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1987 FORD Mustang OEM Service and Repair Workshop Manual

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CAN (high-speed controller area network) to the ACM (audio front control module) , to control SYNC functions.

Bluetooth Mode

The APIM (SYNC module) supports multiple Bluetooth profiles, allowing the SYNC system to interact with both Bluetooth-enabled phones and Bluetooth-enabled media devices.

USB (universal serial bus) Mode

The APIM (SYNC module) receives serial data input from connected USB (universal serial bus) devices. The USB (universal serial bus) cables to the APIM (SYNC module) are shielded to prevent interference from electromagnetic sources. The APIM (SYNC module) provides 5 volt power for the USB (universal serial bus) port in the media hub.

Voice Commands

When the steering wheel voice button is pressed, a CAN (controller area network) message is sent to the APIM (SYNC module) , initiating the voice command feature.

When voice commands are spoken, the monitored sounds are converted into analog signals by the microphone and sent to the APIM (SYNC module) . The APIM (SYNC module) software interprets them and outputs a command.

Compass

NOTE

To identify the SYNC system, click on the "ADDITIONAL INFORMATION" link on the OASIS tab on PTS (Professional Technician System) .

SYNC 4 Low is identified by the code IEVAR.

SYNC 4 is identified by the code IEVAQ.

The GPS (global positioning system) antenna is used to acquire the compass heading.

SYNC 4 Low

The compass data is sent through the GPS (global positioning system) cable to the TCU (telematic control unit module) . The TCU (telematic control unit module) uses this data to calculate and provide accurate vehicle tracking. The TCU (telematic control unit module) processes the data and transmits it through the CAN (controller area network) to the APIM (SYNC module) and the IPC (instrument panel cluster) for the vehicle location and compass display.

SYNC 4

The compass data is sent through the GPS (global positioning system) cable to the APIM (SYNC module) . The APIM (SYNC module) uses this data in addition to wheel speed and wheel rotation direction messages from

This feature is not available in North America.

FordPass (if equipped)

The FordPass system uses the TCU (telematic control unit module) to communicate via the cellular network with a device running the FordPass application. The TCU (telematic control unit module) communicates with other vehicle modules over the CAN (controller area network) to obtain information or to carry out application commands, depending on the request.

The primary means of communication between the TCU (telematic control unit module) and the cellular network uses a cellular antenna integrated into the GPS (global positioning system) /satellite radio antenna. A separate coaxial cable connects the cellular portion of the antenna to the TCU (telematic control unit module) . The secondary means of communication between the TCU (telematic control unit module) and the cellular network is the secondary cellular (TCU (telematic control unit module)) antenna. The TCU (telematic control unit module) antenna connects to the TCU (telematic control unit module) via a coaxial cable.

FordPass data is transmitted via the cellular network to a server or cellular device with the FordPass application installed. The data received via the cellular network from the device application is processed by the GWM (gateway module A) , which can make vehicle system commands via the CAN (controller area network) .

All communication of the GWM (gateway module A) to the cloud via the TCU (telematic control unit module) for the Ford Pass feature is done through the Ethernet cable.

Vehicle Wi-Fi Hotspot (if equipped)

The TCU (telematic control unit module) provides the vehicle Wi-Fi access point.

The TCU (telematic control unit module) communicates to the cellular network by two means. The primary connection is through the cable to the cellular antenna incorporated into the GPS (global positioning system) /Satellite antenna. The secondary means is through the cable to the secondary cellular (TCU (telematic control unit module)) antenna.

Over The Air Updates (if equipped)

Refer to: Module Configuration - System Operation and Component Description(418-01B Module Configuration - Vehicles With: Over-the-Air (OTA) Programming, Description and Operation).

Component Description

AM (amplitude modulation) / FM (frequency modulation) 1/ DAB (digital audio broadcasting) Antenna

The AM (amplitude modulation) / FM (frequency modulation) 1/ DAB (digital audio broadcasting) antenna (also called the audio unit antenna) is an aerial antenna, mounted to the right side of the cowl. It receives AM (amplitude modulation) / FM (frequency modulation) / DAB (digital audio broadcasting) radio waves and sends them through the audio unit antenna amplifier to the ACM (audio front control module) via the audio unit antenna coaxial cable.

The SCCM (steering column control module) requires PMI (programmable module installation) when it is replaced.

SECM (steering effort control module)

The voltage drop over an internal SECM (steering effort control module) resistor is changed by the different audio switch function resistances. The SECM (steering effort control module) monitors the voltage drop across its internal resistor to determine which steering wheel switch is pressed.

The SECM (steering effort control module) requires PMI (programmable module installation) when it is replaced.

Media Hub

The media hub contains two USB (universal serial bus) ports and is powered by the APIM (SYNC module) . The media hub has an internal 5 volt power source for the USB (universal serial bus) ports. Each port consists of two circuit connections for the 5 volt power, plus two more circuits for digital serial data.

The APIM (SYNC module) provides the 12 volt power source and ground for the internal USB (universal serial bus) switch to control data flow between each port. Data is sent from the two media hub USB (universal serial bus) ports to the APIM (SYNC module) through a USB (universal serial bus) cable.

LVDS (low voltage differential signaling) Cable

The four-circuit (8 inch monitor) or six-circuit (12 inch monitor) shielded LVDS (low voltage differential signaling) cable provides power and ground from the APIM (SYNC module) to the display unit processor. Data is transmitted between the APIM (SYNC module) and the display unit via the LVDS (low voltage differential signaling) cable.

Display Unit

The APIM (SYNC module) and the display unit exchange information via the LVDS (low voltage differential signaling) cable. The APIM (SYNC module) can communicate display unit-related Diagnostic Trouble Codes (DTCs) over the CAN (controller area network) . The display unit itself does not communicate over the CAN (controller area network) .

The APIM (SYNC module) provides the display unit with power and ground through the LVDS (low voltage differential signaling) cable for vehicles equipped with the 8 inch display unit. A separate connector is used to provide power and ground for vehicles with the 12 inch display unit.

Audio Control Panel

The audio control panel transfers button press data over a dedicated LIN (local interconnect network) to the APIM (SYNC module) .

The audio control panel does not require PMI (programmable module installation) when it is replaced.

The audio control panel is not equipped on vehicles with a 15 inch center display.

ACM (audio front control module)

USB (universal serial bus) drive, the APIM (SYNC module) CIP (consumer interface processor) writes the new software level and VIN (vehicle identification number) back to the USB (universal serial bus) drive. The vehicle owner must transmit this information back to Ford via the internet.

BCM (body control module)

The BCM (body control module) contains the clock software and sends the date/time data information to other modules via the CAN (controller area network) .

ACM (audio front control module)	B150C:13	Automobile Audio Bus (A2B) Node 1: Circuit Open	GO to Pinpoint Test C
ACM (audio front control module)	B150C:55	Automobile Audio Bus (A2B) Node 1: Not Configured	GO to Pinpoint Test C
ACM (audio front control module)	B150C:87	Automobile Audio Bus (A2B) Node 1: Missing Message	GO to Pinpoint Test C
ACM (audio front control module)	B150C:8F	Automobile Audio Bus (A2B) Node 1: Erratic	GO to Pinpoint Test C
ACM (audio front control module)	B150C:95	Automobile Audio Bus (A2B) Node 1: Incorrect Assembly	GO to Pinpoint Test C
ACM (audio front control module)	B1511:01	Automobile Audio Bus (A2B) Master Node: General Electrical Failure	GO to Pinpoint Test C
ACM (audio front control module)	B1511:11	Automobile Audio Bus (A2B) Master Node: Circuit Short To Ground	GO to Pinpoint Test C
ACM (audio front control module)	B1511:12	Automobile Audio Bus (A2B) Master Node: Circuit Short To Battery	GO to Pinpoint Test C
ACM (audio front control module)	B1511:13	Automobile Audio Bus (A2B) Master Node: Circuit Open	GO to Pinpoint Test C
ACM (audio front control module)	B1511:95	Automobile Audio Bus (A2B) Master Node: Incorrect Assembly	GO to Pinpoint Test C
ACM (audio front control module)	B1A01:01	Speaker #1: General Electrical Failure	GO to Pinpoint Test F

ACM (audio front control module)	B1A02:12	Speaker #2: Circuit Short To Battery	GO to Pinpoint Test F
ACM (audio front control module)	B1A02:12	Speaker #2: Circuit Short To Battery	GO to Pinpoint Test H
ACM (audio front control module)	B1A02:13	Speaker #2: Circuit Open	GO to Pinpoint Test F
ACM (audio front control module)	B1A02:13	Speaker #2: Circuit Open	GO to Pinpoint Test H
ACM (audio front control module)	B1A03:01	Speaker #3: General Electrical Failure	GO to Pinpoint Test F
ACM (audio front control module)	B1A03:01	Speaker #3: General Electrical Failure	GO to Pinpoint Test G
ACM (audio front control module)	B1A03:01	Speaker #3: General Electrical Failure	GO to Pinpoint Test H
ACM (audio front control module)	B1A03:11	Speaker #3: Circuit Short To Ground	GO to Pinpoint Test F
ACM (audio front control module)	B1A03:11	Speaker #3: Circuit Short To Ground	GO to Pinpoint Test G
ACM (audio front control module)	B1A03:11	Speaker #3: Circuit Short To Ground	GO to Pinpoint Test H
ACM (audio front control module)	B1A03:12	Speaker #3: Circuit Short To Battery	GO to Pinpoint Test F

ACM (audio front control module)	B1A04:12	Speaker #4: Circuit Short To Battery	GO to Pinpoint Test F
ACM (audio front control module)	B1A04:12	Speaker #4: Circuit Short To Battery	GO to Pinpoint Test G
ACM (audio front control module)	B1A04:12	Speaker #4: Circuit Short To Battery	GO to Pinpoint Test H
ACM (audio front control module)	B1A04:13	Speaker #4: Circuit Open	GO to Pinpoint Test F
ACM (audio front control module)	B1A04:13	Speaker #4: Circuit Open	GO to Pinpoint Test G
ACM (audio front control module)	B1A04:13	Speaker #4: Circuit Open	GO to Pinpoint Test H
ACM (audio front control module)	B1A06:01	Speaker #6: General Electrical Failure	GO to Pinpoint Test F
ACM (audio front control module)	B1A06:11	Speaker #6: Circuit Short To Ground	GO to Pinpoint Test F
ACM (audio front control module)	B1A06:12	Speaker #6: Circuit Short To Battery	GO to Pinpoint Test F
ACM (audio front control module)	B1A06:13	Speaker #6: Circuit Open	GO to Pinpoint Test F
ACM (audio front control module)	B1A07:13	Speaker #7: Circuit Open	GO to Pinpoint Test H

ACM (audio front control module)	U0198:00	Lost Communication With Telematic Control Module: No Sub Type Information	GO to Pinpoint Test AH
ACM (audio front control module)	U0238:00	Lost Communication With Digital Audio Control Module "D": No Sub Type Information	GO to Pinpoint Test AI
ACM (audio front control module)	U0253:00	Lost Communication With Accessory Protocol Interface Module: No Sub Type Information	GO to Pinpoint Test AJ
ACM (audio front control module)	U201A:51	Control Module Main Calibration Data: Not Programmed	GO to Pinpoint Test AO
ACM (audio front control module)	U201B:04	Control Module Calibration Data #2: System Internal Failure	GO to Pinpoint Test AO
ACM (audio front control module)	U201B:51	Control Module Calibration Data #2: Not Programmed	GO to Pinpoint Test AO
ACM (audio front control module)	U201B:55	Control Module Calibration Data #2: Not Configured	GO to Pinpoint Test AO
ACM (audio front control module)	U2024:00	Control Module Cal-Config Data: No Sub Type Information	GO to Pinpoint Test AO
ACM (audio front control module)	U2024:57	Control Module Cal-Config Data: Invalid / Incompatible Software Component	GO to Pinpoint Test AO
ACM (audio front control module)	U2026:54	Control Module Cal-Config Data #3: Missing Calibration	GO to Pinpoint Test AO
ACM (audio front control module)	U2100:00	Initial Configuration Not Complete: No Sub Type Information	GO to Pinpoint Test AO

			O
APIM (SYNC module)	B108E:4B	Display: Over Temperature	GO to Pinpoint Test O
APIM (SYNC module)	B108E:87	Display: Missing Message	GO to Pinpoint Test O
APIM (SYNC module)	B119F:01	GPS Antenna: General Electrical Failure	GO to Pinpoint Test W
APIM (SYNC module)	B119F:13	GPS Antenna: Circuit Open	GO to Pinpoint Test W
APIM (SYNC module)	B1252:11	USB Port: Circuit Short to Ground	GO to Pinpoint Test S
APIM (SYNC module)	B1252:13	USB Port: Circuit Open	GO to Pinpoint Test S
APIM (SYNC module)	B14FD:11	External Media Control Connectivity: Circuit Short To Ground	GO to Pinpoint Test S
APIM (SYNC module)	B156D:54	TCU Customer Connectivity Settings Synchronization With HMI: Missing Calibration	GO to Pinpoint Test AU
APIM (SYNC module)	B156D:89	TCU Customer Connectivity Settings Synchronization With HMI: Data Transfer Failure	GO to Pinpoint Test AU
APIM (SYNC module)	B15EB:57	Consumer Apps: Invalid / Incompatible Software Component	GO to Pinpoint Test AU
APIM (SYNC module)	B1D79:11	Microphone Input: Circuit Short To Ground	GO to Pinpoint Test Q