achievable pressure below 2000kPa (290 PSI).

NOTE: Actual line pressure reading is expected to be less than commanded line pressure.

   (5). Record the pressure value observed on the gauge as Pre Ramp.
   (6). Command SSA_AMP # to 1.0A (five quick up arrow clicks).
   (7). Record the pressure value observed on the gauge as Applied A.
   (8). Command SSA_AMP # to 0mA (five quick down arrow clicks).
   (9). Command SSC_AMP # to 1.0A (five quick up arrow clicks).
   (10). Record the pressure value observed on the gauge as Applied C.
   (11). Command SSC_AMP # PID off to 0mA (five quick down arrow clicks).
   (12). Test is complete. Release control of all parameters then turn the ignition off.
6. Download the CDF calculator tool.

NOTE: The calculator is an ".exe" file type. Make sure the computer firewall is set to allow this type of file to download.

   (1). Click here to download the CDF calculator tool in English.
   (2). Click here to download the CDF calculator tool in Spanish.
   (3). Click here to download the CDF calculator tool in French.
7. Enter the value recorded as Pre Ramp into CDF calculator for both fields Pre Ramp Valley and Pre Ramp Peak.
8. Enter the value recorded as Applied A into CDF calculator for both fields Applied A Valley and Applied A Peak.
9. Enter the value recorded as Applied C into CDF calculator for both fields Applied C Valley and Applied C Peak.
10. Refer to CDF calculator results. Does the "A-clutch Leakage Rate %" field display green?
    (1). Yes - proceed to Step 11.
    (2). No (field displays red) - this article does not apply. Refer to WSM, Section 307-01 > Diagnosis and Testing > A Clutch.
11. Does the "C-Clutch vs A-Clutch %" field display green?
    (1). Yes - this article does not apply. Refer to WSM, Section 307-01 for normal diagnostics.
    (2). No (field displays red) - proceed to "Repair Procedure" in this article.

Repair Procedure

1. Remove the transmission and mount the transmission to the bench. Refer to WSM, Section 307-01.
2. Disassemble the transmission. Perform only the necessary steps to remove the clutch and planetary assembly from the transmission case. Refer to WSM, Section 307-01.
   (1). It is only necessary to remove the torque converter, transmission fluid pan and gasket, transmission fluid auxiliary pump (if equipped), fluid filter and main control valve body assembly, all 4 speed sensors (intermediate speed sensor A [ISSA], intermediate speed sensor B [ISSB], TSS and OSS), transmission fluid pump, front support assembly and the clutch and planetary assembly. Refer to WSM, Section 307-01.
3. Disassemble the clutch and planetary assembly. Perform only the necessary steps to remove the clutch and planetary container cylinder, the CDF clutch cylinder and the No. 3 sun gear shaft and No. 2 ring gear assembly from the clutch and planetary assembly. Refer to WSM, Section 307-01.
   (1). It is only necessary to remove the A clutch assembly, the selective shim and T3 thrust bearing, remove and discard the 5 input shaft front seals.
   (2). Remove the No. 1 planetary carrier snap ring, clutch and planetary container cylinder, the No. 4 ring gear snap ring and the No. 4 ring gear from the clutch and planetary container cylinder. Discard the clutch and planetary container cylinder. Refer to WSM, Section 307-01.
   (3). Remove the E clutch and input shaft assembly, the No. 3 planetary carrier and No. 3 sun gear, the No. 3 sun gear shaft and No. 2 ring gear assembly. Refer to WSM, Section 307-01.
4. Remove and discard the sun gear No. 3 shaft seals. Install the 4 new sun gear No. 3 shaft seals. Refer to WSM, Section 307-01.
5. Disassemble the C, D and F clutch assemblies from the CDF cylinder. Discard the CDF cylinder. Refer to WSM, Section 307-01.
6. Assemble the C, D and F clutch assemblies into the new CDF clutch cylinder. Refer to WSM, Section 307-01.
7. Perform the C, D and F clutch clearance measurements. Refer to WSM, Section 307-01 > Overhaul
8. Remove and discard the input shaft-to-sun gear No. 3 shaft seals. Install the 5 new input shaft-to-sun gear No. 3 shaft seals. Refer to WSM, Section 307-01.
9. Remove and discard the input shaft seal. Install the new input shaft seal. Refer to WSM, Section 307-01.
10. Install the 5 new input shaft front seals. Refer to WSM, Section 307-01.
11. Install the No. 4 ring gear and snap ring into a new clutch and planetary container cylinder.
12. To reassemble the clutch and planetary assembly, reverse the disassembly procedure. Refer to WSM, Section 307-01.
13. Perform the T3 thrust bearing measurement to set transmission front end clearance. Refer to WSM, Section 307-01 > Overhaul
14. Reassemble the transmission. Refer to WSM, Section 307-01.
15. Install the transmission. Refer to WSM, Section 307-01.
16. Perform an adaptive learning drive cycle. Refer to WSM, Section 307-01.

NOTE: Advise the customer that this vehicle is equipped with an adaptive transmission shift strategy which allows the vehicle's computer to learn the transmission's unique parameters and improve shift quality. When the adaptive strategy is reset, the computer will begin a relearning process. This relearning process may result in firmer than normal upshifts and downshifts for several days.

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