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1998 FORD Mustang Convertible OEM Service and Repair Workshop Manual

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Transmission Fluid Heater Coolant Control Valve

<i>303-03E Engine Cooling - 5.0L 32V Ti-VCT</i>	<i>2022 F-150</i>
<i>Removal and Installation</i>	<i>Procedure revision date: 10/2/2020</i>

Transmission Fluid Heater Coolant Control Valve

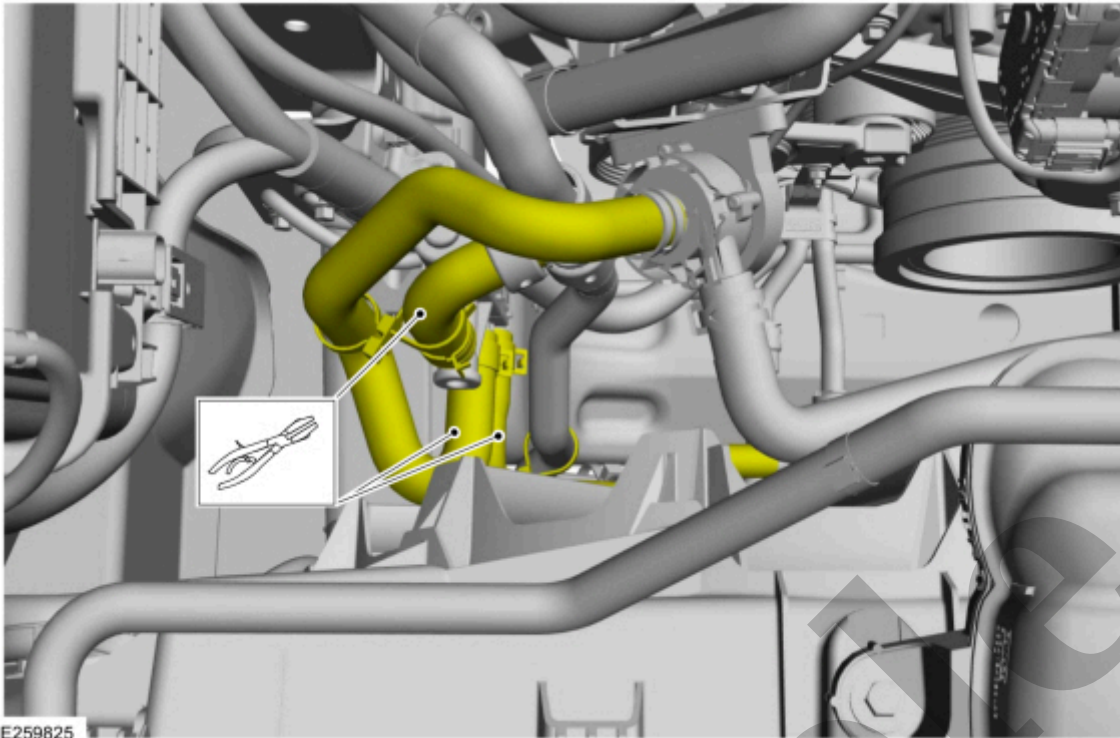
Removal



WARNING

When releasing the cooling system pressure, cover the coolant expansion tank cap with a thick cloth.

Loosen the pressure relief cap.

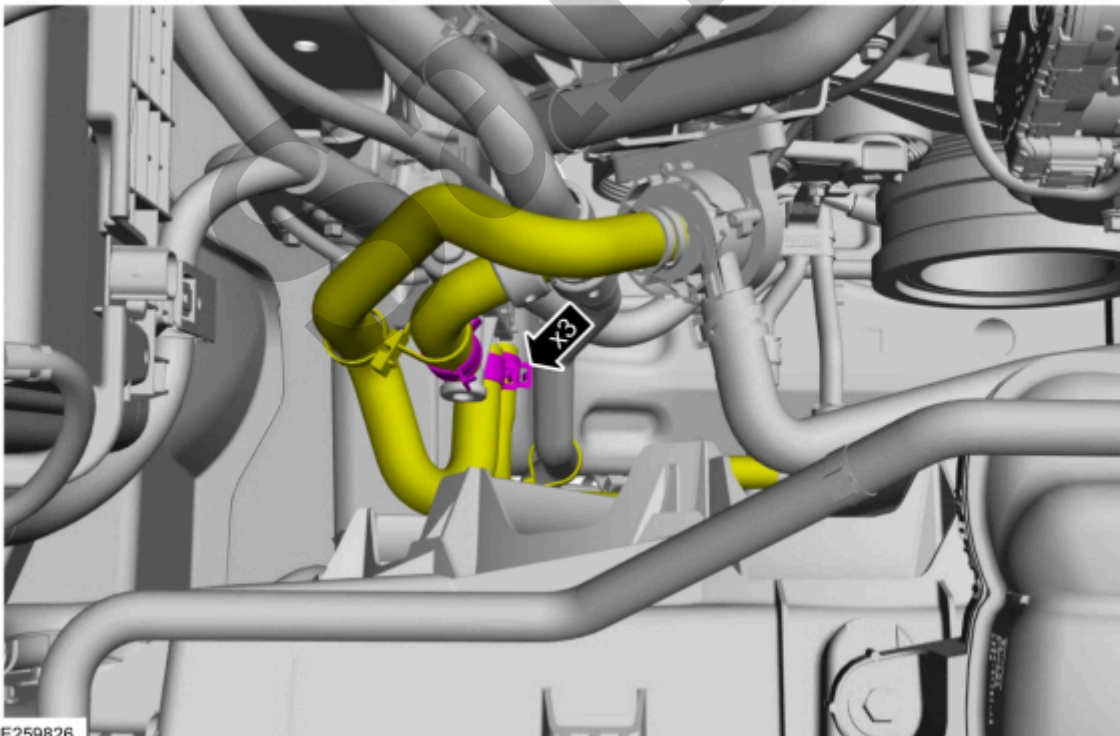


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4. Release the clamps and disconnect the coolant hoses.

Use the General Equipment: Hose Clamp Remover/Installer



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Specifications

303-03E Engine Cooling - 5.0L 32V Ti-VCT	2022 F-150
Specifications	Procedure revision date: 10/2/2020

Specifications

Lubricants, Fluids, Sealants and Adhesives

Name	Specification	Fill Capacity
Motorcraft® Yellow Concentrated Antifreeze/Coolant VC-13-G	WSS-M97B57-A1	13.2 qt (12.5L)
Motorcraft® Yellow Prediluted Antifreeze/Coolant VC-13DL-G	WSS-M97B57-A2	13.2 qt (12.5L)
Motorcraft® Premium Cooling System Flush VC-1	ESR-M14P7-A	-

Cooling System Pressure

Complete cooling system maximum pressure	145 kPa (21 psi)
Pressure relief cap	145 kPa (21 psi)
Radiator pressure test (removed from the vehicle)	138 kPa (20 psi)

Thermostat Opening Temperatures

Wireless Accessory Charging Module (WACM) - Overview

414-06 Accessory Charging	2022 F-150
Description and Operation	Procedure revision date: 07/21/2020

Wireless Accessory Charging Module (WACM) - Overview

The WACM (wireless accessory charging module) is a 5 watt wireless power transmitter designed to energize a secondary coil found in a secondary device such as a smartphone or in an added accessory such as a wireless charging phone sleeve. The WACM (wireless accessory charging module) supports wireless charging of the Wireless Power Consortium's (WPC) Qi (pronounced chee).

The WACM (wireless accessory charging module) node is powered at all times from a fused battery and performs network management on HS-CAN3 (high-speed controller area network 3) . Wireless charging status is provided as a CAN (controller area network) signal on the HS-CAN3 (high-speed controller area network 3) .

The BCM (body control module) provides a protected switch to protected battery input to the WACM (wireless accessory charging module) when an interior passive key search is in progress to disable the wireless charging feature. This prevents possible interference with the passive key when placed in close proximity to the WACM (wireless accessory charging module) during a charge session of a secondary device. A redundant CAN (controller area network) signal is also sent by the BCM (body control module) in addition to the protected switch to protected battery input.

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1	GWM (gateway module A)
2	BCM (body control module)
3	APIM (SYNC module)
4	ACM (audio front control module)
5	WACM (wireless accessory charging module) GWM (gateway module A)

Network Message Chart

APIM (SYNC module) Module Network Input Messages

Broadcast Message	Originating Module	Message Purpose
WACM (wireless accessory charging module) send signals	WACM (wireless accessory charging module)	Contains the status of the WACM (wireless accessory charging module) charging input to be used for FCIM (front controls interface module) display.

WACM (wireless accessory charging module) Module Network Input Messages

Broadcast Message	Originating Module	Message Purpose
ACU_Response_Signals	ACM (audio front control module)	Used by the WACM (wireless accessory charging module) to determine if the AM/FM radio is in use to perform AM (amplitude modulation) avoidance when the tuned band is AM (amplitude modulation) .
ACU_Send_Signals_13	ACM (audio front control module)	Determines if AM (amplitude modulation) is the tuned band and if a seek/scan is taking place to perform AM (amplitude modulation) avoidance.
ACU_Send_Signals	ACM (audio front control module)	Used by the WACM (wireless accessory charging module) to determine if the tuned AM (amplitude modulation) frequency requires AM (amplitude modulation) avoidance.

The WACM (wireless accessory charging module) sends signals to sync to display charging status updates such as wireless charger active and foreign/metal object detected, to the user.

The WACM (wireless accessory charging module) features foreign object detection that detects when foreign objects (metals and non-metals) are placed between the device and the charging surface. When this is detected, the Information and Entertainment Display Unit displays a message until the condition is corrected. For additional tips on how to effectively use the wireless charger, refer to owners literature.

Some devices feature a built-in wireless charging capability. Customers should check with their phone manufacturer to determine if it supports wireless charging. Not all phones are compatible with wireless charging.

Component Description

Body Control Module (BCM)

The BCM (body control module) is a multifunction module that supplies voltage signals and network messages to the WACM (wireless accessory charging module) for the wireless charging function. For additional information about the BCM (body control module),

Refer to: [Module Controlled Functions - System Operation and Component Description](#)

(419-10 Multifunction Electronic Modules, Description and Operation).

Wireless Accessory Charging Module (WACM)

The WACM (wireless accessory charging module) is a 5 watt wireless power transmitter used to inductively charge a single Qi (chee) compatible mobile device. The WACM (wireless accessory charging module) requires PMI (programmable module installation) when it is replaced.

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WACM (wireless accessory charging module)	U0184:00	Lost Communication With Radio: No Sub Type Information	GO to Pinpoint Test E
WACM (wireless accessory charging module)	U201A:51	Control Module Main Calibration Data: Not Programmed	GO to Pinpoint Test G
WACM (wireless accessory charging module)	U2100:00	Initial Configuration Not Complete: No Sub Type Information	GO to Pinpoint Test G
WACM (wireless accessory charging module)	U2101:00	Control Module Configuration Incompatible: No Sub Type Information	GO to Pinpoint Test G
WACM (wireless accessory charging module)	U3000:41	Control Module: General Checksum Failure	GO to Pinpoint Test F
WACM (wireless accessory charging module)	U3000:42	Control Module: General Memory Failure	GO to Pinpoint Test F
WACM (wireless accessory charging module)	U3000:49	Control Module: Internal Electronic Failure	GO to Pinpoint Test F
WACM (wireless accessory charging module)	U3003:16	Battery Voltage: Circuit Voltage Below Threshold	GO to Pinpoint Test C
WACM (wireless accessory charging module)	U3003:17	Battery Voltage: Circuit Voltage Above Threshold	GO to Pinpoint Test C

Symptom Chart(s)

Symptom Chart: WACM (Wireless Accessory Charging Module)

Diagnostics in this manual assume a certain skill level and knowledge of Ford-specific diagnostic practices.

DTC (diagnostic trouble code)	Description	Fault Trigger Condition
BCM (body control module) B1554:11	Wireless Accessory Charger Enable/Disable: Circuit Short To Ground	This DTC (diagnostic trouble code) sets when the module senses lower than expected voltage on the WACM (wireless accessory charging module) hardwired status circuit, indicating a short to ground. The primary method of configuring WACM (wireless accessory charging module) off during an interior key search may not work; the CAN (controller area network) signal backup is the only mechanism to prevent WACM (wireless accessory charging module) from interfering with an interior key search.
BCM (body control module) B1554:13	Wireless Accessory Charger Enable/Disable: Circuit Open	This DTC (diagnostic trouble code) sets when the module senses no voltage on the WACM (wireless accessory charging module) hardwired status circuit, indicating an open circuit. The primary method of configuring WACM (wireless accessory charging module) off during an interior key search may not work; the CAN (controller area network) signal backup is the only mechanism to prevent WACM (wireless accessory charging module) from interfering with an interior key search.

Possible Sources

- Wiring, terminals or connectors
- WACM (wireless accessory charging module)

Visual Inspection and Pre-checks

- Recheck wireless charging process with a known good smart phone that contains the built-in wireless charging technology. Or test wireless charging process with a cell phone with a wireless-capable back cover or adapter.
- With a known Qi Compatible device resting on the WACM (wireless accessory charging module) pad, monitor the FCIM (front controls interface module) (if equipped) or IPC (instrument panel cluster) message center (if equipped) for the WACM (wireless accessory charging module) charging status message "Wireless Charger Active". This message displays after a Qi Compatible device has been laid on the charging pad and has started a wireless charging session (may only appear on first charging session of a given ignition cycle). A recheck of this message can be performed by turning the ignition off, then back on, then placing the Qi compatible device back on the charging pad.
- The "Charge Terminated" message will typically appear within 25 seconds after a foreign object /phone misaligned is detected on the charging pad.
- Inspect for loose or corroded WACM (wireless accessory charging module) connections.

Yes	GO to A3
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No	DIAGNOSE the WACM (wireless accessory charging module) does not communicate with the diagnostic scan tool.
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A3 CHECK THE BCM (BODY CONTROL MODULE) WACM (WIRELESS ACCESSORY CHARGING MODULE) STATUS CIRCUIT FOR A SHORT TO VOLTAGE

- Ignition OFF.
- Disconnect BCM (body control module) C2280B .
- Ignition ON.
- Measure:

Positive Lead	Measurement / Action	Negative Lead
C2280B-11	\bar{V}	Ground

Is there any voltage present?

Yes	REPAIR the circuit.
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No	GO to A4
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A4 CHECK THE BCM (BODY CONTROL MODULE) WACM (WIRELESS ACCESSORY CHARGING MODULE) STATUS CIRCUIT FOR A SHORT TO GROUND

- Measure:

Positive Lead	Measurement / Action	Negative Lead
C2280B-11	Ω	Ground