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# AEM EV
# VCU CAN Transmit

Revision D

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Revision History

| Revision | Date | Change Description |
|----------|------|--------------------|
| A | 6/1/2020 | Initial Release |
| B | 6/3/2020 | Add Cautions and Warning section |
| C | 6/23/2020 | Add VCU300 messages M128 – M134 |
| D | 6/25/2020 | Add baud rate |

## Cautions and Warnings

Working on tractive systems (which includes but is not limited to motor(s), inverter(s), high voltage battery packs and high voltage cables) requires special experience and training. AEM EV has implemented fault detection and failsafe logic into its vehicle control units ("VCU"), however this does not mean that your VCU installation will be safe or effective, or that your VCU installation will not interfere with other systems on your vehicle and create a hazardous situation. It is the responsibility of the installer to understand the implications of each stage of tractive system installation and testing and to recognize what might be unique about your application that presents potential hazards or safety issues – and it is the responsibility of the installer to solve or address any such hazards or issues.

The following list includes basic recommended practices. This is not a comprehensive list; as noted below, if you are not well-versed in the appropriate installation and testing procedures, you should refer the installation and calibration to a reputable installation facility or contact AEM EV for a referral in your area.

- When access is required near the battery pack, the cell segments must be separated by using an appropriate maintenance disconnect plug.

- When working on the battery pack or tractive system, safety gloves with side shields and appropriate insulated tools must be used.

- Always wear Class 0 gloves rated at 1000V with leather protectors.

- Only use CAT III rated digital multimeters (DMM) and test leads.

- When working on the battery pack or tractive system, work with one hand while keeping the other behind your back.

- During initial system power up and testing, the vehicle must be raised off the ground and supported appropriately. Wheels and tires should be removed.

- During the VCU firmware upgrade process, battery cell segments must be separated using an appropriate maintenance disconnect plug.

- Do not make calibration changes when the inverter pulse width modulation (PWM) is enabled.

USE THIS VCU WITH EXTREME CAUTION. MISUSE AND/OR IMPROPER INSTALLATION CAN CAUSE SIGNIFICANT DAMAGE TO YOUR VEHICLE AND PROPERTY BELONGING TO YOU OR OTHERS, AS WELL AS PERSONAL INJURY OR DEATH. IF YOU ARE NOT WELL VERSED IN THE INSTALLATION OF TRACTIVE SYSTEMS OR CONFIGURING THE CALIBRATIONS IN THE AEM EV VCU THAT ARE NECESSARY TO CONTROL THE VEHICLE, YOU SHOULD REFER THE INSTALLATION AND VCU CALIBRATION TO A REPUTABLE INSTALLATION FACILITY, OR CONTACT AEM EV FOR A REFERRAL IN YOUR AREA. IT IS THE RESPONSIBILITY OF THE INSTALLER TO ULTIMATELY CONFIRM THAT THE INSTALLATION AND CALIBRATIONS ARE SAFE FOR ITS INTENDED USE.

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The VCU CAN transmit interface operates at 500Kb.

| Message Name | M100_VCU_States1 |
|---|---|
| Type | CAN Extended |
| ID | 0x2F0A000 |
| DLC | 8 |
| Update Rate | 100 ms |
| Byte Order | Motorola |

| Name | Startbit | Length [Bit] | Value Type | Factor | Minimum | Maximum | Unit | Comment |
|---|---|---|---|---|---|---|---|---|
| Run_Mode_State | 8 | 2 | Unsigned | 1 | 0 | 3 | unitless: | |
| Drive_Mode_State | 10 | 4 | Unsigned | 1 | 0 | 15 | unitless: | |
| Run_Time | 14 | 10 | Unsigned | 1 | 0 | 1023 | time:s | |
| Stop_Command_State | 16 | 1 | Unsigned | 1 | 0 | 1 | unitless: | |
| Start_Command_State | 17 | 1 | Unsigned | 1 | 0 | 1 | unitless: | |
| OPState | 18 | 6 | Unsigned | 1 | 0 | 63 | unitless: | |
| MC2DischargeCmd | 24 | 1 | Unsigned | 1 | 0 | 1 | unitless: | VCU300 Only |
| MC1DischargeCmd | 25 | 1 | Unsigned | 1 | 0 | 1 | unitless: | |
| MCPower | 26 | 1 | Unsigned | 1 | 0 | 1 | unitless: | |
| MC4Enable | 27 | 1 | Unsigned | 1 | 0 | 1 | unitless: | VCU300 Only |
| MC3Enable | 28 | 1 | Unsigned | 1 | 0 | 1 | unitless: | VCU300 Only |
| MC2Enable | 29 | 1 | Unsigned | 1 | 0 | 1 | unitless: | VCU300 Only |
| MC1Enable | 30 | 1 | Unsigned | 1 | 0 | 1 | unitless: | |
| Start_Safe | 31 | 1 | Unsigned | 1 | 0 | 1 | unitless: | |
| MC3ContEnable | 32 | 1 | Unsigned | 1 | 0 | 1 | unitless: | VCU300 Only |
| MC2ContEnable | 33 | 1 | Unsigned | 1 | 0 | 1 | unitless: | VCU300 Only |
| MC1ContEnable | 34 | 1 | Unsigned | 1 | 0 | 1 | unitless: | |
| PumpCont_XCheck | 35 | 1 | Unsigned | 1 | 0 | 1 | unitless: | |
| HVIL_Charge | 36 | 1 | Unsigned | 1 | 0 | 1 | unitless: | |
| HVIL_Main | 37 | 1 | Unsigned | 1 | 0 | 1 | unitless: | |
| MC4DischargeCmd | 38 | 1 | Unsigned | 1 | 0 | 1 | unitless: | VCU300 Only |
| MC3DischargeCmd | 39 | 1 | Unsigned | 1 | 0 | 1 | unitless: | VCU300 Only |
| MC1_PosFB | 40 | 1 | Unsigned | 1 | 0 | 1 | unitless: | Not currently supported |
| MC1_NegFB | 41 | 1 | Unsigned | 1 | 0 | 1 | unitless: | |
| MC1_HVDetect | 42 | 1 | Unsigned | 1 | 0 | 1 | unitless: | |
| MC4_DCVoltageSafeState | 43 | 1 | Unsigned | 1 | 0 | 1 | unitless: | VCU300 Only |
| MC3_DCVoltageSafeState | 44 | 1 | Unsigned | 1 | 0 | 1 | unitless: | VCU300 Only |
| MC2_DCVoltageSafeState | 45 | 1 | Unsigned | 1 | 0 | 1 | unitless: | VCU300 Only |
| MC1_DCVoltageSafeState | 46 | 1 | Unsigned | 1 | 0 | 1 | unitless: | |
| MC4ContEnable | 47 | 1 | Unsigned | 1 | 0 | 1 | unitless: | VCU300 Only |
| MC3_PosFB | 48 | 1 | Unsigned | 1 | 0 | 1 | unitless: | Not currently supported |
| MC3_NegFB | 49 | 1 | Unsigned | 1 | 0 | 1 | unitless: | VCU300 Only |
| MC3_HVDetect | 50 | 1 | Unsigned | 1 | 0 | 1 | unitless: | VCU300 Only |
| MC2_PreChgFB | 51 | 1 | Unsigned | 1 | 0 | 1 | unitless: | Not currently supported |
| MC2_PosFB | 52 | 1 | Unsigned | 1 | 0 | 1 | unitless: | Not currently supported |
| MC2_NegFB | 53 | 1 | Unsigned | 1 | 0 | 1 | unitless: | VCU300 Only |
| MC2_HVDetect | 54 | 1 | Unsigned | 1 | 0 | 1 | unitless: | VCU300 Only |
| MC1_PreChgFB | 55 | 1 | Unsigned | 1 | 0 | 1 | unitless: | Not currently supported |
| Performance_Level | 56 | 3 | Unsigned | 1 | 0 | 7 | unitless: | |
| MC4_PreChgFB | 59 | 1 | Unsigned | 1 | 0 | 1 | unitless: | Not currently supported |
| MC4_PosFB | 60 | 1 | Unsigned | 1 | 0 | 1 | unitless: | Not currently supported |
| MC4_NegFB | 61 | 1 | Unsigned | 1 | 0 | 1 | unitless: | VCU300 Only |
| MC4_HVDetect | 62 | 1 | Unsigned | 1 | 0 | 1 | unitless: | VCU300 Only |
| MC3_PreChgFB | 63 | 1 | Unsigned | 1 | 0 | 1 | unitless: | Not currently supported |

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| Message Name | M102_VCU_States2 |
|---|---|
| Type | CAN Extended |
| ID | 0x2F0A002 |
| DLC | 8 |
| Update Rate | 100 ms |
| Byte Order | Motorola |

| Name | Startbit | Length [Bit] | Value Type | Factor | Offset | Minimum | Maximum | Unit | Comment |
|---|---|---|---|---|---|---|---|---|---|
| VCU_12V_Input | 0 | 8 | Unsigned | 0.1 | 0 | 0 | 25.5 | voltage:V | |
| MC1_PreChg_Cmd | 8 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| MC1_Pos_Cmd | 9 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| VCU_5V_Output | 10 | 6 | Unsigned | 0.1 | 0 | 0 | 6.3 | voltage:V | |
| MC4_Pos_Cmd | 16 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| MC3_PreChgComplete | 17 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| MC3_PreChg_Cmd | 18 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| MC3_Pos_Cmd | 19 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| MC2_PreChgComplete | 20 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| MC2_PreChg_Cmd | 21 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| MC2_Pos_Cmd | 22 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| MC1_PreChgComplete | 23 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| SpeedMode_Allowed | 24 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| InvControl_Mode | 25 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Launch_Mode | 26 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| Burnout_Mode | 27 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| Idle_Mode | 28 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Creep_Mode | 29 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| MC4_PreChgComplete | 30 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| MC4_PreChg_Cmd | 31 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| LineLock_Cntrl | 32 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| TransBrake_Cntrl | 33 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| Cool_Pump_Wake | 34 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Cool_Pump2_Cntrl | 35 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| Cool_Pump1_Cntrl | 36 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| OilPump1_On | 37 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Cool_Fan2_On | 38 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Cool_Fan1_On | 39 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Cool_PumpSpdTarget | 40 | 8 | Unsigned | 25 | 0 | 0 | 6375 | angular_speed:rpm | |
| Brake_LampsCntrl | 48 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| TransBrake_Switch | 49 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| LineLock_Switch | 50 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| Inertia_Switch | 51 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | Not currently supported |
| IMDState | 52 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| ShiftSol_Cntrl | 53 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| Shift_Sol2 | 54 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| Shift_Sol1 | 55 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| Contactors_Enabled | 56 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| ChargeContactorCntrl | 57 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | Not currently supported |
| Acc_PowerCntrl | 58 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless:V | |
| Acc_LightCntrl | 59 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| ReverseLamps_Cntrl | 60 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| ParkLamps_Cntrl | 61 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| HVSafetyLight_Cntrl | 62 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Head_LampsCntrl | 63 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |

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| Message Name | M104_VCU_States3 |
|---|---|
| Type | CAN Extended |
| ID | 0x2F0A004 |
| DLC | 8 |
| Update Rate | 20 ms |
| Byte Order | Motorola |

| Name | Startbit | Length [Bit] | Value Type | Factor | Offset | Minimum | Maximum | Unit | Comment |
|---|---|---|---|---|---|---|---|---|---|
| LimMult_MC1Temp_Active | 0 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| LimMult_MC1Curr_Active | 1 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| LimMult_Launch_Time_Active | 2 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| LimMult_DriveShaft_Spd_Active | 3 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| LimMult_CellVolt_Min_Active | 4 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| LimMult_CellVolt_Max_Active | 5 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| LimMult_Batt_SOC_Active | 6 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| LimMult_Batt_DCL_Active | 7 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| LimMult_Motor1_Temp_Active | 8 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| LimMult_Motor1_SpdLo_Active | 9 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| LimMult_MC4Temp_Active | 10 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| LimMult_MC4Curr_Active | 11 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| LimMult_MC3Temp_Active | 12 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| LimMult_MC3Curr_Active | 13 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| LimMult_MC2Temp_Active | 14 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| LimMult_MC2Curr_Active | 15 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| LimMult_Pack_Current_Active | 16 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| LimMult_Over_rev_Active | 17 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| LimMult_Motor4_Temp_Active | 18 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| LimMult_Motor4_SpdLo_Active | 19 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| LimMult_Motor3_Temp_Active | 20 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| LimMult_Motor3_SpdLo_Active | 21 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| LimMult_Motor2_Temp_Active | 22 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| LimMult_Motor2_SpdLo_Active | 23 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| LimMult_Shift5_Tq_Active | 24 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | Not currently supported |
| LimMult_Shift4_Tq_Active | 25 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | Not currently supported |
| LimMult_Shift3_Tq_Active | 26 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | Not currently supported |
| LimMult_Shift2_Tq_Active | 27 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| LimMult_Shift1_Tq_Active | 28 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| LimMult_Pack_Voltage_Active | 29 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| LimMult_Pack_TempLo_Active | 30 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| LimMult_Pack_TempHi_Active | 31 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| LaunchTimer_Running | 33 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| LimMult_MC4CurrRamp_Active | 34 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| LimMult_MC3CurrRamp_Active | 35 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| LimMult_MC2CurrRamp_Active | 36 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| LimMult_MC1CurrRamp_Active | 37 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| LimMult_VehSpd_Lo_Active | 38 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| LimMult_VehSpd_Hi_Active | 39 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| LaunchRamp_Time | 40 | 8 | Unsigned | 0.1 | 0 | 0 | 25.5 | time:s | VCU300 Only |
| Run_Time_Counter | 56 | 16 | Unsigned | 1 | 0 | 0 | 65535 | time:s | |

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| Message Name | M106_DriverInputs1 |
|---|---|
| Type | CAN Extended |
| ID | 0x2F0A006 |
| DLC | 8 |
| Update Rate | 20 ms |
| Byte Order | Motorola |

| Name | Startbit | Length [Bit] | Value Type | Factor | Offset | Minimum | Maximum | Unit | Comment |
|---|---|---|---|---|---|---|---|---|---|
| AccelPedal | 0 | 8 | Unsigned | 0.392157 | 0 | 0 | 99.9999993 | fraction:% | |
| AccelPedal1 | 8 | 8 | Unsigned | 0.392157 | 0 | 0 | 99.9999993 | fraction:% | |
| AccelPedal2 | 16 | 8 | Unsigned | 0.392157 | 0 | 0 | 99.9999993 | fraction:% | |
| AccelPedalXCheckDiff | 24 | 8 | Unsigned | 0.392157 | 0 | 0 | 99.9999993 | fraction:% | |
| Start_Switch | 32 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Ignition_Switch | 33 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Brake_Switch2 | 34 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Brake_Switch1 | 35 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Brake_Switch | 36 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| AccelPedal2Valid | 37 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| AccelPedal1Valid | 38 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| AccelPedalValid | 39 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Manual_Regen | 40 | 8 | Unsigned | 0.392157 | 0 | 0 | 99.9999993 | fraction:% | |
| Manual_Regen1 | 48 | 8 | Unsigned | 0.392157 | 0 | 0 | 99.9999993 | fraction:% | |
| Manual_Regen2 | 56 | 8 | Unsigned | 0.392157 | 0 | 0 | 99.9999993 | fraction:% | |

| Message Name | M108_DriverInputs2 |
|---|---|
| Type | CAN Extended |
| ID | 0x2F0A008 |
| DLC | 8 |
| Update Rate | 20 ms |
| Byte Order | Motorola |

| Name | Startbit | Length [Bit] | Value Type | Factor | Offset | Minimum | Maximum | Unit | Comment |
|---|---|---|---|---|---|---|---|---|---|
| ManRegen_XCheckDiff | 0 | 8 | Unsigned | 0.392157 | 0 | 0 | 99.9999993 | fraction:% | |
| ParkLamp_Switch | 8 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Head_LampSwitch | 9 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Reverse_Switch | 10 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Drive_Switch | 11 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Neutral_Switch | 12 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Park_Switch | 13 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Manual_Regen2Valid | 14 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Manual_Regen1Valid | 15 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Logging_Switch | 16 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| Wake_Switch | 17 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Acc_LightSwitch | 18 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| ACSwitch | 19 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | Not currently supported |
| HeaterSwitch | 20 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | Not currently supported |
| Cooling_PumpOrdSwitch | 21 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| Cooling_FanOrdSwitch | 22 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| Enable_Switch | 23 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| CCSetCst | 28 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | Not currently supported |
| CCRsmAcc | 29 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | Not currently supported |
| CCOn | 30 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | Not currently supported |
| CCCancel | 31 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | Not currently supported |

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| Message Name | M112_VehicleInputs1 |
|---|---|
| Type | CAN Extended |
| ID | 0x2F0A012 |
| DLC | 8 |
| Update Rate | 20 ms |
| Byte Order | Motorola |

| Name | Startbit | Length [Bit] | Value Type | Factor | Offset | Minimum | Maximum | Unit | Comment |
|---|---|---|---|---|---|---|---|---|---|
| Brake_Pressure | 8 | 16 | Unsigned | 0.1 | 0 | 0 | 6553.5 | pressure_gauge:psi(g) | |
| Transmission_Pressure | 24 | 16 | Unsigned | 0.1 | 0 | 0 | 6553.5 | pressure_gauge:psi(g) | VCU300 Only |
| WheelBar_Press1 | 40 | 16 | Unsigned | 0.1 | 0 | 0 | 6553.5 | pressure_gauge:psi(g) | VCU300 Only |
| WheelBar_Press2 | 56 | 16 | Unsigned | 0.1 | 0 | 0 | 6553.5 | pressure_gauge:psi(g) | VCU300 Only |

| Message Name | M114_VehicleInputs2 |
|---|---|
| Type | CAN Extended |
| ID | 0x2F0A014 |
| DLC | 8 |
| Update Rate | 20 ms |
| Byte Order | Motorola |

| Name | Startbit | Length [Bit] | Value Type | Factor | Offset | Minimum | Maximum | Unit | Comment |
|---|---|---|---|---|---|---|---|---|---|
| Transmission_Temp | 0 | 8 | Unsigned | 1 | -50 | -50 | 205 | temperature:C | VCU300 Only |
| Coolant_Temp1 | 8 | 8 | Signed | 1 | 0 | -128 | 127 | temperature:C | |
| Coolant_Temp2 | 16 | 8 | Signed | 1 | 0 | -128 | 127 | temperature:C | VCU300 Only |
| AmbientAirTemp | 24 | 8 | Signed | 1 | 0 | -128 | 127 | temperature:C | Not currently supported |
| HeaterInletTemp | 32 | 8 | Signed | 1 | 0 | -128 | 127 | temperature:C | Not currently supported |
| HeaterOutletTemp | 40 | 8 | Signed | 1 | 0 | -128 | 127 | temperature:C | Not currently supported |
| ACPressure | 56 | 16 | Unsigned | 0.1 | 0 | 0 | 6553.5 | pressure_gauge:psi(g) | Not currently supported |

| Message Name | M116_VehicleInputs3 |
|---|---|
| Type | CAN Extended |
| ID | 0x2F0A016 |
| DLC | 7 |
| Update Rate | 20 ms |
| Byte Order | Motorola |

| Name | Startbit | Length [Bit] | Value Type | Factor | Offset | Minimum | Maximum | Unit | Comment |
|---|---|---|---|---|---|---|---|---|---|
| BrakeVacPressure | 0 | 8 | Unsigned | 0.14504 | -14.696 | -14.696 | 22.2892 | pressure_gauge:psi(g) | Not currently supported |
| Vehicle_Speed | 8 | 8 | Unsigned | 1 | 0 | 0 | 255 | speed:mph | |
| DriveShaft_Speed | 24 | 16 | Unsigned | 1 | 0 | 0 | 65535 | angular_speed:rpm | |
| DriveWheel_Speed | 32 | 8 | Unsigned | 1 | 0 | 0 | 255 | speed:mph | |
| Ground_WheelSpeed | 40 | 8 | Unsigned | 1 | 0 | 0 | 255 | speed:mph | |
| TC_Slip_Measured | 48 | 8 | Unsigned | 1 | 0 | 0 | 255 | speed:mph | Not currently supported |

| Message Name | M118_VehicleInputs4 |
|---|---|
| Type | CAN Extended |
| ID | 0x2F0A018 |
| DLC | 4 |
| Update Rate | 20 ms |
| Byte Order | Motorola |

| Name | Startbit | Length [Bit] | Value Type | Factor | Offset | Minimum | Maximum | Unit | Comment |
|---|---|---|---|---|---|---|---|---|---|
| Vehicle_Odometer | 24 | 32 | Unsigned | 0.01 | 0 | 0 | 42949672.95 | distance:mi | Not currently supported |

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| Message Name | M120_MotorTorqueData1 |
| --- | --- |
| Type | CAN Extended |
| ID | 0x2F0A020 |
| DLC | 8 |
| Update Rate | 20 ms |
| Byte Order | Motorola |

| Name | Startbit | Length [Bit] | Value Type | Factor | Offset | Minimum | Maximum | Unit | Comment |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Motor1_Torque_Request | 12 | 12 | Signed | 0.5 | 0 | -1024 | 1023.5 | torque:N.m | |
| Motor1_TqLimHi | 16 | 12 | Unsigned | 0.5 | 0 | 0 | 2047.5 | torque:N.m | |
| Motor1_TqLimLo | 36 | 12 | Signed | 0.5 | 0 | -1024 | 1023.5 | torque:N.m | |
| Motor1_TqTable | 40 | 12 | Unsigned | 0.5 | 0 | 0 | 2047.5 | torque:N.m | |
| Motor1_TqLimMultHi | 48 | 8 | Unsigned | 0.005 | 0 | 0 | 1.275 | fraction:frac | |
| Motor1_TqLimMultLo | 56 | 8 | Unsigned | 0.005 | 0 | 0 | 1.275 | fraction:frac | |

| Message Name | M122_MotorTorqueData2 |
| --- | --- |
| Type | CAN Extended |
| ID | 0x2F0A022 |
| DLC | 8 |
| Update Rate | 20 ms |
| Byte Order | Motorola |

| Name | Startbit | Length [Bit] | Value Type | Factor | Offset | Minimum | Maximum | Unit | Comment |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Motor1_CreepTorque | 12 | 12 | Unsigned | 0.1 | 0 | 0 | 409.5 | torque:N.m | |
| Motor1_ReverseTorque | 16 | 12 | Unsigned | 0.1 | 0 | 0 | 409.5 | torque:N.m | |
| Motor1_TorqueTrimTable | 36 | 12 | Signed | 0.001 | 0 | -2.048 | 2.047 | fraction:frac | |
| MotorTqSpd_FeedForward | 40 | 12 | Unsigned | 0.5 | 0 | 0 | 2047.5 | torque:N.m | |
| PedalTqMult_Tbl1 | 48 | 8 | Signed | 1 | 0 | -128 | 127 | fraction:% | |
| PedalTqMult_Tbl2 | 56 | 8 | Signed | 1 | 0 | -128 | 127 | fraction:% | |

| Message Name | M124_MotorTorqueData3 |
| --- | --- |
| Type | CAN Extended |
| ID | 0x2F0A024 |
| DLC | 8 |
| Update Rate | 20 ms |
| Byte Order | Motorola |

| Name | Startbit | Length [Bit] | Value Type | Factor | Offset | Minimum | Maximum | Unit | Comment |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Motor2_TorqueRequest | 12 | 12 | Signed | 0.5 | 0 | -1024 | 1023.5 | torque:N.m | VCU300 Only |
| Motor2_TqLimHi | 16 | 12 | Unsigned | 0.5 | 0 | 0 | 2047.5 | torque:N.m | VCU300 Only |
| Motor2_TqLimLo | 36 | 12 | Signed | 0.5 | 0 | -1024 | 1023.5 | torque:N.m | VCU300 Only |
| Motor2_TqTable | 40 | 12 | Unsigned | 0.5 | 0 | 0 | 2047.5 | torque:N.m | VCU300 Only |
| Motor2_TqLimMultHi | 48 | 8 | Unsigned | 0.005 | 0 | 0 | 1.275 | fraction:frac | VCU300 Only |
| Motor2_TqLimMultLo | 56 | 8 | Unsigned | 0.005 | 0 | 0 | 1.275 | fraction:frac | VCU300 Only |

| Message Name | M126_MotorTorqueData4 |
| --- | --- |
| Type | CAN Extended |
| ID | 0x2F0A026 |
| DLC | 8 |
| Update Rate | 20 ms |
| Byte Order | Motorola |

| Name | Startbit | Length [Bit] | Value Type | Factor | Offset | Minimum | Maximum | Unit | Comment |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Motor2_CreepTorque | 12 | 12 | Unsigned | 0.1 | 0 | 0 | 409.5 | torque:N.m | VCU300 Only |
| Motor2_ReverseTorque | 16 | 12 | Unsigned | 0.1 | 0 | 0 | 409.5 | torque:N.m | VCU300 Only |
| Motor2_TorqueTrimTable | 36 | 12 | Signed | 0.001 | 0 | -2.048 | 2.047 | fraction:frac | VCU300 Only |
| RegenBrake_Torque | 40 | 12 | Unsigned | 0.5 | 0 | 0 | 2047.5 | torque:N.m | |
| PedalTqMult_Tbl3 | 48 | 8 | Signed | 1 | 0 | -128 | 127 | fraction:% | |
| PedalTqMult_Tbl4 | 56 | 8 | Signed | 1 | 0 | -128 | 127 | fraction:% | |

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| Message Name | M128_MotorTorqueData5 |
|---|---|
| Type | CAN Extended |
| ID | 0x2F0A028 |
| DLC | 8 |
| Update Rate | 20 ms |
| Byte Order | Motorola |

| Name | Startbit | Length [Bit] | Value Type | Factor | Offset | Minimum | Maximum | Unit | Comment |
|---|---|---|---|---|---|---|---|---|---|
| Motor3_TorqueRequest | 12 | 12 | Signed | 0.5 | 0 | -1024 | 1023.5 | torque:N.m | VCU300 Only |
| Motor3_TqLimHi | 16 | 12 | Unsigned | 0.5 | 0 | 0 | 2047.5 | torque:N.m | VCU300 Only |
| Motor3_TqLimLo | 36 | 12 | Signed | 0.5 | 0 | -1024 | 1023.5 | torque:N.m | VCU300 Only |
| Motor3_TqTable | 40 | 12 | Unsigned | 0.5 | 0 | 0 | 2047.5 | torque:N.m | VCU300 Only |
| Motor3_TqLimMultHi | 48 | 8 | Unsigned | 0.005 | 0 | 0 | 1.275 | fraction:frac | VCU300 Only |
| Motor3_TqLimMultLo | 56 | 8 | Unsigned | 0.005 | 0 | 0 | 1.275 | fraction:frac | VCU300 Only |

| Message Name | M130_MotorTorqueData6 |
|---|---|
| Type | CAN Extended |
| ID | 0x2F0A030 |
| DLC | 8 |
| Update Rate | 20 ms |
| Byte Order | Motorola |

| Name | Startbit | Length [Bit] | Value Type | Factor | Offset | Minimum | Maximum | Unit | Comment |
|---|---|---|---|---|---|---|---|---|---|
| Motor3_CreepTorque | 12 | 12 | Unsigned | 0.1 | 0 | 0 | 409.5 | torque:N.m | VCU300 Only |
| Motor3_ReverseTorque | 16 | 12 | Unsigned | 0.1 | 0 | 0 | 409.5 | torque:N.m | VCU300 Only |
| Motor3_TorqueTrimTable | 36 | 12 | Signed | 0.001 | 0 | -2.048 | 2.047 | fraction:frac | VCU300 Only |
| Motor4_TorqueRequest | 40 | 12 | Signed | 0.5 | 0 | -1024 | 1023.5 | torque:N.m | VCU300 Only |

| Message Name | M132_MotorTorqueData7 |
|---|---|
| Type | CAN Extended |
| ID | 0x2F0A032 |
| DLC | 8 |
| Update Rate | 20 ms |
| Byte Order | Motorola |

| Name | Startbit | Length [Bit] | Value Type | Factor | Offset | Minimum | Maximum | Unit | Comment |
|---|---|---|---|---|---|---|---|---|---|
| Motor4_TqLimHi | 12 | 12 | Unsigned | 0.5 | 0 | 0 | 2047.5 | torque:N.m | VCU300 Only |
| Motor4_TqLimLo | 16 | 12 | Signed | 0.5 | 0 | -1024 | 1023.5 | torque:N.m | VCU300 Only |
| Motor4_TqTable | 36 | 12 | Unsigned | 0.5 | 0 | 0 | 2047.5 | torque:N.m | VCU300 Only |
| Motor4_CreepTorque | 40 | 12 | Unsigned | 0.1 | 0 | 0 | 409.5 | torque:N.m | VCU300 Only |
| Motor4_TqLimMultHi | 48 | 8 | Unsigned | 0.005 | 0 | 0 | 1.275 | fraction:frac | VCU300 Only |
| Motor4_TqLimMultLo | 56 | 8 | Unsigned | 0.005 | 0 | 0 | 1.275 | fraction:frac | VCU300 Only |

| Message Name | M134_MotorTorqueData8 |
|---|---|
| Type | CAN Extended |
| ID | 0x2F0A034 |
| DLC | 8 |
| Update Rate | 20 ms |
| Byte Order | Motorola |

| Name | Startbit | Length [Bit] | Value Type | Factor | Offset | Minimum | Maximum | Unit | Comment |
|---|---|---|---|---|---|---|---|---|---|
| Motor4_ReverseTorque | 12 | 12 | Unsigned | 0.1 | 0 | 0 | 409.5 | torque:N.m | VCU300 Only |
| Motor4_TorqueTrimTable | 16 | 12 | Signed | 0.001 | 0 | -2.048 | 2.047 | fraction:frac | VCU300 Only |
| Launch_Torque_Multiplier | 24 | 8 | Unsigned | 1 | 0 | 0 | 255 | fraction:% | VCU300 Only |
| Launch_Torque_Time | 32 | 8 | Unsigned | 0.1 | 0 | 0 | 25.5 | time:s | VCU300 Only |

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| Message Name | M136_MotorSpeedData1 |
|---|---|
| Type | CAN Extended |
| ID | 0x2F0A036 |
| DLC | 8 |
| Update Rate | 20 ms |
| Byte Order | Motorola |

| Name | Startbit | Length [Bit] | Value Type | Factor | Offset | Minimum | Maximum | Unit | Comment |
|---|---|---|---|---|---|---|---|---|---|
| IdleTarget_Speed | 8 | 16 | Unsigned | 0.25 | 0 | 0 | 16383.75 | angular_speed:rpm | |
| StartRamp_TargetSpeed | 24 | 16 | Unsigned | 0.25 | 0 | 0 | 16383.75 | angular_speed:rpm | |
| FreeRevTarget_Speed | 40 | 16 | Unsigned | 0.25 | 0 | 0 | 16383.75 | angular_speed:rpm | |
| BurnoutTargetSpeed | 56 | 16 | Unsigned | 0.25 | 0 | 0 | 16383.75 | angular_speed:rpm | VCU300 Only |

| Message Name | M138_MotorSpeedData2 |
|---|---|
| Type | CAN Extended |
| ID | 0x2F0A038 |
| DLC | 8 |
| Update Rate | 20 ms |
| Byte Order | Motorola |

| Name | Startbit | Length [Bit] | Value Type | Factor | Offset | Minimum | Maximum | Unit | Comment |
|---|---|---|---|---|---|---|---|---|---|
| LaunchTarget_Speed | 8 | 16 | Unsigned | 0.25 | 0 | 0 | 16383.75 | angular_speed:rpm | VCU300 Only |
| Motor_TargetSpeed | 24 | 16 | Unsigned | 0.25 | 0 | 0 | 16383.75 | angular_speed:rpm | |
| SpeedControl_PID | 44 | 12 | Signed | 0.5 | 0 | -1024 | 1023.5 | torque:N.m | |
| SpeedControl_PID_Error | 48 | 12 | Signed | 0.5 | 0 | -1024 | 1023.5 | torque:N.m | |

| Message Name | M140_MotorSpeedData3 |
|---|---|
| Type | CAN Extended |
| ID | 0x2F0A040 |
| DLC | 6 |
| Update Rate | 20 ms |
| Byte Order | Motorola |

| Name | Startbit | Length [Bit] | Value Type | Factor | Offset | Minimum | Maximum | Unit | Comment |
|---|---|---|---|---|---|---|---|---|---|
| SpeedControl_PID_PTerm | 12 | 12 | Signed | 0.5 | 0 | -1024 | 1023.5 | torque:N.m | |
| SpeedControl_PID_ITerm | 16 | 12 | Signed | 0.5 | 0 | -1024 | 1023.5 | torque:N.m | |
| SpeedControl_PID_DTerm | 36 | 12 | Signed | 0.5 | 0 | -1024 | 1023.5 | torque:N.m | |

| Message Name | M144_VCU_FaultStates1 |
| --- | --- |
| Type | CAN Extended |
| ID | 0x2F0A044 |
| DLC | 7 |
| Update Rate | 100 ms |
| Byte Order | Motorola |

| Name | Startbit | Length [Bit] | Value Type | Factor | Offset | Minimum | Maximum | Unit | Comment |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Fault_AccPedal2_Spike | 0 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Fault_AccPedal2_InputLo | 1 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Fault_AccPedal2_InputHi | 2 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Fault_AccPedal1_Spike | 3 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Fault_AccPedal1_Input_Lo | 4 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Fault_AccPedal1_Input_Hi | 5 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Fault_Acc_Power | 6 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Fault_Acc_LED | 7 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Fault_Cool_Temp1_InputLo | 8 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Fault_Cool_Temp1_InputHi | 9 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Fault_Cooling_Pump2 | 10 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| Fault_Cooling_Pump1 | 11 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Fault_Brk_Press_InputLo | 12 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Fault_Brk_Press_InputHi | 13 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Fault_Brake_Lamps | 14 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Fault_AccelPedal_XCheck | 15 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Fault_MC1SupplyVoltageLow | 16 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Fault_MC1_Contactor | 17 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Fault_IgnChgPlug_XCheck | 18 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Fault_Idle_Target | 19 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Fault_Head_Lamps | 20 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Fault_DCVoltage_SafeLight | 21 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Fault_Cool_Temp2_InputLo | 22 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| Fault_Cool_Temp2_InputHi | 23 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| Fault_LineLock_Sol | 24 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| Fault_MC5SupplyVoltageLow | 25 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | Not currently supported |
| Fault_MC4SupplyVoltageLow | 26 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| Fault_MC4_Contactor | 27 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| Fault_MC3SupplyVoltageLow | 28 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| Fault_MC3_Contactor | 29 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| Fault_MC2SupplyVoltageLow | 30 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| Fault_MC2_Contactor | 31 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| Fault_Regen_LeverXChk | 32 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Fault_Park_Lamps | 33 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Fault_Manual_Regen2_Spike | 34 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Fault_Manual_Regen2_InputLo | 35 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Fault_Manual_Regen2_InputHi | 36 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Fault_Manual_Regen1_Spike | 37 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Fault_Manual_Regen1_InputLo | 38 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Fault_Manual_Regen1_InputHi | 39 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Fault_WheelBar_Press1_InputHi | 40 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| Fault_Trans_Temp_InputLo | 41 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| Fault_Trans_Temp_InputHi | 42 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| Fault_Trans_Press_InputLo | 43 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| Fault_Trans_Press_InputHi | 44 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| Fault_TransBrk_Sol | 45 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| Fault_Shift_Sol | 46 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| Fault_Reverse_Lamps | 47 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Fault_Wheel_Speed_NR_Spike | 48 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Fault_Wheel_Speed_NL_Spike | 49 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Fault_Wheel_Speed_DR_Spike | 50 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Fault_Wheel_Speed_DL_Spike | 51 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Fault_Wheel_Speed_DD_Spike | 52 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | |
| Fault_WheelBar_Press2_InputLo | 53 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| Fault_WheelBar_Press2_InputHi | 54 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |
| Fault_WheelBar_Press1_InputLo | 55 | 1 | Unsigned | 1 | 0 | 0 | 1 | unitless: | VCU300 Only |