



# W 8032 A6

Maintenance Instruction

## Generator (LSA56)



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## 1 Scope

This Maintenance Instruction (W) applies to following generator:

- Leroy Somer Type LSA56

## 2 Purpose

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

- ⇒ Daily check
- ⇒ Change the oil

**3 Maintenance interval**

Maintenance work	Maintenance interval	Carried out by <sup>1)</sup>
⇒ Daily check	Daily	K
⇒ Change the oil	10,000 Oh	K
⇒ Inspecting and cleaning the generator	10,000 Oh	INNIO
⇒ Measuring the insulation/polarisation	10,000 Oh <sup>1)</sup>	INNIO
⇒ Carrying out a vibration measurement and replacing the earth brush (if fitted)	10,000 Oh	INNIO
⇒ Overhauling the generator	60,000 Oh / 15,000 starts	INNIO

<sup>1)</sup> or more than 3 months' standstill.

**Valid for:**

- Type 6: Maintenance schedule A

Maintenance work	Maintenance interval	Carried out by <sup>1)</sup>
⇒ Daily check	Daily	K
⇒ Change the oil	10,000 Oh	K
⇒ Inspecting and cleaning the generator	10,000 Oh	INNIO
⇒ Measuring the insulation/polarisation	10,000 Oh <sup>1)</sup>	INNIO
⇒ Carrying out a vibration measurement and replacing the earth brush (if fitted)	10,000 Oh	INNIO
⇒ Overhauling the generator	60,000 Oh	INNIO

<sup>1)</sup> or more than 3 months' standstill.

**Valid for:**

- Type 6: Maintenance schedule B Maintenance schedule D

**\*) 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.

## 5 Additional information

### Relevant documents

I 8030 0 - Inspection plan by grid code events

TA 1000-0044 – Transport safety pegs

TA 1100-0105 – Engine shut-down

TA 2300-0001 – Employee protection

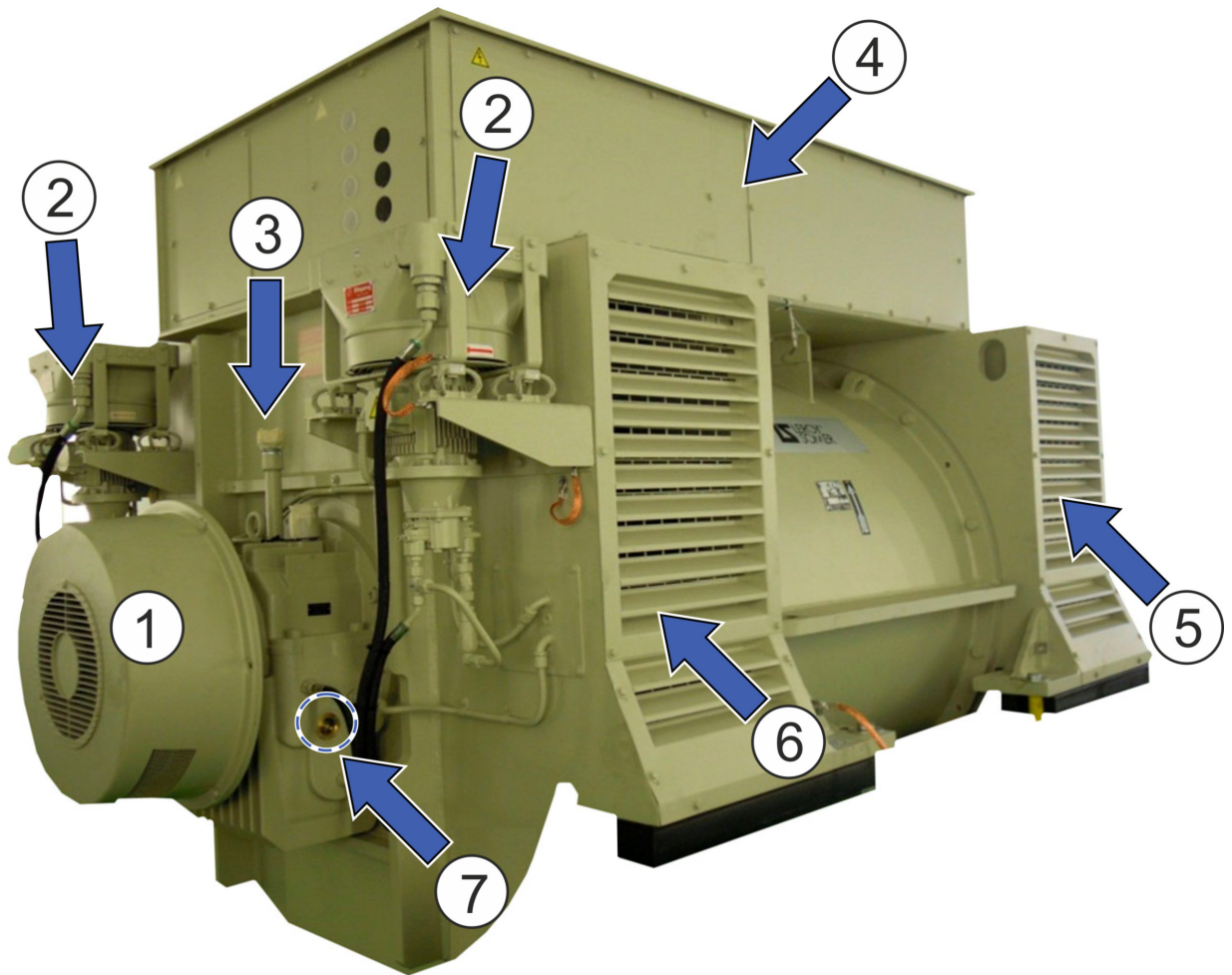
TA 2300-0005 – Safety instruction

TA 2300-0010 – Guidelines for using the LOTO kit

### 5.1 Transport safety pegs

The generator is fitted with transport safety pegs to prevent the bearings from being damaged during transport. Remove all the transport safety pegs before commissioning and keep them for possible future transport – see TA 1000-0044.

## 5.2 General overview of the generator



①	Non-drive end	⑤	Ventilation outlet louvre
②	Lubricating oil system (Aerotherm)	⑥	Ventilation inlet louvre
③	Oil filler	⑦	Oil level sight glass
④	Terminal box		

## 5.3 Decommissioning the plant

When prolonged scheduled or unscheduled downtimes occur, e.g. after the heating season when operating as a cogeneration plant, the plant must be prepared (preserved) for its downtime according to its geographical location (climate, proximity of the sea, etc.). As conditions can vary enormously, we recommend that you consult a suitable specialist firm concerning the measures to be taken or contract it to carry out the work.

The Aerotherm need not be switched on when turning the generator by hand or with a tool!

## 5.4 Recommissioning the plant

Before re-commissioning the installation, ensure that the installation is in its normal operational condition again.

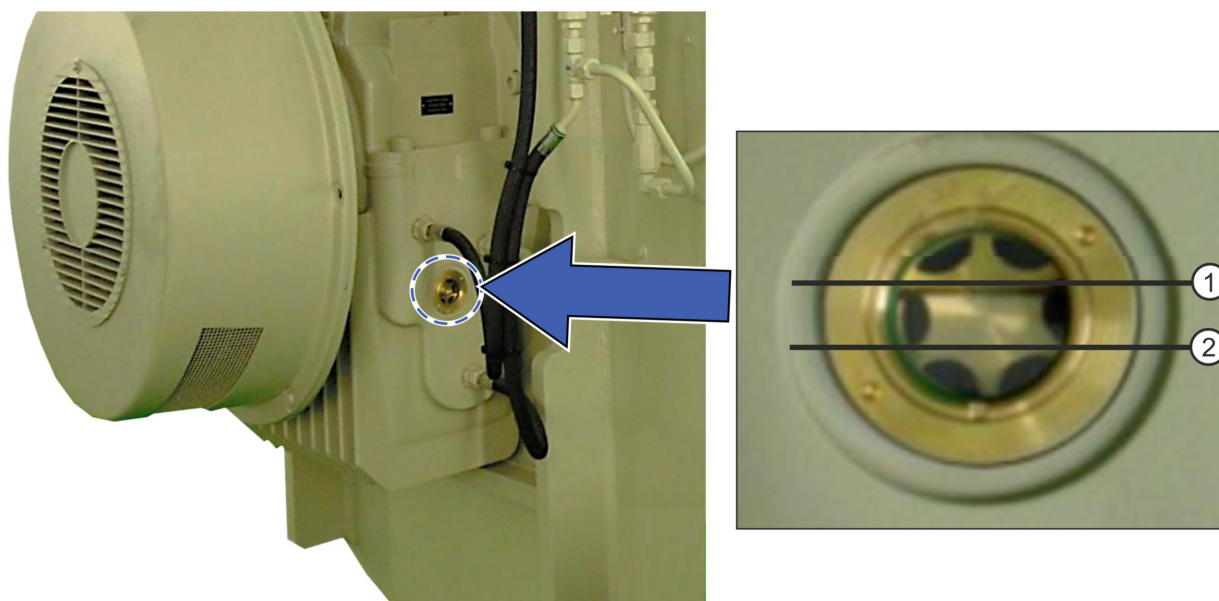
## 6 Work steps

### 6.1 Daily check

#### Oil level check

The oil level in the sight glass should be between the ① and ② marks during operation. If the oil level is below the mark ②, lubricating oil must be added to top it up.

If the oil level is too low, overheating or damage to the generator can result!



①	Maximum oil level
②	Minimum oil level

#### Visual Inspection

- Check that the bolts are seated properly and inspect for damage.
- Check the generator (terminal box, generator surface, ventilation louvres, etc.) for dirt and damage.

#### Checking for smoke and smells

Shut down the engine immediately if smoke or unusual smells are noticed!



**⚠ 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.

**Checking for unusual noises during operation**

Shut down the engine immediately if unusual noises are noticed. Contact the Jenbacher Customer Service or a company selected by INNIO authorised to carry out work on the generator!

**⚠ 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.

**Leak test**

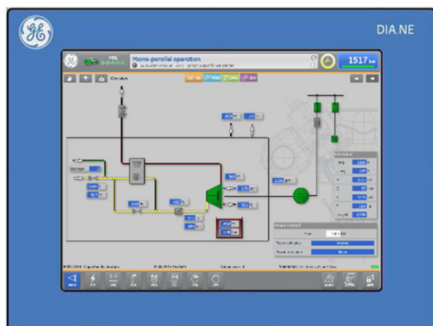
Check the generator for oil leaks, especially at the lubricating oil connections.

**6.1.1 Grid fault check (if installed)****General:**

If a mains failure occurs that causes a defined change in the voltage, current or frequency at the generator, a warning or trip message is displayed on the DIA.NE screen (or optionally on a remote computer).

The DIA.NE screen shown below is only a symbolic representation, as different versions of the engine management exist.





①

DIA.NE system



②

① DIA.NE (engine management)	② Remote computer (optional)
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## Course of action with DIA.NE systems:

Press the "Alarm" button in the DIA.NE system and search for the mains failures listed below:

Type	Date/Time	No.	Text
	09/07/2013 11:43:25.373	1170	Temperature after catalyst high
	09/07/2013 11:43:06.550	1169	Temperature before catalyst high
	09/07/2013 11:42:53.519	1233	Operation on
	09/07/2013 11:42:17.355	1004	Reserve failure 4 trip
	09/07/2013 11:42:04.634	1001	Reserve failure 1 trip
	09/07/2013 11:35:29.263	3586	Mains failure maintenance request
	09/07/2013 11:34:55.806	2835	Mains failure + leading power factor operation
	09/07/2013 11:34:21.48	2834	Mains failure + static rotor angle maximum
	09/07/2013 11:33:40.597	2833	Mains failure + dynamic rotor angle maximum
	09/07/2013 11:33:09.851	2832	Mains failure + Generator Pole slip
	09/07/2013 11:32:11.984	2831	Low Voltage Ride Through Event

① Grid faults

If any of the above operational messages are displayed, carry out the measures specified in Inspection Instruction I 8030 0!

These error messages are generally due to a mains failure. Consult the Error message list to find out the exact mains events.

### 6.1.2 Record bearing temperature

Data collection when monitoring the temperature of drive bearings and non-drive bearings:



Enter the measurements in the **operational data booklet**.

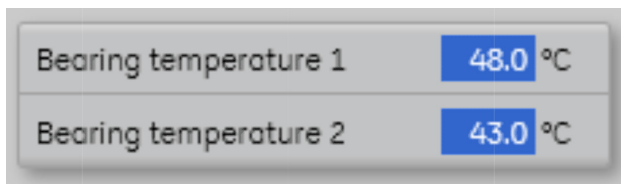
#### General:

Best practice is to take the first measurement (see Initial Commissioning data sheet) as a baseline in order to establish a trend in the deterioration of the condition of the bearings. Temperature fluctuations without any apparent reason (such as changes in ambient temperature) indicate a malfunction somewhere, in which case the bearing in question should be checked.

Check the temperature of the bearings when re-greasing them. The bearing temperature may increase during the lubrication process, but should return to normal operating values after a few minutes of operation.

#### Test method:

Read off and log the bearing temperature value on the DIA.NE or remote computer.



*The illustration may vary due to the different DIA.NE system applications.*

#### Assessment criterion:

The temperature rise should remain within the limits. If the temperature increases continuously despite the load being constant, caution should be exercised.

#### Bearing temperature limits:

Warning: > 85 °C

Trip: > 90 °C

#### Procedure in the event of deviations:

If limit values set in the system are reached, a warning message/engine shutdown is activated automatically. If a limit value is found to be exceeded during the inspection, shut down the engine at once. Contact the Jenbacher customer service!

**⚠ 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.

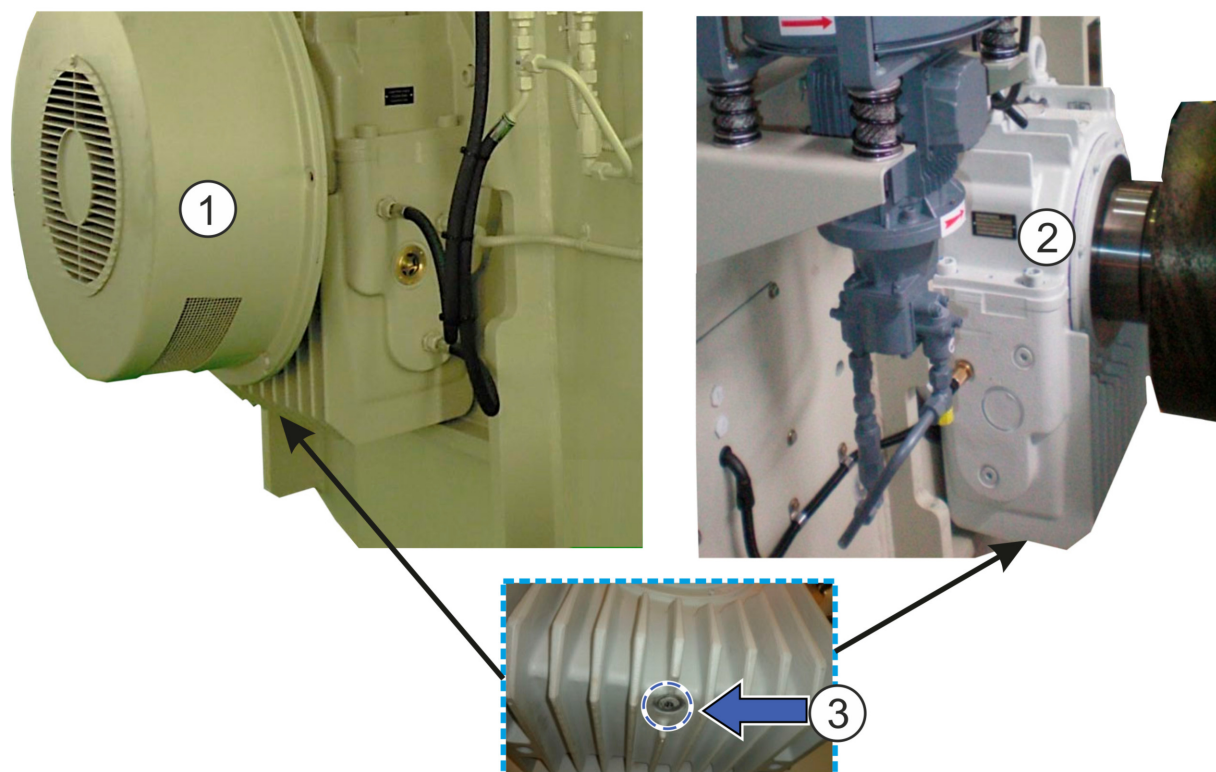
**6.2 Change the oil****⚠ WARNING****Danger from unauthorised restarting**

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.



- The lubricating oil should be drained while the engine is at operating temperature.
- Place a container underneath the oil drain plug to catch the oil (e.g. an oil tray).
- Open the screw plugs at the non-drive end and drive end, drain off and catch the lubricating oil.



①	Non-drive end
②	Drive end
③	Oil drain plug

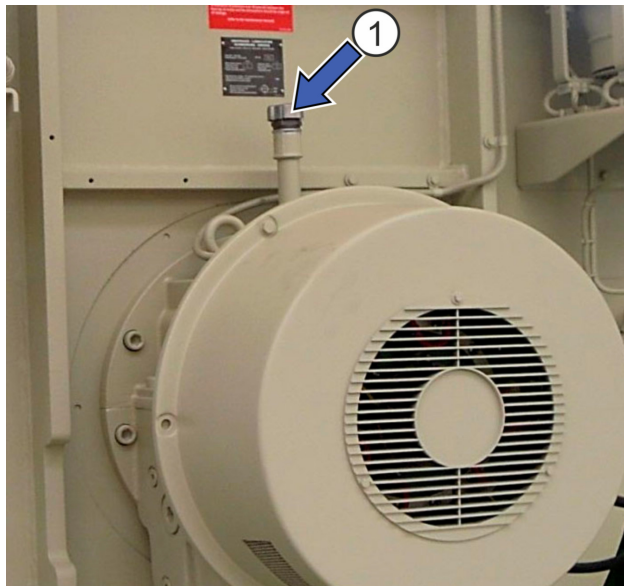
- If the oil contains unusual residues (fine metallic particles) or looks significantly different, the causes of this change must be remedied. Inspect the bearing if necessary.
- Screw the oil drain plug back in with the following torque:

Bearing size	14	18	22	28
Torque [Nm]	30	40	60	60

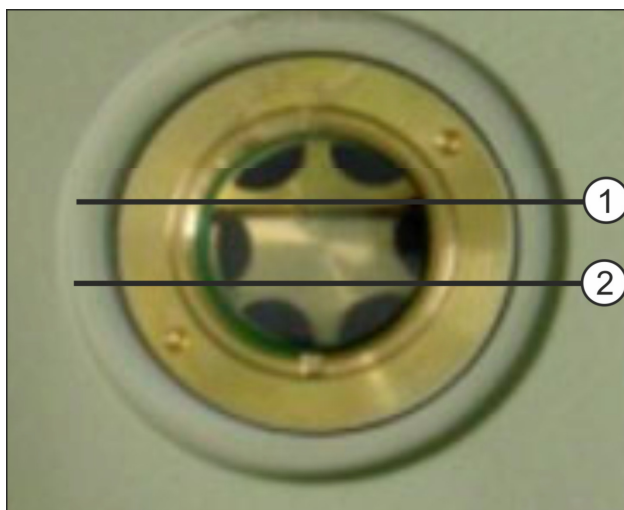


**Note: Replace the copper seal ring (if fitted).**

- Remove the oil filler plug ①.



- Make sure that no dirt particles can penetrate into the bearing. Use a lubricating oil (ISO VG 46 mineral oil) with the viscosity stated on the bearing type plate.
- **Synthetic oil is prohibited, as it attacks the seals.**
- Pour oil into the oil filling opening until the level reaches the "Maximum oil level" mark.



① Maximum oil level

② Minimum oil level

Total filling quantity approx. 30 litres (approx. 15 litres per bearing).

- Refit the oil filler plug with the following torque:

Bearing size	14	18	22	28
Torque [Nm]	30	40	60	60



**Note: Replace the copper seal ring (if fitted).**

### 6.3 Inspecting and cleaning the generator

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

- Check the generator for damage
- Check cable for wear (chafing)
- Check rubber buffers (if fitted)
- Check anti-condensation heating (if fitted)
- Check varistor and rectifier diodes
- Cleaning the generator

### 6.4 Measuring the insulation/polarisation

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

### 6.5 Carrying out a vibration measurement and replacing the earth brush (if fitted)

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

### 6.6 Overhauling the generator

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
12	30.04.2019	GE durch INNIO ersetzt / GE replaced by INNIO	<b>Fallzberger F.</b> <i>Pichler R.</i>
11	31.07.2018	Strukturelle Anpassungen / Structural adaptations Standard Peaking Wartungsintervall ergänzt / Standard peaking maintenance interval added	<b>Krainz G.</b> <i>Krainz G.</i>
10	02.11.2017	Strukturelle Anpassungen / Structural adaptations Änderung Kapitel 11 / Change of chapter 11	<b>Burkhard P.</b> <i>Krainz G.</i>
9	29.05.2015	Änderung Abschnitt 8 / Change of section 8	<b>Kecht</b> <i>Krainz</i>
8	24.10.2013	Grundlegende Überarbeitung / Fundamental revision	<b>Sadhasivam.V / Bilek</b> <i>Krainz</i>
7	05.02.2013	1) Von GE – Jenbacher oder einem von GE Jenbacher ausgewählten Unternehmen .... / 1) By GE Jenbacher or by GE Jenbacher a specialist company ....	<b>Bilek</b> <i>Krainz</i>