CERTAIN 2021 MODEL YEAR F-150 AND MUSTANG MACH-E VEHICLES WITH FORD CO-PILOT360™ ACTIVE 2.0 PREP PACKAGE (INCLUDES FORD BLUECRUISE PREP KIT) - BLUECRUISE MODULE PROGRAMING

IMPORTANT: ERROR PREVENTION - Follow all steps exactly as written for successful programing. It is suggested to print this instruction in COLOR.

SERVICE PROCEDURE

NEW! Module Programming

1. From the vehicle settings menu disable the 30 minute max idle option.

   • For F-150 vehicles, from the center display screen press the vehicle Settings button and turn **OFF** the **30 min Max Idle** setting. See Figure 1.

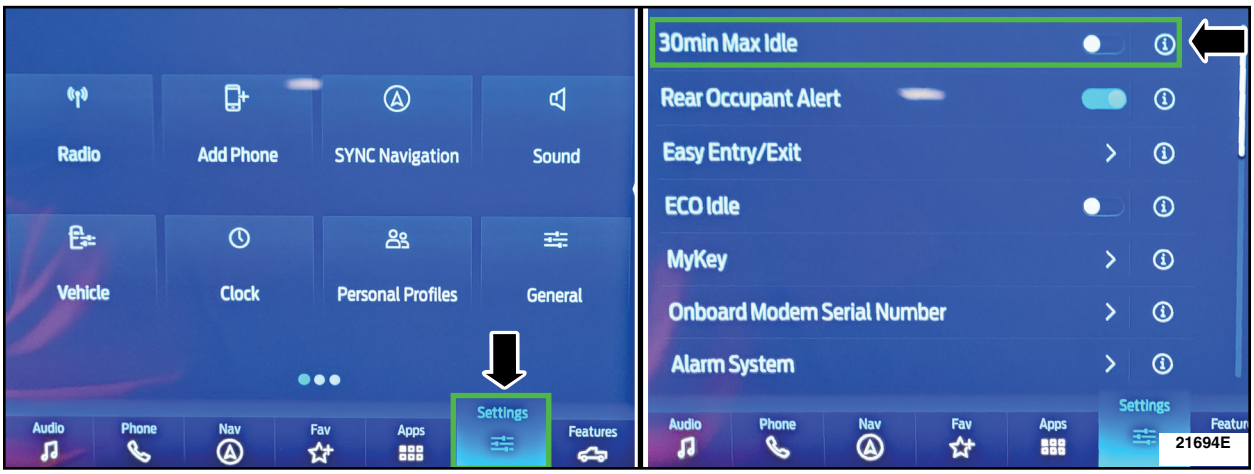

FIGURE 1

   • For Mach-E vehicles, from the center display screen press the vehicle icon in the upper left corner > select the Vehicle setting tab > and turn **OFF** the ***Vehicle Power Down Timer.*** See Figure 2.

FIGURE 2

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2. Check the vehicle's **State Of Charge Parameter Identification Data (PID)** by performing the following:

   - Launch the Ford Diagnostic and Repair System (FDRS) and navigate to toolbox tab > datalogger > BCM and select **BATT_SOC PID**.
   - Ensure that the **BATT_SOC PID** reads over **80%**. If the PID is less than 80%, fully recharge the vehicle's 12-volt battery using the appropriate Rotunda battery tester and charger.
   - Remove the charger from the vehicle and using FDRS, navigate to toolbox tab > **BCM** > **Reset Battery**.
   - Monitor Sensor Learned Values application. Perform the Battery Monitoring System (BMS) reset.
   - Connect the Rotunda battery tester and charger and set it to maintain 12.6 to 13.6 volts. Monitor the voltage real time using the indicator at the bottom right corner of FDRS to ensure that it is within this range.

NOTE: Verify that the negative cable of the charger is installed on a chassis or engine ground, and not the 12 volt battery negative terminal to prevent the battery saver mode from activating on the vehicle.

NOTE: If the diagnostic software does not load or if the vehicle cannot be identified properly, make sure there is a good internet connection and the Vehicle Communication Module (VCM) is properly connected to the Data Link Connector (DLC).

NOTE: VCM 3 is recommended for improved data download time.

3. Log into Ford Diagnostic and Repair System (FDRS). Ensure FDRS is updated to the latest version at ***35.5.5*** or higher.

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NOTE: A 32GB or larger USB flash drive is required for APIM, TCU, Cluster, and GWM software updates. Make sure the USB flash drive being used is formatted correctly. To see the available drives, hold down the Windows icon keyboard key and press the E keyboard key. Right click on the USB flash drive and select Properties. If File System under the General tab is not exFAT, the drive must be formatted.

- To format the USB flash drive:
  - Right click on the USB flash drive
  - Select Format, select exFAT for the File System
  - Select Default Allocation Size for the Allocation Unit Size.
  - De-selecting Quick Format is not necessary and will result in a lengthier operation. See Figure 3.

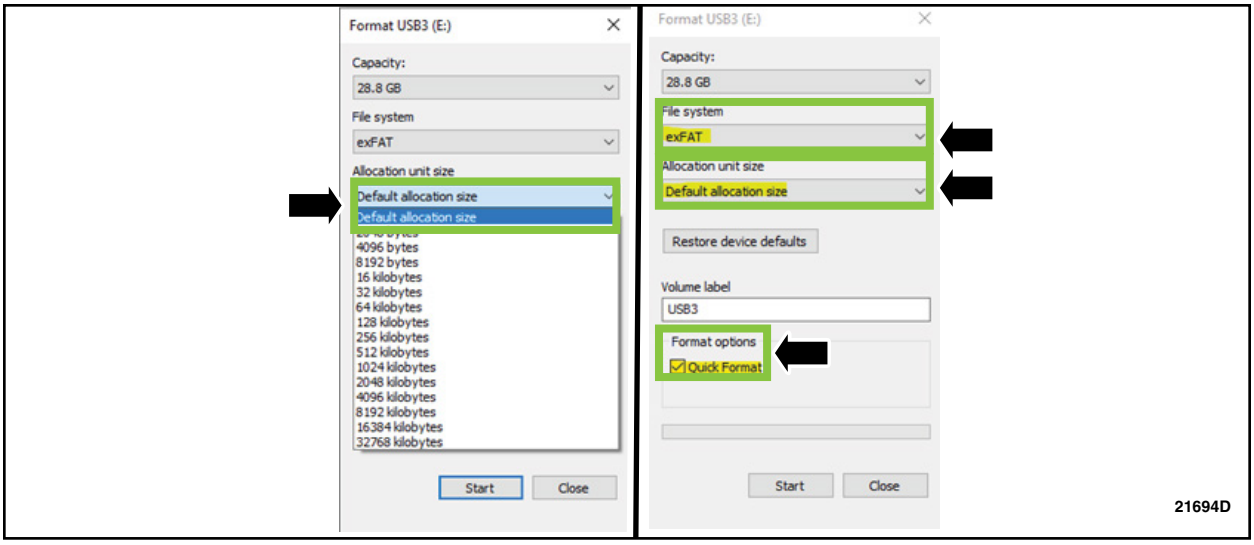

FIGURE 3

4. Start a new FDRS session.

NOTE: Vehicle information is automatically retrieved by the diagnostic software and a Network Test is run. Vehicle identification data appears on the screen when this is complete.

5. Select **Toolbox** tab.

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NEW!

STEPS 6 THROUGH 11 WILL BE USED MULTIPLE TIMES DURING STEPS 13 THROUGH 26.

6. Select **Software Updates** tab to see updates available.

7. Select the module from the Module Programming Sequence section below starting at Step *13*.

8. When prompted by the FDRS, connect the USB flash drive to the personal computer (PC).

9. When prompted by the FDRS, safely remove/eject the USB flash drive from the PC, turn the vehicle to Key On Engine Running (KOER), and connect the USB to the media hub to install the software update. The update starts automatically and may take 10 minutes or longer to complete.

NOTE: It may take up to 5 minutes for the vehicle to recognize the USB flash drive software update.

10. For APIM, TCU, IPC, and GWM USB software updates when center display screen prompts to restart the vehicle:
    - Turn the vehicle **OFF**.
    - Wait ten (10) minutes.
    - Turn the vehicle to **KOER**.

11. Leave the USB drive inserted into the vehicle, until the vehicles center display screen states **programming successful**.

NOTE: It may take up to 5 minutes before center display screen displays a "Programing Successful" pop up. After 5 minutes if “Successful” pop up is not shown on center display screen, remove the USB and select **YES** on the FDRS “Was the USB Update Successful” prompt (FDRS verifies if the module software update was successfully installed on the module).

NOTE: *See Steps 6-11 while performing steps 13-26.*

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MODULE PROGRAMMING SEQUENCE

IMPORTANT NOTE: Modules need to be programmed in **EXACTLY** the order as listed below (some are repeated) unless there is no update available. Module updates will vary per vehicle based on Ford Power-UP over-the-air (OTA) updates previously completed. Some modules may already be at the latest level.

*12. Check SYNC Software Version and Product Revision numbers using the SYNC Display; OTA updates may have taken place. Go to **SYNC** and selecting **General**, then **Settings**, then **About SYNC**. See Figure 4.*

- *If the SYNC 4 Software Version is:*
  - ***21146**_Product Revision: **145**, proceed to Step 16.*
  - ***21174**_Product Revision: **168**, proceed to Step 16.*
  - ***22087**_Product Revision: **415**, proceed to Step 19.*
  - ***22177**_Product Revision: **473**, proceed to Step 24.*
  - ***22228**_Product Revision: **539**, proceed to Step 24.*
  - ***22293**_Product Revision: **610**, proceed to Step 24.*
  - ***23031**_Product Revision: **713**, proceed to Step 24.*

- *If the SYNC version in the vehicle does **NOT** match any of the above, proceed to Step 13.*

NOTE: Mach-E shown, F-150 similar.

FIGURE 4

13. Select **GWM** - Gateway Module (GWM) – software update.
    - See Steps 6-11.
    - Run application.
    - If no more software updates are available, move to the next module in the sequence.

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NOTE: If FSA 22B08 is open for this vehicle, perform that field action before proceeding.

14. Select **TCU** - Telematics Control Unit (TCU) - software update.
    - See Steps 6-11.
    - Run application.
    - If error message is shown on center display screen or there is no activity after 10 minutes:
        - See TSB 22-2404 - Module Recovery.
        - Retry TCU software update with same USB drive.
    - If no more software updates are available, move to the next module in the sequence.

15. Select **APIM** - Accessory Protocol Interface Module (APIM/SYNC) - software update.
    - See Steps 6-11.
    - Run application.
    - Follow General Service Bulletin (GSB) 21-7088 - SYNC Programming, USB flash drive method.
    - If error message is shown on center display screen or there is no activity after 10 minutes:
        - See TSB 22-2404 - Module Recovery.
        - Retry APIM software update with same USB drive.
    - If no more software updates are available, move to the next module in the sequence.

NOTE: *Several modules require updates to be made in phases. Follow all steps exactly as written.*

*16. Select **GWM - Read the Gateway Module A (GWM) Configuration Data** application.*
    - Run application.

17. Select **GWM -** Gateway Module (GWM) - software update.
    - See Steps 6-11.
    - Run application.
    - If no more software updates are available, move to the next module in the sequence.

18. Select **APIM** - Accessory Protocol Interface Module (APIM)/TCU - Telematics Control Unit (TCU) - software update.
    - See Steps 6-11.
    - Run application.
    - If no update is available, move to the next module in the sequence.

19. Select **GWM** - Gateway Module (GWM) - software update.
    - See Steps 6-11.
    - Run application.
    - If no update is available, move to the next module in the sequence.

*20. Select **APIM - SYNC - Module [APIM] Software Update.***
    - *See Steps 6-11.*
    - *Run application.*
    - *If no update is available, move to the next module in the sequence.*

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*21. Mach-E vehicles **ONLY** - **Not required for F-150:***

- *Select **Toolbox** tab.*
- *From the list on the LH side of the screen, select the **PCM**.*
- *From the list on the RH side of the screen, select **PCM - Powertrain Control Module (PCM)** Software Update.*
  - *This will be a coordinated update of multiple modules*
- *Click **RUN**. Follow all on-screen instructions carefully.*
- *If no more software updates are available, move to the next module in the sequence.*

*22. Select **IPC** from the Toolbox menu:*
Is the Instrument Panel Cluster (IPC) - software update application available?

- *YES - Proceed to Step A.*
- *NO - Proceed to Step 23.*

Step A: See Steps 6-11. Run application. Proceed to step B.

Step B: Did the IPC application complete successfully?

- *YES - Proceed to Step 23.*
- *NO - If IPC module fails to update over USB, FDRS will ask "Did the update install successfully?", select **NO**. Proceed to step C.*

*Step C: Follow FDRS prompts and select: **Try CAN programming process.***

- *This takes approximately **5 hours** using **VCM3** (program time is significantly longer with VCM2).*
- *No tech interaction is needed once programming has started.*
- *Once programing has completed, proceed to Step 23.*

*23. Select **IPMA** – **Image Processing Module A (IPMA) - software update.***
- *See Steps 6-11.*
- *Run application*
- *This will be a coordinated update of four modules.*
- *Select **OK** if conditions are met to continue to next module including; Camera Module Rear (CMR),then Cruise Control Module (CCM) module, and then the Power Steering Control Module (PSCM).*
- *Preform TSB's 22-2121 and 23-2040 if they apply.*
- *If no more software updates are available, move to the next module in the sequence.*

*24. Select **APIM** - **Enable BlueCruise Prep Kit**.*
- *Download and run Application.*

25. Perform ten (10) ignition cycles (off/on) to update the BlueCruise map subscription expiration date.

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26. Confirm 2073 BlueCruise map expiration:

Go to **SYNC** and selecting **General**, then **Settings**, then **About SYNC**.

- Ensure the "Hands-Free Driving Mode available" shows a date *of 2073*.
- See Figure 5 below for Mach-E, F-150 similar.
- Date structure listed as **Day – Month – Year**.
- Figure 5 example shows an expiration date of March 14, 2022 which is past.
- If the expiration *year is* ***NOT 2073***, the GWM has not been fully updated, return to Step 12.

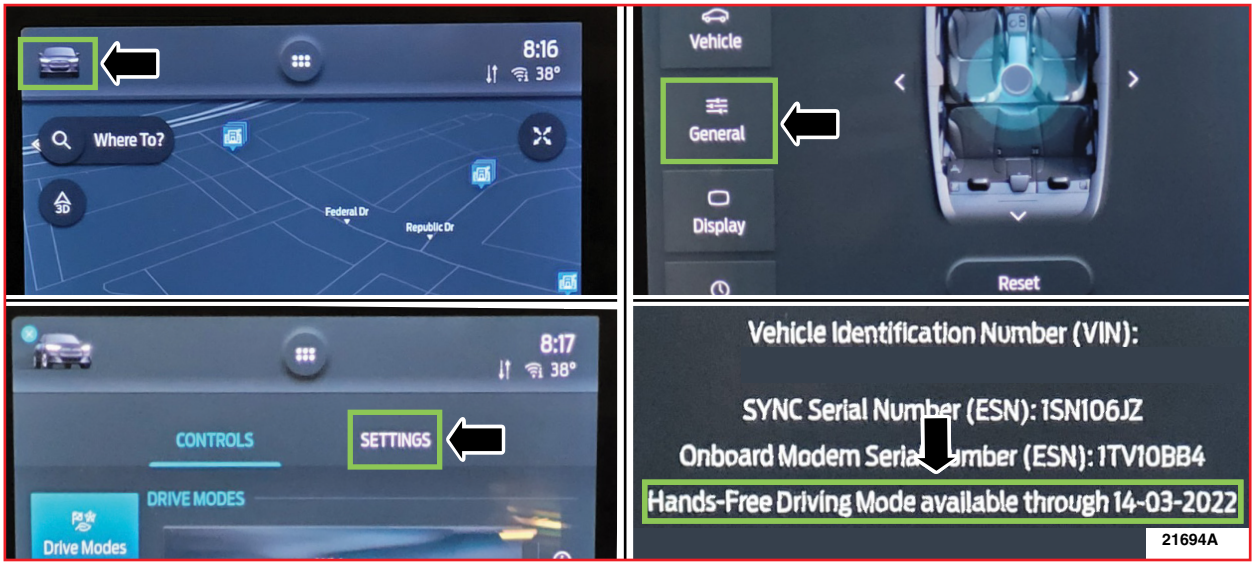

FIGURE 5

27. **Mach-E vehicles ONLY -** Not required for F-150:
    - Select Toolbox tab in FDRS.
    - Select **APIM** – Reset the SYNC module [APIM] / **Download** and **Run**.
    - *Select **APIM** – Reset the SYNC module [APIM] / **Run**.*
        - *This is two (2) hardware resets for SYNC* (otherwise hands-free option will not be visible).

28. **F-150 vehicles ONLY -** Not required for Mach-E:
    - Select Toolbox tab in FDRS.
    - Select **APIM** – Reset the SYNC module [APIM] / **Download** and **Run**.
        - *This is a hardware reset for SYNC* (otherwise hands-free option will not be visible).

NOTE: Program appropriate vehicle modules before performing diagnostics and clear all DTCs after programming. For DTCs generated after programming, follow normal diagnostic service procedures.

29. Testing BlueCruise to confirm installation (BlueCruise test drive over 0.5 hours is optional but recommended to confirm operation).

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NOTE: There are both **Hands-ON** and **Hands-FREE** driving assist modes. Both functions are enabled by turning on “Lane Centering Assist with Hands-Free.”

30. "Turn ON": **Adaptive Cruise Control, Lane Centering with Hands-Free,** and **Activation Prompts.** See Figure 6.

- Touch **Settings** on vehicle's center display screen
- Tap **Driver Assistance.**
- Select **Cruise Control**.
- Press **Lane Centering with Hands-Free** - *Only available if programing successful.*
- Touch **Activation Prompts**.

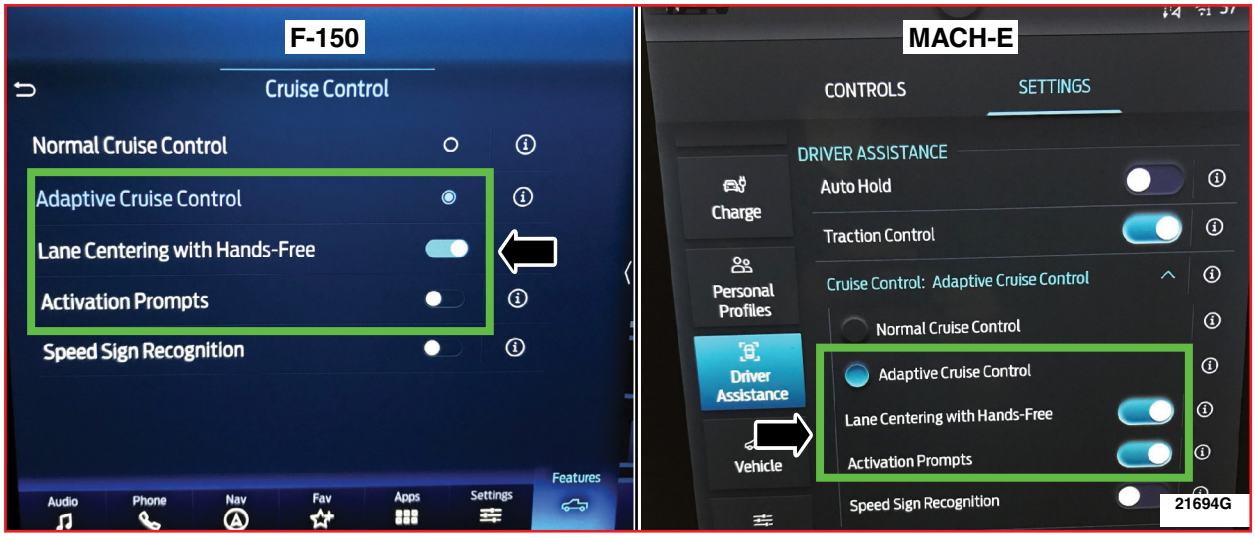

FIGURE 6

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31. Determine the nearest hands-free Blue Zone roadway entry ramp locations near your Dealership.
    - See attachment IV - which now includes a route finding map link as an option.
    - GPS Coordinates can be used with online mapping to provide directions from dealer. Ranked per closest entry point.
    - Some dealers may not have a Blue Zone within a reasonable distance but can still test the Hands-On function.
    - The Hands-On function can still be tested on any open highway with clearly defined lane markings with a vehicle speed above 40 mph (64kmh).
    - If test drive can be completed within the allocated Labor Time of 0.5 Hours, perform test drive.

NOTE: If "Intelligent Cruise Control" is shown under the Cruise Control menu – The BlueCruise programing is **NOT** complete. Return to Step 12. See Figure 7.

NOTE: F-150 shown, Mach-E similar.

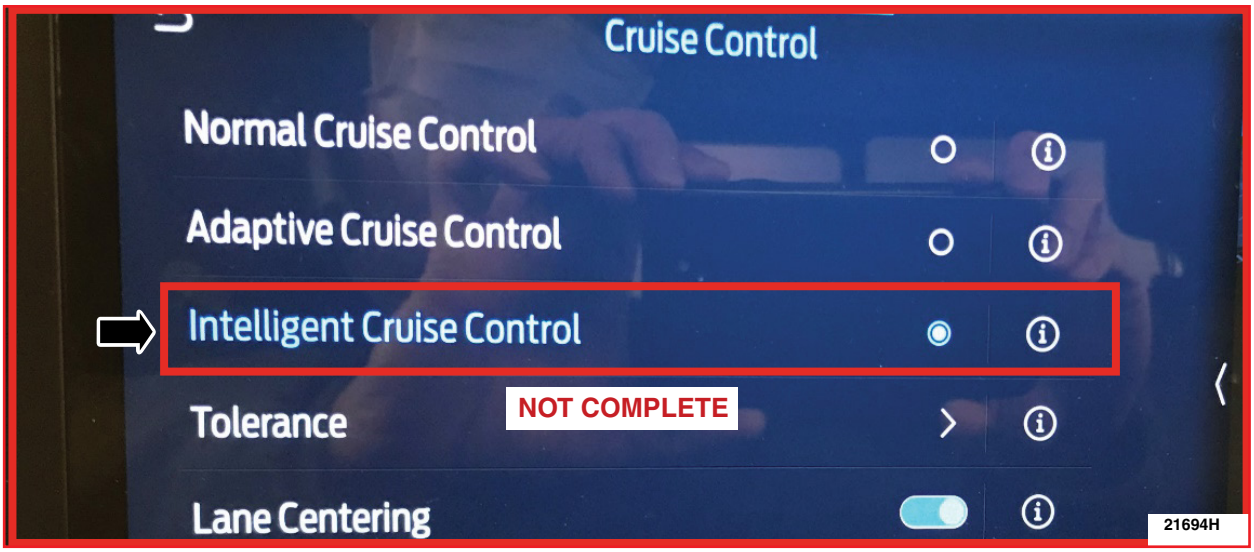

FIGURE 7

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32. Use the steering wheel button to turn ON **Lane Keep Assist.** See Figure 8.

FIGURE 8

33. To verify “Hands-ON” or "Hands-OFF" drive assist, press the cruise control steering wheel button to activate when the following conditions are satisfied. See Figure 9.
    - Settings from previous steps are verified.
    - All vehicle cameras are clean.
    - Drive above 40 mph (64.37 kph).
    - Drive on a road surface with well-marked lane lines.
    - The same conditions are needed for Hands-OFF drive assist.

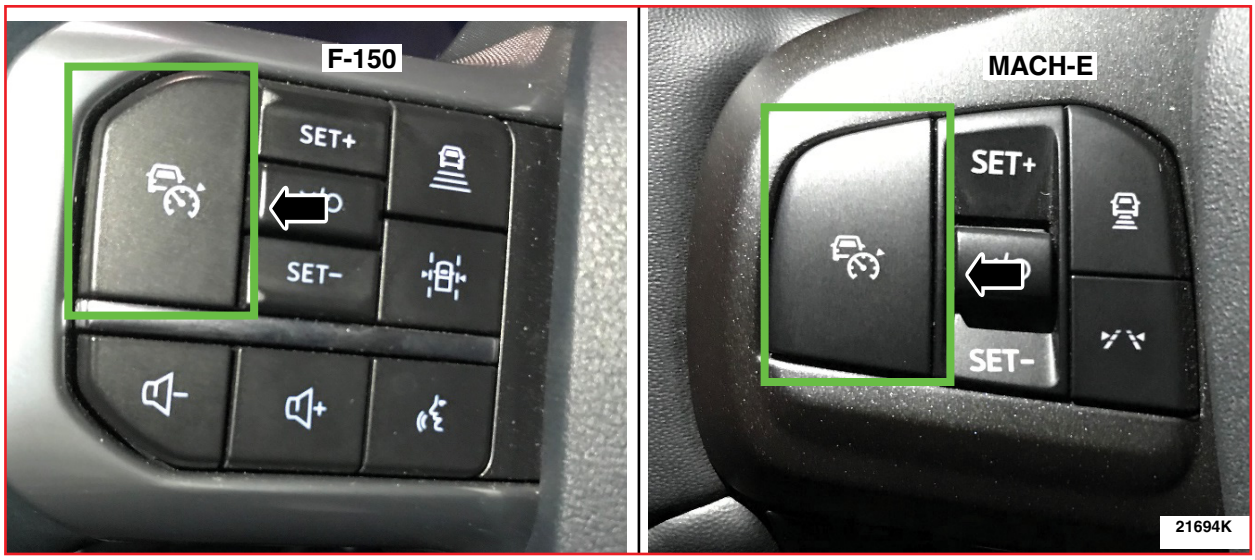

FIGURE 9

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34. Optional verification if performing Hands-OFF BlueCruise test drive *when the following conditions are satisfied.* See Figure 10.
    - All previous parameters and settings are met.
    - Driving in confirmed Blue Zone.
    - Activate cruise control from the steering wheel button.
    - A blue IPC screen and “Hands-Free” icon present indicates full BlueCruise functionality.

NOTE: F-150 shown, Mach-E similar.

FIGURE 10

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Important Information for Module Programming

NOTE: When programming a module, use the following basic checks to ensure programming completes without errors.
- Make sure the 12V battery is fully charged before carrying out the programming steps.
- Connect FDRS/scan tool to a power source.

NOTE: A good internet connection is necessary to identify the vehicle and to load the diagnostic software.
- Inspect VCM/VCMM and cables for any damage. Make sure scan tool connections are not interrupted during programming.
- A hardwired connection is strongly recommended.
- Turn off all unnecessary accessories (radio, heated/cooled seats, headlamps, interior lamps, HVAC system, etc.) and close doors.
- Disconnect/depower any aftermarket accessories (remote start, alarm, power inverter, CB radio, etc.).
- Follow all scan tool on-screen instructions carefully.
- Disable FDRS/scan tool sleep mode, screensaver, hibernation modes.
- Create all sessions key-on-engine-off (KOEO). Starting the vehicle before creating a session will cause errors within the programming inhale process.

Recovering a module when programming has resulted in a blank module

a. Disconnect the VCM II/VCM III or the VCMM from the data link connector (DLC) and your PC.
b. After ten seconds, reconnect the VCMII/VCMIII or the VCMM to the DLC and the PC. Launch FDRS. The VCMII/VCMIII or the VCMM icon should turn green in the bottom right corner of the screen. If it does not, troubleshoot the FDRS to VCM connection.
c. If you are using the same FDRS as the initial programming attempt, select the appropriate VIN from the Vehicle Identification menu. If you are using a different FDRS, select “Read VIN from Vehicle” and proceed through the Network Test.
d. In the Toolbox menu, navigate to the failed module and Download/Run Programmable Module Installation (PMI). Follow the on-screen prompts. When asked if the original module is installed, select “No” and continue through the installation application.
e. Once programming has completed, a screen may list additional steps required to complete the programming process. Make sure all applicable steps are followed in order.

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