



TA 1400-0164

Technical Instruction

Big-end bearing temperature monitoring, Type 9 engines



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1 Scope

This Technical Instruction [TA] applies to the following Jenbacher Gas Engines:

- Type 9 engines

2 Purpose

This Technical Instruction [TI] describes the following aspects of the big-end bearing temperature monitoring system:

- Function
- Assembly
- Setting

3 Introduction

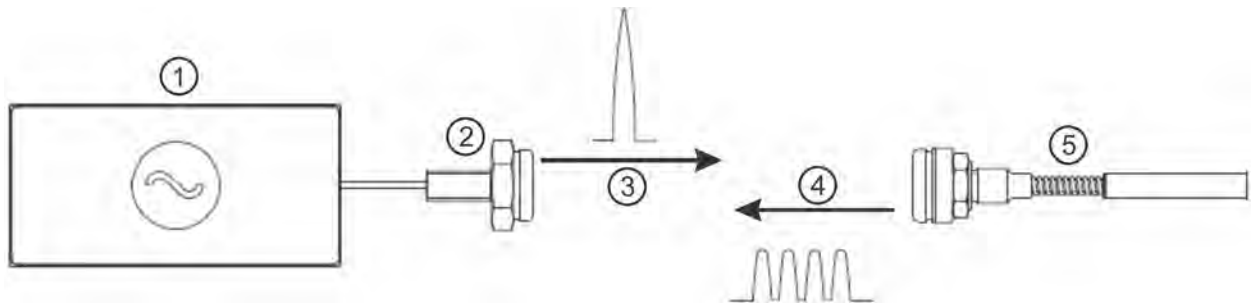


The big-end bearing monitoring system is a wireless system that uses a sensor to capture the big-end bearing temperature and an antenna to transmit it to the evaluation unit, all without the need for cables. There, the temperature signal is processed and made available on the CANbus.

Certain installation conditions must be observed in order to ensure the efficient transmission of the signal. However, the main condition is the gap between the sensor and the antenna. Filler rings are used to adjust the gap to 15 ± 2 mm.

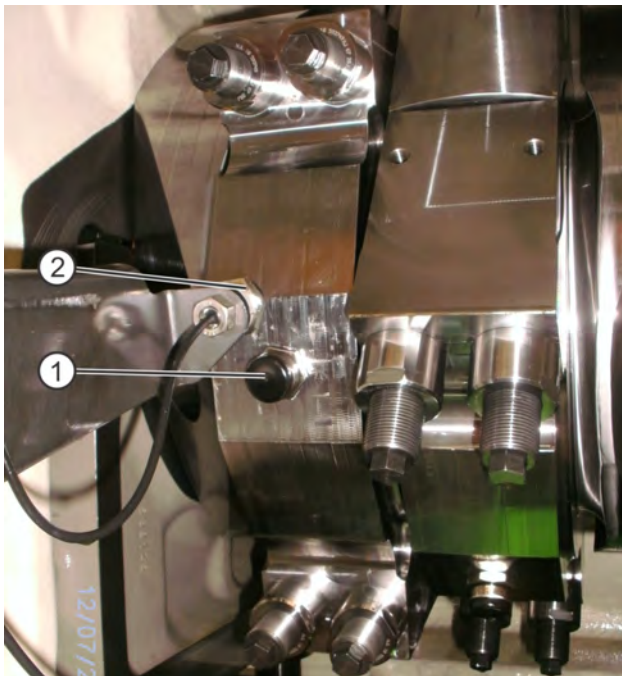
Following an upgrade or conversion in the field, a situation may arise in which the gaps are no longer within the specified range, resulting in increased signal failures.

The signal runtimes and amplification factors for each individual cylinder are stored in the signal processor. If these values have changed (e.g. because a sensor has been replaced or the gap has changed), it may be necessary to recalibrate the signal runtime and amplification factor.



Principle of big-end bearing temperature measurement

①	Signal processor (Sentry GBP)	④	Radar pulse from temperature sensor
②	Stationary antenna (Sentry GBS)	⑤	Temperature sensor (Sentry GBW)
③	Radar pulse from signal processor		



Big-end bearing temperature sensor on the J920

①	Temperature sensor	②	Antenna
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4 Part numbers

J920 engine with big-end bearing temperature monitoring system only

GE Part Name No.	Detail	Description
121175 0	Kongsberg 20-cylinder SPU evaluation unit (GBP200AK20S)	CANopen Converts temperature signals to CANbus 20 cylinder
122658 3	Cable set: all cables in their new lengths are included	
652198	Cable for no. 1 cylinder/big-end bearing	GB-717/9 Adjusted cable length, with marking:

GE Part No.	Name	Detail	Description
652409	Cable for no. 2 cylinder/big-end bearing	GB-717/8	
652410	Cable for no. 3 cylinder/big-end bearing	GB-717/14	
652411	Cable for no. 4 cylinder/big-end bearing	GB-717/19	
652412	Cable for no. 5 cylinder/big-end bearing	GB-717/25	
652413	Cable for no. 6 cylinder/big-end bearing	GB-717/31	
652414	Cable for no. 7 cylinder/big-end bearing	GB-717/37	
652415	Cable for no. 8 cylinder/big-end bearing	GB-717/44	
652416	Cable for no. 9 cylinder/big-end bearing	GB-717/50	
652417	Cable for no. 10 cylinder/big-end bearing	GB-717/56	
122658 5	Cable for no. 11 cylinder/big-end bearing	GB-717/8	
658026	Cable for no. 12 cylinder/big-end bearing	GB-717/7	
658025	Cable for no. 13 cylinder/big-end bearing	GB-717/14	
122658 6	Cable for no. 14 cylinder/big-end bearing	GB-717/19	
658027	Cable for no. 15 cylinder/big-end bearing	GB-717/26	
122658 7	Cable for no. 16 cylinder/big-end bearing	GB-717/32	
122658 9	Cable for no. 17 cylinder/big-end bearing	GB-717/45	
658028	Cable for no. 18 cylinder/big-end bearing	GB-717/50	
658029	Cable for no. 19 cylinder/big-end bearing	GB-717/56	
658030	Cable for no. 20 cylinder/big-end bearing	GB-717/62	
652199	Cable gland	GB485	Cable gland M18x1.5
652214	Antenna for Kongsberg conrod monitoring system including 700 mm of cable	GBS100/45-7	Antenna for installation in crankcase
120687 5	Antenna for Kongsberg conrod monitoring system including 1400 mm of cable	GBS100/45-14	Antenna for installation in crankcase (where big-end bearing has been fitted so that both SPUs are mounted on the B side)

GE Part No.	Name	Detail	Description
652215	Sensor for Kongsberg conrod monitoring system, 53mm	GBW100/CF53	Sensor for installation in crankcase for SCE and MCE
122421 7	Sensor for Kongsberg conrod monitoring system, 62mm	GBW100/CF62	Sensor for reinforced conrod with thick bearing shell
120621 1	Sensor for Kongsberg conrod monitoring system, 63 mm	GBW100/CF63	Sensor for installation in crankcase with Wyman conrod (part number 9009673)
123489 4	Sensor for Kongsberg conrod monitoring system, 63mm, improved design	GBW100/CF63	Improved weld seam, strengthened tube and cap material Grivory HTV-4H1
123602 5	Sensor for Kongsberg conrod monitoring system, 62mm, improved design	GBW100/CF62	Type 9, with improved weld seam, strengthened tube and cap material Grivory HTV-4H1
122338 7	Filler ring for antenna		

5 Assembly

NOTE



Damage to screw connection at the crankcase signal cable gland

If the screw connection at the signal cable gland on the inside of the crankcase is damaged, the big-end bearing temperature monitoring system will cease to operate.

- When fitting the screw connection to or removing it from the crankcase signal cable gland, ensure that it does not sustain damage as a result of the lifting motion of the tool between the crankcase wall and the gland or between the two glands.

Note the following when fitting:

- Do not use cable ties to secure the antenna cable.
These become brittle and could therefore fall into the engine oil pan.
- Tightening torque for the sensors: 40 Nm
- Tightening torque for the cable glands: 5 Nm
- Do not use an impact wrench when fitting.
- The plug connectors for the cabling must audibly click together when connected and the connection must then be checked.
- Do not use the section of the sensor above the hexagon (plastic cap and metal housing with marking) to screw in or unscrew the sensor. It is fragile and can break off under mechanical load. The screw may only be handled or loosened/tightened using its hexagonal part.

6 Adjustment instructions

The condition of the components must be inspected in the following cases:

- Frequent signal interruptions (loss of big-end bearing temperature signal in DIA.NE WIN) with shutdowns tripped by measurement signal failures of the big-end bearing monitoring system

- Warning "3559 Big-end bearing signal strength low" is displayed (operational message 2822 with the cylinder number is displayed as an additional figure)

Check following components:

- Plug connectors on the analysis unit
- Plug connectors on the crankcase cable gland
- Antenna cabling as far as the analysis unit

It is also possible that a sensor is defective.

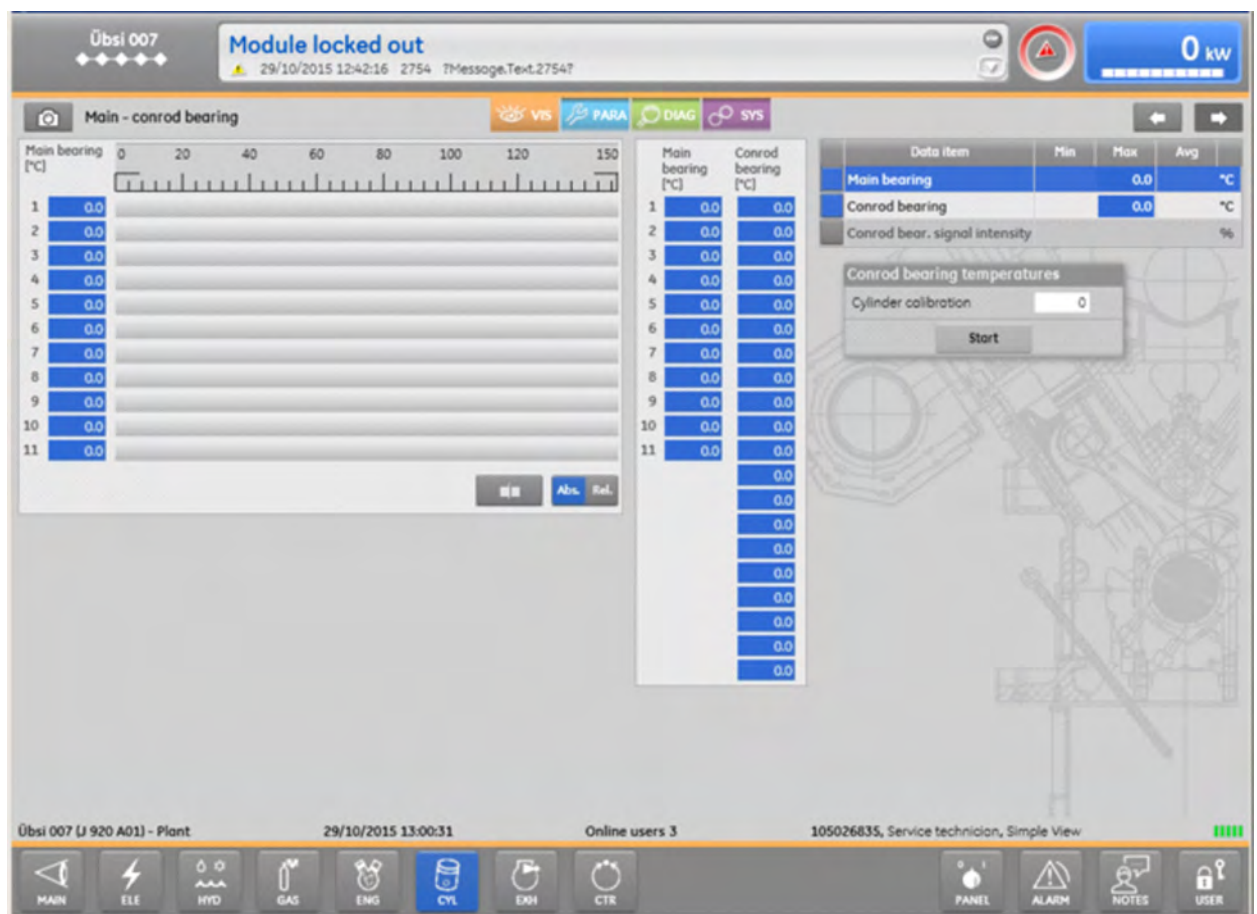
After any change to the sensor following a sensor replacement or if there are frequent measuring signal failures, the sensor must be calibrated with the engine at rest. Use the turning device to rotate the sensor exactly in front of the antenna. Select the appropriate cylinder from the "Cylinder calibration" number field. Only one sensor can be calibrated with the engine at rest. To begin the calibration process, press the "Start" button.

There is also the option of displaying the sensor signal strength for each cylinder. The sensor signal strength is determined on every successful engine start and shutdown. The values should always lie around 50%. A warning is triggered accordingly below 40%. The display therefore allows early detection of when a sensor indicates a low signal strength near the borderline.



You cannot calibrate all the sensors at the same time with the engine at rest.

However, you can calibrate all the sensors at the same time with the engine running. To do so, select "0" from the "Cylinder calibration" number field.



It is recommended to perform the calibration with the engine at rest. In principle, a calibration can be performed with the engine running, but this is not generally necessary.

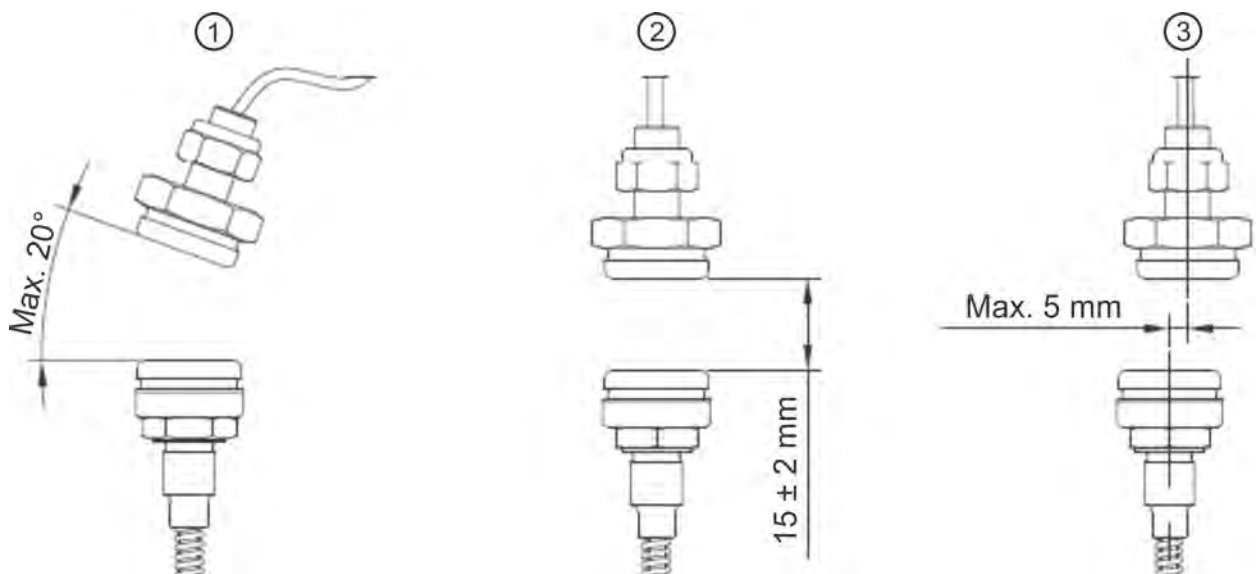
The sensors do not transmit a temperature signal during calibration with the engine running. Before starting calibration with the engine running, you must always check in advance that the big-end temperatures are stable and no bearing is showing a borderline deviation from the average.

You should also check the gap and the offset between the sensor and the antenna and adjust if necessary. You must maintain a gap of 15 ± 2 mm since this allows for the best signal strength (and reliability of signal transmission). Use a vernier calliper to check the gap.

When using washers to adjust the supports or the gaps, you must always ensure that rotating parts do not come into contact with the support or the sensor. You should therefore use the turning gear to turn the engine.

In previous versions, the gap between the sensor and antenna must be adjusted using washers.

In newer versions, the support has been shortened and the antenna gap is adjusted accordingly using nuts and locknuts.



Installation limits for sensor and antenna

①	Angle between antenna and sensor	③	Offset between antenna and sensor
②	Gap between antenna and sensor		

If the gap between a sensor and antenna changes, the sensor must be recalibrated. This ensures that the calibration is correctly set to the new distance.

7 Revision code

Revision history

Index	Date	Description / Revision summary	Expert Auditor
6	11.04.2019	GE durch INNIO ersetzt / GE replaced by INNIO	Opoku Pichler R.
5	31.08.2016	Punkt 3, 4, 5 und 6 aktualisiert / Update of point 3, 4, 5 and 6	Meintker N. Spreitzer K.
4	09.03.2016	Punkt 1, 2, 3, 4, 5 und 6 aktualisiert / Update of point 1, 2, 3, 4, 5 and 6	Meintker N. Spreitzer K.
3	30.04.2015	Hinweis bei Sensortausch hinzugefügt / Added Information at sensor replacement	Kecht Spreitzer

Revision history

2	21.05.2014	Neue Bestelldetails, Einbau ergänzt / new order details, included assembly	Boxleitner <i>Weigl C.</i>
1	18.11.2013	Erstausgabe / First issue	Boxleitner <i>Weigl C.</i>

