

ONside[®] STEP MOUNT KIT INSTALLATION GUIDE P3/P4 CASCADIA

INSTALLATION PROCEDURES



TP19022

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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

General Information

How to Obtain Additional Maintenance, Service and Product Information

If you have any questions about the material covered in this publication, or for more information about the WABCO product line, please contact WABCO Customer Care Center at 855-228-3203 (United States and Canada); 800-953-0248 (Mexico); by email at wnacustomercenter@wabco-auto.com; or visit our website: www.wabco-na.com.

Refer to the Society of Automotive Engineers (SAE) website to find all current SAE documents and standards applicable to WABCO products (such as SAE J447 and SAE J908 at www.sae.org).

Refer to the National Highway Traffic Safety Administration (NHTSA) website to find all current documents referenced in the manual at www.nhtsa.gov.

WABCO Academy



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

WABCO online product catalog



<https://www.wabco-customercenter.com>

Your direct contact to WABCO

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www.wabco-na.com

2 Safety Information

Provisions for a safe work environment

- Only trained and qualified auto technicians and automotive mechanics 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 manufacturer's specifications and instructions.
- Observe all accident regulations of the respective company 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).

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

WARNING

The OnSide Blind Spot Detection System is an Advanced Driver Assistance System and will not prevent contact with other vehicles, persons or objects. The system is not intended as a substitute for proper lane change procedures. Drivers must remain aware of their surroundings by using all available mirrors before changing lanes. Never rely solely on the system.

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 OnSide components. When diagnosing OnSide, TOOLBOX™ Software (12.7 or higher) must be used. Be aware that diagnostic devices must be connected prior to keying on the unit to minimize possible OnSide 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: wnacustomercenter@wabco-auto.com, wabconorders@wabco-auto.com or wabconaspecs@wabco-auto.com.

4 OnSide Blind Spot Detection (BSD) Upgrade Kit

This OnSide Step Mount Kit Installation Guide can be used for the installation of 250kBd or 500kBd systems on P3 or P4 Cascadias with step part number 22-73639-100 (Standard or Heavy Duty).

Confirm the Kit has an OnSide Radar Sensor with a baud rate that matches the vehicle CAN baud rate.

- OnSide Radar Sensor part number: **400 874 500 0** = 500kBd
- OnSide Radar Sensor part number: **400 874 006 0** = 250kBd

This technical publication provides procedures for installing parts included in the OnSide Blind Spot Detection upgrade kit.

The following parts are included in the kit:

- Radar OnSide (Blind Spot Detection) Sensor
- OnSide Step Mount Bracket
- OnSide (BSD) Light Indicator
- Wiring Harness with connector and terminal packet
- Radar Sensor Mounting Plate
- Shim Housing
- Shims (9)
- M6 Lock Nuts (4)
- M8 Lock nut
- Fascia
- Fascia M6 x 20 mm Bolts (2)
- Fascia M6 Flat washers (2)
- 5/16 Flat Washers (4)
- 5/16-18 Bolts (4)
- 5/16 Nuts Prev Torq (4)

Items needed that are not included in the kit:

- Laptop with WABCO TOOLBOX 12.12 or newer (TOOLBOX PLUS is WABCO's diagnostic software which can be obtained from www.wabco.snapon.com)
- TOOLBOX compatible RP1210A diagnostic communication adapter/device
- Basic shop tools and materials

5 Installation Procedures

5.1 Radar Sensor and Mounting Bracket Installation



Installation may vary due to different equipment on each truck model.

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.

1. Wear safe eye protection. Park the vehicle on a level surface. Apply the parking brake. Ensure that the ignition is turned OFF.
2. Block the rear wheels to prevent the vehicle from moving.
3. Locate the step on the passenger side (Figure 1).

Fig. 1



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Installation Procedures

4. Locate an area underneath the passenger side upper step between 10 feet and 14 feet from the front bumper mounting zone. Figure 2. Pick an area that is least likely to become a trip hazard usually toward the rear of the step. When mounted, the center of the radar should be as close to 23.4 inches (600 mm) from the ground as possible, but maybe mounted as high as 31 inches (800 mm) or as low as 20 inches (500 mm).

Fig. 2



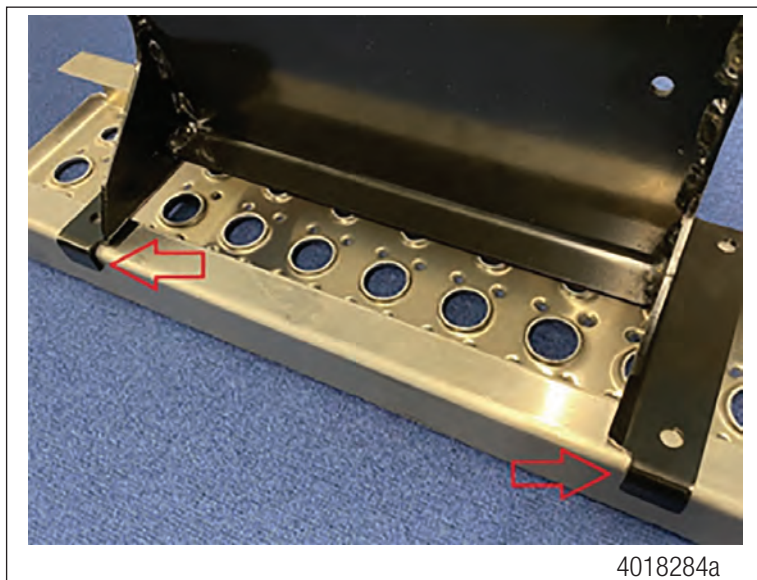
5. In order to mount the OnSide bracket to the step, the step will need to be removed. Prior to removing the step, note the position of the step in relation to the step mounting brackets. Note the front and back sides of the step. It is also recommended to mark on the bottom of the step, where the step mates to the rear step mounting bracket. This will aid in positioning the Onside bracket once the step has been removed from the vehicle.
6. Remove the 2 mounting bolts and mounting bars (Figure 3) from the upper step, according to the manufacturer's recommended guidelines, and remove the step from the vehicle.

Fig. 3



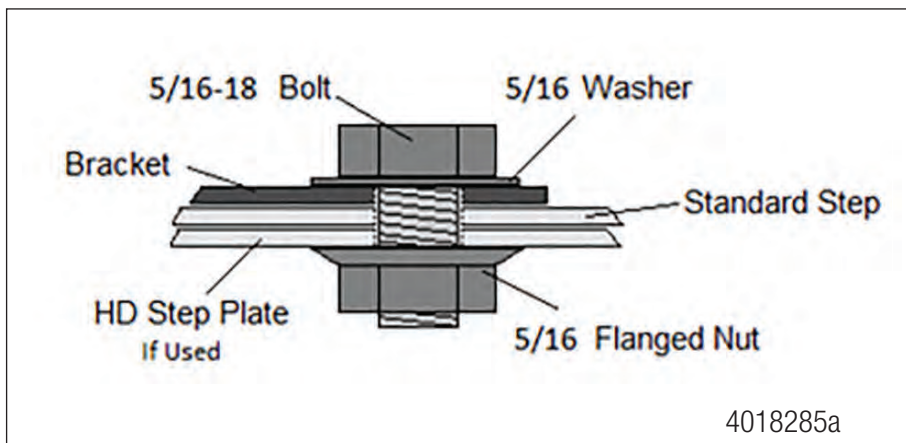
7. Place the step on a work bench or other suitable surface where holes may be safely drilled into the step. Make sure the work surface is clean, free of any debris, and will not damage or scratch the step.
8. Use the OnSide bracket itself as the template for drilling the mounting holes. Turn the step upside down. Make sure the step is oriented so the back side of the step will now be facing toward you (the installer) and place the OnSide mounting bracket on the step. Locate the mark on the bottom of the step created in Step 5. Slide the OnSide bracket into place no less than 1/8 of an inch from where the step will mount to the step mounting bracket. Make sure the OnSide bracket alignment tabs are on the side nearest the installer and are tight against the step (Figure 4).

Fig. 4



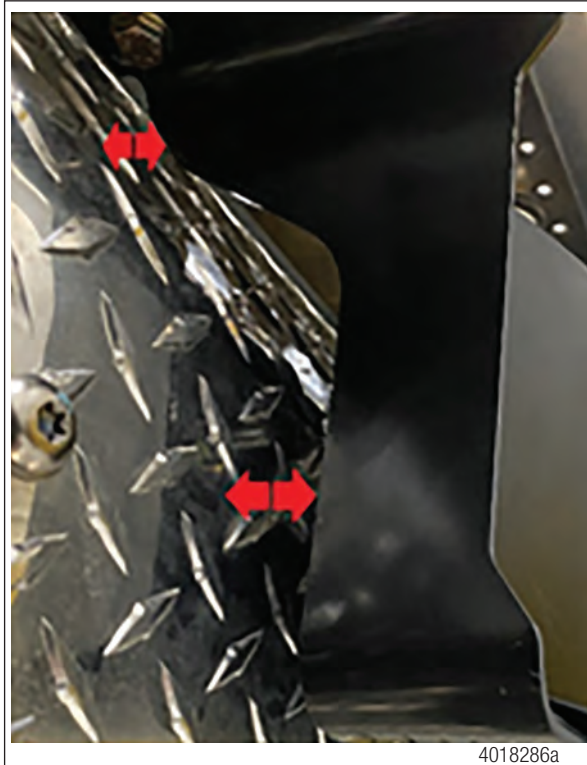
9. Hold the OnSide bracket in place on the step and mark the centers of the four OnSide bracket mounting holes on the step.
10. Remove the OnSide bracket from the step and drill a 5/16" hole at each of the four marked locations. Remove any burrs or shavings from the step.
11. Install the OnSide mounting bracket on to the step using the 4 - 5/16-18 bolts, 5/16 washers and 5/16 flanged nuts (Figure 5). Torque the bolts to 22-24 ft-lb (30-32 Nm).

Fig. 5



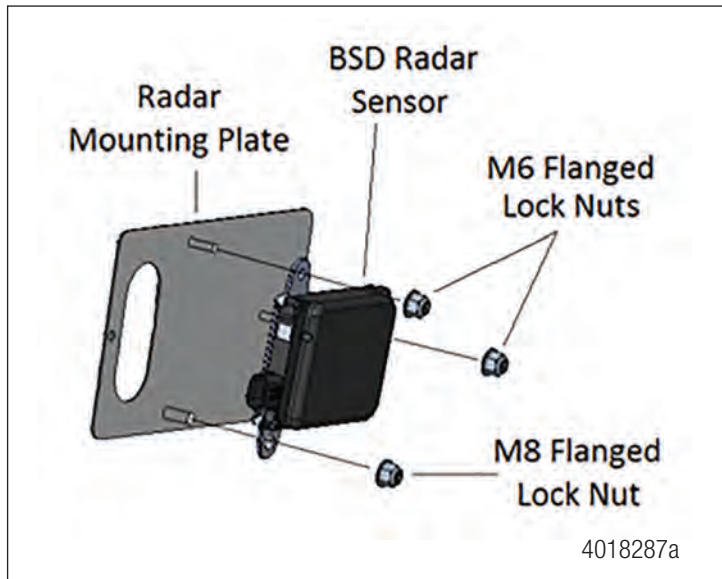
12. Re-install the step back on to the vehicle (according to the manufacturer's recommended guidelines). Make sure the step is straight and that there is clearance between the back of OnSide bracket and any tanks or shielding behind the step (Figure 6).

Fig. 6



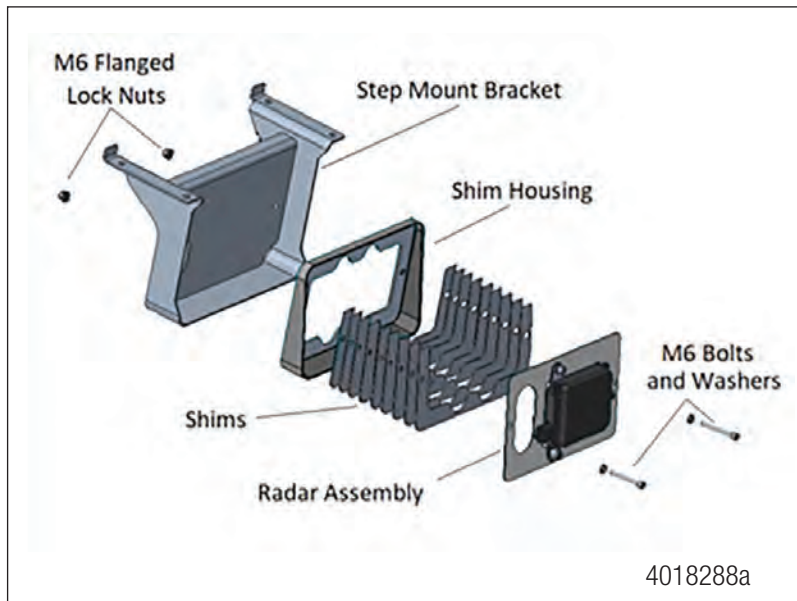
13. Install the radar sensor on to the radar mounting plate (Figure 7) using the 2 M6 flanged lock nuts and the M8 flanged lock nut. Tighten the lock nuts to 61-75 in-lb (6.9-8.4 Nm).

Fig. 7



14. To determine the correct amount of shims needed, loosely assemble the shim housing and radar assembly to the step mount bracket using the M6 bolts (do not tighten). Measure the angle of the radar sensor using a digital level. Insert as many shims as needed to obtain a slight downward angle of -2.5° (Figure 8). No shims may be needed as long as the correct angle is achieved.

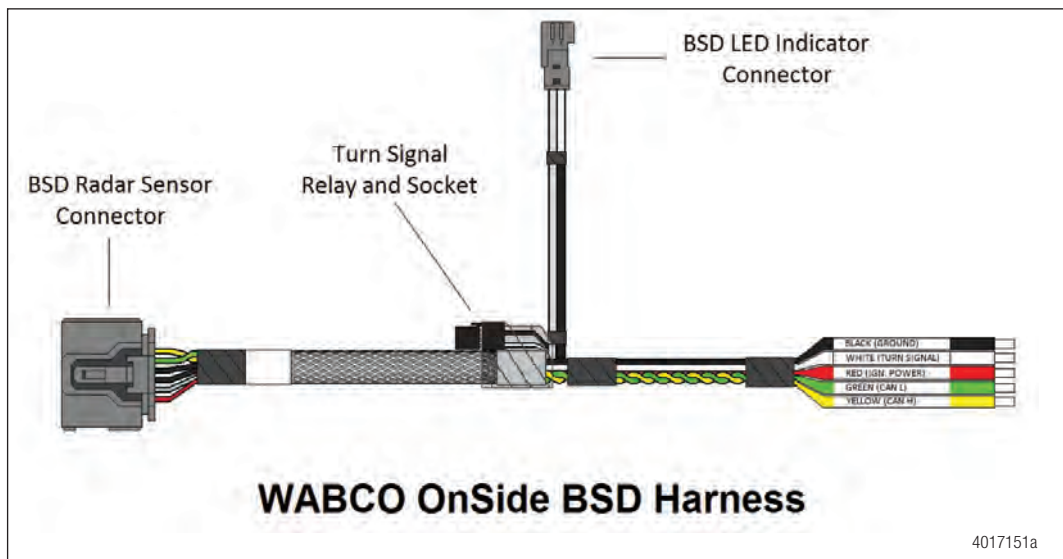
Fig. 8



Shims may be installed open end up or down.

15. Connect the harness (Figure 9) to the radar sensor.

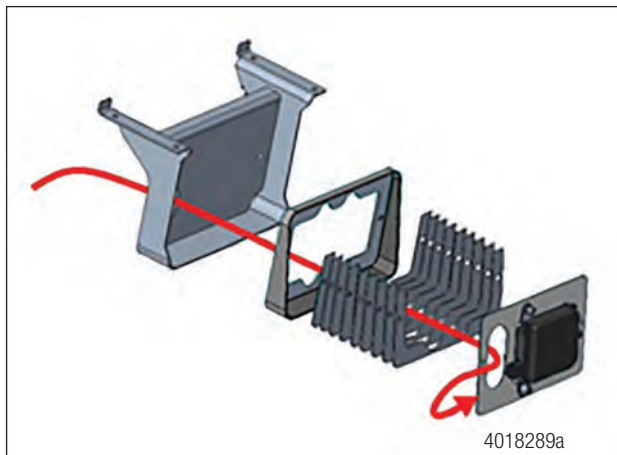
Fig. 9





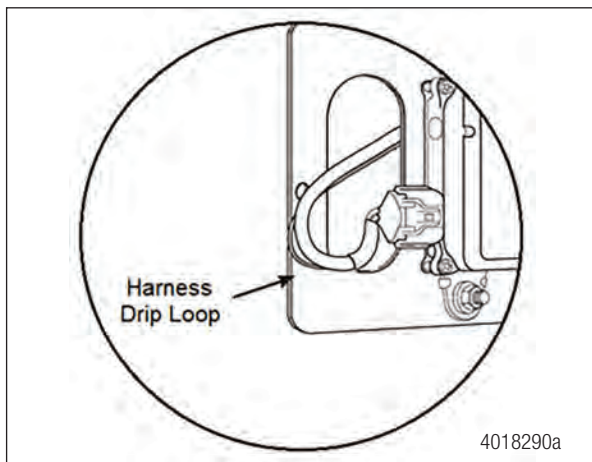
It is recommended to feed the radar connector end of the harness, from the back, through the step mount bracket, shim housing, shims and radar assembly plate, and connect it to the radar (Figure 10).

Fig. 10



16. When connecting to the radar, make sure to leave enough slack in the harness for a “Drip Loop” at the connector (Figure 11).

Fig. 11

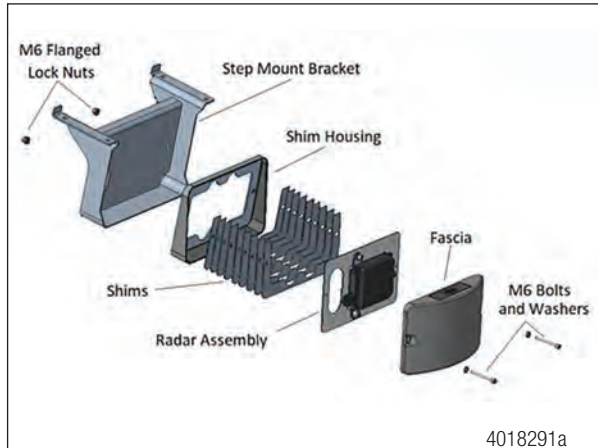


17. While holding the radar and shim assembly in place on the step mount bracket, remove the two M6 bolts that were loosely installed in Step 14, place the fascia over the radar shim assembly and reinstall the M6 bolts using the M6 flanged lock nuts. Tighten to 92 in-lb (10.4 Nm) (Figure 12).



When installing the fascia, try to keep the drip loop intact and avoid pinching the harness with the fascia.

Fig. 12



18. Starting from the radar connection, route the harness along the vehicle's body or under the step, up into the cab and secure the cable every 12 inches (304.8 mm) when possible with tie wraps. Make sure to avoid heat sources such as engine and exhaust components sharp objects as well as abrasion areas.
19. Try to locate an existing grommet or pass-thru for feeding the harness into the cab (Figure 13). If no existing pass-thru is available, it may be necessary to drill a 1-5/8" (41 mm) hole for cab access. Follow the OEM Guidelines for treating the hole if needed.

Fig. 13



In order to route the harness through the cab, it may be necessary to remove the glove box and various other dash panels. Remove items according to the manufacturer's guidelines.

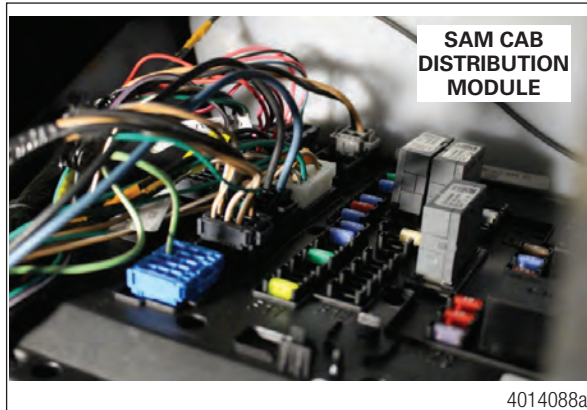
20. At each location, once the correct length of each wire is determined, excess may be removed or bundled and stowed securely. Crimp the correct terminal (supplied) to each wire.

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21. For connecting the harness to power and ground, locate the SAM cab module:

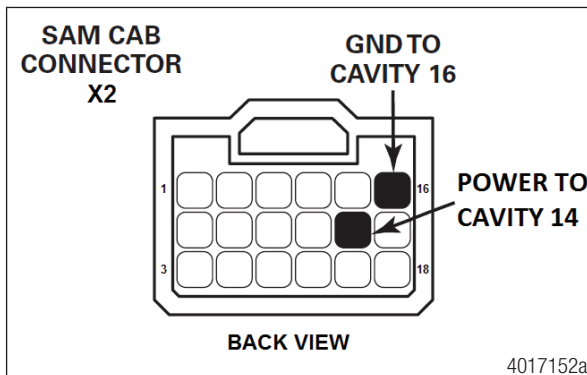
- P3, behind the glove box (Figure 14)
- P4, behind the doghouse

Fig. 14



22. Connect the red (POWER) wire of the OnSide harness to pin 14 of the X2 connector. Connect the black (GND5) wire to pin 16 of the X2 connector (Figure 15).

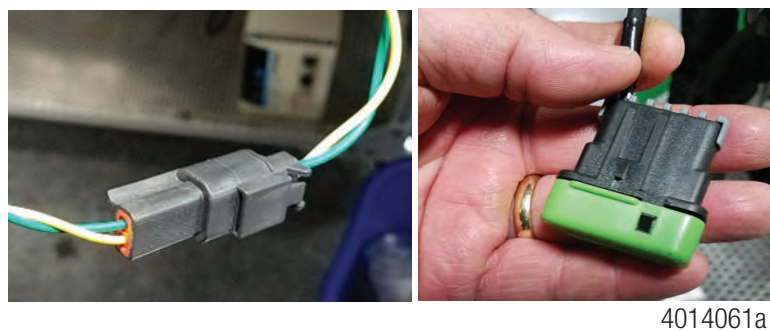
Fig. 15



If the pin shown here is used, find an alternative ignition power source.

23. Connect both the green (CAN LO) and yellow (CAN HI) wires to the vehicle J1939 circuit. Locations to easily access the J1939 circuit are usually found under the dash on the passenger side. (See Figure 16 for common points of access.) Tap into the J1939 circuit according to the OEM guidelines. Review the OEM reference materials if necessary.

Fig. 16

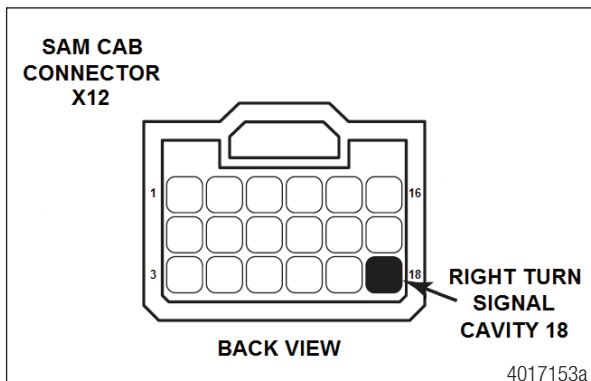


24. If the vehicle has OnGuard and uses the WABCO dash display, the white turn signal wire may be connected to the vehicle; this can provide additional OnSide audible and visual warnings through the OnGuard display. If this feature is desired, the OnGuard display software will need to be updated. Please review the display software update procedure in OnSide Maintenance Manual MM16167. The OnSide Maintenance Manual and display update software (TP18054) are both available at our website: www.wabco-na.com/literature.

If the vehicle does not use the OnGuard dash display, you may disregard connecting the white turn signal wire. The white wire may be sealed and tucked back into the harness.

25. At a convenient location, connect the white turn signal wire from the OnSide harness into the right turn signal wire from the SAM CAB X12 connector cavity 18 (Figure 17). Make the splice according to the OEM guidelines. Review the manufacturers reference materials if necessary.

Fig. 17



Leave the remaining two wires (gray and black) to be installed after the OnSide LED indicator is mounted to the A-pillar.

5.2 OnSide Blind Spot Light Indicator Installation

1. Locate a position within the vehicle driver's field of view to mount the BSD indicator lamp (Figure 18). The recommended location is the passenger side windshield A-pillar. This will allow the driver to see the BSD indicator lamp every time they look at the right-side mirror before a lane change.

Fig. 18



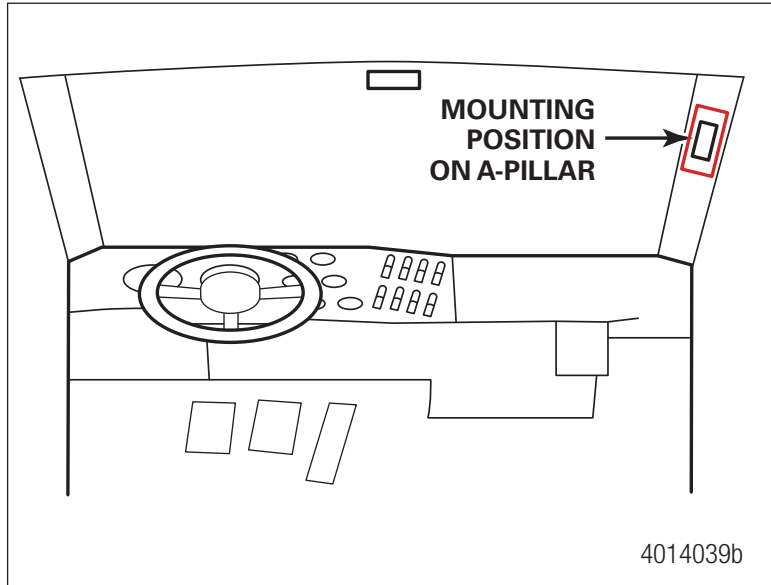
The OnSide Blind Spot LED lamp has push-in rivets in the back to make it easier to install on the vehicle's A-pillar plastic cover (Figure 19). To keep the indicator from moving after installation, put 3M VHB tape on one of the inner edges of the light indicator before installation.

Fig. 19



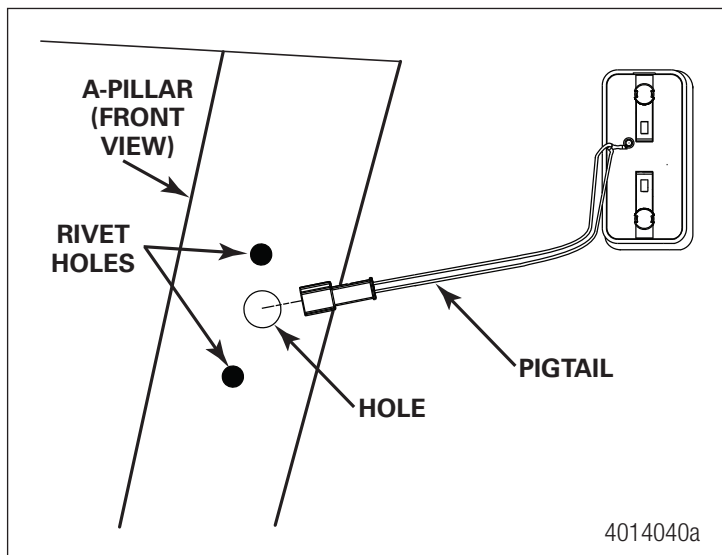
2. Remove the A-pillar plastic cover and locate the desired mounting position (Figure 20). Print out the template in the Appendix near the end of this publication. Make sure the size is 100% to scale. Place the template in the desired mounting position and drill the holes (Figure 16).

Fig. 20



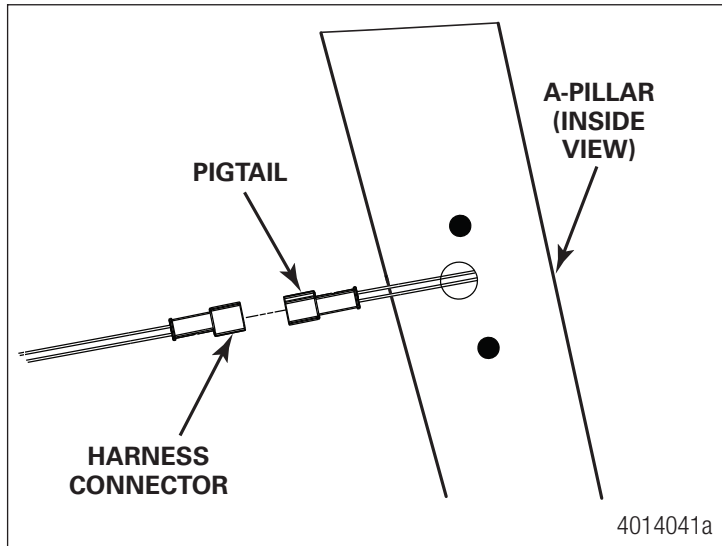
3. Route the indicator pig tail to the center hole and install the indicator push-in rivets as shown (Figure 21).

Fig. 21



4. Connect the indicator pig tail to the harness connector while installing the cover back on the A-pillar (Figure 22).

Fig. 22



5. Re-install the glove box or any dash panels that were removed, following the OEM guidelines.

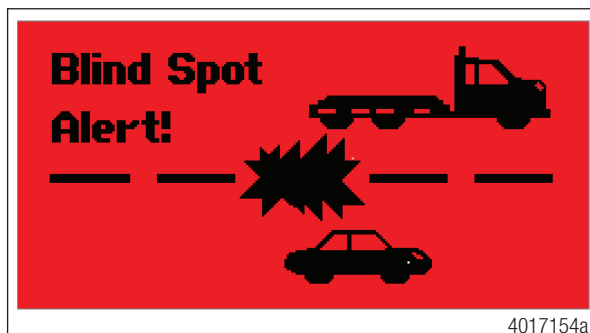
5.3 OnGuard® Display

If the vehicle has OnGuard and uses the WABCO Dash Display (Figure 23), the OnSide system can be integrated into the WABCO display system to provide additional OnSide audible (beeping) and visual warnings (Figure 24).

Fig. 23



Fig. 24



If this feature is desired, the white turn signal wire from the OnSide harness will need to be connected to the vehicle (refer to Section 5.1 step 25) and the OnGuard display software will need to be updated. Please review the display software update procedure in OnSide Maintenance Manual MM16167. The OnSide Maintenance Manual and display update software (TP18054) are both available at our website: www.wabco-na.com/literature.

5.4 Verifying Correct System Operation

Confirm that the OnSide System is installed and operating correctly by verifying the following:

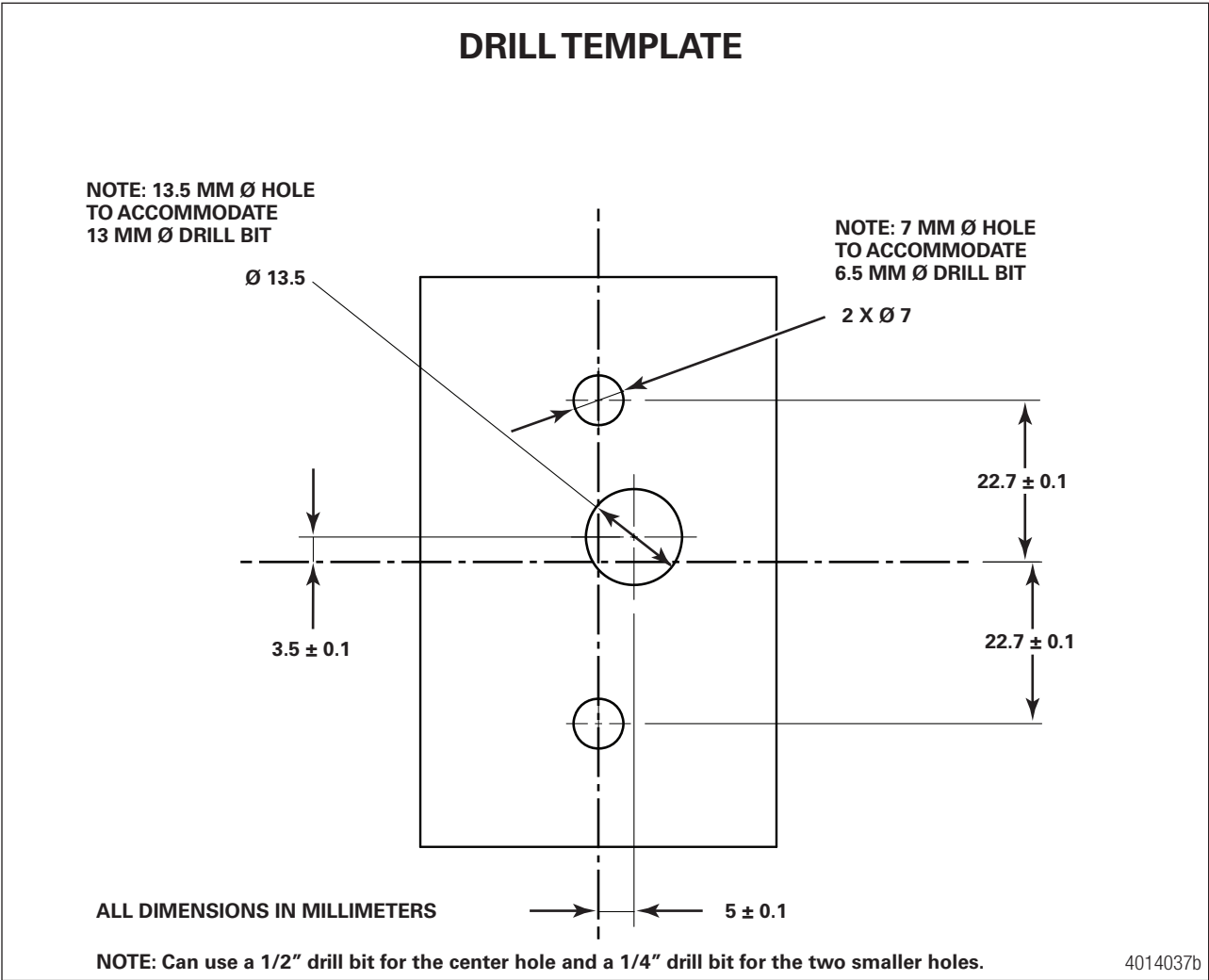
1. When the vehicle ignition is turned on, the system issues a trial warning on the OnSide Blind Spot Light indicator.
2. Drive the vehicle above 15 mph (24 kph) with a moving vehicle in your blind spot. Confirm the OnSide Blind Spot Indicator light turns on and off when a car passes on your side. **Note that parked cars or stationary objects will not activate the light.**
3. If the vehicle is equipped with an OnGuard display, activate the right turn signal when a vehicle is in your blind spot. The indicator light should illuminate and the OnGuard® display should beep.



For further information regarding OnSide system operation, diagnostics and repair, please see the OnSide Maintenance Manual (MM16167) which may be obtained from our website www.wabco-na.com/literature.

6 Appendix

Fig. 25





**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**.

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