Troubleshoot generator speed sensor

Does this solve the problem?

1] Yes

2] No

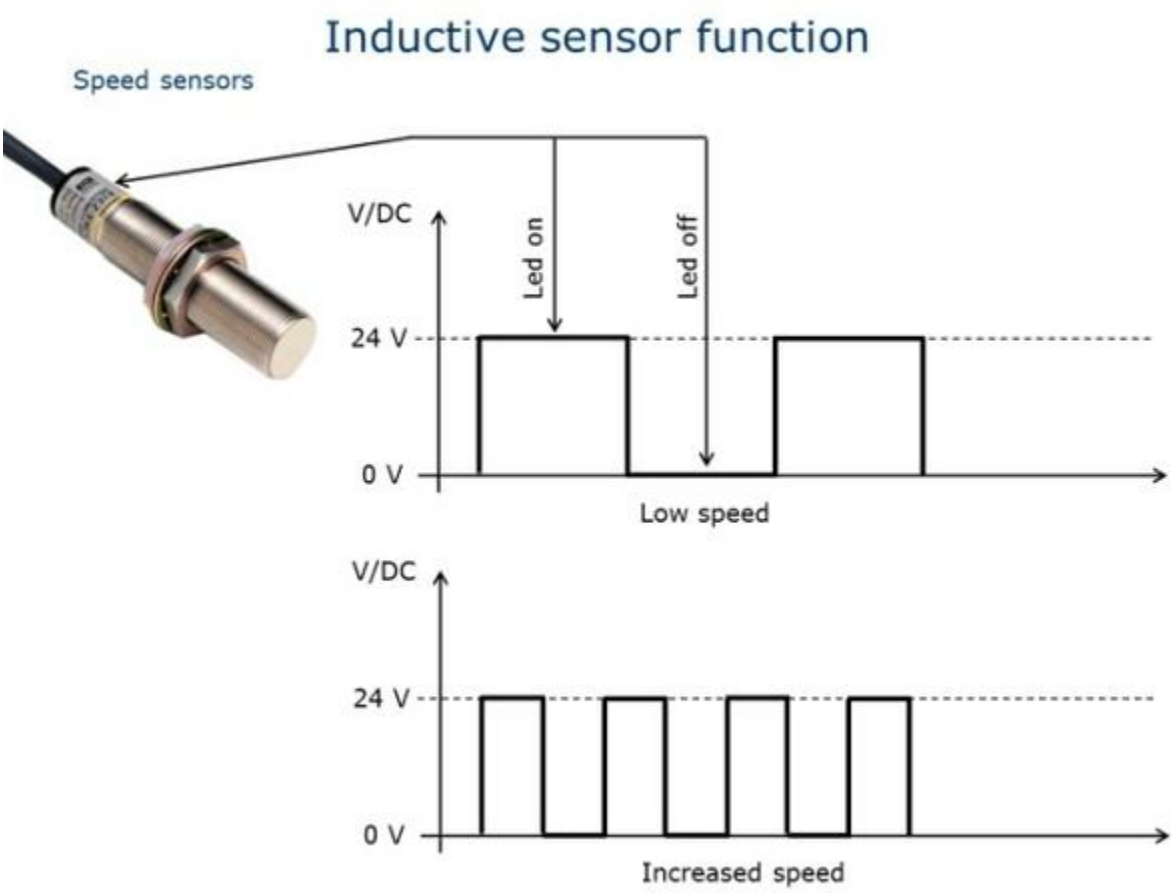
3] I don't know

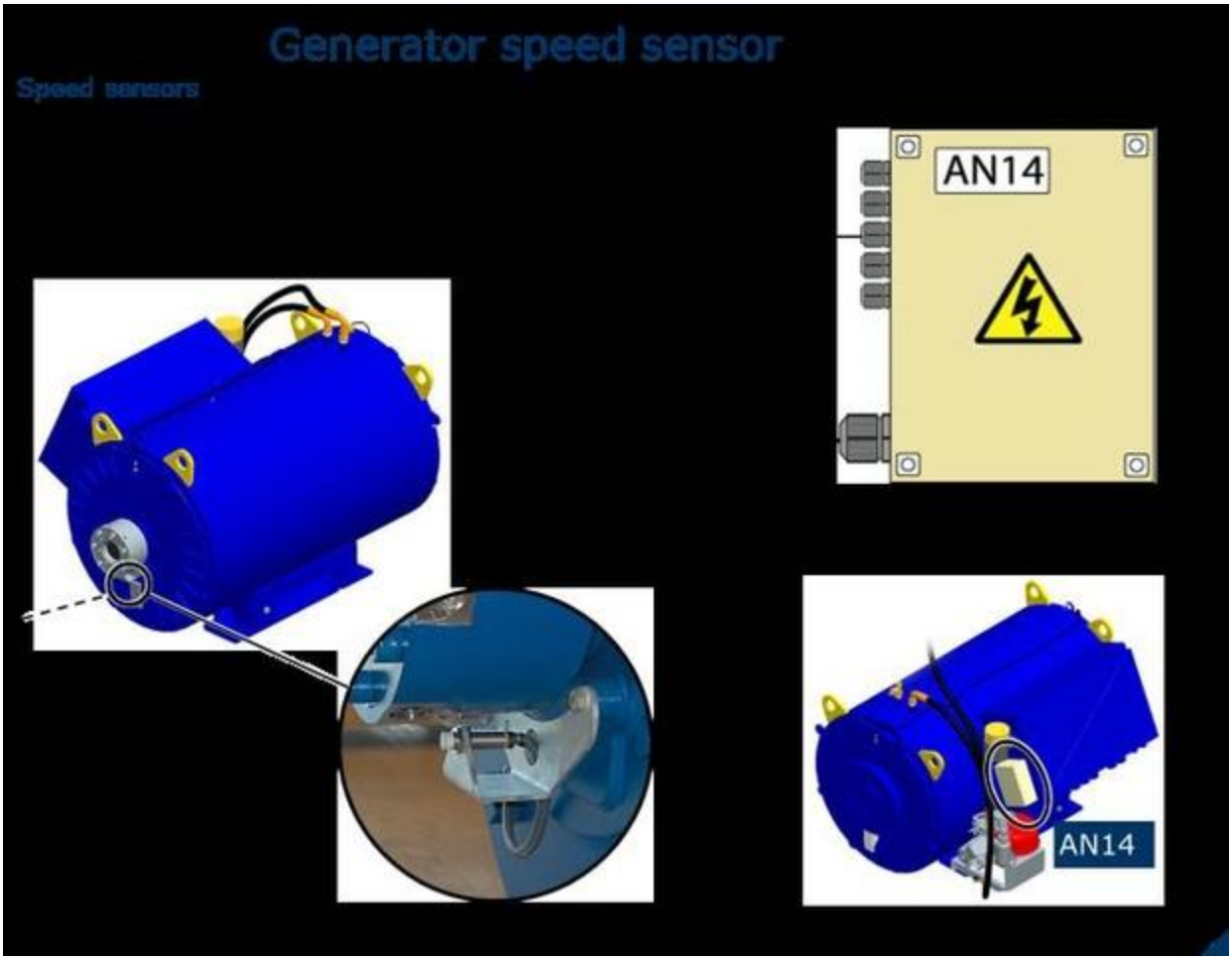
- **Explanation**

Check the turbine alarm logs for 260-Generator speed sensor 1 fault (this alarm will set if the generator RPM does not match the rotor RPM x Gear ratio >3 rpm difference).

The generator speed is measured by an inductive proximity sensor which creates a pulse signal as a pickup point passes over it.

It is possible that the sensor is dirty or misadjusted and occasionally does not pick up the bolt interruption. If the sensor is contaminated, wipe it with a cloth to clean.

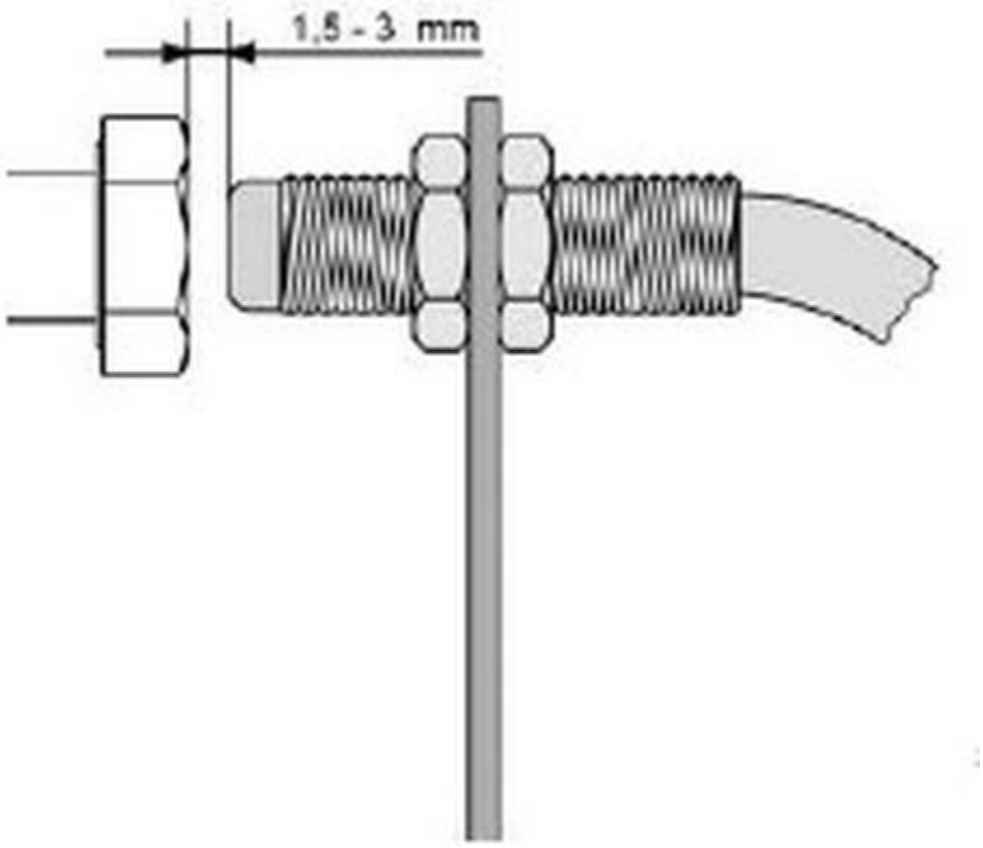




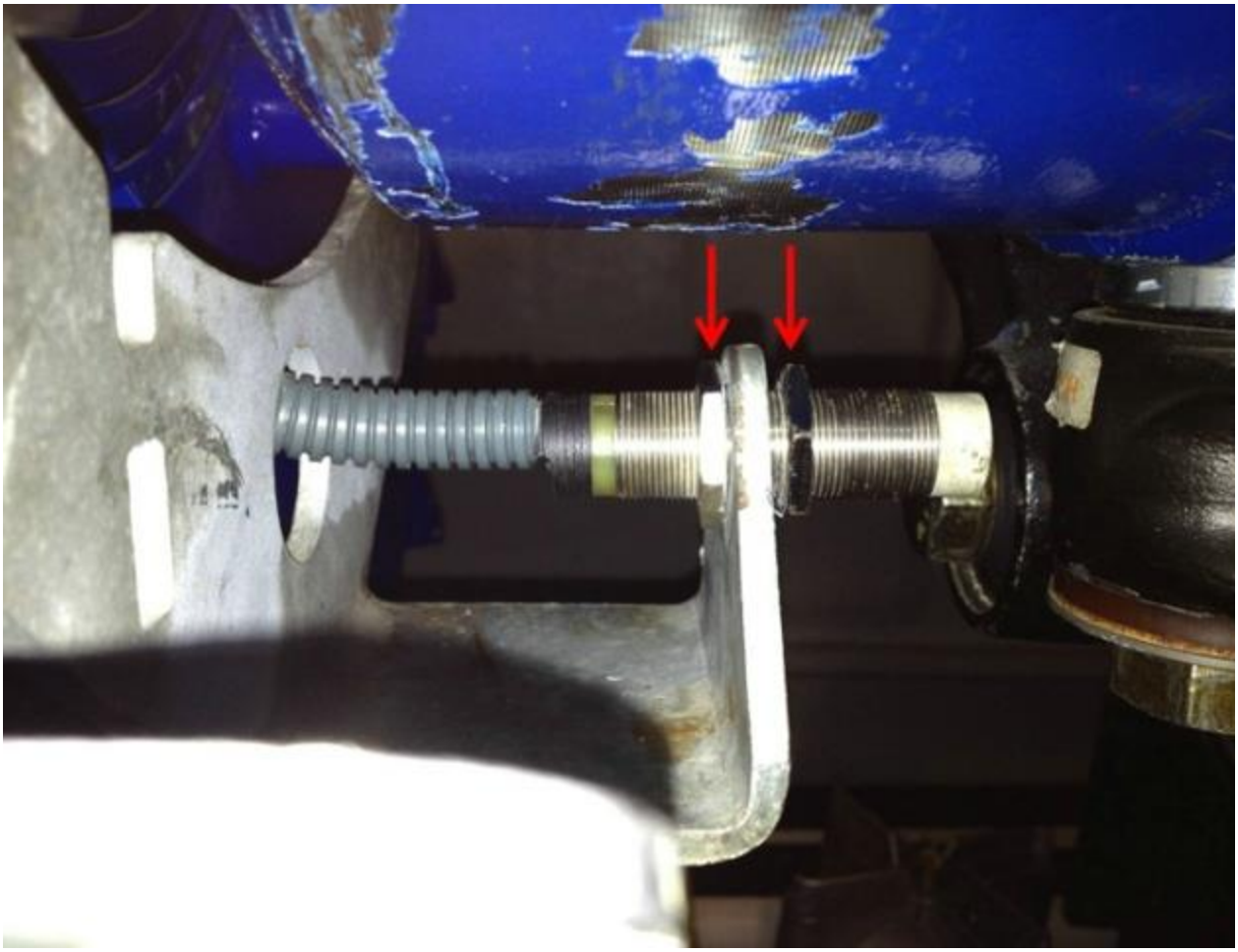
In the case of the generator, there are seven pickup points for every rotation of the shaft therefore the speed is calculated as # of pulses/7 =generator RPM. If the sensor is loose or failing it can "flicker" which will simulate a higher RPM than actual. The sensor can be tested by passing a screwdriver or other ferrous object past the sensor. If it consistently emits a light the sensor is likely operational. The sensor can also be tested by rotating the generator shaft and ensuring that the sensor emits a light when each of the (7) link element bolts passes over the sensor.

If the sensor does not emit a light each time a link element bolt passes over it, lock the shaft and check for correct sensor adjustment. Check the bolts on the speed sensor bracket and ensure that they are properly tightened. The end of the sensor should be within 1,5-3 mm from the pickup point. Adjust the sensor by loosening the nuts that clamp it to the mounting bracket and move it forward or back to achieve the required distance from the pickup point.

Speed sensor measurement



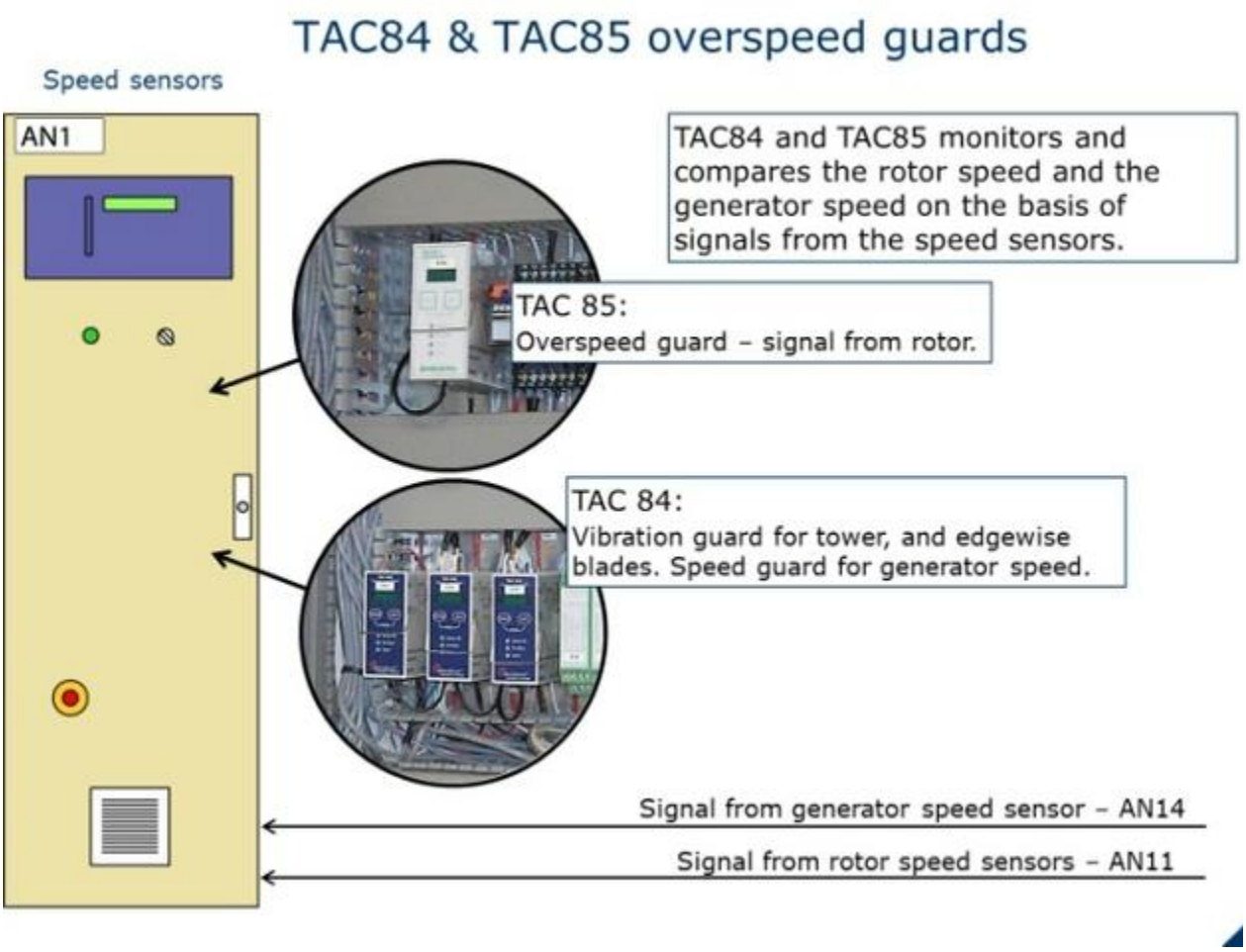
Sensor adjustment nuts:



If after adjustment the sensor still does not light up, or lights up intermittently when passing the pickup point- replace the sensor (sensor and cable are combined-W509)

Relevant spare parts	
Description	**Item No.**
Cable -W509 NM30t. inductive sensor	60021406

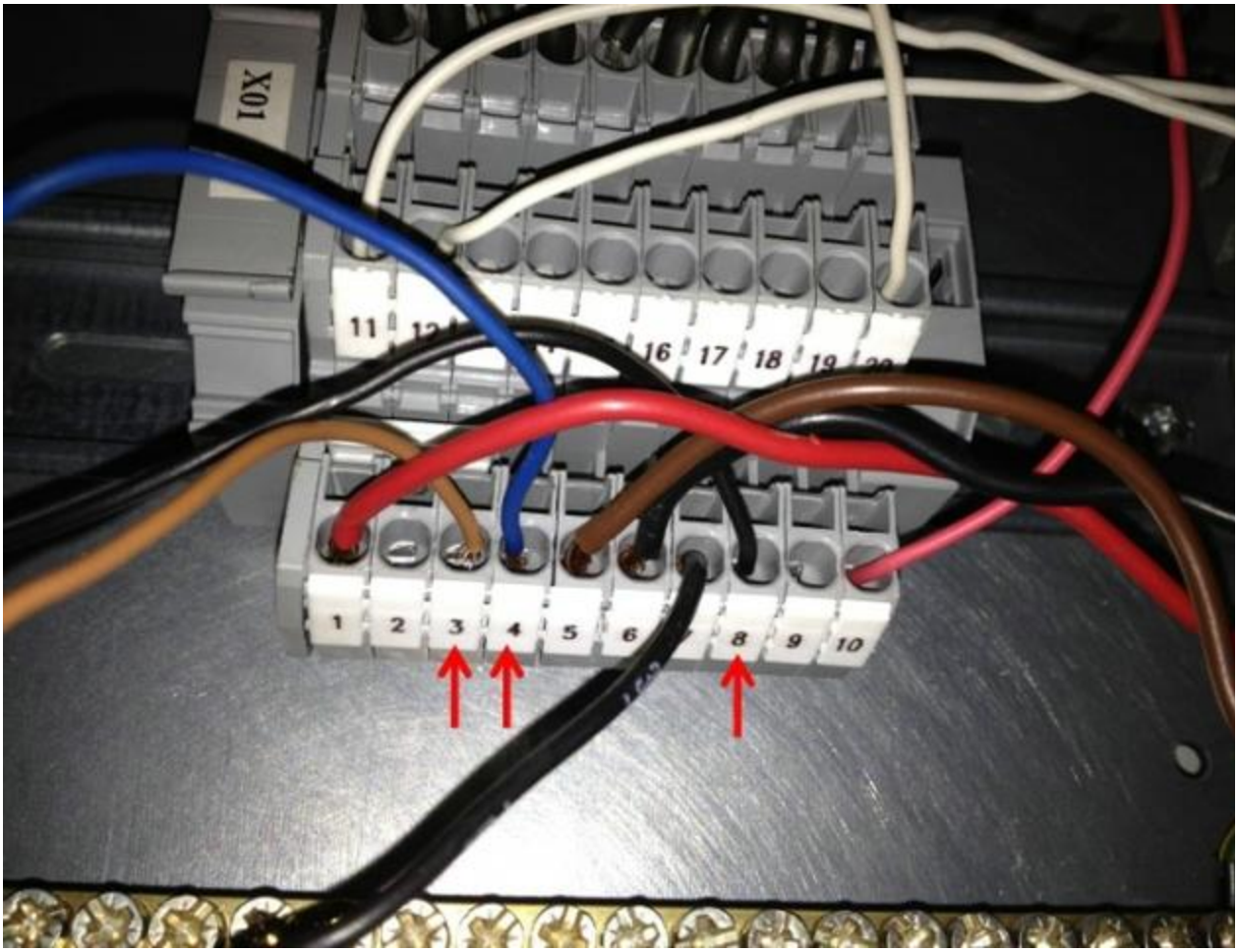
The signal is transmitted to the TACII controller and the three Vibration/overspeed guard modules.



Before replacing the sensor or components, check the circuit for loose connections.

Check for loose sensor terminations in the AN14 panel. (The AN14 terminal panel exists only in V82 1.65 Mw. NM72/82 1650Kw generator speed sensor cables terminate directly at the AN1 Top Box).

Terminal block –X01 terminals 3, 4 & 8:



Check for loose wire terminations in the AN1 Top Box (sensor wire from the AN14 terminates into F42 Varistor Box terminal 6

The signal wires from the F42 varistor box are double stacked, pay close attention to this crimped connection as the wires may be loose:

Wait/Check heater operation

Does this solve the problem?

1] Yes

2] No

3] I don't know

- **Explanation**

  If multiple turbines at site are affected and conditions support the formation of ice, it is likely that ice has accumulated on the wind sensors. If this is the case, the fault will clear when the conditions no longer support the formation of ice. If the above conditions exist but only one turbine is affected, check the sensor heater settings in the TAC controller (Test the heating of the wind vanes and the anemometer in the TAC controller => TEST FUNCTIONS => HEAT TOP SET => ENTER). If settings are okay, physically check the sensors for heater operation.

Align wind sensors

Does this solve the problem?

1] Yes

2] No

3] I don't know

- **Explanation**

Check wind sensor alignment and function SWI 1001876 (Function of all sensors i.e. Ultrasonic, CG and NRG).

For ultrasonic sensors use commissioning manual DMS 0000-9925

For NRG mechanical wind sensors use DMS 1001339

For CG mechanical wind sensors use SWI 1001337

Relevant documentation	
Description	**DMS No.**
commissioning manual V82	0000-9925
Alignment of NRG wind vanes	1001339
Alignment of Carlo Gavazzi wind vanes	1001337

SWI meteorological equipment V82	1001876

Align blades

Does this solve the problem?

1] Yes

2] No

3] I don't know

- **Explanation**
  Check blade calibration and alignment.

  Blade calibration: Use commissioning manual DMS 0000-9925

  Blade alignment: Use rotor assembly manual (section for pitch zero adjustment) DMS 1000812 (for AL blades) or assembly manual DMS 1000798 (for LM blades).

Relevant documentation	
Description	**DMS No.**
Commissioning instructionV82 -1.65-Mk4	0000-9925
Assembling the rotor with AL blades	1000812
Assembling the rotor with LM blades	1000798

Replace bearing/gear

Does this solve the problem?

1] Yes

2] No

3] I don't know

- **Explanation**
  Check VTM for any bearing temperature alerts.

Check for damaged bearings in the drive train by listening for unusual noise during freewheeling. Rolling resistance in the drivetrain can result from failed bearings in the generator, gear-box, or main bearing. Visually inspect gearbox internally for damage in accordance with the service manual for the gearbox (WKI 1001058). If a failed bearing is found, and it is possible- replace the bearing.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