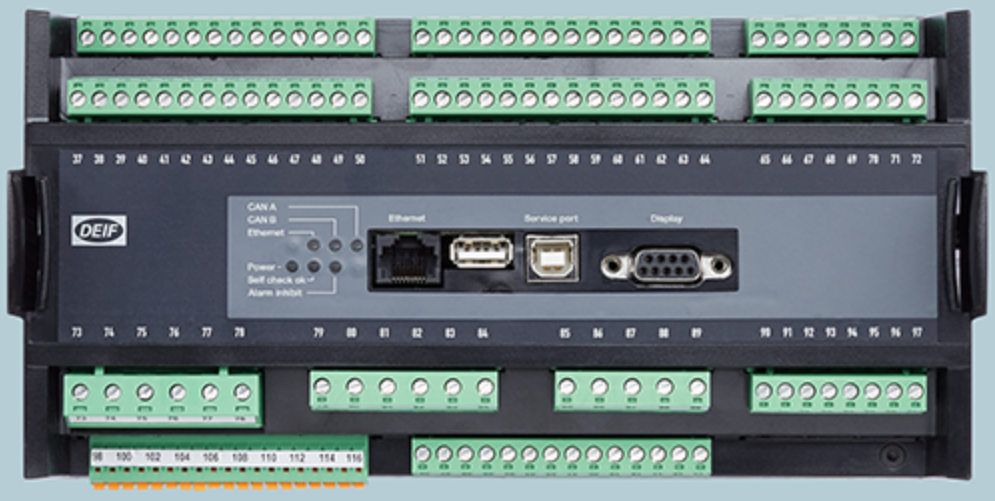
DESCRIPTION OF OPTIONS

AGC-4 Options H5, H7, H12 and H13
CAN bus engine communication



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1. Description of the engine communication option

2. Generic J1939

3. Specific engine types

1. Description of the engine communication option

1.1 Introduction

1.1.1 Overview

The H5, H7, H12 and H13 options allow CAN bus communication between AGC-4 and several engine types.

The AGC receives information from the Electronic Control Unit (ECU) of the engine. The AGC can use the information as input for its own control functions. The AGC can also use the information as display values, alarms, shutdown alarms and as values to be transmitted through Modbus. If the ECU allows it, the AGC can send telegrams with commands and set points.

You can read the engine data from the AGC over Modbus if option H2 or N is present. See the **Modbus tables** for more information.

For the AGC engine communication parameters, see the Parameter list.

See the ECU user manuals for the ECU protocol technical description and details of each communication value.

J1939-based protocols

Most of the engine communication protocols are based on SAE J1939. J1939 is a very large standard, and most of it is irrelevant to engine communication. The AGC supports only relevant parts of J1939. The parts of J1939 that the AGC supports are described in Generic J1939.

If your ECU is not included in **Specific engine types** chapter, you can use the parts of J1939 that the AGC and ECU both support.

If the ECU is included in **Specific engine types** chapter, you can use the parts of J1939 that the AGC and ECU both support. You can also use the custom functions described for the specific ECU.

Relationship between the AGC and ECU for J1939

Information	Communication	Included in the AGC J1939	Not included in the AGC J1939	Specific engine types
Alarms	The ECU broadcasts the information as a SPN+FMI combination.	The AGC has an alarm text for each SPN+FMI combination.	The AGC displays the SPN+FMI. The user can look up the SPN in the J1939 standard. The AGC also displays the text "N/A" and uses the FMI to add text like "High" or "Most severe".	The AGC assigns texts to the proprietary alarms listed in this document. Some ECUs use proprietary alarm systems. For example, Scania uses KWP2000.
Statuses	The ECU broadcasts the information as a PNG number, with each status defined by a bit.	The AGC treats the information like a digital input.	The AGC ignores the information.	The AGC has custom functions for the additional/ proprietary statuses listed in this document.
Measurements	The ECU broadcasts the CAN ID, with a priority and the information as a PNG number, with each measurement defined by a byte or 2.	The AGC treats the information like an analogue input. The measurements can activate alarms. Some measurements can be used for running detection, and others can activate Tier 4 actions (for example, DEF level shutdown).	The AGC ignores the information.	The AGC has custom functions for the additional/ proprietary measurements listed in this document.

Information	Communication	Included in the AGC J1939	Not included in the AGC J1939	Specific engine types
Commands	The AGC sends a telegram with the command.	The AGC can send the telegram. If the ECU supports the command, it responds accordingly.	The AGC will not send the telegram.	The AGC can send the additional telegrams listed in this document.
Set points	The AGC sends a telegram with the set point at regular intervals. Set points are mostly used for speed regulation. Some ECUs allow idle speed and frequency regulation.	The AGC can send the telegram. If the ECU supports the set point, it responds accordingly.	The AGC will not send the telegram.	The AGC can send the additional telegrams listed in this document.

INFO
Note that the **MTU J1939 Smart Connect** protocol is based on J1939.

MTU protocols

MDEC and ADEC communication is NOT based on J1939. MDEC and ADEC are based on MTU-designed protocols. See the **Specific engine types** chapter for a full description of how the AGC supports each of the MDEC and ADEC protocols.

Other engines and controllers

If you have an engine or controller that is not listed in this document, contact DEIF.

1.1.2 Supported controllers and engines

The AGC can communicate with the following controllers and engines.

Manufacturer	Controllers	Engines	AGC can write commands	Notes
Generic J1939	Any controller that uses J1939	Any engine that uses J1939	Yes	
Caterpillar	ADEM III and A4	C4.4, C6.6, C9, C15, C18, C32, 3500, 3600	Yes	
Cummins	CM 500/558/570/850/2150/2250	QSL, QSB5, QSX15 and 7, QSM11, QSK 19/23/50/60	Yes	
Detroit Diesel	DDEC III and IV	Series 50, 60 and 2000	Yes	
Deutz	EMR3, EMR 2 (EMR)	912, 913, 914 and L2011	Yes	
Isuzu	ECM	4JJ1X, 4JJ1T, 6WG1X FT-4	Yes	
Iveco	EDC7 (Bosch MS6.2), NEF, CURSOR and VECTOR 8		Yes	
John Deere	JDEC	PowerTech M, E and Plus	Yes	
Kohler	ECU2-HD	KD62V12	Yes	
Moteurs Baudouin	ECU WISE15		Yes	
MTU	ADEC, ECU7 with SAM module	Series 2000 and 4000 (ECU7), MTU PX	Yes	MTU ADEC (CANopen)

Manufacturer	Controllers	Engines	AGC can write commands	Notes
MTU	ADEC, ECU7 without SAM module (software module 501)	Series 2000 and 4000	Yes	MTU ADEC module 501
MTU	J1939 Smart Connect, ECU8, ECU9	Series 1600	Yes	MTU J1939 Smart Connect
MTU	MDEC, module M.201 or M.304	Series 2000 and 4000	Yes	MTU MDEC module 201/304
MTU	MDEC, module M.302 or M.303	Series 2000 and 4000	Yes	MTU MDEC module 302/303
Perkins	ADEM III and A4	Series 850, 1100, 1200, 1300, 2300, 2500 and 2800	Yes	
PSI/Power Solutions		PSI/Power Solutions	Yes	
Scania	EMS		Yes	Scania EMS
Scania	EMS S6 (KWP2000)	Dx9x, Dx12x, Dx16x	Yes	Scania EMS S6
Scania	EMS 2 S8	DC9, DC13, DC16	Yes	Scania EMS2 S8
Volvo Penta	EDC4		Yes	
Volvo Penta	EMS		Yes	
Volvo Penta	EMS 2.0 to EMS2.3, EDCIII	D6, D7, D9, D12, D16 (GE and AUX variants only)	Yes	EMS 2 SW version 2.4
Volvo Penta	EMS2.4		Yes	Volvo Penta EMS2.4

1.1.3 Software version

This document is based on the AGC-4 software version 4.80.1.

1.1.4 AVR communication

This document primarily describes CAN bus **engine** communication.

Data can also be transmitted over CAN bus between the AGC and the following AVRs:

Manufacturer	AVR Types
Caterpillar	CDVR
DEIF	DVC 550 and DVC 310

AVR control requires option D1 in combination with option H5, H7, H12 or H13.

More information
See the **DVC 550 Designer's handbook** for more information about communication with DVC 550. See **Option T2** on the DVC 310 product page for more information about communication with DVC 310.

1.1.5 Engineering units

Use parameter 10970 (Engineering units) to select *Bar/Celsius* or *Psi/Fahrenheit*.

The selection affects:

- The display readings
- The values used for alarm evaluation (menu 76xx)
- The data readable by Modbus communication (option H2/N)

1.1.6 Writing decimal and hexadecimal numbers

Unless otherwise specified, all numbers in this document are decimal numbers.

Hexadecimal numbers start with 0x. For example, 0x1C is 28.

1.1.7 Parameter list

This is an overview of the parameters used in engine communication. See the descriptions in the rest of this document for more information.

Parameter	Name	Range	Default	Details
2771	Droop	0 to 25 %	0 %	Only for Scania.
2772	Scania rpm	User 1500RPM 1800RPM Low idle	User	Only for Scania.
2773	Cummins gain	0 to 10	5	Only for Cummins.
2781	Reg. output GOV	Relay/Analogue/EIC	Relay	Select EIC to enable the AGC to do speed control through the ECU.
2783	Reg. output AVR	Relay/Analogue/EIC	Relay	
2791	Local Norm sw.	Analogue CAN Up/Down ECU Up/Down CAN Analogue ECU Analogue ECU relative Frequency	Analogue CAN	EIC speed demand switch setup: local normal switch position.
2792	Local Emerg sw.	Analogue CAN Up/Down ECU Up/Down CAN Analogue ECU Analogue ECU relative Frequency	Analogue CAN	EIC speed demand switch setup: local emergency switch position.
2793	Remote Norm sw.	Analogue CAN Up/Down ECU Up/Down CAN Analogue ECU Analogue ECU relative Frequency	Analogue CAN	EIC speed demand switch setup: remote normal switch position.
2794	Remote Emerg sw.	Analogue CAN Up/Down ECU Up/Down CAN Analogue ECU Analogue ECU relative Frequency	Analogue CAN	EIC speed demand switch setup: remote emergency switch position.
7551	EIC Derate	Enable	Not enabled	

Parameter	Name	Range	Default	Details
7561	Engine I/F	OFF DDEC EMR JDEC Iveco Perkins Caterpillar Volvo Penta Volvo Penta EMS2 Scania EMS Scania EMS2 MDEC 2000/4000 M.302 MDEC 2000/4000 M.303 MTU ADEC Cummins Generic J1939 MTU J1939 Smart Connect PSI/Power Solutions Isuzu Kohler Volvo Penta EMS2.4 Scania EMS2 S8	Generic J1939	
7562	EIC SA/ADEC ID	0 to 255	0	Engine ECU source address.
7563	EIC Controls	ON/OFF	ON	Enable writing commands to the ECU.
7564	EIC Auto View	ON/OFF	OFF	Extra display views in V1 and V2 showing all EIC engine data.
7566	TSC1 SA	-1 to 255	-1	EIC speed/Torque control source address. If -1, the pre-programmed source address is used.
7570	EI Comm. error	Alarm selections	Not enabled	Supervision of the engine communication CAN bus.
7580	EIC Warning	Alarm selections	Not enabled	Standard DEIF alarm based on the EIC reading.
7590	EIC Shutdown	Alarm selections	Not enabled	Standard DEIF alarm based on the EIC reading.
7600	EIC Overspeed	Alarm selections	Not enabled	Standard DEIF alarm based on the EIC reading.
7610	EIC Coolant T.1	Alarm selections	Not enabled	Standard DEIF alarm based on the EIC reading.
7620	EIC Coolant T.2	Alarm selections	Not enabled	Standard DEIF alarm based on the EIC reading.
7630	EIC Oil pres. 1	Alarm selections	Not enabled	Standard DEIF alarm based on the EIC reading.
7640	EIC Oil pres. 2	Alarm selections	Not enabled	Standard DEIF alarm based on the EIC reading.
7650	EIC Oil temp. 1	Alarm selections	Not enabled	Standard DEIF alarm based on the EIC reading.
7660	EIC Oil temp. 2	Alarm selections	Not enabled	Standard DEIF alarm based on the EIC reading.

Parameter	Name	Range	Default	Details
7670	EIC Coolant L. 1	Alarm selections	Not enabled	Standard DEIF alarm based on the EIC reading.
7680	EIC Coolant L. 2	Alarm selections	Not enabled	Standard DEIF alarm based on the EIC reading.
7690	EIC Cyl diff. 1	Alarm selections	Not enabled	Standard DEIF alarm based on the EIC reading.
7700	EIC Cyl diff. 2	Alarm selections	Not enabled	Standard DEIF alarm based on the EIC reading.
7841	CAN A A1.HI - A3.LO	OFF/PMS Primary/PMS Secondary/EIC*	OFF	EIC communication selection for option H7. *Note: You must have option H7 to see EIC in this list.
7843	CAN C 29.HI - 31.LO	OFF/EIC	OFF	EIC communication selection for option H12.2.
7844	CAN D 32.HI - 34.LO	OFF/EIC	OFF	EIC communication selection for option H12.2
7845	CAN E 128.LO-130.HI	OFF/EIC/Ext. Modules DEIF	OFF	EIC communication selection for option H12.8
7846	CAN F 133.HI - 131.LO	OFF/EIC	OFF	EIC communication selection for option H12.8
15000	Izuzu ESCmode SD thr	Time delay	Not enabled	Timer threshold for engine shutdown during escape mode.
15010	Kohler ECU reset	Relay selection	Not enabled	Selection of the relay and parameters to reset the ECU.
15021	JCB Livelink	JCB Livelink	OFF	Enables J1939/75 (EIC Livelink). See J1939/75.
15022	Livelink Fuel 1	OFF Multi input 102 Multi input 105 Multi input 108	Multi input 108	To send the associated measurement as a DM1 to J1939/75 (JCB Livelink), select the AGC-4 input.
15023	Livelink Fuel 2		OFF	
15024	Livelink Oil press		Multi input 105	
15025	Livelink Coolant		Multi input 102	
15030	CM1 SA	-1 to 255	-1	Selection of EIC J1939 CAB message 1 source address. If **-1**, the AGC uses the default. The AGC telegrams for DPF regeneration use this source address.
15040	GC1 SA	-1 to 255	-1	Selection of EIC J1939 Generator Control 1 source address. If **-1**, the AGC uses the default. If the M-Logic *EIC Start/Stop enable* command is activated, the start/stop telegram uses this source address.
15060	EIC RelativeHumidity	-100 to 100 % 0 to 100 s	50 % 5 s	Engine humidity derate alarm. Only for Caterpillar/Perkins.
15090	EIC Start/Stop	OFF	ON	This has the same effect as the M-Logic command *EIC Start/Stop enable*.

Parameter	Name	Range	Default	Details
		ON		
15110	Volvo speed control	Standard J1939 Volvo proprietary - Primary speed 50Hz Volvo proprietary - Primary speed 60Hz	Standard J1939	For all Volvo Penta engines, you can select the primary speed of the engine (that is, the speed configured for the engine at the factory) to ensure the correct proprietary telegrams for speed control.

1.1.8 Terms and abbreviations

Term	Abbreviation	Explanation
Advanced Genset Controller	AGC	The DEIF controller.
CAN bus		A standard for devices to communicate with each other.
CANopen		A high-level communication protocol based on the CAN protocol.
Clear DM2 alarms	DM3	In the EIC alarms, DM3 clears the DM2 alarms.
Clear DM1 alarms	11	In the EIC alarms, 11 clears the DM1 alarms.
Diagnostic message	DM1, DM1se, DM2	An alarm from the ECU. DM1: Active EIC alarms DM1se: Active EIC alarms from the secondary ECU DM2: History EIC alarms
Diesel Exhaust Fluid	DEF	Used to reduce NOx emissions from diesel engines.
Diesel particulate filter	DPF	An after-treatment technology used to reduce emission of carbon particles.
Electronic control unit	ECU	The part of the engine controller that communicates with the AGC. This is sometimes called an electronic control module (ECM).
Engine interface communication	EIC	
Engine power	kWm	The kW output on the engine shaft. The generator electrical output is lower (due to losses).
Failure Mode Identifier	FMI	A J1939 number to show the severity of a fault.
Occurance counter	oc	The number of times an alarm has been activated.
Parameter Group Number	PGN	The part of the J1939 message that identifies the data type.
Receive	Rx	The AGC receives data from the ECU.
Red lamp alarm		Shutdown alarm
	RS-485	A serial bus standard. RS-485 communication is not described in this document.
	SAE J1939	A Vehicle Network Communication standard using CAN for communication.
Selective catalytic reduction	SCR	An after-treatment technology used to control NOx.
Society of Automotive Engineers	SAE	The group that developed the J1939 protocol.
Stage V		The European (EU) standard to limit diesel emissions from machinery engines.
Suspect Parameter Number	SPN	A J1939 number to show the type of fault (for example, warning or shutdown).
Tier 4 Final	Tier 4	The US Environmental Protection Agency (EPA) standard to limit diesel emissions from machinery engines.

Term	Abbreviation	Explanation
Transmit	Tx	The AGC transmits data to the ECU.
Yellow lamp alarm		Warning alarm

1.1.9 Factory settings

The Multi-line 2 unit is delivered from the factory with default settings. These are not necessarily correct for the engine/generator set. Check all the settings before running the engine/generator set.

1.1.10 Legal information and disclaimer

DEIF takes no responsibility for installation or operation of the generator set. If there is any doubt about how to install or operate the engine/generator controlled by the Multi-line 2 unit, the company responsible for the installation or the operation of the set must be contacted.

INFO
The Multi-line 2 unit is not to be opened by unauthorised personnel. If opened anyway, the warranty will be lost.

Disclaimer

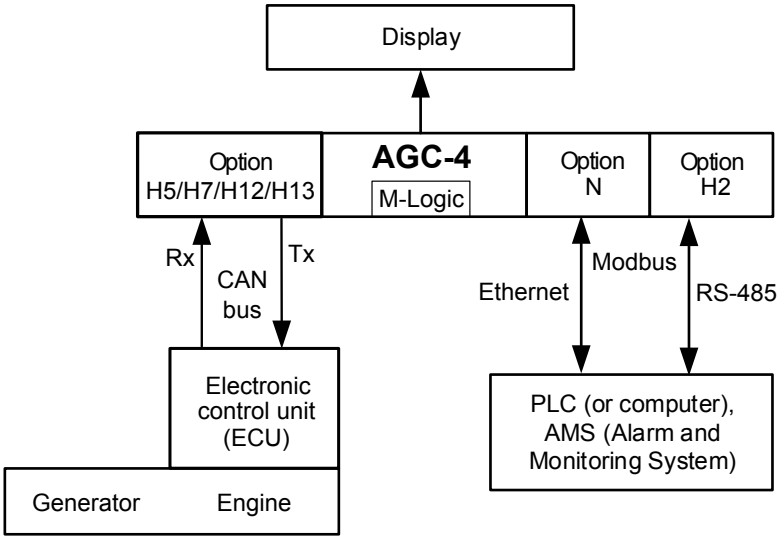
DEIF A/S reserves the right to change any of the contents of this document without prior notice.

The English version of this document always contains the most recent and up-to-date information about the product. DEIF does not take responsibility for the accuracy of translations, and translations might not be updated at the same time as the English document. If there is a discrepancy, the English version prevails.

1.2 Wiring

1.2.1 Communication principles

Figure 1.1 Principle diagram



More information
See the **Installation instructions** for wiring details.

1.2.2 Option H5.2

The engine interface communication module is in slot 2.

Terminal	Function	Description
29[1]	CAN-H	CAN bus card option H5.2, Engine Interface Communication
30	CAN-GND	
31[2]	CAN-L	
32[1]	CAN-H	
33	CAN-GND	
34[2]	CAN-L	
35	Not used	
36	Not used	

Note 1: Terminals 29 and 32 are internally connected.

Note 2: Terminals 31 and 34 are internally connected.

1.2.3 Option H5.8

The engine interface communication module is in slot 8.

Terminal	Function	Description
127	Not used	Not used
126	Not used	
128[2]	CAN-L	CAN bus card option H5.8, Engine Interface Communication
129	CAN-GND	
130[1]	CAN-H	
131[2]	CAN-L	
132	CAN-GND	
133[1]	CAN-H	

Note 1: Terminals 130 and 133 are internally connected.

Note 2: Terminals 128 and 131 are internally connected.

1.2.4 Option H7

Option H7 is a limited version of H5. A number of advanced features are **not** supported, including:

- CIO modules
- Redundant power management
- Tier 4/Stage 5
- MTU J1939 Smart Connect, MTU MDEC and MTU ADEC module 501
- New engines (for example, Volvo EMS 2.4)

When option H7 is activated, it occupies CAN A. Power management communication can then only use CAN B (even if CAN A or both is selected in the plant configuration).

The engine interface communication module is in slot 7.

Terminal	Function	Description
A1	CAN-H	CAN I/F A
A2	CAN-GND	
A3	CAN-L	

1.2.5 Option H12.2 dual CAN

Option H12 is a dual CAN card that includes option H5 (engine interface communication) and option H8 (external I/O modules). Option H12.2 goes in slot 2.

Select **EIC** in parameters 7843 (CAN C 29.HI - 31.LO) and 7844 (CAN D 32.HI - 34.LO).

Terminal	Function	
29	CAN-H	CAN C
30	CAN-GND	
31	CAN-L	
32	CAN-H	CAN D
33	CAN-GND	
34	CAN-L	
35	Not used	
36	Not used	

1.2.6 Option H12.8 dual CAN

Option H12 is a dual CAN card that includes option H5 (engine interface communication) and option H8 (external I/O modules). Option H12.8 goes in slot 8.

Select **EIC** in parameters 7845 (CAN E 130.HI - 128.LO) and 7846 (CAN F 133.HI - 131.LO).

Terminal	Function	Description
126	Not used	
127	Not used	
128	CAN-L	CAN E
129	CAN-GND	
130	CAN-H	
131	CAN-L	CAN F
132	CAN-GND	
133	CAN-H	

1.2.7 Option H13

Option H13 is a software option for the MTU ADEC module 501 protocol. Option H13 requires option H5 or H12. The ECU is connected to the option H5 or H12 CAN bus terminals.

1.3 Engine control commands

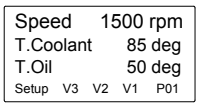
The AGC can send standard J1939 engine control commands. These are described in the **Generic J1939** chapter.

The control commands supported for each engine/controller type are described in the **Specific engine types** chapter. If the required commands are not listed, then the start/stop and other commands must be sent to the controller using hardwired connections.

1.4 Show engine values in the display unit

You can configure the AGC so that the operator can see the values from the ECU in the display unit. By default, 20 views are available. Use the Autoview function to increase the number of views.

Figure 1.2 Display example showing engine speed, coolant and oil temperature



Default view configuration

Use the PC Utility Software function *Configuration of the user views*. The function icon is in the horizontal toolbar:  . Up to 20 three-line views can be configured.

This method is useful if the 20 user-configurable views are not already required for other values, and/or only a few EIC values need to be shown.

Autoview function

You can activate the Autoview function in parameter 7564 (EIC Auto view). This way the first 20 three-line views are not changed. The engine values are added to the list of the 20 three-line views. In total, 20 + 14 three-line views are available. The first 20 views are user-configurable. The additional 14 three-line views are dedicated to EIC and not configurable.

This method is useful if the operator needs to see all the EIC data from the ECU. All available EIC data is shown until the additional 14 three-line views are used. The number of extra display views used depends on the data available from the specific engine controller.

Activating Autoview

The extra view lines are displayed if parameter 7564 is **On** and the engine CAN bus is active. You may need to start the engine before changing 7564 to **On**. The parameter automatically returns to **Off**.

Deactivating Autoview

Autoview is not reset automatically when no engine is selected. To de-activate Autoview:

1. Change Engine I/F type to **OFF** (parameter 7561).
2. Change EIC Auto view to **On** (parameter 7564).
3. Change EIC Auto view to **Off** (parameter 7564).

1.5 AGC EIC alarms

The following EIC alarms can be configured in the AGC and activated by data from the ECU.

When the AGC alarm is activated, the AGC activates the corresponding M-Logic event (see *Events, Alarms*).

Menu	Alarm	M-Logic event	Comment
7570	EI comm. error	EIC Comm. error	Communication error
7580	EIC warning	EIC Warning	Any alarm listed as a warning for the specific engine type (yellow lamp).
7590	EIC shutdown	EIC Shutdown	Any alarm listed as a shutdown for the specific engine type (red lamp).
7600	EIC overspeed	EIC Overspeed	Engine RPM
7610/7620	EIC coolant T. (2 levels)	EIC Coolant Temp 1/2	High engine temperature (from coolant temperature)
7630/7640	EIC oil pres. (2 levels)	EIC Oil pressure 1/2	High engine pressure
7650/7660	EIC oil temp. (2 levels)	EIC Oil temperature 1/2	High engine temperature (from oil temperature)
7670/7680	EIC coolant L. (2 levels)	EIC Coolant Level 1/2	Low engine cooling water level
7690/7700	EIC Cylinder exhaust diff. temp. (2 levels)	EIC Cylinder exhaust diff. temp. 1/2	High exhaust differential temperature

1.6 M-Logic

1.6.1 Events

The following events are available in M-Logic under *Events, EIC event*. The events listed here are only for J1939 protocols.

See Tier 4 Final/Stage V for the exhaust after-treatment events.

If an event is only supported by one engine/controller, it is included in the section for that engine/controller.

Engine communication M-Logic events

Event	Description
Engine Fuel Leakage 1 (status)	Activated by the J1939 object *EngineFuelLeak1*
Engine Wait to Start (status)	Activated by the J1939 object *EngineWaitToStart*
Engine Protect Sys Shutdown (status)	Activated by the J1939 object *EngineProtectSysShutdown*
Engine Protect Sys Appro Shutdown (status)	Activated by the J1939 object *EngineProtectSysApproShutdown*
Engine Alarm Acknowledge (status)	Activated by the J1939 object *EngineAlarmAcknowledge*
Engine Air Shutoff Command Status (status)	Activated by the J1939 object *EngineAirShutoffCommandStatus*
Engine Overspeed Test (status)	Activated by the J1939 object *EngineOverspeedTest*
Engine Shutoff Status (status)	Activated by the J1939 object *EngineShutoffStatus*

1.6.2 Commands

The following commands are available in M-Logic under *Output, EIC commands*.

See Tier 4 Final/Stage V for the exhaust after-treatment commands.

If a command is only supported by one engine/controller, it is included in the section for that engine/controller.

Engine communication M-Logic commands

Command	Description
EIC droop	If the droop parameters are enabled in the AGC, the AGC commands the ECU to activate the droop function. Cummins: The AGC sends the droop set point to the ECU. Scania and Volvo Penta: The AGC sends an enable to the ECU.
EIC droop emulation	The AGC uses the droop setting in parameter 2771. The AGC adjusts the speed set point to emulate droop. This is useful if a droop set point cannot be sent to the ECU.
EIC Reset trip fuel	The AGC commands the ECU to reset the trip counter for fuel.
EIC Enable Cylinder Cutout	The ECU is allowed to use cylinder cut-out.
EIC Engine overspeed test	The AGC makes the ECU perform a overspeed test. Instead of raising the RPM, the overspeed alarms limits are lowered.
Inh. EIC alarms	When this command is active, the AGC will not shutdown the engine based on EIC alarms. This is typically necessary while the engine is stopping. The following alarms are inhibited: • EIC red alarm • EIC yellow alarm • EIC malfunction • EIC protection
EIC Start/Stop enable	The AGC transmits PGN65223, SPN 786 (2 bits) to control start and stop: • Engine start command: The AGC transmits 00: Injection enable • Engine stop command: The AGC transmits 01: Injection disable. ◦ The default transmission is 01. The AGC also transmits PGN65223, SPN 3542 (4 bits) to control start and stop: • 0000: Normal engine shutdown on engine stop command • 0001: Rapid engine shutdown on engine stop command • 0100: Rapid engine start on engine start command If *EIC normal engine start* is activated at the same time, the AGC replaces 0100: Rapid engine start with 0011: Normal engine start. Alternatively, you can use *EIC Start/Stop*, parameter 15090.
EIC Speed Control Inhibit (TSC1)	The AGC will not send a speed set point to the ECU.
EIC Warning auto-ack	The AGC automatically acknowledges all yellow lamp alarms from the ECU.
EIC Priming on Engine Start	The AGC commands the ECU to activate priming on engine start.
EIC Normal Engine Start	When this command is active, the engine start sequence type is the normal engine start sequence. See *Normal Engine Start* in the J1939 standard. Note that this command does not start the engine. This command only selects the start sequence type.

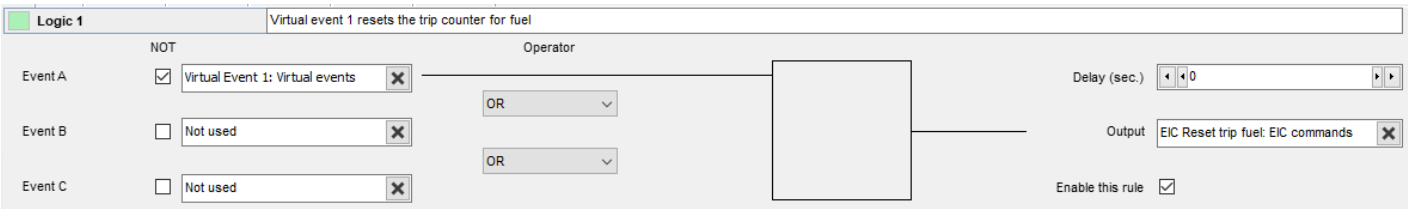
1.6.3 Using Modbus to activate M-Logic commands

You can use Modbus virtual events to activate ECU commands in M-Logic.

Virtual events 1 to 32 can be activated using the discrete output coil (01;05;15) (Modbus addresses 48 to 79) or the holding register (03;06;16) (Modbus addresses 8 to 10).

Virtual events 33 to 96 can only be activated using the discrete output coil (01;05;15) (Modbus addresses 142 to 205).

Figure 1.3 Example: Virtual event 1 resets the trip counter for fuel



More information
See the **AGC-4 Modbus tables** and **Application Notes M-Logic AGC-4** for more information.

1.7 Other

1.7.1 EIC derate

The AGC can derate the engine power by adjusting the set point sent to the ECU. Enable the function using parameter 7551 (EIC Derate).

More information
See the **Designer's Reference Handbook** for more information.

1.7.2 Differential measurement

The AGC can use ECU measurements as analogue inputs in the differential measurement function. The function compares analogue inputs and activates an alarm if the difference drops below the set point.

More information
See the **Designer's Reference Handbook** for more information.

2. Generic J1939

2.1 General

2.1.1 Basic information

Engine controller/type: Any controller which uses generic J1939.
DEIF Utility software parameter 7561: Select **Generic J1939**.
Complies with the J1939 standard
Supported options: H5, H7, H12
AGC can write commands: Yes
Baud rate: 250 kb/s

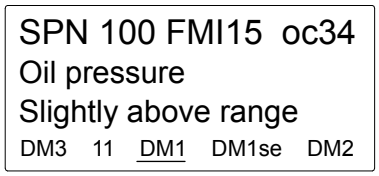
2.1.2 Warnings and shutdowns

These standard warnings and shutdowns are supported:

- EIC yellow lamp
- EIC red lamp
- EIC malfunction
- EIC protection

2.1.3 Displaying alarms

The DU-2 display can show J1939 diagnostic messages. You can acknowledge these alarms from the display unit. Press the LOG button for 3 seconds to see the EIC alarm log.



oc##: The number of times the alarm has occurred.

Selection	Description
DM3	Clears the DM2 alarm list.
11	Clears the DM1 alarm list.
DM1	The active alarms.
DM1se	The active alarms from the secondary ECU. This is only shown if a secondary ECU is present.
DM2	The historic alarm log list (since the last clear).

Use the △ and ▽ buttons to scroll through the list.

INFO
If the controller has no text for an SPN diagnostic number, *Text N/A* is shown. For information about particular SPN numbers, see the engine manufacturer's documentation. Alternatively, see SAE J1939-71 for a general description.

2.1.4 Write commands

Use parameter 7563 (EIC Controls) to enable write commands.

J1939 write commands

Command	Description
Speed control	To enable speed regulation, select **EIC** in parameter 2781 (Reg. output GOV). By default, the governor offset is 50 % of the nominal speed. At 0 % it is -120 RPM, and at 100 % it is +120 RPM. The CAN bus ID for speed control is 0xC000003. J1939 TSC1 (transmission rate is 40 ms). You can use M-Logic to disable speed control: *Output, EIC commands, EIC Speed Control Inhibit (TSC1)*.
Idle speed	The AGC can use speed control to regulate the ECU to run at idle speed (700 RPM). Use parameter 6292 to enable idle speed during engine start up (parameter 6291 is the timer). Use parameter 6294 to enable idle speed when the engine stops (parameter 6293 is the timer).
Start/Stop	This is the standard J1939 command to start the engine if it is stopped, and stops the engine if it is running. The AGC determines whether to start or stop the engine. The decision is based on the AGC's inputs, logic and calculations.
EIC start/stop enable	This is a more advanced function than the standard J1939 Start/Stop commands. See the M-Logic commands for details. If the M-Logic command is enabled, the AGC can also send the standard J1939 start/stop command. The AGC determines whether to start or stop the engine. The decision is based on the AGC's inputs, logic and calculations.
Frequency selection (50 or 60 Hz)	The AGC automatically writes the nominal frequency (50 or 60 Hz) to the ECU. The nominal frequency is defined in parameters 6001, 6011, 6021 and 6031. In general, the AGC uses the frequency to calculate the speed offset in TSC1.
Shutdown override	This command can be used in order to prevent shutdown actions from the ECU. The function is activated by the standard AGC function *Shutdown override* (digital input on the AGC).

2.1.5 TSC1 SA Torque Speed Control

Torque Speed Control 1 (TSC1) is the speed control signal from AGC to the ECU. For known protocols, the AGC uses the expected source address when parameter 7566 (TSC1 SA) is **-1** (default value). You can configure parameter 7566 for a specific source address (the range is 0 to 255). You can ask the engine manufacturer to verify the TSC1 source address.

2.1.6 Tier 4 Final/Stage V

The AGC engine communication supports the Tier 4 Final/Stage V requirements. In some countries, Tier 4 after-treatment support must be active during power production.

Standard J1939

The AGC receives the standard J1939 Tier 4 information that is available from the ECU. For a list of the Tier 4 information supported by the AGC, see the *EIC measurement* and *EIC state* functions in the *Input register (04)* in the **Modbus tables**.

The AGC sends standard J1939 commands for DM management, and can send commands to inhibit or force regeneration.

Engine-specific information

Depending on the engine, the AGC may support proprietary events and commands. See the engine's description in the **Specific engine types** chapter for details.

Viewing Tier 4 operation with TDU 107

The TDU 107 Exhaust After-Treatment Dashboard uses the standard symbols to show the Tier 4 operating information. For more information, see the **TDU 107 Operator's manual**.

M-Logic events

A range of Tier 4 operating information is available in M-Logic as events. General Tier 4 events are listed in the following table. Proprietary events are described under the specific engine.

Tier 4 M-Logic events

Event	Description
DPF Lamp OFF	The Diesel Particular Filter does not need regeneration.
DPF Lamp ON (solid)	The Diesel Particular Filter needs regeneration.
DPF Lamp ON (blink)	The Diesel Particular Filter needs regeneration soon.
DPF Active Regeneration not activated (status)	The Diesel Particular Filter is not being regenerated.
DPF Active Regeneration activated (status)	The Diesel Particular Filter is being regenerated.
DPF Active Regeneration needed (status)	The Diesel Particular Filter needs active regeneration.
DPF Regen not needed (status)	The Diesel Particular Filter does not need regeneration.
DPF Regen needed - lowest level (status)	The Diesel Particular Filter needs regeneration, but not urgently.
DPF Regen needed - moderate level (status)	The Diesel Particular Filter needs regeneration soon.
DPF Regen needed - highest level (status)	The Diesel Particular Filter urgently needs regeneration.
DPF Regen not inhibited (lamp)	The Diesel Particular Filter regeneration is not inhibited.
DPF Regen inhibited (lamp)	The Diesel Particular Filter regeneration is inhibited.
High Exh Syst Temp OFF (lamp)	The exhaust gas has no high temperature alarm.
High Exh Syst Temp ON (lamp)	The exhaust gas has a high temperature alarm.
DEF Level LOW ICON OFF (lamp)	No active alarm.
DEF Level LOW ICON ON (solid)	Alarm active.
DEF Level LOW ICON ON (blink)	Alarm active (higher severity than solid).
AT Yellow Lamp OFF (status)	No after treatment warning.
AT Yellow Lamp ON (status)	There is an after treatment warning.
AT Red Lamp OFF (status)	No after treatment shutdown.
AT Red Lamp ON (status)	There is an after treatment shutdown.

M-Logic commands

Some Tier 4 commands are available in M-Logic. General Tier 4 commands are listed in the following table. Proprietary commands are described under the specific engine.

Tier 4 M-Logic commands

Command	Description
EIC DPF Regeneration Inhibit	The AGC commands the ECU to inhibit the regeneration of the Diesel Particulate Filter.
EIC DPF Regeneration Force	The AGC commands the ECU to regenerate the Diesel Particulate Filter.
EIC DPF Regeneration M-Logic control command	

2.1.7 J1939 measurements

These are the J1939 measurements that the AGC supports. Engine communication display values begin with **EIC**. Not all measurements are supported by all engines (see the specific engine description).

You can configure the view lines on the display unit to show these values.

By default, the engine is expected to use source address **0** (the most commonly used setting on ECUs). If a different source address is required, you can configure it in parameter 7562 (EIC SA/ADEC ID). The range is 0 to 255.

PGN:	Parameter group number
SPN:	Suspect parameter number
P:	J1939 priority
S:	Object's start byte in the CAN telegram
L:	Object's length. By default, the value is in bytes. If the value is in bits, this is specified.
Unit:	Unit in display (bar/°C can be changed to psi/°F)

Text	PGN	S	L	P	SPN	Unit	J1939-71 scaling	Offset
EngineAuxShutdown switch[1]	61441/0xF001	4.5	2 bits	6	970	0..3	4 states/2 bit	0
EIC acc. pedal pos.	61443/0xF003	2	1	3/6	91	%	0.4 %/bit	0
EIC % load, c. speed	61443/0xF003	3	1	3/6	92	%	1 %/bit	0
EIC d.d.% torque	61444/0xF004	2	1	3/6	512	%	1 %/bit	-125 %
EIC actual % torque	61444/0xF004	3	1	3/6	513	%	1 %/bit	-125 %
EIC speed	61444/0xF004	4	2	3/6	190	RPM	0.125 RPM/bit	0
Engine Demand - Torque[1]	61444/0xF004	8	1	3	2432	%	1 %/bit	-125 %
AT1IntTNOx [1]	61454/0xF00E	1	2	6	3216	ppm	0.05 ppm/bit	-200 ppm
Aftertreatment 1 Intake Oxygen[1]	61454/0xF00E	3	2	6	3217	%	0.000514 %/bit	-12 %
AT1OutLNOx [1]	61455/0xF00F	1	2	6	3226	ppm	0.05 ppm/bit	-200 ppm
Aftertreatment 1 Outlet Oxygen[1]	61455/0xF00F	3	2	6	3227	%	0.000514 %/bit	-12 %
AT2IntTNOx [1]	61456/0xF010	1	2	6	3255	ppm	0.05 ppm/bit	-200 ppm
Throttle Actuator Control[1]	61466/0xF01A	1	2	4	3464	%	0.0025 %/bit	0
AT2OutLNOx [1]	61457/0xF011	1	2	6	3265	ppm	0.05 ppm/bit	-200 ppm
AT1ExhFA.DQ [1]	61475/0xF023	1	2	3	4331	g/h	0.3 g/h per bit	0
AT1ExhFluDAB [1]	61475/0xF023	6	1	3	4334	kPa	8 kPa/bit	0
AT1ExhFluDRQ [1]	61476/0xF024	1	2	6	4348	g/h	0.3 g/h per bit	0
AT2ExhFA.DQ [1]	61478/0xF026	1	2	3	4384	g/h	0.3 g/h per bit	0
AT2ExhFluDAB [1]	61478/0xF026	6	1	3	4387	kPa	8 kPa/bit	0
AT2ExhFluDRQ [1]	61479/0xF027	1	2	3	4401	g/h	0.3 g/h per bit	0
Next Regen [1]	64697/0xFCB9	1	4	6	5978	s	1 s/bit	
Battery Charger 1 State	64788/0xFD14	1.1	4 bits	6	4990	bit	16 states/4 bit	
Battery Charger 1 Power Line State	64788/0xFD14	1.5	2 bits	6	4991	bit	4 states/2 bit	
Battery Charger 1 Output Voltage	64788/0xFD14	2	2	6	4992	V	0.05 V/bit	
Battery Charger 1 Output Current	64788/0xFD14	4	2	6	4993	A	0.05 A/bit	
AT2SCRCInG [1]	64824/0xFD38	1	2	6	4413	°C/°F	0.03125 °C/bit	-273 °C

Text	PGN	S	L	P	SPN	Unit	J1939-71 scaling	Offset
AT2SCRCOuG [1]	64824/0xFD38	4	2	6	4415	°C/°F	0.03125 °C/bit	-273 °C
AT2ExhFlu DT [1]	64827/0xFD3B	3	1	6	4390	°C/°F	1 °C/bit	-40 °C
AT1SCRCInG [1]	64830/0xFD3E	1	2	5	4360	°C/°F	0.03125 °C/bit	-273 °C
AT1SCRCOuG [1]	64830/0xFD3E	4	2	5	4363	°C/°F	0.03125 °C/bit	-273 °C
AT1ExhFlu DT [1]	64833/0xFD41	3	1	6	4337	°C/°F	1 °C/bit	-40 °C
Long-term Fuel Trim[1]	64841/0xFD49	1	2	6	4237	%	0.1 %/bit	-100 %
Short-term Fuel Trim[1]	64841/0xFD49	3	2	6	4236	%	0.1 %/bit	-100 %
Exhaust Gas Oxygen Sensor Status[1]	64841/0xFD49	5.1	4 bits	6	4240	bit	16 states/4 bit	0
AT1ExhAvrCons[1]	64878/0xFD6E	1	2	6	3826	l/h	0.05 l/h per bit	0
EngOperatingState [1]	64914/0xFD92	1.1	4 bits	3	3543	0..15	16 states/4 bit	0
Engine Derate Request[1]	64914/0xFD92	8	1	3	3644	%	0.4 %/bit	0
EngineAT1RegenerationStatus, MLogic[1]	64929/0xFDA1	7.5	2 bits	6	3483	0..3	4 states/2 bit	0
DPF OUTL T [1]	64947/0xFDB3	3	2	6	3246	°C/°F	0.03125 °C/bit	-273 °C
EIC Air filter diff. pressure	64976/0xFDD0	1	1	6	2809	bar/psi	0.05 kPa	0
EIC Intake manifold #1 absolute pressure	64976/0xFDD0	5	1	6	3563	bar/ psi	2 kPa/bit	
Sp.Humidity [1]	64992/0xFDE0	3	2	6	4490	g/kg	0.01 g/kg per bit	0
EIC Exhaust gas temp. R manifold	65031/0xFE07	1	2	6	2433	°C/°F	0.03125 ºC/bit	-273 °C
EIC Exhaust gas temp. L manifold	65031/0xFE07	3	2	6	2434	°C/°F	0.03125 ºC/bit	-273 °C
DEF LEVEL [1]	65110/0xFE56	1	1	6	1761	%	0.4 %/bit	0
AT1ExhFluTank deg[1]	65110/0xFE56	2	1	6	3031	°C/°F	1 °C/bit	-40 °C
bScrOprInducementActive Lamp, MLogic[1]	65110/0xFE56	5.6	3 bits	6	5245	0 to 7	8 states/3 bit	0
SCR IND. SEV. [1]	65110/0xFE56	6.6	3 bits	6	5246	0 to 7	8 states/3 bit	0
No view, for Coolant water regulation[1]	65129/0xFE69	3	2	6	1637	°C/°F	0.03125 °C/bit	-273 °C
EIC Fuel supply pump inlet pressure	65130/0xFE6A	2	1	6	1381	bar/psi	2 kPa/bit	0
EIC Fuel filter (ss) diff. pressure	65130/0xFE6A	3	1	6	1382	bar/psi	2 kPa/bit	0
Engine Desired Ignition Timing[1]	65159/0xFE87	1	2	7	1433	deg	1/128 deg/bit	-200 deg
Engine Actual Ignition Timing[1]	65159/0xFE87	7	2	7	1436	deg	1/128 deg/bit	-200 deg

Text	PGN	S	L	P	SPN	Unit	J1939-71 scaling	Offset
EngineFuelLeak1, MLogic[1]	65169/0xFE91	1	2	7	1239	bit	00 no leakage detect. 01 leakage detect.	
AuxCool Pr. [1]	65172/0xFE94	1	1	6	1203	kPa	4 kPa/bit gain, 0 kPa offset	
T. Cool Aux [1]	65172/0xFE94	2	1	6	1212	°C/°F	1 °C/bit gain	−40 °C
Tcharger 2 [1]	65179/0xFE9B	2	2	7	1169	RPM	4 RPM/bit gain	0 RPM
Tcharger 3 [1]	65179/0xFE9B	4	2	7	1170	RPM	4 RPM/bit gain	0 RPM
T-ECU [1]	65188/0xFEA4	3	2	6	1136	°C/°F	0.03125 °C/bit gain	−273 °C
Intake Man T2 [1]	65189/0xFEA5	1	1	7	1131	°C/°F	1 °C/bit gain	−40 °C
EIC trip fuel gaseous	65199/0xFEAF	1	4	7	1039	kg	0.5 kg/bit,	0
EIC total fuel used gaseous	65199/0xFEAF	5	4	7	1040	kg	0.5 kg/bit	0
EIC Mean trip fuel consumption	65203/0xFEB3	5	2	7	1029	l/h	0,05 [l/h]/bit	
Est. Fan RPM [1]	65213/0xFEBD	1	1	6	975	%	0.4 %/bit gain	0 %
EIC Nominal Power	65214/0xFEBE	1	2	7	166	kW	0.5 kW/bit	
Diagnostic message 1/2	65226/0xFECA	-	-	3/6/7	-	-	-	
EIC faults	65230/0xFECE	1	1	6	1218	-	1/bit	0
Number of Software Identification Fields[1]	65242/0xFEDA	1	1	6	965	step	1 count/bit	0
Software Identification[1]	65242/0xFEDA	2	Variable	6	234	SCII	ASCII	0
Tcharger 1 [1]	65245/0xFEDD	2	2	6	103	RPM	4 RPM/bit gain	0 RPM
Nom. Friction [1]	65247/0xFEDF	1	1	6	514	%	1 %/bit gain	-125 %
Desired [1]	65247/0xFEDF	2	2	6	515	RPM	0.125 RPM/bit gain	0 RPM
EngineWaitToStart, MLogic[1]	65252/0xFEE4	4.1	2 bits	6	1081	bit	00 off 01 on	
EngineProtectSysShutdown, MLogic[1]	65252/0xFEE4	5.1	2 bits	6	1110	bit	00 yes 01 no	
EngineProtectSysApproShutdown, MLogic[1]	65252/0xFEE4	5.3	2	6	1109	bit	00 not approaching 01 approaching	
EngineAlarmAcknowledge, MLogic[1]	65252/0xFEE4	7.1	2 bits	6	2815	0..3	4 states/2 bit	0
EngineAirShutoffCommandStatus, MLogic[1]	65252/0xFEE4	7.5	2 bits	6	2813	0..3	4 states/2 bit	0
EngineOverspeedTest, MLogic[1]	65252/0xFEE4	7.7	2 bits	6	2812	0..3	4 states/2 bit	0
EngineShutoffStatus, MLogic[1]	65252/0xFEE4	8.3	2 bits	6	5404	0..3	4 states/2 bit	0

Text	PGN	S	L	P	SPN	Unit	J1939-71 scaling	Offset
EIC engine hours	65253/0xFEE5	1	4	3/6	247	h	0.05 hrs/bit, max: 32767 hrs	0
EIC engine trip fuel	65257/0xFEE9	1	4	6	182	L	0.5 L/bit	0
EIC engine total fuel used	65257/0xFEE9	5	4	6	250	L	0.5 L/bit	0
EIC coolant temp.	65262/0xFEEE	1	1	3/6	110	°C/°F	1 °C/bit	-40 °C
EIC fuel temp.	65262/0xFEEE	2	1	3/6	174	°C/°F	1 °C/bit	-40 °C
EIC oil temp.	65262/0xFEEE	3	2	3/6	175	°C/°F	0.03125 °C/bit	-273 °C
EIC turbo oil temp.	65262/0xFEEE	5	2	3/6	176	°C/°F	0.03125 °C/bit	-273 °C
EIC Intercooler temperature	65262/0xFEEE	7	1	3/6	52	°C/°F	1 °C/bit	-40 °C
EIC fuel del. press.	65263/0xFEEF	1	1	6	94	bar/ psi	4 kPa/bit,	0
EIC oil level	65263/0xFEEF	3	1	6	98	%	0.4 %/bit	0
EIC oil pressure	65263/0xFEEF	4	1	6	100	bar/ psi	4 kPa/bit	0
EIC crankcase press.	65263/0xFEEF	5	2	6	101	bar/ psi	1/128 kPa/bit,	-250 kPa
EIC coolant pressure	65263/0xFEEF	7	1	6	109	bar/ psi	2 kPa/bit,	0
EIC coolant level	65263/0xFEEF	8	1	6	111	%	0.4 %/bit	0
EIC fuel rate	65266/0xFEF2	1	2	6	183	l/h	0.05 l/h per bit	0
EIC atmospheric press.	65269/0xFEF5	1	1	6	108	bar/ psi	0.5 kPa/bit	0
EIC ambient air temp.	65269/0xFEF5	4	2	6	171	°C/°F	0.03125 °C/bit	-273 °C
EIC air inlet temp.	65269/0xFEF5	6	1	6	172	°C/°F	1 °C/bit	-40 °C
EIC particulate trap inlet	65270/0xFEF6	1	1	6	81	bar/ psi	0.5 kPa/bit	0
EIC intake manifold #1 P. (EIC boost P)	65270/0xFEF6	2	1	6	102	bar/ psi	2 kPa/bit	0
EIC intake manifold 1 temp. (EIC charge air temp)	65270/0xFEF6	3	1	6	105	°C/°F	1 °C/bit	-40 °C
EIC air inlet pressure	65270/0xFEF6	4	1	6	106	bar/ psi	2 kPa/bit	0
EIC air filter diff.	65270/0xFEF6	5	1	6	107	bar/ psi	0.05 kPa/bit	0
EIC exhaust gas temp.	65270/0xFEF6	6	2	6	173	°C/°F	0.03125 °C/bit	-273 °C
EIC coolant filter diff.	65270/0xFEF6	8	1	6	112	bar/ psi	0.5 kPa/bit	0
EIC key switch battery potential	65271/0xFEF7	7	2	6	158	V DC	0.05 V DC/bit	0

Text	PGN	S	L	P	SPN	Unit	J1939-71 scaling	Offset
EIC Fuel filter diff. pressure	65276/0xFEFC	3	1	3/6	95	bar/psi	2 kPa/bit	0
EIC oil filter diff. press.	65276/0xFEFC	4	1	3 /6	99	bar/ psi	0.5 kPa/bit	0
EIC water in. fuel	65279/0xFEFF	1	2	6	97	-	00: No, 01: Yes, 10: Error, 11: Not available	
ENG CAC T	64617/0xFC69	7	2	6	2630	°C/°F	0.03125 °C/bit	-273 °C
DPF Soot Load	64891/0xFD7B	1	1	6	3719	%	1 %/bit	0

Note 1: Not supported by option H7.

More information
See **Modbus analogue values** for Modbus scaling.

Error messages

The following error messages can occur:

Message	Description
Engine I. value N.A.	The view is not selectable for the present engine type.
Value selected error	The value cannot be read due to sensor error, sub-system or module error.
N.A.	The value is not supported by the engine, or due to communication error.

2.1.8 J1939/75

When an engine protocol is selected in parameter 7561 and parameter 15021 is *JCB Livelink*, the AGC sends J1939/75 data. Other systems (including JCB LiveLink) can use this data.

Standard data over J1939/75

The AGC sends the following standard J1939/75 data. The scaling, units, start bit, length, offset, minimum, maximum, and update rate follow the standard.

PGN	SPN	Instrument	Notes
0xFE06	0x988	Generator Average Line Line AC RMS Voltage	The AGC sends the standard shutdown high, shutdown low, warning high and warning low.
0xFE06	0x98C	Generator Average Line Neutral AC RMS Voltage	The AGC sends the standard shutdown high, shutdown low, warning high and warning low.
0xFE06	0x984	Generator Average AC Frequency	The AGC sends the standard shutdown high, shutdown low, warning high and warning low.
0xFE06	0x990	Generator Average AC RMS Current	The AGC sends the standard shutdown high and warning high.
0xFE03	0x989	Generator Phase A Line Line AC RMS Voltage	
0xFE03	0x98D	Generator Phase A Line Neutral AC RMS Voltage	
0xFE03	0x985	Generator Phase A AC Frequency	
0xFE03	0x991	Generator Phase A AC RMS Current	
0xFE02	0x995	Generator Phase A Real Power	

PGN	SPN	Instrument	Notes
0xFE02	0x99D	Generator Phase A Apparent Power	
0xFE01	0x999	Generator Phase A Reactive Power	
0xFE00	0x98A	Generator Phase B Line Line AC RMS Voltage	
0xFE00	0x98E	Generator Phase B Line Neutral AC RMS Voltage	
0xFE00	0x986	Generator Phase B AC Frequency	
0xFE00	0x992	Generator Phase B AC RMS Current	
0xFDFF	0x996	Generator Phase B Real Power	
0xFDFF	0x99E	Generator Phase B Apparent Power	
0xFDFE	0x99A	Generator Phase B Reactive Power	
0xFDFD	0x98B	Generator Phase C Line Line AC RMS Voltage	
0xFDFD	0x98F	Generator Phase C Line Neutral AC RMS Voltage	
0xFDFD	0x987	Generator Phase C AC Frequency	
0xFDFD	0x993	Generator Phase C AC RMS Current	
0xFDFC	0x997	Generator Phase C Real Power	
0xFDFC	0x99F	Generator Phase C Apparent Power	
0xFDFB	0x99B	Generator Phase C Reactive Power	
0xFDFA	0x9A4	Generator Accumulated Energy Export (kWh)	
0xFD8E	0xE09	Generator Accumulated Energy Export (kVArh)	
0xFE05	0x994	Generator Total Real Power	
0xFE05	0x99C	Generator Total Apparent Power	
0xFE04	0x998	Generator Total Reactive Power	
0xFE04	0x9A0	Generator Overall Power Factor	
0xFE04	0x9D6	Generator Overall Power Factor Lagging	
0xF004	0xBE	ENGINE_SPEED	The AGC sends the standard shutdown high, shutdown low, warning high and warning low.
0xFEEF	0x64	Oil Pressure	The AGC sends the standard shutdown high, shutdown low, warning high, warning low and fault sensor.
0xFEEE	0x6E	COOLANT_T	The AGC sends the standard shutdown high, shutdown low, warning high, warning low and fault sensor.
0xFEFC	0x60	Fuel Level 1	The AGC sends the standard shutdown high, shutdown low, warning high and warning low.
0xFEF7	0x9E	Charge Alternator System Potential	The AGC **does not** send the standard shutdown low and warning low.
0xFEF7	0xA8	Battery Potential	The AGC sends the standard shutdown high, shutdown low, warning high and warning low.
0xFD92	0xE17	Emergency Shutdown Indication	
0xFEE5	0xF0	ENGINE_HOURS	
0xFEBE	0xE57	CRANK_ATTEMPTS	
0xFEFC	0x26	Fuel Level 2	

INFO
If you need the AGC to send additional J1939/75 data, please contact DEIF.

AGC multi-input data over J1939/75

The AGC can send these measurement inputs as DM1s (the parameter to select the AGC input is in brackets):

- Fuel 1 (tank level) (*Livelink Fuel 1*, 15022)
- Fuel 2 (tank level) (*Livelink Fuel 2*, 15023)
- Oil pressure (*Livelink Oil press*, 15024)
- Coolant temperature (*Livelink Coolant*, 15025)

2.1.9 Modbus alarms

Alarm, status and measurement table (read only) function code 04h.

Addr.	Content	Bit	Type
1020	EIC alarms, DEIF controller	0	7570 EIC communication error
		1	7580 EIC warning
		2	7590 EIC shutdown
		3	7600 EIC overspeed
		4	7610 EIC coolant water temperature 1
		5	7620 EIC coolant water temperature 2
		6	7630 EIC oil pressure 1
		7	7640 EIC oil pressure 2
		8	7650 EIC oil temp. 1
		9	7660 EIC oil temp. 2
		10	7670 EIC coolant level 1
		11	7680 EIC coolant level 2
1024	EIC alarms, engine controller (DM1)	0	EIC communication error
		1	EIC yellow
		2	EIC red
		3	EIC protection
		4	EIC malfunction

2.1.10 Modbus analogue values

The reading of values is independent of the engine type. All the readings below are available in the Modbus protocol.

The data available depends on the specific engine. Refer to the engine manual.

These data refer to the common J1939 display reading list.

Measurement table (read only) function code 04h

Addr	Content	Unit	Scaling	SPN	Description
593	EIC speed	RPM	1/1	190	Speed
594	EIC coolant temp.	°C/°F	1/10	110	Coolant temperature
595	EIC oil pressure	bar/psi	1/100	100	Engine oil pressure
596	EIC no of faults	-	1/1	1218	Number of faults
597	EIC oil temp.	°C/°F	1/10	175	Engine oil temperature

Addr	Content	Unit	Scaling	SPN	Description
598	EIC fuel temp.	°C/°F	1/1	174	Fuel temperature
599	EIC intake manifold #1 P	bar/psi	1/100	102	Intake manifold #1 P
600	EIC air inlet temp.	°C/°F	1/1	172	Air inlet temperature
601	EIC coolant level	%	1/10	111	Coolant level
602	EIC fuel rate	L/h	1/10	183	Fuel rate
604	EIC intake manifold 1 T (or EIC charge air T)	°C/°F	1/1	105	Intake manifold 1 temperature
605	EIC d.d. % torque	%	1/1	512	Driver’s demand engine - percent torque
606	EIC actual % torque	%	1/1	513	Actual engine - percent torque
607	EIC acc. pedal pos.	%	1/1	91	Accelerator pedal position
608	EIC % load, c. speed	%	1/1	92	Percent load at current speed
609	EIC air inlet pressure	bar/psi	1/100	106	Air inlet pressure
610	EIC exhaust gas temp.	°C/°F	1/10	173	Exhaust gas temperature
611	EIC engine hours	h	1/1	247	ENGINE HOURS
612	EIC oil filter diff. press.	bar/psi	1/100	99	Oil filter diff press
613	EIC battery voltage	V	1/10	158	Keyswitch battery potential
614	EIC fuel del. press.	bar/psi	1/100	94	Fuel delivery pressure
615	EIC oil level	%	1/10	98	Engine oil level
616	EIC crankcase press.	bar/psi	1/100	101	Crankcase pressure
617	EIC coolant pressure	bar/psi	1/100	109	Coolant pressure
618	EIC water in fuel	2 bits	1/1	97	Water in fuel (1 = Yes, 0 =NO)
619	Reserved	-	-	-	-
620	Reserved	-	-	-	-
621	Reserved	-	-	-	-
622	Reserved	-	-	-	-
623	EIC turbo oil temp.	°C/°F	1/10	176	Turbo oil temp.
624	EIC trap inlet	bar/psi	1/100	81	Trap inlet
625	EIC Air filter diff press	bar/psi	1/1000	107	Air filter diff press
626	EIC Cool filter diff press	bar/psi	1/100	112	Cool filter diff press
627	EIC Atm press	bar/psi	1/100	108	Atmospheric pressure
628	EIC Ambient air temp	°C/°F	1/10	171	Ambient air temp [F/10]
629	EIC exch. temp A	°C/°F	1/10	2433	Exhaust Temperature Right
630	EIC exch. temp B	°C/°F	1/10	2434	Exhaust Temperature Left
638	EIC engine trip fuel	L	1/1	182	Engine trip fuel
639	EIC engine total fuel used	kL	1/10	250	Engine total fuel used
640	EIC trip fuel_gaseous	kg	1/1	1039	Trip fuel, gaseous
641	EIC total fuel used_gaseous	ton	1/10	1040	Total fuel used, gaseous
850[1]	AT2ExhFluDRQ	g/h	1/10	4401	Aftertreatment 2 Diesel Exhaust Fluid Dosing Requested Quantity
851[1]	AT2SCRCInG	°C/°F	1/10	4413	Aftertreatment 2 SCR Catalyst Intake Gas Temperature

Addr	Content	Unit	Scaling	SPN	Description
852[1]	AT2SCRCOuG	°C/°F	1/10	4415	Aftertreatment 2 SCR Catalyst Outlet Gas Temperature
853	EIC Engine Oil-Filter Outlet Pressure	bar/psi	1/100	3549	Engine Oil-Filter Outlet Pressure
854[1]	EngOperatingState	-	1/1	3543	Engine Operating State
855	EIC SA of Controlling Device	-	1/1	1483	Source Address of Controlling Device
856	EIC Engine Rated Speed	RPM	1/1	199	Engine Rated Speed
857	EIC Engine Speed At Idle, Point 1	RPM	1/1	188	BAM message: Engine Speed At Idle, Point 1 (Engine Configuration)
858	EIC Engine Controller 5	-	1/1	-	MTU only: Engine Controller 5
859	EIC Fuel Consumption	g/kWh	1/1	-	MTU only: Fuel Consumption
860	EIC UREA Level	%	1/10	-	Urea level
861[1]	SCR IND. SEV	-	1/1	5246	Severity status of the operator inducement system
862[1]	DPF OUTL T	°C/°F	1/10	3246	Temperature of engine combustion byproducts leaving the diesel particulate filter exhaust in exhaust bank 1.
863	Next Regen	h	1/10	5978	Time to activate next regeneration for diesel particulate filter
864	ENG CAC T	°C/°F	1/10	2630	Temperature of combustion air after it exits from the Charge Air Cooler 1 but before any mixing of recirculated exhaust gas.
865	DPF Soot Load	%	1/1	3719	Aftertreatment 1 Diesel Particulate Filter Soot Load Percent
901	EIC nominal power	kWm	1/1	166	Nominal power of the engine
902	EIC trip fuel liquid	L	1/2	182	High word
903	EIC trip fuel liquid	L	1/2	182	Low word
904	EIC total fuel liquid	L	1/2	250	High word
905	EIC total fuel liquid	L	1/2	250	Low word
911	Int Man abs	bar/psi	1/100	3563	Engine intake manifold #1 Absolute pressure
912	EIC Air filter diff. pressure	bar/psi	1/100	2809	Change in engine air system pressure
913	EIC Fuel supply pump inlet pressure	bar/psi	1/100	1381	Absolute pressure of fuel at the fuel supply pump intake
914	EIC Fuel filter (suction side) diff. pressure	bar/psi	1/100	95	Differential pressure measured across the fuel filter between the fuel tank and the supply pump
915	EIC Fuel filter diff. pressure	bar/psi	1/100	1382	Diff pressure
939[1]	T-ECU	°C/°F	1/10	1136	ECU temperature
971[1]	T. Cool Aux	°C/°F	1/1	1212	Coolant temperature of intercooler which is located after the turbocharger
974	EIC Engine Auxiliary Coolant Pressure	bar/psi	1/100	1203	Engine Auxiliary Coolant Pressure
975[1]	Sp.Humidity	g/kg	1/10	4490	Ambient Conditions 2 Specific Humidity
976[1]	Tcharger 2	RPM	1/1	1169	Engine Turbocharger 2 Speed
977[1]	Tcharger 3	RPM	1/1	1170	Engine Turbocharger 3 Speed
978	EIC Trip Engine Running Time	h	1/1	1036	Trip Engine Running Time

Addr	Content	Unit	Scaling	SPN	Description
979	EIC Trip Idle Time	h	1/1	1037	Trip Idle Time
980	EIC Estimated Percent Fan Speed	%	1/10	975	Estimated Percent Fan Speed
981[1]	Tcharger 1	RPM	1/1	103	Engine Turbocharger 1 Speed
982	EIC Nominal Friction - Percent Torque	%	1/1	514	Nominal Friction - Percent Torque
983	EIC Engine's Desired Operating Speed	RPM	1/1	515	Engine's Desired Operating Speed
984	EIC Engine Intake Manifold 2 Temperature	°C/°F	1/1	1131	Engine Intake Manifold 2 Temperature
985[1]	EIC DEF LEVEL	%	1/10	1761	Aftertreatment 1 Diesel Exhaust Fluid Tank Level
986[1]	EIC DEF temperature	°C/°F	1/1	3031	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature
987[1]	AT1IntTNOx	ppm	1/10	3216	Aftertreatment 1 Intake NOx
988[1]	AT1OutLNOx	ppm	1/10	3226	Aftertreatment 1 Outlet NOx
989[1]	AT1ExhFA.DQ	g/h	1/10	4331	Aftertreatment 1 Diesel Exhaust Fluid Actual Dosing Quantity
990[1]	AT1ExhFluDAB	bar/psi	1/100	4334	Aftertreatment 1 Diesel Exhaust Fluid Dosing Absolute Pressure
991[1]	AT1ExhFlu DT	°C/°F	1/1	4337	Aftertreatment 1 SCR Dosing Air Assist Valve
992[1]	AT1ExhFlu DT	g/h	1/1	4348	Aftertreatment 1 Diesel Exhaust Fluid Dosing Requested Quantity
993[1]	AT1SCRCInG	°C/°F	1/10	4360	Aftertreatment 1 SCR Catalyst Intake Gas Temperature
994[1]	AT1SCRCOuG	°C/°F	1/10	4363	Aftertreatment 1 SCR Catalyst Outlet Gas Temperature
995[1]	AT2IntTNOx	ppm	1/10	3255	Aftertreatment 2 Intake NOx
996[1]	AT2OutLNOx	ppm	1/10	3265	Aftertreatment 2 Outlet NOx
997[1]	AT2ExhFA.DQ	g/h	1/10	4384	Aftertreatment 2 Diesel Exhaust Fluid Actual Dosing Quantity
998[1]	AT2ExhFluDAB	bar/psi	1/100	4387	Aftertreatment 2 Diesel Exhaust Fluid Dosing Absolute Pressure
999[1]	AT2ExhFlu DT	°C/°F	1/1	4390	Aftertreatment 2 SCR Dosing Air Assist Valve
1819[1]	Intake Man T2	°C/°F	1/1	1131	Temperature of pre-combustion air found in intake manifold of engine air supply system

INFO
Addresses marked [1] are not supported for option H7.

2.2 Troubleshooting

2.2.1 Diagnostic codes

The J1929 diagnostic codes can be read using Modbus, function code 04. For more information, see the AGC-4 **Modbus tables**.

An alarm diagnostic code is a combination of 3 values:

1. **SPN** = Suspect Parameter Number: The value that the alarm is based on. Since SPN numbers can be quite big, the SPN number is read with a combination of Low [LO] word and High [HI] word in the Modbus lists.
2. **FMI** = Failure Mode Indicator: The alarm severity.
3. **OC** = Occurrence Counter: How many times the alarm has occurred.

High coolant temperature shutdown example

SPN code is **110**: The coolant temperature.
FMI code is **0**: The most severe high level alarm (shutdown).
OC code is **2**: The second time the alarm appears.

The diagnostic codes can also be seen in the DU-2 display. Press the LOG button for 3 seconds to see the diagnostic codes.

To interpret an SPN and/or FMI number, see the documentation of the engine manufacturer.

The tables below show the combination of SPN, FMI and OC codes for each alarm.

There are 10 alarm combinations for active alarms (DM1) and 10 for historical alarms (DM2).

The lists are *first-in-first-out*. This means that alarm 1 is always the latest alarm. When a new alarm appears, alarm 10 is pushed off of the list. The previous alarm 9 is now alarm 10, and so on.

Active Alarms (DM1)

Alarm	Modbus addresses			
	SPN (Suspect Parameter Number)		FMI (Failure Mode Identifier)	OC (Occurrence Counter)
	LO word	HI word		
1	1370	1380	1402	1418
2	1371	1381	1403	1419
3	1372	1382	1404	1420
4	1373	1383	1405	1421
5	1374	1384	1406	1422
6	1375	1385	1407	1423
7	1376	1386	1408	1424
8	1377	1387	1409	1425
9	1378	1388	1410	1426
10	1379	1389	1411	1427

Historical Alarms (DM2)

Alarm	Modbus addresses			
	SPN (Suspect Parameter Number)		FMI (Failure Mode Identifier)	OC (Occurrence Counter)
	LO word	HI word		
1	1434	1444	1466	1482
2	1435	1445	1467	1483
3	1436	1446	1468	1484
4	1437	1447	1469	1485
5	1438	1448	1470	1486
6	1439	1449	1471	1487
7	1440	1450	1472	1488
8	1441	1451	1473	1489

Alarm	Modbus addresses			
	SPN (Suspect Parameter Number)		FMI (Failure Mode Identifier)	OC (Occurrence Counter)
	LO word	HI word		
9	1442	1452	1474	1490
10	1443	1453	1475	1491

2.2.2 Troubleshooting the CAN bus connection

Troubleshooting the CAN bus connection is not normally necessary. When you connect the AGC CAN bus terminals to an ECU that follows the J1939 standard, communication starts without needing any other actions.

If required, you can use a CAN bus sniffer with CAN PC software to verify the communication between the ECU and the AGC. The CAN bus sniffer must be connected to the CAN bus wiring. Refer to the CAN bus sniffer and CAN PC software documentation for more information.

As an example, see the following telegram:

0xCF00400 FF 7D 7D E0 15 FF F0 FF

DATA BYTE: 1 2 3 4 5 6 7 8

- 0xC is the priority (12)
- F004 is the PGN number (61444)
- The 8 bytes following the CAN ID (**0xCF00400**) are data, starting with byte 1

The priority bits need to be converted to decimal, then divided by 4 to calculate the priority.

0xC = 12 => Priority 3

INFO
The 3 priority bits here are in the CAN ID (that is, 0x**C**F00400, instead of 0x**0C**F00400). Another example: 0x18FEF200 (PGN 65266).

Priority	Decimal ID	Hexadecimal ID
1	4	0x4
2	8	0x8
3	12	0xC
4	16	0x10
5	20	0x14
6	24	0x18
7	28	0x1C

In SAE J1939, normally only priority 3 and 6 are used.

Hereafter the data can be read (PGN 61444):

0xCF00400 xD FF 7D 7D E0 15 FF F0 FF

	Byte	Value	Note
Engine torque	1	0xFF	Not available
Driver demand torque	2	0x7D	
Actual engine torque	3	0x7D	
Engine speed	4	0xE0	
Engine speed	5	0x15	
Source address	6	0xFF	Not available
Engine starter mode	7	0xF0	
Engine Demand	8	0xFF	Not available

Calculation example: RPM resolution is 0.125 RPM/bit, offset 0.

The result is then 0x15E0 (5600)*0.125 = 700 RPM.

3. Specific engine types

3.1 Caterpillar/Perkins

3.1.1 Basic information

Caterpillar

Engine manufacturer: Caterpillar
Controller types: ADEM III and A4
Engine types: C4.4, C6.6, C9, C15, C18, C32, 3500, 3600
DEIF Utility software parameter 7561: Select **Caterpillar**.

Perkins

Engine manufacturer: Perkins
Controller types: ADEM III and A4
Engine types: Series 850, 1100, 1200, 1300, 2300, 2500 and 2800
DEIF Utility software parameter 7561: Select **Perkins**.

General

Communication based on: J1939
Supported options: H5, H7, H12
AGC can write commands: Yes
Baud rate: 250 kb/s
DM1se: The secondary DM1 logs shows alarms from the EMCP 3.x genset controller.
EIC RelativeHumidity alarm (menu 15060): You can configure a relative humidity alarm (range -100 to 100 %, default is 50 %), with a delay of 0 to 100 s (default is 5 s).
Other: The AGC sends a "heartbeat" telegram (broadcast PGN 61688 globally (255)) every second. This prevents a communication warning from the ECU.

3.1.2 Warnings and shutdowns

These standard warnings and shutdowns are supported:

- EIC yellow lamp
- EIC red lamp
- EIC malfunction
- EIC protection

In addition, these warnings and shutdowns are supported:

Warning and shutdown list	J1939 codes		
	SPN	FMI warning	FMI shutdown
Low oil pressure	100	17	1
Intake manifold #1 P	102	15	-
Coolant temperature	110	15	1
High inlet air temp.	172	15	-
Fuel temperature	174	15	-
Overspeed	190	15	0

Note: If FMI is "-" the alarm is not supported.

3.1.3 Display texts

J1939 name	Display text
Engine Exhaust Gas Port 1 Temperature	Exh.P T01
Engine Exhaust Gas Port 2 Temperature	Exh.P T02
Engine Exhaust Gas Port 3 Temperature	Exh.P T03
Engine Exhaust Gas Port 4 Temperature	Exh.P T04
Engine Exhaust Gas Port 5 Temperature	Exh.P T05
Engine Exhaust Gas Port 6 Temperature	Exh.P T06
Engine Exhaust Gas Port 7 Temperature	Exh.P T07
Engine Exhaust Gas Port 8 Temperature	Exh.P T08
Engine Exhaust Gas Port 9 Temperature	Exh.P T09
Engine Exhaust Gas Port 10 Temperature	Exh.P T10
Engine Exhaust Gas Port 11 Temperature	Exh.P T11
Engine Exhaust Gas Port 12 Temperature	Exh.P T12
Engine Exhaust Gas Port 13 Temperature	Exh.P T13
Engine Exhaust Gas Port 14 Temperature	Exh.P T14
Engine Exhaust Gas Port 15 Temperature	Exh.P T15
Engine Exhaust Gas Port 16 Temperature	Exh.P T16
Engine Coolant Temperature 2	T. Coolant2
Engine Coolant Temperature 3	T. Coolant3
Engine Coolant Pump Outlet Temperature	T. Cool PO
Engine Filtered Fuel Delivery Pressure	P. FilFuel
Engine Auxiliary Coolant Temperature	T. Cool Aux
Engine Turbocharger 1 Turbine Intake Temperature	Turb.int1
Engine Turbocharger 2 Turbine Intake Temperature	Turb.int2

3.1.4 Write commands

Use parameter 7563 (EIC Controls) to enable write commands.

Caterpillar/Perkins write commands

Command	Description
Speed control	In general, this is the same as the J1939 command. However, the CAN bus ID for speed control is 0xC000000. J1939 TSC1 (transmission rate is 20 ms).
Idle speed	See the J1939 command.
Start/Stop	See the J1939 command.
EIC start/stop enable	See the J1939 command.

3.1.5 J1939 measurements

You can configure the view lines on the display unit to show these values.

For Modbus scaling, see the J1939 Modbus analogue values.

PGN:	Parameter group number
P:	J1939 priority
S:	Object's start byte in CAN telegram
L:	Object's length (bytes)
Unit:	Unit in display (bar/°C can be changed to psi/°F)

Caterpillar/Perkins measurements

Object	PGN	P	S	L	SPN	Unit	J1939-71 scaling	Offset
EIC Coolant Temp 2[1]	64870	6	1	1	4076	°C/°F	1 °C/bit	-40 °C
EIC Coolant Temp 3[1]	64870	6	8	1	6209	°C/°F	1 °C/bit	-40 °C
EIC Coolant Pump Outlet Temp[1]	64870	6	2	1	4193	°C/°F	1 °C/bit	-40 °C
EIC Filtered Fuel Delivery Pressure[1]	64735	6	2	1	5579	kPa	4 kPa/bit	0
EIC Auxiliary Coolant Temp[1]	65172	6	2	1	1212	kPa	4 kPa/bit	0
EIC Turbo 1 Intake Temp[1]	65176	6	1	2	1180	°C/°F	0.03125 °C/bit	-273 °C
EIC Turbo 2 Intake Temp[1]	65176	6	3	2	1181	°C/°F	0.03125 °C/bit	-273 °C
EIC Exhaust Gas P1 Temp[2]	65187	7	1	2	1137	°C/°F	0.03125 °C/bit	-273 °C
EIC Exhaust Gas P2 Temp[2]	65187	7	3	2	1138	°C/°F	0.03125 °C/bit	-273 °C
EIC Exhaust Gas P3 Temp[2]	65187	7	5	2	1139	°C/°F	0.03125 °C/bit	-273 °C
EIC Exhaust Gas P4 Temp[2]	65187	7	7	2	1140	°C/°F	0.03125 °C/bit	-273 °C
EIC Exhaust Gas P5 Temp[2]	65186	7	1	2	1141	°C/°F	0.03125 °C/bit	-273 °C
EIC Exhaust Gas P6 Temp[2]	65186	7	3	2	1142	°C/°F	0.03125 °C/bit	-273 °C
EIC Exhaust Gas P7 Temp[2]	65186	7	5	2	1143	°C/°F	0.03125 °C/bit	-273 °C
EIC Exhaust Gas P8 Temp[2]	65186	7	7	2	1144	°C/°F	0.03125 °C/bit	-273 °C
EIC Exhaust Gas P9 Temp[2]	65185	7	1	2	1145	°C/°F	0.03125 °C/bit	-273 °C
EIC Exhaust Gas P10 Temp[2]	65185	7	3	2	1146	°C/°F	0.03125 °C/bit	-273 °C
EIC Exhaust Gas P11 Temp[2]	65185	7	5	2	1147	°C/°F	0.03125 °C/bit	-273 °C
EIC Exhaust Gas P12 Temp[2]	65185	7	7	2	1148	°C/°F	0.03125 °C/bit	-273 °C
EIC Exhaust Gas P13 Temp[2]	65184	7	1	2	1149	°C/°F	0.03125 °C/bit	-273 °C
EIC Exhaust Gas P14 Temp[2]	65184	7	3	2	1150	°C/°F	0.03125 °C/bit	-273 °C
EIC Exhaust Gas P15 Temp[2]	65184	7	5	2	1151	°C/°F	0.03125 °C/bit	-273 °C
EIC Exhaust Gas P16 Temp[2]	65184	7	7	2	1152	°C/°F	0.03125 °C/bit	-273 °C

Note 1: Fixed to source address 0.

Note 2: Fixed to source address 241.

3.1.6 Modbus analogue values

Table 3.1 Measurement table (read only) function code 04h

Addr	Content	Unit	J 1939 scaling	Description
947	EIC Exhaust Gas P1 Temp	°C/°F	1/10	
948	EIC Exhaust Gas P2 Temp	°C/°F	1/10	

Addr	Content	Unit	J 1939 scaling	Description
949	EIC Exhaust Gas P3 Temp	°C/°F	1/10	
950	EIC Exhaust Gas P4 Temp	°C/°F	1/10	
951	EIC Exhaust Gas P5 Temp	°C/°F	1/10	
952	EIC Exhaust Gas P6 Temp	°C/°F	1/10	
953	EIC Exhaust Gas P7 Temp	°C/°F	1/10	
954	EIC Exhaust Gas P8 Temp	°C/°F	1/10	
955	EIC Exhaust Gas P9 Temp	°C/°F	1/10	
956	EIC Exhaust Gas P10 Temp	°C/°F	1/10	
957	EIC Exhaust Gas P11 Temp	°C/°F	1/10	
958	EIC Exhaust Gas P12 Temp	°C/°F	1/10	
959	EIC Exhaust Gas P13 Temp	°C/°F	1/10	
960	EIC Exhaust Gas P14 Temp	°C/°F	1/10	
961	EIC Exhaust Gas P15 Temp	°C/°F	1/10	
962	EIC Exhaust Gas P16 Temp	°C/°F	1/10	
967	EIC Filtered Fuel DeliveryPress	bar/psi	1/100	
968	EIC Coolant Temp 2	°C/°F	1/1	
969	EIC Coolant Temp 3	°C/°F	1/1	
970	EIC Coolant Pump Outlet Temp	°C/°F	1/1	
971	EIC Auxiliary Coolant Temp	°C/°F	1/1	
972	EIC Turbo 1 Intake Temp	°C/°F	1/10	
973	EIC Turbo 2 Intake Temp	°C/°F	1/10	

3.1.7 Modbus alarms

Alarm, status and measurement table (read only) function code 04h.

Addr.	Content	Bit	Type
1020	EIC alarms, DEIF controller	0	7570 EIC communication error
		1	7580 EIC warning
		2	7590 EIC shutdown
		3	7600 EIC overspeed
		4	7610 EIC coolant water temperature 1
		5	7620 EIC coolant water temperature 2
		6	7630 EIC oil pressure 1
		7	7640 EIC oil pressure 2
		8	7650 EIC oil temp. 1
		9	7660 EIC oil temp. 2
		10	7670 EIC coolant level 1
		11	7680 EIC coolant level2

Addr.	Content	Bit	Type
1024	EIC alarms, engine controller (DM1)	1	EIC low oil pressure, warning
		2	EIC low oil pressure, shutdown
		3	EIC boost pressure, warning
		4	EIC high coolant temperature, warning
		5	EIC low coolant level, shutdown
		6	EIC high inlet air temperature, warning
		7	EIC fuel temperature, warning
		8	EIC ECU yellow lamp, warning
		9	EIC ECU red lamp, shutdown
		10	EIC overspeed, warning
		11	EIC overspeed, shutdown
		12	EIC protection
		13	EIC malfunction

3.2 Cummins

3.2.1 Basic information

Engine manufacturer: Cummins
Controller types: CM 500/558/570/850/2150/2250
Engine types: QSL, QSB5, QSX15 and 7, QSM11, QSK 19/23/50/60
DEIF Utility software parameter 7561: Select **Cummins**.
Communication based on: J1939
Supported options: H5, H7, H12
AGC can write commands: Yes
Baud rate: 250 kb/s

INFO
If the AGC must use RS-485 Modbus-based communication with the Cummins engine, select **Option H6**.

3.2.2 Warnings and shutdowns

These standard warnings and shutdowns are supported:

- EIC yellow lamp
- EIC red lamp
- EIC malfunction
- EIC protection

In addition, these warnings and shutdowns are supported:

Warning and shutdown list	J1939 codes		
	SPN	FMI warning	FMI shutdown
Low oil pressure	100	18	1
Coolant temperature	110	16	0
Oil temperature	175	16	0
Intake manifold temp	105	16	0
Fuel temperature	174	16	0
Coolant level low	111	18	1
Overspeed	190	-	16
Crankcase pressure high	101	-	0
Coolant pressure low	109	-	1

Note: If FMI is "-" the alarm is not supported.

3.2.3 Write commands

Use parameter 7563 (EIC Controls) to enable write commands.

Cummins write commands

Command	Description
Speed control	In general, this is the same as the J1939 command. However, the CAN bus ID for speed control (engine with PCC controller): 0x**0FF69DC**. The source address of the AGC is 0xDC (220).

Command	Description
	• If the AGC is replacing a Cummins PCC1301, enable the M-Logic function *EIC Select Cummins PCC1301*. This automatically configures the source address of the AGC as 0xDC (220).
Idle speed	See the J1939 command.
Frequency selection (50 or 60 Hz)	In general, see the J1939 command. In addition, the AGC meets the proprietary requirements for this command.
Governor gain	You can set the ECU governor gain in parameter 2773 (Cummins gain). The AGC sends this value to the ECU.
Droop	Use M-Logic to enable sending a droop set point: *Output, EIC commands, EIC Droop*. When *EIC Droop* is activated, the AGC sends the droop setting in parameter 2771 as the set point for the ECU droop.
Shutdown override	See the J1939 command.

3.2.4 Cummins After Treatment

If Cummins After Treatment equipment is installed in the exhaust line and the system is connected to the ECU, then the AGC can receive the treatment system data. In addition, some regeneration can be controlled.

The table shows lamps and status indicators from the after treatment. This information is available in M-Logic (under *Events, EIC event*) and can be shown on a DEIF AOP-1 or AOP-2 display unit.

Status indicator state	Source	M-Logic event
OFF	Particulate filter lamp	DPF Lamp OFF
OFF	High exhaust system temp.	High Exh Syst Temp OFF (lamp)
ON solid	Particulate filter lamp	DPF Lamp ON (solid)
ON solid	High exhaust system temp.	High Exh Syst Temp ON (lamp)
ON fast blink	Particulate filter lamp	DPF Lamp ON (blink)
Inhibited	Regeneration disabled	DPF Regen inhibited (lamp)
Not inhibited	Regeneration disabled	DPF Regen not inhibited (lamp)
Not Active	Diesel particulate filter regeneration status	DPF Active Regeneration not activated (status)
Active	Diesel particulate filter regeneration status	DPF Active Regeneration activated (status)
Regeneration needed	Diesel particulate filter regeneration status	DPF Active Regeneration needed (status)
Regeneration not needed	Diesel particulate filter status	DPF Regen not needed (status)
Regeneration lowest level	Diesel particulate filter status	DPF Regen needed - lowest level (status)
Regeneration moderate level	Diesel particulate filter status	DPF Regen needed - moderate level (status)
---Regeneration highest level	Diesel particulate filter status	DPF Regen needed - highest level (status)

3.2.5 Modbus alarms

Alarm, status and measurement table (read only) function code 04h.

Addr.	Content	Bit	Type
1020	EIC alarms, DEIF controller	0	7570 EIC communication error
		1	7580 EIC warning
		2	7590 EIC shutdown
		3	7600 EIC overspeed
		4	7610 EIC coolant water temperature 1
		5	7620 EIC coolant water temperature 2
		6	7630 EIC oil pressure 1
		7	7640 EIC oil pressure 2
		8	7650 EIC oil temp. 1
		9	7660 EIC oil temp. 2
		10	7670 EIC coolant level 1
		11	7680 EIC coolant level 2
1023	EIC alarms, engine controller (DM1)	0	EIC yellow
		1	Red
		2	EIC protection
		3	EIC malfunction
1024	EIC alarms, engine controller (DM1)	0	EIC DEC communication error
		1	EIC low oil pressure, warning
		2	EIC low oil pressure, shutdown
		3	EIC high coolant temp, warning
		4	EIC high coolant temperature, shutdown
		5	EIC low coolant level, warning
		6	EIC low coolant level, shutdown
		7	EIC intake manifold temp, warning
		8	EIC intake manifold, shutdown
		9	EIC fuel temp., warning
		10	EIC fuel temp, shutdown
		11	EIC coolant pressure, shutdown
		12	EIC oil temp., warning
		13	EIC oil temp., warning
		14	EIC overspeed shutdown
		15	EIC crankcase press., shutdown

3.3 Detroit Diesel

3.3.1 Basic information

Engine manufacturer: Detroit Diesel
Controller types: DDEC III and IV
Engine types: Series 50, 60 and 2000
DEIF Utility software parameter 7561: Select **DDEC**.
Communication based on: J1939
Supported options: H5, H7, H12
AGC can write commands: Yes
Baud rate: 250 kb/s

3.3.2 Warnings and shutdowns

These standard warnings and shutdowns are supported:

- EIC yellow lamp
- EIC red lamp
- EIC malfunction
- EIC protection

3.3.3 Write commands

Use parameter 7563 (EIC Controls) to enable write commands.

Detroit Diesel DDEC write commands

Command	Description
Speed control	See the J1939 command.
Idle speed	See the J1939 command.

3.3.4 Modbus alarms

Alarm, status and measurement table (read only) function code 04h.

Addr.	Content	Bit	Type
1020	EIC alarms, DEIF controller	0	7570 EIC communication error
		1	7580 EIC warning
		2	7590 EIC shutdown
		3	7600 EIC overspeed
		4	7610 EIC coolant water temperature 1
		5	7620 EIC coolant water temperature 2
		6	7630 EIC oil pressure 1
		7	7640 EIC oil pressure 2
		8	7650 EIC oil temp. 1
		9	7660 EIC oil temp. 2
		10	7670 EIC coolant level 1
		11	7680 EIC coolant level 2

Addr.	Content	Bit	Type
1024	EIC alarms, engine controller (DM1)	0	EIC communication error, warning
		1	EIC warning
		2	EIC shutdown
		3	EIC protection
		4	EIC malfunction

3.4 Deutz

3.4.1 Basic information

Engine manufacturer: Deutz
Controller types: EMR3, EMR 2 (EMR)
Engine types: 912, 913, 914 and L2011
DEIF Utility software parameter 7561: Select **EMR**.
Communication based on: J1939
Supported options: H5, H7, H12
AGC can write commands: Yes
Baud rate: 250 kb/s

3.4.2 Warnings and shutdowns

These standard warnings and shutdowns are supported:

- EIC yellow lamp
- EIC red lamp
- EIC malfunction
- EIC protection

In addition, these warnings and shutdowns are supported:

Warning and shutdown list	J1939 codes		
	SPN	FMI warning	FMI shutdown
Low oil pressure	100	-	1
Coolant temperature	110	-	0
Overspeed	190	-	0

Note: If FMI is "-" the alarm is not supported.

3.4.3 Write commands

Use parameter 7563 (EIC Controls) to enable write commands.

Deutz write commands

Command	Description
Speed control	In general, this is the same as the J1939 command. For J1939 TSC1, the source address of the AGC is **3**.
Idle speed	See the J1939 command.
Stop request	When the AGC-4 wants to stop the engine, it sends this proprietary telegram.

3.4.4 Modbus alarms

Alarm, status and measurement table (read only) function code 04h.

Addr.	Content	Bit	Type
1020	EIC alarms, DEIF controller	0	7570 EIC communication error
		1	7580 EIC warning
		2	7590 EIC shutdown
		3	7600 EIC overspeed
		4	7610 EIC coolant water temperature 1
		5	7620 EIC coolant water temperature 2
		6	7630 EIC oil pressure 1
		7	7640 EIC oil pressure 2
		8	650 EIC oil temp. 1
		9	7660 EIC oil temp. 2
		10	7670 EIC coolant level 1
		11	7680 EIC coolant level 2
1024	EIC alarms, engine controller (DM1)	0	EIC high coolant temperature, shutdown
		1	EIC low oil pressure, shutdown
		2	EIC overspeed, shutdown
		3	EIC EMR shutdown (LS: lamp status)
		4	EIC EMR warning (LS: lamp status)
		5	EIC communication error
		6	EIC protection
		7	EIC malfunction

3.5 Isuzu

3.5.1 Basic information

Engine manufacturer: Isuzu
Controller type: ECM
Engine types: 4JJ1X, 4JJ1T, 6WG1X FT-4
DEIF Utility software parameter 7561: Select **Isuzu**.
Communication based on: J1939
Supported options: H5, H7, H12
AGC can write commands: Yes
Baud rate: 250 kb/s

3.5.2 Warnings and shutdowns

These standard warnings and shutdowns are supported:

- EIC yellow lamp
- EIC red lamp
- EIC malfunction
- EIC protection

3.5.3 Write commands

Use parameter 7563 (EIC Controls) to enable write commands.

Isuzu write commands

Command	Description
Speed control	In general, this is the same as the J1939 command. By default, the governor offset is 50 % of the nominal speed. At 0 % it is -90 RPM, and at 100 % it is +90 RPM.
Idle speed	In general, this is the same as the J1939 command. However, the idle speed is 1000 RPM.
Start/Stop	See the J1939 command.
EIC start/stop enable	See the J1939 command.

3.5.4 Escape mode

Escape mode is a shutdown override. It will keep the engine running for the configured time, even if the DEF (Diesel Exhaust Fluid) level is critically low.

Configure escape mode in menu 15000 *Isuzu ESCmode SD thr*.

Use parameter 15002 to Enable (or Disable) escape mode. Alternatively, activate the M-Logic output *EIC commands, EIC Isuzu Escape mode command*.

Parameter 15001 is the timer for Escape mode. When the timer runs out, the AGC starts the engine stop sequence.

3.5.5 Purge function

The AGC ensures that the purge meets the requirements. That is, during the purge the genset must be running in island mode or the breaker is open, and the engine speed is 1800 RPM. The AGC also meets the requirements for the time since engine starting, and the time since the purge request.

The following events are available in M-Logic under *Events, EIC event*. The M-Logic events are activated by an Isuzu proprietary telegram.

Purge function M-Logic events

Event	Description
Isuzu Manual Purge ECU activated (status)	A manual purge is active in the ECU.
Isuzu Manual Purge E-IDSS activated (status)	E-IDSS (an Isuzu service PC tool) activated a manual purge.
Isuzu Force Purge activated (status)	A force purge is active.

3.5.6 Tier 4 aftertreatment support

For a general description, see Tier 4 Final/Stage V. Tier 4 is supported if the ECU is version 2.3 or later.

The TDU 107 supports aftertreatment for the Isuzu engine protocol. For Tier 4 icon dashboard handling, the yellow lamp icon is active for a malfunction lamp, and also if *EXH. SYSTEM Lamp* is received from 0x18FFE200.

3.5.7 Modbus analogue values

The readings below are available in the Modbus protocol. Generic J1939 Modbus readings may also be available.

Measurement table (read only) function code 04h

Address	Content	Unit	Scaling J1939	Description
860	EIC UREA Level	[%]	1/10	UREA Level
899	Inducement timer	[min]	1/1	The time for which the engine has been in escape mode. If the inducement timer exceeds the timer in parameter 15001, then the AGC shuts down the engine.

3.6 Iveco

3.6.1 Basic information

Engine manufacturer: Iveco
Controller types: EDC7 (Bosch MS6.2), NEF, CURSOR and VECTOR 8
DEIF Utility software parameter 7561: Select **Iveco**.
Communication based on: J1939
Supported options: H5, H7, H12
AGC can write commands: Yes
Baud rate: 250 kb/s

3.6.2 Warnings and shutdowns

These standard warnings and shutdowns are supported:

- EIC yellow lamp
- EIC red lamp
- EIC malfunction
- EIC protection

In addition, these warnings and shutdowns are supported:

Warning and shutdown list	J1939 codes		
	SPN	FMI warning	FMI shutdown
Low oil pressure	100	17	1
Intake manifold #1 P	102	15	-
Coolant temperature	110	15	0
High inlet air temp.	172	15	-
Fuel temperature	174	15	-
Overspeed	190	15	0

Note: If FMI is "-" the alarm is not supported.

3.6.3 Write commands

Use parameter 7563 (EIC Controls) to enable write commands.

Iveco write commands

Command	Description
Speed control	In general, this is the same as the J1939 command. The CAN bus ID for speed control is 0xC000000. For J1939 TSC1, the source address of the AGC is **3**.
Idle speed	See the J1939 command.

Iveco Vector 8 write commands

Command	Description
Frequency control	The AGC regulates the frequency by adjusting the governor set point for the ECU.
EIC start/stop enable	See the J1939 command.

3.6.4 J1939 measurements

See the J1939 description for the measurements that the AGC supports. Values specific to Iveco are listed below.

Text	PGN	S	L	P	SPN	Unit	J1939-71 scaling	Offset
EIC coolant temp.	65282/0xFF02	5	1	6	110	°C	1 °C/bit	-40 °C
EIC oil temp.	65282/0xFF02	6	1	6	175	°C	0.03125 °C/bit	-273 °C
EIC oil pressure[1]	65282/0xFF02	7	1	6	100	bar	8 kPa/bit	0

Note 1: Range: 0 to 2000 kPa.

3.6.5 Modbus alarms

Alarm, status and measurement table (read only) function code 04h.

Addr.	Content	Bit	Type
1020	EIC alarms, DEIF controller	0	7570 EIC communication error
		1	7580 EIC warning
		2	7590 EIC shutdown
		3	7600 EIC overspeed
		4	7610 EIC coolant water temperature 1
		5	7620 EIC coolant water temperature 2
		6	7630 EIC oil pressure 1
		7	7640 EIC oil pressure 2
		8	7650 EIC oil temp. 1
		9	7660 EIC oil temp. 2
		10	7670 EIC coolant level 1
		11	7680 EIC coolant level 2
1024	EIC alarms, engine controller (DM1)	0	EIC communication error
		1	EIC low oil pressure, warning
		2	EIC low oil pressure, shutdown
		3	EIC boost pressure, warning
		4	EIC high coolant temperature, warning
		5	EIC low coolant level, shutdown
		6	EIC high inlet air temperature, warning
		7	EIC fuel temperature, warning
		8	EIC ECU yellow lamp, warning
		9	EIC ECU red lamp, shutdown
		10	EIC overspeed, warning
		11	EIC overspeed, shutdown
		12	EIC protection
		13	EIC malfunction

3.7 John Deere

3.7.1 Basic information

Engine manufacturer: John Deere
Controller type: JDEC
Engine types: PowerTech M, E and Plus
DEIF Utility software parameter 7561: Select **JDEC**.
Communication based on: J1939
Supported options: H5, H7, H12
AGC can write commands: Yes
Baud rate: 250 kb/s

3.7.2 Warnings and shutdowns

These standard warnings and shutdowns are supported:

- EIC yellow lamp
- EIC red lamp
- EIC malfunction
- EIC protection

In addition, these warnings and shutdowns are supported:

Warning and shutdown list	J1939 codes		
	SPN	FMI warning	FMI shutdown
Low oil pressure	100	18	1
Intake manifold	105	16	-
Coolant temperature	110	16	0
Fuel injection pump	1076	10	6
Fuel temperature	174	-	16
ECU failure	2000	-	6

Note: If FMI is "-" the alarm is not supported.

3.7.3 Write commands

Use parameter 7563 (EIC Controls) to enable write commands.

John Deere JDEC write commands

Command	Description
Speed control	See the J1939 command.
Idle speed	See the J1939 command.
Frequency selection (50 or 60 Hz)	See the J1939 command.
Regeneration	The command is activated through M-Logic: *Output, EIC commands, EIC JDEC Stationary regeneration setting*.

3.7.4 Tier 4 aftertreatment support

For a general description, see Tier 4 Final/Stage V.

3.7.5 Modbus alarms

Alarm, status and measurement table (read-only) function code 04h.

Addr.	Content	Bit	Type
1020	EIC alarms, DEIF controller	0	7570 EIC communication error
		1	7580 EIC warning
		2	7590 EIC shutdown
		3	7600 EIC overspeed
		4	7610 EIC coolant water temperature 1
		5	7620 EIC coolant water temperature 2
		6	7630 EIC oil pressure 1
		7	7640 EIC oil pressure 2
		8	7650 EIC oil temp. 1
		9	7660 EIC oil temp. 2
		10	7670 EIC coolant level 1
		11	7680 EIC coolant level 2
1024	EIC alarms, engine controller (DM1)	0	EIC high coolant temperature, shutdown
		1	EIC low oil pressure, shutdown
		2	EIC fuel temperature, shutdown
		3	EIC fuel control valve, shutdown
		4	EIC ECU failure, shutdown
		5	EIC oil pressure, warning
		6	EIC intake manifold, warning
		7	EIC coolant temperature, warning
		8	EIC fuel injection pump, warning
		9	EIC JDEC shutdown (LS: lamp status)
		10	EIC JDEC warning (LS: lamp status)
		11	EIC communication error
		12	EIC protection
		13	EIC malfunction

3.8 Kohler

3.8.1 Basic information

Engine manufacturer: Kohler
Controller type: ECU2-HD
Engine type: KD62V12
DEIF Utility software parameter 7561: Select **Kohler**.
Communication based on: J1939
Supported options: H5, H7, H12
AGC can write commands: Yes
Baud rate: 250 kb/s

3.8.2 Warnings and shutdowns

These standard warnings and shutdowns are supported:

- EIC yellow lamp
- EIC red lamp
- EIC malfunction
- EIC protection

3.8.3 Write commands

Use parameter 7563 (EIC Controls) to enable write commands.

Kohler write commands

Command	Description
Speed control	See the J1939 command.
EIC start/stop enable	See the J1939 command.

3.8.4 ECU reset

The Kohler ECU needs to be reset after it has been on for a number of hours. If the ECU reset function is enabled, when the AGC gets a signal from the ECU, the AGC disconnects the power to the ECU (if the engine is not running).

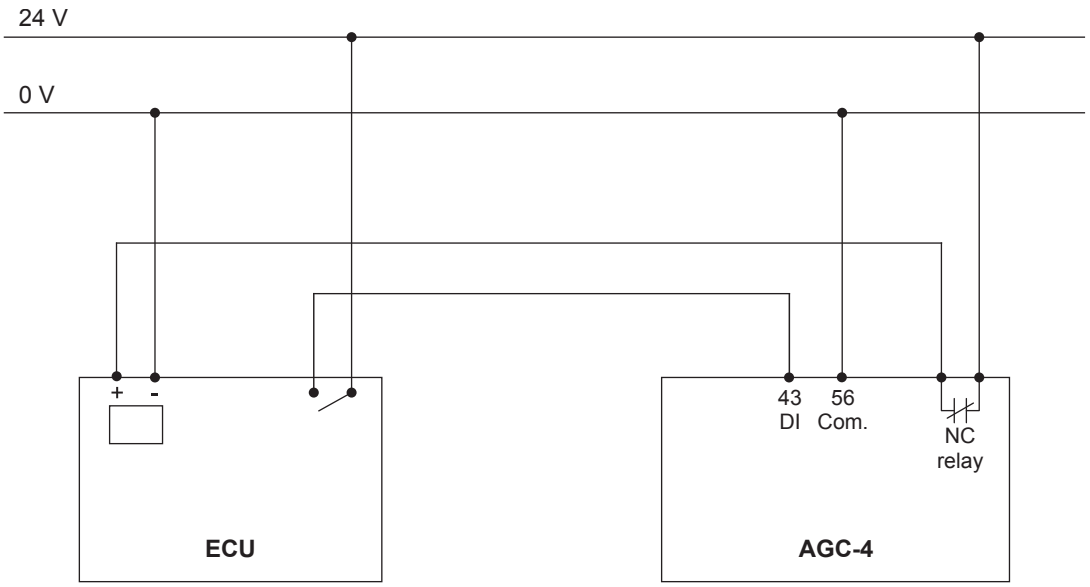
The AGC must have option M12. The parameters for this function are in menu 15010 (Kohler ECU Reset).

Wiring

The signal from the ECU must be connected to terminal 43 on the AGC.

You can assign any available AGC relay to disconnect the ECU power. This AGC relay must be configured as normally closed.

Figure 3.1 Wiring for the ECU reset function



Parameters

Enable the function in parameter 15014.

Select the reset relay in parameter 15012/15013 (Output A/Output B).

When the function is activated, the relay is activated (cutting off the ECU power) for the time in parameter 15011 (default is 5 s).

How it works

If the ECU does not need a reset soon, the ECU relay is open.

If the ECU needs a reset soon, it closes the ECU relay. The AGC ignores the digital input when it is continuously closed.

If the ECU relay pulses at 1 Hz, an ECU reset is required. If the engine is not running, the AGC opens the AGC relay to cut off the ECU power.

3.9 Moteurs Baudouin

3.9.1 Basic information

Engine manufacturer: Moteurs Baudouin
Controller type: ECU WISE15
DEIF Utility software parameter 7561: Select **Generic J1939**.
Communication based on: J1939
Supported options: H5, H7, H12
AGC can write commands: Yes
Baud rate: 250 kb/s

3.9.2 Warnings and shutdowns

These standard warnings and shutdowns are supported:

- EIC yellow lamp
- EIC red lamp

In addition, these warnings and shutdowns are supported:

Warning and shutdown list	J1939 codes		
	SPN	FMI warning	FMI shutdown
Low oil pressure	100	18	1
Intake manifold	105	16	-
Coolant temperature	110	16	0
Fuel injection pump	1076	10	6
Fuel temperature	174	-	16
ECU failure	2000	-	6

Note: If FMI is "-" the alarm is not supported.

3.9.3 Write commands

Use parameter 7563 (EIC Controls) to enable write commands.

Mouteurs Baudoin write command

Command	Description
Speed control	In general, this is the same as the J1939 command. However, the CAN bus ID for speed control is 0xC00000B. J1939 TSC1.

3.10 MTU ADEC (CANopen)

3.10.1 Basic information

The MTU ADEC is not part of J1939. The reading of values, alarms and shutdowns are different.

Engine manufacturer: MTU
Controller types: ADEC, ECU7 with SAM module
Engine types: Series 2000 and 4000 (ECU7), MTU PX[1]
DEIF Utility software parameter 7561: Select **MTU ADEC**
Communication based on: MTU (CANopen)
Supported options: H5, H7, H12
AGC can write commands: Yes
Baud rate: 125 kb/s

Note 1: For the AGC to support MTU PX engines, the MTU SAM module must have an updated J1939 protocol supporting DM1/DM2.

3.10.2 Warnings

Below is a list of warnings that can be shown on the display. Each warning is shown as an alarm in the alarm window. The alarms can be acknowledged from the display, but they will be visible until the alarm disappears in the ECU.

Warning	Display text
Coolant temp. high	HI T-Coolant
Charge air temp. high	HI T-Charge Air
Intercooler coolant temp. high	HI T-Coolant Interc
Lube oil temp. high	HI T-Lube Oil
ECU temp. high	HI T-ECU
Engine speed too low	SS Engine Speed Low
Prelube fail.	AL Prelub. Fail
Start speed not reached	AL Start Spe. N. Re.
Common alarm (yellow)	AL Com. Alarm Yellow
Lube oil pressure low	LO P-Lube Oil
Coolant level low	LO Coolant Level
Intercooler coolant level low	LO Interc. Cool. L.
ECU defect	AL ECU Defect
Speed demand failure	AL Speed Demand Def.
Power supply low voltage	LO Power Supply
Power supply high voltage	HI Power supply
Overspeed	SS Overspeed
Lube oil pressure low low	LOLO P-Lube Oil
Coolant temp. high high	HIHI T-Coolant
Lube oil temp. high high	HIHI T-Lube Oil
Charge air temp. high high	HIHI T-Charge Air
ECU power supply high high	HIHI ECU PS Voltage

Warning	Display text
ECU power supply low low	LOLO ECU PS Voltage
Generator temp. high	T-Generator Warning
Holding tank high level	HI Level Day-Tank
Holding tank low level	LO Level Day-Tank
Generator winding 1 high temp.	HI T-Winding 1
Generator winding 2 high temp.	HI T-Winding 2
Generator winding 3 high temp.	HI T-Winding 3
Ambient temp. high	HI T-Ambient
Water in fuel 1	AL Water I F. Pref. 1
Water in fuel 2	AL Water I F. Pref. 2
Fuel temp. high	HI T-Fuel
Exhaust bank A high temp.	HI T-Exhaust A
Exhaust bank B high temp.	HI T-Exhaust B
Fuel high pressure 1	HI Pressure 1
Fuel high pressure 2	HI Pressure 2
Day tank high level	HI L. Holding-Tank
Day tank low level	LO L. Holding-Tank
Run-up speed not reached	AL Runup. Speed N. Re
Idle speed not reached	AL Idle Speed N. Re

3.10.3 Shutdown

Below is a shutdown value that can be shown on the display. You can configure *EIC shutdown* in parameter 7590.

Shutdown	AGC display text
AL Com. Alarm Red	AL Com. Alarm Red

3.10.4 Display texts

Display readings
Ambient temperature
Battery
EIC faults
Engine power
Fuel rate
Mean T. fuel
Nom. power
Operation
P. Aux 1
P. Aux 2
P. Boost

Display readings
P. Fuel
P. Oil
Speed
T. Charg A
T. Coolant
T. Exh. L
T. Exh. R
T. Fuel
T. Int. Co.
T. Oil
T. Winding 1
T. Winding 2
T. Winding 3
Trip fuel

3.10.5 Write commands

Use parameter 7563 (EIC Controls) to enable write commands.

The ADEC ID is selected in parameter 7562 and is 6 (the default for CANopen protocols).

MTU ADEC (CANopen) write commands

Command	Description
Speed control	To enable speed regulation, select **EIC** in parameter 2781 (Reg. output GOV). By default, the governor offset is 50 % of the nominal speed. At 0 % it is -120 RPM, and at 100 % it is +120 RPM. The CAN bus ID for speed control is 0x300+ADEC ID (the speed demand telegram). The CAN bus ID is therefore 0x306.
Idle speed	See the J1939 command.
Start/Stop	See the J1939 command.
Frequency selection (50 or 60 Hz)	See the J1939 command.
Demand switch	Use menu 2790 to select the speed control type: • Digital (*Up/down ECU* with relay controls) • Analogue (*Analog ECU Relative* for analogue VDC control) • J1939 commands (*Analog CAN*). See the MTU documentation for the ECU8 for more information about switching between normal and emergency operation in local or remote.
Trip counter	This command resets the trip fuel consumption counter. The command is activated through M-Logic (*Output, EIC commands, EIC Reset trip fuel*).
Shutdown override	See the J1939 command.
Enable Cylinder Cutout	The command can be used to engage all cylinders if the engine is running with one bank only. The command is activated through M-Logic (*Output, EIC commands, EIC Enable Cylinder Cutout*).

3.10.6 Modbus alarms

Alarm, status and measurement table (read only) function code 04h.

Addr.	Content	Bit	Type
1020	EIC alarms, DEIF controller	0	EIC 7570 communication error
		2	EIC 7590 shutdown
		3	EIC 7600 overspeed
		4	EIC 7610 coolant water temperature 1
		5	EIC 7620 coolant water temperature 2
		6	EIC 7630 oil pressure 1
		7	EIC 7640 oil pressure 2
		8	EIC 7650 oil temp. 1
		9	EIC 7660 oil temp. 2
		10	EIC 7670 coolant level 1
		11	EIC 7680 coolant level 2
1022	EIC alarms, engine controller	0	EIC ECU power supp voltage LoLo
		1	EIC Fuel high temp
		2	EIC Exhaust A high temp
		3	EIC Exhaust B high temp
		4	EIC Pressure 1 high (Aux 1)
		5	EIC Pressure 2 high (Aux 2)
		6	EIC Day tank high level
		7	EIC Day tank low level
		8	EIC Run-up speed not reached
		9	EIC Idle speed not reached

Addr.	Content	Bit	Type
1023	EIC alarms, engine controller	0	EIC Common alarm red
		1	EIC Overspeed
		2	EIC Lube oil press LowLow
		3	EIC Coolant temperature HiHi
		4	EIC Lube oil temp HiHi
		5	EIC Charge air temp HiHi
		6	EIC ECU power supp voltage HiHi
		7	EIC Generator temp high warning
		8	EIC Holding tank high level
		9	EIC Holding tank low level
		10	EIC Winding 1 temp high
		11	EIC Winding 2 temp high
		12	EIC Winding 3 temp high
		13	EIC Ambient temp high
		14	EIC Water in fuel 1
		15	EIC Water in fuel 2
1024	EIC alarms, engine controller	0	EIC Coolant high temp
		1	EIC Charge air high temp
		2	EIC Intercooler coolant high temp
		3	EIC Lube oil high temp
		4	EIC ECU high temp
		5	EIC Engine speed low
		6	EIC Prelube fail
		7	EIC Start speed not reached Common alarm
		8	EIC yellow
		9	EIC Lube oil pressure low
		10	EIC Coolant level low
		11	EIC Intercooler coolant level low
		12	EIC ECU defect
		13	EIC Speed demand defect
		14	EIC Power supply low voltage
		15	EIC Power supply high voltage

3.10.7 Modbus analogue values

The readings below are available in the Modbus protocol. Generic J1939 Modbus readings may also be available.

Measurement table (read only) function code 04h

Addr	Content	Unit	Scaling	SPN	Description
631	EIC Winding 1 temp	°C/°F	1/1	-	Gen winding 1 temp
632	EIC Winding 2 temp	°C/°F	1/1	-	Gen winding 2 temp

Addr	Content	Unit	Scaling	SPN	Description
633	EIC Winding 3 temp	°C/°F	1/1	-	Gen winding 3 temp
636	EIC T. Charge A	°C/°F	1/10	-	Turbo Charger Air temp
637	EIC Intercooler temp	°C/°F	1/10	52	Intercooler temp
900	EIC trip average fuel rate	L/h	1/10	1029	Average fuel rate
906	EIC mean trip fuel consumption	L/h	1/1000	1029	High word
907	EIC mean trip fuel consumption	L/h	1/1000	1029	Low word
908	EIC engine power	kWm	1/1	-	Nominal power of the engine (ADEC)
942	EIC camshaft	RPM	1/1	-	Camshaft speed
943	EIC Temp lube HI	°C/°F	1/10	-	Lube oil temperature HI
944	EIC Temp lube HIHI	°C/°F	1/10	-	Lube oil temperature HIHI
945	EIC speed demand analog	Digit	1/1	-	Speed demand analog

3.11 MTU ADEC module 501

3.11.1 Basic information

The MTU ADEC module 501 is not a part of J1939. The reading of values, alarms and shutdowns are different.

Engine manufacturer: MTU
Controller type: ADEC, ECU7 without SAM module (software module 501)
Engine types: Series 2000 and 4000
DEIF Utility software parameter 7561: Select **MTU ADEC module 501**
Communication based on: MTU
Supported options: H13 only
AGC can write commands: Yes
Baud rate: 125 kb/s

3.11.2 Display texts

Display readings
Act-Droop
Battery
Camshaft
ECU Stop activated 1
F speed an
INJECT-QUAN
MDEC Faults
Mean T. fuel
Nom power
Operation
P L Oil Lo
P L Oil Lolo
P. Ch. Air
P. Fuel
P. Oil
Speed
Speed D SW
T. Ch. Air
T. Coolant
T. Fuel
T. Oil
TCOOL-HIHI
T-ECU
T-INTERC
T-LUBE-HI
T-LUBE-HIHI

Display readings
Total fuel
Trip fuel

3.11.3 Displaying alarms

This is a list of alarms that can be shown on the display. The alarms will be shown in the alarm window. The alarms can be acknowledged from the display, but they will be visible until the alarm disappears in the ECU.

Alarm	Display text	Warning	Shutdown
ADEC yellow alarm	EIC yellow lamp WA	X	-
ADEC red alarm	EIC red lamp SD.	-	X
High high engine speed	Overspeed shutdown	X	-
Low low lube oil pressure	L Oil Pres. Shutdown	X	-
High high coolant temperature	H Coolant T Shutdown	X	-
High intercooler temperature	H Interc. T Warning	X	-
Sensor Defect Coolant Level	SD Coolant Level	X	-
Low low coolant level	L Cool. Lev. Shutdown	X	-
ADEC ECU failure	MDEC ECU Failure	X	-
Low Lube oil pressure	L Oil Pres. Warning	X	-
Low Common rail fuel pressure	LO P-Fuel Com-Rail	X	-
High Common rail fuel pressure	HI P-Fuel Com-Rail	X	-
Low preheat temperature	AL Preheat Temp. Low	X	-
Low low Charge air coolant level	SS Cool Level Ch-Air	X	-
Power amplifier 1 failure	AL Power Amplifier 1	X	-
Power amplifier 2 failure	AL Power Amplifier 2	X	-
Transistor output status	AL Status Trans-Outp	X	-
Low ECU power supply voltage	LO ECU Power Supply	X	-
High ECU power supply voltage	HI ECU Power	X	-
High charge air temperature	HI T-Charge Air	X	-
High Lube oil temperature	HI T-Lube Oil	X	-
High ECU temperature	HI T-ECU	X	-
Low engine speed	SS Eng. Speed Low	X	-
Check error code	AL Check Error Code	X	-
Common rail leakage	AL Com. Rail Leakage	X	-
Automatic engine stop	AL Aut. Engine Stop	X	-
MG Start speed not reached	MG Start Speed Fail	X	-
MG runup speed not reached	MG Runup Speed Fail	X	-
MG idle speed reached	MG Idle Speed Fail	X	-
Low low ECU power supply voltage	LOLO ECU Pow. Supply	X	-
High high ECU power supply voltage	HIHI ECU Pow. Supply	X	-
Sensor Defect coolant level charge air	SD Cool Level Ch-Air	X	-

Alarm	Display text	Warning	Shutdown
High fuel temperature	HI T-Fuel	X	-
Override feedback from ECU	SS Override	X	-
High high lube oil temperature	H Oil Temp. Shutdown	X	-
Speed demand defected	AL Speed demand Def.	X	-
High coolant temperature	H Coolant T Warning	X	-
High high temperature charge air	H Ch. Air T Shutdown	X	-
Low fuel oil pressure	LO P-Fuel Oil	X	-
Low low fuel oil pressure	SS P-Fuel Oil	X	-

Note: "-" means that the alarm is not supported.

3.11.4 Write commands

Use parameter 7563 (EIC Controls) to enable write commands.

MTU ADEC module 501 (without SAM) write commands

Command	Description
Speed control	To enable speed regulation, select **EIC** in parameter 2781 (Reg. output GOV). By default, the governor offset is 50 % of the nominal speed. At 0 % it is -120 RPM, and at 100 % it is +120 RPM.
Idle speed	See the J1939 command.
Start/Stop	See the J1939 command.
Frequency selection (50 or 60 Hz)	See the J1939 command.
Demand switch	Use menu 2790 to select the speed control type: • Digital (*Up/down ECU* with relay controls) • Analogue (*Analog ECU Relative* for analogue VDC control) • J1939 commands (*Analog CAN*). See the MTU documentation for the ECU8 for more information about switching between normal and emergency operation in local or remote.
Trip counter	This command resets the trip fuel consumption counter. The command is activated through M-Logic (*Output, EIC commands, EIC Reset trip fuel*).
Priming on engine start	Engage the pre-lubrication oil pump if installed. The command is activated through M-Logic (*Output, EIC commands, EIC Interval Priming*).
Shutdown override	See the J1939 command. The shutdown override can also be inhibited through M-Logic (*Output, EIC commands, EIC MTU inhibit Shutdown override*).
Enable Cylinder Cutout	The command can be used to engage all cylinders if the engine is running with one bank only. The command is activated through M-Logic (*Output, EIC commands, EIC Enable Cylinder Cutout*).
Speed increase	This command increases the speed of the engine by a small amount. The command is activated through M-Logic (*Output, EIC commands, EIC Speed Increase)*.
Speed decrease	This command decreases the speed of the engine by a small amount. The command is activated through M-Logic (*Output, EIC commands, EIC Speed Decrease)*.
Engine overspeed test	The ECU runs its overspeed test. The command is activated through M-Logic (*Output, EIC commands, EIC Engine overspeed test)*.

Command	Description
Binary speed enable	The ECU uses (or does not use) EIC binary speed for the speed bias. The command is activated through M-Logic (*Output, EIC commands, EIC binary Speed In-De Enable*). The function is MTU-specific.
Inhibit AL speed demand	The command is activated through M-Logic (*Output, EIC commands, EIC MTU inhibit AL speed demand*). The function is MTU-specific.

3.11.5 Modbus alarms

Alarm, status and measurement table (read only) function code 04h.

Addr.	Content	Bit	Type
1020	EIC alarms, DEIF controller	0	EIC communication error
		2	EIC shutdown
		3	EIC overspeed
		4	EIC coolant water temperature 1
		5	EIC coolant water temperature 2
		6	EIC oil pressure 1
1022	EIC alarms, engine controller	0	EIC Automatic engine stop
		1	EIC MG start speedfail
		2	EIC Runup speedfail1
		3	EIC Idle speedfail
		4	EIC ECU power supply voltage low limit2
		5	EIC ECU power supply voltge high limit2
		6	EIC Aftercooler coolant level sensor defect
		7	EIC Fuel temperature high limit 2
1023	EIC alarms, engine controller	0	EIC Common rail fuel pressure limit 1
		1	EIC Common rail fuel pressure limit 2
		2	EIC Override
		3	EIC Preheat temperature low
		4	EIC Charge air coolant level 2
		5	EIC Power amplifier 1
		6	EIC Power amplifier 2
		7	EIC Transistor output status, TAA1 to TAA6
		8	EIC ECU Power supply voltage low limit1
		9	EIC ECU Power supply voltage high limit1
		10	EIC Charge air temperature limit1
		11	EIC Lube oil temperature limit1
		12	EIC ECU temperature limit1
		13	EIC Engine speed low limit1
		14	EIC Check error code
		15	EIC Common rail leakage

Addr.	Content	Bit	Type
1024	EIC alarms, engine controller	0	EIC overspeed, shutdown
		1	EIC low oil pressure, warning
		2	EIC low oil pressure, shutdown
		3	EIC low coolant level, shutdown
		4	EIC ADEC ECU failure, shutdown
		5	EIC high coolant temperature, warning
		6	EIC high coolant temperature, shutdown
		7	EIC high intercooler coolant temp, warning
		8	EIC high oil temperature, shutdown
		9	EIC high charge air temperature, shutdown
		10	EIC defect coolant level switch, warning
		11	EIC ADEC yellow alarm, warning
		12	EIC ADEC red alarm, shutdown
		13	EIC communication error
		14	EIC fuel delivery pressure limit1
		15	EIC fuel delivery pressure limit2

3.12 MTU J1939 Smart Connect

3.12.1 Basic information

Engine manufacturer: MTU
Controller types: J1939 Smart Connect, ECU8, ECU9
Engine types: Series 1600
DEIF Utility software parameter 7561: Select **MTU J1939 Smart Connect**
Communication based on: J1939
Supported options: H5, H12
AGC can write commands: Yes
Baud rate: 250 kb/s

3.12.2 Warnings and shutdowns

These standard warnings and shutdowns are supported:

- EIC yellow lamp
- EIC red lamp
- EIC malfunction
- EIC protection

3.12.3 Alarm texts

These alarm texts are only supported for ECU9.

DEIF Display	MTU	SPN	FMI
SD Feedback Thrott A	SD Feedback Throttle A	51	11
Al Req Angle Throt A	Al Req Angle Throttle A	51	15
AL mixture throt A f	AL mixture throttle A fault	51	31
SS T-Coolant Interco	SS T-Coolant Intercooler	52	0
SD T-Coolant InterC	SD T-Coolant Intercooler	52	11
HI T-Coolant Interco	HI T-Coolant Intercooler	52	15
SS P-Fuel	SS P-Fuel	94	1
SD P-Fuel before Fil	SD P-Fuel before Filter	94	11
LO P-Fuel	LO P-Fuel	94	17
SS P-Diff-Fuel	SS P-Diff-Fuel	95	0
SD P-Diff Fuel	SD P-Diff Fuel	95	11
HI P-Diff-Fuel	HI P-Diff-Fuel	95	15
SD Level W.Fuel PreF	SD Level Water Fuel Prefilter	97	11
HI Level W.Fuel PreF	HI Level Water Fuel Prefilter	97	15
AL L2 Level Lube oil	AL L2 Level Lube Oil J1939	98	1
SD Level Lube oil	SD Level Lube Oil J1939	98	11
SD Level Lube oil	SD Level Lube Oil	98	11
AL L1 Level Lube Oil	AL L1 Level Lube Oil J1939	98	17
SS P-Diff-Lube Oil	SS P-Diff-Lube Oil	99	0
SD P-Diff Lube Oil	SD P-Diff Lube Oil	99	11

DEIF Display	MTU	SPN	FMI
HI P-Diff-Lube Oil	HI P-Diff-Lube Oil	99	15
SS P-Lube Oil	SS P-Lube Oil	100	1
SD P-Lube Oil	SD P-Lube Oil	100	11
LO P-Lube Oil	LO P-Lube oil	100	17
SS P-Crank Case	SS P-Crank Case	101	0
LOLO P-Crank Case	LOLO P-Crank Case	101	1
SD P-CrankCase	SD P-CrankCase	101	11
HI P-Crank Case	HI P-Crank Case	101	15
LO P-Crank Case	LO P-Crank Case	101	17
HIHI P-Charge Mix A	HIHI P-Charge Mix A	102	0
SD P-Charge Mix A	SD P-Charge Mix A	102	11
SS ETC1 Overspeed	SS ETC1 Overspeed	103	0
SD Charger 1 Speed	SD Charger 1 Speed	103	11
HI ETC1 Overspeed	HI ETC1 Overspeed	103	15
AL L2 P-Lubeoil ETCA	AL L2 P-Lubeoil ETC A	104	1
SD-P-Lubeoil ETC A	SD-P-Lubeoil ETC A	104	11
AL L1 P-Lubeoil ETCA	AL L1 P-Lubeoil ETC A	104	17
HIHI T-Charge Mix	HIHI T-Charge Mix	105	0
HIHI T-Intake Air	HIHI T-Intake Air	105	0
SS T-Charge Air	SS T-Charge Air	105	0
SD T-Charge Air	SD T-Charge Air	105	11
SD T-Charge Mix	SD T-Charge Mix	105	11
HI T-Charge Mix	HI T-Charge Mix	105	15
HI T-Charge Air	HI T-Charge-air	105	15
HI T-Intake Air	HI T-Intake Air	105	15
LO T-Charge Mix	LO T-Charge Mix	105	17
SD P-Intake Air Filt	SD P-Intake Air Filter Diff.	107	11
SD P-AmbientAirT2800	SD P-Ambient Air (HDT2800)	108	11
SS P-Coolant	SS P-Coolant	109	1
SD P-Coolant	SD P-Coolant	109	11
HI P-Coolant	HI P-Coolant	109	15
LO P-Coolant	LO P-Coolant	109	17
SS T-Coolant L4	SS T-Coolant L4	110	0
SD T-Coolant	SD T-Coolant	110	11
HI T-Coolant	HI T-Coolant	110	15
SS T-Coolant	SS T-Coolant	110	16
ALL2 Lev Cool. Water	AL L2 Level Coolant Water	111	1
SD Level Coolant W.	SD Level Coolant Water	111	11
ALL1 Lev Coola Water	AL L1 Level Coolant Water	111	17

DEIF Display	MTU	SPN	FMI
LO Coolant Level	LO Coolant Level	111	17
SD P-Coolant Diff	SD P-Coolant Diff	112	11
LO P-Coolant Diff	LO P-Coolant Diff	112	17
SD P-HD	SD P-HD	157	11
HI P-Fuel (ComRail)	HI P-Fuel (Common Rail)	157	15
LO P-Fuel (ComRail)	LO P-Fuel (Common Rail)	157	17
HIHI ECU PS Voltage	HIHI ECU Power Supply Voltage	158	0
LOLO ECU PS Voltage	LOLO ECU Power Supply Voltage	158	1
SD ECU PS Voltage	SD ECU Power Supply Voltage	158	11
HI ECU PS Voltage	HI ECU Power Supply Voltage	158	15
LO ECU PS Voltage	LO ECU Power Supply Voltage	158	17
SD T0-AmbientAir	SD T0-Ambient Air (HDT2800)	171	11
LOLO T-Intake Air	LOLO T-Intake Air	172	1
SD T-Intake Air	SD T-Intake Air	172	11
LO T-Intake Air	LO T-Intake Air	172	17
SD-T-Exh. after Eng.	SD-T-Exh. after Engine	173	11
AL L1 T-Exh. aft.Eng	AL L1 T	173	17
AL L2 T-Fuel b.Eng.	AL L2 T-Fu	174	0
SS T-Fuel	SS T-Fuel	174	0
AL T-Gas L2	AL T-Gas L2	174	1
SD T-Fuel	SD T-Fuel	174	11
SD T-Fuel b.Engine	SD T-Fu	174	11
SD T-Gas	SD T-Gas	174	11
AL L1 T-Fuel b.Eng.	AL L1 T-Fu	174	15
HI T-Fuel	HI T-Fuel	174	15
AL T-Gas L1	AL T-Gas L1	174	17
SS T-Lube Oil	SS T-Lube Oil	175	0
SD T-Lube Oil	SD T-Lube Oil	175	11
HI T-Lube Oil	HI T-Lube Oil	175	15
AL L2 T-Lubeoil ETC	AL L2 T-Lubeoil ETC	176	0
SD-T-Lubeoil ETC	SD-T-Lubeoil ETC	176	11
AL L1 T-Lubeoil ETC	AL L1 T-Lubeoil ETC	176	15
SS Idle Sp.N Reac	SS Idle Speed Not Reached	188	1
SS Engine Overspeed	SS Engine Overspeed	190	0
SS Engine Speed tooL	SS Engine Speed too Low	190	1
AL Eng Hours Cnt def	AL Eng Hours Counter Defect	247	31
AL Fuel Cons.Cnt def	AL Fuel Cons. Counter Defect	250	31
AL L1 T-Aux 1	AL L1 T-Aux 1	441	15
AL L2 T-Aux2	AL L2 T-Aux2	442	0

DEIF Display	MTU	SPN	FMI
AL L1 T-Aux 2	AL L1 T-Aux 2	442	15
AL Comb. Alarm Red	AL Comb. Alarm Red (Plant)	623	31
AL Comb. Alarm Yel	AL Comb. Alarm Yel (Plant)	624	31
SD Speed Demand	SD Speed Demand	898	11
AL Develop PR Set	AL Develop PR Set	966	31
AL L2 Aux1	AL L2 Aux1	1083	0
SD AUX 1	SD AUX 1	1083	11
AL L1 Aux 1	AL L1 Aux 1	1083	15
AL L2 Aux2	AL L2 Aux2	1084	0
SD AUX 2	SD AUX 2	1084	11
AL L1 Aux 2	AL L1 Aux 2	1084	15
AL HIHI T-ChargeAirB	AL HIHI T-Charge Air B	1131	0
SD T-Charge Air B	SD T-Charge Air B	1131	11
AL HI T-Charge Air B	AL HI T-Charge Air B	1131	15
SD T-ECU	SD T-ECU	1136	11
HI T-ECU	HI T-ECU	1136	15
AL L2 P-Lubeoil ETCB	AL L2 P-Lubeoil ETC B	1168	1
AL L1 P-Lubeoil ETCB	AL L1 P-Lubeoil ETC B	1168	17
SD P-Lube Oil (R2)	SD P-Lube Oil (R2)	1168	31
SD-P-Lubeoil ETC B	SD-P-Lubeoil ETC B	1168	31
SS ETC2 Overspeed	SS ETC2 Overspeed	1169	0
SD Charger 2 Speed	SD Charger 2 Speed	1169	11
HI ETC2 Overspeed	HI ETC2 Overspeed	1169	15
SS ETC3 Overspeed	SS ETC3 Overspeed	1170	0
SD Charger 3 Speed	SD Charger 3 Speed	1170	11
HI ETC3 Overspeed	HI ETC3 Overspeed	1170	15
SS ETC4 Overspeed	SS ETC4 Overspeed	1171	0
SD Charger 4 Speed	SD Charger 4 Speed	1171	11
HI ETC4 Overspeed	HI ETC4 Overspeed	1171	15
ALL2TExh.bef.TurbA1	AL L2 T-Exh. bef. HP Turbine A1	1172	1
ALL1TExh.bef.TurbA1	AL L1 T-Exh. bef. HP Turbine A1	1172	17
AL L2 P-IntakeA a.FA	AL L2 P-Intake Air after Filter A	1176	1
AL L1 P-IntakeA a.FA	AL L1 P-Intake Air after Filter A	1176	17
AL L2 P-IntakeA a.FB	AL L2 P-Intake Air after Filter B	1177	1
AL L1 P-IntakeA a.FB	AL L1 P-Intake Air after Filter B	1177	17
SS P-Coolant InterC	SS P-Coolant InterCooler	1203	1
SD P-Coolant InterC	SD P-Coolant Intercooler	1203	11
LO P-Coolant InterC	LO P-Coolant InterCooler	1203	17
SD P-Lube Oil bef. F	SD P-Lube Oil before Filter	1208	11

DEIF Display	MTU	SPN	FMI
AL Override applied	AL Override applied	1237	31
SD Level Leak. Fuel	SD Level Leakage Fuel	1239	11
HI Level LeakageFuel	HI Level Leakage Fuel	1239	15
SD P-HD2	SD P-HD2	1349	11
SD-P-Fuel before Eng	SD-P-Fuel before Engine	1349	11
HI P-Fuel 2(ComRail)	HI P-Fuel 2 (Common Rail)	1349	15
AL L1 P-Fuel bef.Eng	AL L1 P-Fuel before Engine	1349	17
LO P-Fuel 2(ComRail)	LO P-Fuel 2 (Common Rail)	1349	17
SD-Level Oil Refill	SD-Level Oil Refill Tank	1380	11
LO Oil Level Refill	LO Oil Level Refill	1380	17
AL L2 T-Aux1	AL L2 T-Aux1	1385	0
SD T-AUX 1	SD T-AUX 1	1385	11
SD T-AUX 2	SD T-AUX 2	1386	11
AL L2 P-Aux1	AL L2 P-Aux1	1387	1
SD P-AUX 1	SD P-AUX 1	1387	11
AL L1 P-Aux 1	AL L1 P-Aux 1	1387	17
AL L2 P-Aux2	AL L2 P-Aux2	1388	1
SD P-AUX 2	SD P-AUX 2	1388	11
AL L1 P-Aux 2	AL L1 P-Aux 2	1388	17
Niveau RM Tank	Niveau RM Tank	1761	11
SS T-Exhaust B	SS T-Exhaust B	2433	0
SD T-Exhaust B	SD T-Exhaust B	2433	11
HI T-Exhaust B	HI T-Exhaust B	2433	15
SS T-Exhaust A	SS T-Exhaust A	2434	0
SD T-Exhaust A	SD T-Exhaust A	2434	11
HI T-Exhaust A	HI T-Exhaust A	2434	15
SD P-Ch MixbefThrott	SD P-Charge Mix before Throttle	2631	11
SD T-RM Tank	SD T-RM Tank	3031	11
HIHI Nox Value	HIHI Nox Value	3226	0
LOLO Nox Value	LOLO Nox Value	3226	1
SD Smart NOx Oxi.Fac	SD Smart NOx Oxidation Factor O2	3226	11
HI Nox Value	HI Nox Value	3226	15
LO Nox Value	LO Nox Value	3226	17
AL NOx ATO1Comm.lost	AL NOx ATO1 Communication Lost	3226	31
AL L2 T-Exhaust Bef.	AL L2 T-Exhaust Before DPF	3242	0
SD T-Exhaust bef.DPF	SD T-Exhaust before DPF A	3242	11
AL L1 T-Exhaust Bef.	AL L1 T-Exhaust Before DPF	3242	15
AL L2 T-ExhaustAfter	AL L2 T-Exhaust After DPF	3246	0
SD T-Exhaust a. DPF	SD T-Exhaust after DPF A	3246	11

DEIF Display	MTU	SPN	FMI
AL L1 T-ExhaustAfter	AL L1 T-Exhaust After DPF	3246	15
AL L2 P-DPF Diff.	AL L2 P-DPF Difference	3251	0
SD P-DeltaExhaustDPF	SD P-DeltaExhaust DPF A	3251	11
AL L1 P-DPF Diff.	AL L1 P-DPF Difference	3251	15
SS T-Fuel B	SS T-Fuel B	3468	0
SD-T-Fuel B	SD-T-Fuel B	3468	11
HI T-Fuel B	HI T-Fuel B	3468	15
AL Urea Qua Release	AL Urea Quality Release	3516	31
AL turning activated	AL turning activated	3543	31
HIHI P-Charge Mix B	HIHI P-Charge Mix B	3562	0
SD P-Charge Mix B	SD P-Charge Mix B	3562	11
SS P-Charge Air	SS P-Charge Air	3563	0
SD P-Charge Air	SD P-Charge Air	3563	11
HI P-Charge Air	HI P-Charge Air	3563	15
SD Level Cool.InterC	SD Level Coolant Intercooler	3668	11
LO Coolant LevelIntC	LO Coolant Level Intercooler	3668	17
SD Feedback Thrott B	SD Feedback Throttle B	3673	11
Al Req Angle Throt B	Al Req Angle Throttle B	3673	15
AL mix throt B fault	AL mixture throttle B fault	3673	31
AL DPF Rigorous TM S	AL DPF Rigorous TM Suppression	3703	11
SD T-Coolant (R2)	SD T-Coolant (R2)	4076	31
SS T-Coolant bef Eng	SS T-Coolant before Engine	4193	0
SD T-Coolant b.Engin	SD T-Coolant b.Engine	4193	11
HI T-Coolant bef Eng	HI T-Coolant before Engine	4193	15
SD EngRPM 3rd Sensor	SD Engine Speed 3rd Sensor	4202	31
AL SCR F1 SU AdBlueQ	AL SCR F1 SU AdBlue Quantity	4348	15
AL L2 T-Exh.Bef.SCR1	AL L2 T-Exhaust Before SCR F1	4360	0
SD T-Exh bef. SCR F1	SD T-Exh before SCR F1	4360	11
SD T-Exh bef. SCR F3	SD T-Exh before SCR F3	4360	11
AL L1 T-Exh.Bef.SCR1	AL L1 T-Exhaust Before SCR F1	4360	15
AL F1 T-Exh bef.SCRL	AL F1 T-Exh before SCR too LOW	4360	17
AL L2 T-Exh.Aft.SCR1	AL L2 T-Exhaust After SCR F1	4363	0
SD T-Exh a. SCR F1	SD T-Exh after SCR F1	4363	11
SD T-Exh aft. SCR F3	SD T-Exh after SCR F3	4363	11
AL L1 T-Exh.Aft.SCR1	AL L1 T-Exhaust After SCR F1	4363	15
AL F1 T-Exh aft.SCRL	AL F1 T-Exh after SCR too LOW	4363	17
AL SCR F1 SU Rev. Ra	AL SCR F1 SU Revolution Range	4375	31
AL SCR F2 SU AdBlueQ	AL SCR F2 SU AdBlue Quantity	4401	15
AL L2 T-Exh.Bef.SCR2	AL L2 T-Exhaust Before SCR F2	4413	0

DEIF Display	MTU	SPN	FMI
SD T-Exh bef. SCR F1	SD T-Exh before SCR F2	4413	11
AL L1 T-Exh.Bef.SCR2	AL L1 T-Exhaust Before SCR F2	4413	15
AL F2 T-Exh bef.SCRL	AL F2 T-Exh before SCR too LOW	4413	17
AL L2 T-Exh.Aft.SCR2	AL L2 T-Exhaust After SCR F2	4415	0
SD T-Exh a. SCR F2	SD T-Exh after SCR F2	4415	11
AL L1 T-Exh.Aft.SCR2	AL L1 T-Exhaust After SCR F2	4415	15
AL F2 T-Exh aft.SCRL	AL F2 T-Exh after SCR too LOW	4415	17
AL SCR F2 SU Rev. Ra	AL SCR F2 SU Revolution Range	4441	31
SD Air Humidity	SD Air Humidity	4490	11
SD Air Humidity	SD Air Humidity (HDT2800)	4490	11
AL Rel. Humidity L1	AL Rel. Humidity L1	4490	15
AL L2 T-Exhaust Bef.	AL L2 T-Exhaust Before DOC	4765	0
SD T-Exhaust bef.DOC	SD T-Exhaust before DOC A	4765	11
AL L1 T-Exhaust Bef.	AL L1 T-Exhaust Before DOC	4765	17
AL Battery Not Charg	AL Battery Not Charging	4990	31
AL L2 P-Charge Air B	AL L2 P-Charge Air B	5422	1
AL L1 P-Charge Air B	AL L1 P-Charge Air B	5422	17
SD-P-Fuel Returnpath	SD-P-Fuel Return path	5571	11
AL L1 P-FuelRet.Path	AL L1 P-Fuel Return Path	5571	17
SD P-L Oil aft L. Pu	SD-P-Lube Oil aft Level Pump	520406	11
AL L1 P-OilNivPump	AL L1 P-OilNivPump	520406	17
AL Wiring TO 1	AL Wiring TO 1	520872	31
AL Selected Mode NV	AL Selected Mode not Valid	520873	31
AL No Valid ModeSw.S	AL No Valid Mode Switch Signal	520874	11
AL Speed Demand Fail	AL Speed Demand Failure	520875	31
AL SD Stop Button	AL SD Stop Button	520876	11
AL SD Start Button	AL SD Start Button	520877	11
AL SD Up Button	AL SD Up Button	520878	11
AL SD Down Button	AL SD Down Button	520879	11
AL SD Ext. Speed D_S	AL SD Ext. Speed Demand Switch	520880	11
AL SD Speed D Inc	AL SD Speed Demand Increase	520881	11
AL SD Bin Speed Lim	AL SD Binary Speed Limitation	520882	11
AL SD Droop 2 Switch	AL SD Droop 2 Switch	520883	11
AL SD Frequency SW	AL SD Frequency Switch	520884	11
AL SD Test Overspeed	AL SD Test Overspeed	520885	11
AL SD Override Butto	AL SD Override Button	520886	11
AL SD Alarm Reset	AL SD Alarm Reset	520887	11
AL SD Cylin CutOut	AL SD Cylinder Cut Out	520888	11
AL SD Request BinOut	AL SD Request BinOut Test	520889	11

DEIF Display	MTU	SPN	FMI
AL SD Ext.Engine Pro	AL SD Ext. Engine Protection	520890	11
AL SD Prelubri. Sig.	AL SD Prelubrication Signal	520891	11
AL SD Ext.IncIdleBin	AL SD Ext. Increased Idle Bin	520892	11
AL SD Request P. DBR	AL SD Request Plant DBR	520893	11
AL Wiring Cylind.A1	AL Wiring Cylinder A1	520900	31
AL Wiring Cylind.A2	AL Wiring Cylinder A2	520901	31
AL Wiring Cylind.A3	AL Wiring Cylinder A3	520902	31
AL Wiring Cylind.A4	AL Wiring Cylinder A4	520903	31
AL Wiring Cylind.A5	AL Wiring Cylinder A5	520904	31
AL Wiring Cylind.A6	AL Wiring Cylinder A6	520905	31
AL Wiring Cylind.A7	AL Wiring Cylinder A7	520906	31
AL Wiring Cylind.A8	AL Wiring Cylinder A8	520907	31
AL Wiring Cylind.A9	AL Wiring Cylinder A9	520908	31
AL Wiring Cylind.A10	AL Wiring Cylinder A10	520909	31
AL Wiring Cylind.B1	AL Wiring Cylinder B1	520910	31
AL Wiring Cylind.B2	AL Wiring Cylinder B2	520911	31
AL Wiring Cylind.B3	AL Wiring Cylinder B3	520912	31
AL Wiring Cylind.B4	AL Wiring Cylinder B4	520913	31
AL Wiring Cylind.B5	AL Wiring Cylinder B5	520914	31
AL Wiring Cylind.B6	AL Wiring Cylinder B6	520915	31
AL Wiring Cylind.B7	AL Wiring Cylinder B7	520916	31
AL Wiring Cylind.B8	AL Wiring Cylinder B8	520917	31
AL Wiring Cylind.B9	AL Wiring Cylinder B9	520918	31
AL Wiring Cylind.B10	AL Wiring Cylinder B10	520919	31
SS T-Coolant L3	SS T-Coolant L3	520923	0
AL Power too high	AL Power too high	520924	15
AL Open L.Cylind.A1	AL Open Load Cylinder A1	520930	31
AL Open L.Cylind.A2	AL Open Load Cylinder A2	520931	31
AL Open L.Cylind.A3	AL Open Load Cylinder A3	520932	31
AL Open L.Cylind.A4	AL Open Load Cylinder A4	520933	31
AL Open L.Cylind.A5	AL Open Load Cylinder A5	520934	31
AL Open L.Cylind.A6	AL Open Load Cylinder A6	520935	31
AL Open L.Cylind.A7	AL Open Load Cylinder A7	520936	31
AL Open L.Cylind.A8	AL Open Load Cylinder A8	520937	31
AL Open L.Cylind.A9	AL Open Load Cylinder A9	520938	31
AL Open L.Cylind.A10	AL Open Load Cylinder A10	520939	31
AL Open L.Cylind.B1	AL Open Load Cylinder B1	520940	31
AL Open L.Cylind.B2	AL Open Load Cylinder B2	520941	31
AL Open L.Cylind.B3	AL Open Load Cylinder B3	520942	31

DEIF Display	MTU	SPN	FMI
AL Open L.Cylind.B4	AL Open Load Cylinder B4	520943	31
AL Open L.Cylind.B5	AL Open Load Cylinder B5	520944	31
AL Open L.Cylind.B6	AL Open Load Cylinder B6	520945	31
AL Open L.Cylind.B7	AL Open Load Cylinder B7	520946	31
AL Open L.Cylind.B8	AL Open Load Cylinder B8	520947	31
AL Open L.Cylind.B9	AL Open Load Cylinder B9	520948	31
AL Open L.Cylind.B10	AL Open Load Cylinder B10	520949	31
AL Wiring TOP 1	AL Wiring TOP 1	520952	31
AL Wiring TOP 2	AL Wiring TOP 2	520953	31
AL Wiring TOP 3	AL Wiring TOP 3	520954	31
AL Wiring TOP 4	AL Wiring TOP 4	520955	31
AL Open Load DI 1	AL Open Load Digital Input 1	520958	31
AL Open Load DI 2	AL Open Load Digital Input 2	520959	31
AL Open Load DI 3	AL Open Load Digital Input 3	520960	31
AL Open Load DI 4	AL Open Load Digital Input 4	520961	31
AL Open Load DI 5	AL Open Load Digital Input 5	520962	31
AL Open Load DI 6	AL Open Load Digital Input 6	520963	31
AL Open Load DI 7	AL Open Load Digital Input 7	520964	31
AL Open Load DI 8	AL Open Load Digital Input 8	520965	31
AL Wiring PWM_CM1	AL Wiring PWM_CM1	520970	31
AL Wiring PWM_CM2	AL Wiring PWM_CM2	520971	31
AL Wiring PWM_CM3	AL Wiring PWM_CM3	520972	31
AL Wiring PWM_CM4	AL Wiring PWM_CM4	520973	31
AL Wiring PWM_CM5	AL Wiring PWM_CM5	520974	31
AL Wiring PWM_CM6	AL Wiring PWM_CM6	520975	31
AL Wiring PWM_CM7	AL Wiring PWM_CM7	520976	31
AL Wiring PWM_CM8	AL Wiring PWM_CM8	520977	31
AL Wiring PWM_CM9	AL Wiring PWM_CM9	520978	31
AL Wiring PWM_CM10	AL Wiring PWM_CM10	520979	31
HIHI U-PDU	HIHI U-PDU	520982	0
LOLO U-PDU	LOLO U-PDU	520982	1
SD U-PDU	SD U-PDU	520982	11
HI U-PDU	HI U-PDU	520982	15
LO U-PDU	LO U-PDU	520982	17
AL Wiring Suct. Res1	AL Wiring Suction Restrictor 1	520983	31
AL Wiring Suct. Res2	AL Wiring Suction Restrictor 2	520984	31
AL Wiring Pres.CV 1	AL Wiring Pressure Control Valve 1	520985	31
AL Wiring Pres.CV 2	AL Wiring Pressure Control Valve 2	520986	31
AL Crash Rec. Init.	AL Crash Rec. Init. Error	520990	31

DEIF Display	MTU	SPN	FMI
AL ECUPower OFF/ON R	AL ECU Power OFF/ON Required	520991	31
AL OL ASO FlapFeedbB	AL OL ASO Flap Feedback B	520994	11
AL ASOFlapB cl. Aerr	AL ASO Flap B closed, A failed	520995	11
AL OL ASO FlapFeedbA	AL OL ASO Flap Feedback A	520996	31
AL ASOFlapA cl. Aerr	AL ASO Flap A closed, B failed	520997	31
AL ASO Flaps Closed	AL ASO Flaps Closed	520998	31
AL ASOFlaps open/err	AL ASO Flaps open / failed to close	520999	31
AL ASO Flap A Not Cl	AL ASO Flap A Not Closed by ECU	521000	31
AL Rail Leakage	AL Rail Leakage	521001	31
SS Release Sp.N Reac	SS Release Speed Not Reached	521002	1
SS Starter Sp.N Reac	SS Starter Speed Not Reached	521003	1
SS T-Preheat	SS T-Preheat	521004	1
LO T-Preheat	LO T-Preheat	521004	17
AL ASO Flap B Not Cl	AL ASO Flap B Not Closed by ECU	521005	31
AL CAN1 Node Lost	AL CAN1 Node Lost	521006	31
AL CAN2 Node Lost	AL CAN2 Node Lost	521007	31
AL CAN Wrong Param.	AL CAN Wrong Parameters	521008	31
AL CAN No PU-Data	AL CAN No PU-Data	521009	31
AL CAN PU-Data Flash	AL CAN PU-Data Flash Error	521010	31
AL CAN1 Bus Off	AL CAN1 Bus Off	521011	31
AL CAN1 Error Pass.	AL CAN1 Error Passive	521012	31
AL CAN2 Bus Off	AL CAN2 Bus Off	521013	31
AL CAN2 Error Pass.	AL CAN2 Error Passive	521014	31
AL Stop Camsh. S def	AL Stop Camshaft Sensor Defect	521016	31
SD Crankshaft Speed	SD Crankshaft Speed	521017	11
SD Camshaft Speed	SD Camshaft Speed	521018	11
SD Frequency Input	SD Frequency Input	521019	11
AL Power Stage Low	AL Power Stage Low	521020	31
AL Power Stage High	AL Power Stage High	521021	31
AL Stop Power Stage	AL Stop Power Stage	521022	31
AL L2 Aux1 Plant	AL L2 Aux1 Plant	521023	0
AL L1 Aux1 Plant	AL L1 Aux1 Plant	521023	15
AL Stop MVWiring GND	AL Stop MV-Wiring Ground	521023	31
AL Open Load Emerg.	AL Open Load Emerg. Stop Input ESI	521024	31
SD Idle/End-TorqueIN	SD Idle/End-Torque Input [%]	521025	11
SS Power Reduct. Act	SS Power Reduction Active	521026	31
AL Stop SD	AL Stop SD	521027	31
AL Wiring FO	AL Wiring FO	521028	31
AL Wiring PWM_CM2	AL Wiring PWM_CM2	521028	31

DEIF Display	MTU	SPN	FMI
AL Ext. Engine Prot.	AL Ext. Engine Protection	521029	31
AL Starter Not Engag	AL Starter Not Engaged	521030	31
AL Power Cut-Off det	AL Power Cut-Off detected	521031	31
AL ESCM Override	AL ESCM Override	521032	31
AL MD CANReq Idle S.	AL MD CAN Request Idle Speed	521033	31
AL MD CAN Speed Limi	AL MD CAN Speed Limitation	521034	31
AL L2 PRV Defect	AL L2 PRV Defect	521035	0
AL L1 PRV Defect	AL L1 PRV Defect	521035	15
AL L1 PRV Defect	AL L1 PRV Defect	521036	31
AL L2 PRV Defect	AL L2 PRV Defect	521037	31
SD ETC1+ETC2	SD ETC1+ETC2	521038	11
AL Doub.Nod. Lost1+2	AL Double Nodes Lost CAN 1 + 2	521039	31
AL EIL Protection	AL EIL Protection	521040	31
AL EIL Error	AL EIL Error	521041	31
AL EGR Throttle ADef	AL EGR Throttle A Defect	521042	31
AL Bypass Throt. Def	AL Bypass Throttle Defect	521043	31
AL Dispen. Throt.Def	AL Dispenser Throttle Defect	521044	31
SD P-Exhaust Lambda	SD P-Exhaust Lambda	521045	11
SD P-Charge Air B	SD P-Charge Air B	521046	11
SD Smart NOx HeaterE	SD Smart NOx Heater Element	521047	11
SD Smart NOx Concent	SD Smart NOx Concentration	521048	11
AL Emission Fault	AL Emission Fault	521050	31
SD P-Fuel	SD P-Fuel	521052	11
AL L2L Voltage ASO	AL L2L Voltage ASO	521053	1
AL SD Voltage ASO	AL SD Voltage ASO	521053	11
AL L1L Voltage ASO	AL L1L Voltage ASO	521053	17
SD P-Ambient Air	SD P-Ambient Air	521060	11
AL Emerg. Stop fail	AL Emergency Stop Failed	521061	31
AL CAN Engine St.Loc	AL CAN Engine Start Lock	521062	31
SD P-Fuel bef. Add.s	SD P-Fuel bef. Add.sec.fuelfilter	521063	11
AL L1 P-Fuel Add.sec	AL L1 P-Fuel Add.sec.fuelfilt. Diff	521063	15
AL L2 P-Fuel b.o.F.	AL L2 P-Fuel b.o.F.	521064	0
SD P-Fuel b.o.F.	SD P-Fuel b.o.F.	521064	11
AL L1 P-Fuel b.o.F.	AL L1 P-Fuel b.o.F.	521064	15
AL Emission Warning	AL Emission Warning	521067	31
AL Gas Path Warning	AL Gas Path Warning	521068	31
AL Gas Path Fault	AL Gas Path Fault	521069	31
AL GPE Lambda v.inva	AL GPE Lambda value invalid	521070	31
AL NOx value invalid	AL NOx value invalid	521071	31

DEIF Display	MTU	SPN	FMI
AL Thermal Manag.Act	AL Thermal Management active	521072	31
AL p5 ctrlvar LO Act	AL p5 ctrlvar lower limit active	521073	31
AL p5 ctrlvar max BO	AL p5 ctrlvar max BOI min active	521074	31
AL Lambda ctrlvar li	AL Lambda ctrlvar limit min active	521075	31
AL Lambda ctrlvar ma	AL Lambda ctrlvar max BOI min act	521076	31
AL Nox p5 min BOI ma	AL Nox p5 min BOI max active	521077	31
AL NOx p5 max BOI mi	AL NOx p5 max BOI min active	521078	31
AL GPS p5 ctrlvar ma	AL GPS p5 ctrlvar max active	521080	31
AL GPS p5 ctrlvar mi	AL GPS p5 ctrlvar min active	521081	31
AL GPS p5 ctrlvar mi	AL GPS p5 ctrlvar min active	521082	31
AL Bypass Throttle 2	AL Bypass Throttle 2 Defect	521083	31
AL Bypass Valve Def.	AL Bypass Valve Defect	521084	31
AL Intake AirThrottl	AL Intake AirThrottle Defect	521085	31
SD Bosch LSU LambdaS	SD Bosch LSU Lambda Sensor	521086	11
AL EGR Throttle BDef	AL EGR Throttle B Defect	521087	31
AL L2 Delta T-NT Int	AL L2 Delta T-NT Intercooler	521088	0
AL L1 Delta T-NT Int	AL L1 Delta T-NT Intercooler	521088	17
AL Lim T-Coolant LT	AL Lim T-Coolant LT Fan	521089	31
AL ETC2 CutIn Failur	AL ETC2 CutIn Failure	521091	31
AL Prelubrication	AL Prelubrication Fault	521092	31
AL MCR exceeded 1h	AL MCR exceeded 1 hour	521093	31
AL EMU Parameter Not	AL EMU Parameter Not Supported	521094	31
SD Spinning Value	SD Spinning Value	521095	11
AL MCR exceeded	AL MCR exceeded	521096	31
AL Rail 2 Leakage	AL Rail 2 Leakage FMI-	521097	31
HI T-Exhaust EMU	HI T-Exhaust EMU	521098	15
LO T-Exhaust EMU	LO T-Exhaust EMU	521098	17
HI T-Coolant EMU	HI T-Coolant EMU	521099	15
SD Coil Current	SD Coil Current	521100	11
AL ETC4 CutIn Failur	AL ETC4 CutIn Failure	521103	31
AL ETC3 CutIn Failur	AL ETC3 CutIn Failure	521104	31
AL Wiring POM Starte	AL Wiring POM Starter 1	521105	11
AL Wiring POM Starte	AL Wiring POM Starter 2	521106	11
AL Open Load POM Alt	AL Open Load POM Alternator	521107	11
AL L1 T-Raw W a. Pum	AL L1 T-Raw water after Pump	521108	17
AL CAN POM Node Lost	AL CAN POM Node Lost	521109	11
AL Low Starter Volta	AL Low Starter Voltage	521110	1
AL POM Error	AL POM Error	521111	31
AL Wrong POM-ID	AL Wrong POM-ID	521112	31

DEIF Display	MTU	SPN	FMI
Write Error Flash	Write Error Flash	521113	31
Oillevel Calibration	Oillevel Calibration Error	521114	31
SD P-Intake Air a.FA	SD P-Intake Air after Filter A	521115	11
SD P-Intake Air a.FB	SD P-Intake Air after Filter B	521116	11
SS Engine Oversp. CS	SS Engine Overspeed Camshaft	521117	0
SD T-Lube Oil Pan	SD T-Lube Oil Pan	521118	11
AL T-Lube Oil Pan LO	AL T-Lube Oil Pan Low	521118	17
SD P-Oil Refill Pump	SD P-Oil Refill Pump	521119	11
LO P-Oil Refill Pump	LO P-Oil Refill Pump	521119	17
SD T-Exhaust A+B	SD T-Exhaust A+B	521120	11
SD T-Lube Oil Pan	SD T-Lube Oil Pan J1939	521121	11
AL MB Valve error	AL MB Valve error	521122	31
AL L2 P-DPF Norm Dif	AL L2 P-DPF Norm Difference	521123	0
AL L4 P-DPF Norm Dif	AL L4 P-DPF Norm Difference	521123	1
AL L1 P-DPF Norm Dif	AL L1 P-DPF Norm Difference	521123	15
AL L3 P-DPF Norm Dif	AL L3 P-DPF Norm Difference	521123	17
AL DPF Rigorous TM A	AL DPF Rigorous TM Aborted	521124	11
AL DPF Periodic Rigo	AL DPF Periodic Rigorous TM	521125	11
AL DPF Flash ReadErr	AL DPF Flash Read Error	521126	11
AL DEF Nozzle Damage	AL DEF Nozzle Damage	521127	11
AL SmartConnect Lost	AL Smart Connect Lost	521128	11
SD-T-Sea water a.Pum	SD-T-Sea water after Pump	521129	11
SD-P-LOil, HP Pump A	SD-P-Lube Oil at HP Pump A	521131	11
SD-P-LOil, HP Pump B	SD-P-Lube Oil at HP Pump B	521132	11
SD Charger 5 Speed	SD Charger 5 Speed	521133	11
AL F1 NOx bef. SCR	AL F1 NOx before SCR SensorDefect	521134	11
AL F1 NOx bef. SCR	AL F1 NOx before SCR Comm Lost	521134	31
AL F1 NOx a. SCR	AL F1 NOx after SCR SensorDefect	521135	11
AL F1 NOx a. SCR C	AL F1 NOx afterSCR Comm Lost	521135	31
AL F2 NOx bef. SCR	AL F2 NOx before SCR SensorDefect	521136	11
AL F2 NOx bef. SCR	AL F2 NOx before SCR Comm Lost	521136	31
AL F2 NOx a. SCR	AL F2 NOx after SCR SensorDefect	521137	11
AL F2 NOx a. SCR	AL F2 NOx after SCR Comm Lost	521137	31
AL F3 NOx bef. SCR	AL F3 NOx before SCR SensorDefect	521138	11
AL F3 NOx bef. SCR	AL F3 NOx before SCR Comm Lost	521138	31
AL F3 NOx a. SCR	AL F3 NOx after SCR SensorDefect	521139	11
AL F3 NOx a. SCR	AL F3 NOx after SCR Comm Lost	521139	31
HI ETC1 Idle Speed H	HI ETC1 Idle Speed too High	521140	31
HI ETC2 Idle Speed H	HI ETC2 Idle Speed too High	521141	31

DEIF Display	MTU	SPN	FMI
HI ETC3 Idle Speed H	HI ETC3 Idle Speed too High	521142	31
HI ETC4 Idle Speed H	HI ETC4 Idle Speed too High	521143	31
HI ETC5 Idle Speed H	HI ETC5 Idle Speed too High	521144	31
AL ETC1 Speed Dev.	AL ETC1 Speed Deviation	521145	31
AL ETC2 Speed Dev.	AL ETC2 Speed Deviation	521146	31
AL ETC3 Speed Dev.	AL ETC3 Speed Deviation	521147	31
AL ETC4 Speed Dev.	AL ETC4 Speed Deviation	521148	31
AL ETC5 Speed Dev.	AL ETC5 Speed Deviation	521149	31
AL ETC Job Rotation	AL ETC Job Rotation	521150	31
AL EIL Different Eng	AL EIL Different Engine Number	521151	31
AL ash volume	AL ash volume	521152	31
AL HIHI T-ChargeAEGR	AL HIHI T-Charge Air before EGR	521153	0
AL HI T-ChargeAirEGR	AL HI T-Charge Air before EGR	521153	15
SD T-Charge Air bef.	SD T-Charge Air before EGR	521153	31
AL HIHI T-Char.ADAB	AL HIHI T-Charge Air Diff AB	521154	0
AL HI T-ChargeAirDAB	AL HI T-Charge Air Diff AB	521154	15
AL Ext.Start, HD HI	AL External Start and HD too high	521155	31
AL Max. BlankShot TE	AL Max. Blank Shot time expired	521156	31
AL HSB1 Comm. lost	AL HSB1 Communication Lost	521157	31
AL HSB1 Actuat. def.	AL HSB1 Actuator defect	521158	31
AL NOx ATO1 Sen. Def	AL NOx ATO1 Sensor Defect	521159	31
AL HSB2 Comm. lost	AL HSB2 Communication Lost	521160	31
AL HSB2 Actuator def	AL HSB2 Actuator defect	521161	31
Defect DEFPsns/act S	Defect in DEF pipe sns/act system	521162	31
DEF Tank ht. sns/act	DEF Tank ht. sns/act defect	521163	31
AL HSB3 Comm. lost	AL HSB3 Communication Lost	521164	31
AL HSB3 Actuator def	AL HSB3 Actuator defect	521165	31
AL HSB4 Comm. lost	AL HSB4 Communication Lost	521166	31
AL HSB4 Actuator def	AL HSB4 Actuator defect	521167	31
AL MB Valve defect 2	AL MB Valve defect 2	521168	31
AL EGR A Ref.learn	AL EGR A Reference learn failed	521169	31
AL Urea Tank L.Empty	AL Urea Tank Level Empty	521170	31
AL EGR B Ref. learn	AL EGR B Reference learn failed	521171	31
AL Bypass A Ref.	AL Bypass A Reference learn failed	521172	31
AL Bypass B Fast lea	AL Bypass B Fast learn failed	521173	31
AL Dispenser Ref.lea	AL Dispenser Reference learn failed	521174	31
AL Intake Thr. Ref L	AL Intake Throttle Ref learn failed	521175	31
AL SCR AdBlue press.	AL SCR AdBlue pressure	521176	31
AL Flow1 SU 1 Comm L	AL Flow 1 Supply Unit 1 Comm Lost	521177	31

DEIF Display	MTU	SPN	FMI
AL Flow1 SU 2 Comm L	AL Flow 1 Supply Unit 2 Comm Lost	521178	31
AL Flow2 SU 1 Comm L	AL Flow 2 Supply Unit 1 Comm Lost	521179	31
AL Flow2 SU 2 Comm L	AL Flow 2 Supply Unit 2 Comm Lost	521180	31
AL Flow3 SU 1 Comm L	AL Flow 3 Supply Unit 1 Comm Lost	521181	31
AL Flow3 SU 2 Comm L	AL Flow 3 Supply Unit 2 Comm Lost	521182	31
AL Trican Comm. Lost	AL Trican Communication Lost	521183	31
AL OLT Comm. Lost	AL OLT Communication Lost	521184	31
AL SD T Coolant Cy.H	AL SD T Coolant at cylinder head	521187	11
HI T-Coolant Cy.Head	HI T-Coolant Cylinder Head	521187	15
SS T-Coolant Cyl. H	SS T-Coolant Cylinder Head	521187	16
AL F1 DEF consump.	AL F1 DEF consumption error	521188	31
AL F1 DEF balance	AL F1 DEF balance error	521189	31
AL F1 Raw gas emissi	AL F1 Raw gas emission error	521190	31
AL F1 NOx Annaeherun	AL F1 NOx Annaeherung error	521191	31
AL Texh bef SCR F1F2	AL T-Exh bef SCR between F1 and F2	521192	31
AL F1 Erw Tabg v SCR	AL F1 Erw T-Abg vor SCR Error	521193	31
AL F1Exp TExh af SCR	AL F1 Exp T-Exh aft SCR error	521194	31
AL F1 gr TExh bf SCR	AL F1 grad T-Exh bef SCR error	521195	31
AL F2 gr TExh bf SCR	AL F2 grad T-Exh bef SCR error	521196	31
AL F1 gr TExh af SCR	AL F1 grad T-Exh aft SCR error	521198	31
AL F2 gr TExh af SCR	AL F2 grad T-Exh aft SCR error	521199	31
AL SCR F3 T-Exh aft.	AL SCR F3 T-Exh after gradient	521200	31
AL L2 T-Exh.Bef.SCR3	AL L2 T-Exhaust Before SCR F3	521201	0
AL L1 T-Exh.Bef.SCR3	AL L1 T-Exhaust Before SCR F3	521201	15
AL L2 T-Exh.Aft.SCR3	AL L2 T-Exhaust After SCR F3	521202	0
AL L1 T-Exh.Aft.SCR3	AL L1 T-Exhaust After SCR F3	521202	15
AL SCR oper. T TooLO	AL SCR operating temperature too-LOW	521203	17
AL Cataly conv. F1	AL Cataly conversion too lowF1	521204	17
AL Cataly conv. F2	AL Cataly conversion too lowF2	521205	17
AL Cataly conv. F3	AL Cataly conversion too lowF3	521206	17
AL Invalid LSI Ch.Co	AL Invalid LSI Channel Config	521207	31
AL SCR SU fault(s)	AL SCR SU fault(s) exist	521208	31
AL ETC0 CutIn Fail	AL ETC0 CutIn Failure	521209	31
AL ETC1 CutIn Fail	AL ETC1 CutIn Failure	521210	31
AL SCR SU fault(s)F2	AL SCR SU fault(s) exist F2	521211	31
AL SCR SU Prim. RF1	AL SCR SU Priming Request F1	521213	31
AL SCR SU Prim. RF2	AL SCR SU Priming Request F2	521214	31
AL L1 P-Oil bef. PuA	AL L1 P-Oil before HD Pump A	521216	17
AL L1 P-Oil bef. PuB	AL L1 P-Oil before HD Pump B	521217	17

DEIF Display	MTU	SPN	FMI
SD Loadp.Analog filt	SD Loadp.Analog filt	521218	11
SD T-Intake Air B	SD T-Intake Air B	521219	11
SS P-Coolant befEng	SS P-Coolant before Engine	521220	1
SD P-Coolant b.Engin	SD P-Coolant b.Engine	521220	11
LO P-Coolant befEngi	LO P-Coolant before Engine	521220	17
SD P-Charge Mix Diff	SD P-Charge Mix Diff	521221	11
HI P-Charge Mix Diff	HI P-Charge Mix Diff	521221	31
HIHI P-ChargeMixDiff	HIHI P-Charge Mix Diff	521221	31
SD ele. Eng powerAI2	SD electr. engine power AI2	521222	31
AL CR Trig. Eng.Stop	AL CR Trigger Engine Stop	521223	31
HIHI Power Diff	HIHI Power Difference	521224	0
LOLO Power Diff	LOLO Power Difference	521224	1
AL GasControlCheck	AL GasControlCheck Fault	521225	31
AL Ignition Fault	AL Ignition Fault	521226	31
AL GasValve Fault	AL GasValve Fault	521227	31
AL EngineSpeedCollap	AL EngineSpeedCollapse Fault	521228	31
AL SAM Missing Data	AL SAM Missing Data Fault	521229	31
L3 AI CANMaxRetar. T	L3 AI CAN Max. Retarded Timing	521235	0
L1 AI CANMaxRetar. T	L1 AI CAN Max. Retarded Timing	521235	15
L2 AI CANMaxRetar. T	L2 AI CAN Max. Retarded Timing	521235	16
AL Cir. Break closed	AL Circuit Breaker Closed	521236	31
AL Hut Changespeed M	AL Hut Changespeed	521237	31
HIHI Actual Value Hu	HIHI Actual Value Hu	521238	0
LOLO Actual Value Hu	LOLO Actual Value Hu	521238	1
HI Actual Value Hu	HI Actual Value Hu	521238	15
LO Actual Value Hu	LO Actual Value Hu	521238	17
AI Knock Intensity	AI Knock Intensity	521239	31
AL Preheating Error	AL Preheating Error	521240	31
AL GET Comm Lost	AL GET Comm Lost	521241	31
AL IC92x Comm Lost	AL IC92x Comm Lost	521242	31
AL FSeries Comm Lost	AL FSeries Comm Lost	521243	31
AL TecJet Comm Lost	AL TecJet Comm Lost	521244	31
AL ProActA Comm Lost	AL ProActA Comm Lost	521245	31
AL ProActB Comm Lost	AL ProActB Comm Lost	521246	31
AL NOxA Comm Lost	AL NOxA Comm Lost	521247	31
AL NOxB Comm Lost	AL NOxB Comm Lost	521248	31
AL Oil Refill Error	AL Oil Refill Error	521249	31
AL GET Yellow	AL GET Yellow	521250	31
AL IC92x Yellow	AL IC92x Yellow	521251	31

DEIF Display	MTU	SPN	FMI
AL FSeries Yellow	AL FSeries Yellow	521252	31
AL TecJet Yellow	AL TecJet Yellow	521253	31
AL ProActA Yellow	AL ProActA Yellow	521254	31
AL ProActB Yellow	AL ProActB Yellow	521255	31
AL NOxA Yellow	AL NOxA Yellow	521256	31
AL NOxB Yellow	AL NOxB Yellow	521257	31
AL GET Red	AL GET Red	521258	31
AL IC92x Red	AL IC92x Red	521259	31
AL FSeries Red	AL FSeries Red	521260	31
AL TecJet Red	AL TecJet Red	521261	31
AL ProActA Red	AL ProActA Red	521262	31
AL ProActB Red	AL ProActB Red	521263	31
AL NOxA Red	AL NOxA Red	521264	31
AL NOxB Red	AL NOxB Red	521265	31
AL Lube Oil Min	AL Lube Oil Min	521266	31
AL Lube Oil Max	AL Lube Oil Max	521267	31
LO Oil Refill	LO Oil Refill	521268	31
HI Oil Refill	HI Oil Refill	521269	31
HI Lube Oil L. Ref	HI Lube Oil Level refill	521270	31
AL ActFuelValvePosL1	AL ActFuelValvePos L1	521271	31
AL MIC5 Yellow	AL MIC5 Yellow	521272	31
AL MIC5 Red	AL MIC5 Red	521273	31
AL MIC5 Comm Lost	AL MIC5 Comm Lost	521274	31
AL ESI activated	AL ESI activated	521275	31
AL MIC5 Sign. diff	AL MIC5 Signature difference	521276	31
AL CAN3 Bus Off	AL CAN3 Bus Off	521277	31
AL CAN3 Error Pas	AL CAN3 Error Passive	521278	31
AL CAN4 Bus Off	AL CAN4 Bus Off	521279	31
AL CAN4 Error Pas	AL CAN4 Error Passive	521280	31
HIHI Delta NOx (A-B)	HIHI Delta NOx (A-B)	521297	0
HI Delta NOx (A-B)	HI Delta NOx (A-B)	521297	15
HI Delta p5 for NOx	HI Delta p5 for NOx	521298	15
AL MIC5 para. DL act	AL MIC5 parameter download active	521299	31
AL F2 DEF consumptio	AL F2 DEF consumption error	521332	31
AL F2 DEF balance	AL F2 DEF balance error	521333	31
AL F2 Raw gas emissi	AL F2 Raw gas emission error	521334	31
AL F2 Nox Annaeherun	AL F2 NOx Annaeherung error	521335	31
AL TExh af. SCR F1F2	AL T-Exh aft SCR between F1 and F2	521336	31
AL F2Exp TExh bf SCR	AL F2 Exp T-Exh bef SCR error	521337	31

DEIF Display	MTU	SPN	FMI
AL F2Exp TExh af SCR	AL F2 Exp T-Exh aft SCR error	521338	31
AL SCRSU AdBlue Pres	AL SCR SU AdBlue Pressure	521350	31
AL Check Sum IIG	AL Check Sum IIG	521351	31
SS ETC5 Overspeed	SS ETC5 Overspeed	521352	0
HI ETC5 Overspeed	HI ETC5 Overspeed	521352	15
AL NOxATO2 Sens Def.	AL NOx ATO2 Sensor Defect	521353	11
AL Nox ATO2 Comm.err	AL NOx ATO2 Communication Lost	521353	19
AL DEF Tank Lev. low	AL DEF Tank Level low	521354	17
AL T.Breakd.NOx sen.	AL Total breakdown NOx sensors	521355	31
AL Redun.lossNOx sen	AL Redundancy loss NOx sensors	521356	31
AL Engine Cold Activ	AL Engine Cold Active	521357	31
AL Engine Cool. T.SD	AL Engine Coolant Temperature SD	521358	11
AL Intake Air T. SD	AL Intake Air Temperature SD	521359	11
AL DEF Tank T. SD	AL DEF Tank Temperature SD	521360	11
AL Engine Cool.V.DEF	AL Engine Coolant Valve Defect(DEF)	521361	31
AL Fl.EgrA Comm.lost	AL Flap Egr A Communication Lost	521362	31
AL Fl.EgrA T.t. high	AL Flap Egr A Temperature too high	521363	0
AL Fl.EgrA Targ.pos	AL Flap Egr A Targetposition	521364	31
AL Fl.EgrB Comm.lost	AL Flap Egr B Communication Lost	521365	31
AL Fl.EgrB T.t. high	AL Flap Egr B Temperature too high	521366	0
AL Fl.EgrB Targ.pos	AL Flap Egr B Targetposition	521367	31
AL Fl.By.A Comm.lost	AL Flap BypassA Communication Lost	521368	31
AL Fl.By.A T.to.high	AL Flap BypassA Temperature too high	521369	0
AL Fl. By. A Tar.pos	AL Flap Bypass A Targetposition	521370	31
AL Fl.By B comm.lost	AL Flap BypassB Communication Lost	521371	31
AL Fl.Byp.B. T. high	AL Flap BypasB Temperature too high	521372	0
AL Fl.Byp B Tar.pos.	AL Flap Bypass B Targetposition	521373	31
AL Fl.Disp.Comm.lost	AL Flap Dispens Communication Lost	521374	31
AL Fl.Disp.T.toohigh	AL Flap DispensTemperature too high	521375	0
AL Fl. Disp. Tar.pos	AL Flap Dispenser Targetposition	521376	31
AL Fl. Int.Comm.lost	AL Flap Intake Communication Lost	521377	31
AL Fl.Int.T.too high	AL Flap Intake Temperature too high	521378	0
AL Fl.int.A Tar.pos.	AL Flap Intake Air Targetposition	521379	31
AL Fl.EgrA Calibr.Dr	AL Flap Egr A Calibration Drive Err	521380	31
AL Fl.EgrB Calibr.Dr	AL Flap Egr B Calibration Drive Err	521381	31
AL Fl.ByA Calibr. Dr	AL Flap BypassA Calibr. Drive Err	521382	31
AL Fl.Byp Calibr. Dr	AL Flap BypassB Calibr. Drive Err	521383	31
AL Fl.Disp.Calibr Dr	AL Flap Dispenser Calibr Drive Err	521384	31
AL Fl.Int.A.Cali. Dr	AL Flap Intake Air Calibr Drive Err	521385	31

DEIF Display	MTU	SPN	FMI
AL L2 PCV Defect	AL L2 PCV Defect	521386	0
AL L1 PCV Defect	AL L1 PCV Defect	521386	15
AL L2 PCV2 Defect	AL L2 PCV2 Defect	521387	0
AL L1 PCV2 Defect	AL L1 PCV2 Defect	521387	15
AL Short Cir.Ana.O 1	AL Short Circuit Analog Out 1	521388	6
AL Short Cir.Ana.O 2	AL Short Circuit Analog Out 2	521389	6

3.12.4 Tier 4 aftertreatment support

For a general description, see Tier 4 Final/Stage V. Tier 4 is supported if the MTU ECU is version 9 or later.

3.12.5 Write commands

Use parameter 7563 (EIC Controls) to enable write commands.

MTU J1939 Smart Connect write commands

Command	Description
Speed control	In general, this is the same as the J1939 command. However, the CAN bus ID for speed control is 0xC0000EA.
Idle speed	See the J1939 command.
Start/Stop*	This sends the standard J1939 command to start the engine if it is stopped, and stops the engine if it is running. The AGC also sends the required proprietary MTU start-stop commands. In addition, the AGC ignores the M-Logic flags and also always sends the more advanced EIC start/stop enable command (see the M-Logic commands for details). The AGC determines whether to start or stop the engine. The decision is based on the AGC's inputs, logic and calculations.
MTU alternate droop setting*	If the M-Logic command (*Output, EIC Commands, EIC MTU Alternate Droop Setting*) is activated, the ACG commands the ECU to activate droop, using the setting in parameter 2771. The function is MTU-specific.
Frequency selection (50 or 60 Hz)	The AGC automatically writes the nominal frequency (50 or 60 Hz) to the ECU. The nominal frequency is defined in parameters 6001, 6011, 6021 and 6031. The AGC writes 50 Hz if the nominal frequency is less than 55 Hz, and 60 Hz if the nominal frequency is more than 55 Hz. Specifically, the AGC sends PGN GC1 0xFD93. On byte 4, the AGC writes 000 for 50 Hz, and 001 for 60 Hz.
Demand switch	Use menu 2790 to select the speed control type: • Digital (*Up/down ECU* with relay controls) • Analogue (*Analog ECU Relative* for analogue VDC control) • J1939 commands (*Analog CAN*). See the MTU documentation for the ECU8 for more information about switching between normal and emergency operation in local or remote. If the MTU ECU cannot detect a valid speed demand signal, it sends *AI Speed deman def.*. This alarm indicates that the MTU ECU may see a CAN speed bias signal, and is setup to 3 - ADEC Analog Relative or that 4 - ADEC Analog relative is used and the signal is out of range (not connected, and so on). When this happens, check the settings on the MTU ECU, PR500 (MTU SAM/Diasys reference) 0 - Default dataset ADEC 1 - ADEC Increase/Decrease Input 2 - CAN Increase/Decrease Input 3 - ADEC Analog Absolute 4 - ADEC Analog Relative

Command	Description
	5 - ADEC Frequency Input 6 - CAN Analog 7 - CAN Speed Demand Switch
Reset trip fuel counter*	This command resets the trip fuel consumption counter. The command is activated through M-Logic (*Output, EIC commands, EIC Reset trip fuel*).
Intermittent oil priming*	Engage the pre-lubrication oil pump (if installed). The command is activated through M-Logic (*Output, EIC commands, EIC Intermittent oil priming*).
Shutdown override	See the J1939 command.
Enable Cylinder Cutout*	The command can be used to engage all cylinders if the engine is running with one bank only. The command is activated through M-Logic (*Output, EIC commands, EIC Enable Cylinder Cutout*).
Speed increase*	This command increases the speed of the engine by a small amount. The command is activated through M-Logic (*Output, EIC commands, EIC Speed Increase)*.
Speed decrease*	This command decreases the speed of the engine by a small amount. The command is activated through M-Logic (*Output, EIC commands, EIC Speed Decrease)*.
Engine overspeed test*	The command is activated through M-Logic (*Output, EIC commands, EIC Engine overspeed test*). The function is MTU-specific.
Engine operating mode*	Switches the operating mode of the engine. The command is activated through M-Logic (*Output, EIC commands, EIC Engine opr mode command*).
Speed gov. param command*	Parameter switch for selection between: Default and Variant 1. M-Logic is used to select variant 1 parameters (*Output, EIC Commands, EIC Engine speed gov param command*). The function is MTU-specific.
Binary speed enable*	The ECU uses (or does not use) EIC binary speed for the speed bias. The command is activated through M-Logic (*Output, EIC commands, EIC binary Speed In-De Enable*). The function is MTU-specific.
Fast engine start*	The command is activated through M-Logic (*Output, EIC commands, MTU Fast Engine Start*). The function is MTU-specific.

*Note: These are M-Logic commands. You can use Modbus virtual events to activate these commands. For more information, see Using Modbus to activate M-Logic commands.

3.12.6 J1939 measurement

See the J1939 description for the measurements that the AGC supports. A value specific to MTU Smart Connect is listed below.

Text	PGN	S	L	P	SPN	Unit	J1939-71 scaling	Offset
EIC faults	65284/0xFF04	1	2	6	1218	-	1/bit	0

3.12.7 M-Logic events

The following additional events are available in M-Logic under *Events, EIC event* for MTU J1939 SmartConnect.

Event	Description
MTU LIMIT LAMP OFF (lamp)	Proprietary event.
MTU LIMIT LAMP ON (solid)	Proprietary event.
MTU LIMIT LAMP ON (blink)	Proprietary event.
MTU Limit Lamp ON Blink 2Hz (status)	Proprietary event.
MTU TIER4 Lamp ON Blink 2Hz (status)	Proprietary event.
MTU Buzzer Lamp OFF (status)	Proprietary event.

Event	Description
MTU Buzzer Lamp ON (solid)	Proprietary event.
MTU Buzzer Lamp ON Blink 1Hz (status)	Proprietary event.
MTU Buzzer Lamp ON Blink 2Hz (status)	Proprietary event (2 Hz is more severe than 1 Hz).

3.12.8 Modbus alarms

Alarms, status and measurement table (read only) function code 04h.

EIC alarms that activate alarms in the AGC

Addr.	Bit	Type	SPN	FMI
60	0	7570 ECU communication error		
60	1	7580 ECU warning		
60	2	7590 ECU shutdown		
60	3	7600 EC overspeed		
60	4	7610 ECU coolant water temp. 1		
60	5	7620 ECU coolant water temp. 2		
60	6	7630 ECU oil pressure level 1		
60	7	7640 ECU oil pressure level 2		
60	8	7650 ECU oil temp. 1		
60	9	7660 ECU oil temp. 2		
60	10	7670 ECU coolant level 1		
60	11	7680 ECU coolant level 2		
1020	0	7570 ECU communication error		
1021	0	SS T - Fuel	174	0
1021	1	SD T – Fuel	174	11
1021	14	ECU Yellow Lamp	188	
1021	15	ECU Red Lamp	190	
1022	0	SS T-Coolant	110	16
1022	1	SD T-Coolant	110	11
1022	2	AL L1 Level Coolant Water	111	17
1022	3	SD Level Coolant Water	111	11
1022	4	HI P-Fuel (Common Rail)	157	15
1022	5	LO P-Fuel (Common Rail)	157	17
1022	6	SD P-HD	157	11
1022	7	LO ECU Power Supply Voltage	158	17
1022	8	LOLO ECU Power Supply Voltage	158	1
1022	9	HI ECU Power Supply Voltage	158	15
1022	10	HIHI ECU Power Supply Voltage	158	0
1022	11	SD ECU Power Supply Voltage	158	11
1022	12	HI T - Intake Air	172	15
1022	13	HIHI T - Intake Air	172	0

Addr.	Bit	Type	SPN	FMI
1022	14	SD T – Intake Air	172	11
1022	15	HI T – Fuel	174	15
1023	0	HI P-Diff-Lube Oil	99	15
1023	1	SS P-Diff- Lube Oil	99	0
1023	2	SD P-Diff- Lube Oil	99	11
1023	3	LO P- Lube Oil	100	17
1023	4	SS P- Lube Oil	100	1
1023	5	SD P-Lube Oil	100	11
1023	6	HI P-Crankcase	101	15
1023	7	SS P-Crankcase	101	0
1023	8	SD P-Crankcase	101	11
1023	9	HI ETC1 Overspeed	103	15
1023	10	SS ETC1 Overspeed	103	0
1023	11	SD Charger Speed 1	103	11
1023	12	HI T-Charge Air	105	15
1023	13	SS T-Charge Air	105	0
1023	14	SD T-Charge Air	105	11
1023	15	HI T-Coolant	110	15
1024	0	EIC Communication Error (Warning)	-	-
1024	5	HI T-Coolant Intercooler	52	15
1024	6	SS T-Coolant Intercooler	52	0
1024	7	SD T-Coolant Intercooler	52	11
1024	8	LO P-Fuel	94	17
1024	9	SS P-Fuel	94	1
1024	10	SD P-Fuel before Filter	94	11
1024	11	HI P-Diff-Fuel	95	15
1024	12	SS P-Diff-Fuel	95	0
1024	13	SD P-Diff Fuel	95	11
1024	14	HI Level Water Fuel Prefilter	97	15
1024	15	SD Level Water Fuel Prefilter	97	11

EIC alarms are only Modbus bits

Addr.	Bit	Type	SPN	FMI
1064	0	HI T-Lube Oil	175	15
1064	1	SS T-Lube Oil	175	0
1064	2	SD T-Lube Oil	175	11
1064	3	SS Idle Speed not Reached	188	1
1064	4	SS Engine Overspeed	190	0
1064	5	SS Engine Speed too Low (only S2000, PR2.2500.027)	190	1
1064	6	SD Speed Demand	898	11

Addr.	Bit	Type	SPN	FMI
1064	7	HI T-ECU	1136	15
1064	8	SD T-ECU	1136	11
1064	9	AL Override applied	1237	31
1064	10	LO P-Fuel 2 (Common Rail)	1349	17
1064	11	HI P-Fuel 2 (Common Rail)	1349	15
1064	12	SD P-HD 2	1349	11
1064	13	SD-P-Fuel before Engine	1381	11
1064	14	AL L1 P-Fuel before Engine	1381	17
1064	15	SD P-Charge Air	3563	11
1065	0	LO Coolant Level Intercooler	3668	17
1065	1	SD Coolant Level Intercooler	3668	11
1065	2	SS T-Coolant L3	520923	0
1065	3	AL Power too high	520924	15
1065	4	LO U-PDU	520982	17
1065	5	LOLO U-PDU	520982	1
1065	6	HI U-PDU	520982	15
1065	7	HIHI U-PDU	520982	0
1065	8	SD U-PDU	520982	11
1065	9	SS Release Speed Not Reached	521002	1
1065	10	SS Starter Speed Not Reached	521003	1
1065	11	SS T-Preheat	521004	1
1065	12	LO T-Preheat	521004	17
1065	13	AL Stop Camshaft Sensor Defect	521016	31
1065	14	SD Crankshaft Speed	521017	11
1065	15	SD Camshaft Speed	521018	11
1066	0	AL Power Stage Low	521020	31
1066	1	AL Power Stage High	521021	31
1066	2	AL Stop Power Stage	521022	31
1066	3	AL Stop MV-Wiring Ground	521023	31
1066	4	SS Power Reduction Active	521026	31
1066	5	AL Stop SD	521027	31
1066	6	AL Ext. Engine Protection	521029	31
1066	7	AL Power Cut-Off detected	521031	31
1066	8	SD ETC1+ETC2	521038	11
1066	9	SD P-Fuel	521052	11

3.12.9 Modbus analogue values

Measurement table (read only) function code 01h

Addr.	Bit	Content	Unit	Scaling	PGN	SPN
52009		CAN Requested Engine Stop			65281/0xFF01	520568
52003		CAN Engine Start			65281/0xFF01	520569

Measurement table (read only) function code 04h

Addr.	Bit	Content	Unit	Scaling	PGN	SPN
593		Engine Speed	RPM	1/1		190
594		T-Coolant HT	°C/°F	1/1		110
595		P-Lube oil engine	bar/psi	1/10		100
597		T-Lube oil engine intake	°C/°F	1/1		175
598		T-Fuel LP	°C/°F	1/10		174
599		P-Charge-air	bar/psi	1/100		102
602		Engine Fuel Rate	l/h	1/10		183
604		T-Charge-air	°C/°F	1/1		105
608		Engine Percent Load at current speed	%	1/1		92
611		Engine Total Hours of Operation	h	1/1		247
613		Power Supply ECU	V	1/10		158
627		bar/psiometric pressure	bar/psi	1/100		108
637		T-Coolant LT	°C/°F	1/1		52
638		Engine Trip Fuel	l	1/10		182
858		Fuel Consumption	g/kWh	1/1		520575
870	10	Engine Protection System has ShutdownEngine (general stop)	-		65252/0xFEE4	1110
870	11	Engine Overspeed Test	-		65252/0xFEE4	2812
870	12	Engine Alarm Acknowledge feedback	-		65252/0xFEE4	2815
886		Engine Starter Mode	-		61444/0xF004	1675
887		Actual Maximum Available Engine-Percent Torque	%		61443/0xF003	3357
888		Engine Coolant Preheated State	-		65130/0xFE6A	3553
889		Engine Safety and Protection Override Status	-		65360/0xFF50	520202
890		Engine Cylinder Cut-off	-		65360/0xFF50	520252
891		MTU Engine Running State	-		65360/0xFF50	520255
892		External Stop State	-		65360/0xFF50	520833
893		MTU Requested Absolute Torque	Nm		65360/0xFF50	520843
894		Source of Current Speed Demand	-		65361/0xFF51	520263
895		Engine Demanded Operating Speed (Speed Demand Effective)	RPM		65361/0xFF51	520707
896		Feedback of Speed Demand CAN	RPM		65361/0xFF51	520828
897		Feedback of Speed Demand Analogue Input	RPM		65361/0xFF51	520829
898		Speed Demand Fail Mode	-		65361/0xFF51	520830
900		Trip Average Fuel Rate	l/h	1/10		1029

Addr.	Bit	Content	Unit	Scaling	PGN	SPN
901		Engine Rated Power	kW	1/1		166
904		Engine Total Fuel	l	1/10		250
939		Engine ECU Temperature	°C/°F	1/10		1136
940		Actual Droop	%	1/1		520831
978		Trip Engine Running Time	h	1/1		1036
1069		Engine Turning Gear Engaged	-		65281/0xFF01	1206
1070		Engine Shutdown Override Switch	-		65265/0xFEF1	1237
1071		MTU Engine Controller Error Code	-	-		520256
1072		Requested Engine Control Mode	-		64915/0xFD93	4080
1073		Engine Overspeed Test	-		65281/0xFF01	520570

3.13 MTU MDEC module 201/304

3.13.1 Basic information

The MTU MDEC is not a part of J1939. The reading of values, alarms and shutdowns are different.

Engine manufacturer: MTU
Controller types: MDEC, module M.201 or M.304
Engine types: Series 2000 and 4000
DEIF Utility software parameter 7561: Select **MDEC 2000/4000 M.303**
Communication based on: MTU
Supported options: H5, H12
AGC can write commands: Yes
Baud rate: 125 kb/s

3.13.2 Write commands

Use parameter 7563 (EIC Controls) to enable write commands.

MTU MDEC module 201/304 write command

Command	Description
Speed control	To enable speed regulation, select **EIC** in parameter 2781 (Reg. output GOV).

3.14 MTU MDEC module 302/303

3.14.1 Basic information

The MTU MDEC is not a part of J1939. The reading of values, alarms and shutdowns are different.

Engine manufacturer: MTU
Controller types: MDEC, module M.302 or M.303
Engine types: Series 2000 and 4000
DEIF Utility software parameter 7561: Select **MDEC 2000/4000 M.302** for module M.302, and **MDEC 2000/4000 M.303** for module M.303.
Communication based on: MTU
Supported options: H5, H12
AGC can write commands: Yes
Baud rate: 125 kb/s

3.14.2 Displaying alarms

Below is a list of alarms that can be shown on the display. The alarms will be shown in the alarm window. The alarms can be acknowledged from the display, but they will be visible until the alarm disappears in the ECU.

Alarm	Display text	Warning	Shutdown
MDEC yellow alarm	EIC yellow lamp	X	-
MDEC red alarm	EIC red lamp SD.	-	X
High high engine speed	Overspeed shutdown	-	X
Low low lube oil pressure	L Oil Pres. Shutdown	X	X
High high coolant temperature	H Coolant T Shutdown	X	X
High high lube oil temperature	H Oil Temp. Shutdown	-	X
High intercooler temperature	H Interc. T Warning	X	-
Sensor Defect Coolant Level	SD Coolant Level	X	-
Low low coolant level	L Cool. Lev. Shutdown	-	X
MDEC ECU failure	MDEC ECU Failure	-	X
Low fuel oil pressure	LO P-Fuel Oil	X	-
Low Lube oil pressure	L Oil Pres. Warning	X	-
Low Common rail fuel pressure	LO P-Fuel Com-Rail	X	-
High Common rail fuel pressure	HI P-Fuel Com-Rail	X	-
Override feedback from ECU	SS Override	X	-
Low preheat temperature	AL Preheat Temp. Low	X	-
Low low Charge air coolant level	SS Cool Level Ch-Air	X	-
Power amplifier 1 failure	AL Power Amplifier 1	X	-
Power amplifier 2 failure	AL Power Amplifier 2	X	-
Transistor output status	AL Status Trans-Outp	X	-
Low ECU power supply voltage	LO ECU Power Supply	X	-
High ECU power supply voltage	HI ECU Power	X	-
High charge air temperature	HI T-Charge Air	X	-
High Lube oil temperature	HI T-Lube Oil	X	-

Alarm	Display text	Warning	Shutdown
High ECU temperature	HI T-ECU	X	-
Low engine speed	SS Eng. Speed Low	X	-
Check error code	AL Check Error Code	X	-
Common rail leakage	AL Com. Rail Leakage	X	-
Automatic engine stop	AL Aut. Engine Stop	X	-
MG Start speed not reached	MG Start Speed Fail	X	-
MG runup speed not reached	MG Runup Speed Fail	X	-
MG idle speed reached	MG Idle Speed Fail	X	-
Low low ECU power supply voltage	LOLO ECU Pow. Supply	X	-
High high ECU power supply voltage	HIHI ECU Pow. Supply	X	-
Sensor Defect coolant level charge air	SD Cool Level Ch-Air	X	-
High fuel temperature	Hi T-Fuel	X	-

Note: "-" means that the alarm is not supported.

3.14.3 Display texts

Display readings
Act-Droop
Battery
Camshaft
ECU Stop activated 1
F speed an
Fuel Rate
INJECT-QUAN
MDEC Faults
Mean T. fuel
Nom power
Operation
P L Oil Lo
P LOil Lolo
P. Ch. Air
P. Fuel
P. Oil
Speed
Speed D SW
T. Ch. Air
T. Coolant
T. Fuel
T. Oil
T-COOL-HI

Display readings
TCOOL-HIHI
T-ECU
T-INTERC
T-LUBE-HI
T-LUBE-HIHI
Total fuel
Trip fuel

3.14.4 Write commands

Use parameter 7563 (EIC Controls) to enable write commands.

MTU MDEC module 302/303 write commands

Command	Description
Speed control	To enable speed regulation, select **EIC** in parameter 2781 (Reg. output GOV).
Reset trip fuel value	MDEC 303 only: The AGC can send this command to the ECU. The command is activated through M-Logic (*Output, EIC commands, EIC Reset trip fuel)*.
Shutdown override	This command can be used in order to prevent shutdown actions from the ECU. The function is activated by the standard AGC function *Shutdown override* (digital input on the AGC). The shutdown override can also be inhibited through M-Logic (*Output, EIC commands, EIC MTU inhibit Shutdown override*).
Inhibit AL speed demand	The command is activated through M-Logic (*Output, EIC commands, EIC MTU inhibit AL speed demand*). The function is MTU-specific.

3.14.5 Modbus alarms

Alarm, status and measurement table (read-only) function code 04h. For MTU MDEC series - 2000/4000 - module 302 & 303.

Addr.	Content	Bit	Type
1020	EIC alarms, DEIF controller	0	EIC communication error
		2	EIC shutdown
		3	EIC overspeed
		4	EIC coolant water temperature 1
		5	EIC coolant water temperature 2
		6	EIC oil pressure 1
		7	EIC oil pressure 2

Addr.	Content	Bit	Type
1022	EIC alarms, engine controller	0	EIC Automatic engine stop
		1	EIC MG start speed fail
		2	EIC Runup speed fail
		3	EIC Idle speed fail
		4	EIC ECU power supply voltage low limit 2
		5	EIC ECU power supply voltage high limit 2
		6	EIC Aftercooler coolant level sensor defect
		7	EIC Fuel temperature high limit 2
1023	EIC alarms, engine controller	0	EIC Common rail fuel pressure limit 1
		1	EIC Common rail fuel pressure limit 2
		2	EIC Override
		3	EIC Preheat temperature low
		4	EIC Charge air coolant level 2
		5	EIC Power amplifier 1
		6	EIC Power amplifier 2
		7	EIC Transistor output status, TAA1 to TAA6
		8	EIC ECU Power supply voltage low limit 1
		9	EIC ECU Power supply voltage high limit 1
		10	EIC Charge air temperature limit 1
		11	EIC Lube oil temperature limit 1
		12	EIC ECU temperature limit 1
		13	EIC Engine speed low limit 1
		14	EIC Check error code
		15	EIC Common rail leakage

Addr.	Content	Bit	Type
1024	EIC alarms, engine controller	0	EIC overspeed, shutdown
		1	EIC low oil pressure, warning
		2	EIC low oil pressure, shutdown
		3	EIC low coolant level, shutdown
		4	EIC MDEC ECU failure, shutdown
		5	EIC high coolant temperature, warning
		6	EIC high coolant temperature, shutdown
		7	EIC high intercooler coolant temp, warning
		8	EIC high oil temperature, shutdown
		9	EIC high charge air temperature, shutdown
		10	EIC defect coolant level switch, warning
		11	EIC MDEC yellow alarm, warning
		12	EIC MDEC red alarm, shutdown
		13	EI communication error
		14	EIC fuel delivery pressure limit 1
		15	EIC fuel delivery pressure limit 2

3.14.6 Modbus analogue values

The readings below are available in the Modbus protocol.

Measurement table (read only) function code 04h

Addr	Content	Unit	Scaling	Description
593	EIC speed	RPM	1/1	Speed
594	EIC coolant temp.	°C/°F	1/10	Coolant temperature
595	EIC oil pressure	bar/psi	1/100	Engine oil pressure
596	EIC no of faults	Faults	1/1	Number of faults
597	EIC oil temp.	°C/°F	1/10	Engine oil temperature
598	EIC fuel temp.	°C/°F	1/10	Fuel temperature
603	EIC charge air press	bar/psi	1/100	Charge air press
604	EIC intake manifold 1 T (or EIC charge air T)	°C/°F	1/10	Intake manifold 1 temperature
611	EIC engine hours	h	1/1	ENGINE HOURS
932	EIC Speed Demand source	Digit	1/1	Identifies speed dem. source 0, Default Dataset ADEC 1, ADEC Incr./Decr. Input 2, CAN Incr./Decr. Input 3, ADEC Analog Absolute 4, ADEC Analog Relative 5, ADEC Frequency Input 6, CAN analog
933	EIC lube oil pressure LO limit	mbar	1/100	Lubrication oil pressure limit 1
934	EIC lube oil pressure LOLO limit	mbar	1/100	Lubrication oil pressure limit 2
935	EIC fuel pressure	bar/psi	1/100	Fuel pressure

Addr	Content	Unit	Scaling	Description
936	EIC coolant limit HI	°C/°F	1/10	Coolant high limit temp. 1
937	EIC coolant limit HIHI	°C/°F	1/10	Coolant high limit temp. 2
938	EIC intercooler coolant	°C/°F	1/10	Intercooler coolant temperature
939	T-ECU	°C/°F	1/10	ECU temperature
940	EIC actual droop	%	1/10	Actual droop percentage
941	EIC act. inject. Quantity	%	1/10	Injection quantity Act. DBR %
946	ECU Stop activated #	bit	Boolean	1: Stop activated, 0: Stop not activated

3.15 Perkins

3.15.1 Basic information

See Caterpillar/Perkins for information about Perkins engines and controllers.

3.16 PSI/Power Solutions

3.16.1 Basic information

Engine manufacturer: PSI/Power Solutions
Engine type: PSI/Power Solutions
DEIF Utility software parameter 7561: Select **PSI/Power Solutions**.
Communication based on: J1939
Supported options: H5, H12
AGC can write commands: Yes
Baud rate: 250 kb/s

3.16.2 Warnings and shutdowns

These standard warnings and shutdowns are supported:

- EIC yellow lamp
- EIC red lamp
- EIC malfunction
- EIC protection

3.16.3 Write commands

Use parameter 7563 (EIC Controls) to enable write commands.

PSI/Power Solutions write commands

Command	Description
Speed control	In general, this is the same as the J1939 command. However, the CAN bus ID for speed control is 0xC0000EA. J1939 TSC1.
Idle speed	See the J1939 command.
Start/Stop	See the J1939 command.
EIC start/stop enable	See the J1939 command.
Shutdown override	See the J1939 command.
Breaker status	The AGC sends these SPNs to indicate the measured state of the generator circuit breakers: SPN 3645: Generator circuit breaker status SPN 3546: Utility circuit breaker status Bit state 000 = Open Bit state 001 = Closed Bit state 010 = Locked out Bit state 011-101 = Available for SAE assignment Bit state 110 = Error Bit state 111 = Not available

3.17 Scania EMS

3.17.1 Basic information

Engine manufacturer: Scania
Controller type: EMS
DEIF Utility software parameter 7561: Select **Scania EMS**.
Communication based on: J1939
Supported options: H5, H7, H12
AGC can write commands: Yes
Baud rate: 250 kb/s

3.17.2 Warnings and shutdowns (DLN2 alarms)

This is a list of warnings and shutdowns that can be shown on the display. Each alarm will be shown as an alarm in the alarm window. The alarms can be acknowledged from the display, but they will be visible until the alarm disappears in the ECU.

Handling of alarms is only active when the engine is running.

Warning/shutdown	DLN2 warning	DLN2 shutdown
EMS warning	X	-
Low oil pressure	X	-
High coolant temp	X	-
Stop limit exceeded	-	X
Charge 61	X	-
EIC yellow lamp	X	-
EIC red lamp	-	X
EIC malfunction	X	-
EIC protection	X	-

Note: If DLN2 is "-" the alarm is not supported.

3.17.3 Write commands

The AGC-4 can only write commands to the engine if the Scania Coordinator is NOT mounted.

Use parameter 7563 (EIC Controls) to enable write commands.

Scania EMS write commands

Command	Description
Speed control	In general, this is the same as the J1939 command. However, the CAN bus ID for speed control is 0xCFF8027, and the CAN bus ID for the offset is 0xCFFF727. J1939 TSC1.
Idle speed	See the J1939 command.
Start/Stop	See the J1939 command.
Shutdown override	See the J1939 command.
Droop	Use M-Logic to enable sending a droop set point: *Output, EIC commands, EIC Droop*. When *EIC Droop* is activated, the AGC sends the droop setting in parameter 2771 as the set point for the ECU droop.
Frequency selection	You can select the nominal speed in parameter 2772 (Scania rpm). The options are:

Command	Description
	• User • 1500RPM • 1800RPM • Low idle If **User** is selected, the AGC bases the nominal speed on the nominal frequency.

INFO
The AGC can send all the above commands to the Scania EMS. The EMS does not necessarily support all of the above commands.

3.18 Scania EMS 2 S6

3.18.1 Basic information

Scania EMS 2 S6 does not use the J1939 SPN/FMI (Suspect Parameter Number/Failure Mode Indicator) system for alarm handling. Instead the DLN2 system is used. For this reason, the alarm handling is also different.

Engine manufacturer: Scania
Controller type: EMS S6 KWP2000
Engine types: Dx9x, Dx12x, Dx16x
DEIF Utility software parameter 7561: Select **Scania EMS2**.
Communication based on: J1939 and DLN2
Supported options: H5, H7, H12
AGC can write commands: Yes
Baud rate: 250 kb/s

3.18.2 Warnings and shutdowns (DLN2 alarms)

This is a list of warnings and shutdowns that can be shown on the display. Each alarm will be shown as an alarm in the alarm window. The alarms can be acknowledged from the display, but they will be visible until the alarm disappears in the ECU.

Handling of alarms is only active when the engine is running.

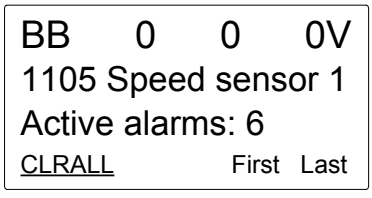
Warning/shutdown	DLN2 warning	DLN2 shutdown
EMS warning	X	-
Low oil pressure	X	-
High coolant temp	X	-
Stop limit exceeded	-	X
Charge 61	X	-
EIC yellow lamp	X	-
EIC red lamp	-	X
EIC malfunction	X	-
EIC protection	X	-

Note: If DLN2 is "-" the alarm is not supported.

3.18.3 Displaying alarms

Press the LOG button for 2 seconds. The display shows the alarm log. The top line shows the AC values, and is not used by the alarm list.

Example:



The Scania KWP2000 log shows a mix of active and passive alarms.

Use the  and  buttons to scroll through the list.

CLRALL: Press ENTER to clear the entire alarm log list. For safety reasons, this requires the master password.

3.18.4 Error log

You can to retrieve and acknowledge alarms in the error log of the Scania EMS S6 (KWP2000).

The alarms available are the same alarms which can be read by the flash combination of the diagnostics lamp on the EMS S6 (please refer to the engine documentation).

INFO
For option H5, the EMS S6 software version and engine number is automatically retrieved when CAN bus communication is established.

Flash code	Display text	Description
11	Overreving	One or both engine speed sensors have indicated above 3000 RPM
12	Speed sensor 1	Engine sensor 1
13	Speed sensor 2	Engine sensor 2
14	Water T sen.	Engine coolant temperature sensor
15	Char. air T sen	Charge air temperature sensor
16	Char. air P sen	Charge air pressure sensor
17	Oil temp. sen.	Oil temperature sensor
18	Oil pres. sen.	Oil pressure sensor
23	Fault in cor.	Fault in coordinator
25	Throttle pedal	CAN message for fine tune nominal speed out of range
27	Emerg. stop o.r	Engine stop overridden
31	Oil pres. prot	Oil pressure protection activated
32	Wrong parameter	Wrong parameter setting for defect CAN communication
33	Battery voltage	Battery voltage out of range
37	Emerg. stop cor	Emergency stop switch activated
43	CAN cir. defect	CAN circuit defect
48	CAN mess. DLN1	CAN message from the coordinator missing or not correct
49	Wrong CAN ver.	Non-matching CAN version in EMS and coordinator
51	Un. inj. cyl. 1	Unit injector cylinder 1
52	Un. inj. cyl. 2	Unit injector cylinder 2
53	Un. inj. cyl. 3	Unit injector cylinder 3
54	Un. inj. cyl. 4	Unit injector cylinder 4
55	Un. inj. cyl. 5	Unit injector cylinder 5
56	Un. inj. cyl. 6	Unit injector cylinder 6
57	Un. inj. cyl. 7	Unit injector cylinder 7
58	Un. inj. cyl. 8	Unit injector cylinder 8
59	Extra ana. inp.	Voltage out of range on extra analogue input pin
61	System shutdown	System shut down incorrectly
66	Coola. l. prot.	Low engine coolant level
86	HW watchdog	Hardware watchdog

Flash code	Display text	Description
87	Fault in RAM	The EMS has detected that the fault code memory is not functioning correctly
89	Seal	The programme in the EMS has been altered in a prohibited manner
94	Coola. shut off	Engine coolant temperature/oil pressure shutdown
96	Overheat prot.	Overheat protection activated
99	Fault in TPU	Error in TPU Timer Processor Unit

3.18.5 Write commands

The AGC-4 can only write commands to the engine if the Scania Coordinator is NOT mounted.

Use parameter 7563 (EIC Controls) to enable write commands.

Scania EMS 2 write commands

Command	Description
Speed control	In general, this is the same as the J1939 command. However, the CAN bus ID for speed control is 0xCFF8027, and the CAN bus ID for the offset is 0xCFFF727. J1939 TSC1.
Idle speed	See the J1939 command.
Start/Stop	See the J1939 command.
Shutdown override	See the J1939 command.
Droop	Use M-Logic to enable sending a droop set point: *Output, EIC commands, EIC Droop*. When *EIC Droop* is activated, the AGC sends the droop setting in parameter 2771 as the set point for the ECU droop.
Frequency selection	You can select the nominal speed in parameter 2772 (Scania rpm). The options are: • User • 1500RPM • 1800RPM • Low idle If **User** is selected, the AGC bases the nominal speed on the nominal frequency.

3.18.6 Modbus alarms

Alarm, status and measurement table (read-only) function code 04h.

EIC alarms

Addr.	Bit	Type
1026	0	EIC overreving
	1	EIC speed sensor 1
	2	EIC speed sensor 2
	3	EIC water temp. sensor
	4	EIC charge air temp. sensor
	5	EIC charge air pressure sensor
	6	EIC oil temp. sensor
	7	EIC oil pressure sensor
	8	EIC fault in cor.
	9	EIC throttle pedal
	10	EIC emergency stop override
	11	EIC oil pressure prot.
	12	EIC wrong parameter
	13	EIC battery voltage
	14	EIC oil pressure prot.
	15	EIC emergency stop cor.
1027	0	EIC CAN cir. defect
	1	EIC CAN mess. DLN1
	2	EIC Wrong CAN version
	3	EIC un. inj. cyl. 1
	4	EIC un. inj. cyl. 2
	5	EIC un. inj. cyl. 3
	6	EIC un. inj. cyl. 4
	7	EIC un. inj. cyl. 5
	8	EIC un. inj. cyl. 6
	9	EIC un. inj. cyl. 7
	10	EIC un. inj. cyl. 8
	11	EIC extra ana. inp.
	12	EIC system shutdown
	13	EIC coola. L. prot.
	14	EIC HW watchdog
	15	EIC fault in RAM

Addr.	Bit	Type
1028	0	EIC seal
	1	EIC coola. shut OFF
	2	EIC overheat prot.
	3	Fault in TPU
	4	Not used
	5	Not used
	6	Not used
	7	Not used
	8	Not used
	9	Not used
	10	Not used
	11	Not used
	12	Not used
	13	Not used
	14	Not used
	15	Not used

3.19 Scania EMS 2 S8

3.19.1 Basic information

Scania EMS 2 S8 does not use the J1939 SPN/FMI (Suspect Parameter Number/Failure Mode Indicator) system for alarm handling. Instead the DLN2 system is used. For this reason, the alarm handling is also different.

Engine manufacturer: Scania
Controller type: EMS S8
Engine types: DC09, DC13, DC16
DEIF Utility software parameter 7561: Select **Scania EMS2 S8**.
Communication based on: J1939, DLN1, DLN2, DLN7 and DLN8
Supported options: H5, H7, H12
AGC can write commands: Yes
Baud rate: 250 kb/s

INFO
The normal shutdown from the ECU activates the AGC alarm *EIC warning* (menu 7580).

3.19.2 Warnings and shutdowns

These standard warnings and shutdowns are supported:

- EIC yellow lamp
- EIC red lamp
- EIC malfunction
- EIC protection

3.19.3 Safe signal for regeneration

To ensure safety, the following conditions must be met for the AGC to send the proprietary telegrams that allow regeneration:

- The genset breaker is open.
- The engine is running.
- The AGC is not in AUTO mode.
- Regeneration is not inhibited by M-Logic (that is, *Output, EIC commands, EIC DPF Regeneration Inhibit*).

3.19.4 Tier 4 aftertreatment support

For a general description, see Tier 4 Final/Stage V.

3.19.5 Write commands

The AGC-4 can only write commands to the engine if the Scania Coordinator is NOT mounted.

Use parameter 7563 (EIC Controls) to enable write commands.

Scania EMS 2 write commands

Command	Description
Speed control	In general, this is the same as the J1939 command. However, the CAN bus ID for speed control is 0xCFF8027, and the CAN bus ID for the offset is 0xCFFF727. J1939 TSC1.
Idle speed	See the J1939 command.
Start/Stop	See the J1939 command.

Command	Description
Shutdown override	See the J1939 command.
Droop	Use M-Logic to enable sending a droop set point: *Output, EIC commands, EIC Droop*. When *EIC Droop* is activated, the AGC sends the droop setting in parameter 2771 as the set point for the ECU droop.
Frequency selection	You can select the nominal speed in parameter 2772 (Scania rpm). The options are: • User • 1500RPM • 1800RPM • Low idle If **User** is selected, the AGC bases the nominal speed on the nominal frequency.

3.20 Volvo Penta EDC4

3.20.1 Basic information

Engine manufacturer: Volvo Penta
Controller type: EDC4
DEIF Utility software parameter 7561: Select **Volvo Penta**.
Communication based on: J1939
Supported options: H5, H7, H12
AGC can write commands: Yes
Baud rate: 250 kb/s

3.21 Volvo Penta EMS

3.21.1 Basic information

Engine manufacturer: Volvo Penta
Controller type: EMS
DEIF Utility software parameter 7561: Select **Volvo Penta**.
Communication based on: J1939
Supported options: H5, H7, H12
AGC can write commands: Yes
Baud rate: 250 kb/s

3.21.2 Warnings and shutdowns

These standard warnings and shutdowns are supported:

- EIC yellow lamp
- EIC red lamp
- EIC malfunction
- EIC protection

In addition, these warnings and shutdowns are supported:

Warning and shutdown list	J1939 codes		
	SPN	FMI warning	FMI shutdown
Low oil pressure	100	5	-
Intake manifold #1 P	102	-	-
Coolant temperature	110	5	-
High inlet air temp.	172	5	-
Fuel temperature	174	-	-
Fuel pressure	94	5	-
Oil level	98	5	-
Overspeed	190	-	0
Coolant level low	111	-	1

3.21.3 Write commands

Use parameter 7563 (EIC Controls) to enable write commands.

Volvo Penta write commands

Command	Description
Speed control	In general, this is the same as the J1939 command. However, the CAN bus ID for speed control is 0xCFF4611 (Volvo Penta proprietary telegram).
Idle speed	See the J1939 command.
Preheat	Before an engine start, the AGC sends a preheat signal. The ECU determines whether preheating is needed. When the preheat is completed, the AGC can start the engine.
Start/Stop	See the J1939 command.

Command	Description
Shutdown override	See the J1939 command.
Frequency selection (50 or 60 Hz)	In general, see the J1939 command. In addition, the AGC meets the proprietary requirements for this command.

3.21.4 Modbus alarms

Alarm, status and measurement table (read-only) function code 04h.

Addr.	Content	Bit	Type
1020	EIC alarms, DEIF controller	0	7570 EIC communication error
		1	7580 EIC warning
		2	7590 EIC shutdown
		3	7600 EIC overspeed
		4	7610 EIC coolant water temperature 1
		5	7620 EIC coolant water temperature 2
		6	7630 EIC oil pressure 1
		7	7640 EIC oil pressure 2
		8	7650 EIC oil temp. 1
		9	7660 EIC oil temp. 2
		10	7670 EIC coolant level 1
		11	7680 EIC coolant level 2
1024	EIC alarms (DM 1)	0	EIC overspeed, warning
		1	EIC oil pressure, warning
		2	EIC oil temperature, warning
		3	EIC high coolant temperature, warning
		4	EIC low coolant level, warning
		5	EIC fuel pressure, warning
		6	EIC ECU yellow lamp, warning
		7	EIC ECU red lamp, shutdown
		8	EIC high inlet air temperature, warning
		10	EIC battery voltage, warning
		11	EIC low oil level, warning
		12	EIC protection
		13	EIC malfunction

3.22 Volvo Penta EMS 2

3.22.1 Basic information

Engine manufacturer: Volvo Penta
Controller types: EMS 2, EDCIII
Engine types: D6, D7, D9, D12, D16 (GE and AUX variants only)
DEIF Utility software parameter 7561: Select **Volvo Penta EMS2**.
Communication based on: J1939
Supported options: H5, H12
AGC can write commands: Yes
Baud rate: 250 kb/s

3.22.2 Warnings and shutdowns

These standard warnings and shutdowns are supported:

- EIC yellow lamp
- EIC red lamp
- EIC malfunction
- EIC protection

In addition, these warnings and shutdowns are supported:

Warning and shutdown list	J1939 codes		
	SPN	FMI warning	FMI shutdown
Low oil pressure	100	5	-
Intake manifold #1 P	102	-	-
Coolant temperature	110	5	-
High inlet air temp.	172	5	-
Fuel temperature	174	-	-
Fuel pressure	94	5	-
Oil level	98	5	-
Overspeed	190	-	0
Coolant level low	111	-	1

Note: If FMI is "-" the alarm is not supported.

3.22.3 Volvo speed control

Use *Volvo speed control* (parameter 15110) to activate proprietary engine control. The default is *Standard J1939* (TSC1 (standard J1939) is used).

For a Volvo ECU, select either *Volvo proprietary - Primary speed 50 Hz* or *Volvo proprietary - Primary speed 60 Hz*, depending on the primary speed of the Volvo engine. The primary speed is the speed configured for the engine at the factory. If either option is used, the AGC disables standard J1939 speed control and uses the Volvo proprietary VP70 instead.

To change the frequency when parameter 15110 is set to *Volvo proprietary - Primary speed 50 Hz* or *Volvo proprietary - Primary speed 60 Hz*:

1. Power down the Volvo ECU/EMS.
2. Change the selection in the AGC.

3. Power up the Volvo ECU/EMS.
4. After powering up the ECU/EMS, change the selection in parameter 15110 within 10 seconds. This ensures that the CAN signal is triggered within 10 seconds of ignition on, to allow detection of the signal edge.
5. Power down the Volvo ECU/EMS.
6. Power up the Volvo ECU/EMS.
7. Start the engine.

The selection is now changed.

3.22.4 Tier 4 aftertreatment support

For a general description, see Tier 4 Final/Stage V. Tier 4 is supported if the ECU is version 2.3 or later.

3.22.5 M-Logic events

The following additional events are available in M-Logic under *Events, EIC event*.

Event	Description
Purge Active ON (status)	Proprietary event.
Inducement not active (status)	Proprietary event.
Inducements warning (status)	Proprietary event.
Derate active (status)	Proprietary event.
Pre severe derate warning (status)	Proprietary event.
Severe derate (status)	Proprietary event.
Temporate override of derate (status)	Proprietary event.
Scr Inducement Reason OK (status)	Proprietary event.
Reagent tank low (status)	Proprietary event.
Incorrect reagent quality (status)	Proprietary event.
Absence of reagent dosing (status)	Proprietary event.

3.22.6 Write commands

Use parameter 7563 (EIC Controls) to enable write commands.

Volvo Penta write commands

Command	Description
Speed control	In general, this is the same as the J1939 command. However, the CAN bus ID for speed control is 0xCFF4611 (Volvo Penta proprietary telegram).
Idle speed	See the J1939 command.
Preheat	Before an engine start, the AGC sends a preheat signal. The ECU determines whether preheating is needed. When the preheat is completed, the AGC can start the engine.
Start/Stop	See the J1939 command.
Shutdown override	See the J1939 command.
Frequency selection (50 or 60 Hz)	In general, see the J1939 command. In addition, the AGC meets the proprietary requirements for this command.

3.23 Volvo Penta EMS 2.4

3.23.1 Basic information

Engine manufacturer: Volvo Penta
Controller types: EMS 2, EDCIII
Engine types: D6, D7, D9, D12, D16 (GE and AUX variants only)
DEIF Utility software parameter 7561: Select **Volvo Penta EMS2.4**.
Communication based on: J1939
Supported options: H5, H12
AGC can write commands: Yes
Baud rate: 250 kb/s

INFO
The normal shutdown from the ECU activates the AGC alarm *EIC warning* (menu 7580).

3.23.2 Warnings and shutdowns

These standard warnings and shutdowns are supported:

- EIC yellow lamp
- EIC red lamp
- EIC malfunction
- EIC protection

In addition, these warnings and shutdowns are supported:

Warning and shutdown list	J1939 codes		
	SPN	FMI warning	FMI shutdown
Low oil pressure	100	5	-
Intake manifold #1 P	102	-	-
Coolant temperature	110	5	-
High inlet air temp.	172	5	-
Fuel temperature	174	-	-
Fuel pressure	94	5	-
Oil level	98	5	-
Overspeed	190	-	0
Coolant level low	111	-	1

Note: If FMI is "-" the alarm is not supported.

3.23.3 Volvo speed control

Use *Volvo speed control* (parameter 15110) to activate proprietary engine control. The default is *Standard J1939* (TSC1 (standard J1939) is used).

For a Volvo ECU, select either *Volvo proprietary - Primary speed 50 Hz* or *Volvo proprietary - Primary speed 60 Hz*, depending on the primary speed of the Volvo engine. The primary speed is the speed configured for the engine at the factory. If either option is used, the AGC disables standard J1939 speed control and uses the Volvo proprietary VP70 instead.

To change the frequency when parameter 15110 is set to *Volvo proprietary - Primary speed 50 Hz* or *Volvo proprietary - Primary speed 60 Hz*:

1. Power down the Volvo ECU/EMS.
2. Change the selection in the AGC.
3. Power up the Volvo ECU/EMS.
4. After powering up the ECU/EMS, change the selection in parameter 15110 within 10 seconds. This ensures that the CAN signal is triggered within 10 seconds of ignition on, to allow detection of the signal edge.
5. Power down the Volvo ECU/EMS.
6. Power up the Volvo ECU/EMS.
7. Start the engine.

The selection is now changed.

3.23.4 Emergency Inducement Override

The AGC can read VP282, a telegram with emergency inducement override information. The AGC can show the information on a display and on Modbus. For more information, see the *Input register (04)*, Modbus addresses 1087, 1088 and 1089 in the **Modbus tables**.

3.23.5 Tier 4 aftertreatment support

For a general description, see Tier 4 Final/Stage V.

3.23.6 M-Logic events

The following additional events are available in M-Logic under *Events, EIC event*.

Event	Description
Purge Active ON (status)	Proprietary event.
Inducement not active (status)	Proprietary event.
Inducements warning (status)	Proprietary event.
Derate active (status)	Proprietary event.
Pre severe derate warning (status)	Proprietary event.
Severe derate (status)	Proprietary event.
Temporate override of derate (status)	Proprietary event.
Scr Inducement Reason OK (status)	Proprietary event.
Reagent tank low (status)	Proprietary event.
Incorrect reagent quality (status)	Proprietary event.
Absence of reagent dosing (status)	Proprietary event.

3.23.7 Write commands

Use parameter 7563 (EIC Controls) to enable write commands.

Volvo Penta write commands

Command	Description
Speed control	In general, this is the same as the J1939 command. However, the CAN bus ID for speed control is 0xCFF4611 (Volvo Penta proprietary telegram).
Idle speed	See the J1939 command.

Command	Description
Preheat	Before an engine start, the AGC sends a preheat signal. The ECU determines whether preheating is needed. When the preheat is completed, the AGC can start the engine.
Start/Stop	See the J1939 command.
Shutdown override	See the J1939 command.
Frequency selection (50 or 60 Hz)	In general, see the J1939 command. In addition, the AGC meets the proprietary requirements for this command.