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Trailer Camera and Tire Pressure Monitoring System (TPMS) Kit

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INSTALLATION

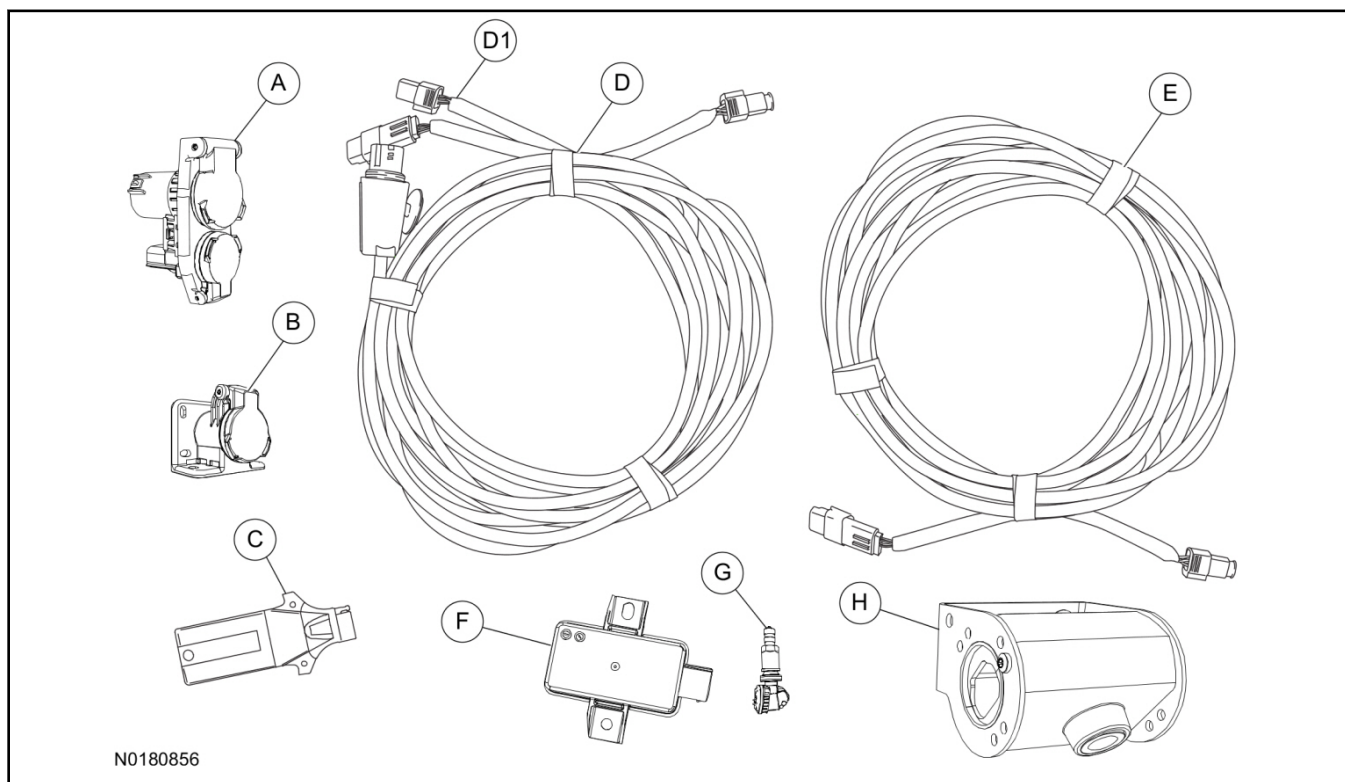
Trailer Camera and Tire Pressure Monitoring System (TPMS) Kit

Trailer Camera Wire Harness and TPMS Kit - Kit Overview

NOTE:

Vehicle must be equipped with Front/Side/Rear view Camera (360 Camera) and Trailer TPMS/ Customer-Placed Trailer Camera DIO Prep Package for necessary vehicle wiring /software configuration to support these kits.

Lay out the camera/TPMS harness along trailer prior to installation to ensure the length is adequate for installation.

**1. NOTE:**

There are two Trailer Camera/TPMS kits available. Vehicles equipped with the Pro Trailer Backup Assist feature and the optional, separately purchased, Trailer Yaw Sensor Kit will use the kit with harness D1 (Yaw). Vehicles without the Trailer Yaw Rate Sensor Kit will use the kit with harness D (less Yaw).

NOTE:

Component installation and kit contents will vary based the specific kit ordered and the desired configuration.

INSTALLATION (Continued)

Review the kit contents:

Trailer Camera & Trailer TPMS Kit		
QTY	ITEM	DESCRIPTION
1	A	7/12-Way Trailer Tow Connector
1	B	Connector Dock Station
1	C	4/7-Way Adapter (Use if needed, to connect 4-Way trailers to 7/12-Way vehicle connector)
1	D	Camera/TPMS Front Harness - Less YAW
1	D1	Camera/TPMS Front Harness - YAW
1	E	Camera Jumper Harness (For Use With Camera Kit)
1	F	TPMS Module
4	G	Trailer TPMS Sensor (Includes Nuts And Washers)
1	H	Camera Assembly
4	-	Trailer TPMS Module Fasteners (Not Shown)
2	-	Dock Station Tie Straps (Not Shown)
30	-	Harness Tie Straps (Not Shown - Quantity Based on Kit Installed)

NOTICE:

Only install the Trailer TPMS sensors on J-type flange wheels with a width greater than 3.5 in (88.9 mm).

J-type flange is by standards 2013 ETRTO Standard Manual Page R .8, T&RA 2013 Manual Page 8-05.

The number to the right of the X must be greater than 3.5 (88.9). This is the wheel width.

The letter to the right of the numbers must be J. This is the rim flange type.

NOTICE:

Trailer TPMS sensors are only compatible on wheels with 0.452 in (11.48 mm) diameter valve stem hole.

NOTICE:

Trailer TPMS valves should not be installed for tube-type tire setups.

NOTICE:

The trailer TPMS sensors should only be used with tires rated for 125 PSI (861 kPa) or less cold inflation pressure.

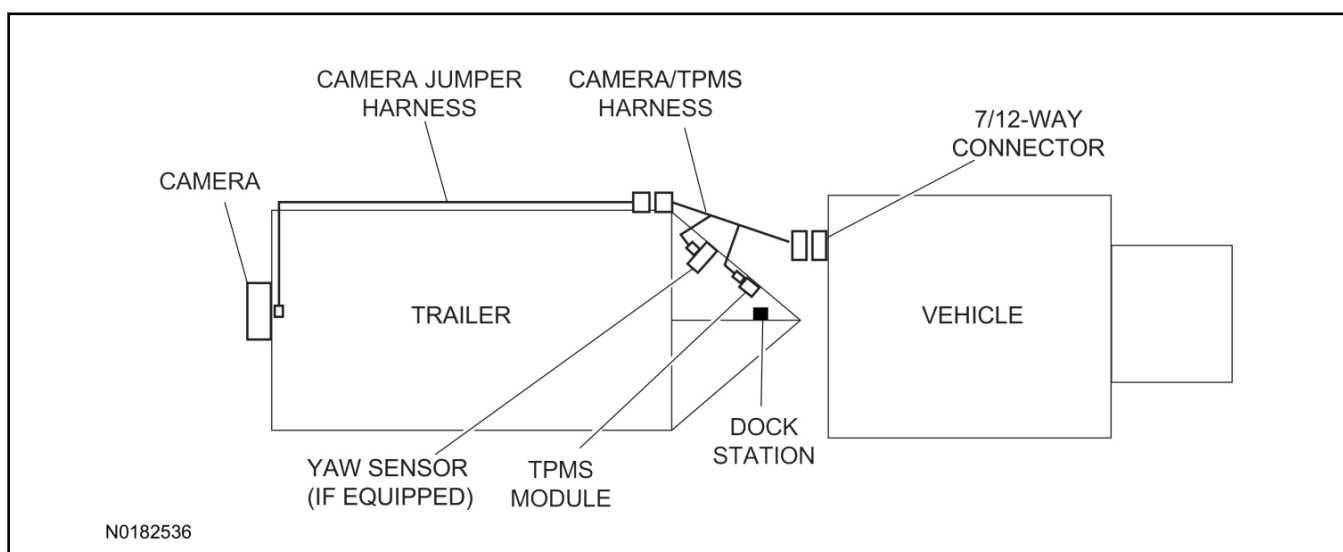
NOTE:

The TPMS sensors cannot be used on steel carcass tires.

INSTALLATION (Continued)**Component Installation Overview****NOTE:**

The following illustration provides an overview of the kit installation and harness routing. Components may vary by the specific kit being installed.

If TPMS sensors are included in the kit they should be installed onto the wheels by qualified technician.

**7/12-Way Trailer Tow Connector****NOTE:**

The 7/12-way trailer tow connector may have been factory or dealer installed previously in the truck bed or bumper. If already installed, skip to step 6.

NOTE:

Removing the spare tire to perform installation may improve access.

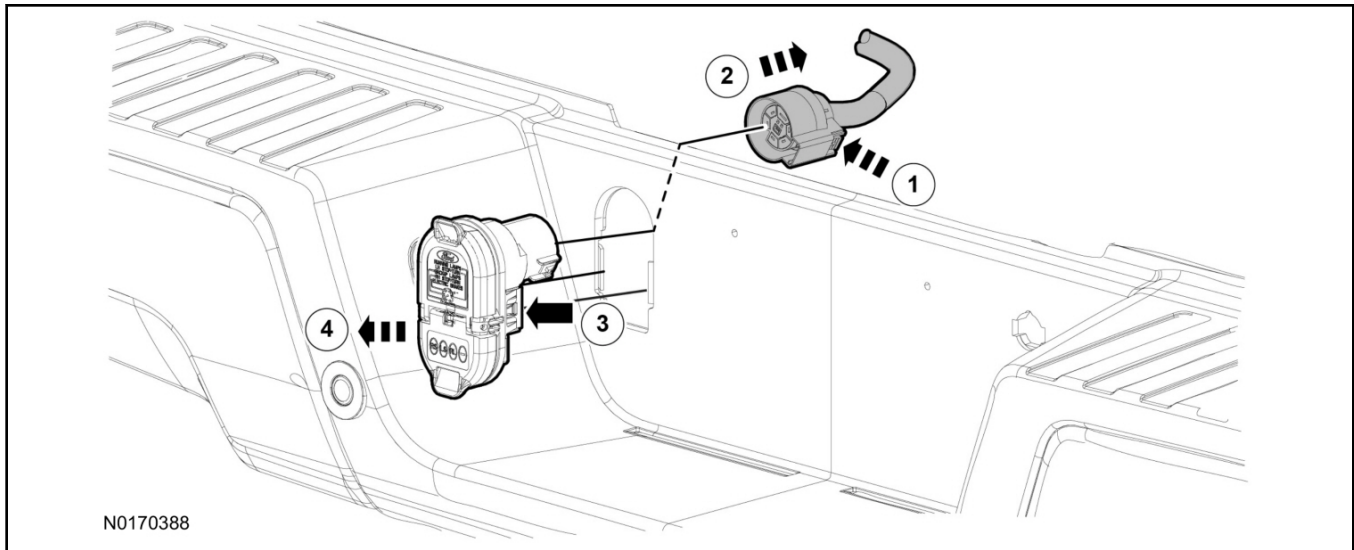
NOTE:

If Yaw sensor is equipped, follow Yaw instructions included in Yaw kit for mounting locations.

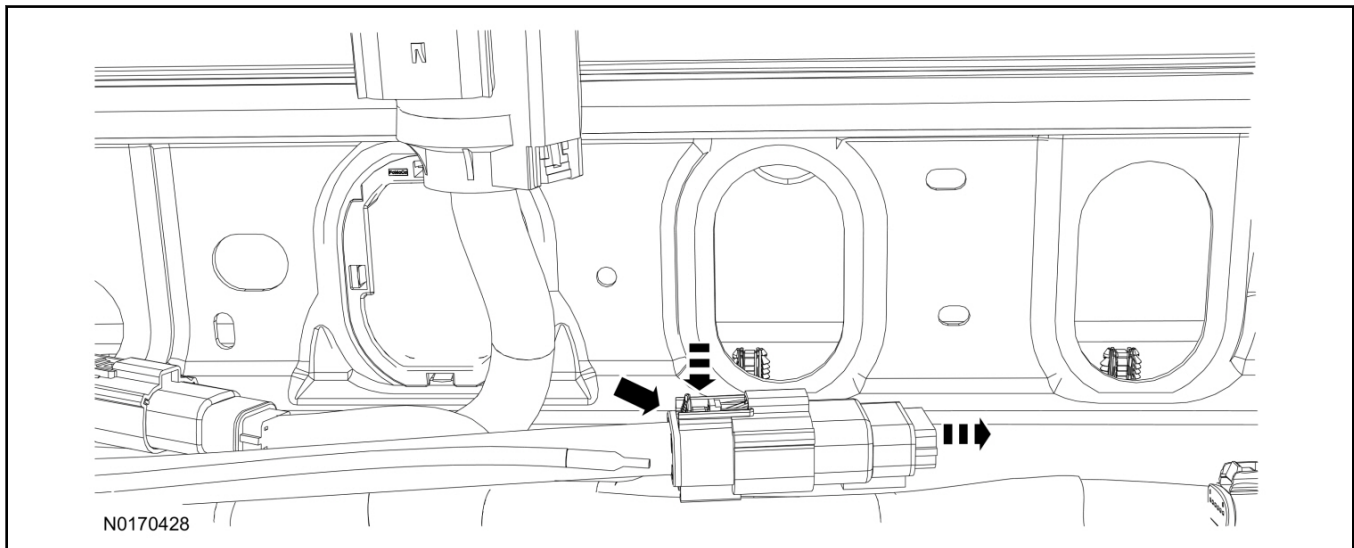
2. Remove the existing trailer tow connector from the vehicle.
 - 1 Depress the release tab on the electrical connector.
 - 2 Disconnect the electrical connector.

INSTALLATION (Continued)

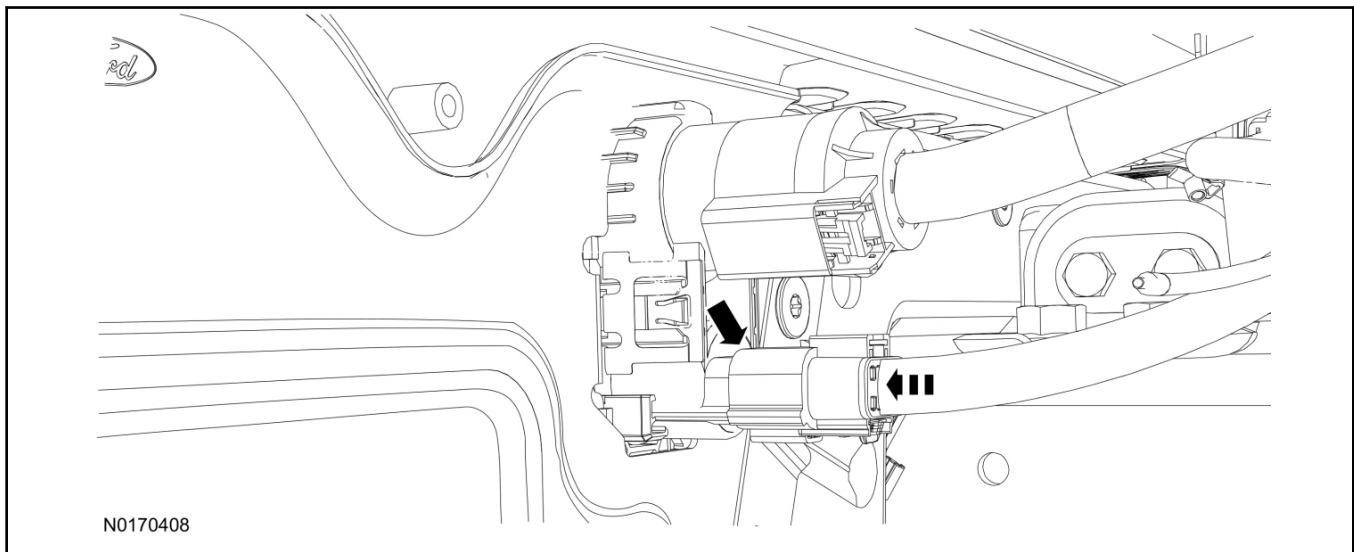
- 3 Depress the metal release tabs on both sides of the trailer tow connector.
- 4 Remove the trailer tow connector.



3. Install the new 7/12-way trailer tow connector onto the vehicle.
 - Reverse the removal procedure to install the new 7/12-way trailer tow connector.
 - An audible click should be heard when the new 7/12-way trailer tow connector is fully installed onto the vehicle bumper.
4. Working under the vehicle, near the trailer hitch, locate the 12-way trailer camera electrical connector. Depress the tab and remove the connector dust cap.



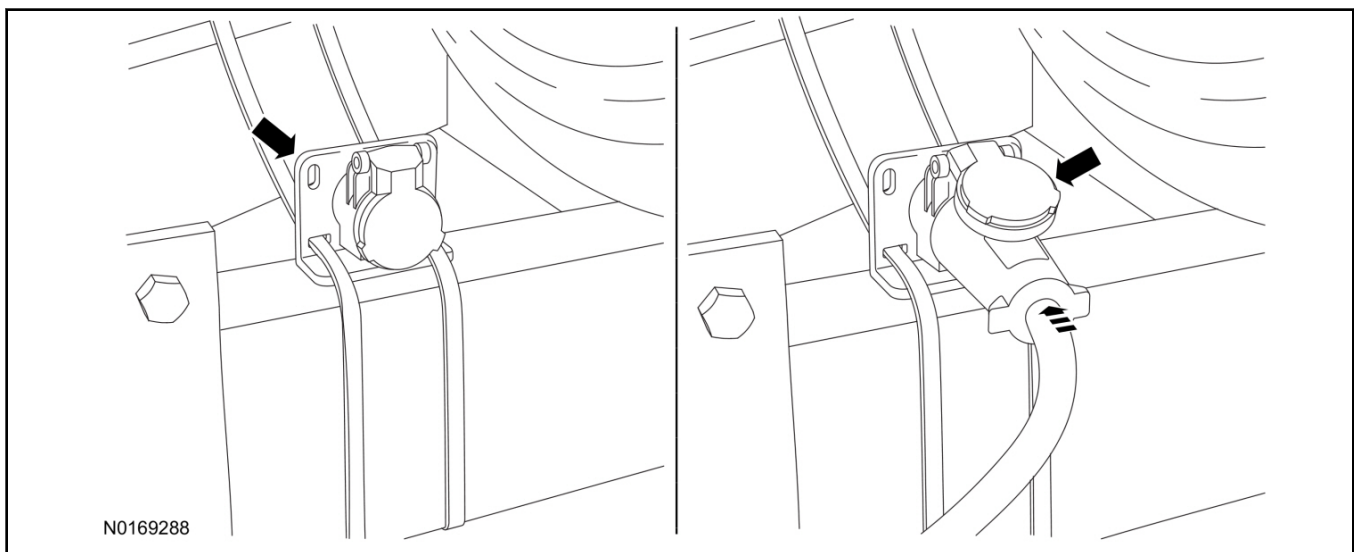
5. Connect the electrical connector to the lower 12-way trailer tow connector.

INSTALLATION (Continued)**Trailer Camera and TPMS Front Harness****6. NOTICE:**

Install the dock station in the orientation shown. Do not install with connector facing up. Installing with the connector face upward can cause water pooling and damage to the electrical connector.

Select a mounting location for the connector dock station and secure to the trailer frame using tie straps.

- Once installed, the camera/TPMS harness-to-vehicle connector is inserted and locked in the dock station when not in use.



INSTALLATION (Continued)

7. Secure the camera/TPMS harness to the trailer.

Observe the following precautions when securing the harness to the trailer:

- Do not secure the wire harness near sharp edges or moving components that may damage the wire harness.
- The camera/TPMS harness-to-vehicle connector meets with the existing trailer connector/wire harness and provides enough slack for connection to the vehicle.
- Do not make any sharp bends (90 degree) in the harness that may compromise the wire integrity.
- The TPMS module connector should have enough slack to reach the TPMS module once installed.
- Bundle and secure any excess wires with tie straps (not provided).

Vehicles with Trailer Yaw Rate Sensor (Pro Trailer Backup Assist)

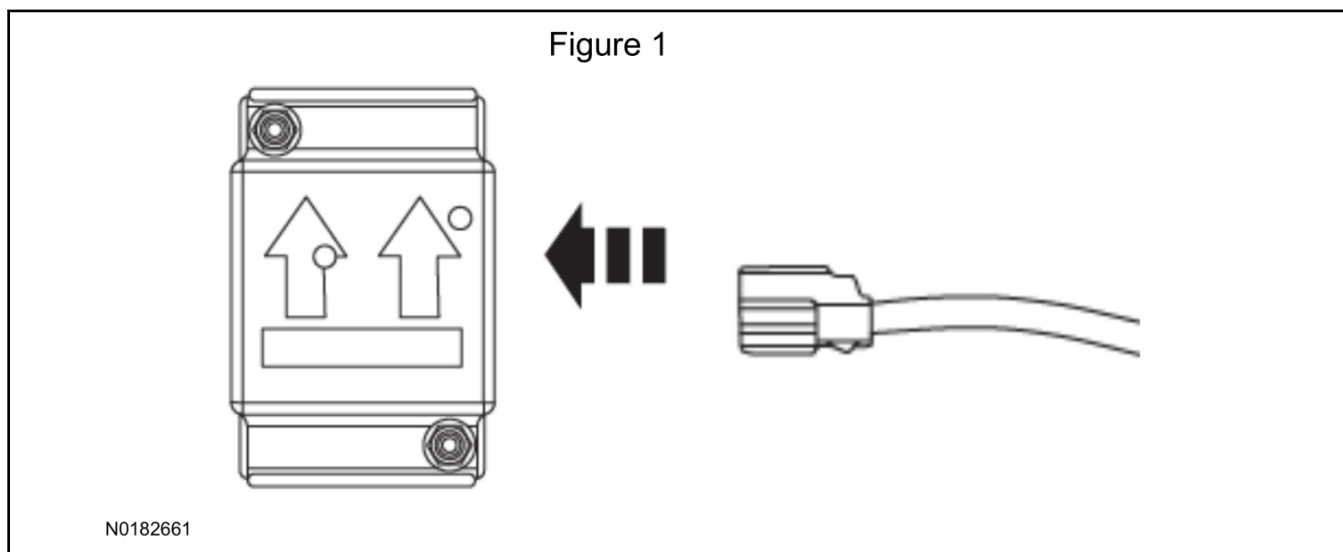
8. The Pro Trailer Backup Assist feature uses an optional, separately purchased, trailer mounted Yaw rate sensor for Trailer Angle Detection (See Figure 1). Specific trailer camera/TPMS kits are available that support vehicles with or without the yaw sensor.

NOTE:

The harness which is provided with the Trailer Yaw Sensor kit is not used when connecting the Yaw sensor to the Trailer Camera/TPMS kit harness (D1) takeout.

NOTE:

Electrical wiring harnesses/connectors routing should leave enough slack taking into account trailer motion during turns, avoid sharp edges, pinch points, and positioned away from direct road spray.



INSTALLATION (Continued)**Conventional Trailers**

9. The Trailer/TPMS kit front trailer harness should plug into the 12 way bumper mounted receptacle.

**General Guidelines for Camera Installation****10. NOTE:**

The camera should be mounted in the center of the of the trailer (trailer center line) and should be level.

NOTE:

It is not recommended to mount the camera lower than 787.4 mm (31 in) above ground level.

NOTE:

The trailer camera is meant to provide enhanced driver visibility during trailer movement.

Select a mounting location.

- 1 Two operators will be required for the installation of the camera.
 - The first operator should monitor the display screen for camera placement.
 - The second operator should move the camera around while communicating with the first operator until the desired view is obtained.

NOTE:

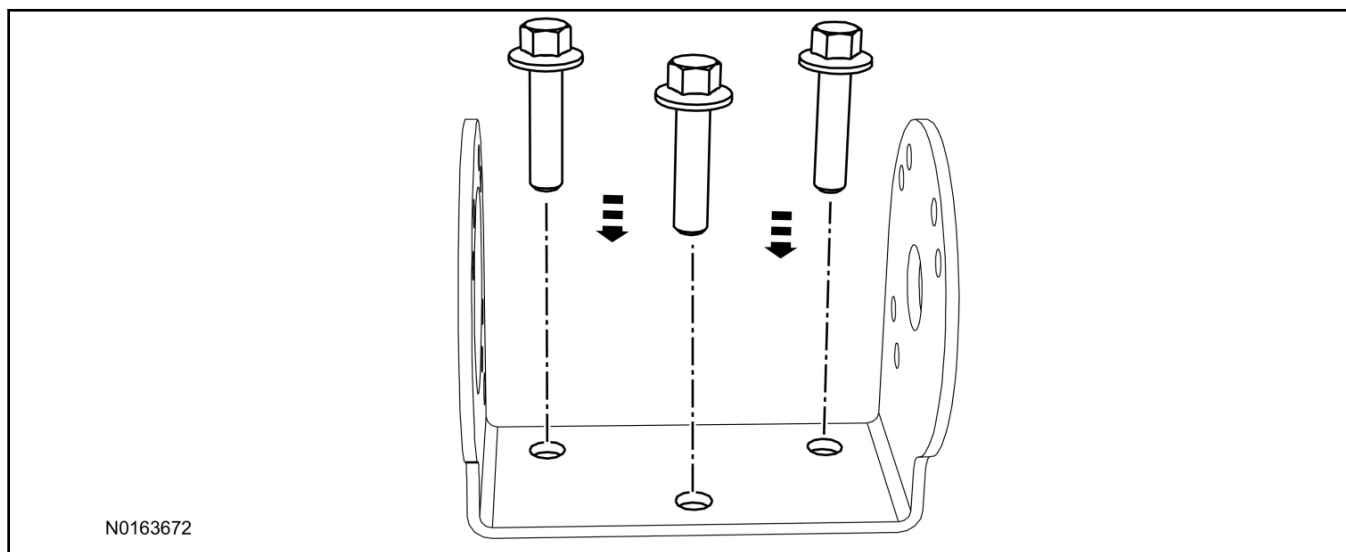
The default angle of the camera is to be positioned at a 45 degree angle on the bracket once installed. While a 45 degree angle is strongly recommended, the angle can be adjusted to a 22.5 degree angle if required.

11. Once the desired view is achieved the camera can be mounted at that location.

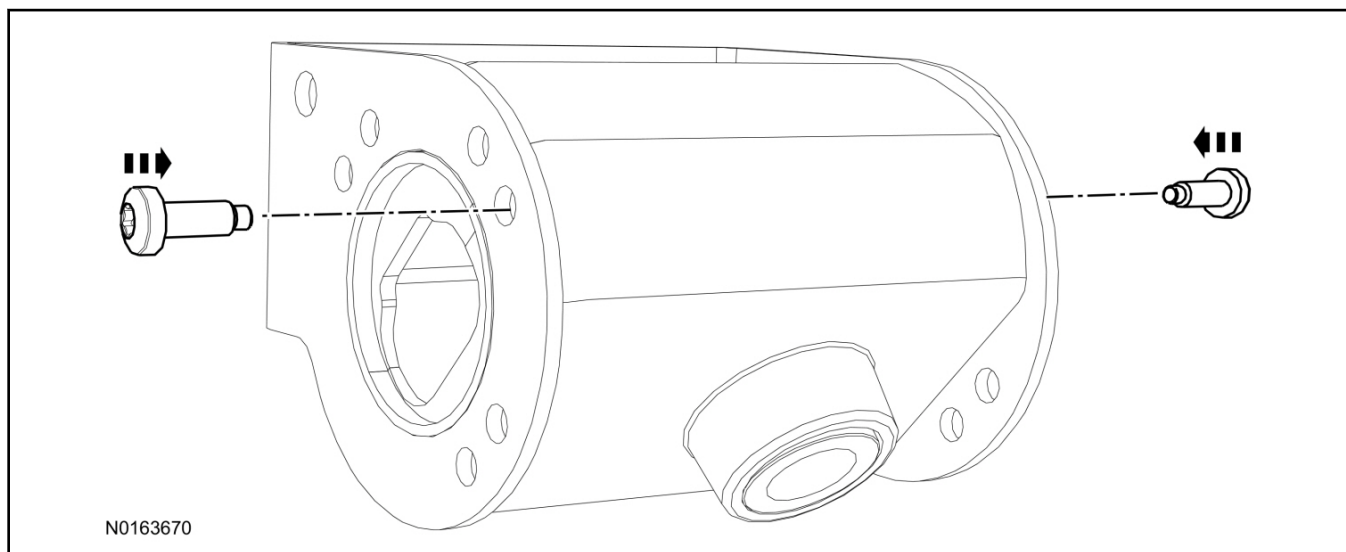
INSTALLATION (Continued)**Camera Installation****NOTE:**

The housing and camera come pre-assembled. Do not disassemble the housing unless required for service of the camera.

12. Install the 3 bracket bolts onto the camera mounting bracket.
 - If required, leave the bolts off of the bracket until the camera mounting location is selected on the trailer and the hole positions are marked on the trailer using the mounting bracket as a template.

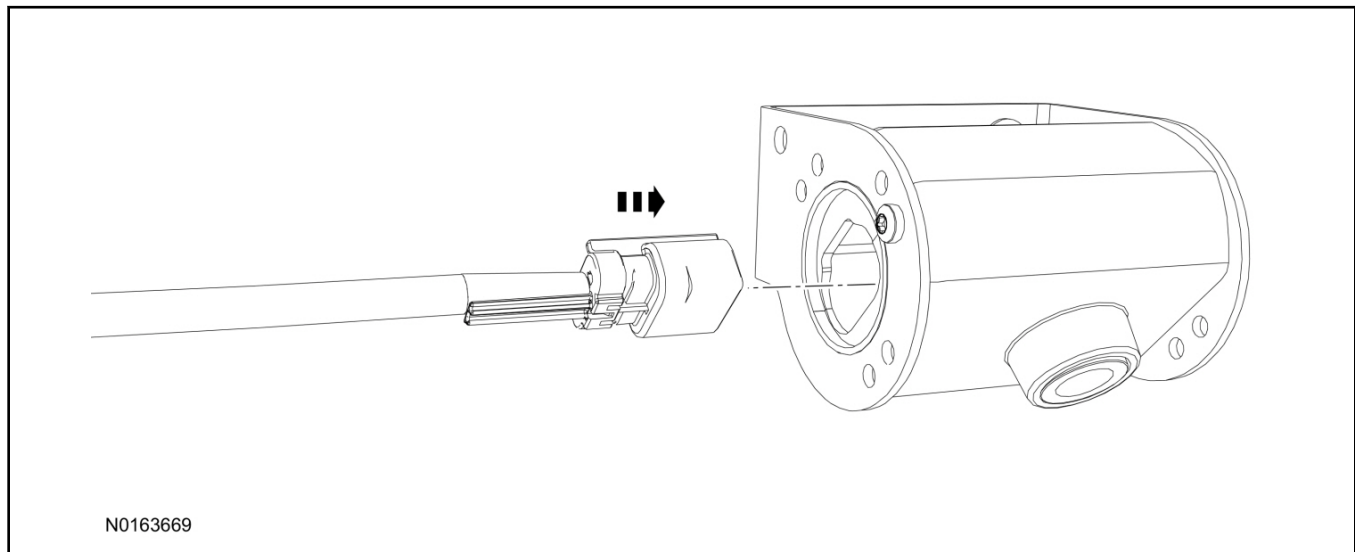


13. Position the camera and case assembly into the mounting bracket. Position the camera so that when the bracket is positioned on the trailer the camera will be facing downward at a 45 or 22.5 degree angle. Install a short screw on both sides to secure the camera in this position on the mounting bracket.
 - Tighten the screws to 6.19 lb-in (0.7 Nm).

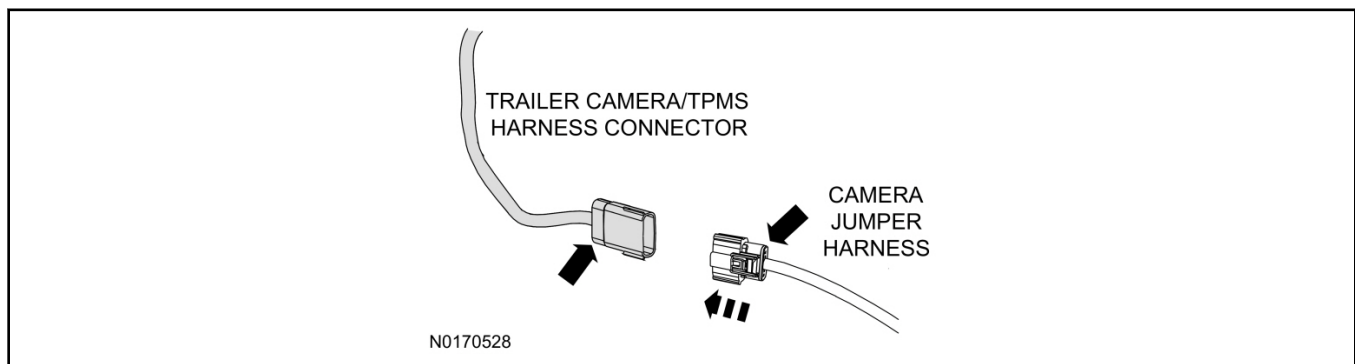


INSTALLATION (Continued)

14. Connect the wire harness to the rear view camera.



15. Remove the connector plugs from both ends of the camera jumper harness and from the previously installed camera/TPMS harness connector end.
16. Connect the camera jumper harness connector to the trailer camera/TPMS harness connector.
- The harness may have rubber sealing grommets used for sealing along trailer routing. These grommets may be removed from the harness if they are not used for installation.
 - The harness rubber sealing grommets can be adjusted/moved along the harness using a soap/water solution to lubricate the grommet.

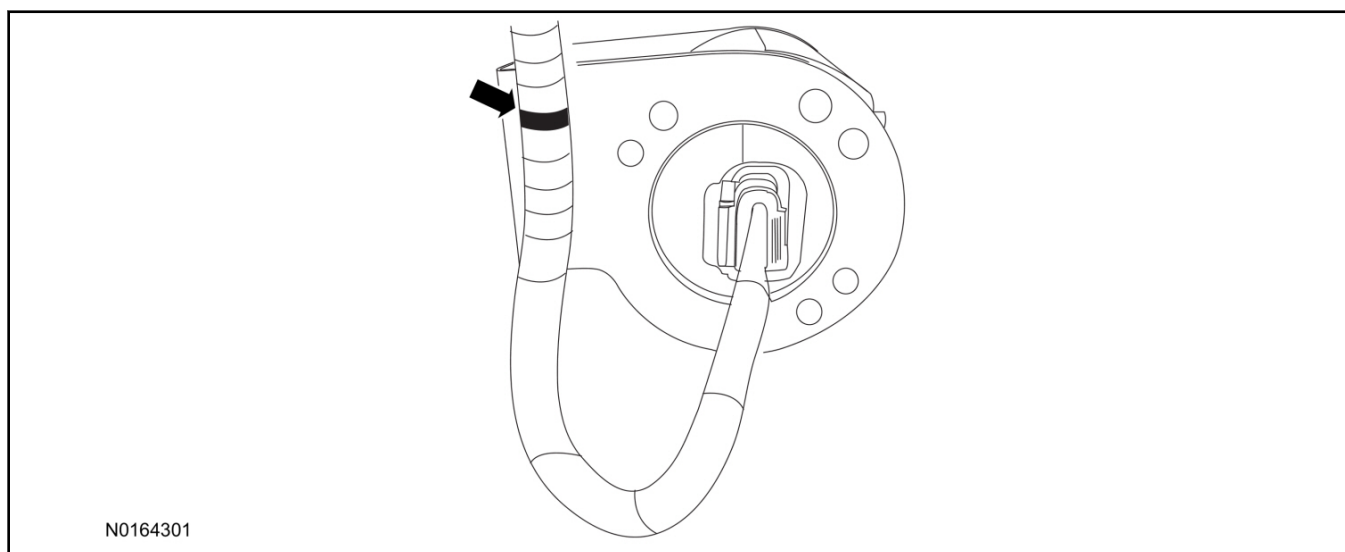


17. Find a suitable location to mount the rear view camera onto the trailer using the guidelines found in the General Guidelines for Installation section.
18. Once the mounting location has been identified, use the mounting bracket as a template to mark the mounting hole locations.
- The rear view camera should be level once installed.
19. Using a 7 mm or 9/32" drill bit, drill the three holes at the locations previously marked.
20. Using bolts and nuts, secure the camera and bracket assembly to the trailer.
- Tighten to 7.4 lb-ft (10 Nm).

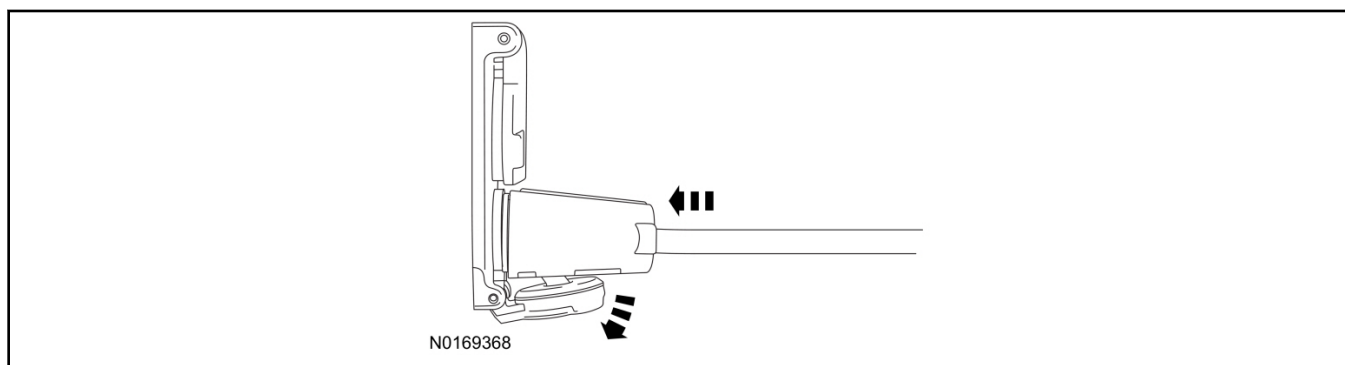
INSTALLATION (Continued)

21. Fasten the wire harness within 100 mm (3.937 in) of the camera (with push pin tie strap and downward loop, as shown) and then every 300 mm (11.811 in) after the first retention point, with tie straps (not supplied).

- While securing the wire harness do not make any sharp bends (90 degree) in the harness that may compromise the wire integrity.
- Do not secure the wire harness near sharp edges or moving components that may damage the wire harness.
- Bundle and secure any excess wire with tie straps (not provided).

**Camera Operation**

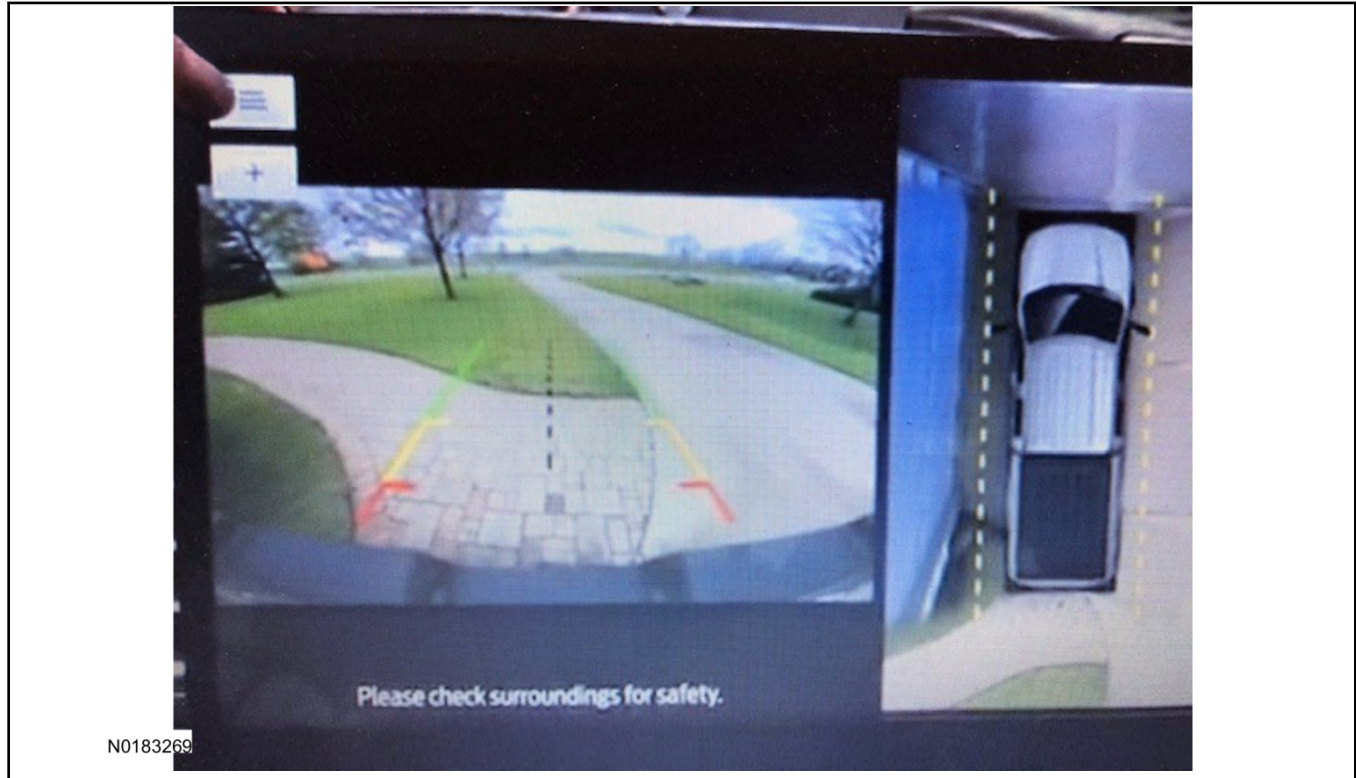
22. Hook up the trailer to the vehicle and connect the trailer's round 7-way electrical connector to the vehicle.
23. Open the cover and connect the camera/TPMS harness-to-vehicle (lower) 12-way trailer tow connector.
- Make sure the connector is locked into place.



INSTALLATION (Continued)**2022 F-150****NOTE:**

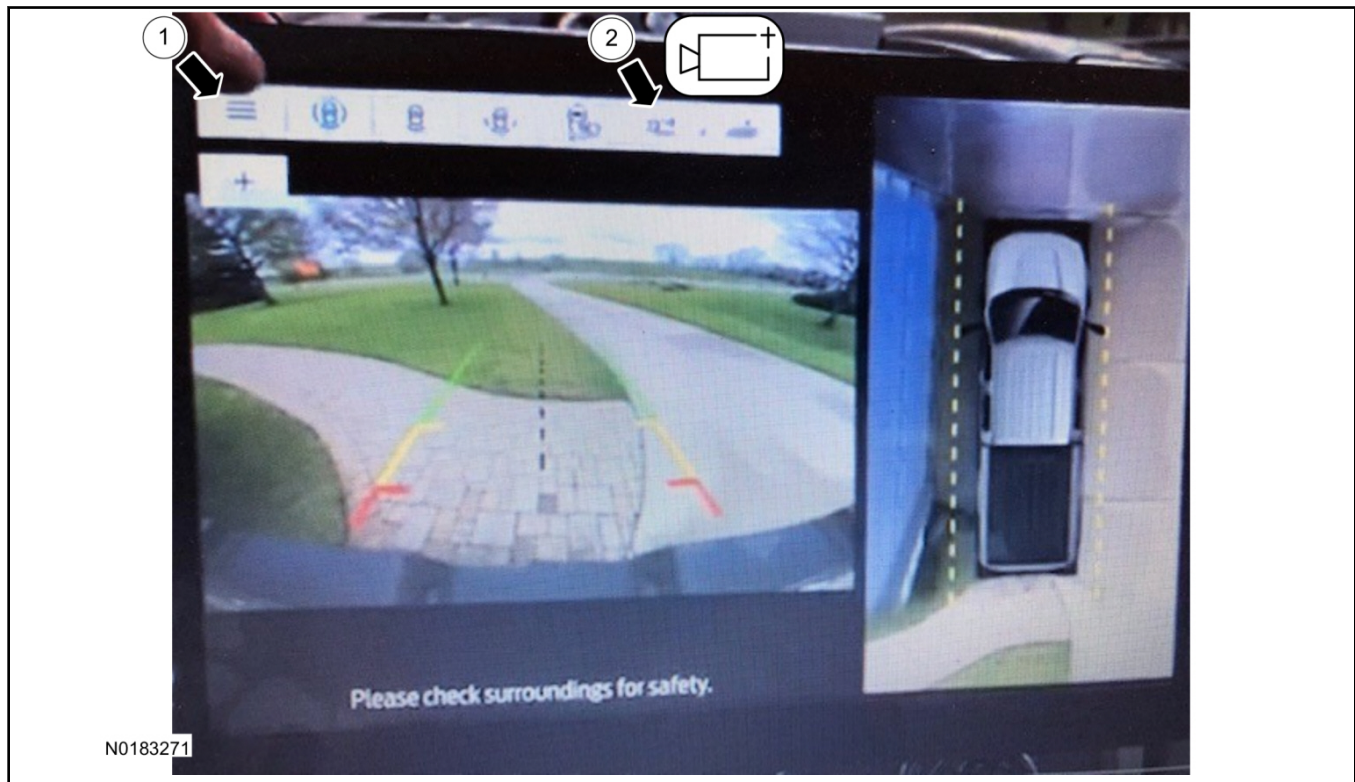
It may be helpful to have part of the trailer visible when selecting the view angle/mounting position.

24. Start the engine and place the transmission gear selector lever in reverse.



25. On the Front Display Interface Module (FDIM) select the following.

- 1 Select Camera Views.
- 2 Select AUX Camera.

INSTALLATION (Continued)

26. On the Front Display Interface Module (FDIM) select AUX Camera to display camera image.

- Refer to the Owner's Manual 360 Degree Camera section.

Tire Pressure Monitoring System (TPMS) - Module and Sensor Installation**NOTE:**

The Trailer TPMS module and the harness connector must be located away from high frequency signals/ devices on the trailer.

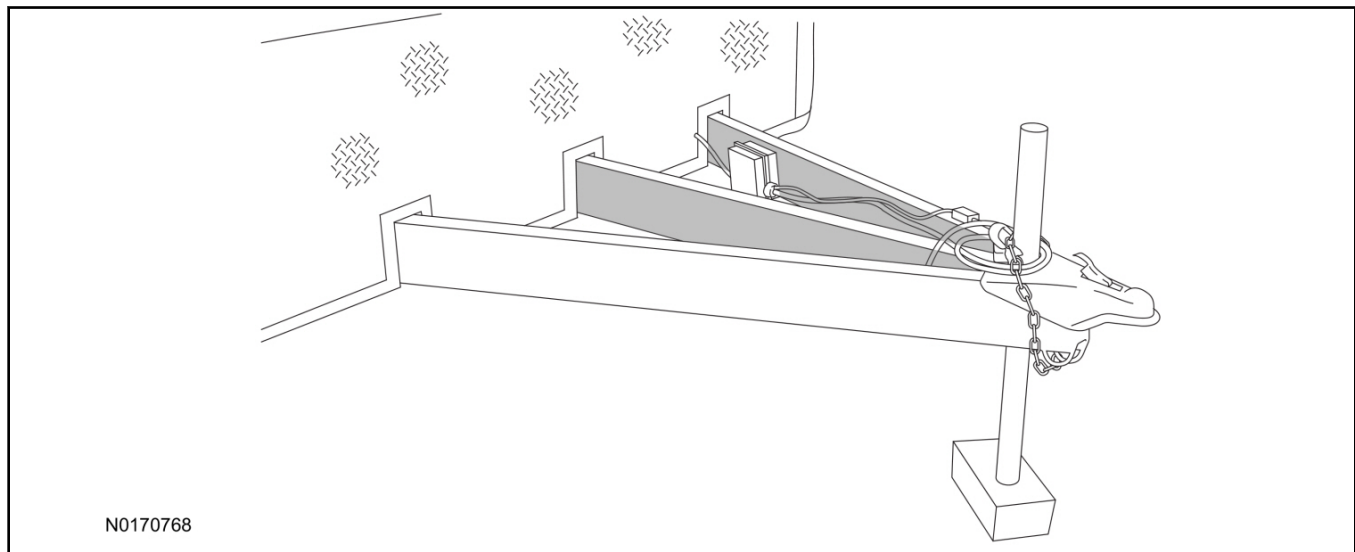
NOTE:

The following illustration provides an overview of acceptable TPMS module mounting locations. The acceptable locations are shaded grey.

Additionally the TPMS module may be mounted on the back of trailer frame crossbeams, under the trailer, as long as it will be shielded from stone chipping.

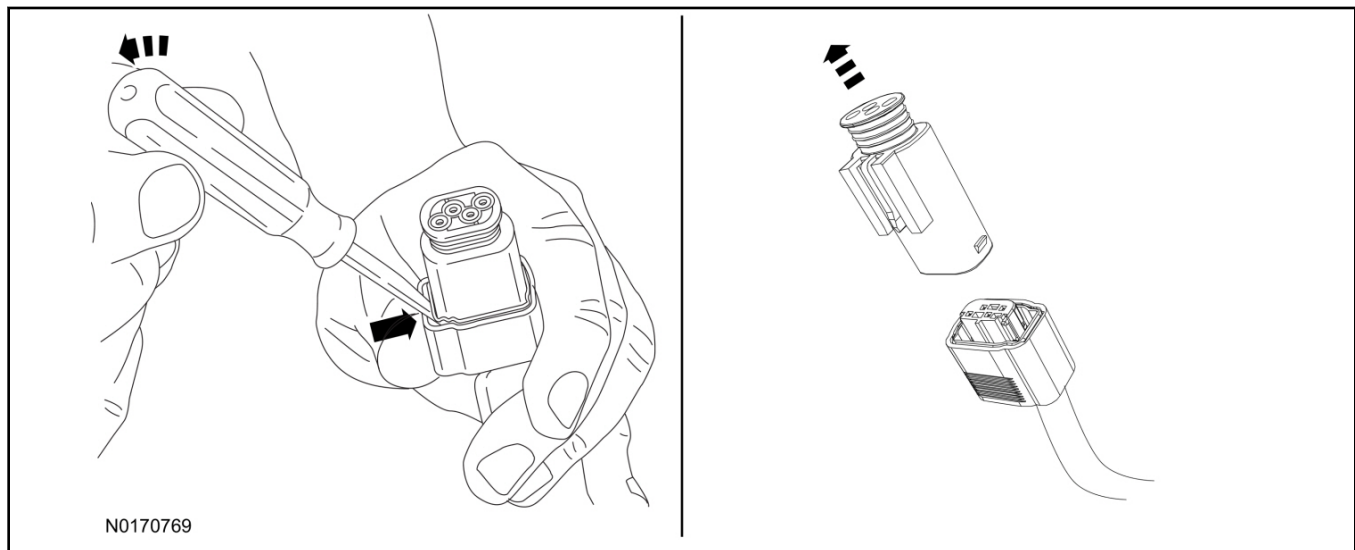
27. Select a mounting location and install the TPMS module onto the front of the trailer.

- The TPMS module mounting location should be protected from stone chipping.
- The TPMS module should be mounted inside the hitch A-frame area or under trailer on back of under trailer frame crossbeam.

INSTALLATION (Continued)

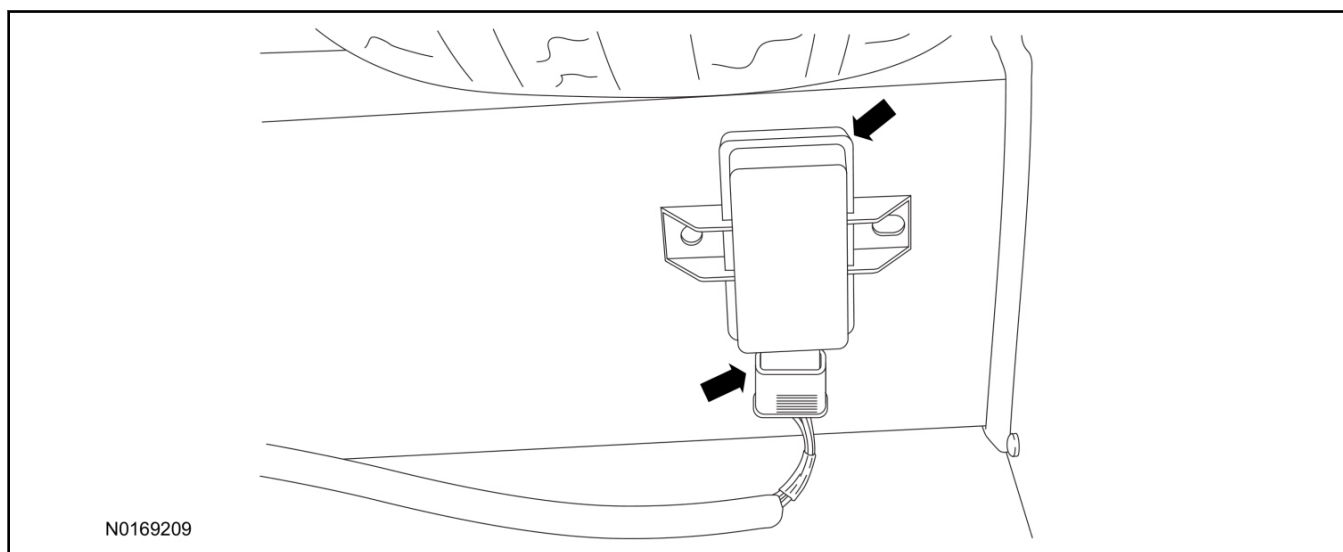
28. Remove the harness connector plug from the trailer TPMS electrical connector.

- 1 Insert a flat screw driver into the slot.
- 2 Tip the screw driver tip toward the connector body.
- 3 Remove the connector plug by pulling rearward on the plug.



29. Mount the TPMS to the trailer and secure using the TPMS module fasteners.

- Using the TPMS module as a template, mark the fastener holes at the TPMS module mounting location on the trailer. Drill fastener holes using a 7/32" (5.5 mm) drill bit.
- When tightening the fasteners do not exceed 62.8 lb-in (7.1 Nm). Higher torque could result in TPMS module damage.

INSTALLATION (Continued)

30. Connect the TPMS harness electrical connector to the TPMS module.

⚠ CAUTION:

Trailer tire disassembly/assembly and Trailer TPMS sensor installation should only be done by a qualified technician.

⚠ CAUTION:

While servicing wheel and tire assemblies be sure to follow all warnings/cautions/notices found within the Ford Workshop Manual.

NOTICE:

Only install the Trailer TPMS sensors on J-type flange wheels with a width greater than 3.5 in (88.9 mm).

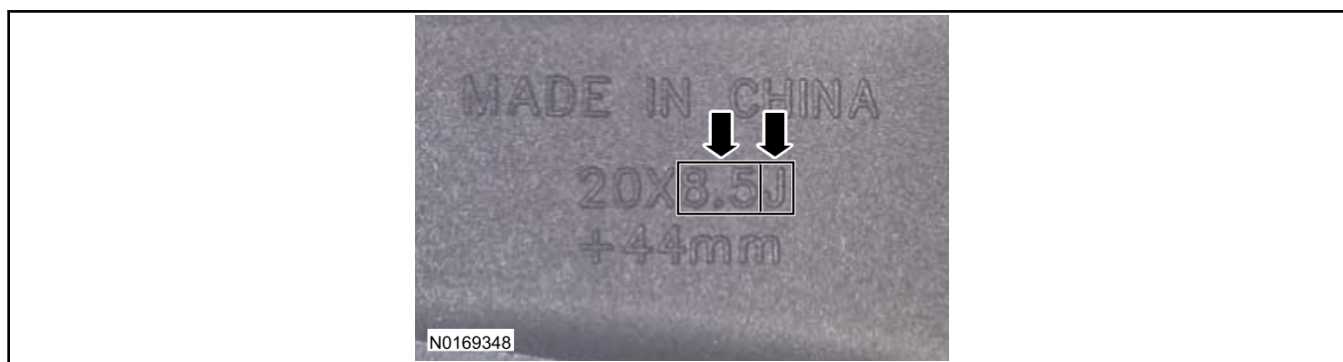
J-type flange is by standards 2013 ETRTO Standard Manual Page R .8, T&RA 2013 Manual Page 8-05.

The number to the right of the X must be greater than 3.5 (88.9). This is the wheel width.

The letter to the right of the numbers must be J. This is the rim flange type.

NOTE:

The TPMS sensors cannot be used on steel carcass tires.



INSTALLATION (Continued)**NOTICE:**

Trailer TPMS sensors are only compatible on wheels with 0.452 in (11.48 mm) diameter valve stem hole.

NOTICE:

Trailer TPMS valves should not be installed for tube-type tire setups.

NOTICE:

The trailer TPMS sensors should only be used with tires rated for 125 PSI (861 kPa) or less cold inflation pressure.

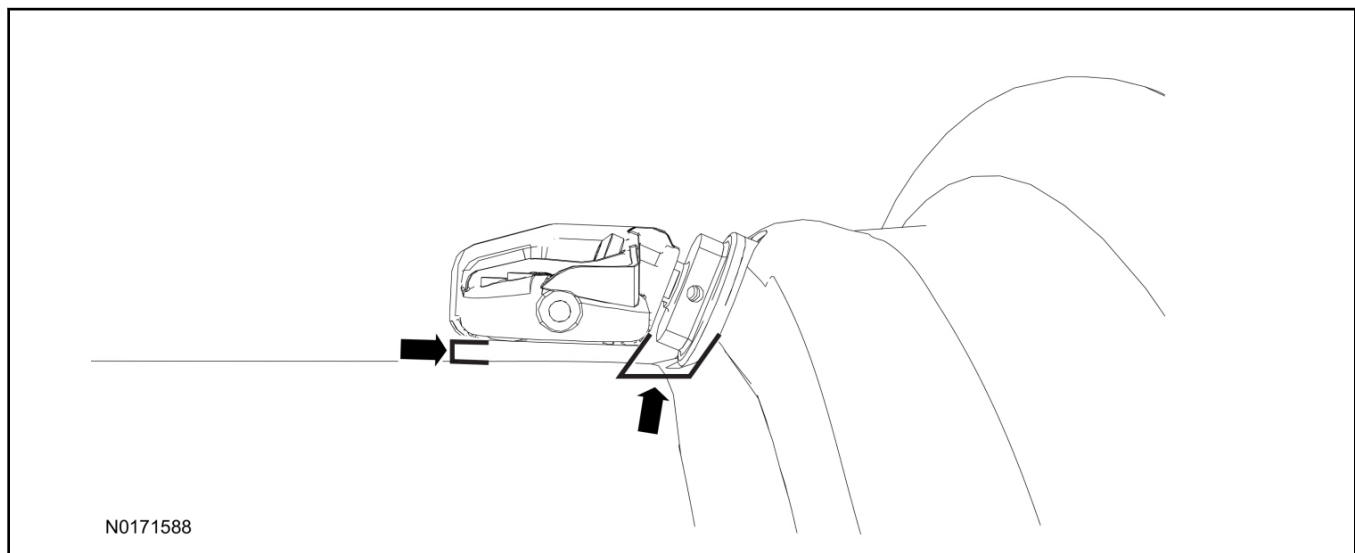
NOTICE:

Damage to the TPMS sensor may result if the tire mounting is not carried out as instructed.

NOTICE:

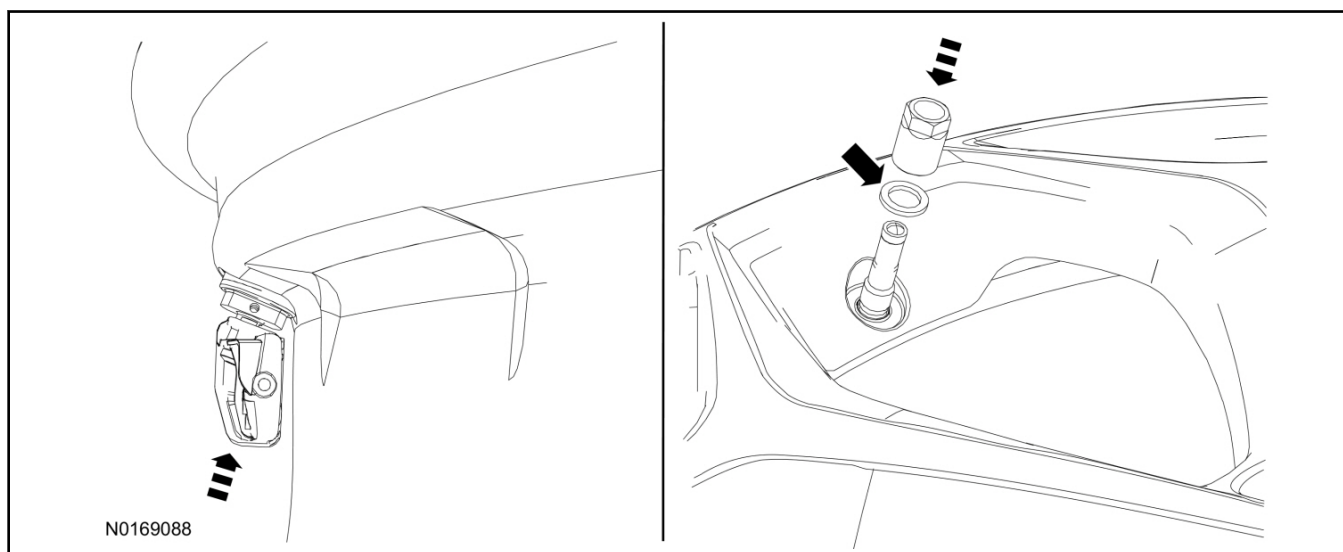
Do not attempt to push downward or flex the sensor when installed on the rim. Doing so will cause damage to the sensor.

31. When installed the TPMS sensors should **NOT** contact the rim.



32. Position the new valve stem and TPMS sensor. Install the washer and nut.

- Tighten the nut to 70.8 lb-in (8.0 Nm).

INSTALLATION (Continued)

33. Leak test the TPMS sensors using a soap/water solution.

34. Reinstall the trailer wheel and tire assemblies.

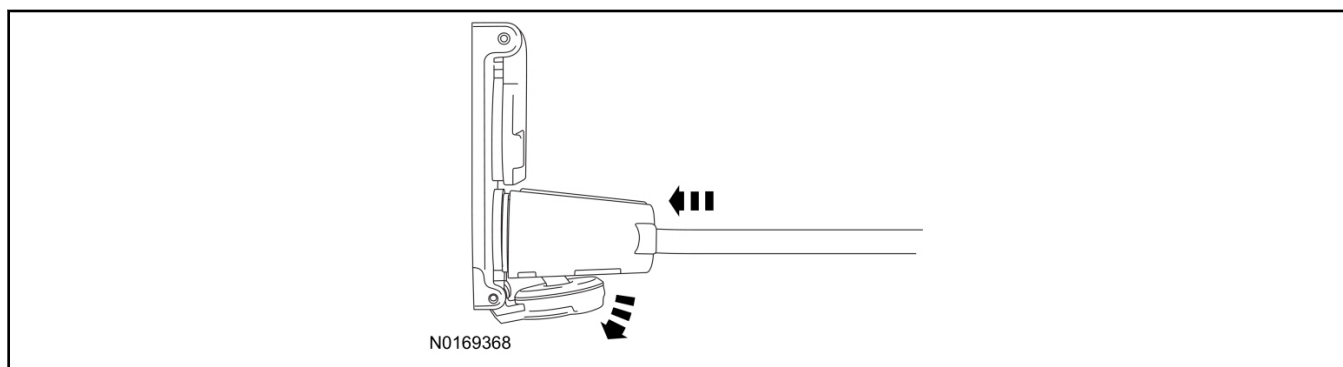
- Refer to the trailer Owner's Manual for torque specifications and retightening procedures.

TPMS Sensor Programming

35. Hook up the trailer to the vehicle and connect the trailer's 7 way brake/lamp electrical connector to the vehicle.

36. Open the cover and connect the camera/TPMS harness-to-vehicle (lower) 12-way trailer tow connector.

- Make sure the connector is locked into place.



37. **NOTE:**

Use of a second person is recommended for this step.

NOTE:

Sensor training time may be reduced by driving trailer over 30 mph (48 km/h) for a few minutes before initiating training procedures.

With the trailer connected to the vehicle, turn the ignition to the ON position. The vehicle should automatically prompt through the Instrument Panel Cluster (IPC) to set up trailer tire pressure training. Press OK to start the process and follow the on screen instructions.

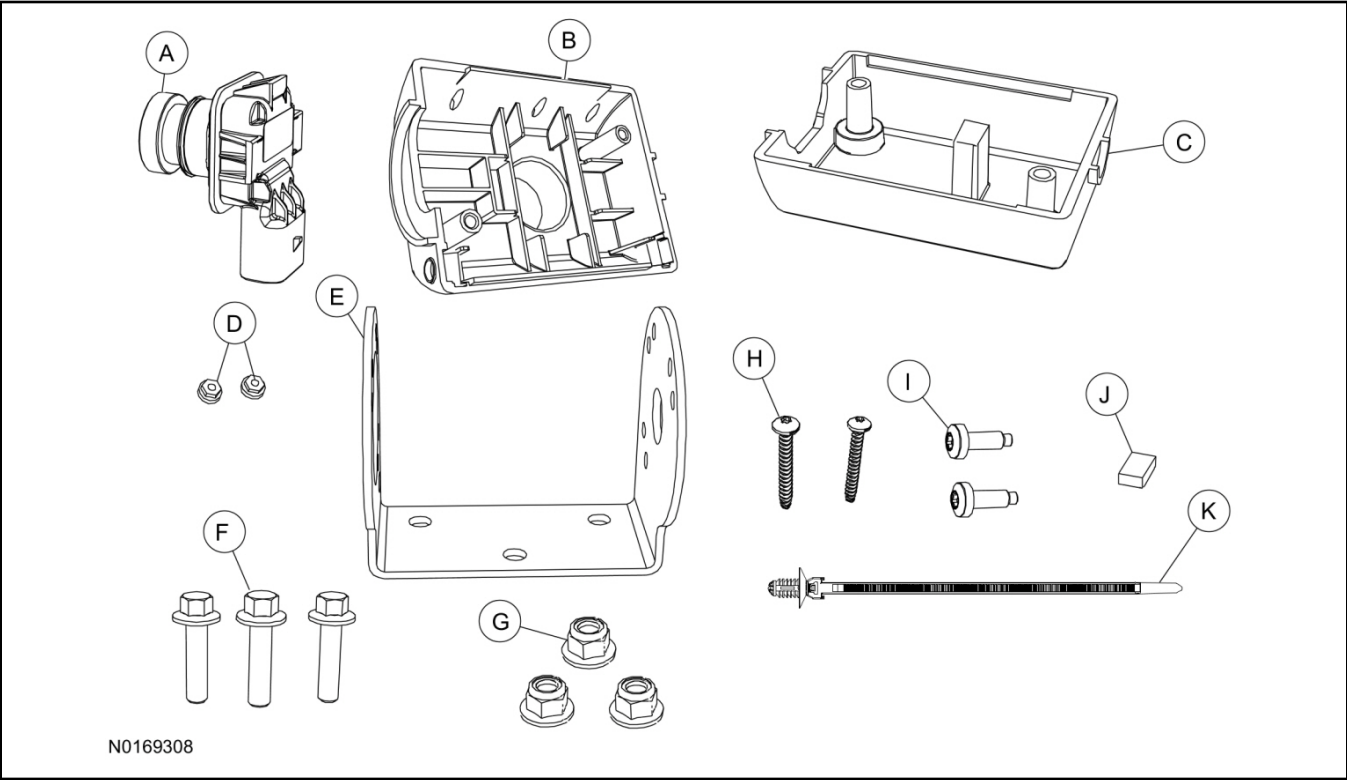
INSTALLATION (Continued)

- To train each trailer tire, release approximately 1-4 PSI (6.8-34.4 kPa) until the green check mark appears in the IPC and horn chirp is heard. Repeat as required until all trailer tires are trained.
- After all the trailer tires are trained, refill tires to specification.
- For additional information, refer to the Wheels and Tires Section within the vehicle Owner's Manual.

Camera Service

NOTE:

The following steps are provided in the event it is necessary to service the camera.



38. NOTE:

The camera will be assembled from factory. Disassembled view shown if camera requires service.

Review the Loose Camera Kit Contents.

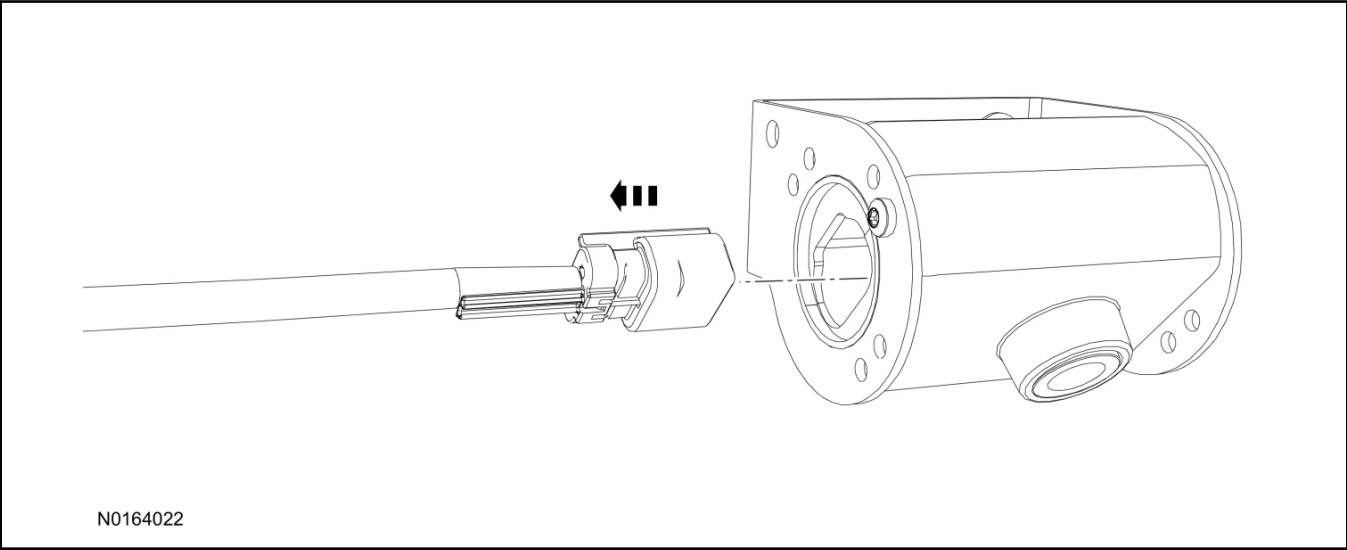
Loose Camera Kit

ITEM	QUANTITY	DESCRIPTION
A	1	Rear View Camera
B	1	Front Camera Case Half
C	1	Rear Camera Case Half
D	2	Screw Retaining nuts
E	1	Mounting Bracket
F	3	Bolts

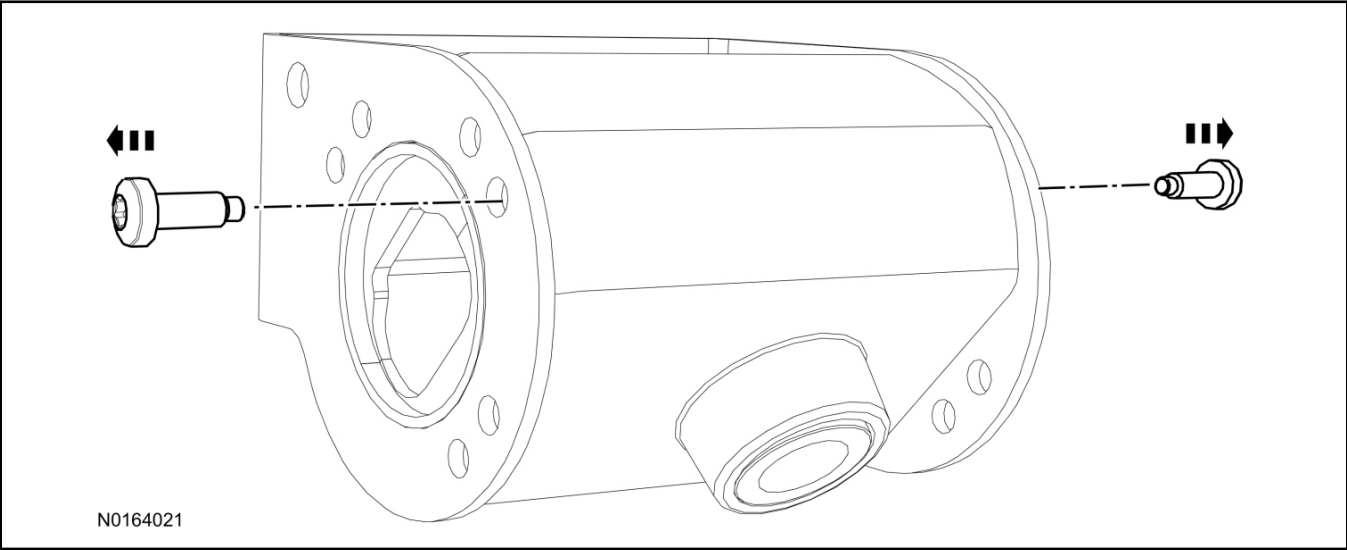
INSTALLATION (Continued)

Loose Camera Kit(Continued)		
G	3	Nuts
H	2	Screws (Longer)
I	2	Screws (Shorter)
J	1	Foam Pad
K	1	Push Pin Tie Strap

39. Disconnect the electrical connector from the camera.

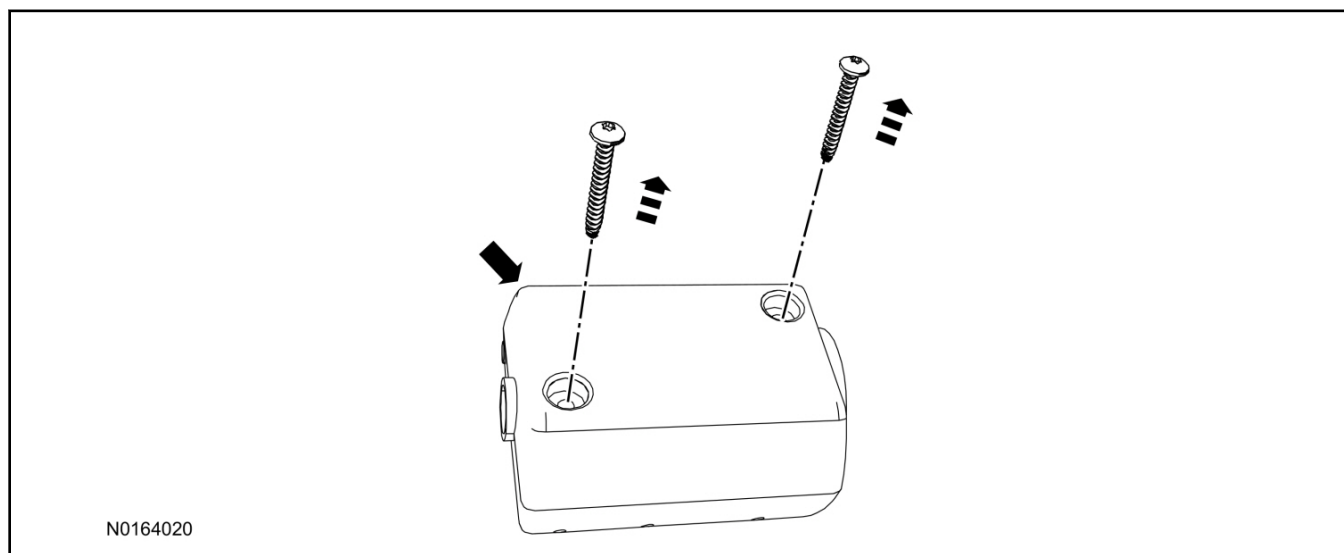


40. Remove the two camera bracket screws and remove the camera from the bracket.

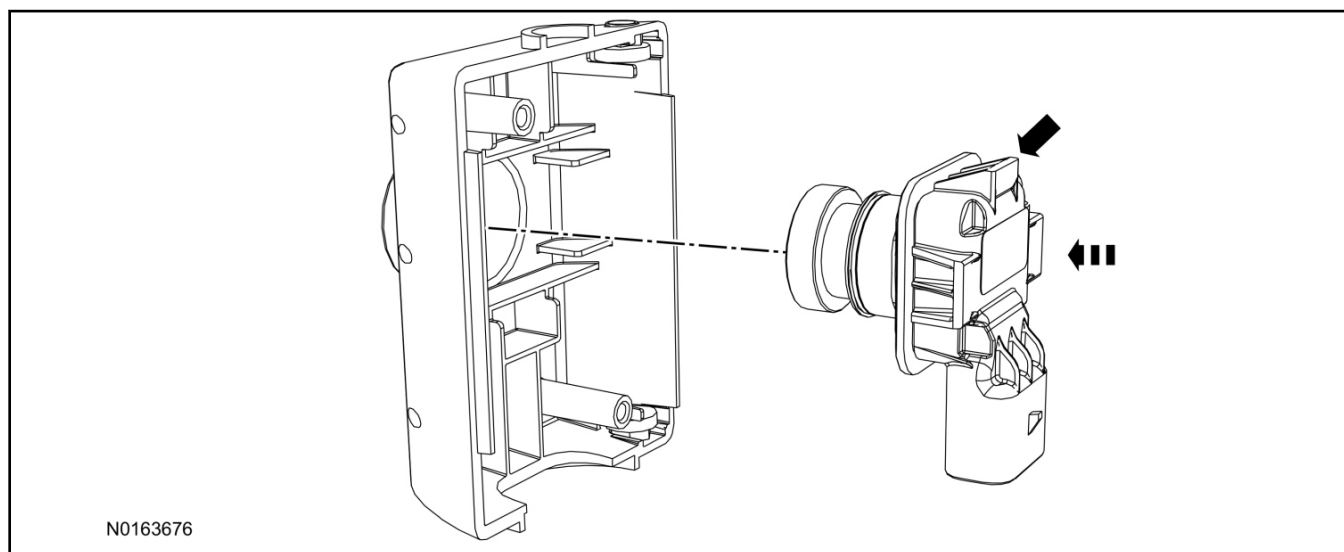


INSTALLATION (Continued)

41. Remove the two long screws from the back of the camera case.

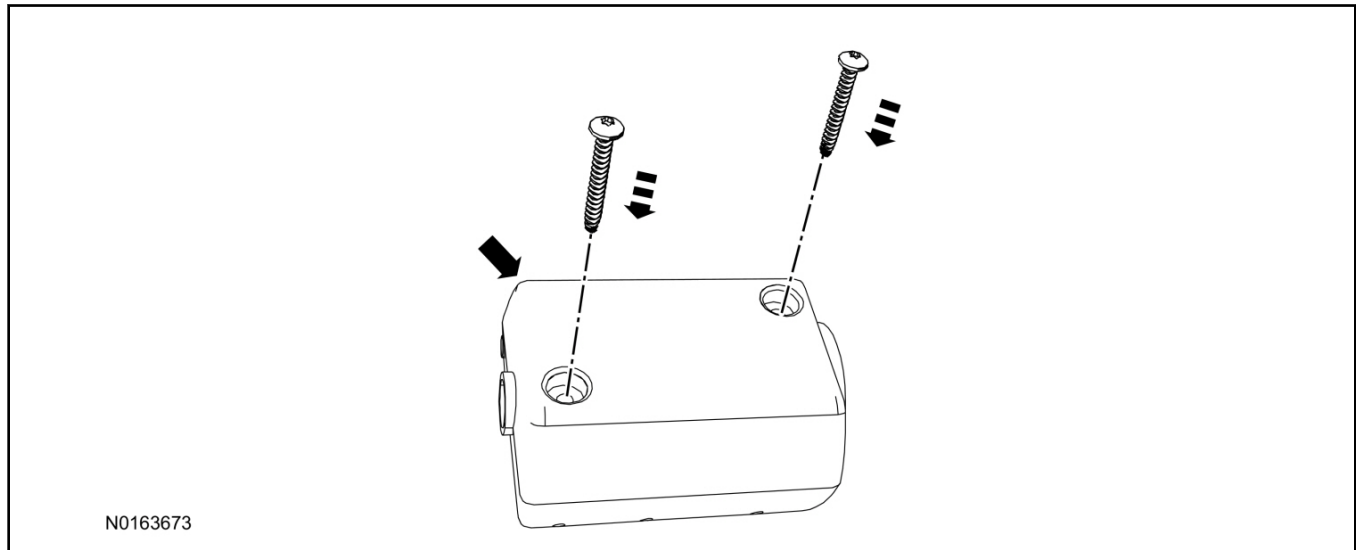


42. Remove the camera and install the new camera into the front camera case half.

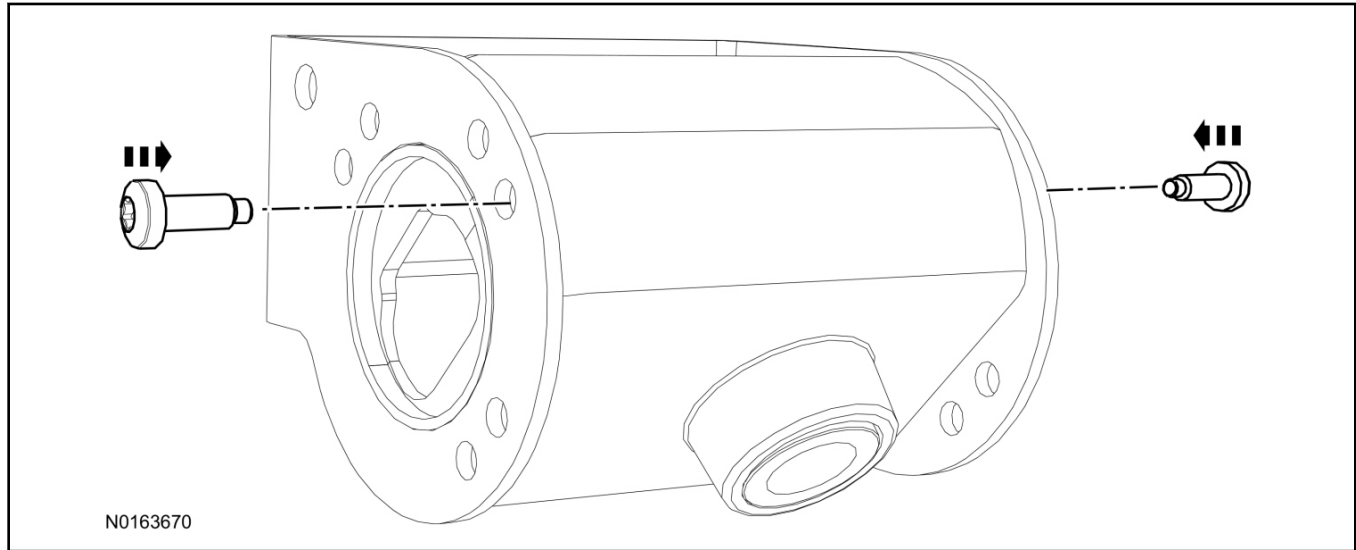


INSTALLATION (Continued)

43. Install the rear camera case half onto the front camera case half and install the two long screws.
- Tighten the screws to 7.08 lb-in (0.8 Nm).

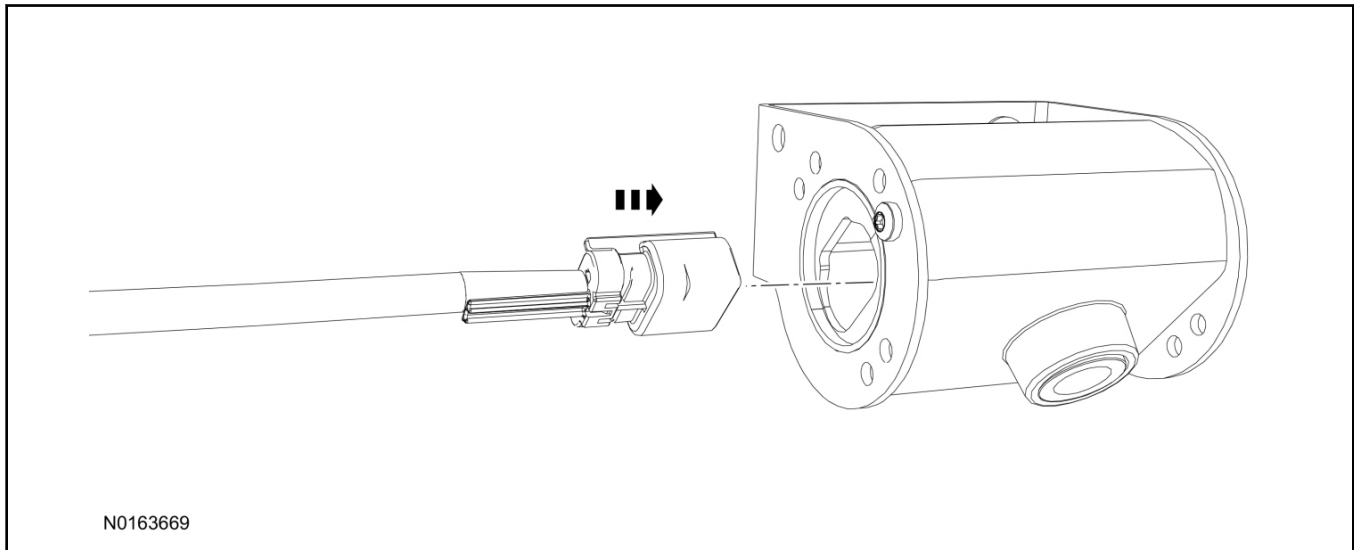


44. Position the camera and case assembly into the mounting bracket. Position the camera so that when the bracket is positioned on the trailer the camera will be facing downward at a 45 degree angle. Install a short screw on both sides to secure the camera in this position on the mounting bracket.
- Tighten the screws to 6.19 lb-in (0.7 Nm).



INSTALLATION (Continued)

45. Connect the electrical connector to the camera.



46. Once the camera installation is complete, verify the camera view is acceptable. Follow the guidelines found in the General Guidelines for Installation section.