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2010 FORD Focus Wagon OEM Service and Repair Workshop Manual

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In order to utilize the PTBA (Pro Trailer Backup Assist) system, each trailer must be set up once. Some trailer specifications have to be entered through the audio system display trailer towing tab. The trailer information is stored in the audio system display for easy recall and the system can store up to a maximum of 10 different conventional trailers. Refer to the Owner's Literature (Pro Trailer Backup Assist Quick Start Guide) to find the detailed steps and instructions required to properly position the vehicle and trailer in order to setup, calibrate and operate the PTBA (Pro Trailer Backup Assist) system. Refer to the Owner's Literature for tips to resolve warnings or difficulties that may occur during setup.

After the PTBA (Pro Trailer Backup Assist) system is setup, the driver can adjust the curvature of the trailer path using the PTBA (Pro Trailer Backup Assist) control knob. The PTBA (Pro Trailer Backup Assist) control knob includes a button to enable and disable the system and the user rotates the knob to control the direction of the trailer while reversing. When the PTBA (Pro Trailer Backup Assist) control knob button is pressed and a stored trailer is selected, the audio system display prompts the driver to shift to REVERSE (R) to activate the system. When the system is in use, releasing the PTBA (Pro Trailer Backup Assist) control knob allows the knob to return to center or zero curvature and the vehicle follows the trailer path. Pressing and releasing the PTBA (Pro Trailer Backup Assist) control knob button or turning the steering wheel at any time the system is active, disables the PTBA (Pro Trailer Backup Assist) system. If the system is disabled by the operator after the system starts to control the steering, the audio system display displays a PTBA (Pro Trailer Backup Assist) canceled message followed by a warning chime.

The PSCM (power steering control module) uses the hitch angle to determine the correct steering angle. The hitch angle is received from the rear parking aid camera or a trailer yaw rate sensor through the RCM (restraints control module) .

The PTBA (Pro Trailer Backup Assist) system keeps the trailer angle and speed within reasonable operating limits enabling the driver to control the path of the trailer. Vehicle speed is always limited to below 10 km/h (6 mph) when the PTBA (Pro Trailer Backup Assist) system is active and the feature deactivates if 10 km/h (6 mph) is exceeded. Vehicle brakes may be automatically applied and engine torque may be automatically reduced to limit speed. The target speed limit varies depending on operating conditions but can be as low as 3 km/h (2 mph).

Several modules communicate with each other to control the PTBA (Pro Trailer Backup Assist) system functions. The TRM (trailer module) reads the PTBA (Pro Trailer Backup Assist) control knob and button analog signals and sends them through the GWM (gateway module A) to the PSCM (power steering control module) . The rear parking aid camera captures the trailer and target sticker image on the trailer and sends the data to the IPMA (image processing module A) over two video signal circuits. The IPMA (image processing module A) reads the video signal from the rear parking aid camera and determines the tracking status and trailer angle. The trailer angle data is then sent from the IPMA (image processing module A) to the PSCM (power steering control module) . For trailers using a trailer yaw rate sensor, the RCM (restraints control module) reads the trailer yaw rate sensor to determine the hitch angle and sends the information through the GWM (gateway module A) to the PSCM (power steering control module) . The PSCM (power steering control module) uses all the data it receives from each interfacing module to control overall PTBA (Pro Trailer

PTBA (Pro Trailer Backup Assist) and Trailer Reverse Guidance Camera Views

When the ignition is ON, the PTBA (Pro Trailer Backup Assist) control knob button is in the on position and reverse gear is selected, the camera system activates the PTBA (Pro Trailer Backup Assist) and Trailer Reverse Guidance camera views that are shown on the audio system display. There are several camera views that are available in the PTBA (Pro Trailer Backup Assist) and Trailer Reverse Guidance system. The different views are accessed by pressing the camera view soft button on the audio system display allowing the driver to cycle through the rear parking aid camera views. The following views are available:

View name	Description
Rear 360 + Rear Normal	Contains the normal rear parking aid camera view, shown next to a 360 degree camera view.
Rear Normal	Provides an image of what is directly behind the vehicle.
Rear Split	Shows 180 degree view of behind the vehicle.
Bed Camera	Shows the truck bed and can be used for 5th wheel or gooseneck trailers.
Trailer Aux	Shows a rear view camera image of what is behind the trailer. This camera needs to be purchased and separately installed.
Trailer reverse guidance	Shows you a view along the sides of your truck and your trailer. In auto mode, this view moves as your trailer moves so that you do not have to adjust the camera as you turn.
Straight backup mode	Use this view when you want to keep your trailer completely in line with your truck. In this mode, a steering wheel graphic shows you which way to turn your steering wheel to keep your trailer straight.
Hitch angle graphic	The hitch angle graphic shows a small, top-view representation of the truck and trailer.

When the ignition is ON, the PTBA (Pro Trailer Backup Assist) control knob button is in the on position and reverse gear is selected, the rear PTBA (Pro Trailer Backup Assist) camera view is shown on the audio system display. Some of the rear PTBA (Pro Trailer Backup Assist) camera views contain an icon representing a trailer attached to a truck on the right side of the display. This icon is called the hitch angle graphic icon. It shows the current trailer angle and the direction the trailer will go based on the PTBA (Pro Trailer Backup Assist) knob input.

For additional information on the audio system display,

Refer to: 360 Degree View Camera Alignment

(413-13B Parking Aid - Vehicles With: Parking Aid Camera, General Procedures).

Component Description

Rear Parking Aid Camera

The rear parking aid camera is located on the tailgate, above the tailgate release handle. The rear parking aid camera captures the trailer and target sticker image on the trailer and sends the data to the IPMA (image processing module A) .

For additional information on the rear parking aid camera,

Refer to: Parking Aid - System Operation and Component Description

(413-13B Parking Aid - Vehicles With: Parking Aid Camera, Description and Operation).

Trailer Assist Lamp

The trailer assist lamp is located on the tailgate, to the right of the release handle, and it is used to illuminate the trailer and the target sticker in low ambient light conditions.

For additional information on the trailer assist lamp,

Refer to: Interior Lighting - System Operation and Component Description

(417-02 Interior Lighting, Description and Operation).

PTBA (Pro Trailer Backup Assist) Control Knob

The PTBA (Pro Trailer Backup Assist) control knob is located on the instrument panel right of the steering wheel and is used to enable the PTBA (Pro Trailer Backup Assist) system and control the direction of the trailer.

PTBA (Pro Trailer Backup Assist) Trailer Target Sticker

The PTBA (Pro Trailer Backup Assist) trailer target sticker is attached to the trailer during initial setup and used by the rear parking aid camera and IPMA (image processing module A) to calculate the angle of the trailer based on the dimensions entered in the audio system display.

Refer to the Owner's Literature (Pro Trailer Backup Assist™ Quick Start Guide) to find the detailed instructions on how to properly position the PTBA (Pro Trailer Backup Assist) trailer target sticker on the trailer.

If there is no viable location on the trailer to install the target sticker or if their are objects in the way of the target sticker, then using a yaw rate sensor becomes a practical solution.

NOTE

Additional target stickers can be ordered through a Ford dealer parts department.

RCM (restraints control module)	B1496:96	Trailer Backup Assist Input Sensor: Component Internal Failure	GO to Pinpoint Test D
TRM (trailer module)	B1496:11	Trailer Backup Assist Input Sensor: Circuit Short To Ground	GO to Pinpoint Test D
TRM (trailer module)	B1496:12	Trailer Backup Assist Input Sensor: Circuit Short To Battery	GO to Pinpoint Test D
TRM (trailer module)	C1A01:11	LED: Circuit Short To Ground	GO to Pinpoint Test A
TRM (trailer module)	U2009:11	Rotary Encoder: Circuit Short To Ground	GO to Pinpoint Test D
TRM (trailer module)	U2009:12	Rotary Encoder: Circuit Short To Battery	GO to Pinpoint Test D
TRM (trailer module)	U2009:1C	Rotary Encoder: Circuit Voltage Out Of Range	GO to Pinpoint Test D

Symptom Chart

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

REFER to: Diagnostic Methods

(100-00 General Information, Description and Operation).

NOTE

If using a targeting sticker rule out any parking aid camera system concerns prior to diagnosing the PTBA (Pro Trailer Backup Assist) system.

NOTE

The customer trailer needs to be connected to the vehicle to properly diagnose a PTBA (Pro Trailer Backup Assist) system concern.

NOTE

Frozen or slow screen transitions between PTBA (Pro Trailer Backup Assist) camera views	GO to Pinpoint Test E
The audio system display shows "Pro Trailer Backup Assist™ System is Not Available."	GO to Pinpoint Test D
The audio system display shows a "Pro Trailer Backup Assist™ Stop Now" message	GO to Pinpoint Test D
The audio system display shows "Sensor Not Detected. Refer to Owners Manual"	GO to Pinpoint Test K
The PTBA (Pro Trailer Backup Assist) system is inoperative or does not operate correctly	GO to Pinpoint Test D
The audio system display shows "Driving Required to initialize Steering"	GO to Pinpoint Test J
The audio system display/ APIM (SYNC module) trailer information or the PTBA (Pro Trailer Backup Assist) displays are inoperative or always displayed	REFER to: Information and Entertainment System(415-00 Information and Entertainment System - General Information, Diagnosis and Testing).
The audio system display/ APIM (SYNC module) are not operating correctly	REFER to: Information and Entertainment System(415-00 Information and Entertainment System - General Information, Diagnosis and Testing).
Rear parking aid camera/display concern	REFER to: Parking Aid(413-13B Parking Aid - Vehicles With: Parking Aid Camera, Diagnosis and Testing).

Pinpoint Test(s)

PINPOINT TEST A : THE PTBA (PRO TRAILER BACKUP ASSIST) CONTROL KNOB STATUS INDICATOR IS INOPERATIVE OR ALWAYS ILLUMINATED

Refer to Wiring Diagrams Cell 95for schematic and connector information.
Normal Operation and Fault Conditions REFER to: Parking Aid - System Operation and Component Description
(413-13D Parking Aid - Vehicles With: Trailer Back Up Assist (TBA), Description and Operation).

- Using the diagnostic scan tool, carry out the GWM (gateway module A) self-test.

Are any Diagnostic Trouble Codes (DTCs) retrieved?

Yes	See the GWM (gateway module A) DTC (diagnostic trouble code) Chart.
No	GO to A3

A3 CHECK FOR DIAGNOSTIC TROUBLE CODES (DTCS) FROM THE PSCM (POWER STEERING CONTROL MODULE) SELF-TEST

- Using the diagnostic scan tool, carry out the PSCM (power steering control module) self-test.

Are any Diagnostic Trouble Codes (DTCs) retrieved?

Yes	See the PSCM (power steering control module) DTC (diagnostic trouble code) Chart. REFER to: Power Steering (211-02 Power Steering, Diagnosis and Testing).
No	GO to A4

A4 CHECK FOR DIAGNOSTIC TROUBLE CODES (DTCS) FROM THE TRM (TRAILER MODULE) SELF-TEST

- Using the diagnostic scan tool, carry out the TRM (trailer module) self-test.

Are any Diagnostic Trouble Codes (DTCs) retrieved?

Yes	REFER to the TRM (trailer module) DTC (diagnostic trouble code) Chart in this section.
No	If the PTBA (Pro Trailer Backup Assist) control knob status indicator is inoperative, GO to A5 If the PTBA (Pro Trailer Backup Assist) control knob status indicator is always illuminated, GO to A9

A5 BYPASS THE TRM (TRAILER MODULE)

- Ignition OFF.
- Disconnect TRM (trailer module) C2498C .

- Disconnect PTBA (Pro Trailer Backup Assist) Control Knob C2599 .
- Measure:

Positive Lead	Measurement / Action	Negative Lead
C2599-7	Ω	Ground

Is resistance greater than 10,000 ohms?

Yes	GO to A7

No	REPAIR the circuit.

A7 CHECK THE PTBA (PRO TRAILER BACKUP ASSIST) CONTROL KNOB STATUS INDICATOR CIRCUIT FOR AN OPEN

- Measure:

Positive Lead	Measurement / Action	Negative Lead
C2599-7	Ω	C2498C-1

Is the resistance less than 3 ohms?

Yes	GO to A8

No	REPAIR the circuit.

A8 CHECK THE PTBA (PRO TRAILER BACKUP ASSIST) CONTROL KNOB GROUND CIRCUIT FOR AN OPEN

- Measure:

A10 CHECK FOR CORRECT TRM (TRAILER MODULE) OPERATION

- Ignition OFF.
- Disconnect and inspect all TRM (trailer module) connectors.
- Repair:
  - corrosion (install new connector or terminals – clean module pins)
  - damaged or bent pins – install new terminals/pins
  - pushed-out pins – install new pins as necessary
- Reconnect the TRM (trailer module) connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS (Online Automotive Service Information System) for any applicable service articles: TSB (Technical Service Bulletin) , GSB (General Service Bulletin) , SSM (special service message) or FSA (Field Service Action) . If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, INSTALL a new TRM (trailer module) . REFER to: Trailer Module (TRM) (417-01 Exterior Lighting, Removal and Installation).

No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

PINPOINT TEST B : THE PTBA (PRO TRAILER BACKUP ASSIST) SYSTEM CONSISTENTLY EXCEEDS TRAILER ANGLE LIMIT

Refer to Wiring Diagrams Cell 95for schematic and connector information.

Normal Operation and Fault Conditions REFER to: Parking Aid - System Operation and Component Description
(413-13D Parking Aid - Vehicles With: Trailer Back Up Assist (TBA), Description and Operation).

Possible Sources

- Communication network concern
- APIM (SYNC module) parameters/measurement concern
- PTBA (Pro Trailer Backup Assist) camera alignment (also known as Trailer Angle Detection (TAD) calibration) concern
- PSCM (power steering control module) concern
- The trailer design is not supported by the PTBA (Pro Trailer Backup Assist)