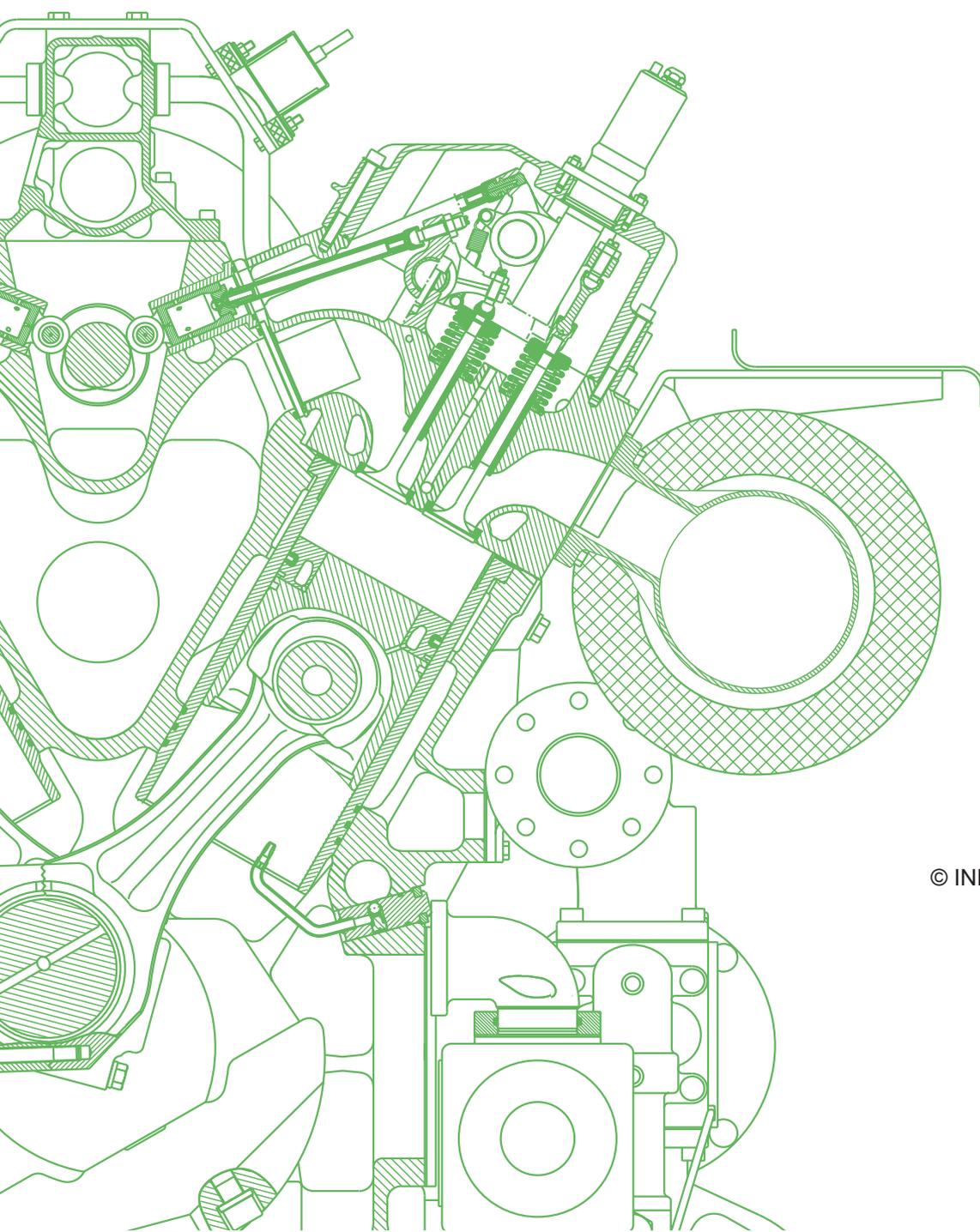




W 8080 A9

Maintenance Instruction

Cooling water



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The target recipients of this document are:

Customers, distribution partners, service partners, commissioning partners, subsidiaries/branches, Jenbach location

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1 Scope

This Maintenance Instruction (W) applies to the following Jenbacher Gas Engines:

- Type 9 engine with electric or hydraulic preheating and engine cooling water circuit

2 Purpose

This Maintenance Instruction (W) lays down the maintenance interval and describes the following activities:

- ⇒ Taking a cooling water sample
- ⇒ Replacing the cooling water

3 Maintenance interval

Maintenance work	Maintenance interval	Carried out by ¹⁾
⇒ Taking a cooling water sample	2,000 Oh / 6 months ¹⁾	K
⇒ Replacing the cooling water pipe O-rings	20,000 Oh	INNIO
⇒ Replacing the cooling water pipe O-rings	30,000 Oh	INNIO
⇒ Replacing the cooling water	Condition-dependent ²⁾	K
⇒ Checking the electrical preheater	2 years	INNIO
⇒ Cleaning the electrical preheater	4 years	INNIO
⇒ Replacing the gaskets on the electrical preheater	6 years	INNIO

¹⁾ See TA 1000-0200. When filling with an anti-corrosion product for the first time, it takes 2-3 months in the engine to stabilise. More frequent analyses as specified in the respective product description are necessary over this time for checking purposes.

²⁾ Depending on the cooling water analysis

Valid for:

- Type 9: Maintenance schedule V

***) Carried out by** This column defines who carries out the maintenance work.

K	This activity is to be carried out by the customer, INNIO or a company selected and authorised by INNIO to carry out this work.
INNIO	This activity is to be carried out by INNIO or a company selected by INNIO authorised to carry out this work.

4 Safety information

⚠ WARNING





Danger from unauthorised restarting

Serious injuries such as cutting, crushing, severing or shearing of body parts due to unintentional contact with rotating or moving machine parts.

- Shut down the engine as described in TA 1100-0105.
- Secure the engine against unauthorised restarting in accordance with TA 2300-0010.

⚠ WARNING

Personal injury



Failure to use personal protective equipment and comply with safety instructions or employee protection information may lead to personal injury.

- Wear the relevant personal protective equipment (PPE).
- Observe the safety instructions as per TA 2300-0005.
- Observe the employee protection information as per TA 2300-0001.

⚠ WARNING

Danger of burns



Hot surfaces

- Do not start any maintenance work until the surface temperatures in the working area are below 50°C.
- If appropriate protective gloves with the appropriate protection against direct contact with hot surfaces are worn (e.g. gloves tested in accordance with EN 504), maintenance work can be carried out at working area surface temperatures below 60°C.
- If necessary, check the temperatures with a contact thermometer before starting the work.
- Wear the appropriate personal protective equipment.

⚠ ATTENTION

Danger from chemicals!



When you work with chemical substances (e.g. cleaning agents, oils etc.), your health can be damaged by skin contact, by being sprayed in the eyes and by inhaling vapours.





- Please read the relevant information in the safety data sheets (SDBs) and, where appropriate, in the Directory of Work Materials and Hazardous Substances (AGV) or the operating instructions.
- Wear appropriate personal protective equipment (PPE) (e.g. chemical-resistant gloves, close-fitting safety glasses; optionally with face mask/breathing mask, protective footwear, chemical protective suit).
- Keep unprotected persons away.

5 Additional information

Relevant documents:

TA 1000-0200 – Composition of cooling water in closed primary circuits

TA 1100-0105 – Engine shut-down

- TA 2300-0001 – Employee protection
- TA 2300-0005 – Safety instruction
- TA 2300-0010 – Guidelines for using the LOTO kit

6 Work steps

6.1 Taking a cooling water sample



The engine need not necessarily be shut down for this work step.

Samples should be taken correctly, as otherwise the analysis results may be falsified.

INNIO recommend having the analysis carried out by Spectro/Jet Care. If this is not possible, the laboratory in question must measure the values specified in **TA 1000-0200**.



TA 1000-0200 – Cooling water quality

INNIO will provide a sampling set (see Analysis Sets).

If you do not use this set, clean glass or plastic vessels must be used. Before taking the samples, rinse the vessels thoroughly (3 to 5 times) with the cooling water to be analysed.

Water samples should be taken while the engine is running. In order to obtain a representative water sample, approx. 0.5 to 1 litre of water must be run off before the actual sample is taken.

If it is not possible to take a sample while the engine is running, the water sample must be taken within 1 hour of the engine shutdown.

Analysis sets

Contents of the starter set:

Part number	Description
510132	Hard plastic case with 20 sample containers, including sample labels and mailing pouches
506605	Sampling hose, 3 m
506606	Sampling pump
460134	Sampling hose including adapter

Refill packs can be ordered from INNIO quoting the following part numbers:

Part number	Description
506602	Refill pack with 5 sample containers
506603	Refill pack with 10 sample containers
506604	Refill pack with 20 sample containers.

Sampling

WARNING



Personal injury

Failure to use personal protective equipment and comply with safety instructions or employee protection information may lead to personal injury.

- Wear the relevant personal protective equipment (PPE).
- Observe the safety instructions as per TA 2300-0005.
- Observe the employee protection information as per TA 2300-0001.

WARNING



Danger to persons from hot pressurised liquids

Hot pressurised liquid will escape when cooling water samples are taken.

- Wear the relevant personal protective equipment (PPE).
- Open the drain valve carefully.
- Run the cooling water out carefully, avoiding any contact with the hot medium.

Use clean new bottles.

The starter set with 20 bottles, sample labels, mailing pouches etc. can be ordered from INNIO under the part no. 510132.

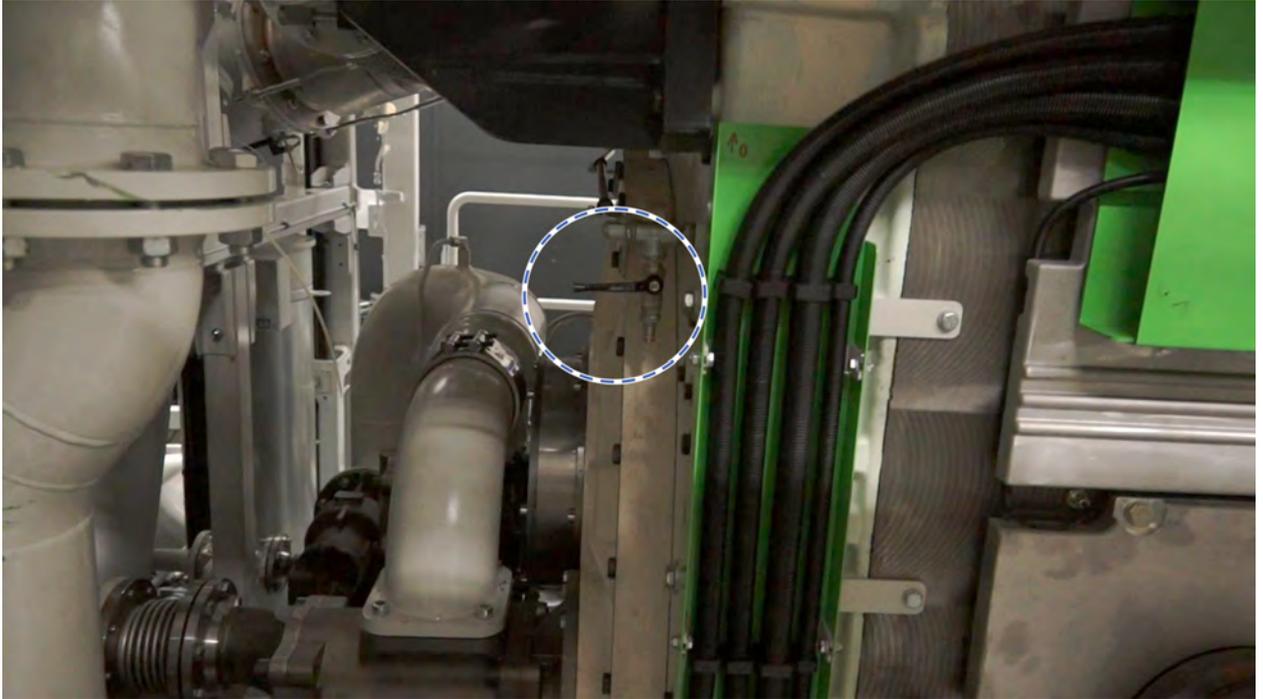
If another 20 bottles are required, a refill pack is available under the part no. 506604.

We recommend taking the water sample at the vent valve if at all possible. See below for a more detailed illustration.

All the liquid to run from the tap briefly before taking the sample in order to avoid contamination by dirt particles, dust or the like.

- Fill the bottle with the coolant/water mixture from the engine.
- Seal the bottle after taking the sample and fill in the label.
- Make a note on the label of the coolant that was used.
- Find out when the water was prepared/mixed for use in the engine and note it on the label.

- Send the bottles directly to the laboratory stated on the bottle.



Cooling water sampling location (photo for information purposes only)

6.2 Replacing the cooling water

The following three sections (Draining, Filling and Venting) apply to the version with the TCA module

Chapters ⇒ Cooling water system and ⇒ High-temperature cooling circuit apply to the version with the TCA and AUX modules

6.2.1 Draining

- Close the vent lines on the engine.



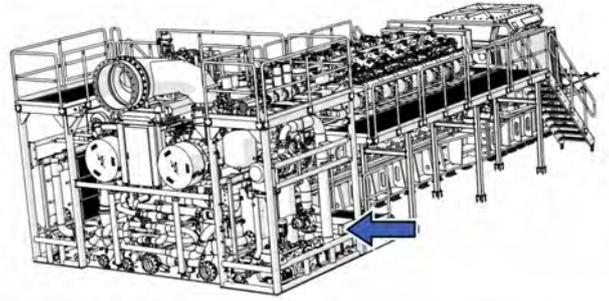
- Close the vent lines on the TCA module.



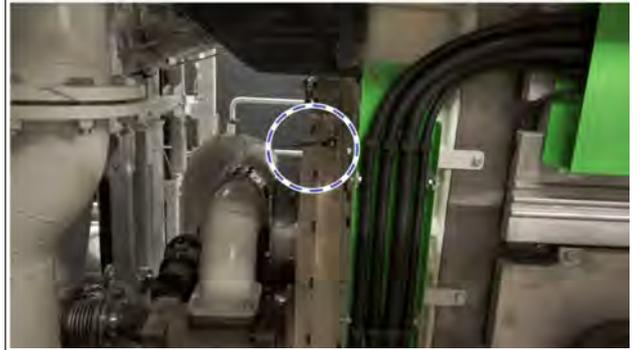
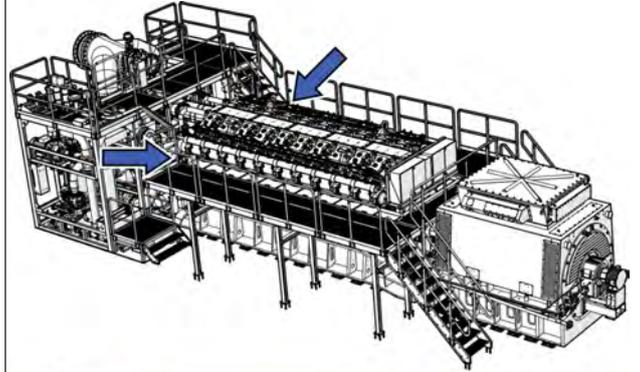
- Place a vessel under the line for the water.



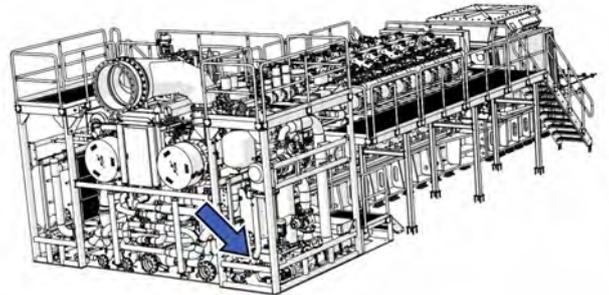
The vessel must have a capacity of at least 2,000 litres.



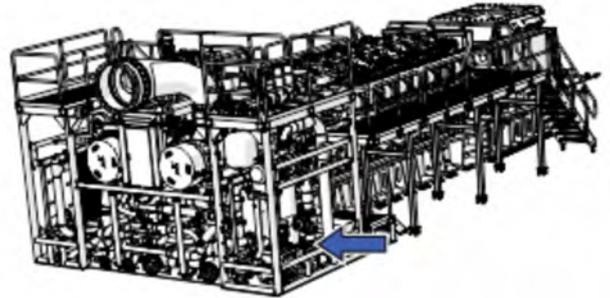
- Open the drain line.



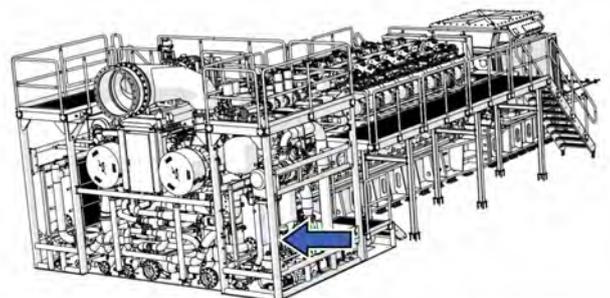
- Position the ball valves as shown in the illustration.



- Open both ball valves.

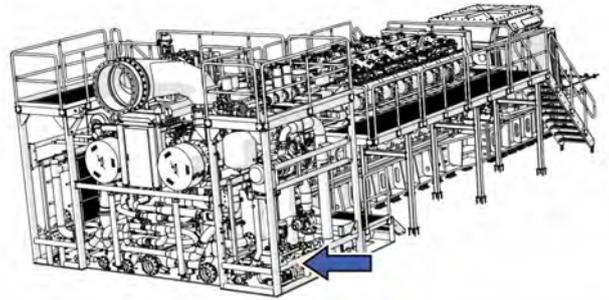


- Switch on the circulation pump.

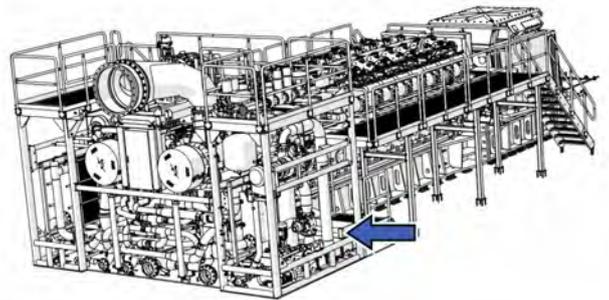




- Check the pressure.
- As soon as the pressure is close to 0 bar, open the vent lines at the engine and TCA module.



- Deactivate the pump when no more cooling water comes out.



6.2.2 Filling

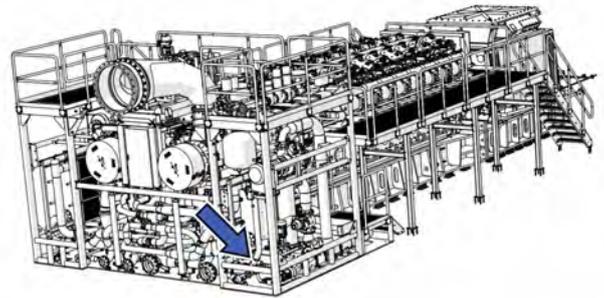
- Open the ball valves for venting on the engine.



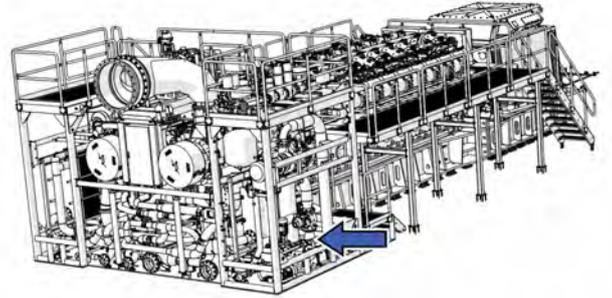
- Open the ball valve for venting on the TCA module.



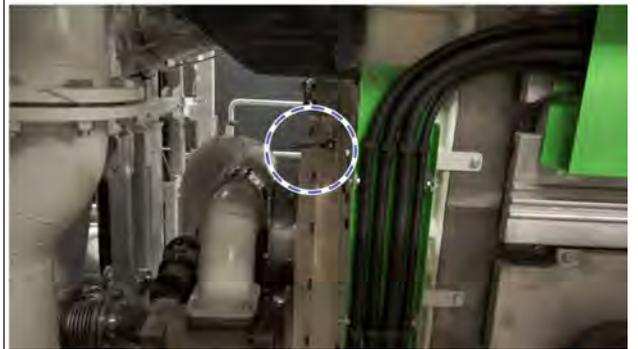
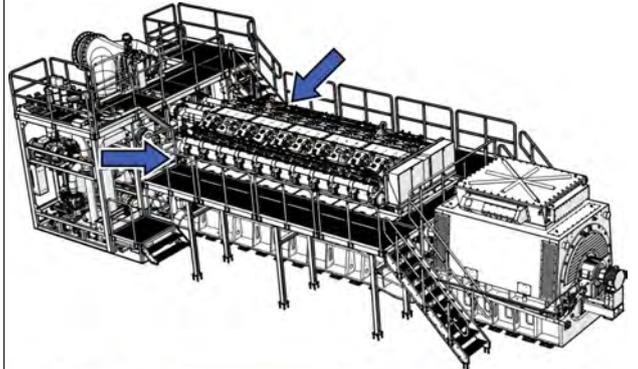
- Bring all the ball valves in the illustration to the positions shown.



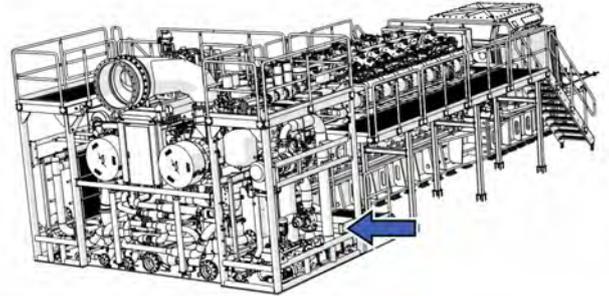
- Bring all the ball valves in the illustration to the positions shown.



- Open the drain lines.



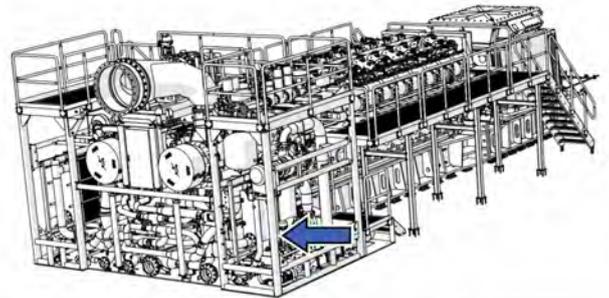
- Open the vent lines.



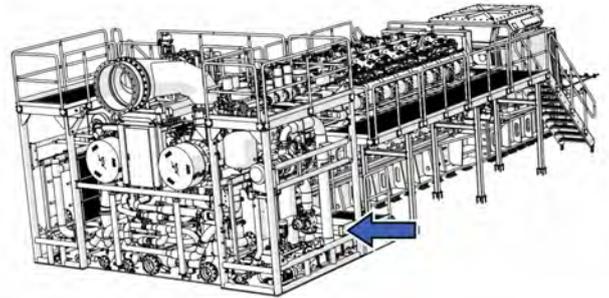
- Switch on the circulation pump.



This procedure may take a considerable time, as approximately 1,800 litres of engine cooling water will be pumped into the system.



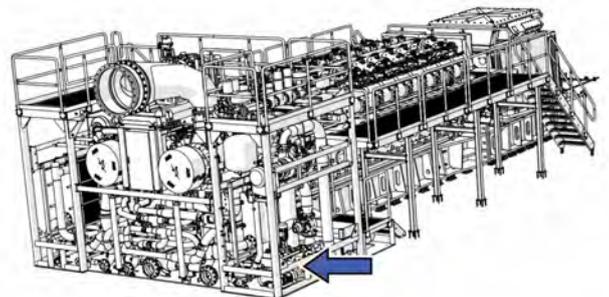
- As soon as cooling water is discharged, close off the vent line.



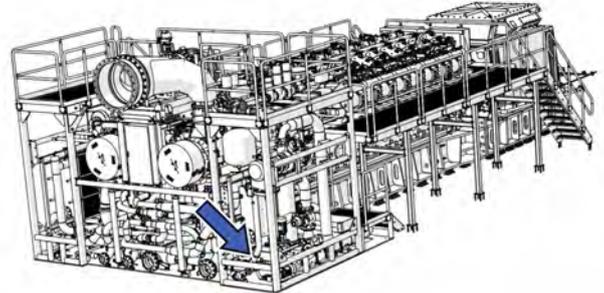
- Once both vent lines are closed, continue building up the pressure in the system.



See the technical diagram in the description and operation documents for details.



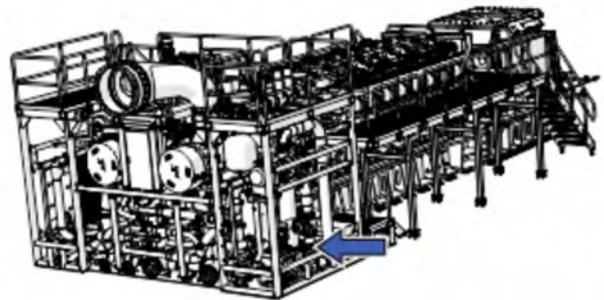
- Switch off the circulation pump.
- Close the ball valve.



- Close one of the ball valves.

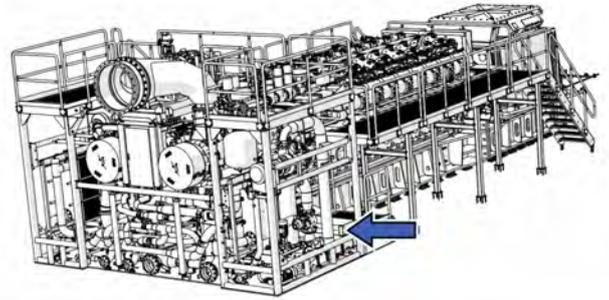


One must remain open to ensure the pressure gauge functions.



6.2.3 Venting

- Vent until no further air bubbles are discharged.
- Close the ball valves again.

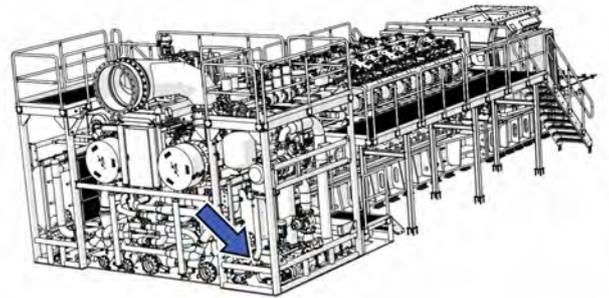


- Open the ball valve.
- Switch on the circulation pump.
- Build up the pressure again.



See the Technical Diagram in the description and operation documents for details.

- Deactivate the cooling water pump.
- Close the ball valve.



- Switch the cooling water pump over from REMOTE to LOCAL ①.
- Start the cooling water pump ②.



Set a frequency of 37 Hz.



Wait 10 mins.



- Deactivate the cooling water pump ①.



Wait 5 mins.

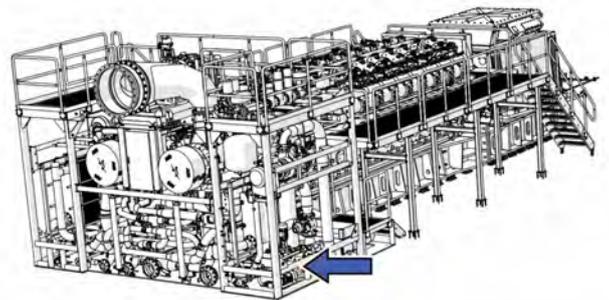


Repeat this procedure from the ⇒ Venting chapter three times. The entire air should have been discharged from the system by then.

- Build up the pressure in the cooling water system.



See the Technical Diagram in the description and operation documents for details.



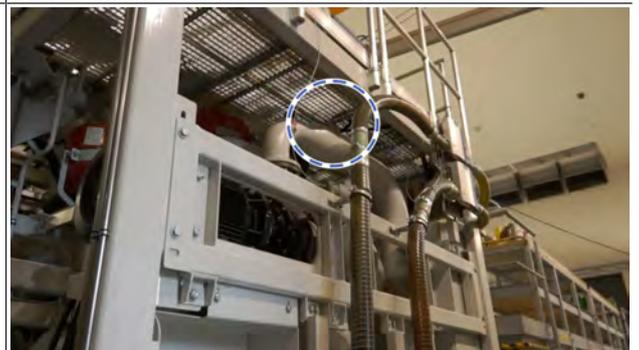
- Switch the cooling water pump back to REMOTE ①.



- Close the ball valves for venting on the engine.



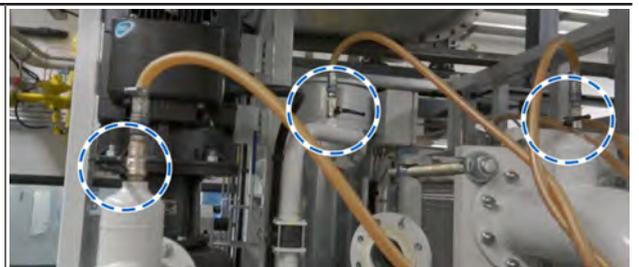
- Close the ball valve for venting on the TCA module.



6.2.4 Cooling water system

Draining

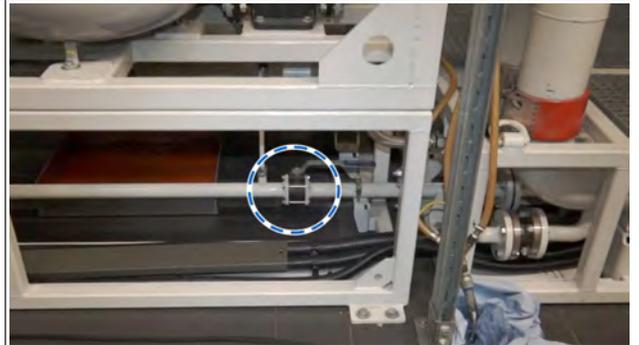
- Close the ventilation ball valves on the TC module.



- Close the ventilation ball valves on the engine.



- Open the ball valve for the filler/drain pipe.



- Place a collection container underneath.
- Connect an external pump provided by the customer (W4 on the technical diagram).
- Feed the cooling water into an external container.



The container must hold at least 2000 l.



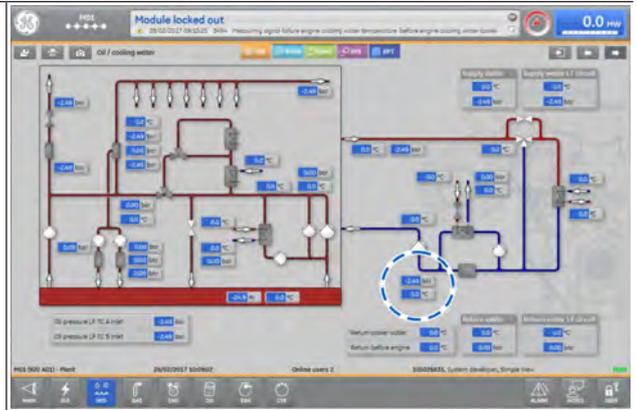
- Open the ball valve for the filler/drain pipe.



- As soon as the pressure reaches approximately 0 bar, open all vent lines to the engine and JW module.



The pressure can be read off on the DIA.NE under the "HYD - Oil/Cooling Water" tab.



- Switch on the pump at W4.
- Deactivate the pump when no more cooling water comes out.

Filling

- Attach the ventilation hose to the ball valves.
- Open the ventilation ball valves on the TC module.



- Attach the ventilation hose to the vent line.
- Open the ventilation ball valves on the engine.



- Open the ball valve on the pressure expansion vessel.



- Connect the external pump to the container with fresh cooling water.
- Switch on the external pump.
- Check whether the cooling water is coming out of the vent lines.
- If so, close the ball valve out of which the cooling water is coming.

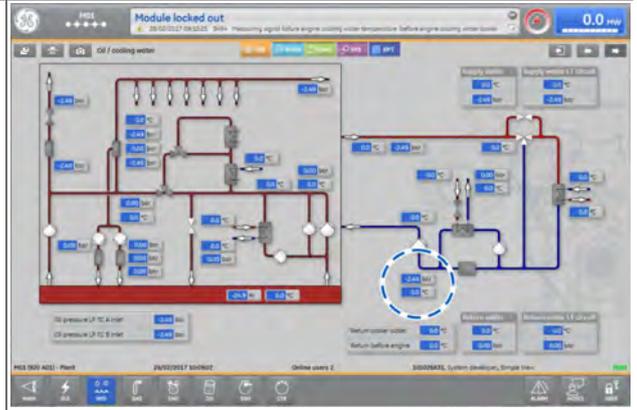
- Once all vent lines are closed, continue building up the pressure in the system.



See the Technical Diagram in the description and operation documents for details.



The pressure can be read off on the DIA.NE under the "HYD - Oil/Cooling Water" tab.



Venting

- Vent the ventilation ball valves on the JW module and engine until no more air bubbles escape.
- Close the ball valves again.
- Switch on the external pump.
- Build up the pressure again.



See the Technical Diagram in the description and operation documents for details.



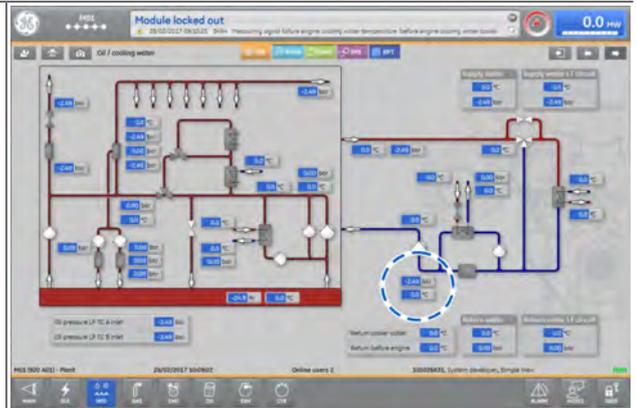
The pressure can be read off on the DIA.NE under the "HYD - Oil/Cooling Water" tab.

- If the pressure has been reached in accordance with the technical diagram, switch off the pump.



Wait 5 mins.

- Repeat the **Venting** work step three times.
- Vent the engine cooling water pump.



- Vent the preheating pump.



- Open the ball valve.
- Switch on the external pump.
- Build up the pressure again.

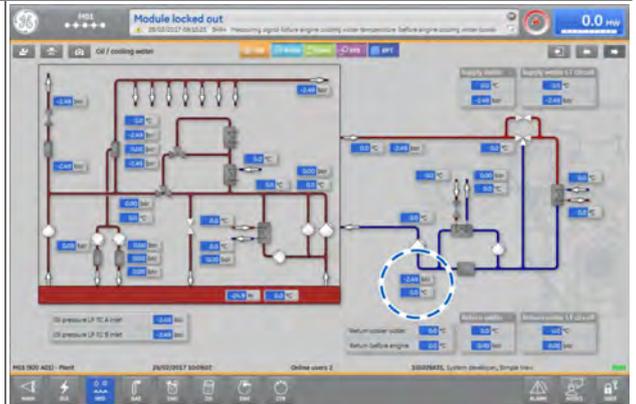


See the Technical Diagram in the description and operation documents for details.



The pressure can be read off on the DIA.NE under the "HYD - Oil/Cooling Water" tab.

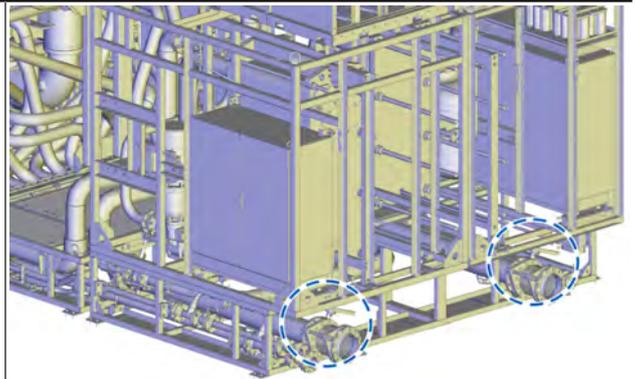
- If the pressure has been reached in accordance with the technical diagram, switch off the pump.



6.2.5 High-temperature cooling circuit

Draining

- Close the shut-off valves on the main lines (2x).



- Attach the lines to all 5 ball valves for draining.
- Feed all lines into a container.

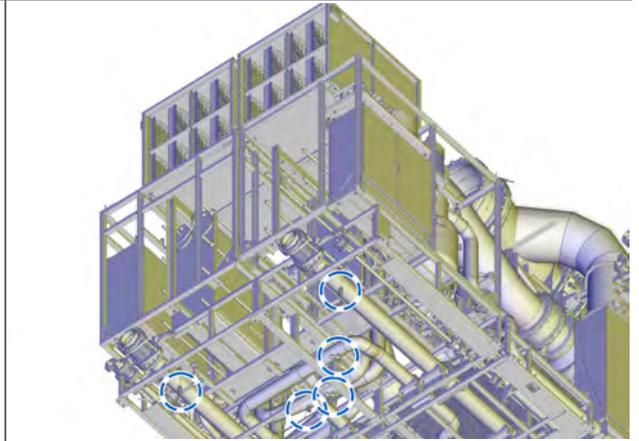


The vessel must have a capacity of at least 1800 litres.

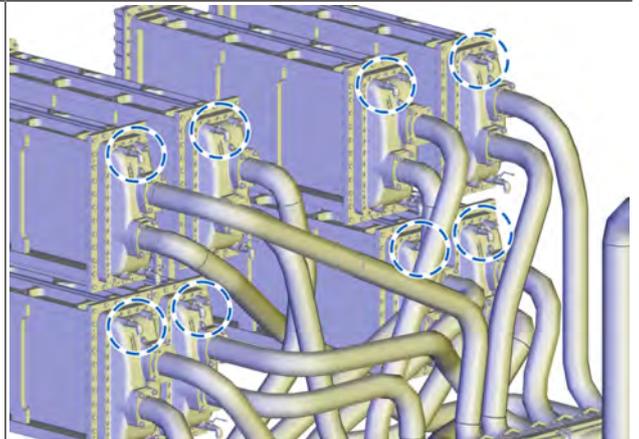
- Open all 5 ball valves.



Wait until no more cooling water comes out.

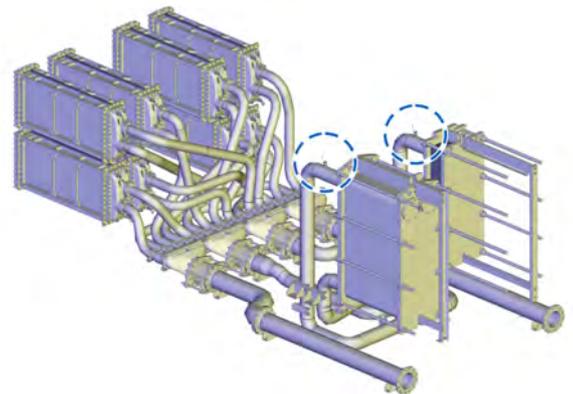


- Open the ventilation ball valves on the charge air cooler.



(Illustration for information purposes only)

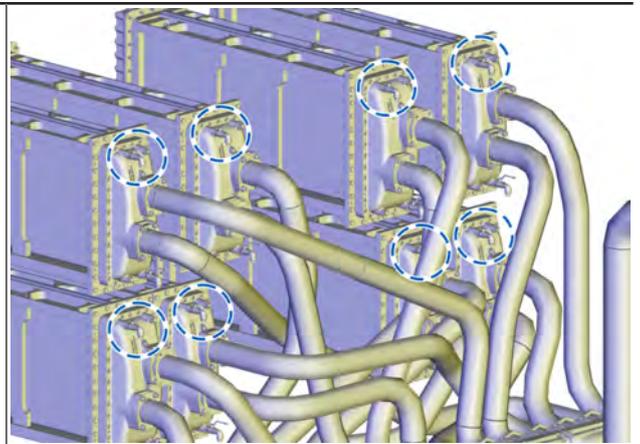
- Open the ventilation ball valves on the plate heat exchanger.



High-temperature cooling circuit (Illustration for information purposes only)

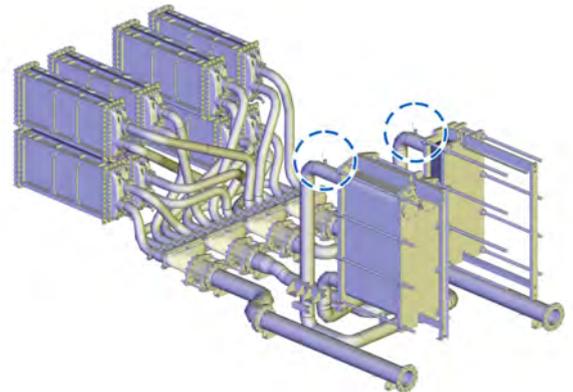
Filling

- Attach the ventilation hose to the ball valves.
- Open the ventilation ball valves on the charge air cooler.



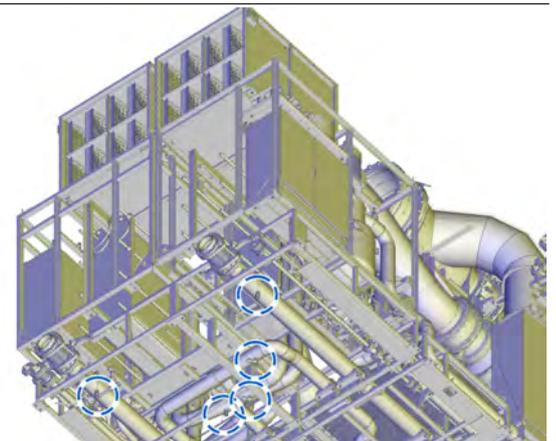
(Illustration for information purposes only)

- Attach the ventilation hose to the vent line.
- Open the ventilation ball valves on the plate heat exchangers.



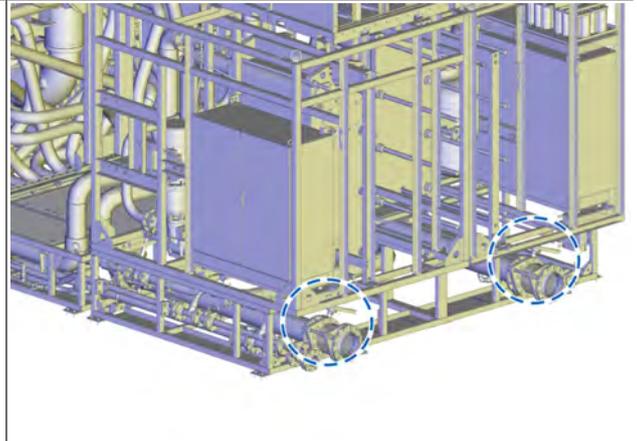
High-temperature cooling circuit (Illustration for information purposes only)

- Close all 5 ball valves for draining.



View from below

- Open the shut-off valves.



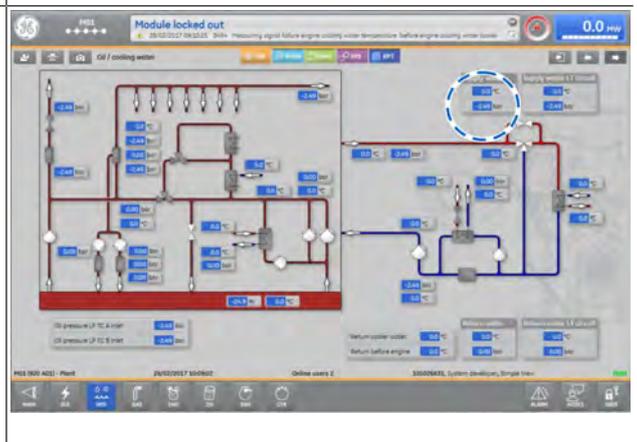
- Fill the high-temperature circuit with fresh cooling water using a pump provided by the customer.
- Build up the pressure in the system.



See the Technical Diagram in the description and operation documents for details.



The pressure can be read off on the DIA.NE under the "HYD - Oil/Cooling Water" tab.



Venting

- Open all ventilation valves until no more air bubbles escape.
- Close the ventilation ball valves again.
- Switch off the external customer's pump.
- Build up the pressure again.



See the Technical Diagram in the description and operation documents for details.

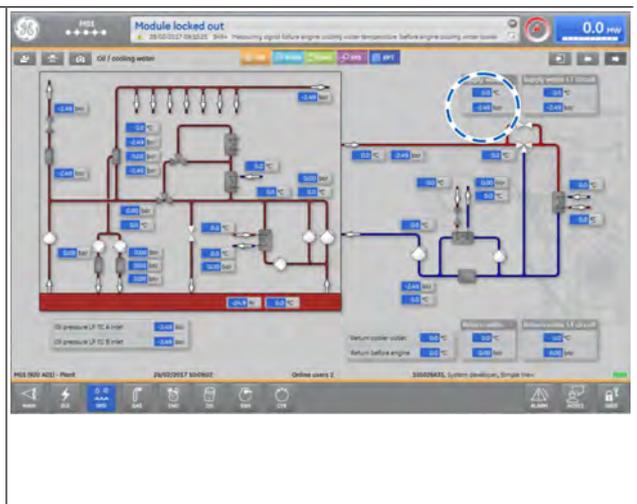


The pressure can be read off on the DIA.NE under the "HYD - Oil/Water" tab.



Wait 5 mins.

- Repeat the **Venting** work step three times.



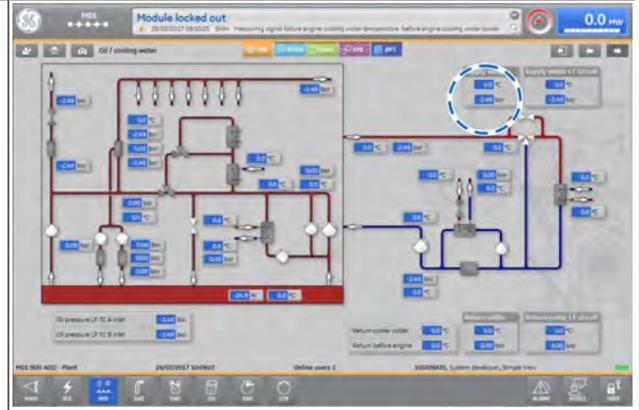
- Switch off the external customer's pump.
- Build up the pressure again.



See the Technical Diagram in the description and operation documents for details.



The pressure can be read off on the DIA.NE under the "HYD - Oil/Water" tab.



6.3 Checking the electrical preheater

This activity is to be carried out by INNIO or a company selected by INNIO authorised to carry out this work.

6.4 Cleaning the electrical preheater

This activity is to be carried out by INNIO or a company selected by INNIO authorised to carry out this work.

6.5 Replacing the gaskets on the electrical preheater

This activity is to be carried out by INNIO or a company selected by INNIO authorised to carry out this work.

6.6 Replacing the cooling water pipe O-rings

This activity is to be carried out by INNIO or a company selected by INNIO authorised to carry out this work.

6.7 Replacing the cooling water pipe O-rings

This activity is to be carried out by INNIO or a company selected by INNIO authorised to carry out this work.

7 Revision code

Revision history

Index	Date	Description / Revision summary	Expert Auditor
6	30.07.2019	GE durch INNIO ersetzt / GE replaced by INNIO	Schweinberger A. Pichler R.
5	18.04.2018	Intervall Kühlwasser tauschen korrigiert, Vorwärmpumpe in eine eigene Wartungsarbeit abgekoppelt (W 8081 A9) / Interval cooling water exchange corrected, Preheating pump in own Maintenance instruction (W 8081 A9)	Rainer M., Madl W.
4	15.11.2017	Intervall Vorwärmpumpe zusätzlich Zeit abhängig und Gleitringdichtung hinzugefügt / Interval pre-heating pump additionally time dependent and mechanical seal added	Rainer M., Madl W.

Revision history

3	20.03.2017	Kapitel für TCM+AUX Module hinzugefügt / Chapter for TCM +AUX Modules added	Rainer M., Madi W.
2	13.12.2016	Wartungsintervall hydraulische Vorwärmeeinheit entfernt, detaillierte Beschreibung der Wartungsschritte Kühlwasser tauschen und Kühlwasserprobe entnehmen / Maintenance interval Hydraulic preheater unit removed, detailed description of cooling water exchange and cooling water sampling	Rainer M., Chvatal S. Madi W.
1	19.02.2015	Erstausgabe / First issue	Kecht Madi

