# The SafetyDirect® By Bendix CVS Web Portal Processor

**FIGURE 1 - *SAFETYDIRECT® WEB PORTAL PROCESSOR***

## 1.0 DESCRIPTION

The SafetyDirect® Web Portal Processor is a component used to collect complex safety data and supply it to the vehicle's On Board Computer (OBC)/Telematics system for transfer to the SafetyDirect web site.

This document covers troubleshooting the processor when used with the Bendix® Wingman® Fusion™ system and its safety systems, including:

- Lane Departure Warning (LDW) Systems;
- Over-Speed Alert & Action (OAA); and
- Collision Mitigation Technology (CMT).

*(For information about the Bendix Wingman Fusion system, see Service Data Sheet, SD-61-4963)*.

For free downloads of Service Data Sheets, visit the Bendix website at: www.bendix.com.

**⚠ WARNING**

**Bendix safety technologies complement safe driving practices and are not intended to enable or encourage aggressive driving. No commercial vehicle safety technology replaces a skilled, alert driver exercising safe driving techniques and proactive, comprehensive driver training. Responsibility for the safe operation of the vehicle remains with the driver at all times.**

## 1.1 BENDIX® WINGMAN® FUSION™ SYSTEM COMPONENTS

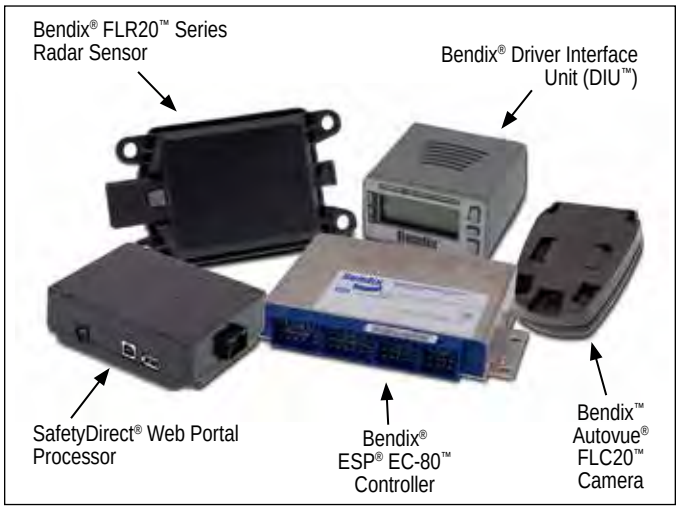


**FIGURE 2 - *MAIN BENDIX® WINGMAN® FUSION® SYSTEM COMPONENTS***

The Bendix Wingman Fusion system has five major components (*See Figure 2*).

1. A Bendix™ Autovue® FLC20™ Camera is a visible-light spectrum camera mounted on the inside of the windshield.
2. The SafetyDirect Web Portal Processor described in this document, normally located in the overhead compartment above the windshield, near the camera.
3. A Bendix® Wingman® FLR20™ radar, located at the front of the vehicle close to – or on – the bumper.
4. A Bendix® ESP® EC-80™ Controller – located in the cab of the vehicle – controls the antilock braking and full stability functions for the vehicle, using a set of wheel-speed, yaw, steering-angle and load sensors. In the Bendix Wingman Fusion system, the controller also manages any actions requested by the Fusion system.
5. A Bendix® Driver Interface Unit (DIU) – or similar OEM dashboard display – communicates between the driver and the Bendix Wingman Fusion system. A set of visual, text, and audible indicators and alerts are provided.

## SD SHEET INDEX



## 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.**
- **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.**
- **You should consult the vehicle manufacturer's operating and service manuals, and any related literature, in conjunction with the Guidelines above.**

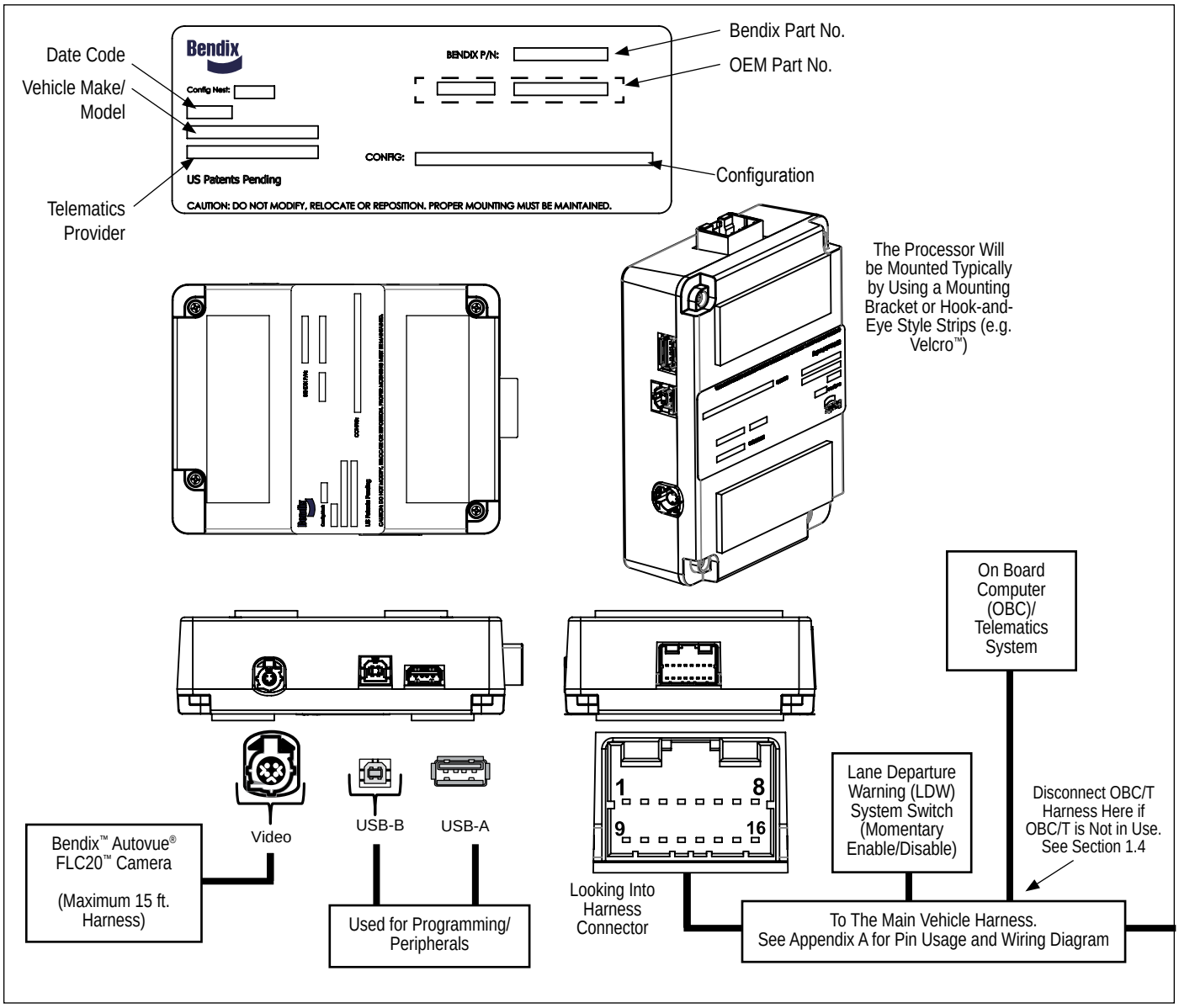


**FIGURE 3 - *SAFETYDIRECT® BY BENDIX CVS WEB PORTAL PROCESSOR FUSION® SYSTEM CONNECTIONS***

## 1.2 CONNECTIONS

The processor has four connection locations. *See Figure 3.*

## 1.3 ENABLE/DISABLE SWITCH FUNCTIONS

In the case of vehicles configured to do so, the enable/disable switch used by the Lane Departure Warning (LDW) system also functions – when depressed for six (6) seconds – to activate a request from the SafetyDirect® By Bendix CVS Web Portal Processor to the On Board Computer (OBC)/Telematics system to transmit the last three (3) minutes of buffered video data.

## 1.4 IMPORTANT NOTE ON TELEMATICS WIRING

Where a vehicle does not have an On Board Computer (OBC)/Telematics system – in order to prevent interference to the SafetyDirect Web Portal Processor – disconnect from the OBC/T harness (any wiring harness provisionally installed in the vehicle for potential use for Telematics) from the main vehicle harness. Re-connect the harness only when an OBC/Telematics system is installed. *(See Appendix B).*

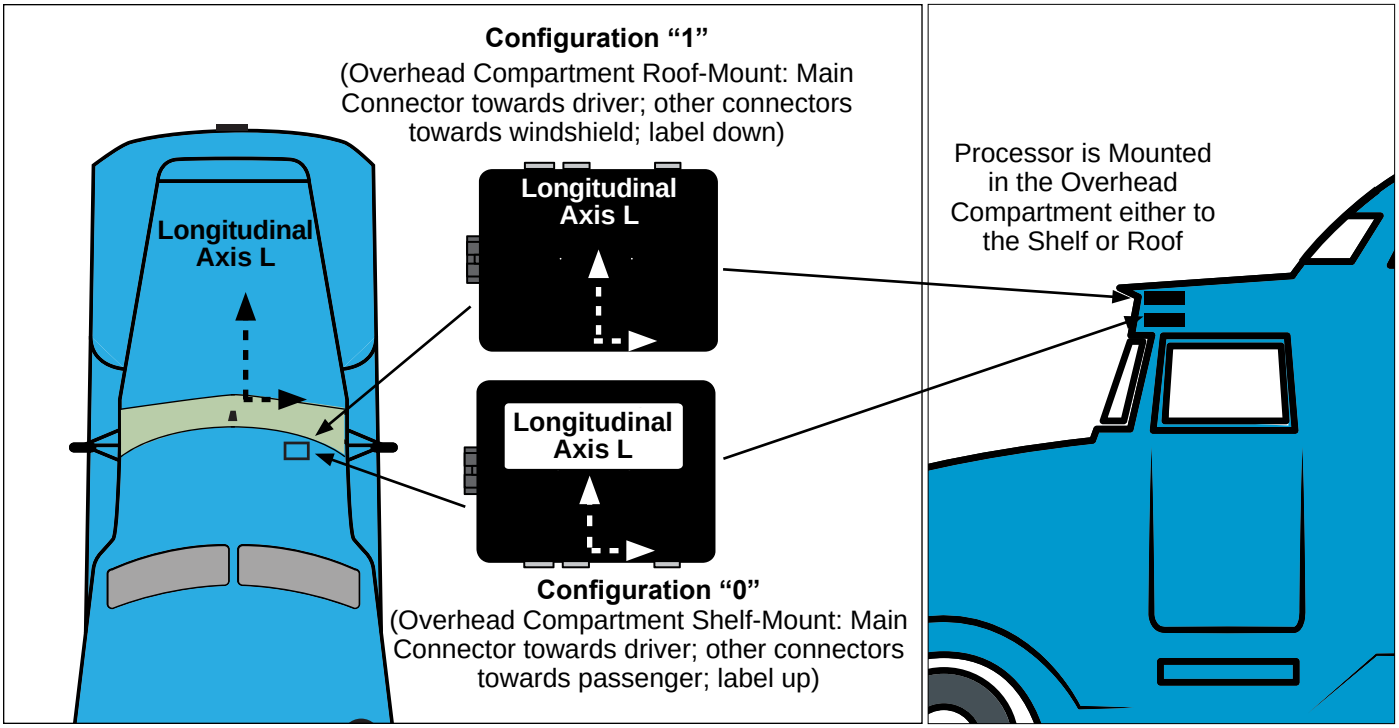


**FIGURE 4 - *SAFETYDIRECT® BY BENDIX CVS WEB PORTAL PROCESSOR PERMISSIBLE CONFIGURATIONS***

## 1.5 ORIENTATION

It is critical that the processor be installed in the expected orientation to the vehicle longitudinal line. *See Figure 4.*

The SafetyDirect® By Bendix CVS Web Portal Processor must be installed in the vehicle using a method that keeps the processor stable and permanently mounted in the same orientation. The two most used orientations are shown in Figure 4. The exact mounting location varies by the OEM, and vehicle model, and should remain consistent for all vehicles in that category. The processor is mounted inside the cab in the overhead compartment to help provide the shortest length for the video cable. The maximum length permitted is 15 feet (4.5 m). In most cases a mounting bracket or professional-quality, hook-and-eye fastening material (e.g. "Velcro™", or similar) may be used.

**IMPORTANT**

Misalignment may result in variation in the reporting of excessive braking and turning.

## 1.6 MAINTENANCE

In normal use, the SafetyDirect Web Portal Processor needs no maintenance. Protect the Processor from damage or being moved from its set location in the overhead compartment.

## 1.7 SAFETYDIRECT WEB PORTAL PROCESSOR INTERCHANGEABILITY

When replacing SafetyDirect Web Portal Processors only use replacements with the same part number (or a direct superceding replacement number supplied by Bendix).

**WARNING**

**SafetyDirect Web Portal Processors of different vehicle models and model years must not be interchanged. The use of an incorrect SafetyDirect Web Portal Processor can lead to Diagnostic Trouble Codes (DTCs) being set, and performance degradation – including unnecessary system interventions and the potential for situations where interventions do not occur when they would normally.**

SafetyDirect Web Portal Processors are designed specifically for particular vehicle and model. DTCs caused by relocating SafetyDirect Web Portal Processors to an incorrect vehicle may result in the vehicle system using the SafetyDirect Web Portal Processor to be partially or fully unavailable.

If you have questions, contact the Bendix Tech Team at 1-800-AIR-BRAKE (1-800-247-2725, option 2).

## 2.0 TROUBLESHOOTING

## 2.1 GENERAL SAFETY GUIDELINES

Read and follow the General Safety Guidelines shown on page two of this document**.**

**Bendix safety technologies complement safe driving practices and are not intended to enable or encourage aggressive driving. No commercial vehicle safety technology replaces a skilled, alert driver exercising safe driving techniques and proactive, comprehensive driver training. Responsibility for the safe operation of the vehicle remains with the driver at all times.**

**IMPORTANT**

***All vehicle Diagnostic Trouble Codes (DTCs) related to the engine, transmission, instrument cluster, engine cruise control and Bendix® ABS, ATC or ESP® systems must first be resolved, with no DTCs present during the vehicle operation while in cruise control, before trying to resolve SafetyDirect® By Bendix CVS Web Portal Processor DTCs.***

**IMPORTANT**

**System Problems.** If a problem with the SafetyDirect Web Portal Processor is detected, it should be serviced as soon as possible to restore full functionality.

## 2.2 SETTING DIAGNOSTIC TROUBLE CODES

If, during operation, the Bendix® Wingman® Fusion™ system detects a problem with the SafetyDirect® Web Portal Processor, a DTC will be set and – depending on the OEM – the driver will be alerted by the dash display an icon or similar method. In these cases, some features of Bendix Wingman Fusion system will not be available.

## 2.3 PC-BASED DIAGNOSTIC SOFTWARE

Use a PC-based software program to provide the technician with the processor diagnostic information and configuration capability.

*See Table 1 For SPN (Suspect Parameter Number) and FMI (Failure Mode Identifier) code combinations.*

For Bendix Wingman Fusion system diagnostics, use Bendix® ACom® Diagnostic Software version 6.9 or higher**.**

**IMPORTANT**

Please note that Bendix ACom Diagnostic Software ***version 6.9 or higher*** is required for troubleshooting the SafetyDirect Web Portal Processor. Further revisions to this document will include more details of Bendix ACom Diagnostic Software troubleshooting functionality; see the bendix web site www.bendix.com for updates to this document.

## Table of System Diagnostic Trouble Codes (DTCs)

Refer to the DTC(s) found and determine the action(s) to take.

| Table of Diagnostic Trouble Codes (DTCs), Causes and Recommended Actions | | | | |
|---|---|---|---|---|
| **SPN** | **FMI** | **DTC Name** | **Condition Found** | **Suggested Remedial Action(s)** |
| **0084** | **02** | **Vehicle's Speed Value Not Found.** | The J1939 Data Bus speed value is not present. | • Check J1939 Data Bus connection.<br>• Is the vehicle's J1939 Data Bus functioning?<br>• If no problems were found during the checks above, replace the processor and re-test. |
| **0084** | **15** | **Vehicle's Speed Value is Out-of-Range.** | The J1939 Data Bus speed value is outside the expected range. | • Check J1939 Data Bus connection.<br>• Is the vehicle's J1939 Data Bus functioning?<br>• If no problems were found during the checks above, replace the processor and re-test. |
| **0625** | **02** | **Wingman® Fusion™ Private Communications Receive Failure.** | Failure of processor to receive on Private Data Bus. | • Check J1939 Data Bus connection.<br>• Is the vehicle's J1939 Data Bus functioning?<br>• If no problems were found during the checks above, replace the processor and re-test. |
| **0628** | **31** | **Software Corrupted. (SDP is Disabled. No Warnings Will be Generated.)** | The internal Electronic Control Unit (ECU) checksum does not match the calculated value. | • Replace the processor and re-test. |
| **0639** | **02** | **J1939 Data Bus Not Found. Receive and/or Transmit Not Present. (SDP is Disabled. No Warnings Will be Generated.)** | The processor is not transmitting on the J1939 Data Bus. | • Check for damaged or reversed J1939 wiring. Check for corroded or damaged connectors and loose connections. Using procedures described by the vehicle manufacturer, verify the presence of the J1939 link. Check for other devices inhibiting J1939 communications.<br>• If no problems were found during the checks above, replace the processor and re-test. |
| For technical support, call the Bendix Tech Team at 1-800-AIR-BRAKE (1-800-247-2725, option 2) Monday through Friday, 8:00 a.m. to 6:00 p.m. ET. The Bendix Tech Team can also be reached by e-mail at: techteam@bendix.com. | | | | |

**FIGURE 1 -** ***TABLE OF DIAGNOSTIC TROUBLE CODES (PAGES 6-9)***

the Bendix Tech Team is available at 1-800-AIR-BRAKE (1-800-247-2725, option 2)

| Table of Diagnostic Trouble Codes (DTCs), Causes and Recommended Actions | | | | |
|---|---|---|---|---|
| **SPN** | **FMI** | **DTC Name** | **Condition Found** | **Suggested Remedial Action(s)** |
| **1564** | **02** | **FLC20 CCD Input Failure.** | Private communications messages with the camera are not present as expected. | • Check the wiring between the camera and the processor.<br>• See the camera SD Sheet SD-64-20124 for more information. |
| **1702** | **02** | **Switch Failure.**<br>**(SDP is Disabled. No Warnings Will be Generated.)** | Private communications input message signals switch failure in switch state field or discrete momentary switch input is stuck in the 'pressed' state for more than 60 seconds. | • Check the wiring between the enable/disable switch and the processor.<br>• Test by temporarily installing a known good switch.<br>• If no problems were found with the wiring, and the test with a good switch did not solve the problem, replace the processor and re-test. |
| **1703** | **03** | **The Right Speaker is Shorted to Power.**<br>**(SDP is Disabled. No Warnings Will be Generated.)** | The resistance from right speaker positive or negative output pins to power input is less than 10Ω during sound generation. | • Check the wiring between the right speaker and the processor.<br>• Test by temporarily installing a known good speaker in the right speaker location.<br>• If no problems were found with the wiring, and the test with a good speaker did not solve the problem, replace the processor and re-test. |
| **1703** | **05** | **The Right Speaker Has an Open Circuit.**<br>**(SDP is Disabled. No Warnings Will be Generated.)** | Resistance between right speaker output pins is greater than 40Ω during sound generation. | • Check the wiring between the right speaker and the processor.<br>• Test by temporarily installing a known good speaker in the right speaker location.<br>• If no problems were found with the wiring, and the test with a good speaker did not solve the problem, replace the processor and re-test. |
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| Table of Diagnostic Trouble Codes (DTCs), Causes and Recommended Actions | | | | |
|---|---|---|---|---|
| **SPN** | **FMI** | **DTC Name** | **Condition Found** | **Suggested Remedial Action(s)** |
| **1703** | **06** | **The Right Speaker is Shorted to Ground.** **(SDP is Disabled. No Warnings Will be Generated.)** | Resistance between right speaker positive or negative output pins and ground is less than 10Ω during sound generation. OR Resistance between right speaker positive and negative output pins is less than 7Ω during sound generation. | • Check the wiring between the right speaker and the processor.<br>• Test by temporarily installing a known good speaker in the right speaker location.<br>• If no problems were found with the wiring, and the test with a good speaker did not solve the problem, replace the processor and re-test. |
| **1704** | **03** | **The Left Speaker is Shorted to Power.** **(No Warnings Will be Generated.)** | Resistance from left speaker positive or negative output pins to power input is less than 10Ω during sound generation. | • Check the wiring between the left speaker and the processor.<br>• Test by temporarily installing a known good speaker in the left speaker location.<br>• If no problems were found with the wiring, and the test with a good speaker did not solve the problem, replace the processor and re-test. |
| **1704** | **05** | **The Left Speaker Has an Open Circuit.** **(No Warnings Will be Generated.)** | Resistance between left speaker output pins is greater than 40Ω during sound generation. | • Check the wiring between the left speaker and the processor.<br>• Test by temporarily installing a known good speaker in the left speaker location.<br>• If no problems were found with the wiring, and the test with a good speaker did not solve the problem, replace the processor and re-test. |
| **1704** | **06** | **The Left Speaker is Shorted to Ground.** **(No Warnings Will be Generated.)** | Resistance between left speaker positive or negative output pins and ground is less than 10Ω during sound generation. OR Resistance between left speaker positive and negative output pins is less than 7Ω during sound generation. | • Check the wiring between the left speaker and the processor.<br>• Test by temporarily installing a known good speaker in the left speaker location.<br>• If no problems were found with the wiring, and the test with a good speaker did not solve the problem, replace the processor and re-test. |
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**FIGURE 1 -** ***TABLE OF DIAGNOSTIC TROUBLE CODES (PAGES 6-9)***

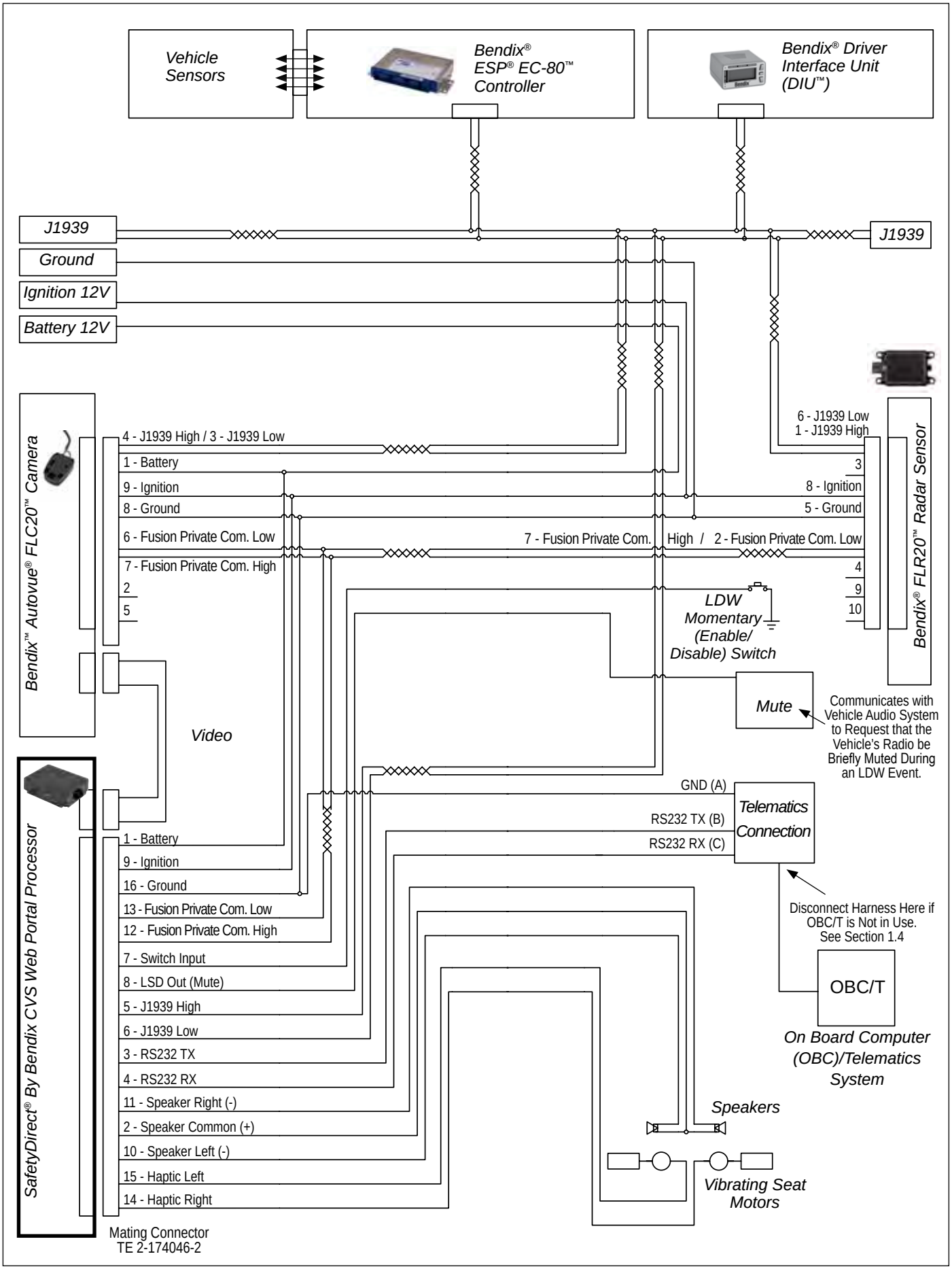
| Table of Diagnostic Trouble Codes (DTCs), Causes and Recommended Actions | | | | |
|---|---|---|---|---|
| **SPN** | **FMI** | **DTC Name** | **Condition Found** | **Suggested Remedial Action(s)** |
| **1705** | **03** | **The Input Voltage is Too High.** | Input voltage is above 16V. | • Measure the ignition voltage. Ensure that ignition voltage is not greater than 16 VDC. Check the vehicle battery and associated components.<br>• Inspect for damaged wiring, damaged or corroded connectors and loose connections. Check the wiring between the ignition and the processor.<br>• If no problems were found during the checks above, replace the processor and re-test. |
| **1705** | **04** | **The Input Voltage is Too Low.** | Input voltage is below 9.5V. | • Check the ignition voltage.<br>• Measure the ignition voltage under load. Ensure that the ignition voltage is greater than 10 VDC (volts DC). Check the vehicle battery and associated components. Inspect for damaged wiring, damaged or corroded connectors and loose connections. Check the condition of the fuse.<br>• Check the wiring between the ignition and the processor.<br>• If no problems were found during the checks above, replace the processor and re-test. |
| **1705** | **05** | **The Enabled Lamp or Status Lamp Output Open.** | Resistance from enabled or status output to ground is greater than 140KΩ while output is not energized. | • Check the wiring between the processor and the switch or status lamp.<br>• Test by temporarily installing a known good switch/status lamp.<br>• If no problems were found with the wiring, and the test with a good switch/status lamp did not solve the problem, replace the processor and re-test. |
| | | (Note: the green “enabled” lamp output **will not** illuminate if this DTC is present) | | |
| **1705** | **06** | **Enabled Lamp or Status Lamp Output Short to Power.** | Current into enabled or status output pin is greater than 4.5A while the output is energized. | • Check the wiring between the processor and the switch or status lamp.<br>• Test by temporarily installing a known good switch/status lamp.<br>• If no problems were found with the wiring, and the test with a good switch/status lamp did not solve the problem, replace the processor and re-test. |
| | | (Note: the green “enabled” lamp output **will not** illuminate if this DTC is present) | | |
| **1705** | **31** | **Internal Failure.** | Internal failure. | • Check the camera cable.<br>• Test by temporarily installing a known good camera.<br>• If no problems were found with the cable and the test with a good camera did not solve the problem, replace the processor and re-test. |
| **For all other DTCs, or problems after re-testing a replacement processor, contact the Bendix Tech Team.** | | | | |
| For technical support, call the Bendix Tech Team at 1-800-AIR-BRAKE (1-800-247-2725, option 2) Monday through Friday, 8:00 a.m. to 6:00 p.m. ET. The Bendix Tech Team can also be reached by e-mail at: techteam@bendix.com. | | | | |

**FIGURE 1 -** ***TABLE OF DIAGNOSTIC TROUBLE CODES (PAGES 6-9)***

## 2.4 CLEARING DIAGNOSTIC TROUBLE CODES (DTCs)

Cycle the ignition power. Power off the vehicle for at least one (1) minute, and then start the engine and run it at idle for at least 15 seconds. If the error returns, call Bendix at 1-800-AIR-BRAKE (1-800-247-2725), option 2, for assistance.

# APPENDIX A - BENDIX® WINGMAN® FUSION™ SYSTEM COMPONENT SCHEMATIC



# APPENDIX B - THE BENDIX™ SAFETYDIRECT® BY BENDIX CVS WEB PORTAL PROCESSOR

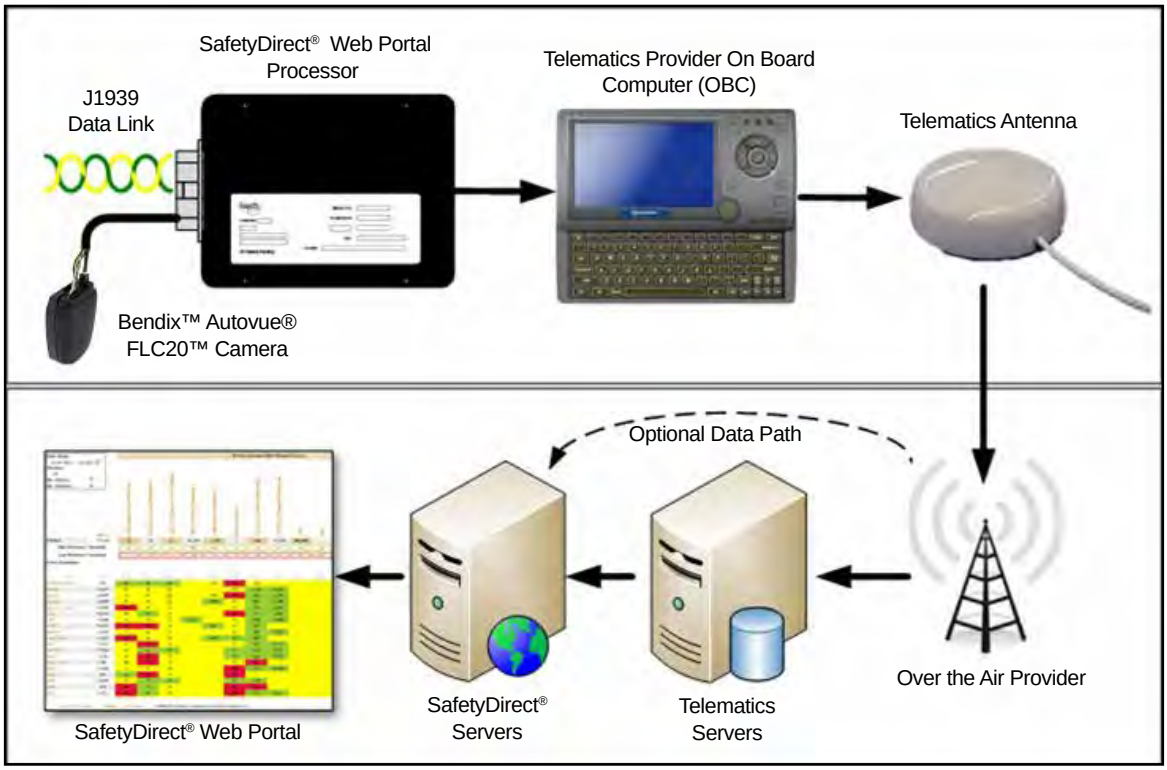
## Appendix B

### The SafetyDirect® Web Portal Processor

The system has the ability to collect relevant driver and vehicle performance data via the the SafetyDirect® Web Portal Processor and the J1939 Private communications bus. When a trigger event occurs, vehicle data and, in some cases, video, is saved in the system for later download via the vehicle telematics system.

***In-Vehicle Hardware***

***Network***



## ADDITIONAL SUPPORT AT WWW.BENDIX.COM/1-800-AIR-BRAKE (1-800-247-2725, OPTION 2)

For the latest information – and for free downloads of the Bendix® ACom® Diagnostics software – and its User Guide, visit the Bendix website at: www.bendix.com**.**

For direct telephone technical support, the Bendix Tech Team is available at 1-800-AIR-BRAKE (1-800-247-2725, option 2) Monday through Friday, 8:00 A.M. to 6:00 P.M. ET. Follow the instructions in the recorded message**.**

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