

Date: August 01, 2017
Subject: Electronic governors WW723; RE Viking 35
Engine type: all variants of M20, M25, M32, M43

Caterpillar confidential: green

Important technical information – please forward immediately to your technical staff in charge on shore and on board

Information about electronic governor updates

Multiple engine applications were equipped with electronic governors by Messrs. Woodward type 723 (in the following WW723) or Messrs. Regulateurs Europa type Viking 35 (in the following RE Viking 35). Our new engine types will have a Caterpillar Modular Alarm & Control System (short MACS) installed for governing, load sharing, engine safety, control and monitoring and all other needs to meet latest and future diesel engine demands.

We are committed to best serve our customers even long after an engine went into service. We therefore observe the installed engine population in the field and inform our customers about occurrences that we notice and which are of interest for operators of similar installations. Over time, we have collected information about electronic governor issues that have occurred occasionally on multi-engine applications controlled by WW723 and RE Viking 35 governors. These are rare occurrences overall, and we are not aware of severe consequences of any of these incidents. However, in several cases, sudden power reduction or blackouts occurred with little or no warning. In order to avoid this risk, we strongly recommend operators to take note of the following information and apply the suggested solutions as soon as possible where applicable.

1. Noted issues at Woodward Propulsion cabinet:

1.1 Blackout by unintended ramp down to minimum speed by interrupted Circuit Breaker (CB) or clutch feedback signal:

Issue:

In the software versions before J a short interruption of the CB or clutch feedback signal will trigger an engine ramp down to minimum speed even if the signal is back immediately. The speed ramps back to rated once minimum speed is reached.

Solution:

Software update to 5418-1987.J or K

Recommended action:

Order the installation of software update to 5418-1987.J or K at your MaK service representative.

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1.2. Speed drop in case of Modbus failure between 723 controller and Twido module

Issue:

In case of interruption of the Modbus communication between 723 controller and Twido PLC (which works as an IO-extension) all input signals from the Twido PLC to 723 controller are interpreted as "false / 0". As a result engine speed ramps down to minimum because the signal "false / 0" for clutch status is interpreted as "clutch disengaged".

Quick solution:

Connect just clutch feedback signal directly to discrete input 8 of 723 controller:

Complete solution:

Install software version 5418-1987.K and connect Stop, Clutch, Raise, Lower, Prop., Geno, Sync. and CB signal direct to the discrete inputs of the 723+ controller.

Note:

Twido modules are sensitive to earth faults. To protect remaining functions of the Twido an insulation module for Modbus communication between Twido and 723 is recommended.

Recommended action:

Order the installation of the complete solution and insulation module at your MaK service representative.

1.3. Multi Master situation

Issue:

Two or more masters are causing irregularities (bad governor control behavior i.e. fluctuating speed / load).

Solution:

Parameter "SW_OR_NEW" need to be set to "false".

This parameter is not a service or configuration parameter. You need to set it to "false" in the debug menu or download the .cfg file, open it with an editor, change it to "false" and load the file modified .cfg file to the 723 controller.

Recommended action:

Order a parameter check at your MaK service representative.

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2. Woodward 723 Generator application:

2.1. Actuator wire break

Issue:

In most of the Woodward generator applications the actuator wire break monitoring is not active. If so the PMS has no feed-back signal in case of reverse power.

Solution:

Enable the actuator wire break monitoring.

Recommended action:

Order the actuator wire break monitoring at your MaK service representative.

3. RE Viking 35 Propulsion cabinet:

3.1. Auto-disengage by CAN bus failure.

Issue:

Multiple propulsion engine operation will be carried out in isochronous mode (master/slave configuration). In case of a CAN bus failure (communication between the engines) all engaged engines will clutch out and fall automatically into droop mode.

Solution:

- A) Undo the disengage command. In case where both engines get the same speed reference droop mode after a CAN bus failure this solution might work. This potential solution depends on the particular setup and must be checked at site whether it is applicable. Depending on the propulsion plant design it might not be the right choice.
- B) For twin engine operation only, install a relay logic that checks whether both engines are engaged. In case of a CAN bus failure a predefined engine will clutch out.

Recommended action:

Order modification of the propulsion cabinet at your MaK service representative.

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4. RE Viking 35 Generator application

4.1 Mixed droop / Isochronous engine operation

Issue:

Under certain circumstances a mixed droop / isochronous engine operation is possible (some failure modes force only the affected engine to droop mode i.e. KW transducer failure).

Such a mixed droop / isochronous engine operation might lead to unstable load sharing and / or to black-out and should be operated under monitored conditions by a well trained personnel.

Solution:

A mixed droop / isochronous operation should be avoided. With software version J0021-10 and higher, droop / synchronous operation is configurable. It can be activated or de-activated.

Recommended action:

Order the installation of the latest software version at your MaK service representative.

4.2 Delayed shutdown of master engine

Issue:

In case of a delayed shutdown of a master engine in isochronous operation the power management system shuts down the engine within one second. At the moment when the engine stops, the circuit breaker opens and the speed control is unbalanced by hard load reductions and a new master gets defined by the Viking 35 governor. Such a situation might lead to a bad control behavior of the new master.

Solution:

Definition of new master engine triggered by an un-delayed shutdown signal in order to have a new master defined already before the PMS starts the shut down process. To realize this, a spare contact of the "Un-delayed Shutdown" signal needs to be connected in parallel to the offload signal of the Viking 35 governor.

Recommended action:

Order the new master definition algorithm triggered by an un-delayed shutdown at your MaK service representative.