

Service action must be taken without delay

Does this solve the problem?

1] Yes

2] No

3] I don't know

- **Explanation**



A “Gear oil filter clogged” alarm shall be understood as a very serious malfunction in the turbine. A service action must be taken without delay.

As a main rule a “Gear oil filter clogged” alarm shall be solved by changing the filter within 5 days. If the service action cannot be executed within 5 days, the turbine must be stopped to avoid serious damages on

the gearbox.

If a new alarm is released within 240 production hours after changing the filter a serious damage on the gearbox must be foreseen. The gearbox must be checked within 5 days after the second alarm in accordance to the written description for Gear Inspection.

In connection with inspection of the gearbox, all observations at the inspection must be reported the CIR [Component Inspection Report] with necessary photos.

A decision whether the turbine can be restarted or remain stopped, can only be taken by the local Tech support or responsible Service Manager.

If it is decided that the turbine can be restarted and the gearbox releases another alarm within 120 operation hours after the second filter change the turbine must be stopped. Without consideration to earlier inspection, a new inspection must be executed in accordance with description for Gear inspection.

The local Tech support or responsible Service Manager decides further actions.

Criteria for inspection are:

- Particles in oil reservoir or other areas.
- Visible cracks, pitting or deep marks on gearwheels or bearings.
- Obvious wears.
- Unusual noise or vibrations.
- Unusual temperatures.
- Large particles of wear in filter unit or suction hose.

Relevant documentation	
Description	DMS No.
Service Instruction for Gearbox manu	1001058

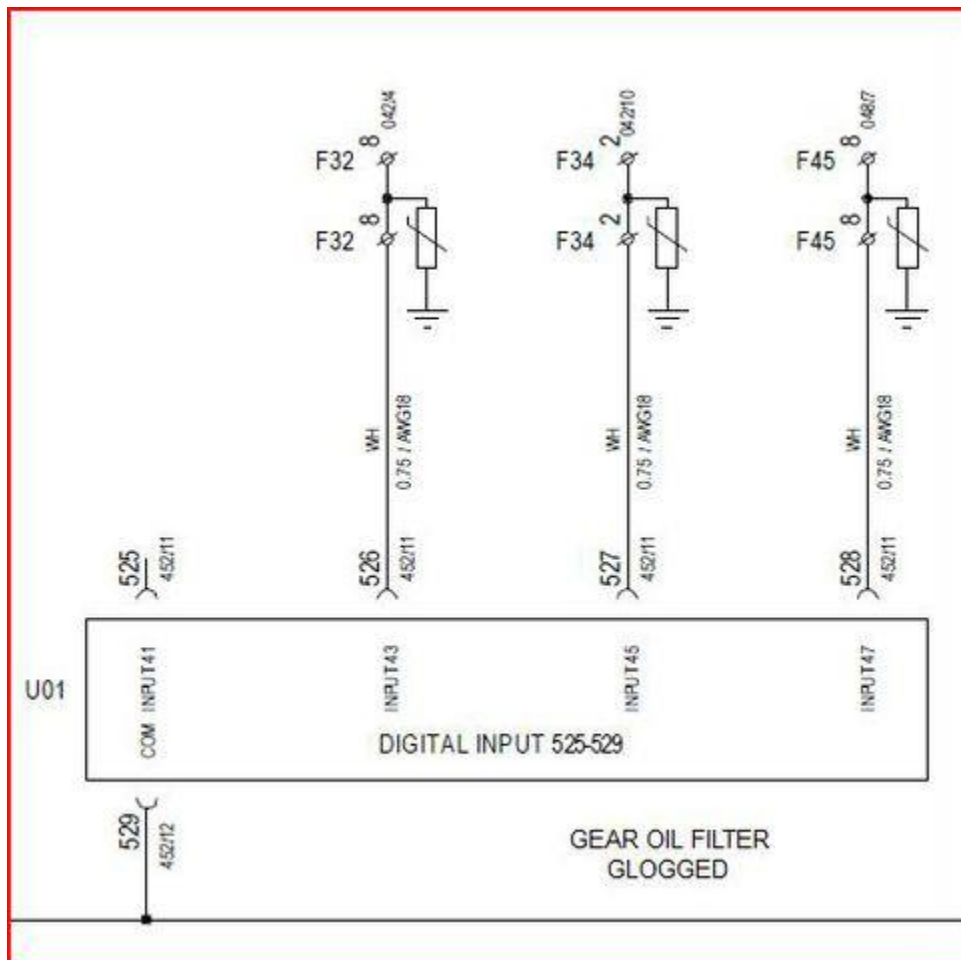
Replace the defective varistor and tighten the loose wires

Does this solve the problem?

1] Yes

3] I don't know

Varistors (F34) can be tested individually by placing a multimeter (set to measure Ω) lead on the common (earth) side of the varistors and the other on the individual varistor terminals. The resistance value over the varistor should be ∞ or in the high M Ω range. If the resistance is lower, the varistor has been damaged by an overvoltage in the circuit and must be replaced.



VARISTOR BOX F34:

Relevant spare parts	
Description	Item No.
VARISTOR BOX X8	51706201

Press the clip on top and bottom of the varistor box and remove the varistor assembly from the housing:



The varistor box is made up of eight varistors and has provisions for 16 wire connections (protection for 8 signals)

IN THE +AN12 CABINET:

Check connections and tightness in +AN12 panel X02 connection 01 and 18.



Check the Sensor cable for any cracks or damage,

If defective replace with a new cable,

Check the sensor termination connections for poor connectivity.

Inspect the filter and filter unit for contamination. Replace the defective filter and clean the contamination from the unit

Does this solve the problem?

1] Yes

2] No

3] I don't know

- **Explanation**
IN THE GEAR OIL FILTER UNIT:

GEAR OIL FILTER CLOGGED CAUSES:

- Excessive foam formed inside the gear boxes.
- Slug/Impurity due to contaminated oil can usage.
- Excessive Loctite's used in the gear box.
- Metal particles from housings due to bearing rotation.
- Metal particles from failed bearing.
- Excessive water content leading to the emulsification of the oil.

Open the filter cover and check for any metal particles present.

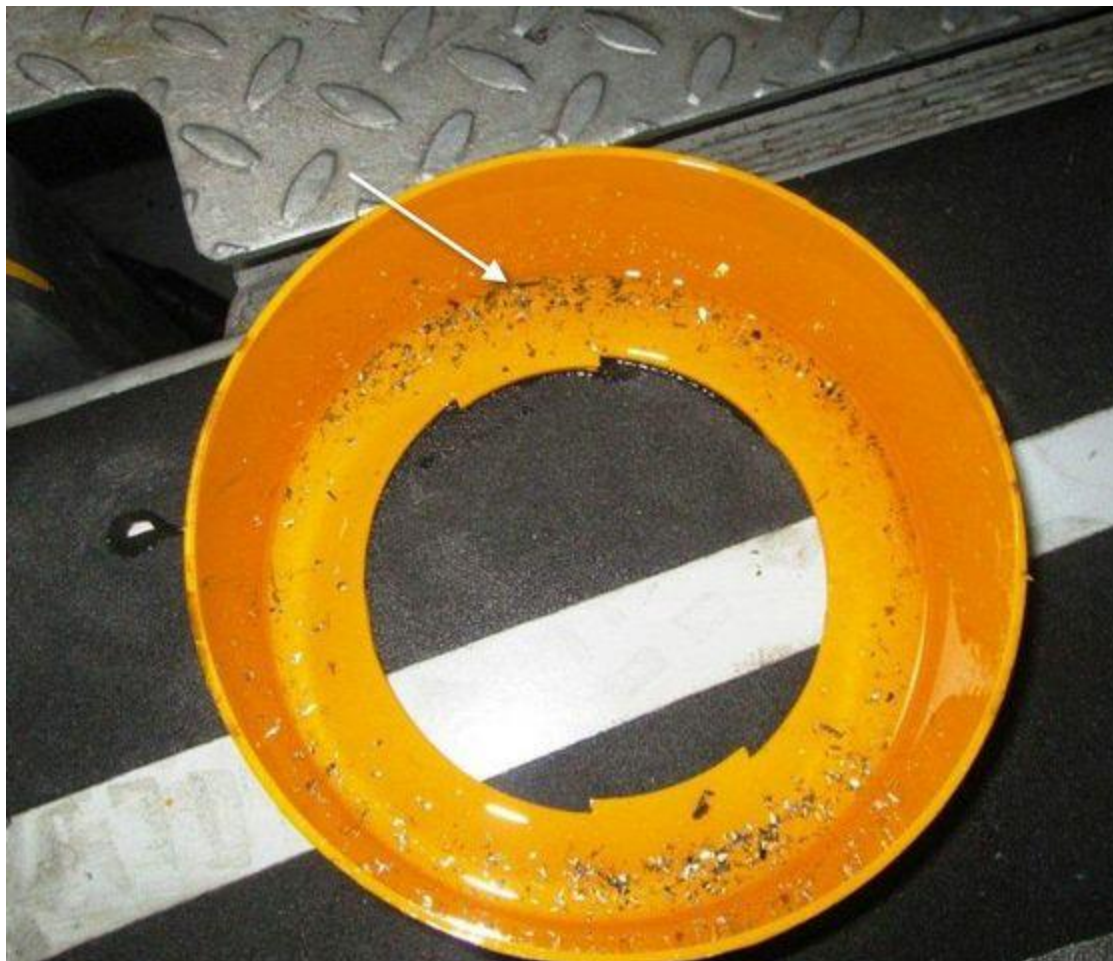
Contaminate Filter unit 1:



Contaminate Filter unit 2:



Contaminate Filter unit 3:



Replace the contaminated filter after cleaning the unit thoroughly.

Relevant spare parts	
Description	Item No.
FILTERELEMENT 1300 R 010 BN4HC	60076343
GEAR OIL,MOBILGEAR SHC XMP 320	60096951

If necessary clean the gear box and housing then replace the gear oil.

Check the name plate details and replace with recommended oil type and quantity.

Replace the defective filter clogged switch or TOI unit

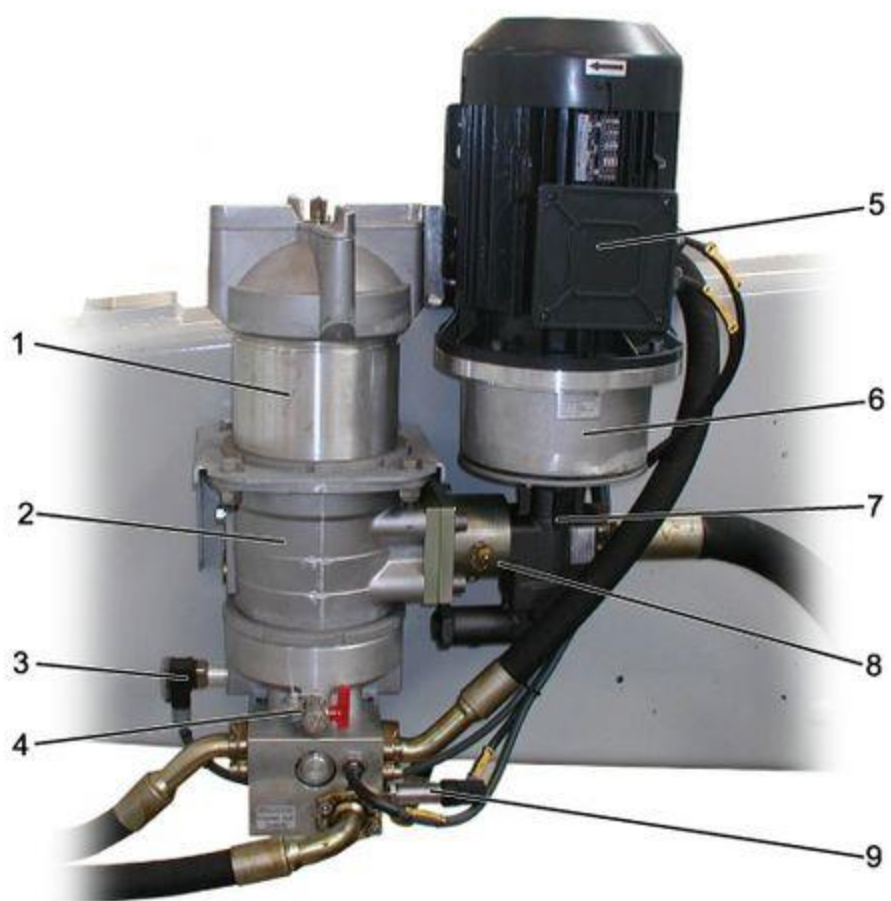
Does this solve the problem?

1] Yes

2] No

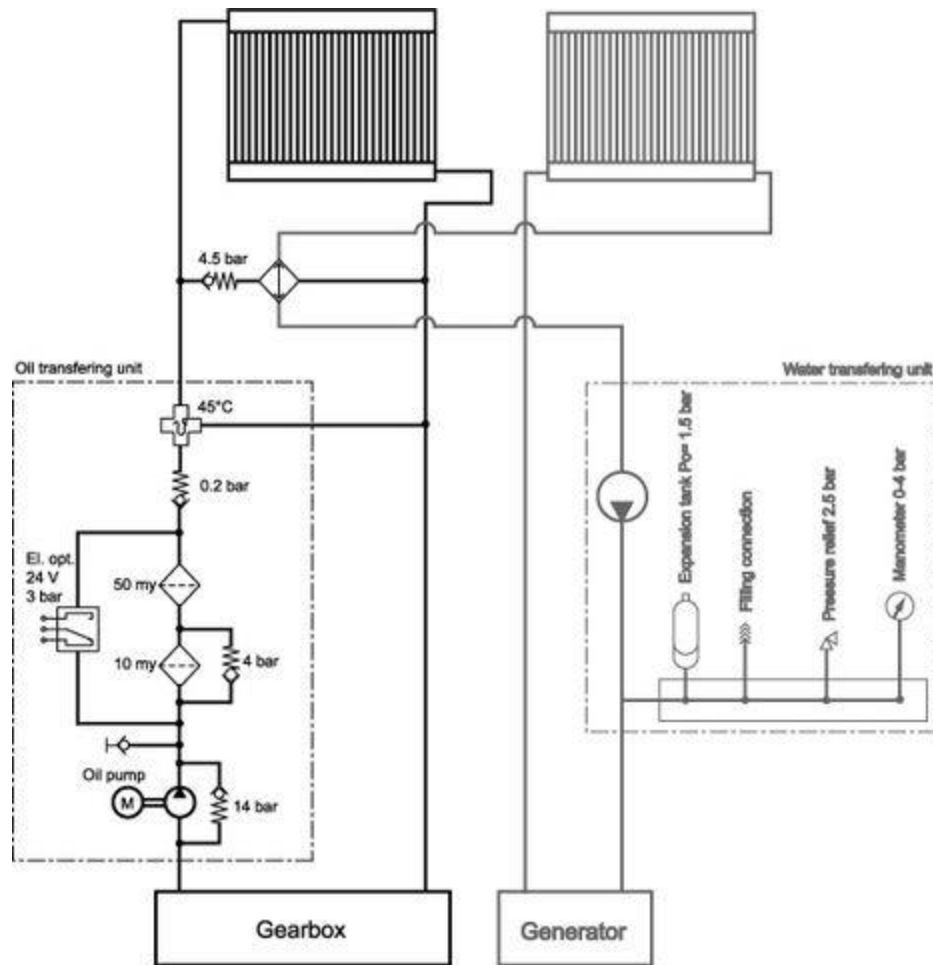
3] I don't know

- **Explanation**
IN THE GEAR OIL FILTER UNIT:



1. Filter Housing
2. Filter Housing
3. Transmitter
4. Drain valve
5. Motor
6. Coupling housing
7. Pump
8. Test connector
9. Transmitter

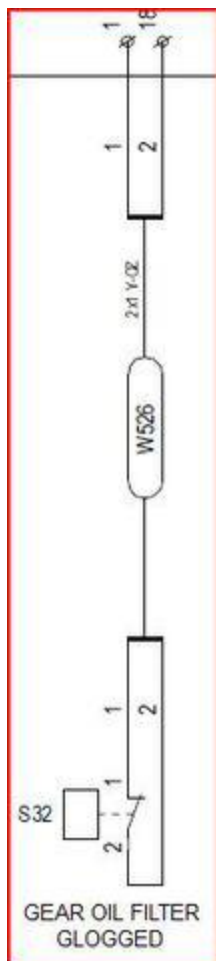
GEAR OIL CIRCUIT:



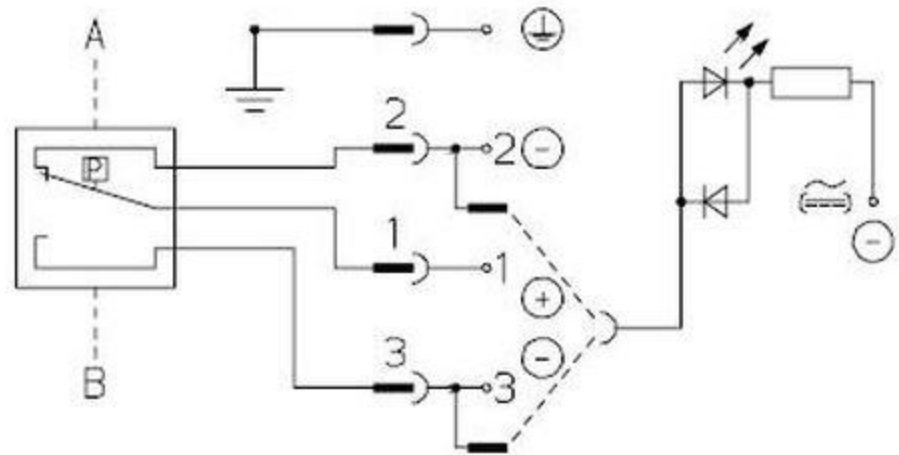
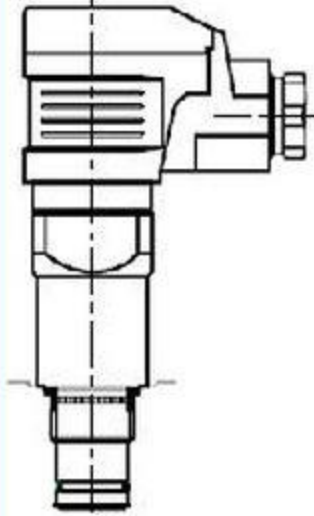
The switch is placed in the gear oil filter unit. In case oil flow is clogged in the filter, the pressure differential will operate the switch and the signal to TOI is cut off then the alarm will arise. The LED light indication in the switch is also OFF.

Check the filter clogged switch light indication and operation of the switch.

If the switch is found to be defective or damaged, a new switch must be installed.



Symbol:





Relevant spare parts	
Description	Item No.
DIFFERENTIAL PRESSURE TRANSDUCER	60099190
OILPUMP UNIT NF1310-NM/1500-50	60094202
TOI-II INTERF EXT POC	51701601

Check the coupling between gear oil pump and motor, replace if found damaged.



Relevant spare parts	
Description	Item No.
COUPLING CPL. 28/38-38/24	60097505

IN THE AN1 CABINET:

If the filter clogged switch and connections are normal, but the filter clogged switch is active in the controller then the likely cause is a faulty nacelle TOI.

Replace the defective TOI unit.



Replace the defect components

Does this solve the problem?

- 1] Yes
- 2] No
- 3] I don't know

- **Explanation**
IN THE NACELLE:

If equipped, check the operation and oil flow of the offline oil filter unit.

Inspect the filter and replace the filter if necessary.

If metal particles found in the filter, clean the filter unit and install new filters.

Replace any defective components.



Relevant documentation	
Description	DMS No.
SWI Offline Filter Unit	1000499

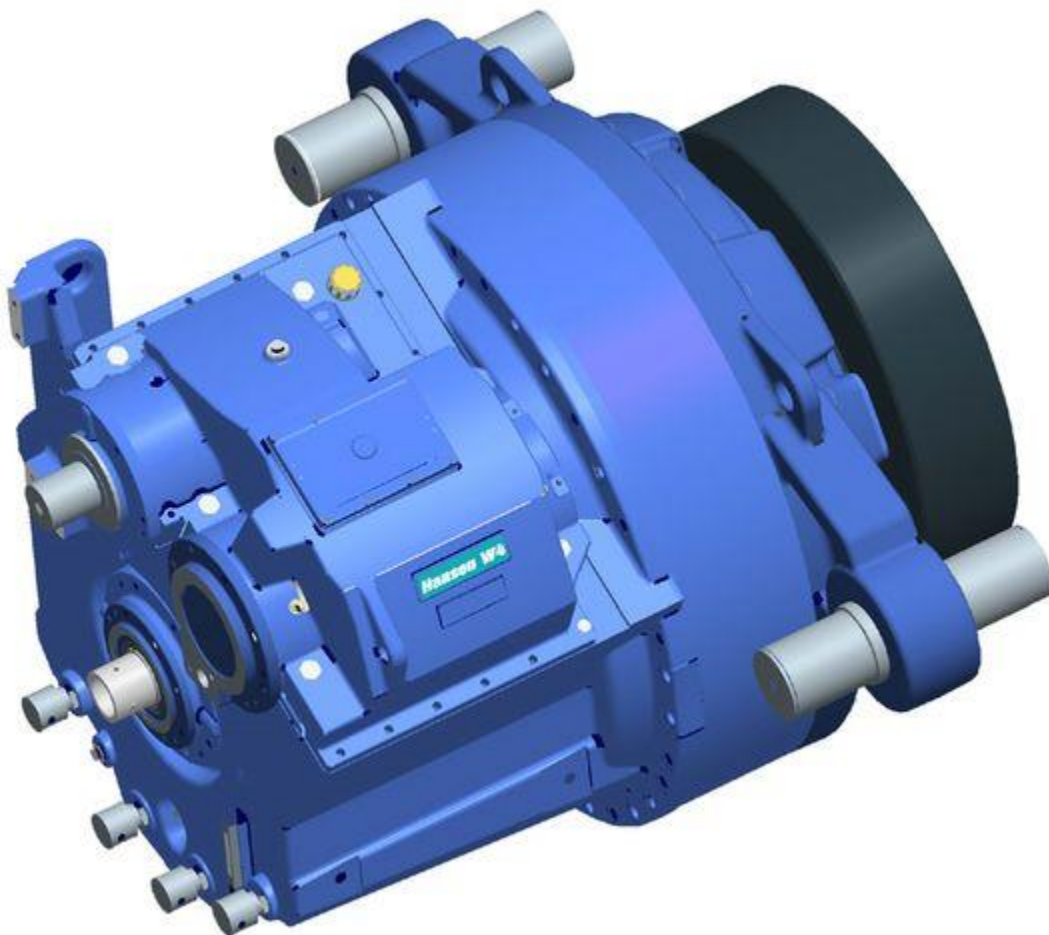
Relevant spare parts	
Description	Item No.
OFF LINE FILTER UNIT ASSEMBLY	60104018

Inspect the Gear box and repair the gears

Does this solve the problem?

- 1] Yes
- 2] No
- 3] I don't know

- **Explanation**
IN THE NACELLE:



GEAR BOX Inspection:

Open the inspection cover and check the inside of the gearbox and bearings for any sign of wear or damage.

Check previous oil Sample reports for any abnormalities.

Relevant documentation	
Description	DMS No.
Gearbox Inspection	1001058
Condition Assessment of Wind Turbine Gearboxes	0022-7865

Check the alarm log for a history of alarm “114 –Gear bear Front temp high” and “116 - Gear bear Rear temp high”. If there is a history of these alarms and the turbine is equipped with a HANSEN gearbox- it is most likely a bearing outer race spinning in the housing causing the fault of PT100 sensors.

Inspect the gearbox rear PT100 sensor tip for signs of wear.

If there is wear on the tip, likely the outer race of the bearing has been rotating within the bore of the housing. Then proceed with repair solution with reference to CIM1312/CIM2217.

HANSEN trained Vestas Technicians will be required to complete the repair

CIM1312: Gearbox - Hansen - EH803- HSS-bearing NR - end OR rotating in housing

Securing Hansen HSS Bearing Outer Races **DMS: 0001-4318**

Gearbox - Hansen - EH803-xN21 - HS-bearing NR - end OR rotating in housing service message **DMS: 0013-8856**

CIM2217: Gearbox - Hansen - EH803 - HS-bearing NR-end OR rotating in housing - factory loctite solution failing.

Prior to repairing the gearbox, a measurement is taken of the gap between the housing bore and the outer race of the bearing. If during repairing the gap between the outer race and housing is >0.23mm, mechanical lock solution will be required to prevent the outer race from spinning. Contact local Engineering department for instructions if the measurement taken is greater than the allowable limit.

Securing HSS Bearing Outer Race Mechanical Lock **DMS: 0011-0753**

Relevant CIM case		
CIM case	Task list	SWI
<u>1312</u>		<u>0001-4318</u>
		<u>0013-8856</u>
<u>2217</u>		<u>0011-0753</u>

HANSEN Technicians will be required onsite to complete the repair

DEMAGE GEAR TOOTH 1 :



DEMAGE GEAR TOOTH 2:

