WIN GD
Winterthur Gas & Diesel

To whom it may concern

UNIC Electronic Modules

Remarks

Procedures for restoring functionality

Subject

Engines with UNIC system

Date: 07/May/2018 Our Reference: 22599/MSL006 Sheet: 1/7

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Appendix 1 CCM-20 Component Return Form

Appendix 2 Technical Bulletin RT-207 (UNIC reboot instructions)

1. Introduction

Recent investigations have shown that a high number of electronic modules have been returned, which in fact were not in defect.

This document describes the procedure and actions to verify the proper function of the CCM20 module. A module shall not be declared as defect before the described procedure has been completed.

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2. Procedures

2.1. Checking of electrical connection

Inside each E95 cabinet the electrical connections of cables need to be checked as well as the earthing of the cable screens.

- Are the data bus lines (CAN 1 & CAN 2) connected correctly and is the terminating resistor installed at the end of the line?
  CAN1 – X32.3(H) and X32.4(L)
  CAN2 – X31.3(H) and X31.4(L)
  Ensure that there are no loose connections between the high and low line, or between CAN1 and CAN2.

- Are the cables for the pickup signal mounted correctly and without any loose connections?
  X32.7 and X32.8 – TDC signal
  X31.7 and X37.8 – BDC signal
  X32.5 and X32.6 – Speed signal from sensor A (only CCM1)
  X31.5 and X31.6 – Speed signal from sensor B (only CCM1)
  X32.5 and X32.6 – Speed signal from sensor C (only CCM2)
  X31.5 and X31.6 – Speed signal from sensor D (only CCM2)

- Does the exhaust valve positioning sensor circuit (cable, sensor and intermediate box) have any loose connections?
  X23.5, X23.7 and X23.8

- Is the exhaust valve control cable mounted correctly and without any loose connections?
  X34.3 and X34.4

- Is the exhaust gas temperature cable mounted correctly and without any loose connections?
  X24.6 and X24.7

- Is the cylinder lubrication oil pressure mounted correctly and without any loose connections?
  X23.1 and X23.3

- Are the fuel injector solenoid valves SV1, SV2 and SV3 in good condition? Connection, cables, intermediate junction box and plugs to be checked for any abnormalities or defects.
  X35.3 and X35.4 – For Fuel Inj Valve 1
  X35.5 and X35.6 – For Fuel Inj Valve 2
  X35.7 and X35.8 – For Fuel Inj Valve 3

- Further checks should be made on the common functions which are running on certain CCM-20 modules, such as: rail pressure, servo oil pressure, control of the servo oil pump, ID plug etc.

If any cable is loose or a sleeve is not clamped properly, please follow the cabling guideline in order to fix it.

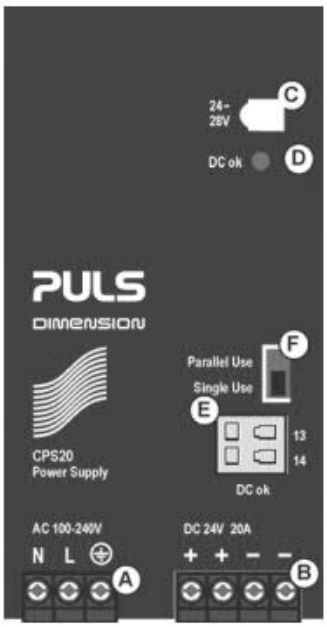
Check potential differences between:
0V (REF) (X21.8) and CCM electronic unit housing
0V (REF) (X21.8) and structure behind the module

2.2. Increase of system supply voltage

The latest standard supply voltage is 26V (before 24V), which is within the power range of CLM20 (18V – 36V). Verify if this standard is applied and eventually adjust it to 26V.

- Open the covers of the E85 cabinets on the rail unit front.
- Use the potentiometer behind the protective cap on the upper right of the power supply (C).
- Clockwise rotation increases the voltage, counter-clockwise rotation will decrease the voltage.
- Adjust the voltage up to 26V (+0.7/-0.0).
- Repeat for all power supplies on the engine.

Fig. 13-1 **Front side**



A **Input Terminals** (screw terminals)
N, L Line input
⏚ PE (Protective Earth) input

B **Output Terminals** (screw terminals, two pins per pole)
+ Positive output
– Negative (return) output

C **Output voltage potentiometer**
Open the flap to adjust the output voltage. Factory set: 24.1V

D **DC-OK LED** (green)
On, when the output voltage is >90% of the adjusted output voltage

E **DC-OK Relay Contact** (quick-connect spring-clamp terminals)
The DC-OK relay contact is synchronized with the DC-OK LED.
See chapter 8 for details.

F **"Parallel Use" "Single Use" selector**
Set jumper to "Parallel Use" when power supplies are connected in parallel to increase the output power. In order to achieve a sharing of the load current between the individual power supplies, the "parallel use" regulates the output voltage in such a manner that the voltage at no load is approx. 4% higher than at nominal load. See also chapter 22.5. A missing jumper is equal to a "Single Use" mode.

2.3. Individual restart of UNIC electronic modules

CCM-20 module

Power off:
Remove plugs X31 and X32 on the affected CCM-20 module
Wait 30s
Power on:
Plug in again in the following sequence:
1. X32
2. X31

IOM-10 module

Power off:
Remove plugs X21 and X11 on the IOM-10 module
Wait 30s
Power on:
Plug in again in the following sequence:
1. X11
2. X21

MCM-11 module

Power off:
Remove plugs X34 and X24
Wait 30s
Power on:
Plug in again in the following sequence:
1. X24
2. X34

LDU-20 module

Power off:
Remove plugs X22 and X21
Wait 30s
Power on:
Plug in again in the following sequence:
1. X21
2. X22

2.4. Swapping of Cylinder Control Modules (CCM-20)

It is possible to swap CCM-20 modules between two cylinders to check if the malfunction remains on the same cylinder (this will indicate mechanic, hydraulic or cabling failure) or if the malfunction is going to follow the module (this will indicate module malfunction).

- Remove power plugs (X31 and X32) from affected module.
- Remove all other connected plugs from affected module.
- Remove power plugs (X31 and X32) from "healthy" module.
- Remove all other connected plugs from "healthy" module.
- Swap both modules on the engine.
- Connect plugs to both modules, except X31 and X32.
- Connect power plugs to the modules in the following sequence:
    1. X32
    2. X31
- Confirm on LDU, on SYSTEM STATUS page, that all modules are in "Operational" mode.
  To see the latest status press the "Refresh" button.
- Turn the engine by means of the turning gear, in order to establish the system's actual crank angle position.
- Start the main engine and check the functioning of both modules.

2.5. Replacement of modules with spares

2.5.1. CCM-20

- Remove power plugs (X31 and X32) from affected module.
- Remove all other connected plugs from affected module.
- Remove affected module and install the spare one.
- Connect plugs to the module, except X31 and X32.
- Connect power plugs to the modules (important: first X32 followed by X31)
- The top LED will first blink red then switch to a rapid yellow (signalling auto download).
- When the top LED stops blinking rapidly, the module is in running state.
- Reboot the module again by removing the plugs X32 and X31 for 30s (important: **first plug in X32**).
- Following that, the module should go directly into running state.
- On LDU SYSTEM STATUS page, the module state: "Operational" should reflect: confirmed.
- To synchronize the crank angle, turn the engine by means of the turning gear.

2.5.2. IOM-10

- Remove power plugs (X21 and X11) from affected module.
- Remove all other connected plugs from affected module.
- Remove affected module and install the spare one.
- Connect plugs to the module, except X21 and X11.
- Connect power plugs to the modules (important: first X11 followed by X21).
- The top LED will first blink red then switch to a rapid yellow (signalling auto download).
- When the top LED stops blinking rapidly, the module is in running state.
- Reboot the module again by removing the plugs X21 and X11 for 30+s (important: **first plug in X11**).
- Following that, the module should go directly into running state.

- On LDU SYSTEM STATUS page, the module state: “Operational” should reflect: confirmed.

2.5.3. MCM-11

- Remove power plugs (X24 and X34) from affected module.
- Remove all other connected plugs from affected module.
- Remove affected module and install the spare one.
- Connect plugs to the module, except X24 and X34.
- Connect power plugs to the modules (important: first X24 followed by X34).
- The top LED will first blink red then switch to a rapid yellow (signalling auto download).
- When the top LED stops blinking rapidly, the module is in running state.
- Reboot the module again by removing plugs X24 and X34 for 30+s (important: **first plug in X24**).
- Following that, the module should go directly into running state.
- On LDU SYSTEM STATUS page, the module state: “Operational” should reflect: confirmed.

2.5.4. LDU-20 ECR

- Remove power plugs (X21 and X22) from affected module.
- Remove all other connected plugs from affected module.
- Remove affected module and install the reserve one.
- Connect plugs to the module, except X21 and X22.
- Connect power plugs to the modules (important: first X21 followed by X22).
- The module will automatically reboot.
- Confirm on the Ethernet page, that the “eth1” is 010.001.001.173.
- On LDU SYSTEM STATUS page, the module state: “Operational” should reflect: confirmed.

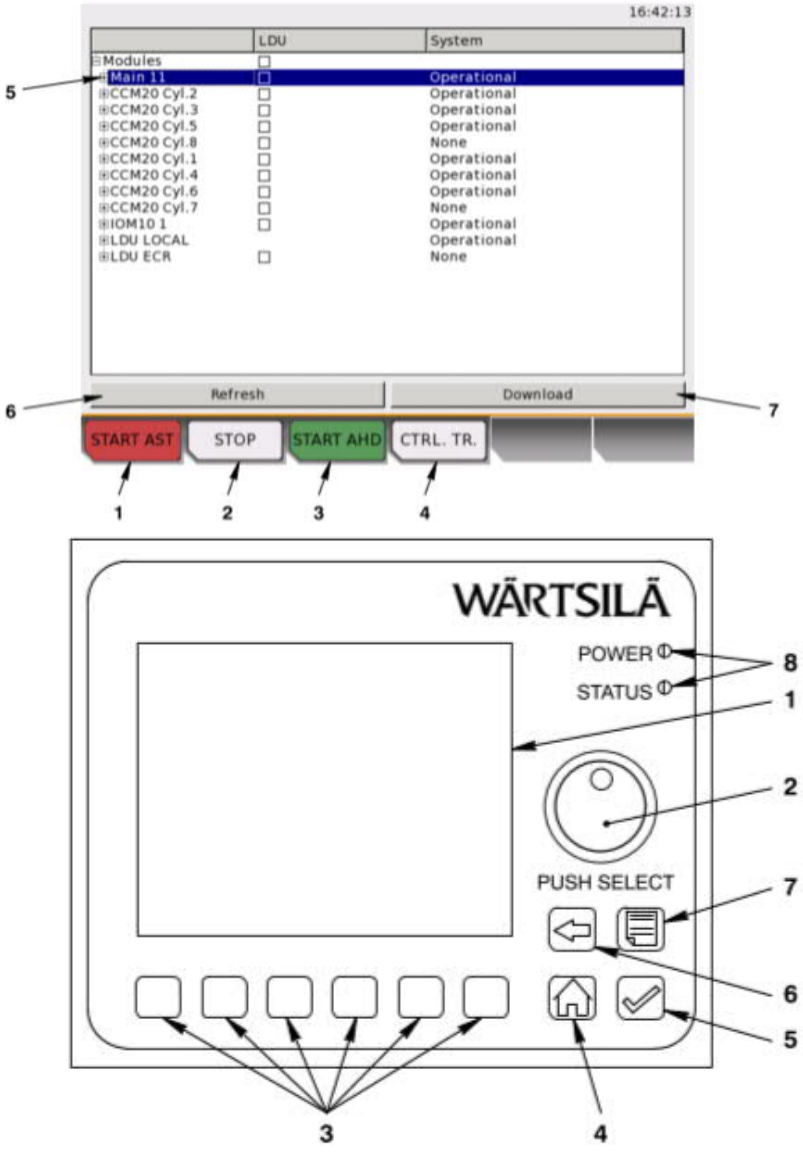
2.5.5. LDU-20 Local

- Remove power plugs (X21 and X22) from affected module.
- Remove all other connected plugs from affected module.
- Remove affected module.
- Remove the LDU in ECR the same way and install it in place of the affected LDU-20 module at E25.
- Connect power plugs to the modules (important: first X21 followed by X22).
- The module will automatically reboot.
- Confirm on Ethernet page that the “eth1” is 010.001.001.171.
- Install the spare one in the ECR.
- Connect plugs to the module, except X21 and X22.
- Connect power plugs to the modules (important: first X21 followed by X22).
- The module will automatically reboot.

2.6. Forced software download

In case of the “auto-download” not starting or the module not entering the “Operational state”, the following steps should be taken to force a download from the Local LDU to the module. (ref. Operation Manual 4002-2/A1)

- On the Local LDU (E25) change the view to SYSTEM STATUS.
- Use the rotary button (2) to scroll down to the affected module.
- Open the sub nodes by pressing the check button (5).
- Select all software parts (Bootloader 2, Application, Configuration) by pressing the rotary button.
- Scroll down to “Download” and start the download by pressing the rotary button.
- A new window on the display will reflect the progress of the download.
- Wait for the download to finish.
- Restart the module according to the above description.



CCM-20 Component Return Form

Appendix 1

Please email this form to Wärtsilä Services Switzerland Ltd. and attach copy with returned component.

Data	Ext. failure condition
Vessel*:	Place of incident*: (E.g. voyage from …. to ….)
Engine running hours*:	Operation during incident: (E.g. manoeuvring, sailing, engine start…)
Date of incident /removal:	Engine room temp at date of incident*:
Module s/n*:	Failure characteristic*: (intermittent or permanent)
Claim / Ident No.:	Component opposed to Excessive vibrations (yes/no)?
Software Info * (see LDU20 "Software info" page) Eng type, DB number, SW version	

All fields with * are mandatory. Attach LDU20 and RCS print-screens or pictures to indicate malfunction.

Failure Description CCM-20 (CCM A1 to Ax for Diesel, CCM G1 to Gx for gas)

☐ **Sticker check**
- ☐ Sticker "Rev.4 changed to 3.5" on CCM20 module

☐ **CCM-20 LED Indications**

	On	Off	Yellow	Red	Blinking
1. PWR1	☐	☐			
2. PWR2	☐	☐			
3. DRV1	☐	☐			
4. DRV2	☐	☐			
5. DIAG	☐	☐	☐	☐	☐

☐ **Analog-In Error**

LDU20 Msg:
- ☐ Fuel pressure ___, meas. Fail
- ☐ Power input, meas. Fail
- ☐ Liner wall aft side, meas. Fail
- ☐ Liner wall fore side, meas. Fail
- ☐ Exhaust gas temp ___, meas. Fail
- ☐ Fuel press before supply unit, meas. Fail
- ☐ Servo oil pressure ___, meas. Fail
- ☐ Bearing oil pressure inlet, meas. Fail
- ☐ Air spring air pressure, meas. Fail
- ☐ Cyl. lub. oil press cyl ___, meas. Fail
- ☐ Exh valve position ___, meas. Fail
- ☐ Firing pressure cyl ___, meas. Fail
- ☐ GAV ___ position cyl ___, meas. Fail
- ☐ Knock signal cyl ___, meas. Fail
- ☐ Gas concentration piston underside, meas. Fail

☐ **HSD output Error**

LDU20 Msg:
- ☐ Start pilot valve cyl ___, Fail
- ☐ Fuel pump setpoint ___, Fail
- ☐ Servo oil pump setpoint ___, Fail
- ☐ Vent valve fuel side, Fail
- ☐ Vent valve exhaust side, Fail
- ☐ Sealing oil shut-off valve, Fail
- ☐ Vent valve engine inlet, Fail
- ☐ Gas shut-off fuel side, Fail
- ☐ Pilot fuel press control valve, Fail
- ☐ Gas shut-off exhaust side, Fail

☐ **Internal module Failure**

LDU20 Msg:
- ☐ Module Fail CCM# _
- ☐ System Bus # _failure CCM # _
- ☐ Hardware Identification Fail CCM # _
- ☐ Power supply failure CCM # _

☐ **Crank angle sensors Failure**

LDU20 Msg:
- ☐ ST5131C – Gear Wheel Sensor A Signal Fail
- ☐ ST5132C – Gear Wheel Sensor B Signal Fail
- ☐ ST5133C – Gear Wheel Sensor C Signal Fail
- ☐ ST5134C – Gear Wheel Sensor D Signal Fail
- ☐ ZS5123C – TDC Signal Fail
- ☐ ZS5124C – BDC Signal Fail

☐ **Other CCM related Failures**

Please describe:

_____

_____

WÄRTSILÄ

TECHNICAL BULLETIN

2 Stroke Engine Services

RT-207
Issue 1, 02 March 2018

UNIC reboot instructions

Information to all Owners and Operators of Wärtsilä and WinGD 2 stroke engines with UNIC engine control system.

For immediate attention

Affected engines
All Wärtsilä and WinGD 2 stroke engines with UNIC (Unified Controls) engine control system.

Current situation
In the event that UNIC needs rebooting, operators require instructions how to power off all 24V power supplies and power on again correctly.

A reboot of the UNIC engine control system without powering off the Local Display Unit (LDU) in the Engine Control Room (ECR) can result in legacy alarms remaining on the ECR LDU.

Solution
UNIC reboot instructions.

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1 Introduction

An incorrect reboot of the UNIC engine control system can cause operating issues:

Without powering off the Local Display Unit (LDU) in the Engine Control Room (ECR), confusing alarms between the local LDU and the LDU in the ECR can result.

Sections 1 and 2 of this Technical Bulletin describe the correct reboot process of the complete UNIC. Information about the correct procedure to reboot individual UNIC modules is included in section 3.

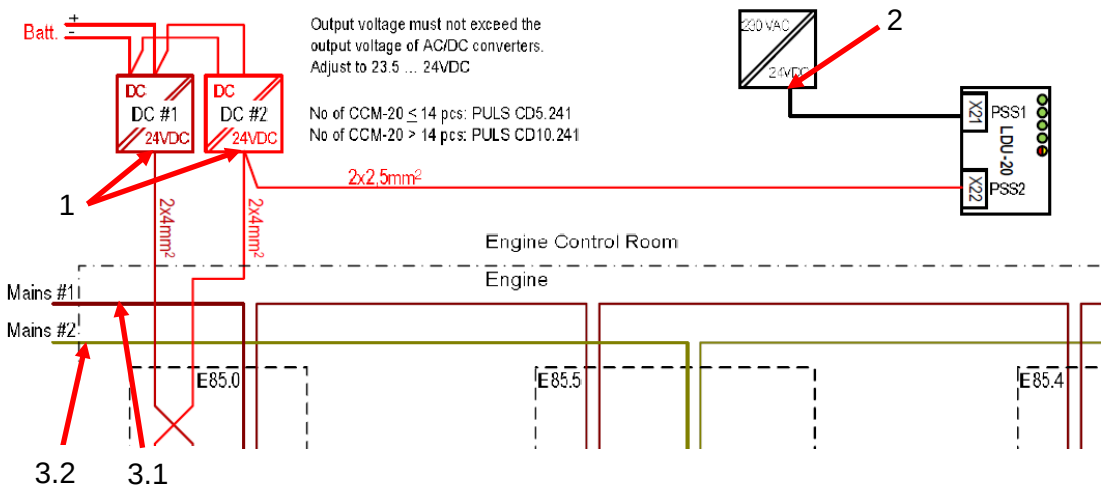
2 Power-off process of the UNIC

To power off UNIC completely, the following components are affected, and must be disconnected in the correct order:

- Battery back-up
- Local Display Unit (LDU) in the Engine Control Room (ECR)
- Emergency supply in the emergency generator room
- Main power supply

NOTE:
The correct location and naming of the connections (fuses, breakers, etc.) differs between individual installations. To identify the correct location and the affected components, please consult shipyard's original drawings. In principle, Figure 1 applies to all vessels, but the exact arrangement might differ.

NOTE:
We recommend to include the complete reboot process into the emergency drill routines, similar to local manoeuvring operation drills.



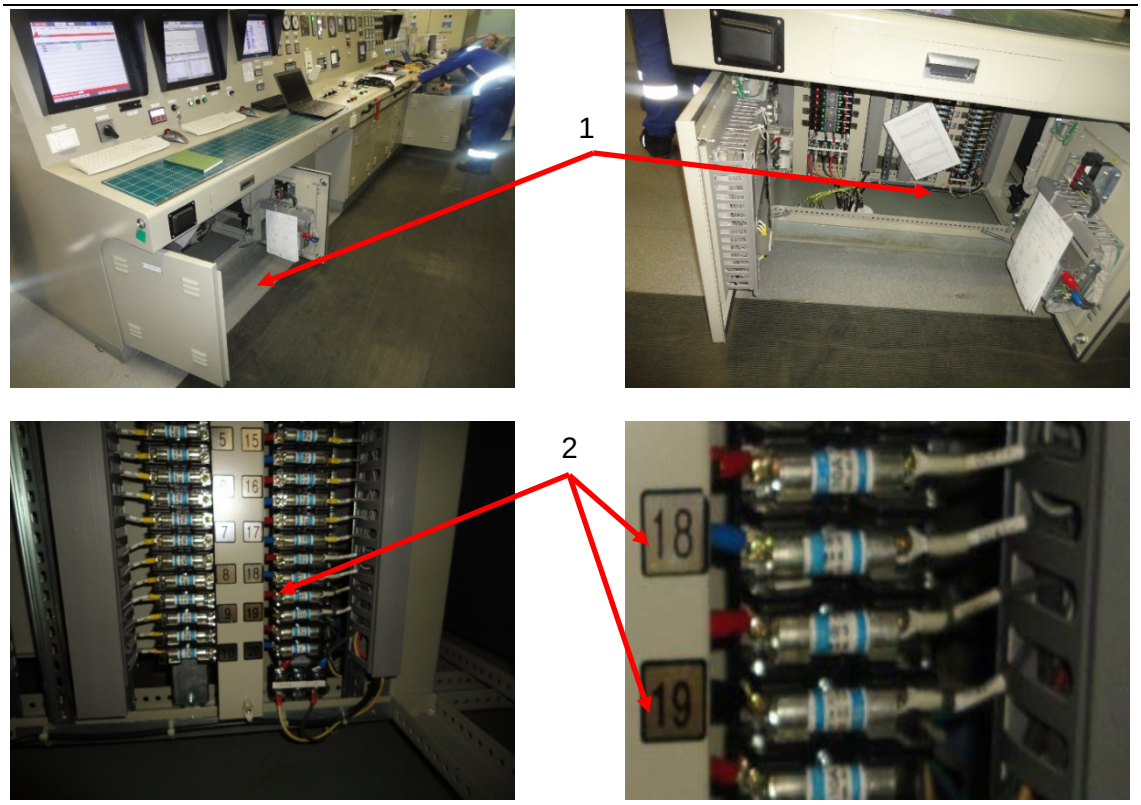
1. *Battery back-up breaker / fuse location*
2. *Power off the ECR LDU*
3. 1. *Power off the UNIC control system*
3. 2. *Power off the UNIC control system*

Figure 1: Drawing example

2.1 Battery back-up breaker / fuse location (Figure 1, #1)

Disconnect UNIC from the Battery back-up. (In this example remove fuses F18 and F19. Figure 2).

Please consider, this arrangement might differ from your installation.

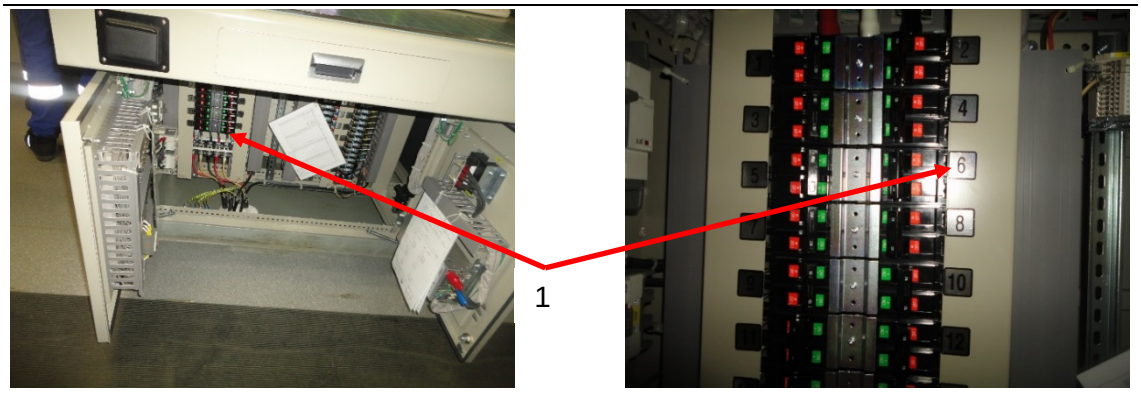


1. *General view of battery back-up fuses*
2. *Fuses F18 and F19*

Figure 2: Removal of fuses in the battery back-up (F18 and F19 in this particular case)

2.2 ECR LDU breaker / fuse location (Figure 1, #2)

Disconnect ECR LDU from the main power (in this example breaker 6 Figure 3).
Please consider, this arrangement might differ from your installation.



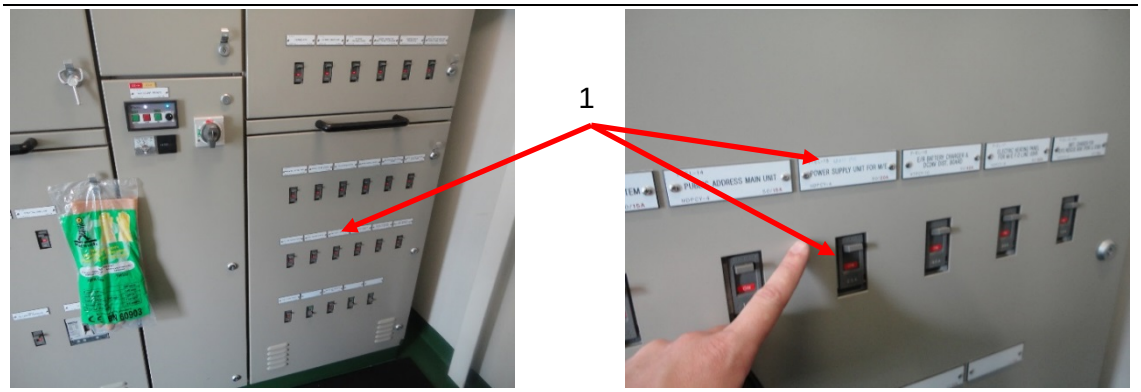
1. Location of breaker 6

Figure 3: Power off the ECR LDU

2.3 UNIC breakers / fuses locations

2.3.1 Emergency switchboard (Figure 1, #3.2)

Disconnect at the emergency switchboard (in this example located in the emergency generator room Figure 4).
Please consider, this arrangement might differ from your installation.



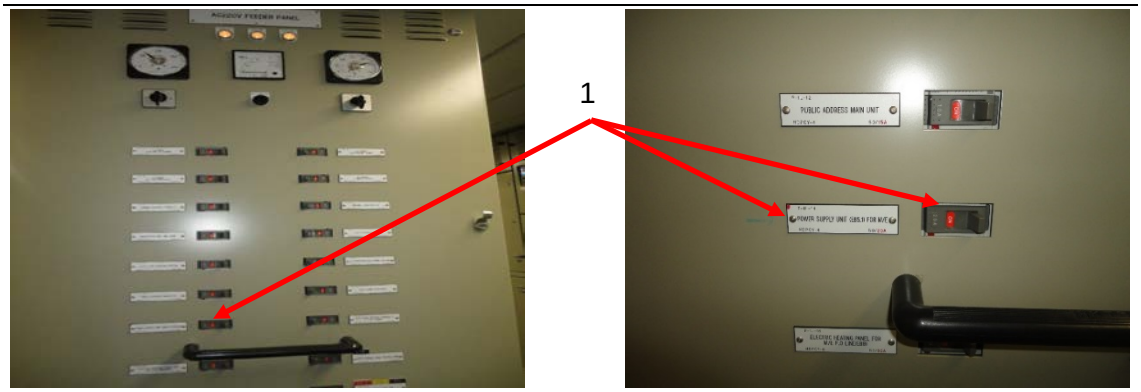
1. Emergency supply

Figure 4: Emergency supply

2.3.2 Main switchboard (Figure 1, #3.1)

Disconnect at the main switchboard (Figure 5).

Please consider, this arrangement might differ from your installation.



1. Main power supply

Figure 5: Main power supply

2.4 Power-on process of UNIC

1. After powering off UNIC, wait approximately two minutes to make sure all LED's on the CCM (Cylinder Control Module), MCM (Main Control Module), IOM (Input Output Module) and LDU are off.
2. Power on the UNIC 230V supplies (see Figure 4) and the 230V in the ECR (see Figure 5).
3. Wait approximately three minutes until the local LDU boots up.
4. Power on the ECR LDU (see paragraph 2.2).
5. Reconnect the battery back-up (see paragraph 2.1).
6. Go to system status at ECR LDU and LDU local und check that all available modules are operational.

3 Procedure to reboot individual modules on engines equipped with UNIC

In case all UNIC components have been unplugged, reconnect in the following sequence shown below (3.1 – 3.4).

3.1 LDU-20 module

Power off:
Remove plugs X22 and X21
Wait 30s

Power on:
Plug in again in the following sequence:
1. X21
2. X22

3.2 CCM-20 module

Power off:
Remove plugs X31 and X32 on the affected CCM-20 module
Wait 30s

Power on:
Plug in again in the following sequence:
1. X32
2. X31

3.3 IOM-10 module

Power off:
Remove plugs X21 and X11 on the IOM-10 module
Wait 30s

Power on:
Plug in again in the following sequence:
1. X11
2. X21

3.4 MCM-11 module

Power off:
Remove plugs X34 and X24
Wait 30s

Power on:
Plug in again in the following sequence:
1. X24
2. X34

4 Contacts

4.1 How to contact Wärtsilä

For questions about the content of this Technical Bulletin, or if you need Wärtsilä assistance, services, spare parts and/or tools, please contact your nearest Wärtsilä representative.

4.2 Contact details for emergency issues

4.2.1 Operation support

For questions concerning operational issues, please send your enquiry to:
TechnicalSupport.chts@Wartsila.com
or phone 24hrs support: +41 52 262 80 10.

4.2.2 Field service

If you need Wärtsilä Field Service, please send your enquiry to:
ch.FieldService@Wartsila.com
or phone 24hrs support: +41 79 255 68 80.

4.2.3 Spare parts

If you need Wärtsilä spare parts and/or tools, please contact your nearest Wärtsilä representative or your key account manager.