

Error Code Guide

Transmission VPD2500

MM5VPDA
03Aug2022

MARMON-HERRINGTON HYDROMECH

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1 Table of Contents

2 Preface 4

3 Additional Resources 5

 3.1 Additional Manuals..... 5

 3.2 Contact Information..... 5

4 Introduction 6

 4.1 How to Use Error Guide 7

 4.2 ERROR Chart..... 8

 4.3 Notes on Pin location 10

 4.4 FMI Brief..... 11

 4.5 Lamp State 12

 4.6 BODAS Guide..... 13

5 VPD Diagnostic Trouble Code Guide 16

 5.1 Input Speed Sensor Error 16

 5.2 Output Speed Sensor Error 17

 5.3 Sun Speed Sensor Error..... 17

 5.4 PTO speed Sensor Error 18

 5.5 Oil Filter Locked Error 18

 5.6 High Pressure Sensor A Error 19

 5.7 High Pressure Sensor B Error 19

 5.8 Hydrostatic Unit Calibration Error 20

 5.9 Lubrication Pressure out of Range / Sensor Error 20

 5.10 System Pressure Out of Range / Sensor Error 21

 5.11 Valve A Hydrostatic Unit Error 21

 5.12 Valve B Hydrostatic Unit Error 22

 5.13 Oil Temperature out of Range / Sensor Error 22

 5.14 Valve Supply Hydrostatic Unit Error 23

 5.15 Valve Supply PTO Error 23

 5.16 Valve PTO Error 24

 5.17 Oil Cooler Relay Error..... 24

 5.18 Handthrottle Potentiometer Track A Error..... 25

 5.19 Handthrottle Potentiometer Track B Error 26

 5.20 Mode Selector Switch Error 26

 5.21 Modelight Output Error 27

 5.22 Limp Home Input Error 27

 5.23 Limp Home Output Error 27

 5.24 Pressure Sensor PTO Error 28

 5.25 HID Sensor supply Error 28

 5.26 Speed Sensor Supply Error 29

 5.27 Engine CANBus Error..... 29

 5.28 Transmission CANBus Error 30

 5.29 License Error 30



5.30	Application Parameter Set Error	30
5.31	Configuration Parameter Set Error	31
5.32	Calibration Parameter Set Error.....	31



2 Preface

The Present Document gives directions to the trained personnel to troubleshoot Error Codes for the **Marmon Herrington (MH) Variable Power Divider (VPD2500)**.

Customary tools and devices, which are workshop standard, are supposed to be available.

Disassembly of and assembly of one version only is explained in this document. Differing working sequences of other possible versions can easily be recognized by the skilled professional.

The repair of the component may require changed working sequences and/or differing adjustment or checking of data, according to the technical development of the product over the years.

Therefore, we recommend rendering your MH product only to the hands of currently trained personnel.

Damages caused by improperly or unprofessionally executed repair work through untrained personnel and the resulting consequences are excluded from any contractual liability.

This also applies when NON-ORIGINAL-PARTS are being used.

General Working Directions

The company repairing M-H Components is in any case responsible for all aspects of safety.

The valid safety regulations and legal directives must be obeyed to avoid injury of persons and damage of the product during maintenance and repair.

The proper repair of the M-H Product requires adequately trained personnel. To undergo training is the obligation of the repairer.

Always assure professional and clean working conditions. Components shall always be cleaned before disassembly.

The use of indicated tools is a precondition.

Carefully remove sensors and wire connectors.

Clean surfaces thoroughly before installing sensors and wire connectors.

Parts that are being damaged during disassembly are to be replaced by new ones.

E.g.: radial oil seals, o-rings, groove-rings, seal cups, protection cap, etc.

On the assembly all given adjustment tolerances, check data and tightening torques have to be observed. M-H Components are to be filled with oil after the repair. Observe filling instructions and lubrication chart. After filling, the oil drain and oil level plugs must be tightened to correct torque.

Use Original M-H Parts only!



3 Additional Resources

3.1 Additional Manuals

Manual	Manual #
Parts Manual	MM1VPD
Service Manual	MM2VPD
Installation & Operations Manual	MM3VPD
General Wiring Schematic	MM4VPD

3.2 Contact Information

Parts Department:

Phone: (502) 253 0277 x 1 / (800) 227 0727 x 1

Email: partsales@marmon-herrington.com

Website: marmon-herrington.com/contact-parts

Service and Warranty Department

Phone: (502) 253 0277 x 3 / (800) 227 0727 x 3

Email: warranty@marmon-herrington.com

Website: marmon-herrington.com/contact-service-warranty



4 Introduction

The VPD2500 is a Variable Power Divider installed between a truck engine and main transmission. It is used to provide constant PTO speed while allowing for variable vehicle drive speeds. Output speeds are managed by a variable displacement hydraulic pump combined with a planetary gearset. The PTO is a hydraulic actuated clutch unit, capable of shifting on the fly. The two modes in which the VPD operate are road mode (PTO off) and work mode (PTO on). The speed range for when a shift between Road mode and Work mode occur can vary based on application. Please contact bodybuilder for such information.

When in Road mode, the VPD operates as a passthrough, not interfering with power transfer from engine to wheels. When in Work mode, the VPD engages the PTO and controls engine speed. This process allows for a PTO speed independent of vehicle speed; thus, operator can change speed of vehicle while operating PTO equipment. The VPD ECU is the brain of this function. The ECU also notifies the operator of any diagnostic trouble codes or Errors as covered in this manual.

This manual provides troubleshooting for the VPD Transmission, including:

- the description of diagnostic codes under their Diagnostic Message 1 (DM1) Suspect Parameter Number (SPN) and BODAS Service Error Number in both decimal and hex values, referred to as Errors in this guide.
- the troubleshooting of said errors and the cause of said error.
- How to use BODAS to find and troubleshoot errors.

Depending on the manufacturer, code displayed can either be a Suspect Part Number in either hex or decimal value through the Bodybuilder's Display. Contact Body Builder for exact display information.

For information on location of signals on the ECU and their terminating location, please see General Wiring Diagram MM4VPD. Please note that your chassis wiring harness is controlled by body builder. For specific information on the wiring harness itself, please contact the respective body builder.

If calling Marmon-Herrington regarding an Error on your VPD/ECU, please make sure to include the following:

- Bodybuilder and Type of Unit
- Symptom of issue
- Diagnostic Error Code in SPN or BODAS Service Error Number
- Serial Number of VPD
- Part Number, Serial number, and Software version of the ECU



4.1 How to Use Error Guide

Below can be found guide on how this Error manual labels errors and the common troubleshooting steps that follow.

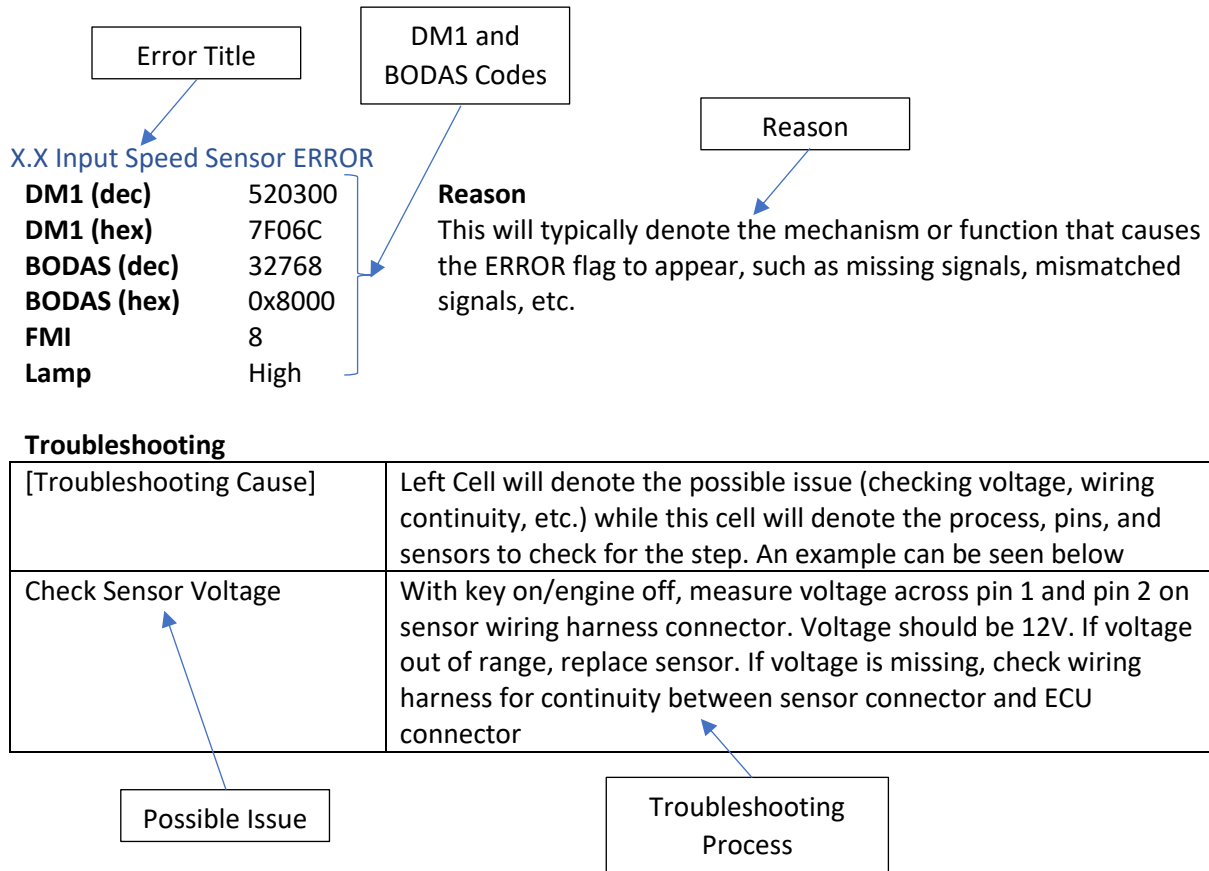


Figure 1: ERROR Troubleshooting Guide



4.2 ERROR Chart

ERROR #	DM1 SPN		Bodas Service Error		Device	Description
	Decimal	Hex	Decimal	Hex		
1	520300	7F06C	32768	8000	n_In S4.1	Input speed sensor Error
2	520301	7F06D	32769	8001	n_Out S4.3	Output speed sensor Error
3	520302	7F06E	32770	8002	n_Sun S4.2	Sun gear speed sensor Error
4	520303	7F06F	32771	8003	n_Pto S8.6	PTO speed sensor Error
5	520304	7F070	32772	8004	b_Oilfilter S5.6	Oil filter Locked
6	520305	7F071	32773	8005	p_HydHPA S5.3	Pressures sensor Hydrostatic Unit A High pressure
7	520306	7F072	32774	8006	p_HydHPB S5.4	Pressure sensor Hydrostatic Unit B High pressure
8	520307	7F073	32775	8007	HydCal	Hydrostatic Unit calibration Error
9	520308	7F074	32776	8008	p_Lub S5.1	Lubrication pressure out of Range / Sensor Error
10	520309	7F075	32777	8009	p_Sys S5.2	System pressure out of Range / Sensor Error
11	520310	7F076	32778	800A	o_ip_HydPmpA Y10.2	Valve A Hydrostatic Unit Error
12	520311	7F077	32779	800B	o_ip_HydPmpB Y10.3	Valve B Hydrostatic Unit Error
13	520312	7F078	32780	800C	tmp_OilSys S4.4	Oil temperature out of range / Sensor Error
14	520313	7F079	32781	800D	o_b_HydCtrl Y10.2 & Y10.3	Valve Supply Error Hydrostatic Unit
15	520314	7F07A	32782	800E	o_b_CltCtrl Y10.1	Valve Supply PTO Error
16	520315	7F07B	32783	800F	o_ip_CltPto Y10.1	Valve PTO Error
17	520316	7F07C	32784	8010	o_b_OilCooler K9.4	Oil cooler Relay Error
18	520317	7F07D	32785	8011	per_HandthrottleA S6.1	Hand throttle Potentiometer Track A Error
19	520318	7F07E	32786	8012	per_HandthrottleB S6.1	Hand throttle Potentiometer Track B Error
20	520319	7F07F	32787	8013	b_ModeSel S7.1	Mode selector Switch Error
21	520320	7F080	32788	8014	o_b_ModeLight H9.3	Mode light Output Error



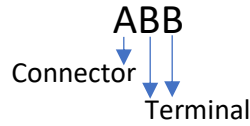
ERROR #	DM1 SPN		Bodas Service Error		Device	Description
	Decimal	Hex	Decimal	Hex		
22	520321	7F081	32789	8015	b_LimpHome F7.1	Limp Home Input Error
23	520322	7F082	32790	8016	o_b_LimpHome H9.1	Limp Home Output Error
24	520323	7F083	32791	8017	p_Pto S 8.1	Pressure sensor PTO Error
25	520324	7F084	32792	8018	o_Sensor1	HID Sensor Supply Error
26	520325	7F085	32793	8019	o_Sensor2	speed Sensor Supply Error
27	520199	7F007	32794	801A	e_CanEng	Engine CAN Bus Error
28	520200	7F008	32795	801B	e_CanTrm	Transmission CAN Bus Error
29	520201	7F009	32796	801C	e_License	License not set
30	520202	7F00A	32797	801D	e_APPLFlashPar	Application parameter set wrong
31	520203	7F00B	32798	801E	e_CFGFlashPar	configuration parameter set wrong
32	520204	7F00C	32799	801F	e_CalPar	calibration parameter set wrong

Depending on body builder, the DM1 SPN code or the Bodas service Error can appear on the dash or through the service tool. If using BODAS service tool, then the Error code displayed will be as the BODAS hex code. Reference the chart above based on the Error output. If an Error is presented that is not on this list, please contact Marmon-Herrington.



4.3 Notes on Pin location

The pin location for the VPD ECU uses a 3-digit code for their callout. The callout is follows



With A referencing the connector the pin is located in and BB referencing the terminal within the connector. For example: Pin 203 would reference connector 2, pin 3 as shown below:

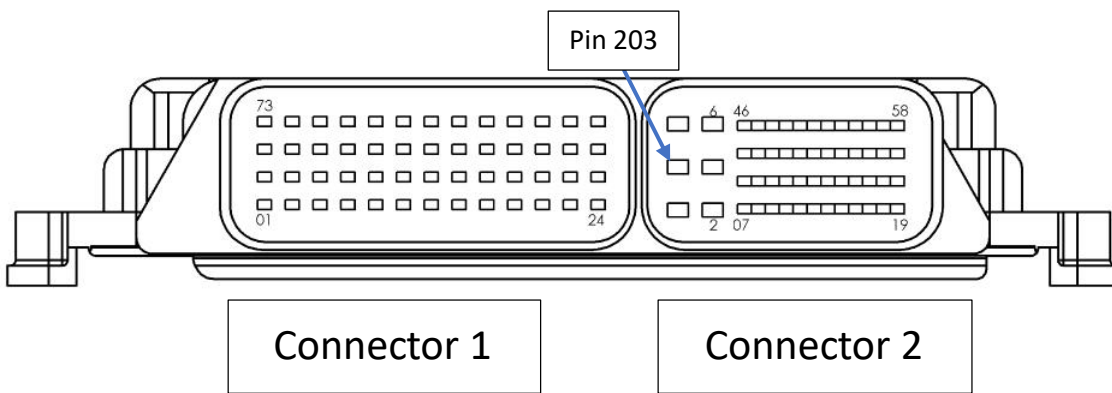


Figure 2

The pin location for the sensor on the VPD does not use a code when calling out pins. For example, pin 3 on the Lubrication Pressure Sensor would just be pin 3 as shown below:

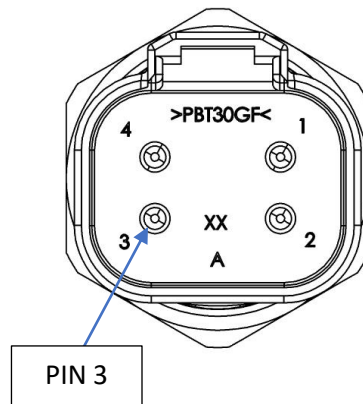


Figure 3

As noted in MM4VPD, wiring harnesses may differ between chasses and thus there could be an intermediate connector between the ECU and the sensor/terminating location. Any troubleshoot steps will require that you check at the intermediate location as well as ECU and sensor to ensure proper troubleshooting. For information on your specific wiring harness, please contact the respective body builder.



4.4 FMI Brief

FMI	short text	description
0	Data Valid But Above Normal Operational Range - Most Severe Level	
1	Data Valid But Below Normal Operational Range - Most Severe Level	
2	Data Erratic, Intermittent Or Incorrect	
3	Voltage Above Normal, Or Shorted To High Source	Short
4	Voltage Below Normal, Or Shorted To Low Source	Cable cracked
5	Current Below Normal Or Open Circuit	Cable cracked
6	Current Above Normal Or Grounded Circuit	Short
7	Mechanical System Not Responding Or Out of Adjustment	
8	Abnormal Frequency Or Pulse Width Or Period	Speed sensor consistency failure
9	Abnormal Update Rate	
10	Abnormal Rate Of Change	
11	Root Cause Not Known	
12	Bad Intelligent Device Or Component	
13	Out Of Calibration	
14	Special Instructions	
15	Data Valid But Above Normal Operating Range - Least Severe Level	
16	Data Valid But Above Normal Operating Range - Moderately Severe Level	
17	Data Valid But Below Normal Operational Range - Least Severe Level	
18	Data Valid But Below Normal Operational Range - Moderately Severe Level	
19	Received Network Data in Error	
20	Data Drifted High	
21	Data Drifted Low	
22-30	Reserved For SAE Assignment	
31	Condition Exists	

Each Error has a related Failure Mode Identifier (FMI) Code that can be used alongside the diagnostic trouble code to help troubleshoot an issue. The FMI may indicate that a problem with an electric circuit or an electrical component has been detected.



4.5 Lamp State

On Equipped trucks, some Error codes will show severity through LED Lamp within chassis, as described in chart below:

State	Amber Lamp	Red Lamp
% LOW	ON	OFF
% MEDLOW	FLASH	OFF
% MEDHIGH	FLASH	ON
% HIGH	FLASH	FLASH

If you are unsure if your chassis is equipped with lamp state option, please contact body builder.



4.6 BODAS Guide

BODAS Service Tool 3.6 is a PC software tool used to interact with the VPD ECU to aid in identifying and troubleshooting VPD ERRORS. BODAS Service 3.6 can be downloaded from the Bosch Rexroth Website and installed on a compatible computer (PC). Connection between the PC and the ECU will require a CAN interface device such as Peak’s PCAN-USB or Vector’s VN1610. Then a connection must be made between the CAN interface device and the CAN Network. Depending on manufacturer, there should be a CAN1 connector available in Cab due to VPD install. If not, the J1939 Port works as well. Check with Body Builder to confirm.

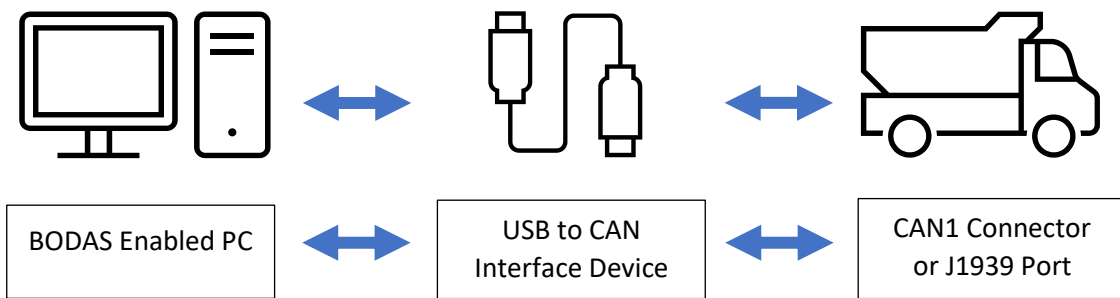


Figure 4: BODAS Interface Setup

Once PC is wired to truck as shown, Start up BODAS. Before scanning for controllers, ensure that BODAS is setup to read the correct CAN Interface device and correct baud rate by navigating to the Tools -> Interface Channel. A should match CAN adapter used while B should be 250 kBaud

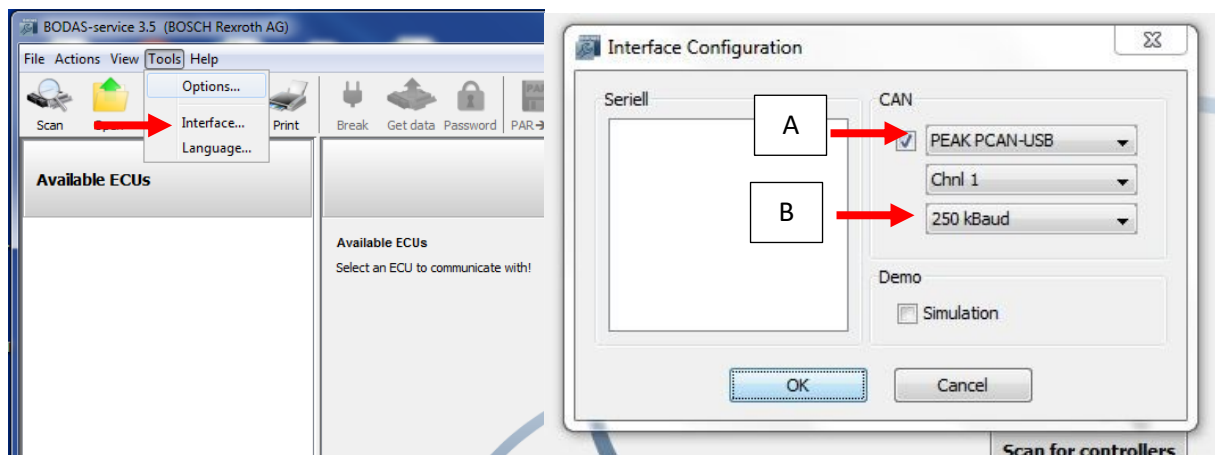


Figure 5: BODAS Interface Configuration

Once set up, press scan for controller. After a brief period, an RC12-10/30 controller should be found as shown:

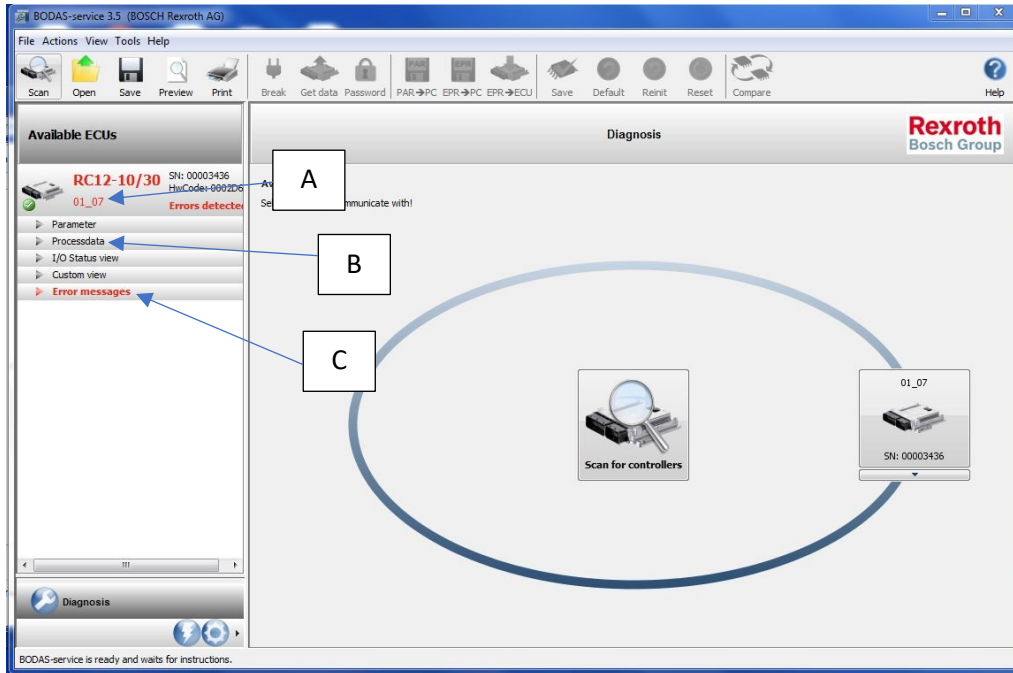


Figure 6: BODAS Controller Menu

The software version of the controller can be seen just below RC12/10-30 (A). The Process Data tab (B) shows values such as system pressure, system temperature, pedal position, input speed, and more, which all can be used to aid troubleshooting errors. Error Messages (C) is the location to find errors from the VPD when using BODAS.



When navigating the Error Messages Tab, two types of errors will be shown. Active errors are errors that the ECU is currently experiencing. Saved Errors are errors that have occurred in the past but are not being experienced currently. BODAS will display the error in the Error code in the hex format (A), the number of times that error has occurred in occurrences (B), error description in error message (C), and the FMI code in Param (D)

Active errors					
	A	B		C	D
Index	Error Code	Occurrences	Timestamp	Error Message	Param
1	0x010A	1	0:01	sys_init: new software version	0
2	0x801B	1	0:01	e_CanTrm	12
3	0x801A	1	0:01	e_CanEng	12
4	0x8004	1	0:01	b_Oilfilter S5.6	8
5	0x800A	1	0:01	o_ip_HydPmpA Y10.2	5
6	0x800B	1	0:01	o_ip_HydPmpB Y10.3	5
7	0x800D	1	0:01	o_b_HydCtrl Y10.2 & Y10.3	5
8	0x0203	100	0:01	can_sendData:buff overflow<chnl>	0
Saved errors:					
Index	Error Code	Occurrences	Timestamp	Error Message	Param
1	0x801B	1	0:01	e_CanTrm	12
2	0x801A	1	0:01	e_CanEng	12
3	0x8004	1	0:01	b_Oilfilter S5.6	8
4	0x800A	1	0:01	o_ip_HydPmpA Y10.2	5
5	0x800B	1	0:01	o_ip_HydPmpB Y10.3	5
6	0x800D	1	0:01	o_b_HydCtrl Y10.2 & Y10.3	5
7	0x0203	1	0:01	can_sendData:buff overflow<chnl>	0

Figure 7: BODAS Error Code Table



5 VPD Diagnostic Trouble Code Guide

5.1 Input Speed Sensor Error

DM1 (dec)	520300	Reason
DM1 (hex)	7F06C	This Error typically occurs when there is a mismatch between the engine speed value (as reported on CANbus) and the input speed sensor on the VPD.
BODAS (dec)	32768	
BODAS (hex)	0x8000	
FMI	8	
Lamp	High	

Troubleshooting

Check Sensor Voltage	With key on/engine off, measure voltage across pin 1 and pin 2 on sensor wiring harness connector. Voltage should be 12V. If voltage out of range, replace sensor. If voltage is missing, check wiring harness for continuity between sensor connector and ECU connector.
Check Sensor Signal	With key on/engine off, using an oscilloscope, measure signal across wire connecting pin 2 of sensor to pin 112 on ECU. Check for any loss of signal along length of harness. If harness is okay and signal is missing, replace sensor.



5.2 Output Speed Sensor Error

DM1 (dec)	520301	Reason
DM1 (hex)	7F06D	This Error typically occurs when there is a difference between calculated speed value of VPD sunshaft (n_Sun) and input shaft (n_in) versus the measured value.
BODAS (dec)	32769	
BODAS (hex)	0x8001	
FMI	8	
Lamp	High	

Troubleshooting

Check if ERROR persists	Cycle Key on/Engine on to key off/engine off. Wait at least 10 seconds, then key on/engine on. Check if Error persists, contact Marmon-Herrington.
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5.3 Sun Speed Sensor Error

DM1 (dec)	520302	Reason
DM1 (hex)	7F06E	This Error typically occurs when there is an electrical issue for the speed sensor on the hydromotor.
BODAS (dec)	32770	
BODAS (hex)	0x8002	
FMI	8	
Lamp	High	

Troubleshooting

Check sensor voltage	With key on/engine on, measure sensor voltage across pins 1 and 2 on sensor. If voltage is outside of range (4.5-20V), replace sensor. If voltage is read as 0V, check harness for continuity.
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5.4 PTO speed Sensor Error

DM1 (dec)	520303	Reason
DM1 (hex)	7F070	This Error typically occurs when the PTO speed sensor (n_PTO) reads 0 when the PTO clutch is closed and is turning.
BODAS (dec)	32771	
BODAS (hex)	0x8003	
FMI	8	
Lamp	High	

Troubleshooting

Check Sensor Voltage	With key on/engine off, measure voltage across pin 1 and pin 2 on sensor wiring harness connector. Voltage should be 12V. If voltage out of range, replace sensor. If voltage is missing, check wiring harness for continuity between sensor connector and ECU connector.
Check Sensor Signal	With key on/engine off, using an oscilloscope, measure signal across wire connecting pin 2 of sensor to pin 108 on ECU. Check for any loss of signal along length of harness. If harness is okay and signal is missing, replace sensor.

5.5 Oil Filter Locked Error

DM1 (dec)	520304	Reason
DM1 (hex)	7F071	This ERROR typically occurs when the filter bypass switch is engaged.
BODAS (dec)	32772	
BODAS (hex)	0x8004	
FMI	8	
Lamp	High	

Troubleshooting

Check Sensor Supply Voltage	With key on/engine on, measure voltage across pin 1 and pin 2 on oil filter bypass switch with sensor connected to harness. If voltage reads zero, check filter for blockage. If no blockage is found, replace sensor.
Check b_HydOilFilter Status	With key on/engine on, connect BODAS equipped PC to truck. Navigate to ProcessData and check status of b_HydOilFilter_can3. If value equals 1, check filter for blockage. Clean and replace filter if necessary. If error persists, replace sensor



5.6 High Pressure Sensor A Error

DM1 (dec)	520305	Reason
DM1 (hex)	7F071	This Error typically occurs the sensor value for High Pressure A is out of range (0-600 bar) (on equipped VPDs)
BODAS (dec)	32773	
BODAS (hex)	0x8005	
FMI	0,1,3,4,15,17	
Lamp	Low (15,17) High (0,1,3,4)	

Troubleshooting

Check Sensor Supply Voltage	With key on/engine off, measure voltage across pin 1 and pin 2 on the sensor. If supply voltage reads 0V, check wiring harness for continuity.
Check Sensor Output Signal	With key on/engine off, measure voltage across pin 1 and pin 4 on the sensor. Voltage should read within 500-4500 mV. If signal voltage reads outside range, replace sensor.

5.7 High Pressure Sensor B Error

DM1 (dec)	520306	Reason
DM1 (hex)	7F072	This Error typically occurs the sensor value for High Pressure B is out of range (0-600 bar) (on equipped VPDs)
BODAS (dec)	32774	
BODAS (hex)	0x8006	
FMI	0,1,3,4,15,17	
Lamp	Low (15,17) High (0,1,3,4)	

Troubleshooting

Check Sensor Supply Voltage	With key on/engine off, measure voltage across pin 1 and pin 2 on the sensor. If supply voltage reads 0V, check wiring harness for continuity.
Check Sensor Output Signal	With key on/engine off, measure voltage across pin 1 and pin 4 on the sensor. Voltage should read within 500-4500 mV. If signal voltage reads outside range, replace sensor.



5.8 Hydrostatic Unit Calibration Error

DM1 (dec)	520307	Reason
DM1 (hex)	7F073	This Error typically occurs when the measured hydro unit ratio is not matching the desired value.
BODAS (dec)	32775	
BODAS (hex)	0x8007	
FMI	13	
Lamp	High	

Troubleshooting

Monitor unit Ratio	With key on, engine on, switch the vehicle to work mode. Using BODAS service tool connected to vehicle, operate the drive pedal and monitor the BODAS service value gi_hyd_act. Its range should fall within -1 to 1. If the ratio is not changing, check the hydropump proportional valves for sticking, if so, replace. If the ratio is changing, the system is not calibrated and will need to be recalibrated. Contact Marmon-Herrington for Recalibration
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5.9 Lubrication Pressure out of Range / Sensor Error

DM1 (dec)	520308	Reason
DM1 (hex)	7F074	This Error typically occurs when the Lubrication Pressure Sensor (p_Lub) is outside of range (0.2-1.5 bar, engine speed dependent)
BODAS (dec)	32776	
BODAS (hex)	0x8008	
FMI	0,1,3,4,15,17	
Lamp	Low (15,17) High (0,1,3,4)	

Troubleshooting

Check Sensor Voltage	With key on/engine on, measure the supply voltage of sensor across Pin 1 and Pin 2 of the sensor along wiring harness. Supply voltage should be 5V. If supply voltage is 0V, check wiring harness for continuity.
Check Sensor Signal	With key on/engine on, measure the signal voltage of the sensor across Pin 1 and Pin 4 of the sensor. If the signal value is missing, check wiring harness for continuity. If the wiring harness is good, replace sensor.
Check Sensor Reading	With key on/engine on, connect BODAS to vehicle and check p_Lub value in diagnostics. Range of sensor reading should be within 0.2-1.5 bar, depending on engine speed. If value outside range, try above troubleshooting steps.



5.10 System Pressure Out of Range / Sensor Error

DM1 (dec)	520309	Reason
DM1 (hex)	7F075	This Error typically occurs when the System Pressure Sensor
BODAS (dec)	32777	(p_Sys) is outside of range (23-28 bar)
BODAS (hex)	0x8009	
FMI	0,1,3,4,15,17	
Lamp	Low (15,17)	
	High (0,1,3,4)	

Troubleshooting

Check Sensor Voltage	With key on/engine on, measure the supply voltage of sensor across Pin 1 and Pin 2 of the sensor along wiring harness. If Supply voltage is 0V, check wiring harness for continuity.
Check Sensor Signal	With key on/engine on, measure the signal voltage of the sensor across Pin 1 and Pin 4 of the sensor. If the signal value is missing, check wiring harness for continuity. If the wiring harness is good, replace sensor.
Check Sensor Reading	With key on/engine on, connect BODAS to vehicle and check p_Lub value in diagnostics. Range of sensor reading should be within 23-28 bar, depending on engine speed. If value outside range, try above troubleshooting steps.

5.11 Valve A Hydrostatic Unit Error

DM1 (dec)	520310	Reason
DM1 (hex)	7F076	This Error typically occurs when measured current does match the
BODAS (dec)	32778	desired current for Hydropump Solenoid A across pin 184 on ECU.
BODAS (hex)	0x800A	
FMI	5, 6	
Lamp	High	

Troubleshooting

Check Sensor Current	With key on, engine on, connect Bodas service tool to truck and change to work mode. Monitor value of i_HydA while pressing pedal of vehicle. Range of i_HydA should be 0 to 1200 mA. This value can also be measured using Amperage Setting of multimeter across Pin 184 on ECU. If Current stays 0, check wiring harness for continuity between sensor and ECU. If wiring harness is okay, check both Output Fuse and Controller fuse. If fuses are okay, then ECU is to be replaced.
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5.12 Valve B Hydrostatic Unit Error

DM1 (dec)	520311	Reason
DM1 (hex)	7F077	This Error typically occurs when actual current does not match the desired current for Hydropump Solenoid B across Pin 185 on ECU.
BODAS (dec)	32779	
BODAS (hex)	0x800B	
FMI	5, 6	
Lamp	High	

Troubleshooting

Check Sensor Current	With key on, engine on, connect Bodas service tool to truck and change to work mode. Monitor value of i_HydB while pressing pedal of vehicle. Range of i_HydB should be 0 to 1200 mA. This value can also be measured using Amperage Setting of multimeter across Pin 185 on ECU. If Current stays 0, check wiring harness for continuity between sensor and ECU. If wiring harness is okay, check both Output Fuse and Controller fuse. If fuses are okay, then ECU is to be replaced.
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5.13 Oil Temperature out of Range / Sensor Error

DM1 (dec)	520312	Reason
DM1 (hex)	7F078	This Error typically occurs when the temperature sensor reading is out of range (typically -50 to 90° C)
BODAS (dec)	32780	
BODAS (hex)	0x800C	
FMI	0,1,3,4	
Lamp	High	

Troubleshooting

Check Sensor Reading	With key on, engine off, connect Bodas service tool to truck and monitor tmp_OilSys value. If the value is above 1500 deg C, check to make sure the sensor is plugged in. If plugged it, check for continuity between the sensor and the ECU. If continuity is confirmed, replace sensor
Check Sensor Resistance	Remove Sensor from cold VPD. Clean off the sensor of any oil and measure the resistance across pin 1 and Pin 2 and compare with Table 1 below. Resistance measured should match ambient temperature. If no match, replace sensor.

Ω	1000	1019	1039	1058	1078	1097	1117	1136	1155	1175	1194
°C	0	5	10	15	20	25	30	35	40	45	50
°F	32	41	50	59	68	77	86	95	104	113	122

Table 1: Sensor Resistance to Temperature Table



5.14 Valve Supply Hydrostatic Unit Error

DM1 (dec)	520313	Reason
DM1 (hex)	7F079	This Error typically occurs when the measured Hydro unit solenoid common supply current does not match with desired current across Pin 128 on the ECU.
BODAS (dec)	32781	
BODAS (hex)	0x800D	
FMI	5,6	
Lamp	High	

Troubleshooting

Check Wiring Harness	With key on, engine off, check continuity between pin 184 on ECU and Pin 1 on Hydropump Solenoid A. Check continuity between ECU pin 128 and pin 2 on Hydropump Solenoid B. Check Continuity between ECU pin 185 and Pin 1 on Hydropump Solenoid B. Check Continuity between ECU pin 128 and Hydropump Solenoid B pin 2. If any of the wires were missing continuity, replace wiring harness.
Check ECU	If neither of previous steps solved issue, check ECU by swapping in new ECU. If Error is gone, replace ECU.

5.15 Valve Supply PTO Error

DM1 (dec)	520314	Reason
DM1 (hex)	7F07A	This Error typically occurs when desired current does match actual current into PTO Control Solenoid across Pin 179 on ECU
BODAS (dec)	32782	
BODAS (hex)	0x8003E	
FMI	5,6	
Lamp	High	

Troubleshooting

Check Wiring Harness	With key on, engine off, check continuity between pin 151 on ECU and Pin 1 on PTO Control Solenoid. Check continuity between ECU pin 179 and pin 2 on PTO Control Solenoid B. If any of the wires were missing continuity, replace wiring harness.
Check ECU	If neither of previous steps solved issue, check ECU by swapping in new ECU. If Error is gone, replace ECU.



5.16 Valve PTO Error

DM1 (dec) 520315
DM1 (hex) 7F07B
BODAS (dec) 32783
BODAS (hex) 0x800F
FMI 5,6
Lamp High

Reason

This Error typically occurs when desired current does match actual current into PTO Control Solenoid across pin 151 on ECU

Troubleshooting

Check Wiring Harness	With key on, engine off, check continuity between pin 151 on ECU and Pin 1 on PTO Control Solenoid. Check continuity between ECU pin 179 and pin 2 on PTO Control Solenoid B. If any of the wires were missing continuity, replace wiring harness.
Check ECU	If neither of previous steps solved issue, check ECU by swapping in new ECU. If Error is gone, replace ECU.

5.17 Oil Cooler Relay Error

DM1 (dec) 520316
DM1 (hex) 7F07C
BODAS (dec) 32784
BODAS (hex) 0x8010
FMI 5,6
Lamp High

Reason

This Error typically occurs when an open load or short circuit is detected across the oil cooler wiring.

Troubleshooting

Check Wiring Harness	With key on/engine off, check continuity between pin 243 on ECU and pin 86 on oil cooler relay. Check continuity on pin 85 on cooler really and ground. Check continuity between battery positive and cooler positive. Check continuity between cooler ground and chassis ground. If any of the wires were missing continuity, replace wiring harness.
Check Output Supply	Check Fuse between battery positive and cooler positive. If damaged, replace with appropriate fuse.
Check ECU	If neither of previous steps solved issue, check ECU by swapping in new ECU. If Error is gone, replace ECU.



5.18 Handthrottle Potentiometer Track A Error

DM1 (dec)	520317	Reason
DM1 (hex)	7F07D	This Error typically occurs when the sensor supply or the sensor signal for the hand throttle unit is missing.
BODAS (dec)	32785	
BODAS (hex)	0x8011	
FMI	5,6	
Lamp	High	

Troubleshooting

Check Wiring Harness	Check continuity between pin 219 on ECU and Pin 1 on handthrottle. Check continuity between pin 222 on ECU and Pin 2 on handthrottle. Check continuity between pin 146 on ECU and Pin 3 on handthrottle. If continuity is missing on any wires, replace harness.
Check Sensor Supply Voltage	With key on/engine off, check voltage across pin 1 and Pin 3 on handthrottle. Voltage Should read 5V. If missing, check continuity. If continuity, check sensor.
Check Sensor Signal	With key on/engine off, measure voltage between Pin 2 and Pin 3 on handthrottle. Voltage should range from 500-4500 mV. If Signal is missing, check harness for continuity. If continuity confirmed, replace sensor.
Check BODAS service value	With key on/engine off, connect BODAS device to CAN1/3 on truck. Interface with the VPD ECU using BODAS software and review value for uper_HandThrottle on BODAS (500-4500 mV) compared to measured value. Check with body manufacturer for range. If out of range, check harness and replace sensor. If Error persists, try different ECU.



5.19 Handthrottle Potentiometer Track B Error

DM1 (dec)	520318	Reason
DM1 (hex)	7F07E	This Error typically occurs when an the signal supply or the sensor signal for the hand throttle unit is missing.
BODAS (dec)	32786	
BODAS (hex)	0x8012	
FMI	5,6	
Lamp	High	

Troubleshooting

Check Wiring Harness	Check continuity between pin 219 on ECU and Pin 1 on handthrottle. Check continuity between pin 222 on ECU and Pin 2 on handthrottle. Check continuity between pin 146 on ECU and Pin 3 on handthrottle. If continuity is missing on any wires, replace harness.
Check Sensor Supply Voltage	With key on, engine off, check voltage across pin 1 and Pin 3 on handthrottle. Voltage Should read 5V. If missing, check continuity. If continuity is confirmed, replace sensor.
Check Sensor Signal	With key on/engine off, measure voltage between Pin 2 and Pin 3 on handthrottle. Voltage should range from 500-4500 mV. If Signal is missing, check harness for continuity. If continuity confirmed, replace sensor.
Check BODAS service value	With key on, engine off, connect BODAS device to CAN1/3 on truck. Interface with the VPD ECU using BODAS software and review value for uper_HandThrottle on BODAS (500-4500 mV) compared to value measured. Check with body manufacturer for range. If out of range, check harness and replace sensor. If Error persists, try different ECU.

5.20 Mode Selector Switch Error

DM1 (dec)	520319	Reason
DM1 (hex)	7F07F	This Error typically occurs when the mode switch button is stuck.
BODAS (dec)	32787	
BODAS (hex)	0x8013	
FMI	2	
Lamp	Medlow	

Troubleshooting

Check Wiring Harness for voltage	With key on/engine off, check voltage across pin 158 on ECU and Pin 3 on pushbutton. No voltage should be seen until pushbutton is depressed. If no voltage is seen during pushbutton operation, check pushbutton. If voltage is seen before, during, and after pushbutton operation, check harness for shorts.
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5.21 Modelight Output Error

DM1 (dec)	520320	Reason
DM1 (hex)	7F080	This Error typically occurs when the signal supply from PIN 193 (o_b_VPD_Mode_193) from ECU experiences an open or a short circuit. The LED lamp used to signal work mode engagement does not light up.
BODAS (dec)	32788	
BODAS (hex)	0x8014	
FMI	5,6	
Lamp	High	

Troubleshooting

Check Light operation	With Key on, engine on, engage work mode of VPD and monitor status of work mode LED Lamp. If lamp is not on after VPD engages work mode, replace LED Lamp.
Check Wiring Harness for open circuit	Check for continuity on wires between PIN 193 on ECU and positive side of LED lamp. Check for continuity between negative side of LED lamp and GND. If continuity missing on either end or both, replace wiring harness.

5.22 Limp Home Input Error

DM1 (dec)	520321	Reason
DM1 (hex)	7F081	This Error occurs typically when the input pin for Limp Home detects a fault.
BODAS (dec)	32789	
BODAS (hex)	0x8015	
FMI	2	
Lamp	Medlow	

Troubleshooting

Replace ECU	Replace ECU and check if Error is still present on Chassis, Contact Marmon-Herrington if such Error occurs.
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5.23 Limp Home Output Error

DM1 (dec)	520322	Reason
DM1 (hex)	7F082	This Error occurs typically when the output pin for Limp Home detects a fault.
BODAS (dec)	32790	
BODAS (hex)	0x8016	
FMI	5,6	
Lamp	High	

Troubleshooting

Replace ECU	Replace ECU and check if Error is still present on Chassis, Contact Marmon-Herrington if such Error occurs.
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5.24 Pressure Sensor PTO Error

DM1 (dec)	520323	Reason
DM1 (hex)	7F083	This Error typically occurs when an issue with the signal for the
BODAS (dec)	32791	PTO Pressure sensor is detected, whether it be missing or out of
BODAS (hex)	0x8017	range.
FMI	0,1,3,4	
Lamp	Medlow (0,1) Medhigh (3,4)	

Troubleshooting

Check Sensor Supply Voltage	With key on/engine off, measure the voltage across pin 1 and pin 2 of the PTO pressure sensor. Value should read 5V. If voltage is missing, check harness for continuity.
Check Sensor Output Signal	With key on/engine off, measure the voltage across pin 1 and pin 4 of the PTO pressure sensor. Voltage should read on range of 500-4500 mV. If voltage out of range, replace sensor. If Voltage is missing, check harness for continuity.
Check BODAS	Connect BODAS enabled PC to truck. With key on/engine on, enter truck into work mode. Read the system pressure variable (p_Sys) when the clutch is closed. If value is out of range (± 1 bar), check sensor output signal. If value is missing, check sensor supply voltage.

5.25 HID Sensor supply Error

DM1 (dec)	520324	Reason
DM1 (hex)	7F084	This Error occurs typically when the pin for the HID Sensor Supply
BODAS (dec)	32792	detects a fault.
BODAS (hex)	0x8018	
FMI	5,6	
Lamp	High	

Troubleshooting

Replace ECU	Replace ECU and check if Error is still present on Chassis, Contact Marmon-Herrington is such Error occurs.
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5.26 Speed Sensor Supply Error

DM1 (dec)	520325	Reason
DM1 (hex)	7F085	This Error typically occurs when either of the Input Speed Sensor,
BODAS (dec)	32793	PTO Speed Sensor, or Motor Speed Sensor are disconnected.
BODAS (hex)	0x8019	
FMI	5,6	
Lamp	High	

Troubleshooting

Check Supply Voltage	With key on/engine off, measure supply voltage from ECU to Sensors. If supply voltage is missing, check harness for continuity
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5.27 Engine CANBus Error

DM1 (dec)	520199	Reason
DM1 (hex)	7F007	This Error typically occurs when the ECU is not detecting CAN
BODAS (dec)	32794	signals from vehicle engine.
BODAS (hex)	0x801A	
FMI	12	
Lamp	High	

Troubleshooting

Check Wiring Harness	With key on, engine on, check for CAN signal on wires leading from PIN 215 (CAN1 High) and PIN 216 (CAN1 LOW) on ECU to truck CAN backbone. Check Signal from Engine CAN to truck CAN backbone. If signal is missing, replace respective wiring harness.
Check ECU	If signal is confirmed above, swap ECU with another appropriate unit. If Error disappears, replace current ECU.



5.28 Transmission CANBus Error

DM1 (dec)	520200	Reason
DM1 (hex)	7F008	This Error typically occurs when the ECU is not detecting CAN signals from vehicle engine.
BODAS (dec)	32795	
BODAS (hex)	0x801B	
FMI	12	
Lamp	High	

Troubleshooting

Check Wiring Harness	With key on, engine on, check for CAN signal on wires leading from PIN 215 (CAN1 High) and PIN 216 (CAN1 LOW) on ECU to truck CAN backbone. Check Signal from Transmission CAN to truck CAN backbone. If signal is missing, replace respective wiring harness.
Check ECU	If signal is confirmed above, swap ECU with appropriate unit. If ERROR disappears, replace current ECU.

5.29 License Error

DM1 (dec)	520201	Reason
DM1 (hex)	7F009	This Error typically occurs when the ECU is not loaded with the correct license
BODAS (dec)	32796	
BODAS (hex)	0x801C	
FMI	12	
Lamp	High	

Troubleshooting

Replace ECU	Contact Marmon-Herrington for a replacement ECU with correct license.
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5.30 Application Parameter Set Error

DM1 (dec)	520202	Reason
DM1 (hex)	7F00A	This Error typically occurs when the ECU is not loaded with the parameter set
BODAS (dec)	32797	
BODAS (hex)	0x801D	
FMI	12	
Lamp	High	

Troubleshooting

Replace ECU	Contact Marmon-Herrington for a replacement ECU with the proper parameter set.
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5.31 Configuration Parameter Set Error

DM1 (dec)	520203	Reason
DM1 (hex)	7F00B	This Error typically occurs when the ECU is not loaded with the correct configuration set
BODAS (dec)	32798	
BODAS (hex)	0x801E	
FMI	12	
Lamp	High	

Troubleshooting

Replace ECU	Contact Marmon-Herrington for a replacement ECU with the proper parameter set.
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5.32 Calibration Parameter Set Error

DM1 (dec)	520204	Reason
DM1 (hex)	7F00C	This Error typically occurs when the ECU is not loaded with the correct configuration set
BODAS (dec)	32799	
BODAS (hex)	0x801F	
FMI	12	
Lamp	High	

Troubleshooting

Check ECU	Confirm Error is repeatable by cycling key off, key on a few times. Check to see if ERROR appears on every key off cycle. If appears after a couple of cycles, replace ECU.
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