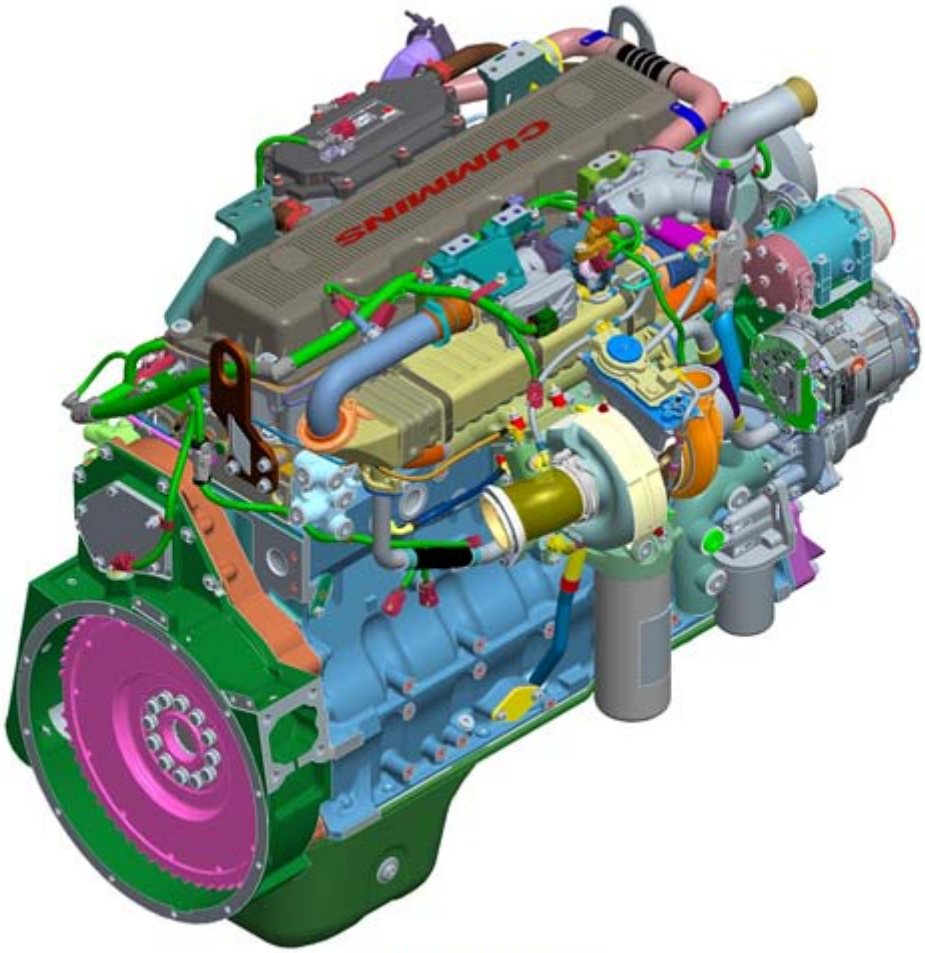
2013 COMMON APPROACH TO CONTROL SYSTEM DIAGNOSTICS

Pacific 2013



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Phase 8.10.0.xx (CM2350) ECM Software

HD 2013 COMMON APPROACH TO CONTROL SYSTEM DIAGNOSTICS

HD 2013 Common Approach To Control System Diagnostics.doc
Beta Version

Where To Find This Document:
CTC LAN: H:\HDE_Pacific\Cals\Common Approach

Revision Number 01

Internet:

Please Forward Suggestions For Improvement To: Amy Sinkhorn

Overview: This document is intended to support on-site troubleshooting and diagnostics of customer complaints for **2013 Heavy-Duty engine platforms**. This document can be used along with CalTerm III for investigation, troubleshooting, and diagnosis of engine performance and electronic controls related issues.

Purpose: The information contained in this document is based on information from Simulink Diagrams and Code Files. The 2013 HD control system includes new control strategies for Air Handling and emissions to meet the 2013 requirements. Information on troubleshooting and diagnostics for these systems is included here. The intent for this document is to provide information and support to those in the field as well as those based in Cummins engineering facilities. This document along with Calterm III will provide more detailed definition of engine conditions associated with specific issues. This information, along with driver comments and concerns, will help in achieving a better responsiveness to customer needs and allow us to develop products which meet or exceed customer expectations.

Tools Required: Calterm III Software installation web address → http://etools.ctg.cummins.com/products/caltermiii/

ECFG File Web address of supported ECFG files → not available yet

Inline V Web address for ordering the Datalink Adapter, driver download, and driver installation instructions → http://inline.cummins.com/

THIS DOCUMENT SUPPORTS THE FOLLOWING SOFTWARE VERSION:

HD13	**8.10.0.xx**	**CM2350**

Document Contents Overview:

THIS DOCUMENT SUPPORTS THE FOLLOWING SOFTWARE VERSION:
HD13 ISX PHASE 7.10.0.xx SOFTWARE CM2350

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Acknowledgement

Thank you CAD Blitz team for your contributions to the Common Approach. The following are the members of the CAD Blitz team that helped build this document for the 2013 Heavy Duty Platforms:

Heavy Duty Diesel Controls

Heavy Duty Fuel Systems Specific Controls

Heavy Duty Powercare
Steve Collins

Heavy Duty System Performance Integration – Aftertreatment Integration
Ryan Edgecomb

Heavy Duty System Performance Integration – Combustion / Performance / Emissions
Dan Dempsey

Heavy Duty System Performance Integration – System Integration

Jamestown Engine Plant – Combustion / Performance / Emissions

Revision History

Rev 00: 12/09/2011
Rev01: 08/13/2012

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I. Datalogging Using Calterm III

Data Logging

The following four methods can be used to collect data using Calterm III:

1. Request/Receive
2. IDL (Internal Data logger)
3. BAM (Broadcast Announce Message)
4. EDM (Engineering Data Monitor)

In this document, only the EDM data logging method will be discussed. EDM data collection mode has sufficient capability to collect data listed in this document. Also, unlike BAM data collection mode, EDM will not stop broadcast on other devices connected to the datalink.

Instructions for using the EDM Data logger

1. Launch Calterm III
2. The monitor screen should be displayed. If Calterm does not automatically display the Select Module Screen, go to File and select Open Module.
3. On the monitor screen, select Module Type and ECFG file. ECFG files for each software phase can be downloaded at the following link: http://www.jep.cummins.com/teams/pde/index_org.html
4. Click Automatic to connect to the module. Once connected, the default monitor screen will be displayed
5. If unable to connect, go to Tools, select Options and click datalink type - Verify the settings on the Datalink tab are configured to work with an Inline 5 adapter.
6. Once connected, add parameters to the monitor screen or open an existing screen file.
    - To add parameters to the monitor screen, change the data collection mode to EDM. Type the parameter name or use F1 to search for parameters.
    - To open an existing screen file, go to Monitor and select open screen file.
7. Depending on the desired data collection rate, add parameters to achieve a maximum data rate of 4000 bytes/second.

-To determine the number of bytes for a given parameter, open the ecfg file using word pad. Search for the the parameter name. Under the parameter name, data_length will be listed.

-The majority of parameters are 2 bytes. For example, the data length of FSS_Total_Fueling is 2 bytes.

-To determine the data rate, add the bytes from all parameter on the screen file and divide by the desired data collection rate.

-For example, at a rate of 4000 bytes/second, 40 two byte parameters can be collected every 20ms.

8. Change the data collection mode to EDM. Select the desired data monitor rate.
9. If parameter values are not displayed on the screen after switching to EDM mode, you may have too many parameters for the data collection rate. Two options for correcting this are
    a. Decrease number of parameters (Use only recommended parameters from this document).
    b. Decrease the data collection rate

-The data rate of 4000 bytes/min is only possible under ideal conditions. Increased datalink traffic will decrease the allowable data rate.

10. To start data collection click on start
11. To stop data collection click stop
12. Save datafile to desired location

II. Critical Parameters List

Mission Data Critical Parameters List

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Standard Engine Investigation List

Accelerator_Pedal_Position	%	P_SCD_CE_NormEff_EWMA_Filt_Val	None
Actual_Gear_Ratio	None	P_SFD_tmh_TFR_ActualTime	hr
Altitude	m	P_SFP_DPSLE_DPF_TrustCond	None
Ambient_Air_Press	kPa	P_SFP_gpl_DPSLE_Adj	g/L
Ambient_Air_Tmptr	Deg_C	P_SFR_Regen_Trigger_State	None
APC_hp_Cmd	bar	PTM_Final_Oper_Mode	None
APC_hp_Fdbk	bar	RetarderSwitchLevel	%
Battery_Voltage	V	RetarderSwitchTorque	N_m
CBM_NOx_Out_Rate	g/hr	Service_Brake_Switch	None
CBM_O2_Out_Rate	g/sec	Stop_Fault_Lamp	None
CBM_PM_Out_Rate	g/hr	Surge_Margin	%
CBR_Alpha	None	TAHR_EMP_Cmd_Final	kPa
CBR_Chi_Mode_Status	HEX	TAHR_IAT_FAF_Error	None
CBR_Chi_Table_Mask	HEX	TAHR_IAT_Position_Cmd	%
CBR_Cold_Amb_Ref_Status	HEX	TAHR_IAT_State	None
CBR_EGR_Frac_Ref	None	TAHR_IAT_ULim	%
CBR_Main_SOI	deg_BTDC	TAHR_IAT_Valve_Fdbk_Cmd	%
CBR_Main_SOI_ColdAmbFactor	None	TAHR_IAT_Valve_Feed_Fwd_Cmd	%
CBR_MCF_Ref	kg/min	TAHR_OSR_dPoP_Final_Cmd	None
CBR_OFC_LLramptimer	s	Tailshaft_Speed	RPM
CBR_Pilot1_Fuel_Quantity_Final	mg/stroke	TGC_VT_Cmd	%
CBR_Pilot1_SOI	None	Total_Fueling	mg/stroke
CBR_Pilot2_Fuel_Quantity_Final	mg/stroke	TPE_Corrected_Air_Flow	kg/s
CBR_Pilot2_SOI	None	TPE_Corrected_Turbo_Speed	RPM
CBR_Post1_Fuel_Quantity_Final	mg/stroke	Turbo_Speed_Est	KRPM
CBR_Post1_SOI	None	V_AIM_fg_Turbo_Out_NOx	g/sec
CBR_Post2_Fuel_Quantity_Final	mg/stroke	V_AIM_NH3_Sensor_Status	None
CBR_Post2_SOI	None	V_AIM_pc_Urea_TankLvl	%
CCP_Zero_Adjustment	kPa_G	V_AIM_pr_DPF_DeltaP	kPa
Charge_Air_Cooler_Outlet_Tmptr	Deg_C	V_AIM_pr_HC_DoserP	kPa
Charge_Flow	kg/min	V_AIM_prg_DPF_OutP	kPa_G
Charge_Flow_Command_State	HEX	V_AIM_prg_UreaPumpP	kPa
Charge_Flow_Derate_Active_State	HEX	V_AIM_ro_PM_Out	Ohm
Charge_Press	kPa	V_AIM_ro_PM_Out_Status	None
Charge_Press_Est	kPa	V_AIM_SCR_ct_NH3Sens_Reset	counts
Charge_Press_IR_Enable	None	V_AIM_SCR_NH3Sens_ReadStbl	None
Charge_Tmptr	Deg_C	V_AIM_SCR_Out_NOxReadStbl	None
Charge_Tmptr_Est	Deg_C	V_AIM_trc_DOC_In	Deg_C
CHP_Pumping_Torque	N_m	V_AIM_trc_DOC_Out	Deg_C
Clutch_Switch	None	V_AIM_trc_DPF_Out	Deg_C
Combustion_Control_Path_Owner	None	V_AIM_trc_SCR_Out	Deg_C
Compressor_Inlet_Tmptr	Deg_C	V_AIM_trc_SCR_T1	Deg_C
Compressor_Outlet_Tmptr	Deg_C	V_AIM_trc_Urea_TankT	Deg_C
Controller_EGR_Flow_Cmd	kg/min	V_AIM_trc_Urea_TankT_Status	None
Controller_EGR_Frac_Cmd	None	V_AIM_trc_UreaSuppT1	Deg_C
Controller_MCF_Cmd	kg/min	V_AIM_trc_UreaSuppT2	Deg_C
Coolant_Level	None	V_ATD_bs_NH3_Enbled	HEX
Coolant_Temperature	Deg_C	V_ATD_bs_NH3_Errs	HEX
Crankcase_Press	kPa_G	V_ATD_bs_PFS_EngOut_Status	HEX
EAC_EGR_Valve_Cmd	%	V_ATD_bs_PFS_Sensor_Status	HEX
ECM_Run_Time	s	V_ATD_bs_PFS_SysIO_Errs	HEX
EGR_Delta_Press	kPa	V_ATD_bs_PFS_SysIO2_Errs	HEX
EGR_DeltaP_Est	kPa	V_ATD_bs_PFS_SysIO3_Errs	HEX
EGR_Flow	kg/min	V_ATD_bs_PFS_SysPerf1_Errs	HEX
EGR_Fraction	None	V_ATD_bs_PFS_SysPerf2_Errs	HEX
EGR_Orif_Press	kPa_A	V_ATD_bs_SCR_ExtInput_Status	HEX
EGR_Orif_Press_Est	kPa	V_ATD_bs_SCR_Sensor_Status	HEX
EGR_Orifice_Delta_Press	kPa	V_ATD_bs_SCR_SysIO1_Errs	HEX
EGR_Orifice_Tmptr	Deg_C	V_ATD_bs_SCR_SysIO2_Errs	HEX
EGR_Position	%	V_ATD_bs_SCR_SysPerf_Errs	HEX
EMM_AECD_State	HEX	V_ATD_bs_UQS_Errs	HEX

EMM_Derate_Flag	None	V_ATD_DPF_Lamp_State	None
EMM_Protection_Flag	None	V_ATD_HET_Lamp_State	None
EMM_Protection_State_1	HEX	V_ATM_SCR_Tamp_Indm_Rqst	None
EMM_Protection_State_2	HEX	V_ATP_Allow_Regen_State	None
Engine_Speed	RPM	V_ATP_fg_Turbo_Out	g/sec
EONOx_Comp_Value	ppm	V_ATP_fv_DPF_OutP	m3/s
EONOx_J39_AftIn_NOx_Read_Stbl	None	V_ATP_NotStbl_O2Transient_Flag	None
EONOx_J39_AftIn_Temp	None	V_ATP_ppm_SCR_Out_NOx_Status	None
EONOx_Sensor_Status	None	V_HIM_bs_DiagStatus	HEX
EPD_Torque_Derate_Value_id	None	V_HIM_DFSOV_Cmd	None
ERC_DriverFractionCmd	None	V_HIM_DFSOV2_Cmd	None
ERC_NumOfCylsBraking	None	V_HIM_fg_HC_Final_Limit	g/sec
Exhaust_Metal_Tmptr	Deg_C	V_HIM_tm_Inj_On_Time	s
Exhaust_Press	kPa	V_OCL_fg_HC_Slip_Limit	g/sec
Exhaust_Press_Est	kPa	V_OCM_fg_HC_In	g/sec
EXM_TMMode	None	V_OCR_fg_HC_Cmd	g/sec
Fan_Drive_State	None	V_OCR_fg_HC_Corr	g/sec
Filtered_Turbo_Speed	KRPM	V_OCR_fg_HC_Der_Cntrl	g/sec
Fresh_Air_Flow	kg/min	V_OCR_fg_HC_Int_Cntrl	g/sec
Friction_Torque	N_m	V_OCR_fg_HC_Nominal	g/sec
H_APC_ti_ImaPWM	mSec	V_OCR_fg_HC_Prp_Cntrl	g/sec
H_HIM_fg_Dosing_Cmd	g/sec	V_OCR_fg_PID_Limit	g/sec
H_HIM_fn_EffComp	None	V_RDM_FdbkState	None
H_HIM_pr_Inj_Fuel_Press_Comp	kPa	V_RDM_HeaterStateRqst	None
H_IAT_HB_Motor_Current	A	V_RDM_State_Rqst	None
H_IAT_HB_Motor_Current_Ave	A	V_SCL_UreaImpLim_Flag	None
H_IAT_HB_Valve_Velocity	%/s	V_SCM_ppm_SCR_Out_NOx_PreClamp	ppm
H_IAT_Position_Cmd	%	V_SCP_fn_NO2NO_Split	None
H_IAT_PWM_Abs_Duty_Cycle	%	V_SCR_ANR_Cmd	None
H_IFM_r_ParasiticLeakage	bar/s	V_SCR_NH3SensComp_Enable	None
H_IMA_i_Cmd	A	V_SCR_ppm_MidCatNH3	ppm
H_IMA_i_Fltr	A	V_SCR_ppm_MidCatNH3_Ref	ppm
H_IMA_r_Fltr	Ohm	V_SCR_ppm_NOxLoop_Corr	ppm
H_OCL_bs_HC_CtrlLimits	HEX	V_SCR_ppm_NOxLoop_NH3Slip_Estim	ppm
H_SFP_DPTrust_Fctr_Adjusted	None	V_SCR_ppm_NOxLoop_NOxSlip_Estim	ppm
H_SFP_gph_Noxid_Rate	g/hr	V_SFP_fv_DPF	m3/s
H_SFP_gph_Oxid_Rate	g/hr	V_SFP_gph_NetSootAccumRate	g/hr
IAT_Position	%	V_SFP_mg_Soot_Load_Comb	gm
INDM_DerateState	None	V_SFP_mg_Soot_Load_DP	gm
J39_AFT_Intake_Per_O2	%	V_SFP_pr_Delta	kPa
J39_NH3_SensorOut1Voltage	mV	V_SFR_Regen_Stage	None
J39_NH3_SensorOut2Voltage	mV	V_SFR_Regen_Trigger	None
J39_UQS_Cat_Reag_Conc	%	V_SFR_trc_Cmd	Deg_C
J39_UQS_Cat_Reag_Temp2	Deg_C	V_UIM_FT_UreaPumpState	None
J39_UQS_Cat_Reag_Type	None	V_UQS_pc_UreaConc_Status	None
LBSC_Status	None	V_USM_bs_Sys_Errs	HEX
MIL_Status	None	V_USM_bs_Sys1_Errs	HEX
Net_Engine_Torque	N_m	V_USM_flm_DosingCmd	ml/sec
Oil_Pressure	kPa_G	V_USM_flm_DosingFdbk	ml/sec
Oil_Temperature	Deg_C	V_USM_Heating_State	None
Out_Of_Gear	None	V_USM_MasterState	None
P_HIM_DFM_Eff_Avg	None	V_USM_pc_DosingCmd	%
P_HIM_DFM_Eff_Regen	None	V_USM_pc_Pump_Cmd	%
P_HIM_Doser_Eff	None	V_UTC_TankHtr_State	None
P_INDM_SevDerateReq_Bitmap	HEX	V_UTD_DEFLamp_State	None
P_OCD_DosEff_EWMA_Filt_Val	None	V_UTM_bs_Sys_Errs	HEX
P_OCD_fn_CompEff	None	Vehicle_Speed	km/hr
P_OCD_fn_Dosing_NmlEff	None	VGT_Position	%
P_SCD_CE_Normalized_NOx_Eff	None	Warning_Fault_Lamp	None

III. Basic Unit Conversions

Deg_F to Deg_C

Deg_C = (Deg_F – 32) * 5/9

InHg to kPa

kPa = 3.3863880 * InHg

MPH to Km/Hr

Km/Hr = 1.6093440 * MPH

Psi to bar

bar = 0.06894757 * Psi

Psi to kPa

kPa = 6.8947570 * Psi

Voltage to Raw Counts

Raw Counts = (Sensor Signal Volts) / (5.175) * 1023

IV. Control System Overview

Pacific System Architecture

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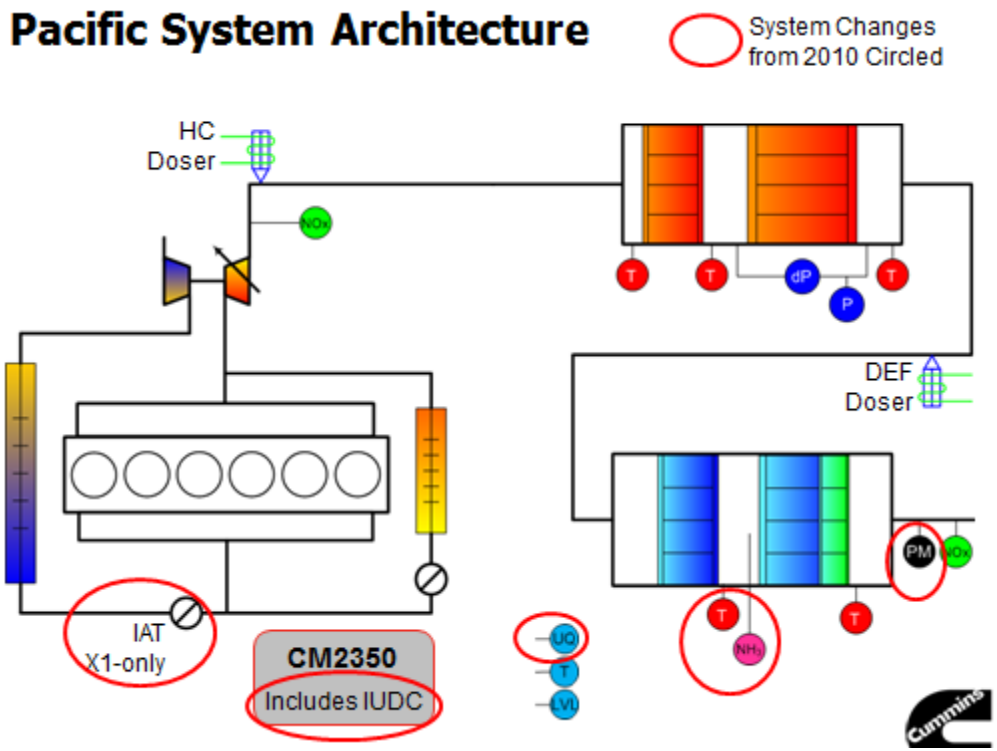

- Changes from Monarch
  - DEF Quality Sensor
  - System Out Particulate (PM) sensor
  - Mid Bed NH3 Sensor
    - With sampling probe for accuracy
  - **Increased accuracy NOx sensors**
    - With sampling probe on system out for accuracy
  - **Dual element fuel rail pressure sensor**
  - AT Temp Sensors from analog to digital (datalinked)
  - TAHR plus IAT Air Handling Controller

Air Handling and Aftertreatment Schematic

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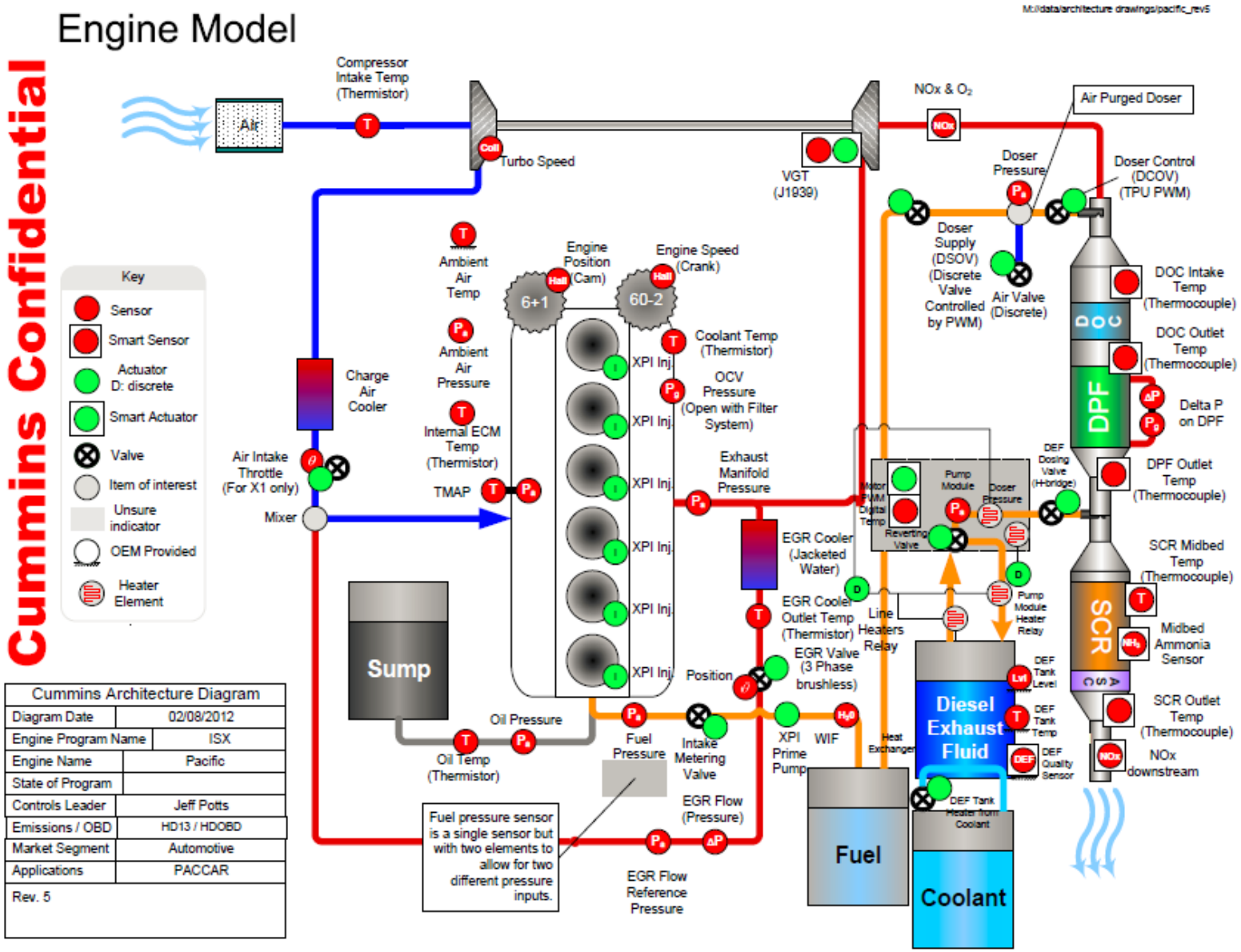
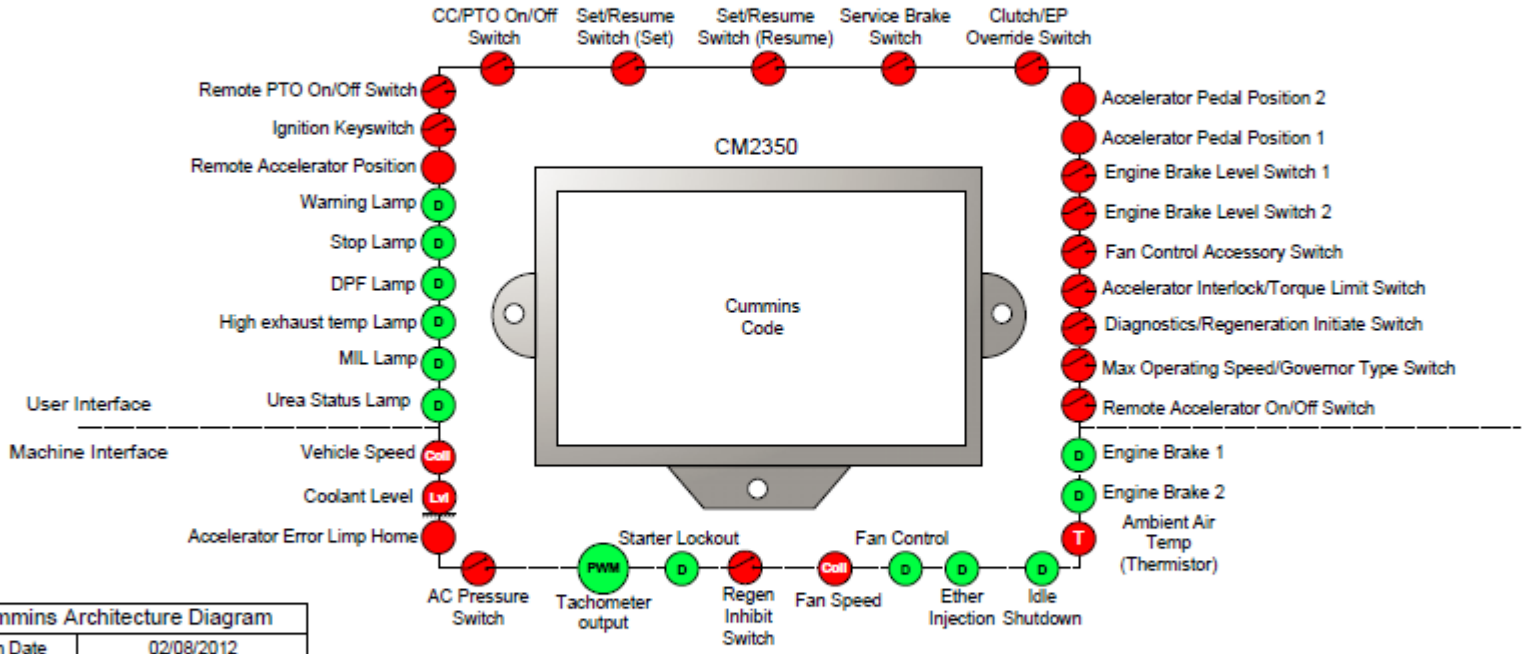


Machine Model

M:\Idata\architecture drawings\pacific_rev5



Cummins Architecture Diagram	
Diagram Date	02/08/2012
Engine Program Name	ISX
Engine Name	Pacific
State of Program	
Controls Leader	Jeff Potts
Emissions / OBD	HD13 / HDOBD
Market Segment	Automotive
Applications	PACCAR
Rev. 5	

Engine Virtual Sensors

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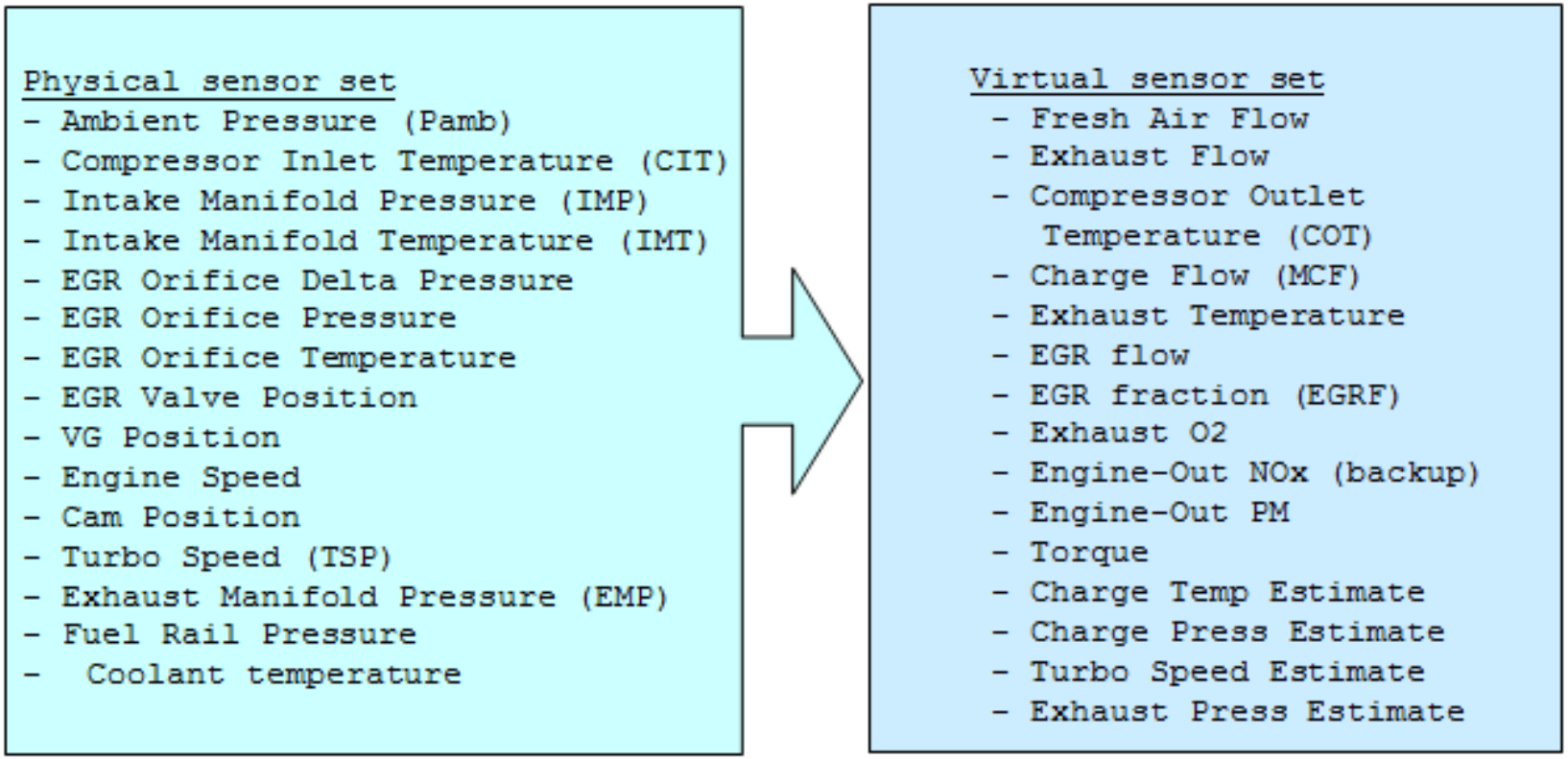
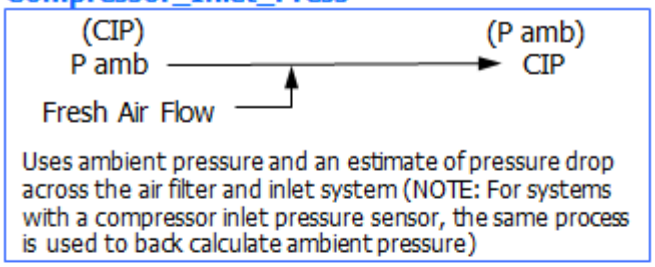
Overview



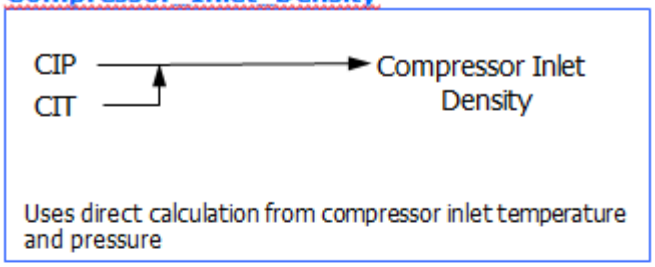
Base Virtual Sensors

Compressor_Inlet_Press



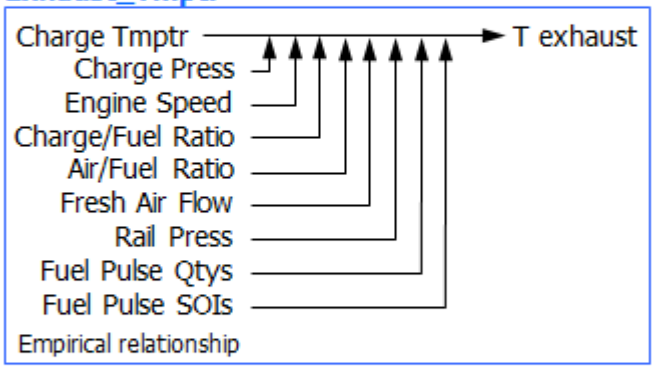
Uses ambient pressure and an estimate of pressure drop across the air filter and inlet system (NOTE: For systems with a compressor inlet pressure sensor, the same process is used to back calculate ambient pressure)

Compressor_Inlet_Density



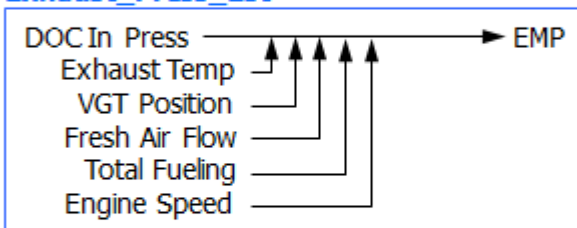
Uses direct calculation from compressor inlet temperature and pressure

Exhaust_Tmptr



Empirical relationship

Exhaust_Press_Est

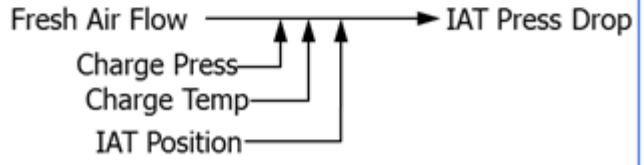


Uses exhaust conditions and turbine maps to predict a turbine expansion ratio; uses expansion ratio and DOC inlet pressure to predict exhaust pressure

Altitude

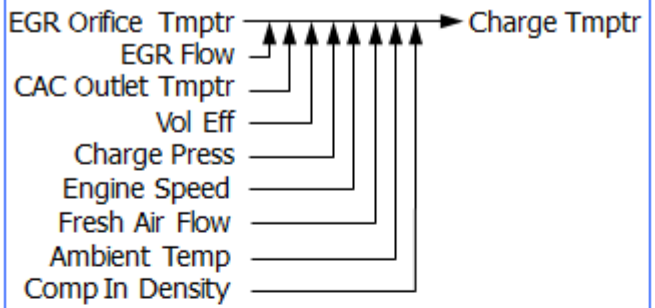
Uses direct calculation from ambient pressure

IAT_Press_Drop



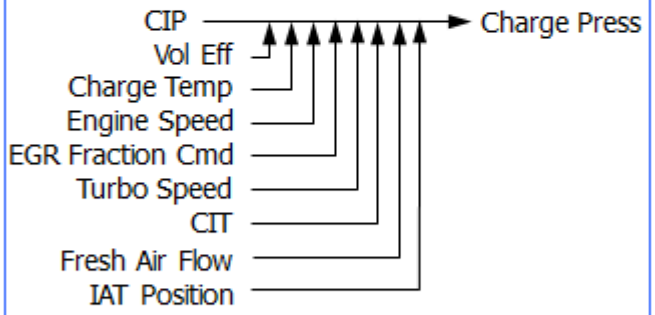
Estimates IAT pressure drop based on volumetric air flow and a known IAT EFA relationship

Charge_Tmptr_Est



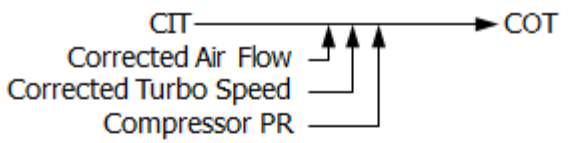
Mass weighted temperature using measured EGR temperature and predicted CAC outlet temperature

Charge_Press_Est



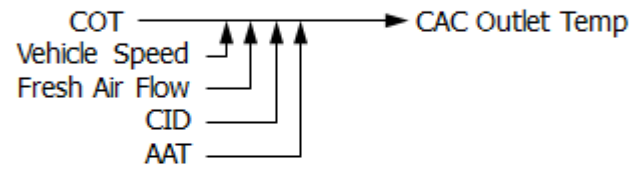
Uses compressor map to get pressure ratio as a function of corrected air flow and corrected turbo speed

Compressor_Outlet_Tmptr



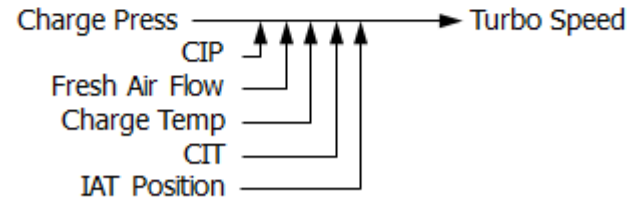
Uses compressor map to get compressor efficiency as a function of corrected air flow and corrected turbo speed; uses efficiency and pressure ratio to compute a temperature rise across the compressor

CAC_Outlet_Tmptr_Est



Predicts CAC effectiveness as a function of vehicle speed, CID and fresh air flow; uses effectiveness, AAT and COT to predict CAC outlet temp

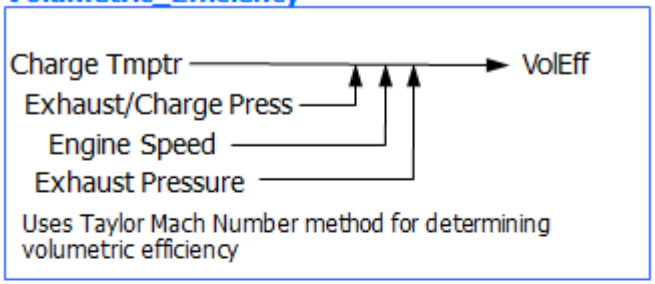
Turbo_Speed_Est



Uses compressor map to get corrected turbo speed as function of pressure ratio and corrected air flow; includes pressure ratio correction to account for charge air cooler

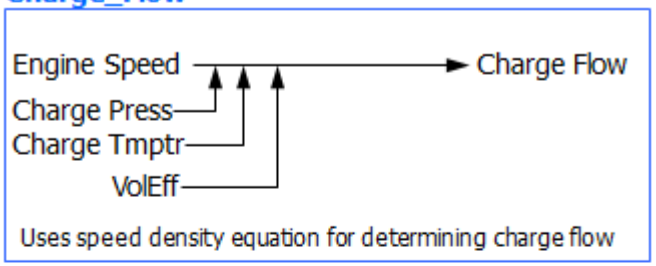
Charge Parameter Virtual Sensors

Volumetric_Efficiency



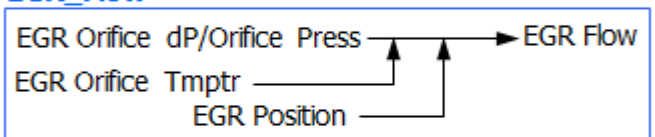
Uses Taylor Mach Number method for determining volumetric efficiency

Charge_Flow



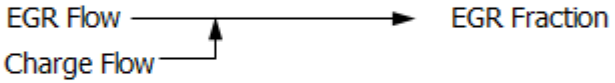
Uses speed density equation for determining charge flow

EGR_Flow



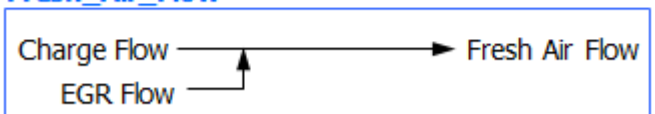
Uses the orifice flow equation in conjunction with a high data rate delta P sensor to predict EGR flow; includes correction factor based on EGR valve lift to account for waveform effects

EGR_Fraction



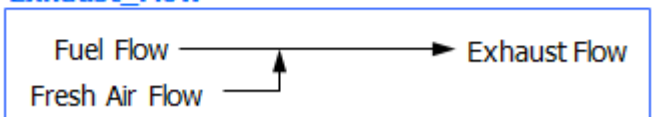
Uses direct calculation (Frac = EGR Flow / Charge Flow)

Fresh_Air_Flow



Uses direct calculation (Fresh = Charge – EGR)

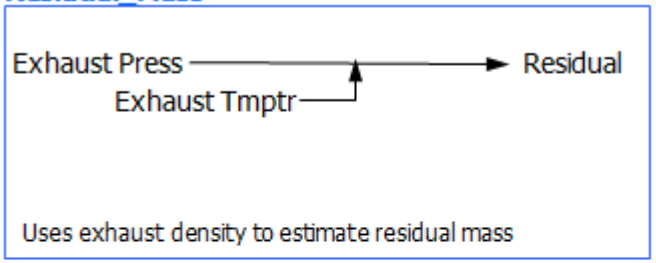
Exhaust_Flow



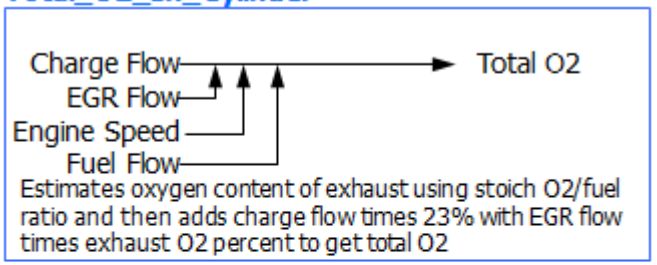
Uses direct calculation (Exhaust = Fresh + Fuel)

Combustion Parameter Virtual Sensors

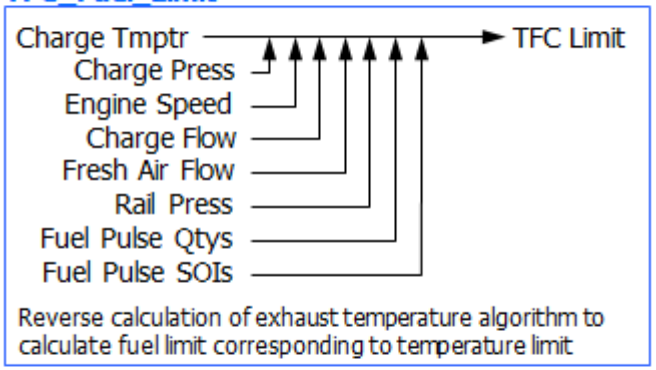
Residual_Mass



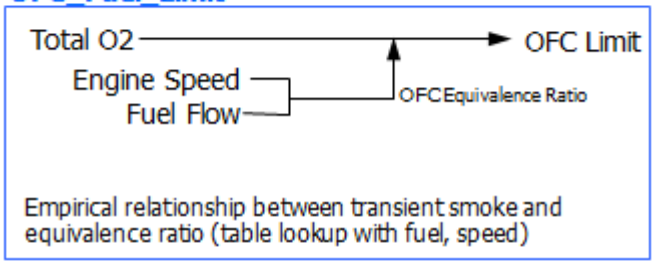
Total_O2_In_Cylinder



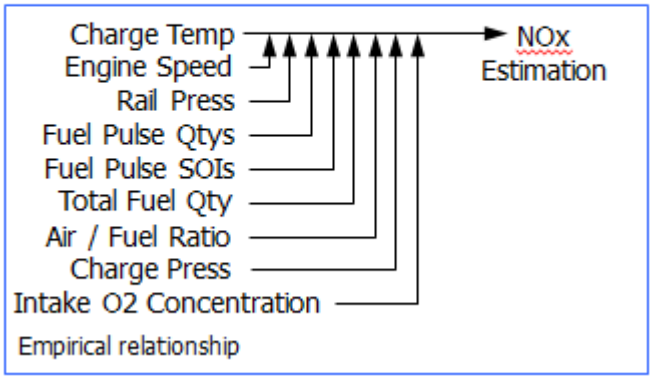
TFC_Fuel_Limit



OFC_Fuel_Limit



NOx Estimation



Aftertreatment Virtual Sensors

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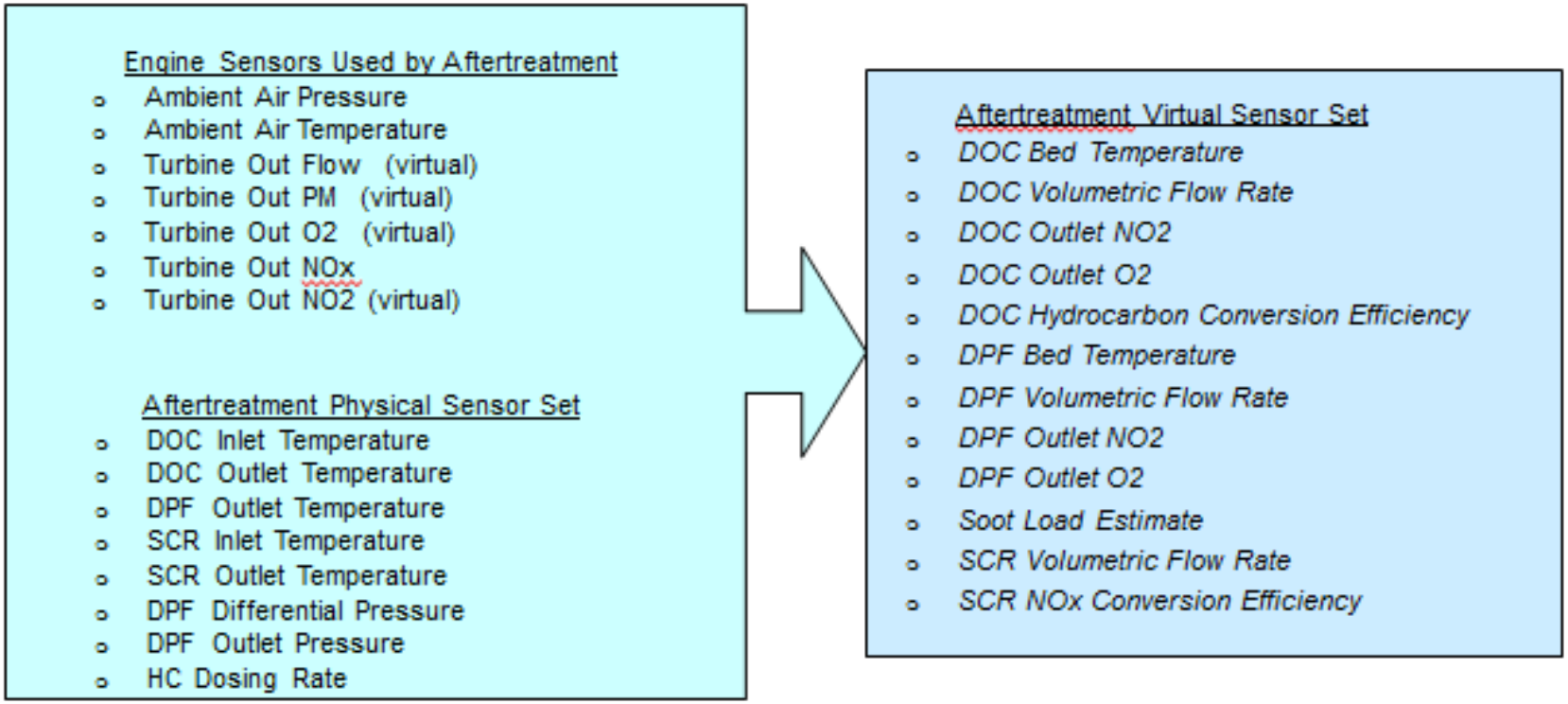
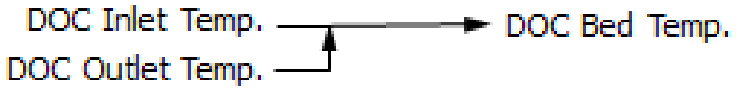
Overview



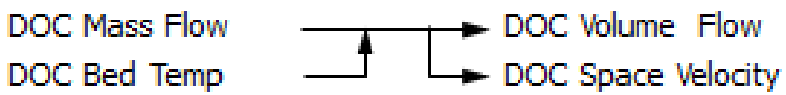
Oxidation Catalyst Parameters

DOC Bed Temperature



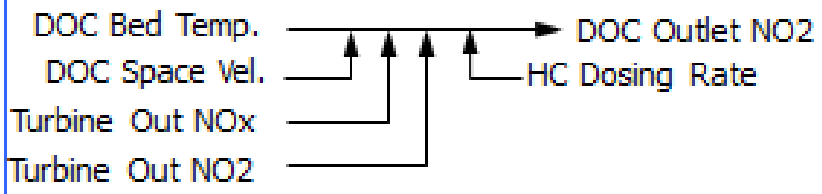
Weighted average of DOC inlet and DOC outlet gas temperatures

DOC Volume Flow



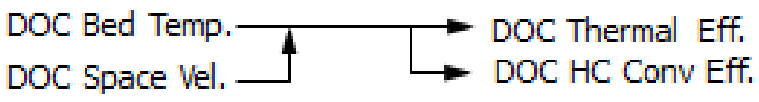
Uses direct calculation from exhaust mass flow

DOC Outlet NO2



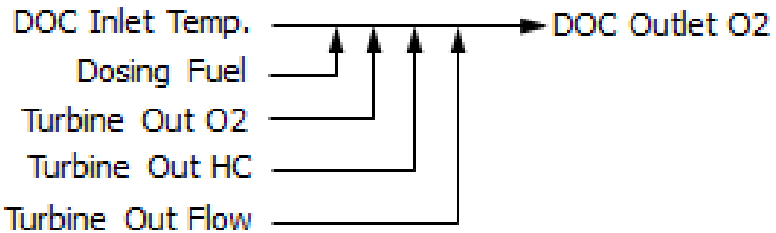
Uses DOC volume flow and bed temp to calulate oxidation efficiency, then sums created NO2 with existing NO2

DOC HC Conversion Efficiency



Uses an empirical lookup

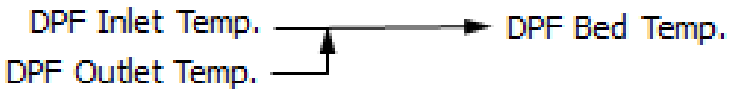
DOC Outlet O2



Uses an energy balance model of the DOC to estimate the O2

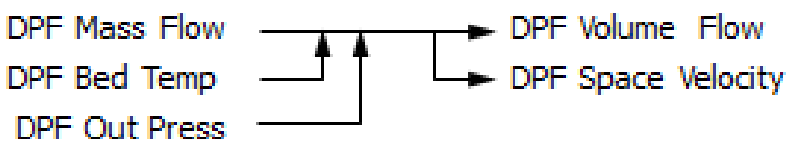
Particulate Filter Parameters

DPF Bed Temperature



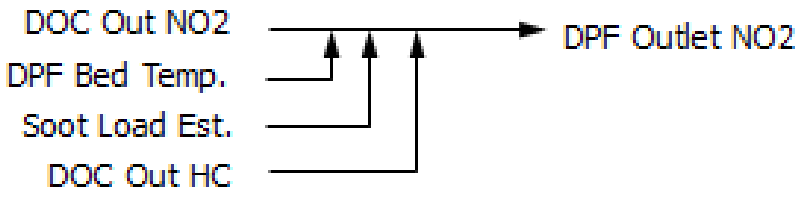
Weighted average of DPF inlet and DPF outlet gas temperatures

DPF Volume Flow



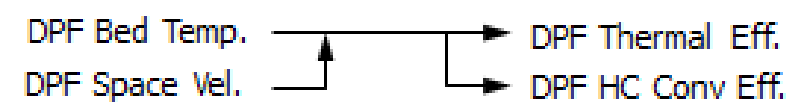
Uses direct calculation from exhaust mass flow

DPF Outlet NO2



Uses DPF volume flow and bed temp to calulate oxidation efficiency, then sums created NO2 with existing NO2

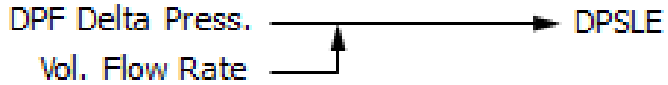
DPF HC Conversion Efficiency



Uses an empirical lookup

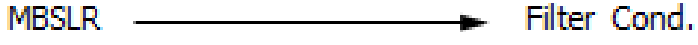
Soot Load Estimation Parameters

Delta Pressure Based Soot Load Estimate (DPSLE)



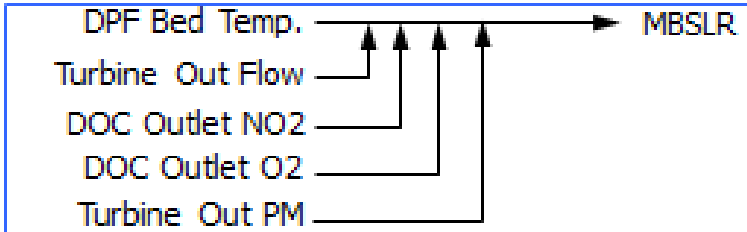
The soot in the DPF is estimated by interpolating in a soot load model based on the volumetric flow rate and comparing these to the DPF delta pressure measurement.

Filter Condition



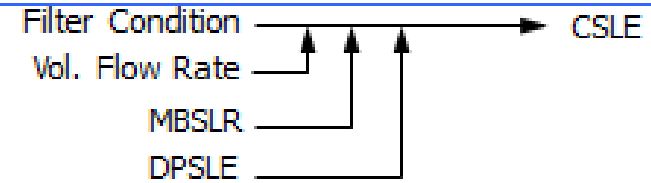
Estimates the degree of soot mal-distribution within the DPF based on soot loading rate

Mass Balance Soot Load Rate (MBSLR)



Uses a physics based equation to estimate soot loading compensating for oxidation by NO2 and O2

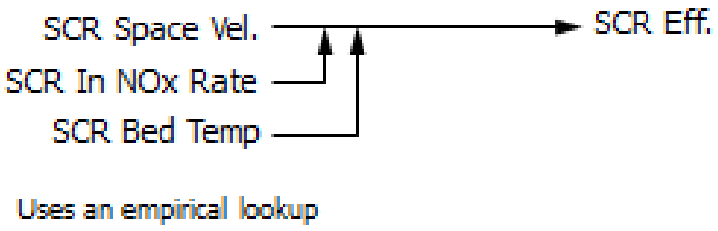
Combined Soot Load Estimate (CSLE)



The CSLE is a weighted average of the MBSLR and the DPSLE. The relative weighting is based on the history and status of the filter provided by the uniform distribution factor and the flow rate.

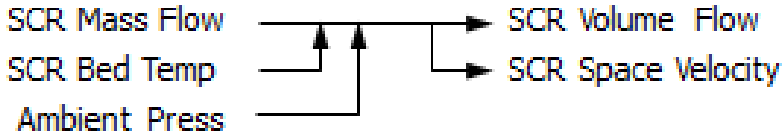
SCR Parameters

SCR NOx Conversion Efficiency



Uses an empirical lookup

SCR Volume Flow



Uses direct calculation from exhaust mass flow

Control System Diagram – Chi Determination Strategy and Interpretation

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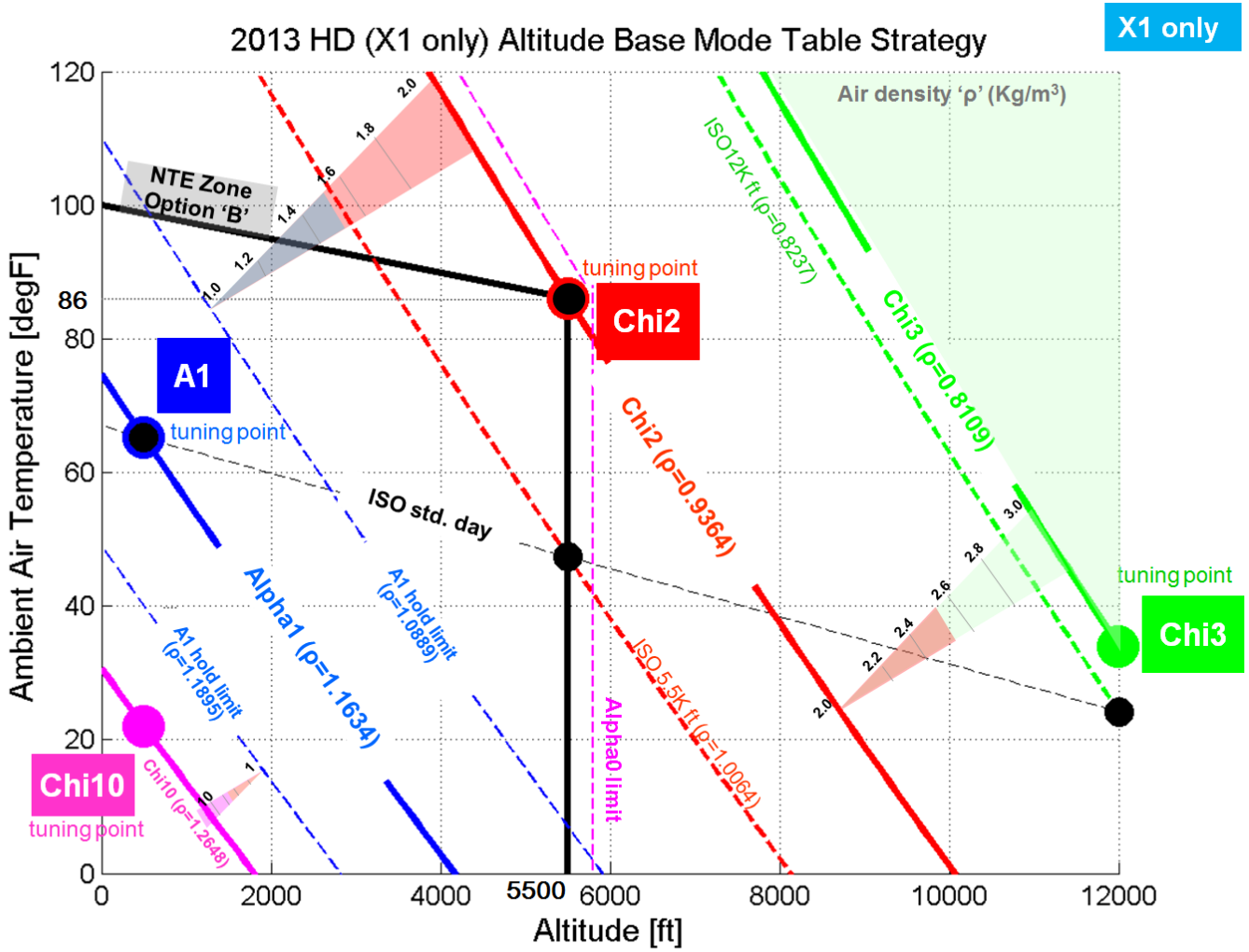
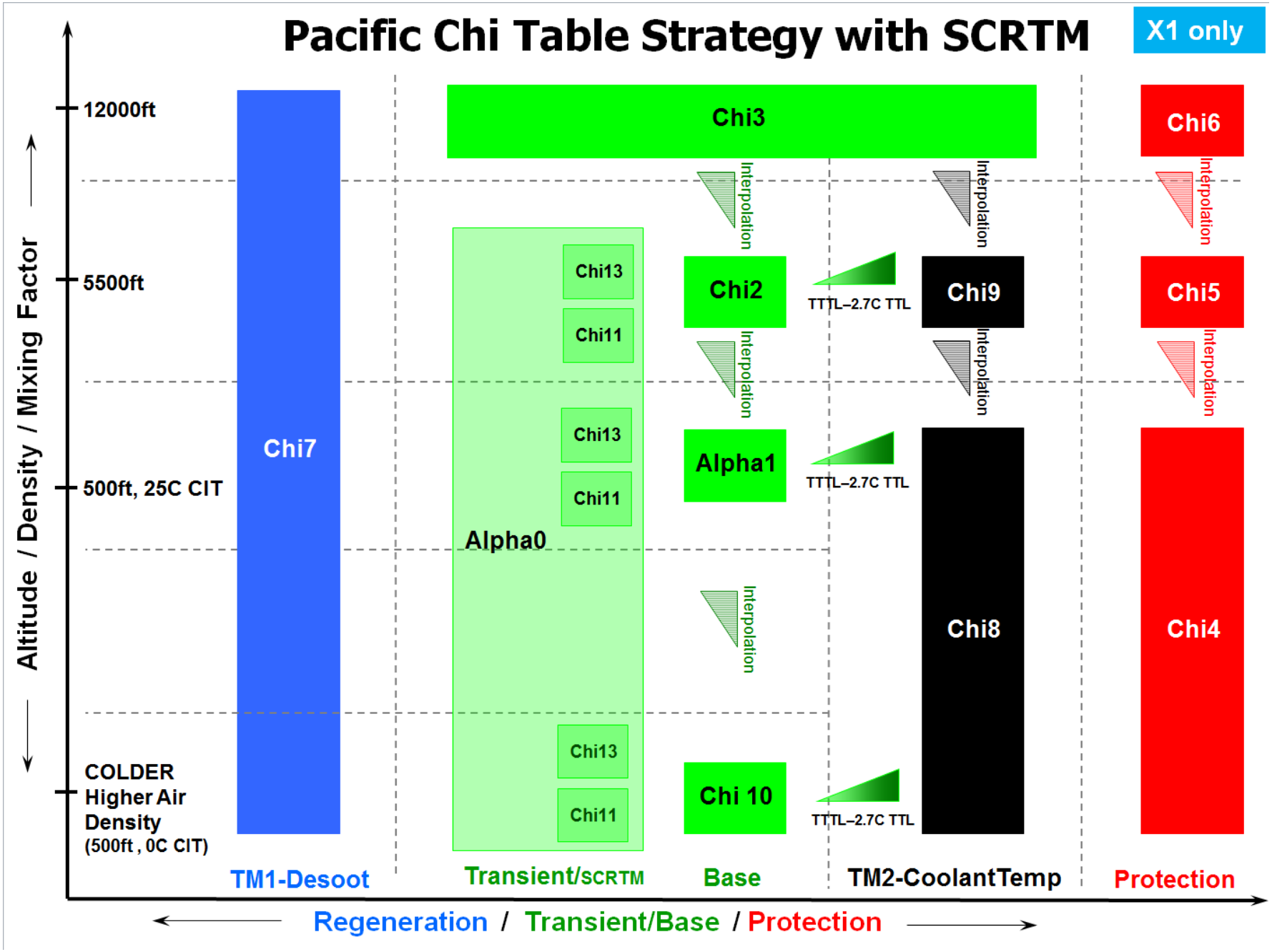
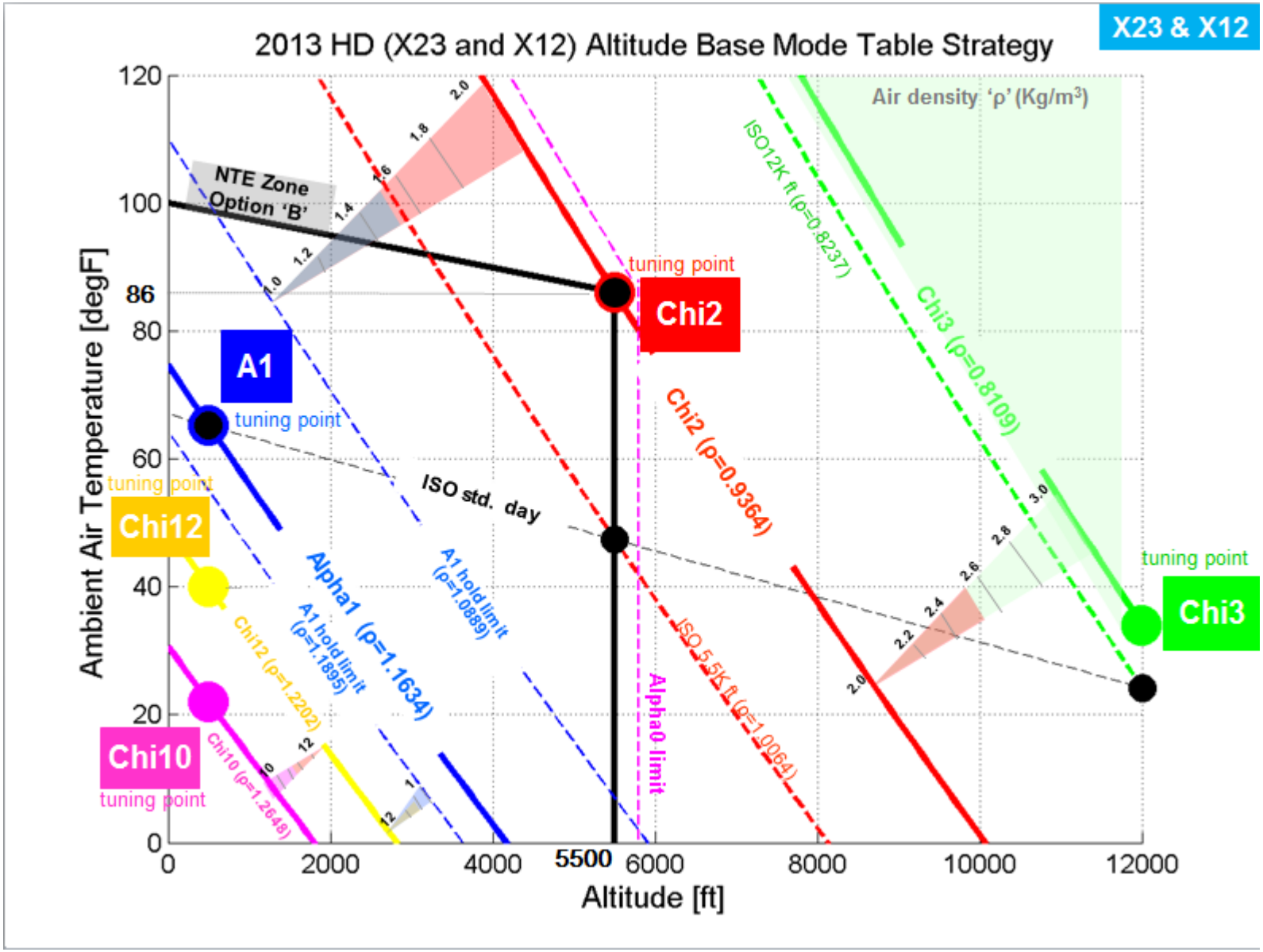
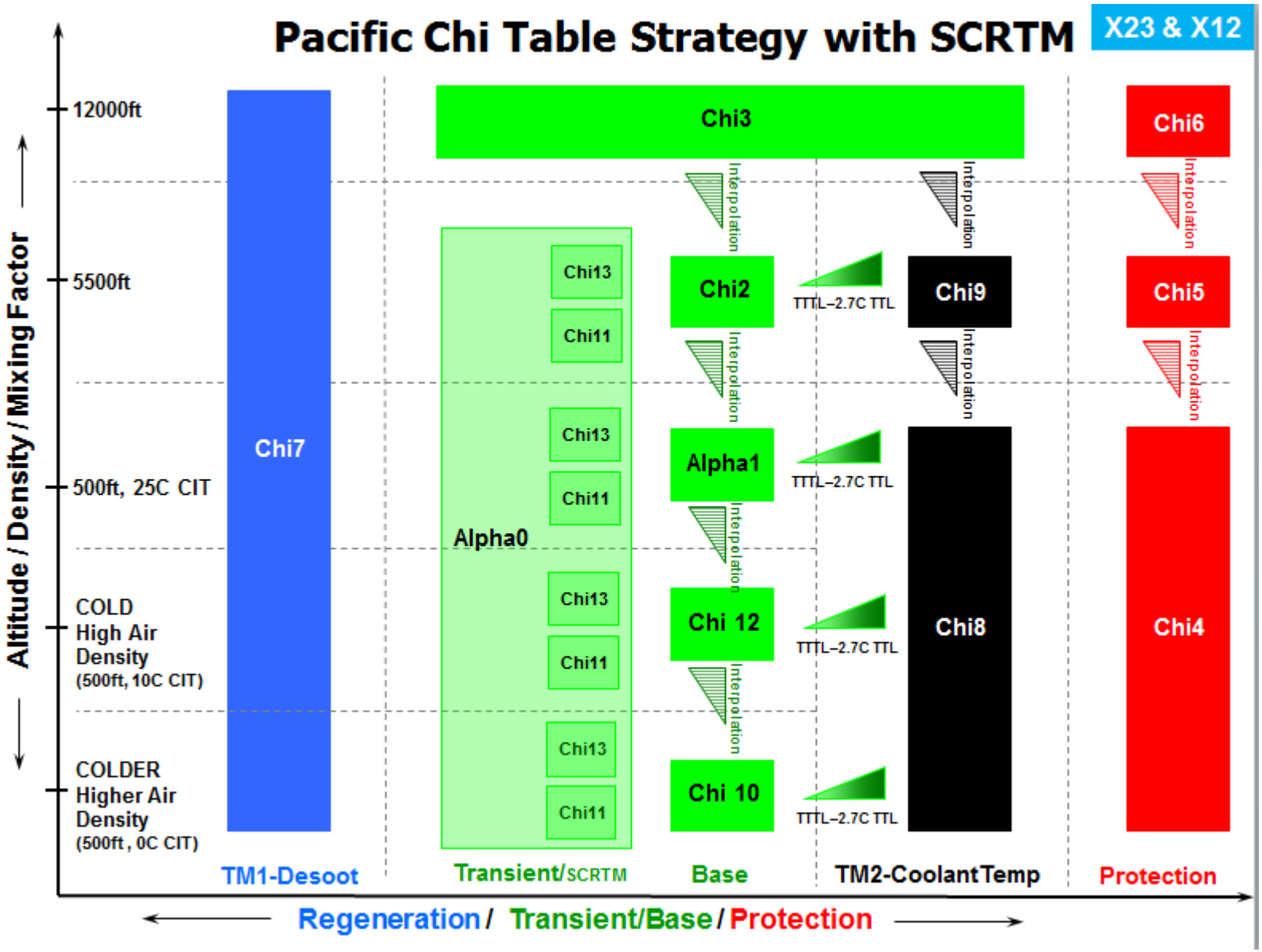
Chi Determination and Interpretation – X1

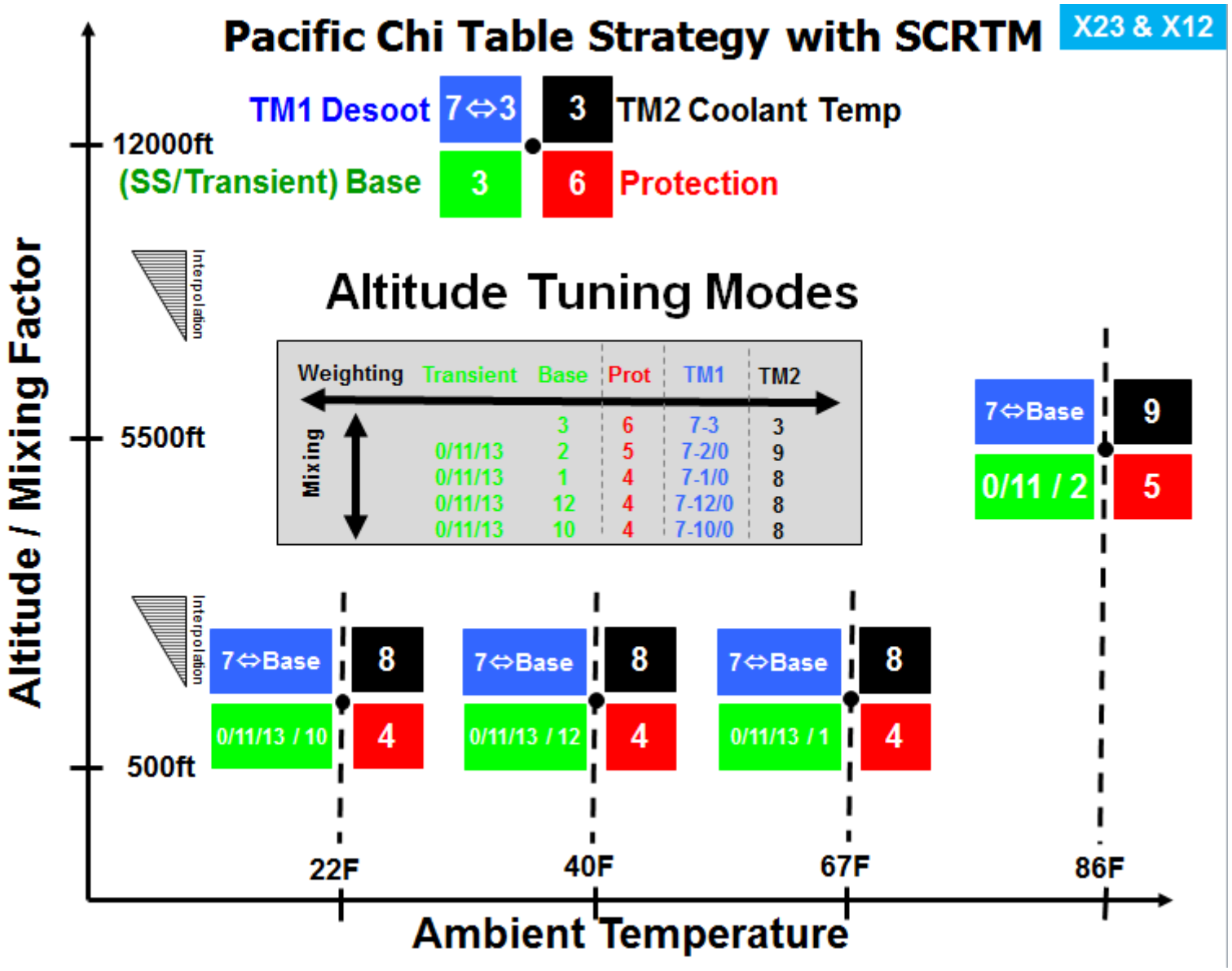



Pacific Chi Table Strategy with SCRTM
X1 only
Altitude / Density / Mixing Factor
12000ft
5500ft
500ft, 25C CIT
COLDER
Higher Air
Density
(500ft , 0C CIT)
Chi7
Chi3
Chi6
Chi13
Chi11
Chi2
Chi9
Chi5
Alpha0
Alpha1
Chi8
Chi4
Chi 10
Interpolation
TTTL–2.7C TTL
TM1-Desoot
Transient/SCRTM
Base
TM2-CoolantTemp
Protection
Regeneration / Transient/Base / Protection

Chi Determination and Interpretation – X23 and X12




Pacific Chi Table Strategy with SCRTM
X23 & X12
Altitude / Density / Mixing Factor
12000ft
5500ft
500ft, 25C CIT
COLD
High Air
Density
(500ft, 10C CIT)
COLDER
Higher Air
Density
(500ft, 0C CIT)
Chi7
Chi3
Chi6
Chi13
Chi11
Alpha0
Chi2
Chi9
Chi5
Alpha1
Chi 12
Chi 10
Chi8
Chi4
Interpolation
TTL–2.7C TTL
TM1-Desoot
Transient/SCRTM
Base
TM2-CoolantTemp
Protection
Regeneration / Transient/Base / Protection


Pacific Chi Table Strategy with SCRTM
X23 & X12
TM1 Desoot
7⇔3
3
TM2 Coolant Temp
(SS/Transient) Base
3
6
Protection
12000ft
5500ft
500ft
Altitude / Mixing Factor
Interpolation
Altitude Tuning Modes
Weighting
Transient
Base
Prot
TM1
TM2
Mixing
3 6 7-3 3
0/11/13 2 5 7-2/0 9
0/11/13 1 4 7-1/0 8
0/11/13 12 4 7-12/0 8
0/11/13 10 4 7-10/0 8
7⇔Base
9
0/11 / 2
5
7⇔Base
8
0/11/13 / 10
4
7⇔Base
8
0/11/13 / 12
4
7⇔Base
8
0/11/13 / 1
4
22F
40F
67F
86F
Ambient Temperature

Chi Table Mask

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CBR_Chi_Table_Mask

HEX	DEC	Value
00000001	1	Alpha-0
00000002	2	Alpha-1
00000004	4	Chi-2
00000008	8	Chi-3
00000010	16	Chi-4
00000020	32	Chi-5
00000040	64	Chi-6
00000080	128	Chi-7
00000100	256	Chi-8
00000200	512	Chi-9
00000400	1024	Chi-10
00000800	2048	Chi-11
00001000	4096	Chi-12
00002000	8192	Chi-13

HEX	DEC	Combination Values
00000003	3	Alpha-0 & Alpha-1
00000801	2049	Alpha-0 & Chi-11
00000006	6	Alpha-1 & Chi-2
00000007	7	Alpha-0 & Alpha-1/Chi-2
00000005	5	Alpha-0 & Chi-2
00000804	2052	Chi-2 & Chi-11
00000805	2053	Chi-2 & Alpha-0/Chi-11
0000000C	12	Chi-2 & Chi-3
00000030	48	Chi-4 & Chi-5
00000060	96	Chi-5 & Chi-6
00000300	768	Chi-8 & Chi-9
00000208	520	Chi-9 & Chi-3
00000401	1025	Alpha-0 & Chi-10
00000403	1027	Alpha-0 & Alpha-1/Chi-10
00000402	1026	Alpha-1 & Chi-10
00001001	4097	Alpha-0 & Chi-12
00001003	4099	Alpha-0 & Alpha-1/Chi-12
00001002	4098	Alpha-1 & Chi-12
		Alpha-0 & Chi-12/Chi-10
00000081	129	Chi-7 & Alpha-0
00000082	130	Chi-7 & Alpha-1
00000086	134	Chi-7 & Alpha-1/Chi-2
00000084	132	Chi-7 & Chi-2
0000008C	140	Chi-7 & Chi-2/Chi-3
00000088	136	Chi-7 & Chi-3

			A0	A1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13
Base Mode	Alpha0	A0	1	3	5	9	17	33	65	129	257	513	1025	2049	4097	8193
Base Mode	Alpha1	A1	3	2	6	10	18	34	66	130	258	514	1026	2050	4098	8194
Base Mode, Altitude	Chi2	C2	5	6	4	12	20	36	68	132	260	516	1028	2052	4100	8196
Base Mode, Altitude	Chi3	C3	9	10	12	8	24	40	72	136	264	520	1032	2056	4104	8200
Protection Mode	Chi4	C4	17	18	20	24	16	48	80	144	272	528	1040	2064	4112	8208
Protection Mode, Altitude	Chi5	C5	33	34	36	40	48	32	96	160	288	544	1056	2080	4128	8224
Protection Mode, Altitude	Chi6	C6	65	66	68	72	80	96	64	192	320	576	1088	2112	4160	8256
Desoot Thermal Mgnt	Chi7	C7	129	130	132	136	144	160	192	128	384	640	1152	2176	4224	8320
High Coolant Temp Mgnt	Chi8	C8	257	258	260	264	272	288	320	384	256	768	1280	2304	4352	8448
High Coolant Temp Mgnt	Chi9	C9	513	514	516	520	528	544	576	640	768	512	1536	2560	4608	8704
Cold Ambient Oper Mode	Chi10	C10	1025	1026	1028	1032	1040	1056	1088	1152	1280	1536	1024	3072	5120	9216
Aggressive SCRTM	Chi11	C11	2049	2050	2052	2056	2064	2080	2112	2176	2304	2560	3072	2048	6144	10240
Cold Ambient Oper Mode	Chi12	C12	4097	4098	4100	4104	4112	4128	4160	4224	4352	4608	5120	6144	4096	12288
Moderate SCRTM	Chi13	C13	8193	8194	8196	8200	8208	8224	8256	8320	8448	8704	9216	10240	12288	8192

Chi Determination Parameters

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(csdd_cbm_ref_lib.mdl\CBM_REF_torque2fuel\determine_chi)

Alpha	None	CBR_Protection_Mixing_Factor	None
Ambient_Air_Press	kPa	CBR_SCRModerTM_ChiHi_Index	None
CBM_Dosing_Prohibit_EGR	None	CBR_SCRModerTM_ChiLo_Index	None
CBR_Alpha	None	CBR_SCRModerTM_Factor	None
CBR_Alpha_WT_Factor	None	CBR_SCRModerTM_Mixing_Factor	None
CBR_ATOL_Chi_High_Index	None	CBR_SCRModerTM_WT_Factor	None
CBR_ATOL_Chi_Low_Index	None	CBR_SCRTM_Chi_High_Index	None
CBR_ATOL_Mixing_Factor	None	CBR_SCRTM_Chi_Low_Index	None
CBR_ATOL_WT_Factor	None	CBR_SCRTM_Factor	None
CBR_Base_Chi_High_Index	None	CBR_SCRTM_Mixing_Factor	None
CBR_Base_Chi_Low_Index	None	CBR_SCRTM_WT_Factor	None
CBR_Base_Chi_Mixing_Factor	None	CBR_Thermal_Felix_Active	None
CBR_Base_Chi_WT_Factor	None	CBR_Thermal_Mgt_Mixing_Factor	None
CBR_Chi_Compressor_Inlet_Density	kg/m3	CBR_Thermal_Mgt2_Mixing_Factor	None
CBR_Compressor_Inlet_Density	kg/m3	CBR_Thermal_Oscar_Active	None
CBR_EC_Alpha_WT_Factor	None	CBR_TM1_Chi_High_Index	None
CBR_EC_Base_Chi_WT_Factor	None	CBR_TM1_Chi_Low_Index	None

CBR_EC_Chi_Table_Mask	HEX	CBR_TM1_Factor	None
CBR_EC_Prot_WT_Factor	None	CBR_TM1_WT_Factor	None
CBR_EC_SCRModerTM_WT_Factor	None	CBR_TM2_Chi_High_Index	None
CBR_EC_SCRTM_WT_Factor	None	CBR_TM2_Chi_Low_Index	None
CBR_EC_TM1_WT_Factor	None	CBR_TM2_Factor	None
CBR_EC_TM2_WT_Factor	None	CBR_TM2_WT_Factor	None
CBR_EGR_Off	None	Combustion_Control_Path_Owner	None
CBR_Max_Ind_Torque_Limit_Status	HEX	Compressor_Inlet_Density	kg/m3
CBR_Prot_Chi_High_Index	None	Compressor_Inlet_Tmptr	Deg_C
CBR_Prot_Chi_Low_Index	None	EMM_Protection_Flag	None
CBR_Prot_Factor	None	H_CBR_EC_Indicated_Torque	N_m
CBR_Prot_WT_Factor	None	Net_Engine_Torque	N_m
CBR_Protection_Chi_Flag	None	Total_Fueling	mg/stroke

(Click here for parameter list in Excel)

V. Pacific CM2350 Fault Code List

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* There may be multiple system errors for some fault codes. For fault codes with multiple errors, see the relevant section for error details.

FC #	System Error	Service Description	Lamp	OBD
111	Mulitple System Errors *	Engine Control Module Critical Internal Failure - Bad intelligent device or component	Stop(Solid)	
115	EPS_Both_Failed_Error	Engine Magnetic Speed/Position Lost Both of Two Signals - Data erratic; intermittent or incorrect	Stop(Solid)	
122	CHARGE_PRESS_OOR_HIGH_ERROR	Intake Manifold 1 Pressure Sensor Circuit - Voltage above normal; or shorted to high source	Warning(Solid)	
123	CHARGE_PRESS_OOR_LOW_ERROR	Intake Manifold 1 Pressure Sensor Circuit - Voltage below normal; or shorted to low source	Warning(Solid)	
124	MCF_UFM_HIFLOW_ERROR	Intake Manifold 1 Pressure - Data Valid But Above Normal Operating Range - Moderately Severe Level	Warning(Solid)	
125	OFC_EQUIV_RATIO_LOWER_LIMIT_ERROR	Intake Manifold 1 Pressure - Data Valid But Below Normal Operating Range - Moderately Severe Level	Warning(Solid)	
131	SAMPLED_THROTTLE_HIGH_ERROR	Accelerator Pedal or Lever Position Sensor 1 Circuit - Voltage above normal; or shorted to high source	Stop(Solid)	
132	SAMPLED_THROTTLE_LOW_ERROR	Accelerator Pedal or Lever Position Sensor 1 Circuit - Voltage below normal; or shorted to low source	Stop(Solid)	
133	REMOTE_ACCEL_POSN_HIGH_ERROR	Remote Accelerator Pedal or Lever Position Sensor 1 Circuit - Voltage above normal; or shorted to high source	Stop(Solid)	
134	REMOTE_ACCEL_POSN_LOW_ERROR	Remote Accelerator Pedal or Lever Position Sensor 1 Circuit - Voltage below normal; or shorted to low source	Stop(Solid)	
135	OIL_PRESSURE_HIGH_ERROR	Engine Oil Rifle Pressure 1 Sensor Circuit - Voltage above normal; or shorted to high source	Warning(Solid)	
141	OIL_PRESSURE_LOW_ERROR	Engine Oil Rifle Pressure 1 Sensor Circuit - Voltage below normal; or shorted to low source	Warning(Solid)	
143	OIL_PRESSURE_FUELING_ERROR	Engine Oil Rifle Pressure - Data Valid But Below Normal Operating Range - Moderately Severe Level	Warning(Solid)	
144	COOLANT_TEMPERATURE_HIGH_ERROR	Engine Coolant Temperature 1 Sensor Circuit - Voltage above normal; or shorted to high source	Warning(Solid)	
145	COOLANT_TEMPERATURE_LOW_ERROR	Engine Coolant Temperature 1 Sensor Circuit - Voltage below normal; or shorted to low source	Warning(Solid)	
146	COOLANT_TEMPERATURE_HIGH_FC_ERROR	Engine Coolant Temperature - Data Valid But Above Normal Operating Range - Moderately Severe Level	Warning(Solid)	
151	COOLANT_TEMPERATURE_RPM_ERROR	Engine Coolant Temperature - Data valid but above normal operational range - Most Severe Level	Stop(Solid)	
153	CHARGE_TMPTR_OOR_HIGH_ERROR	Intake Manifold 1 Temperature Sensor Circuit - Voltage above normal; or shorted to high source	Warning(Solid)	
154	CHARGE_TMPTR_OOR_LOW_ERROR	Intake Manifold 1 Temperature Sensor Circuit - Voltage below normal; or shorted to low source	Warning(Solid)	
155	IMT_RPM_DERATE_ERROR	Intake Manifold 1 Temperature - Data valid but above normal operational range - Most Severe Level	Stop(Solid)	
175	Mulitple System Errors *	Electronic Throttle Control Actuator Driver Circuit - Voltage above normal, or shorted to high source	Stop(Solid)	
176	Mulitple System Errors *	Electronic Throttle Control Actuator Driver Circuit - Voltage below normal, or shorted to low source	Stop(Solid)	
177	IAT_HB_VALVE_AUTOZERO_ERROR	Electronic Throttle Control Actuator - Mechanical system not responding or out of adjustment	Stop(Solid)	
187	SENSOR_SUPPLY_2_VOLTAGE_LOW_ERROR	Sensor Supply 2 Circuit - Voltage below normal; or shorted to low source	Warning(Solid)	
195	COOLANT_LEVEL_HIGH_ERROR	Coolant Level Sensor 1 Circuit - Voltage above normal; or shorted to high source	Warning(Solid)	
196	COOLANT_LEVEL_LOW_ERROR	Coolant Level Sensor 1 Circuit - Voltage below normal; or shorted to low source	Warning(Solid)	
197	ENGINE_COOLANT_LEVEL_LOW	Coolant Level - Data Valid But Below Normal Operating Range - Moderately Severe Level	Warning(Solid)	

212	OIL_TEMPERATURE_HIGH_ERROR	Engine Oil Temperature Sensor 1 Circuit - Voltage above normal; or shorted to high source	Warning(Solid)	
213	OIL_TEMPERATURE_LOW_ERROR	Engine Oil Temperature Sensor 1 Circuit - Voltage below normal; or shorted to low source	Warning(Solid)	
214	OIL_TEMPERATURE_ABOVE_NORMAL_ERROR	Engine Oil Temperature - Data valid but above normal operational range - Most Severe Level	Stop(Solid)	
221	AMBIENT_AIR_PRESSURE_HIGH_ERROR	Barometric Pressure Sensor Circuit - Voltage above normal; or shorted to high source	Warning(Solid)	
222	AMBIENT_AIR_PRESSURE_LOW_ERROR	Barometric Pressure Sensor Circuit - Voltage below normal; or shorted to low source	Warning(Solid)	
227	SENSOR_SUPPLY_2_VOLTAGE_HIGH_ERROR	Sensor Supply 2 Circuit - Voltage above normal; or shorted to high source	Warning(Solid)	
234	ENGINE_OVERSPEED_ERROR	Engine Crankshaft Speed/Position - Data valid but above normal operational range - Most Severe Level	Stop(Solid)	
235	COOLANT_LEVEL_FUELING_ERROR	Coolant Level - Data valid but below normal operational range - Most Severe Level	Stop(Solid)	
238	SENSOR_SUPPLY_3_VOLTAGE_LOW_ERROR	Sensor Supply 3 Circuit - Voltage below normal; or shorted to low source	Warning(Solid)	
239	SENSOR_SUPPLY_3_VOLTAGE_HIGH_ERROR	Sensor Supply 3 Circuit - Voltage above normal; or shorted to high source	Warning(Solid)	
241	Mulitple System Errors *	Wheel-Based Vehicle Speed - Data erratic; intermittent or incorrect	Warning(Solid)	
242	VSS_TAMPERING_ERROR	Wheel-Based Vehicle Speed Sensor Circuit tampering has been detected - Abnormal rate of change	Warning(Solid)	
245	FAN_CLUTCH_HIGH_CTRL_ERROR	Fan Control Circuit - Voltage below normal; or shorted to low source	Warning(Solid)	
249	AIR_TMPTR_OOR_HIGH_ERROR	Ambient Air Temperature Sensor 1 Circuit - Voltage above normal; or shorted to high source	Warning(Solid)	
256	AIR_TMPTR_OOR_LOW_ERROR	Ambient Air Temperature Sensor 1 Circuit - Voltage below normal; or shorted to low source	Warning(Solid)	
271	APC_IMV_SHORT_ERROR	Engine Fuel Pump Pressurizing Assembly 1 Circuit - Voltage below normal; or shorted to low source	Warning(Solid)	
272	APC_IMV_OPEN_ERROR	Engine Fuel Pump Pressurizing Assembly 1 Circuit - Voltage above normal; or shorted to high source	Warning(Solid)	
285	Mulitple System Errors *	SAE J1939 Multiplexing PGN Timeout Error - Abnormal update rate	Warning(Solid)	
286	Mulitple System Errors *	SAE J1939 Multiplexing Configuration Error - Out of Calibration	Warning(Solid)	
288	J39_MUX_REM_ACCEL_DATA_ERROR	SAE J1939 Multiplexing Remote Accelerator Pedal or Lever Position Sensor System - Received Network Data In Error	Stop(Solid)	
295	Mulitple System Errors *	Barometric Pressure - Data erratic, intermittent or incorrect	Warning(Solid)	
322	Injector_1_Circuit_1_Error	Injector Solenoid Driver Cylinder 1 Circuit - Current below normal or open circuit	Warning(Solid)	
323	Injector_5_Circuit_1_Error	Injector Solenoid Driver Cylinder 5 Circuit - Current below normal or open circuit	Warning(Solid)	
324	Injector_3_Circuit_1_Error	Injector Solenoid Driver Cylinder 3 Circuit - Current below normal or open circuit	Warning(Solid)	
325	Injector_6_Circuit_1_Error	Injector Solenoid Driver Cylinder 6 Circuit - Current below normal or open circuit	Warning(Solid)	
331	Injector_2_Circuit_1_Error	Injector Solenoid Driver Cylinder 2 Circuit - Current below normal or open circuit	Warning(Solid)	
332	Injector_4_Circuit_1_Error	Injector Solenoid Driver Cylinder 4 Circuit - Current below normal or open circuit	Warning(Solid)	
334	Mulitple System Errors *	Engine Coolant Temperature - Data erratic; intermittent or incorrect	Warning(Solid)	
338	ISD_RELAY_LOW_ERROR	Idle Shutdown Vehicle Accessories Relay Driver Circuit - Voltage above normal; or shorted to high source	Warning(Solid)	
339	ISD_RELAY_HIGH_ERROR	Idle Shutdown Vehicle Accessories Relay Driver Circuit - Voltage below normal; or shorted to low source	Warning(Solid)	

343	POWEROFF_COMMAND_IGNORED_ERROR	Engine Control Module Warning Internal Hardware Failure - Bad intelligent device or component	Warning(Solid)	
346	TRIMS_CONFIGURATION_ERROR	Engine Control Module Calibration Memory Software - Bad intelligent device or component	Warning(Solid)	
351	Low_Boost_Voltage_Error	Injector Power Supply - Bad intelligent device or component	Warning(Solid)	
352	SENSOR_SUPPLY_1_VOLTAGE_LOW_ERROR	Sensor Supply 1 Circuit - Voltage below normal; or shorted to low source	Warning(Solid)	
386	SENSOR_SUPPLY_1_VOLTAGE_HIGH_ERROR	Sensor Supply 1 Circuit - Voltage above normal; or shorted to high source	Warning(Solid)	
415	OIL_PRESSURE_RPM_ERROR	Engine Oil Rifle Pressure - Data valid but below normal operational range - Most Severe Level	Stop(Solid)	
418	WATER_IN_FUEL_ERROR	Water in Fuel Indicator - Data Valid But Above Normal Operating Range - Least Severe Level	Warning(Blinking)	
421	OIL_TEMPERATURE_FUELING_ERROR	Engine Oil Temperature - Data Valid But Above Normal Operating Range - Moderately Severe Level	Warning(Solid)	
425	Mulitple System Errors *	Engine Oil Temperature - Data erratic; intermittent or incorrect	Warning(Solid)	
427	J1939_AUX_NDOT_TIMEOUT_ERROR	SAE J1939 Datalink - Abnormal update rate	None	
428	WATER_IN_FUEL_HIGH_ERROR	Water in Fuel Indicator Sensor Circuit - Voltage above normal; or shorted to high source	Warning(Solid)	
429	WATER_IN_FUEL_LOW_ERROR	Water in Fuel Indicator Sensor Circuit - Voltage below normal; or shorted to low source	Warning(Solid)	
435	Mulitple System Errors *	Engine Oil Rifle Pressure - Data erratic, intermittent or incorrect	Warning(Solid)	
436	Mulitple System Errors *	Intake Manifold 1 Temperature - Data erratic; intermittent or incorrect	Warning(Solid)	
441	BATTERY_VOLTAGE_LOW_ERROR	Battery 1 Voltage - Data Valid But Below Normal Operating Range - Moderately Severe Level	Warning(Solid)	
442	BATTERY_VOLTAGE_HIGH_ERROR	Battery 1 Voltage - Data Valid But Above Normal Operating Range - Moderately Severe Level	Warning(Solid)	
451	APC_DIESEL_PRS_OOR_HIGH_ERROR	Injector Metering Rail 1 Pressure Sensor Circuit - Voltage above normal; or shorted to high source	Warning(Solid)	
452	APC_DIESEL_PRS_OOR_LOW_ERROR	Injector Metering Rail 1 Pressure Sensor Circuit - Voltage below normal; or shorted to low source	Warning(Solid)	
483	APC_DIESEL_PRS2_OOR_HIGH_ERROR	Injector Metering Rail 2 Pressure Sensor Circuit - Voltage above normal; or shorted to high source	Warning(Solid)	
484	APC_DIESEL_PRS2_OOR_LOW_ERROR	Injector Metering Rail 2 Pressure Sensor Circuit - Voltage below normal; or shorted to low source	Warning(Solid)	
515	SENSOR_SUPPLY_6_VOLTAGE_HIGH_ERROR	Sensor Supply 6 Circuit - Voltage above normal; or shorted to high source	Warning(Solid)	
516	SENSOR_SUPPLY_6_VOLTAGE_LOW_ERROR	Sensor Supply 6 Circuit - Voltage below normal; or shorted to low source	Warning(Solid)	
535	Mulitple System Errors *	Engine Fuel Temperature - Data erratic; intermittent or incorrect	Warning(Solid)	
553	APC_DIESEL_HIGH_PRS_ERROR	Injector Metering Rail 1 Pressure - Data Valid But Above Normal Operating Range - Moderately Severe Level	Warning(Solid)	
555	CRANKCASE_PRESSURE_MOD_HIGH	Crankcase Pressure - Data Valid But Above Normal Operating Range - Moderately Severe Level	Warning(Solid)	
556	CRANKCASE_PRESSURE_SEV_HIGH	Crankcase Pressure - Data valid but above normal operational range - Most Severe Level	Stop(Solid)	
559	APC_DIESEL_LOW_PRS_ERROR	Injector Metering Rail 1 Pressure - Data Valid But Below Normal Operating Range - Moderately Severe Level	Warning(Solid)	
584	SL_RELAY_LOW_ERROR	Starter Relay Driver Circuit - Voltage above normal; or shorted to high source	Warning(Solid)	
585	SL_RELAY_HIGH_ERROR	Starter Relay Driver Circuit - Voltage below normal; or shorted to low source	Warning(Solid)	
595	TURBO_SPEED_OOR_HIGH_ERROR	Turbocharger 1 Speed - Data Valid But Above Normal Operating Range - Moderately Severe Level	Warning(Solid)	

596	AFW_HIGH_VOLTAGE_ERROR	Electrical Charging System Voltage - Data Valid But Above Normal Operating Range - Moderately Severe Level	Warning(Solid)	
597	AFW_LOW_VOLTAGE_ERROR	Electrical Charging System Voltage - Data Valid But Below Normal Operating Range - Moderately Severe Level	Warning(Solid)	
598	AFW_VERY_LOW_VOLTAGE_ERROR	Electrical Charging System Voltage - Data valid but below normal operational range - Most Severe Level	Stop(Solid)	
629	CHRG_EPD_TDP_TRQ_DRT_ERROR	Turbocharger 1 Compressor Intake Pressure - Data Valid But Below Normal Operating Range - Moderately Severe Level	Warning(Solid)	
649	LUBE_OIL_REQUIRES_CHANGE_ERROR	Engine Oil Change Interval - Condition Exists	Warning(Blinking)	
687	TURBO_SPEED_OOR_LOW_ERROR	Turbocharger 1 Speed - Data Valid But Below Normal Operating Range - Moderately Severe Level	Warning(Solid)	
689	Mulitple System Errors *	Engine Crankshaft Speed/Position - Data erratic; intermittent or incorrect	Warning(Solid)	
691	COMP_IN_TMPTR_OOR_HIGH_ERROR	Turbocharger 1 Compressor Intake Temperature Circuit - Voltage above normal; or shorted to high source	Warning(Solid)	
692	COMP_IN_TMPTR_OOR_LOW_ERROR	Turbocharger 1 Compressor Intake Temperature Circuit - Voltage below normal; or shorted to low source	Warning(Solid)	
693	Mulitple System Errors *	Turbocharger 1 Compressor Intake Temperature - Data erratic; intermittent or incorrect	Warning(Solid)	
731	EPS_Phase_Shift_Error	Engine Speed / Position Camshaft and Crankshaft Misalignment - Mechanical system not responding or out of adjustment	Warning(Solid)	
755	Mulitple System Errors *	Injector Metering Rail 1 Pressure - Mechanical system not responding or out of adjustment	Warning(Solid)	
778	Mulitple System Errors *	Engine Camshaft Speed / Position Sensor - Data erratic; intermittent or incorrect	Warning(Solid)	
784	Mulitple System Errors *	Adaptive Cruise Control Mode - Data erratic; intermittent or incorrect	None	
1117	Mulitple System Errors *	Power Supply Lost With Ignition On - Data erratic, intermittent or incorrect	None	
1139	QTD_INJECTOR_1_COI_ERROR	Injector Solenoid Driver Cylinder 1 - Mechanical system not responding or out of adjustment	Warning(Solid)	
1141	QTD_INJECTOR_2_COI_ERROR	Injector Solenoid Driver Cylinder 2 - Mechanical system not responding or out of adjustment	Warning(Solid)	
1142	QTD_INJECTOR_3_COI_ERROR	Injector Solenoid Driver Cylinder 3 - Mechanical system not responding or out of adjustment	Warning(Solid)	
1143	QTD_INJECTOR_4_COI_ERROR	Injector Solenoid Driver Cylinder 4 - Mechanical system not responding or out of adjustment	Warning(Solid)	
1144	QTD_INJECTOR_5_COI_ERROR	Injector Solenoid Driver Cylinder 5 - Mechanical system not responding or out of adjustment	Warning(Solid)	
1145	QTD_INJECTOR_6_COI_ERROR	Injector Solenoid Driver Cylinder 6 - Mechanical system not responding or out of adjustment	Warning(Solid)	
1228	Mulitple System Errors *	EGR Valve Position - Data erratic; intermittent or incorrect	Warning(Solid)	
1239	ACCEL_POS_SENSOR2_HIGH_ERROR	Accelerator Pedal or Lever Position Sensor 2 Circuit - Voltage above normal; or shorted to high source	Warning(Solid)	
1241	ACCEL_POS_SENSOR2_LOW_ERROR	Accelerator Pedal or Lever Position Sensor 2 Circuit - Voltage below normal; or shorted to low source	Warning(Solid)	
1242	DUAL_ACCEL_CONFORMANCE_ERROR	Accelerator Pedal or Lever Position Sensor 1 - Data erratic; intermittent or incorrect	Stop(Solid)	
1515	J39_MUX_ACCEL_DATA_ERROR	SAE J1939 Multiplexed Accelerator Pedal or Lever Sensor System - Received Network Data In Error	Stop(Solid)	
1654	CYLINDER_1_MISFIRE_ERROR	Engine Misfire Cylinder 1 - Condition Exists	Warning(Solid)	
1655	CYLINDER_2_MISFIRE_ERROR	Engine Misfire Cylinder 2 - Condition Exists	Warning(Solid)	
1656	CYLINDER_3_MISFIRE_ERROR	Engine Misfire Cylinder 3 - Condition Exists	Warning(Solid)	

1657	CYLINDER_4_MISFIRE_ERROR	Engine Misfire Cylinder 4 - Condition Exists	Warning(Solid)	
1658	CYLINDER_5_MISFIRE_ERROR	Engine Misfire Cylinder 5 - Condition Exists	Warning(Solid)	
1659	CYLINDER_6_MISFIRE_ERROR	Engine Misfire Cylinder 6 - Condition Exists	Warning(Solid)	
1664	DOC_NOT_PRESENT_ERR	Aftertreatment 1 Diesel Oxidation Catalyst Missing - Condition Exists	Warning(Solid)	
1668	UREA_TANKLVL_OOR_LO_ERR	Aftertreatment 1 Diesel Exhaust Fluid Tank Level Sensor Circuit - Voltage below normal; or shorted to low source	Warning(Solid)	
1669	UREA_TANKLVL_OOR_HI_ERR	Aftertreatment 1 Diesel Exhaust Fluid Tank Level Sensor Circuit - Voltage above normal; or shorted to high source	Warning(Solid)	
1673	UREA_TANKLVL_EMPTY_MAINT_ERR	Aftertreatment 1 Diesel Exhaust Fluid Tank Level - Data valid but below normal operational range - Most Severe Level	Warning(Solid)	
1677	UREA_TANKT_OOR_LO_ERR	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature Sensor - Voltage below normal; or shorted to low source	Warning(Solid)	
1678	UREA_TANKT_OOR_HI_ERR	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature Sensor - Voltage above normal; or shorted to high source	Warning(Solid)	
1679	UREA_TANKT_IR_ERR	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature - Data erratic; intermittent or incorrect	Warning(Solid)	
1682	UREA_DOSER_FAIL_TO_PRIME_ERR	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Input Lines - Condition Exists	Warning(Solid)	
1683	UTDD_TANKHTR1_HIGH_ERR	Aftertreatment 1 Diesel Exhaust Fluid Tank Heater - Voltage above normal; or shorted to high source	Warning(Solid)	
1684	UTDD_TANKHTR1_LOW_ERR	Aftertreatment 1 Diesel Exhaust Fluid Tank Heater - Voltage below normal; or shorted to low source	Warning(Solid)	
1691	DOC_NMHC_LOW_EFF_ERR	Aftertreatment 1 Diesel Oxidation Catalyst Conversion Efficiency - Data Valid But Below Normal Operating Range - Moderately Severe Level	Warning(Solid)	
1694	Mulitple System Errors *	Aftertreatment 1 Outlet NOx Sensor - Data erratic; intermittent or incorrect	Warning(Solid)	
1695	SENSOR_SUPPLY_5_VOLTAGE_HIGH_ERROR	Sensor Supply 5 - Voltage above normal; or shorted to high source	Warning(Solid)	
1696	SENSOR_SUPPLY_5_VOLTAGE_LOW_ERROR	Sensor Supply 5 - Voltage below normal; or shorted to low source	Warning(Solid)	
1712	UREA_TANKHTR1_FAIL_TO_THAW_ERR	Aftertreatment 1 Diesel Exhaust Fluid Tank Heater - Data Valid But Below Normal Operating Range - Moderately Severe Level	Warning(Solid)	
1713	UREA_TANKHTR1_STUCK_ON_ERR	Aftertreatment 1 Diesel Exhaust Fluid Tank Heater - Data Valid But Above Normal Operating Range - Moderately Severe Level	Warning(Solid)	
1718	MULTIPLE_CYLINDERS_MISFIRE_ERROR	Engine Misfire for Multiple Cylinders - Condition Exists	Warning(Solid)	
1843	CRANKCASE_PRESS_OOR_HIGH_ERROR	Crankcase Pressure Circuit - Voltage above normal; or shorted to high source	Warning(Solid)	
1844	CRANKCASE_PRESS_OOR_LOW_ERROR	Crankcase Pressure Circuit - Voltage below normal; or shorted to low source	Warning(Solid)	
1852	WATER_IN_FUEL_EXTENDED_TIME_ERROR	Water in Fuel Indicator - Data Valid But Above Normal Operating Range - Moderately Severe Level	Warning(Solid)	
1866	Mulitple System Errors *	Exhaust Gas Recirculation Differential Pressure - Data erratic, intermittent or incorrect	Warning(Solid)	
1867	Mulitple System Errors *	Exhaust Gas Recirculation Temperature - Data erratic; intermittent or incorrect	Warning(Solid)	
1879	DPF_DELTAP_OOR_HI_ERR	Aftertreatment Diesel Particulate Filter Differential Pressure Sensor Circuit - Voltage above normal; or shorted to high source	Warning(Solid)	
1881	DPF_DELTAP_OOR_LO_ERR	Aftertreatment Diesel Particulate Filter Differential Pressure Sensor Circuit - Voltage below normal; or shorted to low source	Warning(Solid)	
1883	Mulitple System Errors *	Aftertreatment Diesel Particulate Filter Differential Pressure Sensor - Data erratic; intermittent or incorrect	Warning(Solid)	

1885	Mulitple System Errors *	Aftertreatment 1 Intake NOx Sensor Circuit - Voltage below normal; or shorted to low source	Warning(Solid)	
1887	Mulitple System Errors *	Aftertreatment 1 Outlet NOx Sensor Circuit - Voltage below normal; or shorted to low source	Warning(Solid)	
1896	Mulitple System Errors *	EGR Valve Controller - Out of Calibration	Warning(Solid)	
1898	VGA_DL_SPAN_CHECK_ERROR	VGT Actuator Controller - Out of Calibration	Warning(Solid)	
1921	DPF_SOOT_LOAD_HI_ERR	Aftertreatment Diesel Particulate Filter Differential Pressure - Data Valid But Above Normal Operating Range - Moderately Severe Level	Warning(Solid)	
1922	DPF_SOOT_LOAD_SEVERE_ERR	Aftertreatment Diesel Particulate Filter Differential Pressure - Data valid but above normal operational range - Most Severe Level	Stop(Solid)	
1923	DOSER_FSOV_PWM_HIGH_ERR	Aftertreatment Fuel Shutoff Valve Circuit - Voltage above normal; or shorted to high source	Warning(Solid)	
1924	DOSER_FSOV_PWM_LOW_ERR	Aftertreatment Fuel Shutoff Valve Circuit - Voltage below normal; or shorted to low source	Warning(Solid)	
1925	DFSOV_LEAK_DOSER_FTP_ERR	Aftertreatment Fuel Shutoff Valve - Data erratic; intermittent or incorrect	Warning(Solid)	
1926	HC_DOSERP_INRANGE_ERR	Aftertreatment Fuel Pressure Sensor - Data erratic; intermittent or incorrect	Warning(Solid)	
1927	HC_DOSERP_OOR_HI_ERR	Aftertreatment Fuel Pressure Sensor Circuit - Voltage above normal; or shorted to high source	Warning(Solid)	
1928	HC_DOSERP_OOR_LO_ERR	Aftertreatment Fuel Pressure Sensor Circuit - Voltage below normal; or shorted to low source	Warning(Solid)	
1932	HC_DOSER_SYS_LEAK_ERR	Aftertreatment Doser - Data erratic; intermittent or incorrect	Warning(Solid)	
1938	VGA_DL_VOLTAGE_LOW_ERROR	ECU Power Output Supply Voltage 1 - Data Valid But Below Normal Operating Range - Moderately Severe Level	Warning(Solid)	
1939	VGA_DL_PS_HIGH_ERROR	ECU Power Output Supply Voltage 1 - Voltage above normal; or shorted to high source	Warning(Solid)	
1941	VGA_DL_PS_LOW_ERROR	ECU Power Output Supply Voltage 1 - Voltage below normal; or shorted to low source	Warning(Solid)	
1942	BEYOND_THD_AZ_ERROR	Crankcase Pressure - Data erratic; intermittent or incorrect	Warning(Solid)	
1943	CBR_DENSITY_DERATE_ERROR_ID	Ambient Air Density - Data Valid But Below Normal Operating Range - Least Severe Level	None	
1961	EGA_DRIVER_IC_OVER_TMPTR_ERROR	EGR Valve Control Circuit Over Temperature - Data Valid But Above Normal Operating Range - Least Severe Level	Warning(Solid)	
1962	VGA_DL_OVER_TEMPERATURE_ERROR	VGT Actuator Driver Over Temperature (Calculated) - Data Valid But Above Normal Operating Range - Least Severe Level	Warning(Solid)	
1963	DFSOV_FTO_ERR	Aftertreatment Fuel Shutoff Valve - Mechanical system not responding or out of adjustment	Warning(Solid)	
1977	DOSER_INJ_ELEC_ERR	Aftertreatment Doser Circuit - Current below normal or open circuit.	Warning(Solid)	
1981	DPF_DELTAP_HIGH_ERR	Aftertreatment 1 Diesel Particulate Filter System - Data Valid But Above Normal Operating Range - Least Severe Level	Warning(Solid)	
2182	ENG_BRK_DRV1_LOW_CONTROL_ERROR	Engine Brake Actuator Driver 1 Circuit - Voltage above normal; or shorted to high source	Warning(Solid)	
2183	ENG_BRK_DRV1_HIGH_CONTROL_ERROR	Engine Brake Actuator Driver 1 Circuit - Voltage below normal; or shorted to low source	Warning(Solid)	
2185	SENSOR_SUPPLY_4_VOLTAGE_HIGH_ERROR	Sensor Supply 4 Circuit - Voltage above normal; or shorted to high source	Warning(Solid)	
2186	SENSOR_SUPPLY_4_VOLTAGE_LOW_ERROR	Sensor Supply 4 Circuit - Voltage below normal; or shorted to low source	Warning(Solid)	
2198	VGA_DL_COMMAND_SOURCE_ERROR	VGT Actuator Driver Circuit - Root Cause Not Known	Warning(Solid)	
2265	Mulitple System Errors *	Electric Lift Pump for Engine Fuel Supply Circuit - Voltage above normal; or shorted to high source	Warning(Solid)	

2266	Mulitple System Errors *	Electric Lift Pump for Engine Fuel Supply Circuit - Voltage below normal; or shorted to low source	Warning(Solid)	
2272	EGA_VALVE_POSITION_ERROR	EGR Valve Position Circuit - Voltage below normal; or shorted to low source	Warning(Solid)	
2273	EGR_DELTA_P_OOR_HIGH_ERROR	Exhaust Gas Recirculation Differential Pressure Sensor Circuit - Voltage above normal; or shorted to high source	Warning(Solid)	
2274	EGR_DELTA_P_OOR_LOW_ERROR	Exhaust Gas Recirculation Differential Pressure Sensor Circuit - Voltage below normal; or shorted to low source	Warning(Solid)	
2288	TURBO_SPEED_TORQUE_DERATE_ERROR	Turbocharger 1 Speed - Data Valid But Above Normal Operating Range - Least Severe Level	None	
2311	Mulitple System Errors *	Electronic Fuel Injection Control Valve Circuit - Condition Exists	Warning(Solid)	
2321	EPS_Main_Intermittent_Sync_Error	Engine Crankshaft Speed/Position - Data erratic; intermittent or incorrect	None	
2322	EPS_Backup_Intermittent_Sync_Error	Engine Camshaft Speed / Position Sensor - Data erratic; intermittent or incorrect	None	
2346	CBR_TFC_DERATE_ERROR_ID	Turbocharger Turbine Intake Temperature - Data Valid But Above Normal Operating Range - Least Severe Level	None	
2347	COT_TORQUE_DERATE_ERROR	Turbocharger Compressor Outlet Temperature (Calculated) - Data Valid But Above Normal Operating Range - Least Severe Level	None	
2349	EGA_DRIVER_OPEN_CIRCUIT_ERROR	EGR Valve Control Circuit - Current below normal or open circuit	Warning(Solid)	
2353	EGA_DRIVER_SHORT_CIRCUIT_ERROR	EGR Valve Control Circuit - Current above normal or grounded circuit	Warning(Solid)	
2363	ENG_BRK_DRV2_HIGH_CONTROL_ERROR	Engine Brake Actuator Driver Output 2 Circuit - Voltage below normal; or shorted to low source	Warning(Solid)	
2367	ENG_BRK_DRV2_LOW_CONTROL_ERROR	Engine Brake Actuator Driver Output 2 Circuit - Voltage above normal; or shorted to high source	Warning(Solid)	
2372	PRS_FUEL_FILTER_CLOGGED_ERROR	Fuel Filter Differential Pressure - Data Valid But Above Normal Operating Range - Moderately Severe Level	Warning(Solid)	
2373	EXHAUST_PRESS_OOR_HIGH_ERROR	Exhaust Gas Pressure Sensor 1 Circuit - Voltage above normal; or shorted to high source	Warning(Solid)	
2374	EXHAUST_PRESS_OOR_LOW_ERROR	Exhaust Gas Pressure Sensor 1 Circuit - Voltage below normal; or shorted to low source	Warning(Solid)	
2375	EGR_ORIFICE_TMPTR_OOR_HIGH_ERROR	Exhaust Gas Recirculation Temperature Sensor Circuit - Voltage above normal; or shorted to high source	Warning(Solid)	
2376	EGR_ORIFICE_TMPTR_OOR_LOW_ERROR	Exhaust Gas Recirculation Temperature Sensor Circuit - Voltage below normal; or shorted to low source	Warning(Solid)	
2377	FAN_CLUTCH_LOW_CTRL_ERROR	Fan Control Circuit - Voltage above normal; or shorted to high source	Warning(Solid)	
2387	VGA_DL_ACTUATION_ERROR	VGT Actuator Driver Circuit (Motor) - Mechanical system not responding or out of adjustment	Warning(Solid)	
2398	Mulitple System Errors *	Ambient Air Temperature - Data erratic; intermittent or incorrect	Warning(Solid)	
2416	Mulitple System Errors *	Engine Control Module Calibration Memory Checksum - Out of Calibration	Warning(Solid)	
2448	COOLANT_LEVEL_MODERATELY_LOW	Coolant Level - Data Valid But Below Normal Operating Range - Least Severe Level	Warning(Blinking)	
2449	VGA_DL_LEARNED_CAL_ERROR	VGT Actuator Controller - Out of Calibration	Stop(Solid)	
2451	EMT_TORQUE_DERATE_ERROR	Turbocharger Turbine Intake Temperature - Data Valid But Above Normal Operating Range - Moderately Severe Level	None	
2468	ASO_OVERSPEED_ERROR	Engine Crankshaft Speed/Position - Data Valid But Above Normal Operating Range - Moderately Severe Level	Warning(Solid)	
2554	Mulitple System Errors *	Exhaust Gas Pressure 1 - Data erratic, intermittent or incorrect	Warning(Solid)	
2634	VGA_DL_DRIVER_CIRCUIT_ERROR	VGT Actuator Controller - Bad intelligent device or component	Stop(Solid)	
2635	Mulitple System Errors *	VGT Actuator Driver Circuit - Condition Exists	Stop(Solid)	

2636	Mulitple System Errors *	VGT Actuator Driver Circuit - Abnormal update rate	Stop(Solid)	
2638	PID_SLIP_USEDUP_ERR	Aftertreatment Diesel Oxidation Catalyst Conversion Efficiency - Data Valid But Below Normal Operating Range - Least Severe Level	None	
2639	DPF_SOOT_LOAD_MEDIUM_ERR	Aftertreatment Diesel Particulate Filter Differential Pressure - Data Valid But Above Normal Operating Range - Least Severe Level	None	
2646	HIGH_COOLANT_TEMP_AECD7_ERROR	Engine Coolant Temperature - Condition Exists	Warning(Solid)	
2718	SERVICE_BRAKE_SW_TRQ_OVRD	Brake and Throttle Conflict - Condition Exists	Warning(Solid)	
2738	ETHER_INJ_LOW_CTRL_ERROR	Start Enable Device 1 Circuit (Ether Injection) - Voltage above normal; or shorted to high source	Warning(Solid)	
2739	ETHER_INJ_HIGH_CTRL_ERROR	Start Enable Device 1Circuit (Ether Injection) - Voltage below normal; or shorted to low source	Warning(Solid)	
2764	EP_RPM_DERATE_ERROR	Exhaust Gas Pressure 1 - Data Valid But Above Normal Operating Range - Moderately Severe Level	Warning(Solid)	
2771	Mulitple System Errors *	Aftertreatment 1 Outlet NOx Sensor - Abnormal update rate	Warning(Solid)	
2777	Mulitple System Errors *	Particulate Trap Active Regeneration Inhibited Due to Inhibit Switch - Condition Exists	Maintenance	
2789	IDLE_LOW_CT_PROTECT_ERROR	Engine Coolant Temperature - Data Valid But Below Normal Operating Range - Moderately Severe Level	Warning(Solid)	
2881	HC_DOSER_FUEL_RESTRICT_ERR	Aftertreatment Fuel Pressure Sensor - Data Valid But Below Normal Operating Range - Least Severe Level	Warning(Solid)	
2961	EGR_TORQUE_DERATE_ERROR	Exhaust Gas Recirculation Temperature - Data Valid But Above Normal Operating Range - Least Severe Level	None	
2962	EGR_RPM_DERATE_ERROR	Exhaust Gas Recirculation Temperature - Data Valid But Above Normal Operating Range - Moderately Severe Level	Warning(Solid)	
2963	COOLANT_TEMPERATURE_FUELING_ERROR	Engine Coolant Temperature - Data Valid But Above Normal Operating Range - Least Severe Level	None	
2964	IMT_TORQUE_DERATE_ERROR	Intake Manifold 1 Temperature - Data Valid But Above Normal Operating Range - Least Severe Level	None	
2973	Mulitple System Errors *	Intake Manifold 1 Pressure - Data erratic, intermittent or incorrec	Warning(Solid)	
2976	UREASUPP_TMPTR_TIMEOUT_ERR	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Temperature - Data erratic; intermittent or incorrect	Warning(Solid)	
3133	DPF_OUTP_OOR_HI_ERR	Aftertreatment 1 Diesel Particulate Filter Outlet Pressure Sensor Circuit - Voltage above normal; or shorted to high source	Warning(Solid)	
3134	DPF_OUTP_OOR_LO_ERR	Aftertreatment 1 Diesel Particulate Filter Outlet Pressure Sensor Circuit - Voltage below normal; or shorted to low source	Warning(Solid)	
3135	Mulitple System Errors *	Aftertreatment 1 Diesel Particulate Filter Outlet Pressure - Data erratic; intermittent or incorrect	Warning(Solid)	
3136	EGR_ORIFICE_PRESS_OOR_HIGH_ERROR	Engine Exhaust Gas Recirculation Outlet Pressure Sensor Circuit - Voltage above normal; or shorted to high source	Warning(Solid)	
3137	EGR_ORIFICE_PRESS_OOR_LOW_ERROR	Engine Exhaust Gas Recirculation Outlet Pressure Sensor Circuit - Voltage below normal; or shorted to low source	Warning(Solid)	
3138	Mulitple System Errors *	Engine Exhaust Gas Recirculation Outlet Pressure - Data erratic, intermittent or incorrect	Warning(Solid)	
3139	ASO_RELAY_LOW_ERROR	Engine Air Shutoff Circuit - Voltage above normal; or shorted to high source	Warning(Solid)	
3141	ASO_RELAY_HIGH_ERROR	Engine Air Shutoff Circuit - Voltage below normal; or shorted to low source	Warning(Solid)	
3146	Mulitple System Errors *	Aftertreatment 1 SCR Outlet Temperature Sensor Circuit - Voltage above normal, or shorted to high source	Warning(Solid)	
3147	Mulitple System Errors *	Aftertreatment 1 SCR Outlet Temperature Sensor Circuit - Voltage below normal, or shorted to low source	Warning(Solid)	
3148	SCR_OUT_IR_DELTAT_ERR	Aftertreatment 1 SCR Outlet Temperature Sensor - Data erratic, intermittent or incorrect	Warning(Solid)	

3151	SCR_CATALYST_SYSTEM_MISSING_ERR	Aftertreatment 1 SCR Catalyst System Missing - Condition Exists	Warning(Solid)	
3165	Mulitple System Errors *	Aftertreatment 1 SCR Outlet Temperature - Data valid but above normal operational range - Most Severe Level	Stop(Solid)	
3167	DOSER_USEDUP_DFM_ERR	Aftertreatment Doser - Data Valid But Below Normal Operating Range - Moderately Severe Level	Warning(Solid)	
3168	DPF_FILTRATION_EFF_ERR	Aftertreatment 1 Diesel Particulate Filter System - Data Valid But Above Normal Operating Range - Moderately Severe Level	Warning(Solid)	
3223	DOSER_ASOV_PWM_LOW_ERR	Aftertreatment Purge Air Actuator Circuit - Voltage below normal; or shorted to low source	Warning(Solid)	
3224	DOSER_ASOV_PWM_HIGH_ERR	Aftertreatment Purge Air Actuator Circuit - Voltage above normal; or shorted to high source	Warning(Solid)	
3225	ASOV_FTO_ERR	Aftertreatment Purge Air Actuator - Mechanical system not responding or out of adjustment	Warning(Solid)	
3228	NOX_IN_SENSOR_IR_LO_ERR	Aftertreatment 1 Intake NOx Sensor - Data erratic; intermittent or incorrect	Warning(Solid)	
3232	Mulitple System Errors *	Aftertreatment 1 Intake NOx Sensor - Abnormal update rate	Warning(Solid)	
3235	SCR_OUT_NR_SEVERE_TMPTR_ERR	Aftertreatment 1 SCR Outlet Temperature - Data Valid But Above Normal Operating Range - Moderately Severe Level	Stop(Solid)	
3237	UREA_LINEHTR1_SC_ERR	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 1 Circuit - Voltage above normal, or shorted to high source	Warning(Solid)	
3238	UREA_LINEHTR1_HIGHSIDE_STG_ERR	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 1 Circuit - Voltage below normal; or shorted to low source	Warning(Solid)	
3239	UREA_LINEHTR2_SC_ERR	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 2 Circuit - Voltage above normal, or shorted to high source	Warning(Solid)	
3241	UREA_LINEHTR2_HIGHSIDE_STG_ERR	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 2 Circuit - Voltage below normal; or shorted to low source	Warning(Solid)	
3242	UREA_TANKHTR1_NO_INITIAL_TMPTR_RISE_ERR	Aftertreatment 1 Diesel Exhaust Fluid Tank Heater - Mechanical system not responding or out of adjustment	Warning(Solid)	
3243	Mulitple System Errors *	Engine Cooling System Monitor - Data Valid But Below Normal Operating Range - Moderately Severe Level	Warning(Solid)	
3245	DPF_DESTROYED_ERR	Aftertreatment 1 Diesel Particulate Filter System - Mechanical system not responding or out of adjustment	Warning(Solid)	
3251	DOC_IN_NR_SEVERE_TMPTR_ERR	Aftertreatment 1 Diesel Oxidation Catalyst Intake Temperature - Data Valid But Above Normal Operating Range - Moderately Severe Level	Stop(Solid)	
3253	Mulitple System Errors *	Aftertreatment 1 Diesel Particulate Filter Intake Temperature - Data Valid But Above Normal Operating Range - Moderately Severe Level	Stop(Solid)	
3254	DOC_OUT_OVERTEMP_ERR	Aftertreatment 1 Diesel Particulate Filter Intake Temperature - Data Valid But Above Normal Operating Range - Least Severe Level	Warning(Solid)	
3255	Mulitple System Errors *	Aftertreatment 1 Diesel Particulate Filter Outlet Temperature - Data Valid But Above Normal Operating Range - Moderately Severe Level	Stop(Solid)	
3256	DPF_OUT_OVERTEMP_ERR	Aftertreatment 1 Diesel Particulate Filter Outlet Temperature - Data Valid But Above Normal Operating Range - Least Severe Level	Warning(Solid)	
3311	DOC_SEVERE_TMPTR_LATCHED_ERR	Aftertreatment 1 Diesel Particulate Filter Intake Temperature - Data valid but above normal operational range - Most Severe Level	Stop(Solid)	
3312	DPF_SEVERE_TMPTR_LATCHED_ERR	Aftertreatment 1 Diesel Particulate Filter Outlet Temperature - Data valid but above normal operational range - Most Severe Level	Stop(Solid)	
3313	Mulitple System Errors *	Aftertreatment 1 Diesel Oxidation Catalyst Intake Temperature Sensor Circuit - Voltage below normal, or shorted to low source	Warning(Solid)	
3314	Mulitple System Errors *	Aftertreatment 1 Diesel Oxidation Catalyst Intake Temperature Sensor Circuit - Voltage above normal, or shorted to high source	Warning(Solid)	
3315	DOC_IN_IR_DELTAT_ERR	Aftertreatment 1 Diesel Oxidation Catalyst Intake Temperature - Data erratic; intermittent or incorrect	Warning(Solid)	

3316	Mulitple System Errors *	Aftertreatment 1 Diesel Particulate Filter Intake Temperature Sensor Circuit - Voltage below normal, or shorted to low source	Warning(Solid)	
3317	Mulitple System Errors *	Aftertreatment 1 Diesel Particulate Filter Intake Temperature Sensor Circuit - Voltage above normal, or shorted to high source	Warning(Solid)	
3318	DOC_OUT_IR_DELTAT_ERR	Aftertreatment 1 Diesel Particulate Filter Intake Temperature - Data erratic; intermittent or incorrect	Warning(Solid)	
3319	Mulitple System Errors *	Aftertreatment 1 Diesel Particulate Filter Outlet Temperature Sensor Circuit - Voltage above normal, or shorted to high source	Warning(Solid)	
3321	Mulitple System Errors *	Aftertreatment 1 Diesel Particulate Filter Outlet Temperature Sensor Circuit - Voltage below normal, or shorted to low source	Warning(Solid)	
3322	DPF_OUT_IR_DELTAT_ERR	Aftertreatment 1 Diesel Particulate Filter Outlet Temperature - Data erratic; intermittent or incorrect	Warning(Solid)	
3326	J39_ACCELERATOR_PEDAL_POSITION_TIMEOUT_ERROR	SAE J1939 Multiplexed Accelerator Pedal or Lever Sensor System - Abnormal update rate	Stop(Solid)	
3328	J39_OUTSHFTSPD_TIMEOUT_ERROR	Transmission Output Shaft Speed - Abnormal update rate	Warning(Solid)	
3338	IDLE_FUEL_LOW_ERROR	Engine Idle Fuel Quantity - Data Valid But Below Normal Operating Range - Moderately Severe Level	Warning(Solid)	
3342	CEGR_UNDERCOOLING_ERROR	Engine Exhaust Gas Recirculation Cooler Efficiency - Data Valid But Below Normal Operating Range - Moderately Severe Level	Warning(Solid)	
3343	CAC_UNDERCOOLING_HIGH_CHT_ERROR	Engine Charge Air Cooler Efficiency - Data Valid But Below Normal Operating Range - Moderately Severe Level	Warning(Solid)	
3348	CHRG_EPD_TDP_SPD_DRT_ERROR	Turbocharger 1 Compressor Intake Pressure - Data valid but below normal operational range - Most Severe Level	Stop(Solid)	
3361	VGA_DL_POSITION_SIR_ERROR	Intake Manifold 1 Pressure - Abnormal rate of change	Warning(Solid)	
3366	COOLANT_LEVEL_OBD_ERROR	Coolant Level - Data Valid But Below Normal Operating Range - Moderately Severe Level	None	
3374	J39_VDC1_ACTIVE_EVENT_ERROR	Roll Over Protection Brake Control Active - Condition Exists	None	
3375	DPF_TOO_FREQUENT_REGEN_ERR	Aftertreatment Diesel Particulate Filter Regeneration too Frequent - Condition Exists	Warning(Solid)	
3376	DPF_INCOMPLETE_REGEN_ERR	Aftertreatment Diesel Particulate Filter Incomplete Regeneration - Condition Exists	Warning(Solid)	
3382	EGR_UFM_LOFLOW_ERROR	Engine Exhaust Gas Recirculation (EGR) System - Data Valid But Below Normal Operating Range - Moderately Severe Level	Warning(Solid)	
3383	EGR_UFM_HIFLOW_ERROR	Engine Exhaust Gas Recirculation (EGR) System - Data Valid But Above Normal Operating Range - Moderately Severe Level	Warning(Solid)	
3385	IDLE_LOW_CHT_PROTECT_ERROR	Intake Manifold 1 Temperature - Data Valid But Below Normal Operating Range - Moderately Severe Level	Warning(Solid)	
3396	DPF_CLOSED_LOOP_ERR	Diesel Particulate Filter 1 Conditions Not Met for Active Regeneration - Condition Exists	Warning(Solid)	
3418	J39_OUTSHFTSPD_ERROR	Transmission Output Shaft Speed - Received Network Data In Error	Warning(Solid)	
3423	UREA_LINEHTR3_HIGHSIDE_STG_ERR	Aftertreatment Diesel Exhaust Fluid Line Heater 3 Circuit - Voltage below normal; or shorted to low source	Warning(Solid)	
3425	Mulitple System Errors *	Aftertreatment Diesel Exhaust Fluid Line Heater 3 Circuit - Current below normal or open circuit	Warning(Solid)	
3488	Mulitple System Errors *	Anti-Lock Braking (ABS) Controller - Abnormal update rate	Warning(Solid)	
3492	Mulitple System Errors *	Real Time Clock - Abnormal rate of change	Warning(Solid)	
3497	UREA_TANKLVL_LO_MAINT_ERR	Aftertreatment 1 Diesel Exhaust Fluid Tank Level - Data Valid But Below Normal Operating Range - Least Severe Level	Warning(Blinking)	
3498	UREA_TANKLVL_WARNING_MAINT_ERR	Aftertreatment 1 Diesel Exhaust Fluid Tank Level - Data Valid But Below Normal Operating Range - Moderately	Warning(Blinking)	

		Severe Level		
3525	Mulitple System Errors *	Wheel-Based Vehicle Speed - Received Network Data In Error	Warning(Solid)	
3526	J39_WHLBSDVEHSPD_TIMEOUT_ERROR	Wheel-Based Vehicle Speed - Abnormal update rate	Warning(Solid)	
3527	J39_AP_LOW_IDLE_SWITCH_DATA_ERROR	Accelerator Pedal or Lever Idle Validation Switch - Received Network Data In Error	Stop(Solid)	
3528	J39_AP_LOW_IDLE_SWITCH_TIMEOUT_ERRO R	Accelerator Pedal or Lever Idle Validation Switch - Abnormal update rate	Stop(Solid)	
3539	IAT_HB_POS_OOR_HIGH_ERROR	Engine Intake Throttle Actuator Position Sensor Circuit - Voltage above normal; or shorted to high source	Warning(Solid)	
3541	IAT_HB_POS_OOR_LOW_ERROR	Engine Intake Throttle Actuator Position Sensor Circuit - Voltage below normal; or shorted to low source	Warning(Solid)	
3542	Mulitple System Errors *	Engine Intake Throttle Actuator Position Sensor - Data erratic; intermittent or incorrect	Warning(Solid)	
3545	Mulitple System Errors *	Aftertreatment 1 Outlet NOx Sensor - Abnormal rate of change	Warning(Solid)	
3547	UREA_TANKLVL_EMPTY_INDUCE_ERR	Aftertreatment Diesel Exhaust Fluid Tank Empty - Condition Exists	None	
3558	Mulitple System Errors *	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit - Voltage above normal; or shorted to high source	Warning(Solid)	
3559	Mulitple System Errors *	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit - Voltage below normal; or shorted to low source	Warning(Solid)	
3562	UTDD_LINEHTR1_HIGH_ERR	Aftertreatment Diesel Exhaust Fluid Line Heater Relay - Voltage above normal; or shorted to high source	Warning(Solid)	
3563	UTDD_LINEHTR1_LOW_ERR	Aftertreatment Diesel Exhaust Fluid Line Heater Relay - Voltage below normal; or shorted to low source	Warning(Solid)	
3567	UREA_DOSER_INJ_ELEC_ERR	Aftertreatment Diesel Exhaust Fluid Dosing Valve - Current below normal or open circuit	Warning(Solid)	
3568	UREA_DOSER_FUNC_RESPONSE_ERR	Aftertreatment Diesel Exhaust Fluid Dosing Valve - Mechanical system not responding or out of adjustment	Warning(Solid)	
3571	UREAPUMPP_OOR_HI_ERR	Aftertreatment 1 Diesel Exhaust Fluid Pressure Sensor - Voltage above normal; or shorted to high source	Warning(Solid)	
3572	UREAPUMPP_OOR_LO_ERR	Aftertreatment 1 Diesel Exhaust Fluid Pressure Sensor - Voltage below normal; or shorted to low source	Warning(Solid)	
3574	UPPM_CTRL_TOOLOW_ERR	Aftertreatment 1 Diesel Exhaust Fluid Pressure Sensor - Data Valid But Below Normal Operating Range - Moderately Severe Level	Warning(Solid)	
3575	UPPM_CTRL_TOOHIGH_ERR	Aftertreatment 1 Diesel Exhaust Fluid Pressure Sensor - Data Valid But Above Normal Operating Range - Moderately Severe Level	Warning(Solid)	
3577	UDD_FCV_HIGH_ERR	Aftertreatment Diesel Exhaust Fluid Return Valve - Voltage above normal; or shorted to high source	Warning(Solid)	
3578	UDD_FCV_LOW_ERR	Aftertreatment Diesel Exhaust Fluid Return Valve - Voltage below normal; or shorted to low source	Warning(Solid)	
3582	SCR_CAT_EFFICIENCY_DEGRADED_ERR	Aftertreatment SCR Catalyst Conversion Efficiency - Data Valid But Below Normal Operating Range - Moderately Severe Level	Warning(Solid)	
3583	NOX_OUT_SENSOR_HTR_WARMUP_ERR	Aftertreatment 1 Outlet NOx Sensor Heater - Abnormal rate of change	Warning(Solid)	
3596	Mulitple System Errors *	Aftertreatment 1 Diesel Exhaust Fluid Pressure Sensor - Data erratic; intermittent or incorrect	Warning(Solid)	
3616	VGA_DL_ACTUATION_NL_ERROR	Engine VGT Nozzle Position - Mechanical system not responding or out of adjustment	None	
3649	Mulitple System Errors *	Aftertreatment 1 Intake NOx Sensor Heater - Abnormal rate of change	Warning(Solid)	
3681	Mulitple System Errors *	Aftertreatment 1 Outlet NOx Sensor Power Supply - Data erratic; intermittent or incorrect	Warning(Solid)	
3682	Mulitple System Errors *	Aftertreatment 1 Intake NOx Sensor Power Supply - Data erratic; intermittent or incorrect	Warning(Solid)	

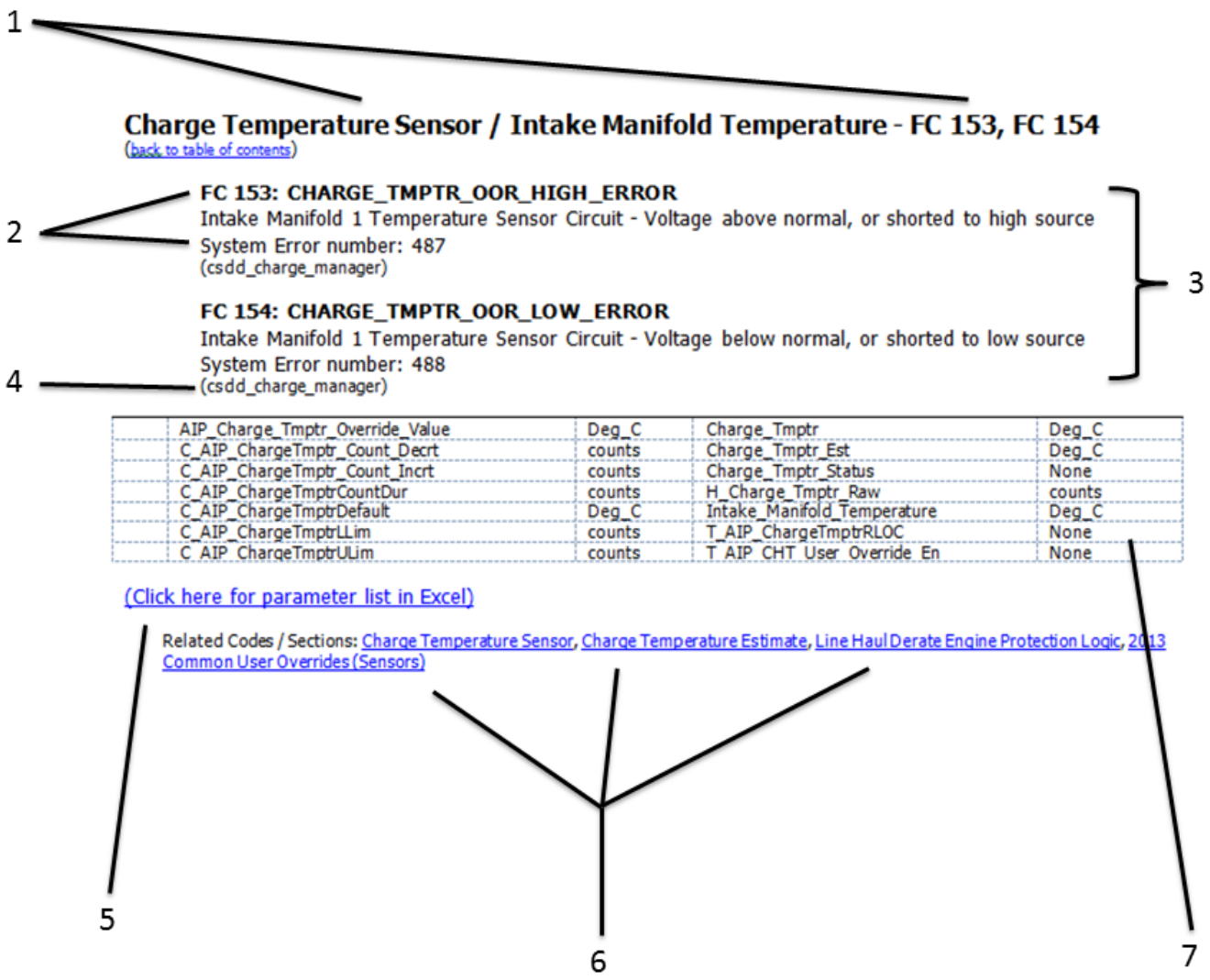
3697	Mulitple System Errors *	Engine Control Module Calibration Memory - Bad intelligent device or component	Stop(Solid)	
3712	SEVERE_INDUCEMENT_ERROR	Aftertreatment SCR Operator Inducement - Data valid but above normal operational range - Most Severe Level	Stop(Solid)	
3714	INDM_TORQUE_DERATE_ERROR	Engine Protection Torque Derate - Condition Exists	Warning(Solid)	
3715	IDLE_SPEED_HIGH_ERROR	Engine Speed At Idle - Data Valid But Above Normal Operating Range - Moderately Severe Level	Warning(Solid)	
3716	IDLE_SPEED_LOW_ERROR	Engine Speed At Idle - Data Valid But Below Normal Operating Range - Moderately Severe Level	Warning(Solid)	
3724	EGA_DRIVER_POWER_LOW_ERROR	Battery 1 Voltage - Data Valid But Below Normal Operating Range - Least Severe Level	Warning(Solid)	
3725	NOX_IN_SENSOR_PERSIST_NOT_VALID_ERR	Aftertreatment 1 Intake NOx Sensor - Abnormal rate of change	Warning(Solid)	
3727	APC_2S_MDV_LOW_POP_OFF_ERROR	High Pressure Common Rail Fuel Pressure Relief Valve - Mechanical system not responding or out of adjustment	None	
3733	BREATHER_HEATER_DRV_LOW_ERR	Crankcase Breather Filter Heater Circuit - Voltage above normal; or shorted to high source	Warning(Solid)	
3734	BREATHER_HEATER_DRV_HIGH_ERR	Crankcase Breather Filter Heater Circuit - Voltage below normal; or shorted to low source	Warning(Solid)	
3737	SLO_OCP_ERROR	Engine Starter Mode Overcrank Protection - Condition Exists	None	
3741	APC_2S_MDV_TRIP_ERROR	High Pressure Common Rail Fuel Pressure Relief Valve - Data valid but above normal operational range - Most Severe Level	Warning(Solid)	
3748	Mulitple System Errors *	Aftertreatment 1 Intake NOx Sensor - Data not Rational - Drifted High	Warning(Solid)	
3749	Mulitple System Errors *	Aftertreatment 1 Outlet NOx Sensor - Data not Rational - Drifted High	Warning(Solid)	
3843	Mulitple System Errors *	Cruise Control Disable Command - Abnormal update rate	None	
3844	J39_CCVS2_FAIL_TO_RESUME_ERROR	Cruise Control Pause Command - Condition Exists	None	
3845	J39_CC_DISABLE_CMD_ACTIVE_ERROR	Cruise Control Disable Command - Condition Exists	None	
3899	Mulitple System Errors *	Aftertreatment 1 SCR Intermediate NH3 Sensor - Voltage below normal; or shorted to low source	Warning(Solid)	
3911	Mulitple System Errors *	Aftertreatment 1 SCR Intermediate NH3 Sensor - Abnormal update rate	Warning(Solid)	
3912	Mulitple System Errors *	Aftertreatment 1 Outlet NH3 Gas Sensor Heater - Abnormal rate of change	Warning(Solid)	
3932	NH3_SENSOR_HTR_VOLT_OORH_ERR	Aftertreatment 1 SCR Intermediate NH3 Gas Sensor Power Supply - Data Valid But Above Normal Operating Range - Moderately Severe Level	Warning(Solid)	
3933	NH3_SENSOR_HTR_VOLT_OORL_ERR	Aftertreatment 1 SCR Intermediate NH3 Gas Sensor Power Supply - Data Valid But Below Normal Operating Range - Moderately Severe Level	Warning(Solid)	
3934	NH3_SENSOR_PWR_INT_ERR	Aftertreatment 1 SCR Intermediate NH3 Gas Sensor Power Supply - Data erratic; intermittent or incorrect	Warning(Solid)	
3935	NH3_SENSOR_TRIMR_OORH_ERR	Aftertreatment 1 SCR Intermediate NH3 Sensor - Out of Calibration	Warning(Solid)	
3936	NH3_SENSOR_ASIC_ERR	Aftertreatment 1 SCR Intermediate NH3 Sensor - Bad intelligent device or component	Warning(Solid)	
3937	NH3_SENSOR_PERSIST_NOT_VALID_ERR	Aftertreatment 1 SCR Intermediate NH3 Sensor - Abnormal rate of change	Warning(Solid)	
4149	DUAL_PWM_ACC_2_DC_OOR_ERROR	Accelerator Pedal or Lever Position Sensor 2 Circuit Frequency - Abnormal frequency or pulse width or period	Warning(Solid)	
4151	Mulitple System Errors *	Aftertreatment Diesel Particulate Filter Temperature Sensor Module - Abnormal update rate	Warning(Solid)	
4152	Mulitple System Errors *	Aftertreatment Selective Catalytic Reduction Temperature Sensor Module - Abnormal update rate	Warning(Solid)	

4155	UDD_SU_HEATER_HIGH_ERR	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Heater Relay - Voltage Above Normal; or Shorted to High Source	Warning(Solid)	
4156	UDD_SU_HEATER_LOW_ERR	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Heater Relay - Voltage below normal; or shorted to low source	Warning(Solid)	
4157	UREA_RVV_FUNC_RESPONSE_ERR	Aftertreatment Diesel Exhaust Fluid Return Valve - Mechanical system not responding or out of adjustment	Warning(Solid)	
4158	Mulitple System Errors *	Aftertreatment Diesel Particulate Filter Temperature Sensor Module - Bad intelligent device or component	Warning(Solid)	
4159	Mulitple System Errors *	Aftertreatment Selective Catalytic Reduction Temperature Sensor Module - Bad intelligent device or component	Warning(Solid)	
4161	EGTS_PFS_ECU_HI_VOLT_ERR	Aftertreatment Diesel Particulate Filter Temperature Sensor Module - Voltage Above Normal; or Shorted to High Source	Warning(Solid)	
4162	EGTS_PFS_ECU_LO_VOLT_ERR	Aftertreatment Diesel Particulate Filter Temperature Sensor Module - Voltage below normal; or shorted to low source	Warning(Solid)	
4163	EGTS_PFS_ECU_OVER_TMPTR_ERR	Aftertreatment Diesel Particulate Filter Temperature Sensor Module- Data Valid But Above Normal Operating Range - Moderately Severe Level	Warning(Solid)	
4164	EGTS_SCR_ECU_HI_VOLT_ERR	Aftertreatment Selective Catalytic Reduction Temperature Sensor Module - Voltage Above Normal; or Shorted to High Source	Warning(Solid)	
4165	EGTS_SCR_ECU_LO_VOLT_ERR	Aftertreatment Selective Catalytic Reduction Temperature Sensor Module - Voltage below normal; or shorted to low source	Warning(Solid)	
4166	EGTS_SCR_ECU_OVER_TMPTR_ERR	Aftertreatment Selective Catalytic Reduction Temperature Sensor Module - Data Valid But Above Normal Operating Range - Moderately Severe Level	Warning(Solid)	
4168	UREA_SM_HTR_HIGH_ERR	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Heater - Voltage Above Normal; or Shorted to High Source	Warning(Solid)	
4169	UREA_SM_HTR_LOW_ERR	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Heater - Voltage below normal; or shorted to low source	Warning(Solid)	
4171	UREA_SUPPUNIT_FAIL_TO_THAW_ERR	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Heater - Data Valid But Below Normal Operating Range - Moderately Severe Level	Warning(Solid)	
4213	INHIBIT_SWITCH_RAT_ERR	Aftertreatment Diesel Particulate Filter Regeneration Inhibit Switch - Data erratic; intermittent or incorrect	Warning(Solid)	
4215	J39_EBC1_ACTIVE_EVENT_ERROR	Anti-Lock Braking (ABS) Active - Condition Exists	None	
4244	UREASUPPT1_RATIONALITY_ERR	Aftertreatment 1 Diesel Exhaust Fluid Dosing Temperature - Data erratic; intermittent or incorrect	Warning(Solid)	
4245	UREASUPPT2_RATIONALITY_ERR	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Heater Temperature - Data erratic; intermittent or incorrect	Warning(Solid)	
4249	UREASUPPT1_IR_STUCK_ERR	Aftertreatment 1 Diesel Exhaust Fluid Dosing Temperature - Abnormal Rate of Change	Warning(Solid)	
4251	UREASUPPT2_IR_STUCK_ERR	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Heater Temperature - Abnormal Rate of Change	Warning(Solid)	
4259	EGTS_PFS_PWR_INT_ERR	Aftertreatment Diesel Particulate Filter Temperature Sensor Module - Root Cause Not Known	Warning(Solid)	
4261	EGTS_SCR_PWR_INT_ERR	Aftertreatment Selective Catalytic Reduction Temperature Sensor Module - Root Cause Not Known	Warning(Solid)	
4278	NH3_SENSOR_INRANGE_HI_ERR	Aftertreatment 1 SCR Intermediate NH3 - Data not Rational - Drifted High	Warning(Solid)	
4279	NH3_SENSOR_INRANGE_LO_ERR	Aftertreatment 1 SCR Intermediate NH3 - Data not Rational - Drifted Low	Warning(Solid)	
4281	NH3_SENSOR_STUCK_RESP_ERR	Aftertreatment 1 SCR Intermediate NH3 - Data erratic; intermittent or incorrect	Warning(Solid)	
4289	DUAL_PWM_ACC_1_DC_OOR_ERROR	Accelerator Pedal or Lever Position Sensor 1 Circuit Frequency - Abnormal frequency or pulse width or period	Stop(Solid)	
4293	ENG_BRK_LAMP_LOW_ERROR	Engine Brake Active Lamp - Voltage Above Normal; or Shorted to High Source	Warning(Solid)	
4294	ENG_BRK_LAMP_HIGH_ERROR	Engine Brake Active Lamp - Voltage below normal; or shorted to low source	Warning(Solid)	

4452	SCR_CTRL_OUTER_LOOP_USEDUP_ERR	Aftertreatment 1 Outlet NOx Sensor Closed Loop Operation - Condition Exists	Warning(Solid)	
4453	SCR_CTRL_INNER_LOOP_USEDUP_ERR	Aftertreatment 1 Outlet NH3 Sensor Closed Loop Operation - Condition Exists	Warning(Solid)	
4517	TI_UNPROGRAMMED_VIN_ERROR	Vehicle Identification Number - Out of Calibration	Warning(Solid)	
4518	Mulitple System Errors *	Aftertreatment 1 SCR Intermediate Gas Temperature Sensor Circuit - Voltage above normal, or shorted to high source	Warning(Solid)	
4519	Mulitple System Errors *	Aftertreatment 1 SCR Intermediate Gas Temperature Sensor Circuit - Voltage below normal, or shorted to low source	Warning(Solid)	
4521	SCR_IR_DELTAT_ERR	Aftertreatment 1 SCR Intermediate Gas Temperature Sensor - Data erratic; intermittent or incorrect	Warning(Solid)	
4524	SCR_IN_SEVERE_TMPTR_ERR	Aftertreatment 1 SCR Intermediate Gas Temperature - Data valid but above normal operational range - Most Severe Level	Stop(Solid)	
4525	SCR_IN_NR_SEVERE_TMPTR_ERR	Aftertreatment 1 SCR Intermediate Gas Temperature - Data Valid But Above Normal Operating Range - Moderately Severe Level	Stop(Solid)	
4526	SERVICE_BRAKE_SWITCH_ERROR	Brake Pedal Position - Data erratic; intermittent or incorrect	Warning(Solid)	
4568	FSOV_ORIFICE_PLUGGED_ERROR	Aftertreatment Fuel Shutoff Valve - Data Valid But Above Normal Operating Range - Moderately Severe Level	Warning(Solid)	
4572	J39_DEF_TANK_TMPTR_TIMEOUT_ERROR	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature - Abnormal Update Rate	Warning(Solid)	
4584	PFS_EGTS_DELEGATED_ASSEMBLY_ERR	Aftertreatment Diesel Particulate Filter System - Special Instructions	Stop(Solid)	
4585	SCR_EGTS_DELEGATED_ASSEMBLY_ERR	Aftertreatment 1 SCR Catalyst System - Special Instructions	Stop(Solid)	
4612	Mulitple System Errors *	Air Handling Feedback Control - Condition Exists	Warning(Solid)	
4616	MCF_UFM_LOFLOW_ERROR	Intake Manifold 1 Pressure - Data Valid But Below Normal Operating Range - Least Severe Level	Warning(Solid)	
4658	DEF_LOW_FLOW_ERR	Aftertreatment SCR Actual Dosing Reagent Quantity - Data Valid But Below Normal Operating Range - Moderately Severe Level	Warning(Solid)	
4679	UREA_TANKLVL_CURRENT_OOR_LO_ERR	Aftertreatment 1 Diesel Exhaust Fluid Tank Level Sensor Circuit - Current below normal or open circuit	Warning(Solid)	
4682	UREA_TANKT_CURRENT_OOR_LO_ERR	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature Sensor Circuit - Current below normal or open circuit	Warning(Solid)	
4691	FUEL_PRESS_LOW_CRANKING_ERROR	Engine Injector Metering Rail 1 Cranking Pressure - Data Valid But Below Normal Operating Range - Moderately Severe Level	Warning(Solid)	
4726	BPD_QTD_LEAKAGE_ERROR	Engine Fuel Leakage - Data Valid But Above Normal Operating Range - Moderately Severe Level	Warning(Solid)	
4727	BPD_QTD_PUMPING_ERROR	Injector Metering Rail 1 Pressure - Data Valid But Above Normal Operating Range - Least Severe Level	Warning(Solid)	
4728	CSERS_TM_ERROR	Exhaust Gas Pressure - Data Valid But Below Normal Operating Range - Moderately Severe Level	Warning(Solid)	
4732	J39_DEF_TANK_LVL_OUT_OF_CALIBRATION_ERROR	Aftertreatment 1 Diesel Exhaust Fluid Tank Level Sensor - Out of Calibration	Warning(Solid)	
4736	UREA_TANKT_CURRENT_OOR_HI_ERR	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature Sensor Circuit - Current above normal or grounded circuit	Warning(Solid)	
4737	UREA_TANKT_SENS_INT_ERR	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature - Root Cause Not Known	Warning(Solid)	
4738	UREA_TANKLVL_CURRENT_OOR_HI_ERR	Aftertreatment 1 Diesel Exhaust Fluid Tank Level Sensor Circuit - Current above normal or grounded circuit	Warning(Solid)	
4739	UREA_TANKLVL_SENS_INT_ERR	Aftertreatment 1 Diesel Exhaust Fluid Tank Level Sensor - Root Cause Not Known	Warning(Solid)	
4769	UREA_TANKLVL_PERSIST_NO_VALUE_ERR	Aftertreatment 1 Diesel Exhaust Fluid Tank Level Sensor - Abnormal Rate of Change	Warning(Solid)	

VI. Common Approach Parameter Lists

Sample Item



1. Item name and associated fault codes
2. System error name and number for reference to algorithm tuning documentation
3. System errors listed individually for multiple error fault codes
4. Simulink model associated with system error and/or fault code
5. External link to parameter list in excel format for easy copy and paste into Calterm / Insite
6. Active internal links to related sections of the document
7. Parameters to monitor with Calterm / Insite for troubleshooting and development

Sensors, Actuators, and ECM

Accelerator Pedal Position Sensor - FC 131, FC 132, FC 1239, FC 1241

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FC 131: SAMPLED_THROTTLE_HIGH_ERROR
Accelerator Pedal or Lever Position Sensor 1 Circuit - Voltage below normal, or shorted to low source
System Error number: 63
(csdd_mca_accel.mdl)

FC 132: SAMPLED_THROTTLE_LOW_ERROR
Remote Accelerator Pedal or Lever Position Sensor 1 Circuit - Voltage above normal, or shorted to high source
System Error number: 64
(csdd_mca_accel.mdl)

FC 1239: ACCEL_POS_SENSOR2_HIGH_ERROR
Accelerator Pedal or Lever Position Sensor 2 Circuit - Voltage above normal, or shorted to high source
System Error number: 1378
(csdd_mca_accel.mdl)

FC 1241: ACCEL_POS_SENSOR2_LOW_ERROR
Accelerator Pedal or Lever Position Sensor 2 Circuit - Voltage below normal, or shorted to low source
System Error number: 1379
(csdd_mca_accel.mdl)

Accel_Position_Sensor_Volts	V	Filtered_Raw_Accel_Value	counts
APP2_Sensor_Voltage	V	H_Filtered_Raw_Accel2_Value	counts

(Click here for parameter list in Excel)

Related Codes / Sections:

Ambient Air Pressure Sensor - FC 221, FC 222

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FC 221: AMBIENT_AIR_PRESSURE_HIGH_ERROR
Barometric Pressure Sensor Circuit - Voltage above normal, or shorted to high source
System Error number: 113
(csdd_charge_base_mgr_lib.mdl)

FC 222: AMBIENT_AIR_PRESSURE_LOW_ERROR
Barometric Pressure Sensor Circuit - Voltage below normal, or shorted to low source
System Error number: 114
(csdd_charge_base_mgr_lib.mdl)

Air_Press	kPa	C_AMB_AirPressRawHighLimit	counts
Air_Press_Sensor	kPa	C_AMB_AirPressRawLowLimit	counts
Air_Press_Sensor_Status	None	C_AMB_AirPressGlobalDefault	kPa_G
Air_Press_Sensor_Volts	V	C_AIP_AirPress_Count_Incrt	counts
Air_Press_Status	None	C_AIP_AirPress_Count_Decrt	counts
T_AmbAirPressEnable	None	C_AMB_AirPressCountDur	counts

(Click here for parameter list in Excel)

Related Codes / Sections:

Ambient Air Temperature Sensor - FC 249, FC 256

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FC 249: AIR_TMPTR_OOR_HIGH_ERROR
Ambient Air Temperature Sensor 1 Circuit - Voltage above normal, or shorted to high source
System error number: 3802
(csdd_charge_base_mgr_lib.mdl)

FC 256: AIR_TMPTR_OOR_LOW_ERROR
Ambient Air Temperature Sensor 1 Circuit - Voltage below normal, or shorted to low source
System error number: 3803
(csdd_charge_base_mgr_lib.mdl)

C_CHM_AAT_Source	None	Ambient_Air_Tmptr_Status	None
Air_Tmptr_Raw	counts	C_AIP_AirTmptr_Count_Decrt	counts
Air_Tmptr_Sensor	Deg_C	C_AIP_AirTmptr_Count_Incrt	counts
Air_Tmptr_Sensor_Status	None	C_AIP_AirTmptrCountDur	counts
Air_Tmptr_Sensor_Volts	V	C_AIP_AirTmptrLLim	counts
Ambient_Air_Tmptr	Deg_C	C_AIP_AirTmptrULim	counts

(Click here for parameter list in Excel)

ASO Overspeed Error - FC 2468

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ASO_OVERSPEED_ERROR
Engine Crankshaft Speed/Position - Data Valid But Above Normal Operating Range - Moderately Severe Level
System Error number: 3939
*(*csdd_mca_aso_lib.mdl\Mca_aso_input_data_proc*)*

T_ASO_Enable	None	T_ASO_Valve_Feedback_En	None
C_ASO_Engine_Stopped_Speed	RPM	T_ASO_Auto_Max_Vehicle_Speed	km/hr
C_ASO_Overspeed_Duration_Th	s	Engine_Speed	RPM
C_ASO_Max_Speed	RPM	Vehicle_Speed	km/hr
C_ASO_Max_Speed_Test	RPM	ASO_Overspeed_Th	RPM
T_ASO_Reset_Timer_Th	s	ASO_Shutoff_Active	None

(Click here for parameter list in Excel)

Related Codes / Sections:

ASO Relay Driver - FC 3139, FC 3141

(back to table of contents)

FC 3139: ASO_RELAY_LOW_ERROR
Engine Air Shutoff Circuit - Voltage above normal, or shorted to high source
System Error number: 3940
(csdd_mca_aso_lib.mdl)

FC 3141: ASO_RELAY_HIGH_ERROR
Engine Air Shutoff Circuit - Voltage below normal, or shorted to low source
System Error number: 3941
(csdd_mca_aso_lib.mdl)

Engine_Speed	RPM	C_ASO_Error_Count_Incrt	counts
ASO_Solenoid_Active	None	C_ASO_Error_Count_Decrt	counts
T_ASO_Enable	None	C_ASO_Error_Set_Count	counts
ASO_Overspeed_Th	RPM	XMGR_Completed_Init_Stage	None

(Click here for parameter list in Excel)

Related Codes / Sections:

ASO System Error - FC 4839

(back to table of contents)

ASO_SYSTEM_ERROR

Engine Air Shutoff - Condition Exists
System Error number: 8830
(csdd_mca_aso_lib.mdl)

ASO_DO_Ovrd_Value	None	ASO_Test_Valve_Fail_FC_Active	None
ASO_Feedback_Ovrd_Val	None	ASO_Valve_Closed	None
ASO_Lamp_Command	None	C_ASO_Error_Count_Decrt	counts
ASO_Man_Sw_Ovrd_Val	None	C_ASO_Error_Count_Incrt	counts
ASO_Manual_Switch_ON	None	C_ASO_Error_Set_Count	counts
ASO_Mode	None	C_ASO_IAT_Enable	None
ASO_Not_Zero_Shutoffs	None	C_IAT_HB_ASO_RLOC	None
ASO_Overspeed_Th	RPM	C_IAT_HB_OnOff_RLOC	None
ASO_PWM_HighErr_Cnt	counts	C_IAT_HB_PS_RLOC	None
ASO_PWM_LowErr_Cnt	counts	C_IAT_HB_RLOC	None
ASO_Shutoff_Active	None	C_IAT_HB_RLOC_Type	None
ASO_Shutoff_FC_Active	None	C_IAT_Position_RLOC	None
ASO_Solenoid_Active	None	H_ASO_Solenoid_Driver_Status	None
ASO_Sys_Error_FC_Active	None	IAT_AS_ASO_Enable	None
ASO_Test_Sw_Ovrd_Val	None	T_ASO_Enable	None
ASO_Test_Switch_ON	None	XMGR_Completed_Init_Stage	None

(Click here for parameter list in Excel)

Related Codes / Sections:

Charge Pressure Sensor / Boost Pressure Sensor - FC 122, FC 123

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FC 122: CHARGE_PRESS_OOR_HIGH_ERROR

Intake Manifold 1 Pressure Sensor Circuit - Voltage above normal, or shorted to high source
System error number: 489
(csdd_charge_mgr_base.mdl)

FC 123: CHARGE_PRESS_OOR_LOW_ERROR

Intake Manifold 1 Pressure Sensor Circuit - Voltage below normal, or shorted to low source
System error number: 490
(csdd_charge_mgr_base.mdl)

Boost_Pressure	kPa_G	C_AIP_ChargePressSupplyID	None
Boost_Pressure_Status	None	C_AIP_ChargePressULim	counts
C_AIP_ChargePress_Count_Decrt	counts	C_ChargePressEnable	None
C_AIP_ChargePress_Count_Incrt	counts	Charge_Press	kPa
C_AIP_ChargePressCountDur	counts	Charge_Press_Sensor	kPa
C_AIP_ChargePressDefault	kPa	Charge_Press_Sensor_Volts	V
C_AIP_ChargePressLLim	counts	Charge_Press_Status	None
C_AIP_ChargePressOverride_En	None	H_Charge_Press_Raw	counts
C_AIP_ChargePressOverride_Raw	counts	T_AIP_ChargePressRLOC	None

(Click here for parameter list in Excel)

Related Codes / Sections: Electronic Sensor and Actuator Failures

Charge Temperature Sensor / Intake Manifold Temperature - FC 153, FC 154

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FC 153: CHARGE_TMPTR_OOR_HIGH_ERROR
Intake Manifold 1 Temperature Sensor Circuit - Voltage above normal, or shorted to high source
System Error number: 487
(csdd_charge_manager)

FC 154: CHARGE_TMPTR_OOR_LOW_ERROR
Intake Manifold 1 Temperature Sensor Circuit - Voltage below normal, or shorted to low source
System Error number: 488
(csdd_charge_manager)

AIP_Charge_Tmptr_Override_Value	Deg_C	Charge_Tmptr	Deg_C
C_AIP_ChargeTmptr_Count_Decrt	counts	Charge_Tmptr_Est	Deg_C
C_AIP_ChargeTmptr_Count_Incrt	counts	Charge_Tmptr_Status	None
C_AIP_ChargeTmptrCountDur	counts	H_Charge_Tmptr_Raw	counts
C_AIP_ChargeTmptrDefault	Deg_C	Intake_Manifold_Temperature	Deg_C
C_AIP_ChargeTmptrLLim	counts	T_AIP_ChargeTmptrRLOC	None
C_AIP_ChargeTmptrULim	counts	T_AIP_CHT_User_Override_En	None

(Click here for parameter list in Excel)

Related Codes / Sections: Charge Temperature Sensor, Charge Temperature Estimate, Line Haul Derate Engine Protection Logic, 2013 Common User Overrides (Sensors)

Compressor Inlet Temperature / Ambient Air Temperature Sensor

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(csdd_charge_base_mgr.mdl, csdd_emissions_manager.mdl)

AIP_CompInTmptr_Override_Value	Deg_C	C_AIP_AirTmptrLLim	counts
Air_Tmptr_Raw	counts	C_AIP_CompInTmptrDefault	Deg_C
Air_Tmptr_Sensor	Deg_C	C_CHM_AAT_Source	None
Air_Tmptr_Sensor_Status	None	Compressor_Inlet_Tmptr	Deg_C
Air_Tmptr_Sensor_Volts	V	Compressor_Inlet_Tmptr_Raw	counts
Ambient_Air_Tmptr	Deg_C	Compressor_Inlet_Tmptr_Sensor	Deg_C
Ambient_Air_Tmptr_Status	None	Compressor_Inlet_Tmptr_Status	None
C_AIP_AirTmptr_Count_Decrt	counts	T_AIP_CompInTmptr_Ovrd_En	None
C_AIP_AirTmptr_Count_Incrt	counts	T_AIP_CompInTmptrRLOC	None
C_AIP_AirTmptrCountDur	counts		

(Click here for parameter list in Excel)

Related Codes / Sections: FC 691, FC 692, FC 249, FC 256

Coolant Level Diagnostics - FC 197, FC 235, FC 2448

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FC 197: ENGINE_COOLANT_LEVEL_LOW
Coolant Level - Data Valid But Below Normal Operating Range - Moderately Severe Level
System Error number: 1897

FC 235: COOLANT_LEVEL_FUELING_ERROR
Coolant Level - Data valid but below normal operational range - Most Severe Level
System Error number: 827

FC 2448: COOLANT_LEVEL_MODERATELY_LOW
Coolant Level - Data Valid But Below Normal Operating Range - Least Severe Level
System Error number: 657

Coolant_Level_Sensor_Voltage	V	C_AIP_Clvl_Stabilization_Time	s
C_AIP_Clvl_Intermediate_Lvl	V	T_AIP_Coolant_Level_RLOC	None
C_AIP_Clvl_Intermediate_Lvl	V	C_Coolant_Level_Sensor_Type	None
C_AIP_Clvl_Low_Lvl	V	T_CoolantLevelSensorEnable	None

(Click here for parameter list in Excel)

Related Codes / Sections:

Coolant Level OBD Error - FC 3366

(back to table of contents)

COOLANT_LEVEL_OBD_ERROR
Coolant Level - Data Valid But Below Normal Operating Range - Moderately Severe Level
System Error number: 3993

Engine_Speed	RPM	C_AIP_Clvl_Intermediate_Lvl	V
Coolant_Level_Sensor_Voltage	V	C_AIP_Clvl_Low_Lvl	V
Coolant_Level	None	C_AIP_Clvl_Stabilization_Time	s
OBD_Fault_Status_Table[492]	None		

(Click here for parameter list in Excel)

Related Codes / Sections:

Coolant Level Sensor - FC 195, FC 196

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FC195: COOLANT_LEVEL_HIGH_ERROR
Coolant Level Sensor 1 Circuit - Voltage above normal, or shorted to high source
System Error number: 572
(csdd_lube_cool.mdl)

FC196: COOLANT_LEVEL_LOW_ERROR
Coolant Level Sensor 1 Circuit - Voltage below normal, or shorted to low source
System Error number: 283
(csdd_lube_cool.mdl)

Coolant_Level	---	T_AIP_Cool_Lev_User_Override_En	---
T_AIP_Coolant_Level_RLOC	---	AIP_Cool_Lev_Override_Value	---
C_AIP_Clvl_SensorSupply_ID	---		
C_Coolant_Level_Type_Select	---	**Diagnostics :**	
C_Coolant_Level_Sensor_Type	---	C_AIP_Clvl_OOR_Upper_Limit	---
Coolant_Level_Sensor_Voltage	V	C_AIP_Clvl_OOR_Lower_Limit	---

(Click here for parameter list in Excel)

Related Codes / Sections:

Coolant Temperature Sensor - FC 144, FC 145

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FC 144: COOLANT_TEMPERATURE_HIGH_ERROR
Engine Coolant Temperature 1 Sensor Circuit - Voltage above normal, or shorted to high source
System Error number: 75
(csdd_lube_cool.mdl)

FC 145: COOLANT_TEMPERATURE_LOW_ERROR

Engine Coolant Temperature 1 Sensor Circuit - Voltage below normal, or shorted to low source
System Error number: 76
(csdd_lube_cool.mdl)

T_Coolant_Temperature_Sensor_Enable	---	**Diagnostics:**	
Coolant_Temperature	Deg_C	C_AIP_CT_Count_OOR_High_Limit	counts
Coolant_Tmptr_Sensor_Volts	V	C_AIP_CT_Count_OOR_Low_Limit	counts
T_AIP_Coolant_Temperature_RLOC	---	C_AIP_CT_IR_Constant_Value	Deg_C
T_AIP_CT_User_Override	---	C_AIP_CT_Count_OOR_Incrt	counts
AIP_Cool_Tmptr_Override_Value	Deg_C	C_AIP_CT_Count_OOR_Decrt	counts
		C_AIP_CoolTempCountDur	counts

(Click here for parameter list in Excel)

Related Codes / Sections: Coolant Temperature Sensor

Cooling System Monitor - FC 3243

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Engine Cooling System Monitor - Data Valid But Below Normal Operating Range – Moderately Severe Level.

NOTE: The OBD system shall detect a malfunction if, within an Regulatory Agency-approved time interval after engine start, the coolant temperature does not reach the temperature required by the OBD system to enable all other OBD diagnostics.

COOLING_SYSTEM_MONITOR_ERROR
System error number: 3190
(csdd_obd_lbe_cool.mdl)

COOL_TEMP_UNEXPECTED_DROP_ERR
Error Flag:
System error number: 8351
(csdd_obd_lbe_cool.mdl)

Engine_Speed	RPM	OBD_LUCL_CSM_Accumulated_Fuel	mg
Net_Engine_Torque	N_m	OBD_LUCL_CSM_Disable_Time	s
Vehicle_Speed	km/hr	OBD_LUCL_CSM_Engine_Duty_Cycle	%
Engine_At_Idle	None	OBD_LUCL_CSM_Idle_Time	s
Coolant_Temperature	Deg_C	OBD_LUCL_CSM_Max_Monitor_Time	s
Coolant_Temperature_Sensor	Deg_C	OBD_LUCL_CSM_Run_Time	s
Coolant_Tmptr_Sensor_Volts	V	OBD_LUCL_CSM_Initial_Cool_Temp	Deg_C
CBM_Torque_Fuel	mg/stroke	OBD_LUCL_CSM_PredictedCoolTemp	Deg_C
OBD_LUCL_CSM_Delta	Deg_C	OBD_LUCL_CSM_Monitor_State	None

(Click here for parameter list in Excel)

OBD_LUCL_CSM_Monitor_State
0 = DISABLED
1 = STARTUP_DELAY_TIME
2 = CT_SENSOR_ERROR
3 = WARM_START
4 = COLD_DISABLE
5 = MAX_TIMEOUT
6 = WARMUP_PASSED
7 = IDLE_TIME
8 = CHT_SENSOR_ERROR
9 = PREDICTION_RUNNING
10 = PREDICTION_FINISHED

Crankcase Pressure Sensor - FC 1843, 1844

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FC 1843: CRANKCASE_PRESS_OOR_HIGH_ERROR
Crankcase Pressure Circuit - Voltage above normal, or shorted to high source
System error number: 1422
(engine_cv_ext.mdl)

FC 1844: CRANKCASE_PRESS_OOR_LOW_ERROR
Crankcase Pressure Circuit - Voltage below normal, or shorted to low source
System error number: 1424
(engine_cv_ext.mdl)

Crankcase_Press_Sensor	kPa_G	Net_Engine_Torque	N_m
Crankcase_Press	kPa_G	Engine_Speed	RPM
T_CCP_Zero_Adjustment	kPa_G	OCV_Pressure_Relief_Active	None
H_CCP_Mod_High_Thd	kPa_G	C_AIP_CrankcasePressULim	counts
H_CCP_Sev_High_Thd	kPa_G	C_AIP_CrankcasePressLLim	counts
Crankcase_Press_Sensor_Volts	V	C_AIP_CrankcasePressDefault	kPa_G
Crankcase_Press_State	HEX	C_AIP_CCP_Count_Incrt	counts
Prev_emx_CCP_Trq_Drt_Idx	None	C_AIP_CCP_Count_Decrt	counts
Boost_Pressure	kPa_G	C_AIP_CrankcasePressCountDur	counts
Crankcase_Press_Source	None		

(Click here for parameter list in Excel)

ECM Comp Functionality - FC 2416

Engine Control Module Calibration Memory Checksum - Out of Calibration

SWD_CVN_ERROR
System Error number: 5354

SWD_MEM_CHK_INCOMPLETE_ERROR
System Error number: 5357

(csdd_cagt_obd_base_lib.mdl)

Checksum1_Status	None	T_CRC_Checksum1_Reference	HEX
Checksum2_Status	None	Checksum1_Calculation	HEX
CRC_Checksum2_Reference	HEX	Checksum2_Calculation	HEX

NOTE: There is a list of trims and the FC can be active by changing the value of at least one parameter from the list:

N:\DL_Diag\Algorithm Tuning 2013\SE5354 SWD_CVN_ERROR\HDD\HD_Build_78262.xlsx

(Click here for parameter list in Excel)

Related Codes / Sections:

ECM Memory Hardware - FC 111, FC343, FC1117, FC3697

(back to table of contents)

FC 111: RAM_HARDWARE_ERROR
Engine Control Module Critical Internal Failure - Bad intelligent device or component.
System Error number: 33

FC 111: ECM_SW_MISSION_DISABLING_FAILURE_ERROR

Engine Control Module Critical Internal Failure - Bad intelligent device or component.
System Error number: 216

FC 111: OSCILLATOR_MONITOR_ERROR
Engine Control Module Critical Internal Failure - Bad intelligent device or component.
System Error number: 5344

FC 343: POWEROFF_COMMAND_IGNORED_ERROR
Engine Control Module Warning Internal Hardware Failure - Bad intelligent device or component
System Error number: 217

FC 1117: PERSISTANT_DATA_LOST_ERROR
Engine Control Module Critical Internal Failure - Bad intelligent device or component.
System Error number: 294

FC 3697: RAM_REFRESH_ERROR
Engine Control Module Calibration Memory - Bad intelligent device or component.
System Error number: 5340

FC 3697: EEPROM_WRITE_ERROR
Engine Control Module Calibration Memory - Bad intelligent device or component.
System Error number: 5339

Run_Location	ECM_Status
C_ESM_SetClrMemErr_Cnt	C_ESM_PowerOff_Cmd_Err_Enable

(Click here for parameter list in Excel)

Related Codes / Sections:

EGR Differential Pressure Sensor - FC 2273, FC 2274

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FC 2273: EGR_DELTA_P_OOR_HIGH_ERROR
Exhaust Gas Recirculation Differential Pressure Sensor Circuit - Voltage above normal, or shorted to high source.
System error number: 485
(csdd_chrg_ext_egr_dp.mdl)

FC 2274: EGR_DELTA_P_OOR_LOW_ERROR
Exhaust Gas Recirculation Differential Pressure Sensor Circuit - Voltage below normal, or shorted to low source.
System error number: 483
(csdd_chrg_ext_egr_dp.mdl)

EGR_Delta_P_Autozero_Offset	kPa	C_AIP_EGRDeltaPressULim	counts
EGR_DeltaP_Sensor_Volts	V	C_AIP_EGRDeltaPressLLim	counts
EGR_Delta_Press	kPa	C_AIP_EGRDeltaPressDefault	kPa
H_EGR_Delta_Press_Raw	Counts	C_AIP_EGRDeltaPress_Count_Incrt	counts
EGR_Delta_Press_Sensor	kPa	C_AIP_EGRDeltaPress_Count_Decrt	counts
EGR_Delta_Press_AP	kPa	C_AIP_ExhaustPressCountDur	counts
EGR_Orifice_Delta_Press	kPa	C_EGRDeltaPEnable	None
EGR_Delta_Press_Sensor			
Override:			
T_EGR_Delta_P_AZ_User_Override	---	T_AIP_EGRDeltaPress_Ovrd_En	---
C_EGR_Delta_P_AZ_Override_Value	kPa	C_AIP_EGRDeltaPress_Ovrd_Val	kPa

(Click here for parameter list in Excel)

EGR Orifice Pressure Sensor

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Air_Press_Sensor	kPa	EGR_Position	%
C_AIP_EGROrifPressDefault	kPa	Engine_Is_Warm	None
Charge_Press	kPa	Engine_Speed	RPM
Charge_Press_Sensor	kPa	Exhaust_Press	kPa
ECM_Run_Time	s	Exhaust_Press_Sensor	kPa
EGR_Flow	kg/min	Key_Switch	None
EGR_Orif_Press	kPa_A	Keyoff_Press_Check_Exec_Cnt	None
EGR_Orif_Press_Est	kPa	MMon_EOP_Keyoff_Error_Flag	None
EGR_Orif_Press_Est_Status	None	MMon_Keyoff_Press_Check_State	None
EGR_Orif_Press_High_Cusum_Value	kPa	MMon_Keyoff_Press_Check_Timer	s
EGR_Orif_Press_IR_Cusum_Timer	s	MMon_Keyoff_Press_Delay_Timer	s
EGR_Orif_Press_IR_Enable	None	Net_Engine_Torque	N_m
EGR_Orif_Press_IR_High_Err	None	Oil_Pressure_Absolute_Sensor	kPa
EGR_Orif_Press_IR_Low_Err	None	VGT_Position	%
EGR_Orif_Press_Low_Cusum_Value	kPa		
EGR_Orif_Press_Sensor	kPa	**Diagnostics:**	
EGR_Orif_Press_Sensor_Status	None	C_AIP_EGROrificeTmptrULim	counts
EGR_Orif_Press_Sensor_Volts	V	C_AIP_EGROrificeTmptrLLim	counts
EGR_Orif_Press_Status	None		

(Click here for parameter list in Excel)

Related Codes / Sections: FC 3136, FC 3137, FC 3138

EGR Orifice Temperature Sensor

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C_AIP_EGROrificeTmptrDefault	Deg_C	EGRT_IR_Stuck_Err	None
ECM_Run_Time	s	Engine_Speed	RPM
EGR_Flow	kg/min	H_EGR_Orifice_Tmptr_Raw	counts
EGR_Orifice_Tmptr	Deg_C	H_EGRT_RPM_Diff	RPM
EGR_Orifice_Tmptr_Sensor	Deg_C	H_EGRT_SIR_Timer	s
EGR_Orifice_Tmptr_Sensor_Status	None	Net_Engine_Torque	N_m
EGR_Orifice_Tmptr_Sensor_Volts	V		
EGR_Orifice_Tmptr_Status	None	**Override:**	
EGR_Position	%	T_AIP_EGROrificeTmptr_Ovrd_En	None
EGRT_In_Range_Cusum_Timer	s		
EGRT_IR_Enable	None	**Diagnostics:**	
EGRT_IR_High_Err	None	C_AIP_EGROrificeTmptrULim	counts
EGRT_IR_Stuck_En	None	C_AIP_EGROrificeTmptrLLim	counts

(Click here for parameter list in Excel)

Related Codes / Sections: FC 1867, FC 2375, FC 2376

EGR Outlet Pressure Sensor - FC 3136, FC 3137

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FC 3136: EGR_ORIFICE_PRESS_OOR_HIGH_ERROR

Engine Exhaust Gas Recirculation Outlet Pressure Sensor Circuit - Voltage above normal, or shorted to high source

System Error Number: 3003

(csdd_charge_base_mgr_lib.mdl)

FC 3137: EGR_ORIFICE_PRESS_OOR_LOW_ERROR

Engine Exhaust Gas Recirculation Outlet Pressure Sensor Circuit - Voltage below normal, or shorted to low source

Sensor error number: 3004
(csdd_charge_base_mgr_lib.mdl)

EGR_Orifice_Press_Status	---	**Diagnostics:**	---
EGR_Orifice_Press	kPa	C_AIP_EGROrifPressULim	counts
EGR_Orifice_Press_Sensor_Volts	V	C_AIP_EGROrifPressLLim	counts
H_EGR_Orifice_Press_Raw	counts	C_AIP_EGROrifPressDefault	kPa_G
EGR_Orifice_Press_Est	kPa	C_AIP_EGROrifPress_Count_Incrt	counts
EGR_Orifice_Press_EStat	---	C_AIP_EGROrifPress_Count_Decrt	counts
		C_AIP_EGROrifPressCountDur	counts
		C_EGROrificePress_Enable	None

(Click here for parameter list in Excel)

EGR Pressure Sensor - FC 2373, FC 2374

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FC 2373: EXHAUST_PRESS_OOR_HIGH_ERROR

Exhaust Gas Pressure Sensor Circuit - Voltage above normal, or shorted to high source
System error number: 493
(csdd_charge_base_mgr_lib.mdl)

FC 2374: EXHAUST_PRESS_OOR_LOW_ERROR

Exhaust Gas Pressure Sensor Circuit - Voltage below normal, or shorted to low source
System error number: 490
(csdd_charge_base_mgr_lib.mdl)

Exhaust_Press_Sensor_Volts	V	**Diagnostics**:	
Exhaust_Press	kPa	C_AIP_ExhaustPressULim	counts
Exhaust_Press_Sensor	kPa	C_AIP_ExhaustPressLLim	counts
H_Exhaust_Press_Raw	Counts	C_AIP_ExhaustPressDefault	kPa_G
Exhaust_Pressure_Keyon_Error	---	C_AIP_ExhaustPress_Count_Incrt	counts
		C_AIP_ExhaustPress_Count_Decrt	counts
Override:		C_AIP_ExhaustPressCountDur	counts
T_AIP_ExhaustPress_Ovrd_En	---	C_ExhaustPressEnable	None
AIP_ExhaustPress_Ovrd_Val	kPa		
		Estimate:	
		Exhaust_Press_Est	kPa
		Exhaust_Press_EStat	---

(Click here for parameter list in Excel)

EGR Temperature Sensor - FC 2375, FC 2376

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FC 2375: EGR_ORIFICE_TMPTR_OOR_HIGH_ERROR

Exhaust Gas Recirculation Temperature Sensor Circuit - Voltage above normal, or shorted to high source
System error number: 496
(csdd_charge_base_mgr_lib.mdl)

FC 2376: EGR_ORIFICE_TMPTR_OOR_LOW_ERROR

Exhaust Gas Recirculation Temperature Sensor Circuit - Voltage below normal, or shorted to low source
System error number: 495
(csdd_charge_base_mgr_lib.mdl)

EGR_Orifice_Tmptr_Status	---	**Override:**	
EGR_Orifice_Tmptr	Deg_C	T_AIP_EGROrificeTmptr_Ovrd_En	---
EGR_Orifice_Tmptr_Sensor_Volts	V	C_AIP_EGROrificeTmptr_Ovrd_Val	Deg_C
H_EGR_Orifice_Tmptr_Raw	counts		
C_AIP_EGROrificeTmptrDefault	Deg_C	**Diagnostics**:	

EGR_Orifice_Tmptr_Source	---	C_AIP_EGROrificeTmptrULim	counts
EGR_Orifice_Tmptr_State	---	C_AIP_EGROrificeTmptrLLim	counts
		C_AIP_EGROrificeTmptrCountIncr	counts
		C_AIP_EGROrificeTmptrCountDecr	counts
		C_AIP_EGROrificeTmptrCountDur	counts

(Click here for parameter list in Excel)

EGR Temperature - FC 1867

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Exhaust Gas Recirculation Temperature - Data erratic, intermittent or incorrect.

EGR_ORIFICE_TMPTR_IR_HIGH_ERROR
Error Flag: EGRT_IR_High_Err
System error number: 3876
(csdd_charge_base_mgr_lib.mdl)

EGR_ORIFICE_TMPTR_IR_LOW_ERROR
Error Flag: EGRT_IR_Low_Err
System error number: 3877
(csdd_charge_base_mgr_lib.mdl)

EGR_ORIFICE_TMPTR_IR_STUCK_ERROR
Error Flag: EGRT_IR_High_Err
System error number: 3878
(csdd_charge_base_mgr_lib.mdl)

ECM_Run_Time	S	EGRT_In_Range_Cusum_Timer	s
Engine_Speed	RPM	EGRT_IR_Enable	None
EGR_Flow	Kg/min	EGRT_IR_High_Err	None
EGR_Orifice_Tmptr	Deg_C	EGRT_IR_Stuck_En	None
EGR_Orifice_Tmptr_Sensor	Deg_C	EGRT_IR_Stuck_Err	None
EGR_Orifice_Tmptr_Sensor_Status	None	EGRT_Stuck_Delta_Value	Deg_C
EGR_Orifice_Tmptr_Sensor_Volts	V	H_EGRT_RPM_Diff	RPM
EGR_Orifice_Tmptr_Status	None	H_EGRT_SIR_Timer	s
EGR_Position	%	Net_Engine_Torque	Nm

EGR_ORIFICE_TMPTR_KEYON_ERROR
Error Flag: MMon_EOT_Keyon_Error_Flag
System error number: 3872
(csdd_magt_mach_monitor.mdl)

ECM_Run_Time	S	MMon_BHD_Check_Enable	None
Engine_Speed	RPM	MMon_BHD_Monitor_State	None
EGR_Orifice_Tmptr	Deg_C	MMon_BHD_State	None
EGR_Orifice_Tmptr_Sensor	Deg_C	MMon_BHD_Timer	s
EGR_Orifice_Tmptr_Sensor_Status	None	MMon_Keyon_Tmptr_Check_State	None
EGR_Orifice_Tmptr_Sensor_Volts	V	MMon_EOT_Keyon_Error_Flag	None
EGR_Orifice_Tmptr_Status	None	MMon_Keyon_Tmptr_Check_Timer	S
Compressor_Inlet_Tmptr_Sensor	Deg_C	Air_Tmptr_Sensor	Deg_C
InternalTmptr_Sensor	Deg_C	Charge_Tmptr_Sensor	Deg_C
Coolant_Temperature_Sensor	Deg_C	Oil_Temperature_Sensor	Deg_C

(Click here for parameter list in Excel)

EGR Valve - FC 1866

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Exhaust Gas Recirculation Valve Delta Pressure - Data erratic, intermittent or incorrect. An error in the EGR delta pressure signal was detected at initial key-on or the sensor failed the autozero test.

EGR_DELTA_P_IR_STUCK_ERROR
Error Flag:
System error number: 3925
(csdd_chrg_ext_egr_dp.mdl)

EGR_DELTA_P_IR_HIGH_ERROR
Error Flag: EGR_DeltaP_IR_High_Err
System error number: 1724
(csdd_chrg_ext_egr_dp.mdl)

EGR_DELTA_P_IR_LOW_ERROR
Error Flag: EGR_DeltaP_IR_Low_Err
System error number: 1728
(csdd_chrg_ext_egr_dp.mdl)

EGR_DELTA_PRESS_KEYON_ERROR
Error Flag:
System error number:
(csdd_chrg_ext_egr_dp.mdl)

ECM_Run_Time	S	EGR_DeltaP_IR_Enable	None
Engine_Speed	RPM	EGR_DeltaP_IR_High_Err	None
Charge_Press	KPa	EGR_DeltaP_IR_Low_Err	None
EGR_Delta_Press_AP	kPa	EGR_DeltaP_Low_Cusum_Value	kPa
EGR_Delta_Press_IR_Filt	kPa	EGR_Flow	Kg/min
EGR_Delta_Press_Sensor_Status	None	EGR_Orif_press	KPa
EGR_Delta_Press_Status	None	EGR_Position	%
EGR_DeltaP_Est	KPa	Exhaust_Press	KPa
EGR_DeltaP_Est_Status	None	Net_Engine_Torque	Nm
EGR_DeltaP_High_Cusum_Value	kPa	OBD_Number_Of_Operation_Cycles	None
EGR_DeltaP_IR_Cusum_Timer	s	VGT_Position	%
EGR_DeltaP_IR_Enable	None		

EGR_DP_AUTOZERO_ERROR
Error Flag: EGR_Delta_P_Autozero_Error
System error number: 1911
(csdd_chrg_ext_egr_dp.mdl)

ECM_Run_Time	S	EGR_Delta_Press_Sensor	KPa
Engine_Speed	RPM	EGR_Delta_Press_Sensor_Status	None
Charge_Tmptr	Deg_C	EGR_Delta_Press_Status	None
Coolant_Temperature	Deg_C	EGR_DeltaP_IR_Enable	None
EGR_Delta_P_Autozero_Enable	None	EGR_DP_AZ_Allowed	None
EGR_Delta_P_Autozero_Error	None	EGR_Flow	Kg/min
EGR_Delta_P_Autozero_Offset	KPa	EGR_Position	%
EGR_Delta_P_AZ_Bypass	None	EGR_Valve_Is_Closed	None
EGR_Delta_P_AZ_Precondition	None	InternalTmptr	Deg_C
EGR_Delta_P_AZ_Tolerance	Kpa	Key_Switch	None
EGR_Delta_P_Sensor_Warm	None		

(Click here for parameter list in Excel)

EGR Valve Actuator

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(csdd_charge_base_mgr.mdl)

Battery_Voltage	V	H_EGA_BM_Pos_Cusum_Reset	None

EAC_EGR_Valve_Cmd	%	H_EGA_BM_Pos_Cusum_SIR_Fault	None
ECM_Run_Time	s	H_EGA_BM_Pos_Cusum_SIR_MaxValue	None
EGA_AZ_State	None	H_EGA_BM_Pos_Cusum_SIR_Value	None
EGA_BM_Status	None	H_EGA_BM_Pos_Cusum_Timer	s
EGA_Control_State	None	H_EGA_BM_Pos_IR_Filtered_Cmd	%
EGA_Driver_Short_Circuit_Fault	None	H_EGA_BM_Pos_IR_Set_Clear_En	None
EGA_Electrical_Fault	None	H_EGA_BM_Position_IR_Fault	None
EGA_Position_Cmd	%	Key_Switch	None
EGA_Position_Ref_Filtered	%	OBD_Number_Of_Key_Cycles	None
EGA_Position_Ref_Unfiltered	%	T_EGA_Cycle_Counter	counts
EGA_PWM_Abs_Duty_Cycle	%	VGT_Position	%
EGR_Position	%		
H_EGA_BM_Motor_Current	A	**Override:**	
H_EGA_BM_Pos_Cusum_Count	counts	T_EGA_Cmd_User_Override	---
H_EGA_BM_Pos_Cusum_Enable	None	C_EGA_Cmd_Override_Value	%
H_EGA_BM_Pos_Cusum_IRH_Fault	None	T_EAC_User_Override	---
H_EGA_BM_Pos_Cusum_IRH_MaxValue	None	C_EAC_Override_Value	%
H_EGA_BM_Pos_Cusum_IRH_Value	None		
H_EGA_BM_Pos_Cusum_IRL_Fault	None		
H_EGA_BM_Pos_Cusum_IRL_MaxValue	None		

(Click here for parameter list in Excel)

Related Codes / Sections: FC 1228

Engine Coolant Temperature - FC 334

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Engine Coolant Temperature - Data erratic, intermittent or incorrect.

COOLANT_TMPTR_KEYON_ERROR
Error Flag: MMon_CT_Keyon_Error_Flag
System error number: 3805
(csdd_magt_mach_monitor.mdl)

COOLANT_TMPTR_IR_STUCK_ERROR
Error Flag: OBD_LUCL_CT_IR_ERROR_FLAG
System error number: 3669
(csdd_obd_lbe_cool.mdl)

COOLANT_TMPTR_IR_LOW_ERROR
Error Flag: OBD_LUCL_CT_IR_ERROR_FLAG
System error number: 3668
(csdd_obd_lbe_cool.mdl)

Air_Tmptr_Sensor	Deg_C	MMon_CT_Keyon_Error_Flag	None
Charge_Tmptr_Sensor	Deg_C	MMon_Keyon_Tmptr_Check_State	None
Compressor_Inlet_Tmptr_Sensor	Deg_C	MMon_Keyon_Tmptr_Check_Timer	S
Coolant_Temperature	Deg_C	Net_Engine_Torque	N-m
Coolant_Temperature_Sensor	Deg_C	OBD_LUCL_CSM_Monitor_State	None
Coolant_Tmptr_Sensor_Volts	V	OBD_LUCL_CT_IR_ERROR_FLAG	None
ECM_Run_Time	S	OBD_LUCL_CT_IRL_State	None
EGR_Orifice_Tmptr_Sensor	Deg_C	OBD_LUCL_CT_SIR_Delta	Deg_C
Engine_Speed	RPM	OBD_LUCL_CT_Stuck_Max_Tmptr	Deg_C
InternalTmptr_Sensor	Deg_C	OBD_LUCL_CT_Stuck_Max_Tmptr	Deg_C
MMon_BHD_Check_Enable	None	OBD_LUCL_CT_Stuck_Min_Tmptr	Deg_C
MMon_BHD_Monitor_State	None	OBD_LUCL_CT_Stuck_Min_Tmptr	Deg_C
MMon_BHD_State	None	Oil_Temperature_Sensor	Deg_C
MMon_BHD_Timer	s		

(Click here for parameter list in Excel)

OBD_LUCL_CT_IRL_State
1 = NO_ERROR
2 = PAUSE
3 = NOT_STARTED
4 = ERROR
5 = COMPLETE

OBD_LUCL_CT_Stuck_State
1 = NO_ERROR
2 = PAUSE
3 = NOT_STARTED
4 = ERROR
5 = COMPLETE

OBD_LUCL_CT_Monitor_State
0 = CT_DISABLED
1 = CT_NO_ERROR
2 = CT_STUCK_RUNNING
3 = CT_IR_LOW_RUNNING
4 = CT_STUCK_PAUSE
5 = CT_IR_LOW_PAUSE
6 = CT_KEYON_ERROR
7 = CT_SIR_ERROR
8 = CT_IRL_ERROR
9 = CT_IRH_ERROR
10 = CT_ABORT
11 = (Future Implementation)

Engine Oil Pressure - FC 435

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Engine Oil Rifle Pressure - Data erratic, intermittent or incorrect. The engine oil pressure sensor is reading an erratic value.

OIL_PRESS_KEYOFF_ERROR
Error Flag: MMon_OP_Keyoff_Error_Flag
System error number: 4443
(csdd_magt_mach_monitor.mdl)

OIL_PRESS_KEYON_ERROR
Error Flag:
System error number: 1817
(csdd_ magt_mm.mdl)

OIL_PRESSURE_SWITCH_ERROR
Error Flag:
System error number: 0687
(csdd_obd_lbe_cool.mdl)

Air_Press_Sensor	kPa	MACH_ECM_Powerdown_Inhibit	HEX
Charge_Press_Sensor	kPa	MMon_AAP_Keyoff_Error_Flag	None
ECM_Run_Time	s	MMon_EOP_Keyoff_Error_Flag	None
EGR_Orif_Press_Sensor	kPa	MMon_EP_Keyoff_Error_Flag	None
Engine_Is_Warm	None	MMon_Keyoff_Press_Check_State	None
Engine_Speed	RPM	MMon_Keyoff_Press_Check_Timer	s
Exhaust_Press_Sensor	kPa	MMon_Keyoff_Press_Delay_Timer	s
Key_Switch	None	MMon_OP_Keyoff_Error_Flag	None
Keyoff_Press_Check_Exec_Cnt	None	Oil_Pressure_Absolute_Sensor	kPa

OIL_PRES_IN_RANGE_HIGH_ERROR
Error Flag:
System error number: 3575
(csdd_obd_lbe_cool.mdl)

OIL_PRES_IN_RANGE_STUCK_ERROR
Error Flag:
System error number: 3576
(csdd_obd_lbe_cool.mdl)

Engine_Speed	RPM	OBD_LUCL_OP_Diag_Sys_State	None
Oil_Pressure	kPa_G	OBD_LUCL_OP_Sensor_IR_Err_Flag	None
Oil_Pressure_Absolute	kPa	OBD_LUCL_OP_Ubnd	kPa
Oil_Pressure_Absolute_Sensor	kPa	OBD_LUCL_OP_Lbnd	kPa
Oil_Tmptr_Sensor_Volts	V	Oil_Press_Sensor_Type	None
		OBD_LUCL_OP_IRH_set_Timer	S
		OBD_LUCL_OP_SIR_Delta	kPa

OBD_LUCL_OP_Diag_Sys_State
0 = OIL_DIAG_SYS_DISABLED
1 = OIL_DIAG_SYS_RUNNING
2 = ENG_SPD_SENSOR_ERROR
3 = NO_GOOD_TMPTR_SENSOR
4 = OIL_PRES_SENSOR_ERROR
5 = ENGINE_NOT_RUNNING
6 = PENDING_STARTUP_DELAY
7 = IRH_ERROR
8 = IRL_ERROR
9 = SIR_ERROR
10 = (not used)
11 = (not used)

Engine Oil Pressure Sensor - FC 135, FC 141

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FC 135: OIL_PRESSURE_HIGH_ERROR
Engine Oil Rifle Pressure 1 Sensor Circuit - Voltage above normal, or shorted to high source
System Error number: 67
(csdd_lube_cool.mdl)

FC 141: OIL_PRESSURE_LOW_ERROR
Engine Oil Rifle Pressure 1 Sensor Circuit - Voltage below normal, or shorted to low source
System Error number: 72
(csdd_lube_cool.mdl)

Oil_Pressure_Absolute	kPa	**Override:**	
Oil_Pressure_Sensor_Volts	V	T_AIP_OP_User_Override	---
Oil_Pressure	kPa_G	AIP_Oil_Press_Override_Value	kPa
Oil_Pressure_Absolute_Sensor			

Diagnostics:

C_AIP_OP_Count_OOR_High_Limit	counts
C_AIP_OP_Count_OOR_Low_Limit	counts
C_AIP_OP_IR_Constant_Value	kPa
C_AIP_OP_Count_OOR_Incrt	counts
C_AIP_OP_Count_OOR_Decrt	counts
C_AIP_OilPresCountDur	counts

(Click here for parameter list in Excel)

Related Codes / Sections:

Engine Oil Temperature - FC 425

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Engine Oil Temperature - Data erratic, intermittent or incorrect.

OIL_TMPTR_IN_RANGE_LOW_ERROR
System error number: 3578
(csdd_magt_mach_monitor.mdl)

OIL_TMPTR_IN_RANGE_STUCK_ERROR
System error number: 3579
(csdd_magt_mach_monitor.mdl)

OIL_TMPTR_KEYON_ERROR
Error Flag: MMon_OT_Keyon_Error_Flag
System error number: 3807
(csdd_magt_mach_monitor.mdl)

ECM_Run_Time	S	MMon_BHD_Timer	s
Engine_Speed	RPM	MMon_Keyon_Tmptr_Check_State	None
Oil_Temperature	Deg_C	MMon_OT_Keyon_Error_Flag	None
Oil_Temperature_Sensor	Deg_C	MMon_Keyon_Tmptr_Check_Timer	S
Oil_Tmptr_Sensor_Volts	V	Air_Tmptr_Sensor	Deg_C
OBD_LUCL_OT_SIR_Delta	Deg C	Charge_Tmptr_Sensor	Deg_C
OBD_LUCL_OT_IRL_Set_Timer	S	Compressor_Inlet_Tmptr_Sensor	Deg_C
MMon_BHD_Check_Enable	None	EGR_Orifice_Tmptr_Sensor	Deg_C
MMon_BHD_Monitor_State	None	InternalTmptr_Sensor	Deg_C
MMon_BHD_State	None	Coolant_Temperature_Sensor	Deg_C

(Click here for parameter list in Excel)

OIL_TMPTR_IR_LOW_ERROR
Error Flag: OBD_LUCL_OT_Sensor_IR_Err_Flag
System error number: 412
(csdd_obd_lbe_cool.mdl)

OIL_TMPTR_IR_STUCK_ERROR
Error Flag: OBD_LUCL_OT_Sensor_IR_Err_Flag
System error number: 413
(csdd_obd_lbe_cool.mdl)

Engine_Speed	RPM	OBD_LUCL_OT_Stuck_Min_Tmptr	Deg_C
Net_Engine_Torque	N_m	OBD_LUCL_OT_Sensor_IR_Err_Flag	None
Oil_Temperature	Deg_C	OBD_LUCL_OT_Lbnd	Deg_C
Oil_Temperature_Sensor	Deg_C	OBD_LUCL_OT_Lbnd	Deg_C
Oil_Tmptr_Sensor_Volts	V	OBD_LUCL_OT_Stuck_Max_Tmptr	Deg_C
		OBD_LUCL_OT_SIR_Delta	Deg_C

OBD_LUCL_OT_Diag_Sys_State
0 = OIL_DIAG_SYS_DISABLED
1 = OIL_DIAG_SYS_RUNNING
2 = (not used)
3 = NO_GOOD_TMPTR_SENSOR
4 = (not used)
5 = ENGINE_NOT_RUNNING
6 = PENDING_STARTUP_DELAY
7 = IRH_ERROR
8 = IRL_ERROR
9 = SIR_ERROR
10 = OIL_TMPTR_SENSOR_ERROR
11 = COOLANT_TMPTR_SENSOR_ERROR

(Click here for parameter list in Excel)

Engine Oil Temperature Sensor - FC 212, FC 213

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FC212: OIL_TEMPERATURE_HIGH_ERROR
Engine Oil Temperature Sensor 1 Circuit - Voltage above normal, or shorted to high source
System Error number: 104
(csdd_lube_cool.mdl)

FC213: OIL_TEMPERATURE_LOW_ERROR
Engine Oil Temperature Sensor 1 Circuit - Voltage below normal, or shorted to low source
System Error number: 105
(csdd_lube_cool.mdl)

Oil_Tmptr_Sensor_Volts	V	**Diagnostics:**	
Oil_Temperature	Deg_C	C_AIP_OT_Count_OOR_High_Limit	counts
Oil_Tmptr_Sensor		C_AIP_OT_Count_OOR_Low_Limit	counts
		C_AIP_OT_IR_Constant_Value	Deg_C
Override:		C_AIP_OT_Count_OOR_Incrt	counts
T_AIP_OT_User_Override	---	C_AIP_OT_Count_OOR_Decrt	counts
AIP_Oil_Tmptr_Override_Value	Deg_C	C_AIP_OilTempCountDur	counts

(Click here for parameter list in Excel)

EPS (Engine Position/Engine Speed) Sensors

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Engine_Speed	RPM	EPS_s_Status	
EPS Main Sensor (Crank):		**EPS Backup Sensor (Cam):**	
H_EPS_s_MainLevel	---	H_EPS_s_BkupLevel	---
(See Note 1)		(See Note 1)	
EPS_s_MainSync	---	EPS_s_BkupSync	---
H_EPS_s_MainSupplyStatus	---	H_EPS_s_BkupSupplyStatus	---
Sensor_Supply_3_Voltage	V	Sensor_Supply_2_Voltage	V

Note 1: The engine must be stopped. This parameter will toggle from 1 to 0 as a ferrous metal is passed in front of the sensor.

(Click here for parameter list in Excel)

Feature Exclusivity Monitor - FC 346

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Engine Control Module Calibration Memory Software - Bad intelligent device or component

TRIMS_CONFIGURATION_ERROR
System Error number: 2909
(csdd_fem.mdl)

C_FEM_Feature1_Enable_Table[8]	None	T_Accelerator_Interlock_Enable	None
C_FEM_Feature1_RLOC_Table[8]	None	T_DIP_Accel_Interlock_RLOC	None
C_FEM_Feature2_Enable_Table[8]	None	T_DIP_PTP_TrqLimSw_RLOC	None
C_FEM_Feature2_RLOC_Table[8]	None	T_FEM_Enable	None
FEM_Trims_Configuration_Error	None	XMGR_Completed_Init_Stage	None

(Click here for parameter list in Excel)

Related Codes / Sections:

Fuel Pressure Sensor - FC 755

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Fuel Rail Pressure Rationality High/Low Error – The fuel rail pressure sensor measurement accuracy has drifted beyond acceptable limits.

FUEL_PRESS2_RATIONALITY_ERROR
Error Index:
System error number: 7212
(obd_ss_fs_hpcr.mdl)

FUEL_PRESS_RATIONALITY_HIGH_ERROR
Error Index: prd_high_error_index
System error number: 7209
(obd_ss_fs_hpcr.mdl)

FUEL_PRESS_RATIONALITY_LOW_ERROR
Error Index: prd_low_error_index
System error number: 7211
(obd_ss_fs_hpcr.mdl)

Engine_Speed	Rpm	H_PRD_r_VarianceScaledPress	None
FSI_q_TotalFueling	mg/stroke	H_PRD_r_VarianceSlope	None
APC_hp_Fdbk	Bar	H_PRD_s_Active (1 = active)	None
APC_qr_Cmd	Bar	H_PRD_s_ConditionsReady	None
H_PRD_ct_DelaySlopeSamples	Counts	H_PRD_s_CorrCnvrgd	None
H_PRD_ct_InrangeHighError	Counts	H_PRD_s_EngineAtIdle	None
H_PRD_ct_InrangeLowError	Counts	H_PRD_s_EngineIsWarm	None
H_PRD_ct_NumSamples	Counts	H_PRD_s_FLMonitorEnable	None
H_PRD_ct_RunsPerOpCycle	Counts	H_PRD_s_HighErrUpdate	None
H_PRD_ct_SampleResetTestHook	Counts	H_PRD_s_LowFuelingErrUpdate	None
H_PRD_hp_Cmd	Bar	H_PRD_s_LowSlopeErrUpdate	None
H_PRD_hp_MeanScaledPress	Bar	H_PRD_s_NeverRun	None
H_PRD_q_AvgMeanFeuling	mg/stroke	H_PRD_s_OperationReset	None
H_PRD_q_MeanFueling	mg/stroke	H_PRD_s_OverrideEnbl	None
H_PRD_r_CorrelationSqrd	None	H_PRD_s_PressCmdStatus	None
H_PRD_r_Covariance	bar.mg/stroke	H_PRD_s_PtmFinalOperMode	None
H_PRD_r_MeanCorrSqrd	None	H_PRD_s_Reset	None
H_PRD_r_MeanPressFueling	None	H_PRD_ti_CycleActivetime	s
H_PRD_r_MeanSlope	mg/stroke/100bar	H_PRD_ti_HighPressHold	s
H_PRD_r_Slope	mg/stroke/100bar	H_PRD_ti_VarSlopeDelay	s
H_PRD_r_VarianceFueling	None	H_PRD_x_DiagStatus	HEX

Note: PRD is active when H_PRD_s_Active = 1. 40 to 80 msec rate EDM log preferred.

(Click here for parameter list in Excel)

Fuel Rail Pressure Sensor - FC451, FC452, FC515, FC516, FC483, FC484, FC 755

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FC 451: APC_DIESEL_PRS_OOR_HIGH_ERROR
System Error Number: 525

FC 452: APC_DIESEL_PRS_OOR_LOW_ERROR
System Error Number: 526

FC 515: SENSOR_SUPPLY_6_VOLTAGE_HIGH_ERROR
System Error Number: 2030

FC 516: SENSOR_SUPPLY_6_VOLTAGE_LOW_ERROR
System Error Number: 2031

FC 483: APC_DIESEL_PRS2_OOR_HIGH_ERROR
System Error Number: 6690

FC 484: APC_DIESEL_PRS2_OOR_LOW_ERROR
System Error Number: 6691

FC 755: FUEL_PRESS_RATIONALITY_HIGH_ERROR
System Error Number: 7209

FC 755: FUEL_PRESS_RATIONALITY_LOW_ERROR
System Error Number: 7211

FC 755: FUEL_PRESS2_RATIONALITY_ERROR
System Error Number: 7212

Engine_Speed	RPM	H_PRD_ct_LowDecisionPerCycle	counts
APC_hp_Cmd	bar	H_PRD_hp_P1P2Diff	bar
APC_hp_Fdbk	bar	H_PRD_s_Error	HEX
APM_ct_Signal2Pressure	counts	H_PRD_s_Press2ErrorStatus	None
Battery_Voltage	V	H_PRD_s_PressStable	None
Combustion_Control_Path_Owner	None	H_PRD_ti_HighError	sec
Engn_Control_Path_Owner	None	H_PRD_ti_LowError	sec
FSI_hp_Cmd	bar	H_PRD_ti_Press2Error	sec
H_APC_ct_DslPrsRaw	counts	Mach_Control_Path_Owner	None
H_APC_hp_MdvDeltaP	bar	Sensor_Supply_1_Voltage	V
H_APC_hp_MdvPeak	bar	Sensor_Supply_2_Voltage	V
H_APC_ti_DslPrs2OOR	sec	Sensor_Supply_3_Voltage	V
H_APC_ti_DslPrsOOR	sec	Sensor_Supply_4_Voltage	V
H_APM_ct_Signal1Raw	counts	Sensor_Supply_5_Voltage	V
H_APM_ct_Signal2Raw	counts	Sensor_Supply_6_Voltage	V
H_APM_s_Signal2Status	None	Sensor_Supply_7_Voltage	V
H_FSI_q_TotalFueling	mg/stroke	Sensor_Supply_8_Voltage	V
H_PRD_ct_HighDecisionPerCycle	counts		

(Click here for parameter list in Excel)

IAT Valve Actuator and Sensor - FC 175, FC 176, FC 177, FC 3539, FC 3541, FC 3542

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FC 175: IAT_HB_CPS_HIGH_CONTROL_ERROR
Electronic Throttle Control Actuator Driver Circuit - Voltage above normal, or shorted to high source
System Error number: 2795

FC 175: IAT_HB_CPS_OL_CONTROL_ERROR
Electronic Throttle Control Actuator Driver Circuit - Voltage above normal, or shorted to high source
System Error number: 3989

FC 176: IAT_HB_CPS_LOW_CONTROL_ERROR
Electronic Throttle Control Actuator Driver Circuit - Voltage below normal, or shorted to low source
System Error number: 2796

FC 177: IAT_HB_VALVE_AUTOZERO_ERROR
Electronic Throttle Control Actuator - Mechanical system not responding or out of adjustment
System Error number: 2796

FC 3539: IAT_HB_POS_OOR_HIGH_ERROR
Engine Intake Throttle Actuator Position Sensor Circuit - Voltage above normal, or shorted to high source
System Error number: 3530

FC 3541: IAT_HB_POS_OOR_LOW_ERROR
Engine Intake Throttle Actuator Position Sensor Circuit - Voltage below normal, or shorted to low source
System Error number: 3529

FC 3542: IAT_HB_POSITION_IRH_ERROR
Engine Intake Throttle Actuator Position Sensor - Data erratic, intermittent or incorrect
System Error number: 4015

FC 3542: IAT_HB_POSITION_IRL_ERROR
Engine Intake Throttle Actuator Position Sensor - Data erratic, intermittent or incorrect
System Error number: 4014

FC 3542: IAT_HB_POSITION_SIR_ERROR
Engine Intake Throttle Actuator Position Sensor - Data erratic, intermittent or incorrect
System Error number: 4016

(csdd_dd_iat_hb.mdl)

Both:		**Sensor:**	
H_IAT_HB_Pos_IR_Filtered_Cmd	%	H_IAT_HB_Pos_Cusum_IRH_Value	None
IAT_Position_Sensor_Volts	V	H_IAT_HB_Pos_Cusum_SIR_Value	None
IAT_Position	%	H_IAT_HB_Pos_Cusum_IRL_Value	None
IAT_Position_Percent_Cmd	%	H_IAT_Position_CountDur	counts
IAT_Driver_Failure	None		
H_IAT_Control_State	None	**Actautor:**	
H_IAT_HB_AZ_Position	%	H_IAT_HB_CPS_High_Error_Timer	mSec
H_IAT_Position_Percent	%	H_IAT_HB_CPS_Low_Error_Timer	mSec
H_IAT_Position_Raw	counts	H_IAT_HB_CPS_OL_Error_Timer	mSec
		H_IAT_HB_Span_Observed	%
		H_IAT_HB_AZ_Timer	mSec

(Click here for parameter list in Excel)

Related Codes / Sections:

Sensor Supply Voltage Diagnostics – FC 386, FC 352, FC 227, FC 187, FC 239, FC 238, FC 2185, FC 2186, FC 1695, FC 1696, FC 515, FC 516

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FC 352: SENSOR_SUPPLY_1_VOLTAGE_LOW_ERROR
Sensor Error number:

FC 386: SENSOR_SUPPLY_1_VOLTAGE_HIGH_ERROR
Sensor Error number:

FC 227: SENSOR_SUPPLY_2_VOLTAGE_HIGH_ERROR
Sensor Error number:

FC 187: SENSOR_SUPPLY_2_VOLTAGE_LOW_ERROR
Sensor Error number:

FC 239: SENSOR_SUPPLY_3_VOLTAGE_HIGH_ERROR
Sensor Error number:

FC 238: SENSOR_SUPPLY_3_VOLTAGE_LOW_ERROR
Sensor Error number:

FC 2185: SENSOR_SUPPLY_4_VOLTAGE_HIGH_ERROR
Sensor Error number:

FC 2186: SENSOR_SUPPLY_4_VOLTAGE_LOW_ERROR
Sensor Error number:

FC 1695: SENSOR_SUPPLY_5_VOLTAGE_HIGH_ERROR
Sensor Error number:

FC 1696: SENSOR_SUPPLY_5_VOLTAGE_LOW_ERROR
Sensor Error number:

FC 515: SENSOR_SUPPLY_6_VOLTAGE_HIGH_ERROR
Sensor Error number:

FC 516: SENSOR_SUPPLY_6_VOLTAGE_LOW_ERROR
Sensor Error number:

Sensor_Supply_1_Voltage	V	V_Sensor_Supply_1_Config[0]	None
Sensor_Supply_2_Voltage	V	V_Sensor_Supply_2_Config[0]	None
Sensor_Supply_3_Voltage	V	V_Sensor_Supply_3_Config[0]	None
Sensor_Supply_4_Voltage	V	V_Sensor_Supply_4_Config[0]	None
Sensor_Supply_5_Voltage	V	V_Sensor_Supply_5_Config[0]	None
Sensor_Supply_6_Voltage	V	V_Sensor_Supply_6_Config[0]	None

(Click here for parameter list in Excel)

Related Codes / Sections:

Turbocharger Speed Sensor

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(csdd_charge_base_mgr.mdl)

Ambient_Air_Press	kPa	Turbo_Speed_Source	---
Ambient_Air_Press_Status	None	Turbo_Speed_State	HEX
C_HP_Turbo_DesPos_Max	%	Turbo_Speed_Status	---
C_Turbo_Speed_Default	KRPM		
C_Turbo_Speed_Eng_Spd_Thd	RPM	**Estimate:**	
C_Turbo_Speed_Fault_Decrement	counts	Turbo_Speed_EStat	HEX
C_Turbo_Speed_Fault_Increment	counts	Turbo_Speed_Est	KRPM
C_Turbo_Speed_Fault_Set	counts		
C_Turbo_Speed_High_Error_Limit	Hz	**Diagnostics:**	
C_Turbo_Speed_Low_Error_Limit	Hz	Turbo_Speed_In_Range_Error	---
C_Turbo_Speed_Press_Ratio_Thd	None	CHL_Turbo_Speed_Drt_Active	---
Charge_Press	kPa	CHL_Turbo_Drt_Fuel_Active	---
Charge_Press_Status	None	C_TSD_OverSpdThd	KRPM
Engine_Speed	RPM	Turbo_Speed_High_Error	---
Filtered_Turbo_Speed	KRPM	C_Turbo_Speed_Eng_Spd_Thd	RPM
HP_Turbo_Condition_Met	None		
Raw_Turbo_Speed	Hz	**Override:**	
T_FIP_TurboSpeedRLOC	None	T_Turbo_Speed_Override_Enable	---
Turbo_Speed_Sensor	KRPM	T_Turbo_Speed_Override	KRPM

(Click here for parameter list in Excel)

Related Codes / Sections: FC 595, FC 687

Turbocharger VG Actuator

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(csdd_dd_vgt_dl.mdl)

VGT_Actuator_Enable	None	**Diagnostics:**	
VGT_Actuator_Status	HEX	C_J39_VGT_Status_Timeout	HEX
VGT_Actuator_Type	None	C_VGA_DL_StatusLB_Fault_Enable	HEX
VGT_Position	%	C_VGA_DL_StatusUB_Fault_Enable	HEX
VGT_Position_At_Shutdown	%	J39_VGT_Actuator_Status	None
VGT_Position_Sensor_Enable	None	VGT_Driver_Failure	mSec
VGT_Position_Sensor_Type	None	VGT_Position_At_Shutdown	%
VGT_Position_Source	None		
VGT_Position_Status	None	**Override:**	
C_J39_VGT_Soft_ID_MjRev	HEX	C_TGC_Override_Value	None
J39_VGT_Actuator_Position	%	C_VGA_DL_Cmd_Override_Value	%
J39_VGT_Addr_Claim_Count	None	T_TGC_User_Override	%
J39_VGT_Customer_ID	None		
J39_VGT_Motor_Effort	None		
J39_VGT_Motor_Type	None		
J39_VGT_Soft_Id	HEX		
J39_VGT_Soft_Id_Bug_Fix	HEX		
J39_VGT_Temperature	Deg_C		
TGC_VT_Cmd	%		
VGA_DL_Desired_Position	%		
VGA_DL_Install_Calib_Enable	None		
VGA_DL_Mode_Command	HEX		
VGA_DL_SH_Test_Enable	None		

(Click here for parameter list in Excel)

VGT Actuator - FC 1898

VGT Actuator Controller - Out of Calibration

VGA_DL_SPAN_CHECK_ERROR
System error number:
(csdd_dd_vgt_dl.mdl)

H_VGA_DL_AS_Active	None	VGA_DL_Desired_Position	%
H_VGA_DL_AS_Timer	s	VGA_DL_Pos_Referenced	None
H_VGA_DL_Pos_LLim	%	VGT_Command_EFA	cm2
H_VGA_DL_Pos_ULim	%	VGT_Position	%
H_VGA_Shutdown	None	VGT_Position_Status	None
H_VGT_Fault_Span_Check	None		

(Click here for parameter list in Excel)

Related Codes / Sections:

VGT Controller

(back to table of contents)

(csdd_tahr_controller.mdl)

Engine_Speed	RPM	MCF_Surge_Corr	None
Net_Engine_Torque	N_m	Surge_Corr_Active	None
Total_Fueling	mg/stroke	TAHR_EGR_EFA_Hi	None
Combustion_Control_Path_Owner	None	TAHR_EGR_Near_Open	None
CBM_Retarder_Comb_Active	None	TAHR_EGR_Valve_Full_Open	None
CBR_Thermal_Oscar_Active	None	TAHR_EMP_Controller_Error	None
Controller_EGR_Flow_Cmd	kg/min	TAHR_EMP_I_EGR_Input	None
Controller_FAF_Cmd	kg/min	TAHR_IAT_State	None

Controller_MCF_Cmd	kg/min	TAHR_IAT_Valve_Fdbk_Cmd	%
Current_Engine_State	None	TAHR_IAT_Valve_Feed_Fwd_Cmd	%
EAC_EGR_Valve_Cmd	%	TAHR_Norm_EGR_EFA	None
EGR_Frac_Surge_Corr	None	TAHR_Sys_ID_Signal	None
EGR_Valve_Delta_Press	kPa	TAHR_VGT_Full_Closed	None
Fresh_Air_Flow	kg/min	TAHR_VGT_Full_Open	None
H_TAHR_IAT_Sys_ID_Amp	%	TAHR_VGT_LLim	%
H_TAHR_Sys_ID_Sample_En	None	TAHR_VGT_ULim	%
H_TAHR_Sys_ID_Sample_Hold	counts	TGC_VT_Cmd	%

(Click here for parameter list in Excel)

VGT DL Actuator Power Supply - FC 1939, FC 1941

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FC 1939: VGA_DL_PS_HIGH_ERROR

ECU Power Output Supply Voltage 1 - Voltage above normal, or shorted to high source
System Error number: 1603

FC 1941: VGA_DL_PS_LOW_ERROR

ECU Power Output Supply Voltage 1 - Voltage below normal, or shorted to low source
System Error number:

(csdd_dd_vgt_dl.mdl\dd_vgt_dl_diag\diagnostics\psd)

ECM_Run_Time	s	OBD_Fault_Status_Table[231]	None
J39_VGT_Actuator_State	None	VGT_Driver_Failure	None
J39_VGT_Actuator_Status	HEX	H_VGA_Shutdown	None
VGT_Actuator_Status	HEX	C_VGA_DL_PS_FaultCode_Enable	None
VGT_Position	%	C_VGA_DL_PS_Device_Side	None
VGA_DL_Desired_Position	%	H_VGT_Fault_Voltage_Low	None
VGA_DL_Pos_Referenced	None	H_VGT_Fault_Span_Check	None
Coolant_Temperature_Sensor	Deg_C	H_VGA_DL_PS_High_Error_Timer	mSec
T_EMM_Prot_State_User_Override	None	H_VGA_DL_PS_High_Fault	None
C_EMM_Prot_State1_Override_Value	HEX	H_VGA_DL_PS_Low_Error_Timer	mSec
C_EMM_Prot_State2_Override_Value	HEX	H_VGA_DL_PS_Low_Fault	None
EMM_Protection_Flag	None	H_VGA_Shutdown	None
Engine_Speed	RPM		

(Click here for parameter list in Excel)

Related Codes / Sections:

Water In Fuel Sensor - FC 428, FC 429

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FC 428: WATER_IN_FUEL_HIGH_ERROR

Water in Fuel Indicator Sensor Circuit - Voltage above normal, or shorted to high source
System Error number: 660
(csdd_cagt_eem.mdl)

FC 429: WATER_IN_FUEL_LOW_ERROR

Water in Fuel Indicator Sensor Circuit - Voltage below normal, or shorted to low source
System Error number: 661
(csdd_cagt_eem.mdl)

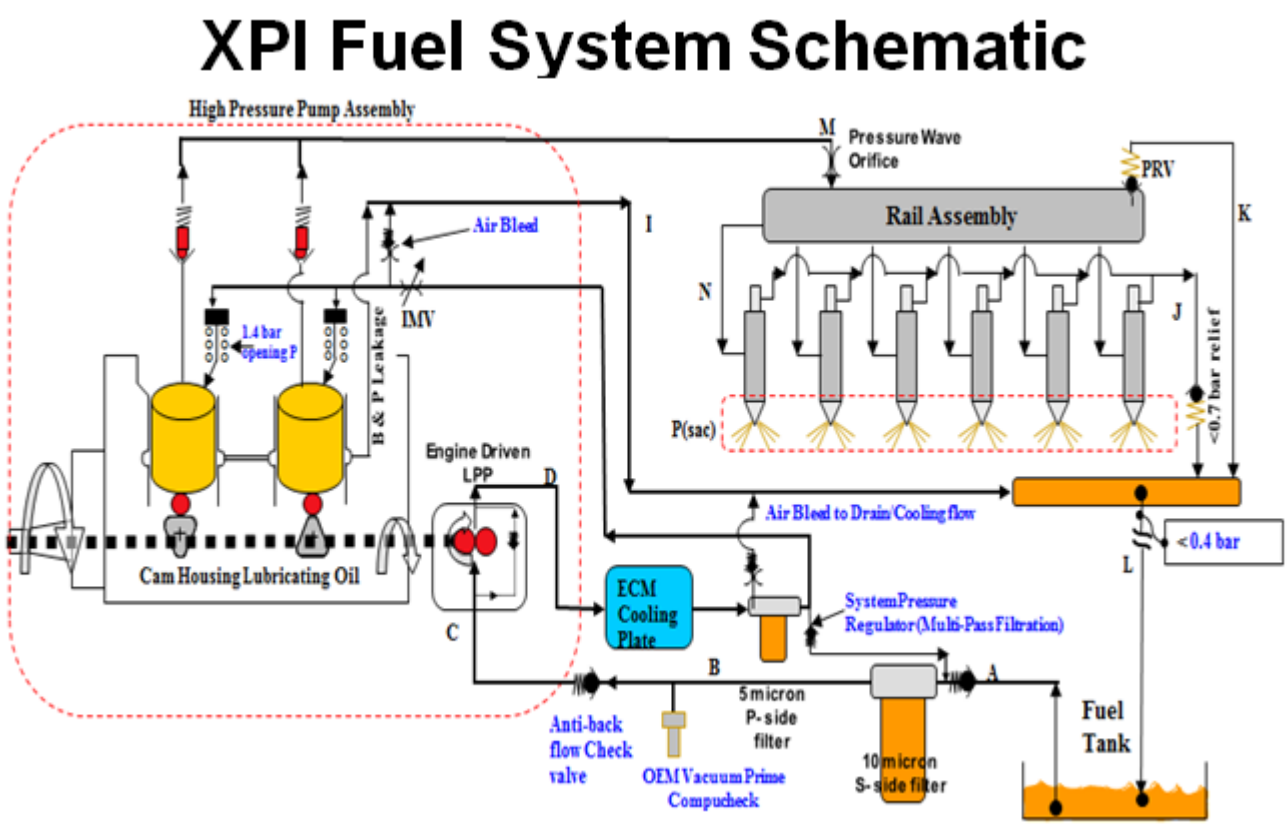
EEM_WIFState	None	C_AIP_WIF_OORCount_Incrt	None
AIP_WIF_Sensor_Voltage	V	C_AIP_WIF_OORCount_Decrt	None
C_AIP_WIF_OORULim	counts	C_AIP_WIF_OOR_ErrPersistence	counts
C_AIP_WIF_OORLLim	counts	T_EEM_WIFEnable	None
C_AIP_WIF_Constant_IR_Value	None		

(Click here for parameter list in Excel)

Related Codes / Sections:

XPI Fuel System:

Schematic



Accumulator Pressure Control (APC) FC 553, FC 559, FC 3741, FC 3727

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FC 553: APC_DIESEL_HIGH_PRS_ERROR
Injector Metering Rail 1 Pressure - Data Valid But Above Normal Operating Range - Moderately Severe Level
System Error Number: 522

FC 559: APC_DIESEL_LOW_PRS_ERROR
Injector Metering Rail 1 Pressure - Data Valid But Below Normal Operating Range - Moderately Severe Level
System Error Number:523

FC 3727: APC_2S_MDV_LOW_POP_OFF_ERROR
High Pressure Common Rail Fuel Pressure Relief Valve - Mechanical system not responding or out of adjustment
System error number:5446

FC 3741: APC_2S_MDV_TRIP_ERROR
High Pressure Common Rail Fuel Pressure Relief Valve - Data valid but above normal operational range - Most Severe Level
System error number: 914

Engine_Speed	RPM	P_APC_i_ImaTrim	A

APC_hp_Cmd	Bar	P_APC_r_ImaTrimGain	None
FSI_hp_Cmd	Bar	H_APC_ct_DslPrsRaw	Counts
APC_hp_Fdbk	Bar	H_APC_ct_DslPrsSupRaw	Counts
APC_qr_Cmd	g/sec	APC_v_DslPrsSensor	V
H_APC_hp_SyncFdbk	Bar	H_APC_s_FdbkConfidence	None
H_APC_hp_FxdFdbk	Bar	H_APC_ti_ImaPWM	mSec
H_APC_hp_MdvPeak	Bar	H_APC_s_AdptStatus	None
P_APC_hp_MdvDrivePeak	Bar	H_APC_s_Error	None
H_IMA_i_Fltr	A	H_APC_ct_DriveMdvResets	Counts
H_IMA_p_Fdbk	%	P_APC_ct_TotalMdvResets	Counts
APC_i_ImaCmd	A	P_APC_ct_TotalMdvPeakCounts	Counts
H_APC_hp_Deviation	Bar	H_APC_s_MdvStatus	None
H_APC_qr_Fueling	g/sec	H_APC_qr_WindupError	g/sec
H_APC_qr_KdTerm	g/sec	H_APC_s_Crank	None
H_APC_qr_KffTerm	g/sec	H_APC_s_LimpHome	None
H_APC_qr_KiTerm	g/sec	H_APC_s_PRDEnable	None
H_APC_qr_KpTerm	g/sec	H_APC_s_Crank	None
H_APC_qr_Limit	g/sec	H_FDH_x_ErrorState	HEX
H_APC_qr_DslFueling	g/sec	Sensor_Supply_6_Voltage	v

Note: 20 to 40 msec rate EDM data log preferred.

(Click here for parameter list in Excel)

Boost Voltage Control (BVC) FC 351

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LOW_BOOST_VOLTAGE_ERROR

Injector Power Supply - Bad intelligent device or component

System Error number: 421

Engine_Speed	RPM	H_BVC_p_AdjustPWM	%
BVC_ct_MaxInjPulses	Counts	H_BVC_p_SlopeAdjustPWM	%
BVC_s_LowBoostVoltage	Noine	H_BVC_ti_LowBoostVoltage	Sec
BVC_vb_DriverVoltage	V	H_BVC_vb_IntegError	V
C_BVC_vb_BoostThreshold	V	C_BVC_vb_DesiredBoost	V
C_BVC_vb_MaxSetpoint	V	C_BVC_ct_BoostVoltageRLOC	V
C_BVC_vb_MinSetpoint	V	C_BVC_ti_LowBoostVoltage	V
H_FDH_x_ErrorState	HEX	C_BVC_s_ClosedLoopEnable	none

(Click here for parameter list in Excel)

BPD QTD Error - FC 4726, FC 4727

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FC 4726: BPD_QTD_LEAKAGE_ERROR

Engine Fuel Leakage - Data Valid But Above Normal Operating Range - Moderately Severe Level

FC 4727: BPD_QTD_PUMPING_ERROR

Injector Metering Rail 1 Pressure - Data Valid But Above Normal Operating Range - Least Severe Level

(fsm_hpcr_bpd_lib.mdl)

BPD_ct_ErrorArrayIndex	counts	P_BPD_ct_ClearPumpingError	counts
BPD_x_ErrorStatus	HEX	P_BPD_ct_IFMHighLeakage	counts
BPD_x_PSPErrorArray[0]	HEX	P_BPD_ct_IFMLeakage	counts
IFM_ct_TotalCycleCount	counts	P_BPD_ct_IFMPumping	counts
IFM_ct_TotalMotorEvt	counts	P_BPD_ct_IFMTotalCycle	counts
IFM_s_CycleType	None	P_BPD_ct_IFMTotalMotorEvt	counts
IFM_s_InitIncomplete	None	P_BPD_ct_PSPLeakage	counts
IFM_s_OutputOutlierCheck	None	P_BPD_ct_PSPPumping	counts
IFM_s_ParasiticLeakage	None	P_BPD_ct_PSPTotalCycle	counts

IFM_s_ParasiticPumping	None	P_BPD_ct_SetHighLeakageError	counts
IFM_s_ResidualCheck	None	P_BPD_ct_SetLeakageError	counts
P_BPD_ct_ClearHighLeakageError	counts	P_BPD_ct_SetPumpingError	counts
P_BPD_ct_ClearLeakageError	counts		

(Click here for parameter list in Excel)

Related Codes / Sections:

Engine Speed Processing (EPS) FC 731, FC 689, FC 115, FC 778, FC 2321, FC 2322

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FC 115: EPS_Both_Failed_Error
Engine Magnetic Speed/Position Lost Both of Two Signals - Data erratic, intermittent or incorrect
System Error Number: 460

FC 689: EPS_Main_No_Pulse_Error
Engine Crankshaft Speed/Position - Data erratic, intermittent or incorrect
System error number:417

FC 689: EPS_Main_No_Sync_Error
Engine Crankshaft Speed/Position - Data erratic, intermittent or incorrect
System error number:54

FC 731: EPS_Both_Failed_Error
Engine Speed / Position Camshaft and Crankshaft Misalignment - Mechanical system not responding or out of adjustment
System Error Number:460

FC 778: EPS_Backup_No_Sync_Error and EPS_Backup_No_Pulse_Error
Engine Speed / Position Camshaft and Crankshaft Misalignment - Mechanical system not responding or out of adjustment
System Error Number: 45, 415

FC 2321: EPS_Main_Intermittent_Sync_Error
Engine Crankshaft Speed/Position - Data erratic, intermittent or incorrect
System Error Number: 419

FC 2322: EPS_Backup_Intermittent_Sync_Error
Engine Crankshaft Speed/Position - Data erratic, intermittent or incorrect
System Error Number: 422

Engine_Speed	RPM	EPS_s_MainSync	None
C_EPS_ca_BkupOffset	deg_BTDC	EPS_s_SensorSelect	None
C_EPS_n_ErrorLowLmt	RPM	EPS_s_Status	None
C_EPS_n_MinGlitch	RPM	H_EPS_ca_BkupPhase	deg_BTDC
C_EPS_ti_BkupGlitchInc	s	H_EPS_ct_HalfCycleToggle	None
C_EPS_ti_BkupGlitchUprLmt	s	H_EPS_ct_MainAtBkupSync	counts
C_EPS_ti_BkupNoPulseErrorUprLmt	s	H_EPS_ct_MainAtBkupTooth	counts
C_EPS_ti_BkupNoPulseUprLmt	s	H_EPS_ct_MainStartInterrupt	None
C_EPS_ti_BkupNoSyncErrorUprLmt	s	H_EPS_ct_PhaseError	counts
C_EPS_ti_BothFailedUprLmt	s	H_EPS_n_BkupRPM	RPM
C_EPS_ti_MainGlitchInc	s	H_EPS_n_MainRPM	RPM
C_EPS_ti_MainGlitchUprLmt	s	H_EPS_s_BkupSupplyStatus	None
C_EPS_ti_MainNoPulseErrorUprLmt	s	H_EPS_s_MainSupplyStatus	None
C_EPS_ti_MainNoPulseUprLmt	s	H_EPS_th_ActMainAtBkupSync	counts

C_EPS_ti_MainNoSyncErrorUprLmt	s	H_FDH_x_ErrorState	HEX
EPS_ca_Offset	Deg BTDC	P_EPS_ti_BkupGlitch	S
EPS_ct_BkupInterrupt	counts	P_EPS_ti_MainGlitch	S
EPS_ct_MainInterrupt	counts	Sensor_Supply_2_Voltage	V
EPS_s_BkupSync	None	Sensor_Supply_3_Voltage	V
EPS_s_CamHalfCycle	None	Total_Fueling	mg/stroke
EPS_s_Error	HEX		

(Click here for parameter list in Excel)

Fuel Rate Limiter (FRL)

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Engine_Speed	RPM	H_FRL_r_NegRateLim	BAR/Sec
APC_hp_Cmd	BAR	H_FRL_r_PosRateLim	BAR/Sec
APC_hp_Fdbk	BAR	H_FRL_s_PulseUpdateFlag	None
FSI_q_TotalFueling	MG/STROKE	H_FRL_s_RateLim	HEX
H_FRL_q_TotalFuel	MG/STROKE	H_FRL_ti_ActiveTime	Sec

(Click here for parameter list in Excel)

Fuel System Fault Derate Handler (FDH)

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Engine_Speed	RPM	Total_Fueling	mg/stroke
Combustion_Control_Path_Owner	None	H_FSI_q_TotalFueling	mg/stroke
H_FDH_ct_DerateWinner	None	Apc_hp_Fdbk	Bar
H_FDH_ct_PumpDemandWinner	None	APC_hp_Cmd	Bar
H_FDH_ct_ShutDownWinner	None	H_APC_s_Error	HEX
H_FDH_q_MustDerate	mg/stroke	EPS_s_Error	HEX
H_FDH_q_PrsBasedLimit	mg/stroke	H_APC_s_MdvStatus	None
H_FDH_r_TrqDerate	None		
H_FDH_s_PumpDemand	None		
H_FDH_x_ErrorState	HEX		

H_FDH_x_ErrorState	**Bit**		**Bit**
Mechanical Dump Valve Popped	0	ADD OFB/Adler (IMV) error	16
Accumulator pressure is high	1	Accumulator pressure bank-to-bank imbalance	17
Accumulator pressure is low	2	Accumulator pressure is very high	18
Accumulator pressure is very low	3	EPS half cycle is unknown	19
Accumulator pressure signal is electrically out of range (OOR)	4	Shut down from other FSM CEN ECM	20
Accumulator pressure signal is not rational (PRD)	5	Large derate from other FSM CEN ECM	21
EPS main sensor problem or running on backup sensor	6	Moderate derate from other FSM CEN ECM	22
EPS backup sensor problem	7	CEN failure	23
EPS phase error between main and backup sensor	8	Pressure command derate from other FSM CEN ECM	24
One or more injectors misfire	9	Not Used	25
Injector Boost Voltage is too low	10	Not Used	26
IMV electrical resistance error	11	Not Used	27
Inlet Metering Valve Flow Demand is high	12	Not Used	28
Inlet Metering Valve Flow Demand is low	13	Not Used	29
ADD Injector error	14	Not Used	30
ADD FSPWM0 (Lift Pump) error	15		

(Click here for parameter list in Excel)

Fuel System Injector Actuator Driver Diagnostics (ADD) FC322-325, FC331, FC332

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FC 322: Injector_1_Circuit_1_Error

System Error Number: 916

FC 323: Injector_5_Circuit_1_Error
System Error Number: 920

FC 324: Injector_3_Circuit_1_Error
System Error Number: 918

FC 325: Injector_6_Circuit_1_Error
System Error Number: 921

FC 331: Injector_2_Circuit_1_Error
System Error Number: 917

FC 332: Injector_4_Circuit_1_Error
System Error Number: 919

Engine_Speed	RPM	H_ADD_x_DfrCyl6	HEX
FSI_q_TotalFueling	Mg/str	H_ADD_x_FsrLatchOff	HEX
APC_qr_cmd	gram/sec	H_ADD_x_FsrPulseTerm	HEX
ADD_s_Misfire	None	H_ADD_x_LatchOffClearDiag	HEX
ADD_x_DieselInjDriverError	None	H_ADD_x_PulseTermClearDiag	HEX
H_ADD_x_DfrCyl1	HEX	P_ADD_x_LatchOffFault	HEX
H_ADD_x_DfrCyl2	HEX	P_ADD_x_PulseTermFault	HEX
H_ADD_x_DfrCyl3	HEX	H_ADD_ct_FsFaultClear	Counts
H_ADD_x_DfrCyl4	HEX	H_ADD_ti_FsrFaultRetry	Sec
H_ADD_x_DfrCyl5	HEX	H_FDH_x_ErrorState	HEX

(Click here for parameter list in Excel)

Fuel Systems Interface (FSI)

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APC_hp_Cmd	bar	FSI_x_CylCutOutBaseMask	HEX
APC_hp_Fdbk	bar	FSI_x_CylCutOutMask	HEX
Combustion_Control_Path_Owner	None	H_FSI_ca_DisplaySOI[0]	Deg_CRK
Engine_Speed	RPM	H_FSI_ct_DisplayCylinder	None
FSI_ct_CbmVersion	HEX	H_FSI_q_DisplayQuantity[0]	mg/stroke
FSI_ct_ECM	None	H_FSI_q_TotalFueling	mg/stroke
FSI_hp_Cmd	bar	H_FSI_s_Cranking	None
FSI_q_TotalFueling	mg/stroke	H_FSI_s_DisplayPulseAction[0]	HEX
FSI_s_Key	None	H_FSI_ti_DisplayOnTime[0]	mSec
FSI_t_Coolant	Deg_C	H_FSI_ti_DisplaySeparation[0]	mSec
FSI_v_Batt	V		

Note: H_FSI_ct_DisplayCylinder must not be zero (1-6 for Pacific)

(Click here for parameter list in Excel)

Fuel Temperature Rationality – FC 535

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FUEL_TEMP_RATIONALITY_HIGH_ERROR
System Error number:
(obd_ss_fs_hpcr_trd_lib.mdl)

FUEL_TEMP_RATIONALITY_LOW_ERROR
System Error number:
(obd_ss_fs_hpcr_trd_lib.mdl)

APC_qr_Cmd	g/sec	TRD_t_FuelAtRailInlet	Deg_C
APC_hp_Fdbk	bar	TRD_t_FuelAtPumpOutlet	Deg_C
Ambient_Air_Tmptr	Deg_C	TRD_t_FuelAtImvOutlet	Deg_C
Coolant_Temperature	Deg_C	TRD_s_UpdateEnable	None
Engine_Speed	RPM	TRD_s_EwmaUpdateEn	None
Net_Engine_Torque	N_m	TRD_ct_WindowResets	counts
FSI_t_Fuel	Deg_C	P_TRD_t_EwmaLowError	Deg_C
H_IMA_r_Fltr	Ohm	P_TRD_t_EwmaHighError	Deg_C
TRD_t_FuelEst	Deg_C	P_TRD_s_EwmaLoRpdRspActive	None
TRD_t_ImvEst	Deg_C	P_TRD_s_EwmaHiRpdRspActive	None
TRD_ti_WindowTimer	s	P_TRD_r_ImvAdaptedRef	Ohm
TRD_ti_ImvAdapt	s	P_TRD_ct_EwmaLoTestsCmplt	counts
TRD_ti_PumpFlowThresh	s	P_TRD_ct_EwmaLoRpdRspTestsCmplt	counts
TRD_ti_PumpFlowPersist	s	P_TRD_ct_EwmaHiTestsCmplt	counts
TRD_t_WindowLow	Deg_C	P_TRD_ct_EwmaHiRpdRspTestsCmplt	counts
TRD_t_WindowHigh	Deg_C		

(Click here for parameter list in Excel)

Related Codes / Sections:

Injection Fuel Control

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FSI_n_EngineSpeed	RPM	H_IFC_ct_CylThirdDoor	None
FSI_s_Key	None	H_IFC_ct_EVTCylIndex	None
FSI_s_Key	None	H_IFC_q_FirstTotalFueling	mg/stroke
H_FSI_ct_DisplayCylinder	None	H_IFC_q_SecondTotalFueling	mg/stroke
H_FSI_s_CommExchIFC	None	H_IFC_q_ThirdTotalFueling	mg/stroke
H_IFC_ca_FirstCylSOTTL_T[0]	deg_BTDC	H_IFC_ti_FirstCylOntime_T[0]	mSec
H_IFC_ca_SecondCylSOTTL_T[0]	deg_BTDC	H_IFC_ti_SecondCylOntime_T[0]	mSec
H_IFC_ca_ThirdCylSOTTL_T[0]	deg_BTDC	H_IFC_ti_ThirdCylOntime_T[0]	mSec
H_IFC_ct_CylFirstDoor	None	IFC_ct_SynchInjEvents	counts
H_IFC_ct_CylSecondDoor	None	IFC_s_SynchActive	None

Note: H_FSI_ct_DisplayCylinder must not be zero (1-6 for Pacific)

(Click here for parameter list in Excel)

Injector Misfire - FC 1654-1659, FC 1718

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Injector misfire has been detected. The injector is not generating a measurable combustion event.

FC1654, CYLINDER_1_MISFIRE_ERROR
Error Flag: MFM_x_MisfireCylMask
System error number: 2344

FC1655, CYLINDER_2_MISFIRE_ERROR
Error Flag: MFM_x_MisfireCylMask
System error number: 2346

FC1656, CYLINDER_3_MISFIRE_ERROR
Error Flag: MFM_x_MisfireCylMask
System error number: 2347

FC1657, CYLINDER_4_MISFIRE_ERROR
Error Flag: MFM_x_MisfireCylMask
System error number: 2345

FC1658, CYLINDER_5_MISFIRE_ERROR
Error Flag: MFM_x_MisfireCylMask

System error number: 2348

FC1659, CYLINDER_6_MISFIRE_ERROR
Error Flag: MFM_x_MisfireCylMask
System error number: 2349

FC1718, MULTIPLE_CYLINDERS_MISFIRE_ERROR
Error Flag: MFM_x_MisfireCylMask
System error number: 2350

(obd_ss_fs_hpcr.mdl)

EPS_ti_MFMAccelBuffer[0]	uSec	H_FDH_x_ErrorState	HEX
EPS_ti_MFMAccelBuffer[4]	uSec	FSI_q_TotalFueling	mg/stroke
EPS_ti_MFMAccelBuffer[2]	uSec	OBDAD_Intrusive_Ctrl_Path_Owner	None
EPS_ti_MFMAccelBuffer[5]	uSec	OBD_Number_Of_Operation_Cycles	None
EPS_ti_MFMAccelBuffer[1]	uSec	OBD_Engn_At_Idle	None
EPS_ti_MFMAccelBuffer[3]	uSec	MFM_s_MonitorStatus (see note)	None
H_MFM_ct_TestCylNumber	None	MFM_x_MisfireCylMask	HEX
FSI_s_CylCutOutToolStatus	None	Engine_Speed	RPM
H_FSI_x_CylCutOutToolMask	HEX	EPS_s_Status	None

Note: Misfire Monitor is active when MFM_s_MonitorStatus = 1. 20 to 40 msec EDM data preferred.

(Click here for parameter list in Excel)

Inlet Metering Actuator Driver Diagnostics (IMA) FC2311, FC271, FC272

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FC 271: APC_IMV_SHORT_ERROR
Engine Fuel Pump Pressurizing Assembly 1 Circuit - Voltage below normal, or shorted to low source
System Error number: 966

FC 272: APC_IMV_OPEN_ERROR
Engine Fuel Pump Pressurizing Assembly 1 Circuit - Voltage above normal, or shorted to high source
System Error number: 965

FC 2311: APC_IMV_RESIS_ERROR
Electronic Fuel Injection Control Valve Circuit - Condition Exists
System Error number: 518

FC 2311: APC_IMV_INTERMITTENT_ERROR
Electronic Fuel Injection Control Valve Circuit - Condition Exists
System Error number: 915

Engine_Speed	RPM	C_IMA_ti_ResisError	
APC_hp_Cmd	bar	Combustion_Control_Path_Owner	None
APC_hp_Fdbk	bar	Engn_Control_Path_Owner	None
Battery_Voltage	V	FSI_hp_Cmd	bar
C_APC_ct_FreeMdvResets	None	H_ADD_ct_PwmFaultClear	counts
C_APC_ct_MdvDeltaPIntrvl	counts	H_ADD_ct_PwmOffFault	counts
C_APC_ct_MdvMaxReset	None	H_ADD_ct_PwmOffNoFault	counts
C_APC_hp_MdvCmdRamp	bar/sec	H_ADD_ct_PwmOnFault	counts
C_APC_hp_MdvControlTol	bar	H_ADD_ct_PwmOnNoFault	counts
C_APC_hp_MdvHoldTol	bar	H_ADD_s_InmtPwmOffError	None
C_APC_hp_MdvLowPopThreshold	bar	H_ADD_s_InmtPwmOnError	None
C_APC_hp_MdvMaxPeak	bar	H_ADD_s_PwmOffClearDiag	None
C_APC_hp_MdvMaxReset	bar	H_ADD_s_PwmOnClearDiag	None
C_APC_hp_MdvMaxTrip	bar	H_ADD_ti_InmtPwmOffError	s
C_APC_hp_MdvMinDeltaPPop	bar	H_ADD_ti_InmtPwmOnError	s
C_APC_hp_MdvMinPeak	bar	H_APC_hp_MdvDeltaP	bar
C_APC_hp_MdvResetCmd	bar	H_APC_hp_MdvPeak	bar

C_APC_hp_MdvSuspectCmd	bar	H_APC_i_UnditheredImaCmd	A
C_APC_n_MdvMinResetSpeed	RPM	H_FSI_q_TotalFueling	mg/stroke
C_APC_n_MdvStallSpeed	RPM	H_IMA_i_Cmd	A
C_APC_n_MinDiagSpeed	RPM	H_IMA_i_Fltr	A
C_APC_n_MinSyncPressSpeed	RPM	H_IMA_r_Fltr	Ohm
C_APC_r_MdvDeltaPFltrCnst	None	H_IMA_s_ResisError	None
C_APC_r_MdvDeltaPMinFltrCnst	None	H_IMA_ti_ResisError	s
C_APC_s_MdvCheckOOR	None	H_IMA_v_Batt	Volt
C_APC_ti_MdvEvent	sec	H_IMA_v_Cmd	Volt
C_APC_ti_MdvMaxReset	sec	H_IMA_v_Pwm	Volt
C_APC_ti_MdvPersistence	sec	Mach_Control_Path_Owner	None
C_APC_ti_MdvSuspect	sec	P_APC_ct_MdvPopCount	counts
C_APC_x_MdvPeakLogic	HEX	P_APC_ct_MdvPopPressLogIdx	None
C_APC_x_MdvTimerActiveMask	HEX	P_APC_ct_TotalMdvPeakCounts	None
C_IMA_i_ResisThreshold	A	P_APC_ct_TotalMdvResets	None
C_IMA_r_Max	Ohm	P_APC_hp_MdvDrivePeak	bar
C_IMA_r_Min	Ohm	P_APC_hp_MdvPopPressLog	bar
C_IMA_s_ResisErrorEnable	None	P_APC_ti_MdvOpenTimer	min

(Click here for parameter list in Excel)

Lift Pump Control (LPC) FC 2265, FC 2266

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FC 2265: LPC_PWM_VOLTAGE_HIGH_ERROR
Electric Lift Pump for Engine Fuel Supply Circuit - Voltage above normal, or shorted to high source
System error number: 3952

FC 2265: LPC_DISCRETE_VOLTAGE_HIGH_ERROR
Electric Lift Pump for Engine Fuel Supply Circuit - Voltage above normal, or shorted to high source
System error number: 3950

FC 2266: LPC_PWM_VOLTAGE_LOW_ERROR
Electric Lift Pump for Engine Fuel Supply Circuit - Voltage below normal, or shorted to low source
System error number: 3953

FC 2266: LPC_DISCRETE_VOLTAGE_LOW_ERROR
Electric Lift Pump for Engine Fuel Supply Circuit - Voltage below normal, or shorted to low source
System error number: 3951

Engine_Speed	RPM	H_LPC_ti_Test	Sec
H_LPC_i_LpcFltr	A	H_LPC_v_Batt	V
H_LPC_p_LiftPumpDuty	%	H_LPC_x_OverrideState	None
H_LPC_s_TestStateReq	None	LPC_s_LiftPumpCmd	None
H_LPC_s_TestStatus	None	LPC_t_InputTmptrSelected	None
H_LPC_ti_CrankingTimer	Sec	LPC_ti_LftPmpKeyOnTime	Sec
H_LPC_ti_KeyOnTimer	Sec	FSI_hp_Cmd	Bar
H_LPC_ti_PrimeModeTimer	Sec	APC_hp_Fdbk	Bar
H_LPC_ti_RuntoStopTimer	Sec	H_FDH_x_ErrorState	HEX

(Click here for parameter list in Excel)

No Start Low Pressure - FC 4691

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FUEL_PRESS_LOW_CRANKING_ERROR
Engine Injector Metering Rail 1 Cranking Pressure - Data Valid But Below Normal Operating Range - Moderately Severe Level
System Error number:

(fsm_hpcr_apc_lib.mdl\FSMG_ControlPressureDiag)

Current_Engine_State	None	H_FDH_x_ErrorState	HEX
Engine_Speed	RPM	H_APC_s_FdbkConfidence	None
APC_hp_Cmd	bar	P_APC_ti_LPrsCrankSetErr	s
APC_hp_Fdbk	bar	APC_ti_LPrsCrankClearErr	s
APC_qr_Cmd	g/sec	APC_s_NSLPEnable	None
Coolant_Temperature	Deg_C	APC_ti_NSLPRunState	s
Ambient_Air_Tmptr	Deg_C	H_APC_qr_Limit	g/sec

(Click here for parameter list in Excel)

Related Codes / Sections:

PRS Fuel Filter Clogged - FC 2372

PRS_FUEL_FILTER_CLOGGED_ERROR
Fuel Filter Differential Pressure - Data Valid But Above Normal Operating Range - Moderately Severe Level
System Error number: 1384

Engine_Speed	RPM	H_APC_s_MdvStatus	None
FSI_hp_Cmd	bar	P_APC_i_ImaTrim	A
FSI_q_TotalFueling	mg/stroke	P_APC_r_ImaTrimGain	None
FSI_t_Coolant	Deg_C	H_FIR_ct_FIRCounts	Counts
FSI_t_Fuel	Deg_C	H_FIR_p_DslFlowFraction	%
FSI_v_Batt	V	H_FIR_qr_FiltDslDmd	g/sec
APC_qr_Cmd	g/sec	H_FIR_s_ErrorState	None
H_APC_hp_Deviation	bar	P_FIR_qr_MaxDslDmd	g/sec
H_APC_i_UnditheredImaCmd	A	Fuel_System_Failure	None
H_APC_qr_DslFueling	g/sec	Fuel_System_Failure2	None
H_APC_qr_KdTerm	g/sec	H_FDH_q_PrsBasedLimit	mg/stroke
H_APC_qr_KffTerm	g/sec	H_FDH_r_TrqDerate	None
H_APC_qr_KiTerm	g/sec	H_FDH_x_ErrorState	HEX
H_APC_qr_KpTerm	g/sec	MIL_Status	None
H_APC_qr_Limit	g/sec		

(Click here for parameter list in Excel)

Related Codes / Sections:

Quantity and Timing - FC 1139, 1141, 1142, 1143, 1144, 1145

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Quantity and Timing Diagnsotic – Critical Ontime of Injection Out of Tolerance, Injection timing or fueling quantity accuracy out of tolerance.

FC1139, QTD_INJECTOR_1_COI_ERROR
Error Index: qtd_coi_error_index
System error number: 3104
(obd_ss_fs_hpcr.mdl)

FC1141, QTD_INJECTOR_2_COI_ERROR
Error Index: qtd_coi_error_index
System error number: 3105
(obd_ss_fs_hpcr.mdl)

FC1142, QTD_INJECTOR_3_COI_ERROR
Error Index: qtd_coi_error_index
System error number: 3102

(obd_ss_fs_hpcr.mdl)

FC1143, QTD_INJECTOR_4_COI_ERROR
Error Index: qtd_coi_error_index
System error number: 3106
(obd_ss_fs_hpcr.mdl)

FC1144, QTD_INJECTOR_5_COI_ERROR
Error Index: qtd_coi_error_index
System error number: 3107
(obd_ss_fs_hpcr.mdl)

FC1145, QTD_INJECTOR_6_COI_ERROR
Error Index: qtd_coi_error_index
System error number: 3108
(obd_ss_fs_hpcr.mdl)

FC554, QTD_COIDEV_CUMSUM_ERROR
Error Index: qtd_coi_error_index
System error number: 3109
(obd_ss_fs_hpcr.mdl)

Engine_Speed	rpm	APC_qr_Cmd	g/sec
APC_hp_Cmd	bar	H_QTD_ct_PassVoteCount	counts
APC_hp_Fdbk	bar	H_QTD_ct_VoteCount	counts
FSI_q_TotalFueling	mg/stroke	P_QTD_ti_DeltaCOIEstimate_T[0]	mSec
C_QTD_s_Enable	None	P_QTD_ti_DeltaCOIEstimate_T[1]	mSec
QTD_s_Mode	None	P_QTD_ti_DeltaCOIEstimate_T[2]	mSec
H_QTD_ct_CycleCount	counts	P_QTD_ti_DeltaCOIEstimate_T[3]	mSec
H_QTD_ct_CylIndex	None	P_QTD_ti_DeltaCOIEstimate_T[4]	mSec
H_QTD_ct_ToothIndex	None	P_QTD_ti_DeltaCOIEstimate_T[5]	mSec
H_QTD_hp_CycleMeanPressure	bar	H_QTD_ti_COIEstimate_T[0]	mSec
H_QTD_hp_DslPressure	bar	H_QTD_ti_COIEstimate_T[1]	mSec
H_QTD_hp_InjPressureDrop	bar	H_QTD_ti_COIEstimate_T[2]	mSec
H_QTD_r_ParasiticLeakage	bar/sec	H_QTD_ti_COIEstimate_T[3]	mSec
H_QTD_ti_TestOntime	mSec	H_QTD_ti_COIEstimate_T[4]	mSec
C_QTD_ct_RunsPerOpCycle	counts	H_QTD_ti_COIEstimate_T[5]	mSec
H_QTD_s_COISearchComplete	None	P_QTD_ti_FltrAvgCOIDev	mSec
OBD_Number_Of_Operation_Cycles	None	C_QTD_s_Enable	None
H_QTD_ct_RunsPerOpCycle	counts	EPS_ct_MainInterrupt	None
C_QTD_s_Enable	None		
EPS_ct_MainInterrupt	None		

Note: QTD is active when QTD_s_Mode = 1. 40 to 80 msec rate EDM Log preferred

(Click here for parameter list in Excel)

Parameter Estimates and Predictions:

Ambient Parameters Estimate

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(csdd_charge_base_mgr_lib.mdl\INM_DetermineCompInletTmptr\ESTAAT)

Ambient Air Temperature Estimate:			
AMB_Amb_Tmptr_Override_Value	Deg_C	Compressor_Inlet_Tmptr_Status	None
Ambient_Air_Tmptr	Deg_C	Engine_Is_Running	None
Ambient_Air_Tmptr_Status	None	Fresh_Air_Flow	kg/min
Compressor_Inlet_Tmptr	Deg_C	Vehicle_Speed	km/hr
Compressor_Inlet_Tmptr_Rise	Deg_C		
Altitude Estimate:			
Altitude	m	Ambient_Air_Press_Status	None
Ambient_Air_Press	kPa		

(Click here for parameter list in Excel)

Charge Flow Estimate

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(csdd_charge_base_mgr_lib.mdlPath\CHRG_Base_DetermineSensor10Estimate\MCF)

Charge Flow Estimate MCF			
Charge_Press	kPa	Charge_Tmptr_Status	None
Charge_Press_Status	None	CHP_Veff_Mode	None
Charge_Tmptr	Deg_C	Exhaust_Press_Status	None
Speed Density Equation			
CHP_Volumetric_Efficiency	None	Charge_Press	kPa
CHP_Intake_Manifold_Tmptr_K	Deg_K	Charge_Flow	kg/min
Volumetric Efficiency			
CBR_Thermal_Oscar_Active	None	CHP_Intake_Manifold_Tmptr_K	Deg_K
Charge_Flow_Status	None	CHP_Veff_Mode	None
Charge_Press	kPa	CHP_Volumetric_Efficiency	None
Charge_Press_Status	None	Exhaust_Press	kPa
Charge_Tmptr	Deg_C	Exhaust_Press_Status	None

(Click here for parameter list in Excel)

Charge Pressure Estimate

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(csdd_charge_base_mgr_lib.mdl\CHRG_Base_Determine10msParameters\CPE)

Turbo_Speed_Sensor_Status	None		
NOTE: charge pressure estimate algorithm is enabled if set to 1			
With M2 Turbo			
CBM_Comb_Load_Ref	None	Charge_Press_Tolerance	kPa
Charge_Press	kPa	CHL_CHP_Error	kPa
Charge_Press_Est_Offset	kPa		
MAF Based			
Charge_Air_Cooler_Outlet_Tmptr	Deg_C	Compressor_Outlet_Tmptr_Status	None
Charge_Air_Cooler_Outlet_Tmptr_Status	None	Filtered_Turbo_Speed	KRPM
Charge_Press_Est_Offset	kPa	Fresh_Air_Flow	kg/min
Charge_Press_Tolerance	kPa	Fresh_Air_Flow_Status	None
Charge_Tmptr	Deg_C	H_CHM_CAC_Press_Drop	kPa
Charge_Tmptr_Status	None	H_CHM_IAT_Press_Drop	kPa
Compressor_Inlet_Press	kPa	Turbo_Speed_Sensor_Status	None
Compressor_Outlet_Press	kPa	Turbo_Speed_Status	None
Compressor_Outlet_Tmptr	Deg_C		

Non - MAF Based

Charge_Air_Cooler_Outlet_Tmptr	Deg_C	EGR_Fraction	None
Charge_Press_Tolerance	kPa	Filtered_Turbo_Speed	KRPM
Charge_Tmptr	Deg_C	Fresh_Air_Flow	kg/min
Charge_Tmptr_Status	None	TPE_CIT_Sqrt	None
CHP_Volumetric_Efficiency	None	TPE_Corrected_Air_Flow	kg/s
Comp_Efficiency_Est	None	TPE_Corrected_Engine_Speed	None
Comp_Press_Ratio_Est	None	TPE_Corrected_Turbo_Speed	RPM
Compressor_Inlet_Press	kPa	TPE_Corrected_Turbo_Speed_Est	RPM
Compressor_Inlet_Press_Status	None	TPE_Pressure_Ratio_Estimate	None
Compressor_Inlet_Tmptr	Deg_C	Turbo_Speed_Sensor_Status	None
Compressor_Inlet_Tmptr_Status	None	Turbo_Speed_Status	None
Compressor_Outlet_Press	kPa		

(Click here for parameter list in Excel)

Charge Temperature Estimate

(back to table of contents)

(csdd_charge_base_mgr.mdl)

CBR_Alpha	None	Compressor_Inlet_Tmptr	Deg_C
cbr_chi[0]		Compressor_Inlet_Tmptr_Status	None
Charge_Air_Cooler_Outlet_Tmptr	Deg_C	EGR_Flow	kg/min
Charge_Tmptr_Est	Deg_C	EGR_Orifice_Tmptr	Deg_C
Charge_Tmptr_EStat	None	Fresh_Air_Flow	kg/min
ChargeTmptr_Min_CACOT_Est	Deg_C	Intake_Manifold_Temperature	Deg_C

(Click here for parameter list in Excel)

Compressor Inlet Density Estimate

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(csdd_charge_base_mgr.mdl)

Estimate:

Compressor_Inlet_Density	kg/m3	Compressor_Inlet_Tmptr	Deg_C
Compressor_Inlet_Press	kPa		

Source:

Compressor_Inlet_Density_Status	---	Compressor_Inlet_Press_Status	---
Compressor_Inlet_Tmptr_Status	---		

(Click here for parameter list in Excel)

Compressor Inlet Pressure Estimate

(back to table of contents)

(csdd_charge_base_mgr.mdl)

Compressor_Inlet_Press	kPa	Compressor_Inlet_Pressure_Drop	kPa
Air_Press	kPa	Fresh_Air_Flow	Kg/min
Ambient_Air_Press	kPa		

(Click here for parameter list in Excel)

Compressor Outlet Temperature Estimate

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(csdd_charge_base_mgr.mdl)

COT Estimate:

C_TPE_COT_Global_Default	Deg_C	Fresh_Air_Flow	kg/min
Comp_Efficiency_Est	None	T_TPE_COT_Estimation_Enable	None

Comp_Press_Ratio_Est	None	TPE_CIT_Sqrt	None
Compressor_Inlet_Press	kPa	TPE_Corrected_Air_Flow	kg/s
Compressor_Inlet_Tmptr	Deg_C	TPE_Corrected_Turbo_Speed	RPM
Compressor_Outlet_Tmptr	Deg_C	TPE_COT_Est_Enable	None
Filtered_Turbo_Speed	KRPM		

COT Estimate Source:

Compressor_Outlet_Tmptr_Status	---	Turbo_Speed_Status	---
Compressor_Inlet_Tmptr_Status	---	Compressor_Inlet_Press_Status	---
Fresh_Air_Flow_Status	---		

(Click here for parameter list in Excel)

Cranking and Cold Ambient Adjust

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Engine_Speed	RPM	Controller_MCF_Cmd	kg/min
Accelerator_Pedal_Position	%	Coolant_Temperature	Deg_C
Alpha	None	Current_Engine_State	None
Ambient_Air_Press	kPa	ECM_Run_Time	s
Ambient_Air_Tmptr	Deg_C	EGR_Flow	kg/min
APC_hp_Cmd	bar	EGR_Fraction	None
APC_hp_Fdbk	bar	EGR_Position	%
Battery_Voltage	V	EMM_AECD_State	HEX
C_CHL_EGR_Slew_Up_Rate	None	EMM_Protection_Flag	None
C_OFC_Equiv_Ratio_Value	None	EMM_Protection_State_1	HEX
CBL_EGR_Frac_Cmd	None	EMM_Protection_State_2	HEX
CBL_MCF_Cmd	kg/min	Engine_Is_Starting	None
CBM_Indicated_Combustion_Torque	N_m	EONOx_Comp_Value	ppm
CBM_Indicated_Fuel	mg/stroke	EPS_s_BkupSync	
CBM_Indicated_Trq_Cmd	N_m	EPS_s_MainSync	
CBM_Indicated_Trq_Fuel	mg/stroke	EPS_s_Status	
CBM_Net_Torque_Demand	N_m	Exhaust_Metal_Tmptr	Deg_C
CBP_Air_Fuel_Ratio	None	Exhaust_Press	kPa
CBR_Alpha	None	Exhaust_Tmptr	Deg_C
CBR_Alpha_WT_Factor	None	EXM_ATM_Oper_Mode_Rqst	None
CBR_Charge_Ref1_ColdAmbFactor	None	Filtered_Turbo_Speed	KRPM
CBR_Chi_Factor	None	Fresh_Air_Flow	kg/min
CBR_Chi_Mode_Status	HEX	Friction_Torque	N_m
CBR_Chi_Table_Mask	HEX	H_IMA_i_Cmd	A
CBR_Cold_Amb_Ref_Status	HEX	H_IMA_i_Fltr	A
CBR_ColdAmb_SpdLoad_Factor	None	H_NDOT_Preset_Torque	N_m
CBR_Compressor_Inlet_Density	kg/m3	H_Net_Torque_Demand	N_m
CBR_EC_SCRTM_WT_Factor	None	IAT_Position	%
CBR_EGR_Frac_Ref	None	IAT_Position_Percent	%
CBR_Fuel_Ref_State	None	J39_AFT_Intake_NOx	ppm
CBR_Main_SOI	deg_BTDC	J39_VGT_Actuator_Position	%
CBR_Main_SOI_ColdAmbFactor	None	J39_VGT_Actuator_State	None
CBR_MCF_Ref	kg/min	J39_VGT_Actuator_Status	HEX
CBR_Pilot1_Fuel_Quantity_Final	mg/stroke	J39_VGT_Motor_Effort	None
CBR_Pilot1_SOI	None	Key_Switch	None
CBR_Pilot2_Fuel_Quantity_Final	mg/stroke	NDOT_Demand	RPM/s
CBR_Pilot2_SOI	None	Net_Brake_Torque	N_m
CBR_Post1_Fuel_Quantity_Final	mg/stroke	Net_Engine_Torque	N_m
CBR_Post1_SOI	None	O_ATR_Oper_Mode_Val	None
CBR_Post2_Fuel_Quantity_Final	mg/stroke	OFC_Equiv_Ratio_Limit	None
CBR_Post2_SOI	None	OFC_Fuel_Limit	mg/stroke
CBR_SCRTM_Mixing_Factor	None	OFC_Fuel_LLim	mg/stroke
CBR_SCRTM_WT_Factor	None	Oil_Pressure	kPa_G
CBR_Torque_Fuel_ColdAmbFactor	None	Oil_Temperature	Deg_C
Charge_Flow	kg/min	Reset_Count	counts
Charge_Press	kPa	TAHR_COT_Drt_xEMP_Error	Deg_C
Charge_Tmptr	Deg_C	TAHR_dP_over_P	None
CHL_EGR_Frac_Cmd	None	TAHR_dP_over_P_Limit	None
CHL_MCF_Cmd	kg/min	TAHR_EMP_Cmd_Final	kPa
CHP_Pumping_Torque	N_m	TAHR_EMP_Fdbk_Cmd	kPa
CNK_Cranking_Mixing_Factor	None	TAHR_EMP_Feed_Fwd_Cmd	kPa

CNK_Fuel	mg/stroke	TAHR_EMP_Xform_Error	None
CNK_Fuelpr	bar	TAHR_EMP_Xform_Fdbk	None
CNK_Main_SOI	deg_BTDC	TAHR_EMP_Xform_Ref	None
CNK_Pilot2_Fuel	mg/stroke	TAHR_IMP_Cmd	kPa
CNK_Pilot2_SOI	deg_BTDC	TAHR_OSR_dPoP_Final_Cmd	None
Combustion_Control_Path_Owner	None	TGC_VT_Cmd	%
Compressor_Inlet_Press	kPa	Total_Fueling	mg/stroke
Compressor_Inlet_Tmptr	Deg_C	Turbine_Out_Tmptr	Deg_C
Compressor_Outlet_Tmptr	Deg_C	VGT_Position	%
Controller_EGR_Frac_Cmd	None		

(Click here for parameter list in Excel)

EGR Fraction Estimate

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(csdd_charge_base_mgr.mdl)

EGR Fraction Estimate:			
CBP_O2_Frac_Residual_Bef_Delay	None	EGR_Flow	kg/min
Charge_Flow	kg/min	EGR_Flow_Status	None
CHP_EGR_Flow_Before_Delay	kg/min	EGR_Flow_Unlimited	kg/min
CHP_EGR_Flow_Delay	s	EGR_Flow_Unlimited_Status	None
CHP_O2_Flow_Delay	s	EGR_Fraction	None
CHP_O2_Frac_EGR	None	EGR_System_Closed	None
CHP_Volumetric_Efficiency	None	Engine_Speed	RPM
EGR Flow Model:			
Charge_Flow	kg/min	Meas_EGR_Flow	kg/min
EGR_Orifice_Delta_Press	kPa	Meas_EGR_Flow_Status	None
HDR_EGR_Delta_Press	kPa	EGR_Orifice_Delta_Press_Status	None
EGR_Orifice_Tmptr	Deg_C	EGR_Orifice_Tmptr_Status	None
EGR_Position	%	EGR_Position_Status	None
EGR_Orif_Press	kPa_A	EGR_Orif_Press_Status	None
Charge_Press	kPa	Charge_Press_Status	None
Charge_Flow_Status	None	EGR_System_Closed	None

(Click here for parameter list in Excel)

EGR Valve and Engine Delta Pressure Estimates

(back to table of contents)

(csdd_charge_base_mgr.mdl)

NOTE: Engine_Delta_Press = EGR_Valve_Delta_Press * (-1)

EGR Valve and Engine Delta Pressure Estimate:			
EGR_Valve_Delta_Press	kPa	Exhaust_Press	kPa
Engine_Delta_Press	kPa	Charge_Press	kPa
EGR_Orifice_Delta_Press	kPa	EGR_Delta_Press	kPa
EGR Valve and Engine Delta Pressure Estimate Source:			
EGR_Valve_Delta_Press_Status	---	Exhaust_Press_Status	---
Engine_Delta_Press_Status	---	Charge_Press_Status	---
EGR_Orifice_Delta_Press_Status	---		

(Click here for parameter list in Excel)

Exhaust Flow Estimation

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(inm_chp_airflw_lib.mdl)

Exhaust_Flow	kg/min	Charge_Flow	kg/min

Fresh_Air_Flow	kg/min	V_ATP_fg_Turbo_Out	g/sec
EGR_Flow	kg/min	Fuel_Delivery_Rate_Per_Min	kg/min

(Click here for parameter list in Excel)

Exhaust Pressure Estimate

(back to table of contents)

(csdd_charge_base_mgr.mdl)

Exhaust Pressure Estimate:			
Exhaust_Tmptr	Deg_C	EGR_Position	%
Engine_Speed	RPM	Fresh_Air_Flow	kg/min
Ambient_Air_Press	kPa	H_EMP_Flow_Factor	None
CBM_Torque_Fuel	mg/stroke	TGC_VT_Cmd	%
Charge_Press	kPa	Total_Fueling	mg/stroke
Exhaust Pressure Estimate Source:			
Exhaust_Tmptr_Status	None	Ambient_Air_Press_Status	None
VGT_Position_Status	None	Exhaust_Press_Est_Status	None
Fresh_Air_Flow_Status	None		

(Click here for parameter list in Excel)

Exhaust Temperature Estimate

(back to table of contents)

(csdd_charge_base_mgr.mdl)

Exhaust Temperature Estimate:			
CBP_Charge_Fuel_Ratio	None	Exhaust_Tmptr	Deg_C
Charge_Press	kPa	TPE_Delta_Exhaust_Tmptr	Deg_C
Charge_Tmptr	Deg_C	TPE_Delta_Exhaust_Tmptr	Deg_C
Engine_Speed	RPM	TPE_Delta_Exhaust_Tmptr_Clamped	Deg_C
Exhaust_Metal_Tmptr	Deg_C	TPE_Invalid_Model	None
Exhaust Temperature Source:			
Exhaust_Tmptr_Status	---	Charge_Tmptr_Status	---
Charge_Flow_Status	---	TPE_Invalid_Model	---
Charge_Press_Status	---		

(Click here for parameter list in Excel)

Fresh Air Flow Estimation

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(csdd_charge_base_mgr.mdl)

Fresh Air Flow Estimate:			
EGR_Flow	kg/min	Fresh_Air_Flow	kg/min
EGR_Flow_Unlimited	kg/min	Exhaust_Flow	kg/min
Charge_Flow	kg/min	Fresh_Air_Flow_Unlimited	kg/min
Fresh Air Flow Source:			
EGR_Flow_Status	None	Fresh_Air_Flow_Status	None
EGR_Flow_Unlimited_Status	None	Exhaust_Flow_Status	None
Charge_Flow_Status	None	Fresh_Air_Flow_Unlimited_Status	None

(Click here for parameter list in Excel)

IMT Lead-Lag Compensation

(back to table of contents)

(csdd_charge_base_mgr.mdl)

TPE_IMT_Lead_Time_Constant	s	TPE_IMT_Lead_Term	Deg_C
TPE_IMT_After_Lead	Deg_C	Charge_Tmptr	Deg_C
Charge_Tmptr_Sensor	Deg_C	Charge_Tmptr_Status	None

(Click here for parameter list in Excel)

NOx Estimation

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(inm_cbp_lib.mdl)

CBM_NOx_Out_PPM	PPM	CBR_Post1_Fuel_Quantity_Final	mg/stk
CBM_Fdbk_AccumulatorPress	Bar_A	CBR_Post1_SOI	BTDC
CBM_FdbkPulseFueling	mg/stk	CBR_Post2_Fuel_Quantity_Final	mg/stk
CBM_FdbkPulseSOI	BTDC	CBR_Post2_SOI	BTDC
CBM_FdbkTorqueFuel	mg/stroke	CBR_Thermal_Felix_Active	---
CBM_NOx_Out_Rate	g/hr	CBR_Thermal_Oscar_Active	---
CBP_Air_Fuel_Ratio	---	Charge_Flow_Status	None
CBP_EGR_Air_Mole_Ratio	---	Charge_Press	kPa
CBP_Exhaust_Mole_Weight	Kg/Kmol	Charge_Press_Status	None
CBP_Intake_Charge_O2_Fraction	---	Charge_Tmptr	Deg_C
CBP_Intake_O2_Concentration	---	Charge_Tmptr_Status	None
CBP_Intake_O2_Concentration	---	EGR_Fraction	---
CBR_Main_SOI	BTDC	Engine_Speed	rpm
CBR_Pilot1_Fuel_Quantity_Final	mg/stk	Exhaust_Flow_Status	None
CBR_Pilot1_SOI	BTDC	Fresh_Air_Flow_Status	None
CBR_Pilot2_Fuel_Quantity_Final	mg/stk	H_CBM_NOx_Out_PPM_Status	None
CBR_Pilot2_SOI	mg/stk		

(Click here for parameter list in Excel)

O2 Estimation

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(csdd_cbm_base_lib.mdl)

Engine_Speed	RPM	Charge_Flow	kg/min
CBM_FdbkTorqueFuel	mg/stk	Exhaust_Flow	kg/min
CBM_O2_Out_Frac	----	Fresh_Air_Flow	kg/min
CBM_O2_Out_Rate	g/s	H_CBM_O2_Out_Frac_Status	----

(Click here for parameter list in Excel)

Particulate Matter Estimation

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(csdd_cbm_base_lib.mdl)

CBM_NOx_Out_PPM	PPM	EGR_Fraction	None
CBM_Comb_Load_Ref	None	Engine_Speed	RPM
CBM_Fdbk_AccumulatorPress	bar_A	Exhaust_Flow	kg/min
CBM_Fdbk_AccumulatorPress	bar_A	Exhaust_Flow_Status	None
CBM_FdbkPulseFueling[0]	mg/stroke	Fresh_Air_Flow_Status	None
CBM_FdbkPulseSOI[0]	deg_BTDC	H_CBM_PM_Out_Frac_Status	None
CBM_FdbkTorqueFuel	mg/stroke	H_PME_Air_Fuel_Ratio_Ref	None
CBM_FdbkTorqueFuel	mg/stroke	H_PME_FuelDeliveryAftGain	g/hr
CBM_NOx_Out_Rate	g/hr	H_PME_MCF_Cmd_Filtered	kg/min
CBM_PM_Out_Frac	None	H_PME_PM_Factor_AFR_Ref	None
CBM_PM_Out_PPM	None	H_PME_PM_Factor_EGRSOI	None

CBM_PM_Out_Rate	g/hr	H_PME_PM_Factor_PRSPIF	None
CBP_Air_Fuel_Ratio	None	H_PME_SootRateClamped	g/hr
CBR_Main_SOI	deg_BTDC	H_PME_SootRateUnclamped	g/hr
Charge_Flow	kg/min	H_PME_SootRateUnclamped_Ref	g/hr
CHL_MCF_Cmd	kg/min	PME_M270_SootRate_Ref	g/hr

(Click here for parameter list in Excel)

Related sections: Item 118

Robust Torque Model / Torque to Fuel

(back to table of contents)

(csdd_cbm_base_lib.mdl)

Engine_Speed	RPM	CBP_Comb_Torque_Limit	N_m
Accelerator_Pedal_Position	%	CBP_Net_Combustion_Torque	N_m
CBM_FdbkTorqueFuel	mg/stroke	CHP_Pumping_Torque	N_m
CBM_Indicated_Fuel	mg/stroke	Current_Engine_State	None
CBM_Indicated_Trq_Cmd	N_m	H_CBM_Friction_Torque	N_m
CBM_Indicated_Trq_Fuel	mg/stroke	H_NDOT_FF_Torque	N_m
CBM_VG_Braking_PumpTrq_Cmd	N_m	H_NDOT_Gov_Torque	N_m
CBP_Air_Fuel_Ratio	None	H_NDOT_PP_Torque	N_m
CBP_Charge_Fuel_Ratio	None	OFC_Fuel_Limit	mg/stroke

(Click here for parameter list in Excel)

Turbine Out Temperature Estimation

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(csdd_charge_manager_lib.mdl)

Turbine_Out_Tmptr	Deg C	TPE_Turb_Out_Press	kPa
CBR_Thermal_Oscar_Active	----	TPE_Turbiine_Press_Ratio	----
Exhaust_Flow	kg/min	TPE_Turbine_Pressure_Ratio_Term	%
Exhaust_Metal_Tmptr	Deg C	Turbine_Out_Tmptr_Mod	Deg C
Exhaust_Press	kPa	Turbine_Out_Tmptr_Reg	Deg C
Filtered_Turbo_Speed	KRPM	V_ATP_tr_DOC_In	Deg_K
TPE_TOT_EFF	%		

(Click here for parameter list in Excel)

Turbo Speed Estimation

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(csdd_charge_manager_lib.mdl)

Turbo Speed Estimate			
Turbo_Speed_Est	KRPM	TPE_CIT_Sqrt	---
TPE_Corrected_Air_Flow	kg/s	TPE_Corrected_Turbo_Speed_Est	RPM
Compressor_Inlet_Press	kPa	Charge_Press	kPa
Charge_Tmptr	Deg_C	Fresh_Air_Flow	kg/min
IAT_Position_Percent	%		
Turbo Speed Estimate Status			
Turbo_Speed_EStat	---	Compressor_Inlet_Tmptr_Status	---
Compressor_Inlet_Press_Status	---	Charge_Press_Status	---
T_Turbo_Speed_Estimation_Enable	---	Fresh_Air_Flow_Status	

(Click here for parameter list in Excel)

UHC (Unburned HydroCarbon) Estimation

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(inm_cbp_lib.mdl)

Engine_Speed	RPM	CBP_UHC_BMEP	kPa
CBP_Gamma_Final	----	Charge_Tmptr	Deg_C
CBP_Net_Combustion_Torque	N_m	Coolant_Temperature	Deg_C
CBP_Tmptr_At_BDC	Deg_K	Final_Timing	Deg_BTDC
CBP_Tmptr_At_Ref_SOI	Deg_K	Total_Fueling	mg/stroke

(Click here for parameter list in Excel)

Water in Fuel - FC 418

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Water in Fuel Indicator - Data Valid But Above Normal Operating Range - Least Severe Level. Water has been detected in the fuel filter.

WATER_IN_FUEL_ERROR
Error Flag: None
System error number: 280
(csdd_cagt_eem.mdl)

Engine_Speed	RPM	C_AIP_WIFVtgThd	Volt
Net_Engine_Torque	N_m	C_EEM_WIF_Timer_Incr_Factor	counts
Vehicle_Speed	km/hr	C_WIF_ExtTimeThd	hr
AIP_WIF_Sensor_Voltage	V	C_EEM_WIF_Delay_Time	Sec.
EEM_WIF_Current_Err_Time	s	C_WIF_ExtendedErr_Enable	none
EEM_WIFState	None	C_WIF_ExtTimeErrEn	none
EEM_WIFTotalTime	s		

(Click here for parameter list in Excel)

Related Codes / Sections:

Water in Fuel Extended Time - FC 1852

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Water in Fuel Indicator - Data Valid But Above Normal Operating Range - Moderately Severe Level.

WATER_IN_FUEL_EXTENDED_TIME_ERROR
Error Flag: None
System error number: 1612
(csdd_cagt_eem.mdl)

Engine_Speed	RPM	C_AIP_WIFVtgThd	Volt
Net_Engine_Torque	N_m	C_EEM_WIF_Timer_Incr_Factor	counts
Vehicle_Speed	km/hr	C_WIF_ExtTimeThd	hr
AIP_WIF_Sensor_Voltage	V	C_EEM_WIF_Delay_Time	Sec.
EEM_WIF_Current_Err_Time	s	C_WIF_ExtendedErr_Enable	none
EEM_WIFState	None	C_WIF_ExtTimeErrEn	none
EEM_WIFTotalTime	s		
EEM_WIFDistance	km		

(Click here for parameter list in Excel)

After-Treatment Diagnostics

DOC / DPF Out-of-Range and In-Range Diagnostics Diagram

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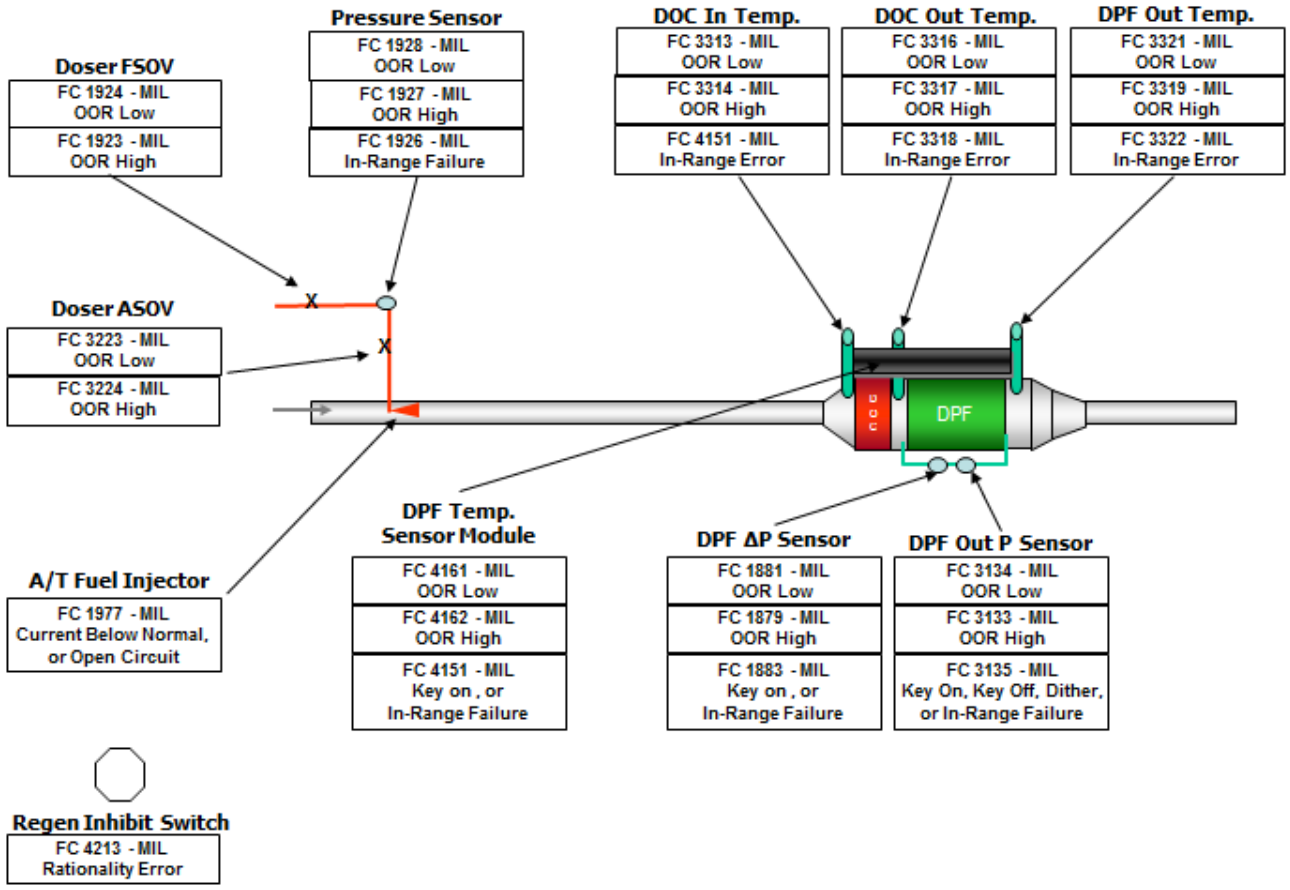

Related Fault Codes: FC 1924, FC 1923, FC 1928, FC 1927, FC 1926, FC 3313, FC 3314, FC 4151, FC 3316, FC 3317, FC 3318, FC 3321, FC 3319, FC 3322, FC 3223, FC 3224, FC 1977, FC 4161, FC 4162, FC 1881, FC 1879, FC 1883, FC 3134, FC 3133, FC 3135, FC 4213

SCR Out-of-Range and In-Range Diagnostics Diagram

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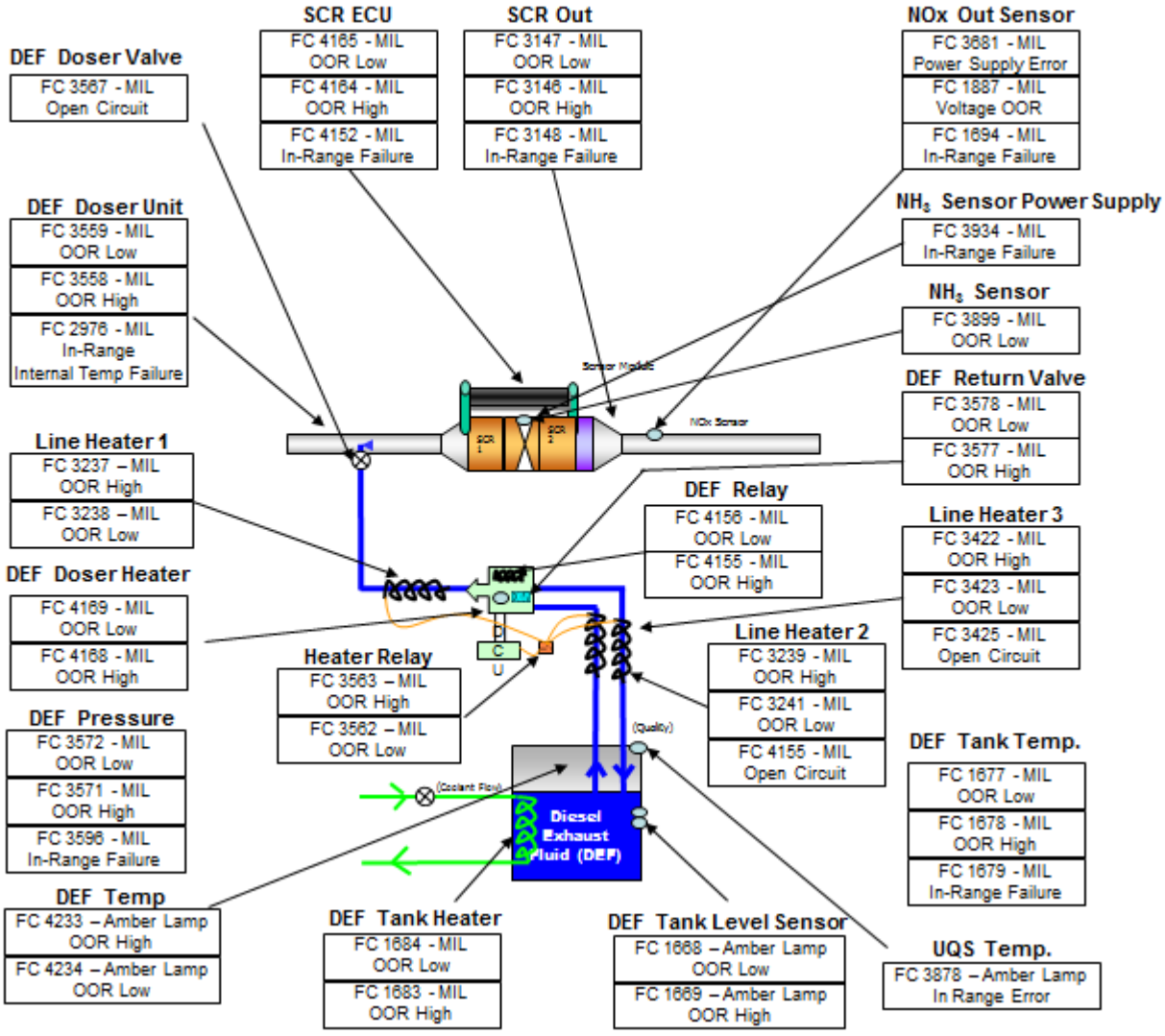

Related Fault Codes: FC 3567, FC 3559, FC 3558, FC 2976, FC 3237, FC 3238, FC 4169, FC 4168, FC 3572, FC 3571, FC 3596, FC 4233, FC 4234, FC 4165, FC 4164, FC 4152, FC 3147, FC 3146, FC 3148, FC 3681, FC 1887, FC 1694, FC 3934, FC 3899, FC 3578, FC 3577, FC 4156, FC 3422, FC 3423, FC 3425, FC 3239, FC 3241, FC 4155, FC 1684, FC 1683, FC 1668, FC 1669, FC 3878

DOC / DPF System Diagnostics

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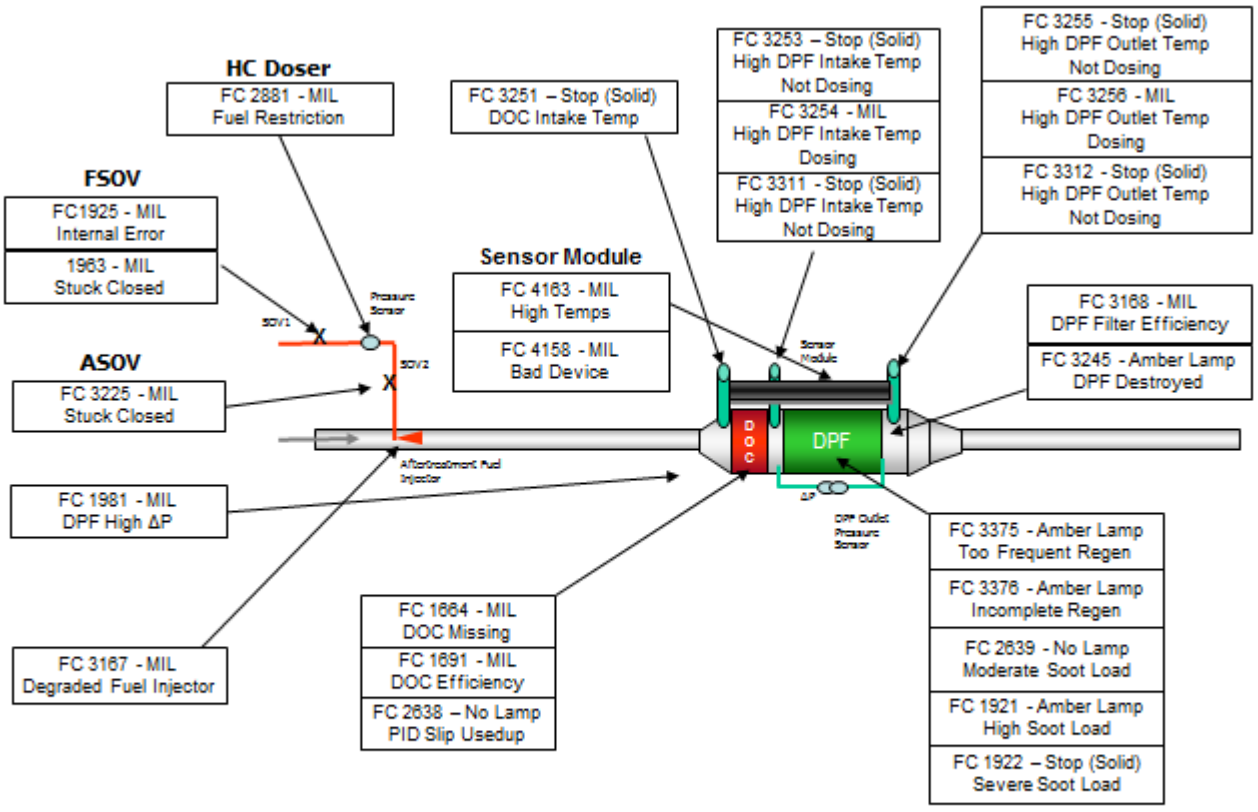

Related Fault Codes: FC 2881, FC 3251, FC 3253, FC 3254, FC 3311, FC 3255, FC 3256, FC 3312, FC 1925, FC 1963, FC 4163, FC 4158, FC 3168, FC 3245, FC 3225, FC 1981, FC 3167, FC 1664, FC 1691, FC 2638, FC 3375, FC 3376, FC 2639, FC 1921, FC 1922

SCR System Diagnostics

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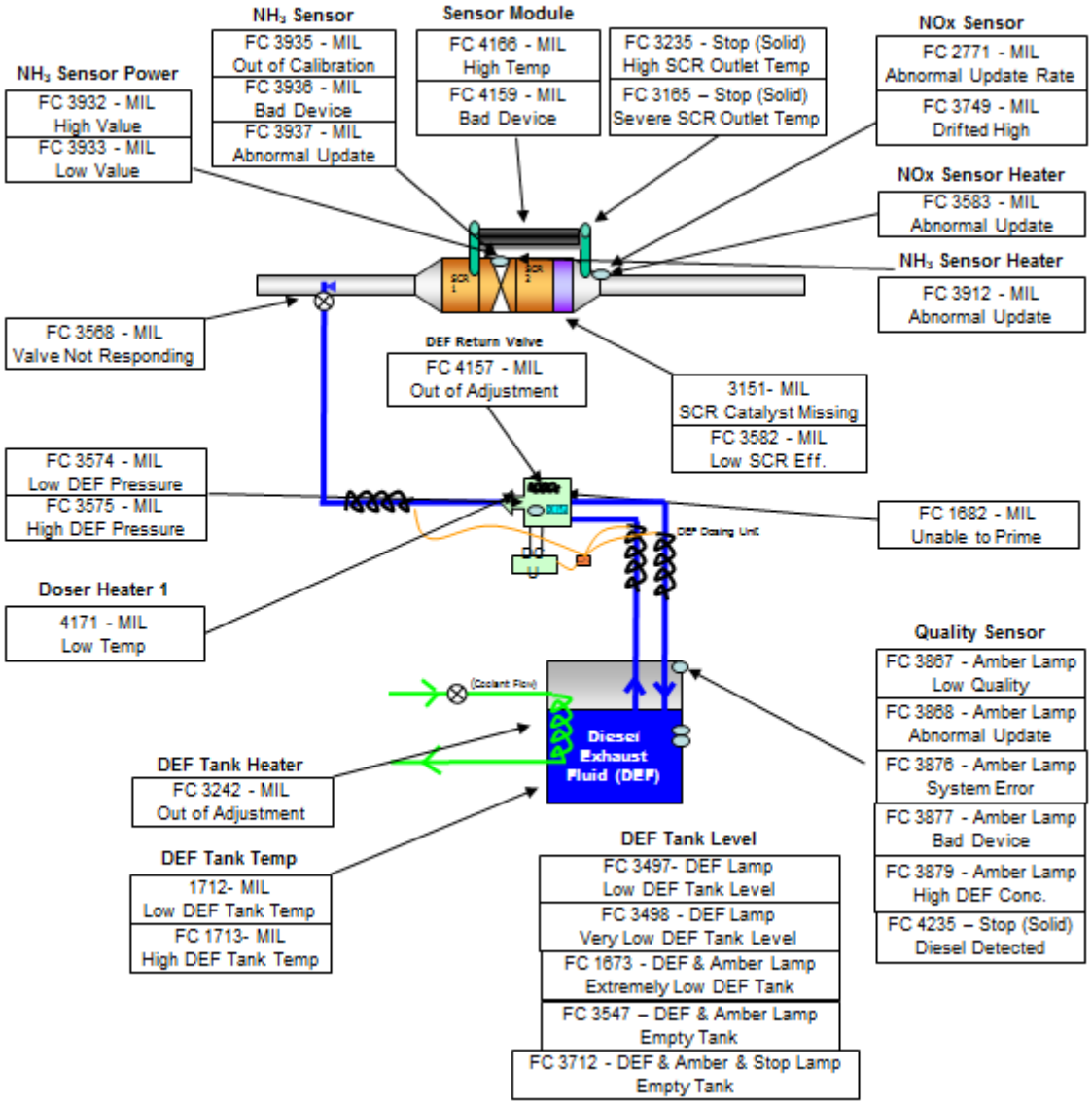

Related Fault Codes: FC 3932, FC 3933, FC 3935, FC 3936, FC 3937, FC 4166, FC 4159, FC 3235, FC 3165, FC 2771, FC 3749, FC 3568, FC 4157, FC 3583, FC 3912, FC 3151, FC 3582, FC 3574, FC 3575, FC 1682, FC 4171, FC 3242, FC 1712, FC 1713, FC 3867, FC 3868, FC 3876, FC 3877, FC 3879, FC 4235, FC 3497, FC 3498, FC 1673, FC 3547, FC 3712

Dosing System Diagnostics: Time Plots

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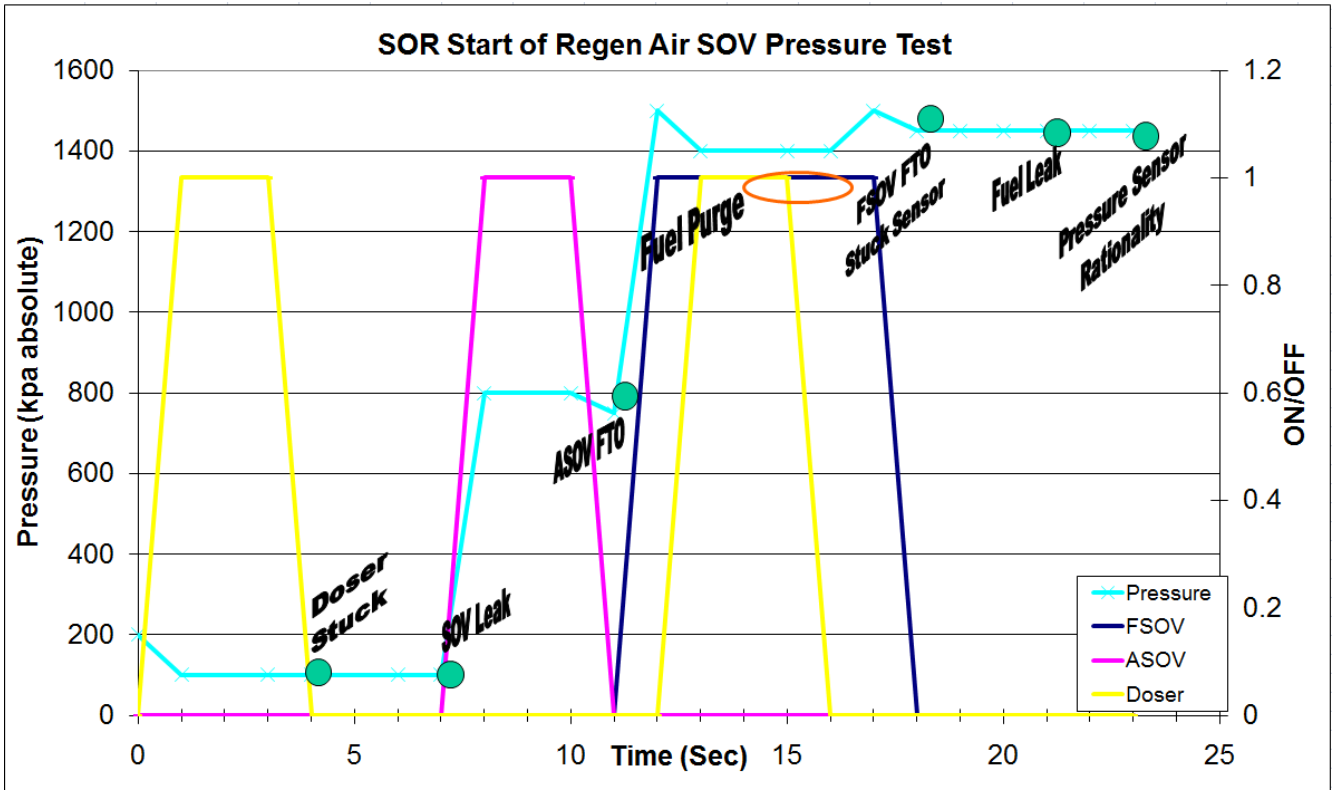
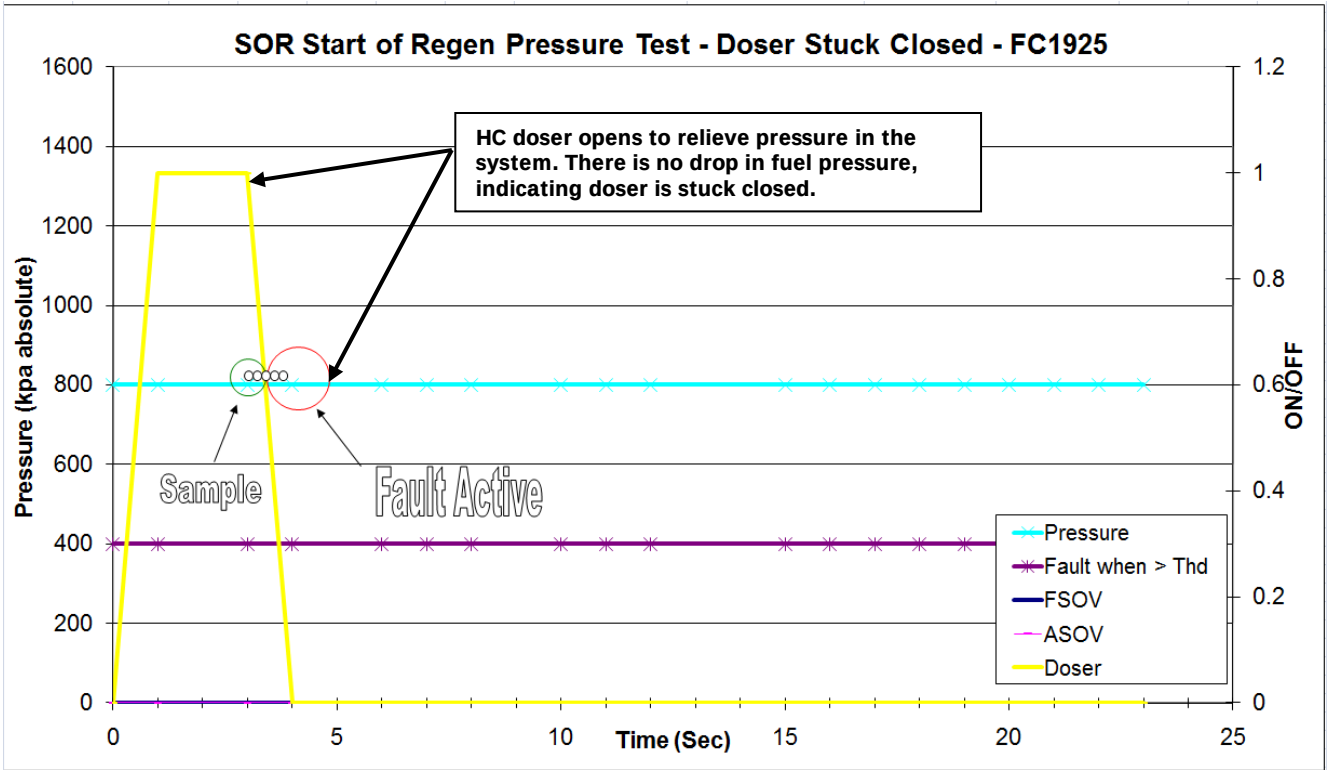
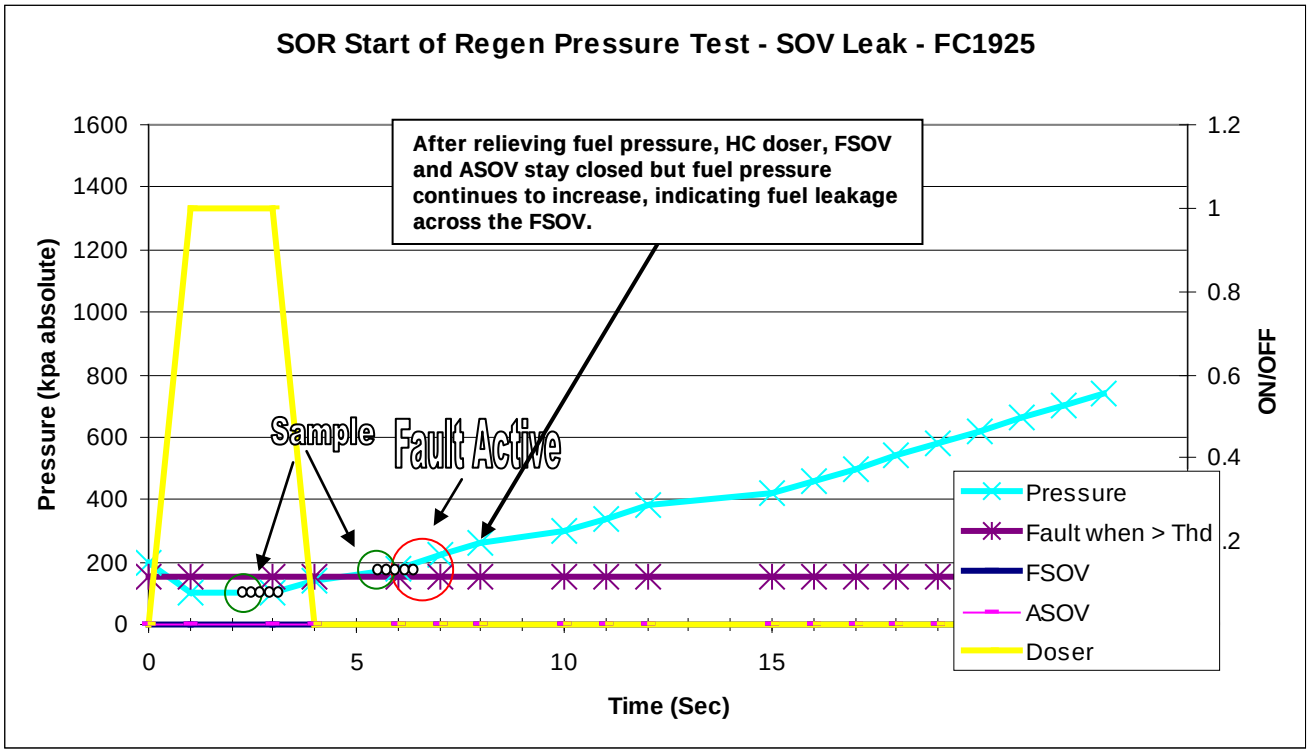
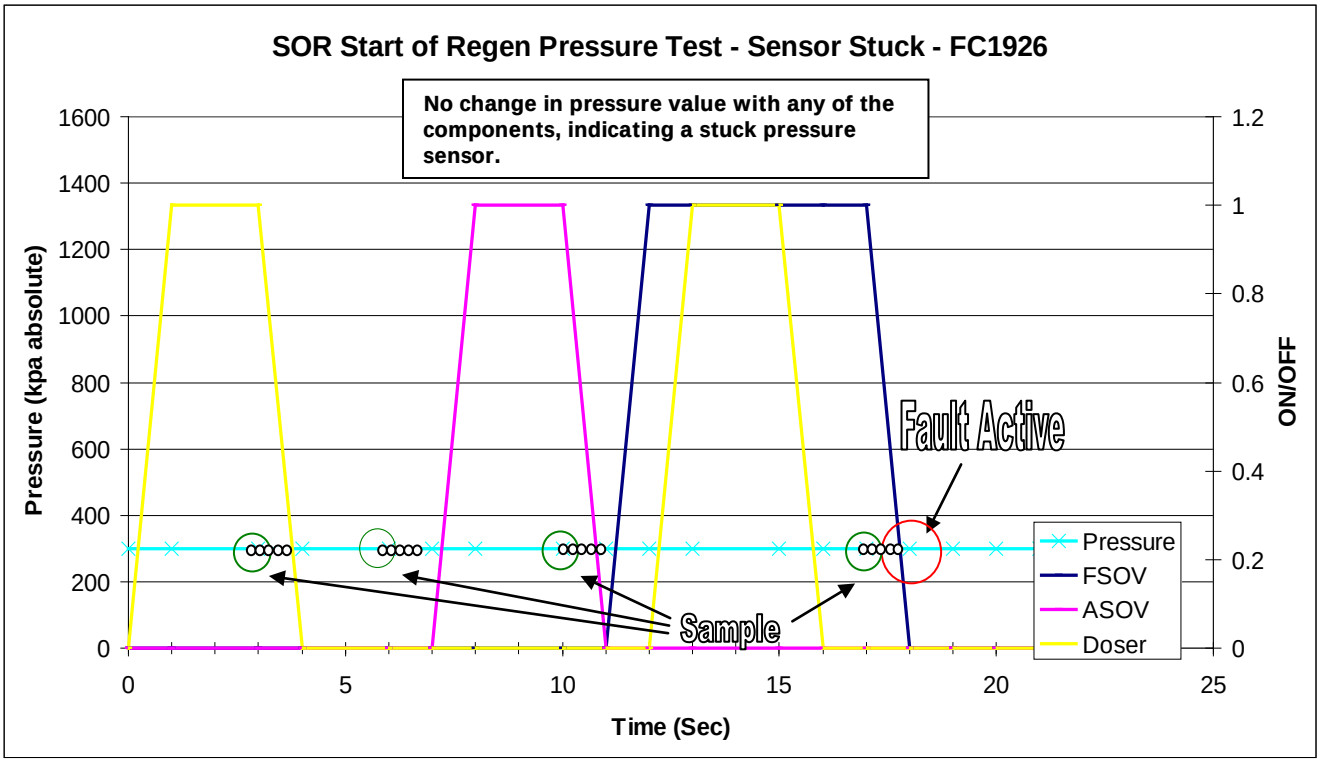
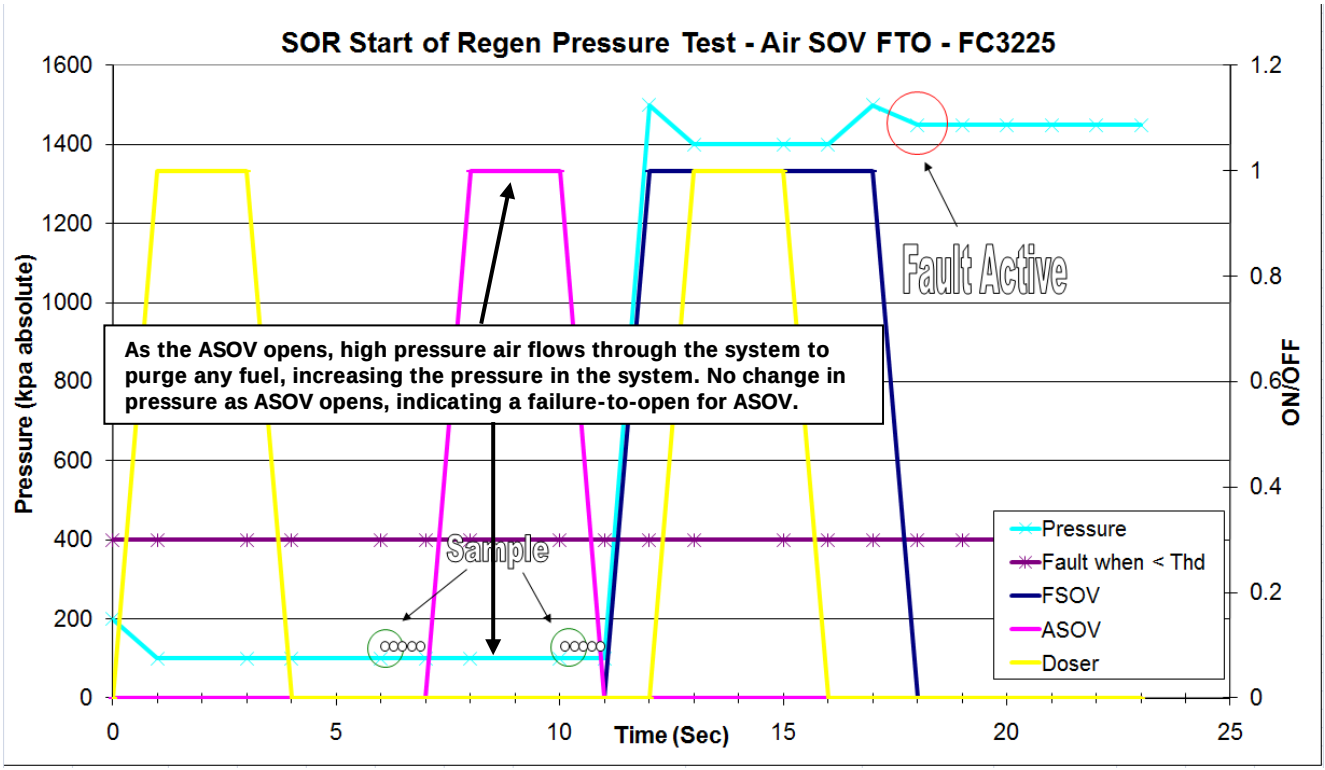
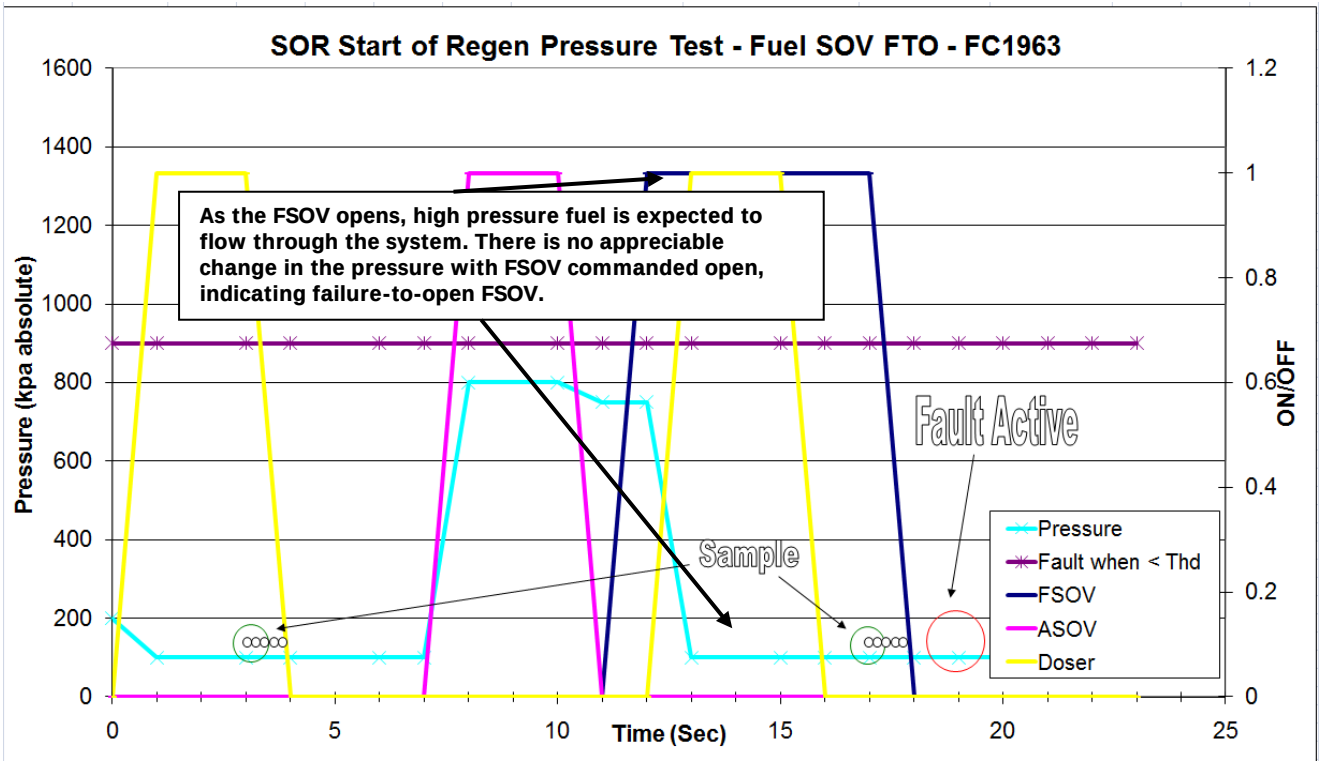


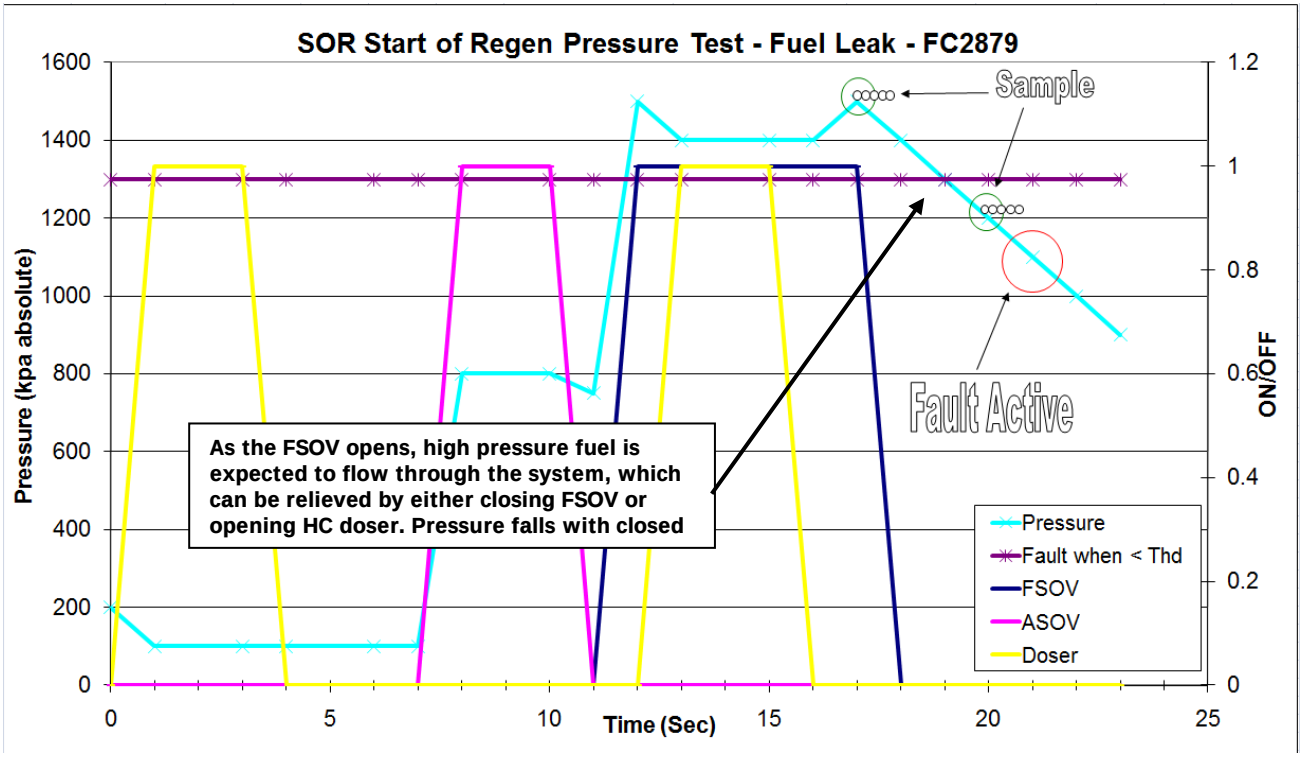


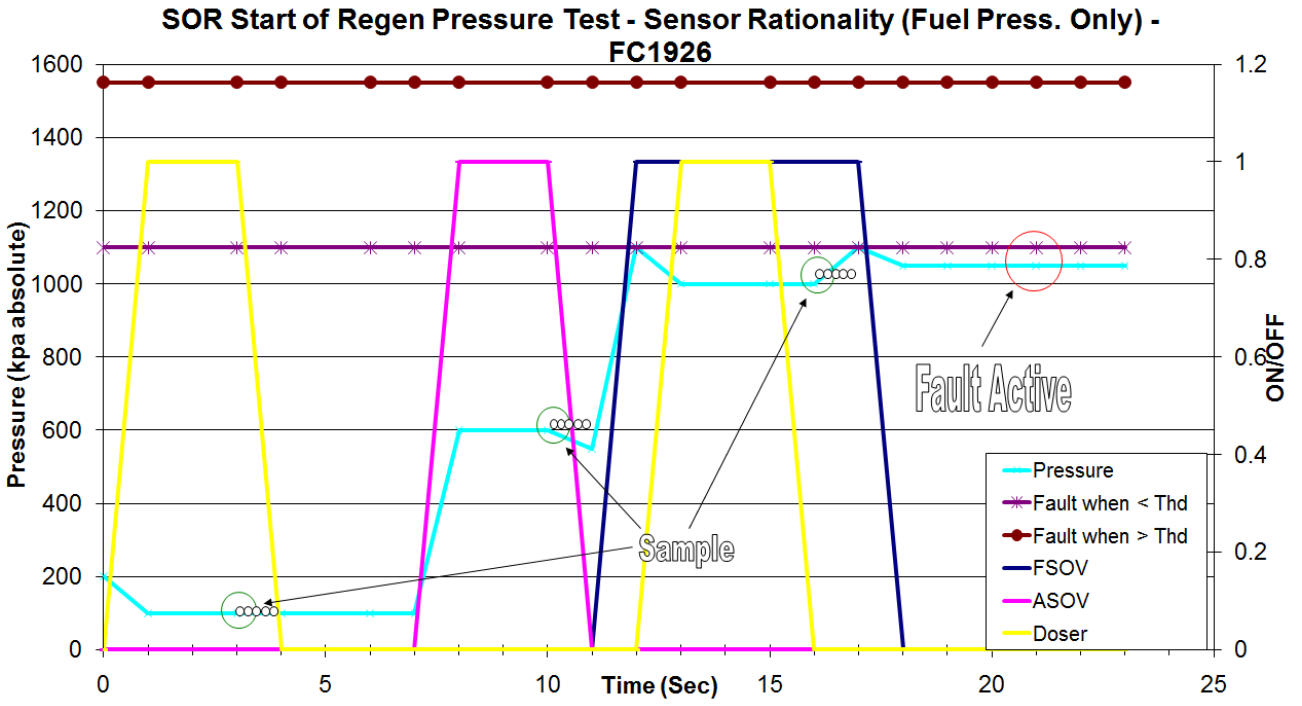

SOR Start of Regen Pressure Test - SOV Leak - FC1925
After relieving fuel pressure, HC doser, FSOV and ASOV stay closed but fuel pressure continues to increase, indicating fuel leakage across the FSOV.
Sample
Fault Active
Pressure (kpa absolute)
ON/OFF
Time (Sec)
Pressure
Fault when > Thd
FSOV
ASOV
Doser

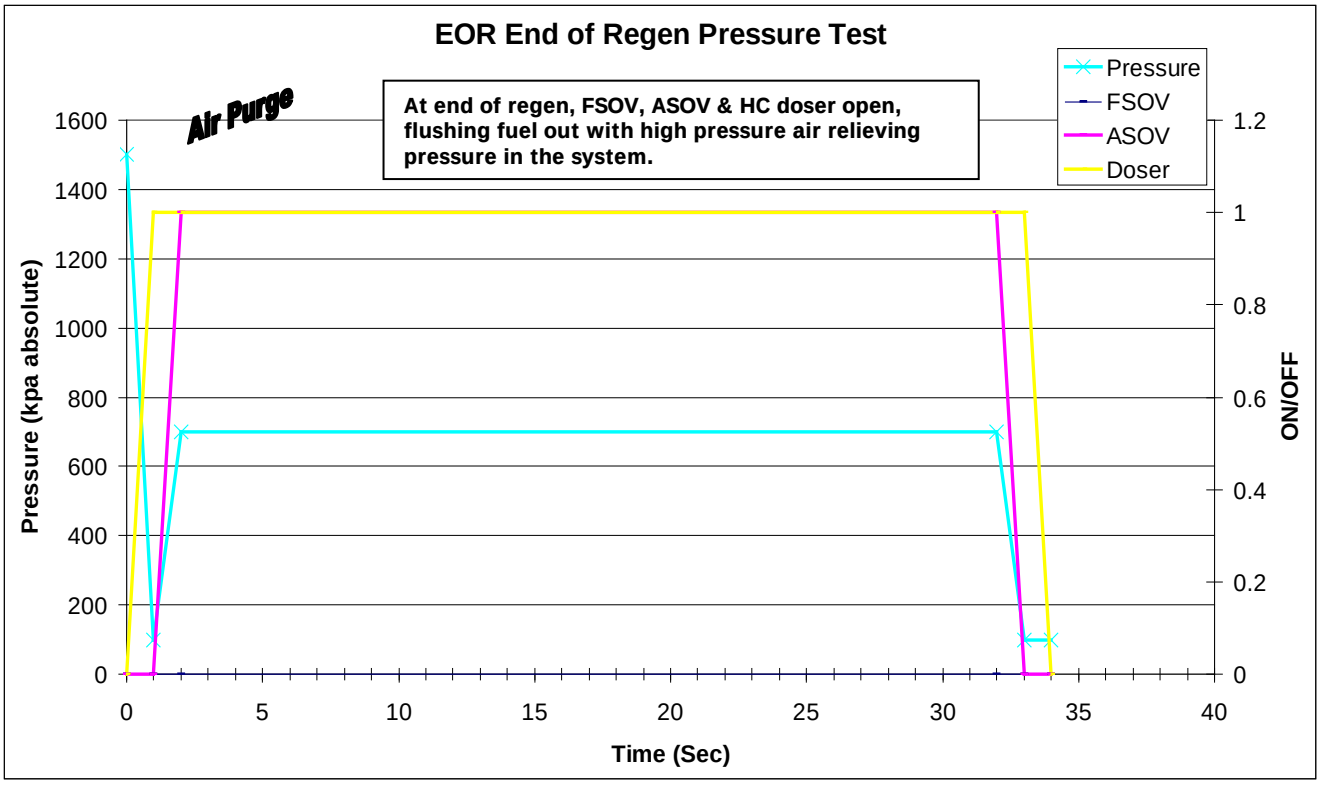

SOR Start of Regen Pressure Test - Sensor Stuck - FC1926
No change in pressure value with any of the components, indicating a stuck pressure sensor.
Fault Active
Sample
Pressure (kpa absolute)
ON/OFF
Time (Sec)
Pressure
FSOV
ASOV
Doser

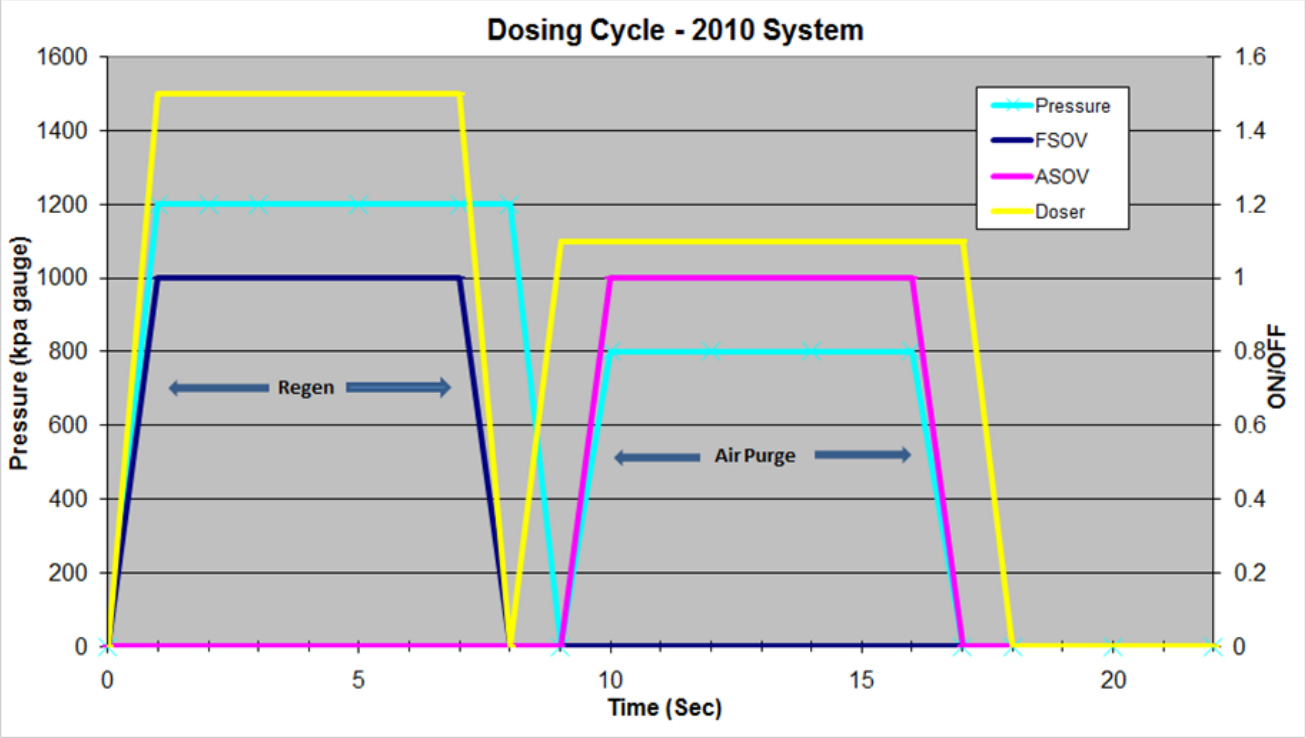

SOR Start of Regen Pressure Test - Air SOV FTO - FC3225
Pressure (kpa absolute)
ON/OFF
Time (Sec)
As the ASOV opens, high pressure air flows through the system to purge any fuel, increasing the pressure in the system. No change in pressure as ASOV opens, indicating a failure-to-open for ASOV.
Fault Active
Sample
Pressure
Fault when < Thd
FSOV
ASOV
Doser

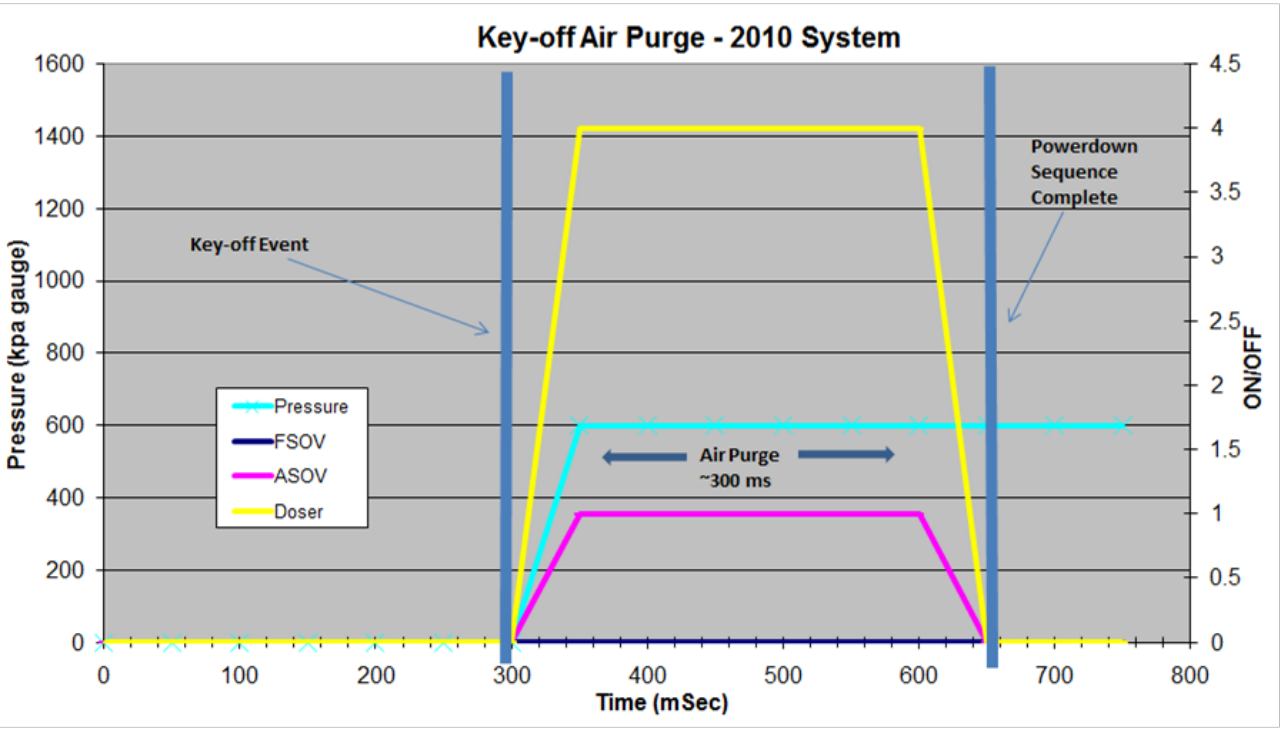

SOR Start of Regen Pressure Test - Fuel SOV FTO - FC1963
Pressure (kpa absolute)
ON/OFF
Time (Sec)
As the FSOV opens, high pressure fuel is expected to flow through the system. There is no appreciable change in the pressure with FSOV commanded open, indicating failure-to-open FSOV.
Fault Active
Sample
Pressure
Fault when < Thd
FSOV
ASOV
Doser


SOR Start of Regen Pressure Test - Fuel Leak - FC2879
Pressure (kpa absolute)
ON/OFF
Time (Sec)
Sample
Fault Active
As the FSOV opens, high pressure fuel is expected to flow through the system, which can be relieved by either closing FSOV or opening HC doser. Pressure falls with closed
Pressure
Fault when < Thd
FSOV
ASOV
Doser


SOR Start of Regen Pressure Test - Sensor Rationality (Fuel Press. Only) - FC1926
Pressure (kpa absolute)
ON/OFF
Time (Sec)
Fault Active
Sample
Pressure
Fault when < Thd
Fault when > Thd
FSOV
ASOV
Doser


EOR End of Regen Pressure Test
Air Purge
At end of regen, FSOV, ASOV & HC doser open, flushing fuel out with high pressure air relieving pressure in the system.
Pressure
FSOV
ASOV
Doser
Pressure (kpa absolute)
ON/OFF
Time (Sec)
0
200
400
600
800
1000
1200
1400
1600
0
0.2
0.4
0.6
0.8
1
1.2
0
5
10
15
20
25
30
35
40


Dosing Cycle - 2010 System
Pressure
FSOV
ASOV
Doser
Regen
Air Purge
Pressure (kpa gauge)
ON/OFF
Time (Sec)
0
200
400
600
800
1000
1200
1400
1600
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
0
5
10
15
20


Key-off Air Purge - 2010 System
Pressure (kpa gauge)
ON/OFF
Time (mSec)
Key-off Event
Powerdown Sequence Complete
Air Purge ~300 ms
Pressure
FSOV
ASOV
Doser
1600
1400
1200
1000
800
600
400
200
0
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
0
100
200
300
400
500
600
700
800

After-treatment Temperature Diagnostic

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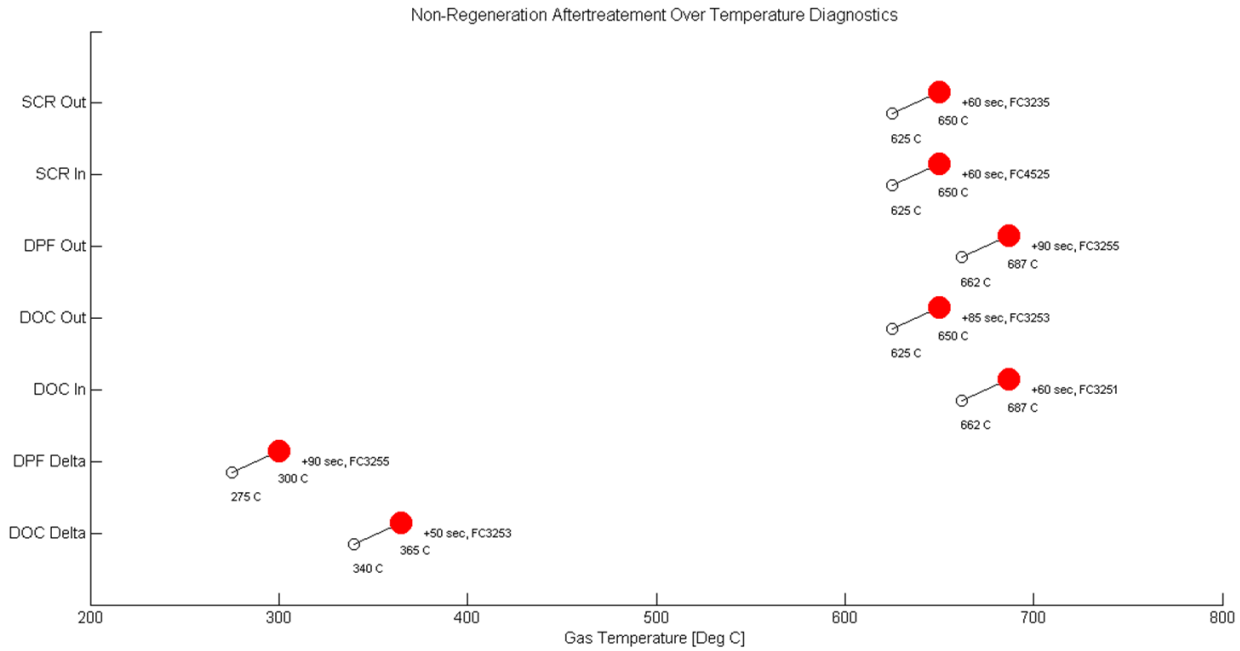

The figure above indicates the fault code threshholds for over temperature faults during non-regeneration periods.

For more information, see Item 298.

Normal OverTemp Diagnostics

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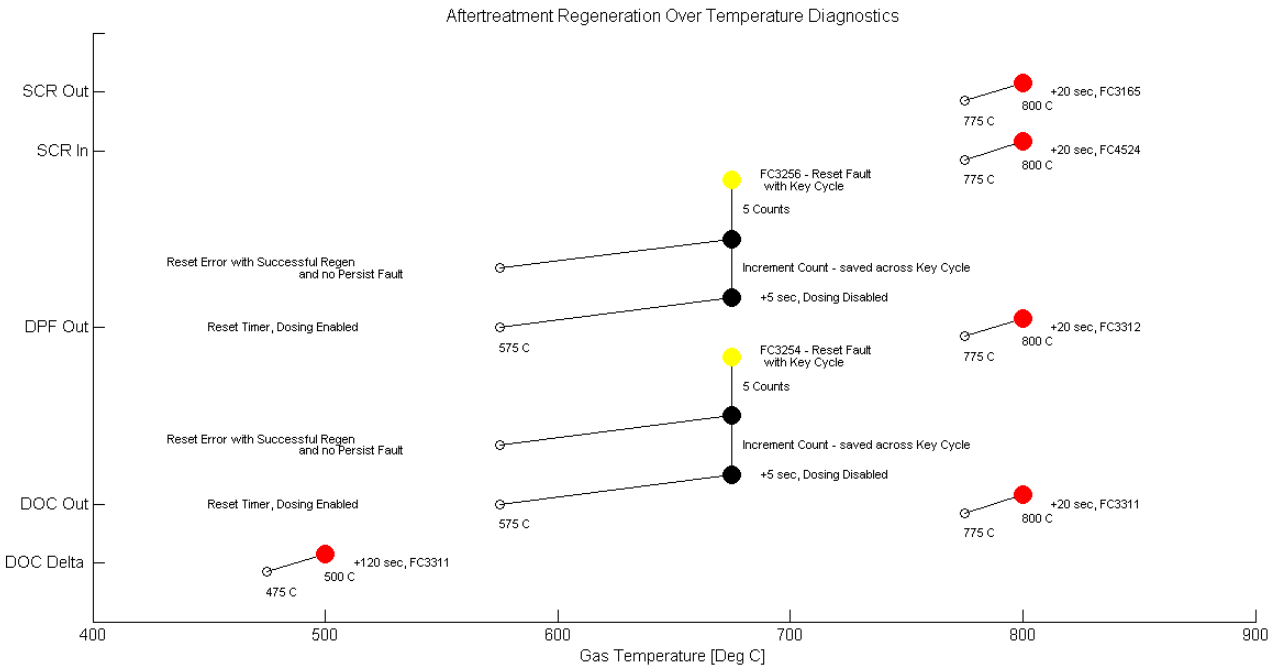

The above figure describes over temperature faults when trying to make heat for aftertreatment regeneration.

There are separate thresholds for non-dosing exhaust temperatures, and all aftertreatment over-temperature red lamp faults have mandatory shutdown after 30 seconds of (flashing) warning to the operator.

For more information, see AECD 7 – Extreme Conditions / Malfunction on page 369.

Urea Tank Level Diagnostics

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DEF (Urea) Gauge	Notification*		Inducement	Deactivate Warning or Inducement
10% reserve not shown on gauge	Lamp	Fault		
>10% full	None	None	None	None
Stage 1 Minimum 10% full (trimmable between 10-60%)	DEF lamp solid	FC 3497	None	Fill DEF tank to a minimum of 2.5% above stage 1 trimmed level
Stage 2 Minimum 5% full (trimmable between 5-55%)	DEF lamp flashing	FC 3498	None	Fill DEF tank to a minimum of 2.5% above stage 2 trimmed level
Stage 3 From minimum of 2.5% to before tank is empty (trimmable between 2.5-50%)	DEF lamp flashing Amber warning lamp solid	FC 1673	25% torque derate	Fill DEF tank to a minimum of 2.5% above stage 3 trimmed level
Stage 4 1% or fail to prime	DEF lamp flashing Amber warning lamp solid	FC3547	40% torque derate and begin search for severe inducement	Fill DEF tank to a minimum of 2.5% above 2% level and system is able to prime
Stage 5 After engine has been intentionally shut down or fuel re-fill or extended idle**	DEF lamp flashing Red lamp solid	FC 3712	Torque derate & vehicle speed limited to 5 mph after one of the 3 possible triggers are met.	Fill DEF tank to a minimum of 2.5% above stage 4 trimmed level and system is able to prime

Urea Heating Control Operation – DEF Tank, Supply Module, & Heated Lines with Heated Connectors

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DEF Tank:

- The DEF Tank temperature is sensed. If below -8 degC, tank defrost mode is activated. Continuous tank heating takes place after the coolant temperature gets above 70 degC and stays above 62 degC. System quits defrost mode when the tank temperature increases above -8 degC.
- When the Tank temperature is in between -8 degC and +5 degC closed loop maintenance heating is initiated to prevent re-freezing. When the temperature falls below 0 degC maintenance heating is (re)initiated.
- Priming is disabled when the Tank temperature is below -8 degC.

Supply Module:

- Supply Module(SM) temperature is sensed. If below -4 degC SM defrost mode is activated. SM heaters are activated and continuous heating occurs until the SM temperature rises above -4 degC. This prevents DEF freezing in the Supply Module.
- When the SM temperature gets above -4degC, maintenance heating is activated to prevent (re)freezing. SM maintenance heating is controlled based on the Ambient Temperature. The following table shows the % heating duty cycle based on ambient temperature.

Ambient Temperature (C)	% Duty Cycle
-30	70
-20	60
-10	45
0	30
5	20
10	10
10	10

- When SM temperature is below -4degC priming is disabled.

DEF Lines:

- Initial ambient temperature is sensed. If the Ambient Temperature is below 4 degC line defrost mode is activated to prevent DEF freezing in lines. Defrost heating is carried out for a fixed amount of time based on initial ambient temperature.

Ambient Temperature (C)	Seconds
-40	4500
-30	2700
-20	1500
-10	720
0	0
5	0

- Line maintenance heating is activated when ambient temperature is above 4 degC.

Ambient Temperature (C)	% Duty Cycle
-40	100
-30	100
-20	100
-10	100
0	100
5	100

- Priming allowed after defrost timer expires

DPF Tactics – Normal Operation

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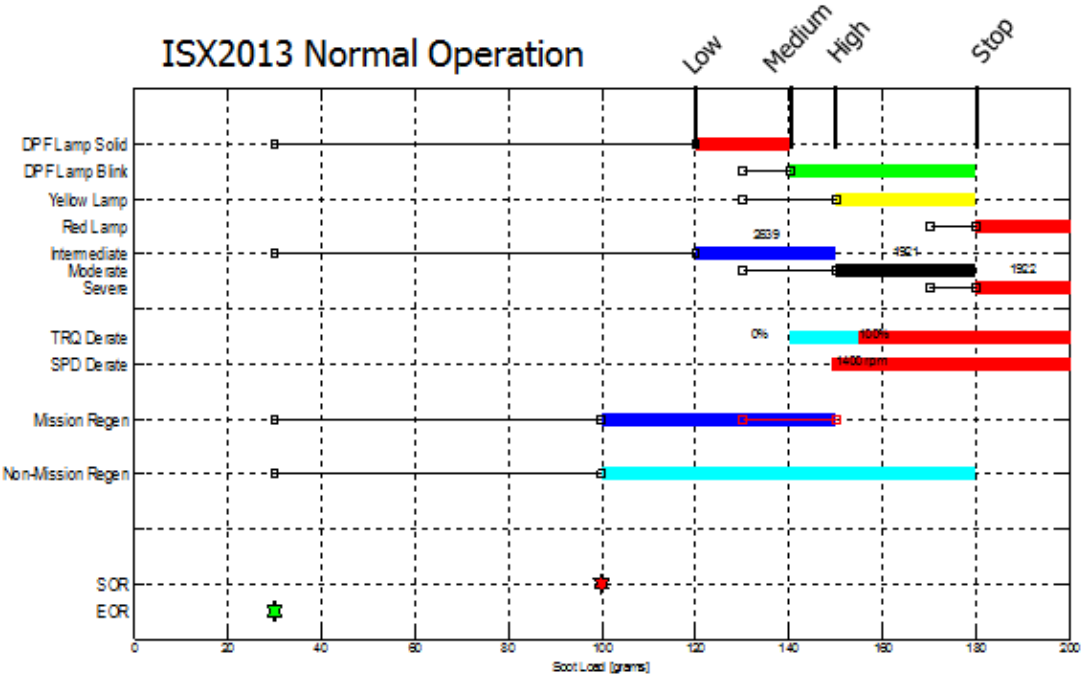

Related Items / Sections: Item 298

DPF Tactics – Inhibit Operation

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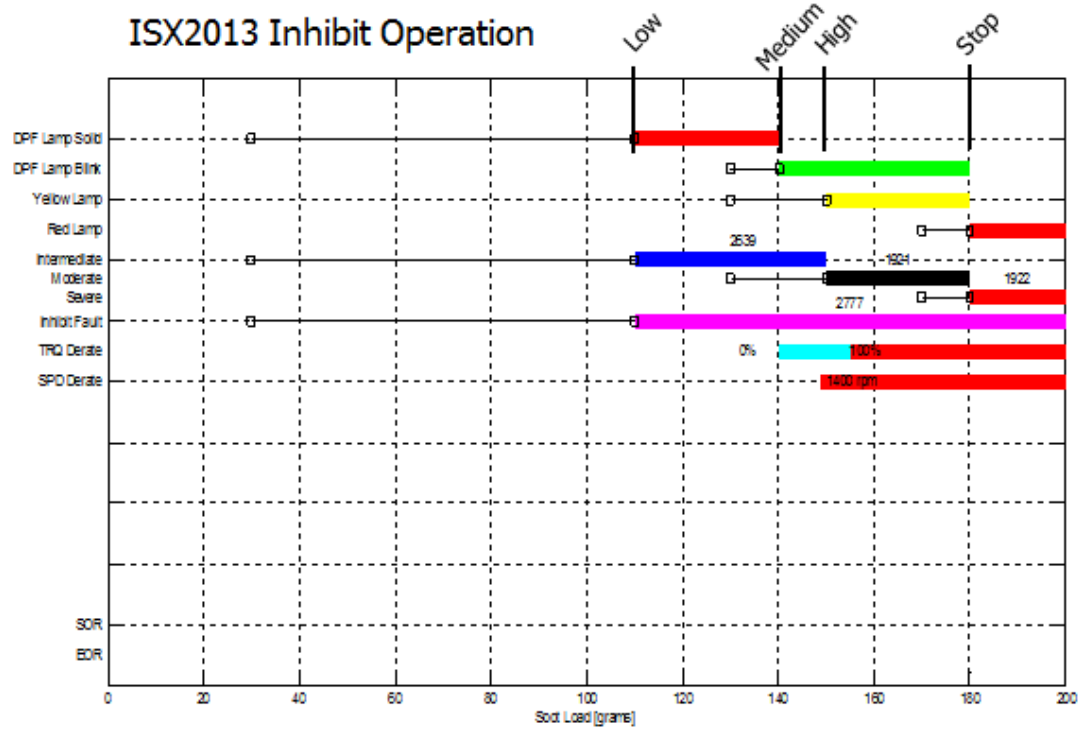

Related Items / Sections: Item 298

After-Treatment Lamp User Interface

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DPF Lamp

Indicates need for assistance in achieving regeneration

High Exhaust System Temperature (HEST) Lamp

Indicates an active regeneration is underway

Malfunction Indicator Lamp (MIL)

Indicates normal operation no longer possible - Service is required

Stop Engine Lamp

Indicates that system damage has occured or is imminent - the engine should be stopped as soon as is practical

DOC Missing – FC 1664

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DOC_NOT_PRESENT_ERR
Aftertreatment 1 Diesel Oxidation Catalyst Missing - Condition Exists
System Error Number: 1757

Charge_Flow	kg/min	V_ATD_bs_PFS_Sensor_Status	HEX
Exhaust_Flow	kg/min	V_ATM_fg_HC_Fdbk_Total	g/sec
H_HIM_fg_Dosing_Cmd	g/sec	V_ATP_fg_Turbo_Out	g/sec
O_OCD_DOC_PresenceCounter_Reset	None	V_ATP_trc_DOC_Out	Deg_C
P_ATR_SFM_OperModeRqst	None	V_OCD_DOC_Presence_Fail	None
P_SFR_Regen_Trigger_State	None	V_OCD_DOC_Presence_Retest	None
PTM_Final_Oper_Mode	None	V_OCD_DOC_Presence_State	None
T_OCD_DOC_Presence_Enable	None	V_OCD_tm_DOC_Presence_Diag	s
V_AIM_trc_DOC_In	Deg_C	V_OCD_tm_DOC_Presence_Enbl	s
V_AIM_trc_DOC_Out	Deg_C	V_OCD_trc_DOC_Delta	Deg_C
V_AIM_trc_DPF_Out	Deg_C	V_OCM_fg_HC_In	g/sec
V_ATD_bs_PFS_EngOut_Status	HEX	V_SFR_Regen_Stage	None

(Click here for parameter list in Excel)

DOC Conversion Efficiency – FC 1691

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DOC_NMHC_LOW_EFF_ERR
Aftertreatment 1 Diesel Oxidation Catalyst Conversion Efficiency - Data Valid But Below Normal Operating Range - Moderately Severe Level
System error number: 4719

Accelerator_Pedal_Position	%	P_OCD_fn_Dosing_NmlEff	None
C_CBR_Alpha_Override_Value	None	P_SFR_Regen_Trigger_State	None
C_OCD_Dos_NmlEff_HiThd_Lamp	None	P_SFR_tmh_ElapsedCleaningTime	hr
C_OCD_Dos_NmlEff_LoThd_Lamp	None	PTM_Final_Oper_Mode	None
C_OCD_DosEff_BPU_Thd	None	T_CBR_Alpha_User_Override	None
C_OCD_DosEff_RR_Diff_Thd	None	T_OCD_DOC_Presence_Enable	None
C_OCD_DosEff_WPA_Thd	None	T_OCD_NMHC_Eff_Diag_Enbl	None
C_OCD_fg_dt_Max_ExhFlow	g/s2	TAHR_dP_over_P	None
C_OCD_fg_dt_Max_HC_Inj_Rate	g/s2	TAHR_EGR_Flow_Cmd	kg/min
C_OCD_fg_MassLowRate_Thd	g/sec	TAHR_EMP_Cmd_Final	kPa
C_OCD_fg_Max_ExhFlow	g/sec	TAHR_IMP_Cmd	kPa
C_OCD_fg_Min_ExhFlow	g/sec	TAHR_OSR_dPoP_Final_Cmd	None
C_OCD_fg_Min_HC_Fdbk	g/sec	TGC_VT_Cmd	%
C_OCD_fg_Min_HC_Inj_Rate	g/sec	Total_Fueling	mg/stroke
C_OCD_tm_DOC_Diag_Steady_Time	s	V_AIM_trc_DOC_In	Deg_C
C_OCD_tm_DOC_Presence_Fail_Thd	s	V_AIM_trc_DOC_Out	Deg_C
C_OCD_tm_Eff_Ideal_Calc	s	V_AIM_trc_DPF_Out	Deg_C
C_OCD_trc_DOC_In_Min	Deg_C	V_AIM_trc_SCR_Out	Deg_C
C_OCD_trc_DOC_Out_Min	Deg_C	V_AIM_trc_SCR_T1	Deg_C
C_OCD_trc_DOC_PresenceDelta_Thd	Deg_C	V_ATD_bs_PFS_EngOut_Status	HEX
C_OCD_trc_DOCin_Thd	Deg_C	V_ATD_bs_PFS_Sensor_Status	HEX
C_SFR_tmh_CleaningRegenMaxThd	hr	V_ATM_fg_HC_Fdbk_Total	g/sec
C_SFR_tmh_SinceActiveRegenThd	hr	V_ATM_OBD_Data_Reset	None
CBR_Alpha	None	V_ATP_fg_Turbo_Out	g/sec
CBR_Thermal_Felix_Active	None	V_OCD_DosEff_Abort	None
CBR_Thermal_Oscar_Active	None	V_OCD_fn_Dos_NmlEff_Cont	None
Charge_Flow	kg/min	V_OCD_tm_AftDos_Duration	s
Charge_Press	kPa	V_OCD_tm_DOC_Presence_Diag	s
Combustion_Control_Path_Owner	None	V_OCD_tm_DOC_Presence_Enbl	s
Compressor_Inlet_Tmptr	Deg_C	V_OCD_tm_Dosing_Duration	s
Compressor_Outlet_Tmptr	Deg_C	V_OCD_tm_EffcThM_Duration	s
ECM_Run_Time	s	V_OCD_tm_Ideal_Time	s
EGR_Flow	kg/min	V_OCD_trc_DOC_Delta	Deg_C
Engine_Speed	RPM	V_OCP_Expected_Therm_ConvEff	None
Exhaust_Flow	kg/min	V_OCP_trc_Bed	Deg_C
Exhaust_Press	kPa	V_SCR_flm_UreaInjCmd	ml/sec
Filtered_Turbo_Speed	KRPM	V_SFP_mg_Soot_Load_Comb	gm
Fresh_Air_Flow	kg/min	V_SFP_mg_Soot_Load_DP	gm
H_HIM_fg_Dosing_Cmd	g/sec	V_SFR_Regen_Stage	None
Net_Engine_Torque	N_m	V_SFR_trc_Regen_Trgt	Deg_C
Net_Engine_Torque	N_m	V_UIM_flm_InjRateCmd	ml/sec
P_ATR_SFM_OperModeRqst	None	Vehicle_Speed	km/hr
P_OCD_DosEff_EWMA_Filt_Val	None	VGT_Position	%

(Click here for parameter list in Excel)

DEF Heater Relay - FC 4155, FC 4156

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FC 4155: UDD_SU_HEATER_HIGH_ERR
Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Heater Relay - Voltage above Normal, or Shorted to High Source
System Error number: 6097

FC 4156: UDD_SU_HEATER_LOW_ERR
Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Heater Relay - Voltage below normal, or shorted to low source

System Error number: 6096

(csdd_ats_udd_cm23xx.mdl)

V_UDD_bs_SU_Heater_FdbkStatus	HEX	T_UDD_SU_Heater_RLOC	None
V_UDD_SU_Heater_Cmd	None	C_UDD_tm_SU_Heater_FaultSetThd	s
V_UDD_tm_SU_Heater_HighErr	s	O_UDD_SU_Heater_Cmd_Enbl	None
V_UDD_tm_SU_Heater_LowErr	s	O_UDD_SU_Heater_Cmd_Val	None

(Click here for parameter list in Excel)

Related Codes / Sections:

DEF SM Pump - FC 1682, FC 3558, FC 3559, FC 4244, FC 4245, FC 4249, FC 4251

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FC 1682: UREA_DOSER_FAIL_TO_PRIME_ERR

Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Input Lines - Condition Exists
System Error number: 6980
(usm_cmd_lib.mdl\USC\EOLDoser)

FC 3558: UDD_POWERCTRL_HIGH_ERR

Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit - Voltage above normal, or shorted to high source
System Error number: 7289
(csdd_ats_udd_cm23xx.mdl)

FC 3558: UDD_PUMP_HIGH_ERR

Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit - Voltage above normal, or shorted to high source
System Error number: 6095
(csdd_ats_udd_cm23xx.mdl)

FC 3559: UDD_POWERCTRL_LOW_ERR

Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit - Voltage below normal, or shorted to low source
System Error number: 7290
(csdd_ats_udd_cm23xx.mdl)

FC 3559: UDD_PUMP_LOW_ERR

Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit - Voltage below normal, or shorted to low source
System Error number: 6094
(csdd_ats_udd_cm23xx.mdl)

FC 4244: UREASUPPT1_RATIONALITY_ERR

Aftertreatment 1 Diesel Exhaust Fluid Dosing Temperature - Data erratic, intermittent or incorrect
System Error number: 6481

FC 4245: UREASUPPT2_RATIONALITY_ERR

Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Heater Temperature - Data erratic, intermittent or incorrect
System Error number: 6482

FC 4249: UREASUPPT1_IR_STUCK_ERR

Aftertreatment 1 Diesel Exhaust Fluid Dosing Temperature - Abnormal Rate of Change
System Error number: 5738

FC 4251: UREASUPPT2_IR_STUCK_ERR

Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Heater Temperature - Abnormal Rate of Change

System Error number: 5739

(usm_diag_lib.mdl\USD\SMTmptrDiag)

Fail to prime:			
C_USD_FailtoPrime_Diag_Enbl	None	V_RDM_PrimeRetry_Allowed	None
C_RDM_ct_Max_PrimeRetry	counts	V_RDM_ct_PrimeRetry	counts
V_AIM_prg_UreaPumpP	kPa	V_RDM_State_Rqst	None
V_RDM_ReadyToPrime	None	V_USM_ReadyToDose	None
V_RDM_FailToPrime_Flag	None	V_USM_PumpFailToPrime_Err	None
V_RDM_tm_Retry_Interval	s	V_AIM_trc_SCR_T1	Deg_C
PowerCTRL High / Low:			
V_UDD_tm_PowerCtrl_HighErr	s	V_UDD_tm_Pump_LowErr	s
V_UDD_tm_PowerCtrl_LowErr	s	C_UTM_LineHtr_ProcA_Enbl	None
V_UDD_PwrCtrl_Cmd	None	C_UTM_LineHtr1Diag_Enbl	None
V_UDD_tm_Pump_HighErr	s	C_UTM_LineHtr2Diag_Enbl	None
C_USM_tm_PwrStartDelay	s	C_UTM_LineHtr3Diag_Enbl	None
C_UDD_tm_PowerCtrl_FaultSetThd	s	T_UIM_FT_SCR_Heating_Type	None
C_UDD_PowerCtrl2_Enbl	None	O_USM_PwrCtrl_Off_Enbl	None
T_UDD_PowerCtrl_RLOC	None	O_USM_PwrCtrl_Off_Val	None
T_UDD_PwrChanType	None		
Voltage High / Low:			
V_UDD_tm_Pump_HighErr	s	O_UDD_pc_Pump_Cmd_Enbl	None
V_UDD_tm_Pump_LowErr	s	O_UDD_pc_Pump_Cmd_Val	%
C_UDD_tm_Pump_FaultSetThd	s		
Fail to Thaw:			
Ambient_Air_Tmptr	Deg_C	V_AIM_trc_InitUreaSuppT1	Deg_C
V_ATP_trc_Ambient_Air_Status	None	V_USD_tm_FailToThaw_Timer	s
V_AIM_UreaSuppT_IsAvail	None	T_AMB_Amb_Tmptr_User_Override	None
V_USM_Heating_State	None	C_USD_trc_AmbMinThd	Deg_C
V_USD_FailToThaw_State	None	C_USM_trc_UreaSuppT1_MinThd	Deg_C
V_AIM_trc_UreaSuppT1	Deg_C	C_USM_tm_HeatingState_Min	s
V_RDM_trc_InitialCoolantTmptr	Deg_C	C_USD_trc_SuppT1_CoolantT_Tol	Deg_C
Temperature:			
V_USD_trc_T1Raised		C_USD_trc_UreaSuppT1Stuck_Thd	
V_USD_trc_SuppT1_ChrgT_Diff		C_USD_trc_SuppT1_ChrgT_Tol	
V_USD_trc_SuppT1_CoolantT_Diff		C_USD_trc_SuppT1_CoolantT_Tol	
V_USD_trc_T2Raised		C_USD_trc_UreaSuppT2Stuck_Thd	
V_USD_trc_SuppT2_ChrgT_Diff		C_USD_trc_SuppT2_ChrgT_Tol	
V_USD_trc_SuppT2_CoolantT_Diff		C_USD_trc_SuppT2_CoolantT_Tol	

(Click here for parameter list in Excel)

Related Codes / Sections:

DEF Unit Heater - FC 4168, FC 4169, FC 4171

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FC 4168: UREA_SM_HTR_HIGH_ERR

Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Heater - Voltage Above Normal, or Shorted to High Source

System Error number: 6688

FC 4169: UREA_SM_HTR_LOW_ERR

Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Heater - Voltage below normal, or shorted to low source

System Error number: 6689

(usm_diag_lib.mdl\USD\SMTmptrDiag)

Voltage High:

V_USD_tm_SMHtrStuck_Heating	s	V_USD_trc_SMHtrTmtr_Raised	Deg_C
V_USD_SMHtr_Stuck_State	None	C_USD_trc_SuppHtrStuck_Thd	Deg_C
V_AIM_trc_UreaSuppT2	Deg_C		

Voltage Low:

V_USD_tm_UreaSuppT1StuckHeating	s	V_USD_UreaSuppT1_SIR_State	None
V_USD_tm_UreaSuppT2StuckHeating	s	V_USD_SMHtr_FuncResp_State	None
V_USD_trc_T1Raised	Deg_C	C_USD_trc_UreaSuppT1Stuck_Thd	Deg_C
V_USD_trc_T2Raised	Deg_C		

Fail to Thaw:

Ambient_Air_Tmptr	Deg_C	V_AIM_trc_InitUreaSuppT1	Deg_C
V_ATP_trc_Ambient_Air_Status	None	V_USD_tm_FailToThaw_Timer	s
V_AIM_UreaSuppT_IsAvail	None	T_AMB_Amb_Tmptr_User_Override	None
V_USM_Heating_State	None	C_USD_trc_AmbMinThd	Deg_C
V_USD_FailToThaw_State	None	C_USM_trc_UreaSuppT1_MinThd	Deg_C
V_AIM_trc_UreaSuppT1	Deg_C	C_USM_tm_HeatingState_Min	s
V_RDM_trc_InitialCoolantTmptr	Deg_C	C_USD_trc_SuppT1_CoolantT_Tol	Deg_C

(Click here for parameter list in Excel)

Related Codes / Sections:

DEF Tank Heaters - FC 1683, FC 1684, FC 1712, FC 1713

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FC 1683: UTDD_TANKHTR1_HIGH_ERR

Aftertreatment 1 Diesel Exhaust Fluid Tank Heater - Voltage above normal, or shorted to high source
System Error number: 6102

FC 1684: UTDD_TANKHTR1_LOW_ERR

Aftertreatment 1 Diesel Exhaust Fluid Tank Heater - Voltage below normal, or shorted to low source
System Error number: 6103

FC 1712: UREA_TANKHTR1_FAIL_TO_THAW_ERR

Aftertreatment 1 Diesel Exhaust Fluid Tank Heater - Data Valid But Below Normal Operating Range - Moderately Severe Level
System Error number: 2962

FC 1713: UREA_TANKHTR1_STUCK_ON_ERR

Aftertreatment 1 Diesel Exhaust Fluid Tank Heater - Data Valid But Above Normal Operating Range - Moderately Severe Level
System Error number: 2965

Engine_Speed	RPM	OBD_Number_Of_Key_Cycles	None
Net_Engine_Torque	N_m	Key_Switch	None
MIL_Status	None	Exhaust_Flow	kg/min

High / Low:

O_UTC_TankHeater1_Val	%	V_UTDD_tm_TankHtr1_LowErr	s
V_UTDD_tm_TankHtr1_HighErr	s	C_UTDD_tm_TankHtr1_FaultSetThd	s

Failure to Thaw:

Ambient_Air_Tmptr	Deg_C	V_UTD_tm_TankHtr_ThawTime	s
Coolant_Temperature	Deg_C	C_UTD_trc_UHM_AmbientTmptr_Min	Deg_C

V_ATP_trc_Urea_TankT	Deg_C	C_UTC_trc_UHM_Coolant_LoThd	Deg_C
V_UTD_FailToThaw_State	None	C_UTC_trc_UHM_Coolant_HiThd	Deg_C
V_UTD_tm_TankHtr_RiseTime	s	C_UTD_trc_DosingTmptr_Min	Deg_C

Stuck On:

V_UTC_UreaTankHeater1_Cmd	%	C_UTD_tm_HeaterStuckOn_Max	s
V_ATP_Engine_Running	None	C_UTD_trc_HeaterStuckOnTmptr	Deg_C
V_ATP_trc_Urea_TankT	Deg_C	T_UTC_FT_TankHeater1_Enbl	None
V_ATP_trc_Urea_TankT_Status	None		

No Initial Rise:

V_AIM_trc_Coolant	Deg_C	V_UTC_UreaTankHeater1_Cmd	%
V_ATD_bs_PFS_SysIO_Enbled	HEX	V_UTD_FailToThaw_State	None
V_ATD_bs_PFS_SysIO_Errs	HEX	V_UTD_NoFuncResp_State	None
V_ATD_bs_PFS_SysIO_Update	HEX	V_UTD_trc_InitTmptrReference	Deg_C
V_ATD_bs_SCR_ExtInput_Status	HEX	V_UTD_trc_InitTmptrRise	Deg_C
V_ATD_bs_SCR_SysPerf_Errs	HEX	V_UTD_UreaHeaterMonEnbl_Rise	None
V_ATM_PFS_Error_Indices[0]	None	V_ATD_bs_PFS_SysIO_Enbled	HEX
V_ATP_Engine_Running	None	V_UTD_UreaHeaterMonEnbl_Rise	None
V_ATP_KeySwitch	None	V_UIM_ct_TankHtr1Test_SpecDen	counts
V_ATP_trc_Ambient_Air	Deg_C	V_UTD_FailToThaw_State	None
V_ATP_trc_Urea_TankT	Deg_C	V_UTD_NoFuncResp_State	None
V_ATP_trc_Urea_TankT_Status	None	V_UTD_TankHtr1_RiseTmptrReached	None
V_HIM_Error_Indices[0]	None	V_UTD_trc_InitTmptrRise	Deg_C
V_RDM_FdbkState	None	V_ATD_bs_PFS_SysIO_Errs	HEX
V_UTC_ClntVlv_CycleOn	None	V_ATD_bs_PFS_SysIO_Update	HEX

(Click here for parameter list in Excel)

Related Codes / Sections:

DEF Tank Level - FC 1668, FC 1669, FC 1673, FC 4769, FC 4739, FC 3497, FC 3498, FC 3547

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FC 1668: UREA_TANKLVL_OOR_LO_ERR
Aftertreatment 1 Diesel Exhaust Fluid Tank Level Sensor Circuit - Voltage below normal, or shorted to low source
System Error number: 2879

FC 1669: UREA_TANKLVL_OOR_HI_ERR
Aftertreatment 1 Diesel Exhaust Fluid Tank Level Sensor Circuit - Voltage above normal, or shorted to high source
System Error number: 2896

FC 1673: UREA_TANKLVL_EMPTY_MAINT_ERR
Aftertreatment 1 Diesel Exhaust Fluid Tank Level - Data valid but below normal operational range - Most Severe Level
System Error number: 324

FC 4769: UREA_TANKLVL_PERSIST_NO_VALUE_ERR
Aftertreatment 1 Diesel Exhaust Fluid Tank Level Sensor - Abnormal Rate of Change- Most Severe Level
System Error number: 8684

FC 4739: UREA_TANKLVL_SENS_INT_ERR
Aftertreatment 1 Diesel Exhaust Fluid Tank Level Sensor - Root Cause Not Known
System Error number: 8293

FC 3497: UREA_TANKLVL_LO_MAINT_ERR
Aftertreatment 1 Diesel Exhaust Fluid Tank Level - Data Valid But Below Normal Operating Range - Least Severe Level
System Error number: 2097

FC 3498: UREA_TANKLVL_WARNING_MAINT_ERR
Aftertreatment 1 Diesel Exhaust Fluid Tank Level - Data Valid But Below Normal Operating Range - Moderately Severe Level
System Error number: 4188

FC 3547: UREA_TANKLVL_EMPTY_INDUCE_ERR
Aftertreatment 1 Diesel Exhaust Fluid Tank Level - Data Valid But Below Normal Operating Range - Moderately Severe Level
System Error number: 4188

(utm_app_lib.mdl)

Level:

V_ATM_OBD_Data_Reset	None	V_UTM_TankLvl_IntlErr_DiagSt	None
V_UTM_TankLvl_Sens_Active	None	V_UTM_tm_TankLvl_IntlErr	s
V_ATP_KeySwitch	None	V_UTM_TankLvl_Volt_OORH_DiagSt	None
V_ATP_EngineState	None	V_UTM_tm_Lvl_Volt_OORH	s
V_AIM_pc_Urea_TankLvl_Status	None	V_UTM_TankLvl_Volt_OORL_DiagSt	None
V_UTM_tm_Lvl_Volt_OORH	s	V_UTM_tm_TankLvl_Volt_OORL	s
V_UTM_tm_TankLvl_Volt_OORL	s	V_UTM_TankLvl_Sens_Active	None
V_UTM_tm_TankLvl_IntlErr	s	V_UTM_tm_TankLvl_SensActivation	s
V_UTM_tm_TankLvl_Curr_OORH	s	V_AIM_pc_Urea_TankLvl_Status	None
V_UTM_tm_TankLvl_Curr_OORL	s	V_ATP_pc_Urea_TankLvl	%
V_UTM_TankLvl_FMIDiag_Abort	None	V_AIM_pc_Urea_TankLvl	%
V_UTM_TankLvl_Curr_OORH_DiagSt	None	V_UTD_LargeLevelChange_Detected	None
V_UTM_tm_TankLvl_Curr_OORH	s	V_AIM_pc_Urea_TankLvl_Raw	%
V_UTM_TankLvl_Curr_OORL_DiagSt	None		
V_UTM_tm_TankLvl_Curr_OORL	s		

Empty:

V_ATP_pc_Urea_TankLvl	%	V_UTD_TankLvlAtWarning	None
V_AIM_pc_Urea_TankLvl	%	V_UTD_TankIsLow	None
V_UTD_TankLvlAtInducement	None	V_RDM_State_Rqst	None
V_UTD_TankIsEmpty	None	P_UTD_TankLvlEmptyHystVal	None
V_RDM_FailToPrime_Inducement	None	P_UTD_TankEmpty	None
V_UTM_UreaPress_CtrlLo_Err	None		

Persist No Value:

V_UTM_TankLvl_Sens_Active	None	V_UTM_bs_TankLvl_Err_Status	HEX
V_ATP_trc_Urea_TankT	Deg_C	V_UTD_tm_LvlPersistNoVal	s
V_ATP_pc_Urea_TankLvl_Status	None	V_UTD_trc_InitTmptrReference	Deg_C
V_ATP_trc_Urea_TankT_Status	None	V_UTD_LvlPersistNoVal_DiagState	None
V_ATP_pc_Urea_TankLvl	%		

(Click here for parameter list in Excel)

Related Codes / Sections:

DEF Tank Heater Valve - FC 1713, FC 3242

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FC 1713: UREA_TANKHTR1_STUCK_ON_ERR
Aftertreatment 1 Diesel Exhaust Fluid Tank Heater - Data Valid But Above Normal Operating Range - Moderately Severe Level
System Error number: 2965

FC 3242: UREA_TANKHTR1_NO_INITIAL_TMPTR_RISE_ERR
Aftertreatment 1 Diesel Exhaust Fluid Tank Heater - Mechanical system not responding or out of adjustment
System Error number: 2964

(usm_diag_lib.mdl\USD\SMTmptrDiag)

No Initial Rise:

V_AIM_trc_Coolant	Deg_C	V_UTC_UreaTankHeater1_Cmd	%
V_ATD_bs_PFS_SysIO_Enbled	HEX	V_UTD_FailToThaw_State	None
V_ATD_bs_PFS_SysIO_Errs	HEX	V_UTD_NoFuncResp_State	None
V_ATD_bs_PFS_SysIO_Update	HEX	V_UTD_trc_InitTmptrReference	Deg_C
V_ATD_bs_SCR_ExtInput_Status	HEX	V_UTD_trc_InitTmptrRise	Deg_C
V_ATD_bs_SCR_SysPerf_Errs	HEX	V_UTD_UreaHeaterMonEnbl_Rise	None
V_ATM_PFS_Error_Indices[0]	None	V_ATD_bs_PFS_SysIO_Enbled	HEX
V_ATP_Engine_Running	None	V_UTD_UreaHeaterMonEnbl_Rise	None
V_ATP_KeySwitch	None	V_UIM_ct_TankHtr1Test_SpecDen	counts
V_ATP_trc_Ambient_Air	Deg_C	V_UTD_FailToThaw_State	None
V_ATP_trc_Urea_TankT	Deg_C	V_UTD_NoFuncResp_State	None
V_ATP_trc_Urea_TankT_Status	None	V_UTD_TankHtr1_RiseTmptrReached	None
V_HIM_Error_Indices[0]	None	V_UTD_trc_InitTmptrRise	Deg_C
V_RDM_FdbkState	None	V_ATD_bs_PFS_SysIO_Errs	HEX
V_UTC_ClntVlv_CycleOn	None	V_ATD_bs_PFS_SysIO_Update	HEX

(Click here for parameter list in Excel)

Related Codes / Sections:

DEF Pressure Sensor - FC 3571, FC 3572, FC 3574, FC 3575, FC 3596

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FC 3571: UREAPUMPP_OOR_HI_ERR
Aftertreatment 1 Diesel Exhaust Fluid Pressure Sensor - Voltage above normal, or shorted to high source
System Error number: 5579

FC 3572: UREAPUMPP_OOR_LO_ERR
Aftertreatment 1 Diesel Exhaust Fluid Pressure Sensor - Voltage below normal, or shorted to low source
System Error number: 5580

FC 3574: UPPM_CTRL_TOOLOW_ERR
Aftertreatment 1 Diesel Exhaust Fluid Pressure Sensor - Data Valid But Below Normal Operating Range - Moderately Severe Level
System Error number: 5808

FC 3575: UPPM_CTRL_TOOHIGH_ERR
Aftertreatment 1 Diesel Exhaust Fluid Pressure Sensor - Data Valid But Above Normal Operating Range - Moderately Severe Level
System Error number: 5807

FC 3596: UPPM_INRANGE_ERR
Aftertreatment 1 Diesel Exhaust Fluid Pressure Sensor - Data erratic, intermittent or incorrect
System Error number: 6966

FC 3596: UPPM_FAIL2STBLZ_ERR
Aftertreatment 1 Diesel Exhaust Fluid Pressure Sensor - Data erratic, intermittent or incorrect
System Error number: 5806

(csdd_dsm_usm.mdl)

Voltage:

O_AIM_prg_UreaPumpP_Enable	None	V_AIM_ev_UreaPumpP	V
V_AIM_prg_UreaPumpP	kPa	C_AIM_fc_UreaPumpP	None
V_AIM_prg_UreaPumpP_Status	None	C_AIM_ct_UreaPumpP_OOR_Decrt	counts
V_USM_bs_Sys_Errs	HEX	C_AIM_ct_UreaPumpP_OOR_Dur	counts
V_HIM_Error_Indices[0]	None	C_AIM_ct_UreaPumpP_OOR_HLim	counts
V_ATD_bs_PFS_SysIO_Errs	HEX	C_AIM_ct_UreaPumpP_OOR_Incrt	counts
V_ATD_bs_PFS_SysIO_Update	HEX	C_AIM_ct_UreaPumpP_OOR_LLim	counts
V_ATM_PFS_Error_Indices[0]	None	T_AIM_UreaPumpP_SupplyRLOC	None
V_AIM_ct_UreaPumpP	counts	T_AIM_UreaPumpP_RLOC	None
V_AIM_ct_UreaPumpP_Raw	counts		

CTRL Too Low / High:

V_USD_LowPress_Flag	None	C_USD_tm_PumpCtrl_CheckHi	s
V_AIM_prg_UreaPumpP	kPa	C_USM_prg_PumpCtrl_LowVal	kPa
V_USD_tm_PressCtrl_BlwLo	s	C_USD_tm_PumpCtrl_CheckLo	s
V_USD_tm_PressCtrl_AbvHi	s	C_USM_prg_PumpCtrl_ConstRef_Val	kPa
V_AIM_prg_UreaPumpP_Status	None	C_AIM_ct_UreaPumpP_OOR_Dur	counts
V_ATD_bs_PFS_SysIO_Errs	HEX	T_UDD_Pump_RLOC	None
V_ATD_bs_PFS_SysIO_Update	HEX	T_AIM_UreaPumpP_RLOC	None
V_USM_MasterState	None	T_AIM_UreaPumpP_SupplyRLOC	None
C_USM_prg_PumpCtrl_HiVal	kPa		

In - Range:

O_USM_MasterState_Val	None	V_UDD_tm_FCV_HighErr	s
O_USM_MasterState_Enbl	None	V_UDD_tm_Pump_LowErr	s
P_USM_UreaPurge_Compl	None	V_UDD_tm_Pump_HighErr	s
V_AIM_prg_UreaPumpP	kPa	V_USM_bs_Sys_Errs	HEX
V_AIM_ct_UreaPumpP	counts	V_USM_bs_Sys1_Errs	HEX
V_USM_MasterState	None	C_USD_PressInRange_Enbl	None
V_USM_PrevMasterState	None	C_USD_prg_PressInRange_Min	kPa
V_USD_PressInRange_State	None	C_USD_prg_PressInRange_Max	kPa
V_USD_prg_PressInRangeDiag	kPa	C_USD_tm_PressInRange	s
V_USD_tm_PressInRangeTimer	s	C_USM_tm_StandbyState_Min	s
V_ATM_OBD_Data_Reset	None	C_AIM_ct_UreaPumpP_OOR_LLim	counts
V_UDD_tm_FCV_LowErr	s	C_AIM_ct_UreaPumpP_OOR_HLim	counts

Fail to stabilize:

C_USD_prg_PressStblz_LoThd	kPa	V_ATD_bs_PFS_SysIO_Update	HEX
C_USD_prg_PressStblz_HiThd	kPa	V_AIM_prg_UreaPumpP	kPa
C_USD_tm_Fail2Stblz_Thd	s	V_AIM_prg_UreaPumpP_Status	None
V_USD_Fail2Stblz_Flag	None	V_AIM_ct_UreaPumpP	counts
V_USD_tm_Fail2Stblz_Count	s	V_AIM_ct_UreaPumpP_Raw	counts
V_ATD_bs_PFS_SysIO_Errs	HEX	V_AIM_ev_UreaPumpP	V

(Click here for parameter list in Excel)

Related Codes / Sections:

DEF Doser Not Responding - FC 3567, FC 3568

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FC 3567: UREA_DOSER_INJ_ELEC_ERR

Aftertreatment Diesel Exhaust Fluid Dosing Valve - Current below normal or open circuit
System Error number: 5102

FC 3568: UREA_DOSER_FUNC_RESPONSE_ERR

Aftertreatment Diesel Exhaust Fluid Return Valve - Mechanical system not responding or out of adjustment
System Error number: 5803

C_UDD_DoserRLOC	None	V_ATD_bs_PFS_SysIO_Errs	HEX
C_UDD_pc_DoserPullinRatchetMax	%	V_ATD_bs_PFS_SysIO_Update	HEX
C_UDD_tm_DoserFaultRatchetDelay	s	V_UDD_DoserInj_Fault	None

C_UDD_pc_DoserPullinRatchetStep	%	V_UDD_bs_DoserInj_FdbkStatus	HEX
C_UDD_Diagnostic_Incrt_Gain	None	V_ATD_bs_PFS_SysIO_Errs	HEX
C_UDD_Diagnostic_Decrt_Gain	None	V_ATD_bs_PFS_SysIO_Update	HEX
C_UDD_tm_DoserInj_FaultSetThd	s	V_UDD_pc_DoserPullinRatchetAdj	%
V_UDD_tmu_Inj_Ontime	uSec	V_UDD_tm_DoserInj_Fault	s

(Click here for parameter list in Excel)

Related Codes / Sections:

DEF Return Valve - FC 4157, FC 3577, FC 3568, FC 3578

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FC 4157: UREA_RVV_FUNC_RESPONSE_ERR

Aftertreatment Diesel Exhaust Fluid Return Valve - Mechanical system not responding or out of adjustment
System Error number: 6955

FC 3577: UDD_FCV_HIGH_ERR

Aftertreatment Diesel Exhaust Fluid Return Valve - Voltage above normal, or shorted to high source
System Error number: 6098

FC 3578: UDD_FCV_LOW_ERR

Aftertreatment Diesel Exhaust Fluid Return Valve - Voltage below normal, or shorted to low source
System Error number: 6099

(usm_diag_lib.mdl\USD)

Not Responding:

V_AIM_prg_UreaPumpP	kPa	C_USD_bs_USMSys1_FCV_Mask	HEX
V_UDD_tm_FCV_HighErr	s	C_USD_FCV_Diag_Enbl	None
V_UDD_tm_FCV_LowErr	s	C_USD_pc_FCVDiag_PumpCmd_Min	%
V_USD_FCVStkOFF_FaultFlag	None	C_USD_prg_FCVDiag_MinPress_Enbl	kPa
V_USD_prg_FCVStkOFF_PressDiff	kPa	C_USD_tm_FCVStkOFF_PressChngTm	s
C_USD_bs_USMSys_FCV_Mask	HEX	C_USM_prg_FCVStkOFF_PressDiff	kPa
V_AIM_prg_UreaPumpP	kPa	V_USD_prg_UDFM_Press_Change	kPa
V_USD_prg_UDFM_PumpP	kPa	C_USD_prg_UDFM_Min_PressDrop	kPa

Voltage High / Low:

O_USM_FCV_Cmd_Enbl	None	V_UDD_tm_FCV_HighErr	s
O_USM_FCV_Cmd_Val	None	V_UDD_tm_FCV_LowErr	s
V_ATD_bs_PFS_SysIO_Errs	HEX	C_UDD_tm_FCV_FaultSetThd	s
V_ATD_bs_PFS_SysIO_Update	HEX		

(Click here for parameter list in Excel)

Related Codes / Sections:

DEF Line Heaters - FC 3237, FC 3238, FC 3239, FC 3241, FC 3258, FC 3261, FC 3422, FC 3423, FC 3425

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FC 3237: UREA_LINEHTR1_HIGHSIDE_STG_ERR

Aftertreatment 1 Diesel Exhaust Fluid Line Heater 1 Circuit - Voltage above normal, or shorted to high source
System Error number: 7814

FC 3238: UREA_LINEHTR1_HIGHSIDE_STB_ERR
Aftertreatment 1 Diesel Exhaust Fluid Line Heater 1 Circuit - Voltage below normal, or shorted to low source
System Error number: 7815

FC 3239: UREA_LINEHTR2_HIGHSIDE_STG_ERR
Aftertreatment 1 Diesel Exhaust Fluid Line Heater 2 Circuit - Voltage above normal, or shorted to high source
System Error number: 7819

FC 3241: UREA_LINEHTR2_HIGHSIDE_STB_ERR
Aftertreatment 1 Diesel Exhaust Fluid Line Heater 2 Circuit - Voltage below normal, or shorted to low source
System Error number: 7820

FC 3258: UREA_LINEHTR1_LOWSIDE_OL_ERR
Aftertreatment 1 Diesel Exhaust Fluid Line Heater 1 Circuit - Current below normal or open circuit
System Error number: 7816

FC 3258: UREA_LINEHTR1_HIGHSIDE_OL_ERR
Aftertreatment 1 Diesel Exhaust Fluid Line Heater 1 Circuit - Current below normal or open circuit
System Error number: 7813

FC 3261: UREA_LINEHTR2_HIGHSIDE_OL_ERR
Aftertreatment 1 Diesel Exhaust Fluid Line Heater 2 Circuit - Current below normal or open circuit
System Error number: 7818

FC 3261: UREA_LINEHTR2_LOWSIDE_OL_ERR
Aftertreatment 1 Diesel Exhaust Fluid Line Heater 2 Circuit - Current below normal or open circuit
System Error number: 7821

FC 3422: UREA_LINEHTR3_HIGHSIDE_STG_ERR
Aftertreatment Diesel Exhaust Fluid Line Heater 3 Circuit - Voltage above normal, or shorted to high source
System Error number: 7823

FC 3423: UREA_LINEHTR3_HIGHSIDE_STB_ERR
Aftertreatment Diesel Exhaust Fluid Line Heater 3 Circuit - Voltage below normal, or shorted to low source
System Error number: 7824

FC 3425: UREA_LINEHTR3_LOWSIDE_OL_ERR
Aftertreatment Diesel Exhaust Fluid Line Heater 3 Circuit - Current below normal or open circuit
System Error number: 7825

FC 3425: UREA_LINEHTR3_HIGHSIDE_OL_ERR
Aftertreatment Diesel Exhaust Fluid Line Heater 3 Circuit - Current below normal or open circuit
System Error number: 7822

(csdd_dsm_utm.mdl\Svc_linehtr_diag)

V_AIM_ev_LineHtr_EV1	V	C_UTM_tm_LineHtr1_ErrSetThd	s
V_AIM_ev_LineHtr_EV2	V	C_UTM_tm_LineHtr2_ErrSetThd	s
V_AIM_ev_LineHtr_EV3	V	C_UTM_tm_LineHtr3_ErrSetThd	s
V_AIM_ec_LineHtrIMON	A	C_UTM_ev_LineHtr_HiThd	V
V_UTDD_UreaLineHeater1_Cmd	None	C_UTM_bs_Sys1_StartUp_Mask	HEX

V_UTM_bs_Sys1_Errs	HEX	T_AIM_LineHtr_EV1_RLOC	None
V_UTC_LineHtr1_State	None	T_AIM_LineHtr_EV2_RLOC	None
V_UTC_LineHtr2_State	None	T_AIM_LineHtr_EV3_RLOC	None
V_UTC_LineHtr3_State	None	T_AIM_LineHtrIMON_RLOC	None

(Click here for parameter list in Excel)

Related Codes / Sections:

DEF Line Heater Relay - FC 3562, FC 3563

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FC 3562: UTDD_LINEHTR1_HIGH_ERR
Aftertreatment Diesel Exhaust Fluid Line Heater Relay - Voltage above normal, or shorted to high source
System Error number: 6100

FC 3563: UTDD_LINEHTR1_LOW_ERR
Aftertreatment Diesel Exhaust Fluid Line Heater Relay - Voltage below normal, or shorted to low source
System Error number: 6101

(csdd_ats_udd.mdl\Svc_utdd_heating_diag\Diagnostics\LineHtr1Diag\LineHtr1Err)

C_UTDD_tm_LineHtr1_FaultSetThd	s	V_UTDD_UreaLineHeater1_Cmd	None
C_UTC_LineHeater1HSD_Enbl	None	O_UTC_LineHeater1_Enbl	None
T_UTC_FT_LineHeater1PWM_Enbl	None	O_UTC_LineHeater1_Val	%
V_UTDD_tm_LineHtr1_HighErr	s	ECM_Active_Error_Index[11]	None
V_UTDD_tm_LineHtr1_LowErr	s	OBD_Pending_ErrorIndex[16]	None
V_ATP_KeySwitch	None		

(Click here for parameter list in Excel)

Related Codes / Sections:

DEF Supply Module Temperature - FC 2976

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Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Temperature - Data erratic, intermittent or incorrect

UREASUPPT1_INVALID_DC_ERR
System Error number: 6963

UREASUPPT1_INVALID_SYNC_ERR
System Error number: 6962

UREASUPPT2_INVALID_DC_ERR
System Error number: 6965

UREASUPPT2_INVALID_SYNC_ERR
System Error number: 6964

UREASUPP_TMPTR_TIMEOUT_ERR
System Error number: 6557

UREASUPPT1_SENS_ERR
System Error number: 6960

UREASUPPT2_SENS_ERR
System Error number: 6961

(usm_diag_lib.mdl\USD\SMTmptrDiag)

Coolant_Temperature	Deg_C	V_AIM_UreaSuppT_ReadRqst	None
Charge_Tmptr	Deg_C	V_AIM_ct_UreaSuppT1_InvalidSync	counts
V_USD_trc_SuppT1_CoolantT_Diff	Deg_C	V_AIM_ct_UreaSuppT1_InvalidDC	counts
V_USD_trc_SuppT1_ChrgT_Diff	Deg_C	V_AIM_ct_UreaSuppT2_InvalidSync	counts
V_USD_trc_SuppT2_CoolantT_Diff	Deg_C	V_AIM_ct_UreaSuppT2_InvalidDC	counts
V_USD_trc_SuppT2_ChrgT_Diff	Deg_C	V_AIM_UreaSuppT_ProcState	None
V_USD_UreaSuppT1_Rat_State	None	V_AIM_pc_UreaSuppT1_Sync	%
V_USD_UreaSuppT2_Rat_State	None	V_AIM_pc_UreaSuppT1_DC	%
V_AIM_tm_ModuleOffTime	s	V_AIM_pc_UreaSuppT2_Sync	%
V_AIM_trc_Coolant_Status	None	V_AIM_pc_UreaSuppT2_DC	%
V_RDM_trc_InitialChargeTmptr	Deg_C	V_AIM_ct_UreaSuppT1_TSF	counts
V_RDM_trc_InitialCoolantTmptr	Deg_C	V_AIM_ct_UreaSuppT2_TSF	counts
V_UID_ColdSoakRdy	None	V_AIM_UreaSuppT_DetStatus	None
V_AIM_UreaSuppT_IsAvail	None	V_AIM_UreaSuppT1_SensErr	None
V_USD_tm_UreaSuppT1StuckHeating	s	V_AIM_UreaSuppT2_SensErr	None
V_USD_tm_UreaSuppT2StuckHeating	s	V_USM_bs_Sys_Errs	HEX
V_USD_trc_T1Raised	Deg_C	V_UID_ColdSoak	None
V_USD_trc_T2Raised	Deg_C	V_AIM_BlockHeater_Mon_State	None
V_USD_UreaSuppT1_SIR_State	None	V_AIM_BlockHeater_State	None
V_USD_UreaSuppT2_SIR_State	None	V_AIM_trc_UreaSuppT1	Deg_C
V_USM_pc_HtrCmd	%	V_AIM_trc_UreaSuppT2	Deg_C

(Click here for parameter list in Excel)

Related Codes / Sections:

DPF Closed Loop Error - FC 3396

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DPF_CLOSED_LOOP_ERR
Diesel Particulate Filter 1 Conditions Not Met for Active Regeneration - Condition Exists
System Error number: 7455
(atm_pfs_atd_lib.mdl\ATD\Diagnostics\FCPL)

Ambient_Air_Press	kPa	V_AIM_trc_DOC_Out	Deg_C
Ambient_Air_Tmptr	Deg_C	V_ATD_FCPL_Abort	s
C_ATD_tm_FCPL_Abort	s	V_ATD_FCPL_Enable	None
C_ATD_tm_FCPL_OperMode	s	V_ATD_FCPL_Pause	None
C_ATD_tm_FCPL_Pause	s	V_ATD_FCPL_Result	None
C_ATD_trc_FCPL_BedHiThd	Deg_C	V_ATD_FCPL_State	None
C_ATD_trc_FCPL_BedLoThd	Deg_C	V_ATD_FCPL_Tmptr_Fail	None
Engine_Is_Running	None	V_ATD_tm_FCPL_Mode	s
Engine_Is_Warm	None	V_ATP_mgPerStk_TorqueFuel	mg/stroke
Engine_Speed	RPM	V_ATP_vr_Engine_Speed	RPM
Key_Switch	None	V_OCP_trc_Tmptr_Tbl_In	Deg_C
Net_Engine_Torque	N_m	Vehicle_Speed	km/hr
V_AIM_trc_DOC_In	Deg_C		

(Click here for parameter list in Excel)

Related Codes / Sections:

DPF Destroyed - FC 3245

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DPF_DESTROYED_ERR
Aftertreatment 1 Diesel Particulate Filter System - Mechanical system not responding or out of adjustment
System Error number: 3552
(sfm_sfd_lib.mdl\SFD\DPFdestroyed)

V_ATP_trc_DPF_Out	Deg_C	V_SFD_tm_DPF_OutT_Destroyed	s
Engine_Speed	RPM	V_SFD_DPF_OutT_Destroyed_Flag	None
C_SFD_trc_DPF_Out_Destroy_HiThd	Deg_C	V_SFD_DPF_OutT_Destroyed_Latch	None
C_SFD_trc_DPF_Out_Destroy_LoThd	Deg_C		

(Click here for parameter list in Excel)

Related Codes / Sections:

DPF Delta P Pressure Rationality – FC1879, FC1881, FC1883, FC1981

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FC1879: DPF_DELTAP_OOR_HI_ERR
Aftertreatment Diesel Particulate Filter Differential Pressure Sensor Circuit - Voltage above normal, or shorted to high source
System error number: 2849

FC1881: DPF_DELTAP_OOR_LO_ERR
Aftertreatment Diesel Particulate Filter Differential Pressure Sensor Circuit - Voltage below normal, or shorted to low source
System error number: 2857

FC1883: DPF_DELTAP_DITHER_ERR
Aftertreatment Diesel Particulate Filter Differential Pressure Sensor - Data erratic, intermittent or incorrect
System error number:2851

FC 1883: DPF_DELTAP_KEYON_ERR
Aftertreatment Diesel Particulate Filter Differential Pressure Sensor - Data erratic, intermittent or incorrect
System error number: 2847

FC 1981: DPF_DELTAP_HIGH_ERR
Aftertreatment 1 Diesel Particulate Filter System - Data Valid But Above Normal Operating Range - Least Severe Level
System error number: 2085

V_AIM_prg_DPF_OutP	[kPa_G]	V_ATD_DPF_dP_Keyon_Enbl_Met	None
Engine_Speed	RPM	V_ATD_DPF_dP_Keyon_Error	None
H_SFD_DeltaP_High_Flag	None	V_ATD_DPF_dP_Keyon_State	None
H_SFD_fv_DPF_Filtered	m3/s	V_ATD_DPF_PTD_DecisionMade	None
H_SFD_tm_DeltaP_High	s	V_ATD_DPF_PTD_Enbl	None
O_AIM_pr_DPF_DeltaP_FiltReset	None	V_ATD_DPF_PTD_Error	None
O_AIM_pr_DPF_DeltaP_FiltReset	[NONE]	V_ATD_DPF_PTD_OBDState	None
O_AIM_pr_HC_DoserP_FiltReset	[NONE]	V_ATD_fv_DPF_PTD_Rng	m3/s
O_AIM_prg_DPF_OutP_FiltReset	[NONE]	V_ATD_pr_DPF_dP_KeyonLog	kPa
T_ATD_DPF_dP_Keyon_Enable	None	V_ATD_prg_DPF_PTD_Rng	kPa_G
T_ATD_DPF_PTD_Enbl	None	V_ATD_prg_DPF_PTD_RngLog	kPa_G
T_SFD_DPFdP_SIR_Enbl	None	V_ATD_PSR_Startup_Complete	None
V_AIM_ct_DPF_DeltaP	counts	V_ATP_Engine_Running	None
V_AIM_ct_DPF_DeltaP_Raw	counts	V_ATP_fv_DPF_OutP	m3/s
V_AIM_ct_DPF_OutP		V_SFD_DPFdP_SIR_Decision	None

V_AIM_ct_DPF_OutP_Raw	[counts]	V_SFD_DPFdP_SIR_Enbl	None
V_AIM_ct_HC_DoserP		V_SFD_DPFdP_SIR_Error	None
V_AIM_ct_HC_DoserP_Raw	[counts]	V_SFD_DPFdP_SIR_OBDState	None
V_AIM_ev_DPF_DeltaP	V	V_SFD_fv_DPF_HighLog	m3/s
V_AIM_ev_DPF_OutP		V_SFD_fv_DPFdP_SIR_Rng	m3/s
V_AIM_ev_HC_DoserP		V_SFD_pr_Delta_HighLog	kPa
V_AIM_pr_DPF_DeltaP	kPa	V_SFD_pr_DPFdP_SIR_Rng	kPa
V_AIM_pr_DPF_DeltaP_Status	None	V_SFD_pr_DPFdP_SIR_RngLog	kPa
V_AIM_pr_HC_DoserP	[kPa]	V_SFP_DeltaPSaturated	None
V_AIM_pr_HC_DoserP_Status	[NONE]	V_SFP_fv_DPF	m3/s
V_AIM_prg_DPF_OutP	kPa_G	V_SFP_GreenFilter	None
V_AIM_prg_DPF_OutP_Status	None	V_SFP_pr_Delta	kPa
V_ATD_bs_PFS_SysIO_Errs	HEX	V_SFP_pr_Delta_Clean	kPa
V_ATD_bs_PFS_SysIO_Update	[HEX]	V_SFP_pr_Delta_High	kPa

(Click here for parameter list in Excel)

DPF Outlet Pressure Sensor Rationality – FC 3133, FC 3134, FC 3135

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FC 3133: DPF_OUTP_OOR_HI_ERR
Aftertreatment 1 Diesel Particulate Filter Outlet Pressure Sensor Circuit - Voltage above normal, or shorted to high source
System error number: 2882

FC 3134: DPF_OUTP_OOR_LO_ERR
Aftertreatment 1 Diesel Particulate Filter Outlet Pressure Sensor Circuit - Voltage below normal, or shorted to low source
System error number:2883

FC 3135: DPF_OUTP_KEYOFF_ERR
Aftertreatment 1 Diesel Particulate Filter Outlet Pressure - Data erratic, intermittent or incorrect
System error number:7317

FC 3135: DPF_OUTP_DITHER_ERR
Aftertreatment 1 Diesel Particulate Filter Outlet Pressure - Data erratic, intermittent or incorrect
System error number: 2983

FC 3135: DPF_OUTP_KEYON_ERR
Aftertreatment 1 Diesel Particulate Filter Outlet Pressure - Data erratic, intermittent or incorrect
System error number: 2984

FC 3135: DPF_OUTP_HIGH_ERR
Aftertreatment 1 Diesel Particulate Filter Outlet Pressure - Data erratic, intermittent or incorrect
System error number: 3284

O_AIM_prg_DPF_OutP_FiltReset	[NONE]	V_ATD_DPF_OutP_Keyon_Error	None
O_ATD_DPFOutP_HiFlagReset	[NONE]	V_ATD_DPF_OutP_Keyon_State	None
T_AIM_DPF_OutP_RLOC	None	V_ATD_DPFOutP_HiFlag	[NONE]
T_AIM_DPF_OutP_SupplyRLOC	None	V_ATD_DPFOutP_High_OBDState	[NONE]
T_ATD_DPF_OutP_Keyon_Enable	None	V_ATD_DPFOutP_SIR_Decision	None
T_ATD_DPFOutP_SIR_Enbl	None	V_ATD_DPFOutP_SIR_Enbl	None
T_PFS_Enbl	None	V_ATD_DPFOutP_SIR_Error	None
V_AIM_ct_DPF_OutP	[counts]	V_ATD_DPFOutP_SIR_OBDState	None
V_AIM_ct_DPF_OutP_Raw	[counts]	V_ATD_fv_DPF_OutP_Filtered	[m3/s]
V_AIM_ev_DPF_OutP	[V]	V_ATD_fv_DPFOutP_HighLog	[m3/s]
V_AIM_pr_DPF_DeltaP	[kPa]	V_ATD_fv_DPFOutP_SIR_Rng	m3/s
V_AIM_pr_DPF_DeltaP_Status	[NONE]	V_ATD_pr_DPF_dP_KeyonLog	[kPa]
V_AIM_prg_DPF_OutP	kPa_G	V_ATD_prg_DPF_OutP_KeyonLog	kPa_G
V_AIM_prg_DPF_OutP_Status	[NONE]	V_ATD_prg_DPFOutP_HighLog	[kPa_G]

V_AIM_prg_DPF_OutP_Status	None	V_ATD_prg_DPFOutP_SIR_Rng	kPa_G
V_AIM_prg_DPF_OutP_Status	None	V_ATD_prg_DPFOutP_SIR_RngLog	kPa_G
V_ATD_bs_PFS_EngOut_Status	[HEX]	V_ATD_PSR_Startup_Complete	[NONE]
V_ATD_bs_PFS_SysIO_Errs	[HEX]	V_ATD_tm_DPFOutP_Hi	[s]
V_ATD_bs_PFS_SysIO_Update	[HEX]	V_ATP_EngineState	[NONE]
V_ATD_DPF_dP_Keyon_Enbl_Met	[NONE]	V_ATP_fv_DPF_OutP	[m3/s]
V_ATD_DPF_dP_Keyon_Error	[NONE]	V_ATP_prg_DPF_OutP_Filtered	[kPa_G]
V_ATD_DPF_dP_Keyon_State	[NONE]	V_ATP_vr_Engine_Speed	[RPM]
V_ATD_DPF_OutP_Keyon_Enbl_Met	None		

(Click here for parameter list in Excel)

DPF OverTemp – FC 3311, FC 3312, FC 3251, FC3254, FC3255, FC3256

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FC 3251: DOC_IN_NR_SEVERE_TMPTR_ERR
Aftertreatment 1 Diesel Oxidation Catalyst Intake Temperature - Data Valid But Above Normal Operating Range - Moderately Severe Level
System error number: 3068

FC 3254: DOC_OUT_OVERTEMP_ERR
Aftertreatment 1 Diesel Particulate Filter Intake Temperature - Data Valid But Above Normal Operating Range - Least Severe Leve
System error number: 1759

FC 3255: DPF_DELTA_NR_SEVERE_TMPTR_ERR
Aftertreatment 1 Diesel Particulate Filter Outlet Temperature - Data Valid But Above Normal Operating Range - Moderately Severe Level
System error number: 3072

FC 3255: DPF_OUT_NR_SEVERE_TMPTR_ERR
Aftertreatment 1 Diesel Particulate Filter Outlet Temperature - Data Valid But Above Normal Operating Range - Moderately Severe Level
System error number: 3071

FC 3256: DPF_OUT_OVERTEMP_ERR
Aftertreatment 1 Diesel Particulate Filter Outlet Temperature - Data Valid But Above Normal Operating Range - Least Severe Level
System error number: 1754

FC 3311: DOC_SEVERE_TMPTR_LATCHED_ERR
Aftertreatment 1 Diesel Particulate Filter Intake Temperature - Data valid but above normal operational range - Most Severe Level
System error number: 3591

FC 3312: DPF_SEVERE_TMPTR_LATCHED_ERR
Aftertreatment 1 Diesel Particulate Filter Outlet Temperature - Data valid but above normal operational range - Most Severe Level
System error number: 3592

DOC Out High		**DOC Severe**	
P_ATD_ct_DOCOut_HiTmptr_Persist	counts	V_ATP_trc_DOC_In	Deg_C
P_ATD_ct_DOCOut_HiTmptr_Persist	counts	V_ATP_trc_DOC_Out	Deg_C
V_ATD_bs_PFS_Sensor_Status	HEX	P_ATD_tm_NR_DOC_Hi_Delay	s
V_ATD_DOC_Out_HiTmptr_Flag	None	V_AIM_trc_DOC_Out_Status	None
V_ATD_DOC_Out_Persist_Fault	None	V_AIM_trc_DOC_In_Status	None
V_ATD_Regen_End	None	V_ATD_tm_NR_DOC_Out_Hi	s
V_ATD_tm_DOC_Out_HiTmptr	s	V_ATD_tm_NR_DOC_Delta_Hi	s
V_ATM_OBD_Data_Reset	None	V_ATD_NR_Overtemp_DOC_Enbl	None

V_ATP_trc_DOC_Out	Deg_C	V_ATD_NR_OT_DOC_Delta_Enbl	None
DPF Out High		**DPF Severe**	
P_ATD_ct_DPFOut_HiTmptr_Persist	counts	V_ATP_trc_DOC_Out	Deg_C
V_ATD_bs_PFS_Sensor_Status	HEX	V_ATP_trc_DPF_Out	Deg_C
V_ATD_DPF_Out_HiTmptr_Flag	None	P_ATD_tm_NR_DPF_Hi_Delay	s
V_ATD_DPF_Out_Persist_Fault	None	V_AIM_trc_DPF_Out_Status	None
V_ATD_Regen_End	None	V_AIM_trc_DOC_Out_Status	None
V_ATD_tm_DPF_Out_HiTmptr	s	V_ATD_tm_NR_DPF_Out_Hi	s
V_ATM_OBD_Data_Reset	None	V_ATD_tm_NR_DPF_Delta_Hi	s
V_ATP_trc_DPF_Out	Deg_C	V_ATD_NR_Overtemp_DPF_Enbl	None
		V_ATD_NR_OT_DPF_Delta_Enbl	None

(Click here for parameter list in Excel)

DPF Temperature Sensor Rationality – FC 3313, FC 3314, FC 3315, FC3316, FC3317, FC3318, FC3319, FC3321, FC3322

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FC 3313
Aftertreatment 1 Diesel Oxidation Catalyst Intake Temperature Sensor Circuit - Voltage below normal, or shorted to low source
System error names: **DOC_IN_OOR_LO_ERR, EGTS_DOC_IN_OOR_LO_ERR**
System error number: 6730

FC 3314
Aftertreatment 1 Diesel Oxidation Catalyst Intake Temperature Sensor Circuit - Voltage above normal, or shorted to high source
System error names: **EGTS_DOC_IN_OOR_HI_ERR, EGTS_PFS_TC1_ASIC_ERR, DOC_IN_OOR_HI_ERR**
System error numbers: 6729, 6735

FC 3315: DOC_IN_IR_DELTAT_ERR
Aftertreatment 1 Diesel Oxidation Catalyst Intake Temperature - Data erratic, intermittent or incorrect
System error numbers: 2858

FC 3316
Aftertreatment 1 Diesel Particulate Filter Intake Temperature Sensor Circuit - Voltage below normal, or shorted to low source
System error names: **DOC_OUT_OOR_LO_ERR, EGTS_DOC_OUT_OOR_LO_ERR**
System error number: 6732

FC 3317
Aftertreatment 1 Diesel Particulate Filter Intake Temperature Sensor Circuit - Voltage above normal, or shorted to high source
System error names: **EGTS_PFS_TC2_ASIC_ERR, EGTS_DOC_OUT_OOR_HI_ERR, DOC_OUT_OOR_HI_ERR**
System error numbers: 6736, 6731

FC 3318: DOC_OUT_IR_DELTAT_ERR
Aftertreatment 1 Diesel Particulate Filter Intake Temperature - Data erratic, intermittent or incorrect
System error number: 2844

FC 3319
Aftertreatment 1 Diesel Particulate Filter Outlet Temperature Sensor Circuit - Voltage above normal, or shorted to high source

System error names: **EGTS_PFS_TC3_ASIC_ERR, DPF_OUT_OOR_HI_ERR, EGTS_DPF_OUT_OOR_HI_ERR**
System error numbers: 6737, 6733

FC 3321
Aftertreatment 1 Diesel Particulate Filter Outlet Temperature Sensor Circuit - Voltage below normal, or shorted to low source
System error names: **DPF_OUT_OOR_LO_ERR, EGTS_DPF_OUT_OOR_LO_ERR**
System error numbers: 6734

FC 3322: DPF_OUT_IR_DELTAT_ERR
Aftertreatment 1 Diesel Particulate Filter Outlet Temperature - Data erratic, intermittent or incorrect
System error number: 2852

O_AIM_trc_DOC_In_Enable	None	V_ATD_DeltaT_Allow_Average	None
O_AIM_trc_DOC_Out_Enable	None	V_ATD_DeltaT_Buffer_Filled	None
O_ATD_SystemCheck_Ok	None	V_ATD_DeltaT_Buffer_Reset	None
V_AIM_EGTS_PFS_TC1_FMI	None	V_ATD_DeltaT_DOC_High	None
V_AIM_EGTS_PFS_TC1_Tmptr_Status	None	V_ATD_DeltaT_DOC_Low	None
V_AIM_EGTS_PFS_TC2_FMI	None	V_ATD_DeltaT_DPF_High	None
V_AIM_EGTS_PFS_TC2_Tmptr_Status	None	V_ATD_DeltaT_DPF_Low	None
V_AIM_EGTS_PFS_TC3_FMI	None	V_ATD_DeltaT_State	None
V_AIM_EGTS_PFS_TC3_Tmptr_Status	None	V_ATD_trc_DeltaT_DOC_Average	Deg_C
V_AIM_PFS_OBD_CtrlPathOwner	None	V_ATD_trc_DeltaT_DPF_Average	Deg_C
V_AIM_trc_DOC_In	Deg_C	V_ATM_Exhaust_Data_To_PFS[1]	None
V_AIM_trc_DOC_In_Status	None	V_ATM_fg_HC_Fdbk_Total	g/sec
V_AIM_trc_DPF_Out	Deg_C	V_ATP_Engine_Running	None
V_AIM_trc_EGTS_PFS_TC1	Deg_C	V_EGTS_tm_DOC_In_OORH	s
V_AIM_trc_EGTS_PFS_TC2	Deg_C	V_EGTS_tm_DOC_In_OORL	s
V_ATD_bs_PFS_EngOut_Status	HEX	V_EGTS_tm_DOC_Out_OORH	s
V_ATD_bs_PFS_SysIO_Enbled	HEX	V_EGTS_tm_DOC_Out_OORL	s
V_ATD_bs_PFS_SysIO_Errs	HEX	V_EGTS_tm_DPF_Out_OORH	s
V_ATD_bs_SCR_SysPerf_Errs	HEX	V_EGTS_tm_DPF_Out_OORL	s

(Click here for parameter list in Excel)

DPF Filtration – FC 3168

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DPF_FILTRATION_EFF_ERR
Aftertreatment 1 Diesel Particulate Filter System - Data Valid But Above Normal Operating Range - Moderately Severe Level
System error number: 4758

P_SFD_ct_DPFEff_N_Vec[0]	counts	V_ATM_PFS_Error_Indices[0]	None
P_SFD_DPFEff_R_Vec[0]	None	V_ATP_Exhaust_Data_To_SFM[0]	None
P_SFD_DPFEffEnblLatch	None	V_ATP_pr_Ambient_Air	kPa
P_SFD_fv_DPFEff_F_Vec[0]	m3/s	V_SFD_DPFEff_FRmean	None
P_SFD_tm_DPFEff_FlowOK	s	V_SFD_DPFEff_FRMeanRaw	None
P_SFD_tm_DPFEffRes_SinceEnbl	s	V_SFD_DPFEff_Intercept	None
P_SFD_tm_DPFEffRes_SinceRegen	s	V_SFD_DPFEff_Ravg[0]	None
P_SFR_Regen_Trigger_State	None	V_SFD_DPFEff_Slope	None
T_SFD_DPFEff_Enbl	None	V_SFD_DPFEffResultDecision	None
V_ATD_bs_PFS_EngOut_Status	HEX	V_SFD_DPFEffResultUpdate	None
V_ATD_bs_PFS_Sensor_Status	HEX	V_SFD_DPFEffResultValid	None
V_ATD_bs_PFS_SysIO_Enbled	HEX	V_SFD_DpfEffState	None
V_ATD_bs_PFS_SysIO_Errs	HEX	V_SFD_fv_DPFEff_Favg[0]	m3/s
V_ATD_bs_PFS_SysIO_Update	HEX	V_SFP_fv_DPF	m3/s
V_ATD_bs_PFS_SysPerf1_Errs	HEX	V_SFP_GreenFilter	None
V_ATD_bs_PFS_SysPerf2_Errs	HEX	V_SFP_pr_Delta	kPa

(Click here for parameter list in Excel)

DPF and SCR Circuit Continuity – FC 4158, FC 4159

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FC 4158
Related System Errors: EGTS_PFS_CJ_OPEN_CKT_ERR, EGTS_PFS_CJ_SHORT_CKT_ERR, EGTS_PFS_CJ_PLAUSIBLE_ERR
Aftertreatment Diesel Particulate Filter Temperature Sensor Module - Bad intelligent device or component
System Error numbers: 6722, 6721, 6724
(csdd_atm_pfs.mdl)

FC 4159
Related System Errors: EGTS_SCR_CJ_OPEN_CKT_ERR, EGTS_SCR_CJ_SHORT_CKT_ERR, EGTS_SCR_CJ_PLAUSIBLE_ERR
Aftertreatment Selective Catalytic Reduction Temperature Sensor Module - Bad intelligent device or component
System Error numbers: 6753, 6752, 6755
(csdd_atm_scr.mdl)

C_EGTS_PFS_tm_CJ_Short_Ckt_Dur	s	V_AIM_EGTS_PFS_CJ_FMI	None
C_EGTS_PFS_tm_CJ_Open_Ckt_Dur	s	V_EGTS_tm_PFS_CJ_Open_Ckt	s
C_EGTS_PFS_tm_CJ_Plausible_Dur	s	V_EGTS_tm_PFS_CJ_Short_Ckt	s
C_EGTS_SCR_tm_CJ_Short_Ckt_Dur	s	V_AIM_trc_EGTS_PFS_CJ	Deg_C
C_EGTS_SCR_tm_CJ_Open_Ckt_Dur	s	V_AIM_trc_EGTS_PFS_ECU	Deg_C
C_EGTS_SCR_tm_CJ_Plausible_Dur	s	V_EGTS_tm_PFS_CJ_Plausible	s

(Click here for parameter list in Excel)

Related Codes / Sections:

SCR Outlet Temperature Sensor Rationality – FC 3146, FC 3147, FC 3148

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FC 3146
Aftertreatment 1 SCR Outlet Temperature Sensor Circuit - Voltage above normal, or shorted to high source
System Errors: **EGTS_SCR_OUT_OOR_HI_ERR, SCR_OUT_OOR_HI_ERR, EGTS_SCR_TC2_ASIC_ERR**
System error numbers: 6762, 2892, 6765

FC 3147
Aftertreatment 1 SCR Outlet Temperature Sensor Circuit - Voltage below normal, or shorted to low source
System Errors: **SCR_OUT_OOR_LO_ERR, EGTS_SCR_OUT_OOR_LO_ERR**
System error numbers: 2893, 6763

FC 3148: SCR_OUT_IR_DELTAT_ERR
Aftertreatment 1 SCR Outlet Temperature Sensor - Data erratic, intermittent or incorrect
System error number: 3785

O_AIM_trc_SCR_T1_Enable	NONE	V_ATD_mg_SCR_In_IR_Stuck_HcInt	g
H_HIM_fg_Dosing_Cmd	g/sec	V_ATD_SCR_In_IR_Stuck_State	None
O_AIM_trc_SCR_Out_Enable	NONE	V_ATD_SCR_TSR_Abort	None
V_AIM_EGTS_SCR_TC1_FMI	NONE	V_ATD_SCR_TSR_Allow	None
V_AIM_EGTS_SCR_TC1_Tmptr_Status	NONE	V_ATD_SCR_TSR_Buffer_Filled	None
V_AIM_EGTS_SCR_TC2_FMI	NONE	V_ATD_SCR_TSR_State	None
V_AIM_EGTS_SCR_TC2_Tmptr_Status	NONE	V_ATD_trc_SCR_DeltaT_PipeAvg	Deg_C
V_AIM_OBD_CtrlPathOwner	None	V_ATD_trc_SCR_DeltaT_ScrAvg	Deg_C

V_AIM_trc_DPF_Out	Deg_C	V_ATD_trc_SCR_In_IR_Stuck_Rng	Deg_C
V_AIM_trc_EGTS_SCR_TC1	Deg_C	V_ATD_trc_SCR_Out_IR_Stuck_Rng	Deg_C
V_AIM_trc_EGTS_SCR_TC2	Deg_C	V_ATM_Exhaust_Data_To_SCR	None
V_AIM_trc_SCR_In	Deg_C	V_ATM_Exhaust_Status_To_SCR	None
V_AIM_trc_SCR_Out	Deg_C	V_ATM_PFS_Error_Indices	None
V_AIM_trc_SCR_Out_Status	NONE	V_ATP_Exhaust_Data_To_SCM	None
V_AIM_trc_SCR_T1	Deg_C	V_ATP_fg_Turbo_Out	g/sec
V_AIM_trc_SCR_T1_Status	NONE	V_ATP_vr_Engine_Speed	RPM
V_ATD_bs_PFS_SysIO_Enbled	HEX	V_EGTS_tm_SCR_Out_OORH	counts
V_ATD_bs_PFS_SysIO_Errs	HEX	V_EGTS_tm_SCR_Out_OORL	counts
V_ATD_bs_PFS_SysIO_Update	HEX	V_EGTS_tm_SCR_T1_OORH	counts
V_ATD_bs_SCR_ExtInput_Status	HEX	V_EGTS_tm_SCR_T1_OORL	counts

(Click here for parameter list in Excel)

SCR Out Overtemp – FC 3165, FC 3235

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FC 3165: SCR_OUT_SEVERE_TMPTR_ERR
Aftertreatment 1 SCR Outlet Temperature - Data valid but above normal operational range - Most Severe Level
System error number: 5293

FC 3165: SCR_CAT_SEVERE_TMPTR_ERR
Aftertreatment 1 SCR Outlet Temperature - Data valid but above normal operational range - Most Severe Level
System error number: 2889

FC 3235: SCR_OUT_NR_SEVERE_TMPTR_ERR
Aftertreatment 1 SCR Outlet Temperature - Data Valid But Above Normal Operating Range - Moderately Severe Level
System error number: 5295

T_ATD_SCR_OT_ShutDwnDiagEnbl	None	P_ATD_tm_NR_SCR_In_Hi_Delay	s
V_ATP_trc_SCR_T1	Deg_C	V_ATD_NR_OT_SCR_In_Enbl	None
V_ATD_SCR_In_Severe_Fault	None	V_ATD_tm_NR_SCR_In_Hi	s
V_ATD_SCR_In_Severe_Condition	None	V_ATD_NR_SCR_In_HiTmptr_Flag	None
V_ATD_tm_SCR_In_Severe_Tmptr	s	V_ATD_tm_NR_SCR_Out_Hi	s
V_ATP_trc_SCR_Out	Deg_C	V_ATD_NR_SCR_Out_HiTmptr_Flag	None
V_ATD_SCR_Out_Severe_Fault	None	V_ATD_SCR_pw_Cat	kW
V_ATD_SCR_Out_Severe_Condition	None	V_ATP_trc_SCR_In_Status	None
V_ATD_tm_SCR_Out_Severe_Tmptr	s	V_ATP_trc_SCR_Out_Status	None
V_ATP_Engine_Running	None	V_ATD_bs_SCR_SysIO1_Errs	HEX
P_ATD_tm_NR_SCR_Out_Hi_Delay	s	V_ATD_SCR_Delta_OverTmptr	None
V_ATD_NR_OT_SCR_Out_Enbl	None		

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SCR In Overtemp - FC 4524, FC 4525

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FC 4524: SCR_IN_SEVERE_TMPTR_ERR
Aftertreatment 1 SCR Intermediate Gas Temperature - Data valid but above normal operational range - Most Severe Level
System Error number: 5292

FC 4525: SCR_IN_NR_SEVERE_TMPTR_ERR
Aftertreatment 1 SCR Intermediate Gas Temperature - Data Valid But Above Normal Operating Range - Moderately Severe Level

System Error number: 5294

(atm_scr_atd_lib.mdl\Diagnostic\OverTmptr\OverTmptr\Normal\SCRIn)

V_AIM_trc_SCR_T1_Status	None	C_ATD_bs_SCRInTmptrSens_Mask	HEX
V_ATD_SCR_In_Severe_Fault	None	C_ATD_SCR_NR_OT_SampleHold_Enbl	None
V_ATD_SCR_In_Severe_Condition	None	C_ATD_trc_NR_SCR_In_HiThd	Deg_C
V_ATD_tm_SCR_In_Severe_Tmptr	s	C_ATD_trc_NR_SCR_In_LoThd	Deg_C
V_ATP_trc_SCR_T1	Deg_C	C_ATD_tm_NR_SCR_In_HiTmptr	s
C_ATD_trc_SCR_In_Severe_HiThd	Deg_C	C_ATD_NR_SCR_In_Latch_Flag	None
C_ATD_trc_SCR_In_Severe_LoThd	Deg_C	C_ATD_SCR_fg_Min_HC_Fdbk	g/sec
C_ATD_tm_SCR_In_Severe_Tmptr	s	C_ATD_tm_NR_SCR_In_PwrDwnCheck	s
C_ATD_tm_NR_SCR_In_Hi_Delay	s	C_ATD_tm_NR_SCR_In_PwrUp	s

(Click here for parameter list in Excel)

Related Codes / Sections:

SCR Catalyst – FC 3151, FC 3582

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FC 3151: SCR_CATALYST_SYSTEM_MISSING_ERR

Aftertreatment 1 SCR Catalyst System Missing - Condition Exists
System error number: 5249

FC 3582: SCR_CAT_EFFICIENCY_DEGRADED_ERR

Aftertreatment SCR Catalyst Conversion Efficiency - Data Valid But Below Normal Operating Range - Moderately Severe Level
System error number: 4893

ECM_Run_Time	s	V_SCM_ppm_SCR_Out_NOx	ppm
Ambient_Air_Press	kPa	V_ATP_ppm_SCR_Out_NOx	ppm
Engine_Speed	RPM	V_ATP_tq_EngineTorque	N_m
J39_AFT_Intake_NOx	ppm	V_ATP_vr_Engine_Speed	RPM
J39_AFT_Outlet_NOx	ppm	V_ATR_fgh_TailpipeNOxTrgt	g/hr
Net_Engine_Torque	N_m	V_SCD_CE_ct_Epsilon_Count	counts
P_SCD_CE_Epsilon	None	V_SCD_CE_ct_NormEff_Count	counts
P_SCD_CE_Normalized_NOx_Eff	None	V_SCD_CE_fn_ANR	None
V_ATR_fgh_TailpipeNOxTrgt	g/hr	V_SCD_CE_Screening_Flag	None
V_ATP_mg_TotalFuelingPerStroke	mg/stroke	V_SCM_fg_MassFlow_In	g/sec
Total_Fueling	mg/stroke	V_SCM_pr_Press_In	kPa
V_ATP_fg_SCR_In_NOx_Status	None	V_SCM_trc_SCR_In	Deg_C
V_ATP_pr_Ambient_Air	kPa	V_SCM_trc_SCR_Out	Deg_C
V_ATP_ppm_SCR_Out_NOx_Status	None	V_SCP_fn_NO2NO_Split	None
V_SCM_fg_HC_In	g/sec	V_SCP_ppm_NO2_In	ppm
V_SCM_fg_NO2_In	g/sec	V_SCP_vs_SCR_Catalyst	1/sec
V_SCL_flm_UreaInjCmd	ml/sec	V_SCR_flm_UreaInjCmd	ml/sec
V_UIM_flm_EstUreaInjRate	ml/sec	V_SCR_ppm_NOx_In	ppm
V_SCM_fg_NOx_In	g/sec	V_UIM_bs_DiagStatus	HEX
V_AIM_trc_SCR_T1	Deg_C	V_UIM_flm_InjRateCmd	ml/sec
V_AIM_trc_SCR_T1_Status	None	V_SCD_FTIS_CatEff_Reset	None
V_AIM_trc_SCR_Out	Deg_C	V_ATM_OBD_Data_Reset	None
V_AIM_trc_SCR_Out_Status	None	V_SCM_pr_Press_In	kPa
V_ATD_bs_SCR_SysIO1_Errs	HEX	P_SCD_CE_Epsilon_EWMA_Filt_Val	None
V_ATD_bs_SCR_SysIO2_Errs	HEX	P_SCD_CE_NormEff_EWMA_Filt_Val	None
V_ATD_bs_SCR_SysPerf_Errs	HEX	V_SCD_pc_SCR_NOx_Conversion	%

(Click here for parameter list in Excel)

SCR Reductant Delivery - FC 4658

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DEF_LOW_FLOW_ERR
Aftertreatment SCR Actual Dosing Reagent Quantity - Data Valid But Below Normal Operating Range - Moderately Severe Level
System Error number: 8289
(usm_diag_lib.mdl\USD\UreaDeliveryMon)

P_USD_pc_UDM_PumpCmdRef	%	V_USD_UDM_DosCmdOffsetOK_Flag	None
V_ATM_OBD_Data_Reset	None	V_USD_UDM_Enbl	None
V_ATP_KeySwitch	None	V_USD_UDM_LowFlowErr	None
V_USD_ct_UDM_OffsetLearn	counts	V_USD_UDM_OffsetSampleCmd	None
V_USD_ct_UDM_OffsetReset	counts	V_USD_UDM_SampleCusumVal	None
V_USD_flm_DosingCmdFilt	ml/sec	V_USD_UreaDeliveryMon_St	None
V_USD_pc_PumpCmdFilt	%	V_USM_bs_Sys_Errs	HEX
V_USD_pc_UDM_NewOffset	%	V_USM_bs_Sys1_Errs	HEX
V_USD_pc_UDM_OffsetSignal	%	V_USM_DosingSysStateRqst	None
V_USD_pc_UDM_PumpCmd	%	V_USM_flm_DosingCmd	ml/sec
V_USD_pc_UDM_SampleMax	%	V_USM_pc_Pump_Cmd	%
V_USD_pc_UDM_SampleMin	%	V_USM_PressCtrl_LoopClosed	None
V_USD_tm_CusumTmr	s	C_USD_UreaDeliveryMon_Enbl	None
V_USD_tm_UDM_Offset	s	C_USD_pc_UDM_CusumTol	%
V_USD_UDM_Abort	None	C_USD_pc_UDM_OffsetDiffLim	%
V_USD_UDM_CusumError	None	C_USD_tm_UDM_OffsetWait	s
V_USD_UDM_CusumReset	None	C_USD_UDM_PmpCmd_Slope	None
V_USD_UDM_CusumValue	None	P_USD_pc_UDM_PumpCmdRef	%

(Click here for parameter list in Excel)

Related Codes / Sections:

SCR Sensor Tempering - FC 4521

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FC 4521: SCR_IR_TAMP_ERR
Aftertreatment 1 SCR Intermediate Gas Temperature Sensor - Data erratic, intermittent or incorrect
System Error number: 7288
(csdd_aca_strt_lkout.mdl)

V_ATP_trc_SCR_T1	Deg_C	V_ATD_SCR_Tamp_Pause	None
V_ATP_pr_Ambient_Air	kPa	V_ATD_bs_PFS_SysIO_Errs	HEX
V_ATP_trc_Ambient_Air	Deg_C	V_ATD_bs_PFS_SysIO_Update	HEX
V_AIM_vr_Engine_Speed	RPM	O_ATD_SCR_Tamp_Enbl	None
V_ATD_bs_SCR_Sensor_Status	HEX	O_ATD_SCR_Tamp_Val	None
V_ATP_vr_Engine_Speed	RPM	C_ATD_tm_SCR_Tamp_EngSpd_Delay	s
V_ATP_mg_TotalFuelingPerStroke	mg/stroke	C_ATD_vr_SCR_Tamp_MinEngSpd	RPM
V_ATD_SCR_Tamp_Update	None	C_ATD_mg_SCR_Tamp_FuelPerStroke	mg/stroke
V_ATD_SCR_Tamp_Result	None	C_ATD_vr_SCR_Tamp_PauseEngSpd	RPM
V_ATD_tm_SCR_Tamp_DiagTimer	s	C_ATD_tm_SCR_Tamp_FaultSetThd	s
V_ATD_SCR_Tamp_Tmptr_Fail	None	C_ATD_trc_SCR_Tamp_Min_Thd	Deg_C
V_ATD_SCR_Tamp_State	None	C_ATD_pr_Tamp_Ambient_Air	kPa
V_ATD_SCR_Tamp_Enable	None	C_ATD_trc_Tamp_Ambient_Air	Deg_C
V_ATD_SCR_Tamp_Spd_Enbl	None	T_ATM_SCR_Tamp_Enbl	None

(Click here for parameter list in Excel)

Related Codes / Sections:

SCR Feedback Control - FC 4452, FC 4453

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FC 4452: SCR_Outer_Loop_UsedUp_Err
Aftertreatment 1 Outlet NOx Sensor Closed Loop Operation - Condition Exists
System Error number: 7835

FC 4453: SCR_Inner_Loop_UsedUp_Err
Aftertreatment 1 Outlet NH3 Sensor Closed Loop Operation - Condition Exists
System Error number: 7834

(scr_mbnc_diag_lib.mdl\Diagnose\CtrlLoopUsedUp)

P_SCD_tm_UsedUp_StrgLvl	s	V_SCD_UsedUp_MinTempOK	None
V_AIM_dn_ComprInlet	kg/m3	V_SCD_UsedUp_OuterLoop	None
V_AIM_NH3_Sensor_Status	None	V_SCD_UsedUp_OutLoop_Enbl	None
V_AIM_Oper_Mode	None	V_SCD_UsedUp_SlipLimOK	None
V_AIM_tm_ModuleOffTime	s	V_SCD_UsedUp_StrgOK	None
V_AIM_tm_ModuleOffTime_Status	None	V_SCL_Is_SystemReady	None
V_ATD_bs_NOx_Out_Errs	HEX	V_SCP_trc_SCR_Bed	Deg_C
V_ATD_bs_SCR_ExtInput_Status	HEX	V_SCR_ANR_Cmd	None
V_ATD_bs_SCR_Sensor_Status	HEX	V_SCR_ClosedLoopDosingAllowed	None
V_ATD_bs_SCR_SysPerf_Errs	HEX	V_SCR_NH3Fdbk_Relay_HighThd	ppm
V_ATM_OBD_Data_Reset	None	V_SCR_NH3Fdbk_Relay_SwMode	None
V_ATP_Engine_Running	None	V_SCR_NH3Sens_ReadStblValid	None
V_ATP_pr_Ambient_Air	kPa	V_SCR_NOxLp_HealthOK	None
V_ATP_trc_Ambient_Air	Deg_C	V_SCR_ppm_MidCatNH3	ppm
V_ATP_trc_SCR_T1	Deg_C	V_SCR_ppm_MidCatNH3_Ref	ppm
V_RDM_State_Rqst	None	V_SCR_ppm_NOxLoop_Corr	ppm
V_SCD_pc_InLoop_UsedUp_Decision	%	V_SCR_ppm_NOxLoop_PreCorr	ppm
V_SCD_pc_OutLoop_UsedUpDecision	%	V_UIM_flm_InjRateCmd	ml/sec
V_SCD_tm_InLp_UsedUp	s		
V_SCD_tm_InLp_UsedUp_Diag	s	**Overrdes:**	
V_SCD_tm_OutLp_UsedUp	s	O_SCD_InLoop_UsedUp_Cond_Enbl	None
V_SCD_tm_OutLp_UsedUp_Diag	s	O_SCD_InLoop_UsedUp_Cond_Val	None
V_SCD_UsedUp_Abort	None	O_SCD_InLoopUsedUp_Flag_Enbl	None
V_SCD_UsedUp_BedTempOK	None	O_SCD_InLoopUsedUp_Flag_Val	None
V_SCD_UsedUp_Common_Enbl	None	O_SCD_OutLoop_UsedUp_Cond_Enbl	None
V_SCD_UsedUp_ExhDosingOk	None	O_SCD_OutLoop_UsedUp_Cond_Val	None
V_SCD_UsedUp_InLoop_Enbl	None	O_SCD_OutLoopUsedUp_Flag_Enbl	None
V_SCD_UsedUp_InnerLoop	None	O_SCD_OutLoopUsedUp_Flag_Val	None

(Click here for parameter list in Excel)

Related Codes / Sections:

FSOV Orifice Plugged - FC 4568

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FSOV_ORIFICE_PLUGGED_ERROR
Aftertreatment Fuel Shutoff Valve - Data Valid But Above Normal Operating Range - Moderately Severe Level
System Error number: 7979
(him_diag_lib.mdl/HIMDiag/DoserUsedUp/OrificePluggedDiag)

OBD_Fault_Status_Table[883]	None	V_HIM_DIAG_Test_Active	None
Engine_Speed	RPM	V_HIM_DIAG_Pressure_Test_State	None
Net_Engine_Torque	N_m	V_HIM_tm_DFM_Time	s
MIL_Status	None	V_HIM_tm_Ineff_Dosing	s
OBD_Number_Of_Key_Cycles	None	V_SFR_Ineff_Regen_Detected_Flag	None
Key_Switch	None	V_HIM_DC_FSOV_Orifice_Plugged	None
Exhaust_Flow	kg/min	V_SFR_Regen_Stage	None
C_ATM_Version	HEX	V_SFP_gpl_Soot_Load_Comb	g/L
P_ATR_SFM_OperModeRqst	None	C_HIM_DFM_FSOV_Diag_Enbl	None
P_HIM_Doser_Eff	None	C_HIM_OrificePlugged_RqstID	None
P_HIM_DFM_Update	None	C_HIM_FSOV_Plugged_DFM_Thd	None
H_HIM_fn_EffComp	None	C_HIM_OrificePluggedScnTlOffset	None
P_HIM_DFM_Eff_Avg	None	C_HIM_FSOV_Filtered_Enbl	None
P_HIM_DFM_Eff_Regen	None	T_HIM_DFM_OBD_Enbl	None
P_SFR_Regen_Trigger_State	None	T_SFD_FreqRegenDiag_Enbl	None
V_HIM_DFM_Abort	None	O_SFP_gpl_Soot_Load_Reset_Val	g/L

V_HIM_DFM_Pause	None	O_SFP_gpl_Soot_Load_Reset_En	None

(Click here for parameter list in Excel)

Related Codes / Sections:

EGTS Delegated Assembly Error - FC 4584, FC 4585

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FC 4584: PFS_EGTS_DELEGATED_ASSEMBLY_ERR

Aftertreatment Diesel Particulate Filter System - Special Instructions
System Error number: 8100
(atm_pfs_atd_lib.mdl\ATD\Diagnostics\DelegatedAssembly)

FC 4585: SCR_EGTS_DELEGATED_ASSEMBLY_ERR

Aftertreatment 1 SCR Catalyst System - Special Instructions
System Error number: 8101
(atm_pfs_atd_lib.mdl\ATD\Diagnostics\DelegatedAssembly)

P_PFS_DA_Validation_Stat	None	V_PFS_DA_Decision	None
V_PFS_DA_EGTS_ReturnVal	None	P_SCR_DA_Validation_Stat	None
V_ATP_KeySwitch	None	V_SCR_DA_EGTS_ReturnVal	None
V_ATP_EngineState	None	V_SCR_DA_EGTS_Info[0]	None
V_PFS_DA_EGTS_Info[0]	None	V_SCR_DA_EGTS_DataStat	None
V_PFS_DA_EGTS_DataStat	None	V_SCR_tm_DA_InitChkTimer_Out	s
V_ATP_tm_EngRunTime_Offset	s	V_SCR_ct_DA_DataStat_Timeout	counts
V_ATP_tm_EngineRunTime	s	V_SCR_ct_DA_ReturnStat_Timeout	counts
V_ATD_FT_GreenFilterPlant	None	V_SCR_DA_Decision	None
V_PFS_tm_DA_InitChkTimer_Out	s	T_PFS_DA_Enbl	None
V_PFS_ct_DA_DataStat_Timeout	counts	T_SCR_DA_Enbl	None
V_PFS_ct_DA_ReturnStat_Timeout	counts		

(Click here for parameter list in Excel)

Related Codes / Sections:

EGTS Smart Module DPF and SCR – FC 4158, FC 4161, FC 4162, FC 4163, FC 4164, FC 4165, FC 4166, FC 4259, FC 4261

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FC 4158: EGTS_PFS_ECU_ASIC_ERR

Aftertreatment Diesel Particulate Filter Temperature Sensor Module - Bad intelligent device or component
System Error number:

FC 4161: EGTS_PFS_ECU_HI_VOLT_ERR

Aftertreatment Diesel Particulate Filter Temperature Sensor Module - Voltage Above Normal, or Shorted to High Source
System Error number:

FC 4162: EGTS_PFS_ECU_LO_VOLT_ERR

Aftertreatment Diesel Particulate Filter Temperature Sensor Module - Voltage below normal, or shorted to low source
System Error number:

FC 4163: EGTS_PFS_ECU_OVER_TEMP_ERR

Aftertreatment Diesel Particulate Filter Temperature Sensor Module- Data Valid But Above Normal Operating Range - Moderately Severe Level
System Error number:

FC 4164: EGTS_SCR_ECU_HI_VOLT_ERR
Aftertreatment Selective Catalytic Reduction Temperature Sensor Module - Voltage Above Normal, or Shorted to High Source
System Error number:

FC 4165: EGTS_SCR_ECU_LO_VOLT_ERR
Aftertreatment Selective Catalytic Reduction Temperature Sensor Module - Voltage below normal, or shorted to low source
System Error number:

FC 4166: EGTS_SCR_ECU_OVER_TMPTR_ERR
Aftertreatment Selective Catalytic Reduction Temperature Sensor Module - Data Valid But Above Normal Operating Range - Moderately Severe Level
System Error number:

FC 4259: EGTS_PFS_PWR_INT_ERR
Aftertreatment Diesel Particulate Filter Temperature Sensor Module - Root Cause Not Known
System Error number:

FC 4261: EGTS_SCR_PWR_INT_ERR
Aftertreatment Selective Catalytic Reduction Temperature Sensor Module - Root Cause Not Known
System Error number:

(csdd_atm_pfs.mdl) (csdd_atm_scr.mdl)

V_ATD_tm_PFSEGTSPwrInt_Timer	s	V_EGTS_tm_PFS_ECU_Hi_Volt	s
V_AIM_EGTS_PFS_ECU_FMI	None	V_AIM_trc_EGTS_PFS_ECU	Deg_C
V_EGTS_tm_PFS_ECU_Asic	s	V_EGTS_tm_PFS_ECU_Over_Tmptr	s
V_EGTS_tm_PFS_ECU_uc	s	V_ATD_ct_PFSEGTSPwrInt_Events	counts
V_EGTS_tm_PFS_ECU_Lo_Volt	s		
C_ATD_ct_SCREGTSPwrInt_Thd	counts	T_ATM_bs_Enbl	HEX
C_ATD_tm_SCREGTSPwrInt_Window	s	C_ATD_ct_PFSEGTSPwrInt_Thd	counts
C_ATD_tm_SCREGTSPwrInt_Delay	s	C_ATD_tm_PFSEGTSPwrInt_Window	s
C_EGTS_SCR_tm_CJ_Short_Ckt_Dur	s	C_ATD_tm_PFSEGTSPwrInt_Delay	s
C_EGTS_SCR_tm_CJ_Open_Ckt_Dur	s	C_EGTS_PFS_tm_TC3_Asic_Dur	s
C_EGTS_SCR_tm_Over_Tmptr_Dur	s	C_EGTS_PFS_tm_Over_Tmptr_Dur	s
C_EGTS_SCR_tm_CJ_Asic_Dur	s	C_EGTS_PFS_tm_CJ_Asic_Dur	s
C_EGTS_SCR_tm_CJ_Plausible_Dur	s	C_EGTS_PFS_tm_ECU_uc_Dur	s
C_EGTS_SCR_tm_ECU_uc_Dur	s	C_EGTS_PFS_tm_ECU_Asic_Dur	s
C_EGTS_SCR_tm_ECU_Asic_Dur	s	C_EGTS_PFS_tm_ECU_Hi_Volt_Dur	s
C_EGTS_SCR_tm_ECU_Hi_Volt_Dur	s	C_EGTS_PFS_tm_ECU_Lo_Volt_Dur	s
C_EGTS_SCR_tm_ECU_Lo_Volt_Dur	s	C_EGTS_PFS_tm_TC1_Asic_Dur	s
C_EGTS_SCR_tm_TC1_Asic_Dur	s	C_EGTS_PFS_tm_TC2_Asic_Dur	s
C_EGTS_SCR_tm_TC2_Asic_Dur	s		

(Click here for parameter list in Excel)

Related Codes / Sections:

EGTS Thermocouple OOR - FC 4518, FC 4519

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FC 4518: EGTS_SCR_T1_OOR_HI_ERR
Aftertreatment 1 SCR Intermediate Gas Temperature Sensor Circuit - Voltage above normal, or shorted to high source
System Error number: 6760

FC 4519: EGTS_SCR_T1_OOR_LO_ERR

Aftertreatment 1 SCR Intermediate Gas Temperature Sensor Circuit - Voltage below normal, or shorted to low source
System Error number: 6761

(atm_scr_atd_lib.mdl\Diagnostic\OverTmptr)

V_AIM_EGTS_SCR_TC1_FMI	None	V_AIM_trc_SCR_T1_Status	None
V_AIM_EGTS_SCR_TC1_Tmptr_Status	None	V_ATD_bs_PFS_SysIO_Errs	HEX
V_AIM_EGTS_SCR_TC2_FMI	None	V_ATD_bs_PFS_SysIO_Update	HEX
V_AIM_EGTS_SCR_TC2_Tmptr_Status	None	V_EGTS_tm_SCR_Out_OORH	s
V_AIM_trc_EGTS_SCR_TC1	Deg_C	V_EGTS_tm_SCR_Out_OORL	s
V_AIM_trc_EGTS_SCR_TC2	Deg_C	V_EGTS_tm_SCR_T1_OORH	s
V_AIM_trc_SCR_Out	Deg_C	V_EGTS_tm_SCR_T1_OORL	s
V_AIM_trc_SCR_Out_Status	None	O_AIM_trc_SCR_T1_Enable	None
V_AIM_trc_SCR_T1	Deg_C	O_AIM_trc_SCR_Out_Enable	None

(Click here for parameter list in Excel)

Related Codes / Sections:

Engine Out NOx Sensor Power and Intermittent – FC3682

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Pre-Fuel Filter Pressure Sensor Circuit - Voltage below normal, or shorted to low source

EONOX_SENSOR_PWR_ERR
System error number: 5152

EONOX_SENSOR_INT_PWR_ERR
System error number: 5829

AIM_Outlet_Dew_Point	None	EONOx_J39_AftIn_NOx_FMI	None
AIM_Outlet_Dew_Point_Status	None	EONOx_J39_AftIn_Power_In_Range	None
Current_Engine_State	None	EONOx_J39_AftIn_Temp	None
EONOx_Comp_Value	ppm	EONOx_J39_Fast_Power_In_Range	None
EONOx_Dew_Point_State	None	EONOx_J39_Fault_Inhibit	None
EONOx_DewPtExceeded	s	EONOx_J39_Sensor_Status	None
EONOx_INT_Pwr	None	EONOx_Power_Fault_Flag	None
EONOx_INT_Pwr_Err	None	EONOx_PwrErr_Timer	s
EONOx_IntPwr_Counter	None	EONOx_Stop_GPD	None
EONOx_IntPwr_Timer	s	H_EONOx_Diag_State	None
EONOx_J39_AftIn_Heater_FMI	None		

(Click here for parameter list in Excel)

Engine Out NOx Sensor Circuit Continuity – FC1885

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Aftertreatment 1 Intake NOx Sensor Circuit - Voltage below normal, or shorted to low source

EONOX_SENSOR_HTR_ERR
System error number: 5151

EONOX_SENSOR_SIGNAL_ERR
System error number: 5153

EO_O2_SENSOR_SIGNAL_ERR
System error number:

AIM_Inlet_Dew_Point	[NONE]	EONOx_J39_AftIn_NOx_FMI	None

Current_Engine_State	None	EONOx_J39_AftIn_Power_In_Range	None
ennox_t_eletrical_system_voltage	[NONE]	EONOx_J39_AftIn_Temp	None
EONOx_Dew_Point_State	None	EONOx_J39_Fault_Inhibit	None
EONOx_DewPtExceeded	[s]	EONOx_J39_Intake_NOx_Volt	[V]
EONOx_FirstCatIn_Temp	[Deg_C]	EONOx_Power_Not_InRange_Flag	[NONE]
EONOx_FirstCatIn_Temp_Status	[NONE]	EONOx_PwrErr_Timer	s
EONOx_HtrErr_Timer	s	EONOx_SigErr_Timer	s
EONOx_J39_AftIn_Heater_Control	[NONE]	EONOx_Voltage_Mismatch_Error	[NONE]
EONOx_J39_AftIn_Heater_FMI	None	H_EONOx_Diag_State	None

(Click here for parameter list in Excel)

Engine Out NOx Sensor Rationality – FC 3228, FC 3748

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FC 3228: NOX_IN_SENSOR_IR_HI_ERR
Aftertreatment 1 Intake NOx Sensor - Data erratic, intermittent or incorrect
System error number: 597

FC 3228: NOX_IN_SENSOR_IR_LO_ERR
Aftertreatment 1 Intake NOx Sensor - Data erratic, intermittent or incorrect
System error number: 599

FC 3748: NOX_IN_SENSOR_IR_LO_MOTOR_ERR
Aftertreatment 1 Intake NOx Sensor - Data not Rational - Drifted High
System error number: 600

FC 3748: NOX_IN_SENSOR_DITHER_ERR
Aftertreatment 1 Intake NOx Sensor - Data not Rational - Drifted High
System error number: 596

FC 3748: NOX_IN_SENSOR_IR_HI_MOTOR_ERR
Aftertreatment 1 Intake NOx Sensor - Data not Rational - Drifted High
System error number: 598

Alpha	None	EONOx_IR_NMot_Timer	s
Ambient_Air_Tmptr	Deg_C	EONOx_IR_State	None
CBM_Indicated_Trq_Fuel	mg/stroke	EONOx_IR_Stuck_En	None
CBM_NOx_Out_PPM	PPM	EONOx_IR_Stuck_Err	None
CBR_Thermal_Felix_Active	None	EONOx_IRH_Cusum_Value	None
CBR_Thermal_Oscar_Active	None	EONOx_IRH_Err	None
Compressor_Inlet_Density	kg/m3	EONOx_IRH_Mot_Cusum_Value	PPM
Current_Engine_State	None	EONOx_IRL_Cusum_Value	None
EGR_Fraction	None	EONOx_IRL_Err	None
EMM_Protection_Flag	None	EONOx_IRL_Mot_Cusum_Value	PPM
EMM_Protection_Flag	None	EONOx_Mot_Flag	None
Engine_Out_NOx_PPM_Status	None	EONOx_OBD_CtrlPathOwner	None
Engine_Speed	RPM	EONOx_Sensor_Status	None
EONOx_Comp_Value	ppm	EONOx_SIR_Delta	ppm
EONOx_Diag_Mot_Enbl	None	EONOx_SIR_Max	ppm
EONOx_IR_Cusum_Timer	s	EONOx_SIR_Min	ppm
EONOx_IR_Mot_Cusum_Timer	s	EONOx_SIR_Timer	s
EONOx_IR_Mot_Hi_Error	None	H_CBM_NOx_Diff	ppm
EONOx_IR_Mot_Lo_Error	None	H_EONOx_SIR_Counter	None
EONOx_IR_Mot_State	None	H_EONOx_SIR_Counter	None
EONOx_IR_Mot_State	None	Net_Engine_Torque	N_m
EONOx_IR_NMot_Enable	None		

(Click here for parameter list in Excel)

Engine Out NOx Sensor Heater Repsonse – FC 3649

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Aftertreatment 1 Intake NOx Sensor Heater - Abnormal rate of change

EONOX_SENSOR_HTR_RESP_ERR
System error number: 5246

EONOX_SENSOR_HTR_WARMUP_ERR
System error number: 5245

EONOx_HtrStatStable_Percent	[%]	EONOx_HtrPerfAvgTimer	s
EONOx_HtrStatStableTimer	[s]	EONOx_HtrPerfMonTimer	s
EONOx_J39_AftIn_Heater_Control	[NONE]	EONOx_HtrStatStableTimer	s
AIM_Inlet_Dew_Point	[NONE]	EONOx_J39_AftIn_Heater_Control	None
Current_Engine_State	[NONE]	EONOx_J39_AftIn_Power_In_Range	None
EONOx_Dew_Point_State	None	eonox_j39_sensor_htr_err	[NONE]
EONOx_DewPtExceeded	[s]	eonox_j39_sensor_signal_err	[NONE]
EONOx_FirstCatIn_Press	kPa	EONOx_J39_Sensor_Status	[NONE]
EONOx_FirstCatIn_Temp	Deg_C	EONOx_J39_Sensor_Status	None
EONOx_FirstCatIn_Temp_Status	[NONE]	EONOx_Power_Fault_Flag	None
EONOx_Gas_Velocity	m/s	Exhaust_Flow	kg/min
EONOx_Htr_Resp_Err	None	H_EONOx_HtrPerfMon_State	None
EONOx_Htr_Warmup_Err	None	H_EONOx_HtrWarmUp_State	None

(Click here for parameter list in Excel)

Engine Out NOx Sensor Response/Persist Not Valid – FC3725

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Aftertreatment 1 Intake NOx Sensor - Abnormal rate of change

NOX_IN_SENSOR_PERSIST_NOT_VALID_ERR
System error number: 5569

AIM_Outlet_Dew_Point	None	EONOx_OBD_CtrlPathOwner	None
AIM_Outlet_Dew_Point_Status	None	EONOx_Persist_Not_Valid_Enbl	None
CBM_Indicated_Trq_Fuel	mg/stroke	EONOx_Persist_Not_Valid_Err	None
CBM_O2_Out_Rate	g/sec	EONOx_Persist_Not_Valid_Timer	s
EONOx_Comp_Value	ppm	EONOx_Resp_Counter	None
EONOx_Dew_Point_State	None	EONOx_Resp_Err	None
EONOx_DewPtExceeded	s	EONOx_Resp_Mot_Enbl	None
EONOx_Diag_Err	None	EONOx_Resp_State	None
EONOx_FirstCatIn_Press	kPa	EONOx_Sensor_Status	None
EONOx_FirstCatIn_Temp_Status	None	Exhaust_Flow	kg/min
EONOx_J39_AftIn_NOx_Read_Stbl	None	Exhaust_Flow_Status	None
EONOx_J39_Sensor_Status	None	H_CBM_O2_Percent_Rate	%/s
EONOx_NotValid_Abort_Flag	None	H_Exhaust_Press_Rate	kPa/s

(Click here for parameter list in Excel)

System Out NOx Sensor Power and Intermittent – FC3681

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Aftertreatment 1 Outlet NOx Sensor Power Supply - Data erratic, intermittent or incorrect

NOX_OUT_SENSOR_PWR_INT_ERR
System error number: 6008

NOX_OUT_SENSOR_PWR_ERR

System error number: 3078

AIM_Outlet_Dew_Point	None	V_ATM_ct_NOxOutPwrInt_Events	[counts]
AIM_Outlet_Dew_Point_Status	None	V_ATM_NOxOutPwrInt_Latch	s
NOX_OUT_SENSOR_TIMEOUT_ERR	None	V_ATM_tm_NOxOutPwrInt_Timer	counts
T_ATM_NOxOut_SenPwrInt_Enbl	None	V_ATP_CatOutNOxDiag_State	None
V_AIM_SCR_FaultInhibit	None	V_ATP_EngineState	None
V_AIM_SCR_Out_NOxAtTmptr	None	V_ATP_tm_CatOutNOxDiag_Timer	s
V_AIM_SCR_Out_NOxFMI	s	V_ATP_tm_CatOutNOxPwrErr_Timer	None
V_AIM_SCR_Out_NOxPowerInRange	None		

(Click here for parameter list in Excel)

System Out NOx Sensor Heater Repsonse – FC3583

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Aftertreatment 1 Outlet NOx Sensor Heater - Abnormal rate of change

SCR_OUT_NOX_SENSOR_HTR_RESP_ERR
System error number: 5050

NOX_OUT_SENSOR_HTR_WARMUP_ERR
System error number: 5051

V_AIM_SCR_OutletHeaterControl	[NONE]	V_ATP_tm_SCROutDewPtExceeded	[s]
V_ATP_trc_SCR_Out	[NONE]	V_ATP_trc_SCR_Out	[Deg_C]
AIM_Outlet_Dew_Point	None	V_ATP_trc_SCR_Out_Status	[NONE]
AIM_Outlet_Dew_Point_Status	[NONE]	V_SCD_bs_NOxSenHtrResetBitMap	HEX
Battery_Voltage	V	V_SCD_Catalyst_Velocity	s
V_AIM_SCR_Out_NOxAtTmptr	None	V_SCD_ct_NOxHtrStatFallCounter	counts
V_AIM_SCR_Out_NOxReadStbl	None	V_SCD_NOxSenHtrResp_State	None
V_AIM_SCR_OutletHeaterControl	None	V_SCD_NOxSenHtrWarmUp_State	None
V_ATD_bs_SCR_SysIO1_Errs	HEX	V_SCD_pc_NOxHtrStatStable	%
V_ATM_NOxOutPwrInt_Latch	None	V_SCD_tm_NOxHtrStatStableTimer	s
V_ATP_EngineState	[NONE]	V_SCD_tm_NOxSenHtrPerfAvgTimer	s
V_ATP_fg_SCR_In_NOx_Status	None	V_SCD_tm_NOxSenHtrPerfMonTimer	s
V_ATP_KeySwitch	None	V_SCM_trc_SCR_Out	Deg_C
V_ATP_ppm_SCR_Out_NOx_Status	None	V_SCP_vs_SCR_Catalyst	1/sec
V_ATP_SCR_Out_NOxPwrIRValid	None		

(Click here for parameter list in Excel)

System Out NOx Sensor Response/Persist Not Valid – FC3545

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Aftertreatment Outlet Oxygen Sensor - Data Valid But Below Normal Operating Range - Moderately Severe Level

NOX_OUT_SENSOR_PERSIST_NOT_VALID_ERR
System error number: 5503

NOX_OUT_SENS_IR_MOTOR_RESPONSE_ERR
System error number: 7610

V_AIM_SCR_Out_NOxReadStbl	[NONE]	V_SCD_ct_NXRT_Index	counts
AIM_Outlet_Dew_Point	None	V_SCD_ct_NXRT_iStartingPoint	counts
P_SCD_ct_NXRT_SR_FIRTestsCompl	counts	V_SCD_ct_NXRT_Reg_Npts	counts
P_SCD_ct_NXRT_SR_RRTestCompl	counts	V_SCD_Engine_Fuel_Status	None
P_SCD_NXRT_SR_RRState	None	V_SCD_NXRT_Filter_State	counts
P_SCD_tc_NXRT_SR_EWMA_Filt	s	V_SCD_NXRT_Log_Lim	None

T_ATP_SCR_Out_NOxSensor_Enbl	None	V_SCD_NXRT_Sensor_Resp_State	None
T_SCD_NXRT_NOx_Sensor_Resp_Enbl	None	V_SCD_NXRT_SimR_NOx_Method	None
V_AIM_OBD_CtrlPathOwner	None	V_SCD_NXRT_Sum_dNOx	None
V_AIM_SCR_Out_NOxReadStbl	None	V_SCD_NXRT_Sum_NOx1_dNOx	None
V_ATD_bs_PFS_SysIO_Errs	[HEX]	V_SCD_NXRT_Sum_NOx1_NOx1	None
V_ATD_bs_SCR_ExtInput_Status	HEX	V_SCD_NXRT_Update	None
V_ATD_bs_SCR_SysIO1_Errs	HEX	V_SCD_ppm_NXRT_NOx_iEndingPoint	ppm
V_ATD_bs_SCR_SysIO2_Errs	HEX	V_SCD_ppm_NXRT_NOx_iStartPoint	ppm
V_ATD_bs_SCR_SysPerf_Errs	HEX	V_SCD_ppm_NXRT_NOxBuffer	ppm
V_ATM_NOxOutPwrInt_Latch	None	V_SCD_ppm_NXRT_SimR_NOx_Amp	ppm
V_ATM_OBD_Data_Reset	None	V_SCD_ppm_NXRT_SimR_NOx_Offset	ppm
V_ATP_mg_TotalFuelingPerStroke	mg/stroke	V_SCD_ppm_NXRT_Sum_NOx	ppm
V_ATP_NotStbl_O2Transient_Flag	None	V_SCD_ppm_NXRT_Sum_NOx1	ppm
V_ATP_pc_SCR_In_O2	[%]	V_SCD_tm_NXRT_SimR_NOx_Tau	s
V_ATP_pc_SCROut_NotStable	%	V_SCM_ppm_SCR_Out_NOx_PreClamp	ppm
V_ATP_ppm_SCR_Out_NOx_Status	None	V_UIM_bs_DiagStatus	HEX
V_ATP_SCR_Out_NOx_NotStbl_Abort	None		

(Click here for parameter list in Excel)

System Out NOx Sensor Rationality – FC 1694, FC 3749

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FC 1694: NOX_OUT_SENSOR_SELFDIAG_LO_ERR
Aftertreatment 1 Outlet NOx Sensor - Data erratic, intermittent or incorrect
System error number: 7832

FC 1694: NOX_OUT_SENSOR_SELFDIAG_HI_ERR
Aftertreatment 1 Outlet NOx Sensor - Data erratic, intermittent or incorrect
System error number: 7831

FC 3749: NOX_OUT_SENSOR_IR_LO_MOTOR_ERR
Aftertreatment 1 Outlet NOx Sensor - Data not Rational - Drifted High
System error number: 5303

FC 3749: NOX_OUT_SENS_IR_STUCK_ERR
Aftertreatment 1 Outlet NOx Sensor - Data not Rational - Drifted High
System error number: 7613

FC 3749: NOX_OUT_SENSOR_IR_HI_MOTOR_ERR
Aftertreatment 1 Outlet NOx Sensor - Data not Rational - Drifted High
System error number: 5052

EONOx_Comp_Value	[ppm]	V_SCD_NM_DitherRun	None
EONOx_Sensor_Status	[NONE]	V_SCD_NM_High_Motor_State	None
P_SCD_ct_NXGRH_FIRTestsCompl	counts	V_SCD_NM_High_Motor_State	None
P_SCD_ct_NXGRH_RRTestCompl	counts	V_SCD_NM_IR_Motoring_Abort	None
P_SCD_ct_NXGRL_FIRTestsCompl	counts	V_SCD_NM_IRH_Err_Motor	None
P_SCD_ct_NXGRL_RRTestCompl	counts	V_SCD_NM_IRH_IRL_MotorRun	None
P_SCD_NXGR_Intrusive_Enbl	None	V_SCD_NM_IRL_Err_Motor	None
P_SCD_NXGRH_EWMA_Filt	None	V_SCD_NM_Low_Motor_State	None
P_SCD_NXGRH_RRState	None	V_SCD_NM_ppm_Dither_Act_Range	ppm
P_SCD_NXGRL_EWMA_Filt	None	V_SCD_NM_ppm_Dither_Est_Range	ppm
P_SCD_NXGRL_RRState	None	V_SCD_NM_ppm_NOxOutAvg	ppm
T_SCD_NOxMonitor_Enbl	None	V_SCD_NM_tm_Dither_Time	s
V_AIM_OBD_CtrlPathOwner	None	V_SCD_NOxMonHiRatResetFlag	None
V_ATD_bs_NOx_Out_Errs	[NONE]	V_SCD_NXGR_Pause	None
V_ATD_bs_SCR_ExtInput_Status	[s]	V_SCD_NXGR_PhaseII_Compl	None
V_ATD_bs_SCR_ExtInput_Status	HEX	V_SCD_NXGR_Ratio	None
V_ATD_bs_SCR_SysIO1_Errs	HEX	V_SCD_NXGR_Update	None
V_ATD_bs_SCR_SysIO2_Errs	HEX	V_SCD_ppm_NXGR_NOx_In	ppm
V_ATD_bs_SCR_SysPerf_Errs	HEX	V_SCD_ppm_NXGR_NOx_Out	ppm

V_ATM_OBD_Data_Reset	None	V_SCD_ppm_SIR_NOxOutMax	[ppm]
V_ATP_fg_SCR_In_NOx_Status	None	V_SCD_ppm_SIR_NOxOutMin	[ppm]
V_ATP_KeySwitch	None	V_SCD_SIR_DiagSt	[NONE
V_ATP_mg_TotalFuelingPerStroke	mg/stroke	V_SCD_SrvPerf_Active	None
V_ATP_ppm_SCR_Out_NOx_Status	None	V_SCD_tm_NXGR_Diagnosis	s
V_ATP_tq_EngineTorque	N_m	V_SCD_tm_NXGR_HiFlow	s
V_ATP_vr_Engine_Speed	RPM	V_SCD_tm_NXGR_Intrusive	s
V_ATR_SCR_Regen_Mode	None	V_SCD_tm_NXGR_Phase_I	s
V_SCD_ct_NXGR_NOx	counts	V_SCD_tm_NXGR_Phase_II	s
V_SCD_ct_SIR_FaultCnt	[Counts]	V_SCD_tm_NXGR_PhaseII_Max	s
V_SCD_fg_NXGR_Flow	g/sec	V_SCD_trc_NXGR_SCR_Filt	Deg_C
V_SCD_fg_NXGR_NOx_In	g/sec	V_SCM_fg_MassFlow_In	g/sec
V_SCD_fg_SIR_NoxIn	[NONE]	V_SCM_ppm_SCR_Out_NOx	ppm
V_SCD_flm_NM_DosingOverride	None	V_SCM_ppm_SCR_Out_NOx_PreClamp	[ppm]
V_SCD_flm_NM_DosingValue	ml/sec	V_SCP_trc_SCR_Bed	Deg_C
V_SCD_FTIS_NOxMon_Reset	None	V_SCP_UreaInjMaxExceed	None
V_SCD_mg_NXGR_NOx_In_Accum	g	V_SCR_fn_DeNOx_Est	None
V_SCD_mg_SIR_NOxIn_Intg	[g]	V_SCR_ppm_NOx_In	ppm
V_SCD_NM_Dither_Abort	None	V_UIM_bs_DiagStatus	HEX
V_SCD_NM_Dither_State	None	V_UIM_PumpState	None
V_SCD_NM_DitherError	None		

(Click here for parameter list in Excel)

System Out NOx Sensor Circuit Continuity – FC1887

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Aftertreatment 1 Outlet NOx Sensor Circuit - Voltage below normal, or shorted to low source

NOX_OUT_SENSOR_HTR_ERR
System error number: 3079

NOX_OUT_SENSOR_SIGNAL_ERR
System error number: 3080

AIM_Outlet_Dew_Point	[NONE]	V_AIM_SCR_Out_NOxPowerInRange	None
V_ATD_bs_PFS_SysIO_Errs	[HEX]	V_AIM_SCR_OutletHeaterControl	[NONE]
AIM_Outlet_Dew_Point	None	V_ATP_EngineState	None
AIM_Outlet_Dew_Point_Status	[NONE]	V_ATP_EngineState	[NONE]
NOX_OUT_SENSOR_TIMEOUT_ERR	None	V_ATP_SCR_Out_NOxPwrIRValid	[NONE]
V_AIM_ev_SCR_NOxOut_Volt_Stat	[NONE]	V_ATP_tm_CatOutNOxDiag_Timer	s
V_AIM_ev_SCR_Out_NOxVolt	[V]	V_ATP_tm_CatOutNOxHtrErr_Timer	None
V_AIM_SCR_ElectricalSysVolt_Sel	[NONE]	V_ATP_tm_CatOutNOxPwrErr_Timer	s
V_AIM_SCR_FaultInhibit	None	V_ATP_tm_CatOutNOxSigErr_Timer	s
V_AIM_SCR_Out_NOxAtTmptr	None	V_ATP_tm_SCROutDewPtExceeded	[s]
V_AIM_SCR_Out_NOxAtTmptr	[NONE]	V_ATP_trc_SCR_Out	[Deg_C]
V_AIM_SCR_Out_NOxFMI	None	V_ATP_trc_SCR_Out_Status	[NONE]
V_AIM_SCR_Out_NOxHeaterFMI	s		

(Click here for parameter list in Excel)

NH3 Sensor Circuit Continuity – FC 3899, FC 3934, FC 3935, FC 3936, FC 3937

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FC 3899
System errors: NH3_SENSOR_HTR_POS_STB_ERR, NH3_SENSOR_HTR_POS_STG_ERR, NH3_SENSOR_HTR_POS_OPEN_ERR, NH3_SENSOR_HTR_NEG_STB_ERR, NH3_SENSOR_HTR_NEG_STG_ERR, NH3_SENSOR_HTR_NEG_OPEN_ERR, NH3_SENSOR_ZCELL_OORL_ERR, NH3_SENSOR_ZCELL_OORH_ERR, NH3_SENSOR_GND_OPEN_ERR, NH3_SENSOR_GND_STB_ERR

Aftertreatment 1 SCR Intermediate NH3 Sensor - Voltage below normal, or shorted to low source System Error numbers: 6494, 6497, 6498, 6496, 6495, 6503, 6504,

FC 3934: NH3_SENSOR_PWR_INT_ERR
Aftertreatment 1 SCR Intermediate NH3 Gas Sensor Power Supply - Data erratic, intermittent or incorrect
System Error number: 6486

FC 3935
System errors: NH3_SENSOR_TRIMR_OORH_ERR, NH3_SENSOR_TRIMR_OORL_ERR
Aftertreatment 1 SCR Intermediate NH3 Sensor - Out of Calibration
System Error numbers: 6405, 6406

FC 3936: NH3_SENSOR_ASIC_ERR
Aftertreatment 1 SCR Intermediate NH3 Sensor - Bad intelligent device or component
System Error number: 6488

FC 3937: NH3_SENSOR_PERSIST_NOT_VALID_ERR
Aftertreatment 1 SCR Intermediate NH3 Sensor - Abnormal rate of change
System Error number: 6487

(csdd_ats_nh3_sens.mdl)

Out of range:

J39_NH3_Heater_NegDiagStatus	None	V_SCR_NH3SensEMF2OORH_State	None
J39_NH3_Heater_PosDiagStatus	None	V_SCR_NH3SensEMF2OORL_State	None
J39_NH3_Volt_OOR_DiagStatus	None	V_SCR_ct_NH3SensEMF2OORH	counts
J39_NH3_TrimR_DiagStatus	None	V_SCR_ct_NH3SensEMF2OORL	counts
J39_NH3_ASIC_DiagStatus	None	V_SCR_NH3SensEMF2VoltDiag	mV
J39_NH3_TmptrCell_DiagStatus	None	V_SCR_NH3SensHtrNegSTB_State	None
J39_NH3_GND_DiagStatus	None	V_SCR_NH3SensHtrNegSTG_State	None
J39_NH3_EMF1_OOR_DiagStatus	None	V_SCR_NH3SensHtrNegOpen_State	None
J39_NH3_EMF2_OOR_DiagStatus	None	V_SCR_ct_NH3SensHtrNegSTB	counts
V_ATD_bs_PFS_SysIO_Errs	HEX	V_SCR_ct_NH3SensHtrNegSTG	counts
V_ATD_bs_PFS_SysIO_Update	HEX	V_SCR_ct_NH3SensHtrNegOpen	counts
V_ATM_PFS_Error_Indices[0]	None	V_SCR_NH3SensHtrPosSTB_State	None
V_SCR_NH3SensEMF1Voltage	mV	V_SCR_NH3SensHtrPosSTG_State	None
V_SCR_NH3SensEMF2Voltage	mV	V_SCR_NH3SensHtrPosOpen_State	None
V_SCR_ev_NH3SensHtrSupply	V	V_SCR_ct_NH3SensHtrPosSTB	counts
V_ATD_bs_SCR_SysPerf_Errs	HEX	V_SCR_ct_NH3SensHtrPosSTG	counts
V_SCR_ro_NH3SensTcell	Ohm	V_SCR_ct_NH3SensHtrPosOpen	counts
V_SCR_ohm_NH3SensTrim	Ohm	V_SCR_NH3SensHtrVOORH_State	None
V_ATM_OBD_Data_Reset	None	V_SCR_NH3SensHtrVOORL_State	None
V_SCR_NH3SensTrimOORL_State	None	V_SCR_ct_NH3SensHtrVOORH	counts
V_SCR_NH3SensTrimOORH_State	None	V_SCR_ct_NH3SensHtrVOORL	counts
V_SCR_NH3Sens_HeaterCmd	None	V_SCR_ev_NH3SensHtrSupplyDiag	V
O_AIM_NH3_IgnoreErr_Enbl	None	V_SCR_NH3SensSigGndSTB_State	None
V_ATD_bs_SCR_Sensor_Status	HEX	V_SCR_NH3SensSigGndOpen_State	None
V_SCR_NH3Sens_LightOff	None	V_SCR_ct_NH3SensSigGndSTB	counts
V_SCR_NH3Sens_ReadStblValid	None	V_SCR_ct_NH3SensSigGndOpen	counts
V_SCR_NH3SensComp_Enable	None	V_SCR_NH3SensTcellOORH_State	None
V_AIM_NH3_Sensor_Status	None	V_SCR_NH3SensTcellOORL_State	None
V_SCR_NH3SensASIC_State	None	V_SCR_ct_NH3SensTcellOORH	counts
V_SCR_ct_NH3SensASIC	counts	V_SCR_ct_NH3SensTcellOORL	counts
V_SCR_NH3SensEMF1OORH_State	None	V_SCR_ro_NH3SensTcellDiag	Ohm
V_SCR_NH3SensEMF1OORL_State	None	V_SCR_ct_NH3SensTrimOORH	counts
V_SCR_ct_NH3SensEMF1OORH	counts	V_SCR_ct_NH3SensTrimOORL	counts
V_SCR_ct_NH3SensEMF1OORL	counts	V_SCR_ro_NH3SensTrimDiag	Ohm
V_SCR_NH3SensEMF1VoltDiag	mV		

Intermittent Power:

V_SCR_ct_NH3SensPwrInt_Init	counts	V_SCR_ct_NH3SensPwrInt_Events	counts
V_ATD_bs_PFS_SysIO_Errs	HEX	V_SCR_tm_NH3SensPwrInt_Timer	s
V_ATD_bs_PFS_SysIO_Update	HEX	V_AIM_SCR_ct_NH3Sens_Reset	counts
V_ATM_OBD_Data_Reset	None	V_SCR_NH3SensPwrIntDiag_State	None

V_AIM_SCR_NH3Sens_DewPtReached	None

(Click here for parameter list in Excel)

Related Codes / Sections:

NH3 Sensor Heater - FC 3912

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Aftertreatment 1 Outlet NH3 Gas Sensor Heater - Abnormal rate of change

NH3_SENSOR_HTR_WARMUP_ERR
System Error number: 6507

NH3_SENSOR_HTR_RESP_INT_ERR
System Error number: 6509

NH3_SENSOR_HTR_RESP_TIME_ERR
System Error number: 6508

(nh3_sens_diag_lib.mdl\Diagnose\SensorHeater)

V_ATM_OBD_Data_Reset	None	V_SCD_ct_NH3SensNotAtTmptr	counts
V_AIM_SCR_ct_NH3Sens_Reset	counts	V_HIM_Error_Indices[0]	None
V_ATP_trc_Ambient_Air	Deg_C	V_SCD_pc_NH3SensNotAtTmptr	%
V_ATD_bs_NH3_Errs	HEX	V_SCD_tm_NH3SensHtrWarmupTimer	s
V_ATD_bs_SCR_SysIO2_Errs	HEX	V_SCD_NH3SensHtrRespInt_State	None
V_SCR_NH3SensExhF_Tmptr_IR	None	V_ATD_bs_PFS_SysIO_Errs	HEX
V_SCR_NH3Sens_PwrIRValid	None	V_ATD_bs_PFS_SysIO_Update	HEX
V_ATD_bs_PFS_SysIO_Enbled	HEX	V_SCD_tm_NH3SensHtrPerfAvgTimer	s
V_SCD_bs_NH3SensHtrResetBitMap	HEX	V_SCD_tm_NH3SensNotAtTmptrTimer	s
V_AIM_NH3_Sens_AtTmptr	None	V_SCD_NH3SensHtrRespTime_State	None
V_SCR_NH3Sens_Htr_Control	None	V_SCD_NH3SensHtrWarmUp_State	None
V_AIM_SCR_NH3Sens_ReadStbl	None	V_ATP_KeySwitch	None
V_AIM_NH3_Sensor_Status	None	V_SCR_ev_Battery_Votage	V
Dewpoint:			
V_SCR_tm_NH3Sens_DewPtExceeded	s	V_AIM_SCR_NH3Sens_DewPtReached	None
V_SCR_trc_NH3SensTmptr	Deg_C	V_ATP_trc_SCR_Out_Status	None
V_ATP_EngineState	None	V_SCR_NH3Sens_HeaterCmd	None

(Click here for parameter list in Excel)

Related Codes / Sections:

NH3 Sensor Heater Voltage - FC 3932, FC 3933

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FC 3932: NH3_SENSOR_HTR_VOLT_OORH_ERR
Aftertreatment 1 SCR Intermediate NH3 Gas Sensor Power Supply - Data Valid But Above Normal Operating Range - Moderately Severe Level
System Error number: 6499

FC 3933: NH3_SENSOR_HTR_VOLT_OORL_ERR
Aftertreatment 1 SCR Intermediate NH3 Gas Sensor Power Supply - Data Valid But Below Normal Operating Range - Moderately Severe Level
System Error number: 6500

(csdd_ats_nh3_sens.mdl)

J39_NH3_Heater_NegDiagStatus	None	V_SCR_NH3SensEMF2OORH_State	None
J39_NH3_Heater_PosDiagStatus	None	V_SCR_NH3SensEMF2OORL_State	None
J39_NH3_Volt_OOR_DiagStatus	None	V_SCR_ct_NH3SensEMF2OORH	counts
J39_NH3_TrimR_DiagStatus	None	V_SCR_ct_NH3SensEMF2OORL	counts
J39_NH3_ASIC_DiagStatus	None	V_SCR_NH3SensEMF2VoltDiag	mV
J39_NH3_TmptrCell_DiagStatus	None	V_SCR_NH3SensHtrNegSTB_State	None
J39_NH3_GND_DiagStatus	None	V_SCR_NH3SensHtrNegSTG_State	None
J39_NH3_EMF1_OOR_DiagStatus	None	V_SCR_NH3SensHtrNegOpen_State	None
J39_NH3_EMF2_OOR_DiagStatus	None	V_SCR_ct_NH3SensHtrNegSTB	counts
V_ATD_bs_PFS_SysIO_Errs	HEX	V_SCR_ct_NH3SensHtrNegSTG	counts
V_ATD_bs_PFS_SysIO_Update	HEX	V_SCR_ct_NH3SensHtrNegOpen	counts
V_ATM_PFS_Error_Indices[0]	None	V_SCR_NH3SensHtrPosSTB_State	None
V_SCR_NH3SensEMF1Voltage	mV	V_SCR_NH3SensHtrPosSTG_State	None
V_SCR_NH3SensEMF2Voltage	mV	V_SCR_NH3SensHtrPosOpen_State	None
V_SCR_ev_NH3SensHtrSupply	V	V_SCR_ct_NH3SensHtrPosSTB	counts
V_ATD_bs_SCR_SysPerf_Errs	HEX	V_SCR_ct_NH3SensHtrPosSTG	counts
V_SCR_ro_NH3SensTcell	Ohm	V_SCR_ct_NH3SensHtrPosOpen	counts
V_SCR_ohm_NH3SensTrim	Ohm	V_SCR_NH3SensHtrVOORH_State	None
V_ATM_OBD_Data_Reset	None	V_SCR_NH3SensHtrVOORL_State	None
V_SCR_NH3SensTrimOORL_State	None	V_SCR_ct_NH3SensHtrVOORH	counts
V_SCR_NH3SensTrimOORH_State	None	V_SCR_ct_NH3SensHtrVOORL	counts
V_SCR_NH3Sens_HeaterCmd	None	V_SCR_ev_NH3SensHtrSupplyDiag	V
O_AIM_NH3_IgnoreErr_Enbl	None	V_SCR_NH3SensSigGndSTB_State	None
V_ATD_bs_SCR_Sensor_Status	HEX	V_SCR_NH3SensSigGndOpen_State	None
V_SCR_NH3Sens_LightOff	None	V_SCR_ct_NH3SensSigGndSTB	counts
V_SCR_NH3Sens_ReadStblValid	None	V_SCR_ct_NH3SensSigGndOpen	counts
V_SCR_NH3SensComp_Enable	None	V_SCR_NH3SensTcellOORH_State	None
V_AIM_NH3_Sensor_Status	None	V_SCR_NH3SensTcellOORL_State	None
V_SCR_NH3SensASIC_State	None	V_SCR_ct_NH3SensTcellOORH	counts
V_SCR_ct_NH3SensASIC	counts	V_SCR_ct_NH3SensTcellOORL	counts
V_SCR_NH3SensEMF1OORH_State	None	V_SCR_ro_NH3SensTcellDiag	Ohm
V_SCR_NH3SensEMF1OORL_State	None	V_SCR_ct_NH3SensTrimOORH	counts
V_SCR_ct_NH3SensEMF1OORH	counts	V_SCR_ct_NH3SensTrimOORL	counts
V_SCR_ct_NH3SensEMF1OORL	counts	V_SCR_ro_NH3SensTrimDiag	Ohm
V_SCR_NH3SensEMF1VoltDiag	mV		

(Click here for parameter list in Excel)

Related Codes / Sections:

NH3 Sensor In-Range - FC 4278, FC 4279, FC 4281

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FC 4278: NH3_SENSOR_INRANGE_HI_ERR

Aftertreatment 1 SCR Intermediate NH3 - Data not Rational - Drifted High
System Error number: 7560

FC 4279: NH3_SENSOR_INRANGE_LO_ERR

Aftertreatment 1 SCR Intermediate NH3 - Data not Rational - Drifted Low
System Error number: 7632

FC 4281: NH3_SENSOR_STUCK_RESP_ERR

Aftertreatment 1 SCR Intermediate NH3 - Data erratic, intermittent or incorrect
System Error number: 7631

(nh3_irh_diag_test.mdl\Automated Results)

V_AIM_Oper_Mode	None	P_SCD_NH3IRH_NormANR_RR_State	None
V_ATD_bs_NH3_Errs	HEX	V_SCD_NH3IRH_Abort	None
V_ATD_bs_SCR_ExtInput_Status	HEX	V_SCD_NH3IRH_CmdANR	None
V_ATD_bs_SCR_Sensor_Status	HEX	V_SCD_NH3IRH_Enable	None
V_ATM_Exhaust_Data_To_SCR[0]	None	V_SCD_NH3IRH_Expctd_ANR	None
V_ATM_OBD_Data_Reset	None	V_SCD_NH3IRH_FailEnbl	None
V_ATP_Engine_Running	None	V_SCD_NH3IRH_PassEnbl	None

V_ATP_Exhaust_Data_To_SCM[0]	None	V_SCD_tm_NH3IRH_StrgLvl	s
V_ATP_trc_SCR_T1	Deg_C	V_SCD_tm_NH3IRH_Tmptr_Pause	s
V_SCP_trc_MidBed_Brik1	Deg_C	V_SCD_tm_NH3IRH_Update	s
V_SCR_ANR_Cmd	None	V_SCD_trc_NH3IRH_Brik1_Avg	Deg_C
V_SCR_ClosedLoopDosingAllowed	None	V_SCD_trc_NH3IRH_Brik1DeltaT	Deg_C
V_SCR_NH3Sens_ReadStblValid	None	V_SCD_NH3IRL_Abort	None
V_SCR_ppm_MidCatNH3	ppm	V_SCD_NH3IRL_Enbl	None
V_UIM_flm_InjRateCmd	ml/sec	V_SCD_evm_NH3IRL_EffEMF	mV
P_SCD_ct_NH3IRH_ANR_FIR_Compl	counts	V_SCD_tm_NH3IRL_DiagTimer	s
P_SCD_ct_NH3IRH_ANR_RR_Compl	counts	V_SCD_NH3IRL_DiagUpdate	None
P_SCD_NH3IRH_EWMA_Filt_Val	None	V_SCD_NH3IRL_FaultActive	None
P_SCD_NH3IRH_NormANR	None		

(Click here for parameter list in Excel)

Related Codes / Sections:

Inhibit Switch Regen Timeout – FC2777

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Particulate Trap Active Regeneration Inhibited Due to Inhibit Switch - Condition Exists

INHIBIT_SWITCH_TIMED_REGEN_ERR
System error number: 5571

INHIBIT_SWITCH_HI_SOOT_ERR
System error number: 2995

(atm_pfs_atd_lib.mdl\ATD\Diagnostics\OperatorInterface\LampStrategy\DPFState\SolidLampTimer)

P_ATD_tmh_TimerRegenRqstActive	hr	V_ATP_Engine_Running	None
P_SFR_Regen_Trigger_State	None	V_SFP_gpl_Soot_Load_Comb	g/L
V_ATP_ApplicationLabel	None		

(Click here for parameter list in Excel)

Feedback Used Up - FC2638

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PID_SLIP_USEDUP_ERR
Aftertreatment Diesel Oxidation Catalyst Conversion Efficiency - Data Valid But Below Normal Operating Range - Least Severe Level
System error number: 3545

V_ATD_bs_PFS_EngOut_Status	HEX	V_SFP_gpl_Soot_Load_DP	g/L
V_ATD_FT_DOC_Reset_Flag	None	V_HIM_DFM_EffComp	None
V_ATD_FT_Doser_Reset_Flag	None	P_ATR_SFM_OperModeRqst	None
V_ATD_bs_PFS_Sensor_Status	HEX	P_OCD_ct_UsedUp_Diag	counts
V_ATM_OBD_Data_Reset	None	P_SFR_tm_Ineff_Dosing	s
V_ATP_trc_Ambient_Air	Deg_C	P_SFR_Regen_Trigger_State	None
V_OCR_fg_HC_Nominal	g/sec	C_OCD_bs_EngOut_UsedUp_Enbl	HEX
V_OCR_fg_HC_PreCorr	g/sec	C_OCD_bs_Sensor_UsedUp_Enbl	HEX
V_OCR_fg_HC_Corr	g/sec	C_OCD_fg_UsedUp_Thd	g/sec
V_ATM_fg_HC_Fdbk_Total	g/sec	C_OCD_trc_UsedUp_Thd	Deg_C
V_OCL_fg_HC_Final_Limit	g/sec	C_OCD_fg_System_UsedUp_Thd	g/sec
V_OCR_fg_HC_Cmd	g/sec	C_OCD_fg_PID_UsedUp_Thd	g/sec
V_ATP_trc_DOC_Out	Deg_C	C_OCD_fg_UsedUp_Low_Thd	g/sec
V_OCR_trc_T_Cmd	Deg_C	C_OCD_trc_UsedUp_AmbAirThd	Deg_C
V_ATM_PFS_gps_TorqueFuel	mg/stroke	C_OCD_ct_UsedUp_Thd	counts
V_SFR_Ineff_Regen_Detected_Flag	None	C_OCD_tm_UsedUp_Max	s
V_OCD_PID_UsedUp_Abort	None	C_OCD_tm_UsedUp	s
V_HIM_tm_DFM_Time	s	C_OCD_gps_UsedUp_FuelThd	mg/stroke

V_AIM_trc_DOC_In	Deg_C	C_OCD_UsedUp_Cntr_RqstID	None
V_AIM_trc_DOC_Out	Deg_C	C_OCD_ct_UsedUp_ScnTlOffset1	counts
V_ATP_trc_DOC_Out	Deg_C	C_OCR_Nominal_Cntrl_Gain	None
V_SFR_trc_Regen_Trgt	Deg_C	T_OCD_Fdbk_Usedup_Enbl	None
V_SFR_Regen_Stage	None	C_OCD_CSERS_Enbl	None
V_HIM_DFM_Eff	None		

(Click here for parameter list in Excel)

Frequent Regen – FC3375

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DPF_TOO_FREQUENT_REGEN_ERR

Aftertreatment Diesel Particulate Filter Regeneration too Frequent - Condition Exists

System error number: 3590

V_SFD_gph_TFR_AvgSootRate	g/hr	V_ATP_Engine_Running	None
P_SFD_gph_TFR_AccumSootRate	g/hr	MIL_Status	None
P_SFD_ct_TFR_AvgSootRate	None	C_SFR_gpl_Ineff_SOR	g/L
V_SFD_gph_TFRNOxidRate_DiagMB	g/hr	C_SFR_gpl_RegenOnSootLoad	g/L
V_SFD_gph_TFROxidRate_DiagMB	g/hr	C_SFD_bs_RegenTrigDiag	HEX
V_SFD_gph_TFRNetSootRate_DMB	g/hr	C_SFD_ct_TFR_NumDecToEnbl	None
CBM_PM_Out_Rate	g/hr	C_SFD_bs_TFR_DecHistMask	None
H_SFR_gpl_Regen_On_Soot_Load	g/L	C_SFD_ct_TFR_FailThd	None
P_SFP_gpl_Soot_Load_Reset_Val	g/L	C_SFD_bs_EngOutStatus_FR_Mask	HEX
P_SFD_gpl_TFR_EORThd	g/L	C_SFD_bs_SensorStatus_FR_Mask	HEX
P_SFP_mg_Ash_Since_Last_Reset	gm	C_SFD_bs_SysPerf1_FR_Mask	HEX
P_SFP_tm_SinceLastDeepClean	s	C_SFD_bs_SysPerf2_FR_Mask	HEX
P_SFR_tm_Ineff_Dosing	s	O_SFP_gpl_Soot_Load_Reset_En	None
P_SFR_tmh_SinceActiveRegen	hr	O_SFP_gpl_Soot_Load_Reset_Val	g/L
P_SFR_tmh_SinceReactRegen	hr	V_SFD_tmh_TFR_EstimateTime	hr
P_SFR_UreaDep_ReactRegenTrigger	None	P_SFD_tmh_TFR_ActualTime	hr
P_SFR_SCREff_ReactRegenTrigger	None	P_SFD_ct_TFR_DiagUpdate	None
P_SFR_Press_ReactRegenTrigger	None	V_SFD_ct_TFR_FailDecisions	None
V_SFR_Ineff_Regen_React	None	P_SFD_TFR_History	None
P_SFR_Regen_Trigger_State	None	T_SFD_IR_UseMin_DPSLE_En	None
V_SFP_mg_Soot_Load_Comb	gm	C_SFD_trc_RegenTrgtThd	Deg_C
V_SFP_mg_Soot_Load_DP	gm	C_SFD_fv_RegenMinFlow	m3/s
V_ATM_Persist_Data_Error	None	C_SFD_tm_AtFlowDebounce	s
V_ATM_OBD_Data_Reset	None	C_SFD_tm_Max_NotAtFlow	s
V_SFP_GreenFilter	None	C_SFD_pc_AtTrgt	%
P_SFP_GreenFilterInField	None	C_SFD_tm_SinceStage5	s
P_SFP_GreenFilterInPlant	None	C_SFD_gpl_DiagMBSLE_Thd	g/L
P_SFD_FR_UpdateEnabled	None	P_SFP_gpl_Soot_Load_MB_Diag	g/L
V_SFD_tmh_TFR_UpdateAtSOR	None		

(Click here for parameter list in Excel)

Incomplete Regen – FC3376

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DPF_INCOMPLETE_REGEN_ERR

Aftertreatment Diesel Particulate Filter Incomplete Regeneration - Condition Exists

System error number: 3036

H_SFP_nu_Exp_Arrhenius_Term	None	V_SFD_IncompleteRegenState	None
H_SFP_nu_O2_In_Norm	None	V_SFD_IncompleteRegenUpdt	None
P_SFD_IncompleteRegenMILUpdate	None	V_SFD_pc_AtTrgt	%
P_SFP_gpl_Soot_Load_MB_Diag	g/L	V_SFD_tm_NotAtFlow	s
P_SFP_gpl_Soot_Load_Reset_Val	g/L	V_SFP_fv_DPF	m3/s
P_SFR_Regen_Trigger_State	None	V_SFP_gph_NetSootAccumRate_DMB	g/hr
T_SFD_IncompleteRegenEnable	None	V_SFP_gph_Noxid_Rate_DiagMB	g/hr
V_ATD_bs_PFS_EngOut_Status	HEX	V_SFP_gph_Oxid_Rate_DiagMB	g/hr
V_ATD_bs_PFS_Sensor_Status	HEX	V_SFP_gpl_Soot_Load_Comb	g/L

V_ATM_OBD_Data_Reset	None	V_SFP_gpl_Soot_Load_DP	g/L
V_SFD_FlowOK	None	V_SFP_GreenFilter	None
V_SFD_gpl_DiagMBSLE_DPSLE_Thd	g/L	V_SFR_Ineff_Regen_Detected_Flag	None
V_SFD_gpl_IncompleteRegen_DPSLE	g/L	V_SFR_Regen_Stage	None
V_SFD_gpl_Min_DPSLE	g/L	V_SFR_trc_Regen_Trgt	Deg_C

(Click here for parameter list in Excel)

Regen Inhibit Switch - FC 4213

INHIBIT_SWITCH_RAT_ERR

Aftertreatment Diesel Particulate Filter Regeneration Inhibit Switch - Data erratic, intermittent or incorrect

System Error number: 6976

(atm_pfs_atd_lib.mdl\ATD\Diagnostics\OperatorInterface\InhitbitSwitchFH)

C_ATP_gpl_InhibitSwRat_SL_Thd	g/L	V_ATP_ApplicationLabel	None
C_ATP_tm_InhibitSw_SootLoad_Max	s	V_SFP_gpl_Soot_Load_Comb	g/L
C_ATP_tm_InhibitSw_SootLoad_Min	s	V_ATM_OBD_Data_Reset	None

(Click here for parameter list in Excel)

Related Codes / Sections:

No Regen OverTemp – FC3253, FC3255

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FC 3253: DOC_OUT_NR_SEVERE_TMPTR_ERR

Aftertreatment 1 Diesel Particulate Filter Intake Temperature - Data Valid But Above Normal Operating Range - Moderately Severe Level

System error number: 3069

FC 3253: DOC_DELTA_NR_SEVERE_TMPTR_ERR

Aftertreatment 1 Diesel Particulate Filter Intake Temperature - Data Valid But Above Normal Operating Range - Moderately Severe Level

System error number: 3070

FC 3255: DPF_DELTA_NR_SEVERE_TMPTR_ERR

Aftertreatment 1 Diesel Particulate Filter Outlet Temperature - Data Valid But Above Normal Operating Range - Moderately Severe Level

System error number: 3072

FC 3255: DPF_OUT_NR_SEVERE_TMPTR_ERR

Aftertreatment 1 Diesel Particulate Filter Outlet Temperature - Data Valid But Above Normal Operating Range - Moderately Severe Level

System error number: 3071

P_ATD_tm_NR_DOC_Hi_Delay	s	V_ATD_tm_NR_DOC_Delta_Hi	s
P_ATD_tm_NR_DPF_Hi_Delay	s	V_ATD_tm_NR_DOC_Out_Hi	s
V_AIM_trc_DOC_In_Status	None	V_ATD_tm_NR_DPF_Delta_Hi	s
V_AIM_trc_DOC_Out_Status	None	V_ATD_tm_NR_DPF_Out_Hi	s
V_AIM_trc_DOC_Out_Status	None	V_ATM_fg_HC_Fdbk_Total	g/sec
V_AIM_trc_DPF_Out_Status	None	V_ATP_Engine_Running	None
V_ATD_bs_PFS_Sensor_Status	HEX	V_ATP_trc_DOC_In	Deg_C
V_ATD_NR_OT_DOC_Delta_Enbl	None	V_ATP_trc_DOC_Out	Deg_C
V_ATD_NR_OT_DPF_Delta_Enbl	None	V_ATP_trc_DOC_Out	Deg_C
V_ATD_NR_Overtemp_DOC_Enbl	None	V_ATP_trc_DPF_Out	Deg_C
V_ATD_NR_Overtemp_DPF_Enbl	None	V_OCL_H2O_Desorb_Request	None
V_ATD_Regen_End	None	V_OCL_HC_Desorb_Request	None

(Click here for parameter list in Excel)

Related sections: DOC/DPF System Diagnostics

HIM (Hydrocarbon Injection Manager) Diagnostic – FC 2639, FC 1921, FC 1922, FC 1923, FC 1925, FC 1924, FC 1926, FC 1927, FC 1928, FC 1977, FC 1932, FC 1963, FC 2732, FC 2733, FC 2741, FC 2777, FC 2878, FC 2879, FC 2881, FC 3167, FC 3223, FC 3224, FC 3225

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FC 1921: DPF_SOOT_LOAD_HI_ERR
Aftertreatment Diesel Particulate Filter Differential Pressure - Data Valid But Above Normal Operating Range - Moderately Severe Level
System error number: 1887

FC 1922: DPF_SOOT_LOAD_SEVERE_ERR
Aftertreatment Diesel Particulate Filter Differential Pressure - Data valid but above normal operational range - Most Severe Level
System error number: 2097

FC 1923: DOSER_FSOV_PWM_HIGH_ERR
Aftertreatment Fuel Shutoff Valve Circuit - Voltage above normal, or shorted to high source
System error number: 3639

FC 1924: DOSER_FSOV_PWM_LOW_ERR
Aftertreatment Fuel Shutoff Valve Circuit - Voltage below normal, or shorted to low source
System error number: 3640

FC 1925: HC_DOSER_AMB_FTP_ERR
Aftertreatment Fuel Shutoff Valve - Data erratic, intermittent or incorrect
System error number:

FC 1926: HC_DOSERP_INRANGE_ERR
Aftertreatment Fuel Pressure Sensor - Data erratic, intermittent or incorrect
System error number: 2837

FC 1927: HC_DOSERP_OOR_HI_ERR
Aftertreatment Fuel Pressure Sensor Circuit - Voltage above normal, or shorted to high source
System error number: 2838

FC1928: HC_DOSERP_OOR_LO_ERR
Aftertreatment Fuel Pressure Sensor Circuit - Voltage below normal, or shorted to low source
System error number: 2839

FC 1932: HC_DOSER_SYS_LEAK_ERR
Aftertreatment Doser - Data erratic, intermittent or incorrect
System error number: 2960

FC 1963: DFSOV_FTO_ERR
Aftertreatment Fuel Shutoff Valve - Mechanical system not responding or out of adjustment
System error number: 2465

FC 1977: UREA_DOSER_INJ_ELEC_ERR

Aftertreatment Doser Circuit - Current below normal or open circuit.
System error number: 5102

FC 2639: DPF_SOOT_LOAD_MEDIUM_ERR
Aftertreatment Diesel Particulate Filter Differential Pressure - Data Valid But Above Normal Operating Range - Least Severe Level
System error number: 2096

FC 2881: HC_DOSER_FUEL_RESTRICT_ERR
Aftertreatment Fuel Pressure Sensor - Data Valid But Below Normal Operating Range - Least Severe Level
System error number: 2961

FC 3167: DOSER_USEDUP_DFM_ERR
Aftertreatment Doser - Data Valid But Below Normal Operating Range - Moderately Severe Level
System error number: 4748

FC 3223: DOSER_ASOV_PWM_LOW_ERR
Aftertreatment Purge Air Actuator Circuit - Voltage below normal, or shorted to low source
System error number: 3581

FC 3224: DOSER_ASOV_PWM_HIGH_ERR
Aftertreatment Purge Air Actuator Circuit - Voltage above normal, or shorted to high source
System error number: 3580

FC 3225: ASOV_FTO_ERR
Aftertreatment Purge Air Actuator - Mechanical system not responding or out of adjustment
System error number: 3073

Decarb	
C_HIM_DDC_Logic_Enbl	None
H_HIM_DDC_tm_No_Dose	s
H_HIM_fg_ATM_HC_Cmd	g/sec
H_HIM_PRR_Pressure_High	None
T_HIM_DIAG_Test_Enbl	None
V_HIM_DDC_Rqst	None
V_HIM_DIAG_AirPurgeRqst	None
V_HIM_DIAG_Pressure_Test_Comp	None

Restriction	
H_HIM_DIAG_Leak_Test_Failed	None
H_HIM_DIAG_Pressure_Test_Failed	None
H_HIM_DIAG_tm_RestrictTest	s
H_HIM_DIAG_tm_RestrictTestFail	s
H_HIM_fg_ATM_HC_Cmd	g/sec
H_HIM_pr_Inj_Fuel_Press_Comp	kPa
O_HIM_DIAG_RestrictTest_Enbl	None
P_ATR_SFM_OperModeRqst	None
T_HIM_DIAG_Test_Enbl	None
V_ATD_DisableDosing	None
V_HIM_DFSOV_Cmd	None
V_HIM_DFSOV2_Cmd	None
V_HIM_DIAG_Amb_Test_Failed	None
V_HIM_DIAG_Pressure_Test_Comp	None
V_HIM_DIAG_RestrictTestFail	None
V_HIM_DIAG_RestrictTestPass	None
V_HIM_FT_Test_Active	None

Pressure Relief	
H_HIM_pr_Inj_Fuel_Press_Comp	kPa
H_HIM_PRR_Blocked	None

Pressure Test	
H_HIM_DIAG_fg_Pressure_Test_Cmd	g/sec
H_HIM_DIAG_Leak_Test_Active	None
H_HIM_DIAG_Pressure_DFSOV_Cmd	None
H_HIM_DIAG_Pressure_DFSOV2_Cmd	None
H_HIM_DIAG_Pressure_Test_Active	None
H_HIM_DIAG_Pressure_Test_Failed	None
H_HIM_DIAG_tm_Pressurize_Delay	s
H_HIM_fg_ATM_HC_Cmd	g/sec
O_HIM_DIAG_Pressure_Test_Enbl	None
P_ATR_SFM_OperModeRqst	None
T_HIM_DIAG_Test_Enbl	None
V_ATD_DisableDosing	None
V_HIM_DIAG_After_Regen_Active	None
V_HIM_DIAG_AirPurgeRqst	None
V_HIM_DIAG_Before_Regen_Active	None
V_HIM_DIAG_ct_Press_Test_Retry	counts
V_HIM_DIAG_DDC_Air_Purge_Rqst	None
V_HIM_DIAG_Press_Error	None
V_HIM_DIAG_Pressure_DFSOV_Cmd	None
V_HIM_DIAG_Pressure_DFSOV2_Cmd	None
V_HIM_DIAG_Pressure_Doser_Cmd	None
V_HIM_DIAG_Pressure_Test_Comp	None
V_HIM_DIAG_Pressure_Test_State	None
V_HIM_Engine_Running	None
V_HIM_FT_Test_Active	None

ASOVFTO and Stuck	
V_HIM_DIAG_ASOV_FTO	None
V_HIM_DIAG_ASOV_FTO_Update	None
V_HIM_DIAG_InRange_Update	None
V_HIM_DIAG_pr_Ambient	kPa
V_HIM_DIAG_pr_ASOV_FTO	kPa

H_HIM_PRR_Burst_Blocked	None
H_HIM_PRR_Burst_Pressure_High	None
H_HIM_PRR_Enabled	None
H_HIM_PRR_Pressure_High	None
P_HIM_PRR_ct_Burst	counts
T_HIM_DIAG_Test_Enbl	None
V_HIM_DFSOV_Cmd	None
V_HIM_DIAG_NoDrain	None
V_HIM_DIAG_Pressure_Test_Comp	None
V_HIM_PRR_Burst_Active	None
V_HIM_PRR_fg_Burst_Cmd	g/sec
V_HIM_PRR_fg_Cmd	g/sec
V_HIM_PRR_Rqst	None

General

H_HIM_DIAG_fg_Pressure_Test_Cmd	g/sec
H_HIM_DIAG_Pressure_DFSOV_Cmd	None
H_HIM_DIAG_Pressure_DFSOV2_Cmd	None
H_HIM_DIAG_tm_Pressure_Test	s
H_HIM_pr_Inj_Fuel_Press_Comp	kPa
O_HIM_tm_Plant_Fuel_Fill_Value	s
V_AIM_pr_HC_DoserP_Status	None
V_ATM_Exhaust_Data_To_PFS[1]	None
V_ATR_fg_HC_Fdbk_from_HIM	g/sec
V_HIM_bs_DiagStatus	HEX
V_HIM_DIAG_After_Regen_Active	None
V_HIM_DIAG_Air_Purge_Active	None
V_HIM_DIAG_Air_Purge_Low_HC	None
V_HIM_DIAG_Amb_Pause_Active	None
V_HIM_DIAG_Before_Regen_Active	None
V_HIM_DIAG_Fuel_Fill_Active	None
V_HIM_DIAG_Integration_Complete	None
V_HIM_DIAG_mg_Integration	g
V_HIM_DIAG_pr_Air_Leak	kPa
V_HIM_DIAG_pr_Ambient	kPa
V_HIM_DIAG_pr_ASOV_FTO	kPa
V_HIM_DIAG_pr_ASOV_PreFTO	kPa
V_HIM_DIAG_pr_Decay_To_Amb_Init	kPa
V_HIM_DIAG_pr_DFSOV_FTO	kPa
V_HIM_DIAG_pr_Doser_FTP	kPa
V_HIM_DIAG_pr_Fuel_Leak	kPa
V_HIM_DIAG_pr_PreAir_Leak	kPa
V_HIM_DIAG_pr_SOV_Leak	kPa
V_HIM_DIAG_Pressure_DFSOV_Cmd	None
V_HIM_DIAG_Pressure_DFSOV2_Cmd	None
V_HIM_DIAG_Pressure_Doser_Cmd	None
V_HIM_DIAG_Pressure_Test_State	None
V_HIM_DIAG_Tip_Dry_Complete	None
V_HIM_fg_HC_Final_Limit	g/sec

SOV Leak

V_HIM_DIAG_pr_Ambient	kPa
V_HIM_DIAG_pr_SOV_Leak	kPa
V_HIM_DIAG_SOV_Leak	None
V_HIM_DIAG_SOV_Leak_Update	None
V_HIM_DIAG_pr_ASOV_PreFTO	kPa
V_HIM_DIAG_pr_DFSOV_FTO	kPa
V_HIM_DIAG_Stuck_Test	None

Air Leak

V_HIM_DIAG_Air_Leak_Test	None
V_HIM_DIAG_pr_Air_Leak	kPa
V_HIM_DIAG_pr_PreAir_Leak	kPa
V_HIM_DIAG_System_Leak_Update	None

Ambient Press Check

V_HIM_DIAG_Amb_Test_Failed	None
V_HIM_DIAG_ASOV_FTO	None
V_HIM_DIAG_Doser_FTP	None
V_HIM_DIAG_pr_Ambient	kPa
V_HIM_DIAG_SOV_Leak_Update	None

DFSOV2FTO

V_HIM_DIAG_DFSOV2_FTO	None
V_HIM_DIAG_DFSOV2_FTO_Update	None
V_HIM_DIAG_pr_ASOV_FTO	kPa
V_HIM_DIAG_pr_ASOV_PreFTO	kPa

DFSOVFTO

V_HIM_DIAG_DFSOV_FTO	None
V_HIM_DIAG_DFSOV_FTO_Update	None
V_HIM_DIAG_pr_Ambient	kPa
V_HIM_DIAG_pr_DFSOV_FTO	kPa

DFSOV Swap

V_HIM_DIAG_DFSOV_Swap	None
V_HIM_DIAG_DFSOV_Swap_Update	None
V_HIM_DIAG_pr_Ambient	kPa
V_HIM_DIAG_pr_DFSOV_FTO	kPa
V_HIM_DIAG_pr_SOV_Leak	kPa

Doser FTP

V_HIM_DIAG_Doser_FTP	None
V_HIM_DIAG_pr_Air_Leak	kPa
V_HIM_DIAG_pr_Doser_FTP	kPa
V_HIM_DIAG_SOV_Leak_Update	None

Fuel Leak

V_HIM_DIAG_Fuel_Leak_Test	None
V_HIM_DIAG_pr_DFSOV_FTO	kPa
V_HIM_DIAG_pr_Fuel_Leak	kPa
V_HIM_DIAG_System_Leak_Update	None

Pressure Rationality

V_HIM_DIAG_ASOV_FTO	None
V_HIM_DIAG_Doser_FTP	None
V_HIM_DIAG_InRange_Update	None
V_HIM_DIAG_pr_Ambient	kPa
V_HIM_DIAG_pr_ASOV_FTO	kPa
V_HIM_DIAG_pr_DFSOV_FTO	kPa
V_HIM_DIAG_pr_Fuel_Leak	kPa
V_HIM_DIAG_pr_SOV_Leak	kPa

(Click here for parameter list in Excel)

Aftertreatment Performance

Aftertreatment Regeneration / Triggers

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(sfm_sfr_lib.mdl)

Engine_Speed	RPM	V_ATP_Exhaust_Data_To_SFM[0]	None
Ambient_Air_Tmptr	Deg_C	V_ATP_KeySwitch	None
CBR_Alpha	None	V_ATP_Oper_Mode_Permitted	HEX
CBR_Chi_Table_Mask	HEX	V_ATP_pr_Ambient_Air	kPa
EAC_EGR_Valve_Cmd	%	V_ATP_vl_Vehicle_Speed	km/hr
Filtered_Turbo_Speed	KRPM	V_ATR_NonMissionRegenActive	None
H_SFP_fv_Unfiltered	m3/s	V_ATR_Oper_Mode_to_SFM	None
H_SFP_gph_Noxid_Rate	g/hr	V_ATR_trc_HiTrgt_Cmd_to_SFM	Deg_C
H_SFP_gph_Oxid_Rate	g/hr	V_OCL_HC_Desorb_Request	None
H_SFR_fg_LLim	g/sec	V_SFP_DeepCleanRqst	None
H_SFR_Forced_Regen_Flag	None	V_SFP_DPSLE_Faulty_Flag	None
H_SFR_gpl_Regen_On_Soot_Load	g/L	V_SFP_FiltNormSCREff	None
H_SFR_OpMode	None	V_SFP_gpl_Soot_Load_Comb	g/L
H_SFR_Plateau_Time_Reached	None	V_SFP_GreenFilter	None
H_SFR_Regen_Trgt_Vec[0]	None	V_SFP_mg_Soot_Load_DP	gm
H_SFR_tm_Plateau_Failure	s	V_SFP_NXGRL_ReactRegen_Trigger	None
Net_Engine_Torque	N_m	V_SFP_pc_NormRegenTrigger	%
O_SFR_Regen_Trigger_On	None	V_SFP_pr_Max_At_High_Flow	kPa
P_SFP_GreenFilterInPlant	None	V_SFP_SCREff_ReactRegenRun	None
P_SFR_ct_Ineff_Regen_Occr	counts	V_SFP_trc_DPF_Bed	Deg_C
P_SFR_ct_RegenRestarts	counts	V_SFR_ct_NMIneff_SpecialDen	counts
P_SFR_NMTmRegenTrig	None	V_SFR_DelayTimerReset	None
P_SFR_Press_ReactRegenTrigger	None	V_SFR_DifficultRegenFlag	None
P_SFR_Regen_Trigger_State	None	V_SFR_DR_StoppedEarly_Flag	None
P_SFR_Regen_Trigger_State_local	None	V_SFR_fg_Min_Flow_Rate	g/sec
P_SFR_SCREff_ReactRegenTrigger	None	V_SFR_gpl_RegenOffSootLoad_Thd	g/L
P_SFR_TimerCleaningRqst	None	V_SFR_Ineff_DPF_Reward	None
P_SFR_tm_Ineff_Dosing	s	V_SFR_Ineff_Regen_Detected_Flag	None
P_SFR_tmh_DelayTimerResetWindow	hr	V_SFR_Ineff_Regen_React	None
P_SFR_tmh_ElapsedCleaningTime	hr	V_SFR_IneffNMRegen	None
P_SFR_tmh_ReactElapsedCleanTime	hr	V_SFR_IneffNMRegen_Trig	None
P_SFR_tmh_SinceActiveRegen	hr	V_SFR_IneffOccCtrClr	None
P_SFR_tmh_SinceActiveRegen	hr	V_SFR_Normal_Regen_End	None
P_SFR_tmh_SinceReactRegen	hr	V_SFR_pc_NormDeltaP_Trig	%
P_SFR_UreaDep_ReactRegenTrigger	None	V_SFR_pc_NormSootLoad_Trig	%
TGC_VT_Cmd	%	V_SFR_pc_NormTime_Trig	%
V_AIM_trc_DOC_In	Deg_C	V_SFR_ppm_Max_Inlet_HC	ppm
V_AIM_trc_DOC_Out	Deg_C	V_SFR_Regen_Stage	None
V_AIM_trc_DPF_Out	Deg_C	V_SFR_Regen_Trigger	None
V_ATD_bs_PFS_EngOut_Status	HEX	V_SFR_Regen_Trigger_State_Ext	None
V_ATD_bs_PFS_Sensor_Status	HEX	V_SFR_RegenDurationExpired	None
V_ATD_FT_DOC_Reset_Flag	None	V_SFR_RegenDurationExpired	None
V_ATD_FT_Doser_Reset_Flag	None	V_SFR_tm_AutoNMRDur	s
V_ATD_FT_Filter_Reset_Flag	None	V_SFR_tm_Warmup_Rqst	s
V_ATD_StopRegen	None	V_SFR_trc_Cmd	Deg_C
V_ATD_tm_DPFOutP_Hi	s	V_SFR_trc_dt_RegenRampRate	deg_C/s
V_ATM_fg_HC_Fdbk_Total	g/sec	V_SFR_trc_dt_WarmupRampRate	deg_C/s
V_ATM_OBD_Data_Reset	None	V_SFR_trc_Regen_Trgt	Deg_C
V_ATM_Persist_Data_Error	None	V_SFR_trc_Regen_Trgt	Deg_C
V_ATM_Persist_Data_Error	None	V_SFR_trc_Warmup_Trgt	Deg_C
V_ATP_AutoNMR_Permit	None	O_SFR_trc_RegenTrgt_Val	Deg_C
V_ATP_Engine_Running	None	O_SFR_trc_RegenTrgt_Enbl	None

(Click here for parameter list in Excel)

Aftertreatment Soot Load

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Engine_Speed	RPM	V_ATR_NMRegenTriggerSource	None
CBR_Alpha	None	V_ATR_NonMissionRegenActive	None
CBR_Chi_Table_Mask	None	V_ATR_Oper_Mode_to_SFM	None
Filtered_Turbo_Speed	KRPM	V_SFD_FlowOK	None
H_SFM_TrustFactorEquivalent	None	V_SFD_Soot_Load_High_Flag	None
H_SFP_ConsMBSLR	None	V_SFD_Soot_Load_Medium_Flag	None
H_SFP_DPTrust_Fctr_Adjusted	None	V_SFM_fg_Mass_Flow_Out	g/sec
H_SFP_DPTrust_Fctr_Unlimited	None	V_SFM_fg_O2_Out	g/sec
H_SFP_gph_Oxid_Rate	g/hr	V_SFM_ppm_NO2_Out	ppm
H_SFP_HighTrustTblUsed	None	V_SFM_ppm_NOx_Out	ppm
H_SFP_MBSLRSensorErrors	None	V_SFP_DeltaPSaturated	None
H_SFP_nu_Exp_Arrhenius_Term	None	V_SFP_DPSLE_Faulty_Flag	None
H_SFP_nu_O2_In_Norm	None	V_SFP_fv_DPF	ACMS
H_SFP_nu_Soot_Load_Norm	None	V_SFP_gph_NetSootAccumRate	g/hr
H_SFP_tc_DPTrust_To_Time	S	V_SFP_gph_Noxid_Hi_Rate	g/hr
H_SFP_tm_DeltaPNotSaturated	S	V_SFP_gph_Noxid_Lo_Rate	g/hr
Net_Engine_Torque	N_m	V_SFP_gph_Oxid_Calc	g/hr
P_SFP_ct_Incomp_Regen_Ext	None	V_SFP_gph_Oxid_Hi_Rate	g/hr
P_SFP_ct_Incomp_Regen_Ext	None	V_SFP_gpl_Current_SootLoadComb	g/l
P_SFP_DPSLE_DPF_TrustCond	None	V_SFP_gpl_Filter_Oper_Range	g/L
P_SFP_gpl_DPSLE_Adj	g/l	V_SFP_gpl_Soot_Load_Comb	g/l
P_SFP_gpl_Soot_Load_DP	g/L	V_SFP_gpl_Soot_Load_DP	g/l
P_SFP_gpl_Soot_Load_MB	g/L	V_SFP_gpl_Soot_Load_MB	g/l
P_SFP_gpl_Soot_Load_Reset_Val	g/l	V_SFP_GreenFilter	None
P_SFP_gpl_Soot_Load_Reset_Val	g/L	V_SFP_mg_Filter_Oper_Range	gm
P_SFP_Soot_Stage	None	V_SFP_mg_Soot_Load_Comb	Gm
P_SFR_ct_Ineff_Regen_Occr	Counts	V_SFP_mg_Soot_Load_DP	Gm
P_SFR_Regen_Trigger_State	None	V_SFP_mg_Soot_Load_MB	Gm
P_SFR_tmh_ElapsedCleaningTime	hr	V_SFP_pc_SootLoad	%
V_AIM_tm_FT_ForcedNMRegen	s	V_SFP_pr_Delta	kPa
V_AIM_trc_DOC_In	Deg_C	V_SFP_pr_Delta_Clean	kPa
V_AIM_trc_DOC_Out	Deg_C	V_SFP_pr_Delta_High	kPa
V_AIM_trc_DPF_Out	Deg_C	V_SFP_pr_Delta_Low	kPa
V_ATD_bs_PFS_EngOut_Status	HEX	V_SFP_pr_Delta_Mid	kPa
V_ATD_bs_PFS_Sensor_Status	HEX	V_SFP_pr_DpEst	kPa
V_ATD_FT_Filter_Reset_Flag	None	V_SFP_pr_Max_At_High_Flow	kPa
V_ATM_OBD_Data_Reset	None	V_SFP_pr_Max_At_High_Flow	kPa
V_ATM_Oper_Mode	None	V_SFP_tmh_StatRegen_RemTime	hr
V_ATP_ApplicationLabel	None	V_SFR_DR_StoppedEarly_Flag	None
V_ATP_Engine_Running	None	V_SFR_gpl_RegenOffSootLoad_Thd	g/l
V_ATP_pr_DPF_Delta	kPa	V_SFR_Ineff_Regen_Detected_Flag	None
V_ATP_trc_DPF_Out	Deg_C	V_SFR_IneffNMRegen_Trig	None

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After-Treatment Parameter Estimates

Engine Out PM Estimate

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Fuel_Delivery_Rate_Per_Min	kg/min	H_PME_FuelDeliveryAftGain	g/hr
Engine_Speed	RPM	H_PME_MCF_Cmd_Filtered	kg/min
CBM_Comb_Load_Ref	None	H_PME_PM_Factor_AFR	None
CBM_Fdbk_AccumulatorPress	bar_A	H_PME_PM_Factor_AFR_Ref	None
CBM_FdbkTorqueFuel	mg/stroke	H_PME_PM_Factor_EGR_Frac	None
CBM_PM_Out_Frac	None	H_PME_PM_Factor_EGRSOI	None
CBM_PM_Out_PPM	None	H_PME_PM_Factor_Fuel	None
CBM_PM_Out_Rate	g/hr	H_PME_PM_Factor_PRS	None
CBP_Air_Fuel_Ratio	None	H_PME_PM_Factor_PRSPIF	None
CBR_Main_SOI	deg_BTDC	H_PME_PM_Factor_SOI	None
Charge_Flow	kg/min	H_PME_PM_Factor_Speed	None
CHL_MCF_Cmd	kg/min	H_PME_PMFuel	mg/stroke
EGR_Fraction	None	H_PME_SootRateClamped	g/hr
Exhaust_Flow_Status	None	H_PME_SootRateUnclamped	g/hr
Fresh_Air_Flow_Status	None	H_PME_SootRateUnclamped_Ref	g/hr
H_CBM_PM_Out_Frac_Status	None	PME_GainFactor	None
H_PME_Air_Fuel_Ratio_Ref	None	PME_M270_SootRate_Ref	g/hr

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DeltaP Soot Load Estimate

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Engine_Speed	RPM	V_SFP_DeltaPSaturated	None
H_SFP_fv_Unfiltered	m3/s	V_SFP_gpl_Soot_Load_Comb	g/L
H_SFP_gpl_Soot_Load	g/L	V_SFP_gpl_Soot_Load_DP_NoClamp	g/L
H_SFP_Min_Flow_Trust	None	V_SFP_mg_Soot_Load_DP	gm
H_SFP_pr_MBPE	kPa	V_SFP_pr_Delta	kPa
H_SFP_tm_DeltaPNotSaturated	s	V_SFP_pr_Delta_Clean	kPa
P_SFP_gpl_DPSLE_Adj	g/L	V_SFP_pr_Delta_High	kPa
P_SFP_gpl_Soot_Load_DP	g/L	V_SFP_pr_Delta_Low	kPa
P_SFP_mg_Soot_Load_DP	gm	V_SFP_pr_Delta_Mid	kPa
V_ATP_Exhaust_Data_To_SFM	None	V_SFP_pr_DpEst	kPa
V_ATP_pr_DPF_Delta	kPa	V_SFP_pr_Max_At_High_Flow	kPa
V_ATP_trc_DPF_Out	Deg_C	V_SFP_trc_DPF_Bed	Deg_C
V_ATR_Oper_Mode_to_SFM	None		

(Click here for parameter list in Excel)

Mass Balanced Soot Load Estimate

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H_SFP_ConsMBSLR	None	V_ATR_Oper_Mode_to_SFM	None
H_SFPfv_Unfiltered	m3/s	V_SFM_fg_Mass_Flow_Out	g/sec
H_SFP_gph_Noxid_Rate	g/hr	V_SFM_fg_O2_Out	g/sec
H_SFP_gph_Oxid_Rate	g/hr	V_SFM_ppm_NOx_Out	ppm
H_SFP_MBSLRSensorErrors	None	V_SFP_gph_NetSootAccumRate	g/hr
H_SFP_nu_Exp_Arrhenius_Term	None	V_SFP_gph_Noxid_Hi_Rate	g/hr
H_SFP_nu_O2_In_Norm	None	V_SFP_gph_Noxid_Lo_Rate	g/hr
H_SFP_nu_Soot_Load_Norm	None	V_SFP_gph_Oxid_Calc	g/hr
P_SFP_gpl_Soot_Load_MB	g/L	V_SFP_gph_Oxid_Hi_Rate	g/hr
P_SFR_ct_Ineff_Regen_Occr	counts	V_SFP_gpl_Filter_Oper_Range	g/L
V_ATD_bs_PFS_EngOut_Status	HEX	V_SFP_gpl_Soot_Load_Comb	g/L
V_ATP_Engine_Running	None	V_SFP_gpl_Soot_Load_MB	g/L
V_ATP_Exhaust_Data_To_SFM[0]	None	V_SFP_mg_Soot_Load_MB	gm
V_ATP_Exhaust_Data_To_SFM[0]	None	V_SFP_NOxidRate_SootNOxCalc	None
V_ATP_pr_DPF_Delta	kPa	V_SFP_trc_DPF_Bed	Deg_C
V_ATP_trc_DPF_Out	Deg_C		

(Click here for parameter list in Excel)

Aftertreatment Overrides

User Overrides

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Description	Parameter	Override Enable	Override Value
Engine Torque	Net_Engine_Torque	O_AIM_tq_EngineTorque_Enbl	O_AIM_tq_EngineTorque_Val
Turbo out mass flow	V_ATP_fg_Turbo_Out	O_AIM_fg_TrbnOut_Enbl	O_AIM_fg_TrbnOut_Val
Torque Fueling	V_ATP_mg_TotalFuelingPerStroke	O_AIM_mg_TotalFueling_Enbl	O_AIM_mg_TotalFueling_Val
Turbo out NO2	V_ATP_ppm_Turbo_Out_NO2	O_AIM_ppm_TrbnOutExh_NO2_Enbl	O_AIM_ppm_TrbnOutExh_NO2_Val
Turbo out NOx	V_ATP_ppm_Turbo_Out_NOx	O_AIM_ppm_TrbnOutExh_NOx_Enbl	O_AIM_ppm_TrbnOutExh_NOx_Val
Turbo out O2	V_ATP_fg_Turbo_Out_O2	O_AIM_fg_TrbnOutExh_O2_Enbl	O_AIM_fg_TrbnOutExh_O2_Val
Turbo out HC target feedback	V_ATP_fg_Turbo_Out_HC	O_AIM_fg_TrbnOutHCTrgtFdbk_Enbl	O_AIM_fg_TrbnOutHCTrgtFdbk_Val
Turbo Out PM	V_ATP_gph_Turbo_Out_PM	O_AIM_gph_TrbnOutExh_PM_Enbl	O_AIM_gph_TrbnOutExh_PM_Val
Non-Mission Regen Switch	V_ATP_NMRegen_Switch	O_AIM_NMRegen_Sw_Enbl	O_AIM_NMRegen_Sw_Val
Permit Switch	V_ATP_Permit_Switch	O_AIM_PermitSwEnbl	O_AIM_PermitSwVal
Chassis Secure Switch	V_AIM_NMChassisSecSwitch	O_AIM_NMChassisSecSwEnbl	O_AIM_NMChassisSecSwVal
DPF Pressure Delta	V_AIM_pr_DPF_DeltaP	O_AIM_pr_DPF_DeltaP_Enable	C_AIM_pr_DPF_DeltaP_Default
HC Doser pressure	V_AIM_pr_HC_DoserP	O_AIM_pr_HC_DoserP_Enable	C_AIM_pr_HC_DoserP_Default
Turbo out pressure	V_ATP_pr_Turbo_Out	O_AIM_pr_TrbnOut_Enbl	O_AIM_pr_TrbnOut_Val
DPF out pressure	V_AIM_prg_DPF_OutP	O_AIM_prg_DPF_OutP_Enable	C_AIM_prg_DPF_OutP_Default
DOC In Temperature	V_AIM_trc_DOC_In	O_AIM_trc_DOC_In_Enable	C_AIM_trc_DOC_In_Default
DOC Out Temperature	V_AIM_trc_DOC_Out	O_AIM_trc_DOC_Out_Enable	C_AIM_trc_DOC_Out_Default
DPF Out Temperature	V_AIM_trc_DPF_Out	O_AIM_trc_DPF_Out_Enable	C_AIM_trc_DPF_Out_Default
SCR Mid Temperature	V_AIM_trc_SCR_T1	O_AIM_trc_SCR_T1_Enable	C_AIM_trc_SCR_T1_Default
SCR Out Temperature	V_AIM_trc_SCR_Out	O_AIM_trc_SCR_Out_Enable	C_AIM_trc_SCR_Out_Default
Turbo Out Temperature	V_ATP_trc_Turbo_Out	O_AIM_trc_TrbnOut_Enbl	O_AIM_trc_TrbnOut_Val
Operation Mode permitted from EXM	V_ATP_Oper_Mode_Permitted	O_ATP_Oper_Mode_Permitted_Enbl	O_ATP_Oper_Mode_Permitted_Val
Vehicle Speed	V_ATP_vl_Vehicle_Speed	O_ATP_vl_Vehicle_Speed_Enbl	O_ATP_vl_Vehicle_Speed_Val
Non Mission Regen	V_ATR_NonMissionRegenActive	O_ATR_NMRegen_Enbl	O_ATR_NMRegen_Val
Non Mission Regen Switch	V_ATP_NMRegen_Switch	O_AIM_NMRegen_Sw_Enbl	O_AIM_NMRegen_Sw_Val
Aftertreatment Operating Mode	V_ATM_Oper_Mode	O_ATR_Oper_Mode_Enbl	O_ATR_Oper_Mode_Val
SCR Regen	V_ATR_SCR_Regen_Mode	O_ATR_SCR_Regen_Enbl	O_ATR_SCR_Regen_Val
Desoot Mode Request	P_ATR_SFM_OperModeRqst	O_ATR_SFM_OperModeRqst_Enbl	O_ATR_SFM_OperModeRqst_Enbl
AT Fuel Shut-Off Valve	V_HIM_DFSOV_Cmd	O_HIM_DFSOV_Control_Enbl	O_HIM_DFSOV_Control_Value
	V_DDD_FSOV_Cmd	O_DDD_FSOV_Cmd_Enbl	O_DDD_FSOV_Cmd_Val
AT Drain Shut-	V_HIM_DFSOV2_Cmd	O_HIM_DFSOV2_Control_Enbl	O_HIM_DFSOV2_Control_Value

Off Valve	V_DDD_SOV2_Cmd	O_DDD_SOV2_Cmd_Enbl	O_DDD_SOV2_Cmd_Val
Max HC slip fueling	V_HIM_fg_HC_Final_Limit	O_HIM_fg_DIAG_OCL_Limit_Enbl	O_HIM_fg_DIAG_OCL_Limit_Val
Doser fueling cmd	H_HIM_fg_Dosing_Cmd	O_HIM_fg_Inj_Cmd_Enbl	O_HIM_fg_Inj_Cmd_Value
Doser injector on time	H_HIM_tm_Inj_On	O_HIM_tm_Inj_On_Enbl	O_HIM_tm_Inj_On_Value
	V_DDD_tmu_Inj_Ontime	O_DDD_tmu_Inj_OnTime_Enbl	O_DDD_tmu_Inj_OnTime_Val
Injector Period for 1 doser injection	V_DDD_tmu_Inj_Period	O_DDD_tmu_Inj_Period_Enbl	O_DDD_tmu_Inj_Period_Val
OCR Dosing Command	V_OCR_fg_HC_Cmd	O_OCR_fg_HC_Inj_Enbl	O_OCR_fg_HC_Inj_Val
Soot load reset	P_SFP_gpl_Soot_Load_Reset_Val	O_SFP_gpl_Soot_Load_Reset_En	O_SFP_gpl_Soot_Load_Reset_En
DPSLE Adjustment	P_SFP_gpl_DPSLE_Adj	O_SFP_gpl_DPSLE_Adj_Enbl	O_SFP_gpl_DPSLE_Adj_Val
DFM Algorithm	V_HIM_DFS_Ctrl_Start	O_HIM_DFM_Enbl	O_HIM_DFM_Val
Regen Override	V_SFR_Regen_Trigger	O_SFR_Regen_Trigger_On	n/a
Regeneration stage	V_SFR_Regen_Stage	O_SFR_RegenStage_Enbl	O_SFR_RegenStage_Val
Regeneration target	V_SFR_trc_Regen_Trgt	O_SFR_trc_RegenTrgt_Enbl	O_SFR_trc_RegenTrgt_Val
SCM Exhaust mass flow	V_ATP_Exhaust_Data_To_SCM[1]	O_AIM_fg_EngExhMassFlow_Enbl	O_AIM_fg_EngExhMassFlow_Val
SCM Exhaust pressure	V_ATP_Exhaust_Data_To_SCM[2]	O_AIM_pr_SCRExhPress_Enbl	O_AIM_pr_SCRExhPress_Val
SCM Exhaust O2 mass flow	V_ATP_Exhaust_Data_To_SCM[4]	O_AIM_fg_SCR_In_ExhO2_Enbl	O_AIM_fg_SCR_In_ExhO2_Val
SCM Exhaust HC mass flow	V_ATP_Exhaust_Data_To_SCM[5]	O_AIM_fg_SCR_In_ExhHC_Enbl	O_AIM_fg_SCR_In_ExhHC_Val
SCM Exhaust PM mass flow	V_ATP_Exhaust_Data_To_SCM[7]	O_AIM_fgh_SCR_In_ExhPM_Enbl	O_AIM_fgh_SCR_In_ExhPM_Val
SCR In NOx	V_ATP_ppm_SCR_In_NOx	O_ATP_ppm_SCR_In_NOx_Val	O_ATP_ppm_SCR_In_NOx_Enbl
NH3 Sensor Value	V_AIM_ppm_NH3	O_AIM_ppm_NH3_Enbl	O_AIM_ppm_NH3_Val
Urea Injection Rate	V_SCL_flm_UreaInjCmd	O_SCL_flm_UreaInjRate_Enbl	O_SCL_flm_UreaInjRate_Val
USM Urea Dosing Command	V_USM_flm_DosingCmd	O_USM_flm_DosingCmd_Val	O_USM_flm_DosingCmd_Enbl
USM Ready to Dose Flag	V_USM_ReadyToDose	O_USM_ReadyToDose_Enbl	O_USM_ReadyToDose_Val
Urea Supply Module Power Control off	V_USM_PowerCtrl_Off	O_USM_PwrCtrl_Off_Enbl	O_USM_PwrCtrl_Off_Val
NH3 Feedback ANR Command	V_SCR_NH3Fdbk_ANR_Cmd	O_SCR_MBNC_ANR_Cmd_Ovrd_Enbl	O_SCR_MBNC_ANR_Cmd_Ovrd_Val
NH3 Reference Table Selection	V_SCR_NH3_Ref_State	O_SCR_NH3_Ref_State_Enbl	O_SCR_NH3_Ref_State_Val
Final Mid-Cat NH3 Reference	V_SCR_ppm_MidCatNH3_Ref	O_SCR_ppm_NH3Ref_Ovrd_Enbl	O_SCR_ppm_NH3Ref_Ovrd_Val
Urea Doser Prime Status	V_SCL_PrimeCondtActive	O_UIM_PumpCondt_Val	O_UIM_PumpCondt_Enbl
Urea Dosing State	V_USM_SysStateFdbk	O_USM_FdbkState_Enbl	O_USM_FdbkState_Val
Tailpipe NH3 Slip Target	V_ATP_ppm_Tailpipe_NH3_Lim	O_ATP_ppm_Tailpipe_NH3_Lim_Val	O_ATP_ppm_Tailpipe_NH3_Lim_Val
Heating for tank & doser	V_ATP_SCR_GlobalHeating_Enable	O_AIM_GlobalHeating_Enbl	O_AIM_GlobalHeating_Val
Urea Pump Pressure	V_AIM_prg_UreaPumpP	O_AIM_prg_UreaPumpP_Enable	C_AIM_prg_UreaPumpP_Default
NH3 Sensor Status	V_AIM_NH3_Sensor_Status	O_AIM_NH3_Status_Enbl	O_AIM_NH3_Status_Val
Pump Control	V_USM_MasterState	O_USM_MasterState_Enbl	O_USM_MasterState_Val

Master State			
Pump Control Operational State	V_USM_OpState	O_USM_OpState_Enbl	O_USM_OpState_Val
Urea Doser Valve Command	V_USM_FCV_Cmd	O_USM_FCV_Cmd_Enbl	O_USM_FCV_Cmd_Val
Urea Doser Valve Command	V_UDD_FCV_Cmd	O_UDD_FCV_Cmd_Enbl	O_UDD_FCV_Cmd_Val
Urea Doser PumpDuty Cycle	V_UDD_pc_Pump_Cmd	O_UDD_pc_Pump_Cmd_Enbl	O_UDD_pc_Pump_Cmd_Val
Urea Doser Injection On Time	V_UDD_tmu_Inj_Ontime	O_UDD_tmu_Inj_OnTime_Enbl	O_UDD_tmu_Inj_OnTime_Val
Urea Doser Injection Period	V_UDD_tmu_Inj_Period	O_UDD_tmu_Inj_Period_Enbl	O_UDD_tmu_Inj_Period_Val
Urea Doser Heater Command	V_UDD_SU_Heater_Cmd	O_UDD_SU_Heater_Cmd_Enbl	O_UDD_SU_Heater_Cmd_Val
Urea Tank Level	V_AIM_pc_Urea_TankLvl	O_AIM_pc_Urea_TankLvl_Enable	C_AIM_pc_Urea_TankLvl_Default
Urea Tank Temp	V_AIM_trc_Urea_TankT	O_AIM_trc_Urea_TankT_Enable	C_AIM_trc_Urea_TankT_Default
Permit Switch	Permit_Switch	O_AIM_PermitSwEnbl	O_AIM_PermitSwVal
Urea Dosing	V_UIM_flm_InjRateCmd	O_UIM_flm_UreaInjCmd_Enbl	O_UIM_flm_UreaInjCmd_Val
PM Sensor Resistance	V_AIM_ro_PM_Out	O_AIM_ro_PM_Out_Enable	C_AIM_ro_PM_Out_Default
PFS Engine out Status	V_ATD_bs_PFS_EngOut_Status	O_ATD_bs_PFS_EngOut_Enbl	O_ATD_bs_PFS_EngOut_Val
SCR Input Status	V_ATD_bs_SCR_ExtInput_Status	O_ATD_bs_SCR_ExtInputStat_Enbl	O_ATD_bs_SCR_ExtInputStat_Val
SCR Tampering Diag Enable	V_ATD_SCR_Tamp_Enable	O_ATD_SCR_Tamp_Enbl	O_ATD_SCR_Tamp_Val

(Click here for complete table of Overrides in Excel)

User Resets

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Reset	Description
O_AIM_pc_Urea_TankLvl_FiltReset	Urea Tank Level filter reset enable
O_AIM_pr_DPF_DeltaP_FiltReset	Override to reset the DeltaP Filter
O_AIM_pr_HC_DoserP_FiltReset	Override to reset the HC Doser Pressure.
O_AIM_prg_DPF_OutP_FiltReset	Override to reset the DPF OutP Filter
O_AIM_prg_UreaPumpP_FiltReset	Supply Unit pressure AIP processing: run time user override to reset the filter
O_AIM_ro_PM_Out_FiltReset	PM sensor resistance filter reset enable
O_AIM_trc_DOC_In_FiltReset	DOC in filter reset enable
O_AIM_trc_DOC_Out_FiltReset	DOC out filter reset enable
O_AIM_trc_DPF_Out_FiltReset	DPF out filter reset enable
O_AIM_trc_SCR_Out_FiltReset	SCR in filter reset enable
O_AIM_trc_SCR_T1_FiltReset	SCR out filter reset enable

O_AIM_trc_Urea_TankT_FiltReset	Urea Tank Tmptr filter reset enable
O_ATD_DOC_Out_SevereFault_Reset	Override used to clear DOC Out severe fault.
O_ATD_DOCOut_PersistFault_Reset	Override used to clear DOC Out Persist_Fault.
O_ATD_DPF_Out_SevereFault_Reset	Override used to clear DPF Out severe fault.
O_ATD_DPF_PTD_Reset	Test Reset for Pressure Tube disconnected Stuck In Range diagnostic
O_ATD_DPFOut_PersistFault_Reset	Override used to clear DPF Out persist fault.
O_ATD_DPFOutP_HiFlagReset	Test Reset for high outlet pressure diagnostic
O_ATD_DPFOutP_SIR_Reset	Test Reset for OutP Stuck In Range diagnostic
O_ATD_SCR_Delta_SevFault_Reset	Override used to clear SCR Delta temperature high severe fault.
O_ATD_SCR_In_SevFault_Reset	Override used to clear SCR In over temperature severe fault.
O_ATD_SCR_Out_SevFault_Reset	Override used to clear SCR Out over temperature severe fault.
O_ATD_SwitchTest_Time_Reset	Reset for switch test
O_OCD_DOC_PresenceCounter_Reset	DOC presence Fail/Pass timer reset
O_OCD_DOC_ReverseCounter_Reset	DOC reverse Fail/Pass timer reset
O_OCP_Bed_Tmptr_Timer_Reset	DOC Bed Temperature Timer Reset
O_OCR_TmptrFdbkInt_Reset	Feedback PID Integrator Reset Override
O_SFD_DPFdP_SIR_Reset	Test Reset for dP Stuck In Range diagnostic
O_SFD_Limit_Flag_Reset	Reset flag for High delta Pressure
O_SFD_SystemCheck_Ok	When this Set flag is true, all system checks for SFD will be override to be true.
O_SFP_gpl_Soot_Load_Reset_En	Reset Enable for the use of O_SFP_Soot_Load

(Click here for complete table of Resets in Excel)

Procedures

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Soot Load Override

1. Set parameter *O_SFP_gpl_Soot_Load_Reset_Val* to the desired soot load (in grams per liter)
    a. Divide desired soot load in grams by 20.39 liters.
2. Set override *O_SFP_gpl_Soot_Load_Reset_En* to a value *1*
3. Steps 2-3 need completed so that the soot load will decrease per the regeneration (if they are not performed the soot load will not decrement and stay at the value set in step 1)
   Set override *O_SFP_gpl_Soot_Load_Reset_En* to a value
4. Set O_SFP_gpl_Soot_Load_Reset_En = 0

Trigger Stationary Regeneration without the Stationary Regen Switch

1. Set override *O_SFR_Regen_Trigger_On* to a value of *1*
2. Verify *T_AIM_PermitSwitchEnbl* = 1
3. Set override *O_AIM_PermitSwEnbl* to a value of *1*
4. Set override *O_AIM_PermitSwVal* to a value of *1*
5. Set override *O_AIM_NMChassisSecSwEnbl* to a value of *1*
6. Set override *O_AIM_NMChassisSecSwVal* to a value of *1*
7. Set override *T_DIP_ClutchSwitchOvrdEn* to a value of *1*
8. Set override *T_DIP_ServiceBrkSwInversion* to a value of *1*
9. Set override *O_AIM_NMRegen_Sw_Val* to a value *1*
10. Set override *O_AIM_NMRegen_Sw_Enbl* to a value *1*
11. When testing is complete, return all parameter settings back to their original values.

After-treatment Fuel Shutoff Valve, After-treatment Air Shutoff Valve, and Doser Override Procedure

The following procedure allows you to individually override SOV#1, SOV#2, to diagnose after-treatment fuel system issues.

1. Set *O_HIM_DFSOV_Control_Enbl, O_HIM_DFSOV2_Control_Enbl, and O_HIM_tm_Inj_On_Enbl* to a value of *1* for doser and SOV override enables
2. Set *O_HIM_DFSOV_Control_Value* to a value of *1* to open the Supply SOV and supply doser with fuel pressure
3. Set *O_HIM_DFSOV2_Control_Value* to a value of *0* to close Air SOV
4. Set *O_HIM_tm_Inj_On_Value* to a value of *10 ms* to turn on the doser
5. When procedure is complete, return all values back to 0 to ensure overrides do not remain on

After-treatment Fuel Injector (Doser) Bucket Test

This procedure will inject 300ml of fuel in 2.5 minutes. The doser must flow a minimum of 275ml during this test. Note, this procedure must be performed with the doser removed from the engine.

1. Set *C_HIM_FT_DoserTest_Enbl* to a value of *1*
2. Set *V_HIM_FT_Test_Mode* to a value of *0*
3. Set *V_HIM_FT_DoserTest_Start* to a value of *1*
4. Set all three overrides in steps 1-3 to a value of *0* after test is complete

Prime Urea Pump

1. Set *O_SCL_PumpCondt_Enbl* to a value of 1
2. Set *O_SCL_PumpCondt_Val* to a value of 1
3. Verify *V_USM_MasterState* ends up at 5 (Metering Control)

Override Urea Dosing

For numerical flow rate (ml/sec)

1. Set *O_UIM_flm_UreaInjCmd_Enbl* to a value of 1
2. Set *O_UIM_flm_UreaInjCmd_Val* to a desired value
3. Monitor *V_UIM_flm_InjRateCmd*

For percent (%) of scale

1. Set *O_USM_pc_DoserCmd_Enbl* to a value of 1
2. Set *O_USM_pc_DoserCmd_Val* to a desired value
3. Monitor *V_USM_pc_DosingCmd*

Air Handling

Ambient Air Density - FC 1943

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Ambient Air Density - Data Valid But Below Normal Operating Range - Least Severe Level. Engine torque has been reduced because the vehicle was operating at a high altitude condition.

CBR_DENSITY_DERATE_ERROR_ID
Error Flag: CBR_Density_Derate_Error
System Error number: 1851
(csdd_cbm_base_lib.mdl)

ECM_Run_Time	S	VGT_Position	%
Engine_Speed	RPM	Ambient_Air_Press	KPa
Net_Engine_Torque	Nm	Altitude	m
EGR_Position	%	Compressor_Inlet_Density	Kg/m3
CBR_Density_Derate_Error	None	CBM_Indicated_Fuel	Mg/str
CBR_Density_Derate_Fault_Timer	S	CBR_TFC_Derate_Fault_Timer	S
Texh_Fuel_Limit	Mg/str	CBR_Density_Fuel_Ratio	None
H_CBR_Density_Max_Fuel	Mg/str	CBR_Turbo_Exh_Fuel_Ratio	None
		CBR_Density_Derate_Fault_Timer	s

(Click here for parameter list in Excel)

Ambient Air Pressure - FC 295

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Barometric Pressure - Data erratic, intermittent or incorrect. An error in the barometric pressure sensor signal was detected by the ECM.

AMBIENT_AIR_PRESS_IR_HIGH_ERROR
Error Flag: AAP_IR_High_Err
System Error number: 3796
(csdd_charge_base_mgr_lib.mdl)

AMBIENT_AIR_PRESS_IR_LOW_ERROR
Error Flag: AAP_IR_Low_Err
System Error number: 3797
(csdd_charge_base_mgr_lib.mdl)

AMBIENT_AIR_PRESS_KEYOFF_ERROR
Error Flag: AAP_IR_Low_Err
System error number: 4438
(csdd_magt_mach_monitor.mdl)

AMBIENT_AIR_PRESS_IR_STUCK_ERROR
Error Flag:
System Error number: 3798
(csdd_charge_mgr_base)

AMBIENT_AIR_PRESS_KEYON_ERROR
Error Flag:
System Error number: 1818
(csdd_ magt_mm.mdl)

Air_Press	kPa	AAP_High_Cusum_Value	kPa

Air_Press_Sensor	kPa	AAP_In_Range_Cusum_Timer	s
Air_Press_Sensor_Status	None	AAP_IR_High_Err	None
Air_Press_Sensor_Volts	V	AAP_IR_Low_Err	None
Air_Press_Status	None	AAP_IR_Stuck_Err	None
Air_Press_IR_Enable	None	AAP_Low_Cusum_Value	kPa
Charge_Press_sensor	KPa	AAP_Stuck_Cusum_Value	kPa
Exhaust_Press_sensor	KPa		
Oil_Pressure_Absolute_Sensor	KPa	MMon_Keyoff_Press_Check_State	---
EGR_Orif_Press_Sensor	KPa	MMon_Euro_Press_Rat_Check	---
Engine_Speed	RPM	Keyoff_Press_Check_Exec_Cnt	Counts
ECM_Run_Time	S	MACH_ECM_Powerdown_Inhibit	---
Key_Switch	None	MMon_Keyoff_Press_Delay_Timer	S
		MMon_Keyoff_Press_Check_Timer	S
H_AAP_Cusum_Counter	Counts	MMon_CHP_Keyoff_Error_Flag	---
H_AAP_IR_Cusum_Reset	---	MMon_AAP_Keyoff_Error_Flag	---
H_CHM_Cusum_Reset_Flag	---	MMon_EOP_Keyoff_Error_Flag	---
H_AAP_High_Cusum_Latch	---	MMon_OP_Keyoff_Error_Flag	---
H_AAP_Low_Cusum_Latch	---	MMon_EP_Keyoff_Error_Flag	---
H_AAP_Stuck_Cusum_Latch	---		

(Click here for parameter list in Excel)

Related Codes / Sections: FC 221, FC 222

Ambient Air Temperature - FC 2398

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Ambient Air Temperature - Data erratic, intermittent or incorrect.

AIR_TMPTR_IR_HIGH_ERROR
Error Flag: EMP_IRH_Err
Syetem error number: 3799
(csdd_charge_base_mgr_lib.mdl)

AIR_TMPTR_IR_LOW_ERROR
System error number: 3800
(csdd_charge_base_mgr_lib.mdl)

AIR_TMPTR_IR_STUCK_ERROR
System error number: 3801
(csdd_charge_base_mgr_lib.mdl)

AIR_TMPTR_KEYON_ERROR
Error Flag: MMon_AT_Keyon_Error_Flag
System error number: 3871
(csdd_charge_base_mgr_lib.mdl)

ECM_Run_Time	S	Coolant_Temperature_Sensor	Deg_C
Engine_Speed	RPM	EGR_Orifice_Tmptr_Sensor	Deg_C
Air_Tmptr_IR_Enable	None	H_AT_Cusum_Counter	None
Air_Tmptr_Sensor	Deg_C	H_AT_IR_Cusum_Reset	None
Air_Tmptr_Sensor_Status	None	InternalTmptr_Sensor	Deg_C
Air_Tmptr_Sensor_Volts	V	MMon_AT_Keyon_Error_Flag	None
Ambient_Air_Tmptr	Deg_C	MMon_BHD_Check_Enable	None
Ambient_Air_Tmptr_Status	None	MMon_BHD_Monitor_State	None
AT_High_Cusum_Value	Deg_C	MMon_BHD_State	None
AT_In_Range_Cusum_Timer	s	MMon_BHD_Timer	s
AT_IR_High_Err	None	MMon_Keyon_Tmptr_Check_State	None
AT_IR_Low_Err	None	MMon_Keyon_Tmptr_Check_Timer	S
AT_IR_Stuck_Err	None	OBD_Number_Of_Operation_Cycles	None
AT_Low_Cusum_Value	Deg_C	Oil_Temperature_Sensor	Deg_C
AT_Stuck_Cusum_Value	Deg_C	P_Air_Tmptr_Max	Deg_C
Charge_Tmptr_Sensor	Deg_C	P_Air_Tmptr_Min	Deg_C

Compressor_Inlet_Tmptr_Sensor	Deg_C

(Click here for parameter list in Excel)

Boost Pressure Slow Response - FC 3361

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Intake Manifold 1 Pressure - Abnormal rate of change.

VGA_DL_POSITION_SIR_ERROR
Error Flag: H_VGA_DL_Pos_Cusum_SIR_Fault
System error number: 5043
(csdd_dd_vgt_dl.mdl)

C_VGA_DL_Pos_IR_Enable	HEX	H_VGA_DL_Pos_Cusum_IRL_Fault	None
C_VGA_DL_Pos_Cusum_Enable_Ovrd	None	H_VGA_DL_Pos_Cusum_IRL_MaxValue	None
C_VGA_DL_Pos_Cusum_IRH_Thd	%	H_VGA_DL_Pos_Cusum_IRL_Value	None
C_VGA_DL_Pos_Cusum_IRL_Thd	%	H_VGA_DL_Pos_Cusum_Reset	None
C_VGA_DL_Pos_Cusum_Max	%	H_VGA_DL_Pos_Cusum_Reset_Count	counts
C_VGA_DL_Pos_Cusum_Reset_Mode	None	H_VGA_DL_Pos_Cusum_SIR_Fault	None
C_VGA_DL_Pos_Cusum_SIR_Thd	%	H_VGA_DL_Pos_Cusum_SIR_MaxValue	None
C_VGA_DL_Pos_Cusum_Timeout	s	H_VGA_DL_Pos_Cusum_SIR_Value	None
C_VGA_DL_Pos_Cusum_Tolerance	%	H_VGA_DL_Pos_Cusum_Timer	s
C_VGA_DL_Pos_Cusum_Warmup_En	None	H_VGA_DL_Pos_IR_Filtered_Cmd	%
C_VGA_DL_Pos_IR_Fault_Count_Lim	counts	H_VGA_DL_Pos_IR_Set_Clear_En	None
C_VGA_DL_Pos_IR_MCF_Criteria_En	None	H_VGA_DL_Pos_IR_Trans_Value	%
C_VGA_DL_Pos_IR_Trans_FiltConst	None	H_VGA_DL_Position_IR_Fault	None
C_VGA_DL_Pos_IR_Trans_Thd	%	H_VGA_Shutdown	None
H_VGA_DL_Pos_Cusum_Count	counts	J39_VGT_Actuator_State	None
H_VGA_DL_Pos_Cusum_Enable	None	OBD_Number_Of_Operation_Cycles	None
H_VGA_DL_Pos_Cusum_IRH_Fault	None	VGT_Driver_Failure	None
H_VGA_DL_Pos_Cusum_IRH_MaxValue	None	VGT_Position	%
H_VGA_DL_Pos_Cusum_IRH_Value	None	VGT_Position_Status	None

(Click here for parameter list in Excel)

Boost Pressure Underboost - FC 4616

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MCF_UFM_LOFLOW_ERROR
Intake Manifold 1 Pressure - Data Valid But Below Normal Operating Range - Least Severe Level
System Error number: 7294
(csdd_obd_UFM_lib.mdl\OBD_UFM\OBD_Univ_Flow_Monitor\Flow Monitors)

Ambient_Air_Press	kPa	Ambient_Air_Tmptr	Deg_C
Charge_Tmptr	Deg_C	Compressor_Inlet_Density	kg/m3
EGR_Orifice_Tmptr	Deg_C	Turbo_Speed_Est	KRPM
Charge_Flow	kg/min	Compressor_Inlet_Press	kPa
Fresh_Air_Flow	kg/min	CAC_Outlet_Tmptr_Sensor	Deg_C
EGR_Flow	kg/min	C_UFM_Amb_Tmptr_Thd	Deg_C
Exhaust_Tmptr	Deg_C	C_UFM_CID_Thd	kg/m3
Compressor_Inlet_Tmptr	Deg_C	C_UFM_Chrg_Lo_Min_Flow_Cmd	kg/min
EGR_Position	%	C_UFM_Chrg_Lo_Max_Flow_Cmd	kg/min
IAT_Position	%	C_UFM_Chrg_Lo_Min_Act_EFA	cm2
Current_Engine_State	None	C_UFM_Chrg_Lo_Max_Act_EFA	cm2

(Click here for parameter list in Excel)

Related Codes / Sections:

CAC Undercooling - FC 3343

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Engine Charge Air Cooler Efficiency - Data Valid But Below Normal Operating Range - Moderately Severe Level.

CAC_UNDERCOOLING_HIGH_CHT_ERROR
Error Flag:
System error number: 5250
(obd_cac_htxh_lib.mdl)

C_CAC_OBD_Select	None	Net_engine_torque	Nm
C_CHT_High_Tmptr_COT_Min	Deg_C	Current_Engine_State	None
C_CHT_High_Tmptr_TQ_Min	Nm	Charge_Tmptr_Status	None
C_CAC_OBD_AMB_Air_Tmptr_Min	Deg_C	Compressor_Outlet_Tmptr_Status	None
C_CHT_High_Tmptr_Thd	Deg_C	CEGR_Undercooling_Error	None
C_CHT_High_Tmptr_Fault_Time	s	CHT_High_Tmptr_Fault_Timer	s
Ambient_Air_Tmptr	Deg_C	CHT_High_Tmptr_Error	None
Compressor_Outlet_Tmptr	Deg_C	CHT_High_Tmptr_Enable	None
Charge_Tmptr	Deg_C		

(Click here for parameter list in Excel)

Compressor Inlet Temperature - FC 691, FC 692

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FC 691: COMP_IN_TMPTR_OOR_HIGH_ERROR
Turbocharger 1 Compressor Intake Temperature Circuit - Voltage above normal, or shorted to high source
System error number: 486
(csdd_charge_base_mgr_lib.mdl)

FC 692: COMP_IN_TMPTR_LOW_HIGH_ERROR
Turbocharger 1 Compressor Intake Temperature Circuit - Voltage above normal, or shorted to high source
System error number: 484
(csdd_charge_base_mgr_lib.mdl)

Compressor_Inlet_Tmptr	Deg_C	Compressor_Inlet_Tmptr_Sensor	Deg_C
Compressor_Inlet_Tmptr_Raw	counts	Compressor_Inlet_Tmptr_Status	---
Compressor_Inlet_Tmptr_State	HEX	C_CompInletTmptrEnable	---
C_AIP_CompInTmptrDefault	Deg_C	Compressor_Inlet_Tmptr_Raw	counts
T_AIP_CompInTmptrRLOC	---	AIP_CompInTmptr_Override_Value	Deg_C
T_AIP_CompInTmptr_Ovrd_En	---	Ambient_Air_Tmptr_Status	---
Ambient_Air_Tmptr	Deg_C		

(Click here for parameter list in Excel)

Compressor Intake Temperature - FC 693

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Turbocharger 1 Compressor Intake Temperature - Data erratic, intermittent or incorrect.

COMP_IN_TMPTR_IR_LOW_ERROR
System error number: 4191
(csdd_ chrg_mgr_base.mdl)

COMP_IN_TMPTR_IR_HIGH_ERROR

Error Flag: CIT_IR_High_Err
System error number: 4190
(csdd_ chrg_mgr_base.mdl)

COMP_IN_TMPTR_IR_STUCK_ERROR
Error Flag: CIT_IR_Stuck_Err
System error number: 4192
(csdd_ chrg_mgr_base.mdl)

COMP_IN_TMPTR_KEYON_ERROR
Error Flag: MMon_CIT_Keyon_Error_Flag
System error number: 4746
(csdd_ chrg_mgr_base.mdl)

ECM_Run_Time	S	MMon_BHD_Check_Enable	None
Engine_Speed	RPM	MMon_BHD_Monitor_State	None
Compressor_Inlet_Tmptr	Deg_C	MMon_BHD_State	None
Compressor_Inlet_Tmptr_Sensor	Deg_C	MMon_BHD_Timer	s
Compressor_Inlet_Tmptr_Sensor_Status	None	MMon_Keyon_Tmptr_Check_State	None
Compressor_Inlet_Tmptr_Raw	counts	MMon_CIT_Keyon_Error_Flag	None
CIT_IR_High_Err	None	MMon_Keyon_Tmptr_Check_Timer	S
CIT_IR_Low_Err	None	Air_Tmptr_Sensor	Deg_C
CIT_IR_Stuck_Err	None	Charge_Tmptr_Sensor	Deg_C
CIT_High_Cusum_Value	Deg_C	Oil_Temperature_Sensor	Deg_C
CIT_In_Range_Cusum_Timer	s	EGR_Orifice_Tmptr_Sensor	Deg_C
CIT_Low_Cusum_Value	Deg_C	InternalTmptr_Sensor	Deg_C
CIT_IR_Stuck_Err	None	Coolant_Temperature_Sensor	Deg_C
CIT_SIR_Min	Deg_C	OBD_Number_Of_Operation_Cycles	None
CIT_SIR_Max	Deg_C		
H_CIT_IR_Cusum_Reset	None		
H_CIT_Cusum_Counter	None		

(Click here for parameter list in Excel)

Crankcase Breather Heater - FC 3733, FC 3734

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FC 3733: SL_RELAY_HIGH_ERROR
Crankcase Breather Filter Heater Circuit - Voltage above normal, or shorted to high source
System Error number: 5499

FC 3734: SL_RELAY_LOW_ERROR
Crankcase Breather Filter Heater Circuit - Voltage below normal, or shorted to low source
System Error number: 5500

(csdd_engine_cv_ext.mdl\CCBH_DrvDiagnostic)

CCBH_Driver	None	T_CCBH_Enable	None
CCBH_HBridge_DutyCycle	%	T_CCBH_Drv_OvrdEn	None
CCBH_Drv_High_Err	None	H_CCBH_HBridge_DC_OvrdVal	%
CCBH_Drv_Low_Err	None	C_CCBH_Error_Set_Count	counts
CCBH_Hi_Err_Count	counts	C_CCBH_Error_Count_Incrt	counts
CCBH_Low_Err_Count	counts	C_CCBH_Error_Count_Decrt	counts
T_CCBH_HW_RLOC	None		

(Click here for parameter list in Excel)

Related Codes / Sections:

Crankcase Pressure - FC 1942

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Crankcase Pressure - Data erratic, intermittent or incorrect. The ECM has detected that the crankcase pressure signal is not changing with engine operating conditions.

CCP_MISSING_FILTER
System error number: 7315

BEYOND_THD_AZ_ERROR
System error number: 7379

CCP_DITHER_ERROR
System error number: 3665

(csdd_engine_cv_ext.mdl)

Engine_Speed	RPM	Key_Switch	None
Net_Engine_Torque	N_m	Current_Engine_State	None
CCP_Zero_Adjustment	kPa_G	Crankcase_Press_Sensor_Volts	V
Boost_Pressure	kPa_G	Crankcase_Press	kPa_G
Ambient_Air_Press	kPa	Crankcase_Pressure	kPa_G
Ambient_Air_Tmptr	Deg C	Crankcase_Press_Sensor	kPa_G
Coolant_Temperature	Deg C	H_CCP_Dither_Err_Differential	kPa
Crankcase_Press_State	None	Charge_Press	kPa

(Click here for parameter list in Excel)

Open Crankcase Ventilation

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Boost_Pressure	kPa_G	H_CCP_Sev_High_Thd	kPa_G
Crankcase_Press	kPa_G	Net_Engine_Torque	N_m
Engine_Speed	RPM	OCV_Pressure_Relief_Active	None
H_CCP_Mod_High_Thd	kPa_G	Prev_emx_CCP_Trq_Drt_Idx	None

(Click here for parameter list in Excel)

EGA Contoller Driver Open Circuit - FC 2349

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EGR Valve Control Circuit - Current below normal or open circuit. Motor terminal or motor coil open circuit has been detected by the smart EGR controller.

EGA_DRIVER_OPEN_CIRCUIT_ERROR
Error Flag: EGA_Driver_Open_Circuit_Fault
System error number: 1825
(csdd_dd_egr_blm.mdl)

EGR_Position	%	Battery_Voltage	V
EAC_EGR_Valve_Cmd	%	EGA_Electrical_Fault	None
EGA_Position_Cmd	%	EGA_Driver_Short_Circuit_Fault	None
EGA_Position_Ref_Filtered	%	EGA_BM_Status	None
EGA_PWM_Abs_Duty_Cycle	%	ECM_Run_Time	Sec
H_EGA_BM_Motor_Current	A	EGA_Control_State	None

(Click here for parameter list in Excel)

EGA Controller Driver Short Circuit - FC 2353

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EGR Valve Control Circuit - Current above normal or grounded circuit.

EGA_DRIVER_SHORT_CIRCUIT_ERROR
Error Flag: EGA_Driver_Short_Circuit_Fault
System error number: 251
(csdd_dd_egr_blm.mdl)

EGR_Position	%	H_EGA_BM_Motor_Current	A
EAC_EGR_Valve_Cmd	%	EGA_Control_State	None
EGA_Position_Cmd	%	EGA_Electrical_Fault	None
EGA_Position_Ref_Filtered	%	EGA_Driver_Short_Circuit_Fault	None
EGA_PWM_Abs_Duty_Cycle	%	EGA_BM_Status	None
Battery_Voltage	V	ECM_Run_Time	Sec

(Click here for parameter list in Excel)

EGA Driver Low Power - FC 3724

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Battery 1 Voltage - Data Valid But Below Normal Operating Range - Least Severe Level.

EGA_DRIVER_POWER_LOW_ERROR
Error Flag: EGA_Driver_PwrLo_Fault
System error number: 4367
(csdd_dd_egr_blm.mdl)

Battery_Voltage	V	EGA_Electrical_Fault	None
EAC_EGR_Valve_Cmd	%	EGA_Position_Cmd	%
ECM_Run_Time	s	EGA_Position_Ref_Filtered	%
EGA_BM_Status	None	EGA_PWM_Abs_Duty_Cycle	%
EGA_Control_State	None	EGR_Position	%
EGA_Driver_Short_Circuit_Fault	None	H_EGA_BM_Motor_Current	A

(Click here for parameter list in Excel)

EGA Driver Temperature - FC 1961

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EGR Valve Control Circuit Over Temperature - Data Valid But Above Normal Operating Range - Least Severe Level.

EGA_DRIVER_IC_OVER_TMPTR_ERROR
Error Flag: EGA_Driver_IC_Over_Tmptr_Fault
System error number: 4368
(csdd_dd_egr_blm.mdl)

EGR_Position	%	EGA_Electrical_Fault	None
EAC_EGR_Valve_Cmd	%	EGA_Driver_Short_Circuit_Fault	None
EGA_Position_Cmd	%	EGA_BM_Status	None
EGA_Position_Ref_Filtered	%	ECM_Run_Time	Sec
EGA_PWM_Abs_Duty_Cycle	%	Battery_Voltage	V
H_EGA_BM_Motor_Current	A	EGA_Control_State	--

(Click here for parameter list in Excel)

EGA Valve Position - FC 2272

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EGR Valve Position Circuit - Voltage below normal, or shorted to low source. Low signal voltage has been detected at the EGR position sensor circuit.

EGA_VALVE_POSITION_ERROR
Error Flag: EGA_Position_Fault
System error number: 1796
(csdd_dd_egr_blm.mdl)

EGR_Position	%	EGA_Electrical_Fault	None
EAC_EGR_Valve_Cmd	%	EGA_Driver_Short_Circuit_Fault	None
EGA_Position_Cmd	%	EGA_BM_Status	None
EGA_Position_Ref_Filtered	%	ECM_Run_Time	Sec
EGA_PWM_Abs_Duty_Cycle	%	Battery_Voltage	V
H_EGA_BM_Motor_Current	A	EGA_Control_State	None

(Click here for parameter list in Excel)

EGR High Flow Rate - FC 3383

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Engine Exhaust Gas Recirculation (EGR) System - Data Valid But Above Normal Operating Range - Moderately Severe Level.

EGR_UFM_HIFLOW_ERROR
Error Flag: EGR_HiFlow_Error
System error number: 7295
(obd_egr_flow_lib.mdl)

C_EGRFL_OBD_VGT_Pos_Max	%	H_EGRFL_OBD_HiFlow_Condition_En	None
C_EGRFL_OBD_En_Condn_Bitmask	HEX	H_EGRFL_OBD_HiFlow_Cusum_Counter	None
C_EGRFL_OBD_HiFlow_Cusum_Max	None	H_EGRFL_OBD_HiFlow_Cusum_Latch	None
C_EGRFL_OBD_HiFlow_Cusum_Thd	None	H_EGRFL_OBD_HiFlow_Cusum_Timer	s
C_EGRFL_OBD_HiFlow_EGR_Pos_Max	%	H_EGRFL_OBD_HiFlow_Cusum_Value	None
C_EGRFL_OBD_HiFlow_Enable	None	H_EGRFL_OBD_HiFlow_Enabled	None
C_EGRFL_OBD_HiFlow_Eng_DP_Min	kPa	H_EGRFL_OBD_HiFlow_Input_Enable	None
C_EGRFL_OBD_HiFlow_FC	None	H_EGRFL_OBD_HiFlow_Max_Cusum_Val	None
C_EGRFL_OBD_HiFlow_Flow_Max	kg/min	EGR_Position	%
C_EGRFL_OBD_HiFlow_Noise_Tol	None	VGT_Position	%
C_EGRFL_OBD_HiFlow_Ovrd_En	None	CBR_Protection_Chi_flag	None
C_EGRFL_OBD_HiFlow_Ovrd_Value	None	EGR_Valve_Delta_Press	Kpa
C_EGRFL_OBD_HiFlow_Reset	None	CHP_HDR_EGR_Flow	kg/min
C_EGRFL_OBD_HiFlow_Timer	s	TAHR_EGR_Flow_Cmd	Kg/min
C_CHP_HDR_EGR_Flow_Active	None	EGR_Flow	Kg/min
Current_Engine_State	None	EGR_Valve_Delta_Press_status	None
		EGR_Flow_status	None

(Click here for parameter list in Excel)

EGR Low Flow Rate - FC 3382

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Engine Exhaust Gas Recirculation (EGR) System - Data Valid But Below Normal Operating Range - Moderately Severe Level.

EGR_UFM_LOFLOW_ERROR

Error Flag: EGR_LoFlow_Error
System error umber: 7296
(obd_ufm.mdl)

C_EGRFL_OBD_VGT_Pos_Max	%	H_EGRFL_OBD_LoFlow_Condition_En	None
C_EGRFL_OBD_En_Condn_Bitmask	HEX	H_EGRFL_OBD_LoFlow_Cusum_Counter	None
C_EGRFL_OBD_LoFlow_Cusum_Max	None	H_EGRFL_OBD_LoFlow_Cusum_Latch	None
C_EGRFL_OBD_LoFlow_Cusum_Thd	None	H_EGRFL_OBD_LoFlow_Cusum_Timer	s
C_EGRFL_OBD_LoFlow_EGR_Pos_Cmd_Min	%	H_EGRFL_OBD_LoFlow_Cusum_Value	None
C_EGRFL_OBD_LoFlow_En_Persis_Time	None	H_EGRFL_OBD_LoFlow_Enabled	None
C_EGRFL_OBD_LoFlow_Enable	None	H_EGRFL_OBD_LoFlow_Input_Enable	None
C_EGRFL_OBD_LoFlow_Eng_Spd_Max	RPM	H_EGRFL_OBD_LoFlow_Max_Cusum_Val	None
C_EGRFL_OBD_LoFlow_Eng_Spd_Min	RPM	Engine_Speed	RPM
C_EGRFL_OBD_LoFlow_FC	None	EGR_Position	%
C_EGRFL_OBD_LoFlow_Flow_Max_Rate	kg/min_sec	VGT_Position	%
C_EGRFL_OBD_LoFlow_Flow_Min	kg/min	CBR_Protection_Chi_flag	None
C_EGRFL_OBD_LoFlow_Flow_Rate_FC	None	Engine_Is_Warm	None
C_EGRFL_OBD_LoFlow_Noise_Tol	None	EGR_Flow	kg/min
C_EGRFL_OBD_LoFlow_Ovrd_En	None	TAHR_EGR_Flow_Cmd	Kg/min
C_EGRFL_OBD_LoFlow_Ovrd_Value	None	Egr_flow_status	None
C_EGRFL_OBD_LoFlow_Reset	None	eac_egr_valve_cmd	%
C_EGRFL_OBD_LoFlow_Timer	s	H_egrfl_obd_loflow_en_wo_persis	None
C_EGRFL_OBD_LoFlow_Torque_Max	None	H_egrfl_obd_loflow_en_duration	s
C_EGRFL_OBD_LoFlow_Torque_Min	None	Cbm_chrg_load_ref	None
Current_Engine_State	None		

(Click here for parameter list in Excel)

EGR On / Off Conditions

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(csdd_dd_egr_blm.mdl , csdd_charge_base_mgr_lib.mdl)

CBR_Alpha	None	EGR_Fraction	None
CBR_EGR_Frac_Ref	None	EGR_Orifice_Delta_Press	kPa
CBR_EGR_Off	None	EGR_Orifice_Tmptr	Deg_C
CBR_EGRF_RefBeforeSelection	None	EGR_Position	%
Charge_Flow	kg/min	EGR_Position_Cmd_Final	%
Charge_Press	kPa	EGR_Position_Error	%
Charge_Tmptr	Deg_C	EGR_Position_Percent	%
CHH_EGRT_Over_Temperature	None	EGR_Position_Status	None
CHL_EGR_Frac_Cmd	None	EGR_System_Closed	None
CHL_MCF_Cmd	kg/min	EGR_Valve_Delta_Press	kPa
Combustion_Control_Path_Owner	None	EGR_Valve_Is_Closed	None
Compressor_Outlet_Tmptr	Deg_C	EGR_Valve_Position_Offset	counts
Coolant_Temperature	Deg_C	EGR_Valve_Position_Sensor_Type	None
EGR_Actuator_EFA	cm2	EMM_AECD_State	HEX
EGR_AZ_High_Error	None	Engine_Speed	RPM
EGR_AZ_Low_Error	None	Filtered_Turbo_Speed	KRPM
EGR_Command_EFA	cm2	Net_Engine_Torque	N_m
EGR_Driver_Failure	None	Total_Fueling	mg/stroke

(Click here for parameter list in Excel)

EGR Outlet Pressure - FC 3138

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Engine Exhaust Gas Recirculation Outlet Pressure - Data erratic, intermittent or incorrect.

EGR_ORIFICE_PRESS_IR_HIGH_ERROR
Error Flag: EGR_Orif_Press_IR_High_Err
System error number: 3926
(csdd_charge_base_mgr_lib.mdl)

EGR_ORIFICE_PRESS_IR_LOW_ERROR
Error Flag: EGR_Orif_Press_IR_Low_Err
System error number: 3927
(csdd_charge_base_mgr_lib.mdl)

EGR_ORIFICE_PRESS_KEYON_ERROR
Error Flag:
System error number: 3917
(csdd_magt_mach_monitor.mdl)

EGR_ORIFICE_PRESS_KEYOFF_ERROR
Error Flag: MMon_EOP_Keyoff_Error_Flag
System error number: 4441
(csdd_magt_mach_monitor.mdl)

Charge_Press	kPa	ECM_Run_Time	S
Exhaust_Press	kPa	Engine_Speed	RPM
EGR_Flow	kg/min	EGR_Position	%
EGR_Orif_Press	kPa_A	VGT_Position	%
EGR_Orif_Press_Est	kPa	Net_Engine_Torque	N_m
EGR_Orif_Press_Est_Status	None	Air_Press_Sensor	kPa
EGR_Orif_Press_Sensor	kPa	Oil_Pressure_Absolute_Sensor	kPa
EGR_Orif_Press_Sensor_Status	None	Exhaust_Press_Sensor	kPa
EGR_Orif_Press_Sensor_Volts	V	Charge_Press_Sensor	kPa
EGR_Orif_Press_Status	None	EGR_Orif_Press_Sensor	kPa
EGR_Orif_Press_High_Cusum_Value	kPa	MMon_Keyoff_Press_Check_State	None
EGR_Orif_Press_IR_Cusum_Timer	s	MMon_Keyoff_Press_Check_Timer	s
EGR_Orif_Press_IR_Enable	None	MMon_Keyoff_Press_Delay_Timer	s
EGR_Orif_Press_IR_High_Err	None	MMon_EOP_Keyoff_Error_Flag	None
EGR_Orif_Press_IR_Low_Err	None	Engine_Is_Warm	None
EGR_Orif_Press_Low_Cusum_Value	kPa	Key_Switch	None
		MMon_Euro_Press_Rat_Check	
Calibration:		Keyoff_Press_Check_Exec_Cnt	
C_EGR_Orif_Press_IR_Enable	HEX		
C_EGR_Orif_Press_IR_High_Thd	kPa		
C_EGR_Orif_Press_IR_Low_Thd	kPa		
C_EGR_Orif_Press_IR_Tolerance	kPa		
C_EGR_Orif_Press_IR_Cusum_Max	kPa		
C_EGR_Orif_Press_IR_Timer	s		
C_EGR_Orif_PressIR_MinEngSpd	RPM		
C_EGR_Orif_PressIR_MinNetEngTrq	N_m		
C_Bench_Test	None		

(Click here for parameter list in Excel)

EGR Pressure - FC 2554

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Exhaust Gas Pressure - Data erratic, intermittent or incorrect. The exhaust gas pressure sensor is reading an erratic value.

EXHAUST_PRESS_IR_HIGH_ERROR
Error Flag: EMP_IRH_Err
System error number: 3924
(csdd_charge_base_mgr_lib.mdl)

EXHAUST_PRESS_IR_LOW_ERROR
Error Flag: EMP_IRL_Err
System error number: 3922
(csdd_charge_base_mgr_lib.mdl)

EXHAUST_PRESS_IR_STUCK_ERROR
Error Flag: 3923
System error number: 3922
(csdd_charge_base_mgr_lib.mdl)

EXHAUST_PRESS_KEYON_ERROR
System error number: 1820
(csdd_magt_mach_monitor.mdl)

EXHAUST_PRESS_KEYOFF_ERROR
Error Flag: MMon_EP_Keyoff_Error_Flag
System error number: 4442
(csdd_magt_mach_monitor.mdl)

Air_Press_Sensor	kPa	Exhaust_Press_Sensor	kPa
Ambient_Air_Press	kPa	Exhaust_Press_Sensor_Status	None
Charge_Press_Sensor	kPa	Exhaust_Press_Sensor_Volts	V
CHM_Cusum_Reset_Flag	None	Exhaust_Press_Status	None
Current_Engine_State	None	H_EMP_Cusum_Counter	None
ECM_Run_Time	s	H_EMP_Enabled	None
EGR_Orif_Press_Sensor	kPa	H_EMP_IR_Cusum_Reset	None
EMP_Cusum_Hi_Value	kPa	Key_Switch	None
EMP_Cusum_Low_Value	kPa	MMon_EP_Keyoff_Error_Flag	None
EMP_Cusum_Sir_Value	kPa	MMon_Keyoff_Press_Check_State	None
EMP_Cusum_Timer_Value	s	MMon_Keyoff_Press_Check_Timer	s
EMP_Irh_Err	None	MMon_Keyoff_Press_Delay_Timer	s
Engine_Is_Warm	None	Net_Engine_Torque	N_m
Engine_Speed	RPM	OBD_Number_Of_Operation_Cycles	None
EP_Override_Mask	HEX	Oil_Pressure_Absolute_Sensor	kPa
Exhaust_Press	kPa	Total_Fueling	Mg/str
Exhaust_Press_Est	kPa	VGT_Position	%
Exhaust_Press_Est_Status	None		

(Click here for parameter list in Excel)

EGR Undercooling - FC 3342

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Engine Exhaust Gas Recirculation Cooler Efficiency - Data Valid But Below Normal Operating Range - Moderately Severe Level.

CEGR_UNDERCOOLING_ERROR
Error Flag: CEGR_UnderCooling_Error
System error number: 3565
(obd_cegr_htxh_lib.mdl)

C_CEGR_OBD_BP_Time_Delay	s	H_CEGR_OBD_BP_Enable	None
C_CEGR_OBD_Cusum_Max	Deg_C	H_CEGR_OBD_Condition_En	None
C_CEGR_OBD_Cusum_Thd	Deg_C	H_CEGR_OBD_Cusum_Counter	None
C_CEGR_OBD_Delta_Tmptr_Min	Deg_C	H_CEGR_OBD_Cusum_Latch	Deg_C
C_CEGR_OBD_Enable	None	H_CEGR_OBD_Cusum_Timer	s
C_CEGR_OBD_Flow_Min	kg/min	H_CEGR_OBD_Cusum_Value	Deg_C
C_CEGR_OBD_Noise_Tol	None	H_CEGR_OBD_Enabled	None
C_CEGR_OBD_Reset	None	H_CEGR_OBD_Input_Enable	None
C_CEGR_OBD_Thd_Filt_Const	None	H_CEGR_OBD_Max_Cusum_Value	Deg_C
C_CEGR_OBD_Threshold_Value_Min	Deg_C	CEGR_OBD_Tmptr_Thd	Deg_C
C_CEGR_OBD_Timer	s	EGR_Orifice_Tmptr	Deg_C
C_CEGR_OBD_CT_Axis	Table	CEGR_Undercooling_Error	None
C_CEGR_OBD_EGR_Flow_Axis	Table	EGR_Driver_Failure	None
C_CEGR_OBD_Tmptr_Thd_Table	Table	V_ATM_Oper_Mode	None
Cegr_obd_coolant_temperature	Deg_C	Engine_Speed	RPM

EGR_Flow	Kg/min	Net_Engine_Torque	N-m
Exhaust_Tmptr	Deg_C	ECM_Run_Time	S
EGR_Flow_Status	None	Coolant_Temperature	Deg_C
Coolant_temperature_status	None	EMM_Protection_Flag	None
Egr_orifice_tmptr_status	None	OBD_Number_Of_Key_Cycles	None
Exhaust_tmptr_status	None	Key_Switch	none

(Click here for parameter list in Excel)

EGR Valve Actuator

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(csdd_tahr_controller_lib.mdl\CRTA\TAHR_ComputeEGRTurbineCommands\Chrg TAHR Controller\EGR Flow Controller)

Battery_Voltage	V	EGR_Position	%
EAC_EGR_Valve_Cmd	%	EGR_Position_Status	None
EGA_Control_State	None	H_EGA_BM_Motor_Current	A
EGA_Electrical_Fault	None		
EGA_Position_Cmd	%	**Overrides:**	
EGA_Position_Fault	None	T_EGA_Cycle_Counter	counts
EGA_Position_Ref_Unfiltered	%	T_EAC_User_Override	None
EGA_PWM_Abs_Duty_Cycle	%	C_EAC_Override_Value	%
EGA_Valve_Autozero_Fault	None	T_EGA_Cmd_User_Override	None
EGR_Driver_Failure	None	C_EGA_Cmd_Override_Value	%
EGR_Fraction	None	C_EGA_PWM_Override_Value	%

(Click here for parameter list in Excel)

EGR Valve Controller

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(csdd_tahr_controller_lib.mdl)

CBM_Chrg_Load_Ref	None	Engine_Speed	RPM
CBM_FdbkTorqueFuel	mg/stroke	H_EAC_ECC_EngStart_Time	s
CBM_Torque_Fuel	mg/stroke	H_EAC_ECC_Open_On	None
CBR_Alpha	None	H_EAC_ECC_Open_Wait_Time	s
CBR_Compressor_Inlet_Density	kg/m3	H_EAC_ECC_OpenEvent_Time	s
CBR_EGR_Frac_Ref	None	H_EAC_EGR_Open_Position	%
CBR_OFC_Detected	None	H_TAHR_EGR_Valve_Sys_ID_Amp	%
CBR_Thermal_Oscar_Active	None	H_TAHR_EGR_Valve_Sys_ID_Mean	%
Charge_Flow	kg/min	H_TAHR_Sys_ID_Sample_En	None
Charge_Tmptr	Deg_C	OFC_EGR_Disable	None
CHL_MCF_Cmd	kg/min	P_EAC_EGR_Off_Timer_Value	s
Combustion_Control_Path_Owner	None	T_EGA_Cycle_Counter	counts
Compressor_Inlet_Density	kg/m3	TAHR_EGR_Err_Bal_Gain	None
EAC_EGR_Valve_Cmd	%	TAHR_EGR_Flow_Cmd	kg/min
EAC_EGR_Valve_Cmd_F	%	TAHR_EGR_Flow_Error	kg/min
EGA_Position_Ref_Unfiltered	%	TAHR_EGR_Flow_Error_Normalized	None
EGR_Flow	kg/min	TAHR_EGR_I_Reset	None
EGR_Fraction	None	TAHR_EGR_ULim	%
EGR_Orifice_Tmptr	Deg_C	TAHR_EGR_Valve_Fdbk_Cmd	%
EGR_Position	%	TAHR_EGR_Valve_Feed_Fwd_Cmd	%
EGR_Valve_Delta_Press	kPa	TAHR_IAT_State	None
EGR_Valve_Is_Closed	None	Total_Fueling	mg/stroke
Engine_Delta_Press	kPa		

(Click here for parameter list in Excel)

EGR Valve Controller - FC 1896

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EGR Valve Controller - Out of Calibration. The EGR valve has failed the automatic calibration procedure at initial key-on.

EGA_VALVE_AUTOZERO_HIGH_ERROR
System error number: 7321
(csdd_dd_egr_blm.mdl)

EGA_VALVE_AUTOZERO_LOW_ERROR
System error number: 7322
(csdd_dd_egr_blm.mdl)

EGR_Position	%	EGA_Electrical_Fault	None
EAC_EGR_Valve_Cmd	%	EGA_Driver_Short_Circuit_Fault	None
EGA_Position_Cmd	%	EGA_BM_Status	None
EGA_Position_Ref_Filtered	%	ECM_Run_Time	Sec
EGA_PWM_Abs_Duty_Cycle	%	Battery_Voltage	V
H_EGA_BM_Motor_Current	A	EGA_Control_State	None

(Click here for parameter list in Excel)

EGR Valve Position - FC 1228

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EGR Valve Position - Data erratic, intermittent or incorrect.

EGA_VALVE_POSITION_IRH_ERROR
Error Flag: H_EGA_BM_Pos_Cusum_IRH_Fault
System error number: 3633
(csdd_dd_egr_blm.mdl)

EGA_VALVE_POSITION_IRL_ERROR
Error Flag: H_EGA_BM_Pos_Cusum_IRL_Fault
System error number: 3635
(csdd_dd_egr_blm.mdl)

EGA_VALVE_POSITION_SIR_ERROR
Error Flag: H_EGA_BM_Pos_Cusum_SIR_Fault
System error number: 3634
(csdd_dd_egr_blm.mdl)

Battery_Voltage	V	H_EGA_BM_Motor_Current	A
EAC_EGR_Valve_Cmd	%	H_EGA_BM_Motor_Current_Ave	A
ECM_Run_Time	s	H_EGA_BM_Over_Cur_Ave	None
EGA_Autozero_In_Progress	None	H_EGA_BM_Pos_Cusum_Count	counts
EGA_AZ_State	None	H_EGA_BM_Pos_Cusum_Enable	None
EGA_BM_Status	None	H_EGA_BM_Pos_Cusum_IRH_Fault	None
EGA_Control_State	None	H_EGA_BM_Pos_Cusum_IRH_MaxValue	None
EGA_Dr_Shutoff_Error	None	H_EGA_BM_Pos_Cusum_IRH_Value	None
EGA_Driver_OC_Fault	None	H_EGA_BM_Pos_Cusum_IRL_Fault	None
EGA_Driver_OC_Fault_Bit	None	H_EGA_BM_Pos_Cusum_IRL_MaxValue	None
EGA_Driver_Over_Current	None	H_EGA_BM_Pos_Cusum_IRL_Value	None
EGA_Driver_Short_Circuit_Fault	None	H_EGA_BM_Pos_Cusum_Reset	None
EGA_Electrical_Error	None	H_EGA_BM_Pos_Cusum_Reset_Count	counts
EGA_Electrical_Fault	None	H_EGA_BM_Pos_Cusum_SIR_Fault	None
EGA_Pos_Diagnostic_Override	None	H_EGA_BM_Pos_Cusum_SIR_MaxValue	None
EGA_Position_Cmd	%	H_EGA_BM_Pos_Cusum_SIR_Value	None
EGA_Position_Ref_Unfiltered	%	H_EGA_BM_Pos_Cusum_Timer	s
EGA_PWM_Abs_Duty_Cycle	%	H_EGA_BM_Pos_IR_Filtered_Cmd	%
EGA_PWM_Enable	None	H_EGA_BM_Pos_IR_Set_Clear_En	None
EGR_Driver_Failure	None	H_EGA_BM_Pos_IR_Trans_Value	%
EGR_Position	%	H_EGA_BM_Position_IR_Fault	None
H_EGA_BM_DD_Test_Enable	%	Key_Switch	None

H_EGA_BM_DeIcing_Flag	None	OBD_Number_Of_Key_Cycles	None
H_EGA_BM_Mot_Cur_Ave_Fault_Bit	None	VGT_Position	%
H_EGA_BM_Mot_Cur_Ave_PWM_Lim	%		

(Click here for parameter list in Excel)

EMT Torque Derate - FC 2451

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Turbocharger Turbine Intake Temperature - Data Valid But Above Normal Operating Range - Moderately Severe Level. Turbocharger turbine inlet temperature has exceeded the engine protection limit.

EMT_TORQUE_DERATE_ERROR
System error number: 868
(csdd_charge_base_mgr_lib.mdl)

ECM_Run_Time	S	EPD_EMT_Enable	None
Engine_Speed	RPM	H_EPD_EMTLogDurSecs	s
Net_Engine_Torque	Nm	H_EPD_EMTLogExtremeVal	Deg_C
EGR_Position	%	H_EPD_EMTLogRealTime	s
Exhaust_Metal_Tmptr	Deg_C	H_EPD_EMTLogRunTime	s
VGT_Position	%	Combustion_Control_Path_Owner	None
Total_Fueling	Mg/str		

(Click here for parameter list in Excel)

High Idle Error - FC 3715

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Engine Speed At Idle - Data Valid But Above Normal Operating Range - Moderately Severe Level

IDLE_SPEED_HIGH_ERROR
System error number: 3775
(csdd_mca_base.mdl)

Engine_Speed	RPM	H_IM_Unst_Idle	None
Accelerator_Pedal_Position	%	IM_Low_Fuel_Deviation_Timer	sec
CBM_Torque_Fuel	mg/str	IM_Speed_Deviation_Timer	sec
Coolant_Temperature	Deg_C	LSI_ReferenceSpd	RPM
Coolant_Temperature_Sensor	Deg_C	Net_Engine_Torque	N_m
Coolant_Tmptr_Sensor_Volts	V	OBD_Engn_At_Idle	None
Current_Engine_State	None	OBD_IM_Enabled	None
Engine_At_Idle	None	OBD_Stable_Idle	None
EPS_s_Status	None	PTO_Status	None
Fuel_System_Failure	None	Vehicle_Speed	km/hr
Fuel_System_Failure	None		

(Click here for parameter list in Excel)

Intake Manifold Pressure - FC 124

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Intake Manifold 1 Pressure - Data Valid But Above Normal Operating Range - Moderately Severe Level.

MCF_UFM_HIFLOW_ERROR
Error Flag: MCF_HiFlow_Error
System error number: 7293

(obd_mcf_flow_lib.mdl)

C_MCF_OBD_En_Condn_Bitmask	None	C_UFM_Exhaust_Speed2_Parameter	None
C_MCF_OBD_Fueling_Min	mg/st	C_UFM_EMT_Post_SOI_Thd	deg_BTDC
C_MCF_OBD_HiFlow_Cusum_Max	None	engine_at_idle	None
C_MCF_OBD_HiFlow_Cusum_Thd	None	H_MCF_OBD_HiFlow_Condition_En	None
C_MCF_OBD_HiFlow_EGR_Pos_Cmd_Min	%	H_MCF_OBD_HiFlow_Cusum_Counter	None
C_MCF_OBD_HiFlow_En_Persis_Time	None	H_MCF_OBD_HiFlow_Cusum_Latch	None
C_MCF_OBD_HiFlow_Enable	None	H_MCF_OBD_HiFlow_Cusum_Timer	s
C_MCF_OBD_HiFlow_FC	None	H_MCF_OBD_HiFlow_Cusum_Value	None
C_MCF_OBD_HiFlow_Flow_Max	kg/min	H_MCF_OBD_HiFlow_Enabled	None
C_MCF_OBD_HiFlow_Flow_Max_Rate	kg/min_sec	H_MCF_OBD_HiFlow_Input_Enable	None
C_MCF_OBD_HiFlow_Flow_Min	kg/min	H_MCF_OBD_HiFlow_Max_Cusum_Value	None
C_MCF_OBD_HiFlow_Flow_Rate_FC	None	EGR_Position	%
C_MCF_OBD_HiFlow_IAT_Pos_Cmd_Min	%	VGT_Position	%
C_MCF_OBD_HiFlow_Noise_Tol	None	CBR_Protection_Chi_flag	None
C_MCF_OBD_HiFlow_Ovrd_En	None	Charge Flow	kg/min
C_MCF_OBD_HiFlow_Ovrd_Value	None	Controller_faf_cmd	kg/min
C_MCF_OBD_HiFlow_Reset	None	Controller_mcf_cmd	kg/min
C_MCF_OBD_HiFlow_Timer	s	Fresh_Air_Flow	kg/min
C_MCF_OBD_VGT_Pos_Max	%	Charge_Flow_Status	None
C_UFM_Exhaust_Boost_Parameter	deg_C/kPa	vehicle_speed	km/hr
C_UFM_Exhaust_Offset_Parameter	Deg_C	C_UFM_Exhaust_Rail_Parameter	deg_C/bar
C_UFM_Oscar_Exh_O2_Frac	None	C_UFM_Exhaust_O2_Concentration	None
C_UFM_Oscar_Exhaust_Boost	deg_C/kPa	C_UFM_Delta_EMT_ULim	Deg_C
C_UFM_Oscar_Exhaust_Offset	Deg_C	C_UFM_VGT_Actuator_EFA_Def	None
C_UFM_Oscar_Exhaust_Rail	deg_C/bar	C_UFM_HotSide_EGR_Valve_Cfg	None
C_UFM_Oscar_Exhaust_Speed	deg_C/rpm	C_UFM_Compressibility_Fil_Cnst	None
C_UFM_Oscar_Exhaust_Speed2	None	C_UFM_EGR_Orifice_EFA	cm2
C_UFM_Oscar_Veff_Max	None	C_UFM_MCF_Shift_Slope	None
C_UFM_Oscar_Veff_Min	None	C_UFM_MCF_Shift_Intercept	None
C_UFM_Oscar_Veff_Parameter_a1	None	C_UFM_FAF_Shift_Slope	None
C_UFM_Oscar_Veff_Parameter_a2	None	C_UFM_FAF_Shift_Intercept	None
C_UFM_Oscar_Veff_Parameter_a3	None	C_UFM_EGR_Shift_Slope	None
C_UFM_Oscar_Veff_Parameter_a5	None	C_UFM_EGR_Shift_Intercept	None
Current_Engine_State	None	C_UFM_Exhaust_Speed_Parameter	deg_C/rpm
Eac_egr_valve_cmd	%	C_UFM_Delta_EMT_FC	None
Engine_Is_Warm	None	C_UFM_Delta_EMT_LLim	Deg_C
Total_Fueling	mg/st	C_UFM_Exhaust_Tmptr_Fil_Cnst	None
		C_UFM_Delta_EMT_Default	Deg_C

(Click here for parameter list in Excel)

Related Codes / Sections:

Intake Manifold Pressure - FC 2973

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Intake Manifold 1 Pressure - Data erratic, intermittent or incorrect.

CHARGE_PRESS_IR_HIGH_ERROR
Error Flag: CHP_IR_High_Err
System error number: 3651
(csdd_charge_base_mgr_lib.mdl)

CHARGE_PRESS_IR_LOW_ERROR
Error Flag: CHP_IR_Low_Err
System error number: 3652
(csdd_charge_base_mgr_lib.mdl)

CHARGE_PRESS_IR_STUCK_ERROR
System error number: 3653
(csdd_charge_base_mgr_lib.mdl)

CHARGE_PRESS_KEYON_ERROR
System error number: 248
(csdd_magt_mach_monitor.mdl)

CHARGE_PRESS_KEYOFF_ERROR
Error Flag: MMon_CHP_Keyoff_Error_Flag
System error number: 524
(csdd_magt_mach_monitor.mdl)

CAC_LK_SET_ERR
Error Flag: MMon_CHP_Keyoff_Error_Flag
System error number: 4193
(csdd_magt_mach_monitor.mdl)

Filtered_Turbo_Speed	KRPM	CHP_IR_Stuck_Err	None
Air_Press_Sensor	kPa	CHP_Low_Cusum_Value	kPa
Charge_Press	kPa	CHP_Stuck_Cusum_Value	kPa
Charge_Press_Est	kPa	Current_Engine_State	None
Charge_Press_Est_Offset	kPa	ECM_Run_Time	s
Charge_Press_EStat	None	EGR_Orif_Press_Sensor	kPa
Charge_Press_IR_Enable	None	EMM_PROTECTION_FLAG	None
Charge_Press_Sensor	kPa	Engine_Is_Warm	None
Charge_Press_Sensor_Status	None	Engine_Speed	RPM
Charge_Press_Sensor_Volts	V	Exhaust_Press_Sensor	kPa
Charge_Press_Status	None	Key_Switch	None
Charge_Press_Tolerance	kPa	MMon_CHP_Keyoff_Error_Flag	None
CHM_Cusum_Reset_Flag	none	MMON_CHP_KEYON_ERROR_FLAG	None
CHP_High_Cusum_Value	kPa	MMon_Keyoff_Press_Check_State	None
CHP_In_Range_Cusum_Timer	s	MMon_Keyoff_Press_Check_Timer	s
CHP_IR_High_Err	None	MMon_Keyoff_Press_Delay_Timer	s
CHP_IR_Low_Err	None	Oil_Pressure_Absolute_Sensor	kPa

(Click here for parameter list in Excel)

Intake Manifold Pressure Low - FC 125

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Intake Manifold 1 Pressure - Data Valid But Below Normal Operating Range - Moderately Severe Level. I ntake manifold pressure is below the minimum operating limit.

OFC_EQUIV_RATIO_LOWER_LIMIT_ERROR
Error Flag: CBR_OFC_Error_Flag
System Error number: 312
(obd_mcf_flow_lib.mdl)

C_OFC_LLimErrorSet_Thd	s	Combustion_Control_Path_Owner	None
C_OFC_LLimRampDelayTime	s	CBM_Net_Torque_Demand	Nm
C_OFC_LLimRampTime	s	CBR_OFC_LLamptimer	s
C_CBR_OFC_Torque_Min	N_m	CBR_total_ofc_time	s
C_CBR_EMD_Enable	None	CBR_OFC_Error_Flag	None
C_CBR_EMD_Enable	None	CBR_OFC_Max_Time	s
Obd_number_of_operation_cycles	None		

(Click here for parameter list in Excel)

Related Codes / Sections:

Intake Manifold Temperature - FC 436

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Intake Manifold 1 Temperature - Data erratic, intermittent or incorrect.

CHARGE_TMPTR_IR_HIGH_ERROR
Error Flag: ChargeTmptr_IR_High_Err
System error number: 4067
(csdd_charge_base_mgr_lib.mdl)

CHARGE_TMPTR_IR_STUCK_ERROR
Error Flag:
System error number: 4069
(csdd_charge_base_mgr_lib.mdl)

CHARGE_TMPTR_IR_LOW_ERROR
Error Flag: ChargeTmptr_IR_Low_Err
System error number: 4070
(csdd_charge_base_mgr_lib.mdl)

CHARGE_TMPTR_KEYON_ERROR
Error Flag: ChargeTmptr_IR_Low_Err
System error number: 3793
(csdd_charge_base_mgr_lib.mdl)

ECM_Run_Time	S	Compressor_Inlet_Tmptr_Sensor	Deg_C
Engine_Speed	RPM	EGR_Orifice_Tmptr_Sensor	Deg_C
Vehicle_speed	kmph	ChargeTmptr_High_Cusum_Value	Deg_C
Fresh_Air_Flow	kg/min	ChargeTmptr_IR_High_Err	None
Ambient_Air_Tmptr	Deg_C	ChargeTmptr_IR_Low_Err	None
Charge_Tmptr	Deg_C	ChargeTmptr_Low_Cusum_Value	Deg_C
Charge_Tmptr_Est	Deg_C	ChargeTmptr_IRH_Enable	None
Charge_Tmptr_EStat	None	ChargeTmptr_IRH_Timer	s
Charge_Tmptr_Sensor	Deg_C	ChargeTmptr_IRL_Enable	None
Charge_Tmptr_Sensor_Status	None	ChargeTmptr_IRL_Timer	S
Charge_Tmptr_Sensor_Volts	V	ChargeTmptr_Low_Cusum_Value	Deg_C
Charge_Tmptr_Status	None	MMon_BHD_Check_Enable	None
CAC_Outlet_Tmptr_Est	Deg_C	MMon_BHD_Monitor_State	None
CAC_Outlet_Tmptr_Est_Status	None	MMon_BHD_State	None
EMM_Protection_State_1	None	MMon_BHD_Timer	s
EMM_Protection_State_2	None	MMon_Keyon_Tmptr_Check_State	None
H_CHT_IR_Condition_En	None	MMon_CT_Keyon_Error_Flag	None
H_CHM_IR_Startup_Delay_En	None	MMon_Keyon_Tmptr_Check_Timer	S
Air_Tmptr_Sensor	Deg_C	Keyon_Tmptr_Check_Exec_Cnt	None
InternalTmptr_Sensor	Deg_C	MMon_AT_Keyon_Error_Flag	None
Coolant_Temperature_Sensor	Deg_C	MMon_CHT_Keyon_Error_Flag	None
Oil_Temperature_Sensor	Deg_C	MMon_EOT_Keyon_Error_Flag	None
		MMon_OT_Keyon_Error_Flag	None

(Click here for parameter list in Excel)

Low Fuel Idle Error - FC 3338

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Engine Idle Fuel Quantity - Data Valid But Below Normal Operating Range - Moderately Severe Level.

IDLE_FUEL_LOW_ERROR
Error Flag: None
System error number: 3783
(csdd_mca_base.mdl)

Engine_Speed	RPM	IM_High_Fuel_Deviation_Timer	sec
Accelerator_Pedal_Position	%	IM_Low_Fuel_Deviation_Timer	Sec
CBM_Torque_Fuel	mg/str	IM_Speed_Deviation_Timer	sec
Coolant_Temperature	Deg_C	LSI_ReferenceSpd	RPM
Coolant_Temperature_Sensor	Deg_C	Net_Engine_Torque	N_m
Coolant_Tmptr_Sensor_Volts	V	OBD_Engn_At_Idle	None
Current_Engine_State	None	OBD_IM_Enabled	None
Engine_At_Idle	None	OBD_Stable_Idle	None
EPS_s_Status	None	PTO_Status	None
Fuel_System_Failure	None	Vehicle_Speed	km/hr
H_IM_Unst_Idle	None		

(Click here for parameter list in Excel)

Low Idle Error - FC 3716

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Engine Speed At Idle - Data Valid But Below Normal Operating Range - Moderately Severe Level

IDLE_SPEED_LOW_ERROR
System error number: 3781
(csdd_mca_base.mdl)

Engine_Speed	RPM	H_IM_Unst_Idle	None
Accelerator_Pedal_Position	%	IM_Low_Fuel_Deviation_Timer	sec
CBM_Torque_Fuel	mg/str	IM_Speed_Deviation_Timer	sec
Coolant_Temperature	Deg_C	LSI_ReferenceSpd	RPM
Coolant_Temperature_Sensor	Deg_C	Net_Engine_Torque	N_m
Coolant_Tmptr_Sensor_Volts	V	OBD_Engn_At_Idle	None
Current_Engine_State	None	OBD_IM_Enabled	None
Engine_At_Idle	None	OBD_Stable_Idle	None
EPS_s_Status	None	PTO_Status	None
Fuel_System_Failure	None	Vehicle_Speed	km/hr
Fuel_System_Failure	None		

(Click here for parameter list in Excel)

Turbo Intake Temperature - FC 2346

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Turbocharger Turbine Intake Temperature - Data Valid But Above Normal Operating Range - Least Severe Level. Turbocharger turbine inlet temperature has exceeded the engine protection limit.

CBR_TFC_DERATE_ERROR_ID
Error Flag: CBR_TFC_Derate_Error
System error number: 1897
(csdd_cbm_base_lib.mdl)

ECM_Run_Time	S	CBR_TFC_Derate_Fault_Timer	S
Engine_Speed	RPM	VGT_Position	%
Net_Engine_Torque	Nm	Exhaust_Metal_Tmptr	Deg_C
EGR_Position	%	CBM_Indicated_Fuel	Mg/str
CBR_TFC_Derate_Error	None	Texh_Fuel_Limit	Mg/str

(Click here for parameter list in Excel)

Turbo Speed Derate - FC 2288

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Turbocharger 1 Speed - Data Valid But Above Normal Operating Range - High turbocharger speed has been detected by the ECM.

TURBO_SPEED_TORQUE_DERATE_ERROR
Error Flag: TSD_Active
System error number: 2023
(csdd_charge_base_mgr_lib.mdl)

ECM_Run_Time	S	VGT_Position	%
Engine_Speed	RPM	Ambient_Air_Press	KPa
Net_Engine_Torque	Nm	Acceleration_Pedal_Position	%
EGR_Position	%	Total_Fueling	Mg/str
Filtered_Turbo_Speed	KRPM	TSD_Active	None
Turbo_Speed_Est	KRPM	Turbo_Speed_Sensor_Status	None
Turbo_Speed_Est_Scaled	KRPM	Turbo_Speed_Status	None
Combustion_Control_Path_Owner	None	Turbo_Speed_EStat	None

(Click here for parameter list in Excel)

Turbo Speed High - FC 595

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Turbocharger 1 Speed - Data Valid But Above Normal Operating Range - Moderately Severe Level.

TURBO_SPEED_OOR_HIGH_ERROR
Error Flag: Turbo_Speed_High_Error
System error number: 3641
(csdd_charge_base_mgr_lib.mdl)

Ambient_Air_Press	kPa	C_Turbo_Speed_Press_Ratio_Thd	None
Ambient_Air_Press_Status	None	Charge_Press	kPa
C_HP_Turbo_DesPos_Max	%	Charge_Press_Status	None
C_Turbo_Speed_Eng_Spd_Thd	RPM	Engine_Speed	RPM
C_Turbo_Speed_Fault_Decrement	counts	HP_Turbo_Condition_Met	None
C_Turbo_Speed_Fault_Increment	counts	Raw_Turbo_Speed	Hz
C_Turbo_Speed_Fault_Set	counts	T_FIP_TurboSpeedRLOC	None
C_Turbo_Speed_High_Error_Limit	Hz	Turbo_Speed_Sensor	KRPM
C_Turbo_Speed_Low_Error_Limit	Hz		

(Click here for parameter list in Excel)

Turbo Speed Low - FC 687

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Turbocharger 1 Speed - Data Valid But Below Normal Operating Range - Moderately Severe Level.

TURBO_SPEED_OOR_LOW_ERROR
Error Flag: Turbo_Speed_Low_Error
System error number: 3642
(csdd_charge_base_mgr_lib.mdl)

ECM_Run_Time	S	Turbo_Speed_Sensor	KRPM
Engine_Speed	RPM	Unfiltered_Turbo_Speed	KRPM
Net_Engine_Torque	Nm	Raw_Turbo_Speed	Hz
Charge_Press	KPa	Raw_Turbo_Speed_High	None
Ambient_Air_Press	KPa	Raw_Turbo_Speed_Low	None
HP_Turbo_Condition_Met	None	Turbo_Speed_High_Error	None
		Turbo_Speed_Low_Error	None

(Click here for parameter list in Excel)

Used Up All Adjustment Feedback Control - FC 4612

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Air Handling Feedback Control - Condition Exists

UUAA_EGR_ULIM_ERROR
System Error number: 7987

UUAA_EGR_LLIM_ERROR
System Error number: 7988

UUAA_MCF_ULIM_ERROR
System Error number: 7989

UUAA_MCF_LLIM_ERROR
System Error number: 7990

UUAA_DPOP_ULIM_ERROR
System Error number: 8281

(obd_fdbk_cntrl_uuaa_lib.mdl)

Ambient_Air_Press	kPa	Total_Fueling	mg/stroke
Ambient_Air_Tmptr	Deg_C	UUAA_EGR_Llim_Cusum_Timer	s
CBR_Thermal_Oscar_Active	None	UUAA_EGR_Llim_Cusum_Value	None
Controller_EGR_Frac_Cmd	None	UUAA_EGR_Ulim_Cusum_Timer	s
Current_Engine_State	None	UUAA_EGR_Ulim_Cusum_Value	None
EGR_Position	%	UUAA_DPoP_Ulim_Cusum_Timer	s
EMM_Protection_State_1	HEX	UUAA_DPoP_Ulim_Cusum_Value	None
EMM_Protection_State_2	HEX	UUAA_MCF_Llim_Cusum_Timer	s
Engine_Speed	RPM	UUAA_MCF_Llim_Cusum_Value	None
IAT_Position	%	UUAA_MCF_Ulim_Cusum_Timer	s
Controller_MCF_Cmd	kg/min	UUAA_MCF_Ulim_Cusum_Value	None
Charge_Flow	kg/min	H_UUAA_EGR_LLim_En	None
Controller_EGR_Flow_Cmd	kg/min	H_UUAA_EGR_ULim_En	None
EGR_Flow	kg/min	H_UUAA_DPoP_ULim_En	None
TAHR_EMP_Cmd_Final	kPa	H_UUAA_MCF_LLim_En	None
Exhaust_Press	kPa	H_UUAA_MCF_ULim_En	None
VGT_Position	%	UUAA_Global_Enable	None
Net_Engine_Torque	N_m		

(Click here for parameter list in Excel)

Related Codes / Sections:

VGA Actuator Low Battery Voltage - FC 1938

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ECU Power Output Supply Voltage 1 - Data Valid But Below Normal Operating Range - Moderately Severe Level. Low battery voltage detected by the VGT actuator.

VGA_DL_VOLTAGE_LOW_ERROR
Error Flag: H_VGT_Fault_Voltage_Low
System error number: 1626
(csdd_dd_vgt_dl.mdl)

TGC_VT_Cmd	%	vga_dl_j39_motor_effort	None
H_VGT_Fault_Learned_Calibration	None	vga_dl_j39_vgt_status	Hex
VGT_Driver_Failure	None	vga_dl_j39_vgt_state	None
VGT_Actuator_Status	None	J39_VGT_Temperature	C
Engine_Speed	RPM	J39_VGT_Actuator_Position	%
VGT_Actuator_Error_Status	None	J39_VGT_Commanded_State	None

(Click here for parameter list in Excel)

VGA Actuation Error - FC 2387

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VGT Actuator Driver Circuit (Motor) - Mechanical system not responding or out of adjustment. The smart VGT controller has detected incorrect stop limits or the VGT is unable to move to the closed position.

VGA_DL_ACTUATION_ERROR
Error Flag: H_VGT_Fault_Actuation
System error number: 1606
(csdd_dd_vgt_dl.mdl)

TGC_VT_Cmd	%	VGT_Driver_Failure	None
J39_VGT_Temperature	Deg_C	VGT_Actuator_Status	HEX
J39_VGT_Actuator_Position	%	Engine_Speed	RPM
J39_VGT_Commanded_State	None	VGT_Actuator_Error_Status	None
H_VGT_Fault_Learned_Calibration	None		

(Click here for parameter list in Excel)

VGA Controller Calibration - FC 2449

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VGT Actuator Controller - Out of Calibration. The VGT has failed the automatic calibration procedure at initial key-on. VGT will be in the open position.

VGA_DL_LEARNED_CAL_ERROR
Error Flag: H_VGT_Fault_Learned_Calibration
System error number: 1605
(csdd_dd_vgt_dl.mdl)

J39_Motor_Effort	None	H_VGT_Fault_Learned_Calibration	None
J39_Actuator_Status	Hex	VGT_Driver_Failure	None
J39_Actuator_State	None	VGT_Actuator_Status	None
J39_VGT_Temperature	C	Engine_Speed	RPM
J39_VGT_Actuator_Position	%	TGC_VT_Cmd	%
J39_VGT_Commanded_State	None	VGT_Actuator_Error_Status	None

(Click here for parameter list in Excel)

VGA Driver - FC 2198

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VGT Actuator Driver Circuit - Root Cause Not Known. Intermittent communication between the smart VGT controller and the ECM and been detected. The VGT controller is not interpreting the J1939 message from the ECM correctly.

VGA_DL_COMMAND_SOURCE_ERROR
Error Flag: H_VGT_Fault_Command_Source
System error number: 1627
(csdd_dd_vgt_dl.mdl)

J39_Motor_Effort	None	H_VGT_Fault_Learned_Calibration	None
J39_Actuator_Status	Hex	VGT_Driver_Failure	None
J39_Actuator_State	None	VGT_Actuator_Status	None
J39_VGT_Temperature	C	Engine_Speed	RPM
J39_VGT_Actuator_Position	%	TGC_VT_Cmd	%
J39_VGT_Commanded_State	None	VGT_Actuator_Error_Status	None

(Click here for parameter list in Excel)

VGA Driver - FC 2634

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VGT Actuator Controller - Bad intelligent device or component. An internal error has been detected by the smart VGT controller.

VGA_DL_DRIVER_CIRCUIT_ERROR
Error Flag: H_VGT_Fault_Driver_Circuit
System error number: 1604
(csdd_dd_vgt_dl.mdl)

TGC_VT_Cmd	%	H_VGT_Fault_Driver_Circuit	None
J39_VGT_Temperature	Deg_C	VGT_Driver_Failure	None
J39_VGT_Actuator_Position	%	VGT_Actuator_Status	HEX
J39_VGT_Commanded_State	None	Engine_Speed	RPM
VGT_Actuator_Error_Status	None		

(Click here for parameter list in Excel)

VGA Driver - FC 2635

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VGT Actuator Driver Circuit - Condition Exists. A calibration mismatch between VGT actuator and the ECM has been detected.

VGA_DL_MISMATCH_ERROR
System error number: 2112

VGA_DL_CONFIG_ERROR
System error number:

(csdd_dd_vgt_dl.mdl)

TGC_VT_Cmd	%	H_VGT_Fault_Software_Release	None
J39_Motor_Effort	None	VGT_Driver_Failure	None
J39_Actuator_Status	Hex	VGT_Actuator_Status	None
J39_Actuator_State	None	Engine_Speed	RPM
J39_VGT_Temperature	C	H_VGT_Fault_Cust_ID_Mismatch	None
J39_VGT_Actuator_Position	%	H_VGT_Fault_Voltage_Mismatch	None
J39_VGT_Commanded_State	None		
VGT_Actuator_Error_Status	None		

(Click here for parameter list in Excel)

VGT Driver Temperature - FC 1962

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VGT Actuator Driver Over Temperature (Calculated) - Data Valid But Above Normal Operating Range - Least Severe Level. High internal VGT actuator temperature has been detected.

VGA_DL_ OVER_TEMPERATURE_ERROR
Error Flag: H_VGT_Fault_Over_Temperature
System error number: 1607
(csdd_dd_vgt_dl.mdl)

Engine_Speed	RPM	J39_VGT_Commanded_State	None
H_VGT_Fault_Actuation	None	J39_VGT_Temperature	Deg_C
H_VGT_Fault_Driver_Circuit	None	TGC_VT_Cmd	%
H_VGT_Fault_Learned_Calibration	None	VGT_Actuator_Error_Status	None
H_VGT_Fault_Over_Temperature	None	VGT_Actuator_Status	HEX
H_VGT_Fault_Voltage_Low	None	VGT_Driver_Failure	None
J39_VGT_Actuator_Position	%		

(Click here for parameter list in Excel)

VGT Nozzle - FC 3616

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Engine VGT Nozzle Position - Mechanical system not responding or out of adjustment.

VGA_DL_ ACTUATION_NL_ERROR
Error Flag: H_VGT_Fault_Actuation_NL
System error number: 5054
(csdd_dd_vgt_dl.mdl)

TGC_VT_Cmd	%	VGT_Driver_Failure	None
J39_VGT_Temperature	Deg_C	VGT_Actuator_Status	HEX
J39_VGT_Actuator_Position	%	Engine_Speed	RPM
J39_VGT_Commanded_State	None	VGT_Actuator_Error_Status	None
H_VGT_Fault_Learned_Calibration	None		

(Click here for parameter list in Excel)

Engine Protection (EPD) and Aftertreatment Protection

EPD - Line Haul Derate Engine Protection Logic (Emergency Vehicle Not Included)

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Sensor	DerateType: (T)orque / (R)PM	Threshold derate begins after X sec	Max derate occurs:	Fault Code	Lamp
Coolant Temperature	Tseverity based	Coolant_Temperature>=C_EPD_CT_Trq_Drt_Err_Sev for C_EPD_CT_Trq_Err_Dur sec	>= C_EPD_CT_Trq_Drt_Max_Thd	2963	None
	Rtime based	Coolant_Temperature>= C_EPD_CT_RPM_Drt_Err_Sev for C_EPD_CT_RPM_Error_Dur sec	>= C_EPD_CT_TB_Time_To_Max_RPM_Drt sec	151	Red
Coolant Temp (2)	Tseverity based	Coolant_Temperature>= C_EPD_CT2_Trq_Drt_Err_Sev for C_EPD_CT2_Trq_ Err_Dur sec	>= C_EPD_CT2_Trq_Drt_Max_Thd	N/A	N/A
Charge Temperature	Tseverity based	Charge_Tmptr> =C_EPD_CHT_Trq_Drt_Err_Sev for C_EPD_CHT_Trq_Err_Dur sec	>= C_EPD_CHT_Trq_Drt_Max_Thd	2964	None
	Rtime based	Charge_Tmptr> =C_EPD_CHT_RPM_Drt_Err_Sev for C_EPD_CHT_RPM_Error_Dur sec	>=C_EPD_CHT_TB_Time_To_MaxRPMDrt sec	155	Red
Oil Temperature	Tseverity based	Oil_Temperature> =C_EPD_OT_Trq_Drt_Err_Sev for C_EPD_OT_Trq_Err_Dur sec	>= C_EPD_OT_Trq_Drt_ Max_Thd	421	Warning
	Rtime based	Oil_Temperature > =C_EPD_OT_RPM_Drt_Err_Sev for C_EPD_OT_RPM_Error_Dur	>=C_EPD_OT_TB_Time_To_Max_RPM_Drt	214	Red
Oil Temperature(2)	Tseverity based	Oil_Temperature>= C_EPD_OT2_Trq_Drt_Err_Sev for C_EPD_OT2_Trq_Err_Dur	>= C_EPD_OT2_Trq_Drt_Max_Thd	N/A	N/A
Oil Pressure	Ttime based	Oil_Pressure <= EPD_OP_Min_Trq_Drt_Thd (Min Torque Drt Table) for C_EPD_OP_Trq_Err_Dur sec	>= C_EPD_OP_TB_Time_To_Max_Trq_Drt sec	143	Warning
	Rtime based	Oil_Pressure < = EPD_OP_RPM_Drt_Thd (RPM Drt Table) for C_EPD_OP_RPM_Error_Dur sec	>= C_EPD_OP_TB_Time_To_Max_RPM_Drt sec	415	Red
Exhaust Metal Temp (Virtual)	Tseverity based	Exhaust_Metal_Tmptr > =C_EPD_EMT_Trq_Drt_Err_Sev for C_EPD_EMT_Trq_Err_Dur sec	>= C_EPD_EMT_Trq_Drt_Max_Thd	2451	None
Comp Out Temp (Virtual)	Tseverity based	Compressor_Outlet_Tmptr >=C_EPD_COT_Trq_Drt_Err_Sev for C_EPD_COT_Trq_Err_Dur sec	>= C_EPD_COT_Trq_Drt_ Max_Thd	2347	None

EGR Return Temp	Tseverity based	EGR_Orifice_Tmptr > =C_EPD_EGR_Trq_Drt_Err_Sev for C_EPD_EGR_Trq_Err_Dur sec	>= C_EPD_EGR_Trq_Drt_Max_Thd	2961	None
	Rtime based	EGR_Orifice_Tmptr >= C_EPD_EGR_RPM_Drt_Err_Sev for C_EPD_EGR_RPM_Error_Dur sec	>= C_EPD_EGR_TB_Time_To_MaxRPMDrt	2962	Warning
EGR Return Temp (2)	Tseverity based	EGR_Orifice_Tmptr >= C_EPD_EGR2_Trq_Drt_Err_Sev for C_EPD_EGR2_Trq_Err_Dur sec	>= C_EPD_EGR2_Trq_Drt_Max_Thd	N/A	N/A
Crank Case Pressure	N/A	Crankcase_Press>=H_CCP_Mod_High_Thd (C_EPD_CCP_Tbl1) for C_EPD_CCP_Trq_Err_Dur sec		555 (No EPD derate)	Warning
	Ttime based	Crankcase_Press>=H_CCP_Sev_High_Thd (C_EPD_CCP_Tbl2) for C_EPD_CCP_Trq_Err_Dur sec	>= C_EPD_CCP_TB_TimeToMax_Trq_Drt	556	Red
Engine Speed	N/A	Engine_Speed >= C_EPD_Overspeed_Limit for C_EPD_Overspeed_Allowed_Time sec	N/A	234	Red
Soot Load	Tseverity based	V_SFP_mg_Soot_Load_Comb >= C_EPD_SL_Trq_Drt_Err_Sev for C_EPD_SL_Trq_Err_Dur	>= C_EPD_SL_Trq_Drt_Max_Thd	N/A	N/A
	Rtime based	V_SFP_mg_Soot_Load_Comb >=C_EPD_SL_RPM_Drt_Err_Sev for C_EPD_SL_RPM_Error_Dur	>= C_EPD_SL_TB_Time_To_Max_RPM_Drt	N/A	N/A
Coolant Level	Ttime based	Coolant_level=0 for C_EPD_CL_Trq_Err_Dur sec		235	Stop
Exhaust Pressure	Rtime based	Exhaust_Press> C_EPD_EP_RPM_Drt_Err_Sev for C_EPD_EP_RPM_Error_Dur sec	>= C_EPD_EP_TB_Time_To_MaxRPMDrt sec	2764	Warning
Turbo PDOS (Pressure Differential Over Seal)	Tseverity based	CHP_TurboSeal_DP<=C_EPD_TDP_Trq_Drt_Err_Sev for C_EPD_TDP_Trq_Err_Dur	<=C_EPD_TDP_Trq_Drt_Max_Thd	629	Warning
	Rtime based	CHP_TurboSeal_DP<=C_EPD_TDP_RPM_Drt_Err_Sev for C_EPD_TDP_RPM_Error_Dur	>= C_EPD_TDP_TB_Time_To_MaxRPMDrt	3348	Stop

EPF - Line Haul Shut Down Engine Protection Logic

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Line Haul Optional Engine Shut Down Protection Logic

NOTE: These shut down protection features are OEM optional, not mandatory

Sensor	Shutdown Type (T)orque / (R)PM	Threshold Shutdown begins after X sec (and lamp begins flashing):	Time before engine shutdown (lamp flashes):	Fault Code	Lamp
Coolant Temperature	Severity based	> =C_EPD_CT_Sev_SD_Thd for C_EPD_CT_SD_Delay_Time sec	C_EPD_CT_SD_Warning_Time_Dur sec	2963	None
Charge Temperature	Severity based	>= C_EPD_CHT_Sev_SD_Thd for C_EPD_CHT_SD_Delay_Time sec	C_EPD_CHT_SD_Warning_Time_Dur sec	2964	None
Oil Temperature	Severity based	>= C_EPD_OT_Sev_SD_Thd for C_EPD_OT_SD_Delay_Time sec	C_EPD_OT_SD_Warning_Time_Dur sec	214	Red
Oil Pressure	Ttime based	Oil_Pressure<= EPD_OP_Min_Trq_Drt_Thd (C_EPD_OP_Min_Trq_Drt_Tbl) for C_EPD_OP_Trq_SD_Time_Dur+ C_EPD_OP_SD_Delay_Time sec	C_EPD_OP_SD_Warning_Time_Dur sec	143	Yellow
	Rtime based	Oil_Pressure<= EPD_OP_RPM_Drt_Thd (C_EPD_OP_Max_Trq_Drt_Tbl) for C_EPD_OP_RPM_SD_Time_Dur+ C_EPD_OP_SD_Delay_Time sec	C_EPD_OP_SD_Warning_Time_Dur sec	415	Red

Line Haul Mandatory Shutdown Protection Logic (Emergency Vehicle Not Included)

Sensor	Shutdown Type (T)orque / (R)PM	Threshold Shutdown begins after X sec (and lamp begins flashing):	Time before engine shutdown (lamp flashes):	Fault Code	Lamp
Aftertreatment Temp	Severity based	During non-regen, V_ATP_trc_DOC_In >= C_ATD_trc_NR_DOC_In_HiThd for C_ATD_tm_NR_DOC_In_HiTmptr + C_ATM_tm_OT_EPSD_Delay	C_ATM_tm_OT_EPSD_Warning Sec	3251	Stop Lamp
	Severity based	During non-regen, V_ATP_trc_DOC_Out > = C_ATD_trc_NR_DPF_Out_HiThd for C_ATD_tm_NR_DOC_Out_HiTmptr + C_ATM_tm_OT_EPSD_Delay sec	C_ATM_tm_OT_EPSD_Warning Sec	3253	Stop Lamp
	Severity based	During non-regen, V_ATP_trc_DOC_Out- V_ATP_trc_DOC_In>= C_ATD_trc_NR_DOC_Delta_HiThd for C_ATD_tm_NR_DOC_Delta_HiTmptr + C_ATM_tm_OT_EPSD_Delay sec	C_ATM_tm_OT_EPSD_Warning Sec	3253	Stop Lamp
	Severity based	During non-regen, V_ATP_trc_DPF_Out>= C_ATD_trc_NR_DOC_Out_HiThd for C_ATD_tm_NR_DPF_Out_HiTmptr+ C_ATM_tm_OT_EPSD_Delay sec	C_ATM_tm_OT_EPSD_Warning Sec	3255	Stop Lamp
	Severity based	During non-regen, V_ATP_trc_DPF_Out- V_ATP_trc_DOC_Out> = C_ATD_trc_NR_DPF_Delta_HiThd for C_ATD_tm_NR_DPF_Delta_HiTmptr+ C_ATM_tm_OT_EPSD_Delay sec	C_ATM_tm_OT_EPSD_Warning Sec	3255	Stop Lamp
	Severity based	V_ATP_trc_DOC_Out> C_ATD_trc_DOC_Out_Severe_HiThd for C_ATD_tm_DOC_Severe_Tmptr+ C_ATM_tm_OT_EPSD_Delay sec	C_ATM_tm_OT_EPSD_Warning Sec	3311	Stop Lamp
	Severity based	(V_ATP_trc_DOC_In>C_ATD_trc_OT_Delta_DOC_In_Thd) and (V_ATP_trc_DOC_Out> C_ATD_trc_OT_Delta_DOC_Out_Thd) and (V_ATP_trc_DOC_Out- V_ATP_trc_DOC_In> = C_ATD_trc_DOC_Delta_Sev_HiThd for C_ATD_tm_DOC_Delta_Severe_Tmptr+ C_ATM_tm_OT_EPSD_Delay sec)	C_ATM_tm_OT_EPSD_Warning Sec	3311	Stop Lamp
	Severity based	V_ATP_trc_DPF_Out>= C_ATD_trc_DPF_Out_Severe_HiThd for C_ATD_tm_DPF_Severe_Tmptr+ C_ATM_tm_OT_EPSD_Delay sec	C_ATM_tm_OT_EPSD_Warning Sec	3312	Stop Lamp
	Severity based	During non-regen, V_ATP_trc_SCR_Out>= C_ATD_trc_NR_SCR_Out_HiThd for C_ATD_tm_NR_SCR_Out_HiTmptr+C_EPD_SCR_OT_SD_Delay_Time	C_EPD_SCR_OT_SD_Warning_Time	3231	Stop Lamp
	Severity based	During non-regen, V_ATP_trc_SCR_In> = C_ATD_trc_NR_SCR_In_HiThd for C_ATD_tm_NR_SCR_In_HiTmptr+ C_EPD_SCR_OT_SD_Delay_Time	C_EPD_SCR_OT_SD_Warning_Time	3235	Stop Lamp
	Severity based	Mass flow rate of the oxidant>= C_ATD_fg_HiOxidantRate_Thd for C_ATD_tm_HiOxidantRate_Dur + C_EPD_SCR_OT_SD_Delay_Time	C_EPD_SCR_OT_SD_Warning_Time	3165	Stop Lamp

Engine Protection Derate Diagnostics – FC 155, FC 2964, FC 2963, FC 151, FC 2347, FC 555, FC 556, FC 2962, FC 2961, FC 2451, FC 234, FC 2764, FC 143, FC 415, FC 214, FC 421, FC 3348, FC 629

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FC 415: OIL_PRESSURE_RPM_ERROR
Engine Oil Rifle Pressure - Data valid but below normal operational range - Most Severe Level
System error number: 279

FC 421: OIL_TEMPERATURE_FUELING_ERROR
Engine Oil Temperature - Data Valid But Above Normal Operating Range - Moderately Severe Level
System error number: 106

FC 555: CRANKCASE_PRESSURE_MOD_HIGH
Crankcase Pressure - Data Valid But Above Normal Operating Range - Moderately Severe Level
System error number: 2018

FC 556: CRANKCASE_PRESSURE_SEV_HIGH
Crankcase Pressure - Data valid but above normal operational range - Most Severe Level
System error number: 2020

FC 629: CHRG_EPD_TDP_TRQ_DRT_ERROR
Turbocharger 1 Compressor Intake Pressure - Data Valid But Below Normal Operating Range - Moderately Severe Level
System error number: 4023

FC 2347: COT_TORQUE_DERATE_ERROR
Turbocharger Compressor Outlet Temperature (Calculated) - Data Valid But Above Normal Operating Range - Least Severe Level
System error number: 866

FC 2764: EP_RPM_DERATE_ERROR
Exhaust Gas Pressure 1 - Data Valid But Above Normal Operating Range - Moderately Severe Level
System error number: 2260

FC 2961: EGR_TORQUE_DERATE_ERROR
Exhaust Gas Recirculation Temperature - Data Valid But Above Normal Operating Range - Least Severe Level
System error number: 870

FC 2962: EGR_RPM_DERATE_ERROR
Exhaust Gas Recirculation Temperature - Data Valid But Above Normal Operating Range - Moderately Severe Level
System error number: 869

FC 2963: COOLANT_TEMPERATURE_FUELING_ERROR
Engine Coolant Temperature - Data Valid But Above Normal Operating Range - Least Severe Level
System error number: 80

FC 2964: IMT_TORQUE_DERATE_ERROR
Intake Manifold 1 Temperature - Data Valid But Above Normal Operating Range - Least Severe Level
System error number: 648

FC 3348: CHRG_EPD_TDP_SPD_DRT_ERROR

Turbocharger 1 Compressor Intake Pressure - Data valid but below normal operational range - Most Severe Level
System error numbers 4024

Combustion_Control_Path_Owner	None	EPD_SpdDrtActive	None
Engine_Speed	RPM	EPD_SpeedDerateValue	RPM
EPD_Engine_State	None	EPD_Torque_Derate_Value_id	None
EPD_Latest_Shutdown_ID	None	EPD_TorqueDerateValue	N_m
EPD_Max_Derate	N_m	EPD_TrqDrtActive	None
EPD_No_Derate_Torque	N_m	H_EPD_Latest_Derate_ID	None
EPD_Shutdown_Override_Switch	None	Net_Engine_Torque	N_m
EPD_ShutdownCount	None	Total_Fueling	mg/stroke
EPD_ShutdownTotal	None		

(Click here for parameter list in Excel)

Threshold Parameter for Monitoring	**SE**
Coolant_Temperature>C_EPD_CT_Trq_Drt_Err_Sev	COOLANT_TEMPERATURE_FUELING_ERROR
Coolant_Temperature>C_EPD_CT_RPM_Drt_Err_Sev	COOLANT_TEMPERATURE_RPM_ERROR
Coolant_Temperature>C_EPD_CT2_Trq_Drt_Err_Sev	COOLANT_TEMPERATURE_FUELING_ERROR2
Charge_Tmptr> C_EPD_CHT_Trq_Drt_Err_Sev	IMT_TORQUE_DERATE_ERROR
Charge_Tmptr> C_EPD_CHT_RPM_Drt_Err_Sev	IMT_RPM_DERATE_ERROR
Oil_Temperature>C_EPD_OT_Trq_Drt_Err_Sev	OIL_TEMPERATURE_FUELING_ERROR
Oil_Temperature>C_EPD_OT_RPM_Drt_Err_Sev	OIL_TEMPERATURE_ABOVE_NORMAL_ERROR
Oil_Temperature> C_EPD_OT2_Trq_Drt_Err_Sev	OIL_TEMPERATURE_FUELING_ERROR2
Oil_Pressure< EPD_OP_Min_Trq_Drt_Thd	OIL_PRESSURE_FUELING_ERROR
Oil_Pressure< EPD_OP_RPM_Drt_Thd	OIL_PRESSURE_RPM_ERROR
Exhaust_Metal_Tmptr> C_EPD_EMT_Trq_Drt_Err_Sev	EMT_TORQUE_DERATE_ERROR
Compressor_Outlet_Tmptr> C_EPD_COT_Trq_Drt_Err_Sev	COT_TORQUE_DERATE_ERROR
EGR_Orifice_Tmptr> C_EPD_EGR_Trq_Drt_Err_Sev	EGR_TORQUE_DERATE_ERROR
EGR_Orifice_Tmptr> C_EPD_EGR_RPM_Drt_Err_Sev	EGR_RPM_DERATE_ERROR
Crankcase_Press>H_CCP_Mod_High_Thd	CRANKCASE_PRESSURE_MOD_HIGH
Crankcase_Press>H_CCP_Sev_High_Thd	CRANKCASE_PRESSURE_SEV_HIGH
Engine_Speed>C_EPD_Overspeed_Limit	ENGINE_OVERSPEED_ERROR
Exhaust_Press> C_EPD_EP_RPM_Drt_Err_Sev	EP_RPM_DERATE_ERROR
CHP_TurboSeal_DP<C_EPD_TDP_Trq_Drt_Err_Sev	CHRG_EPD_TDP_TRQ_DRT_ERROR
CHP_TurboSeal_DP<C_EPD_TDP_RPM_Drt_Err_Sev	CHRG_EPD_TDP_SPD_DRT_ERROR

Related Codes / Sections: Line Haul Derate Engine Protection Logic

Engine Protection EPF

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(eng_prot_util, csdd_charge_base_mgr_lib.mdl)

Accelerator_Pedal_Position	%	EPD_Latest_Shutdown_ID	None
C_EPD_Restart_Number	None	EPD_Shutdown_Override_Switch	None
Charge_Flow	kg/min	EPD_ShutdownCount	None
Charge_Tmptr	Deg_C	EPD_TorqueDerateValue	N_m
CHL_EGR_Frac_Cmd	None	Exhaust_Metal_Tmptr	Deg_C
CHL_MCF_Cmd	kg/min	J39_VGT_Actuator_Position	%

Combustion_Control_Path_Owner	None	Net_Engine_Torque	N_m
Compressor_Outlet_Tmptr	deg C	Oil_Pressure	kPa_G
Coolant_Level	None	Oil_Temperature	Deg_C
Coolant_Temperature	Deg_C	TGC_VT_Cmd	%
ECM_Run_Time	s	Total_Fueling	mg/stroke
EGR_Flow	kg/min	VGT_Position	%
EGR_Fraction	None		
EGR_Orifice_Tmptr	Deg_C	**Trimmables:**	
EGR_Position	%	T_EPD_Engine_Protection_En	None
Engine_Speed	RPM	T_EPD_Override_Switch_Function	None
ENGN_EpdShtdwnEngine	None	T_EPD_Restart_En	None
ENGN_EpdSpdDrtIdDurSD	None	T_EPD_Shutdown_En	None
ENGN_EpdTrqDrtIdDurSD	None	T_EPD_Shutdown_Override_En	None
EPD_Auxiliary_Shutdown_Switch	None		

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EPF - Aftertreatment High Temp Engine Protection

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(atm_pfs_atd_lib.mdl\ATD\Protection)

Engine_Speed	RPM	V_ATD_OORShutdownInvalid	None
H_HIM_fg_Dosing_Cmd	g/sec	V_ATD_OT_EPSD_Request	None
Net_Engine_Torque	N_m	V_ATD_OT_PrevEPSD	None
O_ATD_DOC_Out_SevereFault_Reset	None	V_ATD_OT_ResetTimer	None
O_ATD_DOCOut_PersistFault_Reset	None	V_ATD_PFS_LmpHome_SensCond	None
O_ATD_DPF_Out_SevereFault_Reset	None	V_ATD_Regen_End	None
O_ATD_DPFOut_PersistFault_Reset	None	V_ATD_RqstProtMode	None
P_ATD_bs_OORErrors	HEX	V_ATD_SCR_In_Severe_Condition	None
P_ATD_ct_DOCOut_HiTmptr_Persist	counts	V_ATD_SCR_In_Severe_Fault	None
P_ATD_ct_DPFOut_HiTmptr_Persist	counts	V_ATD_SCR_Out_Severe_Condition	None
P_ATD_OT_EPSD_Request	None	V_ATD_SCR_Out_Severe_Fault	None
P_ATD_tm_NR_DOC_Hi_Delay	s	V_ATD_Stop_NMRegen	None
P_ATD_tm_NR_DPF_Hi_Delay	s	V_ATD_StopDesorb	None
P_ATD_tm_NR_SCR_In_Hi_Delay	s	V_ATD_StopRegen	None
P_ATD_tm_NR_SCR_Out_Hi_Delay	s	V_ATD_StopRegen_Ext	None
V_AIM_Engine_Warm_Flag	None	V_ATD_StopRegen_local	None
V_AIM_trc_DOC_In_Status	None	V_ATD_tm_DOC_Delta_Severe_Tmptr	s
V_AIM_trc_DOC_Out_Status	None	V_ATD_tm_DOC_Out_HiTmptr	s
V_AIM_trc_DPF_Out_Status	None	V_ATD_tm_DOC_Out_Severe_Tmptr	s
V_ATD_bs_PFS_EngOut_Status	HEX	V_ATD_tm_DPF_Out_HiTmptr	s
V_ATD_bs_PFS_Sensor_Status	HEX	V_ATD_tm_DPF_Out_Severe_Tmptr	s
V_ATD_bs_PFS_SysIO_Errs	HEX	V_ATD_tm_EPD_LatchWindow	s
V_ATD_bs_PFS_SysPerf1_Errs	HEX	V_ATD_tm_EPSDRequest	s
V_ATD_bs_PFS_SysPerf2_Errs	HEX	V_ATD_tm_NR_DOC_Delta_Hi	s
V_ATD_bs_SCR_Sensor_Status	HEX	V_ATD_tm_NR_DOC_In_Hi	s
V_ATD_DisableDosing	None	V_ATD_tm_NR_DOC_Out_Hi	s
V_ATD_DisableDosing_Ext	None	V_ATD_tm_NR_DPF_Delta_Hi	s
V_ATD_DisableDosing_local	None	V_ATD_tm_NR_DPF_Out_Hi	s
V_ATD_DOC_Delta_Severe_Cond	None	V_ATD_tm_NR_SCR_In_Hi	s
V_ATD_DOC_Delta_Severe_Enbl	None	V_ATD_tm_NR_SCR_Out_Hi	s
V_ATD_DOC_Delta_Severe_Fault	None	V_ATD_tm_SCR_In_Severe_Tmptr	s
V_ATD_DOC_Out_Persist_Fault	None	V_ATD_tm_SCR_Out_Severe_Tmptr	s
V_ATD_DOC_Out_Severe_Condition	None	V_ATM_fg_HC_Fdbk_Total	g/sec
V_ATD_DOC_Out_Severe_Fault	None	V_ATM_OBD_Data_Reset	None
V_ATD_DPF_Out_Persist_Fault	None	V_ATM_Oper_Mode	None
V_ATD_DPF_Out_Severe_Condition	None	V_ATP_Engine_Running	None
V_ATD_DPF_Out_Severe_Fault	None	V_ATP_KeySwitch	None
V_ATD_EPSD_ClrLatch	None	V_ATP_Rqst_ATOL_Mode	None
V_ATD_EPSD_InProgress	None	V_ATP_trc_DOC_In	Deg_C
V_ATD_NR_OT_DOC_Delta_Enbl	None	V_ATP_trc_DOC_Out	Deg_C
V_ATD_NR_OT_DPF_Delta_Enbl	None	V_ATP_trc_DPF_Out	Deg_C
V_ATD_NR_OT_SCR_In_Enbl	None	V_ATP_trc_SCR_Out	Deg_C
V_ATD_NR_OT_SCR_Out_Enbl	None	V_ATP_trc_SCR_T1	Deg_C
V_ATD_NR_Overtemp_DOC_Enbl	None	V_ATR_NonMissionRegenActive	None
V_ATD_NR_Overtemp_DPF_Enbl	None	V_OCL_H2O_Desorb_Request	None

V_ATD_NR_SCR_In_HiTmptr_Flag	None	V_OCL_HC_Desorb_Request	None
V_ATD_NR_SCR_Out_HiTmptr_Flag	None		

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EPF - Compressor Outlet Temperature Engine Protection

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(csdd_charge_base_mgr_lib.mdl\CHRG_EPDEngineProtection\epd_channels\COT)

C_EPD_COT_RPM_Thd	RPM	C_EPD_COT_Trq_Err_Dur	s
C_EPD_COT_SD_Delay_Time	s	CHRG_CotPrevSevSdReq	None
C_EPD_COT_SD_Warning_Time_Dur	s	CHRG_CotPrevSevSdReq	None
C_EPD_COT_Sev_SD_En	None	Compressor_Outlet_Tmptr	Deg_C
C_EPD_COT_Sev_SD_Thd	Deg_C	Compressor_Outlet_Tmptr_Status	None
C_EPD_COT_Trq_Drt_En	None	H_EPD_COTLogDurSecs	s
C_EPD_COT_Trq_Drt_Err_Sev	Deg_C	H_EPD_COTLogExtremeVal	Deg_C
C_EPD_COT_Trq_Drt_Fault_Code	None	Prev_COT_Trq_Drt_Idx	None
C_EPD_COT_Trq_Drt_Max_Thd	Deg_C	T_EPD_COT_Trq_Drt_Log[0]	

(Click here for parameter list in Excel)

EPF - Coolant Level Engine Protection

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(csdd_lube_cool/LUCL_EPF_Data_proc/CL)

Coolant_Level	None	C_EPD_CL_Trq_Drt_Type	None
AIP_Cool_Lev_Override_Value	None	C_EPD_CL_Trq_Err_Dur	s
C_EPD_CL_Restart_Lim_En	None	C_EPD_CL_Trq_SD_Time_Dur	s
C_EPD_CL_RPM_Thd	RPM	CLSD_Ovrd_Cmd	None
C_EPD_CL_SD_Delay_Time	s	CLSD_Ovrd_State	None
C_EPD_CL_SD_Warning_Time_Dur	s	EPD_CL_Enable	None
C_EPD_CL_TB_Time_To_Max_Trq_Drt	s	LUCL_EPD_CL_Trq_Drt_Dur_Time	s
C_EPD_CL_Time_Trq_SD_En	None	Prev_CL_Trq_Drt_Idx	None
C_EPD_CL_Trq_Drt_En	None	T_AIP_Cool_Lev_User_Override_En	None
C_EPD_CL_Trq_Drt_Fault_Code	None	T_EPD_CLSD_Ovrd_Mux_En	None
C_EPD_CL_Trq_Drt_Threshold	None		

(Click here for parameter list in Excel)

EPF - Coolant Temperature Engine Protection

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(csdd_lube_cool/LUCL_EPF_Data_proc/CT)

Coolant_Temperature	Deg_C	C_EPD_CT_Spd_Derate	RPM
C_EPD_CT_RPM_Drt_En	None	C_EPD_CT_Start_Time	s
C_EPD_CT_RPM_Thd	RPM	C_EPD_CT_Time_RPM_SD_En	None
C_EPD_CT_Restart_Lim_En	None	C_EPD_CT_Trq_Drt_En	None
C_EPD_CT_RPM_Drt_Err_Sev	Deg_C	C_EPD_CT_Trq_Drt_Err_Sev	Deg_C
C_EPD_CT_RPM_Drt_Err_Sev	Deg_C	C_EPD_CT_Trq_Drt_Fault_Code	None
C_EPD_CT_RPM_Drt_Fault_Code	None	C_EPD_CT_Trq_Drt_Max_Thd	Deg_C
C_EPD_CT_RPM_Error_Dur	s	C_EPD_CT_Trq_Drt_Type	None
C_EPD_CT_RPM_SD_Time_Dur	s	C_EPD_CT_Trq_Err_Dur	s
C_EPD_CT_SB_Time_To_Max_Trq_Drt	s	EPD_CT_Enable	None
C_EPD_CT_SD_Delay_Time	s	LUCL_CtPrevSevSdReq	None
C_EPD_CT_SD_Warning_Time_Dur	s	Prev_CT_RPM_Drt_Idx	None
C_EPD_CT_Sev_SD_En	None	Prev_CT_Trq_Drt_Idx	None
C_EPD_CT_Sev_SD_Thd	Deg_C	T_EPD_CT_RPM_Drt_Log[0]	

(Click here for parameter list in Excel)

EPF - Coolant Temp2 Engine Protection

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(csdd_lube_cool/LUCL_EPF_Data_proc/CT2)

Coolant_Temperature	Deg_C	C_EPD_CT2_Trq_Drt_Fault_Code	None
C_EPD_CT2_RPM_Thd	RPM	C_EPD_CT2_Trq_Drt_Max_Thd	Deg_C
C_EPD_CT2_Start_Time	s	C_EPD_CT2_Trq_Drt_Type	None
C_EPD_CT2_TB_TimeToMax_Trq_Drt	s	C_EPD_CT2_Trq_Err_Dur	s
C_EPD_CT2_Trq_Drt_En	None	Prev_CT2_Trq_Drt_Idx	None
C_EPD_CT2_Trq_Drt_Err_Sev	Deg_C		

(Click here for parameter list in Excel)

EPF - CrankCase Pressure Engine Protection

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(csdd_engine_cv_ext/EMX_EPF_Data_Proc)

Crankcase_Press	kPa_G	C_EPD_CCP_Trq_Drt_Ramp_Rate	N_m
C_CCP_Delay_Ambient_Tmptr_Thd	Deg_C	C_EPD_CCP_Trq_Drt_Type	None
C_CCP_Delay_Diag_En	None	C_EPD_CCP_Trq_Err_Dur	s
C_CCP_Min_Time	s	C_EPD_CCP_yellow_lamp_delay	s
C_EPD_CCP_RPM_Thd	RPM	EPD_CCP_Enable	None
C_EPD_CCP_TB_TimeToMax_Trq_Drt	s	H_CCP_Sev_High_Thd	kPa_G
C_EPD_CCP_Tbl1[0:0]	kPa	H_EPD_CCPLogRealTime	s
C_EPD_CCP_Tbl2[0:0]	kPa	H_EPD_CCPLogRunTime	s
C_EPD_CCP_Trq_Drt_Fault_Code	None		

(Click here for parameter list in Excel)

EPF - EGR Orifice Temperature Engine Protection

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(csdd_charge_base_mgr_lib.mdl\CHRG_EPDEngineProtection\epd_channels\EGR)

EGR_Orifice_Tmptr	Deg_C	C_EPD_EGR_Start_Time	s
C_EPD_EGR_RPM_Drt_En	None	C_EPD_EGR_Trq_Drt_En	None
C_EPD_EGR_RPM_Thd	RPM	C_EPD_EGR_Trq_Drt_Err_Sev	Deg_C
C_EPD_EGR_RPM_Drt_Err_Sev	Deg_C	C_EPD_EGR_Trq_Drt_Fault_Code	None
C_EPD_EGR_RPM_Drt_Fault_Code	None	C_EPD_EGR_Trq_Drt_Max_Thd	Deg_C
C_EPD_EGR_RPM_Error_Dur	s	C_EPD_EGR_Trq_Err_Dur	s
C_EPD_EGR_SD_Delay_Time	s	CHRG_EgrPrevSevSdReq	None
C_EPD_EGR_SD_Warning_Time_Dur	s	EGR_Orifice_Tmptr_Status	None
C_EPD_EGR_Sev_SD_En	None	Prev_EGR_RPM_Drt_Idx	None
C_EPD_EGR_Sev_SD_Thd	Deg_C	Prev_EGR_Trq_Drt_Idx	None

(Click here for parameter list in Excel)

EPF - EGR Orifice Temperature 2 Engine Protection

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(csdd_charge_base_mgr_lib.mdl\CHRG_EPDEngineProtection\epd_channels\EGR_Silent)

EGR_Orifice_Tmptr	Deg_C	C_EPD_EGR2_Trq_Drt_Max_Thd	Deg_C
C_EPD_EGR2_RPM_Thd	RPM	C_EPD_EGR2_Trq_Err_Dur	s
C_EPD_EGR2_Start_Time	s	EGR_Orifice_Tmptr_Status	None
C_EPD_EGR2_Trq_Drt_En	None	Prev_EGR2_Trq_Drt_Idx	None
C_EPD_EGR2_Trq_Drt_Err_Sev	Deg_C		

(Click here for parameter list in Excel)

EPF - Engine Over Speed Protection

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(csdd_engine_manager_lib.mdl\ENGN_eop_data_proc\ept)

Engine_Speed	RPM	C_EPD_Overspeed_Limit	RPM
C_EPD_Overspeed_Allowed_Time	s	C_EPD_Overspeed_Error_Reset	RPM

(Click here for parameter list in Excel)

EPF - Exhaust Metal Temperature Engine Protection

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(csdd_charge_base_mgr_lib.mdl\CHRG_EPDEngineProtection\epd_channels\EMT)

Exhaust_Metal_Tmptr	Deg_C	C_TFC_Fuel_Limit_LLim	mg/stroke
Charge_Press	kPa	CHRG_EmtPrevSevSdReq	None
C_EPD_EMT_RPM_Thd	RPM	H_EPD_EMTLogDurSecs	s
C_EPD_EMT_SB_Time_To_MaxTrqDrt	s	H_EPD_EMTLogExtremeVal	Deg_C
C_EPD_EMT_Trq_Drt_En	None	H_EPD_EMTLogExtremeVal	Deg_C
C_EPD_EMT_Trq_Drt_Err_Sev	Deg_C	H_EPD_EMTLogRunTime	s
C_EPD_EMT_Trq_Drt_Fault_Code	None	Prev_EMT_Trq_Drt_Idx	None
C_EPD_EMT_Trq_Drt_Max_Thd	Deg_C	T_EPD_EMT_Trq_Drt_Log[0]	
C_EPD_EMT_Trq_Drt_Type	None	T_EPD_EMT_Trq_Drt_Log[0]	
C_EPD_EMT_Trq_Err_Dur	s		

(Click here for parameter list in Excel)

EPF - Exhaust Pressure Engine Protection

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(csdd_charge_base_mgr_lib.mdl\CHRG_EPDEngineProtection\epd_channels\EP)

Exhaust_Press	kPa	C_EPD_EP_TB_Time_To_MaxRPMDrt	s
Exhaust_Press_Status	None	H_EPD_EPLogRPMDurSecs	s
C_EPD_EP_RPM_Drt_En	None	H_EPD_EPLogRPMDurSecs	s
C_EPD_EP_RPM_Drt_Err_Sev	kPa	H_EPD_EPLogRPMExtremeVal	kPa
C_EPD_EP_RPM_Drt_Fault_Code	None	H_EPD_EPRPMLogRealTime	s
C_EPD_EP_RPM_Error_Dur	s	Prev_EP_RPM_Drt_Idx	None
C_EPD_EP_RPM_Thd	RPM	T_EPD_EP_RPM_Drt_Log[0]	

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EPF - Oil Pressure Engine Protection

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(csdd_lube_cool/LUCL_EPF_Data_proc/OP)

Oil_Pressure	kPa_G	C_EPD_OP_Trq_Drt_Fault_Code	None
C_EPD_OP_RPM_Drt_En	None	C_EPD_OP_Trq_Err_Dur	s
C_EPD_OP_RPM_Thd	RPM	C_EPD_OP_Trq_SD_Time_Dur	s
C_EPD_OP_RPM_Drt_Fault_Code	None	EPD_OP_Enable	None
C_EPD_OP_RPM_Error_Dur	s	EPD_OP_Min_Trq_Drt_Thd	kPa_G
C_EPD_OP_RPM_SD_Time_Dur	s	EPD_OP_RPM_Drt_Delta	kPa_G
C_EPD_OP_SB_Time_To_Max_Trq_Drt	s	EPD_OP_RPM_Drt_Thd	kPa_G
C_EPD_OP_SD_Delay_Time	s	EPD_OP_Trq_Drt_Delta	kPa_G
C_EPD_OP_SD_Warning_Time_Dur	s	LUCL_OpPrevTbSpdSdReq	None
C_EPD_OP_Spd_Derate	RPM	LUCL_OpPrevTbTrqSdReq	None
C_EPD_OP_Start_Time	s	Prev_OP_RPM_Drt_Idx	None
C_EPD_OP_Time_RPM_SD_En	None	Prev_OP_Trq_Drt_Idx	None
C_EPD_OP_Time_Trq_SD_En	None	T_EPD_OP_RPM_Drt_Log[0]	

Oil_Pressure	kPa_G	C_EPD_OP_Trq_Drt_Fault_Code	None
C_EPD_OP_Trq_Drt_En	None		

(Click here for parameter list in Excel)

EPF - Oil Temperature Engine Protection

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(csdd_lube_cool/LUCL_EPF_Data_proc/OT)

Oil_Temperature	Deg_C	C_EPD_OT_Start_Time	s
C_EPD_OT_RPM_Drt_En	None	C_EPD_OT_Trq_Drt_En	None
C_EPD_OT_RPM_Thd	RPM	C_EPD_OT_Trq_Drt_Err_Sev	Deg_C
C_EPD_OT_RPM_Drt_Err_Sev	Deg_C	C_EPD_OT_Trq_Drt_Fault_Code	None
C_EPD_OT_RPM_Drt_Err_Sev	Deg_C	C_EPD_OT_Trq_Drt_Max_Thd	Deg_C
C_EPD_OT_RPM_Drt_Fault_Code	None	C_EPD_OT_Trq_Err_Dur	s
C_EPD_OT_RPM_Error_Dur	s	EPD_OT_Enable	None
C_EPD_OT_RPM_Thd	RPM	EPD_OT_Ext_Enable	None
C_EPD_OT_SD_Delay_Time	s	LUCL_OtPrevSdReq	None
C_EPD_OT_SD_Warning_Time_Dur	s	Prev_OT_RPM_Drt_Idx	None
C_EPD_OT_Sev_SD_En	None	Prev_OT_Trq_Drt_Idx	None
C_EPD_OT_Sev_SD_Thd	Deg_C		

(Click here for parameter list in Excel)

EPF - Soot Load Engine Protection

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(csdd_atm_pfs.mdl\Svc_EPF_Data_Proc\EPD\SootLevel)

Engine_Speed	RPM	O_SFP_gpl_Soot_Load_Reset_Val	g/L
Net_Engine_Torque	N_m	Prev_SL_Trq_Drt_Idx	None
C_EPD_SL_RPM_Drt_Err_Sev	gm	T_EPD_SL_RPM_Drt_Log[0]	
C_EPD_SL_Spd_Derate	RPM	V_AIM_EPD_EngProtection_Enbl	None
C_EPD_SL_Time_RPM_SD_En	None	V_AIM_EPD_Soot_Enbl	None
C_EPD_SL_Time_Trq_SD_En	None	V_AIM_HSI_StaticHighPriority	None
C_EPD_SL_Trq_Drt_En	None	V_AIM_mg_DPF_Soot_Load_fxp	gm
C_EPD_SL_Trq_Drt_Err_Sev	gm	V_AIM_NoDrtTrq	None
C_EPD_SL_Trq_Drt_Max_Thd	gm	V_AIM_Prev_SootLoadRPM_Err	None
C_EPD_SL_Trq_Err_Dur	s	V_ATP_tm_ECM_Real_Time	s
O_SFP_gpl_Soot_Load_Reset_En	None	V_SFP_mg_Soot_Load_Comb	gm

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EPF - Idle Engine Protection – FC 2789, FC 3385

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FC 2789: IDLE_LOW_CT_PROTECT_ERROR

Engine Coolant Temperature - Data Valid But Below Normal Operating Range - Moderately Severe Level

System Error number: 3609

(csdd_emissions_manager_lib.mdl\EMM_AECD\AECD_and_Derate\AECD_Event_Logic)

FC 3385: IDLE_LOW_CHT_PROTECT_ERROR

Intake Manifold 1 Temperature - Data Valid But Below Normal Operating Range - Moderately Severe Level

System Error number: 3610

(csdd_emissions_manager_lib.mdl\EMM_AECD\AECD_and_Derate\AECD_Event_Logic)

Coolant_Temperature	Deg_C	C_EMO_Idle_CHT_CT_Thd	Deg_C
Charge_Tmptr	Deg_C	C_EMO_Idle_CHT_Delay	s

EMO_Idle_CT_EGR_Off	None	C_EMO_Idle_CHT_Enable	None
EMO_Idle_CHT_EGR_Off	None	C_EMO_Idle_CHT_Thd	Deg_C
C_EMO_Idle_CT_Amb_Tmptr_Thd	Deg_C	C_EMO_Idle_CHT_Timeout_Thd	s
C_EMO_Idle_CT_Delay	s	C_EMO_Idle_EGR_Frac_Thd	None
C_EMO_Idle_CT_Enable	None	C_EMO_Idle_Low_Fuel_Delay	s
C_EMO_Idle_CT_Thd	Deg_C	EMM_AECD_State	HEX
C_EMO_Idle_CHT_Amb_Tmptr_Thd	Deg_C	EMM_AECD_State_Vector[0]	HEX

(Click here for parameter list in Excel)

Related Codes / Sections:

Engine Coolant Temperature - FC 146

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Engine Coolant Temperature - Data Valid But Above Normal Operating Range - Moderately Severe Level

COOLANT_TEMPERATURE_HIGH_FC_ERROR
System Error number: 2157

Coolant_Temperature	Deg_C	**Diagnostics:**	
Coolant_Temperature_Sensor	Deg_C	C_EPD_CT_Trq_Drt_Err_Sev	Deg_C
Coolant_Tmptr_Sensor_Volts	V	C_EPD_Derate_Suppress_En	None
Engine_Speed	RPM	C_EPD_CT_Trq_Err_Dur	s
Total_Fueling	mg/stroke	C_LUCL_Em_Veh_App_Enable	None
Net_Engine_Torque	N_m		

(Click here for parameter list in Excel)

Related Codes / Sections:

Engine Coolant Temperature (AECD7) - FC 2646

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Engine Coolant Temperature - Condition Exists

HIGH_COOLANT_TEMP_AECD7_ERROR
System Error number: 2141
(csdd_emissions_manager_lib.mdl\EMM_AECD)

Coolant_Temperature	Deg_C	C_EMO_Extreme_Amb_AECD_Off_Thd	Deg_C
EMM_CT_Protection_Flag	None	C_EMO_Extreme_Amb_AECD_Offset	Deg_C
EMO_Extreme_Amb_AECD7_Active	None	C_EMO_Extreme_Amb_AECD_On_Thd	Deg_C
T_EMO_Stationary_Pwr_AECD_En	None	C_EMO_Extreme_Amb_Startup_Delay	s
C_EMM_AECD_7_3a_En	HEX		

(Click here for parameter list in Excel)

Related Codes / Sections:

SCR Inducement Torque Derates - FC 3712, FC 3714

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FC 3712: SEVERE_INDUCEMENT_ERROR
Aftertreatment SCR Operator Inducement - Data valid but above normal operational range - Most Severe Level

System Error number: 5496

FC 3714: INDM_TORQUE_DERATE2_ERROR
Engine Protection Torque Derate - Condition Exists
System Error number: 5737

FC 3714: INDM_TORQUE_DERATE_ERROR
Engine Protection Torque Derate - Condition Exists
System Error number: 5408

(csdd_inducement_mgr_private_lib.mdl)

C_EPD_INDM_RPM_Thd	RPM	INDM_Trq2DerateRequest	None
C_EPD_INDM_Start_Time	s	P_INDM_Trq1DerateReq_Bitmap	HEX
C_EPD_INDM_TB_TimeToMaxTrq1_Drt	s	P_INDM_SevDerateReq_Bitmap	HEX
C_EPD_INDM_TB_TimeToMaxTrq2_Drt	s	P_INDM_Warn2_Req_Bitmap	HEX
C_EPD_INDM_TB_TimeToMinTrq2_Drt	s	Vehicle_Speed	km/hr
C_EPD_INDM_Trq_Drt_En	None	P_INDM_ActivationCounter[0]	None
C_EPD_INDM_Trq_Err_Dur	s	EMM_AECD_State	HEX
C_INDM_Derate_Enable	HEX	EMM_Protection_State_1	HEX
C_INDM_EngRunDelay	s	EMM_Protection_State_2	HEX
C_INDM_Euro6_Enable	None	INDM_DerateState	None
C_INDM_Max_VSS_Trq_Activation_Thresh	ml/s/s	EMM_Derate_State_2	HEX
C_EMM_Driver_Inducement_Enable	None	INDM_SevDerate_Is_Active	None
Engine_Speed	RPM	INDM_Trq1DerateRequest	None
Net_Engine_Torque	N_m	Warning_Fault_Lamp	None
ECM_Run_Time	s	P_INDM_Trq2DerateReq_Bitmap	HEX
EMM_Derate_Flag	None	P_INDM_Warn1_Req_Bitmap	HEX
EMM_Derate_State_1	HEX	V_ATP_pc_Urea_TankLvl	%
INDM_Lamp_State	None	P_INDM_ResetTimer[0]	None
INDM_SevDerateRequest	None		

(Click here for parameter list in Excel)

Related Codes / Sections:

Governor Performance

Cab Switchable Governor (All Speed and 4D Governors)

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Engine_Speed	RPM	Engine_No_Load_Torque	N_m
Total_Fueling	mg/stroke	Accelerator_Pedal_Position	%
Combustion_Control_Path_Owner	None	H_ABS_NDOT_Demand	RPM/s
Selected_Governor	None	NDOT_Demand	RPM/s
H_MACH_NetTorqueCmd	N_m	H_MCAA_DU_Request_Reference	N_m
H_ABS_NDOT_Demand	RPM/s	H_NDOT_UserDemand	RPM/s
Inertia_Index	None	H_NDOT_Gov_Torque	N_m
Net_Brake_Torque	N_m		

(Click here for parameter list in Excel)

Cruise Control

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(csdd_mca_road_speed_control_lib.mdl)

Accelerator_Pedal_Position	%	H_CC_Error	km/hr
C_VSS_ZeroRoadSpdThd	km/hr	H_CC_NDOT_Demand	RPM/s
CC_Accel_Pedal_Override	None	H_CC_ProportionalGain	None
CC_AutoResumeFlag	None	H_DRS_CC_Delta	km/hr
CC_Bump_Down_Switch	None	H_RSC_Error	km/hr
CC_Bump_Up_Switch	None	H_RSC_NDOT_Demand	RPM/s
CC_CommandMode	---	Net_Brake_Torque	N_m
CC_IsochronousSpeed	km/hr	Out_Of_Gear	None
CC_IsochSpdSave	km/hr	RSC_CompensatedVehicleSpeed	km/hr
CC_ReferenceSpeed	km/hr	RSC_GD_ProtectionDisable	None
CC_ResumeInProgress	None	RSC_IsochronousSpeed	km/hr
CC_Status	None	RSC_Status	None
Combustion_Control_Path_Owner	None	T_CC_AR_Enable	None
DRS_Reward_State	None	T_CC_BottomDroopWidth	km/hr
Effective_Gear_Ratio	None	T_CC_EB_Enable	None
Engine_Acceleration	RPM/s	T_CC_TopDroopWidth	km/hr
Engine_Acceleration	RPM/s	T_RSC_GlobalMaxRoadSpeed	km/hr
Engine_Speed	RPM	T_RSC_MaxRoadSpeed	km/hr
H_CC_Droop	km/hr	Vehicle_Speed	km/hr

Status:

CC_Status	None	CC_ResumeInProgress	None
CC_DL_ResumeAllowed	None	CC_Disable_Flag	None
CC_Analog_Switch_Diff_Error	None	CC_Analog_Sw_NV_Ratio_Raw	RPM/s
Cruise_AD_Learned	None	CC_Analog_Sw_NV_Ratio	RPM/s
Cruise2_AD_Learned	None	CC_Analog_Sw_NV_Ratio_Int	None
CC_DL_ResumeAllowed	None		

(Click here for parameter list in Excel)

Gear Down Protection

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(csdd_mcae_auto_rsc_lib.mdl)

RSC_GearEvaluation	None	RSC_GD_State	None
Accelerator_Pedal_Position	%	RSC_IsochronousSpeed	km/hr
C_VSS_ZeroRoadSpdThd	km/hr	T_RSC_GD_GearRatio	None
Combustion_Control_Path_Owner	None	T_RSC_GD_HighLoadDelta	km/hr

Effective_Gear_Ratio	None	T_RSC_GD_LightLoadDelta	km/hr
Engine_Acceleration	RPM/s	T_RSC_GD_ProtectionEnable	None
Engine_Speed	RPM	T_RSC_GlobalMaxRoadSpeed	km/hr
H_RSC_GD_FilteredTorque	N_m	T_RSC_HighLoadSpeed	km/hr
H_RSC_NDOT_Demand	RPM/s	T_RSC_LightLoadSpeed	km/hr
Net_Brake_Torque	N_m	T_RSC_MaxRoadSpeed	km/hr
Out_Of_Gear	None		

(Click here for parameter list in Excel)

High Idle (HSG)

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Engine_Speed	RPM	H_NDOT_Gov_Torque	N_m
Combustion_Control_Path_Owner	None	HSI_ActiveBrkPtSpd	RPM
Engine_Acceleration	RPM/s	HSI_ActiveDroopSlope	None
H_HSI_ActiveDroop	%	HSI_DroopWidth	RPM
H_HSI_CompensatedEngineSpeed	RPM	HSI_ReferenceSpd	RPM
H_HSI_NDOT_Demand	RPM/s	Total_Fueling	mg/stroke

(Click here for parameter list in Excel)

Load Based Speed Control (LBSC)

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(csdd_mcae_base_lbsc)

Engine_Speed	RPM	LBSC_Status	None
ACA_Torque	N_m	MME_Engine_Inertia_At_Wheels	kg
Actual_Gear_Ratio	None	MME_Tire_Radius	m
Combustion_Control_Path_Owner	None	MME_Vehicle_Mass	kg
H_LBSC_Downshift_Active	None	Net_Brake_Torque	N_m
H_LBSC_Engine_Torque	N_m	Out_Of_Gear	None
H_LBSC_Ref_Speed_Adjust	RPM	PTO_Status	None
H_LBSC_Reference_Speed	RPM	Rear_Axle_Ratio	None
H_LBSC_Torque_Accel	N_m	T_LBSC_Enable	None
H_LBSC_Torque_Grade	N_m	T_RSC_GD_GearRatio	None
H_LBSC_Torque_Threshold	N_m	T_RSC_TopGearRatio	None
H_LBSC_Vehicle_Acceleration	m/s2	Torque_Limit_At_Current_Speed	N_m
LBSC_High_Load	None	Total_Fueling	mg/stroke
LBSC_Low_Load	None	Vehicle_Speed	km/hr
LBSC_Ref_Mode	None		

Thresholds

MME_Engine_Inertia_At_Wheels	Kg	MME_Torque_Transmission	N-m
MME_Tire_Radius	m	PTO_Status	None
MME_Torque_Aero	N-m	Rear_Axle_Ratio	None
MME_Torque_Axle	N-m	T_RSC_GD_GearRatio	None
MME_Torque_Grade	N-m	T_RSC_TopGearRatio	None
MME_Torque_Rolling	N-m	Torque_Limit_At_Current_Speed	N-m

(Click here for parameter list in Excel)

Low Idle – Shutdown

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(csdd_mca_base/MCAB_Idle_Shutdown)

Accelerator_Pedal_Position	%	PTO_State	None
Clutch_Switch	None	Service_Brake_Switch	None
Combustion_Control_Path_Owner	None	T_ISD_Enable	None
Coolant_Temperature	Deg_C	T_ISD_GHG_Enable	None
Engine_Acceleration	RPM/s	T_ISD_Loading_Thd	%
Engine_Speed	RPM	T_ISD_MinAmbAir_Tmptr	Deg_C
H_ISD_Disable_ID		T_ISD_NoOvrdHigh_Thd	Deg_C
H_ISD_TimeLimit	s	T_ISD_NoOvrdLow_Thd	Deg_C
HSLS_Request_Shutdown	None	T_ISD_Ovrd_Enable	None
ISD_Allowed_By_Machine	None	T_ISD_PB_Sw_Enable	None
ISD_Driver_Alert_Mode	None	T_ISD_Period	s
ISD_Has_Shutdown_Engine	None	T_ISD_Relay_Enable	None
ISD_Operator_Activity	None	T_ISD_ShutdownDuringPTOEn	None
ISD_Relay	None	T_ISD_SrvBrkPreventsISDEn	None
ISD_Shutdown_Approaching	None	T_ISD_Tmptr_Enable	None
ISD_Timer	s	T_ISDRelay_HW_RLOC	None
ISD_Timer_On	None	Total_Fueling	mg/stroke
ISD_Timer_Override	None	Vehicle_Speed	km/hr
Parking_Brake_Switch	None	XMGR_Completed_Init_Stage	None
PrcntLoadAtCurSpd	%		
Overrides:			
ESS_Override_State	None	T_ISD_MinAmbAir_Tmptr	Deg_C
ESS_Override_Time_Remaining	s	T_ISD_NoOvrdHigh_Thd	Deg_C
ISD_Operator_Activity	None	T_ISD_NoOvrdLow_Thd	Deg_C
T_ISD_GHG_Enable	None	T_ISD_Ovrd_Enable	None
T_ISD_High_Tmp_AutoOvrd_En	None	T_ISD_Tmptr_Enable	None

(Click here for parameter list in Excel)

Low Speed Governor (LSG)

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(csdd_mca_base)

Combustion_Control_Path_Owner	None	LSI_Idle_Lock_Request	None
Engine_Acceleration	RPM/s	LSI_IsochSpeedPathOwner	None
Engine_Speed	RPM	LSI_MaxLimPathOwner	None
H_LSI_ActiveBrkPtSpd	RPM	LSI_MaxLimReqRegisterCtrl	None
H_LSI_ActiveDroopSlope	None	LSI_MaxLimRequestCallList[0]	
H_LSI_ActiveIsocSpd	RPM	LSI_NDOT_Demand	RPM/s
H_LSI_ActiveMaxLim	RPM	LSI_ReferenceSpd	RPM
H_LSI_BaseGainHigh	1/sec	LSI_SpeedReqRegisterCtrl	None
H_LSI_BaseProportionalGain	None	LSI_SpeedRequestCallList[0]	
H_LSI_CompensatedEngineSpeed	RPM	T_LSI_Breakpoint_Speed	RPM
H_LSI_Error	RPM	T_LSI_Droop_Selected_Percent	%
H_LSI_Error_Dot_Filtered	RPM/s	T_LSI_Idle_Speed_Save_En	None
H_LSI_ErrorGrowing	None	T_LSI_Idle_Speed_Step	RPM
H_LSI_ErrorLarge	None	T_LSI_Incrt_Decrt_Select_En	None

(Click here for parameter list in Excel)

Machine Mass Estimator

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(csdd_magt_mme)

Engine_Speed	RPM	H_MME_Net_Torque_At_Wheels	N_m
Actual_Gear_Ratio	None	H_MME_Oog_Avg_Road_Speed	km/hr

C_GEAR_DefaultGearRatio	None	H_MME_Oog_Road_Speed_1	km/hr
C_MME_Torque_Aero_Cnst	N/(km/hr)2	H_MME_Oog_Road_Speed_Delta	km/hr
C_MME_Torque_Axle_Cnst_1	N_m	H_MME_Oog_Time	s
C_MME_Torque_Axle_Cnst_2	N-m-s2	H_MME_Oog_Vehicle_Speed_Rate	km/hr/s
C_MME_Torque_Axle_Cnst_3	None	H_MME_Road_Grade_Detected	None
C_MME_Torque_Trans_Cnst_1	N_m	H_MME_Start_Data_Processing	None
C_MME_Torque_Trans_Cnst_2	N-m-s2	H_MME_Torque_Filt_Const	None
C_MME_Torque_Trans_Cnst_3	None	H_MME_Vehicle_Acceleration	m/s2
C_MME_Trq_Rolling_Dynamic_Cnst	hr/km	MME_Engine_Inertia_At_Wheels	kg
C_MME_Trq_Rolling_Static_Cnst	None	MME_Estimated_GCVW	N
Combustion_Control_Path_Owner	None	MME_Tire_Radius	m
H_MME_Adjusted_Avg_GCVW	N	MME_Torque_Accel	N_m
H_MME_Average_GCVW	N	MME_Torque_Aero	N_m
H_MME_Collect_Data	None	MME_Torque_Axle	N_m
H_MME_Confidence_Samples	None	MME_Torque_Grade	N_m
H_MME_Data_Processing_Complete	None	MME_Torque_Rolling	N_m
H_MME_Estimated_Vehicle_Weight	N	MME_Torque_Transmission	N_m
H_MME_Excess_Machine_Torque	N_m	MME_Vehicle_Mass	kg
H_MME_Filtered_Torque	N_m	Net_Brake_Torque	N_m
H_MME_Instantaneous_Avg_GCVW	N	Out_Of_Gear	None
H_MME_Instantaneous_Samples	None	Rear_Axle_Ratio	None
H_MME_Major_Change_Flag	None	T_TWA_Adjusted_Tire_Size	revs/km
H_MME_Major_Mass_Increase_Flag	None	Total_Fueling	mg/stroke
H_MME_Mass_Increase_Confirmed	None	Vehicle_Speed	km/hr

(Click here for parameter list in Excel)

NDOT Governor

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(csdd_machine_manager_lib.mdl\MACH_fuel_control\gv\ndot_calc)

Engine_Speed	RPM	H_NDOT_IntegratorResetAdj	None
Engine_Acceleration	RPM/s	H_NDOT_PP_Torque	N_m
Net_Brake_Torque	N_m	H_NDOT_Preset_Torque	N_m
ACA_Torque	N_m	H_NDOT_Proportional_Gain	None
Accelerator_Pedal_Position	%	H_NDOT_UserDemand	RPM/s
Combustion_Control_Path_Owner	None	Inertia_Index	None
Driver_Demand_Torque	N_m	LSI_NDOT_Demand	RPM/s
Engine_Demand_Torque_Mach_Limit	N_m	Mach_Control_Path_Owner	None
H_MACH_NetTorqueCmd	N_m	NDOT_Demand	RPM/s
H_NDOT_Actual_Feedback	RPM/s	NDOT_Feedforward_Gain	None
H_NDOT_CONV_SREF	None	NDOT_PathOwner	None
H_NDOT_Engine_Acceleration	RPM/s	NDOT_UserPathOwner	None
H_NDOT_FF_Torque	N_m	Torque_Limit_At_Current_Speed	N_m
H_NDOT_Gov_Torque	N_m	Total_Fueling	mg/stroke
H_NDOT_Integral_Gain	None	Vehicle_Speed	km/hr

(Click here for parameter list in Excel)

Out of Gear Protection

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Accelerator_Pedal_Position	%	Net_Brake_Torque	N_m
C_VSS_ZeroRoadSpdThd	km/hr	OOG_Detected	None
Combustion_Control_Path_Owner	None	Out_Of_Gear	None
Effective_Gear_Ratio	None	RSC_OOGTorqueLimit	N_m
Engine_Acceleration	RPM/s	RSC_ReferenceSpeed	km/hr
Engine_Speed	RPM	T_MaxEngSpd_With_Zero_Vss	RPM
H_NDOT_Gov_Torque	N_m	Total_Fueling	mg/stroke

H_RSC_NDOT_Demand	RPM/s	Vehicle_Speed	km/hr

(Click here for parameter list in Excel)

PTO Governor

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Combustion_Control_Path_Owner	None	PTO_Set_Switch	None
Engine_Speed	RPM	PTO_State	None
H_PTO_CompensatedEngineSpeed	RPM	PTO_Status	None
H_PTO_Device_Detected	None	PTO_Switch	None
H_PTO_DroopedReference	RPM	PTO_Winning_Switch	None
H_PTO_ES_Override_Value	RPM	T_PTO_Gain_User_Override	None
H_PTO_GainMultiplier	None	T_PTO_Max_VS_Thd	km/hr
H_PTO_IntegralPathTorque	N_m	T_PTO_Remote_En	None
H_PTO_NDOT_Demand	RPM/s	T_PTOA_Load_Based_InertiaIndx	None
Net_Brake_Torque	N_m	Total_Fueling	mg/stroke
PTO_Ref_Speed	RPM	Vehicle_Speed	km/hr
PTO_Resume_Switch	None		

(Click here for parameter list in Excel)

Remote PTO

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Engine_Speed	RPM	PTO_State	None
Total_Fueling	mg/stroke	PTO_Remote_Switch	None
Combustion_Control_Path_Owner	None	PTO_Ref_Speed	RPM
Net_Brake_Torque	N_m	_Max_Engine_Speed_With_Zero_Vss	RPM
Vehicle_Speed	km/hr		

(Click here for parameter list in Excel)

Road Speed Governor (RSG)

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Accelerator_Pedal_Position	%	RSC_CompensatedVehicleSpeed	km/hr
C_VSS_ZeroRoadSpdThd	km/hr	RSC_GD_State	None
Combustion_Control_Path_Owner	None	RSC_IsochronousSpeed	km/hr
DRS_Reward_State	None	RSC_ReferenceSpeed	km/hr
Effective_Gear_Ratio	None	RSC_Status	None
Engine_Acceleration	RPM/s	Sev_Inducement_Active	None
Engine_Speed	RPM	T_MaxEngSpd_With_Zero_Vss	RPM
H_DRS_RSC_Delta	km/hr	T_RSC_BottomDroopWidth	km/hr
H_NDOT_Gov_Torque	N_m	T_RSC_GlobalMaxRoadSpeed	km/hr
H_RSC_Droop	km/hr	T_RSC_MaxRoadSpeed	km/hr
H_RSC_NDOT_Demand	RPM/s	T_RSC_TopDroopWidth	km/hr
Net_Brake_Torque	N_m	Total_Fueling	mg/stroke
Out_Of_Gear	None	Vehicle_Speed	km/hr

(Click here for parameter list in Excel)

Smart Torque and Vocational Smart Power

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(csdd_machine_manager_lib.mdl \MACH_fuel_control\mtl\auto\stq_vsp)

Engine_Speed	RPM	T_RSC_GD_GearRatio	None
Actual_Gear_Ratio	None	Tau	None
Combustion_Control_Path_Owner	None	Tau_0_Percent_Load	None
Coolant_Temperature	Deg_C	Tau_State	None
Engine_Acceleration	RPM/s	Torque_Limit_At_Current_Speed	N_m
Inertia_Index	None	Total_Fueling	mg/stroke
Net_Brake_Torque	N_m	Vehicle_Speed	km/hr
PTO_State	None	VOPR_Gear_Ratio	None
STQ_gear_ratio	None	VOPR_Take_Off_Filt_Road_Speed	km/hr
T_CC_MaxRoadSpeed	km/hr	VSP_Smart_Torque_State	None

(Click here for parameter list in Excel)

Charge Limit Manager Performance

Charge Flow Derate

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(csdd_charge_base_mgr_lib.mdl\CHRG_Base_Cmd_Derate \Determine Charge Flow Derate Errors)

Ambient_Air_Press	kPa	CHL_Delta_P_Drt_Active	None
CBL_EGR_Frac_Cmd	None	CHL_EGR_Frac_Cmd	None
CBR_Thermal_Oscar_Active	None	CHL_EGR_Frac_Shutoff	None
Charge_Flow	kg/min	CHL_EGR_Off_DP_Drt_Active	None
Charge_Press	kPa	CHL_Engine_DP_Drt_Active	None
Charge_Flow_Derate_Active_State	HEX	CHL_MCF_Cmd	kg/min
Combustion_Control_Path_Owner	None	CHL_Turbo_Drt_Transient	None
Compressor_Outlet_Tmptr	Deg_C	CHL_Turbo_Speed_Drt_Active	None
Current_Engine_State	None	CHS_MCF_Cmd	kg/min
EGR_Valve_Delta_Press	kPa	H_CHL_COT_Deriv_Term	None
Engine_Speed	RPM	H_CHL_COT_Drt_Error	Deg_C
Exhaust_Press	kPa	H_CHL_EGR_Off_dP_Drt_Error	kPa
Net_Engine_Torque	N_m	H_CHL_Engine_dP_Drt_Error	kPa
Total_Fueling	mg/stroke	H_CHL_Turbo_Speed_Drt_Error	KRPM
CHL_COT_Drt_Active	None		
CHL_Delta_Fuel_Rate	mg/sec		

(Click here for parameter list in Excel)

Charge Limit Management (CHL)

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(csdd_charge_base_mgr_lib.mdl\CHRG_Base_Cmd_Derate\CHL)

Ambient_Air_Press	kPa	CHL_MCF_Derate_State	HEX
CBL_CHP_Cmd_Enable	None	CHL_MCF_Error	kg/min
CBL_EGR_Frac_Cmd_Enable	None	CHL_Surge_Limit	kg/s
CBL_FAF_Cmd_Enable	None	CHL_Turbo_Drt_Active_Mult	%
CBL_Fuel_Cmd	mg/stroke	CHL_Turbo_Drt_Fuel_Timer	s
CBL_Fuel_Cmd_Filtered	mg/stroke	CHL_Turbo_Drt_Hold_Flag	None
CBL_Fuel_Cmd_Flt_Delayed	mg/stroke	CHL_Turbo_Drt_Hold_Timer	s
CBL_Fuel_Cmd_Flt_Delayed_Dbl	mg/stroke	CHL_Turbo_Drt_Limit	KRPM
CBL_MCF_Cmd_Enable	None	CHL_Turbo_Drt_Multiplier	None
CBM_Retarder_Comb_Active	None	CHL_Turbo_Drt_Transient	None
CBR_Thermal_Oscar_Active	None	CHL_Turbo_Speed_Drt_Active	None
Charge_Flow	kg/min	CHS_CHP_Cmd	kPa
Charge_Press	kPa	CHS_EGR_Frac_Cmd	None
CHL_CHP_Cmd	kPa	CHS_FAF_Cmd	kg/min
CHL_CHP_Derate_State	None	CHS_MCF_Cmd	kg/min
CHL_CHP_Error	kPa	Combustion_Control_Path_Owner	None
CHL_COT_Drt_Active	None	Compressor_Outlet_Tmptr	Deg_C
CHL_Delta_Fuel_Rate	mg/sec	Current_Engine_State	None
CHL_Delta_P_Drt_Active	None	EGR_Fraction	None
CHL_Delta_P_Drt_Active_Mult	%	EGR_Valve_Delta_Press	kPa
CHL_Delta_P_Drt_Fuel_Active	None	Exhaust_Press	kPa
CHL_Delta_P_Drt_Fuel_Timer	s	Filtered_Turbo_Speed	KRPM
CHL_Delta_P_Drt_Hold_Flag	None	H_CHL_COT_Deriv_Term	None
CHL_Delta_P_Drt_Hold_Timer	s	H_CHL_COT_Drt_Error	Deg_C
CHL_Delta_P_Drt_Multiplier	None	H_CHL_EGR_dP_Drt_Error	kPa
CHL_Delta_P_Drt_Transient	None	H_CHL_EGR_Off_dP_Drt_Error	kPa
CHL_EGR_Derate_Is_Active	None	H_CHL_EGRFract_Effective_Cmd	None
CHL_EGR_Frac_Cmd	None	H_CHL_Engine_dP_Drt_Error	kPa
CHL_EGR_Frac_Shutoff	None	H_CHL_Selected_Ex_Pr_Limit	kPa
CHL_EGR_Fract_Error	None	H_CHL_Selected_Surge_Margin_Limit	%
CHL_EGR_Off_DP_Drt_Active	None	H_CHL_Surge_Drt_Error	None
CHL_EGR_Off_DP_Drt_Active_Mult	%	H_CHL_TBV_OvrSpd_TrbSpdTgt	KRPM

CHL_EGR_Off_DP_Drt_Fuel_Active	None	H_CHL_TBV_Turb_dSpd	None
CHL_EGR_Off_DP_Drt_Fuel_Timer	s	H_CHL_TBV_Turb_SpdErr	None
CHL_EGR_Off_DP_Drt_Hold_Flag	None	H_CHL_Turbo_Deriv_Term	None
CHL_EGR_Off_DP_Drt_Hold_Timer	s	H_CHL_Turbo_Speed_Drt_Error	KRPM
CHL_EGR_Off_DP_Drt_Multiplier	None	H_CHL_TurSpd_Limited_Boost	kPa
CHL_EGR_Off_DP_Drt_Transient	None	Surge_Line_SAE	kg/s
CHL_EGRFract_Derate_State	None	Surge_Margin	%
CHL_Engine_DP_Deriv_Term	None	Surge_Margin_Status	None
CHL_Engine_DP_Drt_Active	None	TPE_Corrected_Air_Flow	kg/s
CHL_FAF_Cmd	kg/min	Turbo_Speed_Est_Scaled	KRPM
CHL_FAF_Derate_State	None	Turbo_Speed_EStat	None
CHL_FAF_Error	kg/min	Turbo_Speed_Status	None
CHL_MCF_Cmd	kg/min		

(Click here for parameter list in Excel)

CHL – Compressor Outlet Temperature Limit Function

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(csdd_charge_base_mgr_lib.mdl\CHRG_Base_Cmd_Derate\CHL\COT Derate)

H_CHL_COT_Drt_Error	Deg_C	CHS_MCF_Cmd	kg/min
CHL_COT_Drt_Active	None	C_CHL_COT_MCF_Cmd_Rate_ULim	kg/min_sec
H_CHL_COT_Deriv_Term	None	C_CHL_COT_Drt_Limit	Deg_C
Compressor_Outlet_Tmptr	Deg_C	C_CHL_COT_Drt_On_Ratio	None
CHL_MCF_Cmd	kg/min	C_CHL_COT_Drt_Off_Ratio	None
Charge_Flow	kg/min		

(Click here for parameter list in Excel)

CHL - Delta-P Derate Function

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(csdd_charge_base_mgr_lib.mdl\CHRG_Base_Cmd_Derate\CHL\Determine Charge Flow Derate Errors\EGR dP Derate)

C_CHL_Delta_P_Drt_Limit	kPa	CHL_MCF_Cmd	kg/min
C_CHL_Delta_P_Drt_Off_Ratio	None	CHS_MCF_Cmd	kg/min
C_CHL_Delta_P_Drt_On_Ratio	None	Current_Engine_State	None
Charge_Flow	kg/min	EGR_Valve_Delta_Press	kPa
CHL_Delta_P_Drt_Active	None	H_CHL_EGR_dP_Drt_Error	kPa

(Click here for parameter list in Excel)

CHL - EGR Off Delta-P Derate Function

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(csdd_charge_base_mgr_lib.mdl\CHRG_Base_Cmd_Derate\CHL\Determine Charge Flow Derate Errors\EGR dP Derate\EGR Off Delta Pressure Limiter)

C_CHL_EGR_Off_DP_Drt_Limit	kPa	CHL_EGR_Off_DP_Drt_Active	None
C_CHL_EGR_Off_DP_Drt_Off_Ratio	None	CHL_EGR_Off_DP_Drt_Active_Mult	%
C_CHL_EGR_Off_DP_Drt_On_Ratio	None	CHL_EGR_Off_DP_Drt_Fuel_Timer	s
CBL_Fuel_Cmd_Flt_Delayed_Dbl	mg/stroke	CHL_EGR_Off_DP_Drt_Hold_Flag	None
CBM_Retarder_Comb_Active	None	CHL_EGR_Off_DP_Drt_Hold_Timer	s
CBR_Thermal_Oscar_Active	None	CHL_EGR_Off_DP_Drt_Multiplier	None
Charge_Flow	kg/min	CHL_EGR_Off_DP_Drt_Transient	None
CHL_Delta_P_Drt_Active	None	CHL_MCF_Cmd	kg/min
CHL_Delta_P_Drt_Active_Mult	%	CHS_MCF_Cmd	kg/min
CHL_Delta_P_Drt_Fuel_Timer	s	Current_Engine_State	None
CHL_Delta_P_Drt_Hold_Flag	None	EGR_Valve_Delta_Press	kPa
CHL_Delta_P_Drt_Hold_Timer	s	H_CHL_EGR_dP_Drt_Error	kPa

C_CHL_EGR_Off_DP_Drt_Limit	kPa	CHL_EGR_Off_DP_Drt_Active	None
CHL_Delta_P_Drt_Multiplier	None	H_CHL_EGR_Off_dP_Drt_Error	kPa
CHL_Delta_P_Drt_Transient	None		

(Click here for parameter list in Excel)

CHL - Surge Limit Function

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(csdd_charge_base_mgr_lib.mdl\CHRG_Base_Cmd_Derate\CHL\Determine Charge Flow Derate Errors)

C_CHL_Surge_Drt_Limit	%	H_CHL_Selected_Surge_Margin_Limit	%
Charge_Flow	kg/min	H_CHL_Surge_Drt_Error	None
CHL_MCF_Cmd	kg/min	Surge_Line_SAE	kg/s
CHL_Surge_Limit	kg/s	Surge_Margin	%
CHS_MCF_Cmd	kg/min	Surge_Margin_Status	None
EGR_Fraction	None	TPE_Corrected_Air_Flow	kg/s

(Click here for parameter list in Excel)

CHL - Turbo Speed Limit Function

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(csdd_charge_base_mgr_lib.mdl \CHRG_Base_Cmd_Derate\CHL\Determine Charge Pressure Derate Errors\Turbo Speed Derate)

Ambient_Air_Press	kPa	CHL_Turbo_Speed_Drt_Active	None
CBL_Fuel_Cmd	mg/stroke	Combustion_Control_Path_Owner	None
CBL_Fuel_Cmd_Flt_Delayed_Dbl	mg/stroke	Compressor_Outlet_Tmptr	Deg_C
CBM_Retarder_Comb_Active	None	EGR_Valve_Delta_Press	kPa
Charge_Press	kPa	Exhaust_Press	kPa
CHL_EGR_Frac_Shutoff	None	Filtered_Turbo_Speed	KRPM
CHL_EGR_Off_DP_Drt_Active_Mult	%	H_CHL_COT_Drt_Error	Deg_C
CHL_EGR_Off_DP_Drt_Fuel_Active	None	H_CHL_EGR_dP_Drt_Error	kPa
CHL_EGR_Off_DP_Drt_Fuel_Timer	s	H_CHL_EGR_Off_dP_Drt_Error	kPa
CHL_EGR_Off_DP_Drt_Hold_Flag	None	H_CHL_Engine_dP_Drt_Error	kPa
CHL_EGR_Off_DP_Drt_Hold_Timer	s	H_CHL_TBV_OvrSpd_TrbSpdTgt	KRPM
CHL_EGR_Off_DP_Drt_Multiplier	None	H_CHL_TBV_Turb_dSpd	None
CHL_EGR_Off_DP_Drt_Transient	None	H_CHL_TBV_Turb_SpdErr	None
CHL_Turbo_Drt_Active_Mult	%	H_CHL_Turbo_Deriv_Term	None
CHL_Turbo_Drt_Fuel_Timer	s	H_CHL_Turbo_Speed_Drt_Error	KRPM
CHL_Turbo_Drt_Hold_Flag	None	H_CHL_TurSpd_Limited_Boost	kPa
CHL_Turbo_Drt_Hold_Timer	s	Turbo_Speed_Est_Scaled	KRPM
CHL_Turbo_Drt_Limit	KRPM	Turbo_Speed_EStat	None
CHL_Turbo_Drt_Multiplier	None	Turbo_Speed_Status	None
CHL_Turbo_Drt_Transient	None		

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Charge System Errors (CSE)

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(csdd_charge_base_mgr_lib.mdl)

Charge_Flow	kg/min	H_CHL_EGR_Off_dP_Drt_Error	kPa
CHL_EGR_Frac_Cmd	None	H_CHL_Engine_dP_Drt_Error	kPa
CHL_EGR_Fract_Error	None	H_CHL_Surge_Drt_Error	None
CHL_MCF_Cmd	kg/min	H_CHL_Turbo_Speed_Drt_Error	KRPM
CHL_MCF_Error	kg/min	Turbo_Speed_Fault_Count	counts
EGR_Fraction	None	Turbo_Speed_High_Error	None
H_CHL_COT_Drt_Error	Deg_C	Turbo_Speed_Low_Error	None

H_CHL_EGR_dP_Drt_Error	kPa

(Click here for parameter list in Excel)

Specialty Performance

Acceleration Noise Control (ANC)

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Accelerator_Pedal_Position	%	EMM_Protection_State_1	HEX
APC_hp_Cmd	bar	EMM_Protection_State_2	HEX
APC_hp_Fdbk	bar	Engine_Speed	RPM
CBR_Alpha	None	Exhaust_Press	kPa
CBR_Chi_Table_Mask	HEX	Filtered_Turbo_Speed	KRPM
CBR_Pilot1_Fuel_Quantity_Final	mg/stroke	Final_Timing	deg_BTDC
CBR_Pilot2_Fuel_Quantity_Final	mg/stroke	H_ANC_CompensatedEngineSpeed	RPM
CBR_Post1_Fuel_Quantity_Final	mg/stroke	H_ANC_Ndot_Demand	RPM/s
CBR_Post2_Fuel_Quantity_Final	mg/stroke	H_HSI_NDOT_Demand	RPM/s
Charge_Flow	kg/min	H_NDOT_Engine_Acceleration	RPM/s
Charge_Press	kPa	HSI_ActiveBrkPtSpd	RPM
Combustion_Control_Path_Owner	None	HSI_ActiveIsocSpd	RPM
Controller_EGR_Flow_Cmd	kg/min	J39_VGT_Actuator_Position	%
Controller_EGR_Frac_Cmd	None	LBSC_Status	None
Controller_MCF_Cmd	kg/min	Net_Engine_Torque	N_m
Coolant_Temperature	Deg_C	OFC_Fuel_Limit	mg/stroke
EAC_EGR_Valve_Cmd	%	Oil_Temperature	Deg_C
Effective_Gear_Ratio	None	TGC_VT_Cmd	%
EGR_Fraction	None	Total_Fueling	mg/stroke
EGR_Orifice_Delta_Press	kPa	V_SFR_Regen_Trigger	None
EGR_Position	%	Vehicle_Speed	km/hr

(Click here for parameter list in Excel)

Altitude Performance

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(csdd_cbm_ref_lib.mdl)

Engine_Speed	RPM	CBR_TM1_WT_Factor	None
Accelerator_Pedal_Position	%	CBR_TM2_Chi_High_Index	None
Altitude	m	CBR_TM2_Chi_Low_Index	None
Ambient_Air_Press	kPa	CBR_TM2_WT_Factor	None
Ambient_Air_Tmptr	Deg_C	Charge_Flow	kg/min
APC_hp_Cmd	bar	Charge_Press	kPa
APC_hp_Fdbk	bar	Charge_Tmptr	Deg_C
CBL_MCF_Ref	kg/min	CHL_COT_Drt_Active	None
CBP_Air_Fuel_Ratio	None	CHL_EGR_Frac_Cmd	None
CBR_Alpha	None	CHL_MCF_Cmd	kg/min
CBR_Alpha_WT_Factor	None	Combustion_Control_Path_Owner	None
CBR_Base_Chi_Alt_Factor	None	Compressor_Inlet_Press	kPa
CBR_Base_Chi_High_Index	None	Compressor_Inlet_Tmptr	Deg_C
CBR_Base_Chi_Low_Index	None	Compressor_Outlet_Tmptr	Deg_C
CBR_Base_Chi_Mixing_Factor	None	Coolant_Temperature	Deg_C
CBR_Base_Chi_WT_Factor	None	Current_Engine_State	None
CBR_Chi_Compressor_Inlet_Density	kg/m3	EGR_Delta_Press	kPa
CBR_Chi_Mode_Status	HEX	EGR_Flow	kg/min
CBR_Chi_Table_Mask	HEX	EGR_Fraction	None
CBR_Compressor_Inlet_Density	kg/m3	EGR_Orifice_Delta_Press	kPa
CBR_EGR_Frac_Ref	None	EGR_Orifice_Tmptr	Deg_C
CBR_FCLR_WT_Factor	None	EGR_Position	%
CBR_Main_SOI	deg_BTDC	EONOx_Comp_Value	ppm
CBR_MCF_Ref	kg/min	Exhaust_Press	kPa
CBR_Pilot1_Fuel_Quantity_Final	mg/stroke	Exhaust_Tmptr	Deg_C
CBR_Pilot1_SOI	None	Filtered_Turbo_Speed	KRPM
CBR_Pilot2_Fuel_Quantity_Final	mg/stroke	Final_Timing	deg_BTDC

CBR_Pilot2_SOI	None	Fresh_Air_Flow	kg/min
CBR_Post1_Fuel_Quantity_Final	mg/stroke	IAT_Position	%
CBR_Post1_SOI	None	IAT_Position_Percent	%
CBR_Post2_Fuel_Quantity_Final	mg/stroke	J39_AFT_Intake_NOx	ppm
CBR_Post2_SOI	None	J39_AFT_Intake_Per_O2	%
CBR_Prot_Chi_High_Index	None	Net_Engine_Torque	N_m
CBR_Prot_Chi_Low_Index	None	OFC_Fuel_Limit	mg/stroke
CBR_Prot_WT_Factor	None	Oil_Pressure	kPa_G
CBR_Protection_Chi_Flag	None	Oil_Temperature	Deg_C
CBR_Protection_Mixing_Factor	None	Surge_Margin	%
CBR_Thermal_Felix_Active	None	TAHR_dP_over_P	None
CBR_Thermal_Mgt_Mixing_Factor	None	TAHR_dP_over_P_Limit	None
CBR_Thermal_Mgt2_Mixing_Factor	None	TAHR_VGT_LLim	%
CBR_Thermal_Oscar_Active	None	TAHR_VGT_ULim	%
CBR_TM1_Chi_High_Index	None	Total_Fueling	mg/stroke
CBR_TM1_Chi_Low_Index	None	VGT_Position	%

(Click here for parameter list in Excel)

Brake and Throttle Conflict - FC 2718

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SERVICE_BRAKE_SW_TRQ_OVRD
Brake and Throttle Conflict - Condition Exists
System Error number: 7827
(csdd_mca_tro_lib.mdl)

Vehicle_Speed	km/hr	C_TRO_DynamicHighPriority	None
Service_Brake_Switch	None	C_TRO_Min_Trq_Allowed	N_m
Idle_Validation_State	None	C_TRO_Min_Veh_Speed	km/hr
H_MCA_TRO_Torque_Limit	N_m	C_TRO_Trq_Drt_Dec_Ramp_Rate	s
MCA_TRO_Delay_Time	s	C_TRO_Trq_Drt_Inc_Ramp_Rate	s
T_TRO_Enable	None	C_TRO_User_Selectable	None
		C_TRO_VSS_Default_Delay	s

(Click here for parameter list in Excel)

Related Codes / Sections:

Engine Brake Command Level Determination

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_EGR_Valve_Position_Commanded	%	Engine_Speed	RPM
Actual_Gear_Ratio	None	H_MACH_NetTorqueCmd	N_m
C_ERC_TransTrqLimGearRatioThd	None	RetarderStatus	None
Clutch_Switch	None	RetarderSwitchTorque	N_m
Combustion_Control_Path_Owner	None	Total_Fueling	mg/stroke
EGR_Position_Status	None		

(Click here for parameter list in Excel)

Engine Braking Performance and Control

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Accelerator_Pedal_Position	%	EngBrkDriver3	None
Boost_Pressure	kPa_G	EngBrkDriver3	None
C_CBL_VGT_Brake_MCF	kg/min	Engine_Speed	RPM
C_ERC_EngBrkDriver1Type	None	Engine_Speed	RPM
C_ERC_EngBrkDriver2Type	None	ERC_DriverFractionCmd	None
CC_BrakingInhibit	None	Exhaust_Press	kPa

Accelerator_Pedal_Position	%	EngBrkDriver3	None
CC_EngageRetarder	None	H_ERC_ActualGrossTrq	None
Charge_Flow	kg/min	H_MACH_NetTorqueCmd	N_m
Charge_Flow	kg/min	RetarderStatus	None
Charge_Press	kPa	RetarderStatus	None
CHL_MCF_Cmd	kg/min	RetarderSwitchLevel	%
Combustion_Control_Path_Owner	None	RetarderSwitchTorque	N_m
Compressor_Inlet_Density	kg/m3	RetarderSwitchTorque	N_m
EGR_Position	%	Total_Fueling	mg/stroke
EngBrkDriver1	None	Total_Fueling	mg/stroke
EngBrkDriver1	None	Vehicle_Speed	km/hr
EngBrkDriver2	None	VGT_Position	%
EngBrkDriver2	None		

(Click here for parameter list in Excel)

Engine Brake Driver 1 and 2 – FC 2182, FC 2183, FC 2363, FC 2367

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FC 2183: ENG_BRK_DRV1_HIGH_CONTROL_ERROR
Engine Brake Actuator Driver 1 Circuit - Voltage below normal, or shorted to low source
System Error number: 454
(csdd_ret_mgr.mdl)

FC 2182: ENG_BRK_DRV1_LOW_CONTROL_ERROR
Engine Brake Actuator Driver 1 Circuit - Voltage above normal, or shorted to high source
System Error number: 455
(csdd_ret_mgr.mdl)

FC 2363: ENG_BRK_DRV2_HIGH_CONTROL_ERROR
Engine Brake Actuator Driver Output 2 Circuit - Voltage below normal, or shorted to low source
System Error number: 456
(csdd_ret_mgr.mdl)

FC 2367: ENG_BRK_DRV2_LOW_CONTROL_ERROR
Engine Brake Actuator Driver Output 2 Circuit - Voltage above normal, or shorted to high source
System Error number: 457
(csdd_ret_mgr.mdl)

EngBrkDriver1	None	C_ERC_Error_Count_Incrt	counts
ERC_Drv1_DutyCycle	%	C_ERC_Error_Count_Decrt	counts
EngineBrakeSelector1Switch	None	C_ERC_Error_Set_Count	counts
EngBrkDriver2	None	C_ERC_MinEngageRPM	RPM
ERC_Drv2_DutyCycle	%	C_ERC_ColdMinEngageRPM	RPM
EngineBrakeSelector2Switch	None		

(Click here for parameter list in Excel)

Related Codes / Sections:

Engine Brake Lamp Driver - FC 4293, FC 4294

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FC 4293: ENG_BRK_LAMP_LOW_ERROR
Engine Brake Active Lamp - Voltage Above Normal, or Shorted to High Source
System Error number: 7494

FC 4294: ENG_BRK_LAMP_HIGH_ERROR
Engine Brake Active Lamp - Voltage below normal, or shorted to low source

System Error number: 7493

(csdd_mca_ret/MCAR_Lamp_DriverDiagnostic)

C_ERC_BrkLampDrvType	None	H_DIP_EngBrkSel3SwOvrdVal	None
C_ERC_Drv_Period	mSec	H_ERC_BrkLamp_Ovrd_Val	None
C_ERC_DynamicUserPriority	None	H_ERC_SwLvl_OvrdVal	%
C_ERC_Exh_Brk_Mom_Sw_En	None	H_ERC_TrqUserOvrdVal	N_m
C_ERC_ExhaustSwTrqTbl[0]	N_m	MCAR_Lamp_High_Error_Counter	counts
C_ERC_ExhTrqTblEngSpdAxis[0]	RPM	MCAR_Lamp_Low_Error_Counter	counts
C_ERC_Sw1Percent	%	RetarderStatus	None
C_ERC_Sw2Percent	%	RetarderSwitchLevel	%
C_ERC_Sw3Percent	%	RetarderSwitchTorque	N_m
C_ERC_SwLvl_Mode_En	None	SystemConfigurationStatus	None
C_ERC_SwTrqTbl[0:0]	N_m	T_DIP_EngBrkSel1SwInversion	None
C_ERC_SwTrqTblEngSpdAxis[0]	RPM	T_DIP_EngBrkSel1SwOvrdEn	None
C_ERC_SwTrqTblSwLvlAxis[0]	%	T_DIP_EngBrkSel1SwRLOC	None
C_MCAR_Lamp_Error_Count_Decrt	counts	T_DIP_EngBrkSel2SwInversion	None
C_MCAR_Lamp_Error_Count_Incrt	counts	T_DIP_EngBrkSel2SwOvrdEn	None
C_MCAR_Lamp_Error_Set_Count	counts	T_DIP_EngBrkSel2SwRLOC	None
DL_RetarderControlMode	HEX	T_DIP_EngBrkSel3SwInversion	None
Engine_Speed	RPM	T_DIP_EngBrkSel3SwOvrdEn	None
EngineBrakeSelector1Switch	None	T_DIP_EngBrkSel3SwRLOC	None
EngineBrakeSelector2Switch	None	T_DOP_BrkLamp_Inversion	None
EngineBrakeSelector3Switch	None	T_DOP_BrkLamp_User_Ovrd_En	None
ERC_Max_Avail_Ret_Torque	N_m	T_DOP_ERC_BrkLamp_RLOC	None
ERC_MaxRetarderTrq	N_m	T_ERC_EngineBrkLampEnable	None
Exhaust_Brake_Torque	N_m	T_ERC_SwLvl_OvrdEn	None
H_DIP_EngBrkSel1SwOvrdVal	None	T_ERC_TrqUserOvrdEn	None
H_DIP_EngBrkSel2SwOvrdVal	None	T_MUX_Retarder_Switch_Level_ID	None

(Click here for parameter list in Excel)

Related Codes / Sections:

Ether Injector Control – FC 2739, FC 2738

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FC 2739: ETHER_INJ_HIGH_CTRL_ERROR

Start Enable Device 1Circuit (Ether Injection) - Voltage below normal, or shorted to low source System Error number: 1510

(csdd_ddr_eis/EIS_Ether_Inj_Ctrl)

FC 2738: ETHER_INJ_LOW_CTRL_ERROR

Start Enable Device 1 Circuit (Ether Injection) - Voltage above normal, or shorted to high source System Error number: 1512

(csdd_ddr_eis/EIS_Ether_Inj_Ctrl)

EIS_Active	None	T_Ether_Injection_Enable	None
EIS_High_Error_Counter	counts	C_EIS_Error_Count_Decrt	counts
EIS_Low_Error_Counter	counts	C_EIS_Error_Count_Incrt	counts
EIS_PWM_Duty_Cycle	%	C_EIS_Error_Set_Count	counts
T_EIS_Relay_RLOC	None		

(Click here for parameter list in Excel)

Related Codes / Sections:

Ether Start Injection

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(csdd_ddr_eis/EIS_Ether_Inj_Ctrl)

Engine_Speed	RPM	Charge_Tmptr	Deg_C
Total_Fueling	mg/stroke	Combustion_Control_Path_Owner	None
C_EIS_CrankMaxTime	s	Coolant_Temperature	Deg_C
C_EIS_CrankTimeDelay	s	EGR_Valve_Is_Closed	None
C_EIS_CrankTmptrThd	Deg_C	EIS_Active	None
C_EIS_Driver_Type	None	EIS_Ether_Injection_Tmptr	Deg_C
C_EIS_Driver_Type	None	EIS_Ether_Used	s
C_EIS_Error_Count_Decrt	counts	EIS_High_Error_Counter	counts
C_EIS_Error_Count_Incrt	counts	EIS_High_Error_Counter	counts
C_EIS_Error_Set_Count	counts	EIS_Number_Injections	None
C_EIS_PreloadMaxTime	s	EIS_Percentage_Ether_Used	%
C_EIS_PreloadTmptrThd	Deg_C	EIS_Preload_Counter	counts
C_EIS_PulseOffTime	mSec	EIS_PWM_Duty_Cycle	%
C_EIS_PulseOnTime	mSec	EIS_PWM_Period	mSec
C_EIS_System_Select		EIS_PWM_Period	mSec
C_EIS_System_Select		T_EIS_FullBottleTime	s
C_EIS_TmptrSel		T_EIS_Relay_RLOC	None

(Click here for parameter list in Excel)

Exhaust Temperature Fuel Limit

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(csdd_cbm_base_lib.mdl\INMCBP_DetermineCombustionParameters_lib\TFC)

Engine_Speed	RPM	Exhaust_Metal_Tmptr	Deg_C
Net_Engine_Torque	N_m	Charge_Flow	kg/min
Total_Fueling	mg/stroke	TPE_Energy_Fraction	Deg_C
Combustion_Control_Path_Owner	None	CBP_Texh_High	Deg_C
Charge_Tmptr	Deg_C	CBP_Turbin_Tmptr_ULim	Deg_C
Texh_Fuel_Limit	mg/stroke	H_TFC_Fuel_Flow_Limit	kg/min

(Click here for parameter list in Excel)

Limp Home Mode

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(atm_pfs_atd_lib.mdl\ATD\Protection\AftProtect\DisableDosing\NM_LimpHome)

Total_Fueling	mg/stroke	Primary_Accel_Ped_Pos	%
Net_Brake_Torque	N_m	Secondary_Accel_Pedal_Pos	%
Accelerator_Auto_Zero	%	T_ACD_Rmt_APP_En	None
Accelerator_Pedal_Position	%	T_LMP_En	None
Combustion_Control_Path_Owner	None	T_Test_Cell_Throt_En	None
Filtered_Raw_Accel_Value	counts	V_ATD_bs_PFS_Sensor_Status	HEX
H_MCAA_DU_Request_Reference	N_m	V_ATR_NonMissionRegenActive	None
Idle_Validation_State	None	Vehicle_Speed	km/hr
Lmp_In_Control_Flag	None		

(Click here for parameter list in Excel)

Oxygen / Fuel Control (OFC) Fuel Limit

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(csdd_cbm_ref_lib.mdl\CBM_REF_torque2fuel\OFC)

Engine_Speed	RPM	CBR_Thermal_Felix_Active	None
Net_Engine_Torque	N_m	CBR_Thermal_Oscar_Active	None
Total_Fueling	mg/stroke	Charge_Press	kPa
C_CBP_Stoic_OF_Ratio	None	Combustion_Control_Path_Owner	None

Engine_Speed	RPM	CBR_Thermal_Felix_Active	None
CBM_FdbkTorqueFuel	mg/stroke	Compressor_Inlet_Density	kg/m3
CBP_Air_Mass	mg/stroke	EGR_Position	%
CBR_Compressor_Inlet_Density	kg/m3	H_OFC_Felix_Gain_Adjust	None
CBR_Fuel_Ref	mg/stroke	J39_VGT_Actuator_Position	%
CBR_Gross_Fuel	mg/stroke	OFC_EGR_Disable	None
CBR_OFC_Error_Flag	None	OFC_Equiv_Ratio_Limit	None
CBR_OFC_LLDelaytimer	s	OFC_Fuel_Limit	mg/stroke
CBR_OFC_LLramptimer	s	OFC_Fuel_LLim	mg/stroke
CBR_Texh_MCF_Window_Active	None	Total_O2_in_Cylinder	mg/stroke

(Click here for parameter list in Excel)

Service Brake Switch - FC 4526

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SERVICE_BRAKE_SWITCH_ERROR

Brake Pedal Position - Data erratic, intermittent or incorrect

System Error number: 8109

(csdd_machine_manager_lib.mdl)

Key_Switch	None	T_ServiceBrkSw2Enable	None
Service_Brake_Switch_1	None	C_ServiceBrkSw2UsrSelectable	None
Service_Brake_Switch_2	None	C_Brake_Switch_Error_Counts	None
Service_Brake_Switch	None	C_Brake_Switch_Error_Reset_Time	s
T_TRO_Enable	None	C_Brake_Switch_Error_Select	None
C_Service_Brk_Sw_Diag_Enable	None	C_Brake_Switch_Error_Set_Time	s

(Click here for parameter list in Excel)

Related Codes / Sections:

Vehicle Feature Information

Alternator Failure Warning - FC 596, FC 597, FC 598

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FC 596: AFW_HIGH_VOLTAGE_ERROR
Electrical Charging System Voltage - Data Valid But Above Normal Operating Range - Moderately Severe Level
System Error number: 323
(csdd_mcae_base_afw.mdl)

FC 597: AFW_LOW_VOLTAGE_ERROR
Electrical Charging System Voltage - Data Valid But Below Normal Operating Range - Moderately Severe Level
System Error number: 324
(csdd_mcae_base_afw.mdl)

FC 598: AFW_VERY_LOW_VOLTAGE_ERROR
Electrical Charging System Voltage - Data valid but below normal operational range - Most Severe Level
System Error number: 324
(csdd_mcae_base_afw.mdl)

Engine_Speed	RPM	C_AFW_MinTimeBeyondLimits	s
H_AFW_Startup_Timer	s	C_AFW_MinTimeBeyondLimits	s
H_AFW_HighVolt_Timer	s	C_AFW_MinTimeBeyondLimits	s
H_AFW_LowVolt_Timer	s	T_AFW_Enable	None
H_AFW_VeryLowVolt_Timer	s	T_AFW_IdleSpeedup_Enable	None

(Click here for parameter list in Excel)

Related Codes / Sections:

Automated Transmissions

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Jcomm_Engine_Speed_Limit_RPM	RPM	Jcomm_Reference_RPM	RPM
Jcomm_Derate_Torque	%	Jcomm_Engine_Control_Byte	HEX
Jcomm_Engine_Torque_Command	%		

(Click here for parameter list in Excel)

Battery Voltage - FC 442, FC 441

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FC 442: BATTERY_VOLTAGE_HIGH_ERROR
Battery 1 Voltage - Data Valid But Below Normal Operating Range - Moderately Severe Level
System Error number: 297
(csdd_esm/esm_BatteryVolt_Processing)

FC 441: BATTERY_VOLTAGE_LOW_ERROR
Battery 1 Voltage - Data Valid But Below Normal Operating Range - Moderately Severe Level
System Error number: 296
(csdd_esm/esm_BatteryVolt_Processing)

Battery_Voltage	V	C_AIP_BattVoltErrInc	counts
H_AIP_BatteryVolt_A2DVolt	V	C_AIP_BattVoltErrDec	counts
H_AIP_BatteryVolt_A2DCount	counts	C_AIP_BattVoltCountDur	counts

C_AIP_BattVolt_OOR_Hi_Limit_0	counts	T_Electrical_System_Voltage	None
C_AIP_BattVolt_OOR_Low_Limit_0	counts	C_BattVolt_Diag_EngOff_Enable	None

(Click here for parameter list in Excel)

Related Codes / Sections:

Driver Reward

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(csdd_mcae_auto_rsc_lib.mdl)

C_DRS_Reward_Period	s	H_DRS_CC_Delta	km/hr
CC_IsochronousSpeed	km/hr	H_DRS_PctIdleTime	%
CC_ReferenceSpeed	km/hr	H_DRS_Reward_Time	s
DIO_Active	None	H_DRS_RSC_Delta	km/hr
DIO_Active_Distance	km	RSC_GearEvaluation	
DIO_Active_Trip_Distance	km	RSC_IsochronousSpeed	km/hr
DIO_Distance_Until_Reset	km	RSC_ReferenceSpeed	km/hr
DIO_Interval_Distance	km	T_CC_MaxRoadSpeed	km/hr
DIO_Ovrd_Distance_Remaining	km	T_RSC_GlobalMaxRoadSpeed	km/hr
DIO_Reset_Distance	km	T_RSC_MaxRoadSpeed	km/hr
DRS_Reward_State	None	Tau_State	None
H_DIO_Max_Isoch_Speed	km/hr	TI_Vehicle_Trip_Avg_Fuel_Eco	km/L
H_DIO_Ramp_Down_Active	None	Vehicle_Speed	km/hr
Trimmable values:			
T_DRS_RSG_CC_Reward1	km/hr	T_DRS_RSG_CC_Reward2	km/hr
T_DRS_RSG_CC_Reward3	km/hr	T_DRS_RSG_CC_Reward4	km/hr
T_DRS_FuelEco_Thd1	km/L	T_DRS_IdleTimePct1	%
T_DRS_FuelEco_Thd2	km/L	T_DRS_IdleTimePct2	%
T_DRS_FuelEco_Thd3	km/L	T_DRS_IdleTimePct3	%
T_RSC_Enable	None	T_DRS_Enable	None

(Click here for parameter list in Excel)

ECM Trip Information / Fuel Economy Accuracy

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NOTE: For comparison of fill gallons / miles against data-logged ECM data at start and end of trip.
Calculate ECM MPG accuracy based on actual (fill/odom/hubo) versus ECM.
Log data at state line crossings or freeway mile markers for reference to Trip_Distance.
Confidence in results increases with long trips. If possible, select trip lengths which require multiple fuel fills between start and end.

Mmon_Trip_Drive_Distance	km	TI_Base_Trip_Full_Load_Time	s
TI_Base_ECM_Trip_Run_Time	s	TI_Base_Trip_Idle_Dst_Fuel_Usd	L
TI_Base_Engine_Trip_Run_Time	s	TI_Base_Trip_Idle_Dst_Time	s
TI_Base_Total_Drive_Avg_Power	kW	TI_Base_Trip_Idle_Fuel_Used	L
TI_Base_Total_Drive_Fuel_Used	L	TI_Base_Ttl_Drv_Dst_Fuel_Used	L
TI_Base_Total_Drive_Time	s	TI_Base_Ttl_Idle_Dsr_Fuel_Usd	L
TI_Base_Total_Fuel_Used	L	TI_PTO_Total_Fuel_Used	L
TI_Base_Total_HC_Fuel_Used	L	TI_PTO_Total_Time	s
TI_Base_Total_Idle_Dst_FuelUsd	L	TI_PTO_Trip_Dst_Fuel_Usd	L
TI_Base_Total_Idle_Dst_Time	s	TI_PTO_Trip_Fuel_Used	L
TI_Base_Total_Idle_Fuel_Used	L	TI_PTO_Trip_Time	s
TI_Base_Total_Idle_Time	s	TI_PTO_Ttl_Dst_Fuel_Used	L
TI_Base_Trip_Drive_Fuel_Used	L	TI_Vehicle_Total_Engine_Dist	km
TI_Base_Trip_Drive_Time	s	TI_Vehicle_Trip_Gear_Down_Dist	km
TI_Base_Trip_Drv_Dst_Fuel_Usd	L	Trip_CC_Distance	km
TI_Base_Trip_Fuel_Used	L	Trip_RSG_Distance	km

(Click here for parameter list in Excel)

Fan Clutch Control - FC 245, FC 2377

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FC 245: FAN_CLUTCH_HIGH_CTRL_ERROR
System Error number: 1003

FC 2377: FAN_CLUTCH_LOW_CTRL_ERROR
System Error number: 1004

Fan_Drive_State	None	FCC_Low_Error_Counter	counts
FCC_Fan_Clutch_Driver	None	C_FCC_Error_Count_Incrt	counts
FCC_Fan_Clutch_PWM_Duty_Cycle	%	C_FCC_Error_Count_Decrt	counts
FCC_Fan_Clutch1_Disc_Output	None	C_FCC_Error_Set_Count	counts
FCC_Fan_Request	%	T_FCC_Fan_Clutch_En	None
FCC_High_Error_Counter	counts	T_FCC_Fan_Clutch_PWM_Rloc	None

(Click here for parameter list in Excel)

Related Codes / Sections:

Fan Control

(back to table of contents)

(csdd_aca_fcc/Aca_fcc_determine_driver_output/Command_Fan_Request)

Engine_Speed	RPM	T_FCC_AC_Time	s
Combustion_Control_Path_Owner	None	T_FCC_AC_VS_Interaction_En	None
Total_Fueling	mg/stroke	T_FCC_CAC_Outlet_Tmptr_En	None
Air_Conditioner_Pressure_Switch	None	T_FCC_Charge_Tmptr_En	None
Charge_Tmptr	Deg_C	T_FCC_Coolant_Tmptr_En	None
Coolant_Temperature	Deg_C	T_FCC_Engine_Brake_En	None
DLC_Fan_2_Request	%	T_FCC_Fan_Clutch_Driver2_Rloc	None
DLC_Fan_Request	%	T_FCC_Fan_Clutch_En	None
ERC_DriverFractionCmd	None	T_FCC_Fan_Clutch_PWM_Rloc	None
Fan_Drive_State	None	T_FCC_Fan_Type_Selection	None
Fan_Speed	RPM	T_FCC_Fuel_Temperature_En	None
FCC_Fan_Clutch_PWM_Duty_Cycle	%	T_FCC_Manual_Input_En	None
FCC_Fan_Clutch_PWM_Period	mSec	T_FCC_OEM_Press2_Enable	None
FCC_Fan_Request	%	T_FCC_OEM_Pressure_En	None
FCC_Fan_Torque	N_m	T_FCC_OEM_Temperature_En	None
H_FCC_Fan_Type_Selection	None	T_FCC_OEM_Tmptr2_Enable	None
Manual_Fan_Input	None	T_FCC_PWM_Inversion	None
T_AC_Pressure_Switch_Mux_Enable	None	T_FCC_RT_En	None
T_FCC_AC_Comp_Enable	None	T_FCC_SIP_Lock_Fan_Enable	None
T_FCC_AC_Pressure_En	None	Vehicle_Speed	km/hr

(Click here for parameter list in Excel)

Idle Shutdown Relay – FC 338, FC 339

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FC 338: ISD_RELAY_LOW_ERROR
System Error number: 998
(csdd_mca_base.mdl)

FC 339: ISD_RELAY_HIGH_ERROR
System Error number: 997
(csdd_mca_base.mdl)

ISD_Relay	None	C_ISD_Error_Count_Incrt	counts
ISD_Relay_DutyCycle	%	C_ISD_Error_Count_Decrt	counts
ISD_Relay_HighErr_Cnt	counts	C_ISD_Error_Set_Count	counts
ISD_Relay_LowErr_Cnt	counts	T_ISD_Enable	None

(Click here for parameter list in Excel)

Related Codes / Sections:

Muxed Accelerator Pedal - FC 1242

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MUX_ACCELERATOR_POSITION_ERROR
Accelerator Pedal or Lever Position Sensor 1 - Data erratic, intermittent or incorrect
System Error number:
(csdd_mca_accel/MCAA_input_data_proc/app/spcp/spt/accelerator_pedal_mux/mux_obd_check)

MCAA_Mux_Accel_Idle_Val_Time	mSec	C_ACD_Mux_FaultSetDelay	mSec
C_ACD_Mux_FaultSetDelay	mSec	Accelerator_Pedal_Position	%
C_ACD_Mux_Hi_Idle	%	On_Idle_Switch	None
C_ACD_Mux_Lo_Idle	%	OBD_Fault_Status_Table[389]	None

(Click here for parameter list in Excel)

Related Codes / Sections:

Oil Change Interval - FC 649

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Engine Oil Change Interval - Condition Exists. Change engine oil and filter.

LUBE_OIL_REQUIRES_CHANGE_ERROR
System error number: 1904
(csdd_oil_cagt_ocm.mdl)

Engine_Speed	RPM	OCM_TimeSinceLastReset	hr
Net_Engine_Torque	N_m	OCM_FuelSinceLastReset	L
Vehicle_Speed	km/hr	OCM_DistanceSinceLastReset	km
Oil_Temperature	Deg_C	OCM_PercentIntervalUsed	%
Engine_Run_Time	s	OCM_FuelFaultStatus	None
H_OCM_AutoOilSeverityFactor	None	OCM_TimeFaultStatus	None
H_OCM_TimeThreshold	hr	OCM_DistanceFaultStatus	None
H_OCM_DistanceThreshold	km	TI_Vehicle_Total_ECM_Distance	km
H_OCM_FuelThreshold	L	TI_Base_Total_Fuel_Used	L
H_OCM_AutoPctTimeUsed	%	TI_Base_Trip_Data_Fault_Status	None
H_OCM_AutoPctFuelUsed	%	Accelerator_Pedal_Position	%
H_OCM_AutoPctDistanceUsed	%	Service_Brake_Switch	None
		TI_Vehi_Trip_Data_Fault_Status	None
		Warning_Fault_Lamp	None

(Click here for parameter list in Excel)

Powertrain Protection

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(csdd_mca_ptp.mdl)

Engine_Speed	RPM	PTP_EngSpd_Limit	RPM
Total_Fueling	mg/stroke	PTP_Torque_Limit	N_m
Combustion_Control_Path_Owner	None	PTP_Torque_Limit_Switch	None
Vehicle_Speed	km/hr	PTP_Torque_Request	N_m
Actual_Gear_Ratio	None	T_PTP_Axle_Trq_Lim	N_m
C_MACH_Torque_1_Tbl[0]	N_m	T_PTP_Enable	None
C_MACH_Torque_Engine_Speed_X[0]	RPM	T_PTP_Trq_Lim_4	N_m
PrcntLoadAtCurSpd	%	T_PTP_TrqLimSw_En	None
PTP_Available_Power_High	kW	T_TSP_SensorType	None
PTP_Available_Power_Low	kW		

(Click here for parameter list in Excel)

Remote Accelerator Pedal - FC 133, FC 134

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FC 133: REMOTE_ACCEL_POSN_HIGH_ERROR

Remote Accelerator Pedal or Lever Position Sensor 1 Circuit - Voltage above normal, or shorted to high source

System Error number: 1367

(csdd_mcae_remote.mdl)

FC 134: REMOTE_ACCEL_POSN_LOW_ERROR

Remote Accelerator Pedal or Lever Position Sensor 1 Circuit - Voltage below normal, or shorted to low source

System Error number: 1368

(csdd_mcae_remote.mdl)

Remote_Accelerator	%	RMT_App_Voltage	V
Commanded_Accelerator_Winner	None	H_RMT_Accelerator_Priority	None
C_AIP_RMT_Accelerator_OOR_Ulim	counts	C_AIP_RMT_Accel_OOR_Count_Decrt	counts
C_AIP_RMT_Accelerator_OOR_Llim	counts	C_AIP_RMT_Accelerator_OOR_Dur	counts
C_AIP_RMT_Accel_IR_Const_Val	%	T_ACD_Rmt_APP_En	None
C_AIP_RMT_Accel_OOR_Count_Incrt	counts	Remote_APP_Switch	None

Override:

T_AIP_RMT_Accelerator_Ovrd_En	H_AIP_RMT_Accel_User_Ovrd_Val

(Click here for parameter list in Excel)

Remote Throttle Control

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(csdd_mcae_remote.mdl)

Accel_Pedal_Position_ID	None	Remote_Accelerator	%
Accelerator_Pedal_Position	%	Remote_APP_Switch	None
C_AIP_RMT_Accel_IR_Const_Val	%	RMT_Remote_Accel_Valid_Reading	None
C_RMT_APP_VehSpd_Check_En	None	T_ACD_Rmt_APP_En	None
C_RMT_APP_VehSpdChk_Hyst_Thd	km/hr	T_AIP_MUX_RMT_Accel_Posn_ID	None
C_RMT_APP_VehSpdChk_Thd	km/hr	T_AIP_Remote_Accelerator_RLOC	None
Commanded_Accelerator_Winner	None	T_AIP_RMT_Accelerator_Ovrd_En	None
H_AIP_RMT_Accel_User_Ovrd_Val	%	T_DIP_MUX_RMT_APP_Switch_ID	None
H_RMT_Accelerator_Priority	None		

(Click here for parameter list in Excel)

Starter Lockout

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(csdd_aca_strt_lkout.mdl)

Engine_Speed	RPM	C_SLO_OCP_Restart_Limit	counts
Key_Switch	None	Clutch_Interlock_Switch	None
C_DSO_Enable	None	Engine_Starter_Mode	None
C_ESLO_Enable	None	H_PWM_SLO_Cmd_Override_Value	None
C_ESLO_Error_ID_Tbl[0]	None	SLO_OCP_Restart_Limit_Count	counts
C_SLO_DriverType	None	SLO_OCP_Starter_Disengaged_Time	s
C_SLO_Error_Count_Decrt	counts	SLO_OCP_Starter_Engaged_Time	s
C_SLO_Error_Count_Incrt	counts	SLO_Relay	None
C_SLO_Error_Set_Count	counts	SLO_RelayState	None
C_SLO_ExitSpd	RPM	T_PWM_SLO_User_Override_En	None
C_SLO_Min_Engine_Speed_Thd	RPM	T_SLO_Enable	None
C_SLO_OCP_En	None	T_SLO_RelayType	None
C_SLO_OCP_Max_Cooldown_Dur	s	T_SLORelay_HW_RLOC	None
C_SLO_OCP_Max_Crank_Dur	s	XMGR_Completed_Init_Stage	None
H_ESLO_Err_Condition	None		

(Click here for parameter list in Excel)

Starter Lockout Overcrank - FC 3737

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SLO_OCP_ERROR

Engine Starter Mode Overcrank Protection - Condition Exists
System Error number:
(csdd_aca_strt_lkout.mdl)

Engine_Speed	RPM	SLO_Relay	None
Key_Switch	None	T_SLO_Enable	None
CBM_Cranking_Active	None	C_SLO_OCP_En	None
SLO_OCP_Starter_Engaged_Time	s	C_SLO_OCP_Max_Crank_Dur	s
SLO_OCP_Starter_Disengaged_Time	s	C_SLO_OCP_Max_Cooldown_Dur	s

(Click here for parameter list in Excel)

Related Codes / Sections:

Starter Lockout Relay - FC 584, FC 585

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FC 584: SL_RELAY_HIGH_ERROR

Starter Relay Driver Circuit - Voltage above normal, or shorted to high source
System Error number: 323
(csdd_aca_strt_lkout.mdl)

FC 583: SL_RELAY_LOW_ERROR

Fuel Supply Pump Intake Pressure - Data Valid But Below Normal Operating Range - Moderately Severe Level
System Error number: 324
(csdd_aca_strt_lkout.mdl)

SLO_Drv_DutyCycle	%	T_SLORelay_HW_RLOC	None

SLO_High_Error_Counter	counts	XMGR_Completed_Init_Stage	None
SLO_Relay	None	C_DSO_Enable	None
SLO_RelayState	None	C_ESLO_Enable	None
Engine_Starter_Mode	None	C_SLO_DriverType	None
H_PWM_SLO_Cmd_Override_Value	None	C_SLO_Error_Count_Decrt	counts
Starter_Lockout_Request	None	C_SLO_Error_Count_Incrt	counts
T_PWM_SLO_User_Override_En	None	C_SLO_Error_Set_Count	counts
T_SLO_Enable	None	C_SLO_OCP_En	None
T_SLO_RelayType	None		

(Click here for parameter list in Excel)

Related Codes / Sections:

Throttle Characteriztion

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(csdd_mca_accel.mdl)

Primary_Accel_Ped_Pos	%	H_APP2_Before_Auto_Zero	%
Secondary_Accel_Pedal_Pos	%	H_Filtered_Raw_Accel2_Value	counts
Accelerator_Auto_Zero	%	Idle_Validation_State	None
Accelerator_Pedal_Position	%	Secondary_Accel_Auto_Zero	%
Combustion_Control_Path_Owner	None	T_Test_Cell_Throt_En	None
Filtered_Raw_Accel_Value	counts		

(Click here for parameter list in Excel)

Related Codes / Sections:

Vehicle Speed Sensor (VSS) Anti-Tampering

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(csdd_magt_vs_determination2)

Accelerator_Pedal_Position	%	Primary_Accel_Ped_Pos	%
Actual_Gear_Ratio	None	T_VSS_Tamper_Sensitivity	None
Aux_Ndot_Status	None	Total_Fueling	mg/stroke
CC_OnSwitch	None	Vehicle_Speed	km/hr
CC_Status	None	VSS_Boost_Trans_Counter	None
Combustion_Control_Path_Owner	None	VSS_Constant_Dur_Time	s
Commanded_Accelerator_Winner	None	VSS_Idle_Dur_Time	s
Engine_Speed	RPM	VSS_IRL_Set_Err_Time	s
Key_Switch	None	VSS_Noise_Dur_Time	s
Mach_Control_Path_Owner	None	VSS_On_Idle_Times	None
OBD_Data_Reset	None	VSS_Scaled_Dur_Time	s
PrcntLoadAtCurSpd	%		

(Click here for parameter list in Excel)

Vehicle Speed Sensor (VSS) Tampering - FC 242

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Wheel-Based Vehicle Speed Sensor Circuit tampering has been detected - Abnormal rate of change

VSS_TAMPERING_ERROR
System Error number: 131

Accelerator_Pedal_Position	%	Vehicle_Speed	km/hr
Actual_Gear_Ratio	None	VSS_Constant_Dur_Time	s
Engine_Speed	RPM	VSS_Idle_Dur_Time	s
Net_Brake_Torque	N_m	VSS_Noise_Dur_Time	s

Out_Of_Gear	None	VSS_Scaled_Dur_Time	s

(Click here for parameter list in Excel)

Related Codes / Sections:

Thermal Management

Thermal Management Regions

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C_EXM_TMMode_Table

X/Y	-200	-1	0	136	271	272	407	408	542	543	800	1200	1762	1763	2000	2600
0	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
550	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
580	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
700	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
820	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
900	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
1000	1	1	1	1	1	1	1	1	1	2	2	2	2	3	3	3
1100	1	1	1	1	1	1	1	1	1	2	2	2	2	3	3	3
1200	1	1	1	1	1	1	1	2	2	2	2	2	2	3	3	3
1300	1	1	1	1	1	2	2	2	2	2	2	2	2	3	3	3
1400	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3
1500	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3
1600	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3
1700	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3
1800	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3
1900	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3
2000	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3
2130	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3
2300	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3

C_TAHR_IAT_Oscar_ULim_Table

X/Y	0	10	20	40	60	80	100	120	140	160	180	200	225	250	275	300
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1000	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
1100	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90
1200	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90
1300	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90
1400	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90
1500	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90
1600	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90
1700	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90
1800	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90
1900	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90
2000	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90
2100	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90

Oscar + IAT Region

X/Y	-200	-1	0	136	271	272	407	408	542	543	800	1200	1762	1763	2000	2600
0																
550																
580																
700																
820																
900																
1000	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1100	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1200	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1300	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1400	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1500	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1600	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1700	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1800	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1900	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2000	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2130	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2300	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

C_EXM_TMMode_Speed_Hysteresis	40
C_EXM_TMMode_Torque_Hysteresis	80

C_MACH_Torque_1_Table

0	1250
550	1250
600	1250
700	1383
800	1514
900	1740
920	1785
1000	2373
1100	2373
1200	2373
1300	2373
1400	2285
1500	2186
1600	2053
1700	1932
1800	1780
1830	1727
2000	1497
2100	1361
2200	1226
2500	819

Mission and Non-Mission ReGen Engine Thermal Management

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(csdd_exhaust_manager_lib.mdl)

Accelerator_Pedal_Position	%	EXM_CID_DPoP_Mix_Factor	None
Alpha	None	EXM_DeNOx_Min_Efficiency	%
Altitude	m	EXM_DOC_In_Tmptr_Target	Deg_C
Ambient_Air_Press	kPa	EXM_DOCInTmptrErr_Mix_Factor	None
Ambient_Air_Press_Status	None	EXM_Engine_SteadyState_Flag	None
Ambient_Air_Tmptr	Deg_C	EXM_EOPM_Rate_Error	None
APC_hp_Cmd	bar	EXM_ExhFlow_LLim_Active	None
APC_hp_Fdbk	bar	EXM_Felix_SCR_ModerTM_Allowed	None
CBM_Chrg_Load_Ref	None	EXM_Felix_SCRTM_Allowed	None
CBM_FdbkHCFuel	g/sec	EXM_Felix_TM_Allowed	None
CBM_FdbkTorqueFuel	mg/stroke	EXM_General_TM_Allowed	None
CBM_Indicated_Trq_Fuel	mg/stroke	EXM_Mission_Regen_Active	None
CBM_O2_Out_Rate	g/sec	EXM_Moder_CID_DPoP_Mix_Factor	None
CBM_PM_Out_Rate	g/hr	EXM_MRegen_Idle_Up_Request	None
CBM_Retarder_Comb_Active	None	EXM_NH3_ColdAmb	ppm
CBR_Alpha	None	EXM_NH3_ColdAmbFactor	None
CBR_Alpha_WT_Factor	None	EXM_NH3_Limit_Chi_Ref	ppm
CBR_ATOL_Chi_High_Index	None	EXM_NH3_Limit_Vector[0]	ppm
CBR_ATOL_Chi_Low_Index	None	EXM_NH3_Ref_State	None
CBR_ATOL_Mixing_Factor	None	EXM_NO2_Out_PPM	PPM
CBR_ATOL_WT_Factor	None	EXM_NoLamp_Ineff_NM_Desoot	None
CBR_Base_Chi_High_Index	None	EXM_NoLamp_Ineff_NM_H2O_Desorb	None
CBR_Base_Chi_Low_Index	None	EXM_NoLamp_Ineff_NM_HC_Desorb	None
CBR_Base_Chi_Mixing_Factor	None	EXM_NonMission_Regen_Active	None
CBR_Base_Chi_WT_Factor	None	EXM_NonMissionRegen_En	None
CBR_Chi_Table_Mask	HEX	EXM_NonMissionRegenProhibitState	None
CBR_ChiBased_Post2_Fuel	mg/stroke	EXM_NOx_ColdAmb	g/hr
CBR_Cold_Amb_Ref_Status	HEX	EXM_NOx_ColdAmbFactor	None
CBR_ColdAmb_SpdLoad_Factor	None	EXM_NOx_Out_PPM	PPM
CBR_FCLR_Chi_High_Index	None	EXM_NOx_Ref_Vector[0]	g/hr
CBR_FCLR_Chi_Low_Index	None	EXM_NOx_Target_Chi_Ref	g/hr
CBR_FCLR_Mixing_Factor	None	EXM_Oper_Mode_Permitted	HEX
CBR_FCLR_WT_Factor	None	EXM_OSCAR_DeltaPoP_Ref	None
CBR_Main_SOI	deg_BTDC	EXM_Oscar_SCR_ModerTM_Allowed	None
CBR_Prot_Chi_High_Index	None	EXM_Oscar_SCRTM_Allowed	None
CBR_Prot_Chi_Low_Index	None	EXM_Oscar_TM_Allowed	None
CBR_Prot_WT_Factor	None	EXM_PostHeat_Fuel_Cmd	mg/stroke
CBR_Protection_Mixing_Factor	None	EXM_ProtectiveChi_Rqst	None
CBR_SCRModerTM_ChiHi_Index	None	EXM_PTO_Regen_EnCond	None
CBR_SCRModerTM_ChiLo_Index	None	EXM_PTOIneff_Desoot	None
CBR_SCRModerTM_Mixing_Factor	None	EXM_PTOIneff_H2O_Desorb	None
CBR_SCRModerTM_WT_Factor	None	EXM_PTOIneff_HC_Desorb	None
CBR_SCRTM_Chi_High_Index	None	EXM_Regen_Fan_Request	%
CBR_SCRTM_Chi_Low_Index	None	EXM_SCR_ModerTMMode	None
CBR_SCRTM_Mixing_Factor	None	EXM_SCR_ModerWarmup_Active	None
CBR_SCRTM_WT_Factor	None	EXM_SCR_TMMode	None
CBR_SOx_Out_Rate	g/sec	EXM_SCR_TMMode_En	None
CBR_Thermal_Felix_Active	None	EXM_SCR_Warmup_Active	None
CBR_Thermal_Mgt_Mixing_Factor	None	EXM_Tailpipe_NH3_Limit	ppm
CBR_Thermal_Mgt2_Mixing_Factor	None	EXM_Tailpipe_NOx_Hi_Target	g/hr
CBR_Thermal_Oscar_Active	None	EXM_TM_Allowed	None
CBR_TM1_Chi_High_Index	None	EXM_TMMode	None
CBR_TM1_Chi_Low_Index	None	EXM_YLamp_Ineff_NM_Desoot	None
CBR_TM1_WT_Factor	None	EXM_YLamp_Ineff_NM_H2O_Desorb	None
CBR_TM2_Chi_High_Index	None	EXM_YLamp_Ineff_NM_HC_Desorb	None
CBR_TM2_Chi_Low_Index	None	Filtered_Turbo_Speed	KRPM
CBR_TM2_WT_Factor	None	H_EXM_AcceleratorPedalEnCond	None
Charge_Flow	kg/min	H_EXM_Cab_Heat_Request	None
Charge_Flow_Status	None	H_EXM_ClutchEnCond	None
Charge_Press	kPa	H_EXM_ControlStateEnCond	None
Charge_Tmptr	Deg_C	H_EXM_CtrlPTO_EnCond	None
CHL_EGR_Frac_Cmd	None	H_EXM_DL_RTD_InhibitRegen	None
CHL_MCF_Cmd	kg/min	H_EXM_DL_ShiftInProgress	None

Combustion_Control_Path_Owner	None	H_EXM_DL_ShiftInProgress_Status	None
Compressor_Inlet_Density	kg/m3	H_EXM_DLC_Prevent_Braking	None
Compressor_Inlet_Tmptr	Deg_C	H_EXM_DLC_Prevent_Regen	None
Current_Engine_State	None	H_EXM_Door_Ajar_Status	None
EAC_EGR_Valve_Cmd	%	H_EXM_EngineWarmEnCond	None
EGR_Driver_Failure	None	H_EXM_EngWarmupProt_Active	None
EGR_Fraction	None	H_EXM_EOPM_Rate_Fault_Cnt	None
EGR_Position	%	H_EXM_EPD_EnCond	None
Engine_Is_Running	None	H_EXM_FirstCat_In_Tmptr	Deg_C
Engine_Speed	RPM	H_EXM_J1939_Eng_Ctrl_SA	None
Exhaust_Flow	kg/min	H_EXM_MobileRegenVehSpdEnThd	km/hr
Exhaust_Press	kPa	H_EXM_MobileVehicleSpeedEnCond	None
Exhaust_Tmptr	Deg_C	H_EXM_MRegen_SpdTrq_EnCond	None
EXM_AECD_10_5_State	HEX	H_EXM_NonMission_Regen_Trig	None
EXM_AECD_Active	None	H_EXM_OEMStatusEnCond	None
EXM_AT_Protection_Rqst	None	H_EXM_OOGearEnCond	None
EXM_ATM_Exhaust_Command[0]		H_EXM_Selected_Gear	None
EXM_ATM_Exhaust_Data[0]		H_EXM_ServiceBrakeEnCond	None
EXM_ATM_Exhaust_Data_Status[0]		H_EXM_Stop_ATM_Rqst	None
EXM_ATM_Flow_LLim_Rqst	g/sec	H_EXM_Stop_GPD	None
EXM_ATM_Flow_Lo_Trgt_Rqst	g/sec	H_EXM_VehicleSpeedEnCond	None
EXM_ATM_HC_Fuel_Trgt_Rqst	g/sec	H_HIM_fg_Dosing_Cmd	g/sec
EXM_ATM_HC_Type_Rqst	None	J39_VGT_Actuator_Position	%
EXM_ATM_NOx_Hi_Trgt_Rqst	g/sec	Net_Engine_Torque	N_m
EXM_ATM_Oper_Mode_Rqst	None	PTM_Final_Oper_Mode	None
EXM_ATM_RqstStruct_To_Engine[0]		TGC_VT_Cmd	%
EXM_ATM_Tmptr_Lo_Trgt_Rqst	Deg_C	Total_Fueling	mg/stroke
EXM_ATM_Tmptr_ULim_Rqst	Deg_C	V_ATP_fg_Turbo_Out	g/sec
EXM_ATM_Version	None	V_ATP_pr_DPF_Delta	kPa
EXM_ATOLMode_Rqst	None	V_ATP_prg_DPF_OutP	kPa_G
EXM_Cab_Heat_State	None	VGT_Driver_Failure	None
EXM_CID_Desoot_EngSpdTgt	RPM	VGT_Position_Status	None

(Click here for parameter list in Excel)

OSCAR – Differential Engine Pressure Control

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(csdd_tahr_controller_lib)

CBM_Chrg_Load_Ref	None	TAHR_COT_Drt_Is_Active	None
CBM_NumOfCylsBraking	None	TAHR_COT_Drt_xEMP_Active	None
CBM_Retarder_Comb_Active	None	TAHR_COT_Drt_xEMP_Error	Deg_C
CBM_VG_Braking_Active	None	TAHR_dP_over_P	None
CBR_Protection_Chi_Flag	None	TAHR_EMP_Cmd_Final	kPa
CBR_Thermal_Felix_Active	None	TAHR_EMP_Controller_Error	None
CBR_Thermal_Oscar_Active	None	TAHR_EMP_FFD_Term	None
CBR_Thermal_Oscar_Active	None	TAHR_EMP_I_Gain	None
Charge_Flow	kg/min	TAHR_EMP_Integral_Term	None
Charge_Press	kPa	TAHR_EMP_P_Gain	None
CHL_EGR_Frac_Cmd	None	TAHR_IAT_State	None
CHL_Turbo_Drt_Limit	KRPM	TAHR_Mode_Selector	None
Compressor_Outlet_Tmptr	Deg_C	TAHR_OSR_dPoP_Final_Cmd	None
Current_Engine_State	None	TAHR_OSR_EGRFrac_Final_Cmd	None
EGR_Flow	kg/min	TAHR_TGC_Is_Active	None
ERC_ExhPressCmd	kPa	TAHR_Turbo_Drt_D_Gain	None
Exhaust_Press	kPa	TAHR_Turbo_Drt_SET_Gain	None
Exhaust_Press_Status	None	TAHR_Turbo_Spd_Drt_Error	None
Filtered_Turbo_Speed	KRPM	TAHR_Turbo_Spd_Drt_Error_Final	None
H_TAHR_COT_Deriv_Term_xEMP	None	TAHR_VGT_Full_Open	None
H_TAHR_Sys_ID_Sample_En	None	TAHR_VGT_LLim	%
H_TAHR_VGT_Sys_ID_Amp	%	TAHR_VGT_ULim	%
H_TAHR_VGT_Sys_ID_Mean	None	TGC_VT_Cmd_F	%

(Click here for parameter list in Excel)

OSCAR – Exhaust Pressure Limiter

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(csdd_tahr_controller_lib.mdl\CRTA\TAHR_ComputeEGRTurbineCommands\Chrg TAHR Controller\Oscar Controller)

Engine_Speed	RPM	CBR_Thermal_Oscar_Active	None
Net_Engine_Torque	N_m	Charge_Flow	kg/min
CBM_FdbkTorqueFuel	mg/stroke	Charge_Press	kPa
Exhaust_Press	kPa	CHL_EGR_Frac_Cmd	None
TAHR_dP_over_P	None	EGR_Flow	kg/min
TAHR_EMP_Cmd_Final	kPa	TAHR_dP_over_P	None
TAHR_OSR_dPoP_Final_Cmd	None	TAHR_EGR_EFA_Hi	None
TGC_VT_Cmd	%	TAHR_EGR_Near_Open	None
J39_VGT_Actuator_Position	%	TAHR_EGR_Valve_Full_Open	None
V_ATP_trc_CCC_In	Deg_C	TAHR_EMP_I_EGR_Input	None
V_ATP_fg_Turbo_Out	g/sec	TAHR_Norm_EGR_EFA	None
Charge_Press	kPa	TAHR_OSR_dPoP_Final_Cmd	None
V_ATP_trc_DOC_Out	Deg_C	TAHR_OSR_EGRFrac_Final_Cmd	None
V_ATP_trc_DPF_Out	Deg_C	TAHR_VGT_Full_Closed	None
V_ATP_trc_DOC_In	Deg_C	TAHR_VGT_Full_Open	None
V_ATP_pr_DPF_Delta	kPa	TGC_VT_Cmd	%

(Click here for parameter list in Excel)

Non-Mission Regen Enable Conditions

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(csdd_exhaust_manager_lib.mdl\EXM_regeneration_process\permit_non_mission_desoot\enable_condition)

Accelerator_Pedal_Position	%	H_EXM_DLC_Prevent_Regen	None
Clutch_Switch	None	H_EXM_EngineWarmEnCond	None
Combustion_Control_Path_Owner	None	H_EXM_EPD_EnCond	None
Engine_Is_Running	None	H_EXM_J1939_Eng_Ctrl_SA	None
Engine_Speed	RPM	H_EXM_OEMStatusEnCond	None
EXM_NonMissionRegen_En	None	H_EXM_OOGearEnCond	None
EXM_NonMissionRegenProhibitState	None	H_EXM_ServiceBrakeEnCond	None
EXM_YLamp_Ineff_NM_Desoot	None	H_EXM_VehicleSpeedEnCond	None
H_EXM_AcceleratorPedalEnCond	None	Net_Engine_Torque	N_m
H_EXM_ClutchEnCond	None	Service_Brake_Switch	None
H_EXM_ControlStateEnCond	None	Total_Fueling	mg/stroke
H_EXM_CtrlPTO_EnCond	None	Vehicle_Speed	km/hr

(Click here for parameter list in Excel)

In-Mission Regen Enable Conditions

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(csdd_exhaust_manager_lib.mdl\EXM_regeneration_process\permit_mission_desoot)

Charge_Tmptr	Deg_C	H_EXM_MobileRegenVehSpdEnThd	km/hr
Compressor_Inlet_Density	kg/m3	H_EXM_MobileVehicleSpeedEnCond	None
EXM_ATM_Oper_Mode_Rqst	None	H_EXM_MRegen_SpdTrq_EnCond	None
EXM_CID_Desoot_EngSpdTgt	RPM	H_EXM_Selected_Gear	None
EXM_Oper_Mode_Permitted	HEX	Net_Engine_Torque	N_m
EXM_PTO_Regen_EnCond	None	T_EXM_MobileRegenVehSpdDisThd	km/hr
EXM_PTOIneff_Desoot	None	V_ATP_Oper_Mode_Permitted	HEX
H_EXM_DL_RTD_InhibitRegen	None	V_ATP_trc_DOC_In	Deg_C
H_EXM_DLC_Prevent_Braking	None	V_ATP_trc_DOC_Out	Deg_C
H_EXM_Door_Ajar_Status	None	V_ATP_trc_DPF_Out	Deg_C
H_EXM_EngineWarmEnCond	None	V_OCP_trc_Bed	Deg_C
H_EXM_EPD_EnCond	None	V_SFP_trc_DPF_Bed	Deg_C
H_EXM_FirstCat_In_Tmptr	Deg_C	Vehicle_Speed	km/hr
H_EXM_J1939_Eng_Ctrl_SA	None		

(Click here for parameter list in Excel)

"Reverse" AFC / AFC Transient Surge

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(csdd_cbm_base_lib.mdl\impl_CBM_BASE_control_lib\combustion\fuel_reference\GFC\Transient Turbo Surge Fueling)

Boost_Pressure	kPa_G	H_CBR_Density_Max_Fuel	mg/stroke
Boost_Pressure_Status	None	H_CBR_Prelim_Fuel_State	None
CBM_FdbkTorqueFuel	mg/stroke	H_CBR_Surge_Limit_Active	None
CBM_Indicated_Fuel	mg/stroke	H_CBR_Surge_Limit_Fuel	mg/stroke
CBM_Indicated_Trq_Fuel	mg/stroke	H_CBR_Surge_Limit_Inhibit	None
CBR_Cold_Amb_Ref_Status	HEX	H_CBR_Surge_Limit_Max_Timer	s
CBR_Density_Max_Fuel_Limt	mg/stroke	H_CBR_Surge_Limit_Off_Timer	s
CBR_Gross_Fuel	mg/stroke	OFC_Fuel_Limit	mg/stroke
CBR_Max_Ind_Torque_Limit_Status	HEX	Surge_Margin	%
CBR_Surge_Limit_Fuel	mg/stroke	Surge_Margin_Status	None
CHL_MCF_Cmd	kg/min	Texh_Fuel_Limit	mg/stroke
CHL_Surge_Limit	kg/s	TPE_Corrected_Air_Flow	kg/s
Comb_Fuel_Limit	mg/stroke	TPE_Corrected_Turbo_Speed	RPM
Comb_Fuel_Limit_State	None	TPE_Corrected_Turbo_Speed_Est	RPM
Combustion_Control_Path_Owner	None	TSD_Active	None
Engine_Speed	RPM		

(Click here for parameter list in Excel)

Engine Torque Limits

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ACA_Torque	N_m	Filtered_Net_Brake_Torque	N_m
CBM_Chrg_Torque_Limit	N_m	Friction_Torque	N_m
CBM_FdbkTorqueFuel	mg/stroke	H_APC_hp_Deviation	bar
CBM_Indicated_Trq_Cmd	N_m	H_LBSC_Engine_Torque	N_m
CBM_Indicated_Trq_Fuel	mg/stroke	H_MACH_Neg_Trq_Limit_At_HSI	N_m
CBM_Surge_Torque_Limit	N_m	H_MACH_Neg_Trq_Limit_At_LSI	N_m
CBM_T2F_Gain	None	H_MACH_Neg_Trq_Limit_At_PK_Trq	N_m
CBR_Main_SOI	deg_BTDC	H_MACH_Neg_Trq_Limit_At_PT3	N_m
CBR_Max_Ind_Trq_Cmd	N_m	H_MACH_Neg_Trq_Limit_At_PT4	N_m
Coolant_Torque_Adjustment	N_m	H_MACH_NetTorqueCmd	N_m
Engine_Demand_Torque_from_Ndot	N_m	H_MME_Filtered_Torque	N_m
Engine_No_Load_Torque	N_m	H_NDOT_Gov_Torque	N_m
Engine_Speed	RPM	Jcomm_Derate_Torque	%
Engine_Torque_Mode	None	Jcomm_Percent_Retarder_Torque	%
ENGN_Final_Torque_Cmd	N_m	MACH_TorqueCurveUserValue	None
EPD_No_Derate_Torque	N_m	Net_Engine_Torque	N_m
EPD_Torque_Derate_Value_id	None	PTP_Torque_Limit	N_m
EPD_TorqueDerateValue	N_m	Torque_Curve_Selection_Switch	None
EWP_Max_Torque	N_m	Torque_Limit_At_Current_Speed	N_m
FCC_Fan_Torque	N_m		

(Click here for parameter list in Excel)

Robust Torque Model / Torque to Fuel

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(csdd_cbm_base_lib.mdl\impl_CBM_BASE_control_lib\combustion\fuel_reference\GFC\T2F)

Accelerator_Pedal_Position	%	CBP_Net_Combustion_Torque	N_m
CBM_FdbkTorqueFuel	mg/stroke	CHP_Pumping_Torque	N_m
CBM_Indicated_Fuel	mg/stroke	Engine_Speed	RPM
CBM_Indicated_Trq_Cmd	N_m	ENGN_T2F_Register_Ctr	None
CBM_Indicated_Trq_Fuel	mg/stroke	H_CBM_Friction_Torque	N_m
CBM_VG_Braking_Active	None	H_NDOT_FF_Torque	N_m

CBM_VG_Braking_PumpTrq_Cmd	N_m	H_NDOT_Gov_Torque	N_m
CBP_Air_Fuel_Ratio	None	H_NDOT_PP_Torque	N_m
CBP_Charge_Fuel_Ratio	None	OFC_Fuel_Limit	mg/stroke
CBP_Comb_Torque_Limit	N_m		

(Click here for parameter list in Excel)

Torque Manager Derates

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(csdd_engine_manager_lib.mdl\ENGN_epf_data_proc\idle_limits\ewp\derate\trq_der\trq_def)

Combustion_Control_Path_Owner	None	EWP_Max_Torque_Class	None
Engine_Speed	RPM	H_ENGN_Unadj_Torque_Demand	N_m
Engine_Warmup_Prot_Active	None	H_EWP_Trq_Lim_Percent	%
Engn_Control_Path_Owner	None	H_MACH_NetTorqueCmd	N_m
ENGN_Final_Torque_Cmd	N_m	H_NDOT_Gov_Torque	N_m
EPD_No_Derate_Torque	N_m	Mach_EngineStatePathOwner	None
EPD_Torque_Derate_Value_id	None	Net_Engine_Torque	N_m
EPD_TorqueDerateValue	N_m	Total_Fueling	mg/stroke
EWP_Max_Torque	N_m	TSD_Active	None

(Click here for parameter list in Excel)

UHC Timing Control

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(csdd_cbm_base_lib.mdl\INMCBP_DetermineCombustionParameters_lib\UHC)

Ambient_Air_Tmptr	Deg_C	Charge_Press_Status	None
Boost_Pressure	kPa_G	Charge_Tmptr	Deg_C
C_CBP_Gamma_Spd_Adj	None	Charge_Tmptr	Deg_C
C_EPS_ca_MainOffset	deg_BTDC	Charge_Tmptr_Status	None
CBP_Gamma_Final	None	Combustion_Control_Path_Owner	None
CBP_Net_Combustion_Torque	N_m	Coolant_Temperature	Deg_C
CBP_Tmptr_At_BDC	Deg_K	FIW_Lowest_Coolant_Temp	Deg_C
CBP_UHC_BMEP	kPa	Intake_Manifold_Temperature	Deg_C
Charge_Flow	kg/min	Total_Fueling	mg/stroke
Charge_Press	kPa	UHC_SOI_Advance	deg_BTDC
Charge_Press_Est	kPa		

(Click here for parameter list in Excel)

Cold Start Emission Reduction Strategy (CSERS) - FC 4728

CSERS_TM_ERR

Exhaust Gas Pressure - Data Valid But Below Normal Operating Range - Moderately Severe Level System Error number:

(obd_csers_tm_lib.mdl)

Ambient_Air_Press	kPa	H_CSERS_TM_Enable	None
Ambient_Air_Tmptr	Deg_C	H_CSERS_TM_Malfunc_Status	None
Exhaust_Press	kPa	H_CSERS_TM_WorkCond_En	None
TAHR_dP_over_P	None	CSERS_TM_SpecialDen	None
TAHR_OSR_dPoP_Final_Cmd	None	H_CSERS_TM_Active_Timer	s
VGT_Position	%	CBR_Chi_Table_Mask	HEX
TGC_VT_Cmd	%	CBR_Alpha	None
Current_Engine_State	None	TAHR_EMP_Cmd_Final	kPa
Engine_Speed	RPM	TAHR_VGT_ULim	%
Total_Fueling	mg/stroke	Controller_MCF_Cmd	kg/min
CBR_Thermal_Oscar_Active	None	Charge_Flow	kg/min

EXM_SCR_ModerWarmup_Active	None	Exhaust_Flow	kg/min
EXM_SCR_Warmup_Active	None	EGR_Fraction	None
EGR_Driver_Failure	None	V_AIM_trc_DOC_In	Deg_C
IAT_Driver_Failure	None	V_AIM_trc_DOC_Out	Deg_C
VGT_Driver_Failure	None	V_AIM_trc_DPF_Out	Deg_C
EMM_Protection_Flag	None	V_AIM_trc_SCR_T1	Deg_C
CSERS_TM_Cusum_Timer	s	V_AIM_trc_SCR_Out	Deg_C
CSERS_TM_Cusum_Error	None	V_SCM_flm_UreaInjCmd_Fdbk	ml/sec
CSERS_TM_Cusum_Value	None	V_UIM_flm_InjRateCmd	ml/sec
CSERS_TM_Cusum_Counter	None	EONOx_Comp_Value	ppm
CSERS_TM_Active	None	V_SCM_ppm_SCR_Out_NOx_PreClamp	ppm

(Click here for parameter list in Excel)

Related Codes / Sections:

User Overrides

2013 Common User Overrides: Actuators

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Description	Variable	Override Enable	Override Value
User override enable for EGR/Assist	EAC_EGR_Valve_Cmd	T_EAC_User_Override	C_EAC_Override_Value
Total Fueling	Total_Fueling	T_CBL_Fuel_User_Override	C_CBL_Fuel_Override_Value
VGT Cmd (legacy)	TGC_VT_Cmd	T_TGC_User_Override	C_TGC_Override_Value
VGT Cmd (before sent to actuator)	TGC_VT_Cmd	C_VGA_DL_Cmd_User_Override	C_VGA_DL_Cmd_Override_Value
IAT position command override enable for the IAT valve controller	H_IAT_Position_Cmd	C_IAT_Cmd_Override_Enable	C_IAT_Cmd_Override_Value

(Click here for complete table in Excel)

2013 Common User Overrides: Commands

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Description	Variable	Override Enable	Override Value
Delta Press Over Charge Pressure	CSE_OCVGT_dP_IMP_Ref	T_CSE_dp_IMP_User_Override	C_CSE_dp_IMP_Override_Value
EGR Fraction Cmd	CHL_EGR_Frac_Cmd	T_CBL_EGR_Frac_User_Override	C_CBL_EGR_Frac_Override_Value
Mass Charge Flow Cmd	CHL_MCF_Cmd	T_CBL_MCF_User_Override	C_CBL_MCF_Override_Value
OFC Fuel Limit	OFC_Fuel_Limit	T_OFC_Fuel_Limit_Override_Value	C_OFC_Fuel_Limit_Override_Value
Exhaust pressure reference	TAHR_EMP_Cmd	T_TAHR_EMP_Ovrd_En	C_TAHR_EMP_Ovrd

(Click here for complete table in Excel)

2013 Common User Overrides: Inputs

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Description	Variable	Override Enable	Override Value
Battery Voltage	Battery_Voltage	T_AIP_Battery_Voltage_Ovrd_En	H_AIP_Battery_Voltage_Ovrd_Val

(Click here for complete table in Excel)

2013 Fuel System User Overrides: Inputs

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Description	Variable	Override Enable	Override Value
Fuel Pressure	APC_hp_Cmd_	C_CBR_Fuelpr_User_Override_En	C_CBR_Fuelpr_Override_Value

Total Fueling	Total_Fueling	T_CBL _Fuel_User_Override	C_CBL_Fuel_Override_Value
Pilot 1	CBR_Pilot1_Fuel_Quantity_Final	C_CBR_Pilot1_Fuel_User_Override_En	C_CBR_Pilot1_Fuel_Override_Val
Pilot 2	CBR_Pilot2_Fuel_Quantity_Final	C_CBR_Pilot2_Fuel_User_Override_En	C_CBR_Pilot2_Fuel_Override_Val
Post 1	CBR_Post1_Fuel_Quantity_Final	C_CBR_Post1_Fuel_User_Override_En	C_CBR_Post1_Fuel_Override_Val
Post 2	CBR_Post2_Fuel_Quantity_Final	C_CBR_Post2_Fuel_User_Override_En	C_CBR_Post2_Fuel_Override_Val
Main SOI	CBR_Main_SOI	C_CBR_Main_SOI_User_Override_En	C_CBR_Main_SOI_Override_Val
Pilot 1 SOI	CBR_Pilot1_SOI	C_CBR_Pilot1_SOI_User_Override_En	C_CBR_Pilot1_SOI_Override_Val
Pilot 2 SOI	CBR_Pilot2_SOI	C_CBR_Pilot2_SOI_User_Override_En	C_CBR_Pilot2_SOI_Override_Val
Post 1 SOI	CBR_Post1_SOI	C_CBR_Post1_SOI_User_Override_En	C_CBR_Post1_SOI_Override_Val
Post 2 SOI	CBR_Post2_SOI	C_CBR_Post2_SOI_User_Override_En	C_CBR_Post2_SOI_Override_Val

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2013 Common User Overrides: Sensors

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Description	Variable	Override Enable	Override Value
Ambient Air Pressure	Ambient_Air_Press	T_AIP_AMB_User_Override_En	AIP_AMB_User_Override_Value
Charge Pressure (Abs)	Charge_Press	T_AIP_Charge_Press_User_Ovrd_En	C_AIP_Charge_Press_Ovrd_Value
CCV Pressure	Crankcase_Press	T_AIP_CrankcasePress_Usr_Ovr_En	C_AIP_CrankcasePress_Ovrd_Value
Comp Inlet Temperature	Compressor_Inlet_Tmptr	T_AIP_CompInTmptr_Ovrd_En	C_AIP_CompInTmptr_Ovrd_Val
Coolant Level	Coolant_Level	T_AIP_Cool_Lev_User_Override_En	AIP_Cool_Lev_Override_Value
Coolant Temperature	Coolant_Temperature	T_AIP_CT_User_Override	AIP_Cool_Tmptr_Override_Value
ECM Internal Temperature	InternalTmptr	T_AIP_InternalTmptr_Ovrd_En	C_AIP_InternalTmptr_Ovrd_Val
EGR Delta Pressure	EGR_Delta_Press	T_AIP_EGRDeltaPress_Ovrd_En	C_AIP_EGRDeltaPress_Ovrd_Val
EGR Return Temperature	EGR_Orifice_Tmptr	T_AIP_EGROrificeTmptr_Ovrd_En	C_AIP_EGROrificeTmptr_Ovrd_Val
EGR Return Temperature 2	EGR_Orifice_Tmptr2	T_AIP_EGROrificeTmptr2_Ovrd_En	C_AIP_EGROrificeTmptr2_Ovrd_Val
Fuel Pressure	Fuel_Rail_Pressure	C_APC_s_DslPrsCmdEnable	
Fuel Temperature	Fuel_Temperature	C_FSI_s_FuelTempUserOverrideEnable	H_FSI_t_FuelTempOverrideValue
Exhaust Pressure	Exhaust_Press	T_AIP_ExhaustPRess_Ovrd_En	C_AIP_ExhaustPress_Ovrd_Val
Charge Temperature	Charge_Tmptr	T_AIP_CHT_User_Override	C_AIP_CHT_Override_Value
OEM Pressure 1	OEM_Pressure_1	T_AIP_OEMPress_Ovrd_En	AIP_OEMPress_Ovrd_Val

OEM Pressure 2	OEM_Pressure_2	T_AIP_OEMPress2_Ovrd_En	AIP_OEMPress2_Ovrd_Val
OEM Temperature 1	OEM_Temperature_1	T_AIP_OEMTmptr_Ovrd_En	AIP_OEMTmptr_Ovrd_Val
OEM Temperature 2	OEM_Temperature_2	T_AIP_OEMTmptr2_Ovrd_En	AIP_OEMTmptr2_Ovrd_Val
OEM Remote Accelerator	RMT_Remote_Accelerator_Posn	T_AIP_RMT_Accelerator_Ovrd_En	H_AIP_RMT_Accel_User_Ovrd_Val
Oil Pressure	Oil_Pressure	T_AIP_OP_User_Override	AIP_Oil_Press_Override_Value
Oil Temperature	Oil_Temperature	T_AIP_OT_User_Override	AIP_Oil_Tmptr_Override_Value
Throttle Position (1)	Accelerator_Pedal_Position	T_AIP_Accelerator_Ovrd_En	AIP_AccPd_User_Ovrd_Val
Throttle Position (2)	Secondary_Accel_Pedal_Pos	T_AIP_APP2_Ovrd_Enable	H_AIP_APP2_User_Ovrd_Val
Turbo Speed	Turbo_Speed_Sensor	T_Turbo_Speed_Override_Enable	T_Turbo_Speed_Override
Water In Fuel	EEM_WIFState	T_AIP_WIF_User_Override_En	H_AIP_WIF_User_Override_Value

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2013 Common User Overrides: States

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Description	Variable	Override Enable	Override Value
Alpha	CBR_Alpha	T_CBR_Alpha_User_Override	C_CBR_Alpha_Override_Value
Emissions Protection State	EMM_Protection_State_1	T_EMO_Prot_State_User_Override	C_EMM_Prot_State1_Override_Value
Emissions Protection State	EMM_Protection_State_2	T_EMM_Prot_State_User_Override	C_EMM_Prot_State2_Override_Value
General Thermal Management		C_EXM_GenTM_User_Override	C_EXM_GenTM_Override_Value
Oscar Thermal Management		C_EXM_OSCAR_User_Override	C_EXM_OSCAR_Override_Value
Felix Thermal Management		C_EXM_FELIX_User_Override	C_EXM_FELIX_Override_Value

(Click here for complete table in Excel)

2013 Chi User Overrides

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MODE	CALTERM PARAMETER	Val	CONFIRMATION	VALUE	
Alpha-0	C_CBR_Alpha_Override_Value	0	CBR_Chi_Table_Mask	00000001	HEX
	C_CBR_Alpha_User_Override	1	CBR_Compressor_Inlet_Density	> 0.9260	kg/m 3
Alpha-1	C_CBR_Alpha_Override_Value	1	CBR_Chi_Table_Mask	00000002	HEX
	C_CBR_Alpha_User_Override	1	CBR_Compressor_Inlet_Density	> 1.0889	kg/m 3
				< 1.2202	kg/m 3

Chi-10	C_CBR_Base_Chi_AltFac_OvrdValue	0	CBR_Base_Chi_WT_Factor	1	
	C_CBR_Base_Chi_AltFac_OvrdEn	1	CBR_Base_Chi_Mixing_Factor	0	
			CBR_Base_Chi_High_Index	10	
			CBR_Base_Chi_Low_Index	1	
			CBR_Chi_Table_Mask	400	HEX
			CBR_Chi_Mode_Status	20	HEX
			CBR_Compressor_Inlet_Density	≥ 1.2202	kg/m3
Chi-11	C_CBR_Alpha_Override_Value	0	CBR_Alpha	0	
	T_CBR_Alpha_User_Override	1	CBR_SCRTM_WT_Factor	1	
	C_ATR_trc_SCR_TM_DPFOutHiThd	500	CBR_Chi_Table_Mask	00000800	HEX
	C_ATR_trc_SCR_TM_DPFOutLoThd	500			
Chi-11	C_CBR_Alpha_Override_Value	0	CBR_Alpha	0	
	T_CBR_Alpha_User_Override	1	CBR_SCRModerTM_WT_Factor	1	
	C_ATR_trc_SCR_TM_DPFOutHiThd	0			
	C_ATR_trc_SCR_TM_DPFOutLoThd	0			
	C_ATR_trc_SCR_TM2_DPFOutHiThd	500			
	C_ATR_trc_SCR_TM2_DPFOutLoThd	500			
Protection	C_EMM_Prot_State1_Override_Value	2	CBR_Chi_Mode_Status	00000001	HEX
	T_EMM_Prot_State_User_Override	1	CBR_Chi_Table_Mask	00000010	HEX
			CBR_Chi_Table_Mask	00000030	HEX
			CBR_Chi_Table_Mask	00000020	HEX
			CBR_Chi_Table_Mask	00000060	HEX
			CBR_Chi_Table_Mask	00000040	HEX
Thermal Mgnt (TM1)	O_SFR_Regen_Trigger_On	1	C_CBR_Chi_Mode_Status	00000004	HEX
Coolant TM2			C_CBR_Chi_Mode_Status	00000008	HEX
			CBR_Chi_Table_Mask	00000100	HEX
			CBR_Chi_Table_Mask	00000300	HEX
			CBR_Chi_Table_Mask	00000200	HEX
			CBR_Chi_Table_Mask	00000208	HEX
			CBR_Chi_Table_Mask	00000003	HEX

2013 Common User Overrides: Switches

(back to table of contents)

Description	Variable	Override Enable	Override Value
Air Conditioner Pressure Switch	Air_Conditioner_Pressure_Switch	T_DIP_AC_Pressure_User_Ovrd_En	

Clutch Interlock Switch	Clutch_Interlock_Switch	T_DIP_SLO_Clutch_Intlk_Ovrd_En	
Manual Fan Input	Manual_Fan_Input	T_DIP_Manual_Fan_User_Ovrd_En	
Clutch Switch	Clutch_Switch	T_DIP_ClutchSwitchOvrdEn	H_DIP_ClutchSwitchOvrdVal
NM Chassis Secure Switch	V_AIM_NMChassisSecSwitch	T_ATP_NM_ChassisSecSwEnbl O_AIM_NM_ChassisSecSwEnbl	O_AIM_NM_ChassisSecSwVal

(Click here for complete table in Excel)

2013 Common User Overrides: Virtual Sensors

(back to table of contents)

Description	Variable	Override Enable	Override Value
Ambient Temp	Ambient_Air_Tmptr	T_AMB_Amb_Tmptr_User_Override	AMB_Amb_Tmptr_Override_Value

(Click here for complete table in Excel)

VII. ENGINEERING STATES

NOTE: This section contains hundreds of tables that contain binary, decimal, and/or hexadecimal values associated with calibration parameters. **Please be aware that some tables may continue on to multiple pages.**

BINARY DEFINITION:

1 = ACTIVE							
0 = NOT ACTIVE							
0000 = 0	0001 = 1	0010 = 2	0011 = 3	0100 = 4	0101 = 5	0110 = 6	0111 = 7
1000 = 8	1001 = 9	1010 = 10	1011 = 11	1100 = 12	1101 = 13	1110 = 14	1111 = 15

Converting DECIMAL to BINARY:
Divide the DECIMAL value by 2, and keep dividing the remainder by 2 until you reach a value of 1. Integer values are only used, so 1 divided by 2 becomes 0 with a remainder of 1. The combined remainders become the BINARY equivalent. Example:

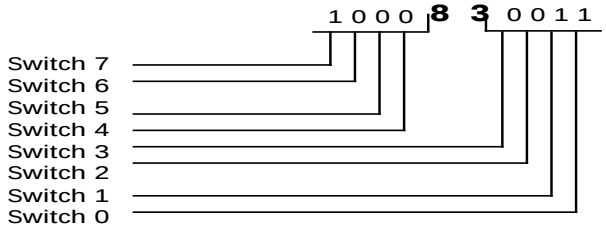
512/2 = 256	remainder	0	BIT 0	87/2 = 43	remainder	1	BIT 0
256/2 = 128	remainder	0	BIT 1	43/2 = 21	remainder	1	BIT 1
128/2 = 64	remainder	0	BIT 2	21/2 = 10	remainder	1	BIT 2
64/2 = 32	remainder	0	BIT 3	10/2 = 5	remainder	0	BIT 3
32/2 = 16	remainder	0	BIT 4	5/2 = 2	remainder	1	BIT 4
16/2 = 8	remainder	0	BIT 5	2/2 = 1	remainder	0	BIT 5
8/2 = 4	remainder	0	BIT 6	1/2 = 0	remainder	1	BIT 6
4/2 = 2	remainder	0	BIT 7				
2/2 = 1	remainder	0	BIT 8				
1/2 = 0	remainder	1	BIT 9				

The BINARY equivalent of 512 is 0010 0000 0000

The BINARY equivalent of 87 is 0101 0111

HEXADECIMAL DEFINITION:

1 = ACTIVE							
0 = NOT ACTIVE							
0000 = 0	0001 = 1	0010 = 2	0011 = 3	0100 = 4	0101 = 5	0110 = 6	0111 = 7
1000 = 8	1001 = 9	1010 = A	1011 = B	1100 = C	1101 = D	1110 = E	1111 = F



AFTERTREATMENT:

Parameters:

C_OCD_SFM_OperModeRqst
EXM_ATM_Oper_Mode_Rqst
H_OCM_Oper_Mode
O_ATR_Oper_Mode_Val
P_ATR_SFM_OperModeRqst
V_ATM_Oper_Mode
V_ATR_Oper_Mode_to_OCM
V_ATR_Oper_Mode_to_PFS
V_ATR_Oper_Mode_to_PFS
V_ATR_PFS_OperMode_toATM
V_ATR_SFM_OperModeRqst
V_SFM_Oper_Mode_In
V_ATR_PFS_OperMode_toATM

State	Decimal Value
RPF_NONE_MODE	0
RPF_NORM_MODE	1
RPF_DENOX_MODE	2
RPF_MISSION_DESOOT_MODE	3
RPF_DESOX_MODE	4
RPF_PROT_MODE	5
RPF_H2O_DESORB_MODE	6
RPF_HC_DESORB_MODE	7
RPF_NON_MISSION_DESOOT_MODE	8
RPF_SCR_TM_MODE	9
RPF_ATOL_MODE	12

Parameters:

EXM_Oper_Mode_Permitted
O_ATP_Oper_Mode_Permitted_Val
V_ATP_Oper_Mode_Permitted

State	Bit
Normal	0
DeNOx	1
Mission Desoot	2
DeSOx	3
Protection Mode	4
H2O Desorb	5
HC Desorb	6
Non Mission Desoot	7
SCR TM Mode	8
(Not) Stay Warm	9
SCR Moder TM Mode	10
ATOL Mode	11

Parameters:

EXM_NonMissionRegenProhibitState

State	Bit
NM Regen Allowed	0
Reserved	1
Reserved	2
Reserved	3
Reserved	4
CLUTCH_BRAKE (clutch or service brake pressed)	5
PARKING_BRAKE (not engaged)	6
THROTTLE (position over threshold)	7
OUT_OF_GEAR (transmission in gear or DL Control preventing regen)	8
PTO (is active and controlling engine speed)	9
OEM (Pressure and/or Temprature check over/under threshold(s))	10
Vehicle Speed (speed over threshold)	11
RETARDER (DL request to disengage thermal management)	12
AIR_HANDLING (EGR or VGT system failure)	13
GOVERNOR (engine is not in allowed control state)	14
ENGINE_PROTECTION (one or more engine protection channel is active or engine shutdow approaching, accompanied by a fault code.)	15
ENGINE_WARMUP (engine is not warmed up)	16

Parameters:

V_ATD_DPF_Lamp_Test_State
PTM_HET_Lamp_State
V_ATD_HET_Lamp_Test_State
PTM_DPF_DL_Lamp_Status
V_ATD_DPF_DL_Lamp_Status
V_ATD_DPF_Lamp_State

State	Decimal Value
Solid	1
Blink	2
Off	3

Parameters:

V_ATM_SCR_DEFLamp_State
V_UIM_EOL_DEFLamp_State
V_UTD_DEFLamp_State

State	Decimal Value
OFF	0
Solid ON	1
Blinking	2

Parameters:

V_ATM_HET_Status

State	Decimal Value
Temperature Only	0
Temperature Or Active Regen	1

Parameters:

PTM_Allow_Regen_State
V_ATP_Allow_Regen_State

State	Decimal Value
Permit Regen	1
Inhibit Regen	2
No Switch Signal	3

Parameters:

P_SFR_Regen_Trigger_State

State	Decimal Value
Soot	0
Delta-P limit	1
Override	2
Timer	3
Ineff Regen	4
Forced Regen	5
Deep Clean	6
Reserved	7
Reactive	8
Auto Non Mission Regen	9
DeSox	10

Parameters:

V_ATP_ApplicationLabel

State	Decimal
GOOD	0
BAD	1
UGLY	2

Parameters:

V_ATP_NMRegenAllow_State

State	Decimal Value
PERMIT_REGEN	1
INHIBIT_REGEN	2
NO_SWITCH_SIGNAL	3

Parameters:

V_ATD_DeltaT_State
V_ATD_DPF_dP_Keyon_State
V_ATD_DPF_OutP_Keyon_State
V_ATD_SCR_OverTmptr_State
V_SCD_CatPres_KeyonRat_State
V_SCD_CE_CatDegradation_State
V_SCD_CE_ReductantDeliver_State
V_SCD_NM_ExceedMon_State
V_SCD_NM_High_Motor_State
V_SCD_NM_High_NonMotor_State
V_SCD_NOxSenHtrPerfMon_State
V_SCD_NOxSenHtrWarmUp_State
V_SCD_NXRT_Sensor_Resp_State
V_OCD_DOC_Presence_State
V_OCD_DOC_Reverse_State
V_OCD_NMHC_Low_Eff_State
V_OCD_DOC_Presence_State
V_OCD_DOC_Reverse_State
V_OCD_Insuff_Exoth_State
V_SCD_UQ_UreaQuality_State
V_SCD_CPH_OBD_State
V_SCD_NM_Dither_State
V_SCD_NM_Low_State
V_UTD_FailToThaw_State

State	Decimal
DIAG_NOT_RUN / DIAG_IDLE	0
DIAG_COMPLETE_PASS	1
DIAG_COMPLETE_FAIL	2
DIAG_PRELIM_FAIL	3
DIAG_ABORT	4
DIAG_PASS	5
DIAG_PROCESSING / DIAG_RUN	6
DIAG_FAIL	7
DIAG_RESET	8
DIAG_PAUSE	9
DIAG_OFF	99

Parameters:

V_ATP_EngineState

State	Decimal
Stopped	0
Starting	1
Running	2
Stopping	3
Braking	4

Parameters:

V_AIM_pr_DPF_DeltaP_Status
V_AIM_pr_HC_DoserP_Status
V_AIM_prg_DPF_OutP_Status
V_AIM_trc_DOC_In_Status
V_AIM_trc_DOC_Out_Status
V_AIM_trc_DPF_Out_Status
V_AIM_trc_SCR_Out_Status
V_AIM_trc_SCR_T1_Status
V_ATP_pr_DPF_DeltaP_Status
V_ATP_trc_Ambient_Air_Status
V_AIM_trc_Urea_TankT_Status

State	Decimal
Data Valid	0
Data Not Available	-1
Data Suspect	-2
Data Error High Confidence	-3
Data Error Medium Confidence	-4
Data Error Default	-5
Data Error No Value	-6
Data Error Timeout	-7

Parameters:

T_AIM_bs_Enbl

State	Bit
ATS - Aftertreatment Manager ATS - Aftertreatment Manager - SCR	0
ATS - ATM Extension - PFS CES	1
ATS - ATM Extension - PFS CES AECD	2
ATS - ATM Extension - PFS CES OBD	3
ATS - Aftertreatment Agent - PFS	4
ATS DSM - Closed Coupled Catalyst Manager	5
ATS DSM - Hydrocarbon Injection Manager	6
ATS DSM - Oxidation Catalyst	7
ATS DSM - Soot Filter	8
ATS Doser Device Driver - CM2100 ATS Doser Device Driver - CM22xx ATS Doser Device Driver - CM23xx ATS Doser Device Driver - CM871 ATS Doser Device Driver - CM876	9
ATS DSM - Thermal Enhancer Manager	10
NA	11
NA	12
NA	13
NA	14
ATS - Aftertreatment Agent - OEM1	15
ATS - ATM Extension - SCR	16
ATS - ATM Extension - SCR CES AECD	17
ATS - ATM Extension - SCR CES OBD	18
ATS DSM - NH3 Sensor	19
ATS DSM - Reductant Delivery Manager	20
ATS DSM - SCR Ref - Mid Bed NH3 Ctrl ATS DSM - SCR Ref - Unified Cat Slip Ctrl	21
ATS DSM - Selective Catalyst Manager Base	22

ATS DSM - Urea Supply Manager ATS DSM - Urea Supply Manager - B ATS DSM - Urea Supply Manager - C ATS DSM - Urea Supply Manager - D	23
ATS DSM - Urea Tank Manager	24
ATS Urea Doser Device Driver - CM22xx ATS Urea Doser Device Driver - CM23xx ATS Urea Doser Device Driver - E - CM23xx	25
ATS Urea Tank Device Driver	26
ATS DSM - Urea Quality Sensor Manager	27
ATS DSM - PM Sensor - A	28
ATS - Aftertreatment Agent - SCR	29
ATS DSM - Urea Tank Manager	30
NA	31

Parameters:

V_ATD_bs_PFS_SysIO_Errs
C_AIM_bs_SysIO_StartUp_Mask
C_ATM_PFS_bs_SysIO_PMErrMask

State	Decimal Value
CCC_IN_OOR_HI_ERR	0
CCC_IN_OOR_LO_ERR	1
CCC_IN_IR_DELTAT_ERR	2
CCC_OUT_OOR_HI_ERR	3
CCC_OUT_OOR_LO_ERR	4
CCC_OUT_IR_DELTAT_ERR	5
DOC_IN_OOR_HI_ERR	6
DOC_IN_OOR_LO_ERR	7
DOC_IN_IR_DELTAT_ERR	8
DOC_OUT_OOR_HI_ERR	9
DOC_OUT_OOR_LO_ERR	10
DOC_OUT_IR_DELTAT_ERR	11
DPF_OUT_OOR_HI_ERR	12
DPF_OUT_OOR_LO_ERR	13
DPF_OUT_IR_DELTAT_ERR	14
RSRVD_ERR392	15
RSRVD_ERR393	16
RSRVD_ERR394	17
DPF_DELTAP_OOR_HI_ERR	18
DPF_DELTAP_OOR_LO_ERR	19
DPF_DELTAP_KEYON_ERR	20
DPF_DELTAP_DITHER_ERR	21
DPF_OUTP_OOR_HI_ERR	22
DPF_OUTP_OOR_LO_ERR	23
DPF_OUTP_KEYON_ERR	24
DPF_OUTP_DITHER_ERR	25
DPF_OUTP_HIGH_ERR	26
RSRVD_ERR395	27
RSRVD_ERR396	28
RSRVD_ERR397	29
RSRVD_ERR398	30
RSRVD_ERR399	31

Parameters:

V_ATD_bs_PFS_SysIO2_Errs
C_AIM_bs_PFS_SysIO2_StartUpMask

State	Decimal Value
EGTS_CCC_ECU_UC_ERR	0
EGTS_CCC_ECU_ASIC_ERR	1
EGTS_CCC_ECU_HI_VOLT_ERR	2
EGTS_CCC_ECU_LO_VOLT_ERR	3
EGTS_CCC_ECU_OVER_TMPTR_ERR	4
EGTS_CCC_IN_OOR_HI_ERR	5
EGTS_CCC_IN_OOR_LO_ERR	6
EGTS_CCC_OUT_OOR_HI_ERR	7
EGTS_CCC_OUT_OOR_LO_ERR	8
EGTS_DOC_IN_OOR_HI_ERR	9
EGTS_DOC_IN_OOR_LO_ERR	10
EGTS_DOC_OUT_OOR_HI_ERR	11
EGTS_DOC_OUT_OOR_LO_ERR	12
EGTS_DPF_OUT_OOR_HI_ERR	13
EGTS_DPF_OUT_OOR_LO_ERR	14
EGTS_PFS_CJ_ASIC_ERR	15
EGTS_PFS_CJ_OPEN_CKT_ERR	16
EGTS_PFS_CJ_PLAUSIBLE_ERR	17
EGTS_PFS_CJ_SHORT_CKT_ERR	18
EGTS_PFS_ECU_ASIC_ERR	19
EGTS_PFS_ECU_HI_VOLT_ERR	20
EGTS_PFS_ECU_LO_VOLT_ERR	21
EGTS_PFS_ECU_OVER_TMPTR_ERR	22
EGTS_PFS_ECU_UC_ERR	23
EGTS_CCC_CJ_SHORT_CKT_ERR	24
EGTS_CCC_CJ_OPEN_CKT_ERR	25
EGTS_CCC_CJ_ASIC_ERR	26
EGTS_CCC_CJ_PLAUSIBLE_ERR	27
EGTS_CCC_PWR_INT_ERR	28
RSRVD_ERR458	29
RSRVD_ERR459	30
RSRVD_ERR460	31

Parameters:

V_ATD_bs_PFS_SysIO3_Errs

State	Decimal Value
EGTS_CCC_TC1_ASIC_ERR	0
EGTS_CCC_TC2_ASIC_ERR	1
EGTS_PFS_TC1_ASIC_ERR	2
EGTS_PFS_TC2_ASIC_ERR	3
EGTS_PFS_TC3_ASIC_ERR	4
EGTS_PFS_PWR_INT_ERR	5
RSRVD_ERR461	6
RSRVD_ERR462	7
RSRVD_ERR463	8
RSRVD_ERR464	9
RSRVD_ERR465	10
RSRVD_ERR466	11
RSRVD_ERR467	12
RSRVD_ERR468	13
RSRVD_ERR469	14
RSRVD_ERR470	15
RSRVD_ERR471	16
RSRVD_ERR472	17
RSRVD_ERR473	18
RSRVD_ERR474	19
RSRVD_ERR475	20
RSRVD_ERR476	21
RSRVD_ERR477	22
RSRVD_ERR478	23
RSRVD_ERR479	24
RSRVD_ERR480	25
RSRVD_ERR481	26
RSRVD_ERR482	27
RSRVD_ERR483	28
RSRVD_ERR484	29
RSRVD_ERR485	30
RSRVD_ERR486	31

Parameters:

V_ATD_bs_PFS_SysPerf1_Errs
C_AIM_bs_SysPerf1_StartUp_Mask
C_ATD_FT_bs_DOC_Reset_Mask
C_ATD_FT_bs_Doser_Reset_Mask
C_ATD_bs_ProtMode_BySysPerf1
C_ATD_bs_StopDosing_BySysPerf1
C_ATD_bs_StopRegen_BySysPerf1
C_SFD_bs_SysPerf1_DPFEff_Mask
C_SFD_bs_SysPerf1_FR_Mask
C_ATP_bs_NO2Status_BySysPerf1
C_ATP_bs_NOxStatus_BySysPerf1
C_ATD_bs_OT_EngSD_SysPerf1Mask
C_ATM_PFS_AECD_bs_10_3_P1
C_ATM_PFS_AECD_bs_7_6G1_P1
C_ATM_PFS_AECD_bs_7_6G2_P1

State	Decimal Value
DOC_NMHC_INVASIVE_EFF_ERR	0
DOC_NMHC_LOW_EFF_ERR	1
CCC_NMHC_LOW_EFF_ERR	2
DOC_INSUFF_EXOTHERM_ERR	3
DOC_NOT_PRESENT_ERR	4
DOC_THERM_REVERSED_ERR	5
DOC_OUT_OVERTEMP_ERR	6
DOC_SEVERE_TMPTR_ERR	7
DOC_SEVERE_TMPTR_LATCHED_ERR	8
DOC_IN_NR_SEVERE_TMPTR_ERR	9
DOC_OUT_NR_SEVERE_TMPTR_ERR	10
DOC_DELTA_NR_SEVERE_TMPTR_ERR	11
DOC_FACE_PLUGGED_ERR	12
PFS_EGTS_DELEGATED_ASSEMBLY_ERR	13
DOC_DET_PERSIST_ERR	14
DOC_OUT_HI_TMPTR_ERR	15
RSRVD_ERR48	16
RSRVD_ERR49	17
CCC_NOT_PRESENT_ERR	18
CCC_THERM_REVERSED_ERR	19
CCC_OUT_OVERTMPTR_ERR	20
CCC_SEVERE_TMPTR_ERR	21
CCC_SEVERE_TMPTR_LATCHED_ERR	22
CCC_IN_NR_SEVERE_TMPTR_ERR	23
CCC_OUT_NR_SEVERE_TMPTR_ERR	24
CCC_DELTA_NR_SEVERE_TMPTR_ERR	25
CCC_OUT_HI_TMPTR_ERR	26
PID_SLIP_USEDUP_ERR	27
DOSER_USEDUP_ERR	28
DOSER_USEDUP_DFM_ERR	29
RSRVD_ERR62	30
SCR_DISABLE_HC_DOSING_ERR	31

Parameters:

V_ATD_bs_PFS_SysPerf2_Errs
C_AIM_bs_SysPerf2_StartUp_Mask
C_ATD_FT_bs_Filter_Reset_Mask
C_ATD_bs_ProtMode_BySysPerf2
C_ATD_bs_StopDosing_BySysPerf2
C_ATD_bs_StopRegen_BySysPerf2
C_ATD_bs_OT_EngSD_SysPerf2Mask
C_SFD_bs_SysPerf2_DPFEff_Mask
C_SFD_bs_SysPerf2_FR_Mask
C_ATP_bs_NO2Status_BySysPerf2
C_ATP_bs_NOxStatus_BySysPerf2
C_ATM_PFS_AECD_bs_10_3_P2
C_ATM_PFS_AECD_bs_7_6G2_P2
C_ATM_PFS_AECD_bs_7_6G1_P2

State	Decimal Value
DPF_FILTRATION_EFF_ERR	0
DPF_SEVERE_TMPTR_LATCHED_ERR	1
DPF_NOT_PRESENT_ERR	2
DPF_TOO_FREQUENT_REGEN_ERR	3
DPF_OUT_OVERTEMP_ERR	4
DPF_SEVERE_TMPTR_ERR	5
DPF_OUT_NR_SEVERE_TMPTR_ERR	6
DPF_DELTAP_HIGH_ERR	7
DPF_DELTA_NR_SEVERE_TMPTR_ERR	8
DPF_DELTAP_KEYOFF_ERR	9
DPF_SOOT_LOAD_SEVERE_ERR	10
DPF_SOOT_LOAD_MEDIUM_ERR	11
DPF_SOOT_LOAD_HI_ERR	12
DPF_PRESS_TUBE_DISCONNECT_ERR	13
DPF_OUTP_KEYOFF_ERR	14
DPF_INCOMPLETE_REGEN_ERR	15
SOOT_LOAD_PROTECTION	16
INHIBIT_SWITCH_HI_SOOT_ERR	17
DPF_OUT_HI_TMPTR_ERR	18
DPF_DESTROYED_ERR	19
ATOL_MAXTRIES_REACHED_ERR	20
INHIBIT_SWITCH_TIMED_REGEN_ERR	21
TIMED_REGEN_TIMEOUT_ERR	22
INHIBIT_SWITCH_RAT_ERR	23
DPF_CLOSED_LOOP_ERR	24
DPF_PMS_FILTRATION_EFF_ERR	25
CSERS_DIAG_ERR	26
RSRVD_ERR91	27
ATM_CEN_TIMEOUT_ERR	28
SFM_INEFF_DOSING_HELP	29
SFM_INEFF_DOSING_ERR	30
INEFF_STAT_REGEN_ERR	31

Parameters:

V_ATD_bs_PFS_Sensor_Status
C_ATD_bs_ProtMode_BySensor
C_ATD_bs_StopDosing_BySensor
C_ATD_bs_NR_DOC_OT_Mask
C_HIM_bs_DFM_SensStat_Mask
C_SFP_bs_Sensor_MBSLR_Mask
C_SFR_bs_PFS_TimerRst_Mask
C_SFD_bs_DPFEffSensorStatusMask
C_SFD_bs_DpfWithMuffler_Sensor
C_OCD_bs_DOCTmptrs_SensStatMask
C_SFD_bs_DPFTmptrSensStat_Mask
C_SFD_bs_SensorStatus_FR_Mask
C_SFD_bs_DPFOutTDestroy_Mask
C_SFD_bs_DPFDeltaTDestroy_Mask
C_OCD_bs_Sensor_UsedUp_Enbl
C_OCD_bs_DOCD_Sensor_Enbl
C_OCD_bs_PFS_Sensor_Eff_Enbl
C_SFD_bs_Incomplete_Sensor_Enbl
C_SFP_bs_DPSLE_Sensor_Err
C_SFP_bs_MBSLR_Sensor_Err
C_ATM_PFS_AECD_bs_10_7_Sens
C_ATM_PFS_AECD_bs_7_6G1_Sens
C_ATM_PFS_AECD_bs_7_6G2_Sens

	State	Decimal Value
MODELED	CCC_In_Tmptr	0
	CCC_Out_Tmptr	1
	DOC_In_Tmptr	2
	DOC_Out_Tmptr	3
	DPF_Out_Tmptr	4
	Rsrvd5	5
	DPF_deltaP	6
	DPF_Out_Gauge_Press	7
	HC_Ext_Doser	8
	PM_Out	9
	Rsrvd10	10
	Rsrvd11	11
	Rsrvd12	12
	Rsrvd13	13
	Rsrvd14	14
	Rsrvd15	15
DEFAULTED	CCC_In_Tmptr	16
	CCC_Out_Tmptr	17
	DOC_In_Tmptr	18
	DOC_Out_Tmptr	19
	DPF_Out_Tmptr	20
	Rsrvd21	21
	DPF_deltaP	22
	DPF_Out_Gauge_Press	23
	HC_Ext_Doser	24
	PM_Out	25
	Rsrvd26	26
	Rsrvd27	27
	Rsrvd28	28
	Rsrvd29	29
	Rsrvd30	30
	Rsrvd31	31

Parameters:

V_ATD_bs_PFS_EngOut_Status
C_ATD_bs_ProtMode_ByEngOut
C_ATD_bs_StopDosing_ByEngOut
C_SFP_bs_DPSLE_EngOut_Err
C_SFP_bs_MBSLR_EngOut_Err
C_SFP_bs_EngOut_MBSLR_Mask
C_SFR_bs_EngOut_TimerRst_Mask
C_SFR_bs_PFS_EO_AmbAirMask
C_SFD_bs_DPFEffEngOutStatusMask
C_SFD_bs_DpfWithMuffler_EngOut
C_SFD_bs_EngOutStatus_FR_Mask
C_OCD_bs_EngOut_UsedUp_Enbl
C_OCD_bs_DOCD_EngOut_Enbl
C_OCD_bs_PFS_EngOut_Eff_Enbl
C_SFD_bs_Incomplete_EngOut_Enbl
C_ATM_PFS_AECD_bs_10_7_Eng
C_ATM_PFS_AECD_bs_7_6G1_Eng
C_ATM_PFS_AECD_bs_7_6G2_Eng

	State	Decimal Value
MODELED	Turbo_Out_Tmptr	0
	Turbo_Out_Mass_Flow	1
	Turbo_Out_Press	2
	Turbo_Out_NOx	3
	Turbo_Out_O2	4
	Turbo_Out_HC_Dosing	5
	Turbo_Out_NO2	6
	Turbo_Out_PM	7
	Turbo_Out_Sox	8
	Turbo_Out_Residual_ HC	9
	Ambient_Air_Press	10
	Engine_Speed	11
	MBSLR	12
	Fuel_System_Failure	13
	Rsrvd14	14
	Rsrvd15	15
DEFAULTED	Turbo_Out_Tmptr	16
	Turbo_Out_Mass_Flow	17
	Turbo_Out_Press	18
	Turbo_Out_NOx	19
	Turbo_Out_O2	20
	Turbo_Out_HC_Dosing	21
	Turbo_Out_NO2	22
	Turbo_Out_PM	23
	Turbo_Out_Sox	24
	Turbo_Out_Residual_ HC	25
	Ambient_Air_Press	26
	Engine_Speed	27
	MBSLR	28
	Fuel_System_Failure	29
	Rsrvd30	30
	Rsrvd31	31

Parameters:

V_HIM_bs_DiagStatus
C_HIM_bs_DiagStat_StartUp_Mask
C_HIM_DIAG_bs_NoDrain_Mask
C_HIM_bs_Diag_DoserDisabled
C_HIM_bs_Diag_DoserErrored
C_HIM_bs_Air_Purge_Mask
C_HIM_bs_FT_ProtMode_Mask

State	Decimal Value
DFSOV_LEAK_DOSER_FTP_ERR	0
DFSOV_FTO_ERR	1
HC_DOSER_SYS_LEAK_ERR	2
HC_DOSER_FUEL_RESTRICT_ERR	3
HC_DOSERP_INRANGE_ERR	4
HC_DOSERP_OOR_HI_ERR	5
HC_DOSERP_OOR_LO_ERR	6
ASOV_FTO_ERR	7
DOSER_ASOV_PWM_LOW_ERR	8
DOSER_ASOV_PWM_HIGH_ERR	9
DFSOV_SWAP_ERR	10
DFSOV2_FTO_ERR	11
RSRVD_ERR207	12
HC_DOSERP_DATA_DEFAULT_ERR	13
DOSER_DSOV_PWM_LOW_ERR	14
DOSER_DSOV_PWM_HIGH_ERR	15
RSRVD_ERR211	16
RSRVD_ERR212	17
RSRVD_ERR213	18
RSRVD_ERR214	19
RSRVD_ERR215	20
RSRVD_ERR216	21
RSRVD_ERR217	22
RSRVD_ERR218	23
RSRVD_ERR219	24
RSRVD_ERR220	25
RSRVD_ERR221	26
RSRVD_ERR222	27
RSRVD_ERR223	28
RSRVD_ERR	29
RSRVD_ERR	30
RSRVD_ERR	31

Parameters:

V_HIM_DosingSysTest_Mode
V_HIM_FT_Test_Mode

State	Decimel
Bucket Test	0
Injector Leak	1
Shutoff Valve Leak	2

Parameters:

H_OCL_bs_HC_CtrlLimits

State	Bit
Rsrvd0	0
Rsrvd1	1
Rsrvd2	2
Rsrvd3	3
Rsrvd4	4
O2 Limited	5
Rsrvd5	6
Rate Limited	7
Rsrvd8	8
Rsrvd9	9
Overall Efficiency Limited	10
Inlet Temp Too Low	11
Face Plugged	12
Flow Not OK	13

Parameters:

V_UIM_bs_DiagStatus
C_UIM_FT_bs_AirSolTest_Mask
C_UIM_FT_bs_DoserErr_DOT_Mask
C_UIM_bs_DOT_Test_DiagStat_Enbl
C_UIM_bs_DPO_Test_DiagStat_Mask

State	Decimal Value
UREA_DOSER_ECU_ERR	0
UREA_DOSER_TMPTR_SENSOR_OOR_ERR	1
UREA_DOSER_DCU_KEYSWITCH_ERR	2
UREA_DOSER_PUMP_FROZEN	3
UREA_DOSER_SOL_HIGH_ERR	4
UREA_DOSER_SOL_LOW_ERR	5
UREA_DOSER_INCORRECT_STATE_ERR	6
UREA_DOSER_DOSING_RATE_ERR	7
UREA_DOSER_INCOMPLETE_PURGE_ERR	8
UIMB_COLD_AMBIENT_SHUTOFF	9
UREA_DOSER_PRIME_INDUCE_ERR	10
UREA_DOSER_PRIME_TIMEOUT_ERR	11
UREA_DOSER_SW_ID_ERR	12
RSRVD_ERR237	13
RSRVD_ERR238	14
RSRVD_ERR239	15
UREA_DOSER_MOTOR_ERR	16
UREA_DOSER_LOW_AIR_UREA_ERR	17
UREA_DOSER_RETURN_LINE_ERR	18
UREA_DOSER_TMPTR_IR_ERR	19
RSRVD_ERR244	20
RSRVD_ERR245	21
UREA_DOSER_INIT_TIMEOUT_ERROR	22
UREA_DOSER_TIMEOUT_ERROR	23
UIMB_INVALID_DATASET_ACK_ERR	24
RSRVD_ERR249	25
RSRVD_ERR250	26

RSRVD_ERR251	27
RSRVD_ERR252	28
RSRVD_ERR253	29
RSRVD_ERR254	30
RSRVD_ERR255	31

Parameters:

V_USMD_bs_Sys_Errs

State	Decimal Value
UDD_POWERCTRL_HIGH_ERR	0
UDD_POWERCTRL_LOW_ERR	1
UREADOSET_OOR_HI_ERR	2
UREADOSET_OOR_LO_ERR	3
UREAPUMPP_OOR_HI_ERR	4
UREAPUMPP_OOR_LO_ERR	5
MOTORFREQ_OOR_HI_ERR	6
MOTORFREQ_OOR_LO_ERR	7
UREA_DOSER_FAIL_TO_PRIME_ERR	8
UPPM_FAIL2FILL_ERR	9
UPPM_FAIL2VENT_ERR	10
UPPM_CTRL_TOOHIGH_ERR	11
UPPM_CTRL_TOOLOW_ERR	12
UPPM_FAIL2STBLZ_ERR	13
UDD_PUMP_LOW_ERR	14
UDD_PUMP_HIGH_ERR	15
UREA_DOSER_INJ_ELEC_ERR	16
UDD_DU_HEATER_LOW_ERR	17
UDD_DU_HEATER_HIGH_ERR	18
UDD_CLNTVLV_HIGH_ERR	19
UDD_CLNTVLV_LOW_ERR	20
RSRVD_ERR491	21
RSRVD_ERR492	22
RSRVD_ERR493	23
RSRVD_ERR494	24
RSRVD_ERR495	25
RSRVD_ERR496	26
RSRVD_ERR497	27
RSRVD_ERR498	28
RSRVD_ERR499	29
RSRVD_ERR500	30
RSRVD_ERR501	31

Parameters:

V_ATA_bs_OEM1_Sys_Errs

State	Bit
ACM_CECU_DATA_TIMEOUT_ERR	0
ACM_NOX_OUT_SENSOR_TIMEOUT_ERR	1
ACM_AT1_DUALEGTS_CJT_TIMEOUT_ERR	2
ACM_AT1_TRIEGTS_CJT_TIMEOUT_ERR	3
ACM_NH3_SENSOR_TIMEOUT_ERR	4
ACM_DPF_OUTP_OOR_LO_ERR	5
ACM_DPF_OUTP_OOR_HI_ERR	6
ACM_HC_DOSERP_OOR_LO_ERR	7
ACM_HC_DOSERP_OOR_HI_ERR	8
ACM_UREAPUMPP_OOR_LO_ERR	9
ACM_UREAPUMPP_OOR_HI_ERR	10
ACM_UREA_TANKT_OOR_LO_ERR	11
ACM_UREA_TANKT_OOR_HI_ERR	12
ACM_DPF_DELTAP_OOR_LO_ERR	13
ACM_DPF_DELTAP_OOR_HI_ERR	14
ACM_UREA_TANKLVL_OOR_LO_ERR	15
ACM_UREA_TANKLVL_OOR_HI_ERR	16
ACM_PM_OUT_OOR_HI_ERR	17
ACM_PM_OUT_OOR_LO_ERR	18
ACM_DOC_IN_OOR_HI_ERR	19
ACM_DOC_IN_OOR_LO_ERR	20
ACM_DOC_OUT_OOR_HI_ERR	21
ACM_DOC_OUT_OOR_LO_ERR	22
ACM_DPF_OUT_OOR_HI_ERR	23
ACM_DPF_OUT_OOR_LO_ERR	24
ACM_SCR_T1_OOR_HI_ERR	25
ACM_SCR_T1_OOR_LO_ERR	26
ACM_SCR_OUT_OOR_HI_ERR	27
ACM_SCR_OUT_OOR_LO_ERR	28
ACM_UREA_DOSER_INCOMPL_PURGE_ERR	29
RSRVD_ERR325	30
RSRVD_ERR326	31

Parameters:

V_ATA_bs_OEM1_Errs

State	Bit
ACM_ENGINE_DATA_TIMEOUT_ERR	0
ACM_NOX_IN_SENSOR_PWR_ERR	1
ACM_NOX_IN_SENSOR_HTR_ERR	2
ACM_NOX_IN_SENSOR_SIGNAL_ERR	3
ACM_NOX_IN_SENSOR_TIMEOUT_ERR	4
ACM_NOX_IN_SENSOR_HTR_RESP_ERR	5
ACM_NOX_IN_SENSOR_HTR_WARMUP_ERR	6
ACM_O2_IN_SENSOR_SIGNAL_ERR	7
ACM_NOX_IN_SENSOR_VOLT_MISMATCH_ERR	8
ACM_AT1IGC1_TIMEOUT_ERROR	9
ACM_AT1IGC2_TIMEOUT_ERROR	10
ACM_AT1OGC1_TIMEOUT_ERROR	11
ACM_AT1OGC2_TIMEOUT_ERROR	12
ACM_PERSISTANT_DATA_LOST_ERR	13
ACM_INTERNAL_HARDWARE_ERR	14
ACM_NOX_IN_SENSOR_PERSIST_NOT_VALID_ERR	15
ACM_HC_DESORB_RQST_ERR	16
ACM_H2O_DESORB_RQST_ERR	17
ACM_HC_DESORB_DRIVE_AWAY_ERR	18
ACM_NOX_IN_PWR_INT_ERR	19
ACM_BATTERY_VOLTAGE_HI_ERR	20
ACM_BATTERY_VOLTAGE_LO_ERR	21
ACM_SENSOR_SUPPLY_4_VOLTAGE_HI_ERR	22
ACM_SENSOR_SUPPLY_4_VOLTAGE_LO_ERR	23
ACM_SENSOR_SUPPLY_5_VOLTAGE_HI_ERR	24
ACM_SENSOR_SUPPLY_5_VOLTAGE_LO_ERR	25
ACM_SENSOR_SUPPLY_1_VOLTAGE_HI_ERR	26
ACM_SENSOR_SUPPLY_1_VOLTAGE_LO_ERR	27
ACM_AT1_DUALEGTS_TT_TIMEOUT_ERR	28
ACM_AT1_TRIEGTS_TT_TIMEOUT_ERR	29
ACM_EGTS_PFS_ERR	30
ACM_EGTS_SCR_ERR	31

Parameters:

V_OEM2_bs_Sys_Errs

State	Bit
SCROUT_REF_OOR_LO_ERR	0
SCROUT_REF_OOR_HI_ERR	1
RSRVD_ERR588	2
RSRVD_ERR589	3
RSRVD_ERR590	4
RSRVD_ERR591	5
RSRVD_ERR592	6
RSRVD_ERR593	7
RSRVD_ERR594	8
RSRVD_ERR595	9
RSRVD_ERR596	10
RSRVD_ERR597	11
RSRVD_ERR598	12
RSRVD_ERR599	13
RSRVD_ERR600	14
RSRVD_ERR601	15
RSRVD_ERR602	16
RSRVD_ERR603	17
RSRVD_ERR604	18
RSRVD_ERR605	19
RSRVD_ERR606	20
RSRVD_ERR607	21
RSRVD_ERR608	22
RSRVD_ERR609	23
RSRVD_ERR610	24
RSRVD_ERR611	25
RSRVD_ERR612	26
RSRVD_ERR613	27
RSRVD_ERR614	28
RSRVD_ERR615	29
RSRVD_ERR616	30
RSRVD_ERR617	31

Parameters:

V_ATD_bs_PMSA_Errs

State	Bit
PM_OUT_HTR_HIGH_ERR	0
PM_OUT_HTR_LOW_ERR	1
PM_OUT_OOR_HI_ERR	2
PM_OUT_OOR_LO_ERR	3
PM_OUT_REACT_TOO_LONG_ERR	4
PM_OUT_HOT_SIGNATURE_ERR	5
PM_OUT_HTR_LS_STG_ERR	6
PM_OUT_COOL_SIGNATURE_ERR	7
RSRVD_ERR400	8
RSRVD_ERR401	9
RSRVD_ERR402	10
RSRVD_ERR403	11
RSRVD_ERR404	12
RSRVD_ERR405	13
RSRVD_ERR406	14
RSRVD_ERR407	15
RSRVD_ERR408	16
RSRVD_ERR409	17
RSRVD_ERR410	18
RSRVD_ERR411	19
RSRVD_ERR412	20
RSRVD_ERR413	21
RSRVD_ERR414	22
RSRVD_ERR415	23
RSRVD_ERR416	24
RSRVD_ERR417	25
RSRVD_ERR418	26
RSRVD_ERR419	27
RSRVD_ERR420	28
RSRVD_ERR421	29
RSRVD_ERR422	30
RSRVD_ERR423	31

Parameters:

V_ATD_bs_SCR_ExtInput_Status
C_ATM_SCR_bs_Tamp_Indm_ExtIn
C_ATD_bs_SCRSysDisable_ExtIn
C_ATD_bs_SCRExtIn_ThrmRat_Mask
C_SCD_bs_NXRT_ExtIn_Mask
C_SCD_bs_NXGR_ExtIn_Mask
C_SCD_bs_ExtInput_CatEffMonMask
C_SCD_bs_InhibSwErr_CE_MonMask
C_SCD_bs_ExtInput_NM_IRMotMask
C_SCD_bs_ExtInput_NM_DitherMask
C_SCD_bs_ExtInput_UreaQuaMask
C_UIM_bs_ExtInput_DED_Mask

	State	Decimal Value
MODELED	Pipe_In_Tmptr	0
	Pipe_In_Mass_Flow	1
	Pipe_In_Press	2
	Pipe_In_NOx	3
	Pipe_In_O2	4
	Pipe_In_HC_Dosing	5
	Pipe_In_NO2	6
	React_Regen_Inhibit_Sw_Err	7
	Compressor_Inlet_Density	8
	Pipe_In_Residual_HC	9
	Ambient_Air_Press	10
	Engine_Speed	11
	Charge_Tmptr	12
	EMM_Protection_Flag	13
	Coolant_Tmptr	14
	Ambient_Air_Tmptr	15
DEFAULTED	Pipe_In_Tmptr	16
	Pipe_In_Mass_Flow	17
	Pipe_In_Press	18
	Pipe_In_NOx	19
	Pipe_In_O2	20
	Pipe_In_HC_Dosing	21
	Pipe_In_NO2	22
	React_Regen_Inhibit_Sw_Err	23
	Compressor_Inlet_Density	24
	Pipe_In_Residual_HC	25
	Ambient_Air_Press	26
	Engine_Speed	27
	Charge_Tmptr	28
	EMM_Protection_Flag	29
	Coolant_Tmptr	30
	Ambient_Air_Tmptr	31

Parameters:

V_ATD_bs_SCR_Sensor_Status
C_ATD_bs_SCRSensorStatus_Mask
C_SCD_bs_SCRSens_NM_DitherMask
C_ATD_bs_SCRInTmptrSens_Mask
C_ATD_bs_SCROutTmptrSens_Mask
C_SCD_bs_SCRSens_CatEffMonMask
C_SCD_bs_SCRSens_NM_IRMotMask
C_SCD_bs_NXGR_SCRSens_SR_Mask
C_SCD_bs_SCRSens_UreaQuaMask

	State	Decimal Value
MODELED	SCR_In_Tmptr	0
	SCR_Out_Tmptr	1
	Urea_Tank_Lvl	2
	DEF_Doser	3
	NOx_Out	4
	NH3_Mid_Bed	5
	Urea_Quality	6
	Rsrvd7	7
	Rsrvd8	8
	Rsrvd9	9
	Rsrvd10	10
	Rsrvd11	11
	Rsrvd12	12

	Rsrvd13	13
	Rsrvd14	14
	Rsrvd15	15
DEFAULTED	SCR_In_Tmptr	16
	SCR_Out_Tmptr	17
	Urea_Tank_Lvl	18
	DEF_Doser	19
	NOx_Out	20
	NH3_Mid_Bed	21
	Urea_Quality	22
	Rsrvd23	23
	Rsrvd24	24
	Rsrvd25	25
	Rsrvd26	26
	Rsrvd27	27
	Rsrvd28	28
	Rsrvd29	29
	Rsrvd30	30
	Rsrvd31	31

Parameters:

V_ATP_ppm_SCR_Out_NOx_Status

State	Decimal
DATA_VALID	0
DATA_NOT_AVAILABLE	-1
DATA_SUSPECT	-2
DATA_ERROR_HIGH_CONFIDENCE	-3
DATA_ERROR_MEDIUM_CONFIDENCE	-4
DATA_ERROR_DEFAULT	-5
DATA_ERROR_NO_VALUE	-6
DATA_ERROR_TIMEOUT	-7

Parameters:

V_ATD_bs_NOx_Out_Errs
C_ATD_bs_NOx_Out_StartUp_Mask
C_ATD_bs_SCRCatOverTmptr_Mask
C_ATM_bs_SCRCatalystEPD_Mask
C_SCD_bs_NXGR_NOx_Out_SR_Mask
C_SCD_bs_NOx_Out_NM_DitherMask
C_SCD_bs_NOx_Out_NM_IRMotMask
C_SCD_bs_NOx_Out_NOxHtrMonMask
C_SCD_bs_SysIO1_NOxHtrMonMask
C_SCD_bs_NOx_Out_ElecErrMask

State	Bit
NOX_OUT_SENS_IR_MOTOR_OFFSET_LO_ERR	0
NOX_OUT_SENS_IR_MOTOR_OFFSET_HI_ERR	1
NOX_OUT_SENSOR_HTR_WARMUP_ERR	2
NOX_OUT_SENSOR_PWR_ERR	3
NOX_OUT_SENSOR_HTR_ERR	4
NOX_OUT_SENSOR_SIGNAL_ERR	5
NOX_OUT_SENSOR_IR_HI_ERR	6
NOX_OUT_SENSOR_IR_LO_ERR	7
NOX_OUT_SENSOR_TIMEOUT_ERR	8

NOX_OUT_SENS_IR_STUCK_ERR	9
NOX_OUT_SENSOR_PWR_INT_ERR	10
NOX_OUT_SENSOR_VOLT_MISMATCH_ERR	11
NOX_OUT_SENSOR_IR_HI_GAIN_ERR	12
NOX_OUT_SENSOR_IR_LO_GAIN_ERR	13
SCR_OUT_NOX_SENSOR_HTR_RESP_ERR	14
NOX_OUT_SENS_IR_MOTOR_RESPONSE_ERR	15
NOX_OUT_SENSOR_PERSIST_NOT_VALID_ERR	16
RSRVD_ERR424	17
RSRVD_ERR425	18
RSRVD_ERR426	19
RSRVD_ERR427	20
RSRVD_ERR428	21
RSRVD_ERR429	22
RSRVD_ERR430	23
RSRVD_ERR431	24
RSRVD_ERR432	25
RSRVD_ERR433	26
RSRVD_ERR434	27
RSRVD_ERR435	28
RSRVD_ERR436	29
RSRVD_ERR437	30
RSRVD_ERR438	31

Parameters:

V_ATD_bs_SCR_SysIO1_Errs
C_AIM_bs_SysIO1_Tool_Mask
C_ATM_SCR_bs_Tamp_Indm_SysIO1
C_SCD_bs_NXRT_SysIO1_SR_Mask
C_UIM_FT_bs_SysIO1_DOT_Mask
C_AIM_bs_SysIO1_StartUp_Mask

State	Decimal Value
SCR_T1_OOR_HI_ERR	0
SCR_T1_OOR_LO_ERR	1
SCR_T1_IR_DELTAT_ERR	2
RSRVD_ERR92	3
SCR_OUT_OOR_HI_ERR	4
SCR_OUT_OOR_LO_ERR	5
SCR_OUT_IR_DELTAT_ERR	6
RSRVD_ERR93	7
SCR_IR_DELTAT_ERR	8
SCR_IN_IR_STUCK_ERR	9
EGTS_SCR_CJ_TIMEOUT_ERR	10
EGTS_SCR_TT_TIMEOUT_ERR	11
UIMB_TAMPERING_ERR	12
EGTS_SCR_ECU_ASIC_ERR	13
EGTS_SCR_ECU_HI_VOLT_ERR	14
EGTS_SCR_ECU_LO_VOLT_ERR	15
EGTS_SCR_ECU_OVER_TMPTR_ERR	16
EGTS_SCR_ECU_UC_ERR	17
EGTS_SCR_T1_OOR_HI_ERR	18
EGTS_SCR_T1_OOR_LO_ERR	19
EGTS_SCR_OUT_OOR_HI_ERR	20
EGTS_SCR_OUT_OOR_LO_ERR	21
EGTS_SCR_CJ_SHORT_CKT_ERR	22
EGTS_SCR_CJ_OPEN_CKT_ERR	23
EGTS_SCR_CJ_ASIC_ERR	24
EGTS_SCR_CJ_PLAUSIBLE_ERR	25

EONOX_TAMPERING_ERR	26
EGTS_SCR_TC1_ASIC_ERR	27
EGTS_SCR_TC2_ASIC_ERR	28
EGTS_SCR_PWR_INT_ERR	29
SCR_IR_TAMP_ERR	30
RSRVD_ERR127	31

Paramters:

V_ATD_bs_SCR_SysPerf_Errs
C_AIM_bs_SysPerf_Tool_Mask
C_AIM_bs_SysPerf_StartUp_Mask
C_SCD_bs_NXRT_SysPerf_SR_Mask
C_UIM_FT_bs_SysPerf_DOT_Mask
C_ATM_SCR_bs_Tamp_Indm_SysPerf
C_ATD_SCR_bs_OT_EngSD_SysPerf
C_ATM_SCR_AECD_bs_13_4b_SysPerf
C_ATD_bs_SCR_DisableHC_Dosing
C_SCD_bs_SysPerf_CatEffMonMask
C_SCD_bs_SysPerf_NM_DitherMask
C_SCD_bs_SysPerf_NM_IRMotMask
C_UIM_bs_EOL_Test_SysPerf_Enbl
C_SCD_bs_NXGR_SysPerf_SR_Mask
C_SCD_bs_SysPerf_UreaQuaMask
C_ATD_bs_PerfRdyStatus_Mask

State	Decimal Value
SCR_CAT_OVER_TMPTR_ERR	0
SCR_CAT_SEVERE_TMPTR_ERR	1
SCR_CAT_PRESENCE_ERR	2
SCR_CAT_REVERSE_ERR	3
SCR_CAT_EFFICIENCY_DEGRADED_ERR	4
SCR_CAT_OVER_TMPTR_DERATE_ERR	5
SCR_SYS_EFF_STAT_PERF_ERR	6
SCR_DOSING_EFF_STAT_PERF_ERR	7
SCR_NOX_EXCEEDANCE_LO_ERR	8
SCR_NOX_EXCEEDANCE_HI_ERR	9
SCR_REDUCTANT_QUALITY_ERR	10
NH3_SENSOR_INRANGE_HI_ERR	11
NH3_SENSOR_INRANGE_LO_ERR	12
NH3_SENSOR_STUCK_RESP_ERR	13
SCR_NH3_SENS_STAT_PERF_ERR	14
UREA_TANKLVL_INDUCEMENT_MAINT_ERR	15
UREA_TANK_FROZEN_ERR	16
UREA_TANKLVL_LO_MAINT_ERR	17
UREA_TANKLVL_EMPTY_MAINT_ERR	18
RSRVD_ERR179	19
RSRVD_ERR180	20
RSRVD_ERR181	21
SCR_IN_NR_SEVERE_TMPTR_ERR	22
SCR_OUT_NR_SEVERE_TMPTR_ERR	23
SCR_REDUCTANT_DELIVERY_FAIL_ERR	24
AMOX_EFFICIENCY_DEGRADED_ERR	25
SCR_IN_SEVERE_TMPTR_ERR	26
SCR_OUT_SEVERE_TMPTR_ERR	27
UREA_DOSER_INJ_ERR	28
SCR_CATALYST_SYSTEM_MISSING_ERR	29
SCR_EGTS_DELEGATED_ASSEMBLY_ERR	30
UREA_TANKLVL_EMPTY_INDUCE_ERR	31

Parameters:

V_USM_bs_Sys_Errs
C_USM_bs_Sys_Tool_Mask
C_USM_bs_Sys_StartUp_Mask
C_USM_bs_DisableDosing_SysErr
C_USM_bs_DisablePump_SysErr
C_USM_bs_SMTmptr_SysErr
C_USD_bs_PrgInbt_SysErr
C_USD_bs_USMSys_FCV_Mask
C_USM_bs_SMTmptr_SysErr

State	Decimal Value
UREA_DOSER_INJ_ELEC_ERR	0
UDD_FCV_LOW_ERR	1
UDD_FCV_HIGH_ERR	2
UREAPUMPP_OOR_HI_ERR	3
UREAPUMPP_OOR_LO_ERR	4
DOSED_MASS_OOR_HI_ERR	5
DOSED_MASS_OOR_LO_ERR	6
UREASUPPT1_INVALID_SYNC_ERR	7
UREASUPPT1_INVALID_DC_ERR	8
UREASUPPT2_INVALID_SYNC_ERR	9
UREASUPPT2_INVALID_DC_ERR	10
UREA_SUPPUNIT_NO_TMPTR_RISE_ERR	11
UREA_SUPPUNIT_FAIL_TO_THAW_ERR	12
UREA_SUPPUNIT_NO_INITIAL_TMPTR_RISE_ERR	13
UREASUPPT1_IR_STUCK_ERR	14
UREASUPPT2_IR_STUCK_ERR	15
UREA_SUPPLY_PRESS_FAIL2CTRL_ERR	16
UREA_SUPPLY_PRESS_FAIL2RISE_ERR	17
UPPM_FAIL2FILL_ERR	18
UPPM_FAIL2CTRL_ERR	19
UPPM_FAIL2RISE_ERR	20
UPPM_CTRL_TOOHIGH_ERR	21
UPPM_CTRL_TOOLOW_ERR	22
UPPM_UREA_FAIL2PURGE_ERR	23
UPPM_FAIL2VENT_ERR	24
UPPM_AIR_FAIL2PURGE_ERR	25
UPPM_FAIL2STBLZ_ERR	26
UREA_DOSER_FUNC_RESPONSE_ERR	27
UREA_DOSER_LEAKAGE_ERR	28
UREA_DOSER_INCOMPL_PURGE_ERR	29
UREASUPPT1_SENS_ERR	30
UREASUPPT2_SENS_ERR	31

Parameters:

V_USM_bs_Sys1_Errs
C_USM_bs_Sys1_Tool_Mask
C_USM_bs_Sys1_StartUp_Mask
C_USM_bs_DisableDosing_SysErr1
C_USM_bs_DisablePump_SysErr1
C_USM_bs_SMTmptr_SysErr1
C_USD_bs_PrgInbt_SysErr1
C_USD_bs_USMSys1_FCV_Mask
C_USM_bs_SMTmptr_SysErr1

State	Decimal Value
UPPM_INRANGE_ERR	0
UDD_SU_HEATER_LOW_ERR	1
UDD_SU_HEATER_HIGH_ERR	2
UDD_PUMP_LOW_ERR	3
UDD_PUMP_HIGH_ERR	4
UREASUPPT1_RATIONALITY_ERR	5
UREASUPPT2_RATIONALITY_ERR	6
UREA_SUPPUNIT_FROZEN_ERR	7
UREASUPP_TMPTR_TIMEOUT_ERR	8
RSRVD_ERR499	9
UREA_SM_HTR_HIGH_ERR	10
UREA_SM_HTR_LOW_ERR	11
UREA_RVV_FUNC_RESPONSE_ERR	12
UREA_DOSER_FAIL_TO_PRIME_ERR	13
REAGENT_CONSUMPTION_ERR	14
DEF_LOW_FLOW_ERR	15
RSRVD_ERR378	16
RSRVD_ERR379	17
RSRVD_ERR380	18
RSRVD_ERR381	19
RSRVD_ERR382	20
RSRVD_ERR383	21
RSRVD_ERR384	22
RSRVD_ERR385	23
RSRVD_ERR386	24
RSRVD_ERR387	25
RSRVD_ERR388	26
RSRVD_ERR389	27
RSRVD_ERR390	28
RSRVD_ERR391	29
AIRPRESSURE_OOR_LO_ERR	30
AIRPRESSURE_OOR_HI_ERR	31

Parameters:

V_USM_bs_Sys2_Errs

State	Decimal Value
FCU_PUMP_STG_ERR	0
FCU_PUMP_OPN_LOAD_ERR	1
FCU_PUMP_SHORTCUT_PHASES_ERR	2
FCU_PUMP_BLOCKED_ERR	3
FCU_PUMP_UNMAIN_TRGTTPRESS_ERR	4
RSRVD_ERR271	5
RSRVD_ERR272	6
RSRVD_ERR273	7
RSRVD_ERR274	8
RSRVD_ERR275	9
RSRVD_ERR276	10
RSRVD_ERR277	11
RSRVD_ERR278	12
RSRVD_ERR279	13
RSRVD_ERR280	14
RSRVD_ERR281	15
RSRVD_ERR282	16
RSRVD_ERR283	17
RSRVD_ERR284	18
RSRVD_ERR285	19
FCU_QTY_SHORT_SUPP_ERR	20
FCU_QTY_STG_ERR	21
FCU_QTY_INTRNL_CRITICAL_ERR	22
FCU_ECU_COMM_TIMEOUT_ERR	23
FCU_ECU_CMD_LOST_IMPLAUS_ERR	24
FCU_QTY_SHORT_UBATT_ERR	25
FCU_RAM_ERR	26
FCU_EEPROM_ERR	27
FCU_SW_WATCHDOG_ERR	28
FCU_HW_INIT_ERR	29
FCU_DATASET_INVALID_ERR	30
FCU_PUMP_WRONG_DIR_ERR	31

Parameters:

V_USM_bs_Sys3_Errs

State	Decimal Value
UDD_FCU_WAKE_HIGH_ERR	0
UDD_FCU_WAKE_LOW_ERR	1
UREA_DOSER_INJ_ELEC_ERR	2
UREA_DOSER_FUNC_RESPONSE_ERR	3
UREA_DOSER_FAIL_TO_PRIME_ERR	4
RSRVD_ERR259	5
RSRVD_ERR260	6
RSRVD_ERR261	7
RSRVD_ERR262	8
RSRVD_ERR263	9
RSRVD_ERR264	10
RSRVD_ERR265	11
RSRVD_ERR266	12
RSRVD_ERR267	13
RSRVD_ERR268	14
RSRVD_ERR269	15
RSRVD_ERR270	16
RSRVD_ERR271	17
RSRVD_ERR272	18
RSRVD_ERR273	19
RSRVD_ERR274	20
RSRVD_ERR275	21
RSRVD_ERR276	22
RSRVD_ERR277	23
RSRVD_ERR278	24
RSRVD_ERR279	25
RSRVD_ERR280	26
RSRVD_ERR281	27
RSRVD_ERR282	28
RSRVD_ERR283	29
RSRVD_ERR284	30
RSRVD_ERR285	31

Parameters:

V_UTM_bs_Sys_Errs
C_UTM_bs_Sys_Tool_Mask
C_UTM_bs_Sys_StartUp_Mask
C_UTM_bs_DisableDosing_SysErr
C_UTM_bs_DisDosCond_SysErr
C_UTM_bs_Tamper_SysErr
C_UTM_bs_LineHtr_SysErr
C_UTM_bs_EOLHtr_Mask

State	Decimal Value
UREA_TANKT_IR_STUCK_ERR	0
UTDD_TANKHTR1_HIGH_ERR	1
UTDD_TANKHTR1_LOW_ERR	2
UTDD_LINEHTR1_HIGH_ERR	3
UTDD_LINEHTR1_LOW_ERR	4
UREA_TANKHTR1_NO_INITIAL_TMPTR_RISE_ERR	5
UREA_TANKLVL_WARNING_MAINT_ERR	6
UREA_TANKLVL_OOR_HI_ERR	7
UREA_TANKLVL_OOR_LO_ERR	8
UREA_TANKT_OOR_HI_ERR	9
UREA_TANKLVL_IR_ERR	10
UREA_TANKHTR1_STUCK_ON_ERR	11
UREA_TANKHTR1_FAIL_TO_THAW_ERR	12
UREA_TANKT_IR_ERR	13
UREA_TANKT_OOR_LO_ERR	14
RSRVD_ERR359	15
UREA_TANKT_SENS_INT_ERR	16
RSRVD_ERR361	17
UREA_TANKLVL_SENS_INT_ERR	18
UREA_TANKT_SENS_TIMEOUT_ERR	19
UREA_TANKLVL_SENS_TIMEOUT_ERR	20
UREA_TANKT_CURRENT_OOR_HI_ERR	21
UREA_TANKT_CURRENT_OOR_LO_ERR	22
UREA_TANKLVL_CURRENT_OOR_HI_ERR	23
UREA_TANKLVL_CURRENT_OOR_LO_ERR	24
UREA_TANKLVL_PERSIST_NO_VALUE_ERR	25
UREA_TANKT_OUT_OF_CALIBRATION_ERR	26
UREA_TANKLVL_OUT_OF_CALIBRATION_ERR	27
RSRVD_ERR372	28
RSRVD_ERR373	29
RSRVD_ERR374	30
RSRVD_ERR375	31

Parameters:

V_UTM_bs_Sys1_Errs

State	Decimal Value
UREA_LINEHTR1_OL_ERR	0
UREA_LINEHTR1_OC_ERR	1
UREA_LINEHTR1_SC_ERR	2
UREA_LINEHTR2_OL_ERR	3
UREA_LINEHTR2_OC_ERR	4
UREA_LINEHTR2_SC_ERR	5
UREA_LINEHTR3_OL_ERR	6
UREA_LINEHTR3_OC_ERR	7
UREA_LINEHTR3_SC_ERR	8
UREA_LINEHTR1_HIGHSIDE_OL_ERR	9
UREA_LINEHTR1_HIGHSIDE_STG_ERR	10
RSRVD_ERR567	11
UREA_LINEHTR1_HIGHSIDE_STB_ERR	12
UREA_LINEHTR1_LOWSIDE_OL_ERR	13
UREA_LINEHTR2_HIGHSIDE_OL_ERR	14
UREA_LINEHTR2_HIGHSIDE_STG_ERR	15
RSRVD_ERR572	16
UREA_LINEHTR2_HIGHSIDE_STB_ERR	17
UREA_LINEHTR2_LOWSIDE_OL_ERR	18
UREA_LINEHTR3_HIGHSIDE_OL_ERR	19
UREA_LINEHTR3_HIGHSIDE_STG_ERR	20
RSRVD_ERR577	21
UREA_LINEHTR3_HIGHSIDE_STB_ERR	22
UREA_LINEHTR3_LOWSIDE_OL_ERR	23
RSRVD_ERR580	24
RSRVD_ERR581	25
RSRVD_ERR582	26
RSRVD_ERR583	27
RSRVD_ERR584	28
RSRVD_ERR585	29
RSRVD_ERR586	30
RSRVD_ERR587	31

Parameters:

V_RDM_bs_Sys_Errs

State	Decimal Value
UREA_DOSER_NONHTR_FROZEN_ERR	0
RSRVD_ERR	1
RSRVD_ERR	2
BATTERY_VOLTAGE_HI_ERR	3
BATTERY_VOLTAGE_LO_ERR	4
RSRVD_ERR	5
RSRVD_ERR	6
RSRVD_ERR	7
RSRVD_ERR	8
RSRVD_ERR	9
RSRVD_ERR	10
RSRVD_ERR	11
RSRVD_ERR	12
RSRVD_ERR	13
RSRVD_ERR	14
RSRVD_ERR	15
RSRVD_ERR	16
RSRVD_ERR	17
RSRVD_ERR	18
RSRVD_ERR	19
RSRVD_ERR	20
RSRVD_ERR	21
RSRVD_ERR	22
RSRVD_ERR	23
RSRVD_ERR	24
RSRVD_ERR	25
RSRVD_ERR	26
RSRVD_ERR	27
RSRVD_ERR	28
RSRVD_ERR	29
RSRVD_ERR	30
RSRVD_ERR	31

Parameters:
V_ATD_bs_NH3_Errs
C_ATD_bs_NH3_StartUp_Mask
C_SCD_bs_NH3_NH3HtrMonMask

State	Bit
NH3_SENSOR_HTR_POS_OPEN_ERR	0
NH3_SENSOR_HTR_NEG_STB_ERR	1
NH3_SENSOR_HTR_NEG_STG_ERR	2
NH3_SENSOR_HTR_NEG_OPEN_ERR	3
NH3_SENSOR_HTR_VOLT_OORL_ERR	4
NH3_SENSOR_HTR_VOLT_OORH_ERR	5
NH3_SENSOR_TRIMR_OORH_ERR	6
NH3_SENSOR_TRIMR_OORL_ERR	7
NH3_SENSOR_TRIMR_OPEN_ERR	8
NH3_SENSOR_ASIC_ERR	9
NH3_SENSOR_ZCELL_OORH_ERR	10
NH3_SENSOR_ZCELL_OORL_ERR	11
NH3_SENSOR_ZCELL_OPEN_ERR	12

NH3_SENSOR_TIMEOUT_ERR	13
NH3_SENSOR_GND_OPEN_ERR	14
NH3_SENSOR_GND_STB_ERR	15
NH3_SENSOR_EMF1_OORH_ERR	16
NH3_SENSOR_EMF1_OORL_ERR	17
NH3_SENSOR_EMF2_OORH_ERR	18
NH3_SENSOR_EMF2_OORL_ERR	19
NH3_SENSOR_PWR_INT_ERR	20
NH3_SENSOR_HTR_RESP_INT_ERR	21
NH3_SENSOR_HTR_RESP_TIME_ERR	22
NH3_SENSOR_HTR_WARMUP_ERR	23
NH3_SENSOR_RESPONSE_ERR	24
NH3_SENSOR_PERSIST_NOT_VALID_ERR	25
RSRVD_ERR439	26
RSRVD_ERR440	27
RSRVD_ERR441	28
RSRVD_ERR442	29
RSRVD_ERR437	30
RSRVD_ERR438	31

Parameters:

V_UID_bs_UDB_Sys1_Errs
C_UIM_bs_DOT_Test_SysErr1_Enbl
C_UIM_bs_DPO_Test_SysErr1_Mask

State	Bit
DB_UREA_INJ_VALVE_LSS_SCB_ERR	0
DB_UREA_INJ_VALVE_LSS_SCGOL_ERR	1
RSRVD_ERR258	2
DB_UREA_INJ_VALVE_HSS_SCB_ERR	3
DB_UREA_INJ_VALVE_HSS_SCG_ERR	4
DB_UREA_TANKLVL_OOR_HIGH_ERR	5
DB_UREA_TANKLVL_OOR_LOW_ERR	6
DB_ENGINETMPTR1_MSG_TIMEOUT_ERR	7
DB_ENG_SPD_UNEXPECTED_VAL_ERR	8
DB_UREA_TANKT_OOR_HIGH_ERR	9
DB_UREA_TANKT_OOR_LOW_ERR	10
DB_UREA_TANKT_IR_HIGH_ERR	11
DB_UREA_TANKT_IR_LOW_ERR	12
RSRVD_ERR269	13
DB_UREA_DOSER_MTR_SHORT_HI_ERR	14
DB_UREA_DOSER_MTR_SHORT_LOW_ERR	15
DB_UREA_DOSER_MTR_OPEN_LOAD_ERR	16
RSRVD_ERR273	17
RSRVD_ERR274	18
DB_UREA_DOSER_MTR_NOT_AVAIL_ERR	19
RSRVD_ERR276	20
DB_UREA_DOSER_RVV_SHORT_HI_ERR	21
DB_UREA_DOSER_RVV_SHORT_LOW_ERR	22
DB_UREA_DOSER_RVV_OPEN_LOAD_ERR	23
DB_UREA_DOSER_PRESS_OOR_HI_ERR	24
DB_UREA_DOSER_PRESS_OOR_LO_ERR	25
DB_UREA_DOSER_PRESS_IR_LO_ERR	26
DB_UREA_DOSER_PRESS_IR_HI_ERR	27
RSRVD_ERR284	28
DB_VAR_DS_RQ_UNEXPECTED_VAL_ERR	29
DB_TRP_RESET_UNEXPECTED_VAL_ERR	30
DB_DIAG_OVR_MSG_LENGTH_ERR	31

Parameters:

V_UID_bs_UDB_Sys2_Errs
C_UIM_bs_DOT_Test_SysErr2_Enbl
C_UIM_bs_DPO_Test_SysErr2_Mask

State	Bit
DB_UREA_DOSER_HTR_SHORT_HI_ERR	0
RSRVD_ERR289	1
DB_UREA_DOSER_HTR_OPEN_LOAD_ERR	2
DB_UREA_TANKHTR1_SHORT_HIGH_ERR	3
DB_UREA_TANKHTR1_SHORT_LOW_ERR	4
DB_UREA_TANKHTR1_OPEN_LOAD_ERR	5
RSRVD_ERR294	6
DB_UREA_TANKHTR1_STUCK_ON_ERR	7
DB_UREA_PL_HTR_SHORT_HIGH_ERR	8
RSRVD_ERR297	9
DB_UREA_PL_HTR_OPEN_LOAD_ERR	10
DB_UREA_SL_HTR_SHORT_HIGH_ERR	11
RSRVD_ERR300	12
DB_UREA_SL_HTR_OPEN_LOAD_ERR	13
DB_UREA_BL_HTR_SHORT_HIGH_ERR	14
RSRVD_ERR303	15
DB_UREA_BL_HTR_OPEN_LOAD_ERR	16
RSRVD_ERR305	17
DB_UREA_DOSER_TMPTR_PER_PWM_ERR	18
DB_UREA_DOSER_TMPTR_DC_PWM_ERR	19
DB_UREA_DOSER_TMPTR_DCINVLD_ERR	20
DB_UREA_DOSER_HTR_T_DCINVLD_ERR	21
DB_UREA_DOSER_HTR_T_DYCFAIL_ERR	22
DB_SM_TMPTR_IR_ERR	23
DB_SM_TMPTR_IR_COLD_START_ERR	24
DB_UREA_DOSER_TMPTR_NO_AVL_ERR	25
DB_SM_HEATERT_IR_ERR	26
DB_SM_HEATERT_IR_COLD_START_ERR	27
DB_SUPPLY_MODULE_T_DYCFAIL_ERR	28
DB_UREA_DOSER_HTR_FUNC_RESP_ERR	29
DB_SM_TMPTR_SENSORS_PLAUS_ERR	30
DB_DIAG_OVR_MSG_TIMEOUT_ERR	31

Parameters:

V_UID_bs_UDB_Sys3_Errs
C_UIM_bs_DOT_Test_SysErr3_Enbl
C_UIM_bs_DPO_Test_SysErr3_Mask

State	Bit
DB_DCU_OVER_TMPTR_ERR	0
DB_BATTERY_VOLTAGE_OOR_HI_ERR	1
DB_BATTERY_VOLTAGE_OOR_LO_ERR	2
RSRVD_ERR323	3
DB_MAIN_RELAY_STUCK_ERR	4
DB_SHUTOFF_WITHOUT_EMPTY_ERR	5
DB_DCU_RELAY_UH_SHORT_HI_ERR	6
DB_DCU_RELAY2_SHORT_HIGH_ERR	7
DB_DCU_RELAY2_SHORT_LOW_ERR	8
DB_DCU_RELAY3_SHORT_HIGH_ERR	9
DB_DCU_RELAY3_SHORT_LOW_ERR	10
DB_DCU_RELAY4_SHORT_HIGH_ERR	11
DB_DCU_RELAY4_SHORT_LOW_ERR	12
RSRVD_ERR333	13
DB_CS_RDY_UNEXPECTED_VAL_ERR	14
DB_UREA_HTR_RELAY_SHORT_HI_ERR	15
DB_UREA_HTR_RELAY_SHORT_LO_ERR	16

DB_UREA_HTR_RELAY_OPEN_LOAD_ERR	17
RSRVD_ERR338	18
DB_DCU_EEP_READ_ERR	19
DB_DCU_VAR_MNG_EEP_ERR	20
DB_DCU_EEP_ERASE_ERR	21
DB_DCU_EEP_WRITE_ERR	22
DB_DCU_INVALID_DATASET_ID_ERR	23
DB_DCU_VAR_DATASET_SWITCH_ERR	24
DB_CS_FLAG_UNEXPECTED_VAL_ERR	25
RSRVD_ERR346	26
DB_DCU_SENSOR_SUPPLY_3_OOR_ERR	27

Parameters:

V_UID_bs_UDB_Sys4_Errs
C_UIM_bs_DOT_Test_SysErr4_Enbl
C_UIM_bs_DPO_Test_SysErr4_Mask
C_UIM_bs_DPO_Test_SysErr4_Mask

State	Bit
DB_UREA_INJ_VALVE_PLAUS_ERR	0
DB_DOSER_RVV_STUCK_CLOSED_ERR	1
RSRVD_ERR354	2
DB_METERING_CTL_UNDER_PRESS_ERR	3
DB_METERING_CTL_OVER_PRESS_ERR	4
DB_UREA_DOSER_OVER_PRESSURE_ERR	5
DB_MNTR_PRESSURE_REDUCTION_ERR	6
DB_UHC_SHUTOFF_WITH_EMPTY_ERR	7
DB_SYSTEM_FILLED_IN_INIT_ERR	8
RSRVD_ERR361	9
RSRVD_ERR362	10
DB_SCR_MON_PRESSURE_CHECK_ERR	11
DB_PRESSURE_STABILISATION_ERR	12
DB_ATISCR_DSR1_MSG_TIMEOUT_ERR	13
DB_ATISCR_DSR1_MSG_LENGTH_ERR	14
DB_ATISCR_DSR2_MSG_TIMEOUT_ERR	15
DB_ATISCR_DSR2_MSG_LENGTH_ERR	16
DB_ATISCR_EXH_T_MSG_TIMEOUT_ERR	17
DB_ATISCR_EXH_T_MSG_LENGTH_ERR	18
DB_BL_HTR_UNEXPECTED_RQST_ERR	19
DB_PL_HTR_UNEXPECTED_RQST_ERR	20
DB_SL_HTR_UNEXPECTED_RQST_ERR	21
DB_SM_HTR_UNEXPECTED_RQST_ERR	22
DB_REAGENT_Q_UNEXPECTED_VAL_ERR	23
DB_RQSTSTATE_UNEXPECTED_VAL_ERR	24
DB_SCR_OUT_T_UNEXPECTED_VAL_ERR	25
DB_SCR_IN_T_UNEXPECTED_VAL_ERR	26
RSRVD_ERR379	27
DB_ADC0_CAL_POWERUP_TIMEOUT_ERR	28
DB_ADC0_CONVERSION_TIMEOUT_ERR	29
DB_DCU_TMPTR_0_OOR_HI_ERR	30
DB_DCU_TMPTR_0_OOR_LO_ERR	31

Parameters:

V_UID_bs_UDB_Sys5_Errs
C_UIM_bs_DOT_Test_SysErr5_Enbl
C_UIM_bs_DPO_Test_SysErr5_Mask

State	Bit

RSRVD_ERR384	0
RSRVD_ERR385	1
DB_DCU_TMPTR_1_OOR_HI_ERR	2
DB_DCU_TMPTR_1_OOR_LO_ERR	3
RSRVD_ERR388	4
RSRVD_ERR389	5
DB_COM_CIL_BUS_OFF_NODE_A_ERR	6
DB_COM_CIL_BUS_OFF_NODE_B_ERR	7
DB_COM_CIL_ERR_PAS_NODE_A_ERR	8
DB_COM_CIL_ERR_PAS_NODE_B_ERR	9
RSRVD_ERR394	10
RSRVD_ERR395	11
DB_MOC_COM_ERR_CNT_ERR	12
DB_MOC_COM_INTERRUPTED_SPI_ERR	13
RSRVD_ERR398	14
RSRVD_ERR399	15
RSRVD_ERR400	16
RSRVD_ERR401	17
RSRVD_ERR402	18
DB_MON_OVER_VOLTAGE_SUPPLY1_ERR	19
DB_MON_UNDR_VOLTAGE_SUPPLY1_ERR	20
DB_DCU_SOFTWARE_RESET_0_ERR	21
DB_DCU_SOFTWARE_RESET_1_ERR	22
DB_DCU_SOFTWARE_RESET_2_ERR	23
DB_AMBIENT_T_MSG_LENGTH_ERR	24
DB_AMBIENT_T_MSG_TIMEOUT_ERR	25
DB_COOLANT_T_UNEXPECTED_VAL_ERR	26
DB_EEC1_MSG_LENGTH_ERR	27
DB_EEC1_MSG_TIMEOUT_ERR	28
DB_AMBIENT_P_UNEXPECTED_VAL_ERR	29
DB_AMBIENT_T_UNEXPECTED_VAL_ERR	30
DB_ENGINETMPTR1_MSG_LENGTH_ERR	31

Parameters:

V_UIM_ECM_DoserState

State	**Bit**
UIM_STATE_DORMANT	0
UIM_STATE_PREPAREFORDOSING	1
UIM_STATE_NORMALDOSING	2
UIM_STATE_SYSTEMERRORPENDING	3
RESERVED	4
UIM_STATE_PROTAGAINSTHEAT	5
UIM_STATE_PROTAGAINSTCOLD	6
UIM_STATE_SHUTOFF	7
UIM_STATE_DIAGNOSIS	8
UIM_STATE_SERVICEDOSING	9
UIM_STATE_SERVICENODOSING	10
UIM_STATE_OFF	11
UIM_STATE_LOSSOFCOMMUNICATIONS	12

Parameters:

V_RDM_FdbkState
V_USM_SysStateFdbk
V_USM_Op_State
V_RDM_State_Rqst
V_UIM_UreaDosingSysState
V_USM_DosingSysStateRqst

State	Decimal
INIT	0
STANDBY	1
PREPARING	2
DOSING	3
SYSERR	4
SERVICE	5
OFF	6

Parameters:

V_ATM_AECD_07_6_State
V_ATM_AECD_10_1_State
V_ATM_AECD_10_2_State
V_ATM_AECD_10_3_State
V_ATM_AECD_10_4_State
V_ATM_AECD_10_6a_State
V_ATM_AECD_10_6b_State
V_ATM_AECD_10_7_State
V_ATM_SCR_AECD_13_1a_State
V_ATM_SCR_AECD_13_1b_State
V_ATM_SCR_AECD_13_3_State
V_ATM_SCR_AECD_13_4a_State
V_ATM_SCR_AECD_13_4b_State
V_ATM_SCR_AECD_13_4c_State
V_ATM_SCR_AECD_8_6_State
C_ATM_AECD_07_6G1_Enbl
C_ATM_AECD_07_6G2_Enbl
C_ATM_AECD_10_1_Enbl
C_ATM_AECD_10_2_Enbl
C_ATM_AECD_10_3_Enbl
C_ATM_AECD_10_4_Enbl
C_ATM_AECD_10_6a_Enbl
C_ATM_AECD_10_6bG1_Enbl
C_ATM_AECD_10_6bG2_Enbl
C_ATM_AECD_10_7_Enbl
C_ATM_SCR_AECD_13_1a_Enbl
C_ATM_SCR_AECD_13_1b_Enbl
C_ATM_SCR_AECD_13_1c_Enbl
C_ATM_SCR_AECD_13_4a_Enbl
C_ATM_SCR_AECD_13_4b_Enbl
C_ATM_SCR_AECD_13_4c_Enbl
C_ATM_SCR_AECD_8_6_State

State	Decimal
Active	1
Emissions Increase	2
Hi Emissions Increase	4
Protection	8
Deficiency	16
Maintenance Derate	32

Parameters:

V_UIM_pc_Tank_Heater_State

State	Decimal
Off	0
On	1

Parameters:

V_USD_UreaSuppT1_Rat_State
V_USD_UreaSuppT2_Rat_State
V_USD_UreaSuppT1_SIR_State
V_USD_UreaSuppT2_SIR_State
V_USD_SMHtr_FuncResp_State
V_USD_SMHtr_Stuck_State
V_USD_PressInRange_State

State	Decimal Value
DIAG_NOT_RUN	0
DIAG_COMPLETE_PASS	1
DIAG_COMPLETE_FAIL	2
DIAG_ABORT	4
DIAG_PROCESSING	6
DIAG_PAUSE	9

Parameters:

V_USD_CtrlHighPress_State
V_USD_CtrlNotStablzPress_State
V_USD_CtrlLowPress_State

State	Decimal Value
DIAG_COMPLETE_PASS	0
DIAG_COMPLETE_FAIL	1
DIAG_ABORT	2
DIAG_PAUSE	3

Parameters:

V_ATD_SCR_TSR_Error

State	Decimal Value
EMD_NOT_RUN	0
EMD_PRELIM_FAIL	3
EMD_ABORT	4
EMD_RUN	6
EMD_FAIL	7
EMD_RESET	9

Parameters:

V_UID_ColdSoakRdy

State	Decimal Value
Warm Soak	0
Cold Soak	1

Parameters:

V_AIM_BlockHeater_Mon_State

State	Decimal Value
NOT_COMPLETE	0

COMPLETE	1
ABORT	2
RUNNING	3

Parameters:

V_AIM_BlockHeater_State

State	Decimal Value
NOT_DETECTED	0
DETECTED	1
WAIT_FOR_TIMER	2
UNKNOWN	3

Parameters:

V_AIM_UreaSuppT_ProcState

State	Decimal Value
INIT	0
CMD	1
RQST	2
READ	3
STOP	4

Parameters:

Current Engine State

State	Decimal Value
ENGINE_STOP_STATE	0
ENGINE_CRANK_STATE	1
ENGINE_RUN_STATE	2
ENGINE_SHUTDOWN_STATE	3
ENGINE_BRAKING_STATE (ENGINE_RETARDER_STATE)	4
	5
ENGINE_SIP_STATE	6
ENGINE_SIP_NO_TM_STATE	7

ACCELERATOR GOVERNOR:

Parameters:

Selected_Governor

State	Decimal Value
ABT	0
ABS	1

ACCELERATOR INTERLOCK:

Parameters:

Accelerator_Interlock_State

State	Decimal Value
UNLOCKED	0
LOCKED	1

ANTI-THEFT:

Parameters:
AT_Engine_Lock_State

State	HEX
LOCKED	1
UNLOCKED	0

Parameters:
AT_Exit_Mode

State	Decimal Value
Manual (lock upon operator request)	0
Automatic (lock when key off)	1

AUXILLIARY GOVERNOR CONTROL:

Parameters:
T_Aux_Governor_Selector

State	Decimal Value
Speed	0
Pressure	1

BATTERY:

Parameters:

H_AIP_Batt_Tmptr_State
H_AIP_Batt_Volt_State

State	Decimal Value
DATA VALID	0
DATA NOT AVAILABLE	-1
DATA SUSPECT	-2
DATA ERROR HIGH CONFIDENCE	-3
DATA ERROR MEDIUM CONFIDENCE	-4
DATA ERROR DEFAULT	-5
DATA ERROR NO VALUE	-6
DATA ERROR TIMEOUT	-7

CHANGE LOCK:

Parameters:

CMGR_ChangeState

State	Decimal Value
CHG_STATE_CHANGES_NOT_OK	0
CHG_STATE_CHANGES_OK	1
CHG_STATE_CANCELING	2
CHG_STATE_SAVING	3

CHARGE FLOW:

Parameters:
CHL_MCF_Derate_State

State	Text Value	Decimal Value
CHL_NO_DERATE_STATE	NO_DRT	0
CHL_COT_DERATE_STATE	COT_DRT	1
CHL_TURBO_SPEED_Derate_State	TURB_DRT	2
CHL_DELTA_P_DERATE_STATE	DLTP_DRT	4
CHL_EGR_Off_DP_DERATE_STATE	DPOFFDRT	8
CHL_EMP_DERATE_STATE	EMP_DRT	16

Parameters:

CHP_Veff_Mode
C_CHP_Veff_With_EMP_Active

State	Decimal
IMP Only	0
EMP/IMP	1

Parameters:
Charge_Flow_Derate_Active_State

State	Decimal Value
All Derates Inactive	0
COT Near Limit	1
Turbo Speed Near Limit	2
Delta P Near Limit	4
Delta P Near EGR Off Limit	8
Engine DP near limit	10

Parameters:
Charge_Flow_Command_State

State	Decimal Value
Normal Operation	0
COT Derate	1
Turbo Speed Derate	2
Delta P Derate	4
Delta P Near EGR Off Limit	8
Density Based MCF Limit	16
CBL MCF Command Override	32
CBL MCF Command Increment	64
Bypass Mode Adjustment	128
Exhaust Temperature Limit	256
Exhaust Flow Low Limit	512
Exhaust Press Limit	1024

COMBUSTION MANAGER:

Parameters:

H_CBM_O2_Out_Frac_Status
H_CBM_PM_Out_Frac_Status

State	Decimal Value
DATA_VALID	0
DATA_ERROR_HIGH_CONFIDENCE	-3

CRUISE CONTROL:

Parameters:

CC_CommandMode

State	Decimal Value
CC_OFF	0
CC_SET	1
CC_CANCEL	2
CC_RESUME	3
CC_COAST	4
CC_BDOWN	5
CC_ACCEL	6
CC_BUP	7
CC_HDWAY	8
CC_HOLD	9
CC_AUTO_RESUME	10

Parameters:

ACC_Mode

State	Decimal
NO_CRUISE	0
NORMAL_CRUISE	1
HEADWAY_CRUISE	2

Parameters:

CC_Status

State	Decimal
Inactive	0
Active	1

Parameters:

J39_Adaptive_Cruise_Control_Mode

State	Enumeration
Off	000
Speed Contorl Active	001
Distance Control Active	010
Overtake Mode	011
Hold Mode	100
Finish Mode	101
Disabled	110
Not Valid	111

Parameters:

T_CC_SetAccelSwitchSelect

State	Decimal
CC_ResumeSwitch	0
CC_SetSwitch	1

CYLINDER PERFORMANCE:

Parameters:

FSI_s_CylCutOutBase

State	Decimal
Inactive	0
Active	1
Internal Cutout	3
Prohibit	4

Parameters:

FSI_s_CylCutOutToolStatus

State	Decimal
Inactive	0
Active	1
Prohibit	4

DATALINK:

Parameters:

CMGR_BroadcastState

State	Value
J1939, port 1	Byte 0, bit 0 (1 = Enabled, 0 = Disabled)
J1939, port 2	Byte 0, bit 1 (1 = Enabled, 0 = Disabled)
J1939, port 3	Byte 9, bit 2 (1 = Enabled, 0 = Disabled)
J1587, port 1	Byte 1, bit 0 (1 = Enabled, 0 = Disabled)
J1587, port 2	Byte 1, bit 2 (1 = Enabled, 0 = Disabled)
J1587, port 3	Byte 1, bit 3 (1 = Enabled, 0 = Disabled)

Parameters:

DL_EngineControlMode

State	Hex
None	0000
Speed Control	0001
Speed Limit Control	0002
Torque Control	0004
Torque Limit Control	0008

DRIVER REWARD:

Parameters:

DRS_Reward_State

State	Decimal
NO_REWARD	0
REWARD_LEVEL_1	1
REWARD_LEVEL_2	2
REWARD_LEVEL_3	3
REWARD_LEVEL_4	4

ECM:

Parameters:

ECM_Status

State	Hex
INITIAL LOAD	5EED
RECALIBRATION IN PROGRESS	1D0A
VALIDATE MEMORY	2B16
VALID PROGRAM	600D

Parameters:

Poweroff_Command_Ignored

State	Hex
POWEROFF IGNORED	1
POWEROFF NOT IGNORED	0

Parameters:

Release_Status

State	Hex
DEVELOPMENT_ECM	187
PRODUCTION_ECM	85

Parameters:

Run_Location

State	Value
ROM	0
Flash	1
RAM	2

Parameters:

Security_Key

State	Hex
SECURE	0000
UNSECURE	00FF

EGR FRACTION:

Parameters:
EGR_Fraction_Command_State

State	Decimal Value
Normal Operation	0
EMM Protection	1
CBR EGR Override	2
OFC EGR Disabled	4
CBL EGR Override	8
Low EGR Command	16
Prevent Opening Against High Delta P	32
CHL Surge Derate	64
CBL EGR Command Increment	128
CBL EGR Fraction CT Limiter	256
CBL EGR Fraction IMT Limiter	512
Bypass Mode Adjust Enable	1024

EMISSION MANAGER:

Parameters:

EMM_AECD_State

State	Bit
Air Handling System Protection	0
Extreme Ambient Overheat Protection	1
Condensation Protection	2
White Smoke / Misfire Protection	3
Extended Idle & PTO Protection	4
Engine Starting & Warmup Protection	5
General Engine Protection	6
Diagnostic Procedures	7
System Modulation	8
RPF Regeneration Protection	9
N/A	10
N/A	11
Selective Catalytic Reduction Protection	12

Parameters:

EMM_Protection_State_1

State	Bit
AECD 1 - Air Handling	0
AECD 2 - Extreme Ambient Overheat	1
AECD 3.1 - Extreme Ambient Conditions - OFC Gain Adjustment	2
AECD 4 - Cold IMT Protection (Wet Stack)	3
AECD 5.1 - Extended Idle - Idle Speed Increase	4
AECD 5.2 - Extended Idle - EGR Valve close	5
AECD 5.3 - Extended Idle - SCR no dosing	6
AECD 6.1 - Engine Starting and Warmup	7
AECD 7.1 - Extreme Conditions / Malfunction - Engine Electronic Sensors and Actuators	8
AECD 7.2 - Extreme Conditions / Malfunction - Extreme Conditions	9
AECD 7.3a - Extreme Conditions / Malfunction - Cooling System Protection - Coolant Temperature	10
AECD 7.3b - Extreme Conditions / Malfunction - Cooling System Protection - EGR Orifice Temperature	11
AECD 7.3c - Extreme Conditions / Malfunction - Cooling System Protection - Coolant Level	12
AECD 7.4a - Extreme Conditions / Malfunction - Turbo Prot - Speed	13
AECD 7.4b - Extreme Conditions / Malfunction - Turbo Prot - Temperature	14
AECD 7.5 - Extreme Condtions / Malfunction - Turbo Surge Prot	15
AECD 7.6 - Extreme Conditions / Malfunction - Aftertreatment System Protection	16
AECD 7.7 - Extreme Condition / Malfunction - Charge Air Cooler Icing Protection	17
AECD 7.8 - Extreme Conditions / Malfunction - Disconnected Turbocharger Compressor Protection	18
AECD 8.1 - Diagnostic Procedures - Fuel Pressure Rationality Check	19
AECD 8.2 - Diagnostic Procedures - Misfire Monitor	20
AECD 8.3 - Diagnostic Procedures - Fresh Air Flow Auto Sensor Correction	21
AECD 8.4 - Diagnostic Procedures - EGR Valve Leakage Check	22
AECD 8.5 - Diagnostic Procedures - Oxygen Sensor Auto Correction	23
AECD 8.6 - Diagnostic Procedures - Nox Sensor Auto Correction?	24
AECD 9.1 - Modulation - Transient and Steady-State Operation	25
AECD 9.2 - Modulation - Ambient Conditions	26
AECD 9.3a - Modulation - Transient Acceleration - OFC	27

AECD 9.4 - Modulation - Automated Transmission Shift	28
AECD 10.1 - Aftertreatment Regeneration - Regen Control	29
AECD 10.2 - Aftertreatment Regeneration - Ineffective Dosing	30
AECD 10.3 - Aftertreatment Regeneration - High Soot Load Aftertreatment Protection	31

Parameters:

EMM_Protection_State_2

State	Bit
AECD 10.4 - Aftertreatment Regeneration - DOC Face-Plugging	0
AECD 10.5 - Aftertreatment Regeneration - Aftertreatment Desorption	1
AECD 10.6a - Aftertreatment Regeneration - Manual Request - Stationary Regen	2
AECD 10.6b - Aftertreatment Regeneration - Manual Request - Inhibit	3
AECD 10.7 - Aftertreatment Regeneration - Electronic Sensors and Actuators	4
AECD 10.8 - Aftertreatment Regeneration - Extreme Ambient Regeneration	5
AECD 10.9 - Aftertreatment Regeneration - Regeneration-Off Engine Protection	6
AECD 11.1 - NAC Regeneration - Base NAC Regeneration Strategy	7
AECD 11.2 - NAC Regeneration - Management of NAC in Speed/Load Domain	8
AECD 11.3a - NAC Regeneration - Management of NAC at High/Low Ambient Temperatures and High/Low Altitudes	9
AECD 11.4 - NAC Regeneration - Oxydation Catalyst Temperature Manager	10
AECD 11.5 - NAC Regeneration - Mutual Exclusivity of Regeneration Events	11
AECD 11.6a - NAC Regeneration - High and Low NAC Temperature Regeneration Limiter	12
AECD 11.7 - NAC Regeneration - Transient NAC Regeneration Limiter	13
AECD 13.1a - SCR Operation - Exhaust Flow	14
AECD 13.4a - SCR Operation - Sensor / Actuator Catalyst Malfunction	15
AECD 13.3 - SCR Operation - Extreme Ambient Thawing Protection	16
N/A	17
AECD 8.8 - Diagnostic Procedures - Fueling Quantity & Timing	18
AECD 11.3b - NAC Regeneration - Management of NAC at Low Ambient	19
AECD 11.6b - NAC Regeneration - High NAC Temperature Regeneration Limiter	20
AECD 9.3b - Modulation - Transient Acceleration - Low Boost Misfire	21
AECD 9.3c - Modulation - Transient Acceleration FCLR	22
AECD 13.1b - SCR Operation - Low Temperature Duty Cycle	23
AECD 13.2 - SCR Operation - Aftertreatment Modulation Thermal Management	24
AECD 13.4b - SCR Operation - DEF Quality	25
AECD 13.4c - SCR Operation - DEF Empty	26
N/A	27
N/A	28
N/A	29
N/A	30
N/A	31

ENGINE BRAKE:

Parameters:

DL_RetarderControlMode

State	Hex
Speed Control	0001
Speed Limit Control	0002
Torque Control	0004
Torque Limit Control	0008

Parameters:

RetarderStatus

State	Hex
NONE	0
OVERRIDE_ONLY	1
OVERRIDE_AND_NON_OVERRIDE	2

Parameters:

Retarder_Torque_Mode

Text Value	Enumeration
No Request	0000

Parameters:

RetarderCommand

Text Value	Bit
Cylinder 1 On	0
Cylinder 2 On	1
Cylinder 3 On	2
Cylinder 4 On	3
Cylinder 5 On	4
Cylinder 6 On	5

ENGINE OPERATING CONDITION (ALPHA / Chi):

Parameters:

CBR_Chi_Table_Mask

State	Bit
Alpha 0	0
Alpha 1	1
Chi 2	2
Chi 3	3
Chi 4	4
Chi 5	5
Chi 6	6
Chi 7	7
Chi 8	8
Chi 9	9
Chi 10	10
Chi 11	11
Chi 12	12
Chi 13	13

Parameters:

Alpha
CBR_Alpha
H_CBR_Alpha

Text Value	Enumeration
URBAN	0
OPEN ROAD	1

ENGINE PROTECTION:

Parameters:

CHRG_ChtPrevSevSdReq
CHRG_ChtPrevSpdSdReq
CHRG_CotPrevSevSdReq
CHRG_EgrPrevSevSdReq
CHRG_EmtPrevSevSdReq
LUCL_CtPrevSevSdReq
LUCL_CtPrevSpdSdReq
LUCL_OpPrevTbSpdSdReq
LUCL_OpPrevTbTrqSdReq
LUCL_OtPrevSdReq

State	Enumeration
Shutdown w/o restart limit	0
Run	1
Shutdown approaching w/o restart limit	2
Shutdown with restart limit	4
Shutdown approaching with restart limit	8
Shutdown timer started (running)	16
Previously shutdown	32

Parameters:

C_EPD_CHT_Trq_Drt_Type
C_EPD_EGR_Trq_Drt_Type
C_EPD_EMT_Trq_Drt_Type

State	Enumeration
Time	0
Severity	1

Parameters:

ENGN_EpdTimerState

State	Enumeration
TIMER INCREMENTING	1
TIMER NOT INCREMENTING	0

Parameters:

EPD_Engine_State

State	Enumeration
Shutdown w/o Restart Limit	0
Run	1
Shutdown Approaching w/o Restart Limit	2
Shutdown with Restart Limit	4
Shutdown Approaching with Restart limit	8
Shutdown Timer Started	16
Previously Shutdown	32

ENGINE SPEED PROCESSING (EPS):

Parameters:

EPS_s_MainSync
EPS_s_BkupSync

State	Enumeration
NO_PULSE	0
HAVE_SYNC	1
NO_SYNC	2
START_SYNC	3
SYNC_STATE_UNKNOWN	4
CAM_SYNC_STATE_SIZING	256

Parameters:

EPS_s_CamHalfCycle

State	HEX
Unknown	0
NO_CAM	1
Determined	2

Parameters:

EPS_s_Status

State	Decimal
FAILED	0
DEGRADED	1
HEALTHY	2
EPS_STOP	3
ES_HEALTHY	255

Parameters:

H_EPS_s_BkupLevel
H_EPS_s_MainLevel

State	Enumeration
Triggered	0
Low	1
High	2

Parameters:

EPS_s_SensorSelect

State	Enumeration
EPS_MAIN_SPEED_SENSOR	0
EPS_BACKUP_SPEED_SENSOR	1
EPS_EXTERNAL_SPEED_SENSOR	2
EPS_SENSOR_SELECT_SIZING	255

ENGINE STATES:

Parameters:

Engn_Actual_State

State	Enumeration
STOPPED	0
STARTING	1
RUNNING	2
STOPPING	3
BRAKING	4
BRAKING_WHILE_FUELING	5

Parameters:

Engine_Torque_Mode

State	Decimal Value
OTHER	0
ENGINE_PROTECTION_TORQUE_DERATE	1
EXHAUST_GAS_RECIRCULATION_DERATE	2
J1939_POWERTRAIN_CTRL_TRQ_DERATE	3
ROAD_SPEED_GOVERNOR	4
ENGINE_PROTECTION_SPD_DERATE	5
J1939_PWRTRN_CTRL_ENG_SPD_DERATE	6
HIGH_SPEED_IDLE_GOVERNOR	7
LIMP_HOME	8
ACCELERATOR_BASED_TRQ_CTRL	9
ACCELERATOR_BASED_SPEED_CTRL	10
ACCELERATOR_BASED_PRES_CTRL	11
ENHANCED_CRUISE_CONTROL	12
POWER_TAKE_OFF	13
LOW_SPEED_IDLE_CONTROL	14
ENGINE_RETARDER_CONTROL	15
CTRL_COLD_AMB_LIMIT	89

Parameters:

Tau_State

State	Decimal Value
NORMAL	0
STEEP_GRADE	1
TAKE_OFF	2

ENGINE TORQUE / FUEL COMMAND:

Parameters:

Combustion_Control_Path_Owner
H_CBR_Prelim_Fuel_State
Mach_Control_Path_Owner
Inc_Dec_Controller
Engn_Control_Path_Owner
CBR_Fuel_Ref_State
CBL_Fuel_State

State	Value
CTRL_NONE_SELECTED	0
CTRL_JCOMM_TORQUE	1
CTRL_JCOMM_SPEED - Engine Torque or Speed altered by an external device (typically transmission). Typically see this condition with an automated manual (Autoshift, SureShift) or a fully automatic transmission at shift points	2
CTRL_PTO	4
CTRL_LIMP_HOME_TORQUE - Accelerator Pedal problems have forced control system into Limp Home state	6
CTRL_ABS	7
CTRL_ABT	8
CTRL_CC - Cruise control is active and a cruise speed is set	9
CTRL_RSC - Road Speed is being limited by Max Road Speed Trim or one of several road speed limiters (i.e. Gear Down Protection, Driver Reward). A max vehicle speed must be set as a parameter in INSITE.	10
CTRL_LSI - This is the normal state at idle condition	11
CTRL_HSI – This is the normal state at high speed conditions (typically fueling is being reduced when on HSG). Engine will typically go on HSG state approximately 100-200 rpm below rated speed. Prematurely hitting HSG state can be an indication of other issues (acceleration noise control, etc).	12
CTRL_TURBO_OVERSPEED – Fueling is limited to a set value less than maximum fueling. Can be caused by altitude operation.	15
CTRL_OFC_FUEL_LIMIT – Fuel limited for amount of intake air - Not enough boost for commanded fueling - Too much boost for commanded fueling.	16
CTRL_TRANSIENT_NOISE - Acceleration Noise Control - Fueling/Torque is being limited in order to reduce drive by noise	17
CTRL_EPD_SPEED - Engine Protection System is asking for speed derate due to a malfunction.	18
CTRL_TORQUE_CURVE - Normal state for maximum throttle/max load condition (on torque curve).	19
CTRL_JCOMM_TORQUE_DERATE - Data Link device (i.e Automated Manual Transmission, ABS, Traction Control) has asked for a torque derate	20
CTRL_OOG_TORQUE_LIMIT - Vehicle speed is above RSG limit and driver is attempting to shift gears. Provides just enough torque to allow engine speed to change in order to complete gear change	21
CTRL_CRANK - Normal State during cranking of the engine. Some engines have a 'jump start' portion of the cranking state - if the engine doesn't start in so many seconds of cranking, commanded fueling .is increased to assist in starting	22
CTRL_FUEL_OVERRIDE	23
CTRL_RETARDER - Normal state during active braking condition (0 commanded fueling).	24
CTRL_ENGINE_OVERSPEED - Control system has detected that engine speed is above the overspeed limit. Typically 2450 RPM on an ISX.	25
CTRL_STOP - Normal state when engine is shutdown (0 rpm).	26
CTRL_SHUTDOWN - Engine has been shutoff but still reading RPM.	27

CTRL_FSS_DERATE - Fuel System Specific controlled derate (additional parameters can be logged to determine this).	28
CTRL_EPD_TORQUE_LIMIT - Torque Derate due to an active engine protection fault (low oil pressure, etc.).	29
CTRL_ENGINE_START_OIL_LIMIT - Prevents reving of engine until oil pressure has built up.	33
CTRL_PTO_TORQUE_LIMIT - PTO Governor is limiting engine torque. PTO will ramp engine speed at a rate of 250 RPM/sec by controlling torque.	34
CTRL_POWERTAIN_PROTECTION - Powertrain protection is active and causing a derate. This can be normal for some applications with Allison automatic transmissions (requested by Allison).	36
CTRL_ANTI_THEFT - Anti Theft algorithm is active	41
CTRL_VAM - Vehicle Acceleration Management. Vehicle acceleration is being limited. Commonly used to decrease noise or fuel consumption	45
CTRL_AIR_DENSITY_FUEL_LIMIT - Derate to protect the turbocharger from excessive temperatures and turbocharger speed, typically due to high altitudes. In 2010 and later products FC 2346 (No Lamp) will indicate if this happens for long durations.	46
CTRL_CHI_FUEL_LIMIT - Full throttle for the CHI state you are in.	47
CTRL_TFC_FUEL_LIMIT - Turbo Fueling Control (TFC) Derate. Fueling and torque is limited due to turbo overspeed.	48
CTRL_GROSS_FUEL_OVERRIDE	49
CTRL_CHM_TORQUE_LIMIT	50
CTRL_JCOMM_PTP_DERATE	51
CTRL_LIMP_HOME_SPEED	52
CTRL_TIS_DYNO - Dyno Operations. Vehicle is being tested on a Dyno	53
CTRL_VSS_DIAGNOSTICS - Vehicle Speed Signal Lost or Tamper faults are active	54
CTRL_ESCC	55
CTRL_WPD	56
CTRL_TSD	57
CTRL_EWP - Engine Warmup Protection	58
CTRL_JCOMM_SPEED_LIMIT	59
CTRL_AUX_NDOT	60
CTRL_FIW - Fast Idle Warmup is active	61
CTRL_FIW_RAMP - Fast Idle Warmup Ramp is active	62
CTRL_AFW - Alternator Failure Warning. This feature has detected low battery voltage and has increased engine speed in order to increase alternator output	63
CTRL_REGEN - DPF Regen in progress. 2007 engines idle speed is increased to 1100 RPM. 2010 engines idle speed is increased to 900 RPM	66
CTRL_RTD	67
CTRL_IRD	68
CTRL_LBSC - Load Base Speed Control. Feature is limiting engine speed in order to decrease drive by noise	69
CTRL_XSC	70
CTRL_XPC	71
CTRL_TORQUE_RATE	73
CTRL_OBD	74
CTRL_JCOMM_MEO	75
CTRL_FUELING_SURGE_LIMIT	76
CTRL_CPL	77
CTRL_ESM_XWIRE	78
JCOMM_Max_LSI	79
CTRL_FUELING_BOOST_OVERRIDE	80

CTRL_LDI	81
CTRL_AC_LSI	82
CTRL_ACI_TRQ_LIMIT	83
CTRL_RS	84
CTRL_HYB_SPD	85
CTRL_JCOMM_LSI	87
CTRL_JCOMM_HEADWAY_TRQ_LMT	88
CTRL_COLD_AMB_LIMIT	89
CTRL_JCOMM_PTO	90
CTRL_INDUCE	91
CTRL_DTC	92
CTRL_MCA_ASO	93
CTRL_MOBILE_PTO	95
CTRL_SWD	96
CTRL_HYB_PWR	97
CTRL_HYB_LSI	98
CTRL_HYB_HSI	99
CTRL_HPM	100
CTRL_ABT_MIN_TORQUE	101
CTRL_ANTITHEFT_LOCKOUT	102
CTRL_MCAHB_MIN_TRQ	103
CTRL_TTL	104
CTRL_USFE	105
CTRL_TPIA	106
CTRL_IVCM	107
CTRL_MOTOR_SPD	108
CTRL_MOTOR_PWR	109
CTRL_MOTOR_OVERSPEED	110
CTRL_MOTOR_OVERTMPTR	111
CTRL_DL_IDLE_UP	112
CTRL_IDD	202
CTRL_FSS_TRQ_DERATE	256
EPD_FUEL_TEMP	514

Parameters:

PTM_Final_Oper_Mode

State	Bit
RPF_NONE_MODE	0
RPF_NORM_MODE	1
RPF_DeNOx_MODE	2
RPF_MISSION_DESOOT_MODE	3
RPF_DESOX_MODE	4
RPF_PROT_MODE	5
RPF_H2O_DESORB_MODE	6
RPF_HC_DESORB_MODE	7
RPF_NON_MISSION_DESOOT_MODE	8
RPF_SCR_TM_MODE	9

ETHER START:

Parameters:

C_EIS_TmptrSel

State	Decimal Value
Coolant Temperature	0
Intake Temperature	1

FAN CONTROL:

Parameters:

Fan_Drive_State

State	Bit Mask
Fan is off	0000
Intake air temperature	0010
Engine coolant temperature	0100
manual control or datalink	1001
A/C system	1011
Timer (fan_clutch_tool_request)	1100
Engine Brake	1101
Other (Fuel Temp, OEMP,OEMT,OEMP2,OEMT2)	1110

Parameters:

H_FCC_Fan_Type_Selection

State	Decimal
On/Off	0
Variable Speed	1
Three Speed	2

FAST IDLE WARMUP:

Parameters:

FIW_State

State	Decimal
FIW_INACTIVE	0
FIW_DELAY	1
FIW_INITIALIZATION	2
FIW_ACTIVE	3

Parameters:

FIW_Test_Status

State	Decimal
INACTIVE	0
ACTIVE	1
ECM_FAULTS	3
ECM_PROHIBITED	4
NO_ENGINE_SPEED	7
ENGINE_SPEED_LOW	9
INITIALIZATION_STATE	12

FUEL SYSTEM:

Parameters:

CBM_FuelSystemStatus

State	Decimal
Fuel System Health	0
FSM Fuel Derate Active	1
FSM Pressure Derate Active	2
Low Pressure	3
High Pressure	4
Cylinder 1 Fired	5
Cylinder 2 Fired	6
Cylinder 3 Fired	7
Cylinder 4 Fired	8
Cylinder 5 Fired	9
Cylinder 6 Fired	10

GEAR DOWN / OUT OF GEAR PROTECTION:

Parameters:

RSC_GD_State

State	Enumeration
INACTIVE	0
HIGH_LOAD_NEXT	1

Parameters:

RSC_GearEvaluation

State	Enumeration
LOW_GEAR	1
NEXT_GEAR	2
TOP_GEAR	3

HIGH SPEED GOVERNOR:

Parameters:

HSI_SwMaxRPM_Selected

State	Decimal
Speed1	1
Speed2	2

HOT SHUTDOWN:

Parameters:

C_TIB_GHS_EWP_Input_Type
Generic_Hot_Shutdown_EWP_Input

State	Enumeration
NONE	0
CT	1
IMT	2
OIL_TEMP	3
OIL_PRES	4

IDLE VALIDATION:

Parameters:

Idle_Validation_State

State	Decimal Value
NOT_IDLE	0
IDLE	1
NOT_SUPPORTED	2

LBSC

Parameters:

LBSC_Ref_Mode

State	Decimal Value
LBSC_NO_DERATE	1
LBSC_SPEED_LOW	2
LBSC_SPEED_HIGH	3
LBSC_NOT_SET	4

NDOT

Parameters:

Aux_Ndot_Status

State	Decimal Value
Active	0
Inactive	1

Parameters:

J1939_Aux_Ndot_Control_State

State	Decimal Value
AUX_NDOT_CNTRL_EXIT	0
AUX_NDOT_CNTRL_REQ	1
AUX_NDOT_CNTRL_ACTIVE	2

OIL CHANGE MONITOR:

Parameters:

Aux_Ndot_Status

State	Decimal Value
TIS_OCM_ERROR	1
TIS_OCM_NO_ERROR	0

Parameters:

T_OCM_Mode

State	Enumeration
AUTOMATIC	0
MANUAL_TIME	1
MANUAL_FUEL	2
MANUAL_DISTANCE	3

PTO

Parameters:

PTO_J1939_State

State	Enumeration
J1939_OFF	0
J1939_HOLD	1
J1939_REMOTE_HOLD	2
J1939_DECELERATE	6
J1939_ACCELERATE	8
J1939_ACCELERATE_OVERRIDE	9
J1939_PROGRAMMED_SET_SPEED_1	10
J1939_PROGRAMMED_SET_SPEED_2	11
J1939_PROGRAMMED_SET_SPEED_3	12
J1939_PROGRAMMED_SET_SPEED_4	13
J1939_PROGRAMMED_SET_SPEED_5	14
J1939_PROGRAMMED_SET_SPEED_6	15
J1939_PROGRAMMED_SET_SPEED_7	16
J1939_PROGRAMMED_SET_SPEED_8	17

Parameters:

PTO_Status

State	Enumeration
Inactve	0
Active	1

Parameters:

PTO_State

State	Enumeration
Remote	1
Inactive	2
Normal	3

REMOTE THROTTLE:

Parameters:

T_RMT_Remote_Accelerator_Mode

State	Enumeration
Remote Accelerator operationwith switch not including transition verification	0
Remote Accelerator operation with switch including transition verification	1
Maximum of Primary Accelerator or Remote Accelerator (when switch is ON)	4

SENSOR SOURCE INFORMATION (A/D SENSORS):

Parameters:

Crankcase_Press_Source
VGT_Position_Source

State	Decimal Value
PRIMARY	0 (0)
BACKUP	1 (-2)
DEFAULT	2 (-4)

SENSOR STATE INFORMATION (A/D SENSORS):

Parameters:

Crankcase_Press_State
Internal_Tmptr_State

State	HEX
Good	0000
Suspect	0001
Failed	0002

SENSOR STATE INFORMATION (ESTIMATES):

Parameters:

Charge_Press_EStat
Charge_Tmptr_EStat
Turbo_Speed_EStat

State	Decimal Value
GOOD	0 (0)
EST_SUSPECT	1 (64)
EST_FAILED	2 (128)

SENSOR STATUS INFORMATION (A/D SENSORS):

Parameters:

Ambient_Air_Press_Status
Ambient_Air_Tmptr_Status
Boost_Pressure_Status
Charge_Press_Status
Charge_Tmptr_Status
Compressor_Inlet_Tmptr_Status
Compressor_Inlet_Press_Status
EGR_Delta_Press_Status
EGR_Orifice_Tmptr_Status
EGR_Position_Status
Exhaust_Press_Gage_Status

State	Decimal Value
Data Valid	0
Config Error / Default	-1
Supply Error active / Default	-2
Backup	-3
Default	-5

SENSOR STATUS INFORMATION (Virtual SENSORS):

Parameters:

Exhaust_Flow_Status
V_AIM_fg_Turbo_Out_Status

State	Decimal Value
Data Valid	0
Config Error / Default	-1
Supply Error active / Default	-2
Backup	-3
Default	-5

SENSOR TYPE SELECTION:

Parameters:

C_Coolant_Level_Type_Select

State	Decimal
Two-State	0
Three-State	1

SETUP FOR DYNO:

Parameters:

Setup_For_Dyno_Test_State

State	Decimal Value
INACTIVE	0
ACTIVE_TEST_THROTTLE	2
ACTIVE_APP_THROTTLE	3
ECM_PROHIBITED	4
ACTIVE_WITH_EPD	5
TIMER_EXPIRED	6

SMART ROAD SPEED GOVERNOR:

Parameters:

SRG_FinalState

State	Decimal Value
SRG_DEFAULT_OFF	0
SRG_HOLD	1
SRG_CANCEL	2
SRG_KICKDOWN	3
SRG_KICKDOWN_RESUME	4
SRG_BUMP_UP	5
SRG_BUMP_DOWN	6
SRG_ACCEL	7
SRG_DECEL	8
SRG_SET	9
SRG_SET_COAST	10
SRG_SET_ACCEL	11
MAX_ROAD_SPEED_TRIM	12
MAX_ROAD_SPEED_TRIM_2	13
NOT_AVAILABLE	14
DE_ICER	15
SRG_MAX_ROAD_SPEED_TRIM_3	16

STARTER LOCKOUT:

Parameters:

SLO_RelayState

State	Decimal Value
Closed	0
Open	1

THERMAL MANAGEMENT:

Parameters:

C_EMO_CT_TMProtectMask
C_EMO_ECC_TMProtectMask
C_EMO_EI_TMProtectMask
C_EMO_IC_TMProtectMask
C_EMO_UHC_TMProtectMask
C_EMO_WS_TMProtectMask

State	Decimal
None	0
Oscar only	1
Felix only	2
Oscar or Felix	3

TRIP INFORMATION:

Parameter:

TIB_Trip_Info_State

State	Word	Bit
TI_EPF_DERATE	0	0
TI_AIR_COMPRESSOR	0	1
TI_BATTERY_AUTO_START	0	2
TI_BLOCK_AUTO_START	0	3
TI_BUNK_AUTO_START	0	4
TI_ENGINE_ESP	0	5
TI_DRIVER_REWARD_1	0	6
TI_DRIVER_REWARD_2	0	7
TI_DRIVER_REWARD_3	0	8
TI_VEHICLE_ESP	0	9
TI_FAN_DUE_TO_EXT	0	10
TI_FAN_DUE_TO_AC	0	11
TI_FAN_DUE_TO_ENGINE	0	12
TI_FAN_1_WITH_MPH	0	13
TI_FAN_1_WITHOUT_MPH	0	14
TI_VEHICLE_OUT_OF_GEAR	0	15
TI_ENGINE_DRIVE	1	0
TI_ENGINE_IDLE	1	1
TI_FAST_ENGINE_IDLE	1	2
TI_ENGINE_PTO	1	3
TI_HOT_SHUTDOWN	1	4
TI_WARMUP_VIOLATION	1	5
TI_IDLE_SHUTDOWN	1	6
TI_IDLE_SHUTDOWN_OVERRIDE	1	7
TI_ENGINE_REVVING	1	8
TI_ENGINE_OVERREV	1	9
TI_VEHICLE_DRIVE	1	10
TI_VEHICLE_PTO	1	11
TI_CRUISE	1	12
TI_RSG	1	13
TI_VEHICLE_COAST	1	14
TI_VEHICLE_ABOVE_SWEET_SPOT	1	15
TI_VEHICLE_BELOW_SWEET_SPOT	2	0
TI_VEHICLE_BRAKE	2	1
TI_TOP_GEAR	2	2
TI_GEAR_DOWN	2	3
TI_ENGINE_BRAKES	2	4
TI_VEHICLE_OVERSPEED_1	2	5
TI_VEHICLE_OVERSPEED_2	2	6
TI_VEHICLE_DECELERATION	2	7
TI_ECM	2	8
TI_FAN_2_ON	2	9
TI_ENGINE_ON	2	10
TI_VEHICLE_PTO_LOADED_AND_NOT_MOVING	2	11
TI_VEHICLE_PTO_LOADED_AND_MOVING	2	12
TI_AUTO_START	2	13
TI_ENGINE_SLEEP_IDLE	2	14
TI_EPF_TORQUE_DERATE	2	15
TI_EPF_RPM_DERATE	3	0
TI_EPD_SHUTDOWN	3	1
TI_EPD_SHUTDOWN_OVERRIDE	3	2

Parameters:

TI_Vehi_Trip_Data_Fault_Status
TI_Base_Trip_Data_Fault_Status

State	Enumeration
False	0
True	1

VEHICLE SPEED SENSOR:

Parameters:

T_TSP_SensorType

State	Enumeration
No Sensor	0
Inductance Vehicle_Speed Sensor	1
Tachograph Sensor	2
Datalink Tailshaft Speed	3
Datalink Road Speed	4
Pulses Per Mile	5

Parameters:

T_GEAR_VSSTransmission

State	Enumeration
Manual	0
Automatic	1
FULL_AMT	2
PART_AMT	3
AUTO_WITHOUT_CLUTCH	4

Parameters:

H_TSP_VSSResolutionStatus
H_VSP_TghResolutionStatus

State	Enumeration
Low	0
High	1

Parameters:

H_VSP_TghConfigurationStatus

State	Enumeration
Configured	0
Waiting for configuration	1
Unconfigured	2

Parameters:

TSP_VSSConfigurationStatus

State	Enumeration
Configured	0
Unconfigured	1

VGT:

Parameters:

J39_VGT_Actuator_State
J39_VGT_Commanded_State

State	Enumeration
Not Used	0
Position Control	1
Self-Calibration	2
Learn	3
Hysteresis Test	4
Step Response	5
Override	6
Loss of Communication	7
Motor Off Diagnostic	8

Parameters:

J39_VGT_Actuator_Status
J39_VGT_System_Error_Status

State	HEX	Fault Code
ACTUATOR_OVER_TEMPERATURE	0001	1962
ACTUATOR_CLOSING_ERROR	0003	2387
ACTUATOR_RESPONSE_ERROR	0004	2387
ACTUATOR_ELECTRICAL_ERROR	0005	2634
ACTUATOR_CMD_SOURCE_TIMEOUT	0008	2198
ACTUATOR_SPAN_TOO_LARGE	0009	2387
ACTUATOR_OUT_OF_TOLERANCE	000A	2387
ACTUATOR_NO_CMD_SOURCE	000B	2198
ACTUATOR_VOLTAGE_SUPPLY_ERROR	000F	1938
ACTUATOR_LIMITED_EFFORT	0016	2387
ACTUATOR_NO_REF_FOUND	0017	2449
COMM_TIMEOUT_ERROR_BIT	0100	2636
SW_ID_ERROR_BIT	0200	2635
SW_ID_TIMEOUT_ERROR_BIT	0400	2636
CUSTOMER_ID_MISMATCH_ERROR	0800	2635
SYSTEM_VOLT_MISMATCH_ERROR	1000	2635
CONFIG_MESS_TIMEOUT_ERROR	2000	2636

Parameters:

C_VGA_DL_StatusLB_Fault_Enable

State	HEX	Fault Code
ACTUATOR_CMD_SOURCE_TIMEOUT	0010	2198
ACTUATOR_NO_CMD_SOURCE	0020	2198
ACTUATOR_VOLTAGE_SUPPLY_ERROR	0040	1938
not used	0080	

ACTUATOR_OVER_TEMPERATURE	0100	1962
ACTUATOR_LIMITED_EFFORT	0200	2387
ACTUATOR_OUT_OF_TOLERANCE	0400	2387
ACTUATOR_CLOSING_ERROR	0800	2387
ACTUATOR_NO_REF_FOUND	1000	2449
ACTUATOR_SPAN_TOO_LARGE	2000	2387
ACTUATOR_RESPONSE_ERROR	4000	2387
ACTUATOR_ELECTRICAL_ERROR	8000	2634

Parameters:

C_VGA_DL_StatusUB_Fault_Enable

State	HEX	Fault Code
COMM_TIMEOUT_ERROR	0100	2636
SW_ID_ERROR	0200	2635
SW_ID_TIMEOUT_ERROR	0400	2636
CUSTOMER_ID_MISMATCH_ERROR	0800	2635
SYSTEM_VOLT_MISMATCH_ERROR	1000	2635
CONFIG_MESS_TIMEOUT_ERROR	2000	2636

Parameters:

VGA_DL_Mode_Command

State	HEX
ACTUATOR_POWER_ON	8000
ACTUATOR_POSITION_CONTROL_STATE	0001
ACTUATOR_CALIBRATE_STATE	0002
ACTUATOR_LEARN_STATE	0003
ACTUATOR_HYSTERESIS_TEST_STATE	0004
ACTUATOR_STEP_RESP_TEST_STATE	0005
ACTUATOR_OVERRIDE_STATE	0006
ACTUATOR_MOTOR_OFF_STATE	0008
ACTUATOR_INSTALL_STATE	0016
ACTUATOR_CLEAR_STOPS	0017
ACTUATOR_CLER_CODES	0018

Parameters:

VGT_Actuator_Error_Status

State	Decimal
DEVICE_OK	0
DEVICE_INOPERABLE	1

Parameters:

VGA_DL_Service_State

State	Enumeration
SERVICE_VGT_NONE	0
SERVICE_VGT_SELF_CAL	2
SERVICE_VGT_LEARN	3
SERVICE_VGT_HYSTERESIS_TEST	4
SERVICE_VGT_STEP_RESP_TEST	5
SERVICE_VGT_OVERRIDE	6
SERVICE_VGT_INSTALL	16
SERVICE_VGT_CLEAR STOPS	17
SERVICE_VGT_CLEAR CODES	18
SERVICE_VGT_TIS_FAILED	99
SERVICE_VGT_CYCLE_POWER0	100
SERVICE_VGT_CYCLE_POWER1	101
SERVICE_VGT_CALIBRATING	102
SERVICE_VGT_OVERRIDE2	106
INSTALLING	116
SERVICE_VGT_CLEAR STOPS	117

WATER-IN-FUEL (WIF):

Parameters:

EEM_WIFState

State	Decimal Value
NO_WATER_DETECTED	0
WATER_DETECTED	1

SMART SRG:

Parameters:

SRG_FinalState

State	Decimal Value
CC_ALLOWED	0
CC_DENIED_DL_PAUSE	1
CC_DENIED_ON_SW	2
CC_DENIED_CANCEL_SW	4
CC_DENIED_BRAKE_SW	6
CC_DENIED_BRAKE_SW_EN	8
CC_DENIED_CLUTCH_SW	10
CC_DENIED_PARK_BRAKE_SW	12
CC_DENIED_YAW_BRAKE_ACTIVE	20
CC_DENIED_YAW_ENG_ACTIVE	21
CC_DENIED_ROLL_BRAKE_ACTIVE	22
CC_DENIED_ROLL_ENG_ACTIVE	23
CC_DENIED_ABS	24
CC_DENIED_ASR_BRAKE_ACTIVE	26
CC_DENIED_ASR_ENG_ACTIVE	27
CC_DENIED_CANCEL_SPD	30
CC_DENIED_MIN_ENG_SPD	32
CC_DENIED_OUT_OF_GEAR	40
CC_DENIED_NV_CHECK	42
CC_DENIED_SMVS	50
CC_DENIED_ACC_MODE	52

CC_DENIED_STATIONARY_PUMP	54
CC_DENIED_PTO	56
CC_DENIED_ACCEL_PED_OVRD	58
CC_DENIED_DL_DRIVELINE_ENGAGE	70
CC_DENIED_DL_OUT_OF_GEAR	72
CC_DENIED_DL_DISABLE	74
CC_DENIED_CCVS2_TIMEOUT	90
CC_DENIED_YAW_BRAKE_TIMEOUT	92
CC_DENIED_YAW_ENG_TIMEOUT	93
CC_DENIED_ROLL_BRAKE_TIMEOUT	94
CC_DENIED_ROLL_ENG_TIMEOUT	95
CC_DENIED_ASR_ENG_TIMEOUT	96
CC_DENIED_ASR_BRAKE_TIMEOUT	97
CC_DENIED_ANALOG_SW_DIFF_ERR	100
CC_DENIED_BRAKE_SW_ERR	102
CC_DENIED_AD_LEARN	104
CC_DENIED_VSS_STATUS	120

VIII. Tool Trimmables – Standard Feature Enables and Settings

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Common 2013 Tool Trimmables

NOTE: The following table contains common trimmables for the Pacific program FP software (Phase 8.10.0.XX). A comprehensive list of all trimmable parameters follows on the proceeding pages.

System	Parameter	Description
Acceleration Noise Control	T_ANC_Speed_Algorithm_Enable	Enable for speed limiting of the acceleration noise control algorithm
Adjustable Low Speed Idle	T_LSI_Breakpoint_Speed	Low Speed Idle reference speed for powerup initialization
	T_LSI_Droop_Selected_Percent	Low Speed Idle Droop value.
	T_LSI_Extension_Enable	This is a required parameter which indicates to the tool whether Low Speed Idle Extension is enabled or disabled. It is tool adjustable.
	T_LSI_Idle_Speed_Save_En	Trim which enables use of Idle Speed Save feature. A value of 1 makes feature active.
	T_LSI_Idle_Speed_Step	Amount Low Idle Reference will increment/decrement when Idle Increment/Decrement switches are pressed.
	T_LSI_Incrt_Decrt_Select_En	Trim which enables/disables Low Speed Idle Increment/Decrement feature. A value of 1 enables.
	T_LSI_Max_Idle_Speed	Maximum value to which Low Speed Idle Reference may be set.
	T_LSI_Min_Idle_Speed	Minimum value to which Low Speed Idle reference may be set.
	T_LSI_Previous_Idle	Value of Low Speed Idle Reference saved at powerdown
Alternator Failure Warning	T_AFW_Enable	This is a required parameter which indicates to the tool whether the Alternator Failure W
	T_AFW_IdleSpeedup_Enable	This parameter is used to enable or disable the Low Speed Idle Speedup when AFW_LOW_VOLTA
Cruise Control	T_CC_AR_Enable	Enables automatic cruise control resume (Auto Resume) functionality.
	T_CC_AccPed_Disengage_En	This is a required parameter which indicates to the tool whether the Cruise Control Accel
	T_CC_AccPed_Disengage_TimeLim	If cruise control is overridden by the accelerator pedal for more than this amount of time, cruise control disengages.
	T_CC_Analog_En	enable to use analog cruise control switch.
	T_CC_Base_Enable	Enables cruise control in the system. Exact functionality of T_CC_Enable except it is ma
	T_CC_BottomDroopWidth	Bottom droop width for cruise control.
	T_CC_Cancel_Switch_Mux_Address	Source address of device sending the Cruise Control Cancel Switch signal.
	T_CC_Disable_With_Clutch_Switch	When set to 1 cruise control is disabled when clutch is pressed.
	T_CC_EB_Enable	Enables use of engine brakes for controlling Vehicle Speed in Cruise Control
	T_CC_EB_MaxBrakingSpeedDelta	The amount of overspeed above the bottom droop width when all of the braking power will be applied.
	T_CC_EB_StartBrakingSpeedDelta	The amount of overspeed above the bottom droop width when the engine brakes will come on.
	T_CC_EB_UserSel	Required by tool
	T_CC_Enable	Enables cruise control in the system.
	T_CC_MaxRoadSpeed	Maximum base vehicle speed allowed for cruise control.
	T_CC_NV_Check_En	Enable to calculate the ratio of engine speed and vehicle speed.
	T_CC_On_Switch_Mux_Address	Source address of device sending the Cruise Control On Switch signal.
	T_CC_Parking_Brake_En	If True allows CC to be disabled if the Parking Brake is Engaged. Required for Euro operation.

	T_CC_PauseSwitch_Enable	Enables use of Pause Switch in Cruise Control
	T_CC_Resume_Switch_Mux_Address	Source address of device sending the Cruise Control Resume Switch signal.
	T_CC_SavePoweroffSpeedEnable	Enables the saving of the last cruise set speed across a powerdown.
	T_CC_SetAccelSwitchSelect	Determines Accel/Coast functionality of the Set/Resume switch.
	T_CC_Set_Switch_Mux_Address	Source address of device sending the Cruise Control Set Switch signal.
	T_CC_Switch_Mux_Enable	This is a required parameter which indicates to the tool whether the Cruise Control Switc
	T_CC_TopDroopWidth	Top droop width for cruise control.
	T_CC_VehicleSpdRampRateEn	This is a required parameter which indicates to the tool whether the Cruise Control Ramp
	T_CC_VehicleSpeedAccelDecel	The desired vehicle acceleration or deceleration rate for large cruise control transients.
	T_CC_VehicleSpeedStep	Bump-Up/Down incremental step size for adjusting Cruise Control Isochronous Speed.

Engine Brake Control	T_ERC_ClutchEn	When true will consider the clutch input as a condition to activate/inactive engine retarder control..
	T_ERC_Enable	Trim which signifies the engine brake feature is available or not.
	T_ERC_EngineBrkLampEnable	Enable for Engine Brake Lamp discete output.
	T_ERC_FractionUserOverride	Enables user override of Driver Fraction command from retarder
	T_ERC_MinEngageVehSpd	The vehicle speed above which engine retarder control may be enabled.
	T_ERC_On_Delay	Minimum required duration engine braking is initiated.
	T_ERC_RetarderType	Indicates type of retarder installed. 2=COMPRESSION, 1=DRIVELINE, 0=EXHAUST
	T_ERC_ServiceBrkActivateEn	When true will consider the service brake as a condition to activate/inactivate engine retarder control.
	T_ERC_ServiceBrkDelay	Time within which the service brake must be depressed to satisfy the enable requirement.
	T_ERC_Smart_Brake_Mode_En	Enable flag for Smart Braking Mode. Smart Braking Mode allows the driver to hold a const
	T_ERC_SwLvl_OvrdEn	Trim which allows the system to override the RetarderSwitchLevel calculation.
	T_ERC_TrqUserOvrdEn	Trim which allows the system to override the braking torque as determined by selectable switches.

Coolant	T_CoolantLevelSensorEnable	Indicates to the tool whether the Coolant Level Sensor is enabled in the ECM.
	T_Coolant_Level_Mux_Enable	Indicates to the tool whether the Coolant Level Multiplexing feature is enabled or disabled.
	T_Coolant_Level_Mux_ID	This parameter is set to the name table name of the parameter responsible for providing the index for Coolant_Level for selection by the Datalink.
	T_Coolant_Temperature_Sensor_Enable	Indicates to the tool whether the Coolant Temperature Sensor is enabled in the ECM. This parameter is not user adjustable.

Fan Control	T_FCC_AC_Comp_Enable	When True (1), Enables the activation of the air conditioning compressor swtich and fan interaction.
	T_FCC_AC_Pressure_En	When True (1), Enables the activation of the air conditioning pressure swtich and fan interaction.
	T_FCC_AC_Pressure_Switch_Rloc	Resource locator for air conditioner pressure switch. A value of 0 is considered to mean that the air conditioner pressure switch is not a physical input to the system.
	T_FCC_AC_Time	The time that must pass at each fan request level, before evaluating whether the fan request should be increased due to AC pressure switch being on.
	T_FCC_AC_VS_Interaction_En	When True (1), Allows special AC pressure switch functionality. It takes into acoount road speed in the control of fan due to pressure switch.
	T_FCC_CAC_Outlet_Tmptr_En	When True (1), Enables the activation of the CAC outlet temperature and fan interaction.
	T_FCC_Charge_Tmptr_En	When True (1), Enables the activation of the charge temperature and fan interaction.
	T_FCC_Coolant_Tmptr_En	When True (1), Enables the activation of the coolant temperature and fan interaction.
	T_FCC_Engine_Brake_En	When True (1), Enables the activation of the EB and fan interaction. fan turns on when Engine brakes turn on to provide additional engine brake torque.
	T_FCC_FLM_2_En	This trim enables the Fan Level 2 Multiplexing feature.
	T_FCC_FLM_En	This trim enables the Fan Level Multiplexing feature.

	T_FCC_FanSpeedOvrdEn	Trim indicates if the fan speed user override feature is enabled.
	T_FCC_FanSpeed_Rloc	Resource locator for fan speed input.
	T_FCC_Fan_2_Request_Rloc	Indicates the desired Fan Level 2 I/O configuration.
	T_FCC_Fan_Clutch_Driver2_Rloc	Resource locator for the second fan device driver.
	T_FCC_Fan_Clutch_En	Global enable for the fan clutch algorithm. When True (1), fan clutch is controlled based on system requirements.
	T_FCC_Fan_Clutch_PWM2_Period	The commanded PWM 2 period of the fan clutch for the TRI_STATE fan type.
	T_FCC_Fan_Clutch_PWM_Period	The commanded PWM period of the fan clutch for the _ON_OFF or _VARIABLE_SPEED fan types.
	T_FCC_Fan_Clutch_PWM_Rloc	Resource locator for the fan PWM device driver.
	T_FCC_Fan_Output_Override	When True (1), the fan request value will be FCC_Fan_Output_User_Value.
	T_FCC_Fan_Request_Rloc	Indicates the desired Fan Level I/O configuration.
	T_FCC_Fan_Type_Selection	Fan drive type select. (0=on/off, 1=variable speed, 2=three speed, 3=Elec viscous no spd
	T_FCC_Fuel_Temperature_En	When True (1), Enables the activation of the fuel temperature and fan interaction.
	T_FCC_Manual_Fan_Switch_Rloc	Resource locator for the operator fan switch.
	T_FCC_Manual_Input_En	When True (1), Enables the activation of the Manual Fan Switch and fan interaction.
	T_FCC_Min_On_Time	Minimum time fan will run each time it is turned on.
	T_FCC_OEM_Press2_Enable	When True (1), Enables the activation of the OEM_Pressure_2 and fan interaction.
	T_FCC_OEM_Pressure_En	When True (1), Enables the activation of the OEM pressure and fan interaction.
	T_FCC_OEM_Temperature_En	When True (1), Enables the activation of the OEM temperature and fan interaction.
	T_FCC_OEM_Tmptr2_Enable	When True (1), Enables the activation of the OEM_Temperature_2 and fan interaction.
	T_FCC_Off_Ramp_Rate	The allowable rate at which the fan request is permitted to change when requesting the fan off.
	T_FCC_On_Ramp_Rate	The allowable rate at which the fan request is permitted to change when requesting the fan on.
	T_FCC_PWM2_Inversion	When True (1), This trim will allow for an inversion of the logic followed in determining the PWM 2 duty cycle fan driver signal.
	T_FCC_PWM_Inversion	When True (1), This trim will allow for an inversion of the logic followed in determining the PWM duty cycle fan driver signal.
	T_FCC_RT_En	When True (1), Enables the activation of the remote throttle swtich and fan interaction.
	T_FCC_SIP_Lock_Fan_Enable	When True (1), Allows the Shift In Progress flag to lock the fan in its current state (i.e. ON or OFF) until the shift has completed.

Gear Down Protection	T_RSC_GD_GearRatio	This is value of gear down gear ratio, down from top gear.
	T_RSC_GD_HighLoadDelta	The difference between gear down light load limit and the next gear down high load limit.
	T_RSC_GD_LightLoadDelta	The difference between gear down light load limit and the next gear down low load limit.
	T_RSC_GD_ProtectionEnable	Enables the Gear Down Protection Feature.

Cab Switchable Governor	T_SwitchableGovernorEnable	Trim variable to enable the cab switchable governor feature

Idle Shutdown	T_ISDRelay_HW_RLOC	Resource Locator for Idle Shutdown Relay .
	T_ISD_AAT_Unlatch_Enable	Enables the release of manual override latch based on Ambient Air Temperature in Manual Override Inhibit Zone (between Intermediate and Hot AAT) for idle shutdown feature
	T_ISD_CoolantTmptr_Thd	Temperature below which an idle shutdown will not occur
	T_ISD_Enable	Indicates to the tool whether the Idle Shutdown feature is enabled in the ECM.
	T_ISD_GHG_Enable	Enable flag for the Idle Shutdown Greenhouse Gas regulation
	T_ISD_GHG_Expiration_Distance	Total distance travelled by the vehicle after which customers can request for OEM password to disable Green House Gas Automatic Engine Shutdown feature.
	T_ISD_High_Tmp_AutoOvrd_En	Selects Idle Shutdown High Temperature Manual/Automatic Override Option. 0=Manual, 1=Automatic
	T_ISD_Loading_Thd	Engine load above which idle shutdown will not occur.
	T_ISD_MinAmbAir_Tmptr	Idle Shutdown is disabled below this temperature
	T_ISD_NoOvrdHigh_Thd	Upper threshold of no override temperature range.
	T_ISD_NoOvrdLow_Thd	Lower threshold of no override temperature range.
	T_ISD_Ovrd_Enable	Allows the override of a shutdown
	T_ISD_PB_Sw_Enable	This enable when TRUE allows a shutdown to occur only when Parking Brake Sw is ON
	T_ISD_Period	Time engine will idle before it is shutdown.
	T_ISD_Relay_Enable	Enables Idle Shutdown Relay driver
	T_ISD_ShutdownDuringPTOEn	Selects shutdown option while in PTO mode
	T_ISD_SrvBrkPreventsISDEn	This enable when TRUE prevents a shutdown from occurring when Service Brake Sw is ON
	T_ISD_Tmptr_Enable	Enables shutdown based on Ambient Air Temperature sensor
	T_ISD_WarningPeriod_UserAdj_Val	Lets the user trim the Warning period after which the engine will shutdown. During this w
	T_ISD_Warning_Period_UserAdj_En	This trimmable parameter indicates to the tool whether the Idle Shutdown Warning Period User Adjustable feature is enabled or disabled.

Limp Home	T_LMP_En	Trim variable to enable the Limp home feature
	T_LMP_HW_DIP_Inversion	Inverts the operation of switch input for the Limp Home HW discrete switch.
	T_LMP_HW_RLOC	The resource locator for the Hardwired Limp Home input
	T_LMP_HW_Select	This is a required parameter which indicates what type of input processing is to be used
	T_Limp_Home_Sw_Enable	Enables the Hard-Wired Limp Home Switch for Muxed Accelerator pedals only. When Enabled,

Load Based Speed Control	T_LBSC_Enable	Indicates to the tool whether the Load Based Speed Control feature is enabled in the ECM.
	T_LBSC_High_RPM_Breakpoint	Max reference speed at max fueling for Load Based Speed Control.
	T_LBSC_Low_RPM_Breakpoint	Min reference speed at no load fueling for Load Based Speed Control.
	T_LBSC_RPM_Breakpoint	Single breakpoint speed for Load Based Speed Control.
	T_LBSC_Vehicle_Mass_Thd	Above this vehicle mass, LBSC is disabled.

PTO	T_PTOA_Cab_Enable	Enables/disables Cab PTO.
	T_PTOA_En	Enables/disabels Automotive PTO.
	T_PTOA_Load_Based_InertiaIndx	Trim to select the appropriate Inertia/Deiveline Stability Index value based on the type
	T_PTOA_Neutral_Interlock_En	Allows PTO to be activated when non manual transmission is in neutral.
	T_PTOA_On_Relay_RLOC	Resource locator for PTOA_On_Relay.
	T_PTOA_PB_Interlock_Type	Parking Brake Interlock Type. Allows PTO to only be operated with the Parking Brake Engag
	T_PTOA_Parking_Brake_En	Allows PTO to only be operated with the Parking Brake Engaged. Required for Euro operation

	T_PTOA_Ref_Speed_Ramp_En	Enables PTO reference speed accel/decel beyond the default set speed after DL_PTO_Active signal is received from the transmission.
	T_PTOA_Torque_Thd	If Net_Brake_Torque is greater than the Torque Threshold, and if system has Vss Errors, the system recognizes that a High Power PTO device is attached.
	T_PTOA_Transmission_Coupled_En	Trim to enable High Power PTO device detection logic.
	T_PTO_Acctr_Override_En	Limits engine speed to T_PTO_Acctr_Ovrride_Max_ES when PTO is in control
	T_PTO_Acctr_Override_Max_ES	Maximum Engine Speed allowed while Accelerator Pedal is Overriding PTO
	T_PTO_Bump_Ref_Speed_En	Trim to Enable Bump Up/Bump Down functionality.
	T_PTO_Default_Set_ES	Reference speed to which the PTO is limited to in automatic transmissions, before receving a DL_PTO_Active command from transmission.
	T_PTO_Disable_With_Brake_Switch	When this parameter is enabled(1), an active Brake_Switch will disable PTO.
	T_PTO_Disable_With_Clutch_Switch	When enabled (1), an active Clutch_Switch will deactivate PTO.
	T_PTO_Droop_Percent	Droop applied to PTO Reference.
	T_PTO_ES_Override_En	When enabled, H_PTO_ES_Override_Value shall be the current PTO reference speed.
	T_PTO_Firetruck_En	Enables/disables PTO Firetruck delay feature.
	T_PTO_Gain_User_Override	Allows user to override Gain.
	T_PTO_Ignore_VSS_Error	When disabled (0), a VSS Error will cause PTO to be disabled.
	T_PTO_Max_Engine_Load	Maximum Engine load allowed during PTO operation.
	T_PTO_Max_Ref_ES	Maximum value to which the PTO reference speed may be set.
	T_PTO_Max_VS_Thd	Maximum vehicle speed that PTO will be allowed to engage.
	T_PTO_Min_Ref_ES	Minimum value to which PTO Reference speed may be set.
	T_PTO_On_Switch_Mux_Address	Source address of device sending the PTO On Switch signal.
	T_PTO_Ref_Speed_Step	Speed Delta for Bump up Bump Down operation.
	T_PTO_Rem_Throt_Interaction_En	Enables/disables Remote PTO interaction with Remote Throttle. When enabled, Remote Throttle will cancel Remote PTO.
	T_PTO_Remote_Count_Lim	Maximum count of Remote 'PTO Switch Position.' Limits the number of set speeds accessible via PTO_Remote_Sw
	T_PTO_Remote_ES_1	Reference speed used when Remote_PTO_Switch is in position 1.
	T_PTO_Remote_ES_2	Reference speed used when Remote_PTO_Switch is in position 2.
	T_PTO_Remote_ES_3	Reference speed used when Remote_PTO_Switch is in position 3.
	T_PTO_Remote_ES_4	Reference speed used when Remote_PTO_Switch is in position 4.
	T_PTO_Remote_ES_5	Reference speed used when Remote_PTO_Switch is in position 5.
	T_PTO_Remote_En	Enables/disables Remote PTO.
	T_PTO_Remote_Sw_Timeout	Time after which the 'PTO Remote Switch Position' is set to a count value if PT
	T_PTO_Remote_Switch_Mux_Address	Mux address for PTO remote switch
	T_PTO_Resume_ES	Reference speed used when PTO_Resume Switch is pressed.
	T_PTO_Resume_Switch_Mux_Address	Source address of device sending the PTO Resume Switch signal.
	T_PTO_Set_ES	Reference speed used when PTO_Set_Switch is pressed
	T_PTO_Set_Resume_ES	Reference speed used when PTO_Set_Switch and PTO_Resume switch are pressed simultaneously.
	T_PTO_Set_Switch_Mux_Address	Source address of device sending the PTO Set Switch signal.
	T_PTO_Switch_Mux_Enable	This is a required parameter which indicates to the tool whether the PTO Switch Multiplexing feature is enabled or disabled.
	T_PTO_Transient_Accel	Desired engine accel rate when PTO reference is increasing
	T_PTO_ZeroVSSLimit_Enable	Limits maximum PTO speed to the maximum engine speed without vehicle speed signal if the vehicle speed signal is lost.

Remote Accelerator	T_ACD_Rmt_APP_En	Indicates to the tool whether the Remote Accelerator feature is enabled in the ECM.
	T_RMT_Accelerator_Mux_Enable	This is a required parameter which indicates to the tool whether the Remote Accelerator Multiplexing feature is enabled or disabled.
	T_RMT_Remote_Accelerator_Mode	This parameter is used to select the desired Remote Accelerator Operating Mode.

Road Speed Control	T_RSC_BottomDroopWidth	Top droop width for RSC
	T_RSC_Enable	Enables road speed control in the system.
	T_RSC_GD_GearRatio	This is value of gear down gear ratio, down from top gear.
	T_RSC_GD_HighLoadDelta	The difference between gear down light load limit and the next gear down high load limit.
	T_RSC_GD_LightLoadDelta	The difference between gear down light load limit and the next gear down low load limit.
	T_RSC_GD_ProtectionEnable	Enables the Gear Down Protection Feature.
	T_RSC_GHG_Default_Speed	The maximum default road speed when Greenhouse Gas Vehicle Speed Limiter is enabled. Con
	T_RSC_GHG_Enable	Enables the Greenhouse Gas Vehicle Speed Limiter.
	T_RSC_GHG_Expiration_Distance	Distance travelled by the engine after which user can request for OEM password to disable Greenhouse Gas Vehicle Speed Limiter. For Tool use only.
	T_RSC_GlobalMaxRoadSpeed	Maximum base final speed allowed in Road Speed or Cruise Control mode.
	T_RSC_HighLoadSpeed	Maximum vehicle speed at high load in low gear
	T_RSC_LightLoadSpeed	Maximum vehicle speed at light load in low gear.
	T_RSC_MaxRoadSpeed	Controlled maximum road speed at which vehicle can operate.
	T_RSC_RearAxleAntiTamperEnable	"When enabled, it allows reduction of RSC speed limit to prevent tampering.Possible values:FALSETRUE"
	T_RSC_TopDroopWidth	Top droop width for RSC
	T_RSC_TopGearRatio	This is Gear ratio above which the transmission is considered in top gear.
	T_RSC_USFE_Max_Road_Speed	Maximum road speed at which the vehicle can operate when User Selected Fuel Economy Index is set to fuel economy mode.

Smart Road Speed Governor	T_SRG_Enable	Enables smart Road Speed Governor in the system.
	T_SRG_KickdownEnable	Enables the Smart RSG Kickdown Feature.
	T_SRG_RampEnable	Enables the Smart RSG Ramp Feature.
	T_SRG_VehicleSpeedStep	Bump-Up/Down incremental step size for adjusting the maximum road speed for Smart Road Speed Governor.
	T_SRG_VehicleSpeedStep_En	Enables the use of the unique trim T_SRG_VehicleSpeedStep for the bump up / bump down val

Starter Lockout	T_SLORelay_HW_RLOC	Resource Locator for Starter Lockout Relay, which is output discrete.
	T_SLO_Clutch_Intrlk_Sw_RLOC	Resource Locator for Clutch Interlock Switch
	T_SLO_Enable	This parameter indicates whether the Starter Lockout feature is enabled or disabled.
	T_SLO_RelayType	Trim used to set whether a Normally Open or Normally Closed relay is used.

Water in Fuel	T_EEM_WIFEnable	This parameter will enable the Water In Fuel Feature in the system
	T_Water_In_Fuel_Mux_Address	Source address of device sending the Water In Fuel signal.
	T_Water_In_Fuel_Mux_Enable	This is a required parameter which indicates to the tool whether the Water In Fuel Multiplexing feature is enabled or disabled.
	T_WIF2Sensor_VtgRLOC	The hardware resource location ID for Second Water In Fuel Sensor voltage.
	T_WIFSensor_VtgRLOC	The hardware resource location ID for Water In Fuel Sensor voltage.
	T_WIF_Dual_Sensor_En	Dual WIF sensor Tool Enable

Comprehensive Tool Trimmable Table

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Note: This table contains a comprehensive list of all trimmable parameters for the Pacific program FP software (Phase 8.10.0.XX).

System	Parameter	Description
All Speed Governor	T_ABS_RefSpd_Accel_Lim	Acceleration limit for All-Speed Governor requests;i.e., sets the positive rate-of-change for ABS_ReferenceSpd.
	T_ABS_RefSpd_Decel_Lim	Deceleration limit for All-Speed Governor requests;i.e., sets the negative rate-of-change for ABS_ReferenceSpd.
	T_ABS_RefSpd_Rate_Lim_En	All Speed Governor Reference Speed Rate Limit feature enable
	T_ABS_ReferenceTypeRloc	Resource Locator for ABS reference type.
ABT	T_ABT_AltPdl_Trq_Sw	This trim selects between normal and alternate ABT tables. Normal = 0, Alt = 1,
	T_ABT_User_Selected_Acctr_Ctrl	This parameter determines whether the accelerator pedal will drive the production of a torque request
Remote Accelerator	T_ACD_Rmt_APP_En	Indicates to the tool whether the Remote Accelerator feature is enabled in the ECM.
	T_RMT_Accelerator_Mux_Enable	This is a required parameter which indicates to the tool whether the Remote Accelerator Multiplexing feature is enabled or disabled.
	T_RMT_Remote_Accelerator_Mode	This parameter is used to select the desired Remote Accelerator Operating Mode.
AC Pressure Switch	T_AC_Pressure_Switch_Mux_Enable	This is a required parameter which indicates to the tool whether the AC Pressure Switch Multiplexing feature is enabled or disabled.
Alternator Failure Warning	T_AFW_Enable	This is a required parameter which indicates to the tool whether the Alternator Failure W
	T_AFW_IdleSpeedup_Enable	This parameter is used to enable or disable the Low Speed Idle Speedup when AFW_LOW_VOLTA
AIM	T_AIM_DOC_In_RLOC	This trim identifies the hardware pin number mapped to DOC In Temperature. It will be a 16 bit unsigned integer.
	T_AIM_DOC_Out_RLOC	Identifies the hardware pin number mapped to DOC out temperature.
	T_AIM_DPFLamp_Enbl	Parameter is used to Enable the DPF lamp and it is mapped to TIS DPF_Lamp_Enable
	T_AIM_DPF_DeltaP_RLOC	Hardware pin number mapped to delta pressure across the DPF.
	T_AIM_DPF_DeltaP_SupplyRLOC	Resource locator passed to Get_input_a2d in order to obtain the DPF DeltaP Supply voltage
	T_AIM_DPF_OutP_RLOC	Hardware pin number mapped to DPF Out Gage Pressure sensor.
	T_AIM_DPF_OutP_SupplyRLOC	Resource locator passed to Get_input_a2d in order to obtain the DPF OutP Supply voltage
	T_AIM_DPF_Out_RLOC	Hardware pin number mapped to the DPF out temperature.
	T_AIM_EPD_Soot_Enbl	Enable for Soot Load EPD
	T_AIM_FT_AutoDesoot_Enbl	Trim to allow Auto Desoot
	T_AIM_FT_NMRegenSwitchEnbl	When this parameter is set, it enables the SRegen Switch otherwise SRegen switch is disabled.
	T_AIM_FT_NMRegenSwitchMuxEnbl	This is a required parameter which indicates to the tool whether the DPF Stationary Regen Switch Multiplexing feature is enabled or disabled.
	T_AIM_HC_DoserP_RLOC	Hardware pin number mapped to injector fuel pressure.
	T_AIM_HC_DoserP_SupplyRLOC	Resource locator passed to Get_input_a2d in order to obtain the Doser Inj Fuel Press Supply voltage
	T_AIM_LineHtrIMON_RLOC	Hardware pin number mapped to the Line Heaters IMON_3 (2013) Current Feedback Channel.
	T_AIM_LineHtr_EV1_RLOC	Hardware pin number mapped to the Line Heater1 ATD Channel.
	T_AIM_LineHtr_EV2_RLOC	Hardware pin number mapped to the Line Heater2 ATD Channel.
	T_AIM_LineHtr_EV3_RLOC	Hardware pin number mapped to the Line Heater3 ATD Channel.
	T_AIM_LineHtr_IMON1_RLOC	Hardware pin number mapped to the Line heater 1 current monitor.
	T_AIM_LineHtr_IMON2_RLOC	Hardware pin number mapped to the Line heater 2 current monitor.
	T_AIM_LineHtr_IMON3_RLOC	Hardware pin number mapped to the Line heater 3 current monitor.
	T_AIM_NMChassisSecSwInversion	When True (1), this trim will allow for an inversion of the logic followed when reading the Non Mission Chassis Secure switch discrete input.

	T_AIM_NMChassisSecSwitchID	This parameter is set to the name table name of the parameter responsible for providing the index for Non Mission Chassis Secure Switch selection by datalink.
	T_AIM_NMChassisSecSwitch_RLOC	Resource locator for Non mission chassis secure switch. A value of FFFF is considered to mean that the switch is not a physical input to the system.
	T_AIM_NMRegen_Switch_ID	This parameter is set to the name table name of the parameter responsible for providing the index for Non Mission Switch selection by datalink.
	T_AIM_NMRegen_Switch_Inversion	When True (1), this trim will allow for an inversion of the logic followed when reading the Non Mission Regen switch discrete input.
	T_AIM_Out_HtrCurrFdbk_RLOC	Resource location for PM Sensor Heater Current Signal.
	T_AIM_PM_Out_RLOC	This trim identifies the hardware pin number mapped to PM Sensor. It will be a 16 bit unsigned integer.
	T_AIM_PM_Out_SupplyRLOC	This trim identifies the hardware supply pin number mapped to PM Sensor. It will be a 16 bit unsigned integer.
	T_AIM_PermitSwitchEnbl	When this parameter is set, it enables the Permit Switch otherwise Permit switch is disabled.
	T_AIM_PermitSwitchID	This parameter is set to the name table name of the parameter responsible for providing the index for Permit Switch selection by datalink.
	T_AIM_PermitSwitchInversion	When True (1), this trim will allow for an inversion of the logic followed when reading the Permit switch discrete input.
	T_AIM_PermitSwitchMuxEnbl	This is a required parameter which indicates to the tool whether the Permit Switch Multiplexing feature is enabled or disabled.
	T_AIM_RTD_RLOC	This trim identifies the hardware pin number mapped to RTD Sensor. It will be a 16 bit unsigned integer.
	T_AIM_RTD_SupplyRLOC	This trim identifies the hardware supply pin number mapped to RTD Sensor. It will be a 16 bit unsigned integer.
	T_AIM_SCR_Out_RLOC	Hardware pin number mapped to the Cat Out temperature.
	T_AIM_SCR_T1_RLOC	Hardware pin number mapped to the Cat In temperature.
	T_AIM_TankInfoOnDatalink_Enbl	Trim to enable datalink as source of urea tank information
	T_AIM_UreaPumpP_RLOC	Supply Unit pressure AIP processing: sensor channel allocation
	T_AIM_UreaPumpP_SupplyRLOC	Supply Unit pressure AIP processing: sensor supply channel allocation
	T_AIM_UreaSuppT_ProcByOsSvc	enable trim that selects OS combo pulse service to process SM temperature signals
	T_AIM_UreaSuppT_RLOC	channel allocation for urea Supply Unit tmptr detection
	T_AIM_Urea_TankLvl_RLOC	Hardware pin number mapped to the Urea Tank Level.
	T_AIM_Urea_TankT_RLOC	Hardware pin number mapped to the Urea Tank temperature.
AIP	T_AIP_AMB_User_Override_En	Trim to enable the user override of Air_Press.
	T_AIP_APP2_Ovrd_Enable	When set to 1, the H_AIP_APP2_User_Ovrd_Val value shall be used instead of the calculated secondary accelerator pedal position.
	T_AIP_APP2_RLOC	Resource locator for the Secondary Accelerator Pedal Position sensor.
	T_AIP_Accelerator_Auto_Max	Trim for the initial auto_max value of primary accelerator pedal position at each power-up.
	T_AIP_Accelerator_Auto_Zero	Trim for the initial auto_zero value of primary accelerator pedal position at each power-up.
	T_AIP_Accelerator_Ovrd_En	When set to 1, the AIP_Accelerator_Ovrd_Val value will be used instead of the calculated accelerator pedal position.
	T_AIP_Accelerator_Pedal_RLOC	Resource Locator for Accelerator Pedal physical input
	T_AIP_AirTmptrRLOC	Resource Locator for air temperature physical input
	T_AIP_Analog_Switch2_RLOC	Resource allocator for Chrysler cruise control swith2.
	T_AIP_Analog_Switch_RLOC	Resource allocator for Chrysler cruise control switch.
	T_AIP_BattTmptrUserOvrdEn	trim indicates if user override functionality is enabled for Battery Temperature processing.
	T_AIP_BattVolt_Count_OOR_Err_En	When True (1), enables the activation of out-of-range diagnostics on the a/d input Battery Voltage.
	T_AIP_Battery_Tmptr_RLOC	Trim indicates resource locator for Battery temperature a2d processing.
	T_AIP_Battery_Voltage_Ovrd_En	If enabled, this trim will allow for the global value of Battery Voltage to be manually s
	T_AIP_CACOutTmptrRLOC	Resource Locator for Charge Air Cooler Outlet temperature physical input
	T_AIP_CCVPressRLOC	Resource Locator for closed Crankcase Ventilation system pPressure physical input.

T_AIP_CCVPressSupplyRLOC	Resource locator passed to Get_input_a2d in order to obtain the CCV Pressure Supply's voltage
T_AIP_CCVPress_Usr_Ovr_En	User override enable for closed Crankcase Ventilation system pressure.
T_AIP_CC_AS2_Supply_ID	Sensor supply ID for Chrysler cruise control analog switch2.
T_AIP_CHT_User_Override_En	This enable allows the global value of Charge_Temperature to be set to AIP_CHT_Override_Value.
T_AIP_CP_User_Override	This cal if enabled will allow for the global value of Coolant_Pressure to be manaully as
T_AIP_CT_User_Override	This cal if enabled will allow for the global value of Coolant_Temperature to be manaully
T_AIP_ChargePressRLOC	Resource Locator for Charge Press physical input
T_AIP_ChargeTmptrRLOC	Resource Locator for ChargeTmptrs physical input
T_AIP_CompInTmptrRLOC	Resource Locator for compressor inlet temperature physical input
T_AIP_CompInTmptr_Ovrd_En	This enable allows the global value of Compressor_Inlet_Tmptr to be set to C_AIP_CompInTmptr_Ovrd_Val.
T_AIP_Cool_Lev_User_Override_En	When set to TRUE, this parameter will assign Coolant_Level to C_AIP_Cool_Lev_Override_Value.
T_AIP_Cool_Level_Sw_SupplyRLOC	Resource locator passed to Get_input_a2d_compensated() in order to obtain the Coolant Level Switch while compensating for the Sensor Supply voltage.
T_AIP_Cool_Press_SupplyRLOC	Resource locator passed to Get_input_a2d_compensated() in order to obtain the Coolant Pressure while compensating for the Sensor Supply voltage.
T_AIP_Coolant_Level_RLOC	This trim identifies the hardware pin number mapped to coolant level. It will be a 16 bit unsigned integer.
T_AIP_Coolant_Level_Sw_RLOC	This trim identifies the hardware resource locator for the coolant level switch.
T_AIP_Coolant_Pressure_RLOC	This trim identifies the hardware pin number mapped to coolant pressure. It will be a 16 bit unsigned integer.
T_AIP_Coolant_Temperature_RLOC	This trim identifies the hardware pin number mapped to coolant temperature. It will be a 16 bit unsigned integer.
T_AIP_CrankcasePressRLOC	Resource Locator for Crankcase Press physical input
T_AIP_CrankcasePressSupplyRLOC	Resource locator passed to Get_input_a2d in order to obtain the Crankcase Press Supply's voltage
T_AIP_CrankcasePress_Usr_Ovr_En	User override enable for Crankcase_Press
T_AIP_Diag_Input_RLOC	Resource locator for the input used for thottle activated diagnostics. A value of FFFF is considered to mean that the diagnostic_input this diagnostic input is not connected in the system.
T_AIP_Diagnostic_Pedal_RLOC	Resource Locator for Diagnostic Pedal physical input.
T_AIP_Droop_Sw_Ovrd_En	When enabled, sets value of the droop switch to T_AIP_Droop_Sw_Ovrd_Val.
T_AIP_Droop_Sw_Ovrd_Val	Override value for Droop Switch physical input.
T_AIP_Droop_Switch_RLOC	Resource Locator for Droop Switch physical input
T_AIP_Droop_Type_Select_Sw	Indicates type of Droop Switch used.
T_AIP_EGRDeltaPressRLOC	Resource Locator for EGR_Delta_Press physical input
T_AIP_EGRDeltaPress_Ovrd_En	This enable allows the global value of EGR Delta Pressure to be set to C_AIP_EGRDeltaPress_Ovrd_Val.
T_AIP_EGROrifPressRLOC	Resource Locator for EGROrif Press physical input
T_AIP_EGROrificeTmptrRLOC	Resource Locator for EGROrificeTmptr physical input
T_AIP_EGROrificeTmptr_Ovrd_En	This enable allows the global value of EGR_Orifice_Tmptr to be set to C_AIP_ExhaustPress_Ovrd_Val.
T_AIP_ExhaustPressRLOC	Resource Locator for Exhaust Press physical input
T_AIP_ExhaustPress_Ovrd_En	This enable allows the global value of Exhaust_Press to be set to C_AIP_ExhaustPress_Ovrd_Val.
T_AIP_FL2_SensorSupply_RLOC	Locator for Fuel_Level2 sensor supply physical input. A value of FFFF is considered to mean that there is no physical input in the system.
T_AIP_FL2_Sensor_RLOC	Locator for Fuel_Level2 physical input. A value of FFFF is considered to mean that there is no physical input in the system.
T_AIP_FL_SensorSupply_RLOC	Locator for Fuel_Level sensor supply physical input. A value of FFFF is considered to mean that there is no physical input in the system.
T_AIP_FL_Sensor_RLOC	Locator for Fuel_Level physical input. A value of FFFF is considered to mean that there is no physical input in the system.
T_AIP_InternalTmptr_IR_En	This trim when set to TRUE will enable the Internal Temperature in range error check functionality. FALSE will disable.

	T_AIP_InternalTmptr_Ovrd_En	If enabled, this trim will allow for the global value of ECM Internal Temperature to be m
	T_AIP_MUX_RMT_Accel_Posn_ID	This parameter is set to the name table name of the parameter responsible for providing the index for the Remote Accelerator Position by datalink.
	T_AIP_OP_Autodetect_En	0 - Disable Oil Pressure sensor auto detection
	T_AIP_OP_User_Override	This cal if enabled will allow for the global value of Oil_Pressure to be manaully assign
	T_AIP_OT_User_Override	This cal if enabled will allow for the global value of Oil_Temperature to be manaully ass
	T_AIP_Oil_Press_SupplyRLOC	Resource locator passed to Get_input_a2d_compensated() in order to obtain the Oil Pressure while compensating for the Sensor Supply voltage.
	T_AIP_Oil_Press_Sw_SupplyRLOC	Resource locator passed to Get_input_a2d_compensated() in order to obtain the Oil Pressure Switch while compensating for the Sensor Supply voltage.
	T_AIP_Oil_Pressure_RLOC	This trim identifies the hardware pin number mapped to oil pressure. It will be a 16 bit unsigned integer.
	T_AIP_Oil_Pressure_Sw_RLOC	This trim identifies the hardware pin number mapped to oil pressure switch. It will be a 16 bit unsigned integer.
	T_AIP_Oil_Temperature_RLOC	This trim identifies the hardware pin number mapped to oil temperature. It will be a 16 bit unsigned integer.
	T_AIP_ParkingBrkSwRLOC	This indicates the desired Parking Brake Switch I/O configuration.
	T_AIP_RMT_Accelerator_Ovrd_En	Trim to allow User to Override the Remote throttle. If enabled, this trim will allow for
	T_AIP_Remote_Accelerator_RLOC	Resource Locator for Remote Accelerator Position sensor.
	T_AIP_SAT_Switch_Ovrd_En	Enables/disables override of Torque_Curve_Selection_Switch to AIP_SAT_Switch_Ovrd_Val
	T_AIP_ServiceBrkSw2RLOC	This indicates the desired Service_Brake_Switch_2 I/O configuration.
	T_AIP_Torque_Sel_Sw_RLOC	Resource Locator for Torque_Curve_Selection_Switch. (Tri-State) A value of FFFF shall be considered a nonexistent resource.
	T_AIP_WIF2_User_Override_En	Permits user to override second water in fuel Physical Input.
	T_AIP_WIF_User_Override_En	Permits user to override Physical Input.
Ambient Sensors	T_AMB_AirPressRLOC	Air_Pressure_Sensor mapping index to HW channel [From 02 -- Units: UNITLESS Size:2 Digits:0 Signed:U Scalar:1] [Jims comp:{EMM}]
	T_AMB_Amb_Tmptr_User_Override	Ambient temperature user override enable trim: 0=FALSE [From 02 -- Units: UNITLESS Size:2 Digits:0 Signed:U Scalar:1] [Jims comp:{EMM}]
	T_AMB_Sensing_Ambient_Pressure	Pressure Sensor Trim 0=Compressor Inlet [From 02 -- Units: UNITLESS Size:2 Digits:0 Signed:U Scalar:1] [Jims comp:{EMM}]
Acceleration Noise Control	T_ANC_Speed_Algorithm_Enable	Enable for speed limiting of the acceleration noise control algorithm
Launch Inhibit	T_APP_GR_Launch_Inhibit_En	Enables the Accelerator Inhibit at Vehicle Launch due to Gear Ratio feature.
Accelerator Pedal Select	T_APP_Hardwired_Accel_Type_Sel	Accelerator Pedal type select.
ASO	T_ASO_Auto_Max_Vehicle_Speed	If the vehicle exceeds this speed limit, do not activate Auxiliary Shutoff. Applicable on
	T_ASO_Automotive_Enable	Set to 1 only if the component is being used in Automotive App so that vehicle speed requiremnts can be applied (Auxiliary Shutoff).
	T_ASO_DOP_Err_Delay	Time to wait to check for valve closed state after the solenoid (output) driver has a 'Shorted to Battery" error. Once this times out, issue the corresponding driver fault code.
	T_ASO_DOP_Is_High_Side	Trim to know if the output driver is High side or low side. Set it to 1 if the driver is high side, set it to 0 if the driver is low side.
	T_ASO_DO_Ovrd_En	Auxiliary Shutoff Output (pwm or discrete) Override Enable
	T_ASO_Enable	Enable or disable the Auxiliary Shutoff feature
	T_ASO_Feedback_Input_Type	Type of Feedback input. 0 - Analog, 1 - Discrete (Auxiliary Shutoff)
	T_ASO_Feedback_Inversion	Auxiliary Shutoff Feedback Inversion
	T_ASO_Feedback_Ovrd_En	Auxiliary Shutoff Feedback Override enable
	T_ASO_Manual_Sw_En	If Enabled, the Auxiliary Shutoff algorithm will process the manual switch as an input to the ECM. 1 = Enable, 0 = Disable
	T_ASO_ParkBrkInterlock_En	If Enabled, ASO will check for Parking_Brake_Switch and ASO will not activate if Parking_Brake_Switch is OFF. This is added functionality only in Automatic and Test Modes.
	T_ASO_Reset_Timer_Th	The time for which we need to keep the test switch on for the system to reset. (Auxiliary Shutoff)
	T_ASO_Shutoff_Priority	Priority of the Auxiliary Shutoff component. This priority is used only when the ASO feature needs to zero machine fueling.

	T_ASO_Sol_Is_DiscOut	Set to 1 of Sol in a Discrete Output. Set to 0 if its PWM. (Auxiliary Shutoff)
	T_ASO_Solenoid_Inversion	Auxiliary Shutoff Solenoid Inversion. 1 to invert, 0 to ingore inverion.
	T_ASO_Solenoid_RLOC	Auxiliary Shutoff Solenoid RLOC
	T_ASO_Test_Sw_Inversion	Auxiliary Shutoff Test Switch Inversion Flag
	T_ASO_Test_Sw_Ovrd_En	Auxiliary Shutoff Test Switch Override Enable
	T_ASO_Test_Switch_Type	Test Switch type. 0 - Analog, 1 - Discrete. (Auxiliary Shutoff)
	T_ASO_Valve_Feedback_En	If valve feedback is available, set this trim to enable. Else set it to disable (Auxiliary Shutoff)
	T_ASO_Valve_Is_Automatic	The Auxiliary Shutoff Valves close on energizing the solenoid. Automatic refers to how th
ATD	T_ATD_DPFOutP_Hi_Enbl	Enable Pressure Tube Disconnected Stuck In Range diagnostic
	T_ATD_DPFOutP_SIR_Enbl	Trim to enable OutP Stuck In Range diagnostic
	T_ATD_DPF_OutP_Keyon_Enable	Trim to enable DPF OutP Keyon Diagnostic
	T_ATD_DPF_PTD_Enbl	Trim to enable Pressure Tube Disconnected Stuck In Range diagnostic
	T_ATD_DPF_dP_Keyon_Enable	enable flag for DPF delta pressure keyon test.
	T_ATD_FCPL_Enbl	Trim enabling DFP Close Loop diagnostic
	T_ATD_FT_HET_DPF_Out_High_Thd	High threshold of exhaust tmptr used to turn on HET Lamp, tool trimmable variable. The t
	T_ATD_FT_HET_DPF_Out_Low_Thd	Low threshold of exhaust tmptr used to turn off HET Lamp, tool trimmable variable.
	T_ATD_FT_HET_Setup_Enbl	Mapped to TIS parameter AFT_HEST_Lamp_Setup_Enable
	T_ATD_HET_Active_Regen_Enable	When set to 1 active regen will turn on the HET lamp, tool trimmable variable.
	T_ATD_HET_Lamp_Enable	Trim to indicate whether the HET lamp is present or not.
	T_ATD_SCR_OT_ShutDwnDiagEnbl	Trim enable for the over temperature shutdown diagnostics.
	T_ATD_vl_HET_Veh_Spd_Thd	Vehicle speed threshold used to disable HET Lamp operation, tool trimmable variable.
ATM	T_ATM_NOxOut_SenPwrInt_Enbl	Enables the NOx sensor power interruption diagnostic
	T_ATM_SCR_DEFLamp_Config	DEF Lamp Configuration: 0 = No DEF Lamp, 1 = Muxed (available via datalink) , 2 = Hardwired (physical lamp present)
	T_ATM_SCR_Tamp_Enbl	Trim enabling SCR tampering diagnostic
	T_ATM_bs_Enbl	Bitmap used to enable/disable aftertreatment components. If set to 0, disables all aftertreatment
ATP	T_ATP_NMChassisSecSwEnbl	If TRUE, enables the non mission chassis secure switch logic. Indicates the presence of a non mission chassis secure switch in the system
	T_ATP_NOx_Out_Sens_VoltChk_Enbl	Flag to enable voltage consistancy checking between the NOx Out Sensor and the system.
	T_ATP_SCR_Out_NOxSensor_Enbl	Enable flag for SCR Outlet NOx Sensor processing.
	T_ATR_ParkBrake_NMRegen_Sw_Enbl	Trim to enable the parking brake as a NM regen switch
Anti-theft	T_AT_Auto_Lock_Enable	Configure whether the "lock when key off" mode is allowed.
	T_AT_Engine_Idle_Lock_Enable	Configure whether the engine is allowed to lock while running at idle
	T_AT_Engine_Shutdown_Enable	Configure whether a running engine is allowed to be shutdown by anti-theft. When enabled, a locked engine at idle would be shutdown if it is no longer considered idle.
	T_AT_OEM_Protocol	Enabled OEM anti-theft protocol
Accelerator Interlock	T_Accelerator_Interlock_Enable	Primary enable for the accelerator interlock feature.
Accelerator Pedal Multiplexing	T_Accelerator_Pedal_Mux_Enable	This is a required parameter which indicates to the tool whether the Accelerator Pedal Multiplexing feature is enabled or disabled.
Adaptive Cruise Control	T_AdaptiveCruiseUserSelectable	Required by tool
	T_Adaptive_Cruise_Enable	Enables adaptive cruise control in the system.
	T_Adaptive_Cruise_Recovery	Allow for using the cruise control recovery.
Alternate Torque Switch	T_Alt_Torque_Sw_Mux_Enable	This is a required parameter which indicates to the tool whether the Alternate Torque Switch Multiplexing feature is enabled or disabled.
Alternate Droop Switch	T_Alternate_Droop_Switch_Mux_Enable	This is a required parameter which indicates to the tool whether the Alternate Droop Switch Multiplexing feature is enabled or disabled.

Ambient Air Pressure Sensor	T_AmbAirPressEnable	Indicates to the tool whether the Ambient Air Pressure Sensor is enabled in the ECM. this parameter is not user adjustable.
	T_AmbAirTmptr_Sensor_Enable	Non functional FTIS enable to support tools.
Auxiliary Governor	T_Aux_Governor_Selector	Selects the Auxiliary Governor Control feature that is enabled (Speed = 0, Pressure = 1).
	T_Aux_Governor_Sw_Mux_Address	Source address of device sending the Auxiliary Governor Switch signal.
	T_Aux_Governor_Tool_Enable	This is a non-functional tool enable. This is a required parameter which indicates to the tool whether the Auxiliaryr Governor Control Base feature is enabled or disabled.
Auxiliary Ndot	T_Aux_Ndot_Enable	Auxiliary Ndot feature enable.
Auxiliary Shutdown Switch	T_Aux_Shutdown_Sw_Mux_Enable	This is a required parameter which indicates to the tool whether the Auxiliary Shutdown Switch Multiplexing feature is enabled or disabled.
Auxiliary Pressure Multiplexing	T_Auxiliary_Pressure_1_Mux_Enable	This is a required parameter which indicates to the tool whether the Auxiliary Pressure 1 Multiplexing feature is enabled or disabled.
	T_Auxiliary_Pressure_2_Mux_Enable	This is a required parameter which indicates to the tool whether the Auxiliary Pressure 2 Multiplexing feature is enabled or disabled.
Auxiliary Temp. Multiplexing	T_Auxiliary_Temperature_1_Mux_Enable	This is a required parameter which indicates to the tool whether the Auxiliary Temperature 1 Multiplexing feature is enabled or disabled.
	T_Auxiliary_Temperature_2_Mux_Enable	This is a required parameter which indicates to the tool whether the Auxiliary Temperature 2 Multiplexing feature is enabled or disabled.
Boost Power	T_BPA_En	This trim will enable Boost Power Automatic
	T_BPS_En	This trim will enable Switched Boost Power functionality.
	T_Boost_Power_Switch_Mux_Enable	This is a required parameter which indicates to the tool whether the Boost Power Switch Multiplexing feature is enabled or disabled.
Battery Voltage	T_Battery_Voltage_RLOC	The hardware resource location ID for battery voltage that is powering the electrical system for a Cummins product.
Bench test	T_Bench_Test	Resets fault set in estimating Delta-P zero offset
	T_CBP_CBM_Torque_BenchOvrd_En	Enable use of CBM_Torque_Fuel instead of feedback fuel in bench test.
Min/Max Transfer Port	T_CAGT_Min_Max_Tx_Port_Id	Identifies the port to transfer the Min Max data on . Port id 3 is the general data logging port .
CBL	T_CBL_EGR_Frac_User_Override	EGR fraction user override in charge reference
	T_CBL_Fuel_User_Override	Fueling user override in CLM algorithm before advance FS Control
	T_CBL_MCF_User_Override	Mass change flow user override on final output of combustion manager
CBR	T_CBR_Alpha_User_Override	Manual Override Enable for Alpha calculations within combustion manager.
	T_CBR_CorrAmbCondEnable	Enable for correction of compressor inlet density based on ambient conditions.
	T_CBR_EGR_Off_User_Override	This trim enables the EGR scalars calculations.
	T_CBR_Oscar_EGR_Disable_Allowed	Trim used to allow EGR disable when in Oscar mode
	T_CBR_Texh_MCF_LLim_Allowed	Lower Limit allowed
	T_CBR_Texh_MCF_Window_Allowed	Trim used to allow MCF command to be limited by exhaust temperature command
Crankcase Breather Heater	T_CCBH_Drv_Inversion	When True (1), this trim will allow for an inversion of the logic followed when setting the engine retarder driver 1 phsical output.
	T_CCBH_Drv_OvrdEn	Indicates if Breather Heater Driver user override is allowed or not.
	T_CCBH_Enable	Breather Heater algorithm enable
	T_CCBH_HW_RLOC	Rloc for breather heater
CCP	T_CCP_AZ_En	Autozero for CCP sensor enable
	T_CCP_BoostCheck	When disabled (0) -- CCP diagnostics feature latches on to CDR_VALVE_FAILED_OPEN error
	T_CCP_Rat_En	Keyon Rationality Err Check enable
CCV	T_CCV_AZ_En	Autozero for Closed crankcase ventilation system pressure sensor enable
	T_CCV_Rat_En	Keyon Rationality Err Check enable for closed crankcase ventilation system pressure sensor.
Cruise Control	T_CC_AR_Enable	Enables automatic cruise control resume (Auto Resume) functionality.
	T_CC_AccPed_Disengage_En	This is a required parameter which indicates to the tool whether the Cruise Control Accel
	T_CC_AccPed_Disengage_TimeLim	If cruise control is overridden by the accelerator pedal for more than this amount of time, cruise control disengages.

	T_CC_Analog_En	enable to use analog cruise control switch.
	T_CC_Base_Enable	Enables cruise control in the system. Exact functionality of T_CC_Enable except it is ma
	T_CC_BottomDroopWidth	Bottom droop width for cruise control.
	T_CC_Cancel_Switch_Mux_Address	Source address of device sending the Cruise Control Cancel Switch signal.
	T_CC_Disable_With_Clutch_Switch	When set to 1 cruise control is disabled when clutch is pressed.
	T_CC_EB_Enable	Enables use of engine brakes for controlling Vehicle Speed in Cruise Control
	T_CC_EB_MaxBrakingSpeedDelta	The amount of overspeed above the bottom droop width when all of the braking power will be applied.
	T_CC_EB_StartBrakingSpeedDelta	The amount of overspeed above the bottom droop width when the engine brakes will come on.
	T_CC_EB_UserSel	Required by tool
	T_CC_Enable	Enables cruise control in the system.
	T_CC_MaxRoadSpeed	Maximum base vehicle speed allowed for cruise control.
	T_CC_NV_Check_En	Enable to calculate the ratio of engine speed and vehicle speed.
	T_CC_On_Switch_Mux_Address	Source address of device sending the Cruise Control On Switch signal.
	T_CC_Parking_Brake_En	If True allows CC to be disabled if the Parking Brake is Engaged. Required for Euro operation.
	T_CC_PauseSwitch_Enable	Enables use of Pause Switch in Cruise Control
	T_CC_Resume_Switch_Mux_Address	Source address of device sending the Cruise Control Resume Switch signal.
	T_CC_SavePoweroffSpeedEnable	Enables the saving of the last cruise set speed across a powerdown.
	T_CC_SetAccelSwitchSelect	Determines Accel/Coast functionality of the Set/Resume switch.
	T_CC_Set_Switch_Mux_Address	Source address of device sending the Cruise Control Set Switch signal.
	T_CC_Switch_Mux_Enable	This is a required parameter which indicates to the tool whether the Cruise Control Switc
	T_CC_TopDroopWidth	Top droop width for cruise control.
	T_CC_VehicleSpdRampRateEn	This is a required parameter which indicates to the tool whether the Cruise Control Ramp
	T_CC_VehicleSpeedAccelDecel	The desired vehicle acceleration or deceleration rate for large cruise control transients.
	T_CC_VehicleSpeedStep	Bump-Up/Down incremental step size for adjusting Cruise Control Isochronous Speed.
CEMS Message	T_CEMS_Msg_Proc_Enable	Enable for processing the heartbeat msg between CEMS and the ECM
CHL	T_CHL_COT_Drt_Enbl	COT Derate Enable
	T_CHL_Delta_P_Drt_Enbl	EGR dP Derate Enable
	T_CHL_EGR_Frac_Drt_Enable	Enable derate of EGR fraction for surge.
	T_CHL_EGR_Off_DP_Drt_Enbl	EGR Off dP Derate Enable
	T_CHL_Engine_DP_Drt_Enbl	Enable for Engine DP Derate
	T_CHL_Ex_Pr_Limit_Override_Enable	Override enalble switch for exhaust pressure limit
	T_CHL_Surge_Margin_Drt_Enbl	Surge Margin Derate Enable
	T_CHL_TBV_EdP_Limit_Enb	Engine dP Derate Enable
	T_CHL_TBV_OvrSpd_Limit_Enb	Turbo Speed Derate Enable
	T_CHL_Turbo_Speed_Drt_Enbl	Turbo Speed Derate Enable
CRC Calculation	T_CRC_Checksum1_Reference	Value used to verify the CRC calculation on Cummins engine control calibrations and integrity check trims.
Charge pressure Estimate	T_Charge_Press_Estimate_Enable	charge pressure estimate algorithm is enabled if set to 1
Clutch Switch	T_ClutchSwitchEnable	When this parameter is set, it enables clutch switch otherwise clutch switch is disabled.
	T_Clutch_Switch_Mux_Address	Source address of device sending the Clutch Switch signal.
	T_Clutch_Switch_Mux_Enable	This is a required parameter which indicates to the tool whether the Clutch Switch Multiplexing feature is enabled or disabled.
Coolant	T_CoolantLevelSensorEnable	Indicates to the tool whether the Coolant Level Sensor is enabled in the

		ECM.
	T_Coolant_Level_Mux_Enable	Indicates to the tool whether the Coolant Level Multiplexing feature is enabled or disabled.
	T_Coolant_Level_Mux_ID	This parameter is set to the name table name of the parameter responsible for providing the index for Coolant_Level for selection by the Datalink.
	T_Coolant_Temperature_Sensor_Enable	Indicates to the tool whether the Coolant Temperature Sensor is enabled in the ECM. This parameter is not user adjustable.
Deicer Speed Limit	T_DICE_SpeedLimitEnable	Enables Deicer Speed Limit.
Driver Initiated Override	T_DIO_Active_Dist_Threshold	Maximum distance that can be covered continuously when DIO Active is TRUE.
	T_DIO_Enable	Parameter indicating to the tool whether the Driver Initiated Override feature is enabled or disabled.
	T_DIO_Max_Dist_Ulim	Defines Maximum Threshold for DIO distance.
	T_DIO_Max_Distance	Max Distance that the driver is allowed to use DIO per Driver_Initiated_Override_Max_Distance_Upper_Limit.
	T_DIO_Max_Rd_Spd_Delta	Maximum allowable vehicle speed gain when DIO is Actvie.
	T_DIO_Reset_Distance_Threshold	Maximum cummulative distance that can be travelled with DIO Active.
	T_DIP_AC_Press_Switch_Inversion	When True (1), This trim will allow for an inversion of the logic followed when reading the air conditioning pressure switch discrete input.
	T_DIP_AC_Pressure_User_Ovrd_En	Enables Override of the Air Conditioner Pressure Switch when enabled.
	T_DIP_ASO_Feedback_RLOC	Auxiliary Shutoff Valve Feedback RLOC.
	T_DIP_ASO_Test_Sw_RLOC	Auxiliary Shutoff Test Switch RLOC
	T_DIP_Acc_Interlock_Ovrd_En	Overrides the Accelerator Interlock Switch when enabled.
	T_DIP_Acc_Interlock_Sw_Logic	Defines whether an Open or Closed accelerator interlock switch will activate the accelera
	T_DIP_Accel_Interlock_RLOC	This indicates the desired Accelerator Interlock Switch I/O configuration.
	T_DIP_Acctr_Gov_Sw_Inversion	When Enabled, the output for Accelerator_Governor_Switch shall be inverted.
	T_DIP_Acctr_Gov_Sw_Ovrd_En	Enables/disables user override of Accelerator_Governor_Switch. When Enabled, Accelerator_Governor_Switch will be set equal to the value of DIP_Acctr_Gov_Sw_Ovrd_Val .
	T_DIP_Acctr_Gov_Sw_RLOC	Locator for Accelerator Governor Switch physical input. A value of FFFF is considered to mean that there is no Accelerator Governor Switch physical input in the system.
	T_DIP_Aux_Governor_Sw_Inversion	When enabled, the output for the Aux_Governor_Switch shall be inverted.
	T_DIP_Aux_Governor_Sw_Ovrd_En	Enables/disables user override of Aux_Governor_Switch. When enabled, the Aux_Governor_Switch will be set equal to the value of DIP_Aux_Governor_Sw_Ovrd_Val.
	T_DIP_Aux_Governor_Sw_RLOC	Resource locator for Aux_Governor_Switch physical input. A value of FFFF is considered to mean that there is no Aux_Governor_Switch physical input in the system.
	T_DIP_Aux_Shutdown_Inv	When Enabled, the output for Auxiliary_Shutdown_Switch shall be inverted.
	T_DIP_Aux_Shutdown_Sw_Ovrd_En	Enables/disables user override of Auxiliary_Shutdown_Switch. When Enabled, Auxiliary_Shutdown_Switch will be set equal to the value of DIP_Aux_Shutdown_Sw_Ovrd_Val .
	T_DIP_Aux_Shutdown_Switch_RLOC	Resource locator for Auxiliary_Shutdown_Switch. A value of FFFF shall be considered a nonexistent resource.
	T_DIP_Boost_Pow_Req_Inv	When Enabled, the output for Boost_Power_Request_Switch shall be inverted.
	T_DIP_Boost_Pow_Req_Ovrd_En	This trim is an enable to override the Boost_Power_Request_Switch.
	T_DIP_Boost_Pow_Req_RLOC	Resource locator for Boost_Power_Request_Switch. A value of 0XFFFF shall be considered a nonexistent resource.
	T_DIP_CC_CancelSwInversion	When Enabled, the output for CC_CancelSwitch shall be inverted.
	T_DIP_CC_CancelSwitchRLOC	Resource locator for CC_CancelSwitch. A value of 0XFFFF shall be considered a nonexistent resource.
	T_DIP_CC_CancelUserOvrdEn	Enables/disables user override of CC_CancelSwitch. When Enabled, CC_CancelSwitch will be
	T_DIP_CC_OnSwInversion	When Enabled, the output for CC_OnSwitch shall be inverted.
	T_DIP_CC_OnSwitchRLOC	Resource locator for CC_OnSwitch. A value of 0XFFFF shall be considered a nonexistent resource.
	T_DIP_CC_OnUserOvrdEn	Enables/disables user override of CC_OnSwitch. When Enabled, CC_OnSwitch will be set equ

	T_DIP_CC_ResumeSwInversion	When Enabled, the output for CC_ResumeSwitch shall be inverted.
	T_DIP_CC_ResumeSwitchRLOC	Resource locator for CC_ResumeSwitch. A value of 0XFFFF shall be considered a nonexistent resource.
	T_DIP_CC_ResumeUserOvrdEn	Enables/disables user override of CC_ResumeSwitch. When Enabled, CC_ResumeSwitch will be
	T_DIP_CC_SetSwInversion	When Enabled, the output for CC_SetSwitch shall be inverted.
	T_DIP_CC_SetSwitchRLOC	Resource locator for CC_SetSwitch. A value of 0XFFFF shall be considered a nonexistent resource.
	T_DIP_CC_SetUserOvrdEn	Enables/disables user override of CC_SetSwitch. When Enabled, CC_SetSwitch will be set e
	T_DIP_CL_RLOC	This trim identifies the hardware pin number mapped to coolant level high detected. It will be a 16 bit unsigned integer.
	T_DIP_CL_User_Override	This cal will enable the ability to override the coolant detected switch when its value i
	T_DIP_Cl_Det_Inversion	Inverts the operation of switch input for the Coolant_Detected_Switch when enabled.
	T_DIP_Cl_Det_Switch_RLOC	Resource Locator of the Coolant_Detected_Switch physical input.
	T_DIP_Cl_Det_User_Ovrd_En	Overrides the Coolant_Detected_Switch when enabled.
	T_DIP_Cl_Not_Det_Inversion	Inverts the operation of switch input for the Coolant_Not_Detected_Switch when enabled.
	T_DIP_Cl_Not_Det_Switch_RLOC	Resource Locator of the Coolant_Not_Detected_Switch physical input.
	T_DIP_Cl_Not_Det_User_Ovrd_En	Overrides the Coolant_Not_Detected_Switch when enabled.
	T_DIP_ClutchSwRawInversion	When Enabled, the output for Clutch_Switch_Raw shall be inverted.
	T_DIP_ClutchSwRawOvrdEn	Enables/disables user override of Clutch_Switch_Raw. When Enabled, Clutch_Switch_Raw will be set equal to the value ofH_ DIP_ ClutchSwRawOvrdVal
	T_DIP_ClutchSwitchInversion	When asserted, the output for Clutch_Switch shall be inverted.
	T_DIP_ClutchSwitchOvrdEn	Enables/disables user override of Clutch_Switch. When Enabled, Clutch_Switch will be set equal to the value ofH_ DIP_ ClutchSwitchOvrdVal
	T_DIP_ClutchSwitchRLOC	Resource locator forClutch_Switch. A value of 0XFFFF shall be considered a nonexistent resource.
	T_DIP_Diag_Decrt_Sw_Inversion	When True (1), this trim will allow for an inversion of the logic followed when reading the diagnostic decrement switch discrete input.
	T_DIP_Diag_Decrt_Sw_RLOC	Resource locator for the diagnostic decrement switch. A value of FFFF is considered to mean that the diagnostic decrement switch is not a physical input to the system.
	T_DIP_Diag_Decrt_User_Ovrd_En	DIP_Diag_Decrt_Sw_User_Ovrd_Val overrides the diagnostic decrement switch only when this parameter is enabled (1).
	T_DIP_Diag_Incrt_Sw_Inversion	When True (1), this trim will allow for an inversion of the logic followed when reading the diagnostic increment switch discrete input.
	T_DIP_Diag_Incrt_Sw_RLOC	Resource locator for the diagnostic increment switch. A value of FFFF is considered to mean that the diagnostic increment switch is not a physical input to the system.
	T_DIP_Diag_Incrt_User_Ovrd_En	When enabled, overrides the physical input Diagnostic_Increment_Switch using DIP_Diag_Incrt_Sw_User_Ovrd_Val.
	T_DIP_Droop_Switch_Inversion	Inverts the input for Droop_Switch when enabled.
	T_DIP_Droop_Switch_RLOC	Resource Locator for Droop_Switch physical input.
	T_DIP_Droop_Switch_User_Ovrd_En	Overrides Droop_Switch when enabled.
	T_DIP_EPD_Aux_Sd_Sw_Ovrd_En	EPD_Auxiliary_Shutdown_Switch user override enable. When Enabled, EPD_Auxiliary_Shutdown_Switch will be set equal to the value of DIP_EPD_Aux_Shutdown_Sw_Ovrd_Val .
	T_DIP_EPD_Aux_Shutdown_Inv	When Enabled, the output for EPD Auxiliary Shutdown Switch shall be inverted.
	T_DIP_EPD_Aux_Shutdown_Sw_RLOC	Resource locator for EPD Auxiliary Shutdown Switch. A value of FFFF shall be considered a nonexistent resource.
	T_DIP_EngBrkSel1SwInversion	When Enabled, the output for EngineBrakeSelector1Switch shall be inverted.
	T_DIP_EngBrkSel1SwOvrdEn	Trim which indicates user override enable or not on EngineBrakeSelector1Switch.
	T_DIP_EngBrkSel1SwRLOC	Resource ID for EngineBrakeSelector1Switch.
	T_DIP_EngBrkSel2SwInversion	When Enabled, the output for EngineBrakeSelector2Switch shall be inverted.
	T_DIP_EngBrkSel2SwOvrdEn	Trim which indicates user override enable or not on EngineBrakeSelector2Switch.
	T_DIP_EngBrkSel2SwRLOC	Resource ID for EngineBrakeSelector2Switch.

	T_DIP_EngBrkSel3SwInversion	When Enabled, the output for EngineBrakeSelector3Switch shall be inverted.
	T_DIP_EngBrkSel3SwOvrdEn	Trim which indicates user override enable or not on EngineBrakeSelector3Switch.
	T_DIP_EngBrkSel3SwRLOC	Resource ID for EngineBrakeSelector3Switch.
	T_DIP_First_Gear_Sw_Inversion	Inverts the operation of switch input for the First Gear Switch when enabled.
	T_DIP_First_Gear_Switch_Ovrd_En	Overrides the First Gear Switch when enabled.
	T_DIP_First_Gear_Switch_RLOC	Resource Locator of the Transmission's First Gear Switch physical input.
	T_DIP_Idle_Decrt_Inversion	Inverts the operation of switch input for the Idle Decrement Switch when enabled.
	T_DIP_Idle_Decrt_Switch_RLOC	Resource Locator for Idle Decrement Switch physcial input.
	T_DIP_Idle_Decrt_User_Ovrd_En	Overrides the Idle Decrement Switch when enabled.
	T_DIP_Idle_Incrt_Inversion	Inverts the operation of switch input for the Idle Increment Switch when enabled.
	T_DIP_Idle_Incrt_Switch_RLOC	Resource Locatorfor the Idle Increment Switch physcial input
	T_DIP_Idle_Incrt_User_Ovrd_En	Overrides the Idle Increment Switch when enabled.
	T_DIP_Key_Switch_Inversion	Inverts the operation of switch input for the Key Switch when enabled.
	T_DIP_Key_Switch_RLOC	Resource Locator for the Keyswitch physical input.
	T_DIP_Key_Switch_User_Ovrd_En	Overrides the Key Switch when enabled.
	T_DIP_MUX_PTP_TrqLimSw_ID	This parameter is set to the name table name of the parameter responsible for providing the index for PTP_Torque_Limit_Switch selection by datalink.
	T_DIP_MUX_RMT_APP_Switch_ID	This parameter is set to the name table name of the parameter responsible for providing the index for the Remote Accelerator Switch by datalink
	T_DIP_Man_Fan_Switch_Inversion	When True (1), This trim will allow for an inversion of the logic followed when reading the in cab manual fan switch discrete input.
	T_DIP_Manual_Fan_User_Ovrd_En	Enables Override of the Manual Fan Input when enabled.
	T_DIP_Neutral_Switch_Inversion	Inverts the operation of switch input for the Neutral Gear Switch when enabled.
	T_DIP_Neutral_Switch_Ovrd_En	Overrides the Neutral Gear Switch when enabled.
	T_DIP_Neutral_Switch_RLOC	Resource Locator of the Transmission's Neutral Gear Switch physical input.
	T_DIP_OP_Inversion	Inverts the operation of switch input for the DIP Oil_Pressure Switch.
	T_DIP_OP_RLOC	This trim identifies the discrete hardware pin number mapped to Oil Pressure. It will be a 16 bit unsigned integer.
	T_DIP_Off_Idle_Inversion	Inverts the operation of switch input for the Off Idle Switch when enabled.
	T_DIP_Off_Idle_Switch_RLOC	Resource Locator of the Accelerator's Off Idle Switch physical input.
	T_DIP_Off_Idle_User_Ovrd_En	Overrides the Off Idle Switch when enabled.
	T_DIP_On_Idle_Inversion	Inverts the operation of switch input for the On Idle Switch when enabled.
	T_DIP_On_Idle_Switch_RLOC	Resource Locator for the Accelerator's On Idle Switch Physical input.
	T_DIP_On_Idle_User_Ovrd_En	Overrides the On Idle Switch when enabled.
	T_DIP_PTOA_MS_Rem_Sw1_RLOC	Resource locator for PTOA_MS_Remote_Sw1. A value of FFFF shall be considered a nonexistent resource.
	T_DIP_PTOA_MS_Rem_Sw2_RLOC	Resource locator for PTOA_MS_Remote_Sw2. A value of FFFF shall be considered a nonexistent resource.
	T_DIP_PTOA_MS_Rem_Sw3_RLOC	Resource locator for PTOA_MS_Remote_Sw3. A value of FFFF shall be considered a nonexistent resource.
	T_DIP_PTOA_Press_Sw_RLOC	Resource locator for PTOA_Pressure_Switch. A value of FFFF shall be considered a nonexistent resource.
	T_DIP_PTO_Accel_Sw_Inversion	When Enabled, the output for PTO_Accel_Switch shall be inverted.
	T_DIP_PTO_Accel_Switch_RLOC	Resource locator for PTO_Accel_Switch. A value of FFFF shall be considered a nonexistent resource.
	T_DIP_PTO_Accel_User_Ovrd_En	Enables/disables user override of PTO_Accel_Switch. When Enabled, PTO_Accel_Switch will be set equal to the value of DIP_PTO_Accel_User_Ovrd_Val
	T_DIP_PTO_Coast_Sw_Inversion	When Enabled, the output for PTO_Coast_Switch shall be inverted.

	T_DIP_PTO_Coast_Switch_RLOC	Resource locator for PTO_Coast_Switch. A value of FFFF shall be considered a nonexistent resource.
	T_DIP_PTO_Coast_User_Ovrd_En	Enables/disables user override of PTO_Coast_Switch. When Enabled, PTO_Coast_Switch will be set equal to the value of DIP_PTO_Coast_User_Ovrd_Val .
	T_DIP_PTO_Remote_Sw_Inversion	When Enabled, the output for PTO_Remote_Switch shall be inverted.
	T_DIP_PTO_Remote_Switch_RLOC	Resource locator for PTO_Remote_Switch. A value of FFFF shall be considered a nonexistent resource.
	T_DIP_PTO_Remote_User_Ovrd_En	Enables/disables user override of PTO_Remote_Switch. When Enabled, PTO_Remote_Switch will be set equal to the value of DIP_PTO_Remote_User_Ovrd_Val .
	T_DIP_PTO_Resume_Sw_Inversion	When Enabled, the output for PTO_Resume_Switch shall be inverted.
	T_DIP_PTO_Resume_Switch_RLOC	Resource locator for PTO_Resume_Switch. A value of FFFF shall be considered a nonexistent resource.
	T_DIP_PTO_Resume_User_Ovrd_En	Enables/disables user override of PTO_Resume_Switch. When Enabled, PTO_Remote_Switch will be set equal to the value of DIP_PTO_Resume_User_Ovrd_Val .
	T_DIP_PTO_Set_Sw_Inversion	When Enabled, the output for PTO_Set_Switch shall be inverted.
	T_DIP_PTO_Set_Sw_User_Ovrd_En	Enables/disables user override of PTO_Set_Switch. When Enabled, PTO_Set_Switch will be set equal to the value ofDIP_PTO_Set_Sw_User_Ovrd_Val.
	T_DIP_PTO_Set_Switch_RLOC	Resource locator for PTO_Set_Switch. A value of FFFF shall be considered a nonexistent resource.
	T_DIP_PTO_Sw_Inversion	When Enabled, the output for PTO_Switch shall be inverted.
	T_DIP_PTO_Sw_User_Ovrd_En	Enables/disables user override of PTO_Switch. When Enabled, PTO_Switch will be set equal to the value of DIP_PTO_Sw_User_Ovrd_Val .
	T_DIP_PTO_Sw_Valid_Sw_RLOC	Resource locator for PTO_Sw_Validation_Sw. A value of FFFF shall be considered a nonexistent resource.
	T_DIP_PTO_Switch_RLOC	Resource locator for PTO_Switch. A value of FFFF shall be considered a nonexistent resource.
	T_DIP_PTP_TrqLimSw_Inversion	This parameter shall Reverse the meaning of the logic for PTP_Torque_Limit_Switch.
	T_DIP_PTP_TrqLimSw_Ovrd_En	This parameter permits user to override the value of PTP_Torque_Limit_Switch.
	T_DIP_PTP_TrqLimSw_RLOC	Hardware resource assignment for PTP_Torque_Limit_Switch.
	T_DIP_ParkingBrkSwOvrdEn	Enables/disables user override of Parking_Brake_Switch. When Enabled, Parking_Brake_Switch will be set equal to the value of H_ DIP_ ParkingBrkSwOvrdVal
	T_DIP_ParkingBrkSwRLOC	This indicates the desired Parking Brake Switch I/O configuration.
	T_DIP_Permit_Switch_RLOC	Resource locator for Permit switch. A value of FFFF is considered to mean that the switch is not a physical input to the system.
	T_DIP_RAR_Switch_Inversion	Inverts the operation of switch input for the Rear Axle Ratio Switch.
	T_DIP_RCPTO_Resume_Sw_Inversion	When Enabled, the output for RCPTO_Resume_Switch shall be inverted.
	T_DIP_RCPTO_Resume_Switch_RLOC	Resource locator for RCPTO_Resume_Switch. A value of FFFF shall be considered a nonexistent resource.
	T_DIP_RCPTO_Resume_User_Ovrd_En	Enables/disables user override of RCPTO_Resume_Switch. When Enabled, RCPTO_Remote_Switch will be set equal to the value of DIP_RCPTO_Resume_User_Ovrd_Val .
	T_DIP_RCPTO_Set_Sw_Inversion	When Enabled, the output for RCPTO_Set_Switch shall be inverted.
	T_DIP_RCPTO_Set_Sw_User_Ovrd_En	Enables/disables user override of RCPTO_Set_Switch. When Enabled, RCPTO_Set_Switch will be set equal to the value of DIP_RCPTO_Set_Sw_User_Ovrd_Val.
	T_DIP_RCPTO_Set_Switch_RLOC	Resource locator for RCPTO_Set_Switch. A value of FFFF shall be considered a nonexistent resource.
	T_DIP_RCPTO_Sw_Inversion	When Enabled, the output for RCPTO_Switch shall be inverted.
	T_DIP_RCPTO_Sw_User_Ovrd_En	Enables/disables user override of RCPTO_Switch. When Enabled, RCPTO_Switch will be set equal to the value of DIP_RCPTO_Sw_User_Ovrd_Val .
	T_DIP_RCPTO_Switch_RLOC	Resource locator for RCPTO_Switch. A value of FFFF shall be considered a nonexistent resource.
	T_DIP_RMT_APP_Switch_Inversion	Inversion bit for remote switch logic
	T_DIP_RMT_Switch_User_Ovrd_En	Overrides the Remote Accelerator Switch when enabled.
	T_DIP_Remote_APP_Switch_RLOC	Resource Locator of Remote Accelerator Switch physical input.
	T_DIP_Reverse_Switch_Inversion	Inverts the operation of switch input for the Reverse Gear Switch when enabled.

	T_DIP_Reverse_Switch_Ovrd_En	Overrides the Reverse Gear Switch when enabled.
	T_DIP_Reverse_Switch_RLOC	Resource Locator of the Transmission's Reverse Gear Switch physical input.
	T_DIP_SLO_Clutch_Intlk_Ovrd_En	Enables clutch interlock switch override value.
	T_DIP_SLO_Clutch_Intrlk_Inv	Allows for an inversion of the logic followed when reading the clutch interlock switch discrete input.
	T_DIP_SMVS_Sw2Inversion	When Enabled, the output for SMVS_Switch2 shall be inverted.
	T_DIP_SMVS_Sw2RLOC	Resource locator for SMVS_Switch2. A value of 0XFFFF shall be considered a nonexistent resource.
	T_DIP_SMVS_Sw2_UserOvrdEn	Enables/disables user override of SMVS_Switch2.
	T_DIP_SMVS_SwInversion	When Enabled, the output for SMVS_Switch shall be inverted.
	T_DIP_SMVS_SwRLOC	Resource locator for SMVS_Switch. A value of 0XFFFF shall be considered a nonexistent resource.
	T_DIP_SMVS_Sw_UserOvrdEn	Enables/disables user override of SMVS_Switch.
	T_DIP_SRegen_Switch_RLOC	Resource locator for the Non Mission Regen switch. A value of FFFF is considered to mean that the switch is not a physical input to the system.
	T_DIP_ServiceBrkSw2Inversion	When Enabled, the output for Service_Brake_Switch_2 shall be inverted
	T_DIP_ServiceBrkSw2OvrdEn	Enables/disables user override of Service_Brake_Switch_2. When Enabled, Service_Brake_Switch_2 will be set equal to the value of T_ DIP_ ServiceBrkSw2OvrdVal
	T_DIP_ServiceBrkSw2OvrdVal	User override value for Service_Brake_Switch_2
	T_DIP_ServiceBrkSw2RLOC	Resource locator for Service_Brake_Switch_2. A value of 0XFFFF shall be considered a nonexistent resource.
	T_DIP_ServiceBrkSwInversion	When asserted, the output for Service_Brake_Switch shall be inverted.
	T_DIP_ServiceBrkSwOvrdEn	Enables/disables user override of Service_Brake_Switch. When Enabled, Service_Brake_Switch will be set equal to the value of H_ DIP_ ServiceBrkSwOvrdVal
	T_DIP_ServiceBrkSwRLOC	Resource locator for Service_Brake_Switch. A value of 0XFFFF shall be considered a nonexistent resource.
	T_DIP_Shutdwn_Ovrd_Inversion	When enabled, inverts the value of EPF_Shutdown_Override_Switch (Converts from Active high to Active Low)
	T_DIP_Shutdwn_Ovrd_User_Ovrd_En	When enabled, allows user to override value of EPD_Shutdown_Override_Switch. EPD_Shutdown_Override_Switch is set to the value of DIP_Shutdwn_Ovrd_User_Ovrd_Val.
	T_DIP_Test_Switch_Inversion	When True (1), this trim will allow for an inversion of the logic followed when reading the diagnostic test switch discrete input.
	T_DIP_Test_Switch_RLOC	Resource locator for the diagnostic test switch. A value of FFFF is considered to mean that the diagnostic test switch is not a physical input to the system.
	T_DIP_Test_Switch_User_Ovrd_En	When enabled, overrides the physical output Test_Switch using DIP_Test_Switch_User_Ovrd_Val.
	T_DIR_FaultSnapshotAssociation[0]	This array is provided for the fault snapshot utility to associate errors/faults with the specific snapshot records in the snapshot table.
	T_DIR_Fault_Snapshot_Table[0]	Table containing the snapshot information for an error that is active or was previously a
	T_DLC_Offset_Enable	Enables the TSC1 Speed Request- NDOT Demand Offset logic. Based on the error between the
	T_DL_Blk_Tbl_Enable	Enable of datalink blocking table feature.
	T_DL_Cntrl_History_Enable	Enable of datalink control history enable.
	T_DL_OOG_Address	Address for either DL_OutOfGear or CNH_OutOfGear. When selected, the Out Of Gear value will be obtained from the associated address.
	T_DM13_Enable	Enables the DM13 Diagnostic message which can be used to start/stop normal ECM broadcast.
	T_DOP_BrkLamp_Inversion	Invert output of engine brake lamp.
	T_DOP_BrkLamp_User_Ovrd_En	Override enable for Engine Brake Lamp
	T_DOP_DPFLampEnable	This is a required parameter which indicates to the tool whether the DPF Regen Lamp feature is enabled or disabled.
	T_DOP_ERC_BrkLamp_RLOC	RLOC for engine brake lamp, this should be a reconfigurable I/O that is shared with the Ether Start output. Enable T_ERC_Engine_BrkLampSel for output.
	T_DOP_ExhBrkDriver_RLOC	Resource locator for the Exhaust Brake discrete driver physical output
Lamp Trims	T_DOP_FLC_MIL_Inversion	When True (1), this trim will allow for an inversion of the logic followed when setting the Malfunction Indicator lamp discrete ouput.
	T_DOP_FLC_MIL_RLOC	Resource locator for the Malfunction Indicator lamp. A value of FFFF is considered to mean that the Malfunction Indicator lamp is not a physical

		output to the system.
	T_DOP_FLC_MIL_User_Ovrd_En	When enabled, overrides the physical output Malfunction Indicator Lamp using DOP_FLC_MIL_User_Ovrd_Val.
	T_DOP_FLC_Maint_Inversion	When True (1), this trim will allow for an inversion of the logic followed when setting the maintenance lamp discrete ouput.
	T_DOP_FLC_Maint_RLOC	Resource locator for the maintenence fault lamp. A value of FFFF is considered to mean that the maintenance fault lamp is not a physical output to the system.
	T_DOP_FLC_Maint_User_Ovrd_En	Overrides the maintenance fault lamp when enabled.
	T_DOP_FLC_Stop_Inversion	When True (1), this trim will allow for an inversion of the logic followed when setting the stop lamp discrete ouput.
	T_DOP_FLC_Stop_RLOC	Resource locator for the stop fault lamp. A value of FFFF is considered to mean that the stop fault lamp is not a physical output to the system.
	T_DOP_FLC_Stop_User_Ovrd_En	When enabled, overrides the physical output Stop_Fault_Lamp using DOP_FLC_Stop_User_Ovrd_Val.
	T_DOP_FLC_Warning_Inversion	When True (1), this trim will invert the setting of Warning_Fault_Lamp.
	T_DOP_FLC_Warning_RLOC	Resource locator for the warning fault lamp. A value of FFFF is considered to mean that the warning fault lamp is not a physical output to the system.
	T_DOP_FLC_Warning_User_Ovrd_En	When enabled, overrides the physical output Warning_Fault_Lamp using DOP_FLC_Warning_User_Ovrd_Val.
	T_DOP_Lamp_ID4_Inversion	When True (1), this trim will allow for an inversion of the logic followed when setting the lamp ouput.
	T_DOP_Lamp_ID4_RLOC	Resource locator for the pwm lamp. A value of FFFF is considered to mean that the lamp is not a physical output to the system.
	T_DOP_Lamp_ID4_User_Ovrd_En	When enabled, overrides the physical output Lamp4 using H_DOP_Lamp4_User_Ovrd_Val.
	T_DOP_Lamp_ID5_Inversion	When True (1), this trim will allow for an inversion of the logic followed when setting the lamp ouput.
	T_DOP_Lamp_ID5_RLOC	Resource locator for the pwm lamp. A value of FFFF is considered to mean that the lamp is not a physical output to the system.
	T_DOP_Lamp_ID5_User_Ovrd_En	When enabled, overrides the physical output Lamp5 using H_DOP_Lamp5_User_Ovrd_Val.
	T_DOP_Lamp_ID6_Inversion	When True (1), this trim will allow for an inversion of the logic followed when setting the lamp ouput.
	T_DOP_Lamp_ID6_RLOC	Resource locator for the lamp id 6. A value of FFFF is considered to mean that the lamp is not a physical output to the system.
	T_DOP_Lamp_ID6_User_Ovrd_En	When enabled, overrides the physical output Lamp6 using DOP_Lamp_ID6_User_Ovrd_Val.
Daul PWM	T_DPWM_Acc1_RLOC	Resource Locator for Dual PWM Accelerator Pedal 1 physical input.
	T_DPWM_Acc2_RLOC	Resource Locator for Dual PWM Accelerator Pedal 2 physical input.
Driver Reward	T_DRS_CC_RSG_Option	This parameter selects how feature outputs should be applied.
	T_DRS_Enable	This parameter indicates to the tool whether Driver Reward is enabled or disabled.
	T_DRS_FuelEco_Thd1	Trimmable fuel economy value above which the highest driver reward level will be applied.
	T_DRS_FuelEco_Thd2	Trimmable fuel economy value above which the second highest driver reward level will be applied.
	T_DRS_FuelEco_Thd3	Trimmable fuel economy value above which the third highest driver reward level will be applied.
	T_DRS_IdleTimePct1	Percent idle time value below which the highest driver reward level will be applied.
	T_DRS_IdleTimePct2	Percent idle time value below which the second highest driver reward level will be applied.
	T_DRS_IdleTimePct3	Percent idle time value below which the third highest driver reward level will be applied.
	T_DRS_RSG_CC_Reward1	The best reward for CC/RSG.
	T_DRS_RSG_CC_Reward2	The second best reward for CC/RSG.
	T_DRS_RSG_CC_Reward3	The third best reward for CC/RSG.
	T_DRS_RSG_CC_Reward4	The least reward for CC/RSG.
	T_Density_Cold_Increment_Enable	Enable Cold Fueling Increment for DCx
Diagnostic Switch Multiplexing	T_Diagnostic_Switch_Mux_Enable	This is a required parameter which indicates to the tool whether the Diagnostic Switch Multiplexing feature is enabled or disabled.
EGR/Assist	T_EAC_User_Override	User override enable for EGR/Assist
	T_TGC_User_Override	User override enable for EGR/Assist

EDC	T_EDC_Collector_Center_Address	This is the GTIS_Collector_Buffer center address of 'Valid Data'.
	T_EDC_Collector_Enable	Enables/disables the engineering data collector functionality of the ECM.
	T_EDC_Collector_End_Address	Address of the byte immediately following the last byte of valid data collected in the GTIS_Collector_Buffer regardless of the mode set in T_EDC_Collector_Stop_Mode.
	T_EDC_Collector_ID_Table[0]	List of public data identifiers to be saved for each data collector record.
	T_EDC_Collector_Interrupt_ID	Each value in the table corresponds to an interrupt. Interrupts include: EPS=1, VSS=2
	T_EDC_Collector_Interval	Value k indicates that k-1 interrupts are to be ignored, then on every kth interrupt, a c
	T_EDC_Collector_Offset	-- offset
	T_EDC_Collector_Start_Address	The GTIS_Collector_Buffer start address of 'Valid Data' regardless of the mode
	T_EDC_Collector_Stop_Mode	Indicator as to how much data is to be recorded following occurrence of T_EDC_Collector_T
	T_EDC_Collector_Trigger	This trigger initiates collection of data into the GTIS_Collector_Buffer for engineering
EDF	T_EDF_CCP_SL1_Duration	Duration at which this signal has been in the least severe severity level range.
	T_EDF_CCP_SL2_Duration	Duration at which this signal has been in the second most severe severity level range.
	T_EDF_CCP_SL3_Duration	Duration at which this signal has been in the most severe severity level range.
	T_EDF_CL_SL3_Duration	Duration at which this signal has been in the most severe severity level range.
	T_EDF_CT_SL1_Duration	Duration at which this signal has been in the least severe severity level range.
	T_EDF_CT_SL2_Duration	Duration at which this signal has been in the second most severe severity level range.
	T_EDF_CT_SL3_Duration	Duration at which this signal has been in the most severe severity level range.
	T_EDF_ES_SL1_Duration	Duration at which this signal has been in the least severe severity level range.
	T_EDF_ES_SL2_Duration	Duration at which this signal has been in the second most severe severity level range.
	T_EDF_ES_SL3_Duration	Duration at which this signal has been in the most severe severity level range.
	T_EDF_IMT_SL1_Duration	Duration at which this signal has been in the least severe severity level range.
	T_EDF_IMT_SL2_Duration	Duration at which this signal has been in the second most severe severity level range.
	T_EDF_IMT_SL3_Duration	Duration at which this signal has been in the most severe severity level range.
	T_EDF_OP_SL1_Duration	Duration at which this signal has been in the least severe severity level range.
	T_EDF_OP_SL2_Duration	Duration at which this signal has been in the second most severe severity level range.
	T_EDF_OP_SL3_Duration	Duration at which this signal has been in the most severe severity level range.
	T_EDF_OT_SL1_Duration	Duration at which this signal has been in the least severe severity level range.
	T_EDF_OT_SL2_Duration	Duration at which this signal has been in the second most severe severity level range.
	T_EDF_OT_SL3_Duration	Duration at which this signal has been in the most severe severity level range.
Engineering Data Monitor	T_EDM_Enable	Feature enable for the Engineering Data Monitor (EDM).
EGA	T_EGA_Brushless_Motor_RLOC	Resource location for the brushless motor.
	T_EGA_Cmd_User_Override	EGR position Command override Enable for the egr valve controller. [From 02 -- Units: UNITLESS Size:2 Digits:0 Signed:U Scalar:1] [Jims comp:{EGRD}]
	T_EGA_Cycle_Counter	Counter for number of EGR valve closing over its lifetime [From 02 -- Units: CNTS Size:4 Digits:0 Signed:U Scalar:1] [Jims comp:{EGRD}]
	T_EGA_Dr_IC_OT_Fault_Clear_En	Allow EGR actuator IC over temperature fault to be cleared
	T_EGA_Dr_IC_OT_Fault_Retry_En	Allow retry after EGR actuator IC over temperature fault
	T_EGA_Dr_Open_Fault_Clear_En	Allow EGR actuator open circuit fault to be cleared
	T_EGA_Dr_Open_Fault_Retry_En	Allow retry after EGR actuator open circuit fault
	T_EGA_Dr_PwrLo_Fault_Clear_En	Allow EGR actuator low power supply fault to be cleared

	T_EGA_Dr_PwrLo_Fault_Retry_En	Allow retry after EGR actuator low power supply fault
	T_EGA_Dr_Short_Fault_Clear_En	Allow EGR actuator short circuit fault to be cleared
	T_EGA_Dr_Short_Fault_Retry_En	Allow retry after EGR actuator short circuit fault
	T_EGA_Enable_Driver_OC_Give_Up	Resets counter/timer and latch in ega over current prot. logic [From 02 -- Units: UNITLESS Size:2 Digits:0 Signed:U Scalar:1] [Jims comp:{EGRD}]
	T_EGA_PWM_User_Override	EGR position Command override Enable for the egr valve controller. [From 02 -- Units: UNITLESS Size:2 Digits:0 Signed:U Scalar:1] [Jims comp:{EGRD}]
	T_EGA_Pos_Cir_Fault_Clear_En	Enable the clearing of EGR valve position circuit open/short fault
	T_EGA_Pos_Seq_Fault_Clear_En	Enables the clearing EGR valve position sequence fault
	T_EGR_DP_IR_Startup_Enable	EGR Delta Press IR startup enable
	T_EGR_Delta_P_AZ_User_Override	This trim allows theEGR_Delta_Press Autozero to be overriden.
	T_EGR_Delta_P_Autozero_Offset	Offset for EGR Delta-P sensor readings [From 02 -- Units: IN_HG Size:2 Digits:3 Signed:S Scalar:0.01590625] [Jims comp:{EGRD}]
Ether Injection	T_EIS_FullBottleTime	Amount of ether available in units of time. If the valve were left open, this trim is th
	T_EIS_Relay_RLOC	Rloc for ether injection. It can be PWM or Discrete RLOC.
	T_Ether_Injection_Enable	This is a required parameter which is used to enable or disable the Ether Injection feature.
EMM	T_EMM_Def_State_User_Override	EMM NTE deficiency state user override enable
	T_EMM_Prot_State_User_Override	EMM general engine protection state user override enable
EMO	T_EMO_Stationary_Pwr_AECD_En	Trim to enable the air handling AECD logic of the emissions manager
Engine Out Nox Sensor	T_EONOx_O2_Sensor_RLOC	RLOC for enigne out O2 sensor
	T_EONOx_Sensor_RLOC	RLOC for enigne out nox sensor
	T_EONOx_User_Override_En	User override enable for Engine out NOx
Engine Overload Protection	T_EOP_Accelerator_Clear_Thd	When Commanded_Accelerator_Pedal is below this threshold for more than T_EOP_Clear_Time the Engine_Overload_Error is cleared
	T_EOP_Clear_Time	Time required to clear the Engine_Overload_Error when the conditions are satisfied
	T_EOP_Enable	Engine Overload Protection Enable
	T_EOP_Engine_Speed_Clear_Thd	If Engine Speed is below this Thresold for more than C_EOP_Clear_Time the Engine_Overload_Error will be cleared.
	T_EOP_Fault_Set_Time	Minimum time for which Net_Brake_Torque should be greater then Alternate_Torque_Curve1 after which Engine_Overload_Error would be set
EPD	T_EPD_Aux_Sd_Sw_Mux_Address	Source address of device sending the EPD Auxiliary Shutdown Switch signal.
	T_EPD_Aux_Sd_Sw_Mux_Enable	This is a required parameter which indicates to the tool whether the EPD Auxiliary Shutdown Switch Multiplexing feature is enabled or disabled.
	T_EPD_Aux_Sev_SD_En	Primary enable for the Auxiliary Shutdown Switch feature.
	T_EPD_CCP_Restart_Lim_En	This is the crankcase pressure restart limitation enable flag.
	T_EPD_CCP_Torque_Derate_En	This trim will enable the engine protection torque derate functionality for the crankcase
	T_EPD_CCP_Trq_Drt_Log[0]	This is a log of the five most recent torque derate occurances for crankcase pressure th
	T_EPD_CHT_RPM_Drt_Log[0]	"This is a log of the five most recent rpm derate occurances for charge temperature
	T_EPD_CHT_Trq_Drt_Log[0]	"This is a log of the five most recent torque derate occurances for charge temperatu
	T_EPD_CLSD_Ovrd_Command_RLOC	Resource locator for the Coolant Level Shutdown Override Command datalink input. This is a datalink only input.
	T_EPD_CLSD_Ovrd_Mux_En	Enable for Coolant Level Shutdown Override via MUX input.
	T_EPD_CLSD_Ovrd_Time_Trq_SD_En	Allows tool to enable/disable coolant level shutdowns when using the Coolant Level Shutdown Override feature. This feature is intended for HHP/PowerGen applications.
	T_EPD_CL_Time_Trq_SD_En	Enables/Disables Engine Protection Shutdowns on the Coolant Level Channel.
	T_EPD_CL_Trq_Drt_En	Enables/Disables Engine Protection Torque Derate on the Coolant Level Channel.
	T_EPD_CL_Trq_Drt_Log[0]	This is a log of the five most recent torque derate occurances for coolant level that is saved during powerdown. The log consists of occurance time and the duration of the occurance.

	T_EPD_COT_Trq_Drt_Log[0]	"This is a log of the five most recent torque derate occurances for COT that is sav
	T_EPD_CP_Trq_Drt_Log[0]	This is a log of the five most recent torque derate occurences for coolant pressure that
	T_EPD_CT_RPM_Drt_Log[0]	This is a log of the five most recent speed derate occurances for coolant temperature th
	T_EPD_CT_Trq_Drt_Log[0]	This is a log of the five most recent torque derate occurances for coolant temperature t
	T_EPD_EGR_RPM_Drt_Log[0]	"This is a log of the five most recent rpm derate occurances for EGR Orifice Tempera
	T_EPD_EGR_Trq_Drt_Log[0]	"This is a log of the five most recent torque derate occurances for EGR orifice temp
	T_EPD_EMT_Trq_Drt_Log[0]	"This is a log of the five most recent torque derate occurances for Exhaust Metal Te
	T_EPD_EP_RPM_Drt_Log[0]	"This is a log of the five most recent rpm derate occurances for Exhaust Pressure t
	T_EPD_Engine_Protection_En	Global trim which will Enable/disable all engine protection derates and shutdowns.
	T_EPD_FT_RPM_Drt_Log[0]	This is a log of the five most recent speed derate occurances for fuel temperature that
	T_EPD_FT_Trq_Drt_Log[0]	This is a log of the five most recent torque derate occurances for fuel temperature that
	T_EPD_Mux_Eng_Shut_ID	This trim identifies the NTN for the EPD Auxiliary Shutdown DL parameter that is desired.
	T_EPD_OP_RPM_Drt_Log[0]	This is a log of the five most recent speed derate occurances for oil pressure that is s
	T_EPD_OP_Trq_Drt_Log[0]	This is a log of the five most recent torque derate occurences for oil pressure that is
	T_EPD_OT_RPM_Drt_Log[0]	This is a log of the five most recent RPM derate occurences for oil temperature that is s
	T_EPD_OT_Trq_Drt_Log[0]	This is a log of the five most recent torque derate occurences for oil temperature that i
	T_EPD_Override_Switch_Function	Tool adjustable parameter that dictates the functionality of the EPD override switch. Wh
	T_EPD_Overspeed_Log[0]	This is a log of the five most recent engine overspeed occurances that are saved during p
	T_EPD_Overspeed_Protection_En	Nonfunctional flag. It has no effect on the status of the overspeed protection. It is used for the service tool to determine whether or not to display data.
	T_EPD_Restart_Counter	This power down trim counts the number of times an engine restart is attempted without a given shutdown condition being eliminated.
	T_EPD_Restart_En	This trim enables the Engine Protection function's resart limitaiton algorithm.
	T_EPD_SL_RPM_Drt_Log[0]	This is a log of the five most recent speed derate occurances for Soot Load that is saved
	T_EPD_SL_Trq_Drt_Log[0]	This is a log of the five most recent torque derate occurances for Soot Load that is save
	T_EPD_Shutdown_En	When enabled this trim will allow shutdown requests to be passed on to the machine from the engine manager. SRS 3.1.2.2.2.
	T_EPD_Shutdown_Override_En	This trim, when enabled, allows the operator to override Engine Protection shutdown
	T_EPD_Shutdown_Override_Rloc	Resource locator for engine shutdown override switch.
	T_EPD_ShutdwnOvrdSwMuxEnable	This is a required parameter which indicates to the tool whether the EPD shutdown switch Multiplexing feature is enabled or disabled.
	T_EPD_TDP_RPM_Drt_Log[0]	"This is a log of the five most recent rpm derate occurances for charge temperature
	T_EPD_TDP_Trq_Drt_Log[0]	"This is a log of the five most recent torque derate occurances for DPOS that is sa
Engine Brake Control	T_ERC_ClutchEn	When true will consider the clutch input as a condition to activate/inactive engine retarder control..
	T_ERC_Enable	Trim which signifies the engine brake feature is available or not.
	T_ERC_EngineBrkLampEnable	Enable for Engine Brake Lamp discete output.
	T_ERC_FractionUserOverride	Enables user override of Driver Fraction command from retarder
	T_ERC_MinEngageVehSpd	The vehicle speed above which engine retarder control may be enabled.
	T_ERC_On_Delay	Minimum required duration engine braking is initiated.
	T_ERC_RetarderType	Indicates type of retarder installed. 2=COMPRESSION, 1=DRIVELINE, 0=EXHAUST
	T_ERC_ServiceBrkActivateEn	When true will consider the service brake as a condition to activate/inactivate engine retarder control.
	T_ERC_ServiceBrkDelay	Time within which the service brake must be depressed to satisfy the enable requirement.

	T_ERC_Smart_Brake_Mode_En	Enable flag for Smart Braking Mode. Smart Braking Mode allows the driver to hold a const
	T_ERC_SwLvl_OvrdEn	Trim which allows the system to override the RetarderSwitchLevel calculation.
	T_ERC_TrqUserOvrdEn	Trim which allows the system to override the braking torque as determined by selectable switches.
EXM	T_EXM_Acc_Pedal_Condi_Disable	A Trim to disable NDOT_Pathowner check in Accelerator Pedal Condition.
	T_EXM_Mission_RTS_En	A Trim to allow Remote Throttle Switch condition in Mission Regen PTO in Operation condition Check
	T_EXM_MobileRegenVehSpdDisThd	Vehicle Speed below which Mobile DPF Regeneration is disengaged
	T_EXM_NoMission_ABS_En	A global Trim to allow ABS condition in No Mission Regen Control condition Check
	T_EXM_NoMission_ALTIdle_En	A global Trim to allow Alternate Idle condition in No Mission Regen Control condition Check
	T_EXM_NoMission_Ind_GlobalEn	A global Trim to allow some Industrial DESOOT No-Mission Regen conditions.
	T_EXM_NoMission_OEM_En	A global Trim to allow OEM EPD condition in No Mission Regen Engine Protection Check
	T_EXM_NoMission_OEM_Press_AboveEn	A Trim to select OEM Press Above Theshold condition in No Mission Regen OEM Status Check
	T_EXM_NoMission_OEM_Press_Diable	A Trim to disable OEM Press condition in No Mission Regen OEM Status Check
	T_EXM_NoMission_OEM_Press_Thd	OEM Pressure threshold below or Above which non-mission regens are permitted
	T_EXM_NoMission_OEM_Tmptr_AboveEn	A Trim to select OEM Temperature Above Theshold condition in No Mission Regen OEM Status Check
	T_EXM_NoMission_OEM_Tmptr_Diable	A Trim to disable OEM tmptr condition in No Mission Regen OEM Status Check
	T_EXM_NoMission_OEM_Tmptr_Thd	OEM Temperature threshold below or Above which non-mission regens are permitted
	T_EXM_NoMission_OTG_Disable	A Trim to disable Out of Gear condition in No Mission Regen
	T_EXM_NoMission_PTO_Disable	A Trim to disable PTO status condition in No Mission Regen PTO status Check
	T_EXM_NoMission_USHFT_Disable	A Trim to disable UpShift condition in NO mission Regen Control State Check
	T_EXM_NonMission_Pedal_Threshold	Throttle threshold below which non-mission regens are permitted
	T_EXM_OEM_Press_Diff_Thd	OEM Pressure Hysterisis threshold which non-mission regens are permitted
	T_EXM_OEM_Tmptr_Diff_Thd	OEM Press threshold below or Above which non-mission regens are permitted
	T_EXM_PTORegenEnable	Trim to allow DESOOT operations in PTO
	T_EXM_ParkingBrakeEnCond	Trim to allow Parking Brake to be enabled before a parked regeneration of the after treatment can occur
	T_EXM_Stay_Warm_Enable	Trim to allow stay warm
Electrical System Voltage	T_Electrical_System_Voltage	Set this parameter to 0 12 volt system or 1 for 24 volt system.
Engine Warm-up Protection	T_Engine_Warmup_Protection_En	Trim which will Enable/disable engine warmup protection
Fan Control	T_FCC_AC_Comp_Enable	When True (1), Enables the activation of the air conditioning compressor swtich and fan interaction.
	T_FCC_AC_Pressure_En	When True (1), Enables the activation of the air conditioning pressure swtich and fan interaction.
	T_FCC_AC_Pressure_Switch_Rloc	Resource locator for air conditioner pressure switch. A value of 0 is considered to mean that the air conditioner pressure switch is not a physical input to the system.
	T_FCC_AC_Time	The time that must pass at each fan request level, before evaluating whether the fan request should be increased due to AC pressure switch being on.
	T_FCC_AC_VS_Interaction_En	When True (1), Allows special AC pressure switch functionality. It takes into acoount road speed in the control of fan due to pressure switch.
	T_FCC_CAC_Outlet_Tmptr_En	When True (1), Enables the activation of the CAC outlet temperature and fan interaction.
	T_FCC_Charge_Tmptr_En	When True (1), Enables the activation of the charge temperature and fan interaction.
	T_FCC_Coolant_Tmptr_En	When True (1), Enables the activation of the coolant temperature and fan interaction.
	T_FCC_Engine_Brake_En	When True (1), Enables the activation of the EB and fan interaction. fan turns on when Engine brakes turn on to provide additional engine brake torque.
	T_FCC_FLM_2_En	This trim enables the Fan Level 2 Multiplexing feature.

	T_FCC_FLM_En	This trim enables the Fan Level Multiplexing feature.
	T_FCC_FanSpeedOvrdEn	Trim indicates if the fan speed user override feature is enabled.
	T_FCC_FanSpeed_Rloc	Resource locator for fan speed input.
	T_FCC_Fan_2_Request_Rloc	Indicates the desired Fan Level 2 I/O configuration.
	T_FCC_Fan_Clutch_Driver2_Rloc	Resource locator for the second fan device driver.
	T_FCC_Fan_Clutch_En	Global enable for the fan clutch algorithm. When True (1), fan clutch is controlled based on system requirements.
	T_FCC_Fan_Clutch_PWM2_Period	The commanded PWM 2 period of the fan clutch for the TRI_STATE fan type.
	T_FCC_Fan_Clutch_PWM_Period	The commanded PWM period of the fan clutch for the _ON_OFF or _VARIABLE_SPEED fan types.
	T_FCC_Fan_Clutch_PWM_Rloc	Resource locator for the fan PWM device driver.
	T_FCC_Fan_Output_Override	When True (1), the fan request value will be FCC_Fan_Output_User_Value.
	T_FCC_Fan_Request_Rloc	Indicates the desired Fan Level I/O configuration.
	T_FCC_Fan_Type_Selection	Fan drive type select. (0=on/off, 1=variable speed, 2=three speed, 3=Elec viscous no spd
	T_FCC_Fuel_Temperature_En	When True (1), Enables the activation of the fuel temperature and fan interaction.
	T_FCC_Manual_Fan_Switch_Rloc	Resource locator for the operator fan switch.
	T_FCC_Manual_Input_En	When True (1), Enables the activation of the Manual Fan Switch and fan interaction.
	T_FCC_Min_On_Time	Minimum time fan will run each time it is turned on.
	T_FCC_OEM_Press2_Enable	When True (1), Enables the activation of the OEM_Pressure_2 and fan interaction.
	T_FCC_OEM_Pressure_En	When True (1), Enables the activation of the OEM pressure and fan interaction.
	T_FCC_OEM_Temperature_En	When True (1), Enables the activation of the OEM temperature and fan interaction.
	T_FCC_OEM_Tmptr2_Enable	When True (1), Enables the activation of the OEM_Temperature_2 and fan interaction.
	T_FCC_Off_Ramp_Rate	The allowable rate at which the fan request is permitted to change when requesting the fan off.
	T_FCC_On_Ramp_Rate	The allowable rate at which the fan request is permitted to change when requesting the fan on.
	T_FCC_PWM2_Inversion	When True (1), This trim will allow for an inversion of the logic followed in determining the PWM 2 duty cycle fan driver signal.
	T_FCC_PWM_Inversion	When True (1), This trim will allow for an inversion of the logic followed in determining the PWM duty cycle fan driver signal.
	T_FCC_RT_En	When True (1), Enables the activation of the remote throttle swtich and fan interaction.
	T_FCC_SIP_Lock_Fan_Enable	When True (1), Allows the Shift In Progress flag to lock the fan in its current state (i.e. ON or OFF) until the shift has completed.
Fuel Consumption Rate	T_FCR_Enable	This variable enables the Fuel Consuption Rate monitoring functionality.
Feature Exclusivity Monitor	T_FEM_Enable	This parameter will enable the Feature Exclusivity Monitor in the system
	T_FIP_TurboSpeedRLOC	This trim is the resource id that is associated with the config_fi_device for turbo speed processing.
Fast Idle Warmup	T_FIW_Desired_Reference_Speed	Desired FIW reference Speed
	T_FIW_Enable	Indicates to the tool whether the Fast Idle Warmup feature is enabled in the ECM. 1=Enable Fast Idle Warmup.
	T_FIW_PTO_Load_Threshold	The PTO load threshold below which Fast Idle Warmup will activate.
Fuel Level	T_FL2_Enable	Feature Enable for Fuel Level 2.
	T_FL2_UserOverrideEnable	When set to 1, Fuel_Level2 is set to H_FL2_UserOverrideValue.
	T_FLC_Inc_Dec_En	When False (0), this trim will ignore the diagnostic increment and decrement switches from changing the current fault in the table CXLT_Active_Fault_Table.
	T_FLC_Throt_Activated_Diag_En	Enables the throttle activated fault flashout sequence request.
	T_FL_Enable	Feature Enable for Fuel Level.
	T_FL_UserOverrideEnable	When set to 1, Fuel_Level is set to H_FL_UserOverrideValue.
Fuel Temp	T_FSI_ct_FuelTempRLOC	Resource Locator for Fuel Temperature physical input

	T_FSI_ct_FuelTempSupplyRLOC	Resource locator passed to Get_input_a2d in order to obtain the Fuel Temperature Sensor Supply's voltage
Friction Torque	T_Friction_Trq_Table_Selection	If value is 1, then Friction_Torque will be dependent on C_ENGN_Friction_Trq_Table. If value is 0, then Friction_Torque will be dependent on Chen-Flynn model.
Transmission Type	T_GEAR_VSSTransmission	This trim specifies the vehicles type of transmission.
GTIS	T_GTIS_Collector_Enable	Enables/disables the Data Collector2 functionality of the ECM.
	T_GTIS_CustomerName[0]	Data plate information - Owner of the Machine in which the engine is operating
	T_GTIS_CustomerName2[0]	Data plate information - Owner of the Machine in which the engine is operating
	T_GTIS_EngineBuildDate	Data Plate information - Date (m,d,y format) that the engine was built
	T_GTIS_Location[0]	Data Plate information - Machines home base of operations. Stored in 15 byte ASCII format.
	T_GTIS_Location2[0]	Data Plate information - Machines home base of operations. Stored in 60 byte ASCII format.
	T_GTIS_OEMName[0]	Data Plate information - Name of the OEM that Manufactured the machine in which the engine is placed.
	T_GTIS_OEMName2[0]	Data Plate information - Name of the OEM that Manufactured the machine in which the engine is placed.
	T_GTIS_OEMVehicleOrEquipmentID[0]	Data Plate information - Model number for the machine in which the engine is installed. Stored as 15 bytes ASCII.
	T_GTIS_OEMVehicleOrEquipmentID2[0]	Data Plate information - Model number for the machine in which the engine is installed. Stored as 60 bytes ASCII.
	T_GTIS_SystemDescription[0]	System Description parameter for GTIS
	T_GTIS_SystemModel[0]	Data Plate information - Engine model number. Stored in 17 byte ASCII format
	T_GTIS_SystemSerialNumber	Data Plate information - Engine's serial number stored in 4 byte binary format
	T_GTIS_UnitNumber[0]	Data Plate information - Machine's unit number. Determined by Customer. Stored as 10 byte ASCII.
	T_GTIS_UnitNumber2[0]	Data Plate information - Machine's unit number. Determined by Customer. Stored as 60 byte ASCII.
	T_GTIS_VINOrEquipmentSerialNum[0]	Data Plate information - Vehicle identification number or equipment's serial number. Set by OEM. Stored as 20 byte, free format, ASCII.
	T_GTIS_VehicleOrEquipmentYear[0]	Data Plate information - Date of manufacture for machine in free format ASCII. Set by OEM. Stored in 10 byte ASCII format.
Hydrocarbon Injection Manager	T_HIM_DC_UsedUp_Diag_Enbl	Calibration to enable used up OBD by doser limitation
	T_HIM_DFM_Diag_Enbl	The option to enable doser flow monitoring
	T_HIM_DFM_OBD_Enbl	Opiton for doser efficiency or doser compensation source. It is one for DFM algorithm and zero for dosing efficiency algorithm
	T_HIM_DIAG_Test_Enbl	Enables the Diagnostic tests, 1 = true.
	T_HIM_pc_DutyCycle	Duty cycle from service tool for hydro carbon injector override test
	T_HIM_pr_Virtual_Injection_Enbl	Enable for Virtual Pressure table.
High Side Driver	T_HSD_EIS_Relay_Inversion	Inversion flag for EIS HSD output
	T_HSD_EIS_Relay_Override_En	User override enable for high side driver.
High speed Idle	T_HSI_Breakpoint_Speed	HSI Breakpoint Speed at switched droop position 1
	T_HSI_Breakpoint_Speed_2	HSI Breakpoint Speed at switched droop position 2
	T_HSI_Breakpoint_Speed_3	HSI Breakpoint Speed at switched droop position 3
	T_HSI_Droop	High Speed Idle Droop used when Droop switch is in position 1, or when there is no droop switch.
	T_HSI_Droop_2	High Speed Idle Droop used when Droop switch is in position 2.
	T_HSI_Droop_3	High Speed Idle Droop used when Droop switch is in position 3.
	T_HSI_Isochronous_Speed	HSI Isochronous Speed at switched droop position 1
	T_HSI_Isochronous_Speed_2	HSI Isochronous Speed at switched droop position 2
	T_HSI_Isochronous_Speed_3	HSI Isochronous Speed at switched droop position 3
	T_HSI_SwMaxRPMEnable	This is a required parameter which indicates to the tool whether the Switched Max Operating Speed feature is enabled or disabled.
	T_HSI_SwMaxRPM_Isoc_Spd	HSI Switched Max Operating Isochronous Speed when HSI_SwMaxRPM_Selected ==1

	T_HSI_SwMaxRPM_Isoc_Spd2	HSI Switched Max Operating Isochronous Speed when HSI_SwMaxRPM_Selected ==2
	T_HSI_SwMaxRPM_Sel_Sw	Selects the switch type for Switched Max Op Speed: 0=Active Open, 1=Active Closed
High Soot Load Shutdown	T_HSLS_Enable	Tool-adjustable enable for High Soot Load Shutdown 1=Enabled, 0=Disabled
Hot Shutdown	T_HSSTRelay_HW_RLOC	Resource Locator for HSST Relay
	T_HSST_Driver_Diag_En	This trim, when TRUE, enables the use of Hot Shutdown driver diagnostics.
	T_HSST_En	This trim, when enabled, turns on the the Hot Shutdown Smart Timer feature
	T_INM_EGRT_Lead_Enable	Enables EGR Orifice Temperature lead compensation algorithm
	T_INM_ICT_Lead_Enable	Enables Charge Temperature lead compensation algorithm
Idle Shutdown	T_ISDRelay_HW_RLOC	Resource Locator for Idle Shutdown Relay .
	T_ISD_AAT_Unlatch_Enable	Enables the release of manual override latch based on Ambient Air Temperature in Manual Override Inhibit Zone (between Intermediate and Hot AAT) for idle shutdown feature
	T_ISD_CoolantTmptr_Thd	Temperature below which an idle shutdown will not occur
	T_ISD_Enable	Indicates to the tool whether the Idle Shutdown feature is enabled in the ECM.
	T_ISD_GHG_Enable	Enable flag for the Idle Shutdown Greenhouse Gas regulation
	T_ISD_GHG_Expiration_Distance	Total distance travelled by the vehicle after which customers can request for OEM password to disable Green House Gas Automatic Engine Shutdown feature.
	T_ISD_High_Tmp_AutoOvrd_En	Selects Idle Shutdown High Temperature Manual/Automatic Override Option. 0=Manual, 1=Automatic
	T_ISD_Loading_Thd	Engine load above which idle shutdown will not occur.
	T_ISD_MinAmbAir_Tmptr	Idle Shutdown is disabled below this temperature
	T_ISD_NoOvrdHigh_Thd	Upper threshold of no override temperature range.
	T_ISD_NoOvrdLow_Thd	Lower threshold of no override temperature range.
	T_ISD_Ovrd_Enable	Allows the override of a shutdown
	T_ISD_PB_Sw_Enable	This enable when TRUE allows a shutdown to occur only when Parking Brake Sw is ON
	T_ISD_Period	Time engine will idle before it is shutdown.
	T_ISD_Relay_Enable	Enables Idle Shutdown Relay driver
	T_ISD_ShutdownDuringPTOEn	Selects shutdown option while in PTO mode
	T_ISD_SrvBrkPreventsISDEn	This enable when TRUE prevents a shutdown from occurring when Service Brake Sw is ON
	T_ISD_Tmptr_Enable	Enables shutdown based on Ambient Air Temperature sensor
	T_ISD_WarningPeriod_UserAdj_Val	Lets the user trim the Warning period after which the engine will shutdown. During this w
	T_ISD_Warning_Period_UserAdj_En	This trimmable parameter indicates to the tool whether the Idle Shutdown Warning Period User Adjustable feature is enabled or disabled.
Idle Inc Dec Switch Multiplexing	T_Idle_Inc_Dec_Switch_Mux_Enable	This is a required parameter which indicates to the tool whether the Idle Inc Dec Switch Multiplexing feature is enabled or disabled.
Idle Validation Switch Multiplexing	T_Idle_Validation_Switch_Mux_Enable	This is a required parameter which indicates to the tool whether the Idle Validation Switch Multiplexing feature is enabled or disabled.
J1939 Trims	T_J1939_Communications_Enable	Flag indicating whether J1939 communications are available for the Data Collector BAM transmissions.
	T_J1939_ECU_Instance	The ECU instance for the ECM defined using J1939 NAME format.
	T_J1939_PTO_Sel	This trim parameter is used to decide on which governor
	T_J1939_RTC_Enable	Trim Enable/Disable for obtaining RTC from a datalink device.
	T_J1939_RTC_Source_Address	Source address of the datalink device providing time for the Real Time Clock
	T_J1939_Service_Comp_Reset_En	Enables service component reset asked from Reset PGN.
	T_J1939_Trip_Reset_En	Enables trip info reset asked from Reset PGN.
	T_J39_AC_High_Pressure_Fan_Switch_Mask[0]	The MASK of the NAME of the device providing J39_AC_High_Pressure_Fan_Switch in the Shutdown Message.
	T_J39_AC_High_Pressure_Fan_Switch_NAME[0]	The NAME of the device providing J39_AC_High_Pressure_Fan_Switch in the Shutdown Message.

T_J39_AP_Low_Idle_Switch_Mask[0]	The MASK of the NAME of the device providing J39_AP_Low_Idle_Switch in the EEC2 Message.
T_J39_AP_Low_Idle_Switch_NAME[0]	The NAME of the device providing J39_AP_Low_Idle_Switch in the EEC2 message.
T_J39_Accelerator_Interlock_Switch_Mask[0]	The MASK of the NAME of the device providing J39_Accelerator_Interlock_Switch in the EBC1 Message.
T_J39_Accelerator_Interlock_Switch_NAME[0]	The NAME of the device providing J39_Accelerator_Interlock_Switch in the EBC1 Message.
T_J39_Accelerator_Pedal_Position_Mask[0]	The Mask of the NAME of the device providing J39_Accelerator_Pedal_Position in the EEC2 message.
T_J39_Accelerator_Pedal_Position_NAME[0]	The NAME of the device providing J39_Accelerator_Pedal_Position in the EEC2 message.
T_J39_Aux_Discrete_Input_1_Addr	Address of device which provides the message containing the Auxiliary Discrete I/O #1 (J39_Aux_Discrete_Input_1).
T_J39_Aux_Discrete_Input_1_Mask[0]	Mask for the NAME of the device providing J39_Aux_Discrete_Input_1 in the Auxiliary Discrete I/O PGN.
T_J39_Aux_Discrete_Input_1_NAME[0]	NAME of the device providing J39_Aux_Discrete_Input_1 in the Auxiliary Discrete I/O PGN.
T_J39_Auxiliary_Pressure_1_Mask[0]	Mask for the NAME of the device providing J39_Auxiliary_Pressure_1 in the Auxiliary Analog Information PGN.
T_J39_Auxiliary_Pressure_1_NAME[0]	NAME for the device providing J39_Auxiliary_Pressure_1 in the Auxiliary Analog Information PGN.
T_J39_Auxiliary_Pressure_2_Mask[0]	Mask for the NAME of the device providing J39_Auxiliary_Pressure_2 in the Auxiliary Analog Information PGN.
T_J39_Auxiliary_Pressure_2_NAME[0]	NAME for the device providing J39_Auxiliary_Pressure_2 in the Auxiliary Analog Information PGN.
T_J39_Auxiliary_Shutdown_Switch_Mask[0]	The MASK of the NAME of the device providing J39_Auxiliary_Shutdown_Switch in the EBC1 Message.
T_J39_Auxiliary_Shutdown_Switch_NAME[0]	The NAME of the device providing J39_Auxiliary_Shutdown_Switch in the EBC1 Message.
T_J39_Auxiliary_Temperature_1_Mask[0]	Mask for the NAME of the device providing J39_Auxiliary_Temperature_1 in the Auxiliary Analog Information PGN.
T_J39_Auxiliary_Temperature_1_NAME[0]	NAME for the device providing J39_Auxiliary_Temperature_1 in the Auxiliary Analog Information PGN.
T_J39_Auxiliary_Temperature_2_Mask[0]	Mask for the NAME of the device providing J39_Auxiliary_Temperature_2 in the Auxiliary Analog Information PGN.
T_J39_Auxiliary_Temperature_2_NAME[0]	NAME for the device providing J39_Auxiliary_Temperature_2 in the Auxiliary Analog Information PGN.
T_J39_CC_CancelSwitch_Mask[0]	The MASK of the NAME of the device providing J39_CC_CancelSwitch in the CCVS Message.
T_J39_CC_CancelSwitch_NAME[0]	The NAME of the device providing J39_CC_CancelSwitch in CCVS Message.
T_J39_CC_OnSwitch_Mask[0]	The MASK of the NAME of the device providing J39_CC_OnSwitch in the CCVS Message.
T_J39_CC_OnSwitch_NAME[0]	The NAME of the device providing J39__CC_OnSwitch in CCVS Message.
T_J39_CC_ResumeSwitch_Mask[0]	The MASK of the NAME of the device providing J39_CC_ResumeSwitch in the CCVS Message.
T_J39_CC_ResumeSwitch_NAME[0]	The NAME of the device providing J39__CC_ResumeSwitch in CCVS Message.
T_J39_CC_SetSwitch_Mask[0]	The MASK of the NAME of the device providing J39_CC_SetSwitch in the CCVS Message.
T_J39_CC_SetSwitch_NAME[0]	The NAME of the device providing J39_CC_SetSwitch in CCVS Message.
T_J39_Clutch_Switch_Mask[0]	The MASK of the NAME of the device providing J39_Clutch_Switch in the CCVS Message.
T_J39_Clutch_Switch_NAME[0]	The NAME of the device providing J39_Clutch_Switch in CCVS Message.
T_J39_Coolant_Level_Mask[0]	The MASK of the NAME of the device providing J39_Coolant_Level in the EFL/P1 Message.
T_J39_Coolant_Level_NAME[0]	The NAME of the device providing J39_Coolant_Level in EFL/P1 Message.
T_J39_EBS_Brake_Switch_Src_Addr	Source Address of J1939 device that supplies J39_EBS_Brake_Switch in the EBC1 Message.
T_J39_EPD_Shutdown_Override_Switch_Mask[0]	Mask for the NAME of J1939 device that supplies J39_EPD_Shutdown_Override_Switch in the CCVS Message.
T_J39_EPD_Shutdown_Override_Switch_NAME[0]	The NAME of the device providing J39_EPD_Shutdown_Override_Switch in the CCVS Message.
T_J39_ESC_On_Switch_Mask[0]	The Mask of the NAME of the device providing J39_ESC_On_Switch in CCVS Message.
T_J39_ESC_On_Switch_NAME[0]	The NAME of the device providing J39_ESC_On_Switch in CCVS Message.
T_J39_ESC_Resume_Switch_Mask[0]	The Mask of the NAME of the device providing J39_ESC_Resume_Switch in CCVS Message.
T_J39_ESC_Resume_Switch_NAME[0]	The NAME of the device providing J39_ESC_Resume_Switch in CCVS Message.

T_J39_ESC_Set_Switch_Mask[0]	_The Mask of the NAME of the device providing J39_ESC_Set_Switch in CCVS Message.
T_J39_ESC_Set_Switch_NAME[0]	The NAME of the device providing J39_ESC_Set_Switch in CCVS Message.
T_J39_Idle_Decrement_Switch_Mask[0]	The MASK of the NAME of the device providing J39_Idle_Decrement_Switch in the CCVS Message.
T_J39_Idle_Decrement_Switch_NAME[0]	The NAME of the device providing J39_Idle_Decrement_Switch in CCVS Message.
T_J39_Idle_Increment_Switch_Mask[0]	The MASK of the NAME of the device providing J39_Idle_Increment_Switch in the CCVS Message.
T_J39_Idle_Increment_Switch_NAME[0]	The NAME of the device providing J39_Idle_Increment_Switch in CCVS Message.
T_J39_PTO_Accel_Switch_Mask[0]	The MASK of the NAME of the device providing J39_PTO_Accel_Switch in the PTO Message.
T_J39_PTO_Accel_Switch_NAME[0]	The NAME of the device providing J39_PTO_Accel_Switch in the PTO Message.
T_J39_PTO_Coast_Switch_Mask[0]	The MASK of the NAME of the device providing J39_PTO_Coast_Switch in the PTO Message.
T_J39_PTO_Coast_Switch_NAME[0]	The NAME of the device providing J39_PTO_Coast_Switch in the PTO Message.
T_J39_PTO_Remote_Switch_Mask[0]	The MASK of the NAME of the device providing J39_PTO_Remote_Switch in the PTO Message.
T_J39_PTO_Remote_Switch_NAME[0]	The NAME of the device providing J39_PTO_Remote_Switch in the PTO Message.
T_J39_PTO_Resume_Switch_Mask[0]	The MASK of the NAME of the device providing J39_PTO_Resume_Switch in the PTO Message.
T_J39_PTO_Resume_Switch_NAME[0]	The NAME of the device providing J39_PTO_Resume_Switch in the PTO Message.
T_J39_PTO_Set_Switch_Mask[0]	The MASK of the NAME of the device providing J39_PTO_Set_Switch in the PTO Message.
T_J39_PTO_Set_Switch_NAME[0]	The NAME of the device providing J39_PTO_Set_Switch in the PTO Message.
T_J39_PTO_Switch_Mask[0]	The MASK of the NAME of the device providing J39_PTO_Switch in the PTO Message.
T_J39_PTO_Switch_NAME[0]	The NAME of the device providing J39_PTO_Switch in the PTO Message.
T_J39_PT_Regen_Force_Switch_Mask[0]	Mask of the device that supplies J39_PT_Regen_Force_Switch in the Cab1 message.
T_J39_PT_Regen_Force_Switch_NAME[0]	The NAME of the device providing J39_PT_Regen_Force_Switch in the Cab1 Message.
T_J39_PT_Regen_Inhibit_Switch_Mask[0]	Mask of the device that supplies J39_PT_Regen_Inhibit_Switch in the Cab1 message.
T_J39_PT_Regen_Inhibit_Switch_NAME[0]	The NAME of the device providing J39_PT_Regen_Inhibit_Switch in the Cab1 Message.
T_J39_Parking_Brake_Switch_Mask[0]	The MASK of the NAME of the device providing J39_Parking_Brake_Switch in the CCVS Message.
T_J39_Parking_Brake_Switch_NAME[0]	The NAME of the device providing J39_Parking_Brake_Switch in CCVS Message.
T_J39_Rear_Axle_Ratio_Switch_Mask[0]	The MASK of the NAME of the device providing J39_Rear_Axle_Ratio_Switch in the CCVS Message.
T_J39_Rear_Axle_Ratio_Switch_NAME[0]	The NAME of the device providing J39_Rear_Axle_Ratio_Switch in CCVS Message.
T_J39_Remote_Accelerator_Mask[0]	The Mask of the NAME of the device providing J39_Remote_Accelerator in the EEC2 message.
T_J39_Remote_Accelerator_NAME[0]	The NAME of the device providing J39_Remote_Accelerator in the EEC2 Message.
T_J39_Remote_Accelerator_Switch_Mask[0]	The Mask of the NAME of the device providing J39_Remote_Accelerator_Switch in the EBC1 message.
T_J39_Remote_Accelerator_Switch_NAME[0]	The NAME of the device providing J39_Remote_Accelerator_Switch in the EBC1 Message.
T_J39_Req_Percent_Fan_Spd_2_Mask[0]	Mask of the device that supplies J39_Req_Percent_Fan_Spd_2 in the Cab1 message.
T_J39_Req_Percent_Fan_Spd_2_NAME[0]	The NAME of the device providing J39_Req_Percent_Fan_Spd_2 in the Cab1 Message.
T_J39_Req_Percent_Fan_Spd_Mask[0]	Mask of the device that supplies J39_Req_Percent_Fan_Spd in the Cab1 message.
T_J39_Req_Percent_Fan_Spd_NAME[0]	The NAME of the device providing J39_Req_Percent_Fan_Spd in the Cab1 Message.
T_J39_RetarderSwitchLevel_Mask[0]	The MASK of the NAME of the device providing J39_RetarderSwitchLevel in the EBC1 Message.
T_J39_RetarderSwitchLevel_NAME[0]	The NAME of the device providing J39_RetarderSwitchLevel in the EBC1 Message.
T_J39_Service_Brake_Switch_Mask[0]	The MASK of the NAME of the device providing J39_Service_Brake_Switch in the CCVS Message.
T_J39_Service_Brake_Switch_NAME[0]	The NAME of the device providing J39_Service_Brake_Switch in CCVS Message.

	T_J39_Test_Switch_Mask[0]	The MASK of the NAME of the device providing J39_Test_Switch in the CCVS Message.
	T_J39_Test_Switch_NAME[0]	The NAME of the device providing J39_Test_Switch in CCVS Message.
	T_J39_Torque_Derate_Switch_Mask[0]	The MASK of the NAME of the device providing J39_Torque_Derate_Switch in the EBC1 Message.
	T_J39_Torque_Derate_Switch_NAME[0]	The NAME of the device providing J39_Torque_Derate_Switch in the EBC1 Message.
JPC	T_JPC_AET_Method	Selects method of calculating Actual_Eng_Indicated_Perc_Trq & Actual_Eng_Ind_Perc_Trq
	T_JPC_Friction_Trq_Selection	Selects between Engine_No_Load_Torque and Friction_Torque for datalink related (broadcast
	T_JPC_Reference_Engine_Torque	
Load Based Speed Control	T_LBSC_Enable	Indicates to the tool whether the Load Based Speed Control feature is enabled in the ECM.
	T_LBSC_High_RPM_Breakpoint	Max reference speed at max fueling for Load Based Speed Control.
	T_LBSC_Low_RPM_Breakpoint	Min reference speed at no load fueling for Load Based Speed Control.
	T_LBSC_RPM_Breakpoint	Single breakpoint speed for Load Based Speed Control.
	T_LBSC_Vehicle_Mass_Thd	Above this vehicle mass, LBSC is disabled.
Limp Home	T_LMP_En	Trim variable to enable the Limp home feature
	T_LMP_HW_DIP_Inversion	Inverts the operation of switch input for the Limp Home HW discrete switch.
	T_LMP_HW_RLOC	The resource locator for the Hardwired Limp Home input
	T_LMP_HW_Select	This is a required parameter which indicates what type of input processing is to be used
	T_Limp_Home_Sw_Enable	Enables the Hard-Wired Limp Home Switch for Muxed Accelerator pedals only. When Enabled,
Lift Pump Control	T_LPC_s_FeatureEn	TIS adjustable Feature Enable for Lift Pump Control.
Low Speed Idle	T_LSI_Breakpoint_Speed	Low Speed Idle reference speed for powerup initialization
	T_LSI_Droop_Selected_Percent	Low Speed Idle Droop value.
	T_LSI_Extension_Enable	This is a required parameter which indicates to the tool whether Low Speed Idle Extension is enabled or disabled. It is tool adjustable.
	T_LSI_Idle_Speed_Save_En	Trim which enables use of Idle Speed Save feature. A value of 1 makes feature active.
	T_LSI_Idle_Speed_Step	Amount Low Idle Reference will increment/decrement when Idle Increment/Decrement switches are pressed.
	T_LSI_Incrt_Decrt_Select_En	Trim which enables/disables Low Speed Idle Increment/Decrement feature. A value of 1 enables.
	T_LSI_Max_Idle_Speed	Maximum value to which Low Speed Idle Reference may be set.
	T_LSI_Min_Idle_Speed	Minimum value to which Low Speed Idle reference may be set.
	T_LSI_Previous_Idle	Value of Low Speed Idle Reference saved at powerdown
MCA	T_MCAB_ShutdownId	Component ID of the last shutdown requestor registered with MCA - Base Speed and Torque. A normal key cycle will indicate 1000 (COMP_MCA_BASE).
	T_MCA_Auto_SD_Time	Amount of time to wait before engine shutdown.
MIL	T_MIL_Mux_Address	Source address of device sending the MIL feedback signal.
	T_MIL_Mux_Enable	This is a required parameter which indicates to the tool whether the MIL Multiplexing feature is enabled or disabled.
Injector Code	T_MIT_x_InjectorCode_Cyl1[0]	The 9-character man-readable injector barcode for cylinder #1.The first 9 bytes are used for the barcode. The last byte is reserved but not used.
	T_MIT_x_InjectorCode_Cyl2[0]	The 9-character man-readable injector barcode for cylinder #2.The first 9 bytes are used for the barcode. The last byte is reserved but not used.
	T_MIT_x_InjectorCode_Cyl3[0]	The 9-character man-readable injector barcode for cylinder #3.The first 9 bytes are used for the barcode. The last byte is reserved but not used.
	T_MIT_x_InjectorCode_Cyl4[0]	The 9-character man-readable injector barcode for cylinder #4.The first 9 bytes are used for the barcode. The last byte is reserved but not used.
	T_MIT_x_InjectorCode_Cyl5[0]	The 9-character man-readable injector barcode for cylinder #5.The first 9 bytes are used for the barcode. The last byte is reserved but not used.
	T_MIT_x_InjectorCode_Cyl6[0]	The 9-character man-readable injector barcode for cylinder #6.The first 9 bytes are used for the barcode. The last byte is reserved but not used.
	T_MIT_x_InjectorCode_Cyl7[0]	The 9-character man-readable injector barcode for cylinder #7.The first 9 bytes are used for the barcode. The last byte is reserved but not used.
	T_MIT_x_InjectorCode_Cyl8[0]	The 9-character man-readable injector barcode for cylinder #8.The first 9 bytes are used for the barcode. The last byte is reserved but not used.

Min/Max Datalogger	T_MMM_DataLogger_Enable	Master Feature Enable for CAGT Min Max Datalogger
Maintenance Monitor	T_MMon_Enable	Enable flag for Maintenance Monitor.
	T_MMon_Keyoff_Press_Check_En	Enable flag for Key-off Pressure Diagnostics.
	T_MMon_Keyon_Press_Check_En	Enable flag for Key-on Pressure Diagnostics.
	T_MMon_Keyon_Tmptr_Check_En	Enable flag for Key-on Temperature Diagnostics.
Multiplexing Address Trims	T_MUX_AC_Pressure_Switch_ID	This parameter is set to the name table name of the parameter responsible for providing the index for ac pressure switch selection by datalink.
	T_MUX_Acc_Interlock_Source_Addr	Source Address of J1939 device that provides DL_Accelerator_Interlock_Switch in the EBC1 Message.
	T_MUX_Acc_Interlock_Switch_ID	This parameter is set to the name table name of the parameter responsible for providing the index for Accelerator_Interlock_State selection by datalink.
	T_MUX_Accelerator_Pedal_ID	This parameter is set to the name table name of the parameter responsible for providing the index for Accelerator_Pedal_Position selection by datalink.
	T_MUX_CC_Cancel_Switch_ID	This parameter is set to the name table name of the parameter responsible for providing the index for CC_Cancel_Switch selection by datalink.
	T_MUX_CC_On_Switch_ID	This parameter is set to the name table name of the parameter responsible for providing the index for CC_On_Switch selection by datalink.
	T_MUX_CC_Resume_Switch_ID	This parameter is set to the name table name of the parameter responsible for providing the index for CC_Resume_Switch selection by datalink.
	T_MUX_CC_Set_Switch_ID	This parameter is set to the name table name of the parameter responsible for providing the index for CC_Set_Switch selection by datalink.
	T_MUX_CLSD_Ovrd_Cmd_ID	This parameter is set to the name table name of the parameter responsible for providing the index for CLSD_Ovrd_Cmd selection by datalink.
	T_MUX_CLSD_Ovrd_Source_Address	Coolant Level Shutdown Override State Source Address
	T_MUX_DL_RS_ID	This trim identifies the address of where the Datalink Road Speed value is obtained. (For example, J1939 address or CNH address).
	T_MUX_Droop_Switch_ID	This trim will be used to specify the NTN of the parameter we which to use for muxing.
	T_MUX_Droop_Trim_ID	This parameter is set to the name table name of the parameter responsible for providing the index for Droop Trim selection by datalink.
	T_MUX_EPD_ShutdownOvrdSwID	This parameter is set to the name table name of the parameter responsible for providing the index for EPD shutdown override switch selection by datalink.
	T_MUX_EPD_Switch_Source_Addr	Trim created to map TIS parameter EPD_Shutdown_Override_Switch_Mux_Address. The CXPS-J1939 Engine component read this so it can determine what device will this parameter.
	T_MUX_Engine_Brake_Level_Source_Addr	Source Address of J1939 device that provides Engine Brake Level.
	T_MUX_FL2_Sensor_ID	This parameter is set to the name table name of the parameter responsible for providing the index for Fuel Level 2 selection by datalink.
	T_MUX_FL_Sensor_ID	This parameter is set to the name table name of the parameter responsible for providing the index for Fuel Level selection by datalink.
	T_MUX_Fan_Request_ID	This parameter is set to the name table name of the parameter responsible for providing the index for DLC_Fan_Request selection by datalink.
	T_MUX_Fan_Torque_ID	This parameter is set to the name table name of the parameter responsible for providing the index for Fan Torque from datalink.
	T_MUX_First_Gear_Switch_ID	This parameter is set to the name table name of the parameter responsible for providing the index for J39_First_Gear_Switch selection by datalink.
	T_MUX_Idle_Decrt_Switch_ID	This parameter is set to the name table name of the parameter responsible for providing the index for Idle_Decrement_Switch selection by datalink.
	T_MUX_Idle_Incrt_Switch_ID	This parameter is set to the name table name of the parameter responsible for providing the index for Idle_Increment_Switch selection by datalink.
	T_MUX_Manual_Fan_Switch_ID	This parameter is set to the name table name of the parameter responsible for providing the index for manual fan switch selection by datalink.
	T_MUX_Neutral_Switch_ID	This parameter is set to the name table name of the parameter responsible for providing the index for J39_Neutral_Switch selection by datalink.
	T_MUX_Off_Idle_Switch_ID	This parameter is set to the name table name of the parameter responsible for providing the index for Off_Idle_Switch selection by

	datalink.
T_MUX_On_Idle_Switch_ID	This parameter is set to the name table name of the parameter responsible for providing the index for On_Idle_Switch selection by datalink.
T_MUX_Reference_Type_ID	This parameter is set to the name table name of the parameter responsible for providing the index for Reference_Type selection by datalink.
T_MUX_Retarder_Switch_Level_ID	This parameter is set to the name table name of the parameter responsible for providing the index for Retarder_Switch_Level by datalink.
T_MUX_Reverse_Switch_ID	This parameter is set to the name table name of the parameter responsible for providing the index for J39_Reverse_Gear_Switch selection by datalink.
T_MUX_SMVS_Sw2_Mux_Address	Source address of the J1939 device that provides the datalink message for SMVS_Switch2
T_MUX_SMVS_Sw_Mux_Address	Source address of the J1939 device that provides J39_SMVS_Switch in proprietary message
T_MUX_SMVS_Switch2_ID	This parameter is set to the name table name of the parameter responsible for providing the index for SMVS_Switch2 selection by datalink.
T_MUX_SMVS_Switch_ID	This parameter is set to the name table name of the parameter responsible for providing the index for SMVS_Switch selection by datalink.
T_MUX_Test_Switch_ID	This parameter is set to the name table name of the parameter responsible for providing the index for test_switch selection by datalink.
T_MUX_WIF2Sensor_VtgID	This trim will be used to specify the NTN of the parameter we which to use for muxing.
T_MUX_WIFSensor_VtgID	This trim will be used to specify the NTN of the parameter we which to use for muxing.
T_MaxEngSpd_With_Zero_Vss	This parameter represents maximum allowable engine speed when vehicle speed is below a threshold value.
T_MultiFuncSwitchEnable	This is a required parameter that indicates to the tool whether the Multi Function Switch feature is enabled in the ECM.
T_Mux_AC_Pressure_Switch_Source_Address	OEM Temperature 2 Source Address
T_Mux_ASO_Feedback_ID	Auxiliary Shutoff Valve Feedback ID
T_Mux_ASO_Test_Sw_ID	Auxiliary Shutoff Test Switch ID
T_Mux_Accelerator_Pedal_Source_Address	Accelerator Pedal Source Address
T_Mux_AirTmptr_ID	This parameter is set to the name table name of the parameter responsible for providing the index for Air Tmptr selection by datalink.
T_Mux_Air_Tmptr_Source_Address	Air Tmptr Source Address
T_Mux_Aux_Governor_Sw_ID	This parameter is set to the name table name of the parameter responsible for providing the index for Aux_Governor_Switch selection by datalink.
T_Mux_Aux_Shtdwn_Sw_Source_Add	Auxiliary Shutdown Source Address
T_Mux_Boost_Power_Switch_Source_Address	Boost Power Switch Source Address
T_Mux_Boost_Sw_ID	This parameter is set to the name table name of the parameter responsible for providing the index for the Boost Switch.
T_Mux_Clutch_Switch_ID	This parameter is set to the name table name of the parameter responsible for providing the index for the Clutch Switch.
T_Mux_Cool_Level_Source_Address	Coolant Level Source Address
T_Mux_Diagnostic_Test_Switch_Source_Address	Diagnostic Test Switch Source Address
T_Mux_Droop_Reference_Type_Source_Address	Droop Reference Type Source Address
T_Mux_Droop_Switch_Source_Address	Droop Switch Source Address
T_Mux_Droop_Trim_Source_Address	Droop Trim Source Address
T_Mux_Eng_Shut_ID	This trim identifies the NTN for the Auxiliary Shutdown DL parameter that is desired.
T_Mux_FL2_Sensor_Source_Address	Fuel_Level2 Source Address
T_Mux_FL_Sensor_Source_Address	Fuel_Level Source Address
T_Mux_Fan_2_Request_Source_Address	This trim identifies the source address of device sending the Fan Level 2 signal. (For example, J1939 address or CNH address).
T_Mux_Fan_Request_Source_Address	This trim identifies the source address of device sending the Fan Level signal. (For example, J1939 address or CNH address).
T_Mux_Fan_Switch_Source_Address	Fan Switch Source Address
T_Mux_Idle_Decrement_Source_Address	Idle Decrement Source Address

	T_Mux_Idle_Increment_Source_Address	Idle Increment Source Address
	T_Mux_Neutral_Switch_Source_Address	Neutral Switch Source Address
	T_Mux_On_Idle_Switch_Source_Address	On Idle Switch Source Address
	T_Mux_PTOA_MS_Rem_Sw1_ID	NTN of the corresponding J39 parameter that provides the value received from the datalink.
	T_Mux_PTOA_MS_Rem_Sw2_ID	NTN of the corresponding J39 parameter that provides the value received from the datalink.
	T_Mux_PTOA_MS_Rem_Sw3_ID	NTN of the corresponding J39 parameter that provides the value received from the datalink.
	T_Mux_PTOA_Press_Sw_ID	Data ID of the corresponding datalinks parameter that provides the value received from the datalink.
	T_Mux_PTO_Remote_Switch_ID	NTN of the corresponding J39 parameter that provides the value received from the datalink.
	T_Mux_PTO_Resume_Switch_ID	NTN of the corresponding J39 parameter that provides the value received from the datalink.
	T_Mux_PTO_Set_Switch_ID	NTN of the corresponding J39 parameter that provides the value received from the datalink.
	T_Mux_PTO_Sw_Valid_Sw_ID	Data ID of the corresponding datalinks parameter that provides the value received from the datalink.
	T_Mux_PTO_Switch_ID	NTN of the corresponding J39 parameter that provides the value received from the datalink.
	T_Mux_Parking_Brake_Switch_ID	This parameter is set to the name table name of the parameter responsible for providing the index for the Parking Brake Switch.
	T_Mux_Permit_Switch_Source_Address	Permit Switch Source Address
	T_Mux_Rmt_Accel_Source_Address	Source address of device sending the Remote Accelerator signal.
	T_Mux_Rmt_Accel_Sw_Source_Addr	Source address of device sending the Remote Accelerator Switch signal.
	T_Mux_SAT_Index_ID	This parameter is set to the name table name of the parameter responsible for providing the index for alternate torque selection by datalink.
	T_Mux_SRegen_Switch_Source_Address	Non Mission Regen Switch Source Address
	T_Mux_Service_Brake_Switch_2_ID	This parameter is set to the name table name of the parameter responsible for providing the index for the Service Brake Switch_2.
	T_Mux_Service_Brake_Switch_ID	This parameter is set to the name table name of the parameter responsible for providing the index for the Service Brake Switch.
	T_Mux_Torque_Curve_Select_Source_Addr ess	Torque Curve Select Source Address
	T_Mux_Water_In_Fuel_Source_Address	Water In Fuel Source Address
Nominal Battery Voltage	T_Nominal_Battery_Voltage	This identifies the nominal battery voltage of the power source currently connected to the ECM.
OCD	T_OCD_DOCD_Eff_Enable	Trim that turns ON/OFF DOC eff diagnostics.
	T_OCD_DOCD_LoEff_Keyon_Clr_En	Trim to turn ON/OFF DOC low eff FC at keyon
	T_OCD_DOCD_Sensor_Err_Clear_En	Enable DOCD low eff error due to sensor errors
	T_OCD_DOC_Presence_Enable	enable flag for EMD feature - DOC Thermistor Presence
	T_OCD_DOC_Reverse_Enable	enable flag for EMD feature - DOC Thermistor Reverse
	T_OCD_Dosing_Eff_Enbl	Enable flag for dosing efficiency
	T_OCD_Dosing_NmlEff_Ovr_Enbl	Override enable flag for dosing normalized efficiency
	T_OCD_Fdbk_Usedup_Enbl	Enable flag for PID Usedup Diagnostics
	T_OCD_Insuff_Exoth_Diag_Enbl	Enable flag for Insufficient Exotherm Diagnostics
	T_OCD_NMHC_Eff_Diag_Enbl	Algorithm enable for OBD/EMD functionality.
OCL	T_OCL_FacePlug_Enbl	Face plugging feature enable
	T_OCL_Min_AFR_Enbl	Air Fuel Ratio Limit Enable
	T_OCL_dt_O2Lim_Max_HC_Enbl	Enable for different HC injection command derivative when HC injection is limited due to insufficient oxygen in exhaust gas.
Oil Change Monitor	T_OCM_AccumDeltaDistance	Vehicle distance traveled since last OCM reset accommodated by severity factor in Automatic mode.
	T_OCM_AccumDeltaFuel	Fuel consumed since last OCM reset accommodated by severity factor in Automatic mode.
	T_OCM_AccumDeltaTime	Engine run time since last OCM reset accommodated by severity factor in Automatic mode.

	T_OCM_DistanceResetLog[0]	Total distance and the weighted distance of the last 3 OCM intervals.
	T_OCM_Enable	Indicates to the tool whether the Oil Change Monitor functionality is enabled in the ECM.
	T_OCM_ErrorResetLog[0]	OCM_Fault_Status of the last 3 OCM intervals.
	T_OCM_FOD_Mass	Fuel accumulated inside oil pan since last oil change reset.
	T_OCM_FaultStatus	Error flag set when error is active which may affect the OCM Data.
	T_OCM_FuelResetLog[0]	Total fuel and weighted fuel of the last 3 OCM intervals.
	T_OCM_IntervalMultiFactor	Used by ECM to modify default values of oil change interval threshold to compensate for special oils/conditions.
	T_OCM_Mode	Oil Change Monitor operation mode. It is enumrated to following values -
	T_OCM_Mode_FOD_Exclusive	Oil Change Monitor operation mode and Fuel in Oil Dilution mode exclusivity. It is enumra
	T_OCM_TimeDifference	Accumulated time difference for accounting the Oil Severity Factor.
	T_OCM_TimeResetLog[0]	Total time and the weighted time of the last 3 OCM intervals.
	T_OCM_UserDistance	OCM Interval of vehicle distance traveled (threshold) set by user in manual mode.
	T_OCM_UserFuel	OCM Interval of fuel used (threshold) set by user in manual mode.
	T_OCM_UserTime	OCM Interval of engine run time (threshold) set by user in manual mode.
	T_OCM_WarningPercent	Early warning of OCM Interval expiring.
OCP	T_OCP_HCCnvEff_BedT_Enbl	The switch to control the x input to the DOC HC conversion efficiency table.
	T_OCP_ThermCnvEff_BedT_Enbl	The switch to control the x input to the DOC thermal conversion (nominal) efficiency table.
OCR	T_OCR_PID_Enbl	To enable PID controller in OCR
	T_OCR_TransComp_Enbl	Transient compensation enable
OFC	T_OFC_Equiv_Ratio_User_Override	OFC equivalence ratio user override
	T_OFC_Fuel_Limit_User_Override	OFC fuel Limit user override
Oil Pressure Sensor	T_OP_Sensor_Ext_En	Enables Tool Interface for Oil Pressure Sensor Extension FTIS.
	T_OP_Type_Select	Selects which type of Oil Pressure Sensing to perform when T_OP_Sensor_Ext_En is Enabled
OS	T_OS_DownloadCompleted	This data is used to determine when a download is completed.
	T_OS_SPE_handling	Used to describe to the system how floating point
Delegated Assembly Diagnostic	T_PFS_DA_Enbl	Enable flag for Delegated Assembly Diagnostic
Power On Indicator	T_POI_Driver_En	This trim enables the Power On Indicator (POI) PWM output feature
	T_POI_Driver_Rloc	Resource locator for Power On Indicator physical output.
	T_POI_FunctionType	Determines the behavior of POI
PTO	T_PTOA_Cab_Enable	Enables/disables Cab PTO.
	T_PTOA_En	Enables/disabels Automotive PTO.
	T_PTOA_Load_Based_InertiaIndx	Trim to select the appropriate Inertia/Deiveline Stability Index value based on the type
	T_PTOA_Neutral_Interlock_En	Allows PTO to be activated when non manual transmission is in neutral.
	T_PTOA_On_Relay_RLOC	Resource locator for PTOA_On_Relay.
	T_PTOA_PB_Interlock_Type	Parking Brake Interlock Type. Allows PTO to only be operated with the Parking Brake Engag
	T_PTOA_Parking_Brake_En	Allows PTO to only be operated with the Parking Brake Engaged. Required for Euro operation
	T_PTOA_Ref_Speed_Ramp_En	Enables PTO reference speed accel/decel beyond the default set speed after DL_PTO_Active signal is received from the transmission.
	T_PTOA_Torque_Thd	If Net_Brake_Torque is greater than the Torque Threshold, and if system has Vss Errors, the system recognizes that a High Power PTO device is attached.
	T_PTOA_Transmission_Coupled_En	Trim to enable High Power PTO device detection logic.
	T_PTO_Acctr_Override_En	Limits engine speed to T_PTO_Acctr_Ovrride_Max_ES when PTO is in control

	T_PTO_Acctr_Override_Max_ES	Maximum Engine Speed allowed while Accelerator Pedal is Overriding PTO
	T_PTO_Bump_Ref_Speed_En	Trim to Enable Bump Up/Bump Down functionality.
	T_PTO_Default_Set_ES	Reference speed to which the PTO is limited to in automatic transmissions, before receving a DL_PTO_Active command from transmission.
	T_PTO_Disable_With_Brake_Switch	When this parameter is enabled(1), an active Brake_Switch will disable PTO.
	T_PTO_Disable_With_Clutch_Switch	When enabled (1), an active Clutch_Switch will deactivate PTO.
	T_PTO_Droop_Percent	Droop applied to PTO Reference.
	T_PTO_ES_Override_En	When enabled, H_PTO_ES_Override_Value shall be the current PTO reference speed.
	T_PTO_Firetruck_En	Enables/disables PTO Firetruck delay feature.
	T_PTO_Gain_User_Override	Allows user to override Gain.
	T_PTO_Ignore_VSS_Error	When disabled (0), a VSS Error will cause PTO to be disabled.
	T_PTO_Max_Engine_Load	Maximum Engine load allowed during PTO operation.
	T_PTO_Max_Ref_ES	Maximum value to which the PTO reference speed may be set.
	T_PTO_Max_VS_Thd	Maximum vehicle speed that PTO will be allowed to engage.
	T_PTO_Min_Ref_ES	Minimum value to which PTO Reference speed may be set.
	T_PTO_On_Switch_Mux_Address	Source address of device sending the PTO On Switch signal.
	T_PTO_Ref_Speed_Step	Speed Delta for Bump up Bump Down operation.
	T_PTO_Rem_Throt_Interaction_En	Enables/disables Remote PTO interaction with Remote Throttle. When enabled, Remote Throttle will cancel Remote PTO.
	T_PTO_Remote_Count_Lim	Maximum count of Remote 'PTO Switch Position.' Limits the number of set speeds accessible via PTO_Remote_Sw
	T_PTO_Remote_ES_1	Reference speed used when Remote_PTO_Switch is in position 1.
	T_PTO_Remote_ES_2	Reference speed used when Remote_PTO_Switch is in position 2.
	T_PTO_Remote_ES_3	Reference speed used when Remote_PTO_Switch is in position 3.
	T_PTO_Remote_ES_4	Reference speed used when Remote_PTO_Switch is in position 4.
	T_PTO_Remote_ES_5	Reference speed used when Remote_PTO_Switch is in position 5.
	T_PTO_Remote_En	Enables/disables Remote PTO.
	T_PTO_Remote_Sw_Timeout	Time after which the 'PTO Remote Switch Position' is set to a count value if PT
	T_PTO_Remote_Switch_Mux_Address	Mux address for PTO remote switch
	T_PTO_Resume_ES	Reference speed used when PTO_Resume Switch is pressed.
	T_PTO_Resume_Switch_Mux_Address	Source address of device sending the PTO Resume Switch signal.
	T_PTO_Set_ES	Reference speed used when PTO_Set_Switch is pressed
	T_PTO_Set_Resume_ES	Reference speed used when PTO_Set_Switch and PTO_Resume switch are pressed simultaneously.
	T_PTO_Set_Switch_Mux_Address	Source address of device sending the PTO Set Switch signal.
	T_PTO_Switch_Mux_Enable	This is a required parameter which indicates to the tool whether the PTO Switch Multiplexing feature is enabled or disabled.
	T_PTO_Transient_Accel	Desired engine accel rate when PTO reference is increasing
	T_PTO_ZeroVSSLimit_Enable	Limits maximum PTO speed to the maximum engine speed without vehicle speed signal if the vehicle speed signal is lost.
PTP	T_PTP_Axle_Trq_Lim	This parameter defines the highest torque allowed by the axle.
	T_PTP_Enable	Primary Enable for Power Train Protection feature.
	T_PTP_GearRatio_1	The gear ratio threshold below which PTP_Torque_Limit shall be set equal to T_PTP_Trq_Lim_1.
	T_PTP_GearRatio_2	The gear ratio threshold below which PTP_Torque_Limit shall be set equal to T_PTP_Trq_Lim_2.
	T_PTP_GearRatio_3	The gear ratio threshold below which PTP_Torque_Limit shall be set equal to T_PTP_Trq_Lim_3 and above which it shall be set equal to T_PTP_Trq_Lim_4.
	T_PTP_Switched_Trq_Lim	Highest torque allowed for switched input mode

	T_PTP_TrqDrtSw_Mux_Address	Source address of device sending the Torque Derate Switch signal.
	T_PTP_TrqLimSw_En	Enables the torque limit switch.
	T_PTP_TrqLimSw_Logic	Defines whether an Open or Closed torque limit switch will activate the highest torque allowed for switched input mode, when not multiplexed.
	T_PTP_Trq_Lim_1	Highest torque allowed when gear ratio is less than or equal to T_PTP_GearRatio_1
	T_PTP_Trq_Lim_2	Highest torque allowed when gear ratio is higher than T_PTP_GearRatio_1 but less than or equal to T_PTP_GearRatio_2
	T_PTP_Trq_Lim_3	Highest torque allowed when gear ratio is higher than T_PTP_GearRatio_2 but less than or equal to T_PTP_GearRatio_3
	T_PTP_Trq_Lim_4	Highest torque allowed when gear ratio is higher than T_PTP_GearRatio_3 or when vehicle is not moving.
PWM	T_PWM2_Fan_Clutch_User_Override	Enables the use of duty cycle override value for fan clutch 2 control.
	T_PWM_EIS_Relay_Inversion	Inversion flag for EIS PWM output
	T_PWM_EIS_Relay_Override_En	User override enable for EIS Relay
	T_PWM_EngBrkDriver1OvrdEn	Trim indicates if engine brake driver 1 user override is allowed or not.
	T_PWM_EngBrkDriver1_Inversion	When True (1), this trim will allow for an inversion of the logic followed when setting the engine retarder driver 1 phsical output.
	T_PWM_EngBrkDriver1_RLOC	Resource Locator for Engine retarder driver1 physical output
	T_PWM_EngBrkDriver2OvrdEn	Trim indicates if engine brake driver 2 user override is allowed or not.
	T_PWM_EngBrkDriver2_Inversion	When True (1), this trim will allow for an inversion of the logic followed when setting the engine retarder driver 2 phsical output.
	T_PWM_EngBrkDriver2_RLOC	Resource Locator for Engine retarder driver2 physical output
	T_PWM_EngBrkDriver3OvrdEn	Trim indicates if engine brake driver 3 user override is allowed or not.
	T_PWM_EngBrkDriver3_Inversion	When True (1), this trim will allow for an inversion of the logic followed when setting the engine retarder driver 3 phsical output.
	T_PWM_EngBrkDriver3_RLOC	Resource Locator for Engine retarder drive31 physical output
	T_PWM_EngBrkDriver4OvrdEn	Trim indicates if engine brake driver 4 user override is allowed or not.
	T_PWM_EngBrkDriver4_Inversion	When True (1), this trim will allow for an inversion of the logic followed when setting the engine retarder driver 4 phsical output.
	T_PWM_EngBrkDriver4_RLOC	Resource Locator for Engine retarder driver4 physical output
	T_PWM_Fan_Clutch_User_Override	Enables the use of duty cycle override value for fan clutch control.
	T_PWM_ISDRelay_User_OvrdEn	User Override enable for Idle Shutdown Relay driver.
	T_PWM_SLO_User_Override_En	Enables the use of duty cycle override value for starter lockout (SLO).
Parking Brake	T_ParkingBrakeSw_Mux_Address	Source address of device sending the Parking Brake Switch signal.
	T_ParkingBrkSwEnable	Non functional FTIS enable to support tools.
	T_ParkingBrkSwInversion	When asserted, the output for Parking_Brake_Switch shall be inverted.
	T_ParkingBrkSw_Type	Trim to select the Parking Brake Switch Type 0 is Discrete, 1 is Analog
Rear Axle Ratio	T_RAR_RearAxleRatioHigh	This trim specifies a value for the rear axle ratio when the rear axle ratio switch is in the high position. Where the low switch position is defined as 1.
	T_RAR_RearAxleRatioLow	This trim specifies a value for a low rear axle ratio when the rear axle ratio switch is in the low position. Where the low switch position is defined as 0.
	T_RAR_RearAxleRatioSwEn	Indicates to the tool if the Rear Axle Ratio Switch is enabled or disabled.
	T_RAR_Sw_Mux_ID	This parameter is set to the name table name of the parameter responsibe for providing the index for RAR MUX switch for selection by the Datalink.
	T_RAR_SwitchRLOC	This parameter specifies the resource locator for the rear axle ratio switch. It is used
	T_RAR_SwitchSupplyID	This trim identifies supply id for analog input for Rear Axle Ratio switch input.
	T_RAR_Switch_Mux_Address	Mux address of Rear Axle Ratio Switch.
	T_RAR_Switch_Ovrd_En	When enabled, sets value of the Rear_Axle_Ratio_Switch to T_RAR_Switch_Ovrd_Val.
	T_RAR_Switch_Ovrd_Val	Override value for Rear_Axle_Ratio_Switch physical input.
	T_RAR_TireSize	This trim specifies the vehicle's tire size.

RCPTO	T_RCPTO_Enable	Enables/disables Remote Cab PTO.
	T_RCPTO_Resume_ES	Reference speed used when RCPTO_Resume Switch is pressed.
	T_RCPTO_Set_ES	Reference speed used when RCPTO_Set_Switch is pressed
	T_RCPTO_Set_Resume_ES	Reference speed used when RCPTO_Set_Switch and RCPTO_Resume switch are pressed simultaneously.
	T_RDM_NoheaterFrozenDet_Enbl	Trim to enable the frozen detection for non-heated urea dosing system
Road Speed Control	T_RSC_BottomDroopWidth	Top droop width for RSC
	T_RSC_Enable	Enables road speed control in the system.
	T_RSC_GD_GearRatio	This is value of gear down gear ratio, down from top gear.
	T_RSC_GD_HighLoadDelta	The difference between gear down light load limit and the next gear down high load limit.
	T_RSC_GD_LightLoadDelta	The difference between gear down light load limit and the next gear down low load limit.
	T_RSC_GD_ProtectionEnable	Enables the Gear Down Protection Feature.
	T_RSC_GHG_Default_Speed	The maximum default road speed when Greenhouse Gas Vehicle Speed Limiter is enabled. Con
	T_RSC_GHG_Enable	Enables the Greenhouse Gas Vehicle Speed Limiter.
	T_RSC_GHG_Expiration_Distance	Distance travelled by the engine after which user can request for OEM password to disable Greenhouse Gas Vehicle Speed Limiter. For Tool use only.
	T_RSC_GlobalMaxRoadSpeed	Maximum base final speed allowed in Road Speed or Cruise Control mode.
	T_RSC_HighLoadSpeed	Maximum vehicle speed at high load in low gear
	T_RSC_LightLoadSpeed	Maximum vehicle speed at light load in low gear.
	T_RSC_MaxRoadSpeed	Controlled maximum road speed at which vehicle can operate.
	T_RSC_RearAxleAntiTamperEnable	"When enabled, it allows reduction of RSC speed limit to prevent tampering.Possible values:FALSETRUE"
	T_RSC_TopDroopWidth	Top droop width for RSC
	T_RSC_TopGearRatio	This is Gear ratio above which the transmission is considered in top gear.
	T_RSC_USFE_Max_Road_Speed	Maximum road speed at which the vehicle can operate when User Selected Fuel Economy Index is set to fuel economy mode.
Road Speed Limit	T_RSL_Mux_ID	This parameter is set to the name table name of the parameter responsible for providing the index for Road_Speed_Limit selection by datalink.
	T_Road_Speed_Limit_RLOC	The RLOC value for the Road Speed Limit Feature.
Receive ETC7	T_Receive_ETC7_Enable	This trim parameter enable datalink to support reading in ETC7 PGN from transmission
SCD	T_SCD_CE_FdbkUreaCmd_Enbl	Enable to use the feedback urea dosing command from the UIM in the catalyst efficiency monitor.
	T_SCD_CatEffMon_Enbl	Enable for the catalyst efficiency monitor.
	T_SCD_CatMissMon_Enbl	Enable for the catalyst substrate missing monitor.
	T_SCD_NOxMonitor_Enbl	Enablefor NOx Monitor Diagnostics.
	T_SCD_NOxOff_Sens_Enbl	Enable flag for the NOx sensor offset diagnostic
	T_SCD_NXGR_Enbl	Trim enable option for NOx Sensor gain rationality diagnosis
	T_SCD_NXRT_NOxOutSens_Resp_Enbl	Enable flag for the Outlet NOx sensor offset/response diagnostic
	T_SCD_NXRT_NOx_SIR_Enbl	Enable Flag for the Stuck-in-range diagnostic
	T_SCD_NXSD_NOx_SelfDiag_Enbl	Enable for NOx Monitor Diagnostics.
	T_SCD_SrvPerf_Enbl	Trim to enable Service Stationary Regen Cat Eff
	T_SCD_UQ_Regen_Abort_Enbl	The Enable flag to abort the urea quality monitor when HC is dosing
	T_SCD_UreaQualityMon_Enbl	Enable for the urea quality monitor.
SCL	T_SCL_Warmup_DPFOutTmptrEnbl	Flag determining which temperature is used to enable SCR thermal management mode. If TRUE(1), DPF Outlet temperature is used. If FALSE (0), then SCR Inlet temperature is used.
	T_SCL_Warmup_InputTmptrSel	Flag determining which temperature is used to enable SCR thermal management mode. If val

Decomposition Reactor Pipe	T_SCP_DRP_UreaDeposit_Enbl	Enable/Disable the Decomposition Reactor Pipe (DRP) regen feature
	T_SCR_DA_Enbl	Enable flag for Delegated Assembly Diagnostic
	T_SCR_NH3Sens_GED_Enbl	Flag to enable engine date gathering.
	T_SCR_NH3Sens_PwrInt_Enbl	Enables the NH3 sensor power interruption diagnostic
	T_SCR_NOxLoop_En	NOx feedback loop enable for the NH3-based control system
Sudden Deceleration	T_SDL_Log_Enable	Enable or disable Sudden Deceleration Event Log Feature.
	T_SDL_NumberOfRecords	Indicates number of sudden decel records. Currently software only supports fixed 3 records.
SFD	T_SFD_DPFEff_Enbl	Trim to turn DPF Efficiency diagnostic on
	T_SFD_DPF_Missing_Enable	enable flag for SFD feature - DPF substrate missing
	T_SFD_DPFdP_SIR_Enbl	Trim to enable for dP Stuck In Range diagnostic
	T_SFD_FreqRegenDiag_Enbl	Trim to turn on Frequent Regen Diagnostic
	T_SFD_HiDeltaP_Diag_Enable	enable flag for high delta_p detection
	T_SFD_HiSootLoad_Diag_Enable	enable flag for running high soot load detection algorithm
	T_SFD_IR_UseMin_DPSLE_En	Incomplete regen uses min DPSLE instead of DPSLE at end of regen
	T_SFD_IncompleteRegenEnable	Enable Incomplete Regen OBD
SFL	T_SFL_OxidRate_MinFlow_En	Enables min flow calculated by oxidation rate. When this trim is TRUE, the min flow in th
SFP	T_SFP_DeepCleanEnbl	Deep clean enable
	T_SFP_RegenRqstDosingEnbl	Trim to enable when regen request is active and dosing is not disabled from error
	T_SFP_Trust_DPSLE_If_GT_CSLE	Trim to turn on the logic.
	T_SFP_gpl_Ash_Adj_Enbl	The flag to enable the Ash adjustment.
SFR	T_SFR_NMTmRegenOn	Enable Non Mission Timed based Regeneration
Shift In Process	T_SIP_Charge_Limit_Enable	Enable for Shift-In-Process algorithm.
	T_SIP_Jcomm_Override	This trim overrides the Jcomm inputs into the SIP flag algorithm. This can be used for stationary testing to simulate an upshift.
	T_SIP_ZF_Enable	Enable for ZF to use the VG Braking algorithm.
Starter Lockout	T_SLORelay_HW_RLOC	Resource Locator for Starter Lockout Relay, which is output discrete.
	T_SLO_Clutch_Intrlk_Sw_RLOC	Resource Locator for Clutch Interlock Switch
	T_SLO_Enable	This parameter indicates whether the Starter Lockout feature is enabled or disabled.
	T_SLO_RelayType	Trim used to set whether a Normally Open or Normally Closed relay is used.
Switched Max Vehicle Speed	T_SMVS2_Enable	Enables Switched Max Vehicle Speed 2 feature.
	T_SMVS_Enable	Enables Switched Max Vehicle Speed feature.
	T_SMVS_MaxRoadSpeed_2	Controlled maximum road speed at which the vehicle can operate if Switched Max Vehicle Speed is active.
	T_SMVS_MaxRoadSpeed_3	Controlled maximum road speed at which the vehicle can operate if Switched Max Vehicle Speed Switch 2 is active.
Smart Road Speed Governor	T_SRG_Enable	Enables smart Road Speed Governor in the system.
	T_SRG_KickdownEnable	Enables the Smart RSG Kickdown Feature.
	T_SRG_RampEnable	Enables the Smart RSG Ramp Feature.
	T_SRG_VehicleSpeedStep	Bump-Up/Down incremental step size for adjusting the maximum road speed for Smart Road Speed Governor.
	T_SRG_VehicleSpeedStep_En	Enables the use of the unique trim T_SRG_VehicleSpeedStep for the bump up / bump down val
Service Brake Switch	T_ServiceBrkSw2Enable	Non functional FTIS enable to support tools.
	T_ServiceBrkSw2Inversion	When asserted, the output for Service_Brake_Switch_2 shall be inverted.
	T_ServiceBrkSw2_Type	Selects the Service_Brake_Switch_2 I/O type: 0 is Discrete, 1 is Analog
	T_ServiceBrkSwEnable	Non functional FTIS enable to support tools.

	T_Service_Brake_Switch_Mux_Address	Source address of device sending the Service Brake Switch signal.
	T_Service_Brake_Switch_Mux_Enable	This is a required parameter which indicates to the tool whether the Service Brake Switch Multiplexing feature is enabled or disabled.
Stationary Pumping	T_Stationary_Pumping_Enable	This is a required parameter which is used to enable or disable the Stationary Pumping feature.
	T_Stationary_Pumping_VSS_Thd	Vehicle speed above which the 'stationary pumping mode' is affected.
Stop Engine	T_StopEngineEnable	Feature enable for the "Stop Engine" feature.
Super User	T_SuperUserHasRun	Flag indicating whether the super user has run on this ECM since reset.
Cab Switchable Governor	T_SwitchableGovernorEnable	Trim variable to enable the cab switchable governor feature
Switched Droop	T_SwitchedDroopEnable	Trim variable to enable the switched droop feature
Tachyometer	T_TAC_s_TachOutputEnable	Enable tachometer output
TAHR	T_TAHR_COT_Drt_Enbl_xEMP	Enable of transformed exhaust pressure COT Derate
	T_TAHR_EGR_Gain_Ovrd_En	Enables override of EGR feedback controller static gain schedule (C_TAHR_EGR_Gain_Ovrd)
	T_TAHR_EGR_ULim_Ovrd_En	Enables override of EGR upper limit(C_TAHR_EGR_ULim_Ovrd)
	T_TAHR_EMP_Ovrd_En	Enables override of the exhaust pressure reference (C_TAHR_EMP_Ovrd)
	T_TAHR_IAT_FF_Ovrd_En	IAT feedforward term override enable
	T_TAHR_IAT_Pos_Ovrd_En	IAT valve override Switch
	T_TAHR_IAT_ULim_Ovrd_En	Enables override of IAT upper limit(C_TAHR_IAT_ULim_Ovrd)
	T_TAHR_MCF_Gain_Ovrd_En	Enables override of the charge feedback controller gain schedule (C_TAHR_MCF_Gain_Ovrd)
	T_TAHR_OFC_EGR_Valve_Reset	"Enable the feature to command zero EGR flow for one sample instant at the onset of
	T_TAHR_VGT_LLim_Ovrd_En	Enable override of VGT lower limit in the exhaust pressure controller
	T_TAHR_VGT_ULim_Ovrd_En	Enable override of VGT upper limit in the exhaust pressure controller
	T_TAHR_dP_over_P_Limit_Ovrd_En	Enables override of C_TAHR_dP_over_P_Limit_Tbl (C_TAHR_dP_over_P_Limit_Ovrd)
	T_TFC_Texh_ULim_Allowed	Trim used to allow aftertreatment request to limit TOT by limiting fuel.When it is enable, the parameter CBP_Texh_ULim goes into a MIN block to set CBP_Turbin_Tmptr_Ulim
THR Logs	T_THR_Max_Power_Log[0]	Log that holds a record associated with max peak power.
	T_THR_Max_Torque_Log[0]	Log that holds a record associated with max peak torque.
	T_THR_Record_Data_Log[0]	Log that holds the last 4 records associated with torque, horsepower or power train protection (PTP) changes.
TIB	T_TIB_DI_Gas_To_Mass_Factor	Conversion factor for calculating the mass of the direct injected gas.
	T_TIB_DI_Gas_To_Volume_Factor	Conversion factorfor calculating the volume of direct injected gas.
	T_TIB_Diesel_To_Mass_Factor	Conversion factor for calculating the mass of the diesel fuel delivered to the system.
	T_TIB_Diesel_To_Volume_Factor	Conversion factor for calculating the volume of diesel used.
	T_TIB_FCR_Engine_Run_Time	The accumulated time that the engine has been running with the Fuel Consumption Rate monitoring enabled.
	T_TIB_FCR_Mass_Fuel_Used	The accumulated mass of the fuel used by the engine for the duration for which the Fuel Consumption Rate monitoring has been enabled.
	T_TIB_FCR_Short_Term_Mass_Log[0]	array contains 40 record of 1 hour average of instantaneous fuel consumption mass rate.
	T_TIB_FCR_Volume_Fuel_Used	Volume of fuel used by the engine
	T_TIB_FU_Gas_To_Mass_Factor	Conversion factor for calculating the mass of the fumigated gas.
	T_TIB_FU_Gas_To_Volume_Factor	Conversion factor for calculating the volume of fumigated gas.
	T_TIB_Fast_Idle_Min_Engine_Spd	RPM above which Idling is considered fast
	T_TIB_Fuel_Adjustment_Enable	This variable Indicates whether the Fuel Adjustment Feature is Enabled or not.
	T_TIB_Fuel_Adjustment_Factor	Tool adjustable factor y which Fuel_Used is calculated.
	T_TIB_HC_Fuel_To_Mass_Factor	Conversion factor for calculating the mass of the dosing diesel fuel delivered to the system.
	T_TIB_HC_Fuel_To_Volume_Factor	Conversion factor for calculating the volume of dosing fuel used.

T_TIB_Last_Reset_Time	Time on Real Time Clock of last Trip Info Reset
T_TIB_MultPTO1_Tot_Dst_FuelUsd	Total non-resetable dosing fuel used at pto preset speed 1.
T_TIB_MultPTO1_Trip_Dst_FuelUsd	Dosing fuel used at pto preset speed 1 since last trip reset.
T_TIB_MultPTO2_Tot_Dst_FuelUsd	Total non-resetable dosing fuel used at pto preset speed 2.
T_TIB_MultPTO2_Trip_Dst_FuelUsd	Dosing Fuel used at pto preset speed 2 since last trip reset.
T_TIB_MultPTO3_Tot_Dst_FuelUsd	Total non-resetable dosing fuel used at pto preset speed 3.
T_TIB_MultPTO3_Trip_Dst_FuelUsd	Dosing Fuel used at pto preset speed 3 since last trip reset.
T_TIB_MultPTO4_Tot_Dst_FuelUsd	Total non-resetable dosing fuel used at pto preset speed 4.
T_TIB_MultPTO4_Trip_Dst_FuelUsd	Dosing Fuel used at pto preset speed 4 since last trip reset.
T_TIB_MultPTO5_Tot_Dst_FuelUsd	Total non-resetable dosing fuel used at pto preset speed 5.
T_TIB_MultPTO5_Trip_Dst_FuelUsd	Dosing Fuel used at pto preset speed 5 since last trip reset.
T_TIB_MultPTO6_Tot_Dst_FuelUsd	Total non-resetable dosing fuel used at pto preset speed 6.
T_TIB_MultPTO6_Trip_Dst_FuelUsd	Dosing Fuel used at pto preset speed 6 since last trip reset.
T_TIB_MultPTO7_Tot_Dst_FuelUsd	Total non-resetable dosing fuel used at pto preset speed 7.
T_TIB_MultPTO7_Trip_Dst_FuelUsd	Dosing Fuel used at pto preset speed 7 since last trip reset.
T_TIB_MultPTO8_Tot_Dst_FuelUsd	Total non-resetable dosing fuel used at pto preset speed 8.
T_TIB_MultPTO8_Trip_Dst_FuelUsd	Dosing Fuel used at pto preset speed 8 since last trip reset.
T_TIB_MultPTOSpd_1_TotFuel_Usd	Total non-resetable fuel used at pto preset speed 1.
T_TIB_MultPTOSpd_1_TripFuel_Usd	Fuel used at pto preset speed 1 since last trip reset.
T_TIB_MultPTOSpd_2_TotFuel_Usd	Total non-resetable fuel used at pto preset speed 2.
T_TIB_MultPTOSpd_2_TripFuel_Usd	Fuel used at pto preset speed 2 since last trip reset.
T_TIB_MultPTOSpd_3_TotFuel_Usd	Total non-resetable fuel used at pto preset speed 3.
T_TIB_MultPTOSpd_3_TripFuel_Usd	Fuel used at pto preset speed 3 since last trip reset.
T_TIB_MultPTOSpd_4_TotFuel_Usd	Total non-resetable fuel used at pto preset speed 4.
T_TIB_MultPTOSpd_4_TripFuel_Usd	Fuel used at pto preset speed 4 since last trip reset.
T_TIB_MultPTOSpd_5_TotFuel_Usd	Total non-resetable fuel used at pto preset speed 5.
T_TIB_MultPTOSpd_5_TripFuel_Usd	Fuel used at pto preset speed 5 since last trip reset.
T_TIB_MultPTOSpd_6_TotFuel_Usd	Total non-resetable fuel used at pto preset speed 6.
T_TIB_MultPTOSpd_6_TripFuel_Usd	Fuel used at pto preset speed 6 since last trip reset.
T_TIB_MultPTOSpd_7_TotFuel_Usd	Total non-resetable fuel used at pto preset speed 7.
T_TIB_MultPTOSpd_7_TripFuel_Usd	Fuel used at pto preset speed 7 since last trip reset.
T_TIB_MultPTOSpd_8_TotFuel_Usd	Total non-resetable fuel used at pto preset speed 8.
T_TIB_MultPTOSpd_8_TripFuel_Usd	Fuel used at pto preset speed 8 since last trip reset.
T_TIB_Mult_PTO_Enable	Indicates whether the Trip Information Multiple PTO feature is enabled in the ECM.
T_TIB_Mult_PTO_Spd_1_Tot_Time	Total non-resetable time spent at pto preset speed 1.
T_TIB_Mult_PTO_Spd_1_Trip_Time	Time spent at pto preset speed 1 since last trip reset.
T_TIB_Mult_PTO_Spd_2_Tot_Time	Total non-resetable time spent at pto preset speed 2.
T_TIB_Mult_PTO_Spd_2_Trip_Time	Time spent at pto preset speed 2 since last trip reset.
T_TIB_Mult_PTO_Spd_3_Tot_Time	Total non-resetable time spent at pto preset speed 3.
T_TIB_Mult_PTO_Spd_3_Trip_Time	Time spent at pto preset speed 3 since last trip reset.
T_TIB_Mult_PTO_Spd_4_Tot_Time	Total non-resetable time spent at pto preset speed 4.
T_TIB_Mult_PTO_Spd_4_Trip_Time	Time spent at pto preset speed 4 since last trip reset.

T_TIB_Mult_PTO_Spd_5_Tot_Time	Total non-resetable time spent at pto preset speed 5.
T_TIB_Mult_PTO_Spd_5_Trip_Time	Time spent at pto preset speed 5 since last trip reset.
T_TIB_Mult_PTO_Spd_6_Tot_Time	Total non-resetable time spent at pto preset speed 6.
T_TIB_Mult_PTO_Spd_6_Trip_Time	Time spent at pto preset speed 6 since last trip reset.
T_TIB_Mult_PTO_Spd_7_Tot_Time	Total non-resetable time spent at pto preset speed 7.
T_TIB_Mult_PTO_Spd_7_Trip_Time	Time spent at pto preset speed 7 since last trip reset.
T_TIB_Mult_PTO_Spd_8_Tot_Time	Total non-resetable time spent at pto preset speed 8.
T_TIB_Mult_PTO_Spd_8_Trip_Time	Time spent at pto preset speed 8 since last trip reset.
T_TIB_Mult_PTO_Speed_1_Tag[0]	Customer adjustable name to identify the device used at pto preset speed 1.
T_TIB_Mult_PTO_Speed_2_Tag[0]	Customer adjustable name to identify the device used at pto preset speed 2.
T_TIB_Mult_PTO_Speed_3_Tag[0]	Customer adjustable name to identify the device used at pto preset speed 3.
T_TIB_Mult_PTO_Speed_4_Tag[0]	Customer adjustable name to identify the device used at pto preset speed 4.
T_TIB_Mult_PTO_Speed_5_Tag[0]	Customer adjustable name to identify the device used at pto preset speed 5.
T_TIB_Mult_PTO_Speed_6_Tag[0]	Customer adjustable name to identify the device used at pto preset speed 6.
T_TIB_Mult_PTO_Speed_7_Tag[0]	Customer adjustable name to identify the device used at pto preset speed 7.
T_TIB_Mult_PTO_Speed_8_Tag[0]	Customer adjustable name to identify the device used at pto preset speed 8.
T_TIB_Mult_PTO_User_Selectable	Used for selection of Multiple PTO feature
T_TIB_PTO_Total_Mass_Fuel_Used	Accumulated fuel used at PTO mode
T_TIB_PTO_Trip_Dst_MassFuelUsd	Accumulated dosing fuel used at PTO mode for current trip
T_TIB_PTO_Trip_Mass_Fuel_Used	Accumulated fuel used at PTO mode for current trip
T_TIB_PTO_Ttl_Dst_MassFuel	Accumulated dosing fuel used at PTO mode
T_TIB_Short_Stop_Idle_Period	Maximum idle elapsed time to be considered a short stop
T_TIB_Short_Term_Log_Acc[0]	Accumulator used to accumulate samples of instantaneuos fuel rate. This is a 64 bit valu
T_TIB_Short_Term_Mass_Log_Acc[0]	Accumulator used to accumulate samples of instantaneuos mass rate. This is a 64 bit valu
T_TIB_Total_Drive_Power_Acc[0]	Accumulator used to accumulate samples of total drive power. This is a 64 bit value that
T_TIB_Total_EPD_Shutdowns	Number of EPD shutdowns over the life of the engine.
T_TIB_Total_Engine_Revolutions	This variable contains a value indicating the number of times the engine has gone through a one complete revolution while the trip info feature is enabled.
T_TIB_Total_Engine_Speed_Acc[0]	Accumulator used to accumulate samples of trip drive engine speed. This is a 64 bit valu
T_TIB_Total_Idle_Mass_Fuel_Used	Accumulated fuel used at idle
T_TIB_Total_Load_Acc[0]	Accumulator used to accumulate samples of trip load. This is a 64 bit value that is the
T_TIB_Total_Mass_Fuel_Used	Accumulated fuel used
T_TIB_Total_PTO_Jcomm_Ctrl_Time	The total non-resettable time spent in PTO commanded via Jcomm
T_TIB_Total_PTO_Mass_Fuel_Used[0]	The total fuel used at PTO preset speed 1
T_TIB_TripPTOJcomCtrlMasFuelUsd	Fuel used under PTO Jcomm conditions since last trip info reset
T_TIB_TripShrtStpIdlMasFuel_Usd	Short stop idle fuel used over current trip
T_TIB_Trip_Derate_Fuel_Used	Amount of fuel used under derate conditions since last trip info reset
T_TIB_Trip_Derate_Mass_Fuel_Usd	Fuel used under derate conditions since last trip info reset
T_TIB_Trip_Derate_Time	The accumulated total time that the engine has been in a derate condition while the trip info feature is enabled.
T_TIB_Trip_Dosing_MassFuel	Total dosing fuel used since trip info was reset
T_TIB_Trip_Drive_Engine_Spd_Acc[0]	Accumulator used to accumulate samples of trip drive engine speed. This is a 64 bit valu

T_TIB_Trip_Drive_Load_Acc[0]	Accumulator used to accumulate samples of trip drive engine speed. This is a 64 bit valu
T_TIB_Trip_Drive_Mass_Fuel_Used	Fuel used under drive conditions since last trip info reset
T_TIB_Trip_Drive_Power_Acc[0]	Accumulator used to accumulate samples of trip drive power. This is a 64 bit value that
T_TIB_Trip_Drt_Dst_Fuel_Usd	Amount of dosing fuel used under derate conditions since last trip info reset
T_TIB_Trip_Drt_Dst_MassFuel	Dosing Fuel used under derate conditions since last trip info reset
T_TIB_Trip_Drv_Dst_MassFuel	Dosing Fuel used under drive conditions since last trip info reset
T_TIB_Trip_Dst_MassFuel	Total Dosing Fuel used since trip info was reset
T_TIB_Trip_EPD_Idle_Shutdowns	The total number of times that engine protection has caused an idle shutdown while the trip info feature is enabled.
T_TIB_Trip_EPD_Shutdowns	Number of Engine Protection Shutdowns since last trip info reset
T_TIB_Trip_ESP_Dst_Fuel_Usd	Amount of dosing fuel used under ESP conditions since last trip info reset
T_TIB_Trip_ESP_Dst_MassFuel	Dosing Fuel used under ESP conditions since last trip info reset
T_TIB_Trip_ESP_Fuel_Used	Amount of fuel used under ESP conditions since last trip info reset
T_TIB_Trip_ESP_Mass_Fuel_Used	Fuel used under ESP conditions since last trip info reset
T_TIB_Trip_ESP_Time	Time operating under ESP conditions since last trip info reset
T_TIB_Trip_Engine_Speed_Acc[0]	Accumulator used to accumulate samples of trip load. This is a 64 bit value that is the
T_TIB_Trip_FIdle_Dsr_Fuel_Usd	Amount of dosing fuel used under Fast Idle conditions since last trip info reset
T_TIB_Trip_FIdle_Dsr_MassFuel	Dosing fuel used under Fast Idle conditions since last trip info reset
T_TIB_Trip_FIdle_Dst_FuelUsd	Amount of dosing fuel used under Fast Idle conditions since last trip info reset
T_TIB_Trip_FIdle_Dst_MassFuel	Dosng Fuel used under Fast Idle conditions since last trip info reset
T_TIB_Trip_FIdle_Dst_Time	Dosing Time operating under Fast Idle conditions since last trip info reset
T_TIB_Trip_FastIdleMassFuel_Usd	Fuel used under Fast Idle conditions since last trip info reset
T_TIB_Trip_Fast_Idle_Fuel_Used	Amount of fuel used under Fast Idle conditions since last trip info reset
T_TIB_Trip_Fast_Idle_Time	Time operating under Fast Idle conditions since last trip info reset
T_TIB_Trip_Hot_Shutdowns	Number of shutdowns under hot conditions since last trip info reset
T_TIB_Trip_Idl_Dst_MassFuel	Desoot fuel used under Idle conditions since last trip info reset
T_TIB_Trip_Idle_Dsr_MassFuel	Desorb fuel used under Idle conditions since last trip info reset
T_TIB_Trip_Idle_Mass_Fuel_Used	Fuel used under Idle conditions since last trip info reset
T_TIB_Trip_Load_Acc[0]	Accumulator used to accumulate samples of trip load. This is a 64 bit value that is the
T_TIB_Trip_Log_En	Enables Trip Log
T_TIB_Trip_Mass_Fuel_Used	Total Fuel used since trip info was reset
T_TIB_Trip_PTOJcomCtrlFuel_Usd	Amount of fuel used under PTO JCOMM Control conditions since last trip info reset
T_TIB_Trip_PTOJcom_Dst_MassFuel	Dosing fuel used under PTO Jcomm conditions since last trip info reset
T_TIB_Trip_PTO_Dst_MassFuel[0]	The dosing fuel used at PTO preset speed 4 since last reset of trip
T_TIB_Trip_PTO_Jcm_Dst_Fuel_Usd	Amount of dosing fuel used under PTO JCOMM Control conditions since last trip info reset
T_TIB_Trip_PTO_Jcomm_Ctrl_Time	Time operating under PTO Jcomm control conditions since last trip info reset
T_TIB_Trip_PTO_Mass_Fuel_Used[0]	The fuel used at PTO preset speed 4 since last reset of trip
T_TIB_Trip_RPMDrt_Dst_FuelUsd	Dosing fuel used while under control of speed engine protection derate since last trip reset
T_TIB_Trip_RPMDrt_Dst_MassFuel	Dosing fuel used while under control of speed engine protection derate since last trip reset
T_TIB_Trip_RPM_Derate_Fuel_Used	Fuel used while under control of speed engine protection derate since last trip reset
T_TIB_Trip_RPM_Derate_Time	The time the fueling has been controlled by speed engine protection since last trip reset

	T_TIB_Trip_RPM_Drt_MasFuel_Usd	Fuel used while under control of speed engine protection derate since last trip reset
	T_TIB_Trip_SStopIdl_Dsr_FuelUsd	Short stop idle desorb fuel used over current trip
	T_TIB_Trip_SStpIdle_Dsr_MasFuel	Short stop idle desorb fuel used over current trip
	T_TIB_Trip_SStp_Dst_FuelUsd	Short stop idle desoot fuel used over current trip
	T_TIB_Trip_SStp_Dst_Time	Desoot time elapsed while idling less than T_TIB_Short_Stop_Idle_Period over the current trip.
	T_TIB_Trip_SStp_Idl_Dst_MasFuel	Short stop idle desoot fuel used over current trip
	T_TIB_Trip_Short_Stop_Idle_Time	Time elapsed while idling less than T_TIB_Short_Stop_Idle_Period over the current trip.
	T_TIB_Trip_ShrtStp_IdlFuel_Usd	Short stop idle fule used over current trip
	T_TIB_Trip_Torque_Derate_Time	The time the fueling has been controlled by torque engine protection since last trip reset
	T_TIB_Trip_TrqDrt_Dst_Fuel_Used	Dosing fuel used while under control of torque engine protection derate since last trip reset
	T_TIB_Trip_TrqDrt_Dst_MassFuel	Dosing fuel used while under control of torque engine protection derate since last trip reset
	T_TIB_Trip_Trq_Drt_Fuel_Usd	Fuel used while under control of torque engine protection derate since last trip reset
	T_TIB_Trip_Trq_Drt_Mas_Fuel_Usd	Fuel used while under control of torque engine protection derate since last trip reset
	T_TIB_Trip_Warm_Up_Violations	The number of times the engine has not been properly warmed up since last trip reset.
	T_TIB_Ttl_Dosing_MassFuel	Accumulated dosing fuel used
	T_TIB_Ttl_Drive_Mass_Fuel_Usd	Accumulated fuel used at drive
	T_TIB_Ttl_Drv_Dst_MassFuel	Accumulated dosing fuel used at drive
	T_TIB_Ttl_Idle_Dsr_MassFuel	Accumulated desorb fuel used at idle
	T_TIB_Ttl_Idle_Dst_MassFuel	Accumulated desoot fuel used at idle
	T_TIB_Ttl_PTOJcomCtrlFuelUsd	The total non-resettable fuel used when PTO commanded via Jcomm
	T_TIB_Ttl_PTOJcomCtrlMasFuelUsd	The total non-resettable fuel used when PTO commanded via Jcomm
	T_TIB_Ttl_PTO_Dst_MassFuel[0]	The total dosing fuel used at PTO preset speed 1
	T_TIB_Ttl_PTO_Jcom_Dst_Fuel_Usd	The total non-resettable dosing fuel used when PTO commanded via Jcomm
	T_TIB_Ttl_PTO_Jcom_Dst_MassFuel	The total non-resettable dosing fuel used when PTO commanded via Jcomm
	T_TIB_Warmup_Period	TI Min warmup time TI warmup logic disengages after this time has elapsed
	T_TID_SdnDecelRate_Thrshld	Vehicle must decelerate at this rate or greater for one second before sudden deceleration is counted.
	T_TID_Trip_Log_En	Enables Distance Trip Information Logging
	T_TI_EPD_Enable	Trimmable Enable for Engine Protection Derate Trip info feature
	T_TI_PTO_Enable	Trimmable Enable for Power Take off Trip info feature
COT	T_TPE_COT_Estimation_Enable	COT virtual sensor enable
Surge Margin	T_TPE_SM_Estimation_Enable	Enable switch for surge margin estimate
	T_TPE_TOT_Selector	Enable switch to use regression based TOT virtual sensor
Torque Request Override	T_TRO_Enable	Enable for the Torque Request Override due to Service Brake feature.
Clutch Abuse	T_TSP_ClAbuse_Dis_Rev	When this is TRUE and Reverse_Switch is TRUE, Clutch Abuse detection is disabled
	T_TSP_ClutchAbuseDet_En	Trim for Enabling the Clutch Switch abuse detection feature
Clutch Tampering	T_TSP_ClutchTamperDet_En	Enable for Clutch Switch Tampering
	T_TSP_InductanceVssRLOC	This trim specifies the resource locator for the Inductance VSS.
	T_TSP_Pulses_Per_KM	Number of pulses per 1 km travelled by the vehicle.
	T_TSP_SensorType	This trim specifies the type of sensor which shall be used to calculate the parameters su
	T_TSP_TeethPerInterrupt	This trim specifies the number of teeth required before the microprocessor will generate an interrupt.

	T_TSP_TeethPerRev	This trim specifies the number of teeth for one complete revolution of the tone wheel..
Tire Wear	T_TWA_Adjusted_Tire_Size	Tire size after the tire wear adjustment has been done
	T_TWA_Enable	This is a required parameter which indicates to the tool whether the Tire Wear Adjustment feature is enabled or disabled.
	T_TWA_ExpectedLifeOfTires	Expected life of new tires
	T_TWA_ExpectedTireSizeChange	Expected percentatge change in the tire size.
	T_TWA_Total_Distance_On_Tires	Total kilometers accumulated on current tire set.
	T_Test_Cell_Throt_En	Test cell throttle switch override enable. When set to 1, the local auto_zero value is set to C_ACD_Test_Cell_Auto_Zero.
	T_Torque_Derate_Override_Enable	This is a flag which enables the torque derate override feature.
	T_Turbo_Speed_Estimation_Enable	trim parameter to enable or disable turbo speed estimation
	T_Turbo_Speed_Hysteresis_Select	Turbo speed Hysteresis: 0=VARIABLE
	T_Turbo_Speed_Override	Turoi speed override
	T_Turbo_Speed_Override_Enable	Turbo speed override enable
UDD	T_UDD_ClntTmptrAdj_Enbl	Doser Injector PWM Pullin duty cycle adjustment enable for coolant temperature compensation
	T_UDD_FCV_RLOC	Resource allocation for Flow Control Valve
	T_UDD_HeaterChanType	Trim to select Heater channel HSD = 0,HSP = 1,LSD = 2,LSP = 3, HB=5
	T_UDD_PowerCtrl2_RLOC	For 2 pins power supply. 2nd pin resource allocation for pump motor power.
	T_UDD_PowerCtrl_RLOC	Resource allocation for pump motor power.
	T_UDD_Pump_RLOC	Resource allocation for Reverting Valve
	T_UDD_PwrChanType	Trim to select Heater channel HSD = 0,HSP = 1
	T_UDD_SU_Heater_RLOC	Resource allocation for Doser Heater
	T_UID_DosingErrDetect_Enbl	Enable for Dosing Error Detection.
	T_UIM_FT_SCR_Heating_Type	Heating type selection.
	T_USM_TmptrProcOvr_Enbl	Tmptr reading processing rqst override enable.
	T_UTC_FT_LineHeater1PWM_Enbl	Enables PWM signal control for driving urea line heater 1 coolant valve. When disabled, HS On/Off signal assumed for driving the coolant valve.
	T_UTC_FT_LineHeater1_Enbl	Enables use of Urea Line Heater 1 Relay output driver
	T_UTC_FT_LineHeater4_Enbl	Enables use of Urea Line Heater 1 Relay output driver
	T_UTC_FT_TankHeater1PWM_Enbl	Enables PWM signal control for driving urea tank heater 1 coolant valve. When disabled, HS On/Off signal assumed for driving the coolant valve.
	T_UTC_FT_TankHeater1_Enbl	Enables use of Urea Tank Heater 1 Relay output driver
UTD	T_UTDD_LineHtr1_RLOC	Resource locator for LineHeater
	T_UTDD_TankHtr1_RLOC	Resource locator for Tank Heater
	T_UTD_TankHtr1_TmptrRise_Enbl	Enable for initial heater temperature rise diagnostic
	T_UTD_pc_Tank1LvlInduce_Thd	Threshold at which urea is considered to be at an Inducement level
	T_UTD_pc_Tank1LvlLow_Thd	Threshold at which urea is considered to be at a low level
	T_UTD_pc_Tank1LvlWarn_Thd	Threshold at which urea is considered to be at a Warning level
UTM	T_UTM_FT_TankConfig_Enbl	Enables or disables the Urea Tank Configuration feature.
	T_UTM_FT_TankLvl_SenMux_Addr	Source address of device sending the DEF Tank Level sensor signal.
	T_UTM_FT_TankTmptrSenMux_Addr	Source address of device sending the DEF Tank Temperature sensor signal.
	T_UTM_NonLinearTankType_Enbl	Enables the use of a urea tank with non-linear level to volume relationship
	T_UTM_TankLvl_SenMux_ID	This parameter is set to the name table name of the parameter responsible for providing the index for Urea Tank Level selection by datalink.
	T_UTM_TankT_SenMux_ID	This parameter is set to the name table name of the parameter responsible for providing the index for Urea Tank Temperature selection by datalink.

	T_UTM_pc_NonLinearTank_X[0]	Urea percent level breakpoints entered by the OEM or service
	T_UTM_vm_LinearTankFullVolume	Volume of linear urea tank corresponding to 100 percent level
	T_UTM_vm_NonLinearTankVol_Tbl[0]	Urea volume breakpoints entered by the OEM or service
VAM	T_VAM_Enable	Used to enable/disable Vehicle Acceleration Management feature.
	T_VAM_VariableAccel_Accel1	Desired vehicle acceleration rate for T_VAM_VariableAccel_Speed1.
	T_VAM_VariableAccel_Accel2	Desired vehicle acceleration rate for T_VAM_VariableAccel_Speed2.
	T_VAM_VariableAccel_Speed1	At this Vehicle_Speed, sets Vehicle Acceleration to T_VAM_VariableAccel_Accel1.
	T_VAM_VariableAccel_Speed2	At this Vehicle_Speed, sets Vehicle Acceleration to T_VAM_VariableAccel_Accel2.
	T_VGA_DL_Actuator_PS_RLOC	VGT Actuator Controller Power Supply ID
	T_VGT_Test_Enable	When Enabled, the VGT datalink command will be routed back to the receive VGT message processing. This will allow testing when a VGT is not present.
VSP	T_VSP_RoadSpdUsrOvrdEn	Enables/disables user override of Road Speed. When Enabled, Road Speed will be set equal to the value of H_TSP_RoadSpdUsrOvrdVal.
	T_VSP_RoadSpdUsrOvrdVal	Overide Value for Road Speed.
	T_VSP_TachographRLOC	This parameter specifies the resource locator for the Tachograph. It is used to associate
	T_VSP_Tachograph_K_factor	K factor for tachograph
VSS	T_VSS_Override_PTO_Pump_Mode	When enabled, Vehicle speed calculation is disabled and the vehicle speed is overriden to ZERO during the PTO Pump Mode operation.
	T_VSS_SpeedLimitType	VSS Diagnostics trim indicating whether Max Load Speed or No Load Speed or Isochronous Sp
	T_VSS_Tamper_Enable	Vehicle Speed Sensor Diagnostic trim that enables VSS Anti-Tampering detection.
	T_VSS_Tamper_Sensitivity	VSS_Tamper_Sensitivity can have either the value of _LOW (0) or _HIGH (1).
WPD	T_WPD_Cold_Idle_Warm_Ext_En	Enables Cold Idle Warmup Extended Range functionality.
	T_WPD_Cold_Idle_Warmup_En	This trim, when enabled, turns on the cold Idle portion of the Engine Protection feature.
	T_WPD_Coolant_Temperature	Coolant Temperature at which the extended cold idle feature is no longer activated.
	T_WPD_Coolant_Tmptr_2	Coolant Temperature at which the primary stage of Cold Idle feature is no longer acvitated.
	T_WPD_Coolant_Tmptr_R	Hysteresis threshold Coolant Temperature of the extended stage of cold idle feature
	T_WPD_Coolant_Tmptr_R_2	Hysteresis threshold of Coolant Temperature of the primary stage of cold idle feature
	T_WPD_Reference_Speed	The higher idle speed at which the engine runs when the extended range operation of the Cold Idle Warmup feature is active.
	T_WPD_Reference_Speed_2	The higher idle speed at which the engine runs as a result of primary range Cold Idle Warmup being active.
	T_WPD_Time_Period	Time Period in seconds in which Cold Idle Warm-up has been activated.
Water in Fuel	T_EEM_WIFEnable	This parameter will enable the Water In Fuel Feature in the system
	T_Water_In_Fuel_Mux_Address	Source address of device sending the Water In Fuel signal.
	T_Water_In_Fuel_Mux_Enable	This is a required parameter which indicates to the tool whether the Water In Fuel Multiplexing feature is enabled or disabled.
	T_WIF2Sensor_VtgRLOC	The hardware resource location ID for Second Water In Fuel Sensor voltage.
	T_WIFSensor_VtgRLOC	The hardware resource location ID for Water In Fuel Sensor voltage.
	T_WIF_Dual_Sensor_En	Dual WIF sensor Tool Enable

Interpreting the Output of the Fault Handler
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Terminology:

1 Operation Cycle: An operation cycle occurs when at least one of the following is true:

- Key switch transitions from ON to OFF, and Engine is running at a speed above 550RPM for a minimum of 2 seconds (Ignition cycle increments by 1). Complete power down is not required.
- The engine is running at a minimum of 550RPM for the cumulative duration of 4 hours in the current operation cycle.

Trip: Trip is Operation cycle without the engine speed requirement.

The flow of the Fault Handler

Any given diagnostic that triggers a Fault Code will go through a series of steps before an actual Lamp is lit on the dash of the truck. This flow proceeds as follows:

1. Any given diagnostic can send either a Set error or a Clear error to the fault handler. Each diagnostic is given a unique System Error to identify it to the fault handler. The system error that we typically read is a text string that is descriptive of the error, however, in the ECM, the text string that identifies this system error is converted into a number that will be used in place of the text name. The SET or CLEAR error that is received by the ECM will be accompanied by this System Error Number (SEN).
2. Each error has been calibrated to define its behavior in the ECM once it receives a Set or Clear error. This calibration will define what lamp is turned on, how many operation cycles with Set errors are needed to activate the lamp, how long the lamp will stay on after the error is cleared, and other additional information. Once the Set error is received, the fault handler will set the Pending Flag for that error.
3. After the Pending Flag has been set for a system error, the fault handler will then begin to count the number of operation cycles that have passed in which a fail decision has been made and then will set the Permanent and Confirmed flags. For a 1 trip fault, the pending, permanent, and confirmed flag come on with the first set error.
4. When the Permanent and Confirmed Flags are on, the associated lamp will be turned on as well.
5. Once the fault is fixed, the algorithm will begin to send only Clear errors to the fault handler. The number of trips required to clear an error is a calibrateable for each fault. Once the number of operation cycles has passed in which only clear errors are made, the Permanent flag will go off and the Lamp will turn off.

Important Tables for diagnosis

When a Faults Code shows active in the CalTerm windows, it is indicating that the last decision that the fault handler received was a set error. *This does not necessarily correspond to the actual Lamp status.* To see the status of any given lamps use the following parameters:

Malfunction_Indicator_Lamp	none
Stop_Fault_Lamp	none
Warning_Fault_Lamp	none

The Fault Code number and the Fault code description will be available in the CalTerm window, however, if the underlying system error that triggered this Fault Code is needed, the following tables should be used:

ECM_Active_Error_Index	none
ECM_Inactive_Error_Index	none

Each of the above tables is system error number based. (See below for a process to find the system error number for a given system error). The SENs corresponding to the active Fault Codes populate the ECM_Active_Error_Index table in order of their occurrence. These tables are ranked in the order they came into the fault handler. The 0 position will be the first of the current errors that was received. The SENs corresponding to the Fault Codes that were previously active populate the ECM_Inactive_Error_Table in the order of de-activation.

When the Permanent and Confirmed flags are both SET for a System Error(s), the corresponding FC(s) activates the MIL.
To look up the System Error(s) triggering the MIL one of the following tables can be used:

1. OBD_State_Table_3: This table contains a list of active System Errors with Permanent and Confirmed flags SET
2. OBD_State_Table_7: This table contains a list of active System Errors with Pending, Permanent and Confirmed flags SET
3. OBD_Fault_Status_Table: Lookup the System Error(s) in this table with Permanent and Confirmed flags SET

OBD_State_Table_x tables are system error number based.
OBD_Fault_Status_Table contains the current error state for each OBD Error in the system.

Finally, the OBD status of any system error can be seen in the following OBD tables. Each of these tables is system error number based and shows the OBD status of each system error.

OBD_Pending_ErrorIndex	none
OBD_Permanent_ErrorIndex	none
OBD_Confirmed_ErrorIndex	none

Finding the System Error Number from a System Error

Each build, the list of system error number will change. This is true for all system errors and one should never assume that the system error number for a given system error is the same from build to build. In order to find the correct System Error Number (SEN), you will need to look into the Error_Table for a given build. This table is located in the Build_Files/Code directory of each software build. Inside of this table, the system errors are listed in order. SEN 1 will be listed first and so on. By pulling up a text editor you can determine the SEN. Additionally, there have been some programs written to aid this process. The Fault Code Translator can help you with this process.

It is possible to log and monitor each of these tables, but it will be necessary to use an individual table location. For instance: If you wanted to log the OBD_Pending_ErrorIndex, you would need to monitor OBD_Pending_ErrorIndex[0].

Determing the Readiness Status of a System Error – Has a given diagnostic run and made decisions?

Find the System Error Number for the diagnostic of interest using the method described above. The table that can be used to determine the readiness status of each system error is listed below:

OBD_ReadinessStatus_CurOprCyc
This is a one dimensional array whose index is the same as the SEN. This indicates whether every System Error is ready for performance check in the current Operation Cycle.

Possible values are:
0 - NOT_READY (Diagnostic has not run)
1 – READY (Diagnostic has run)

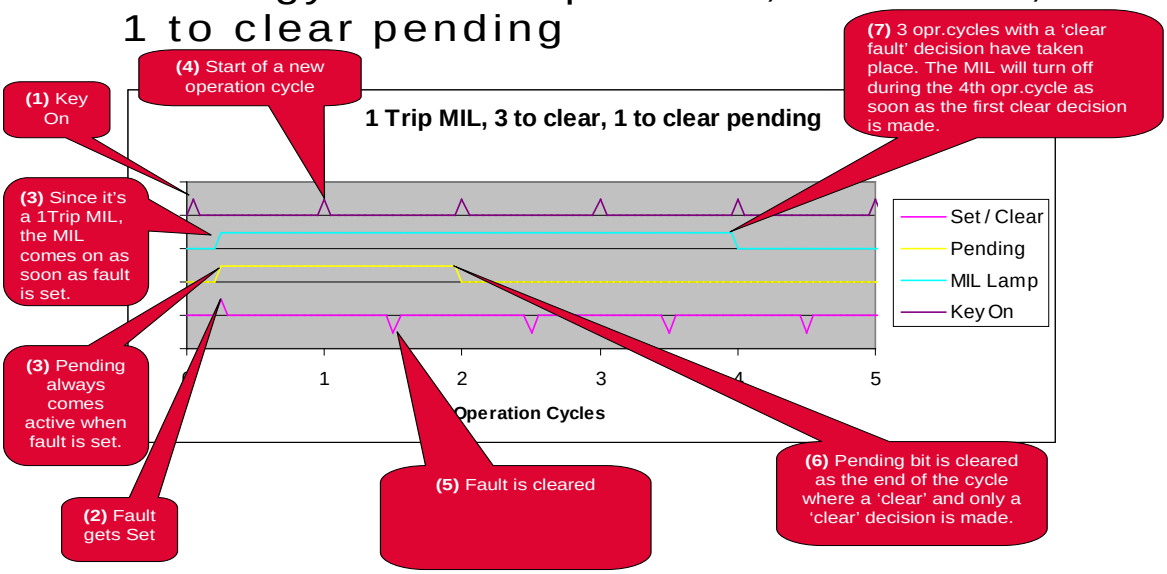
Fault Handler Lamp Behavior

In addition to the AWL and the RSL used in the 2007 calibration release, a Malfunction Indicator Lamp (MIL) is now present. Please see below under 'Proper MIL lamp response' to better understand the correct way to respond to a MIL lamp.

Below you will find all the standard Lamp configurations and their behavior. It should be noted that the MIL lamp will not behave as the AWL did. Regulations require that this lamp stay on for a set period of time even after the fault has been corrected. Sending a clear all faults command from the service tool can override this waiting period to clear a fault.

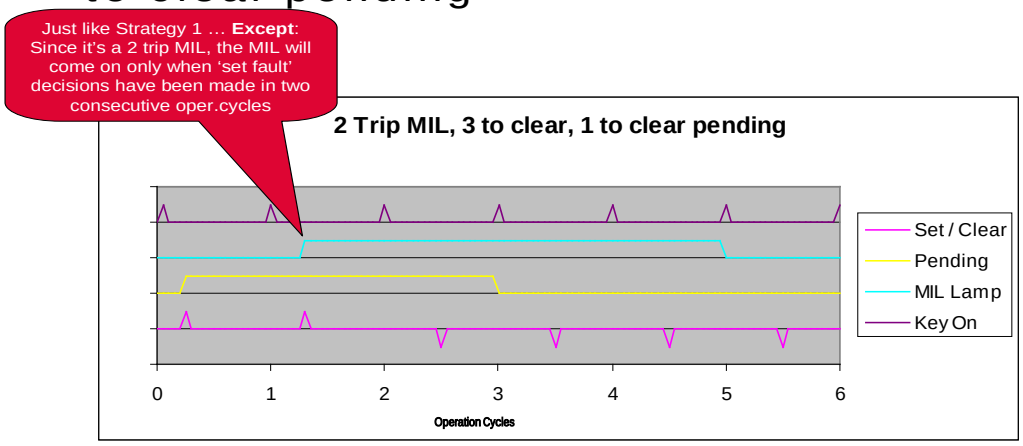
One additional note: With many of the new OBD faults, certain conditions must be met before the algorithm will run. Care should be taken to understand a particular fault in order to know when and if it has made a decision.

Strategy # 1: 1 Trip to MIL, 3 to clear, 1 to clear pending



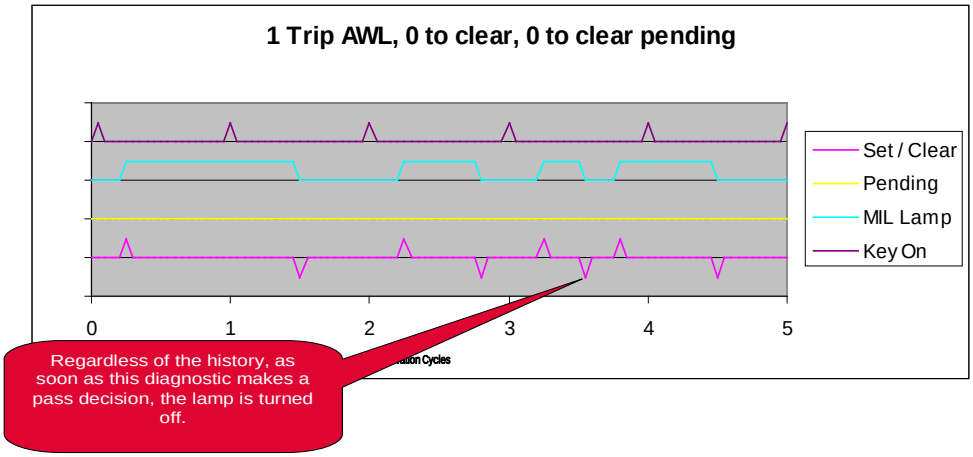
1-3-1 MIL Lamp

Strategy # 2: 2 Trip MIL, 3 to clear, 1 to clear pending



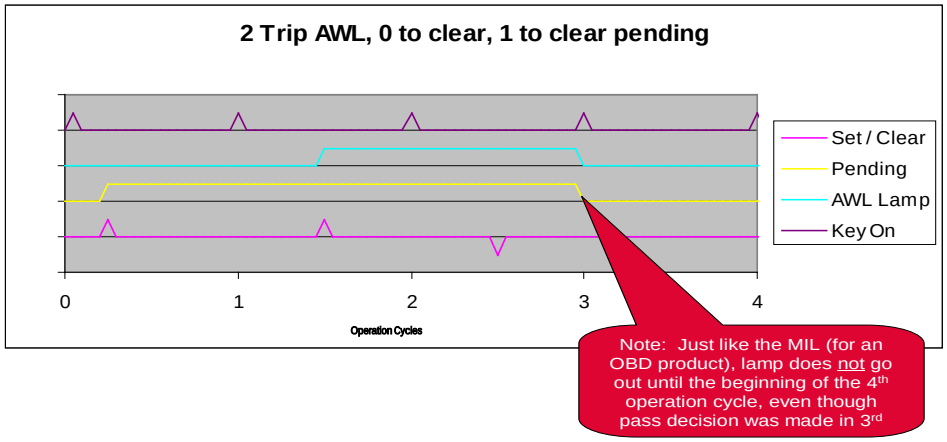
2-3-1 MIL Lamp

Strategy # 4: 1 Trip AWL, 0 to clear, 0 to clear pending (same as pre 2010)



Standard AWL

Strategy # 5: 2 Trip AWL, 0 to clear, 1 to clear pending



2 Trip AWL – Only available on EMD+ Products.

Proper MIL Lamp Response

Malfunction Indicator Lamp:

With the launch of the 2013 ISX engine, a new lamp with be on the dash. This lamp, the MIL (Malfunction Indicator Lamp) will be similar to the AWL (Amber Warning Lamp). The MIL lamp should be reacted to in the same way you respond to the AWL. Both indicate a malfunction of some vehicle component and service should be sought at the first opportunity.

The MIL lamp is a special lamp that indicates a problem with a component on your vehicle that is related to emissions. This means that when the MIL lamp is on, some component has been diagnosed as failed that can adversely affect tailpipe emissions. This problem should be repaired.

Currently the AWL is configured to be activated with most of the emissions (MIL) related faults. AWL is triggered when a Fault Code goes active and it is cleared when the Fault code goes inactive. This AWL is configuration is completely independent of the MIL operation. This default functionality could be altered in future for some of the Fault codes via AWL suppression resulting in the some of the emission related faults activating only the MIL.

The AWL will now exclusively be used to indicate problems with non-emissions related components. Both lamps indicate a problem and your vehicle should be taken to an authorized Cummins service center for diagnosis at your first opportunity.

The AWL has historically come on as soon as there was an active fault code. Once that fault code went inactive, the AWL was turned off. This is still the case for the AWL.

However, once the MIL is illuminated, for 3 trips to clear faults, it will stay on until the diagnostic that turned it on has made only pass decisions for three consecutive operation cycles. Thus, even if the problem is repaired, the MIL will stay on for three operation cycles. This delay can be eliminated if, after fixing the problem, a clear all faults command is given by Calterm / Insite.

Two Trip Faults:

Along with OBD comes the concept of “two-trip faults”. Two-trip faults are used when we require that a diagnostic make two consecutive “fail” decisions before turning on the MIL.

Example: If a particular diagnostic makes a “fail” decision on one trip, this results in an active fault code that is visible via Calterm or Insite. However, no lamp or electronic dash message should be visible at this point. Only after experiencing two consecutive drive cycles where the diagnostic ran and made a “fail” decision would the MIL be turned on.

Red Stop Lamp and MIL faults:

In OBD products (X1), there are a handful of fault codes which along with lighting a Red Stop Lamp (RSL) will also light a MIL. These are listed below.

111
115
131
132
1242
1515
2449
2634
2635
2636
3326
3527
3528
3697

For all the above faults, the MIL and RSL will both come ON simultaneously after 1 trip where a fail decision has occurred. However, instead of taking 3 trips to clear the lamps, these faults will clear the fault and both the lamps immediately after a pass decision occurs.

On EMD+ products (X2, X3, and Black), these faults behave as regular non-obd Red Stop Lamps similar to 2007 products. NOTE: All faults and lamps on EMD+ products, be it 1 or 2 trips, be it AWL or RSL, will clear immediately when a pass decision occurs.

IX. EPA Certification Information

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AECD List

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AECD 1 – Air Handling System

AECD 4 – Cold Intake Manifold Temperature Protection

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- AECD 7.3 – Cooling System Protection
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AECS 8 – Diagnostic Procedures

- AECD 8.2 – Misfire Monitor
- AECD 8.8 – Fueling Quantity and Timing (ISX1 Only)
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AECD 9 - Modulation

- AECD 9.1 – Transient and Steady State Operations
- AECD 9.2 – Ambient Conditions
- AECD 9.3 – Transient Acceleration
- AECD 9.4 – Automated Transmission Shift Modulation
- AECD 9.5 – Coolant Temperature Overheat Protection

AECD 10 – DPF Regeneration

- AECD 10.1 – DPF Regeneration Aftertreatment Modulation
- AECD 10.2 – Ineffective Dosing
- AECD 10.6 – Manual Requests : Non-Mission Regeneration and Inhibit Regen
- AECD 10.7 – Aftertreatment Protection

AECD 13 – Selective Catalytic Reduction (SCR)

- AECD 13.1 – SCR System Modulation
- AECD 13.1b – SCR Low Temperature Operation
- AECD 13.2 – Thermal Management
- AECD 13.3 – DEF Thawing Protection
- AECD 13.4 – SCR System Malfunction

Inlet Density Chi Interpolation

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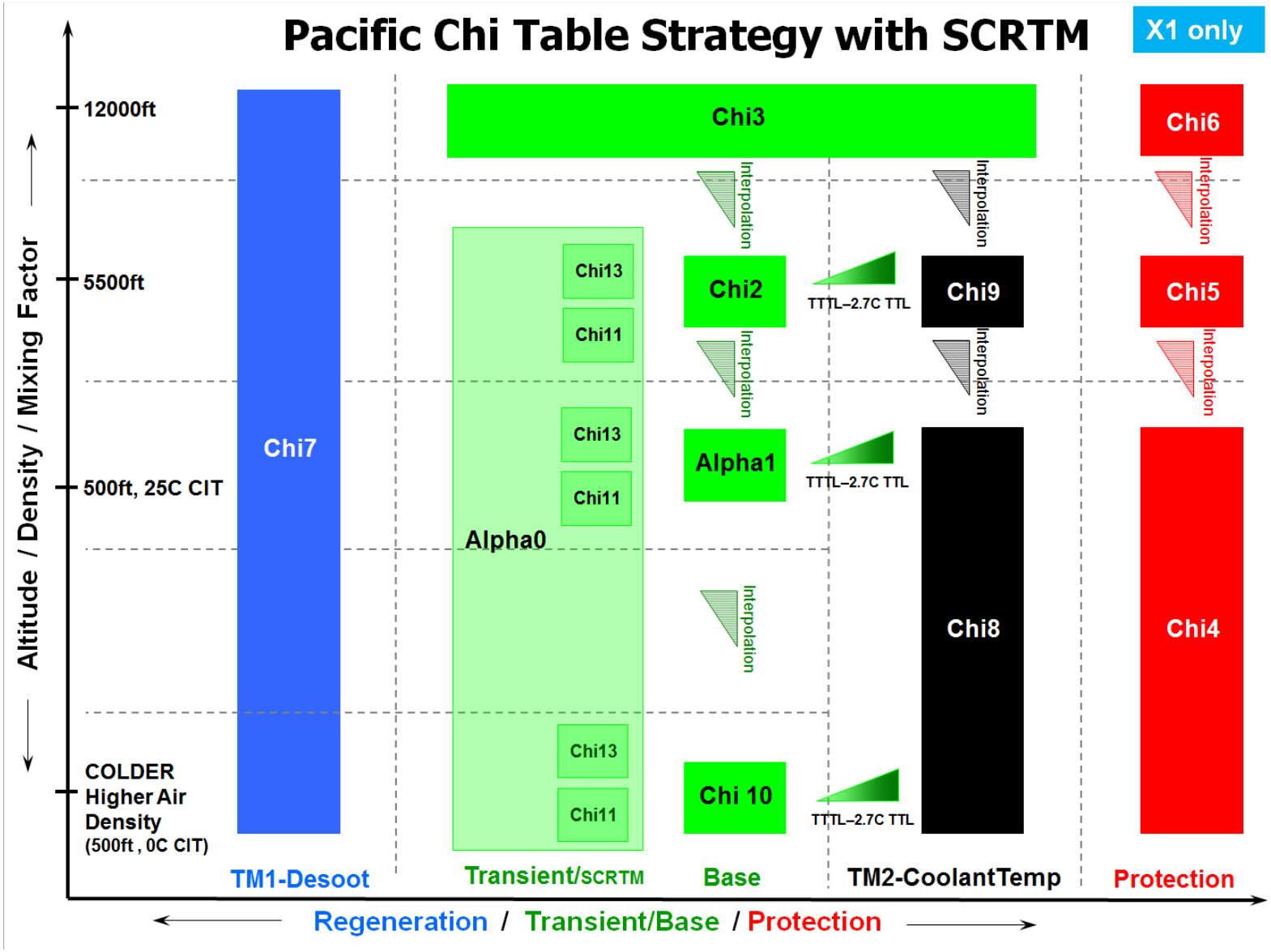

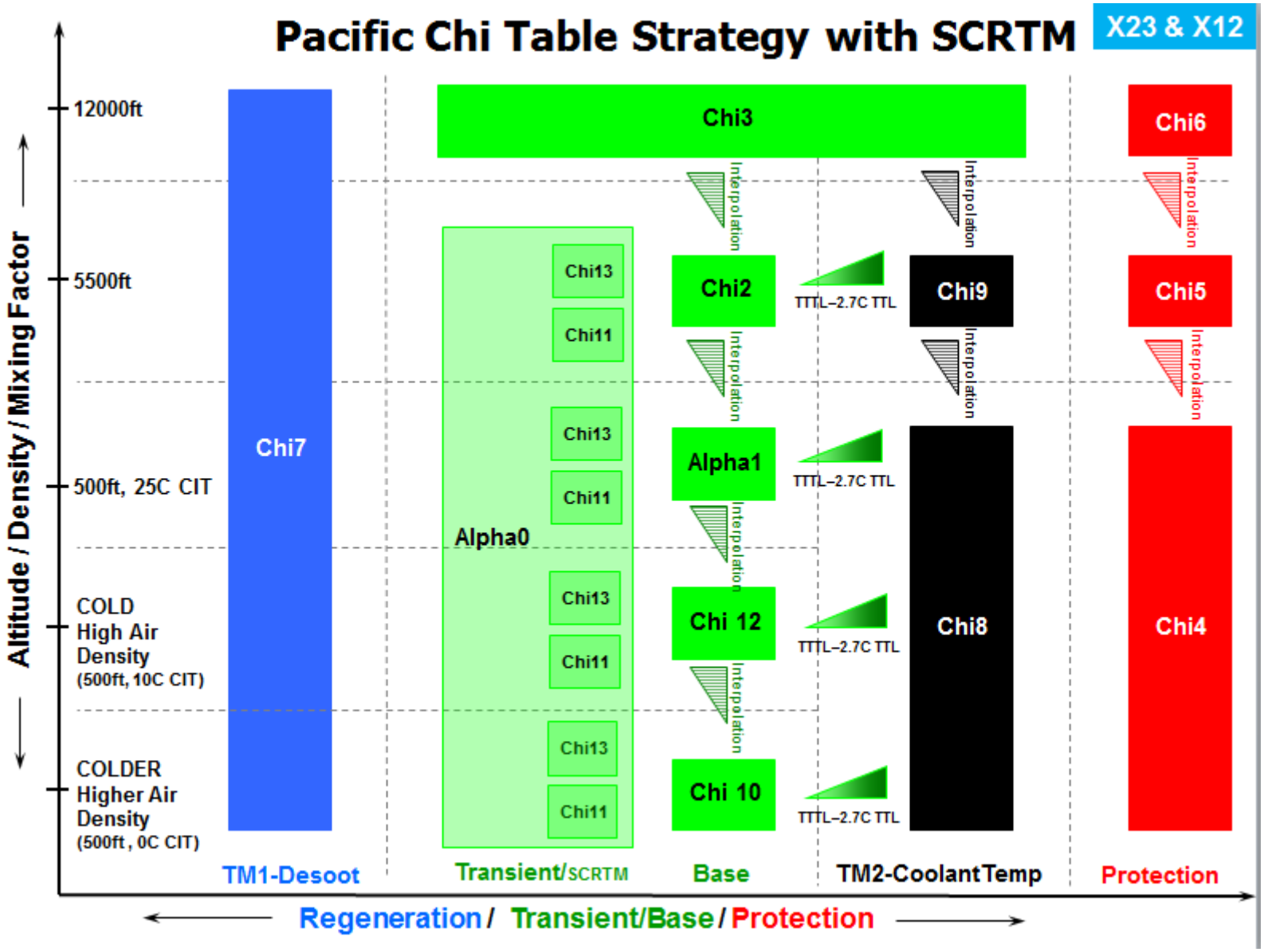
Pacific Chi Table Strategy with SCRTM
X23 & X12
Altitude / Density / Mixing Factor
12000ft
5500ft
500ft, 25C CIT
COLD
High Air
Density
(500ft, 10C CIT)
COLDER
Higher Air
Density
(500ft , 0C CIT)
Chi7
Chi3
Chi6
Chi13
Chi11
Chi2
Chi9
Chi5
Alpha0
Alpha1
Chi8
Chi4
Chi 12
Chi 10
Interpolation
TTL–2.7C TTL
TM1-Desoot
Transient/SCRTM
Base
TM2-CoolantTemp
Protection
Regeneration / Transient/Base / Protection

AECD 1 – Air Handling System

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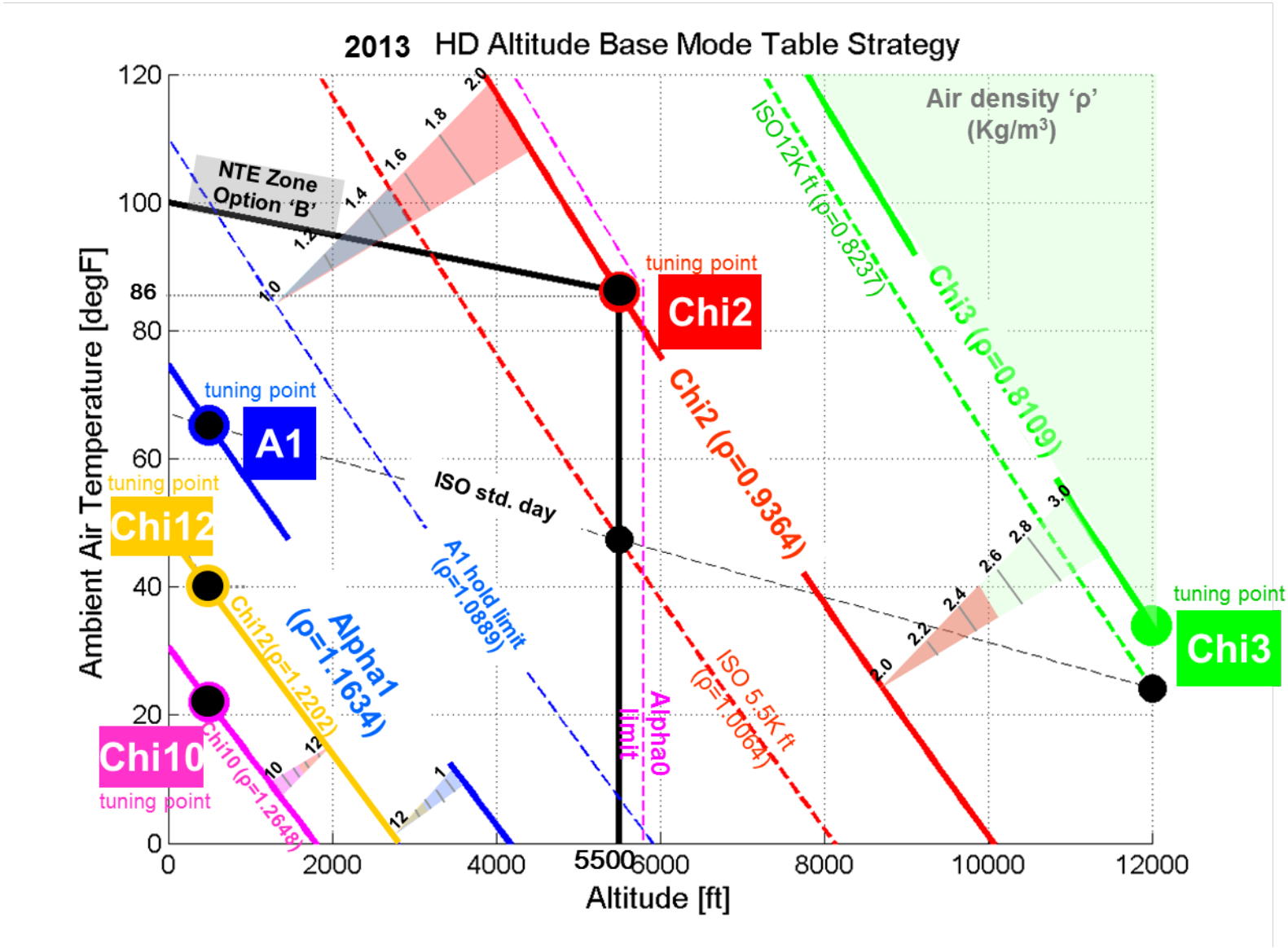
Parameters sensed to activate the AECD:

- Turbocharger Speed : measured speed, compared to design limits to identify need for protection
- Compressor Inlet Temperature and Pressure : measured, used in estimation of compressor inlet density for determination desired control strategy, and estimation of ambient air temperature and estimation of compressor outlet temperature
- Intake Manifold Pressure, Intake Manifold Temperature, and Exhaust Manifold Pressure : measured, used in estimation of charge flow, estimation of EGR Fraction, estimation of turbine inlet temperature
- Massflow Device Differential Pressure : used in estimation of EGR fraction
- Engine Speed : used in establishing target values for EGR fraction and Charge Flow and injection parameters, used in various virtual sensors

Ambient Operating Conditions Chi Value Determination



Note: Figure is valid for both ISX12 and ISX15 products.

AECD 4 – Cold Intake Manifold Temperature Protection AECD

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This AECD limits incomplete combustion during cold weather operation, that results in white smoke, i.e. unburned hydrocarbons, and engine misfire.

The AECD is activated under ambient temperature conditions that would otherwise create poor combustion with retarded injection timing.

This algorithm works in conjunction with Coolant Temperature (separately described in AECD #6)

- Charge Temperature : measured, located in Intake Manifold, used in conjunction with Coolant Temperature to determine cold ambient factor
- Engine Speed : is used in establishing target values for various Fuel System and Air Handling commands
- Fueling Command : is used in establishing target values for various Fuel System and Air Handling commands

AECD 5 – Extended Idle and PTO Protection - Cold

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This AECD is designed to take action only if coolant temperature remains below 60 deg C continuously for a period of 60 minutes, or if charge temperature (intake manifold temperature) remains below 20 deg C and coolant temperature is above 60 C continuously for a period of 10 minutes. For a normal engine, these temperatures will not be below these thresholds until ambient temperatures are below -20 deg C. The control system takes action to disable EGR flow until such time as fueling increases or temperatures increase above the above thresholds. This limits the amount of deposits that can build up in the air handling system.

- Coolant Temperature Threshold : If coolant temperature is colder than 60 deg C, for a period greater than 60 minutes, EGR flow ceases (move to Protection tables).

- Charge Temperature Threshold : If the charge temperature is colder than 20 deg C and coolant temperature is warmer than 60 deg C, for a period greater than 10 minutes, EGR flow ceases. Every 4 hours a return to EGR function is forced to see if the engine is warmed to allow warmer charge temperatures and eliminate the need for EGR. Hence a maximum continuous usage of the extended idle AECD for charge temp AECD is 4 hours out of 4.17.

Low coolant temperature occurs after periods of overnight shutdown. Normally coolant temperature warms up in less than 30 minutes after starting. If this period is excessive, combustion deposits may form. Low intake manifold temperature occurs in very cold climates, and the normal operation quickly warms up within 15 minutes due to EGR heating. If this period is excessive, combustion deposits may form. A fault code (FC 2789) is recorded and a yellow dash lamp is lit if the ambient temperature is above 5 deg C, but coolant temperature is cold. A different fault code (FC 3385) is recorded and a yellow dash lamp is lit if coolant is warm, charge temperature is cold, and if ambient temperature is above 0 deg C. These errors occur when there are cooling system issues.

AECD 6 – Engine Starting and Warm-up

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a. Sensors used to directly measure parameter or operating conditions for which limits may be exceeded

Engine Speed
Engine Fueling
Charge Temperature
Coolant Temperature

Parameters sensed as surrogates to estimate the parameter for which limits may be exceeded

EGR Off Coolant Temperature Threshold
EGR Off Charge Temperature Threshold

After the engine is started from cold conditions, appropriate action is taken with EGR and Fuel System Parameters to protect the engine - If the coolant temperature is below a threshold (15.5 deg C), charge temperature is below a threshold (-6.7 degC) and the injection timing is advanced due to the the unburned hydrocarbon protection AECD, the EGR valve is closed to avoid fouling of the intake manifold by unburned fuel in the exhaust which can then be recirculated which results in lacquered intake and egr cooler deposits. (Parameters Controlled: Injection Timing and Quantity, EGR Fraction, and Rail Pressure)

AECD 7 – Extreme Conditions / Malfunction

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Part 1 – Electronic Sensor and Actuator Failures

Component	ErrorName	FC	Lamp	Trip	EGR OFF	SCR off	HC Dosing OFF	DEF Dosing OFF	Derate
Charge Temperature Sensor	CHARGE_TMPTR_OOR_HIGH_ERROR	153	MIL	1	Yes	Yes	Yes	Yes	Maintenance Derate
	CHARGE_TMPTR_OOR_LOW_ERROR	154	MIL	1	Yes	Yes	Yes	Yes	Maintenance Derate
	CHARGE_TMPTR_IR_HIGH_ERROR	436	MIL	1	Yes	Yes	Yes	Yes	Maintenance Derate
	CHARGE_TMPTR_IR_LOW_ERROR	436	MIL	1	Yes	Yes	Yes	Yes	Maintenance Derate
	CHARGE_TMPTR_KEYON_ERROR	436	MIL	1	Yes	Yes	Yes	Yes	Maintenance Derate
Charge Pressure Sensor	CHARGE_PRESS_OOR_HIGH_ERROR	122	MIL	1	Yes	Yes	Yes	Yes	Maintenance Derate
	CHARGE_PRESS_OOR_LOW_ERROR	123	MIL	1	Yes	Yes	Yes	Yes	Maintenance Derate
	CHARGE_PRESS_IR_HIGH_ERROR	2973	MIL	1	Yes	Yes	Yes	Yes	Maintenance Derate
	CHARGE_PRESS_IR_LOW_ERROR	2973	MIL	1	Yes	Yes	Yes	Yes	Maintenance Derate
	CHARGE_PRESS_KEYOFF_ERROR	2973	MIL	1	Yes	Yes	Yes	Yes	Maintenance Derate
Compressor Inlet Temperature Sensor	COMP_IN_TMPTR_IR_HIGH_ERROR	693	MIL	1	Yes	Yes	Yes	Yes	Maintenance Derate
	COMP_IN_TMPTR_IR_STUCK_ERROR	693	MIL	1	Yes	Yes	Yes	Yes	Maintenance Derate
	COMP_IN_TMPTR_KEYON_ERROR	693	MIL	1	Yes	Yes	Yes	Yes	Maintenance Derate
EGR Delta Pressure Sensor	EGR_DELTA_P_OOR_HIGH_ERROR	2273	MIL	1	Yes	Yes	Yes	Yes	Maintenance Derate
	EGR_DELTA_P_OOR_LOW_ERROR	2274	MIL	1	Yes	Yes	Yes	Yes	Maintenance Derate
	EGR_DP_AUTOZERO_ERROR	1866	MIL	1	Yes	Yes	Yes	Yes	Maintenance Derate
Exhaust Pressure Sensor	EXHAUST_PRESS_IR_HIGH_ERROR	2554	MIL	1	Yes				Maintenance Derate
	EXHAUST_PRESS_IR_LOW_ERROR	2554	MIL	1	Yes				Maintenance Derate
	EXHAUST_PRESS_OOR_HIGH_ERROR	2373	MIL	1	Yes				Maintenance Derate
	EXHAUST_PRESS_OOR_LOW_ERROR	2374	MIL	1	Yes				Maintenance Derate
	EXHAUST_PRESS_KEYOFF_ERROR	2554	MIL	1	Yes				Maintenance Derate

Electronic Sensor and Actuator Failures (continued)

Component	ErrorName	FC	Lamp	Trip	EGR OFF	SCR off	HC Dosing OFF	DEF Dosing OFF	Derate
EGR Orifice Temperatrure Sensor	EGR_ORIFICE_TMPTR_OOR_HIGH_ERROR	2375	MIL	1	Yes	Yes	Yes	Yes	Maintenance Derate
	EGR_ORIFICE_TMPTR_OOR_LOW_ERROR	2376	MIL	1	Yes	Yes	Yes	Yes	Maintenance Derate
	EGR_ORIFICE_TMPTR_IR_HIGH_ERROR	1867	MIL	1	Yes	Yes	Yes	Yes	Maintenance Derate
	EGR_ORIFICE_TMPTR_IR_LOW_ERROR	1867	MIL	1	Yes	Yes	Yes	Yes	Maintenance Derate
	EGR_ORIFICE_TMPTR_IR_STUCK_ERROR	1867	MIL	1	Yes	Yes	Yes	Yes	Maintenance Derate
	EGR_ORIFICE_TMPTR_KEYON_ERROR	1867	MIL	1	Yes	Yes	Yes	Yes	Maintenance Derate
Ambient Air Pressure Sensor	AMBIENT_AIR_PRESS_IR_HIGH_ERROR	295	MIL	1	Yes	Yes		Yes	Maintenance Derate
	AMBIENT_AIR_PRESS_IR_LOW_ERROR	295	MIL	1	Yes	Yes		Yes	Maintenance Derate
	AMBIENT_AIR_PRESSURE_HIGH_ERROR	221	MIL	1	Yes	Yes		Yes	Maintenance Derate
	AMBIENT_AIR_PRESSURE_LOW_ERROR	222	MIL	1	Yes	Yes		Yes	Maintenance Derate
	AMBIENT_AIR_PRESS_KEYOFF_ERROR	295	MIL	1	Yes	Yes		Yes	Maintenance Derate
EGR Orifice Pressure Sensor	EGR_ORIFICE_PRESS_OOR_HIGH_ERROR	3136	MIL	1	Yes				Maintenance Derate
	EGR_ORIFICE_PRESS_OOR_LOW_ERROR	3137	MIL	1	Yes				Maintenance Derate
	EGR_ORIF_PRESS_IR_HIGH_ERROR	3138	MIL	1	Yes				Maintenance Derate
	EGR_ORIF_PRESS_IR_LOW_ERROR	3138	MIL	1	Yes				Maintenance Derate
	EGR_ORIFICE_PRESS_KEYOFF_ERROR	3138	MIL	1	Yes				Maintenance Derate
EGR Driver Actuator	EGA_DRIVER_OPEN_CIRCUIT_ERROR	2349	MIL	1	Yes				Maintenance Derate
	EGA_DRIVER_SHORT_CIRCUIT_ERROR	2353	MIL	1	Yes				Maintenance Derate
	EGA_DRIVER_POWER_LOW_ERROR	3724	MIL	1	Yes				Maintenance Derate
	EGA_DRIVER_IC_OVER_TMPTR_ERROR	1961	MIL	1	Yes				Maintenance Derate
	EGA_VALVE_POSITION_IRH_ERROR	1228	MIL	1	Yes				Maintenance Derate
	EGA_VALVE_POSITION_SIR_ERROR	1228	MIL	1	Yes				Maintenance Derate
	EGA_VALVE_POSITION_IRL_ERROR	1228	MIL	1	Yes				Maintenance Derate
	EGA_VALVE_AUTOZERO_LOW_ERROR	1896	MIL	1	Yes				Maintenance Derate
	EGA_VALVE_AUTOZERO_HIGH_ERROR	1896	MIL	1	Yes				Maintenance Derate
	EGA_VALVE_POSITION_ERROR	2272	MIL	1	Yes				Maintenance Derate

Electronic Sensor and Actuator Failures (continued)

Component	ErrorName	FC	Lamp	Trip	EGR OFF	SCR off	HC Dosing OFF	DEF Dosing OFF	Derate
VGT Driver Actuator	VGA_DL_MISMATCH_ERROR	2635	Stop(Solid)	1	Yes				Maintenance Derate
	VGA_DL_ACTUATION_ERROR	2387	MIL	2	Yes				Maintenance Derate
	VGA_DL_DRIVER_CIRCUIT_ERROR	2634	Stop(Solid)	1	Yes				Maintenance Derate
	VGA_DL_LEARNED_CAL_ERROR	2449	Stop(Solid)	1	Yes				Maintenance Derate
	VGA_DL_COMMAND_SOURCE_ERROR	2198	MIL	1	Yes				Maintenance Derate
	J39_VGT_COMM_TIMEOUT_ERROR	2636	Stop(Solid)	1	Yes				Maintenance Derate
IAT Driver Actuator	IAT_HB_CPS_HIGH_CONTROL_ERROR	175	Stop(Solid)	1	Yes				Maintenance Derate
	IAT_HB_CPS_LOW_CONTROL_ERROR	176	Stop(Solid)	1	Yes				Maintenance Derate
	IAT_HB_POS_OOR_HIGH_ERROR	3539	MIL	1	Yes				Maintenance Derate
	IAT_HB_POS_OOR_LOW_ERROR	3541	MIL	1	Yes				Maintenance Derate
	IAT_HB_CPS_OL_CONTROL_ERROR	175	Stop(Solid)	1	Yes				Maintenance Derate
	IAT_HB_POSITION_IRH_ERROR	3542	MIL	2	Yes				Maintenance Derate
	IAT_HB_POSITION_IRL_ERROR	3542	MIL	2	Yes				Maintenance Derate
	IAT_HB_VALVE_AUTOZERO_ERROR	177	Stop(Solid)	1	Yes				Maintenance Derate
Fuel System Driver Actuator	APC_2S_MDV_LOW_POP_OFF_ERROR	3727	MIL	1	Yes				Maintenance Derate
	APC_2S_MDV_TRIP_ERROR	3741	MIL	1	Yes				Maintenance Derate
	APC_IMV_INTERMITTENT_ERROR	915	MIL	1	Yes				Maintenance Derate
	APC_IMV_RESIS_ERROR	518	MIL	1	Yes				Maintenance Derate
	APC_DIESEL_HIGH_PRS_ERROR	553	MIL	1	Yes				Maintenance Derate
	APC_DIESEL_LOW_PRS_ERROR	559	MIL	1	Yes				Maintenance Derate
	APC_DIESEL_PRS_OOR_HIGH_ERROR	451	MIL	1	Yes				Maintenance Derate
	APC_DIESEL_PRS_OOR_LOW_ERROR	452	MIL	1	Yes				Maintenance Derate
	APC_DIESEL_PRS2_OOR_HIGH_ERROR	483	MIL	1	Yes				Maintenance Derate
	APC_DIESEL_PRS2_OOR_LOW_ERROR	484	MIL	1	Yes				Maintenance Derate
	FUEL_PRESS_RATIONALITY_HIGH_ERROR	755	MIL	1	Yes				Maintenance Derate
	FUEL_PRESS_RATIONALITY_LOW_ERROR	755	MIL	1	Yes				Maintenance Derate
	FUEL_PRESS2_RATIONALITY_ERROR	755	MIL	1	Yes				Maintenance Derate

	EPS_Both_Failed_Error	115	Stop(Solid)	1	Yes				Maintenance Derate
	EPS_Main_No_Pulse_Error	689	MIL	1	Yes				Maintenance Derate
	EPS_Main_No_Sync_Error	689	MIL	1	Yes				Maintenance Derate
	EPS_Backup_No_Pulse_Error	778	MIL	1	Yes				Maintenance Derate
	EPS_Backup_No_Sync_Error	778	MIL	1	Yes				Maintenance Derate
	EPS_Phase_Shift_Error	731	MIL	1	Yes				Maintenance Derate
	CYLINDER_1_MISFIRE_ERROR	1654	MIL	1	Yes				Maintenance Derate
	CYLINDER_2_MISFIRE_ERROR	1655	MIL	1	Yes				Maintenance Derate
	CYLINDER_3_MISFIRE_ERROR	1656	MIL	1	Yes				Maintenance Derate
	CYLINDER_4_MISFIRE_ERROR	1657	MIL	1	Yes				Maintenance Derate
	CYLINDER_5_MISFIRE_ERROR	1658	MIL	1	Yes				Maintenance Derate
	CYLINDER_6_MISFIRE_ERROR	1659	MIL	1	Yes				Maintenance Derate
	MULTIPLE_CYLINDERS_MISFIRE_ERROR	1718	MIL	1	Yes				Maintenance Derate
	Low_Boost_Voltage_Error	351	MIL	1	Yes				Maintenance Derate
	Injector_1_Circuit_1_Error	322	MIL	1	Yes				Maintenance Derate
	Injector_5_Circuit_1_Error	323	MIL	1	Yes				Maintenance Derate
	Injector_3_Circuit_1_Error	324	MIL	1	Yes				Maintenance Derate
	Injector_6_Circuit_1_Error	325	MIL	1	Yes				Maintenance Derate
	Injector_2_Circuit_1_Error	331	MIL	1	Yes				Maintenance Derate
	Injector_4_Circuit_1_Error	332	MIL	1	Yes				Maintenance Derate
	APC_IMV_SHORT_ERROR	271	MIL	1	Yes				Maintenance Derate
	APC_IMV_OPEN_ERROR	272	MIL	1	Yes				Maintenance Derate
	PRS_FUEL_FILTER_CLOGGED_ERROR	2372	AWL	1	Yes				Maintenance Derate

Electronic Sensor and Actuator Failures (continued)

Component	ErrorName	FC	Lamp	Trip	EGR OFF	SCR off	HC Dosing OFF	DEF Dosing OFF	Derate
Engine Out NOx Sensor	EONOX_SENSOR_HTR_ERR	1885	MIL	1		Yes		Yes	Maintenance Derate
	EONOX_SENSOR_PWR_ERR	3682	MIL	2		Yes		Yes	Maintenance Derate
	EONOX_SENSOR_SIGNAL_ERR	1885	MIL	1		Yes		Yes	Maintenance Derate
	J39_ATI1_TIMEOUT_ERROR	3232	MIL	1		Yes		Yes	Maintenance Derate
DOC Inlet Temperature Sensor	EGTS_DOC_IN_OOR_HI_ERR	3314	MIL	1		Yes	Yes	Yes	Maintenance Derate
	EGTS_DOC_IN_OOR_LO_ERR	3313	MIL	1		Yes	Yes	Yes	Maintenance Derate
	DOC_IN_IR_DELTAT_ERR	3315	MIL	2		Yes	Yes	Yes	Maintenance Derate
DOC Out Temperature Sensor	EGTS_DOC_OUT_OOR_HI_ERR	3317	MIL	1		Yes	Yes	Yes	Maintenance Derate
	EGTS_DOC_OUT_OOR_LO_ERR	3316	MIL	1		Yes	Yes	Yes	Maintenance Derate
	DOC_OUT_IR_DELTAT_ERR	3318	MIL	2		Yes	Yes	Yes	Maintenance Derate
DPF Out Temperature Sensor	EGTS_DPF_OUT_OOR_HI_ERR	3319	MIL	1		Yes	Yes	Yes	Maintenance Derate
	EGTS_DPF_OUT_OOR_LO_ERR	3321	MIL	1		Yes	Yes	Yes	Maintenance Derate
	EGTS_PFS_CJ_SHORT_CKT_ERR	4158	MIL	1		Yes	Yes	Yes	Maintenance Derate
	EGTS_PFS_CJ_OPEN_CKT_ERR	4158	MIL	1		Yes	Yes	Yes	Maintenance Derate
	EGTS_PFS_CJ_PLAUSIBLE_ERR	4158	MIL	1		Yes	Yes	Yes	Maintenance Derate
	EGTS_PFS_ECU_UC_ERR	4158	MIL	1		Yes	Yes	Yes	Maintenance Derate
	EGTS_PFS_ECU_ASIC_ERR	4158	MIL	1		Yes	Yes	Yes	Maintenance Derate
	EGTS_PFS_ECU_LO_VOLT_ERR	4162	MIL	1		Yes	Yes	Yes	Maintenance Derate
	EGTS_PFS_ECU_HI_VOLT_ERR	4161	MIL	1		Yes	Yes	Yes	Maintenance Derate
	EGTS_PFS_PWR_INT_ERR	4259	MIL	2		Yes	Yes	Yes	Maintenance Derate
	DPF_OUT_IR_DELTAT_ERR	3322	MIL	3		Yes	Yes	Yes	Maintenance Derate
DPF Delta Pressure Sensor	DPF_DELTAP_KEYON_ERR	1883	MIL	2		Yes		Yes	Maintenance Derate
	DPF_DELTAP_DITHER_ERR	1883	MIL	2		Yes		Yes	Maintenance Derate
	DPF_DELTAP_OOR_LO_ERR	1881	MIL	1		Yes		Yes	Maintenance Derate
	DPF_DELTAP_OOR_HI_ERR	1879	MIL	1		Yes		Yes	Maintenance Derate

Electronic Sensor and Actuator Failures (continued)

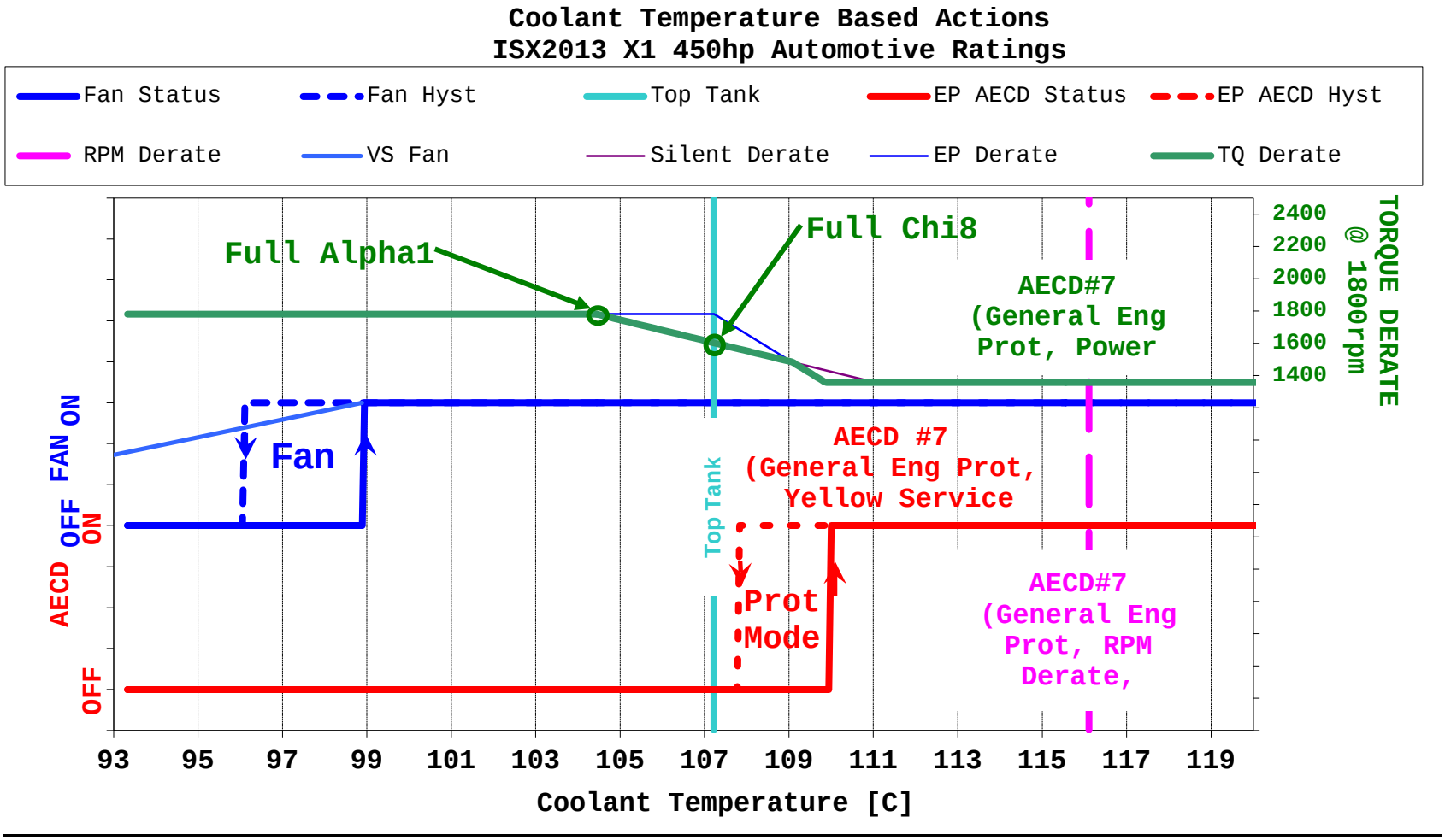
Component	ErrorName	FC	Lamp	Trip	EGR OFF	SCR off	HC Dosing OFF	DEF Dosing OFF	Derate
DPF Out Pressure Sensor	DPF_OUTP_KEYON_ERR	3135	MIL	2		Yes		Yes	Maintenance Derate
	DPF_OUTP_DITHER_ERR	3135	MIL	2		Yes		Yes	Maintenance Derate
	DPF_OUTP_HIGH_ERR	3135	MIL	2		Yes		Yes	Maintenance Derate
	DPF_OUTP_OOR_HI_ERR	3133	MIL	1		Yes		Yes	Maintenance Derate
	DPF_OUTP_OOR_LO_ERR	3134	MIL	1		Yes		Yes	Maintenance Derate
SCR System Temperature	SCR_CAT_SEVERE_TMPTR_ERR	3165	Stop(Solid)	1		Yes		Yes	Maintenance Derate
	SCR_IN_NR_SEVERE_TMPTR_ERR	4525	Stop(Solid)	1		Yes		Yes	Maintenance Derate
	SCR_OUT_NR_SEVERE_TMPTR_ERR	3235	Stop(Solid)	1		Yes		Yes	Maintenance Derate
	SCR_IN_SEVERE_TMPTR_ERR	4524	Stop(Solid)	1		Yes		Yes	Maintenance Derate
	SCR_OUT_SEVERE_TMPTR_ERR	3165	Stop(Solid)	1		Yes		Yes	Maintenance Derate
	SCR_CATALYST_SYSTEM_MISSING_ERR	3151	MIL	1		Yes		Yes	Maintenance Derate
SCR Mid-Bed Temperature Sensor	EGTS_SCR_T1_OOR_HI_ERR	4518	MIL	1		Yes		Yes	Maintenance Derate
	EGTS_SCR_T1_OOR_LO_ERR	4519	MIL	1		Yes		Yes	Maintenance Derate
	SCR_T1_IR_DELTAT_ERR	4521	MIL	2		Yes		Yes	Maintenance Derate
	SCR_IR_DELTAT_ERR	4521	MIL	2		Yes		Yes	Maintenance Derate
SCR Out Temperature Sensor	SCR_OUT_IR_DELTAT_ERR	3148	MIL	2		Yes		Yes	Maintenance Derate
	EGTS_SCR_OUT_OOR_HI_ERR	3146	MIL	1		Yes		Yes	Maintenance Derate
	EGTS_SCR_OUT_OOR_LO_ERR	3147	MIL	1		Yes		Yes	Maintenance Derate

Electronic Sensor and Actuator Failures (continued)

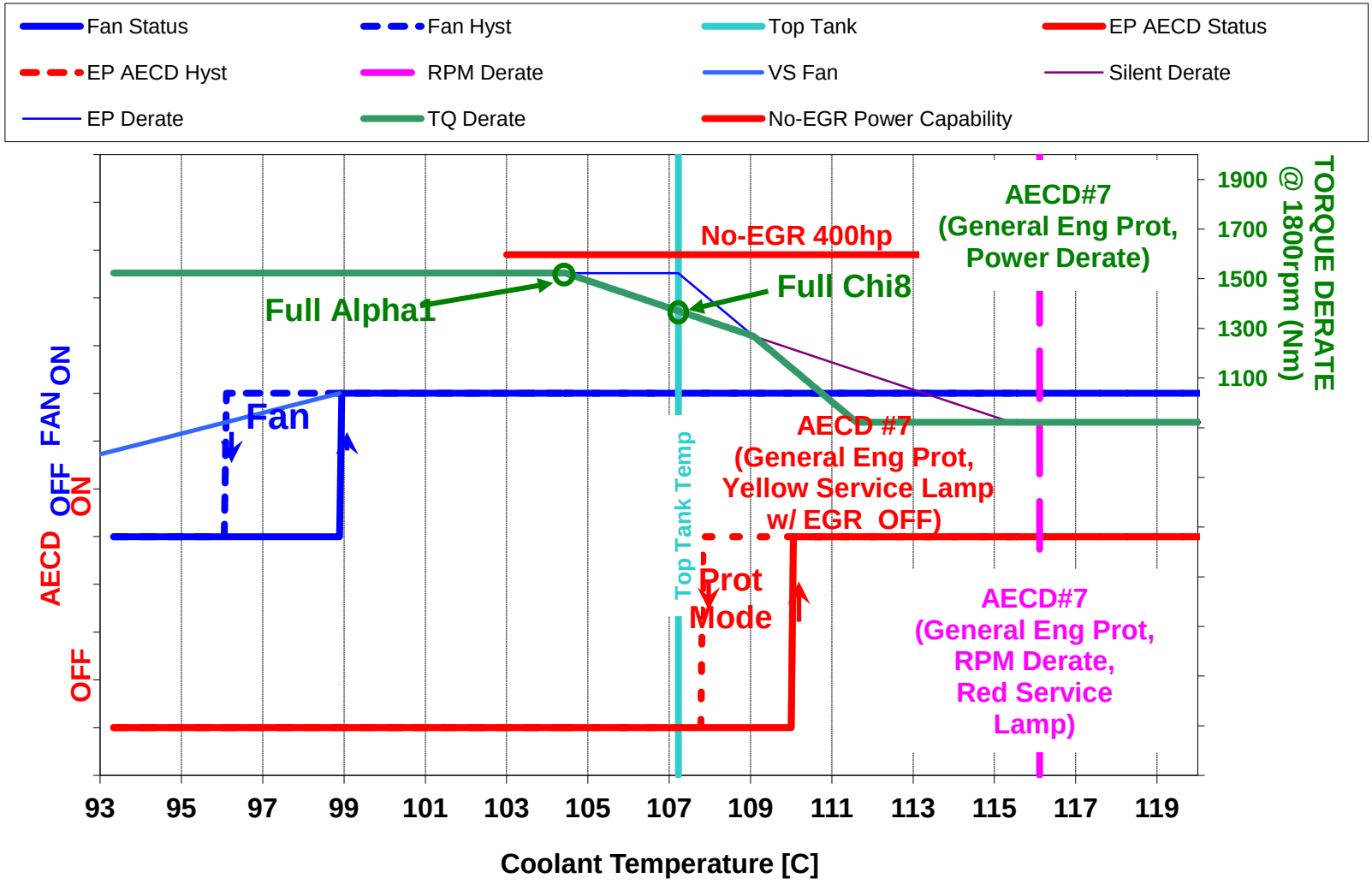
Component	ErrorName	FC	Lamp	Trip	EGR OFF	SCR off	HC Dosing OFF	DEF Dosing OFF	Derate
DEF Dosing System	UREA_DOSER_INJ_ELEC_ERR	3567	MIL	1		Yes		Yes	Maintenance Derate
	UDD_FCV_HIGH_ERR	3577	MIL	1		Yes		Yes	Maintenance Derate
	UREAPUMPP_OOR_HI_ERR	3571	MIL	1		Yes		Yes	Maintenance Derate
	UREAPUMPP_OOR_LO_ERR	3572	MIL	1		Yes		Yes	Maintenance Derate
	UDD_POWERCTRL_HIGH_ERR	3558	MIL	1		Yes		Yes	Maintenance Derate
	UDD_POWERCTRL_LOW_ERR	3559	MIL	1		Yes		Yes	Maintenance Derate
	UPPM_CTRL_TOOHIGH_ERR	3575	MIL	2		Yes		Yes	Maintenance Derate
	UPPM_INRANGE_ERR	3596	MIL	2		Yes		Yes	Maintenance Derate
	UDD_PUMP_LOW_ERR	3559	MIL	1		Yes		Yes	Maintenance Derate
	UDD_PUMP_HIGH_ERR	3558	MIL	1		Yes		Yes	Maintenance Derate
	UREA_TANKHTR1_STUCK_ON_ERR	1713	MIL	2		Yes		Yes	Maintenance Derate
	UREA_LINEHTR1_HIGHSIDE_OL_ERR	3258	MIL	1		Yes		Yes	Maintenance Derate
	UREA_LINEHTR1_HIGHSIDE_STG_ERR	3238	MIL	1		Yes		Yes	Maintenance Derate
	UREA_LINEHTR1_LOWSIDE_OL_ERR	3258	MIL	1		Yes		Yes	Maintenance Derate
	UREA_LINEHTR2_HIGHSIDE_OL_ERR	3261	MIL	1		Yes		Yes	Maintenance Derate
	UREA_LINEHTR2_HIGHSIDE_STG_ERR	3241	MIL	1		Yes		Yes	Maintenance Derate
	UREA_LINEHTR2_LOWSIDE_OL_ERR	3261	MIL	1		Yes		Yes	Maintenance Derate
	UREA_LINEHTR3_HIGHSIDE_OL_ERR	3425	MIL	1		Yes		Yes	Maintenance Derate
	UREA_LINEHTR3_HIGHSIDE_STG_ERR	3423	MIL	1		Yes		Yes	Maintenance Derate
	UREA_LINEHTR3_LOWSIDE_OL_ERR	3425	MIL	1		Yes		Yes	Maintenance Derate
HC Doser	DOSER_FSOV_PWM_LOW_ERR	1924	MIL	1			Yes		
	DOSER_FSOV_PWM_HIGH_ERR	1923	MIL	1			Yes		
	DOSER_INJ_ELEC_ERR	1977	MIL	1			Yes		
	DFSOV_LEAK_DOSER_FTP_ERR	1925	MIL	1			Yes		
	DFSOV_FTO_ERR	1963	MIL	1			Yes		
	HC_DOSER_SYS_LEAK_ERR	1932	MIL	1			Yes		
	HC_DOSER_FUEL_RESTRICT_ERR	2881	MIL	1			Yes		

	HC_DOSERP_INRANGE_ERR	1926	MIL	1			Yes		
	HC_DOSERP_OOR_HI_ERR	1927	MIL	1			Yes		
	HC_DOSERP_OOR_LO_ERR	1928	MIL	1			Yes		
	DOSER_ASOV_PWM_LOW_ERR	3223	MIL	1			Yes		
	DOSER_ASOV_PWM_HIGH_ERR	3224	MIL	1			Yes		
	BATTERY_VOLTAGE_LOW_ERROR	441	AWL	1			Yes		

Part 3 – Cooling System Protection

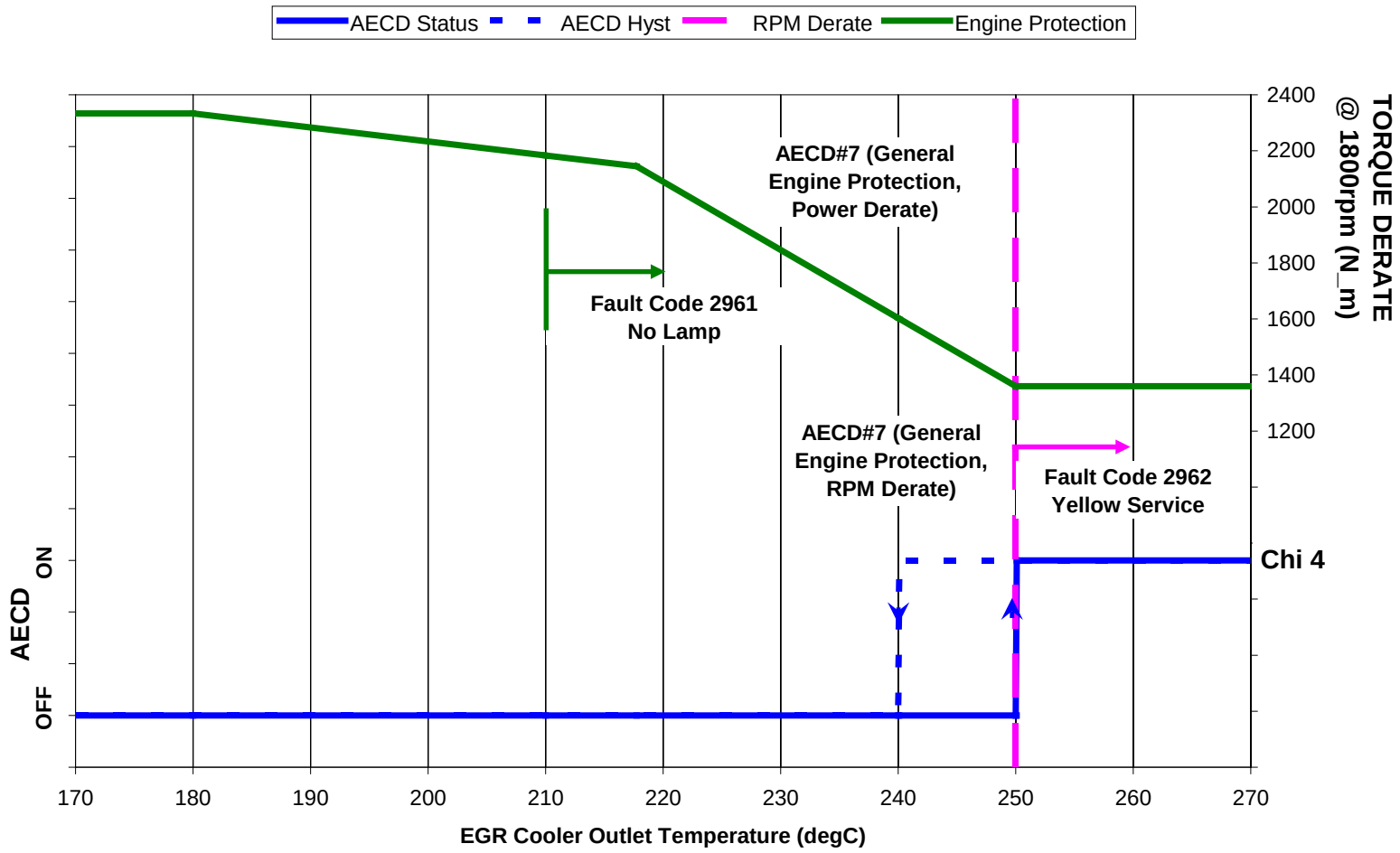


Coolant Temperature Based Actions
ISX12 LE1-LE2 Family (385-1450)



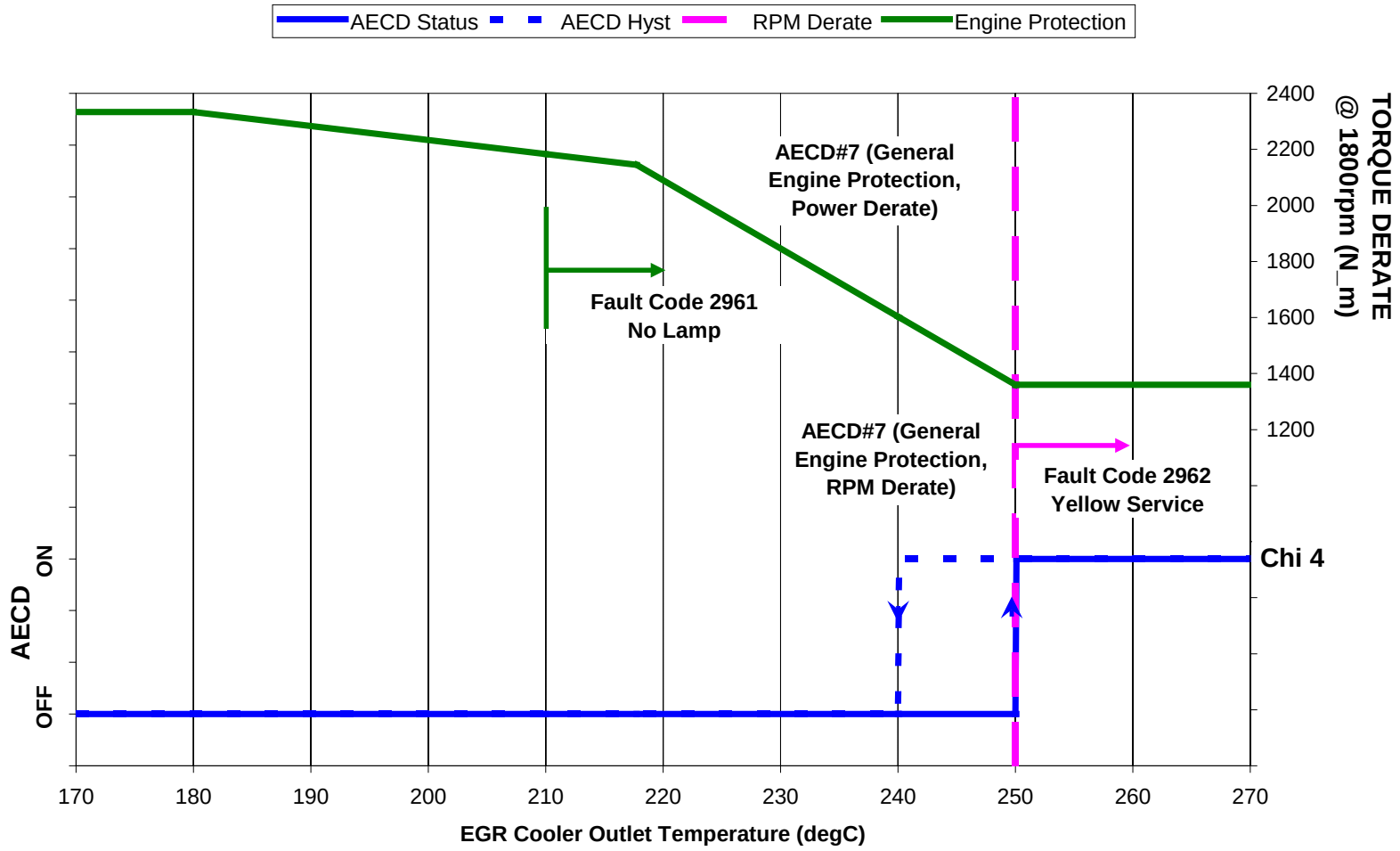
Part 3 – Cooling System Protection

X1

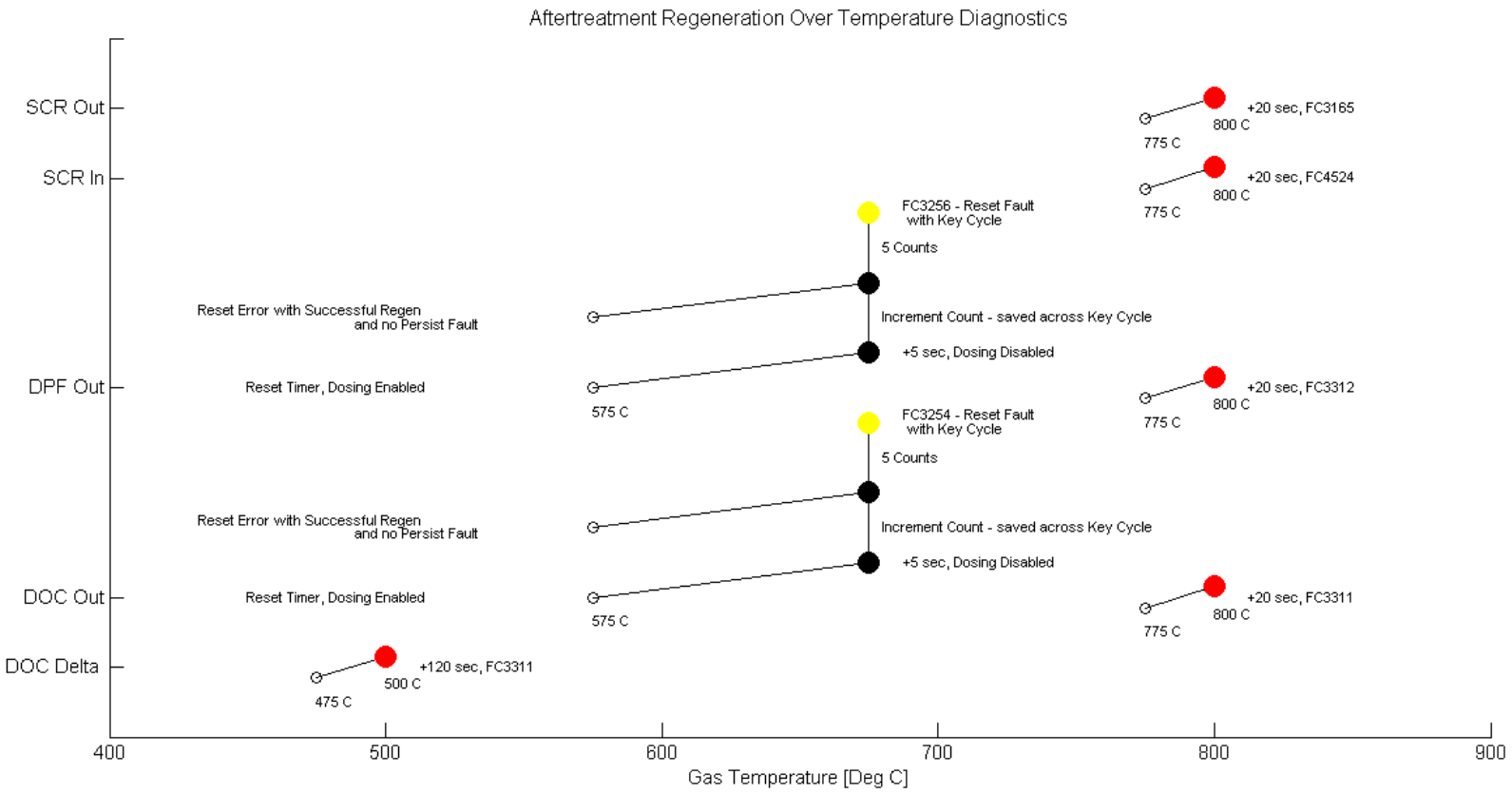


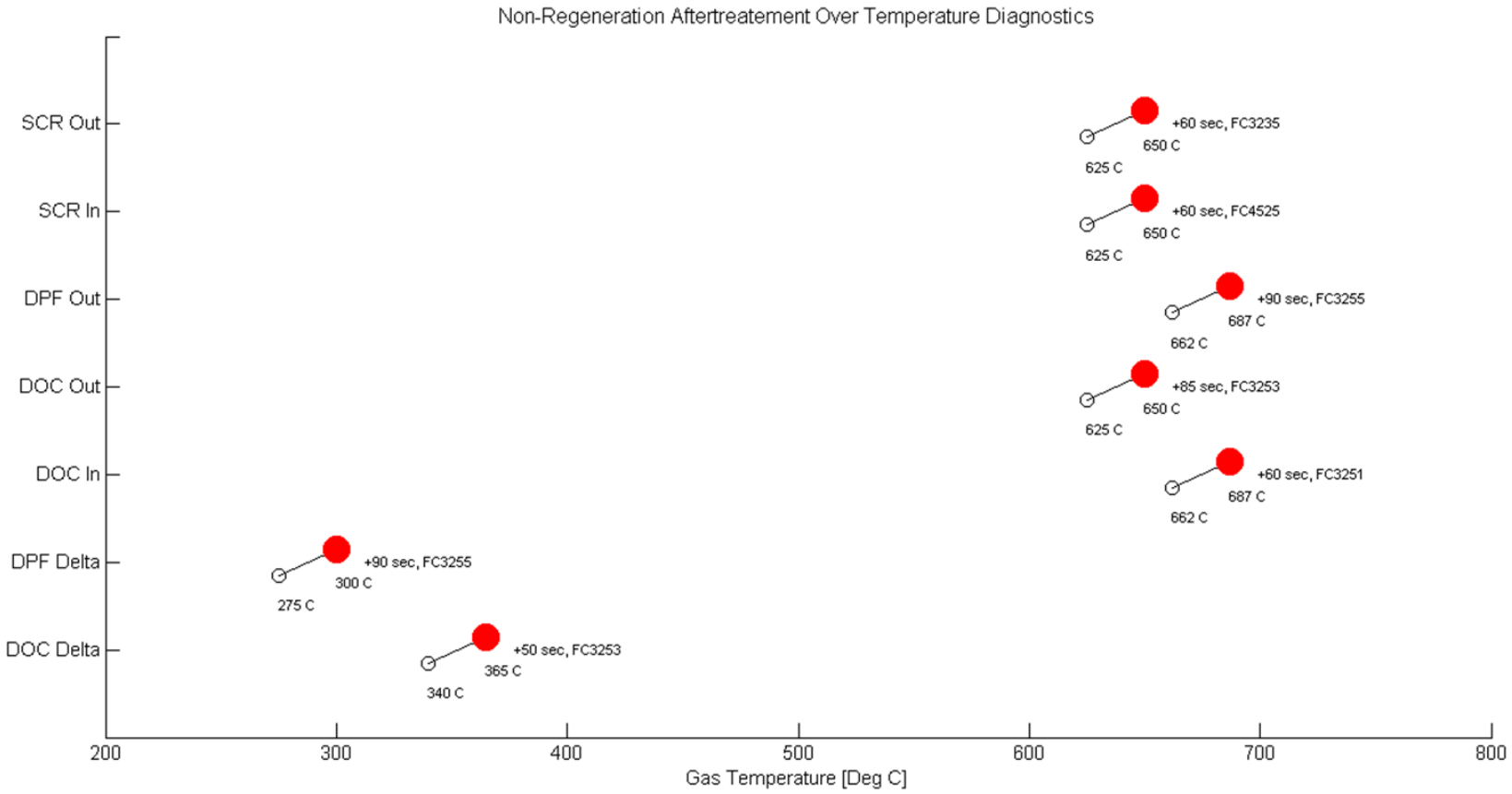
Part 3 – Cooling System Protection

X12



Part 6 – Aftertreatement Protection




Non-Regeneration Aftertreatement Over Temperature Diagnostics
SCR Out
SCR In
DPF Out
DOC Out
DOC In
DPF Delta
DOC Delta
+60 sec, FC3235
650 C
625 C
+60 sec, FC4525
650 C
625 C
+90 sec, FC3255
687 C
662 C
+85 sec, FC3253
650 C
625 C
+60 sec, FC3251
687 C
662 C
+90 sec, FC3255
300 C
275 C
+50 sec, FC3253
365 C
340 C
200
300
400
500
600
700
800
Gas Temperature [Deg C]

AECD 8 – Diagnostic Procedures

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This AECD is designed to take action only if an OBD monitor does not make a pass decision.

AECD 8.2 – Misfire Monitor

The feature described in this AECD is designed to check for misfire conditions of any of the 6 cylinders by intrusively modulating fueling to each cylinder and assessing the effect of such modulation on engine speed.

AECD 8.8 – Fueling Quantity and Timing (ISX1 Only)

The monitor strategy is based on the closed-loop fueling compensation feature. This feature outputs an adaptive, learned model of the flow characteristics of each fuel injector on the engine, which is used by the control system to compensate for variation in injector characteristics. The models describe the quantity of fuel delivered by each injector as a function of the accumulator pressure and the injector actuation command (injection pulse ontime). The models are updated periodically during operation of the engine, which allows the control system to adapt to changes in the injector flow characteristics over the life of the engine. The models are also used to detect malfunctions of the fuel injectors that cause their fueling characteristics to be outside of acceptable limits for compensation.

The injector models are updated based on periodic, intrusive fueling measurements taken during motoring (zero commanded fueling with non-zero engine speed). Fueling measurements are taken at several calibrated rail pressure and pulse ontime values. The system commands fuel injection pulses on a single injector and measures the corresponding drop in accumulator pressure. The quantity of fuel delivered by each injection is estimated based on the pressure drop and other system parameters. Each fueling measurement describes the fuel quantity delivered by an injector at only a single accumulator pressure and ontime. The compensation algorithm assembles these individual fueling measurements into an injector model that describes fueling over a continuous range of accumulator pressure and pulse ontime values.

After the injector model is updated due to a fueling measurement, the diagnostic checks if the injected fuel quantity indicated by the updated model is within calibrated upper and lower limits. The algorithm tests the injector model for several values of pulse ontime at two accumulator pressures. The two pressure values are defined by calibration, but the ontimes are determined dynamically based on the calibrated rail pressure and the updated injector model. At each calibrated pressure, the model is tested at ontime values ranging from the "zero-fueling ontime" (the smallest ontime for which the model indicates a non-zero injected fuel quantity at the corresponding accumulator pressure) up to the "maximum compensated ontime" (the pulse ontime corresponding to a calibrated maximum compensated fuel quantity at the corresponding accumulator pressure). If the model indicates that the injector is fueling higher or lower than the calibrated upper or lower limits at any of these test points, then an injector-specific error persistence counter is incremented, and the fault code is set when the persistence counter reaches the limit. The algorithm diagnoses the health of an injector only when the corresponding model is converged. A model is considered converged when the average error between the injector model and the actual injector characteristic is less than a calibrated threshold.

If the updated injector model exceeds the limits, then the updated model is discarded and the model reverted to its state before the fueling measurement. This behavior effectively imposes a limit on the range of compensation that can be applied to a fuel injector.

AECD 8.10 – DEF Injector Functional Response Monitor

The DEF injector valve controls the flow of DEF by adjusting the time that the injector valve is open within a fixed injection period. Supply module pressure falls when the injector opens and the pressure rises when the injector is closed. The difference between the rise and fall of the supply module pressure indicates the opening and closing of the injector. If the injector does not open or is stuck open the difference between pressure fall and rise is negligible or is small incase of partial failure. The pressure difference between fall and rise in pressure during injector On/Off cycle determines if the doser is working or not. In a drive cycle, multiple intrusive tests are performed within short time periods to check for persistence, and decision made at least once per trip.

AECD 9 – Modulation

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AECD 9.1 – Transient and Steady State Operations

This AECD modulates the emission control system in response to transient and steady-state operating conditions, while maintaining emissions control, by employing two sets of control tables.
For example, in order to meet the FTP transient test and NTE requirements, the transient calibration tables (Alpha 0) are specifically populated and optimized for those tests. Likewise, in order to meet the Euro III test, NTE requirements, and California CLEAN IDLE, the steady-state calibration tables (Alpha 1) are specifically populated and optimized for those tests.

AECD 9.2 – Ambient Conditions

Conventional calibration techniques optimize engine operation at nominal ambient conditions. Changes in ambient conditions such as ambient temperature and ambient pressure cause the engine operation to deviate from nominal behavior. For example, a higher ambient temperature increases the intake manifold temperature and thus increases NOx.
Under these conditions, the emissions control system modulates the control parameters while maintaining emissions compliance and meeting all mechanical, thermal design and air handling control limits.

AECD 9.3 – Transient Acceleration

During periods of acceleration (rapid fueling increase), the turbocharger exhibits a certain amount of lag (turbo lag) due to the inertia of the turbine and compressor wheels. The boost pressure is lower than the equilibrium boost pressure. (For this discussion, boost pressure is considered synonymous with

intake manifold pressure). As a result of this lag, the air flow into the engine is insufficient compared to the fuel requested to accelerate the engine or vehicle causing very high fuel/oxygen ratios and, in turn, excessive smoke, particulates, and hydrocarbons. This concern can be addressed by appropriately limiting fueling during transient events.

AECD 9.4 – Automated Transmission Shift Modulation

This AECD modulates the emission control system in response to a datalink commanded transmission shift event. An improvement in shift quality is possible with an alternative air handling control behavior which can yield faster and smoother gear shift events. This is made feasible given the recognizable conditions and predictable behavior of the SAE J1939 datalink commands for an automated/mechanical transmission requested shift event.

The fully-automated manual transmissions issue J1939 commands to override driver commands and accomplish gear shifting. The transmission has complete control over engine torque and speed commands during all shift maneuvers, and takes the indication of driver requested performance based on accelerator pedal position, or may also take actions during cruise control (foot-off accelerator) or road-speed governing (foot-on accelerator) conditions.

The gear shifting occurs though electronic control of shifter solenoids internal to the transmission without any driver action. Shifting takes place automatically without a shift lever and without any movement of the accelerator pedal to accomplish the shift. The driver input is via requesting part-throttle or full “throttle” during upshifting events with increasing vehicle speed and foot-off or part-throttle accelerator position during downshift events with decreasing vehicle speed.

AECD 9.5 – Coolant Temperature Overheat Protection

Many components on heavy duty diesel engines require coolant to maintain their mechanical integrity while experiencing high local operational temperatures. Not only does coolant carry heat away from certain metal components to reduce their temperature, it also provides the mechanism to cool engine lubrication oil which is critical to long life of wear components. Under certain conditions and applications, coolant temperature will increase to levels considered ‘high’ or ‘extreme’ relative to the normal design of the system. As the coolant temperature approaches what is called the ‘Top Tank Temperature Limit’ and beyond, its ability to effectively protect mechanical components from thermal damage is reduced. At these extreme temperatures, actions are taken to reduce the chance of damage to critical components. These actions include changes to engine fueling parameters. If coolant temperature continues to rise above the Top Tank Temperature Limit, interaction with AECD #7-3 will occur

AECD 10 – Aftertreatment Regeneration Strategy

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Part 1 – Regeneration Strategy

Exhaust fuel dosing is permitted once satisfactory aftertreatment temperatures have been achieved, requiring the following conditions

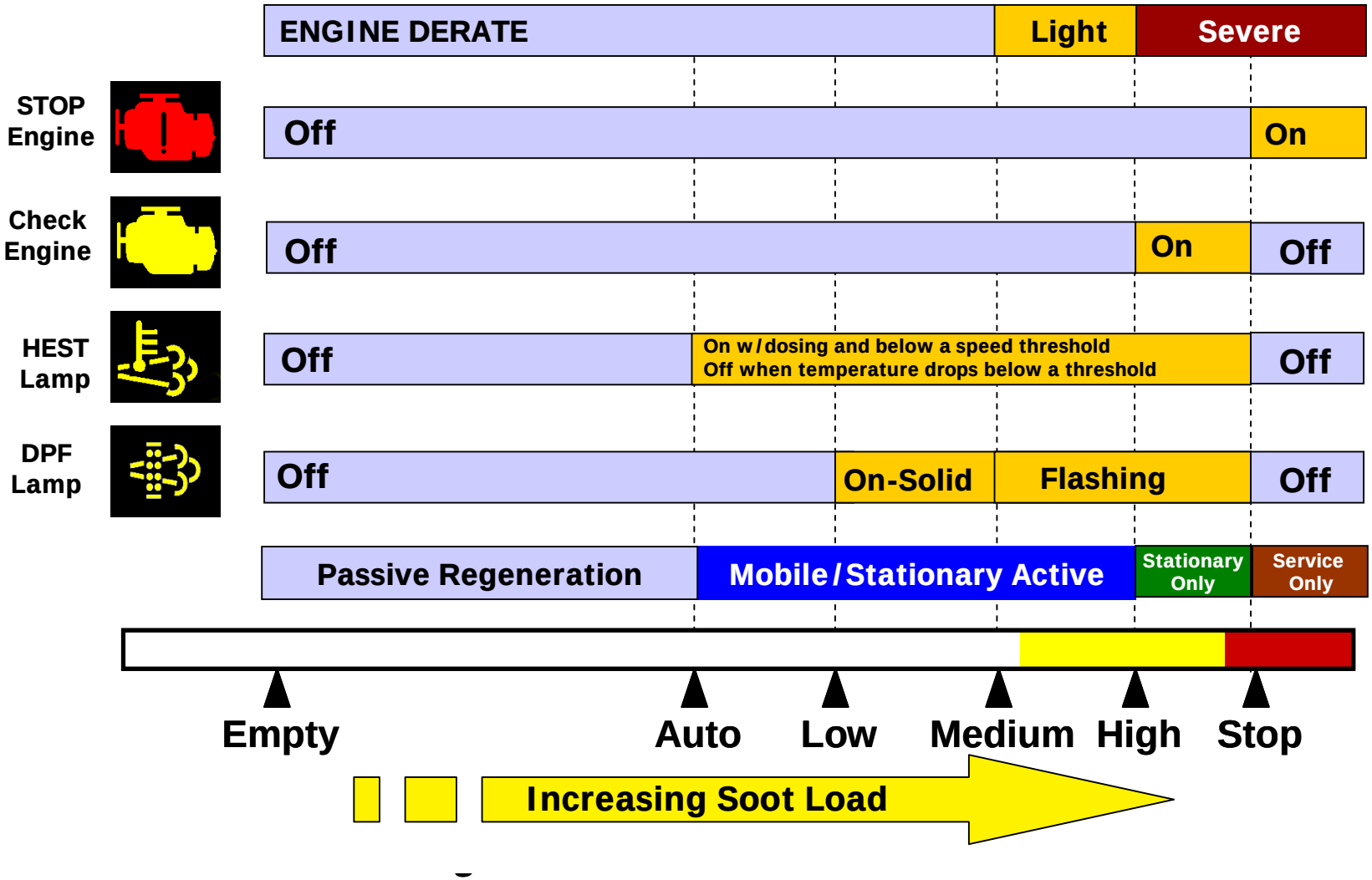
1. DOC inlet temperature > 250 C
2. DOC bed temperature > 250 C
3. Exhaust mass flow
   - Mission regeneration > 125 g/sec
   - Non-mission regeneration > 50 g/sec
4. Vehicle Speed > threshold (default = 0 MPH, max trim to 25, 0.62 MPH hysteresis)

Dosing is interrupted during active regeneration when the vehicle speed falls below an OEM trimmable value. This characteristic was requested by our OEM's. The purpose of this interruption is to limit thermal output from the exhaust while operating at low speeds. The OEM's may set any speed in the range of 0-25mph. Cummins has chosen to additionally limit the lower speed to be at least 5mph, resulting in a practical range of 5-25mph. Dosing resumes when the vehicle returns to a speed 2mph than the dosing inhibit setpoint. No other control actions are altered by this change. For example, if thermal management was operating prior to the interruption, it continues to act during the interruption.

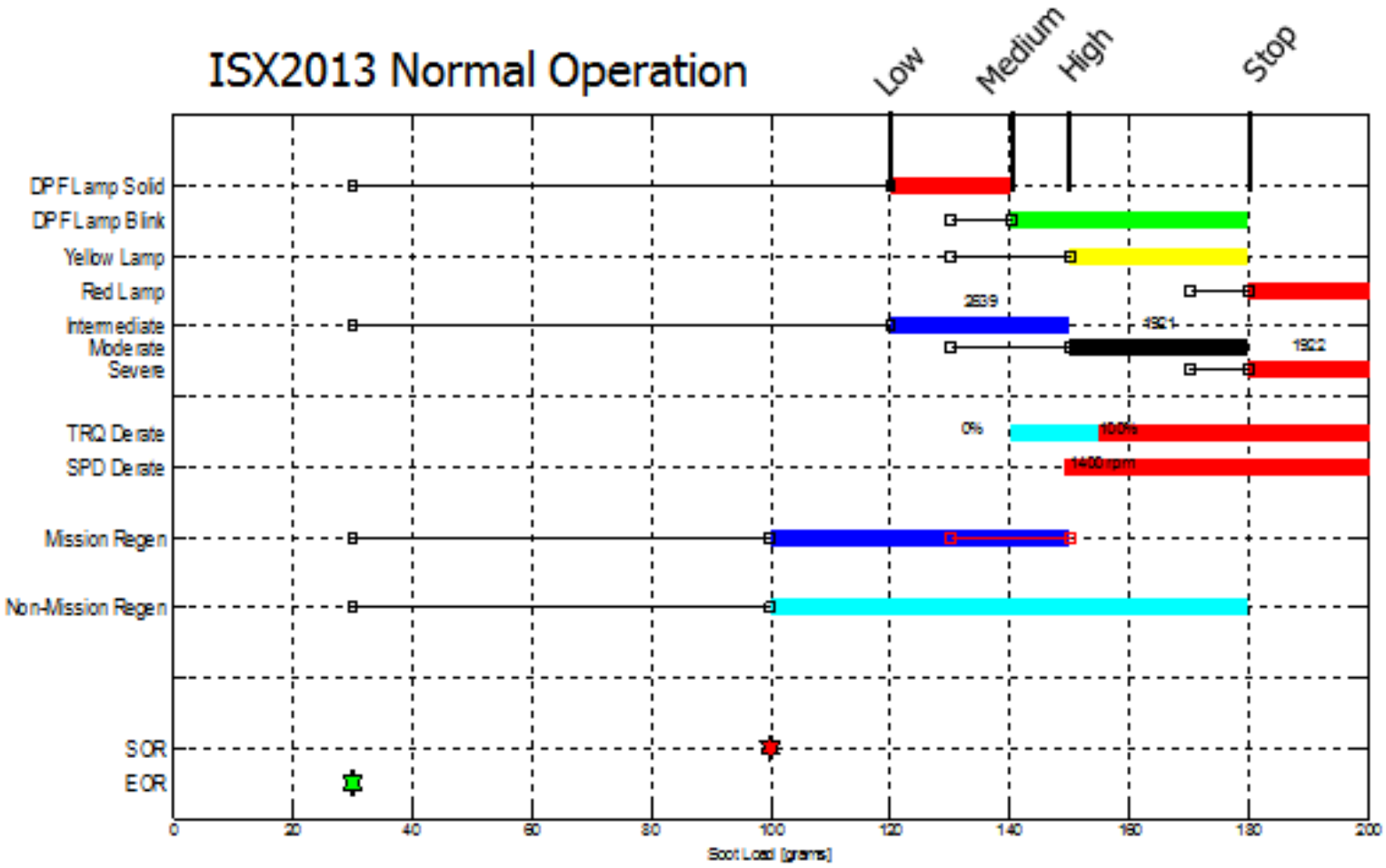
If regenerations are not triggered based on soot loading, then they will be triggered based on a timer every 100 hours.

Part 1 – Regeneration Strategy (continued)

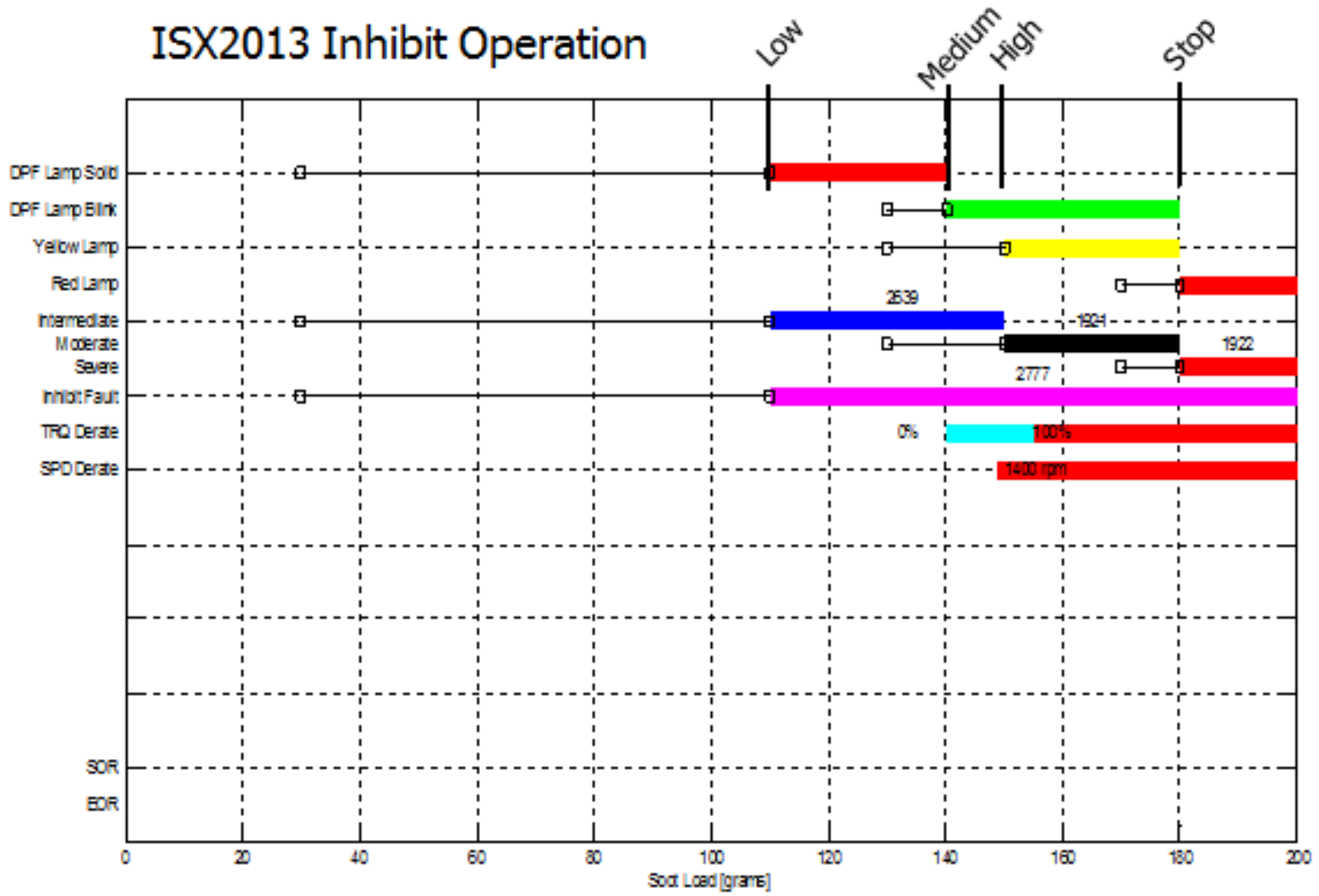
AT Regeneration Lamp Behaviors



Part 1 – Regeneration Strategy (continued)



Normal accomodations as soot load increases.

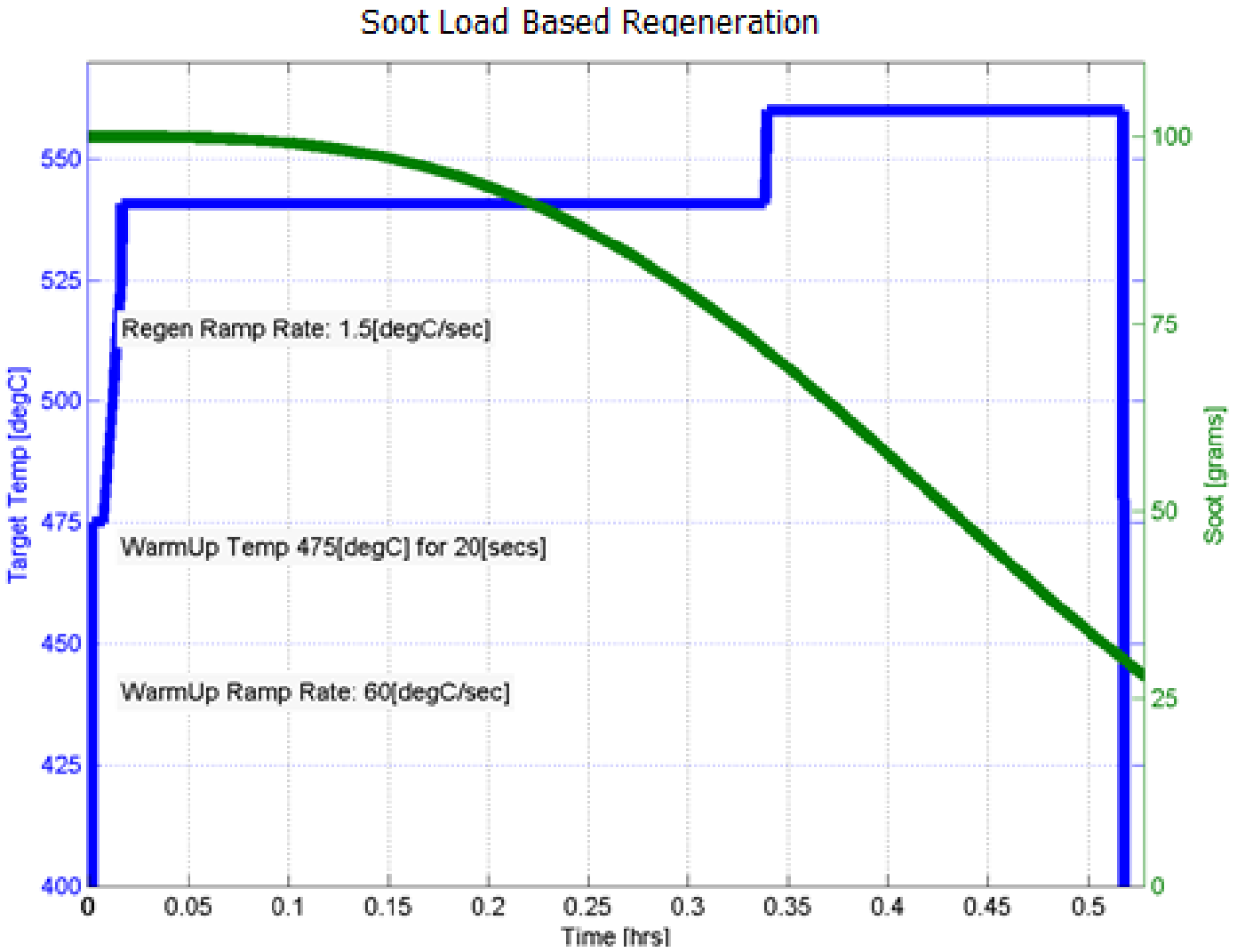


Manual Regeneration Request or Manual Regeneration Inhibit.

Accomodations as soot load increases and the regeneration inhibit switch is on.

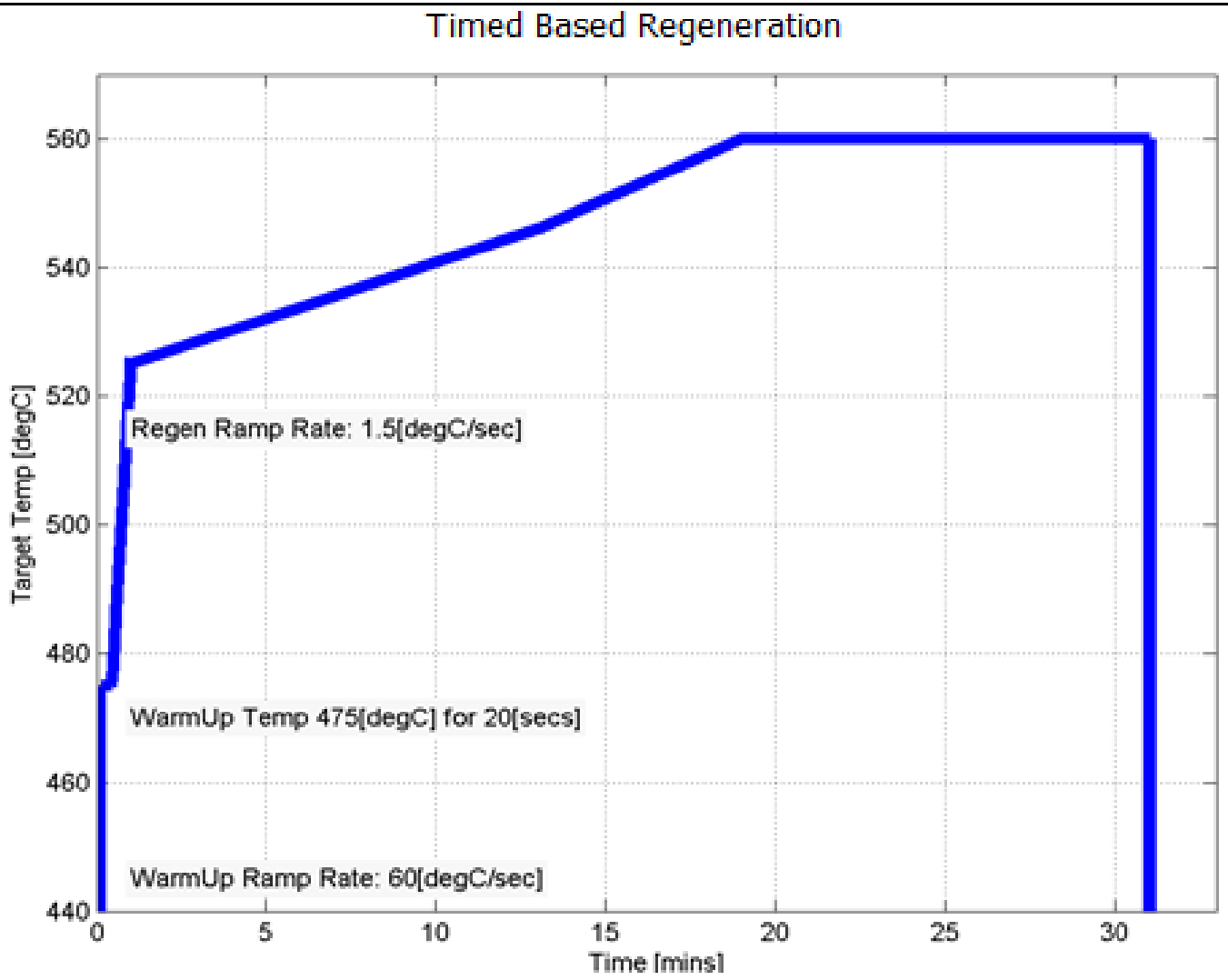
Soot Load Based Regen Trajectory Example

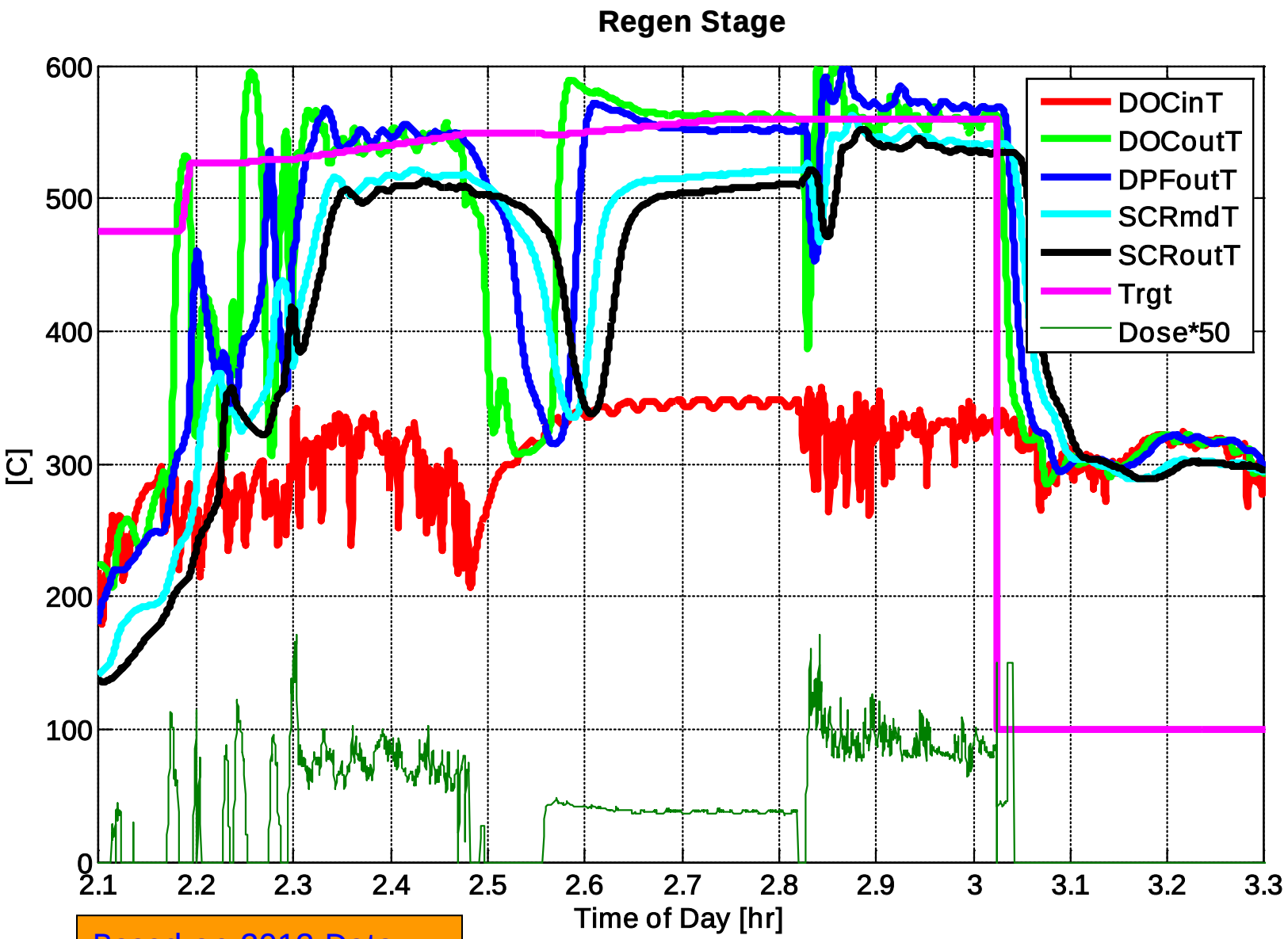
ISX2013 Temperature Trajectory Example



Time Based Regen Target Temperature Trajectory Example

ISX2013 Temperature Trajectory Example





Based on 2013 Data

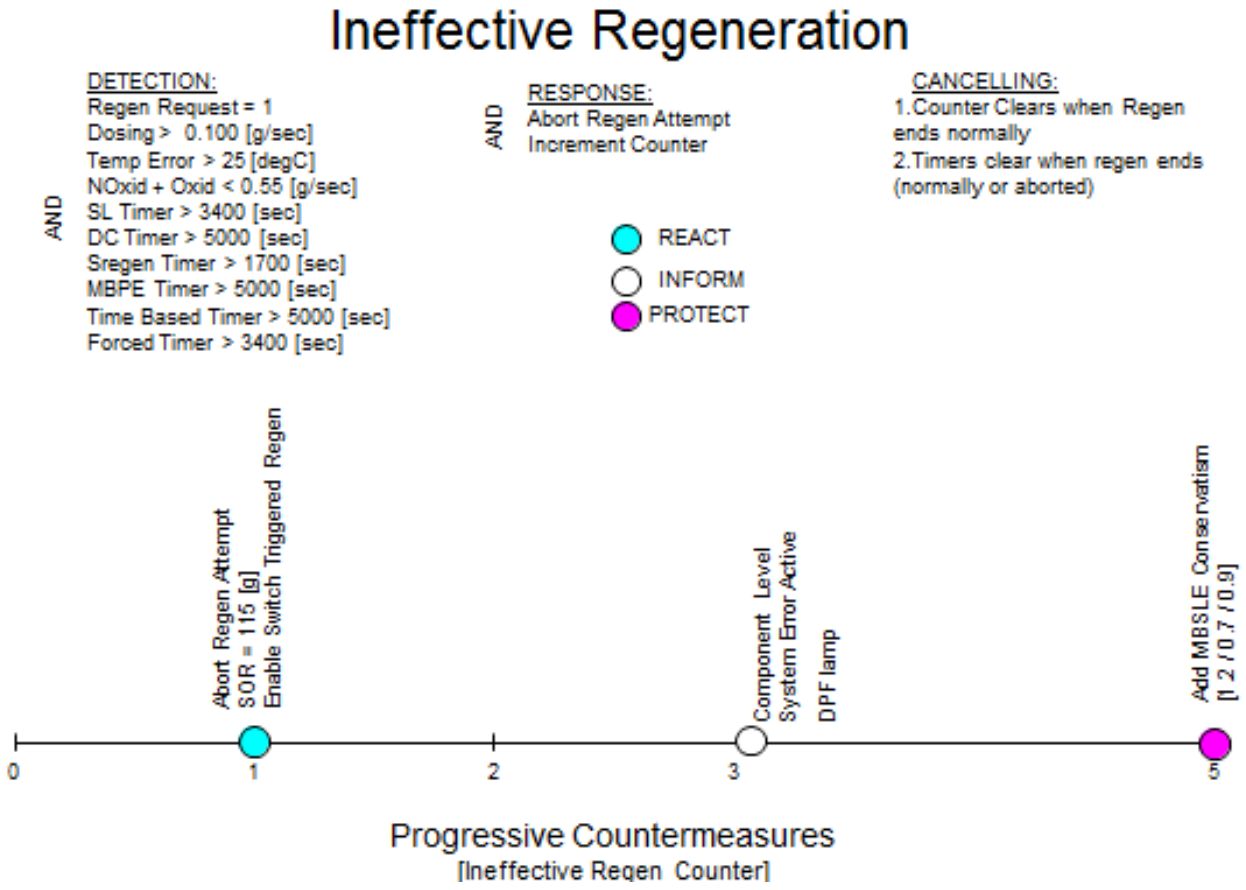
Part 2 – Ineffective Dosing

This AECD is designed to protect the aftertreatment should the DOC/doser system fail mechanically or the duty cycle be too transient that fuel is dosed but regeneration does not occur, thus accumulating hydrocarbons in the DPF.

Parameters sensed to activate AECD

DOC out Temperature located at DOC exit

The following figure illustrates how parameters controlled respond/react to parameters sensed or estimated.



Part 6 – Manual Regeneration Request or Manual Regeneration Inhibit

Manual Regeneration Request:

Certain driving cycles may provide for limited opportunity to accomplish effective regenerations. The electronic control module will alert the operator to the need for regeneration via a dashlamp. When the operator has the opportunity between missions to accomplish regeneration in a stationary condition, he can initiate an automated regeneration during the out-of-service period. If the regeneration control does not estimate sufficient DPF soot loading and the need to regenerate, the request is ignored.

Manual Regeneration Inhibit:

Vehicle Manufacturers can provide a datalink request to the electronic control module to disable regeneration when in unsafe zones. This request is commanded by the vehicle in response to an operator switch, as required for operation in hazardous areas.

Both Manual Regeneration Request and Manual Regeneration Inhibit are available as an option for use by the original equipment manufacturer to accomplish these functions.

Part 7 – Electronic Sensor and Actuator Failures

While electronic sensors and actuators rarely fail, Cummins takes certain actions when sensors or actuators fail that lead to an inability to safely monitor and control aftertreatment regenerations. A complete list of all sensor and actuator failures and the resulting accommodations are listed in Item 298, part 1.

AECD 13 – Selective Catalytic Reduction (SCR)

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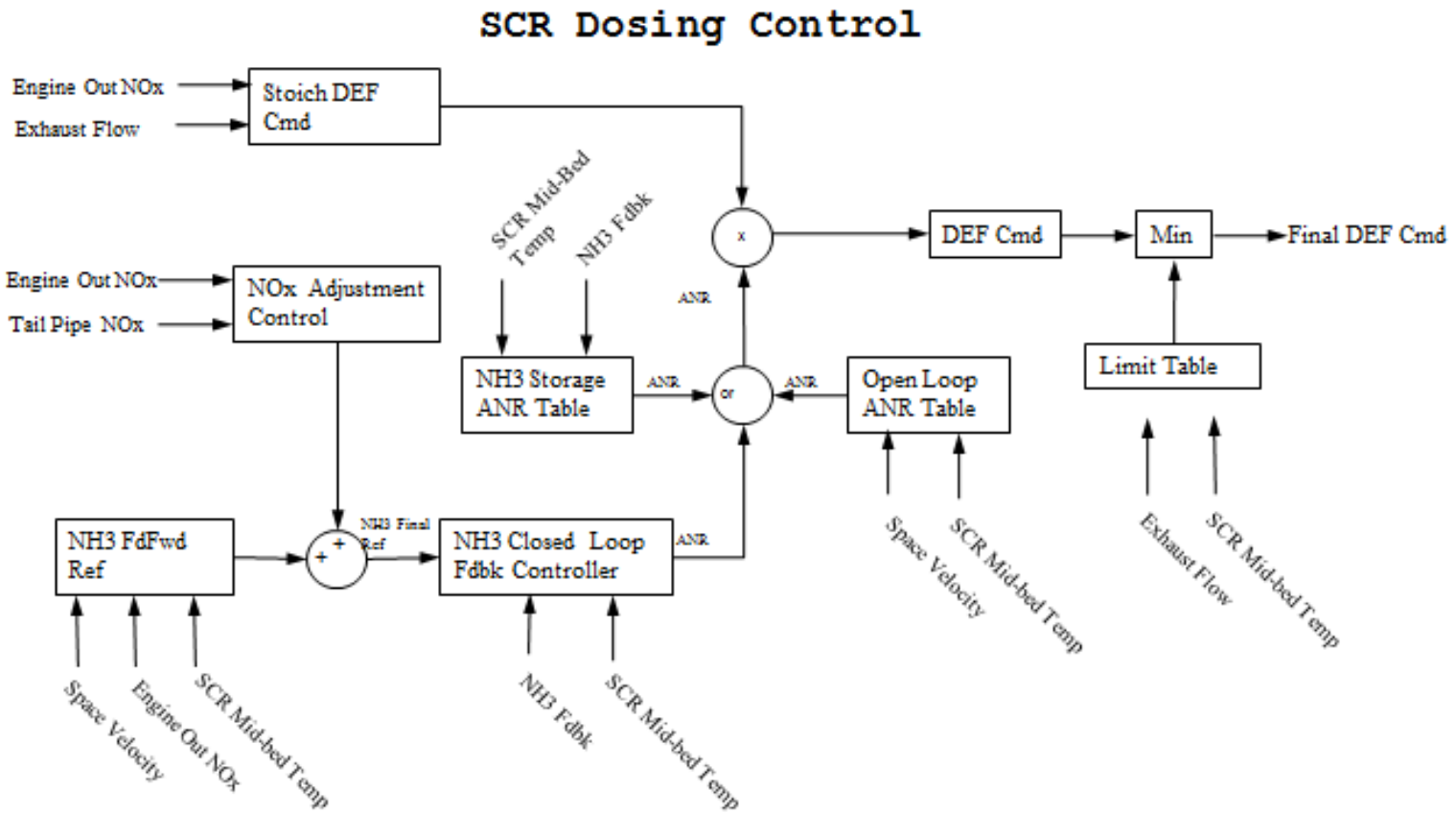
Part 1 – SCR System Modultion

If the SCR bed temperature is less than the required dosing threshold or when the DPF outlet temperature is less than the required dosing threshold, DEF dosing is not enabled:

DPF outlet temperature lower limit: 190 deg C

SCR Mid-Bed temperature lower limit: 190 deg C



Part 4 – SCR System Malfunction

Certain failure modes of engine or aftertreatment hardware can rapidly progress to poor SCR DeNOx efficiency, unacceptable secondary emissions, or damage in the SCR system. These failures can be categorized in three groups.

When certain DEF dosing actuators fail, DEF dosing is not possible. This results in loss of SCR DeNOx efficiency.

When certain operator errors exist, accurate DEF dosing rates are unknown or not possible. This results in poor or nonexistent SCR DeNOx efficiency.

When certain sensors or actuators on the engine or aftertreatment fail, critical exhaust gas properties are unknown. Accurate DEF dosing rates are therefore unknown. This may lead to poor SCR DeNOx efficiency or unacceptable NH3 release. In extreme cases, exhaust system plugging due to urea deposits can result in an inoperable engine due to extreme backpressure.

NOTE: For a complete list of all sensor and actuator failures with inducements: see Item 298, part 1

SCR Tampering Inducement

Detecting the following conditions will result in the SCR system tampering inducement to be activated:

1. Disconnected DEF tank level sensor
2. Blocked DEF line or dosing valve
3. Disconnected DEF dosing valve
4. Disconnected DEF pump
5. Disconnected SCR wiring harness
6. Disconnected NOx sensors
7. Disconnected DEF quality sensor
8. Disconnected Tank Heater

Condition	Notification	Inducement
System normal	None	None
Tampering fault detected (see list) **	AWL Solid or MIL per OBD requirements*  	None
Tampering fault detected, at detection + 1 hours **	AWL and MIL per OBD requirements*  	25% torque derate
Tampering fault detected, at detection + 5 hours	AWL Solid MIL per OBD requirements*  	40% Torque derate
Tampering fault detected, at detection + 5 hours, and after the engine has been shut down or fuel re-fill event or in 1 hour extended idle **	AWL Solid Red Lamp Solid and MIL per OBD requirements*   	Vehicle speed limited to 5 mph after one of the 3 possible triggers are met.

SCR Tampering Error List

Error Name	FC	Lamp	Trip	Inducement	HC OFF	SCR OFF	Tampering
EONOX_SENSOR_HTR_ERR	1885	MIL	1	Torque and Vehicle Speed	No	Yes	Yes
J39_AT1_DUALEGTS_CJT_TIMEOUT_ERROR	4152	MIL	1	Torque and Vehicle Speed	No	No	Yes
J39_AT1_DUALEGTS_TT_TIMEOUT_ERROR	4152	MIL	1	Torque and Vehicle Speed	No	No	Yes
J39_ATI1_TIMEOUT_ERROR	3232	MIL	1	Torque and Vehicle Speed	No	Yes	Yes
J39_ATO1_TIMEOUT_ERROR	2771	MIL	1	Torque and Vehicle Speed	No	No	Yes
J39_NH3_INFO1_TIMEOUT_ERROR	3911	MIL	1	Torque and Vehicle Speed	No	No	Yes
J39_NH3_INFO2_TIMEOUT_ERROR	3911	MIL	1	Torque and Vehicle Speed	No	No	Yes
J39_NH3_INFO3_TIMEOUT_ERROR	3911	MIL	1	Torque and Vehicle Speed	No	No	Yes
J39_UQS_CRI1_TIMEOUT_ERROR	3868	AWL	1	Torque and Vehicle Speed	No	No	Yes
NOX_IN_SENSOR_IR_HI_MOTOR_ERR	3748	MIL	2	Torque and Vehicle Speed	No	No	Yes
UDD_POWERCTRL_LOW_ERR	3559	MIL	1	Torque and Vehicle Speed	No	Yes	Yes
UDD_PUMP_LOW_ERR	3559	MIL	1	Torque and Vehicle Speed	No	Yes	Yes
UDD_SU_HEATER_LOW_ERR	4156	MIL	1	Torque and Vehicle Speed	No	No	Yes
UPPM_CTRL_TOOHIGH_ERR	3575	MIL	2	Torque and Vehicle Speed	No	Yes	Yes
UPPM_CTRL_TOOLOW_ERR	3574	MIL	1	Torque and Vehicle Speed	No	No	Yes
UPPM_FAIL2STBLZ_ERR	3596	MIL	2	Torque and Vehicle Speed	No	No	Yes
UQS_CONC_CURRENT_OOR_LO_ERR	4741	AWL	1	Torque and Vehicle Speed	No	No	Yes
UQS_CONC_VOLTAGE_OOR_HI_ERR	1686	AWL	1	Torque and Vehicle Speed	No	No	Yes
UQS_LOW_CONC_ERR	3867	AWL	1	Torque and Vehicle Speed	No	No	Yes
UQS_TMPTR_CURRENT_OOR_LO_ERR	4743	AWL	1	Torque and Vehicle Speed	No	No	Yes
UQS_TMPTR_OOR_LO_ERR	4234	AWL	1	Torque and Vehicle Speed	No	No	Yes
UQS_UNKNOWN_FLUID_TYPE_ERR	4768	AWL	1	Torque and Vehicle Speed	No	No	Yes
UREA_DOSER_FAIL_TO_PRIME_ERR	1682	MIL	1	Torque and Vehicle Speed	No	No	Yes
UREA_DOSER_FUNC_RESPONSE_ERR	3568	MIL	2	Torque and Vehicle Speed	No	No	Yes

UREA_DOSER_INJ_ELEC_ERR	3567	MIL	1	Torque and Vehicle Speed	No	Yes	Yes
UREA_LINEHTR1_HIGHSIDE_OL_ERR	3258	MIL	1	Torque and Vehicle Speed	No	Yes	Yes
UREA_LINEHTR1_LOWSIDE_OL_ERR	3258	MIL	1	Torque and Vehicle Speed	No	Yes	Yes
UREA_LINEHTR2_HIGHSIDE_OL_ERR	3261	MIL	1	Torque and Vehicle Speed	No	Yes	Yes
UREA_LINEHTR2_LOWSIDE_OL_ERR	3261	MIL	1	Torque and Vehicle Speed	No	Yes	Yes
UREA_LINEHTR3_HIGHSIDE_OL_ERR	3425	MIL	1	Torque and Vehicle Speed	No	Yes	Yes
UREA_LINEHTR3_LOWSIDE_OL_ERR	3425	MIL	1	Torque and Vehicle Speed	No	Yes	Yes
UREA_SM_HTR_LOW_ERR	4169	MIL	1	Torque and Vehicle Speed	No	No	Yes
UREA_TANKLVL_EMPTY_INDUCE_ERR	3547	AWL	1	Torque and Vehicle Speed	No	No	Yes
UREA_TANKLVL_EMPTY_MAINT_ERR	1673	AWL	1	Torque and Vehicle Speed	No	No	Yes
UREA_TANKLVL_INDUCEMENT_MAINT_ERR	1673	AWL	1	Torque and Vehicle Speed	No	No	Yes
UREA_TANKLVL_LO_MAINT_ERR	3497	Maint.	1	Torque and Vehicle Speed	No	No	Yes
UREA_TANKLVL_OOR_HI_ERR	1669	AWL	1	Torque and Vehicle Speed	No	No	Yes
UREA_TANKLVL_WARNING_MAINT_ERR	3498	Maint.	1	Torque and Vehicle Speed	No	No	Yes
UREA_TANKT_OOR_HI_ERR	1678	MIL	1	Torque and Vehicle Speed	No	No	Yes
UREAPUMPP_OOR_LO_ERR	3572	MIL	1	Torque and Vehicle Speed	No	Yes	Yes
UREASUPP_TMPTR_TIMEOUT_ERR	2976	MIL	2	Torque and Vehicle Speed	No	No	Yes
UTDD_LINEHTR1_LOW_ERR	3563	MIL	1	Torque and Vehicle Speed	No	No	Yes
UTDD_TANKHTR1_HIGH_ERR	1683	MIL	1	Torque and Vehicle Speed	No	No	Yes

AECD Bit Mask Tables

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EMM_AECD_State		
State	**Decimal Value**	**Bit Mask**
Emission Protection	0	None
Air Handling System Protection	1	Bit 0
Extreme Ambient Overheat Protection	2	Bit 1
Extreme Ambient Conditions Protection	4	Bit 2
Cold Intake Manifold Temperature Protection	8	Bit 3
Extended Idle & PTO Protection	16	Bit 4
Engine Starting & Warmup Protection	32	Bit 5
General Engine Protection	64	Bit 6
Diagnostic Procedures	128	Bit 7
System Modulation	256	Bit 8
Aftertreatment Regeneration Protection	512	Bit 9
N/A	1024	Bit 10
N/A	2048	Bit 11
Selective Catalytic Reduction Protection	4096	Bit 12

EMM_Protection_State_1		
State	**Decimal Value**	**Bit Mask**
Normal Operation	0	None
AECD 1 – Air Handling	1	Bit 0
AECD 2 – Extreme Ambient Overheat	2	Bit 1
AECD 3.1 – Extreme Ambient Conditions – OFC Gain Adjustment	4	Bit 2
AECD 4 – Cold IMT Protection (Wet Stack)	8	Bit 3
AECD 5.1 – Extended Idle – Idle Speed Increase	16	Bit 4
AECD 5.2 – Extended Idle – EGR Valve close	32	Bit 5
AECD 5.3 – Extended Idle – SCR no dosing	64	Bit 6
AECD 6.1 – Engine Starting and Warmup	128	Bit 7
AECD 7.1 – Extreme Conditions / Malfunction – Engine Electronic Sensors and Actuators	256	Bit 8
AECD 7.2-N/A	512	Bit 9
AECD 7.3a – Extreme Conditions / Malfunction – Cooling System Protection – Coolant Temperature	1024	Bit 10
AECD 7.3b – Extreme Conditions / Malfunction – Cooling System Protection – EGR Orifice Temperature	2048	Bit 11
AECD 7.3c – Extreme Conditions / Malfunction – Cooling System Protection – Coolant Level	4096	Bit 12
AECD 7.4a – Extreme Conditions / Malfunction – Turbo Prot – Speed	8192	Bit 13
AECD 7.4b – Extreme Conditions / Malfunction – Turbo Prot – Temperature	16,384	Bit 14

AECD 7.5 – Extreme Condtions / Malfunction – Turbo Surge Prot	32,768	Bit 15
AECD 7.6 – Extreme Conditions / Malfunction – Aftertreatment System Protection	65,536	Bit 16
AECD 7.7a – N/A	131,072	Bit 17
AECD 7.8 – Extreme Conditions / Malfunction – Disconnected Turbo Comp Protection	262,144	Bit 18
AECD 8.1 – N/A	524,288	Bit 19
AECD 8.2 – Diagnostic Procedures – Misfire Monitor	1,048,576	Bit 20
AECD 8.4 – N/A	4,194,304	Bit 22
AECD 8.5 – N/A	8,388,608	Bit 23
AECD 8.6 – N/A	16,777,216	Bit 24
AECD 9.1– Transient and Steady State Operations	33,554,432	Bit 25
AECD 9.2– Ambient Conditions	67,108,864	Bit 26
AECD 9.3a – Modulation – Transient Acceleration – OFC	134,217,728	Bit 27
AECD 9.3c– N/A	2,097,152	Bit 21
AECD 9.4 – Modulation – Automated Transmission Shift	268,435,456	Bit 28
AECD 10.1 – Aftertreatment Regeneration – Regen Control	536,870,912	Bit 29
AECD 10.2 – Aftertreatment Regeneration – Ineffective Dosing	1,073,741,824	Bit 30
AECD 10.3 – Aftertreatment Regeneration – High Soot Load Prot	2,147,483,648	Bit 31

EMM_Protection_State_2		
State	**Decimal Value**	**Bit Mask**
Normal Operation	0	None
AECD 10.4 – Aftertreatment Regeneration – DOC Face-Plugging	1	Bit 0
AECD 10.5 – Aftertreatment Regeneration – Aftertreatment Desorption	2	Bit 1
AECD 10.6a – Aftertreatment Regeneration – Manual Request – Stationary Regen	4	Bit 2
AECD 10.6b – Aftertreatment Regeneration – Manual Request – Inhibit	8	Bit 3
AECD 10.7 – Aftertreatment Regeneration – Electronic Sensors and Actuators	16	Bit 4
AECD 10.8- N/A	32	Bit 5
AECD 10.9-N/A	64	Bit 6
AECD 13.1a – SCR Operation – Exhaust Flow	16384	Bit 14
AECD 13.4a – SCR Operation – System Malfunction	32768	Bit 15
AECD 13.3 – SCR Operation – Extreme Ambient Thawing Prot	65536	Bit 16
AECD 8.8 – Diagnostic Procedures – Fueling Quantity & Timing	262,144	Bit 18
AECD 9.3b – Modulation – Transient Acceleration – Low Boost	2,097,152	Bit 21
AECD 13.1b – SCR Operation – Low Catalyst Temp	8,388,608	Bit 23
AECD 13.2 – SCR Operation – Thermal Management	16,777,216	Bit 24
AECD 13.4b – SCR Operation – DEF Quality	33,554,432	Bit 25
AECD 13.4c – SCR Operation – DEF Empty	67,108,864	Bit 26

AECD 7.9 – N/A	134,217,728	Bit 27
AECD 7.7b – N/A	268,435,456	Bit 28
AECD 9.5 – Modulation – High Coolant Temp EGR Modulation	1,073,741,824	Bit 30