

**MERITOR WABCO**

## Technical Bulletin

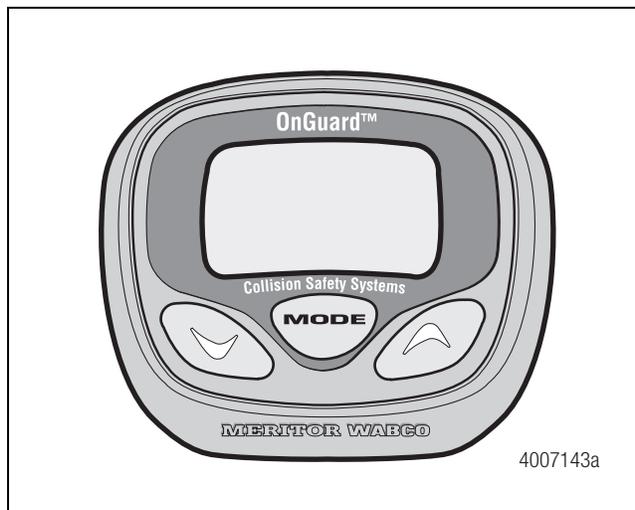
# OnGuard™ Display Operating Instructions

## Hazard Alert Messages

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.

## How to Obtain Additional Maintenance and Service Information

This manual contains operating instructions for the Meritor WABCO OnGuard™ Display. Figure 1.



**Figure 1**

For additional OnGuard™ service and maintenance information, please refer to Maintenance Manual MM-0951, OnGuard™ Collision Safety System. To obtain publications or for additional assistance, call ArvinMeritor's Customer Service Center at 800-535-5560.

Meritor WABCO publications are also available on our website:  
[www.meritorwabco.com](http://www.meritorwabco.com)

## OnGuard™ Display

OnGuard™ is a forward-looking, radar-based adaptive cruise control system with active braking. OnGuard™ is part of the Meritor WABCO family of Collision Safety System products. The system is fully integrated with Meritor WABCO anti-lock braking and Stability Control Systems Electronic Control Unit (ECU). It works in conjunction with the company's SmartTrac™ Stability Control Systems which include Electronic Stability Control (ESC), Roll Stability Control (RSC) and Automatic Traction Control (ATC). OnGuard™ includes the following systems.

### Collision Warning System (CWS)

- Detects developing rear end collisions
- Audible and visual alerts
- Integral with both Adaptive Cruise Control with Active Braking and Collision Mitigation System

### Adaptive Cruise with Active Braking (ACC)

- Supplements vehicle's cruise control
- Attempts to maintain safe following distance
- Supplies audible, visual and haptic alerts
- Automatically decelerates vehicle using throttle, engine and foundation brakes
- Automatically accelerates vehicle when lane is clear

### Collision Mitigation System (CMS)

- Detects developing rear end collisions
- Supplies audible, visual and haptic alerts
- Automatically disengages if driver takes appropriate action
- Automatically decelerates vehicle using throttle, engine and foundation brakes
- If collision is unavoidable, intervention can minimize impact

The OnGuard™ Display provides the interface for the driver. Audible and visual warnings, as well as verification of correct system operation and faults, are communicated to the driver. The driver is able to monitor the status of target vehicles that the OnGuard™ system is tracking.

### **⚠ WARNING**

The OnGuard™ Collision Safety System should only be considered an aid and is not intended to replace driver control over the vehicle at any time. OnGuard™ is only intended to initiate braking of the vehicle in an effort to avoid a collision and braking by the driver is also required. OnGuard™ is a backup safety system and is not to be relied on to function in all circumstances where braking may be required. In the event the OnGuard™ Collision Safety System requires activation of the foundation brakes, there is a limit to its maximum braking ability (by design). The driver is expected to intervene and assume control of the braking of the vehicle.

OnGuard™ should not be relied on to track target vehicles when either or both vehicles (base and target) have entered and are traveling through a curve in the road. ACC is not recommended for use in winding (curving) roads. OnGuard™ should not be expected to track smaller objects such as motorcycles, mopeds, bicycles, etc. OnGuard™ will not track fixed or stationary objects.

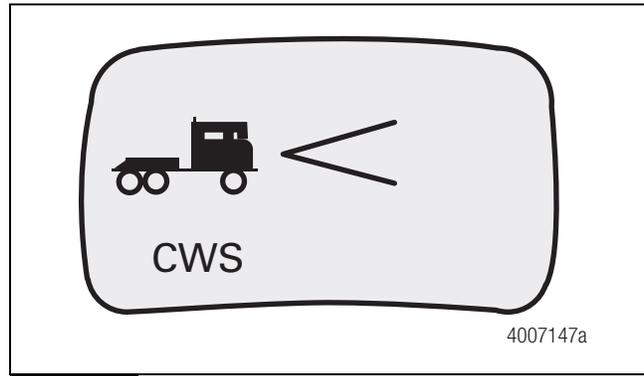
When operating a vehicle, always use safe driving techniques. The driver is ALWAYS the most important factor in safe vehicle operation.

## **Collision Warning System**

The Collision Warning System (CWS) will generate an audible and visible alert when the vehicle's following distance may result in a collision. CWS is an extension of Adaptive Cruise Control (ACC) and is based on the ACC sensor. CWS provides only a warning and will not control vehicle speed unless ACC is engaged. CWS cannot be turned off and is always active at vehicle speeds above 15 mph.

### **CWS: Standby**

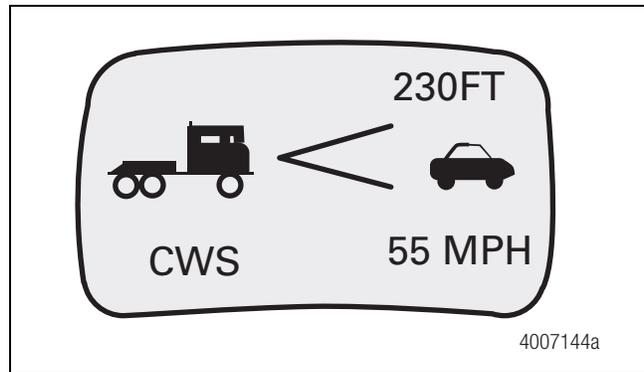
When no lead vehicle is detected, the display shows that CWS is on and the radar is searching. The display background is blue. Figure 2.



**Figure 2**

### **CWS: Object Detected**

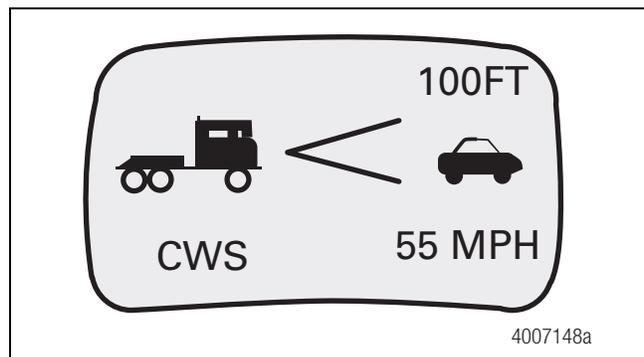
When a lead vehicle is detected in the lane ahead, the display shows that CWS is on and the radar is tracking a target at the speed shown. The display background is green. Figure 3.



**Figure 3**

### **CWS: Following-Interval Alert**

If you are following too closely behind another vehicle at a steady driving speed, the following-interval alert will emit a moderate audible alert. This alert will end when your vehicle speed drops below the lead vehicle speed and the following interval is increased. The following-interval alert is disabled (will NOT alert) when your vehicle speed is below 15 mph. The display background is yellow. Figure 4.



**Figure 4**

## CWS: Collision Warning

If the lead vehicle is braking or traveling more slowly than the driver's vehicle, CWS warns of an impending collision by emitting an urgent audible alert and displaying the collision warning symbol.

The braking control is NOT active. The driver must initiate braking. The display background is red. Figure 5.

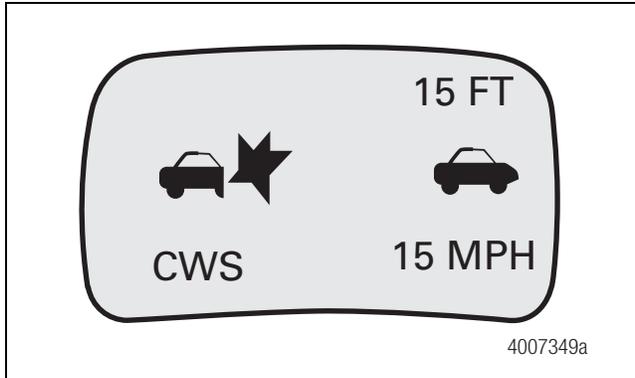


Figure 5

## Adaptive Cruise Control

Adaptive Cruise Control (ACC) is a radar-based system that works in conjunction with conventional cruise control to maintain the set cruise speed when no vehicle is being tracked and maintains a minimum following interval when a target vehicle is being tracked. The minimum following interval is maintained by automatically decelerating the vehicle using throttle, engine and foundation brakes without driver intervention. When the target vehicle is no longer being tracked, the set cruise speed resumes automatically.

### ACC: Standby

When cruise control is engaged and no lead vehicle is detected, OnGuard™ operates similarly to conventional cruise control. The cruise control set speed is shown. The display background is blue. Figure 6.

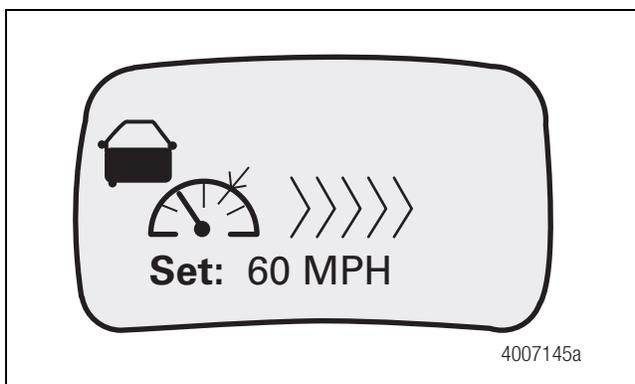


Figure 6

### ACC: Object Detected

When a lead vehicle is detected in the lane ahead, the display shows that ACC is on and the radar is tracking a target at the speed shown. The display background is green. Figure 7.

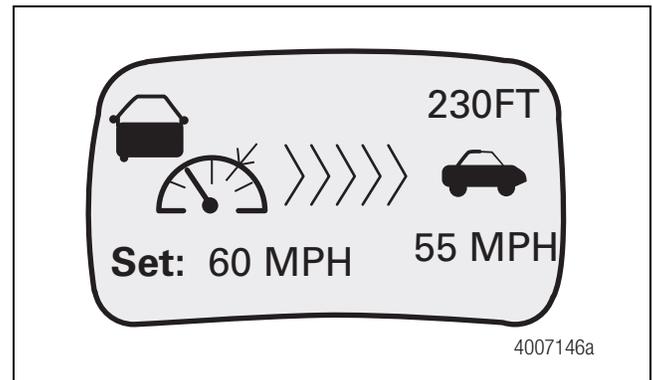


Figure 7

### ACC: Following-Interval Alert

If the driver is using the accelerator pedal to override the cruise control and approaches a vehicle too closely, the following-interval alert will emit a moderate audible signal. This signal will end when the driver's vehicle speed drops below the lead vehicle speed and the following interval is increased. The following-interval alert is disabled (will NOT alert) when the driver's vehicle speed is below 15 mph. The display background is yellow. Figure 8.

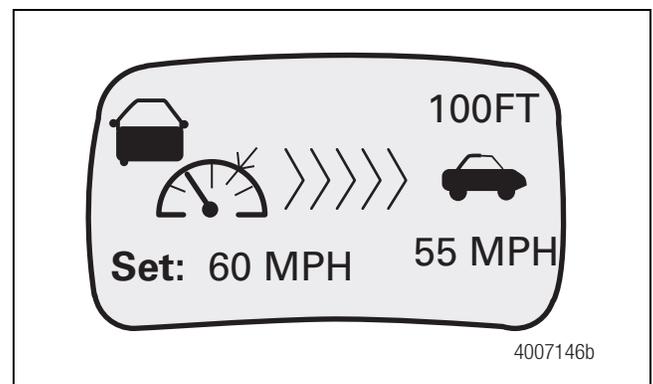


Figure 8

### ACC: Collision Warning

If the lead vehicle is braking or traveling more slowly than the driver's vehicle, ACC warns of an impending collision by emitting an urgent audible alert and displaying the collision warning symbol.

The braking control will activate and slow the vehicle. The driver must also initiate braking. The display background is red. Figure 9.

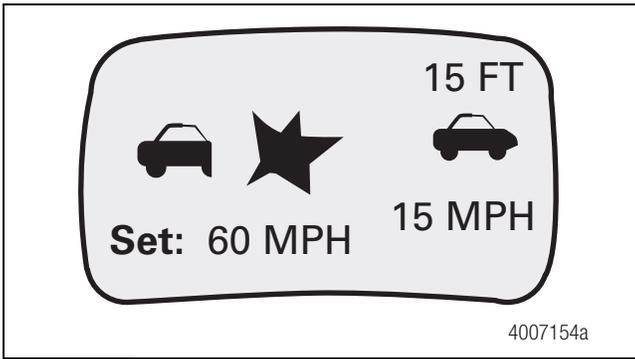


Figure 9

## Collision Mitigation System (CMS)

Collision Mitigation System (CMS) is integral to the OnGuard™ Collision Safety System. The system will provide driver alerts with both a visual and audible alarm through an in-cab dash display when the vehicles following distance could result in a rear-end collision. If a potential rear-end collision is developing and the driver does not take action to decelerate the vehicle, OnGuard™'s Active Braking automatically de-throttles the engine, applies the engine and foundation brakes to provide up to 0.35Gs of braking power. This Active Braking application is intended only to provide early braking as the driver is recognizing and reacting to the situation — the driver must take the appropriate corrective action in response to the collision warning. The OnGuard™ Collision Safety System will not become active below 15 mph.

## Error Screens

If a system fault is detected, the display will switch immediately to the error screen. Figure 10. On this screen, the first error code transmitted will be displayed. The UP/DOWN buttons will display additional faults if there is more than one current error. Refer to Maintenance Manual MM-0951, OnGuard™ Collision Safety System, for a full list of faults.

The display does not show stored fault codes.

**NOTE:** OnGuard™ does NOT function when any error screen is on the display (Figure 10, Figure 11 and Figure 12).

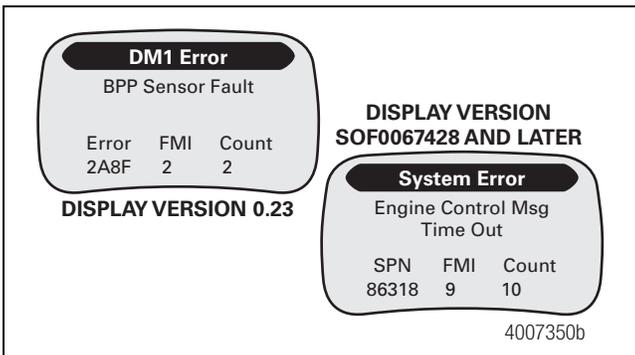


Figure 10

If there is no communication between the OnGuard™ display and the radar sensor, an error screen indicating a broken data link to the OnGuard™ radar sensor will show. The display background is red. Figure 11.

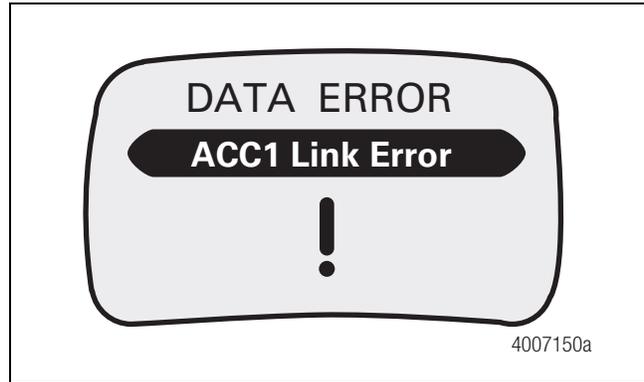


Figure 11

If the OnGuard™ display shows a red screen with the message “Mode 6 Error”, the display is not able to correctly process error messages that the display is receiving from the radar sensor. Contact your vehicle manufacturer dealer or ArvinMeritor Customer Service Center at 800-535-5560 for further instructions. Figure 12.

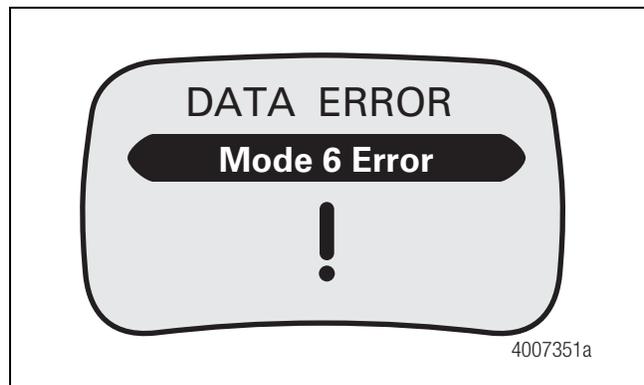


Figure 12

## ACC or CWS Failure

If there is a fault in the system, the CWS may not emit collision warnings or apply braking. If this occurs, take the vehicle in for service as soon as possible. Standard cruise control will not function with an active OnGuard™ system fault.

## Additional OnGuard™ Display Features

Access the Additional Features menus by pressing the MODE key from the CWS and ACC main operating screens. All screens are accessible while moving. Depending on the software version of the display, most will automatically return to the main screen if no key is pressed for 60 seconds. The Radar Alignment screen does not automatically return to the main screen.

## Display Control

The display control includes alarm volume adjustment, LCD brightness and LCD contrast adjustment capability and U.S./metric unit conversion. The display will store the last display control settings in non-volatile memory (remains stored in memory when turned off). The display background is green. Figure 13.

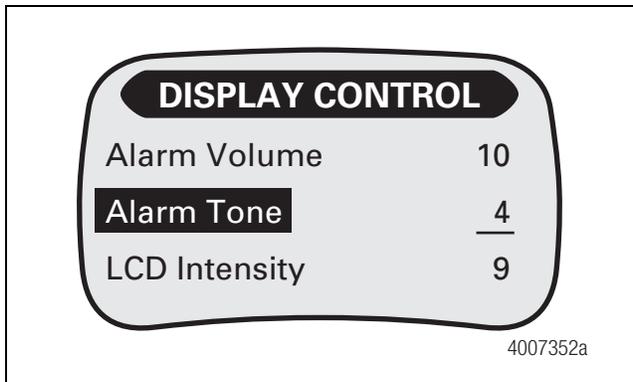


Figure 13

- Press the UP/DOWN keys to scroll through the menu list.
- Press the MODE key to select the value to be changed.
- In edit mode, the screen will display **\*\*EDIT VALUE\*\***.
- Press the UP/DOWN keys to change the value setting.
- Press the MODE key to save the setting.
- Press the MODE key again to advance to the Radar Alignment screen.

## Radar Alignment

The display provides visual indication of the alignment state of the radar sensor, the distance of the current radar target to the vehicle, and the estimated vehicle mass. Figure 14.

- The upper section of the display shows the Target Distance. When there is no target detected as in CWS Standby or ACC Standby, the Distance to Target will display NA.
- The middle section of the display provides a horizontal bar graph showing the horizontal angle to the target vehicle. When following a vehicle on a smooth, straight road, the indicator bar should hover around the center indicator arrows.
- The lower section of the display shows the estimated vehicle mass determined by the ABS controller. Mass will reset to “Not Available” if the data is not available (e.g., if the vehicle is not moving for several minutes). Version 0.12 and version 0.23 software display 144,478 lb (65 535 kg) when mass is not available.

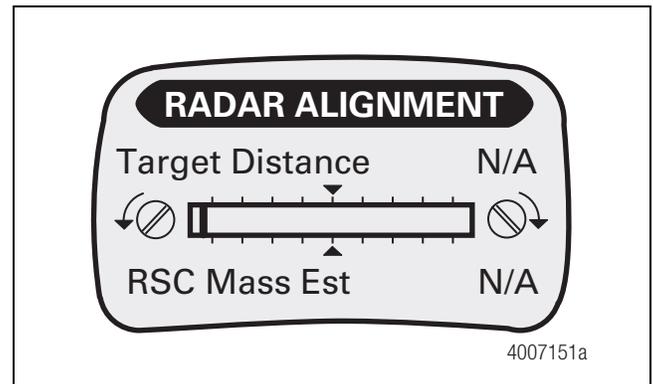


Figure 14

The background color changes while in the Radar Alignment screen to indicate the radar target status.

- The display background is blue when the radar is searching.
- The display background is green when the radar is tracking a vehicle.

If radar sensor alignment is required, contact the vehicle manufacturer dealer as soon as possible. Refer to Maintenance Manual MM-0951 for radar sensor alignment instructions.

**NOTE:** This is the only additional feature screen that will remain active longer than one minute if no key is pressed.

Press the MODE key to advance to the ACC Function/Component Test Menu.

## ACC Function/Component Test Menu

The component test screen provides a method of verifying correct operation of several system components and is a valuable tool to diagnose OnGuard™ system errors. The display background is blue.

Depending on the release level of the display, the header of the display will read “ACC FUNCTION” or “COMPONENT TEST.” There may be other small differences in the display terminology and the sequence of menu items.

The ACC Function/Component Test screen will provide access to the following components. Figure 15.

Press the UP/DOWN keys to scroll through the list. Press the MODE key to advance to the Software Version screen.

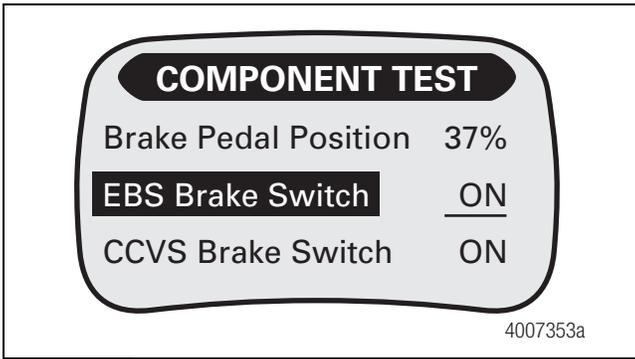


Figure 15

### Brake Pedal Position

The Brake Pedal Position status displays % depression of the brake pedal or N/A. 0% represents full release of the brake pedal. Typical full brake applications will not exceed 70%. Figure 16.

**NOTE:** If N/A displays, refer to Maintenance Manual MM-0951 for additional instructions.

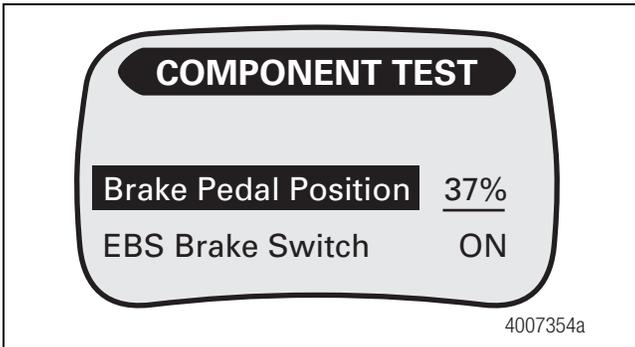


Figure 16

### EBS Brake Switch

The EBS Brake Switch status is shown as OFF when the brake pedal is released and ON when the brake pedal is pressed. Figure 17.

The EBS Brake Switch status is determined by the ABS controller. This is a different signal than CCVS Brake Switch.

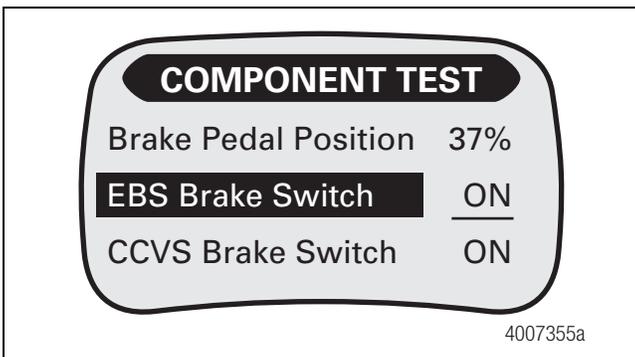


Figure 17

### CCVS Brake Switch

The Cruise Control Vehicle Speed (CCVS) Brake Switch status is shown as OFF when the brake pedal is released and ON when the brake pedal is pressed. Figure 18.

The CCVS Brake Switch status is determined by the vehicle's conventional cruise control system (typically part of the engine control electronics). This is a different signal than EBS Brake Switch. The two brake switch signals may not be the same at very low brake pedal stroke, but should match if brake pedal position exceeds 5%.

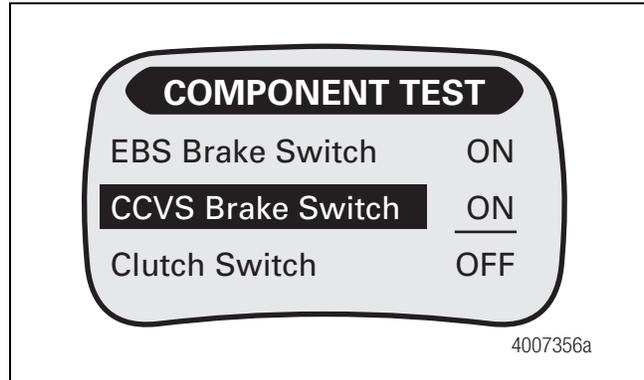


Figure 18

### Clutch Switch

The Clutch Switch status is shown as OFF when the clutch pedal is released and ON when the clutch pedal is pressed. Clutch Switch status is normally shown as "Not Available" with transmissions that do not require a clutch pedal (e.g., AMT and automatics). Figure 19.

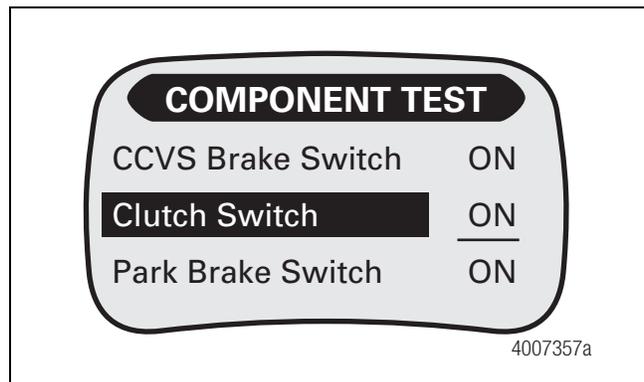


Figure 19

### Park Brake Switch

The Park Brake Switch status is shown as OFF when the park brake is released and ON when the park brake is applied. Figure 20.

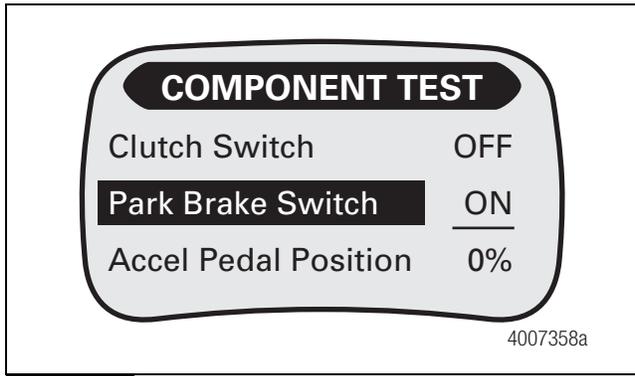


Figure 20

### Accelerator Pedal Position

The Accelerator Pedal Position status is shown as a percentage. The percentage will be from 0% to 100% with 0% representing full release and 100% representing full application. Figure 21.

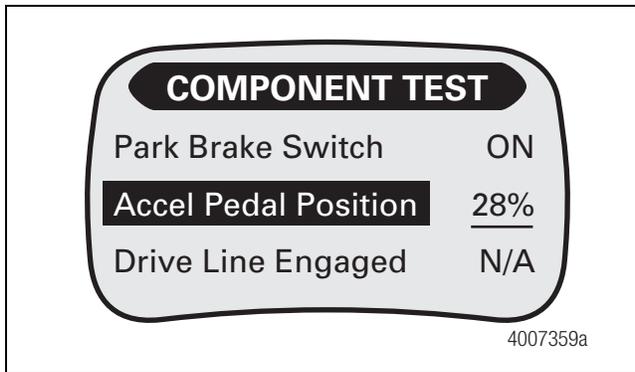


Figure 21

### Transmission Driveline Engaged

The Transmission Driveline Engaged status is shown as NO when the driveline is disengaged and YES when the driveline is engaged. Figure 22.

Driveline Engaged normally shows “Not Available” with manual transmissions. Electronically controlled transmissions typically must be driven to observe changes in Driveline Engaged status.

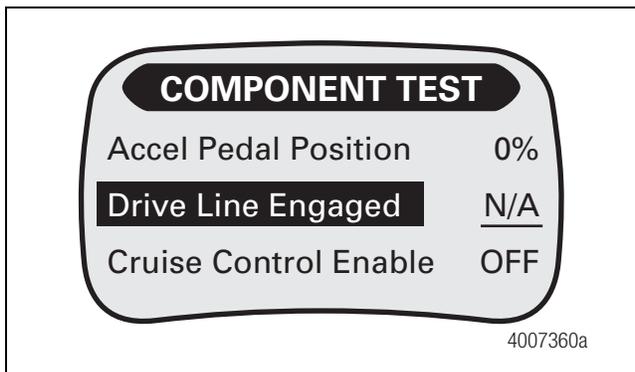


Figure 22

### Cruise Control Enable (On/Off) Switch

The Cruise Control Enable Switch status is shown as OFF when cruise control is disabled and ON when cruise control is enabled. Figure 23.

**NOTE:** Some engine controllers report Cruise Control Enable Switch status as OFF if the switch was in the ON position when the ignition key was switched ON. The Cruise Control Enable Switch may have to be cycled OFF then ON to get the Cruise Control Enable Switch status to be shown as ON.

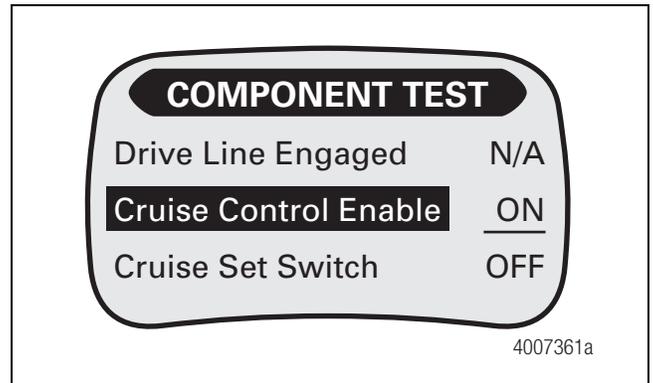


Figure 23

### Cruise Control Set Speed Switch

The Cruise Control Set Speed Switch status is shown as OFF when the cruise control set speed switch is not pressed and ON when the cruise control set speed switch is pressed. Figure 24.

**NOTE:** It is common for one switch to be used for “Set Speed” and “Coast” (or “Decel”) functions.

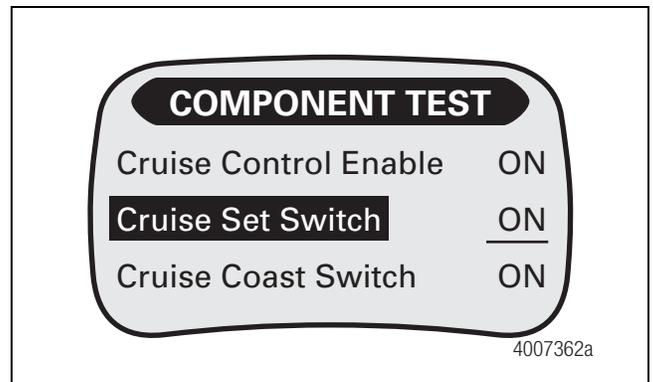


Figure 24

## Cruise Control Coast Switch

The Cruise Control Coast Switch status is shown as OFF when the switch is not pressed and ON when the switch is pressed.  
Figure 25.

**NOTE:** It is common for one switch to be used for “Set Speed” and “Coast” (or “Decel”) functions.

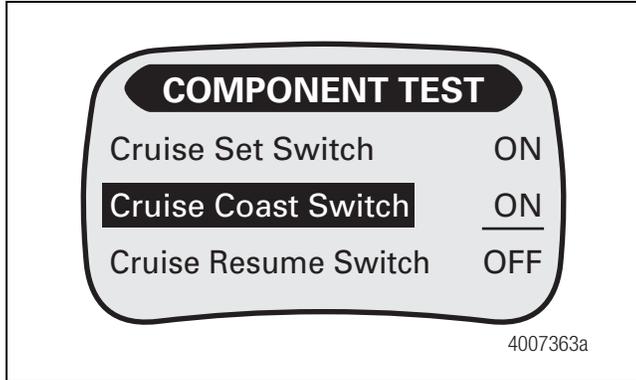


Figure 25

## Cruise Control Accelerate Switch

The Cruise Control Accelerate Switch status is shown as OFF when the switch is not pressed and ON when the switch is pressed.  
Figure 27.

**NOTE:** It is common for one switch to be used for “Resume” and “Accel” functions.

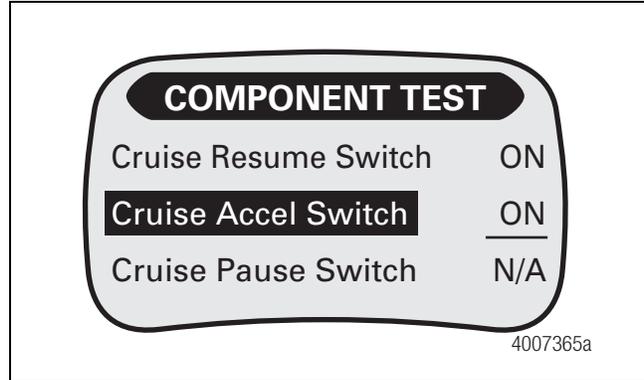


Figure 27

## Cruise Control Resume Switch

The Cruise Control Resume Switch status is shown as OFF when the switch is not pressed and ON when the switch is pressed.  
Figure 26.

**NOTE:** It is common for one switch to be used for “Resume” and “Accel” functions.

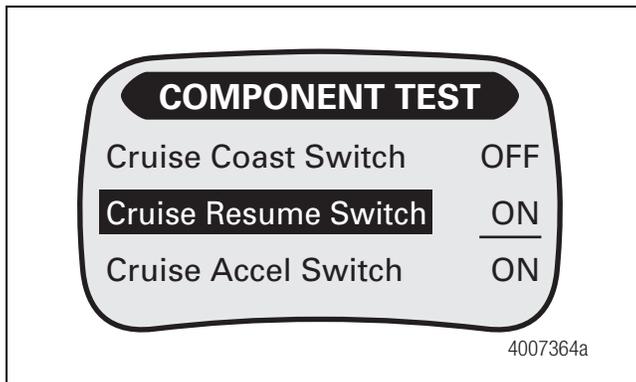


Figure 26

## Cruise Control Pause or Cancel Switch

The Cruise Control Pause (or Cancel) Switch status is shown as OFF when the switch is not pressed and ON when the switch is pressed.  
Figure 28.

**NOTE:** It is common for certain vehicle models to have no Cruise Control Pause switch installed. The status will show as N/A on these vehicles.

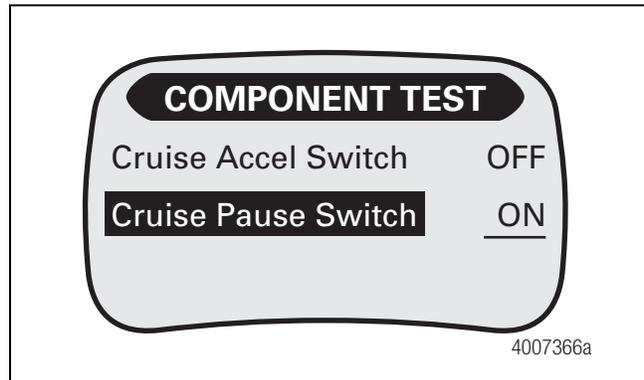


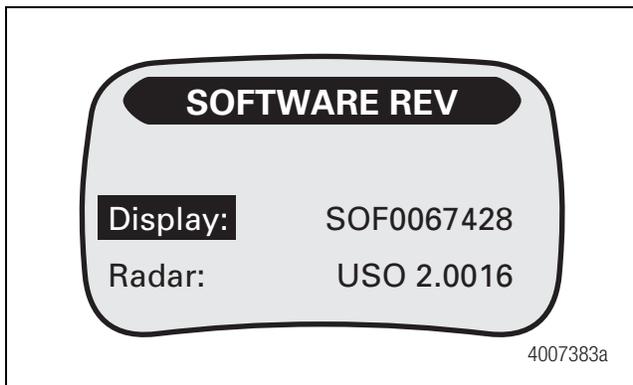
Figure 28

## Software Version

The Software Revision screen displays the Display Software version and the Radar Sensor Software version. The Software Revision background is green. Figure 29.

Knowledge of the software versions of the OnGuard™ Radar and Display may be required in the event that the system requires service.

Press the MODE key to advance to the CWS or ACC main operating screens.



**Figure 29**

Notes



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