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TECHNICAL SERVICE BULLETIN

Subject: Maintenance Recommendations - CH₄ Bypass Switch Function in Torque and Jug-A-0 loaders (Not applicable to C9, Basic MMS).

Purpose / Scope

This bulletin outlines maintenance recommendations and technical information for the CH₄ Bypass Switch used only in Torque and Jug-A-0 machines, ensuring the system operates as per design and meets all safety requirements.

Background

The following observations have been made regarding CH₄ Bypass switch operation:

- The current system functions correctly and safely when installed and maintained, as per Nautitech system design.
- It has now been observed, however highly unlikely, that the internal switch wire, connected to the CH₄ Bypass Switch terminal, (red & white wires), may become loose during operation.
- When this occurs, the system is designed to display a bright yellow visual alarm “CH₄ BYPASS”, on the screen, accompanied by flashing amber LEDs, to notify the operator that the system is now in CH₄ Bypass mode.



Figure 1. CH₄ Bypass Mode shown on the screen.

- In this state, the machine continues to operate, however, disabling the ability to initiate a shutdown when required to do so due to the presence of high CH₄.
- **Please note:** By design, any fault in the wiring (orange & white) will cause the MMS system to shut down the machine.

Identified Issue

The issue occurs when the red or white wires in the terminal screws on the CH₄ Bypass Switch become disconnected or loose. This can result in a false detection of the switch position. This condition can be avoided by including the CH₄ Bypass switch into your regular maintenance schedules, as noted below in this technical bulletin.



Figure 2. Example of CH₄ Switch and I.S. Junction Box



Figure 3. Example of loose vs correctly secured wires

Maintenance Recommendations for Nautitech stainless steel Bypass Switch

System	Part Number	Part Description
MMS Torque	ME5070-1-99-462	Torque Deputy Bypass Junction Box, No sensor
MMS JUG-A-0	ME5070-1-99-461	JUG Deputy Bypass Junction Box, No sensor

Table 1. Junction Box - Part Numbers

1. Inspect the IP rated CH4 Bypass/RTD Junction Box for mechanical damage.
2. Remove screws to open the box and inspect the condition of the switch terminals, wires, and bootlace ferrules.
3. Check the wires are in place and tighten terminal screws to **1.0 Nm MAX**. Perform a simple pull test.
4. Verify Switch Functionality: Switch between Normal and Bypass mode. Confirm mode change on MMS display and ensure the switch does not falsely trigger Bypass mode.
5. Check the Locking Mechanism: Ensure the locking feature operates correctly and securely.
6. Inspect the Enclosure Lid: Visually inspect the gasket and confirm all screws are present and torqued to **1.2 Nm**.

Recommended Maintenance Schedule

Frequency	Action
Daily	Visual external inspection
Weekly	External operational check. Check display logs to review and action if required.
26 Weekly	Detailed internal inspection



Figure 4. Log messages screen

For machines fitted with the Nautitech Data Master product. The system provides the ability to automatically record and report the machine operation and other safety-critical processes. These reports are transmitted almost immediately—depending on Wi-Fi coverage or once the machine reaches the surface—and are automatically delivered to the email inboxes of relevant personnel.

The extract below is taken from Data Master - generated PDF reports for a machine operating in Australia. It displays the time and date stamps corresponding to periods when the machine was in bypass mode. This functionality significantly enhances diagnostic coverage for detecting incidents.

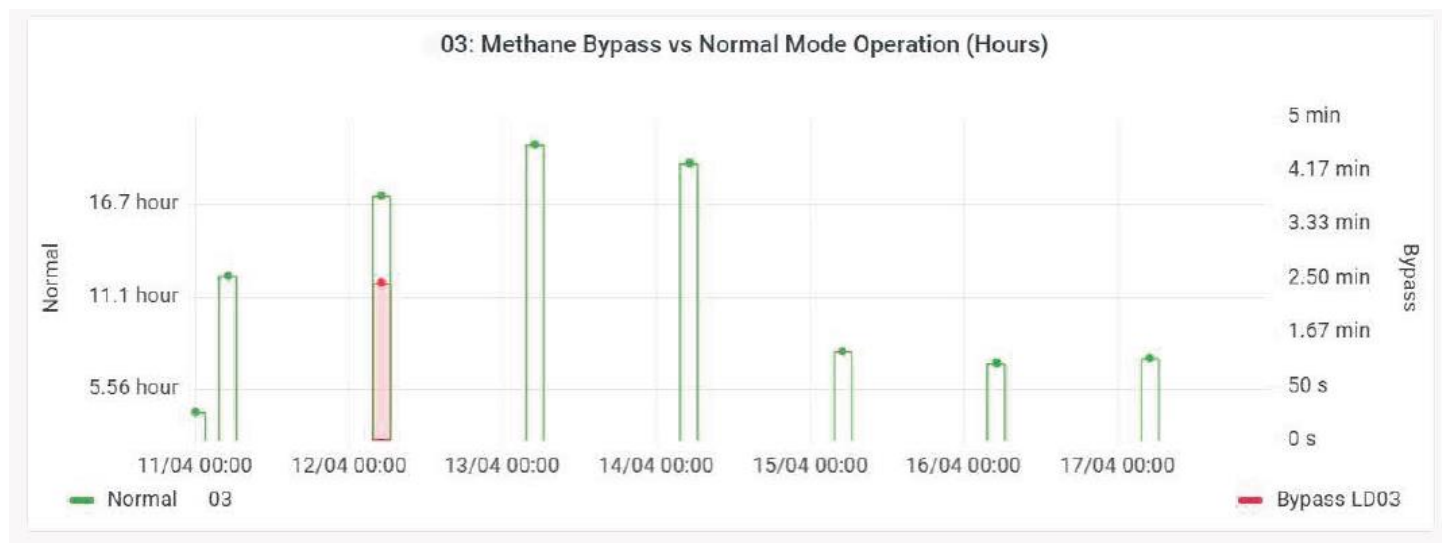


Figure 5. DATA MASTER - Methane Bypass Vs Normal Mode Operation

Engineering Update

As the Original Equipment Manufacturer and as a result of our investigation, we will be recommending a comprehensive solution to the CH₄ Bypass Switch design and its functional operation, that ensures safety in any potential fault condition caused by wiring disconnection or mechanical damage / failure.

Please contact Nautitech for further details.

Contact Information

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