



Installation Instructions

Bendix® Wingman® FLR10™ to FLR20™ Radar Changeover Kit for International® ProStar® Vehicles

Kit Part Numbers
K097916 and K097917

Contact your Navistar® dealer with the ProStar® VIN to determine the proper replacement kit for your vehicle. These instructions are used for Part Number K097917 — for older vehicles made up to 1/31/2011 — and K097916 for newer models.



FIGURE 1 - INTERNATIONAL PROSTAR BRACKETS

| Kit Contents | |
|---|-----|
| Description | Qty |
| Bendix FLR20 Reman Radar | 1 |
| Adjustors/Screws. | 1 |
| ProStar Bracket (varies by kit) | 1 |
| Harness Adapter | 1 |
| Deutsch Connector Mating Kit | 1 |
| Loom (convolute) | 1 |
| Cable Ties | 5 |
| Template (<i>see inside this Instruction Sheet</i>) | 1 |

GENERAL SAFETY GUIDELINES



WARNING! PLEASE READ AND FOLLOW THESE INSTRUCTIONS



TO AVOID PERSONAL INJURY OR DEATH:

When working on or around a vehicle, the following guidelines should be observed **AT ALL TIMES**:

- ▲ Park the vehicle on a level surface, apply the parking brakes and always block the wheels. Always wear personal protection equipment.

▲ Stop the engine and remove the ignition key when working under or around the vehicle. When working in the engine compartment, the engine should be shut off and the ignition key should be removed. Where circumstances require that the engine be in operation, **EXTREME CAUTION** should be used to prevent personal injury resulting from contact with moving, rotating, leaking, heated or electrically-charged components.

▲ Do not attempt to install, remove, disassemble or assemble a component until you have read, and thoroughly understand, the recommended procedures. Use only the proper tools and observe all precautions pertaining to use of those tools.

▲ If the work is being performed on the vehicle's air brake system, or any auxiliary pressurized air systems, make certain to drain the air pressure from all reservoirs before beginning ANY work on the vehicle. If the vehicle is equipped with a Bendix® AD-IS® air dryer system, a Bendix® DRM™ dryer reservoir module, or a Bendix® AD-9si™ air dryer, be sure to drain the purge reservoir.

▲ Following the vehicle manufacturer's recommended procedures, deactivate the electrical system in a manner that safely removes all electrical power from the vehicle.

▲ You should consult the vehicle manufacturer's operating and service manuals, and any related literature, in conjunction with the Guidelines above.
- ▲ Never exceed manufacturer's recommended pressures.

▲ Never connect or disconnect a hose or line containing pressure; it may whip. Never remove a component or plug unless you are certain all system pressure has been depleted.

▲ Use only genuine Bendix® brand replacement parts, components and kits. Replacement hardware, tubing, hose, fittings, etc. must be of equivalent size, type and strength as original equipment and be designed specifically for such applications and systems.

▲ Components with stripped threads or damaged parts should be replaced rather than repaired. Do not attempt repairs requiring machining or welding unless specifically stated and approved by the vehicle and component manufacturer.

▲ Prior to returning the vehicle to service, make certain all components and systems are restored to their proper operating condition.

▲ For vehicles with Automatic Traction Control (ATC), the ATC function must be disabled (ATC indicator lamp should be ON) prior to performing any vehicle maintenance where one or more wheels on a drive axle are lifted off the ground and moving.

▲ The power **MUST** be temporarily disconnected from the radar sensor whenever any tests **USING A DYNAMOMETER** are conducted on a Bendix® Wingman® Advanced™-equipped vehicle.

PREPARATION

Park the vehicle on level ground. Switch off the ignition and disconnect the battery. See the *General Safety Guidelines on page one*. Read and understand this document before beginning work.

TYPICAL TOOLS REQUIRED

Torx T20 Driver; Wire Cutter; Wire Stripper; Deutsch Crimp Tool HDT-48-00; 13mm Socket and Driver; Wire Brush; Scissors; Pencil; Wax Pencil; Screwdriver (RG); Sheet Metal Cutter; and a Torque Wrench.

INSTALLATION

Remove the Bendix® FLR10™ Radar

1. Disconnect the wire harness from the Bendix FLR10 radar. Protect the connector and harness from damage.
2. Remove and retain the four bolts from the Radar Assembly. (Inspect the bolts; replace corroded bolts as necessary, using Navistar® P/N 31056R1 - HEX FLG HD M8 X 30 10.9 PHC BLACK.)

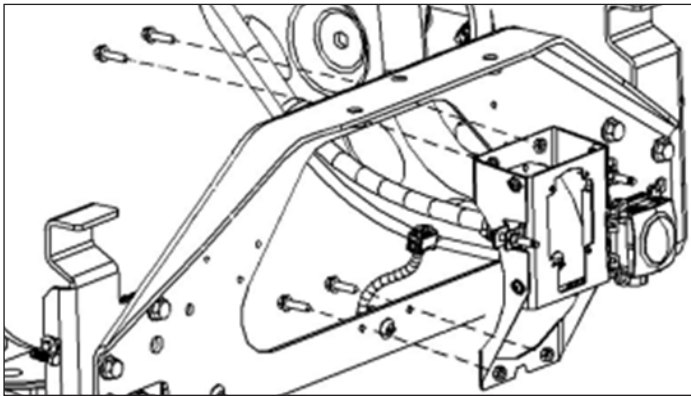


FIGURE 2 - REMOVE ORIGINAL BRACKET

3. Remove the old radar assembly from the bracket and save for core return.

Inspection

4. Inspect and clean all surfaces of the cross member. Any damage found that would affect the installation of the new radar and bracket should be addressed before continuing with the installation.

Preparing the Harness

5. Look at the wire colors used by the OEM. Record the wire colors used for the following locations of the existing speciality vehicle wire harness.

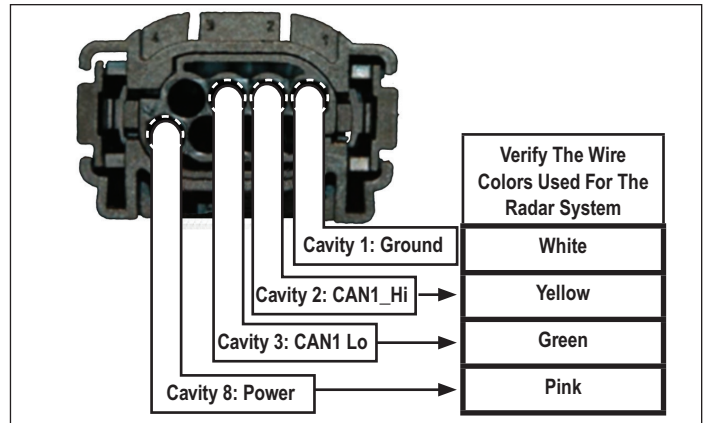


FIGURE 3 - EXISTING WIRE DESIGNATIONS

6. Cut the existing wire harness 4 inches, or less, from the connector. After verifying that the wire colors recorded in step 5 above are correct, discard the connector.
7. Carefully review the Deutsch connector manufacturer's instructions for stripping and crimping the wire into the new connector before proceeding.

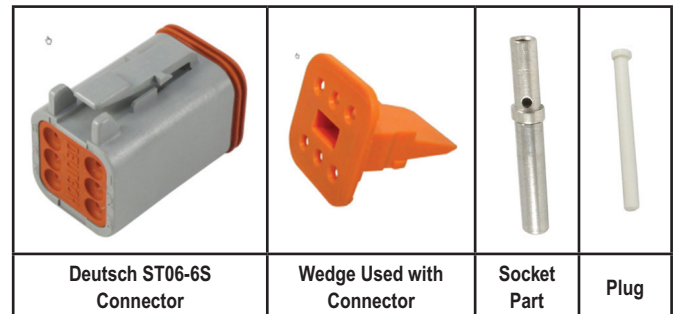


FIGURE 4 - CONNECTOR COMPONENTS

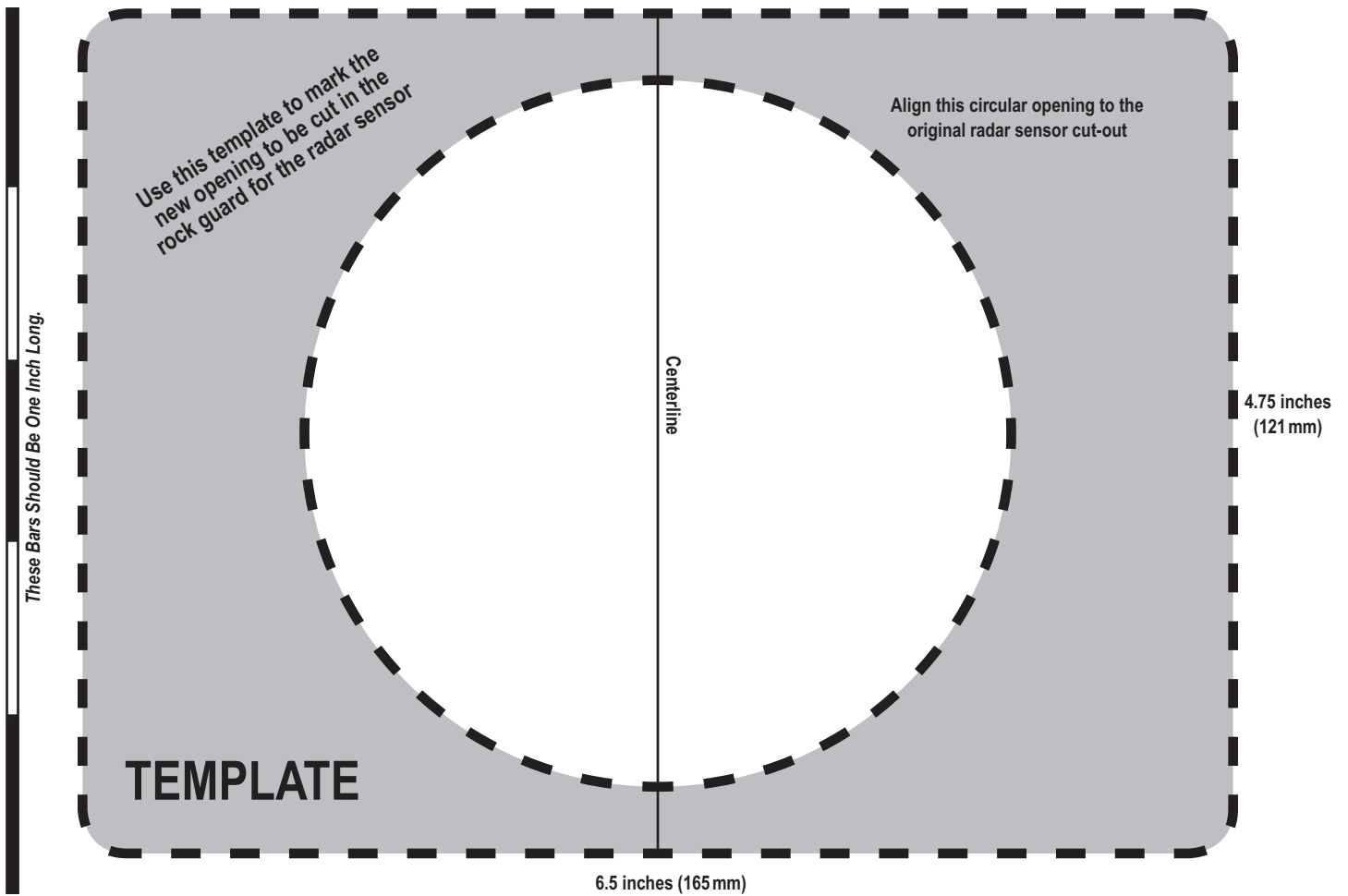
Follow the manufacturer's directions in lieu of the recommendations supplied here:

- (a) Strip all four wires 0.250 to 0.312 inch.
- (b) Crimp the Deutsch socket part [0462-201-16141] on each of the exposed wires. See Figure 4.
- (c) Insert color coded wire/terminal from the truck side (from step 5) into cavity from the rear, following the wiring colors recorded in Step 5. For the two locations not being used, insert the [0413-217-1605] white sealing plugs.

| DT06-6S Cavity | Function | From Step 5, Copy The Wire Colors Used For the Radar System |
|----------------|----------|---|
| 1 | Ground | |
| 2 | CAN1_Hi | |
| 3 | Not Used | Use Plug Supplied |
| 4 | Not Used | Use Plug Supplied |
| 5 | CAN1_Lo | |
| 6 | Power | |

Listen for the audible (and tactile) "click", when the socket seats correctly in the plug.

8. Insert the Deutsch W6S™ locking wedge into the front of the connector. See Figure 4.



9. Plug the assembled connector into the harness Adapter supplied.

Prepare the Vehicle's Rock Guard

10. Remove the rock guard.
11. Confirm the included template is printed with a 1:1 ratio, by measuring and verifying the dimensions of the template. The opening should be not less than 6.5 in wide by 4.75 in high.
12. Cut out the template by folding it along the center line, and then cut out the rectangle and center hole.
13. Using the center hole, align the template over the existing radar opening. Mark the outside edges of the template with a wax pen.
14. Using a suitable cutting tool (typically, snips will work), cut the rock guard along the marked lines to the appropriate size.
15. Attach the loom (convolute) to the edge of the rock guard cut-out. Trim the loom to length as needed.
16. Use cable ties to secure the loom through the rock guard.
17. Trim the cable ties.

Prepare the Bendix® FLR20™ Radar and Bracket

18. Insert the three (3) new standoff adjuster assemblies into the bracket.

19. Insert the six (6) standoff adjustor mounting screws into the assembly. Using a Torx T20 driver, start every screw into the assembly, then tighten them all to 30 in-lbs.

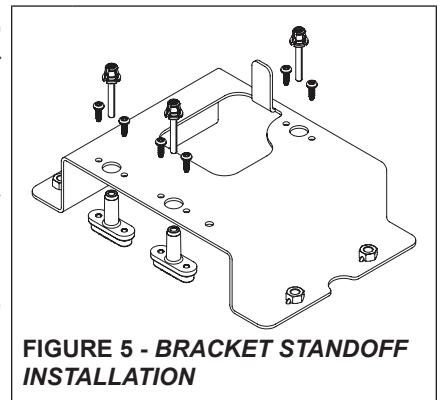


FIGURE 5 - BRACKET STANDOFF INSTALLATION

20. Align the new radar sensor, with the connector pointed to left (the passenger side of the vehicle), with the small mirror facing outward. Install the new radar to the bracket by pressing, by hand, with moderate force, on the surface of the radar. Verify that all three clips have fully engaged into the radar.

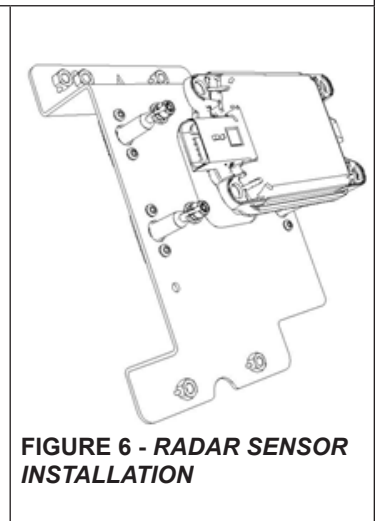


FIGURE 6 - RADAR SENSOR INSTALLATION

TEMPLATE ON REVERSE SIDE



Install the Bendix® FLR20™ Radar

21. Install the Radar Assembly on to the vehicle by using four (4) Navistar P/N 31056R1 - HEX FLG HD M8 X 30 10.9 PHC BLACK bolts. Torque to OE specifications.

FIGURE 7 -
TYPICAL
RADAR
SENSOR
INSTALLATION



22. Insert the connector into the FLR20 Radar.
23. Slide the orange Connector Position Assurance (CPA) tab to the right, making sure the connector is fully engaged.

24. Using a cable tie, securely attach the wire harness to the bracket.
25. Reinstall the rock guard.
26. Align the radar, per Appendix C on pages 5-7 or refer to Bendix Service Data Sheet, SD-61-4960, available for download from www.bendix.com.
27. Return the radar sensor removed from the vehicle for core return credit. The radar must be carefully packaged using suitable materials in a separate container from other core returns.

Bendix Technical Assistance Team

For direct telephone technical support, call the Bendix Tech Team at:

1-800-AIR-BRAKE (1-800-247-2725), option 2. Tech Team members are available Monday through Friday, 8:00 A.M. to 6:00 P.M. ET.

Or, if you prefer, e-mail us at: techteam@bendix.com. Please have the following information ready when you contact the Bendix Tech Team: Bendix product model number; part number and configuration; vehicle make and model.

APPENDIX - RADAR ALIGNMENT USING BENDIX® ALIGNMENT CLIP AND TOOL

Appendix

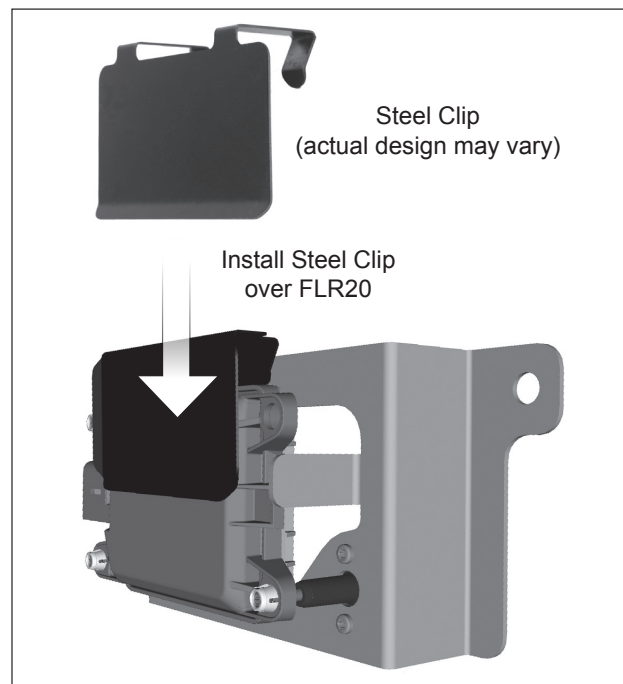
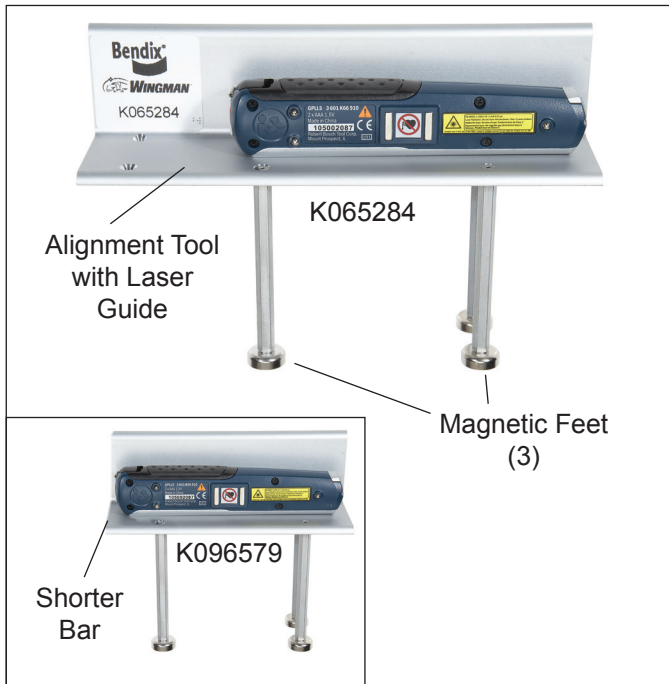
Bendix® FLR20™ Radar Alignment

A1 LATERAL ALIGNMENT USING THE BENDIX® ALIGNMENT CLIP AND TOOL

This is the method to use for lateral alignment when a radar and/or bracket is replaced.

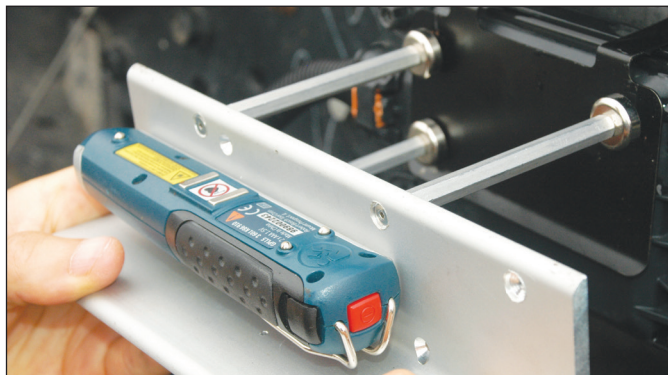
Tools needed: Bendix® alignment kit, steel clip, Torx T-20 screwdriver and a tape measure.

- One of the Bendix® Alignment Tools part no: K065284 and K096579—available from Bendix parts outlets—are used. The alignment procedure also requires a steel clip, part number K073087.



ALIGNMENT TOOLS AVAILABLE

- A1 Park the vehicle on a level floor. Air suspensions must be charged and stable. Install the steel clip supplied over the radar sensor.
- A2 Attach the alignment tool onto the clip using its magnet feet. Inspect to make sure that the alignment tool is approximately horizontal width-wise.



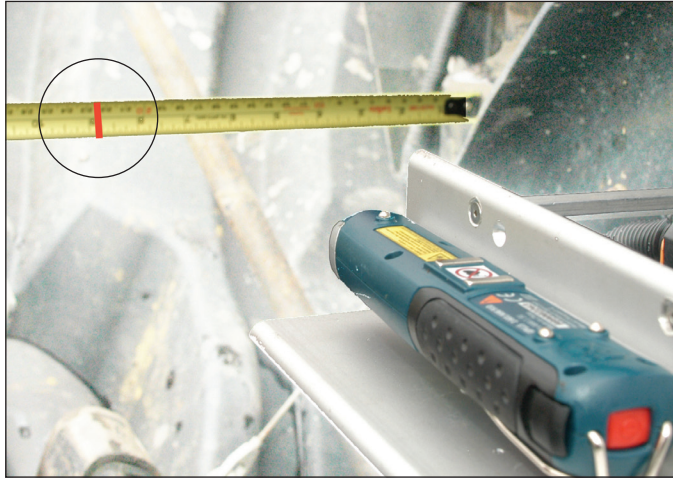
- A3 Activate the lateral alignment laser light "on" switch. Place the tool into position for the first measurement. (The tool will be reversed when the second measurement is made.)

Appendix

Bendix® FLR20™ Radar Alignment

LATERAL ALIGNMENT USING THE BENDIX® ALIGNMENT CLIP AND TOOL (CONTINUED)

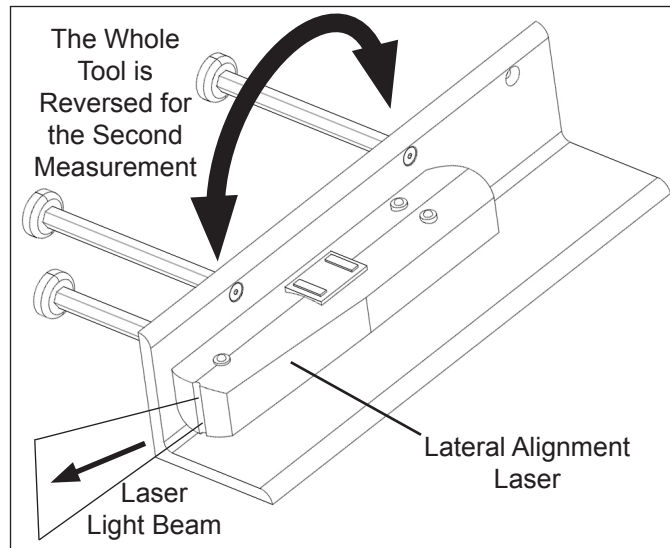
- A4 Locate symmetrical points on the front of the vehicle that are at least 12 inches from the vehicle's center line (such as the tow hooks). Using a ruler or tape measure, record the distance from each side to the laser light line.



LATERAL ALIGNMENT LEFT MEASUREMENT

NOTE: The technician must be careful during the laser positioning process to double-check the values measured on each side of the truck. Be sure to check back and forth for each side of the radar sensor several times to ensure accuracy.

- A5 Repeat the process for the opposite side, reversing the tool, so that the laser light points to the other side of the vehicle.



- A6 Compare the left and right distance measurements. A properly aligned radar sensor will have the same measurement from each side. If these two dimensions are within 1/8" (3 mm), no alignment is necessary and the technician can go to Step A10 to check the vertical alignment. If an adjustment is needed, follow the instructions in A7-9

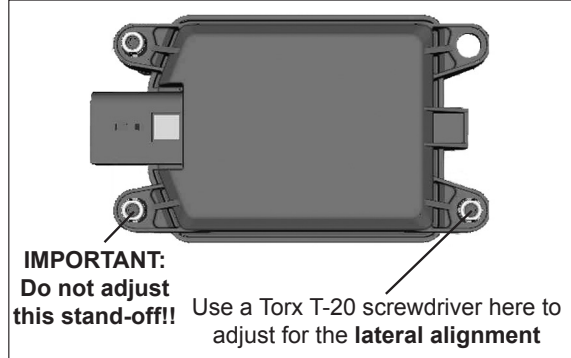
Appendix

Bendix® FLR20™ Radar Alignment

C LATERAL ALIGNMENT USING THE BENDIX® ALIGNMENT CLIP AND TOOL (CONTINUED)

NOTE: Complete these steps only if a lateral adjustment is necessary.

- A7 With the Bendix alignment tool still in place, use the Torx T-20 screwdriver to turn by hand the driver-side stand-off adjustment screw until the desired alignment is reached.



- A8 Re-measure the distances from symmetrical points located at least 12" from the center line of the vehicle. Reverse the tool for each measurement, until the values are the same [within 1/8" (3 mm)].
- A9 After the lateral alignment procedure is complete, if there is an active misalignment DTC (codes 55, 56, or 57), use the instructions in Bendix Service Data Sheet, SD-61-4960 (available from www.bendix.com for download) to clear the Bendix® Wingman® Advanced™ system Diagnostic Trouble Code (DTC) using the procedure in Section 4.4: *Clearing Diagnostic Trouble Codes (DTCs)* and reset the alignment value by connecting the vehicle to a PC with Bendix® ACom® Diagnostics software and follow steps B4.4-20 to reset the alignment value. (Also, see Appendix H of the Service Data Sheet.)

- A10 **IMPORTANT: Before returning the vehicle to service, check the vertical alignment.**

- A11 [The steel clip and alignment tool should already be in place. See A1-2.]

- A12 Calibrate (or "zero") the inclinometer on a horizontal section of the frame rail. Follow the manufacturer's instructions (typically digital inclinometers have a "SET" button for this purpose).



Calibrate (or "zero") the Digital Inclinometer on a Cab Frame Rail in the direction that the vehicle travels.

Place the calibrated digital inclinometer onto the surface of the tool, **so that the tool is in the same direction as it was on the rail. Verify that the display shows 0° (± 1.5°) from vertical.**



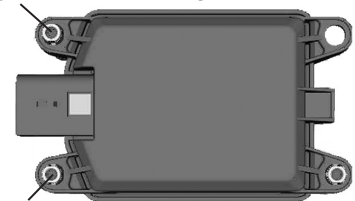
NOTE: Complete these steps only if a vertical adjustment is necessary.

- A13 With the Bendix alignment tool still in place, use the screwdriver to turn by hand the top-left adjustment stand-off. See the Figure on the right. During the adjustment, observe the digital display on the inclinometer and turn the vertical alignment screw clockwise or counterclockwise depending on the vertical direction (up or down) needed, until the reading is near zero degrees.

- A14 **The radar is aligned vertically when the display is near zero (0°).**

Note: The alignment process shown here is for Bendix alignment brackets. For other brackets, similar alignment steps will be needed; consult the vehicle manual for full instructions.

Use a Torx T-20 screwdriver here to adjust for the vertical alignment



IMPORTANT:
Do not adjust this stand-off!!

NOTE: The alignment process is complete after the vertical alignment has been checked (and adjusted, if necessary.) You do not need to test-drive the vehicle.

Call the Bendix Tech Team at 1-800-AIR-BRAKE (1-800-247-2725, option 2) for troubleshooting assistance.



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