

ONGUARD® KIT INSTALLATION GUIDE FOR P3 CASCADIA 500KBD WITH ESC

TECHNICAL BULLETIN

TP19042

WABCO
Mobilizing Vehicle Intelligence



Table of Contents

1	General Information	4
2	Safety Information	6
3	How to Obtain Parts and Kits	6
4	OnGuard Collision Mitigation System (CMS) Kit	7
5	Installation Procedures	9
5.1	OnGuard Radar Installation	9
5.2	OnGuard Radar Harness Installation – All Versions	12
5.3	OnGuard Display Installation	15
5.4	OnGuard Cab Harness (400 877 004 4) Installation for Vehicles with Detroit Diesel Engine/Manual Detroit Diesel Engine/DT-12 AMT	17
5.5	OnGuard Cab Harness (400 877 007 4, 400 877 002 4) Installations for Vehicles with Detroit Diesel Engine/Eaton AMTs, Cummins Engine/AMT or Cummins Engine/Manual	22
5.6	OnGuard Radar Integration and System Checks	29
5.7	Alignment and Road Test.....	39
6	Important Information	40
7	Appendix – Radar Template	43

Edition 1

Version 1 (01.2021)
TP19042 (en)

This publication is not subject to any update service. Information contained in this publication was in effect at the time the publication was approved for printing and is subject to change without notice or liability. WABCO reserves the right to revise the information presented or to discontinue the production of parts described at any time.

1 General Information

Symbols used in this document

DANGER

Description of an immediate situation which will result in irreversible injury or death if the warning is ignored.

WARNING

Description of a possible situation which may result in irreversible injury or death if the warning is ignored.

CAUTION

Description of a possible situation which may result in irreversible injury if the warning is ignored.

NOTICE

Description of a possible situation which may result in material damage if the warning is ignored.



Important information, notes and/or tips



Reference to information on the internet

1. Action step
 - Action step
 - ⇒ Consequence of an action
- List
 - List
-  *Note on the use of a tool/WABCO tool*

How to Obtain Additional Maintenance, Service and Product Information

If you have any questions about the material covered in this bulletin, or for information about the WABCO product line, please contact WABCO North America Customer Care at 855-228-3203 or visit our website: wabco-auto.com.

General Information

WABCO Academy



<https://www.wabco-academy.com/home/>

WABCO Online product catalog



<http://inform.wabco-auto.com/>

Your direct contact to WABCO

**WABCO North America
WABCO USA LLC
1220 Pacific Drive
Auburn Hills, MI 48326
Customer Care Center: (855) 228-3203
www.wabco-na.com**

2 Safety Information

Read and observe all Warning and Caution hazard alert messages in this publication. They provide information that can help prevent serious personal injury, damage to components, or both.

- Only experienced, trained and qualified automotive technicians may carry out work on the vehicle.
- Read this publication carefully.
- Follow all warnings, notices and instructions to avoid personal injury and property damage.
- Always abide by the vehicle's Original Equipment Manufacturer (OEM) specifications and instructions.
- Observe all accident regulations of the repair facility as well as regional and national regulations.
- The workplace should be dry, sufficiently lit and ventilated.
- Use personal protective equipment if required (safety shoes, protective goggles, respiratory protection and ear protectors).

WARNING

To prevent serious eye injury, always wear safe eye protection when you perform vehicle maintenance or service.

WARNING

Park the vehicle on a level surface. Block the wheels to prevent the vehicle from moving. Support the vehicle with safety stands. Do not work under a vehicle supported only by jacks. Jacks can slip and fall over. Serious personal injury and damage to components can result.

WARNING

Release all air from the air systems before you remove any components. Pressurized air can cause serious personal injury. Refer to the vehicle manufacturer's service manual for instructions.

WARNING

Verify and diagnose all active faults in the system prior to replacing OnGuard components. When diagnosing OnGuard, TOOLBOX™ Software (12.10 or higher) must be used. If you do not have TOOLBOX software, you can obtain it by going to www.wabco.snapon.com to purchase a subscription to TOOLBOX PLUS software. Be aware that diagnostic devices must be connected prior to keying on the unit to minimize possible OnGuard faults during diagnosis.

3 How to Obtain Parts and Kits

Contact the WABCO Customer Care Center at 855-228-3203 (United States and Canada); 800-953-0248 (Mexico). Email: wnacustomer@wabco-auto.com, wabconorders@wabco-auto.com or wabconaspecs@wabco-auto.com.

4 OnGuard Collision Mitigation System (CMS) Kit

This technical bulletin provides procedures for installing parts included in the OnGuard Collision Mitigation system kit.

The following parts are included in the kit.

- Radar Sensor (1)
- Radar Bracket (1)
- OnGuard Display (1)
- Fascia (1)
- Radar Harness (1)
- Cab Harness (1)
- J1939 Jumper Harness (Not included in the Detroit Diesel/Manual or DT12 AMT Kits) (1)
- 1/2" Flange Bolts (2)
- Radar M6 Nuts (3)
- Fascia M6 Bolts (3)
- Display 6-32 Nuts (2)
- Display #6 Internal Tooth Washers (2)
- Door Jamb Warning Sticker (1)
- Harness Warning Stickers (2)

Items needed that are not included in the kit.

- Laptop with WABCO TOOLBOX PLUS. (TOOLBOX PLUS is WABCO's diagnostic software which can be obtained from www.wabco.snapon.com)
- TOOLBOX compatible RP1210A diagnostic communication adapter/device
- ABS Update (E8 ABS ECUs ONLY)
- Engine diagnostic software and communication device
- Basic shop tools and materials



Make sure to verify the correct kit part number is being installed on the vehicle as all CMS radars look alike. To verify that the kit is compatible with the vehicle, see the information and list below to confirm.

These kits are for 500kBd P3 Cascadia's with ESC (Electronic Stability Control) only.

In addition, these kits **are not** for use on vehicles with Allison transmissions or for vehicles with factory installed Tire Pressure Monitoring Systems (TPMS).

OnGuard Collision Mitigation System (CMS) Kit

Set Part Number	Engine/Transmission Type
400 611 065 0	Detroit Diesel /MAN
400 611 066 0	Detroit Diesel/DT 12 AMT
400 611 067 0	Detroit Diesel/Eaton AMT
400 611 068 0	Cummins/MAN
400 611 069 0	Cummins/AMT

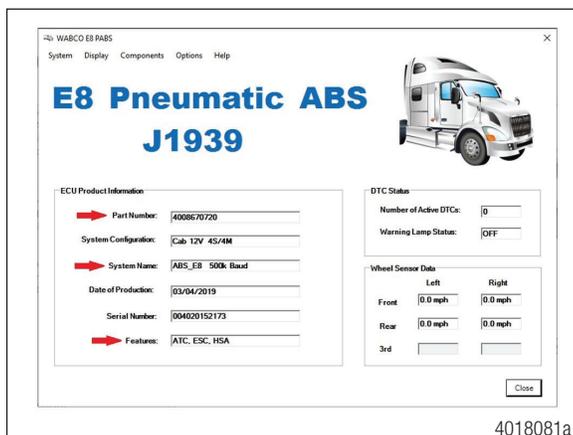
ABS ECU Confirmation

Regardless of ABS ECU type, ESC should be listed either on the ABS ECU label or in the TOOLBOX ECU Product Information "Features" list (Figure 1).

 These kits cannot be used on vehicles without ESC.

If the vehicle has an E8 ABS ECU, it will need to be updated in order to be compatible with OnGuard. To determine if the vehicle has an E8 ESC ABS ECU, obtain the part number and features either directly from the label on the ABS ECU or by obtaining the information through TOOLBOX in the "ECU Product Information" field (Figure 1).

Fig. 1



All P3 Cascadia's with E8 ESC ABS ECUs will have a part number that begins with 400 867 XXX 0, confirm the "400 867".

If the ABS ECU requires an update, refer to Section 5.6 OnGuard Radar Integration and System Checks later in this document for information on how to obtain and install the update into the ABS ECU.

If the vehicle does not have an E8 ABS ECU, no ABS ECU update is necessary.

5 Installation Procedures

5.1 OnGuard Radar Installation

1. Check the parts in the kit against the parts list and make sure the kit is complete.
2. Wear safe eye protection. Park the vehicle on a level surface. Apply the parking brake. Ensure the ignition is turned OFF.
3. It is also recommended to turn the battery disconnect off or disconnect the battery.
4. Check the bumper type to determine the correct location for mounting the radar to the bracket as indicated on the bracket label.
5. For vehicles with a plastic aerodynamic/Aerodyne bumper (Figure 2), position the radar to the upper set of mounting holes marked as shown (Figure 3).

Fig. 2



Fig. 3



Installation Procedures

6. For vehicles with a steel Hendrickson Aeroclad bumper (Figure 4), position the radar to the lower set of mounting holes marked as shown (Figure 5).

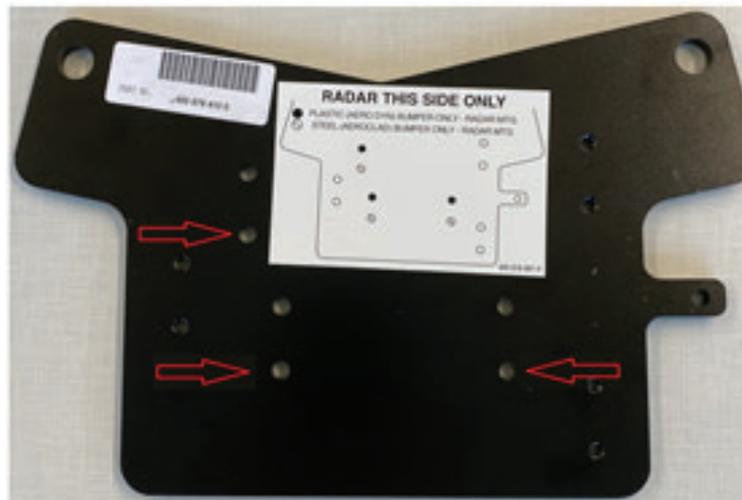
Fig. 4



**HENDRICKSON AEROCLAD
"STEEL" BUMPER**

4014092c

Fig. 5



**AEROCLAD "STEEL" BUMPER
RADAR MOUNTING LOCATION**

4014089c

7. Assemble the radar to the mounting bracket using the three M6 flanged nuts and tighten to 61-75 in-lb (6.9-8.4 N•m).
8. Remove the bumper according to the vehicle manufacturer's recommended instructions.

Installation Procedures

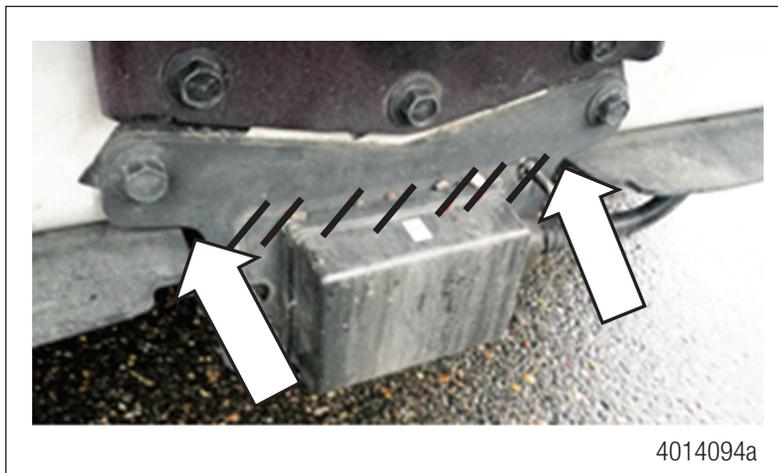
- Place the radar bracket assembly in mounting position on the cross member just below the hood mount pivot (Figure 6). Install the two 1/2-13 flanged bolts provided in the kit and tighten to 80-110 ft-lb (108-150 Nm).

Fig. 6



- The air dam baffle should tuck behind the radar bracket. If necessary, modify the air dam baffle to clear the radar bracket (Figure 7). After modification, ensure the radar bracket does not bind on any part of air dam when installed.

Fig. 7



Make sure the radar and bracket are secure; there should be no visual or physical movement or slack in the radar or the radar mounting bracket.

5.2 OnGuard Radar Harness Installation – All Versions

The radar harness will route as follows.

- A. From the radar across the vehicle's front closing cross member to the driver's side frame rail
- B. Around the radiator back into the frame rail.
- C. Past the engine with the existing wiring and electrical harness to the front firewall.
- D. Up out of the frame rail, up to the fire wall and up to the cab bulk head connector.



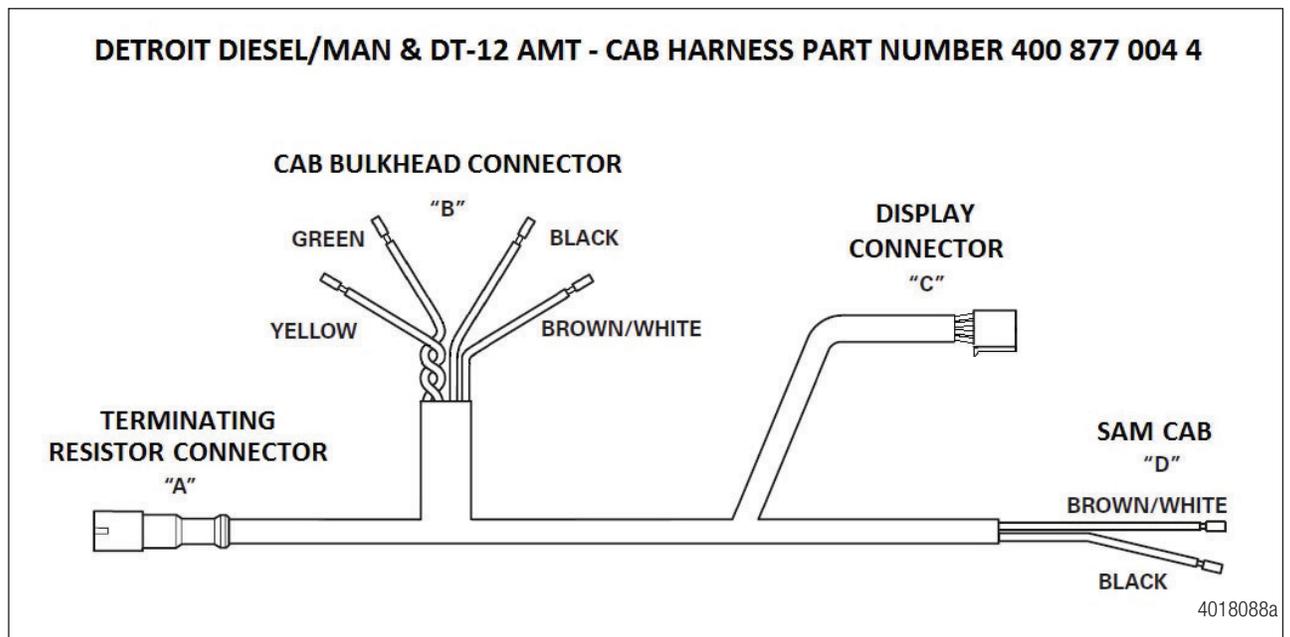
The following schematic shows the harness layout. Figure 8.

End A. Radar plug at the front center of the bumper.

End B. The terminating resistor location on the side forward frame rail.

End C. The cab bulkhead connection on the driver side firewall.

Fig. 8



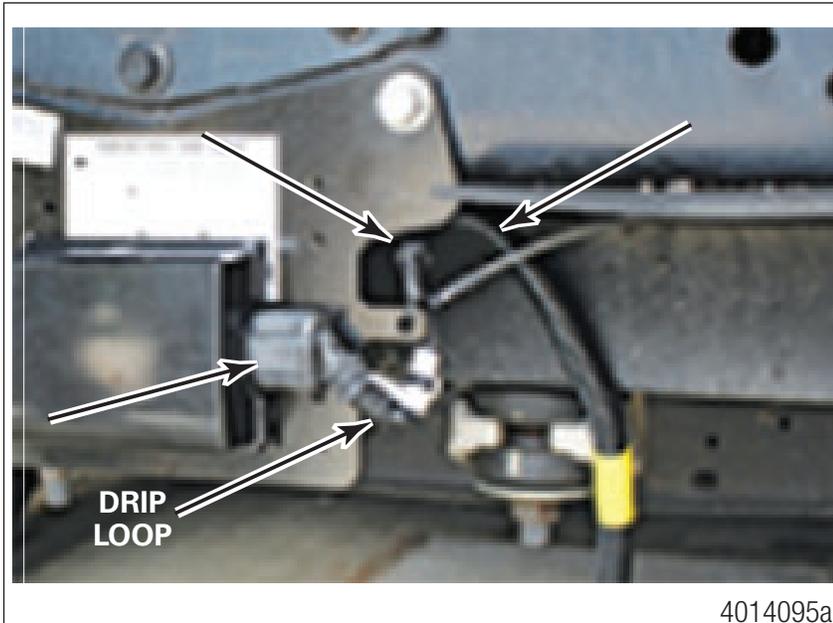
1. Starting at the radar, connect the A leg harness connector into the radar connector firmly until you feel it click. Make sure the boot is properly seated over the connector. Make a drip loop then zip tie the harness at the radar bracket to ensure the harness is secure (Figure 9).



Do not over tighten zip ties (may cause damage or stress points to the harness wires).

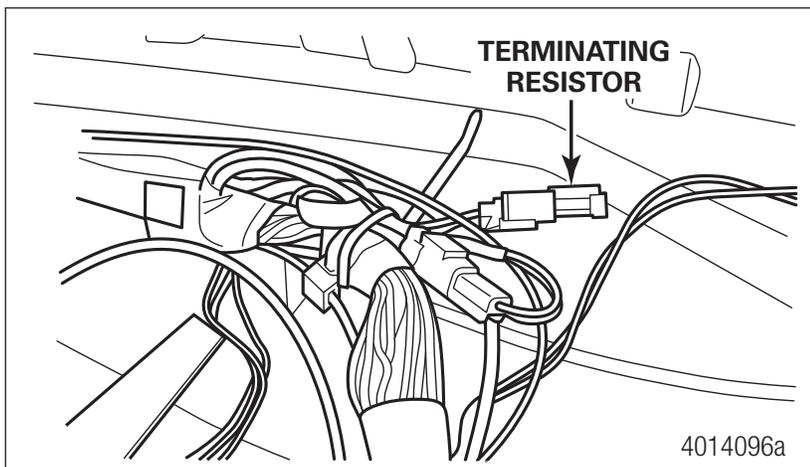
Installation Procedures

Fig. 9



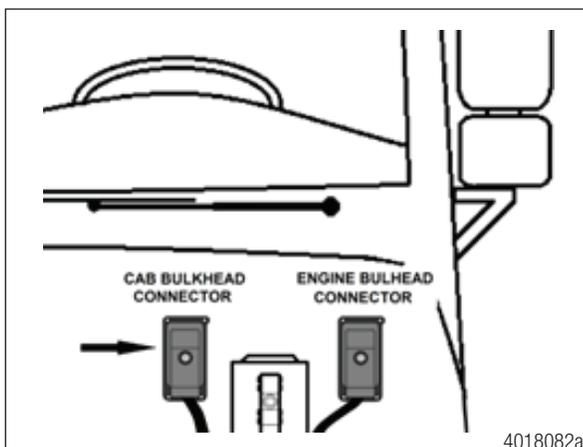
2. Route the harness across the front closing cross member to inside the driver's side frame rail. When routing the harness through the frame rail, ensure the J1939 terminating resistor connector leg B is accessible near the front frame rail, will need to be accessed later (Figure 10).

Fig. 10



3. Route the harness along the inside of the frame rail to the front of the firewall, then up to the cab bulkhead connector (Figure 11).

Fig. 11



Installation Procedures

4. Disconnect the harness from the cab bulkhead connector.
5. Remove the red terminal locking plate (Figure 12) from the cab bulkhead harness connector. Refer to the factory harness installation information.

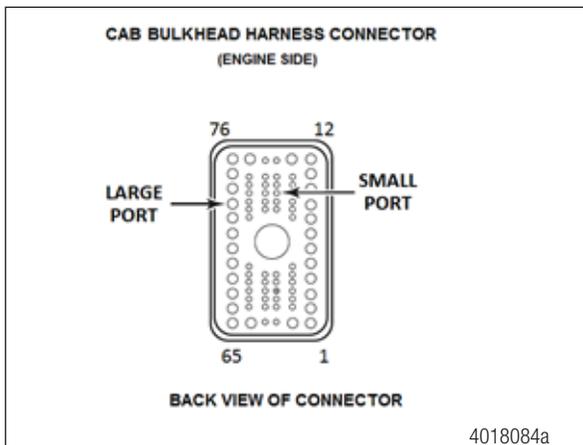
Fig. 12



Before connecting the wires to the cab harness bulkhead connector, if you have extra length of WABCO harness, bundle the extra in a safe location along the frame rail or in the area near the firewall and tie it down to the main bundle.

6. Install the following radar harness (Leg C) wires into the backside of the cab harness bulkhead connector (Figure 13):
 - Brown/white wire (Power) – Large terminal
 - Yellow wire (CAN_H) – Large terminal
 - Green wire (CAN_L) – Large terminal
 - Black wire (Ground) – Small terminal

Fig. 13





The available cab bulkhead connector terminal ports may vary based on the vehicle's options. There are only two port sizes (Figure 13), all the large ports are around the perimeter of the connector and most of the small ports are toward the center of the connector. Any open ports can be used.

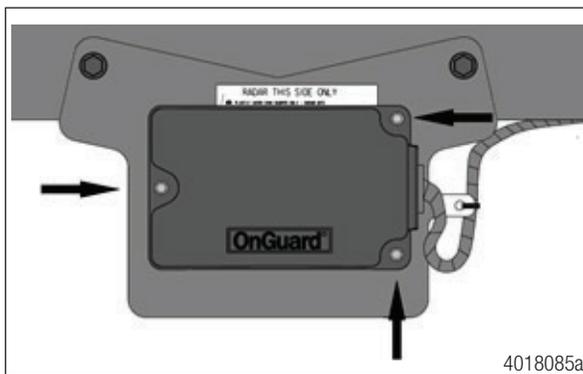
7. Note the locations of the wires as each is installed, the notes will be needed later when installing the wires into the mating connector.
8. Reinstall the red terminal locking plate into the cab bulkhead connector to lock the pins in place.



Do not reinstall the harness connector at this time. Access to the cab side of the cab bulkhead connector will be needed later when installing the in-cab harness.

9. After the wires have been installed into the connector, review the routing. Ensure the harness does not contact any fuel or air discharge lines. Make sure it is adequately secured the entire path and will not rub against any sharp edges.
10. Install the fascia over the radar, using the three M6 bolts (Figure 14), secure the fascia to the bracket, and tighten to 92 in-lb (10.4 N•m).

Fig. 14



5.3 OnGuard Display Installation

1. Locate adequate space on the B-panel to install the OnGuard display (Figure 15).

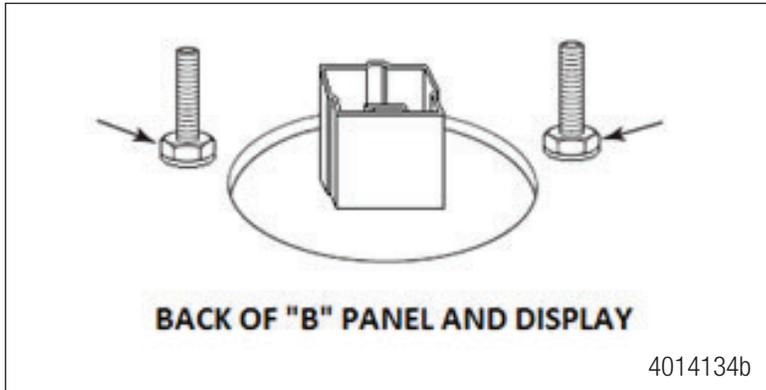
Fig. 15



Installation Procedures

- Carefully remove the B-panel, according to the vehicle manufacturer's recommended instructions.
- Tape the supplied template (see Appendix at the end of this document) in place, cut and/or drill the required holes on the template and B-panel (Figure 16).

Fig. 16



- Once the holes are finished, mount the WABCO display to the B-panel using the supplied 6-32 nuts and internal tooth washers (Figure 17), tighten the 6-32 nuts to 6-8 in-lb (0.68-0.9 N•m).

Fig. 17



Do not reinstall the B-panel at this time; access through the B-panel opening will be needed later to install the harness.

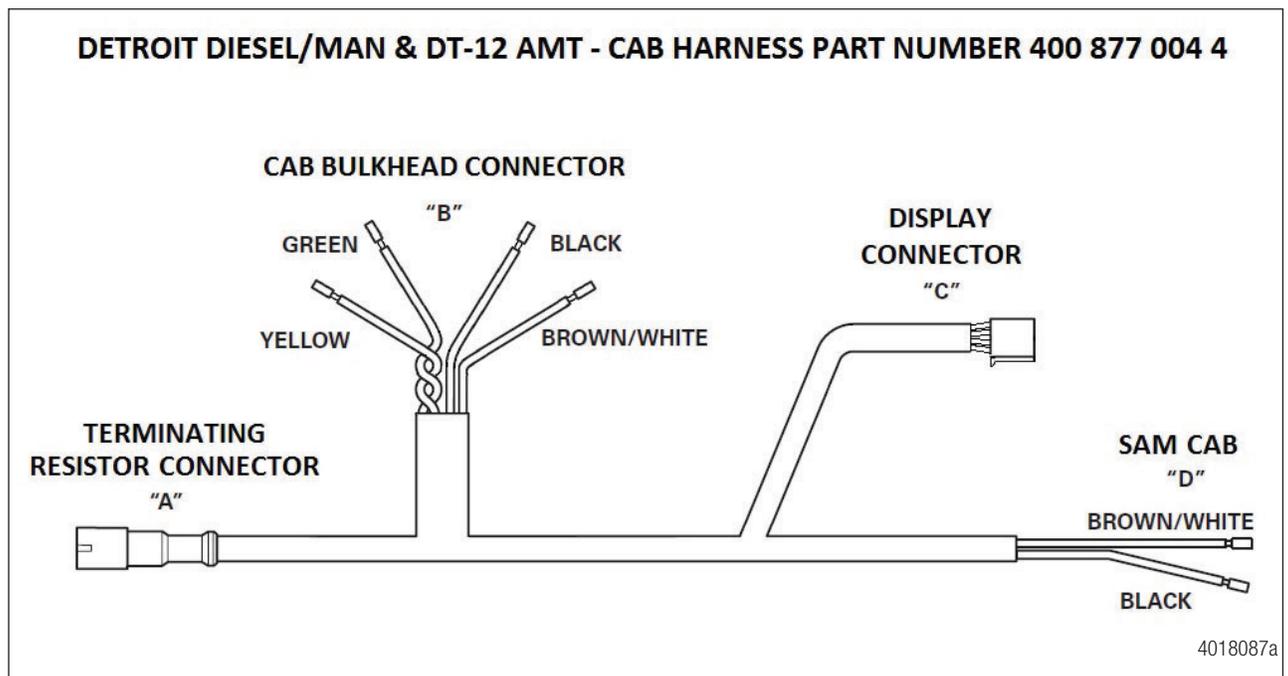
5.4 OnGuard Cab Harness (400 877 004 4) Installation for Vehicles with Detroit Diesel Engine/Manual or Detroit Diesel Engine/DT-12 AMT



The following schematic shows the harness layout (Figure 18).

- A. J1939 connection at the driver side kick panel
- B. Cab bulkhead connector at the firewall
- C. Display connection at the B-panel
- D. Power/Ground connection SAM cab under glove box

Fig. 18



1. To gain adequate access for harness routing, in addition to the already removed B-panel, remove the driver's side kick panel, instrument cluster and glove box assembly as necessary (Figures 19, 20 and 21). Refer to the vehicle manufacturer's instructions for correct procedures.

Fig. 19

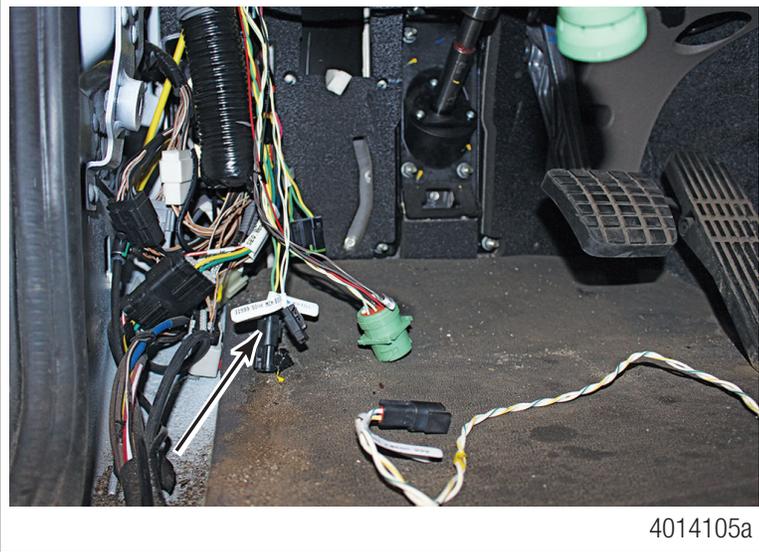


Fig. 20



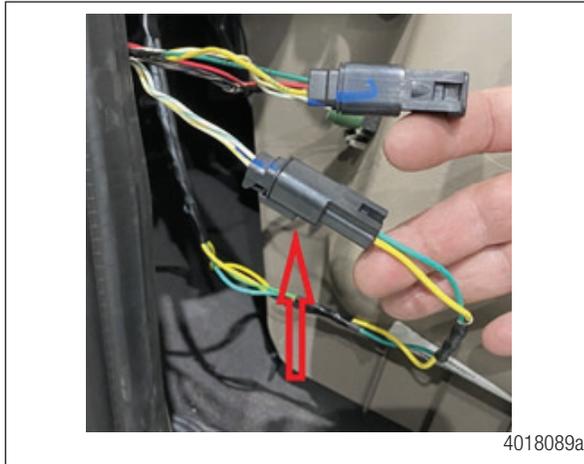
Fig. 21



Installation Procedures

2. Starting at the B-panel location, feed the A leg of the cab harness in the direction of the instrument cluster and down to the left side kick panel area. Feed the B leg of the harness toward the cab bulkhead connector. Leave the C leg of the harness at the B-panel opening. Feed the D leg of the harness toward the switch activation module (SAM) cab in the glove box area.

Fig. 22



3. At the kick panel harness area, locate the vehicle 500kBd CAN harness white/green and white/yellow twisted pair wires with the terminating resistor. Remove the terminating resistor and set aside. Connect the now empty vehicle terminating resistor harness connector to the A leg of the of the cab harness (Figure 22).
4. Route the B leg of the cab harness to the cab bulkhead connector area inside the cab.
5. From the engine bay side, remove the center screw, disconnect the cab bulkhead harness connector, remove the four mounting screws from the cab bulkhead connector and remove the red terminal locking plate from the cab bulkhead connector (Figure 23) according to the vehicle manufacturer's instructions.

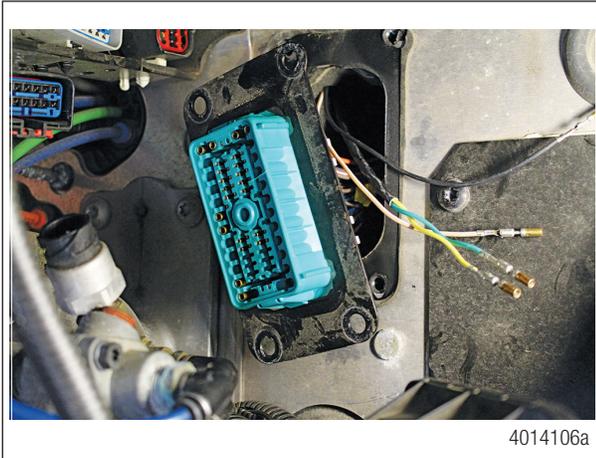
Fig. 23



Installation Procedures

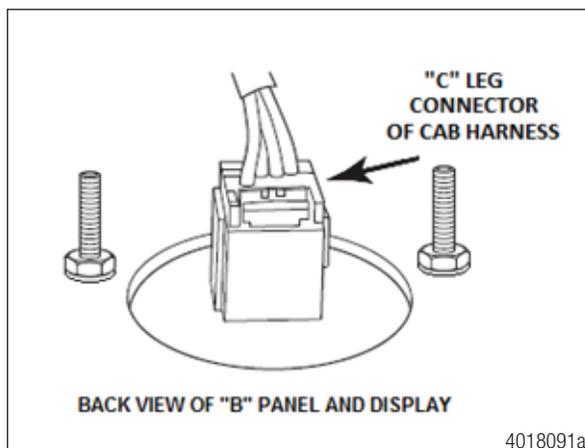
6. Pull the cab bulkhead connector forward to access the back side (Figure 24).

Fig. 24



7. Feed the B leg wires of the cab harness from the cab into the engine bay (Figure 24).
8. Install the wires from leg B of the cab harness into the cab side of the cab bulkhead connector. Refer to the notes taken in Section 5.2 Step 8 for appropriate pin locations.
9. Reinstall the red terminal locking plate into the cab bulkhead harness connector to lock the pins in place, according to the vehicle manufacturer's instructions.
10. Reinstall the cab bulkhead with the four mounting screws and reconnect the cab bulkhead harness to the cab bulkhead connector, according to the vehicle manufacturer's instructions.
11. Install the J1939 terminating resistor that was removed from the vehicle CAN twisted pair connector at the kick panel in Step 3 (Figure 22) and install it in the radar harness leg B connector referenced in Step 2 of Section 5.2 (Figure 10).
12. At the B-panel inside the cab, plug the C leg connector of the cab harness into the newly mounted display (Figure 25). Ensure there is enough slack in the harness before the tie down to allow access to the B-panel, without stressing the harness.

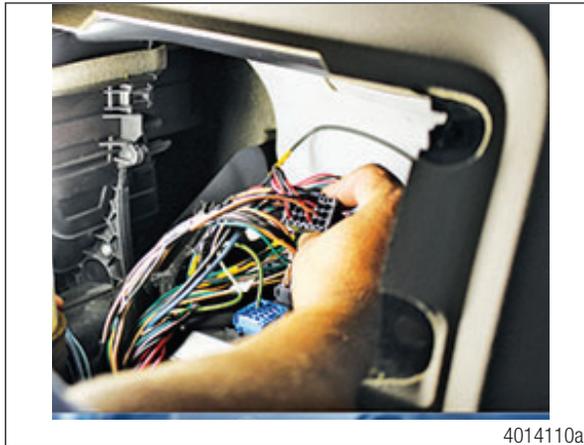
Fig. 25



Installation Procedures

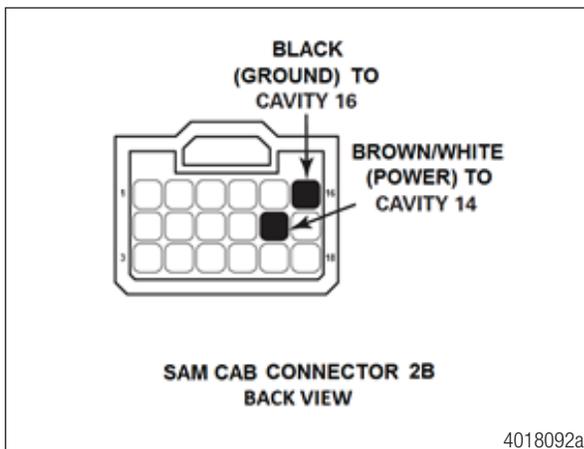
13. At the SAM cab under the glove box, pull connector 2B from the SAM cab (Figure 26) and unlock the connector slide lock according to the vehicle manufacturer's instructions

Fig. 26



14. Install the brown/white and black wires from the D leg of the cab harness into the back of the 2B connector (Figure 27). Install the brown/white (power) wire into cavity 14 and install the black (ground) wire into cavity 16.

Fig. 27



15. Relock the connector according to the vehicle manufacturer's instructions.
16. Reconnect the 2B connector back into the SAM cab module.
17. Once the harness installation is complete, inspect the harness to ensure it is tied down adequately and avoids all sharp edges, wear spots or heat sources.
18. Reinstall the bumper according to the manufacturer's recommended instructions. Ensure there is at least 1/4-inch (6.35 mm) of clearance between the radar sensor/fascia and the bumper in all directions.



Contact between the radar/fascia mounting and the bumper can cause damage to the radar sensor or false activation of the system.

19. Continue to Section 5.6 OnGuard Radar Integration and System Checks.

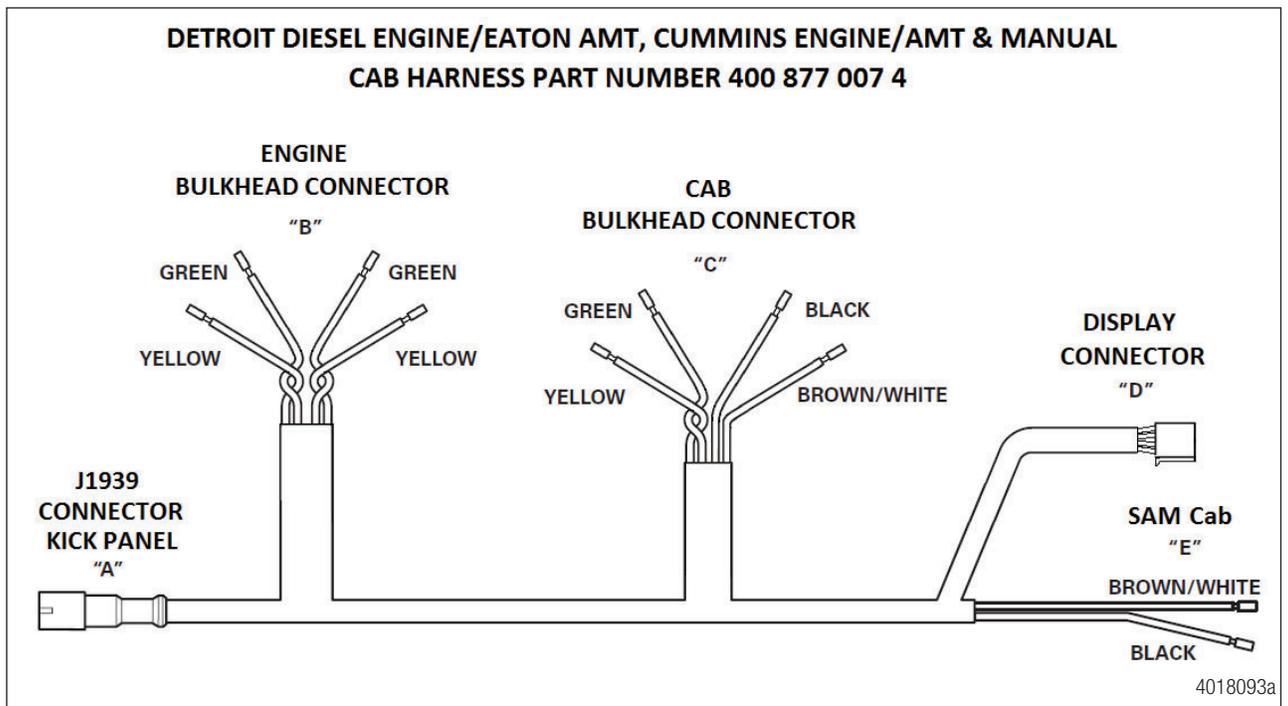
5.5 OnGuard Cab Harness (400 877 007 4, 400 877 002 4) Installations for Vehicles with Detroit Diesel Engine/Eaton AMTs, Cummins Engine/AMT or Cummins Engine/Manual



The schematic below shows the harness layout and connection locations (Figure 28).

- A. J1939 connection, left hand kick panel
- B. Engine bulkhead connector, outer driver side firewall
- C. Cab bulkhead connector, inner driver side firewall
- D. Display connection, B-panel
- E. Power/Ground connection, SAM Cab under glove box

Fig. 28



1. To gain adequate access for harness routing, in addition to the already removed B-panel, remove the driver's side kick panel, instrument cluster and glove box assembly as necessary (Figures 29, 30 and 31). Refer to the vehicle manufacturer's instructions for correct procedures.

Fig. 29

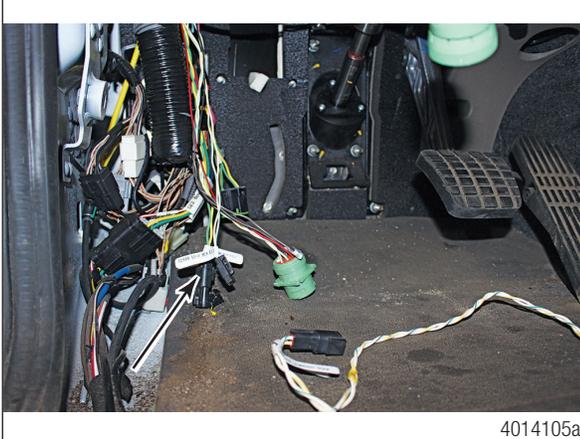


Fig. 30



Fig. 31



2. Starting at the B-panel location, feed the A leg of the cab harness in the direction of the instrument cluster and down to the left side kick panel area. Feed the B leg of the harness toward the engine bulkhead connector. Feed the C leg of the harness toward the cab bulkhead connector. Leave the D leg of the harness at the B-panel opening. Feed the E leg of the harness toward the SAM cab in the glove box area.

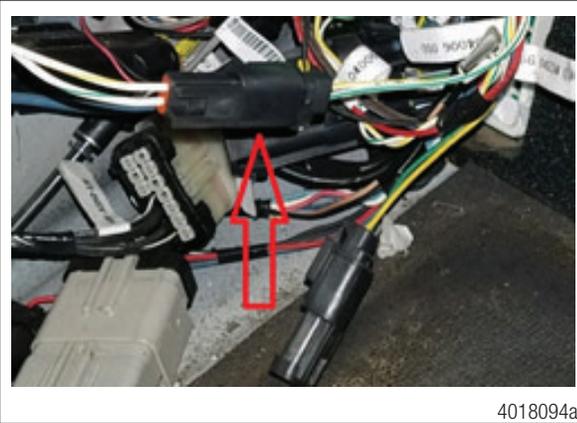


In the next few steps, a portion of the vehicle CAN harness will be by-passed with the new WABCO cab harness.

Installation Procedures

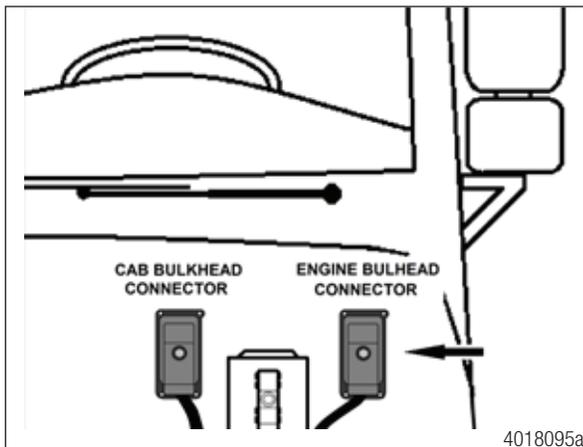
3. At the driver side kick panel harness area, locate the vehicle 500kBd CAN harness green/white and yellow/white twisted pair with an in-line connector and disconnect the in-line connector (Figure 32).

Fig. 32



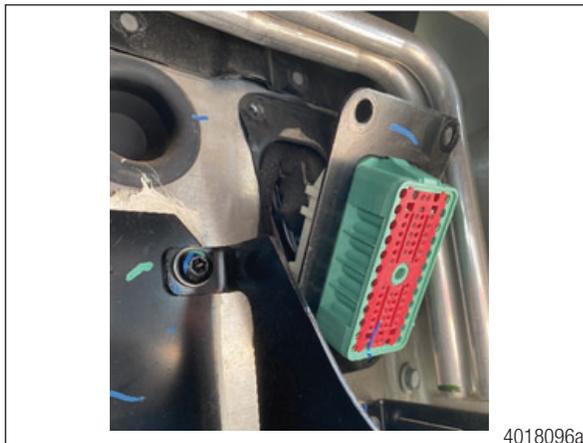
4. Route the B leg of the harness to the engine bulkhead connector area inside the cab.
5. At the engine bulkhead connector (Figure 33), from the engine bay side, remove the center screw, disconnect the engine bulkhead harness connector from the engine bulkhead connector and remove the four mounting screws, according to the vehicle manufacturer's instructions.

Fig. 33



6. Pull the engine bulkhead connector (Figure 34) forward to access the cab (back) side and remove the red terminal locking plate from the engine bulkhead connector, according to the vehicle manufacturer's instructions.

Fig. 34



Installation Procedures

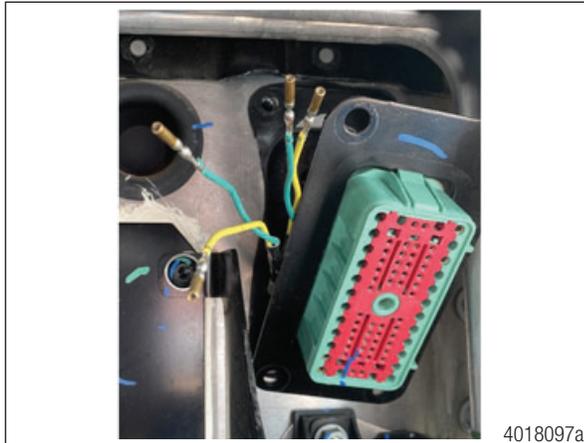
7. Locate the J1939 twisted pair wires (white/green J1939- in cavity 55 and white/yellow J1939+ in cavity 56) in the engine bulkhead connector, cab side and remove the wires.
8. Perform a resistance test on each of the two wires to confirm continuity to the two J1939 harness kick panel wires unplugged in Step 3. Once you have confirmed these are the correct wires, tape off the two CAN wires near the bulkhead and the CAN connector at the other end in the kick panel area. Stow the wires/harness as necessary.



This is the portion of vehicle harness that is by-passed, mentioned in the Step 2 Note.

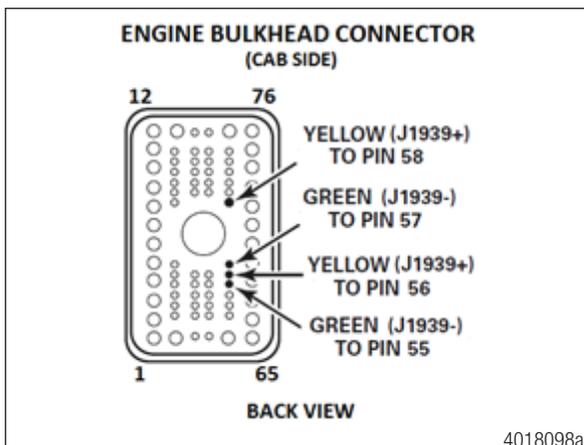
9. Feed the B leg of the harness through the engine bulkhead connector opening and into the engine bay (Figure 35).

Fig. 35



10. Install the following wires into the back of the engine bulkhead connector, cab side (Figure 36).
 - Green J1939- wire to pin 55, verify continuity to A leg connector green wire prior to installing
 - Yellow J1939+ wire to pin 56, Verify continuity to A leg connector yellow wire prior to installing
 - Green wire J1939- to pin 57
 - Yellow wire J1939+ to pin 58

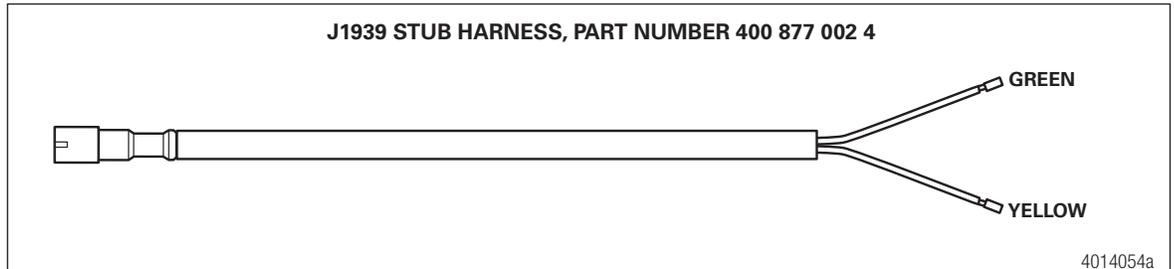
Fig. 36



Installation Procedures

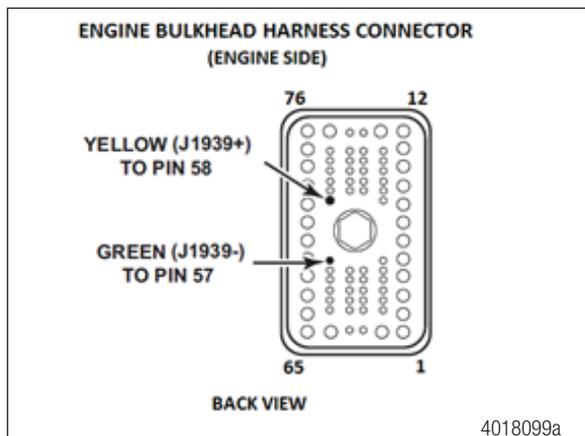
11. Reinstall the red terminal locking plate into the engine bulkhead connector to lock the pins in place and reinstall the engine bulkhead connector into the fire wall using the four mounting bolts, according to the vehicle manufacturer's instructions.
12. Remove the red terminal locking plate from the engine bulkhead harness connector, according to the vehicle manufacturer's instructions (Figure 37).

Fig. 37



13. Install the green and yellow wires of the J1939 jumper stub harness, part number 400 877 002 4 (supplied), into the back side of engine bulkhead harness connector as follows (Figure 38):
 - Green J1939- wire in to pin 57
 - Yellow J1939+ wire in to pin 58

Fig. 38



14. Reinstall the red terminal locking plate into the engine bulkhead harness connector to lock the pins in place, according to the vehicle manufacturer's instructions.
15. Reinstall the engine bulkhead harness connector to the engine bulkhead connector, tighten the center bolt, and reinstall the cover, according to the vehicle manufacturer's instructions.
16. Locate the J1939 terminating resistor in the harness near the engine bulkhead connector (Figure 39) and remove the terminating resistor (set terminating resistor aside).

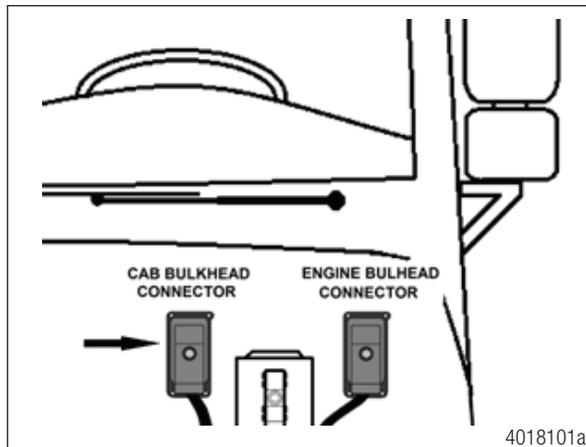
Fig. 39



Installation Procedures

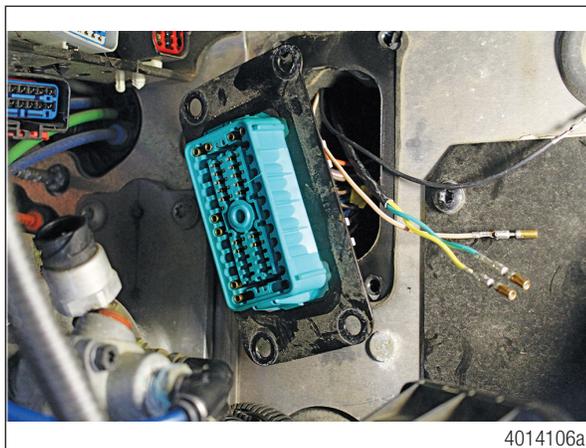
17. Connect the J1939 jumper stub harness to the now empty vehicle J1939 terminating resistor harness connector.
18. Install the J1939 terminating resistor that was just removed from the vehicle harness, into the radar harness leg B connector, referenced in Section 5.2 Step 2 (Figure 10).
19. From the engine bay, remove the four mounting screws from the cab bulkhead connector (Figure 40) and pull the connector forward to access the back side, according to the vehicle manufacturer's instructions.

Fig. 40



20. Feed the C leg wires of the cab harness from the cab into the engine bay (Figure 41).

Fig. 41

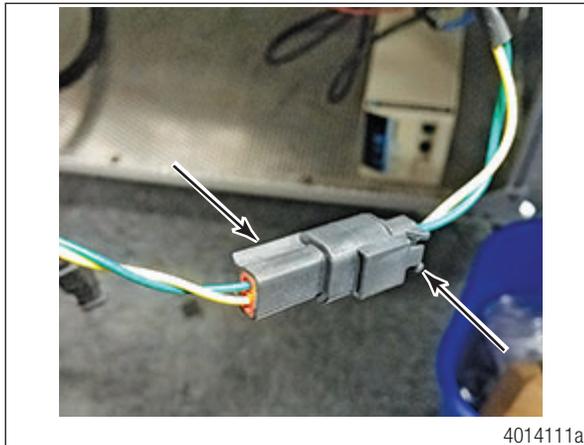


21. Install the wires from the C leg of the cab harness into the cab side of the cab bulkhead connector. Refer to the notes taken in Section 5.2 Step 8 for appropriate pin locations.
22. Reinstall the red terminal locking plate into the cab bulkhead connector to lock the pins in place according to the vehicle manufacturer's instructions.
23. Reinstall the cab bulkhead with the four mounting screws and reconnect the cab bulkhead harness to the cab bulkhead connector, tighten the center bolt, and reinstall the cover, according to the vehicle manufacturer's instructions.

Installation Procedures

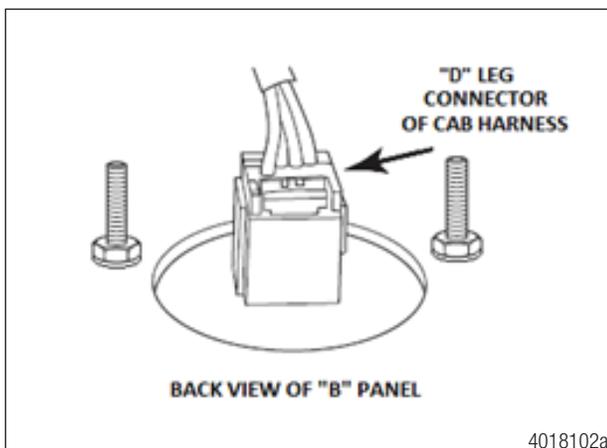
24. At the kick panel location, connect the A leg of the cab harness into the vehicle J1939 harness that was disconnected in Step 3 (Figure 42).

Fig. 42



25. At the B-panel inside the cab, connect the D leg connector of the cab harness into the newly mounted display (Figure 43). Ensure there is enough slack in the harness before the tying down to allow access to the B-panel, without stressing the harness.

Fig. 43



26. Route the E leg of the harness to the SAM cab module.

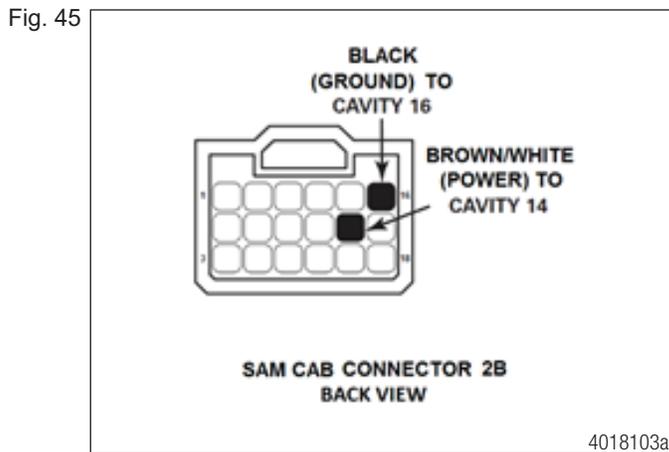
27. At the SAM cab under the glove box, pull connector 2B from the SAM cab (Figure 44) and unlock the connector slide lock according to the vehicle manufacturer's instructions.

Fig. 44



Installation Procedures

28. Install the brown/white and black wires from the E leg of the cab harness into the back side of the 2B connector (Figure 45). Install the brown/white (power) wire to cavity 14 and the black (ground) wire into cavity 16.



29. Relock the connector according to the vehicle manufacturer's instructions.
30. Reconnect the 2B connector back into the SAM cab.
31. Once the harness installations are complete, inspect the harnesses to ensure they are tied down adequately and avoid all sharp edges.
32. Reinstall the bumper according to the manufacturer's recommended instructions. Ensure there is at least 1/4 inch (6.35 mm) of clearance between the radar sensor/fascia and the bumper in all directions.



Contact between the radar/fascia mounting and the bumper can cause damage to the radar sensor or false activation of the system.

33. Continue to Section 5.6 OnGuard Radar Integration and System Checks.

5.6 OnGuard Radar Integration and System Checks

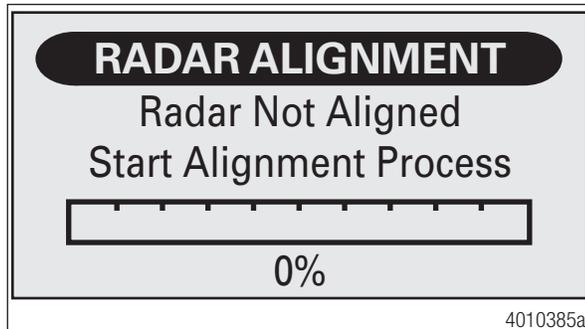
1. Once all installation procedures have been completed, inspect and verify all the harnesses are secure and avoid all sharp edges, wear spots or heat sources. Verify all the connectors are secure and properly connected.
2. Reconnect the battery or turn the battery disconnect back on.
3. Perform a resistance test across pins C and D at the J1939 diagnostic connector. There should be approximately 60 ohms of resistance. If you get a reading of 120 ohm, only one of the end-of-line resistors installed. If resistance is 30 ohms, you have three resistors installed. The correct number is two end-of-line resistors, located on each end of the J1939 back bone.

4. Cycle the ignition to Accessories ON. The OnGuard system will run through its self-checks and should end with a Radar Alignment screen (Figure 46). If the display is in the Radar Alignment screen, the display will remain with this screen until the alignment has been completed.



The display may be in an amber System Error screen as the engine and/or ABS have not been update yet. Once the engine and/or ABS have been updated, the Radar Not Aligned screen should be displayed.

Fig. 46



5.6.1 Engine Update

With a certified engine communication tool, turn on/enable the engine parameters according to the Detroit Diesel or Cummins engine specification for OnGuard.

5.6.2 E8 ABS Update

If you have an E8 ABS ECU, determined earlier in Section 4, an update to the ABS ECU will be needed. Items needed to complete the ABS ECU update process are:

- A laptop with access to the Internet that has TOOLBOX 12.10 or higher installed.
- A TOOLBOX-compatible diagnostic communication adapter/device (RP1210A). (Example: Nexiq USB Link 2 or Noregon DLA+2)
- A new ABS ECU configuration file.



If needed, TOOLBOX software can be obtained through our website WABCO.Snapon.com. TOOLBOX software will need to be installed prior to updating the ABS ECU.

1. To obtain the new ABS ECU config file, go to the WABCO.Snapon.com website.
2. When you reach the WABCO.Snapon.com website, enter your Username and Password (Figure 47).

Fig. 47

Registered Users

Returning users can log on using the controls below. New users must register using one of the options in the New Users panel.

Username*

Forgot Username?

Password*

Forgot Password?

Sign In

New Users

You need to create a user account before you can place an order.

Create a new user account

* denotes required field

4018104b



If this is your first time logging into this site, you will need to create an account. Click on the Create a new user account button and follow the steps.

3. Select Retrofit Configuration File from either the task bar near the top of the page or from the Categories box on the left side of the page (Figure 48).

Fig. 48

TOOLBOX Software > Aftermarket Programming Configuration Files > Retrofit Configuration File

Home / Catalog

Shopping Cart: 0 Items \$0.00

Categories

- TOOLBOX Software
- Aftermarket Programming Configuration Files
- Retrofit Configuration File

TOOLBOX PLUS

We are happy to announce the release of WABCO TOOLBOX PLUS™, the latest generation of our PC-based diagnostics software that expedites vehicle and trailer diagnosis and minimizes downtime.

The newest version of WABCO TOOLBOX™ software features a redesigned homepage interface, support for the WABCO product portfolio—including our latest product releases Intelligent Anti-lock Braking System (IABS™), Modular Braking System Platform (mBSP™) and TailGUARD™ reversing collision avoidance system; automatic detection of WABCO systems on the vehicle, and pre-populated warranty forms for email to the WABCO Customer Care Center.

TOOLBOX PLUS is available in one, two and three year subscriptions. To purchase a subscription, visit <https://wabco.snapon.com/Shopping/Product.aspx?ProductNumber=TOOLBOXPLUS> or call Snap-on Customer Care at +1 (800) 639-6774.

4018105b

4. In the blue Part Details section (Figure 49), enter:
 - The full VIN
 - Retrofit Type (for this procedure, enter code E8 XBR 20:1)
 - ABS ECU part number
 - After verifying the J1939 vehicle communications, then check the J1939 Communications conformation box
 - Click on the Find Configuration button

Fig. 49

Part Details

VIN* All 17 Characters

Retrofit Type*

ABS ECU Part Number* 10 Digits (400xxxxxx0)

I have read the limitations above and confirm that this vehicle supports J1939 communications.

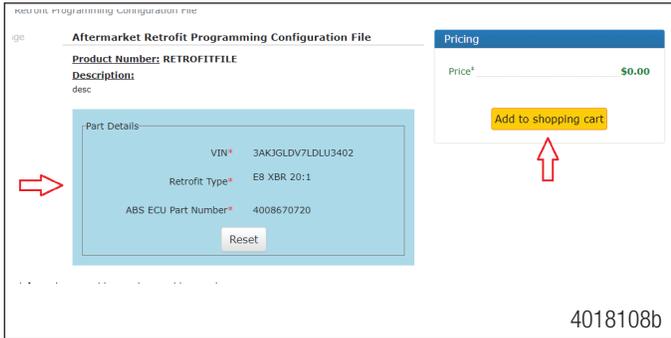
Find Configuration

4018107b

Installation Procedures

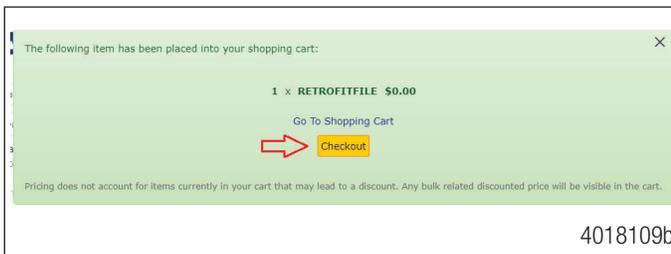
5. Confirm the Part Details information and click on the Add to shopping Cart button (Figure 50).

Fig. 50



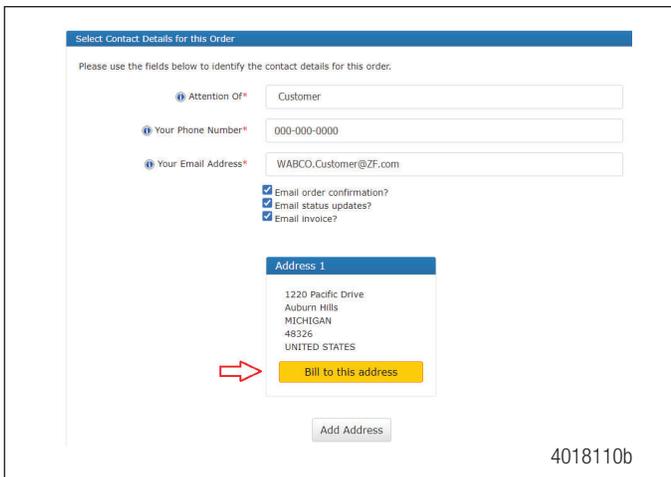
6. Click on the "Checkout" button in the green go to shopping cart window (Figure 51).

Fig. 51



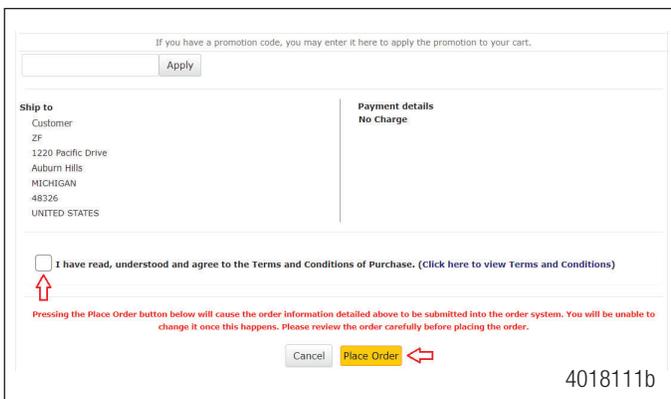
7. Confirm billing address information is correct and click on the Bill to this address button (Figure 52).

Fig. 52



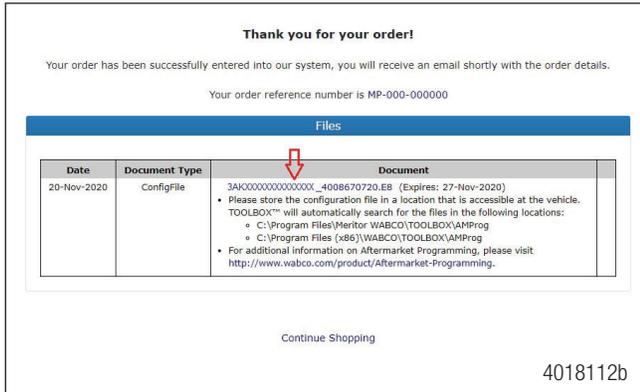
8. Check the Terms and Conditions box and click on the Place Order button (Figure 53).

Fig. 53



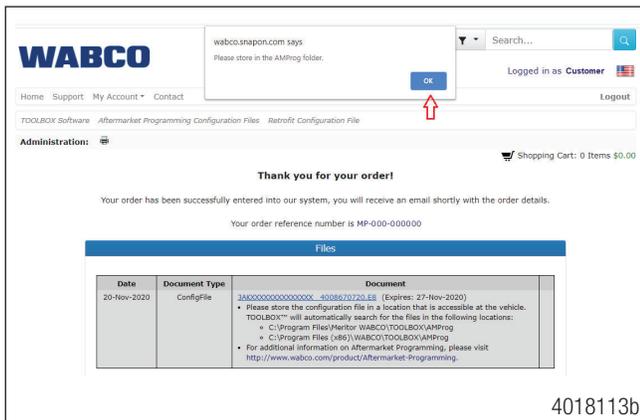
- Click on the highlighted file name in the Document section (Figure 54).

Fig. 54



- Click OK in the Please store in the AMProg folder message window (Figure 55).

Fig. 55



Depending on how your computer is set up, the new file will be sent to either your downloads folder or directly to the AMProg folder in C:\Program Files (x86)\WABCO\TOOLBOX.

If the new file was sent to “Downloads”, copy the file and paste it in C:\Program Files (x86)\WABCO\Toolbox\AMProg folder.



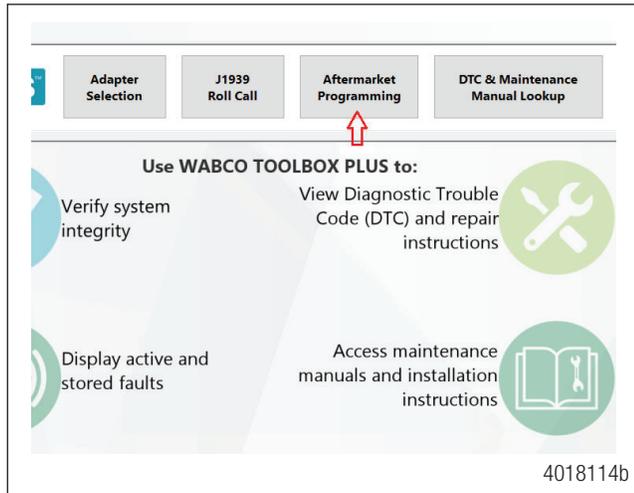
May require admin rights to perform this task.

- Now that the new file has been stored in the proper location, connect the laptop to the vehicle using the RP1210A adapter/device, turn the ignition on, open TOOLBOX 12.10 or higher software to the home page and click on the Aftermarket Programming button at the top of the page (Figure 56).



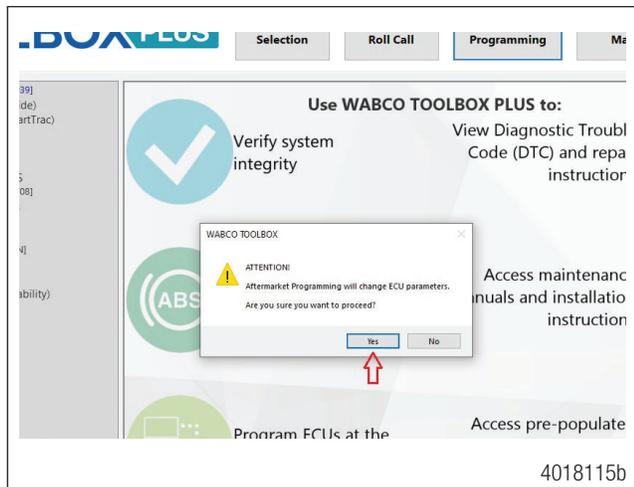
TOOLBOX screens may look different depending on the version of TOOLBOX software being used but the work instructions still apply.

Fig. 56



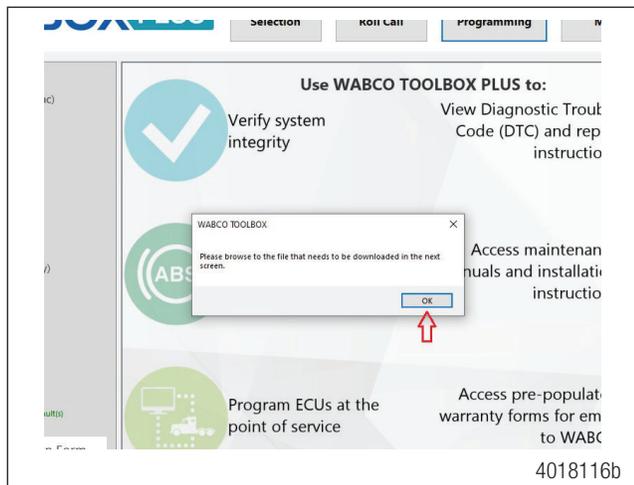
12. A WABCO TOOLBOX Attention message will appear warning that this procedure will change the ABS ECU parameters, click the Yes button (Figure 57).

Fig. 57



13. To direct TOOLBOX to the new file, click OK in the browsing message window (Figure 58).

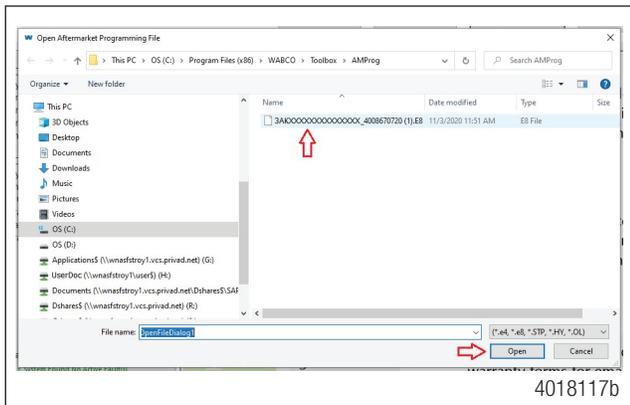
Fig. 58



Installation Procedures

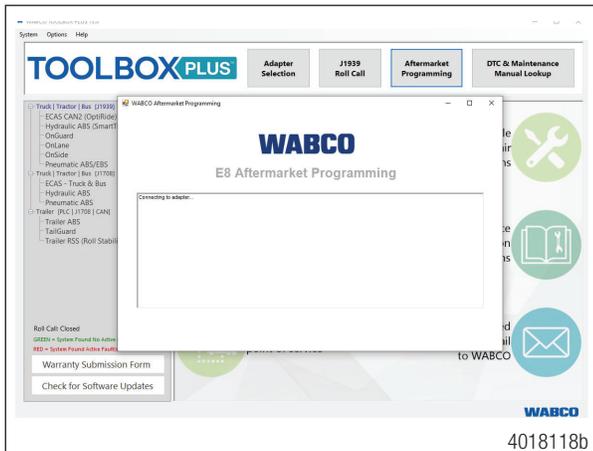
14. Once you have located the new file, click on it one time to highlight the file, then click Open (Figure 59).

Fig. 59



15. Opening the file will start the programming process and the Programming window be displayed (Figure 60).

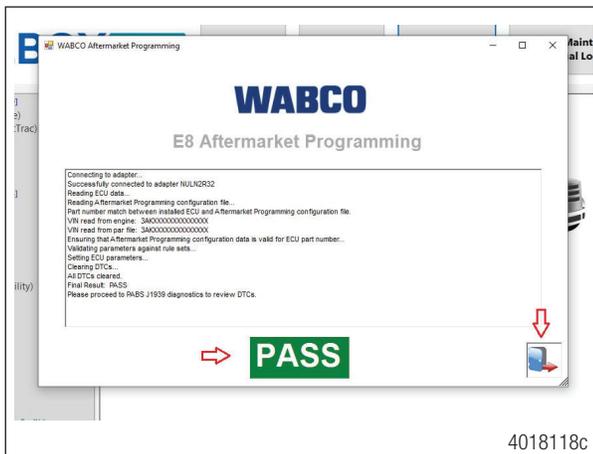
Fig. 60



 The programming process will be quick (less than one minute).

16. When the programming has been successfully completed, a green PASS message will appear at the bottom of the window. Click on the Exit icon to close the window (Figure 61). Close out of the TOOLBOX software and cycle the key off.

Fig. 61

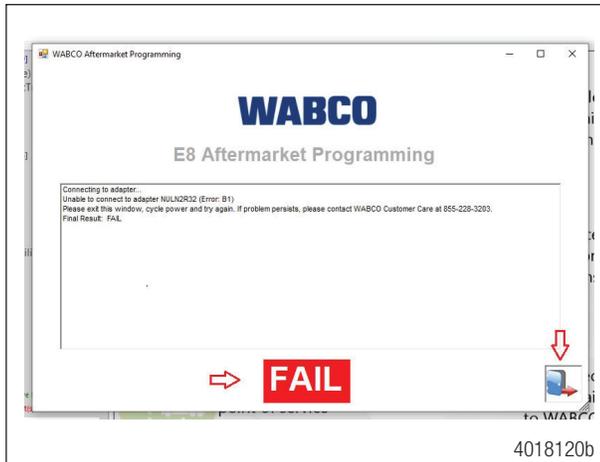




The ABS light will be ON but should go out once the vehicle wheel speed is above 14 mph.

If a red FAIL message appears, indicating the programming failed (Figure 62), click on the Exit icon to close the window. Verify the key is on, check the adapter connections between the laptop and the vehicle, cycle the ignition and try programming again.

Fig. 62



5.6.3 Warning Label Installation

The WABCO OnGuard Aftermarket harness is very similar to the original equipment harness but the harness routing and pin locations at the cab bulkhead connector may not be the same. To aid in future system diagnostics and repair, the WABCO OnGuard Aftermarket Warning labels must be installed.



The WABCO OnGuard Aftermarket WARNING labels in Steps 4 and 5 can be found on one sheet (provided in the kit, part number 899 202 703 4).

1. Install one of the TP19045 labels to each of the WABCO harnesses that lead to the cab bulkhead connector (engine compartment and in-cab). Fold the labels around the harnesses, carefully align and press the back sides of the label together, smoothing out any wrinkles or bubbles. The labels should be placed within a foot of the cab bulkhead connector. Make sure the information is clearly legible from either side of the harness (Figures 63 and 64).

Installation Procedures

Fig. 63



Engine compartment location

Fig. 64



In-Cab location

2. Locate an area on the driver's side door jamb (door or B-pillar) to install the WABCO OnGuard Aftermarket WARNING door jamb label TP19044 (supplied on sheet, part number 899 202 703 4). Make sure the area is clean and free from any dirt, oil or grease. Press the label into place and smooth out any wrinkles or bubbles (Figure 65).

Fig. 65



4018123a

5.6.4 Installation Final Review

1. Verify all new components are properly mounted and secure.
2. Verify that all of the harnesses are secure and avoid any sharp objects, potential rub spots or heat sources.
3. Reinstall all the dash panels that were removed during the harness installation, according to vehicle manufacturer's recommended instructions.
4. Proceed to Section 5.7 Alignment and Road Test.

5.7 Alignment and Road Test



While the OnGuard system is in Service Alignment mode, OnGuard will not track vehicles or operate until the Service Alignment procedure is completed.

1. Drive the vehicle on a straight road above 30 mph (48 km/h). The road should have telephone poles, sign posts and or other non-moving objects along the roadside. There must also be other traffic on the road, either on-coming or lead vehicles at distances greater than 150 ft (45.72 m).

While in Radar Alignment mode, the OnGuard display will show the progress of the alignment until it reaches 100% (Figures 66 and 67).

Fig. 66

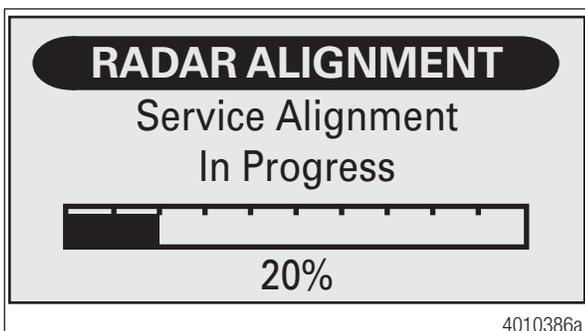
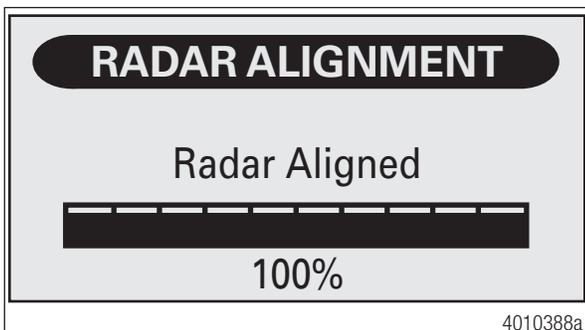


Fig. 67



Stopping the vehicle or turning corners while traveling in traffic is acceptable but will increase the time needed to complete the alignment procedure.

2. Once the alignment has completed, the system will automatically revert to one of the normal operating screens. This completes the Radar Sensor Service Alignment procedure. The OnGuard System should now be aligned.

Important Information



At the completion of the Service Alignment, the engine may have an active diagnostic trouble code because Adaptive Cruise Control was inoperable during the alignment. If this is the case, park the vehicle in a safe location and turn the ignition switch OFF for two minutes. This will allow the engine ECU to complete a full sleep cycle and reset the trouble codes.

3. After the radar alignment has been completed, it is recommended that the vehicle should be taken on a short test drive to confirm proper OnGuard and vehicle performance.
4. Confirm that OnGuard is properly tracking vehicles, screen is blue when no vehicles are being tracked and green when tracking a vehicle.
5. Confirm Adaptive Cruise Control (ACC) is functioning properly.
6. Verify there are no OnGuard or vehicle warning lights or DTCs.
7. Clear any stored DTCs that may have occurred during the installation process from the engine, ABS or OnGuard.



For more detailed information on OnGuard performance and operation, please refer to: OnGuardActive Driver Tips Guide SP1658, available from our Literature Center at wabco-na.com/literature. For further information, contact the WABCO Customer Care Center at 855-228-3203 (United States and Canada); 001-800-889-1834 (Mexico); or email wnacustomer@wabco-na.com.

6 Important Information

WARNING

The OnGuardACTIVE® Collision Mitigation System (CMS) is a driver aid only. It is designed to assist the vehicle operator in maintaining a safe following distance and, if needed, provide limited initial braking to reduce the severity of a possible collision. It is not an auto-pilot system for operating the vehicle.

The OnGuardACTIVE CMS is no substitute for the most important factor in vehicle safety, which is a safe, conscientious driver. Use of OnGuardACTIVE CMS cannot compensate for a driver who is distracted, inattentive or impaired by fatigue, drugs or alcohol. As always, it is the driver's responsibility to:

- Use safe driving techniques
- Exercise proper judgment for the traffic, road and weather conditions
- Maintain a safe distance between vehicles
- Apply the brakes when needed to maintain control of the vehicle

Whether OnGuardACTIVE CMS is in use or not, the driver is responsible for the vehicle's speed, distance between other vehicles and braking the vehicle, if necessary, to avoid a collision. Never wait for an OnGuardACTIVE CMS warning before applying the brakes. Failure to do so can result in serious personal injury or death, and/or severe property damage.

WARNING

The driver is responsible for understanding the operation and limitations of the OnGuardACTIVE system before operating the vehicle. Failure to do so can result in serious personal injury or death, and/or severe property damage.

WARNING

If the driver accelerates to a faster speed than the one set to overtake a vehicle, OnGuardACTIVE CMS will return to the last stored speed once the driver removes his/her foot from the accelerator pedal. The driver must be aware of the last stored speed to make sure that the vehicle can remain in control or deactivate the system. Failure to do so can result in serious personal injury or death, and/or severe property damage.

WARNING

OnGuardACTIVE CMS may take a few moments to adjust to the selected speed. Adjust the speed as necessary to accommodate the current road, traffic and weather conditions. Use care to avoid dramatic acceleration or deceleration of the vehicle which can lead to a loss of control. Serious personal injury or death, and/or severe property damage can result.

WARNING

Using the “Resume” option will return the vehicle to the last stored set speed. It is the driver’s responsibility to be aware of what the last stored speed is and ensure it is safe and legal for the current road, traffic and weather conditions. Failure to do so can result in serious personal injury or death, and/or severe property damage.

WARNING

The driver should consider the benefit/risk of using the ACC function under the following conditions:

- Weather such as rain, sleet, snow, ice, heavy fog, as well as smoke or dust. These conditions can make roads slippery which can cause a spinout, or block or limit the radar’s distance sensing ability.
- Construction zones, off road, dirt roads or muddy roads with loose surface. These conditions can cause the wheels to lose traction and limit the ability of OnGuardACTIVE to provide appropriate warning and adequate braking.
- Curvy or winding roads, roads with sharp turns can make it difficult for the OnGuardACTIVE® CMS radar to track vehicles in it’s path. While in a sharp turn or if the preceding vehicle is in a sharp turn, OnGuardACTIVE may no longer track a vehicle in front of you. Your vehicle could then unexpectedly accelerate to the previously selected speed.
- Heavy or complicated traffic, entry and exit ramps, downhill, cross traffic and intersections. OnGuardACTIVE CMS is not capable of taking into account these complex traffic situations and respond to each scenario. It cannot track traffic and objects traveling perpendicular to it’s path.
- Driving in these conditions with OnGuardACTIVE CMS active can produce false warnings, unexpected braking or no response at all. Serious personal injury or death, and/or severe property damage can result.

Important Information

WARNING

The driver is responsible for understanding the operation and limitations of the OnGuardACTIVE CMS before operating the vehicle. Failure to do so can result in serious personal injury or death, and/or severe property damage.

WARNING

Do not allow the fascia to become blocked by any foreign matter (dirt, snow, ice, stickers, deer guards, etc.), otherwise a system fault will occur and the OnGuardACTIVE system will be disabled. If the system becomes disabled, immediately inspect the OnGuardACTIVE fascia for a blockage and correct it as necessary. Whether or not the radar is working correctly, it is the driver's responsibility to apply the brakes when necessary to maintain vehicle control. Failure to do so can result in serious personal injury or death, and/or severe property damage.

WARNING

If the OnGuardACTIVE CMS is not correctly tracking vehicles that are in your lane or is tracking vehicles that are not in your lane, this may be due to radar operational issues. Typically, these are radar operational issues that can result from the following problems: Debris (dirt, snow, ice) on the radar fascia or between the fascia and the radar sensor. This must be removed.

A loose radar sensor or one that is not tightly secured on the mounting bracket. The radar sensor may be too close to, or actually contacting, the bumper as mounted. There should be at least 1/4 inch of clearance between the fascia, radar sensor or bracket and the bumper.

WARNING

When active Diagnostic Trouble Codes (DTCs) are present, the OnGuardACTIVE CMS may be partially or fully disabled depending on whether the DTC(s) is associated with the Adaptive Cruise Control (ACC) functions or the CMS functions. If OnGuardACTIVE CMS is not functioning correctly or as expected, have the OnGuardACTIVE CMS inspected immediately to correct the issue. Whether or not the radar is working correctly, it is the driver's responsibility to apply the brakes when necessary to maintain vehicle control. Failure to do so can result in serious personal injury or death, and/or severe property damage.

WARNING

The OnGuardACTIVE system is designed to monitor the distance between your vehicle and the vehicle in front of you, moving or stationary. It may not identify a vehicle moving TOWARD it in the road. As such, the OnGuardACTIVE system will not provide engine torque control or braking. The driver must always be aware of the objects in front of his vehicle and be ready to apply the brakes, if required. Failure to apply the brakes when needed can result in an accident.

WARNING

The driver is responsible for selecting a safe and legal speed setting that is appropriate for the traffic, road surface and weather conditions. Adjust the speed setting as necessary when driving in reduced visibility or potentially slick conditions. Driving with the OnGuardACTIVE system at a speed that is inappropriate for following a vehicle safely can lead to an accident. Serious personal injury or death, and/or severe property damage can result.

WARNING

If a potential collision is developing and the driver does not take action to decelerate the vehicle, the OnGuardACTIVE CMS sounds an alert, automatically de-throttles the engine, and sends a message to the ABS ECU requesting foundation brake application to provide up to 0.35 g of braking power. (For information about the ABS system, refer to the latest ABS maintenance manual available from www.wabco-auto.com.) The driver must still apply the brakes to provide additional braking force to help avoid an accident. Failure to apply the brakes when necessary can result in serious personal injury or death, and/or severe property damage.

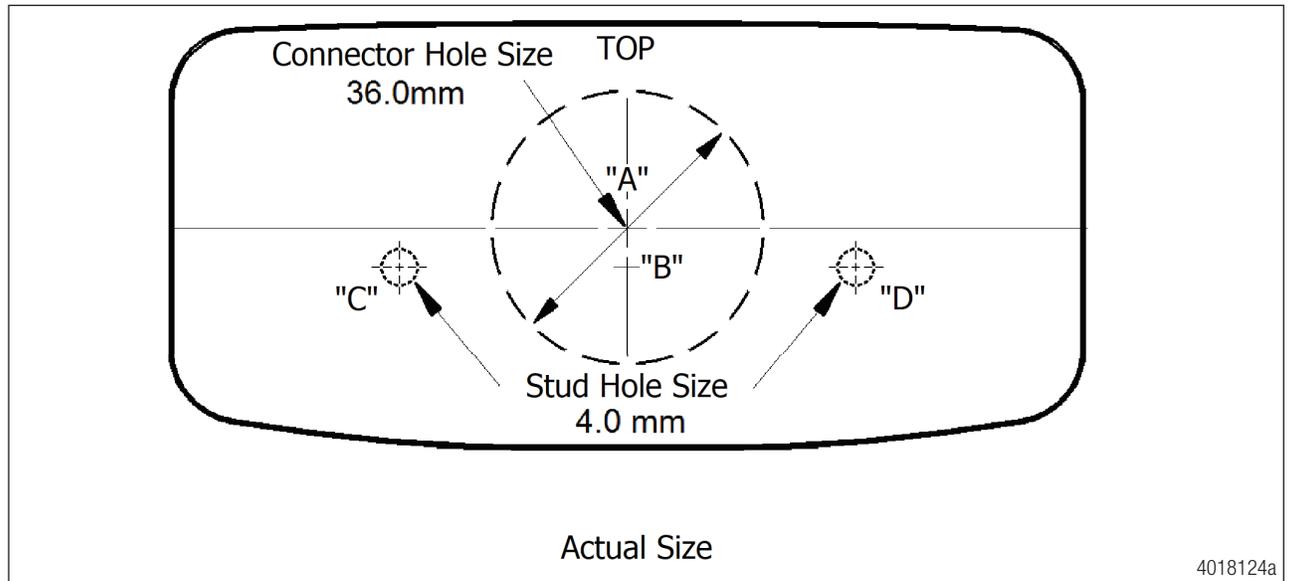
WARNING

The OnGuardACTIVE CMS requires time to recognize an object or potential obstacle. An object moving at a speed of approximately 20 mph or more may not be recognized in enough time to produce a warning or brake the vehicle. Never wait for the OnGuardACTIVE CMS to intervene when a potentially hazardous situation arises. The driver must always monitor traffic and apply the brakes, if needed, to avoid a crash. Failure to do so can result in serious personal injury or death, and/or severe property damage.

7 Appendix – Radar Template

Before using the template and drilling the holes in the B-panel, confirm the template holes align with the display. Print a copy of the template or cut the template directly from the page. Tape the template in place on the B-panel in a location with adequate room. Cut and or drill the required holes on the template and B-panel.

Fig. 68



If a template cannot be printed, or will not print to the correct size, use the steps below to mark the display “Connector” and the “Stud” hole locations. Notice the “A”, “B”, “C” and “D” locations indicated in the template (Figure 68).

i Do not drill any holes until **all** marks have been made.

Find a location on the “B” panel with adequate room to mount the display. On the “B” panel:

1. Place a mark near the center of the display mounting area that is 28 mm from what will be the top edge of the display and 61 mm in from what will be either side edge of the display (this will be location “A”).
2. Place another mark 5.2 mm directly below location “A” (this will be location “B”).
3. From location “B”, measure 30.5 mm toward the left side and make a mark (this will be location “C”).
4. From location “B”, measure 30.5 mm toward the right side and make a mark (this will be location “D”).

i There should be 61 mm between locations “C” and “D”.

5. At location “A”, drill or cut out a 36 mm hole (for display connector).
6. At location “C”, drill a 4 mm hole (for display mounting stud).
7. At location “D”, drill a 4 mm hole (for display mounting stud).



For further details contact the
WABCO Customer Care Center at 855-228-3203.

About ZF Friedrichshafen AG

ZF is a global technology company and supplies systems for passenger cars, commercial vehicles and industrial technology, enabling the next generation of mobility. ZF allows vehicles to see, think and act. In the four technology domains Vehicle Motion Control, Integrated Safety, Automated Driving, and Electric Mobility, ZF offers comprehensive solutions for established vehicle manufacturers and newly emerging transport and mobility service providers. ZF electrifies different kinds of vehicles. With its products, the company contributes to reducing emissions and protecting the climate.

ZF, which acquired WABCO Holdings Inc. on May 29, 2020, now has 162,000 employees worldwide with approximately 260 locations in 41 countries. In 2019, the two then-independent companies achieved sales of €36.5 billion (ZF) and \$3.4 billion (WABCO). For more information, visit www.wabco-na.com.

WABCO

Mobilizing Vehicle Intelligence