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AEM EV VCU CAN Transmit

Revision D



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Revision History

Revision	Date	Change Description
Α	6/1/2020	Initial Release
В	6/3/2020	Add Cautions and Warning section
С	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
Туре	CAN Extended
ID	0x2F0A000
DLC	8
Update Rate	100 ms
Byte Order	Motorola

							otorola	Mo	Byte Order
~	Comment	Jnit 🔻	Maximum 🔻	Minimum 🔻	Factor	Value Type	Length [Bit]	Startbit 💌	Name
		unitless:	3	0	1	Unsigned	2	8	Run_Mode_State
		unitless:	15	0	1	Unsigned	4	10	Drive_Mode_State
		ime:s	1023	0	1	Unsigned	10	14	Run_Time
		unitless:	1	0	1	Unsigned	1	16	Stop_Command_State
		unitless:	1	0	1	Unsigned	1	17	Start_Command_State
		unitless:	63	0	1	Unsigned	6	18	OPState
	VCU300 Only	unitless:	1	0	1	Unsigned	1	24	MC2DischargeCmd
		unitless:	1	0	1	Unsigned	1	25	MC1DischargeCmd
		unitless:	1	0	1	Unsigned	1	26	MCPower
	VCU300 Only	unitless:	1	0	1	Unsigned	1	27	MC4Enable
	VCU300 Only	unitless:	1	0	1	Unsigned	1	28	MC3Enable
	VCU300 Only	unitless:	1	0	1	Unsigned	1	29	MC2Enable
		unitless:	1	0	1	Unsigned	1	30	MC1Enable
		unitless:	1	0	1	Unsigned	1	31	Start_Safe
	VCU300 Only	unitless:	1	0	1	Unsigned	1	32	MC3ContEnable
	VCU300 Only	unitless:	1	0	1	Unsigned	1	33	MC2ContEnable
		unitless:	1	0	1	Unsigned	1	34	MC1ContEnable
		unitless:	1	0	1	Unsigned	1	35	PumpCont_XCheck
		unitless:	1	0	1	Unsigned	1	36	HVIL_Charge
		unitless:	1	0	1	Unsigned	1	37	HVIL_Main
	VCU300 Only	unitless:	1	0	1	Unsigned	1	38	MC4DischargeCmd
	VCU300 Only	unitless:	1	0	1	Unsigned	1	39	MC3DischargeCmd
rted	Not currently suppo	unitless:	1	0	1	Unsigned	1	40	MC1_PosFB
		unitless:		0	1	Unsigned	1	41	MC1_NegFB
		unitless:	1	0	1	Unsigned	1	42	MC1_HVDetect
	VCU300 Only	unitless:	1	0	1	Unsigned	1	43	MC4_DCVoltageSafeState
	VCU300 Only	unitless:	1	0	1	Unsigned	1	44	MC3_DCVoltageSafeState
	VCU300 Only	unitless:	1	0	1	Unsigned	1	45	MC2_DCVoltageSafeState
		unitless:	1	0	1	Unsigned	1	46	MC1_DCVoltageSafeState
	VCU300 Only	unitless:	1	0	1	Unsigned	1	47	MC4ContEnable
rted	Not currently suppo	unitless:	1	0	1	Unsigned	1	48	MC3_PosFB
	VCU300 Only	unitless:	1	0	1	Unsigned	1	49	MC3_NegFB
	VCU300 Only	unitless:	1	0	1	Unsigned	1	50	MC3_HVDetect
rted	Not currently suppo	unitless:	1	0	1	Unsigned	1	51	MC2_PreChgFB
rted	Not currently suppo	unitless:	1	0	1	Unsigned	1	52	MC2_PosFB
	VCU300 Only	unitless:	1	0	1	Unsigned	1	53	MC2_NegFB
	VCU300 Only	unitless:	1	0	1	Unsigned	1	54	MC2 HVDetect
rted	Not currently suppo	unitless:	1	0	1	Unsigned	1	55	MC1 PreChgFB
		unitless:		0	1	Unsigned		56	
rted	Not currently suppo	unitless:	1	0	1	Unsigned		59	MC4_PreChgFB
	Not currently suppo			0	1	Unsigned		60	MC4_PosFB
				0	1			61	MC4_NegFB
	VCU300 Only			0	1	Unsigned		62	MC4_HVDetect
rtod	Not currently suppo			0	1	Unsigned		63	MC3 PreChgFB
)	VCU300 Only VCU300 Only VCU300 Only Not currently support VCU300 Only Not currently support VCU300 Only Not currently support VCU300 Only VCU300 Only Not currently support Not currently support Not currently support VCU300 Only VCU300 Only VCU300 Only	unitless:	1 1 1 1 1 1 1 1 1 1 1 1 7 1 1 1 1 1	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Unsigned	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	43 44 45 46 47 48 49 50 51 52 53 54 55 56 59 60 61 62	MC1_HVDetect MC4_DCVoltageSafeState MC3_DCVoltageSafeState MC2_DCVoltageSafeState MC1_DCVoltageSafeState MC4ContEnable MC3_PosFB MC3_NegFB MC3_HVDetect MC2_PreChgFB MC2_PosFB MC2_HVDetect MC1_PreChgFB MC1_PreChgFB MC4_PreChgFB MC4_PreChgFB MC4_PreChgFB MC4_PreChgFB MC4_PosFB MC4_NegFB MC4_NegFB MC4_HVDetect



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CAN Extended
0x2F0A002
8
100 ms
Motorola
:

Byte Order		Motorola							
Name	Startbit	Length [Bit]	Value Type	Factor	Offset	Minimum	Maximum	Unit	Comment
VCU_12V_Input	0	8	Unsigned	0.1	C		0 25.5	voltage:V	
MC1_PreChg_Cmd	8	1	Unsigned	1	C		0 1	unitless:	
MC1_Pos_Cmd	9	1	Unsigned	1	C		0 1	unitless:	
VCU_5V_Output	10	6	Unsigned	0.1	C			voltage:V	
MC4_Pos_Cmd	16	1	Unsigned	1	C		0 1	unitless:	VCU300 Only
MC3 PreChgComplete	17	1	Unsigned	1	C			unitless:	VCU300 Only
MC3_PreChg_Cmd	18	1	Unsigned	1	C		0 1	unitless:	VCU300 Only
MC3_Pos_Cmd	19		Unsigned	1	C		0 1	unitless:	VCU300 Only
MC2_PreChgComplete	20		Unsigned	1	C		0 1	unitless:	VCU300 Only
MC2_PreChg_Cmd	21		Unsigned	1	C		0 1	unitless:	VCU300 Only
MC2_Pos_Cmd	22	1	Unsigned	1	C		0 1	unitless:	VCU300 Only
MC1_PreChgComplete	23		Unsigned	1	C		0 1	unitless:	
SpeedMode_Allowed	24	1	Unsigned	1	C		0 1	unitless:	
InvControl Mode	25		Unsigned	1	C		0 1	unitless:	
Launch_Mode	26	1	Unsigned	1	C		0 1	unitless:	VCU300 Only
Burnout Mode	27	1	Unsigned	1	C		0 1	unitless:	VCU300 Only
Idle Mode	28		Unsigned	1	C		0 1	unitless:	
Creep Mode	29		Unsigned	1	C		0 1	unitless:	
MC4 PreChgComplete	30		Unsigned	1	C		0 1	unitless:	VCU300 Only
MC4 PreChg Cmd	31		Unsigned	1	C		0 1	unitless:	VCU300 Only
LineLock Cntrl	32		Unsigned	1	0			unitless:	VCU300 Only
TransBrake Cntrl	33		Unsigned	1	0		0 1	unitless:	VCU300 Only
Cool_Pump_Wake	34		Unsigned	1	0		0 1	unitless:	,
Cool_Pump2_Cntrl	35		Unsigned	1	C		0 1	unitless:	VCU300 Only
Cool Pump1 Cntrl	36	1	Unsigned	1	C		0 1	unitless:	
OilPump1_On	37	1	Unsigned	1	C		0 1	unitless:	
Cool_Fan2_On	38		Unsigned	1	C		0 1	unitless:	
Cool Fan1 On	39	1	Unsigned	1	C		0 1	unitless:	
Cool_PumpSpdTarget	40	8	Unsigned	25	C		0 6375	angular_speed:rpm	
Brake_LampsCntrl	48	1	Unsigned	1	C			unitless:	
TransBrake_Switch	49		Unsigned	1	C		0 1	unitless:	VCU300 Only
LineLock_Switch	50		Unsigned	1	C		0 1	unitless:	VCU300 Only
Inertia_Switch	51		Unsigned	1	C		0 1	unitless:	Not currently supported
IMDState	52		Unsigned	1	C		0 1	unitless:	,
ShiftSol_Cntrl	53		Unsigned	1	C		0 1	unitless:	VCU300 Only
Shift_Sol2	54		Unsigned	1	C		0 1	unitless:	VCU300 Only
Shift Sol1	55	1	Unsigned	1	C		0 1	unitless:	VCU300 Only
Contactors_Enabled	56	1	Unsigned	1	C		0 1	unitless:	
 ChargeContactorCntrl	57		Unsigned	1	C		0 1	unitless:	Not currently supported
Acc_PowerCntrl	58		Unsigned	1	C		0 1	unitless:	,
Acc LightCntrl	59		Unsigned	1			-	unitless:	VCU300 Only
ReverseLamps Cntrl	60		Unsigned	1				unitless:	,
ParkLamps_Cntrl	61		Unsigned	1				unitless:	
HVSafetyLight_Cntrl	62		Unsigned	1				unitless:	
Head_LampsCntrl	63		Unsigned	1				unitless:	



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Message Name	M104_VCU	_States3]					
Туре	CAN Extend	ded							
ID	0x2F0A004								
DLC	8								
Update Rate	20 ms								
Byte Order	Motorola								
Name	Startbit 🔽 L	ength [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		Unsigned	1	0	0	1	unitless:	
LimMult_Motor1_SpdLo_Active	9		Unsigned	1	0	0	1	unitless:	
LimMult_MC4Temp_Active	10		Unsigned	1	0	0	1	unitless:	VCU300 Only
LimMult_MC4Curr_Active	11		Unsigned	1	0				VCU300 Only
LimMult_MC3Temp_Active	12		Unsigned	1	0				VCU300 Only
LimMult_MC3Curr_Active	13		Unsigned	1	0				VCU300 Only
LimMult MC2Temp Active	14		Unsigned	1	0				VCU300 Only
LimMult_MC2Curr_Active	15		Unsigned	1	0				VCU300 Only
LimMult_Pack_Current_Active	16		Unsigned	1	0			unitless:	
LimMult Over rev Active	17		Unsigned	1	0			unitless:	
LimMult_Motor4_Temp_Active	18		Unsigned	1	0				VCU300 Only
LimMult_Motor4_SpdLo_Active	19		Unsigned	1	0				VCU300 Only
LimMult_Motor3_Temp_Active	20		Unsigned	1	0				VCU300 Only
LimMult_Motor3_SpdLo_Active	21		Unsigned	1	0			_	VCU300 Only
	22			1	0				VCU300 Only
LimMult_Motor2_Temp_Active			Unsigned		0				VCU300 Only
LimMult_Motor2_SpdLo_Active	23		Unsigned	1					
LimMult_Shift5_Tq_Active	24		Unsigned	1	0				Not currently supported
LimMult_Shift4_Tq_Active	25		Unsigned	1	0				Not currently supported
LimMult_Shift3_Tq_Active	26		Unsigned	1	0				Not currently supported
LimMult_Shift2_Tq_Active	27		Unsigned	1	0				VCU300 Only
LimMult_Shift1_Tq_Active	28		Unsigned	1	0				VCU300 Only
LimMult_Pack_Voltage_Active	29		Unsigned	1	0			unitless:	
LimMult_Pack_TempLo_Active	30		Unsigned	1	0			unitless:	
LimMult_Pack_TempHi_Active	31		Unsigned	1	0			unitless:	
LaunchTimer_Running	33		Unsigned	1	0				VCU300 Only
LimMult_MC4CurrRamp_Active	34	1	Unsigned	1	0			unitless:	VCU300 Only
LimMult_MC3CurrRamp_Active	35		Unsigned	1	0	0	1	unitless:	VCU300 Only
LimMult_MC2CurrRamp_Active	36		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
Туре	CAN Extended
ID	0x2F0A006
DLC	8
Update Rate	20 ms
Byte Order	Motorola

- / 10 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0																
Name	Startbit	-	Length [Bit]	¥	Value Type	*	Factor	¥	Offset 💌	Mi	nimum	*	Maximum 🔻	Unit	~	Comment
AccelPedal		0		8	Unsigned		0.3921	57	C)		0	99.999993	fractio	n:%	
AccelPedal1		8		8	Unsigned		0.3921	57	C	כ		0	99.999993	fractio	n:%	
AccelPedal2		16		8	Unsigned		0.3921	57	C)		0	99.999993	fractio	n:%	
AccelPedalXCheckDiff	f	24		8	Unsigned		0.3921	57	C	כ		0	99.999993	fractio	n:%	
Start_Switch		32		1	Unsigned			1	C)		0	1	unitless	s:	
Ignition_Switch		33		1	Unsigned			1	C)		0	1	unitless	s:	
Brake_Switch2		34		1	Unsigned			1	C	כ		0	1	unitless	s:	
Brake_Switch1		35		1	Unsigned			1	C	כ		0	1	unitless	s:	
Brake_Switch		36		1	Unsigned			1	C)		0	1	unitless	s:	
AccelPedal2Valid		37		1	Unsigned			1	C)		0	1	unitless	s:	
AccelPedal1Valid		38		1	Unsigned			1	C	כ		0	1	unitless	s:	
AccelPedalValid		39		1	Unsigned			1	C	כ		0	1	unitless	s:	
Manual_Regen		40		8	Unsigned		0.3921	57	C)		0	99.999993	fractio	n:%	
Manual_Regen1		48		8	Unsigned		0.3921	57	C	כ		0	99.999993	fractio	n:%	
Manual_Regen2		56		8	Unsigned		0.3921	57	C)		0	99.999993	fractio	n:%	

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

				_													
*	Startbit	w	Length [Bit]	T	Value Type	*	Factor	~	Offset	T	Minimum 🔻	Ma	ximum	¥	Unit	Comment	~
F		0		8	Unsigned		0.3922	L57		0	0	9	9.999999	93	fraction:%		
		8		1	Unsigned			1		0	0			1	unitless:		
		9		1	Unsigned			1		0	0			1	unitless:		
		10		1	Unsigned			1		0	0			1	unitless:		
		11		1	Unsigned			1		0	0			1	unitless:		
		12		1	Unsigned			1		0	0			1	unitless:		
		13		1	Unsigned			1		0	0			1	unitless:		
		14		1	Unsigned			1		0	0			1	unitless:		
		15		1	Unsigned			1		0	0			1	unitless:		
		16		1	Unsigned			1		0	0			1	unitless:	VCU300 Only	
		17		1	Unsigned			1		0	0			1	unitless:		
		18		1	Unsigned			1		0	0			1	unitless:	VCU300 Only	
		19		1	Unsigned			1		0	0			1	unitless:	Not currently suppor	ted
		20		1	Unsigned			1		0	0			1	unitless:	Not currently suppor	ted
ch		21		1	Unsigned			1		0	0			1	unitless:	VCU300 Only	
		22		1	Unsigned			1		0	0			1	unitless:	VCU300 Only	
		23		1	Unsigned			1		0	0			1	unitless:		
		28		1	Unsigned			1		0	0			1	unitless:	Not currently suppor	ted
		29		1	Unsigned			1		0	0			1	unitless:	Not currently suppor	ted
		30		1	Unsigned			1		0	0			1	unitless:	Not currently suppor	ted
		31		1	Unsigned			1		0	0			1	unitless:	Not currently suppor	ted
			0 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 28 29 30	0 8 9 10 11 12 13 14 15 16 16 17 18 19 20 16 21 22 23 28 29 30	0 8 8 1 9 1 10 1 11 1 12 1 13 1 14 1 15 1 16 1 17 1 18 1 19 1 20 1 11 2 20 1 21 2 21 2 23 1 28 1 29 1	0 8 Unsigned 8 1 Unsigned 9 1 Unsigned 10 1 Unsigned 11 1 Unsigned 12 1 Unsigned 13 1 Unsigned 14 1 Unsigned 15 1 Unsigned 16 1 Unsigned 17 1 Unsigned 18 1 Unsigned 19 1 Unsigned 20 1 Unsigned 21 Unsigned 22 1 Unsigned 23 1 Unsigned 24 Unsigned 25 1 Unsigned 26 1 Unsigned 27 Unsigned 28 1 Unsigned 29 1 Unsigned 29 1 Unsigned 30 1 Unsigned	0 8 Unsigned 8 1 Unsigned 9 1 Unsigned 10 1 Unsigned 11 Unsigned 12 1 Unsigned 13 1 Unsigned 14 1 Unsigned 15 1 Unsigned 16 1 Unsigned 17 1 Unsigned 18 1 Unsigned 19 1 Unsigned 20 1 Unsigned 21 Unsigned 22 1 Unsigned 23 1 Unsigned 24 Unsigned 25 1 Unsigned 26 Unsigned 27 Unsigned 28 1 Unsigned 29 1 Unsigned 29 1 Unsigned 30 1 Unsigned	0 8 Unsigned 0.3921 8 1 Unsigned 9 1 Unsigned 10 1 Unsigned 11 1 Unsigned 12 1 Unsigned 13 1 Unsigned 14 1 Unsigned 15 1 Unsigned 16 1 Unsigned 17 1 Unsigned 18 1 Unsigned 19 1 Unsigned 20 1 Unsigned 21 1 Unsigned 22 1 Unsigned 23 1 Unsigned 28 1 Unsigned 29 1 Unsigned 1 Unsigned 1 Unsigned	0 8 Unsigned 0.392157 8 1 Unsigned 1 9 1 Unsigned 1 10 1 Unsigned 1 11 1 Unsigned 1 12 1 Unsigned 1 13 1 Unsigned 1 14 1 Unsigned 1 15 1 Unsigned 1 16 1 Unsigned 1 17 1 Unsigned 1 18 1 Unsigned 1 19 1 Unsigned 1 20 1 Unsigned 1 21 1 Unsigned 1 22 1 Unsigned 1 23 1 Unsigned 1 28 1 Unsigned 1 29 1 Unsigned 1 1 Unsigned 1 29 1 Unsigned 1 1 Unsigned 1	0 8 Unsigned 0.392157 8 1 Unsigned 1 9 1 Unsigned 1 10 1 Unsigned 1 11 1 Unsigned 1 12 1 Unsigned 1 13 1 Unsigned 1 14 1 Unsigned 1 15 1 Unsigned 1 16 1 Unsigned 1 17 1 Unsigned 1 18 1 Unsigned 1 19 1 Unsigned 1 20 1 Unsigned 1 21 1 Unsigned 1 22 1 Unsigned 1 23 1 Unsigned 1 28 1 Unsigned 1 29 1 Unsigned 1 1 Unsigned 1 1 29 1 Unsigned 1 1 Unsigned 1 1 29 1 Unsigned 1 20 1 Unsigned 1	0 8 Unsigned 0.392157 0 8 1 Unsigned 1 0 9 1 Unsigned 1 0 10 1 Unsigned 1 0 11 1 Unsigned 1 0 12 1 Unsigned 1 0 13 1 Unsigned 1 0 14 1 Unsigned 1 0 15 1 Unsigned 1 0 16 1 Unsigned 1 0 17 1 Unsigned 1 0 18 1 Unsigned 1 0 19 1 Unsigned 1 0 20 1 Unsigned 1 0 21 1 Unsigned 1 0 22 1 Unsigned 1 0 23 1 Unsigned 1 0 28 1 Unsigned 1 0	0 8 Unsigned 0.392157 0 0 8 1 Unsigned 1 0 0 9 1 Unsigned 1 0 0 10 1 Unsigned 1 0 0 11 1 Unsigned 1 0 0 12 1 Unsigned 1 0 0 13 1 Unsigned 1 0 0 14 1 Unsigned 1 0 0 15 1 Unsigned 1 0 0 16 1 Unsigned 1 0 0 17 1 Unsigned 1 0 0 18 1 Unsigned 1 0 0 19 1 Unsigned 1 0 0 20 1 Unsigned 1 0 0 21 1 Unsigned 1 0 0 22 1 Unsigned 1 0 0 23 1 Unsigned 1 0 0 28 1 Unsigned 1 0	0 8 Unsigned 0.392157 0 0 9 8 1 Unsigned 1 0 0 9 1 Unsigned 1 0 0 10 1 Unsigned 1 0 0 11 1 Unsigned 1 0 0 12 1 Unsigned 1 0 0 13 1 Unsigned 1 0 0 14 1 Unsigned 1 0 0 15 1 Unsigned 1 0 0 16 1 Unsigned 1 0 0 17 1 Unsigned 1 0 0 18 1 Unsigned 1 0 0 19 1 Unsigned 1 0 0 20 1 Unsigned 1 0 0 21 1 Unsigned 1 0 0 22 1 Unsigned 1 0 0 23 1 Unsigned 1 0 0 28 1 Unsigned 1	0 8 Unsigned 0.392157 0 0 99.999999 8 1 Unsigned 1 0 0 9 1 Unsigned 1 0 0 10 1 Unsigned 1 0 0 11 1 Unsigned 1 0 0 12 1 Unsigned 1 0 0 13 1 Unsigned 1 0 0 14 1 Unsigned 1 0 0 15 1 Unsigned 1 0 0 16 1 Unsigned 1 0 0 17 1 Unsigned 1 0 0 18 1 Unsigned 1 0 0 20 1 Unsigned 1 0 0 21 1 Unsigned 1 0 0 22 1 Unsigned 1 0 0 23 1 Unsigned 1 0 0 28 1 Unsigned 1 0 0 29 1 Unsigned 1 <td>0 8 Unsigned 0.392157 0 0 99.99999993 8 1 Unsigned 1 0 0 1 9 1 Unsigned 1 0 0 1 10 1 Unsigned 1 0 0 1 11 1 Unsigned 1 0 0 1 12 1 Unsigned 1 0 0 1 13 1 Unsigned 1 0 0 1 14 1 Unsigned 1 0 0 1 15 1 Unsigned 1 0 0 1 16 1 Unsigned 1 0 0 1 17 1 Unsigned 1 0 0 1 18 1 Unsigned 1 0 0 1 19 1 Unsigned 1 0 0 1 20 1 Unsigned 1 0 0</td> <td>0 8 Unsigned 0.392157 0 0 99.9999993 fraction:% 8 1 Unsigned 1 0 0 1 unitless: 9 1 Unsigned 1 0 0 1 unitless: 10 1 Unsigned 1 0 0 1 unitless: 11 1 Unsigned 1 0 0 1 unitless: 12 1 Unsigned 1 0 0 1 unitless: 13 1 Unsigned 1 0 0 1 unitless: 14 1 Unsigned 1 0 0 1 unitless: 15 1 Unsigned 1 0 0 1 unitless: 16 1 Unsigned 1 0 0 1 unitless: 17 1 Unsigned 1 0 0 1 unitless: 18 1 Unsigned 1 0 0 1</td> <td>0 8 Unsigned 0.392157 0 0 99.9999993 fraction:% 8 1 Unsigned 1 0 0 1 unitless: 9 1 Unsigned 1 0 0 1 unitless: 10 1 Unsigned 1 0 0 1 unitless: 11 1 Unsigned 1 0 0 1 unitless: 12 1 Unsigned 1 0 0 1 unitless: 13 1 Unsigned 1 0 0 1 unitless: 14 1 Unsigned 1 0 0 1 unitless: 15 1 Unsigned 1 0 0 1 unitless: VCU300 Only 17 1 Unsigned 1 0 0 1 unitless: VCU300 Only 18 1 Unsigned 1 0</td>	0 8 Unsigned 0.392157 0 0 99.99999993 8 1 Unsigned 1 0 0 1 9 1 Unsigned 1 0 0 1 10 1 Unsigned 1 0 0 1 11 1 Unsigned 1 0 0 1 12 1 Unsigned 1 0 0 1 13 1 Unsigned 1 0 0 1 14 1 Unsigned 1 0 0 1 15 1 Unsigned 1 0 0 1 16 1 Unsigned 1 0 0 1 17 1 Unsigned 1 0 0 1 18 1 Unsigned 1 0 0 1 19 1 Unsigned 1 0 0 1 20 1 Unsigned 1 0 0	0 8 Unsigned 0.392157 0 0 99.9999993 fraction:% 8 1 Unsigned 1 0 0 1 unitless: 9 1 Unsigned 1 0 0 1 unitless: 10 1 Unsigned 1 0 0 1 unitless: 11 1 Unsigned 1 0 0 1 unitless: 12 1 Unsigned 1 0 0 1 unitless: 13 1 Unsigned 1 0 0 1 unitless: 14 1 Unsigned 1 0 0 1 unitless: 15 1 Unsigned 1 0 0 1 unitless: 16 1 Unsigned 1 0 0 1 unitless: 17 1 Unsigned 1 0 0 1 unitless: 18 1 Unsigned 1 0 0 1	0 8 Unsigned 0.392157 0 0 99.9999993 fraction:% 8 1 Unsigned 1 0 0 1 unitless: 9 1 Unsigned 1 0 0 1 unitless: 10 1 Unsigned 1 0 0 1 unitless: 11 1 Unsigned 1 0 0 1 unitless: 12 1 Unsigned 1 0 0 1 unitless: 13 1 Unsigned 1 0 0 1 unitless: 14 1 Unsigned 1 0 0 1 unitless: 15 1 Unsigned 1 0 0 1 unitless: VCU300 Only 17 1 Unsigned 1 0 0 1 unitless: VCU300 Only 18 1 Unsigned 1 0



Phone (8am-5pm M-F PST): 310-484-2322 Fax: 310-484-0152

Message Name		M112_VehicleInp	uts1						
Туре		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	2	4 16	Unsigned	0.1	. 0	0	6553.5	pressure gauge:psi(g)	VCU300 On

			0					10 0 - 1 (0)	
Transmission_Pressure	2	4 16	Unsigned	0.1	0	0	6553.5	pressure_gauge:psi(g)	VCU300 Only
WheelBar_Press1	4	0 16	Unsigned	0.1	0	0	6553.5	pressure_gauge:psi(g)	VCU300 Only
WheelBar_Press2	5	6 16	Unsigned	0.1	0	0	6553.5	pressure_gauge:psi(g)	VCU300 Only
Message Name		M114_VehicleInp	uts2						

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

5,000.00		11.010.010							
Name	Startbit 🔻	Length [Bit]	Value Type 🔻	Factor	Offset 🔻	Minimum 🔻	Maximum 🔻	Unit	Comment
Transmission_Temp	C	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
Туре	CAN Extended
ID	0x2F0A016
DLC	7
Update Rate	20 ms
Byte Order	Motorola

Name	*	Startbit	•	Length [Bit] 🔻	Value Type	▼ Fa	ctor	Offset 🔻	Minimum	Maximu	m 🔻	Unit	Comment
BrakeVacPressure			0	8	Unsigned	C	0.14504	-14.696	-14.69	6 22.	2892	pressure_gauge:psi(g)	Not currently supported
Vehicle_Speed			8	8	Unsigned		1	0		0	255	speed:mph	
DriveShaft_Speed		2	24	16	Unsigned		1	0		0 6	5535	angular_speed:rpm	
DriveWheel_Speed		3	32	8	Unsigned		1	0		0	255	speed:mph	
Ground_WheelSpee	ed	4	40	8	Unsigned		1	0		0	255	speed:mph	
TC_Slip_Measured		4	48	8	Unsigned		1	0		0	255	speed:mph	Not currently supported

Message Name	M118_VehicleInputs4
Туре	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	C	42949672.9	5 distance:mi	Not currently supported



Phone (8am-5pm M-F PST): 310-484-2322 Fax: 310-484-0152

Message Name	M120_MotorTorqueData1
Туре	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
Туре	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
Туре	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
Туре	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:%	



Motor3_TqLimMultHi

Motor3_TqLimMultLo

AEM Performance Electronics 2205 W 126th Street, Unit A Hawthorne, CA 90250

Phone (8am-5pm M-F PST): 310-484-2322 Fax: 310-484-0152

1.275 fraction:frac VCU300 Only

1.275 fraction:frac VCU300 Only

sales@aemev.com tech@aemev.com

Message Name			M128_MotorTorqueData5															
Туре			CAN	CAN Extended														
ID			0x2F	0x2F0A028														
DLC			8	3														
Update Rate			20 m	0 ms														
Byte Order			Motorola															
Name	¥	Startb	it 🔻	Length	[Bit]	Value Type	¥	Factor	₩.	Offset	*	Minimum	v	Maximum	*	Unit	*	Comment -
Motor3_TorqueReque	st		12		12	Signed		0	.5		0	-10	24	1023	3.5	torque:N.	m	VCU300 Only
Motor3_TqLimHi			16		12	Unsigned		0	.5		0		0	2047	7.5	torque:N.	m	VCU300 Only
Motor3_TqLimLo			36		12	Signed		0	.5		0	-10	24	1023	3.5	torque:N.	m	VCU300 Only
Motor3 TgTable			40		12	Unsigned		0	.5		0		0	2047	7.5	torque:N.	m	VCU300 Only

0.005

0.005

0

0

0

8 Unsigned

8 Unsigned

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

48

56

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					
Туре	CAN Extended					
ID	0x2F0A032					
DLC	8					
Update Rate	20 ms					
Byte Order	Motorola					

Name	Startbi	t ▼	Length [Bit]	Value Type	*	Factor	Offset 💌	Minimum	Maximum 🔻	Unit	Comment 🔻
Motor4_TqLimHi		12	12	Unsigned		0.5	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	(2047.5	torque:N.m	VCU300 Only
Motor4_CreepTorqu	e	40	12	Unsigned		0.1	0	(409.5	torque:N.m	VCU300 Only
Motor4_TqLimMultH	li	48	8	Unsigned		0.005	0	(1.275	fraction:frac	VCU300 Only
Motor4_TqLimMultL	О	56	8	Unsigned		0.005	0	(1.275	fraction:frac	VCU300 Only

Matera BoyersoTermus	12 12 Unsigned
Byte Order	Motorola
Update Rate	20 ms
DLC	8
ID	0x2F0A034
Туре	CAN Extended
Message Name	M134_MotorTorqueData8

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



Phone (8am-5pm M-F PST): 310-484-2322 Fax: 310-484-0152

Message Name	M136_MotorSpeedData1
Туре	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
Туре	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_Erro	r 48	12	Signed	0.5	0	-1024	1023.5	torque:N.m	

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

Name	₩.	Startbit	¥	Length [Bit]	*	Value Type	¥	Factor	Offset	*	Minimum 🔻	Maxin	num	*	Unit	*	Comment 💌
SpeedControl_PID_PTern	n		12	1	12	Signed		0.5		0	-1024		1023	.5	torque:N.ı	m	
SpeedControl_PID_ITerm	1		16	1	12	Signed		0.5		0	-1024		1023	.5	torque:N.ı	m	
SpeedControl PID DTerr	n		36	1	12	Signed		0.5		0	-1024		1023	.5	torque:N.i	m	



Phone (8am-5pm M-F PST): 310-484-2322 Fax: 310-484-0152

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

Update Rate	100 h										
Byte Order	Moto								_		
Name	Startbit 💌	Length [Bit]	Value Type 💌	Factor	₹ (Offset 💌	Minimum 💌	Maximum 💌	U	nit 💌	Comment
Fault_AccPedal2_Spike	0	1	Unsigned		1	0	0	1	Lur	nitless:	
Fault_AccPedal2_InputLo	1	. 1	Unsigned		1	0	0	1	Lur	nitless:	
Fault_AccPedal2_InputHi	2	. 1	Unsigned		1	0	0	1	Lur	nitless:	
Fault_AccPedal1_Spike	3	1	Unsigned		1	0	0	1	Lur	nitless:	
Fault_AccPedal1_Input_Lo	4	1	Unsigned		1	0	0	1	Lur	nitless:	
Fault_AccPedal1_Input_Hi	5		Unsigned		1	0	0		_	nitless:	
Fault_Acc_Power	6		Unsigned		1	0	0		_	nitless:	
Fault_Acc_LED	7		Unsigned		1	0	0		_	nitless:	
Fault_Cool_Temp1_InputLo			Unsigned		1	0	0		_	nitless:	
Fault_Cool_Temp1_InputHi	9		Unsigned		1	0	0		_	nitless:	
	10				1	0	0		-		VCU300 Only
Fault_Cooling_Pump2	11		Unsigned		1	0	0		_		VC0300 Offig
Fault_Cooling_Pump1			Unsigned		-				_	nitless:	
Fault_Brk_Press_InputLo	12		Unsigned		1	0	0			nitless:	
Fault_Brk_Press_InputHi	13		Unsigned		1	0	0		_	nitless:	
Fault_Brake_Lamps	14		Unsigned		1	0	0		_	nitless:	
Fault_AccelPedal_XCheck	15		Unsigned		1	0	0		_	nitless:	
Fault_MC1SupplyVoltageLow	16		Unsigned		1	0	0	1	Lur	nitless:	
Fault_MC1_Contactor	17	1	Unsigned		1	0	0	1	Lur	nitless:	
Fault_IgnChgPlug_XCheck	18	1	Unsigned		1	0	0	1	Lur	nitless:	
Fault_Idle_Target	19	1	Unsigned		1	0	0	1	Lur	nitless:	
Fault_Head_Lamps	20	1	Unsigned		1	0	0	1	Lur	nitless:	
Fault_DCVoltage_SafeLight	21	. 1	Unsigned		1	0	0	1	Lur	nitless:	
Fault_Cool_Temp2_InputLo	22	. 1	Unsigned		1	0	0	1	Lur	nitless:	VCU300 Only
Fault_Cool_Temp2_InputHi	23		Unsigned		1	0	0	1	Lur	nitless:	VCU300 Only
Fault_LineLock_Sol	24		Unsigned		1	0	0		_		VCU300 Only
Fault MC5SupplyVoltageLow	25		Unsigned		1	0	0		_		Not currently supported
Fault_MC4SupplyVoltageLow	26		Unsigned		1	0	0		_		VCU300 Only
Fault_MC4_Contactor	27		Unsigned		1	0	0		_		VCU300 Only
Fault_MC3SupplyVoltageLow	28		Unsigned		1	0	0		_		VCU300 Only
	29				1	0	0		_		VCU300 Only
Fault_MC3_Contactor			Unsigned		_				_		
Fault_MC2SupplyVoltageLow	30		Unsigned		1	0	0		_		VCU300 Only
Fault_MC2_Contactor	31		Unsigned		1	0	0		_		VCU300 Only
Fault_Regen_LeverXChk	32		Unsigned		1	0	0		_	nitless:	
Fault_Park_Lamps	33		Unsigned		1	0	0			nitless:	
Fault_Manual_Regen2_Spike	34		Unsigned		1	0	0		_	nitless:	
Fault_Manual_Regen2_InputLo	35	1	Unsigned		1	0	0	1	Lur	nitless:	
Fault_Manual_Regen2_InputHi	36	1	Unsigned		1	0	0	1	Lur	nitless:	
Fault_Manual_Regen1_Spike	37	1	Unsigned		1	0	0	1	Lur	nitless:	
Fault_Manual_Regen1_InputLo	38	1	Unsigned		1	0	0	1	Lur	nitless:	
Fault_Manual_Regen1_InputHi	39	1	Unsigned		1	0	0	1	Lur	nitless:	
Fault_WheelBar_Press1_InputHi	40	1	Unsigned		1	0	0	1	Lur	nitless:	VCU300 Only
Fault_Trans_Temp_InputLo	41	. 1	Unsigned		1	0	0	1	Lur	nitless:	VCU300 Only
Fault Trans Temp InputHi	42		Unsigned		1	0	0	1	Lur	nitless:	VCU300 Only
Fault_Trans_Press_InputLo	43		Unsigned		1	0	0		_		VCU300 Only
Fault Trans Press InputHi	44		Unsigned		1	0	0		_		VCU300 Only
Fault_TransBrk_Sol	45		Unsigned		1	0	0		_		VCU300 Only
Fault_Shift_Sol	46		Unsigned		1	0	0		_		VCU300 Only
					_				_		
Fault_Reverse_Lamps	47		Unsigned		1	0	0		_	nitless:	
Fault_Wheel_Speed_NR_Spike	48		Unsigned	-	1	0	0		_	nitless:	
Fault_Wheel_Speed_NL_Spike	49		Unsigned		1	0	0			nitless:	
Fault_Wheel_Speed_DR_Spike	50		Unsigned		1	0	0		_	nitless:	
Fault_Wheel_Speed_DL_Spike	51		Unsigned		1	0	0			nitless:	
Fault_Wheel_Speed_DD_Spike	52		Unsigned		1	0	0			nitless:	
Fault_WheelBar_Press2_InputLo	53	1	Unsigned		1	0	0				VCU300 Only
Fault_WheelBar_Press2_InputHi	54	1	Unsigned		1	0	0	1	Lur	nitless:	VCU300 Only
Fault_WheelBar_Press1_InputLo	55	1	Unsigned		1	0	0	1	ur	nitless:	VCU300 Only