CREATING
POWER
SOLUTIONS

HATZ

GD 3200 RV

ASSEMBLY INSTRUCTIONS

Hatz

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1 Legal notices

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This manual may only be copied or distributed if written approval has been received. This also applies to the copying or distribution of excerpts of this manual. The same conditions apply to distribution of this manual to third parties in digital form.

Original manual

This manual has been translated into multiple languages.

The German version is the **original manual**. All other language versions are **translations** of the **original manual**.

Revision

Version	Date	Name
Ver. 00	05/15/2025	GMT-CI/bw
Ver. 01	18.06.2025	GMT-CI/bw

2 General information

Information on the document

Our engines are state of the art and meet the basic safety and health requirements specified in the EC - Machinery Directive (2006/42/EC). These Assembly Instructions contain important instructions on how to safely assemble the engine. In addition, the rules and regulations for accident preventions applicable for the place of use must be heeded.

The engine provides a high degree of operational safety and a high quality standard which is ensured by a certified quality management system (EN ISO 9001). Proper functioning of all engines is checked prior to leaving the factory.

HATZ diesel engines are efficient, robust, and have a long service life. Therefore, they are usually installed in machines that are used for commercial purposes.

You must read the manual for diesel engine before starting the first time. It will help you avoid accidents, operate and maintain the engine correctly and, hence, ensure a long service life.

Give the manual for diesel engine to any further users or subsequent owner of the engine.

Machine

This manual describes the following machine.

Machine name	GD 3200-120 Silent Pack (fiPMG Silent Pack)
Engine type designation	1B30VE

Customer service

Have service work performed by qualified technicians only. We recommend that you work with one of the over 500 **HATZ service stations**. Trained specialists there will repair your machine with **genuine HATZ spare parts** and with **HATZ tools**. The global HATZ service network is at your disposal to advise you and supply you with spare parts. For the address of the **Hatz service station** nearest you, please see the enclosed spare parts list or visit us in the Internet at: **www.hatz-diesel.com**

Installation of unsuitable spare parts can lead to problems. We cannot accept liability for direct damage or secondary damage that results from this.

We therefore recommend the use of **genuine Hatz spare parts**. These parts are manufactured according to strict Hatz specifications and achieve maximum operational reliability through their perfect fit and functionality. The order number can be found in the Internet at: **www.hatz.com**

Exclusion of liability

The manufacturer cannot be held liable for personal injury, damage to property or damage to the machine itself caused by improper use, foreseeable misuse, or failure to follow or adequately follow the safety measures and procedures described in this manual. This also applies to changes made to the machine and the use of unsuitable spare parts.

Modifications, which serve the technical improvements, are reserved.

3 Safety

3.1 General information

Introduction

This chapter contains the information you need to work safely with this machine.

To prevent accidents and damage to the machine, it is imperative that these safety instructions be followed.

Read this chapter carefully before beginning work.

3.1.1 Intended use

Intended use

The machine described in this Operator's Manual fulfills the following functions:

- Power supply and current strength as per technical data (see chapter *4.2.2 Inverter, page 20*).

This generating set is only approved for use in mobile homes. Any other use is not intended and therefore not permitted. In this case, the safety of people located in the vicinity of the machine may be impaired. Motorenfabrik HATZ does not accept any liability for harm resulting from this.

The generating set fulfills the basic protection measure of protective separation with equipotential bonding (ungrounded system).
A personal protection device must be integrated in the wiring between the generating set and the AC power connection in the mobile home. It interrupts the current supply to the power sockets if an electrical fault occurs in the system. The personal protection device must meet local regulations.

The operational safety of the machine is only guaranteed if it is used as intended.

Use according to the intended purpose also includes observance of the instructions in this Operator's Manual.

Foreseeable misuse

The following is considered to be foreseeable misuse:

- Any use that varies from or extends beyond the uses specified above.
- Failure to comply with the instructions in this Operator's Manual.
- Failure to comply with the safety instructions.
- Failure to immediately eliminate malfunctions that impact safety before continuing work with the machine (working with the machine when it is not in perfect condition, either functionally or in terms of safety).
- Fuel other than specified in the instructions.
- Failure to perform the necessary inspection and maintenance work.
- Any unauthorized modification of or removal of safety equipment.
- Use of spare parts and accessories that are unsuitable or have not been approved by HATZ.
- Operation in flammable or hazardous environments.
- Operation in closed-off or poorly ventilated rooms.
- Operation in an aggressive atmosphere (e.g., high salt content) without further measures for corrosion protection.
- The use of engine cooling air to heat the vehicle.
- Connection of electrical consumers that are not suitable for operation with this machine.
- Connection of electrical consumers whose total power consumption exceeds the power rating of the machine.
- Parallel operation with other energy sources (public network, PV units, energy storage unit, other generating sets, etc.).
- Use of the machine as a life-support system. The generating set may switch off without warning. Humans or animals that depend on an uninterruptible power supply may become injured or die if the generating set fails.
- Improper operation at variance with ISO 3046-1 and ISO 8528 (climate, load, safety).

- Improper operation at variance with the standards and regulations ANSI/RVIA EGS-1, CSA Electrical Bulletin 946 (Requirements for Internal Combustion Engine-Driven Electric. Generators for Use in Recreational Vehicles), NFPA No. 1192 (Recreational Vehicles), NFPA No. 70, Article 551 – (Recreational Vehicles and Recreational Vehicle Parks).

Residual risks

Residual risks result during daily use and in association with maintenance work.

These residual risks will be pointed out in chapter *3.2.2 Machine-specific safety instructions for operation, page 13* and in chapter *3.2.3 Machine-specific safety instructions for maintenance work, page 14* as well as in the further contents of the manual, directly in front of the descriptions or operating instructions concerned.

3.1.2 Obligations of the operator

User obligations

The operator is obliged to only operate the machine when it is in perfect condition. The operator must check the condition of the machine before use and ensure that any defects are eliminated before it is taken into service. Operating the machine while identified defects exist is not permitted. The operator must also ensure that all persons who work on the machine are familiar with the contents of this manual, and the Diesel Engine Manual.

Obligations of the operating and maintenance personnel

Personnel assigned with operating and maintaining the machine must have read and understood this manual or must possess the qualifications necessary for working with this equipment, acquired in training/instructional courses. No one may work with the machine without the necessary qualifications, even if for just a brief period.

The operating and maintenance personnel must not be under the influence of drugs, medication or alcohol.

All work performed on the machine must be in compliance with the information provided in this manual.

Storing the Operator's Manual

These instruction and the associated documents are an integral part of this machine (including when sold). They must be stored in the direct vicinity of the machine and be accessible to personnel at all times.

Other applicable documents

For more information on the individual components, see also the detailed information in the respective manufacturer documentation.

The manufacturer documentation is included as an appendix to this Operator's Manual (see the list of additional documentation in the appendix).

3.1.3 Representation of safety notes

Overview

This machine has been designed and built according to state-of-the-art technology and the recognized safety standards. Despite these precautions, risks exist when operating the machine and during maintenance work.

These risks are identified in this manual by means of safety notes.

The safety notes precede the relevant description or operating step.

Structure of the safety notes

The safety notes consist of:

- Danger symbol
- Signal word
- Description of the danger
- Possible consequences
- Preventative measures

General danger symbol

The general danger symbol is used to identify the danger of personal injury.

Signal words

Signal words identify the magnitude of the risk and the seriousness of possible injury:

Danger symbol/ signal word	Meaning
DANGER	This signal word is used to indicate imminently dangerous situations which, if not avoided, will lead to serious injury or death.
WARNING	This signal word is used to indicate potentially dangerous situations which, if not avoided, may lead to serious injury or death.
CAUTION	This signal word is used to indicate potentially dangerous situations which, if not avoided, may lead to minor or moderate injury.
CAUTION	This signal word, without a danger symbol, is used to indicate the risk of property damage.
NOTICE	This signal word indicates additional useful information, such as operating tips and cross references.

3.1.4 Meaning of safety symbols

Explanation of symbols

The following table describes the meanings of the safety symbols used in this Operator's Manual.

Symbol	Meaning
	Smoking, fire, and open flames are prohibited!
	Warning of personal injury!
	Warning of dangerous voltage levels!
	Warning of hot surfaces!
	Warning of flammable substances!
	Warning of explosive substances!
	Warning of toxic engine exhaust!
	Warning of heavy loads!
	Warning of environmental damage!
	Comply with the Operator's Manual or additional documentation from other manufacturers or the carrier.
	Additional information that is useful to the reader.

3.2 Safety notes

3.2.1 Operational safety

Introduction

This chapter contains all of the important safety instructions for personal protection and for safe and reliable operation. Additional, task-related safety instructions can be found at the beginning of each chapter.

⚠ DANGER	
	**Danger to life, danger of injury or danger of property damage due to failure to comply with this manual and the safety instructions contained therein.** ▪ As the operator of the machine, you must ensure that all people working on the machine are familiar with the content of this manual. ▪ Before working on the machine, read this manual carefully, paying special attention to the safety notes in Diesel Engine Manual.. ▪ Fulfill all required safety conditions before working on the machine. ▪ Follow all general safety instructions as well as the specific task-related safety instructions contained in the individual chapters.

Using the machine

- Only operate the machine for the purposes described in chapter *3.1.1 Intended use, page 7*.

Automatic start system

In vehicles with an integrated or additional AGS control (Automatic Generator Start System), the following dangers can arise if the machine is started unexpectedly:

- Danger of poisoning from engine exhaust (carbon monoxide poisoning)
- Danger of injury from rotating parts
- Danger of injury from electric shock

Always switch the AGS off when:

- Maintenance work is performed
- The vehicle is parked in a garage or other closed or poorly ventilated area

Compliance with other regulations

- The manuals delivered for the individual machine components must be complied with (see the list of additional documentation in the appendix).
- The applicable regulations of the relevant professional associations must be observed.
- In addition, local safety, accident prevention and environmental regulations also apply when operating the machine.

Personal protective equipment

During operation and maintenance of the machine, personal protective equipment must be available and must be used if necessary. The use of personal protective equipment is specified in the description of the operating steps.

Personal protective equipment	Pictogram	Function
Safety shoes		Safety shoes offer protection against: ▪ Slipping ▪ Falling objects
Hearing protection		Hearing protection offers protection against ear injuries due to excessive and constant noise.

Personal protective equipment	Pictogram	Function
Safety gloves		Safety gloves protect the hands against injury, e.g., from battery acid.
Safety goggles (with side protection)		Safety goggles protect the eyes from flying objects (e.g., dust particles, spraying liquids, spraying acid).
Fine dust mask		A fine dust mask protects the wearer against particulate pollutants.
Working clothes		Wear close-fitting working clothes. It must not restrict the wearer's freedom of movement, however.

Warning labels and information signs on the machine

The warning labels and information signs on the machine must be followed (see chapter "Labels" *3.3 Labels, page 17*).

The warning labels and information signs must be kept legible and must be replaced if necessary. For this purpose, contact your nearest **HATZ Service**.

Maintenance work

Maintenance work that goes beyond the scope described in this manual must only be performed by qualified technicians (see chapter *2 General information, page 6*).

Independent maintenance work and constructional changes to the machine, especially to the safety equipment, are not permitted.

Safety equipment

Safety equipment must not be modified and must not be rendered ineffective during normal operation.

General safety instructions

⚠ DANGER	
	**Danger to life and danger of injury due to failure to follow the warnings on the machine and in this manual.** ▪ Heed the warnings on the machine and in this manual.

⚠ WARNING	
	**Danger of injury and danger of incorrect operation due to inadequate personnel qualifications.** ▪ The personnel must have read and understood this manual or must possess the qualifications necessary for working with this equipment, acquired in training/instructional courses. ▪ Only qualified personnel is permitted to operate and maintain this machine. ▪ Failure to comply will cause the warranty to become void.

⚠ WARNING

Danger of injury from failure to follow the Operating Instructions and from performing unauthorized tasks on the machine.

- Follow all instructions.
- Do not perform activities for which no qualification is available. Contact properly trained personnel if necessary.

⚠ CAUTION

Danger of injury from overloading the body.

Lifting the machine to transport it or to move it to another location can lead to injuries (of the back, for example)

- Only lift the machine with a hoist (see chapter *6.1 Transport, page 25*).

3.2.2 Machine-specific safety instructions for operation

Introduction

The machine can pose residual risks during operation. To eliminate these risks, all persons working on the machine must follow the general and machine-specific safety instructions.

Safe operation

- Before switching on the machine, ensure that no one can be injured when the machine is started up.
- During machine operation, ensure that unauthorized persons do not have access to the area in which the machine has an impact.

Machine

- The outlet for cooling air and exhaust gas becomes hot during operation. Risk of injury from touching hot parts! Let the engine cool before maintenance.
- Do not refuel during operation.

Faults

- Immediately eliminate faults that compromise safety.
- Switch off the machine and do not take into service again until all faults have been eliminated.

Safety instructions for operation

⚠ DANGER

Danger to life from electric shock.

Live machine connections, feed lines and outgoing lines can cause life-threatening electric shock.

- Maintain the machine, and especially the cabling in a proper, undamaged condition.
- Only operate the machine when all protective devices are installed and undamaged.

⚠ DANGER

Danger to life from inhaling exhaust gases.

Toxic engine exhaust gases can lead to loss of consciousness, and even death, in closed-off and poorly ventilated rooms.

- Never operate the machine in closed-off or poorly ventilated rooms.
- Do not breathe in the exhaust gases.

DANGER

Danger of fire from hot exhaust gas system.

If inflammable materials come into contact with the exhaust gas flow or the hot exhaust gas system, these materials can ignite.

- Keep inflammable materials away from the exhaust gas system.
- Do not operate the engine (exhaust flow or hot exhaust gas system) in the direct vicinity of combustible materials.

DANGER

Fire hazard from fuel.

Leaked or spilled fuel can ignite on hot engine parts and cause serious burn injuries.

- Only refuel when the engine is switched off and has cooled down.
- Never refuel in the vicinity of open flames or sparks that can cause ignition.
- Do not smoke.
- Do not spill fuel.

3.2.3 Machine-specific safety instructions for maintenance work

Introduction

The machine can pose residual risks during maintenance. To eliminate these risks, all persons working on the machine must follow the general and machine-specific safety instructions.

Maintenance intervals

- Strictly adhere to the maintenance intervals.
- Check the safety equipment regularly to ensure it is in good condition and functioning properly.
- Check connections, cables and fasteners regularly to ensure they are in good condition.

Maintenance work

Maintenance work that goes beyond the scope described in this manual must only be performed by qualified technicians. We recommend that you work with one of the over 500 **HATZ service stations**.

Measures following maintenance and troubleshooting

- Securely reconnect loose electrical connections; check that the electrical components and equipment are functioning properly.
- Check the entire machine for foreign bodies; remove any foreign bodies.

Safety instructions for maintenance work

DANGER

Danger of injury from voltage.

Serious injury can occur during work on electrical equipment.

- Work on electrical equipment with a rated voltage of more than 50 V may only be performed by certified electricians as per IEC 60050[IEV 195-4-1].

DANGER

Danger of explosion from flammable cleaning agents.

Cleaning with benzene is an explosion hazard. It is highly flammable, can become electrostatically charged, and can generate an explosive gas/air mixture.

- Use halogen-free, cold cleaners with a high flash point for cleaning.
- Comply with manufacturer's instructions.

WARNING

Danger of injury from compressed air and dust particles.

Eye injuries can occur when cleaning with compressed air.

- Wear safety goggles.

CAUTION

Danger of injury from ignoring the maintenance instructions.

- Only perform maintenance work when the engine is switched off.
- Disconnect the negative battery terminal.
- When the maintenance work has been completed, ensure that all tools are removed from the machine.

CAUTION

Danger of burns.

There is a danger of burns when working on a hot engine.

- Let the engine cool before maintenance.

3.2.4 Electrical equipment

Safety notes

DANGER

Danger to life from electric shock.

Live machine connections, feed lines and extension lines can cause life-threatening electric shock.

- Use the machine, machine feed lines and extension lines only if they are in perfect, undamaged condition.
- Only operate the machine if all protective devices are installed, undamaged and functional.
- Never touch the generating set or connected machines with wet hands.

DANGER

Danger of explosion from flammable substances.

There is a danger of explosion from flammable gases.

- Keep batteries away from open flames and incendiary sparks.
- Do not smoke when working with batteries.

⚠ WARNING

Danger of injury or danger of property damage due to incorrect use of batteries.

- Do not place tools on the battery.
- Before performing work on the electrical equipment, always disconnect the negative battery terminal.
- Never swap the positive (+) and negative (–) battery terminals.
- When connecting the machine to the battery, first connect the **positive cable** and then the **negative cable**.
- When disconnecting the connections, first disconnect the **negative cable** and then the **positive cable**.
- It is imperative to prevent short circuits and mass contact of current carrying cables.
- If faults occur, check the cable connections for good contact.

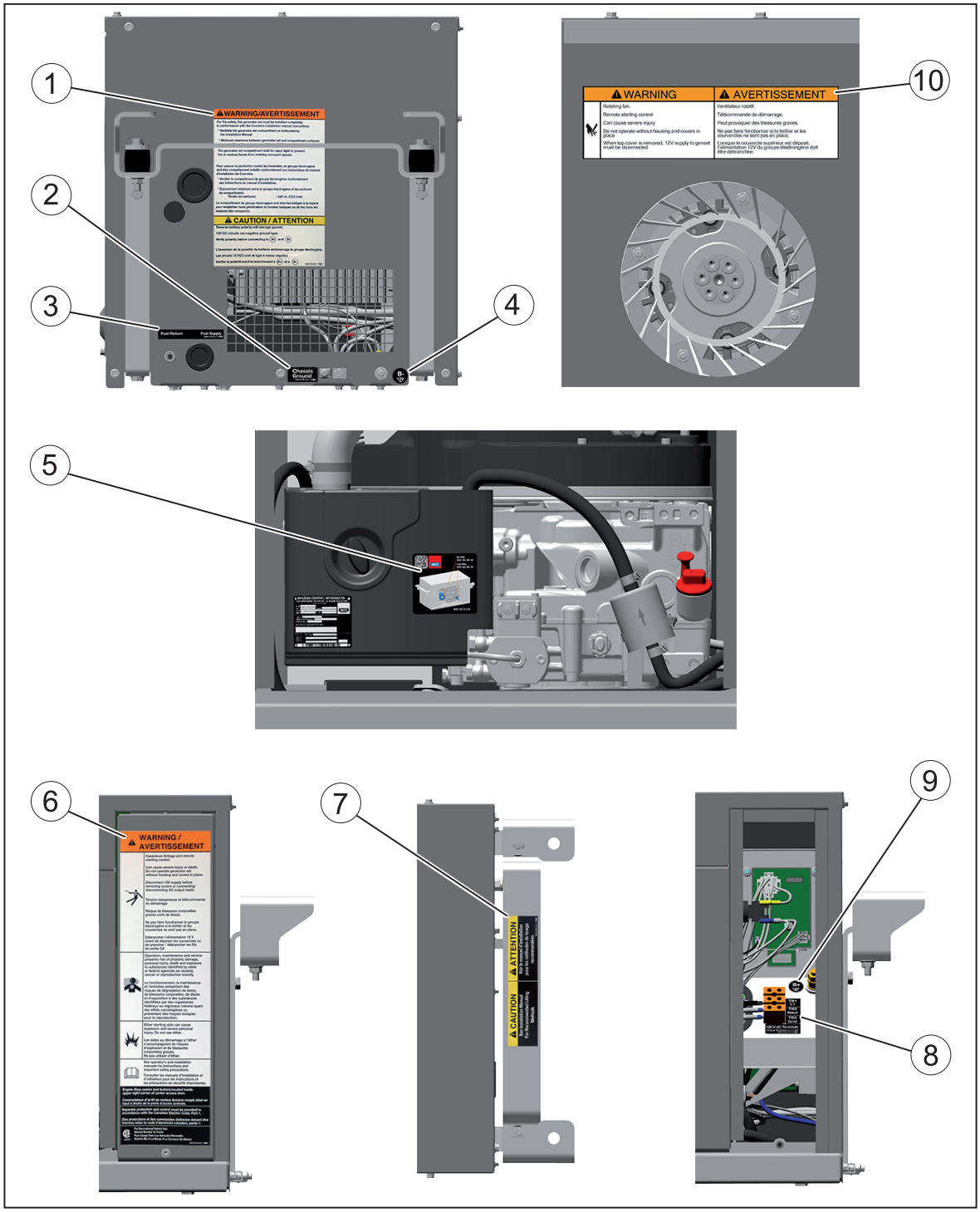
- To avoid the danger of electric shock during an unexpected start, note the following points before beginning work:
  - Switch off the Automatic Generator Start System (AGS), if present.
  - Switch off the control panel, press the stop switch and disconnect the battery cable negative terminal (B-) from the generating set.
- The electrical output of the generator must be connected by a qualified electrician in accordance with local regulations.
- The generating set is not permitted to be connected to the power grid. Feeding power back into the power grid can lead to electric shocks and damage to the equipment. An approved switching device must be used that prevents interconnection with the power grid.
- Do not disconnect the battery while the machine is running. Resulting voltage peaks could destroy the electronic components.

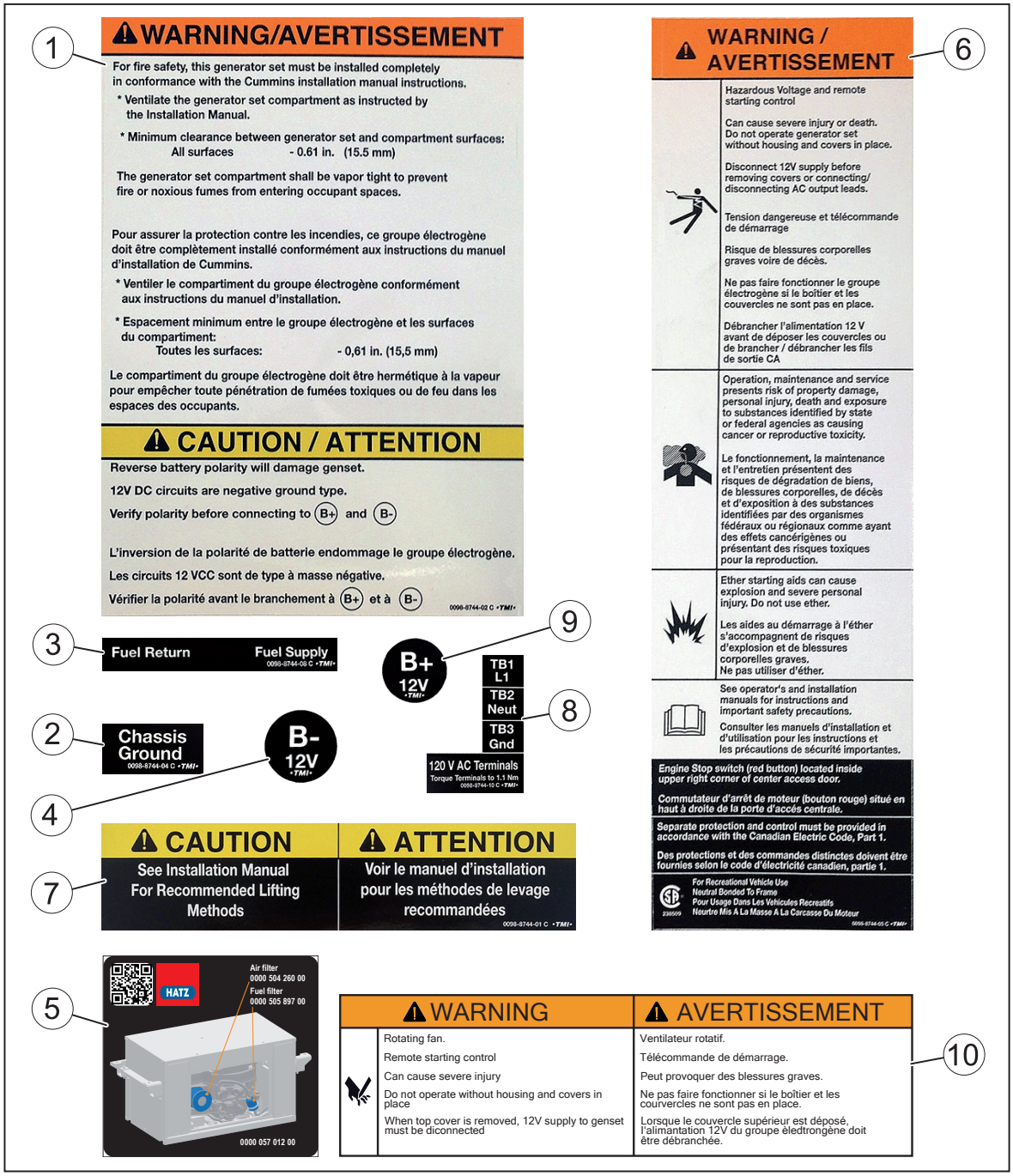
NOTICE

We cannot be held liable for electrical equipment that is not designed according to HATZ wiring diagrams.

3.3 Labels

Warning labels and information signs on the machine



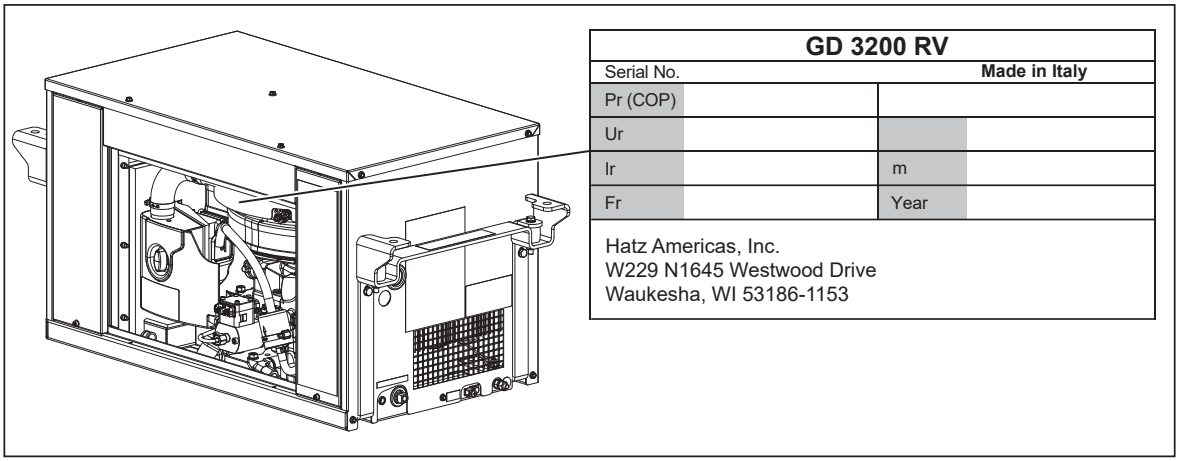


Pos.	Designation
1	Warning of faulty installation of the machine
2	Ground connection to housing
3	Fuel connections
4	Connection to battery negative terminal
5	Service information
6	Main warning message
7	Note on recommended lifting methods
8	Terminal strip wiring
9	Connection to battery positive terminal
10	Warning of injuries from rotating fan

4 Technical data

4.1 Generating set

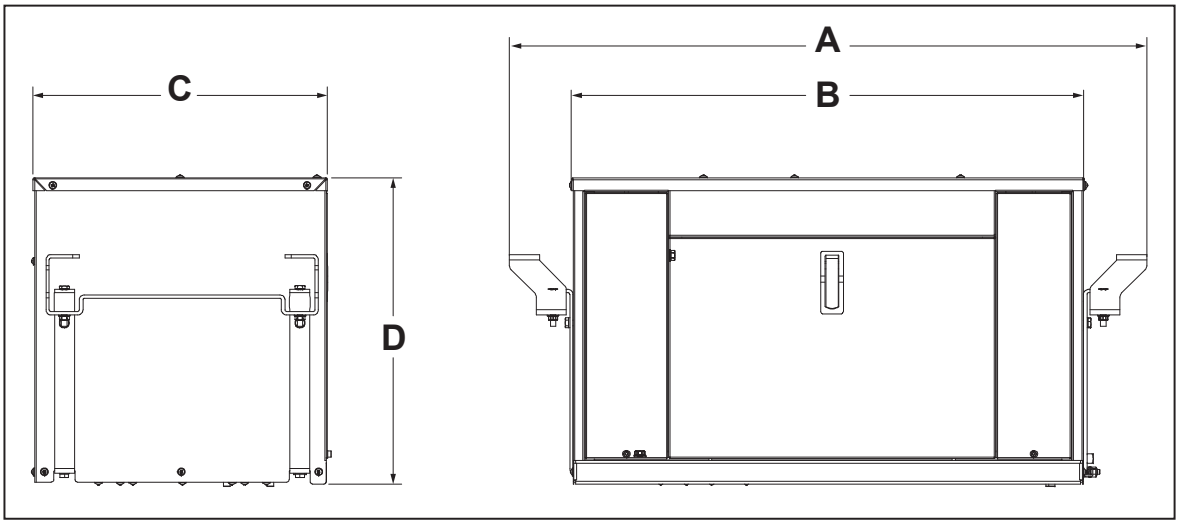
Machine type plate



Please enter the data from the type plate into the following table to ensure you have access to the data even in the event of loss or damage.

Entry	Description	Unit	Value
Serial no.	Engine serial number	–	
Pr (COP)	Rated power	kW	
Ur	Rated voltage	V	
Ir	Rated current	A	
Fr	Frequency	Hz	
m	Weight	kg	
Year	Model year	–	

Dimensions and weights



Parameter	Unit	Value
Total length (A)	mm	952
Length without holders (B)	mm	766
Width (C)	mm	439
Height (D)	mm	453
Weight	kg	97

Noise data

Parameter	Unit	Value
Guaranteed sound power level (LWA)	dB(A)	90
Sound pressure level at half load (LpA at 7 m distance) including measurement uncertainty	dB(A)	65
Measurement uncertainty (K)	dB(A)	2

Explosion protection

The machine does **not feature explosion protection**.

4.2 Components

Overview

The machine consists of the following main components:

Components	Name/type
Engine	HATZ diesel engine 1B30VE
Alternator	Microtec permanent magnet generator
Inverter	Microtec
Fuel pump	BOSCH EKP3
Housing	Enclosed, soundproof steel plate housing

4.2.1 Alternator

Technical data

Parameter	Unit	Value
Manufacturer		Microtec
Type		Synchronous, permanent magnetic excitation
Max. speed	rpm	3100

4.2.2 Inverter

Technical data

Parameter	Unit	Value
Manufacturer		Microtec
Voltage controller		electronic
Rated power	W	3200
Rated voltage	V (AC)	120
Rated current	A	26,7
Frequency	Hz	60
Protection class		IP 21
Voltage accuracy	%	± 5 (ohmic load)

4.2.3 Fuel pump

Technical data

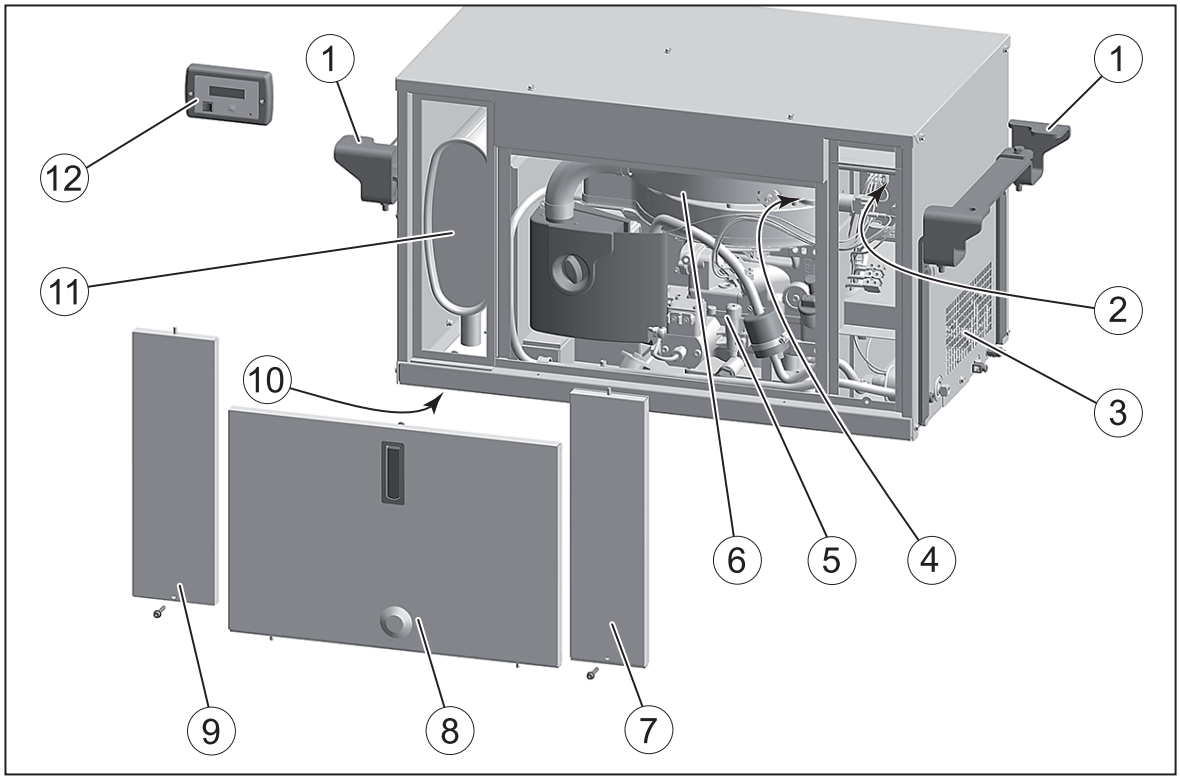
Parameter	Unit	Value
Manufacturer		BOSCH
Machine type		EKP3
Suction height	Meter	1.0

5 Machine overview

5.1 Configuration and function

5.1.1 Machine overview

View of machine



1	Fastening system
2	Plug-in fuse on internal control panel
3	Intake opening for cooling and combustion air
4	Stop switch
5	Diesel engine
6	Generator (integrated in diesel engine)
7	Service access to internal control panel
8	Maintenance access to diesel engine
9	Service access to muffler
10	Outlet for hot cooling air
11	Muffler
12	Remote operating panel (option)

Use

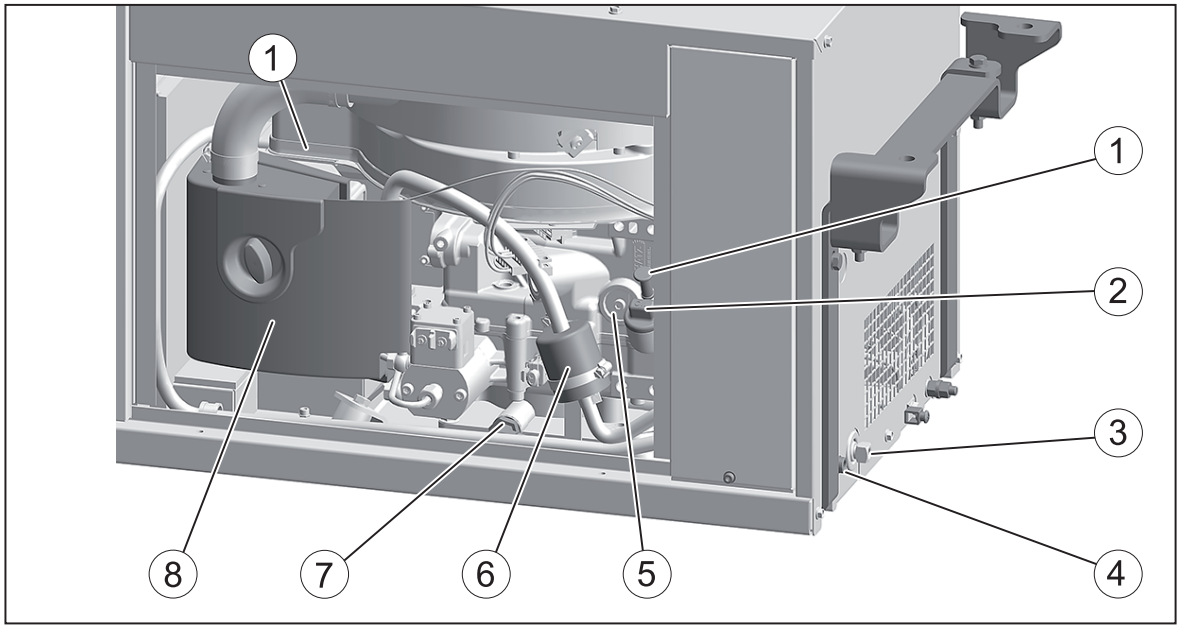
The machine is used to generate current for the operation of electrical machines with alternating voltages and frequencies as specified on the machine type plate. The engine, alternator, inverter, and fuel pump are secured in an enclosed and soundproof housing.

Functional procedure

The engine powers a permanent magnet alternator integrated in the flywheel. The inverter regulates the alternating current in the generator to the necessary voltage and frequency.

5.1.2 Mechanical components

Engine



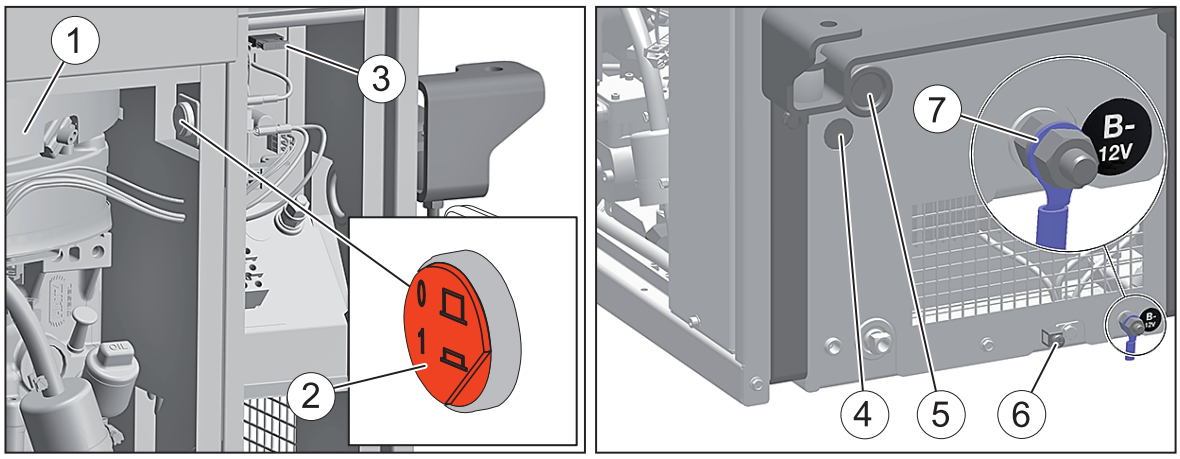
1	Dipstick
2	Oil filler plug
3	Connection for fuel feed line
4	Connection for fuel return line
5	Screw plug for oil filter
6	Main fuel filter
7	Oil drain screw
8	Air filter cover

5.1.3 Electrical components

Overview of electrical components

- Alternator with electrical equipment
- Control panel

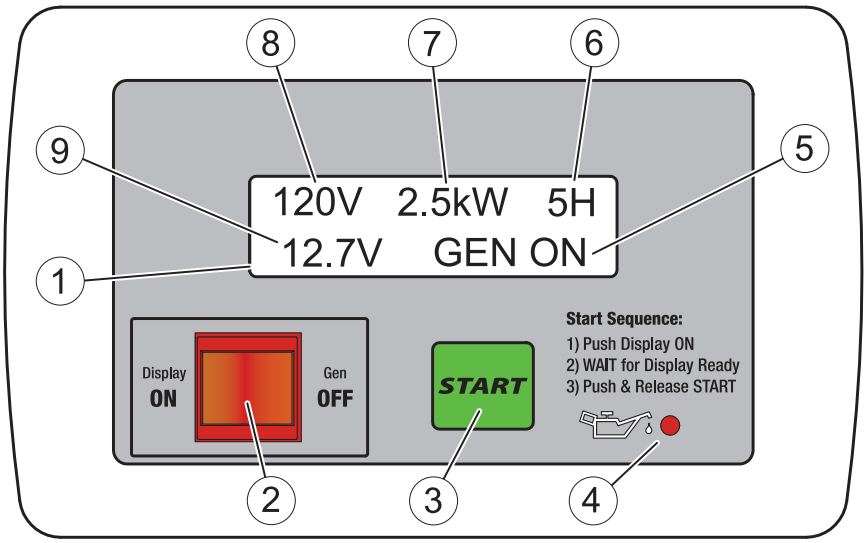
Alternator with electrical equipment



1	Alternator
2	Stop switch

3	Plug-in fuse on internal control panel
4	Through-hole for AC cable (AC)
5	Through-hole for battery cable (positive terminal) and connection cable for operating panel
6	Ground terminal
7	Connection for battery cable negative terminal (B–)

Operating panel (option)



1	Display
2	Rocker switch for switching the display on (display ON) and switching the machine off (Gen OFF)
3	START button
4	Low oil indicator lamp
	Standard display during operation
5	Status message
6	Operating hours
7	Supplied power
8	Supplied voltage
9	DC voltage of starter battery

The control panel has the purpose of displaying and monitoring all important functions. The integrated fault diagnosis system makes it easier to locate faults. The maintenance indicator indicates when maintenance work is due.

6 Transport and packaging

6.1 Transport

Safety notes

⚠ WARNING

Danger of injury from improper lifting and transport.

Danger of crushing from falling or tipping of the machine.

- The machine may only be lifted using the lifting fixtures mounted on the sides (1).
- Only use suitable hoists (2) with a sufficient carrying capacity.
- Attach the hoist to the lifting fixtures (1) in such a way that there is no slippage.
- Do not remain under suspended loads.

⚠ CAUTION

Danger of injury from overloading the body.

Lifting the machine to transport it or to move it to another location can lead to injuries (of the back, for example).

- Only lift the machine with a hoist.

NOTICE

Danger of environmental damage from leaking fluid.

If the machine is tilted, engine oil and fuel can run out.

- Only transport the machine in an upright position.

- When transporting the machine, follow the safety instructions.
- When transporting, follow the applicable safety and accident prevention regulations.
- After delivery, check the machine for completeness and transport damage.
- Only transport the machine when it is switched off and has cooled down.
- If you have questions on transporting the machine, please contact your nearest **HATZ service station**. For contact data, see chapter Legal notices or **www.hatz-diesel.com**.

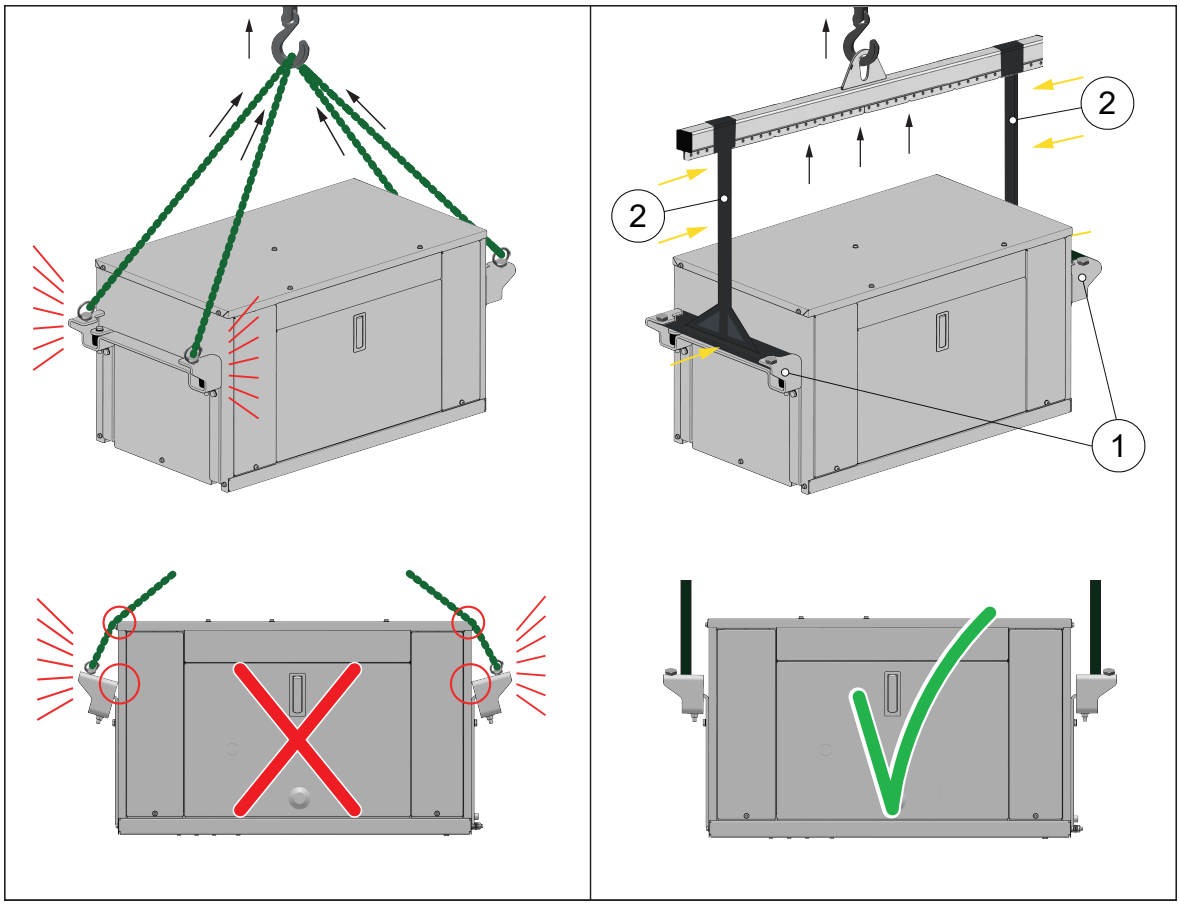
Transport damage

- Inspect the product for transport damage.
- Document any transport damage in the shipping documents, have them countersigned by the shipping agent and immediately inform the manufacturer.

Transport safety

- Select means of transport according to the weight and packaging of the engine (see shipping documents).
- Secure the load properly and transport carefully.
- When transporting by crane, use a lifting system (lifting eyes).

Recommended hoist (see example in figure on right)



1	Lifting fixture (mounting holder for installation in vehicle)
2	Hoist (connect to lifting fixture without slippage)

6.2 Packaging

Dispose of packaging materials (cardboard, wood, PET strip, etc.) according to local environmental regulations.

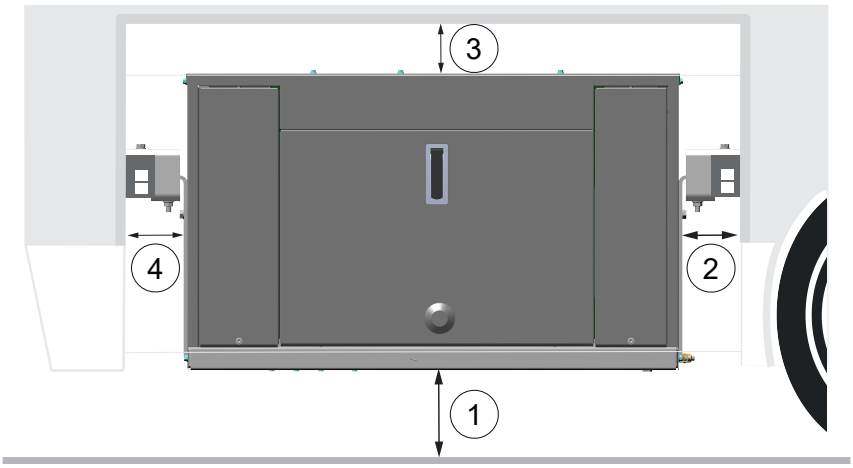
7 Location, installation and ventilation

7.1 Location

NOTICE

These machines are only suitable for underfloor installation. The holders supplied must be used for attachment to the vehicle frame.

- Front maintenance and service hatches and oil drain opening (below) must be easily accessible for regular maintenance work in accordance with the operator's manual.
- Easy access for connecting and disconnecting fuel lines, battery cables, remote control cables, and AC power cables must be ensured.
- No frame cross members, exhaust tailpipes, or other devices must be installed below the oil drain screw, or the air inlet and outlet openings.
- Maintain sufficient distance from the ground to ensure optimal ventilation and reduce the suction of dust by the cooling fan.
- Protect the air intake from direct road spray.
- Use only approved material (26 gage galvanized steel or equivalent) to create a vapor and fire resistant barrier between the generator and the vehicle interior.
- Acoustic and thermal insulation as well as adhesives must be classified as "self-extinguishing".
- The base of a section must not be lined with fuel and oil absorbing insulation materials.



The following minimum distances around the system must be observed when installing it in a vehicle.

Pos.	Minimum distances between generator and vehicle
1	305 mm (air outlet)
2	89 mm (air inlet)
3/4	15.5 mm

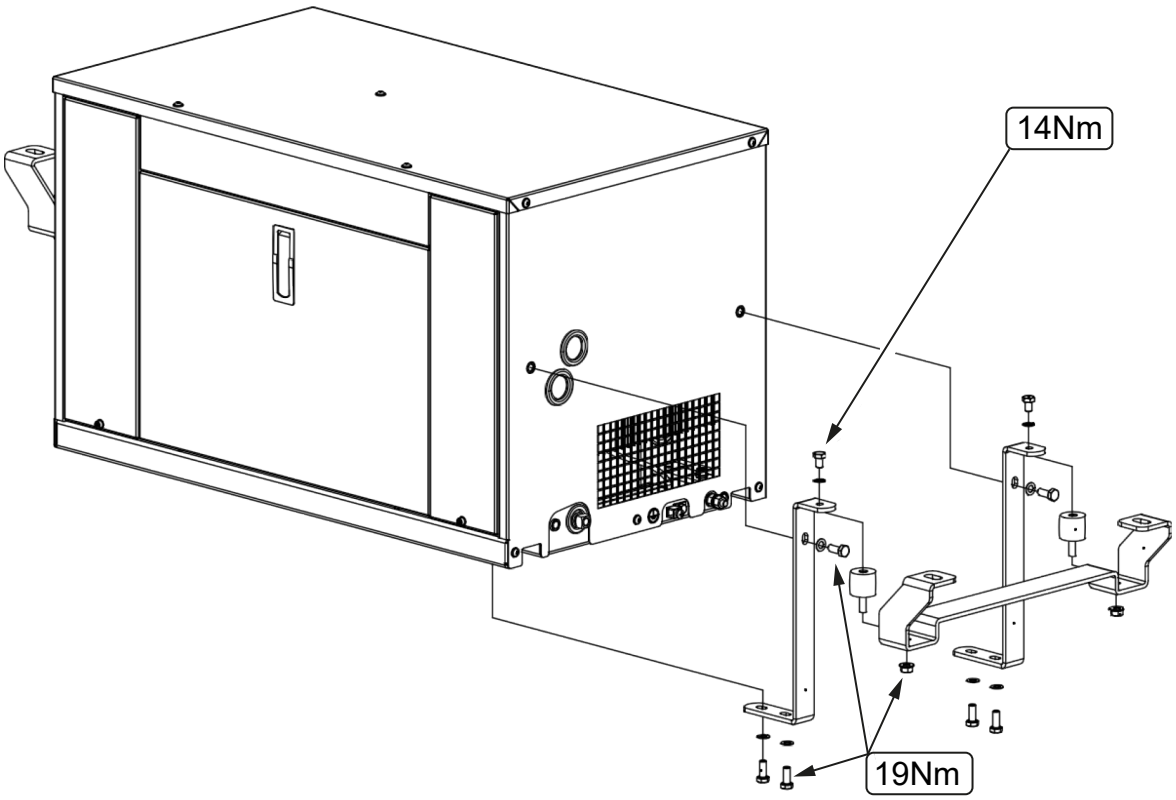
7.2 Installation

The generating set is delivered from the factory with a preassembled fastening system. If not, the mounting holders and vibration dampers must be installed at both ends of the machine, as shown in the figure below.

- After the installation of the fastening system, secure the generating set to the vehicle structure with 4 screws - see the screw specifications for fastening in the *4 Technical data, page 19*.

The following must be observed:

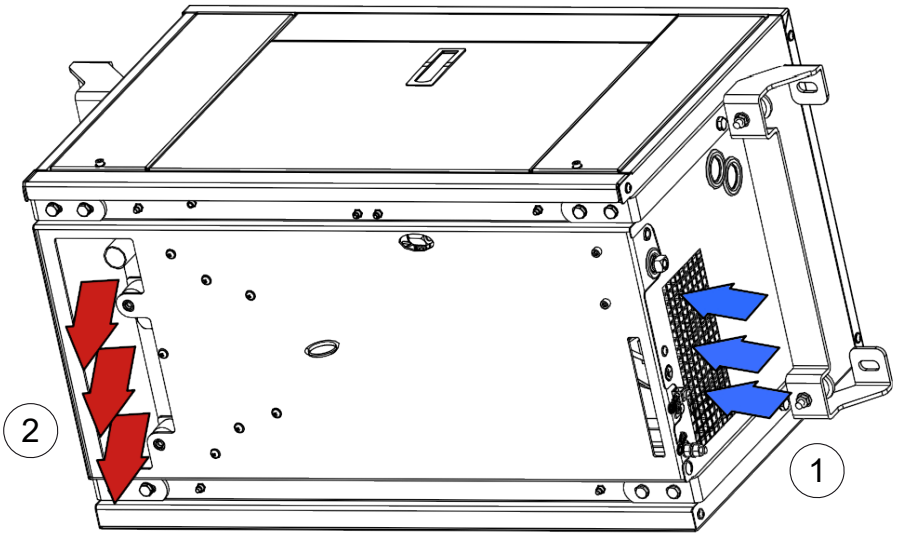
- The vehicle structure must be strong enough to support the generator under dynamic loads:
  - ±3 g vertical
  - ±1 g horizontal.
- Mounting points must be level, clean, and free of oil, grease, or dirt.
- The orientation of the generator on the vehicle must match the intended installation position. Make sure the bracket is precisely aligned to ensure a stress-free installation.



7.3 Ventilation

The air inlet (1) and air outlet (2) on the machine must not be blocked by any objects; these restrict the airflow and can lead to overheating of the generator. Proper functioning and full lifetime of the generator can only be guaranteed with unobstructed airflow.

Frame cross members, exhaust tailpipes and other components must not run below the hot air outlet opening.



8 Exhaust system

DANGER

Danger to life from inhaling exhaust gases.

Engine exhaust contains carbon monoxide, an odorless, colorless, poisonous gas that can lead to unconsciousness and death.

- The machine should only be started once it has been confirmed that the vehicle's interior is adequately sealed against exhaust gas ingress, for example, by using gas-tight insulation between the generator and the interior.

DANGER

Danger to life from inhaling exhaust gases.

Engine exhaust contains carbon monoxide, an odorless, colorless, poisonous gas that can lead to unconsciousness and death.

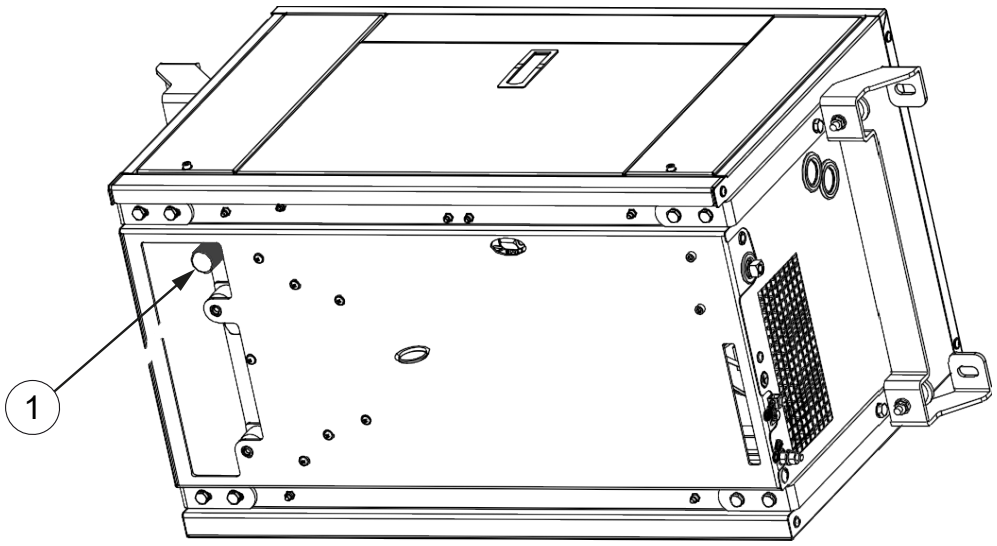
- Never switch on the generating set if the vehicle is parked in a garage or other closed or poorly ventilated area.
- Never stay in the vehicle while the generating set is running unless the vehicle has a functioning carbon monoxide detector.
- Do not breathe in the exhaust gases.

CAUTION

The exhaust piping between the engine and the muffler must be gas-tight to prevent exhaust gases from entering the vehicle.

8.1 Exhaust gas connections

The muffler is mounted on the engine side in the generating set. Pos. 1 shows the exhaust gas outlet pipe where the exhaust gas tailpipe is connected.



A generator without a properly installed and maintained spark protection system can cause a forest fire.

Responsibility for any damage, injuries, or warranty costs resulting from modifications to the exhaust gas system or the use of unauthorized parts rests with the individual who performed the modification or installed the unauthorized components.

For approved exhaust gas system parts, contact one of our HATZ service stations.

Connecting and installing the exhaust gas piping:

- Use an exhaust pipe made of aluminum-coated steel pipe with an inner diameter of 1 1/4 inches (= 31.75 mm). Do not use flexible pipes. These are neither gas-tight nor durable.
- Attach flexible exhaust hangers at 2 to 3 foot (0.6 to 0.9 m) intervals to a steel frame, not to wood or other combustible materials.
- The exhaust pipe must extend at least 1 inch (= 25 mm) beyond the periphery of the vehicle. Mount the last exhaust pipe suspension as close to the end as possible; see figure.
- Route the exhaust pipe so that it does not obstruct the draining of the engine oil.
- Do not install the exhaust pipe closer than 3 inches (76.2 mm) to any combustible material (wood, felt, cotton, organic fibers, etc.) unless it is insulated or shielded. The temperature rise (above ambient temperature) of adjacent combustible material must not exceed 117 °F (= 65 °C).
- Do not route the exhaust pipe near fuel lines or fuel tanks. The exhaust pipe must not end near a fuel filler opening.
- The exhaust pipe must not end closer than 6 inches (153 mm) to any opening inside the vehicle (door, window, vent).
- Route the exhaust pipe so it does not touch the ground when the vehicle is moving. It must not be located in the angles of approach/departure of the vehicle and must be above the axle distance line.
- To avoid damage to the engine, it is not permitted to connect the generator set to the exhaust gas system of the vehicle engine.
- Exhaust back pressure must not exceed 21.7 inches (550 mm) of water column at full load. Excessive back pressure can lead to loss of power and engine damage.

9 Fuel system

9.1 Fuel

DANGER

Fire hazard from fuel.

Leaked or spilled fuel can ignite on hot engine parts and cause serious burn injuries.

- Only refuel when the engine is switched off and has cooled down.
- Never refuel in the vicinity of open flames or sparks that can cause ignition.
- Do not smoke.
- Do not spill fuel.

CAUTION

Danger of engine damage from low quality fuel.

The use of fuel that does not meet the specifications can lead to engine damage.

- Only use fuel that is very low in sulfur or that contains no sulfur at all.
- The use of fuels that do not meet specifications require approval by Motorenfabrik HATZ (main plant).

NOTICE

When filling the additional tank with fuel for the first time, the fuel system must be completely filled with fuel and bled. It is important to prevent the system from running empty as this will cause air to enter the engine fuel system and the injection system of the device may become damaged.

NOTICE

Never run the tank empty if possible, as otherwise air can enter the fuel system. This can lead to damage to the injection system.
If the tank is still run empty, proceed as follows:

- Fill the fuel tank with diesel fuel.
- Vent the fuel system.

Even trace amounts of zinc, lead and copper can lead to deposits in the injection nozzles, which is why elements containing zinc, copper or lead are not permitted to be used in the fuel system. Galvanized (passivated) components may be used.

Zinc flake coating and hot-dip galvanizing produces a bare zinc surface and must be avoided.

- Zinc ions lead to accelerated clogging of the injection holes in the injectors.
- Copper acts as a catalytic converter and massively lowers the fuel oxidation stability in combination with the FAME (**F**atty **A**cid **M**ethyl **E**ster) content in modern fuels of up to 7 %. This also causes injection nozzles to clog more rapidly with combustion residue.

9.2 Fuel specification

See the **Diesel Engine Manual**.

9.3 Fuel connections

Notes on routing the fuel lines:

- Fuel lines must not be routed close to electrical lines or hot exhaust components.
- They must be readily accessible for maintenance work.
- Protection must be provided against vibrations, kinks, sharp edges and abrasion.

9.4 Fuel connections

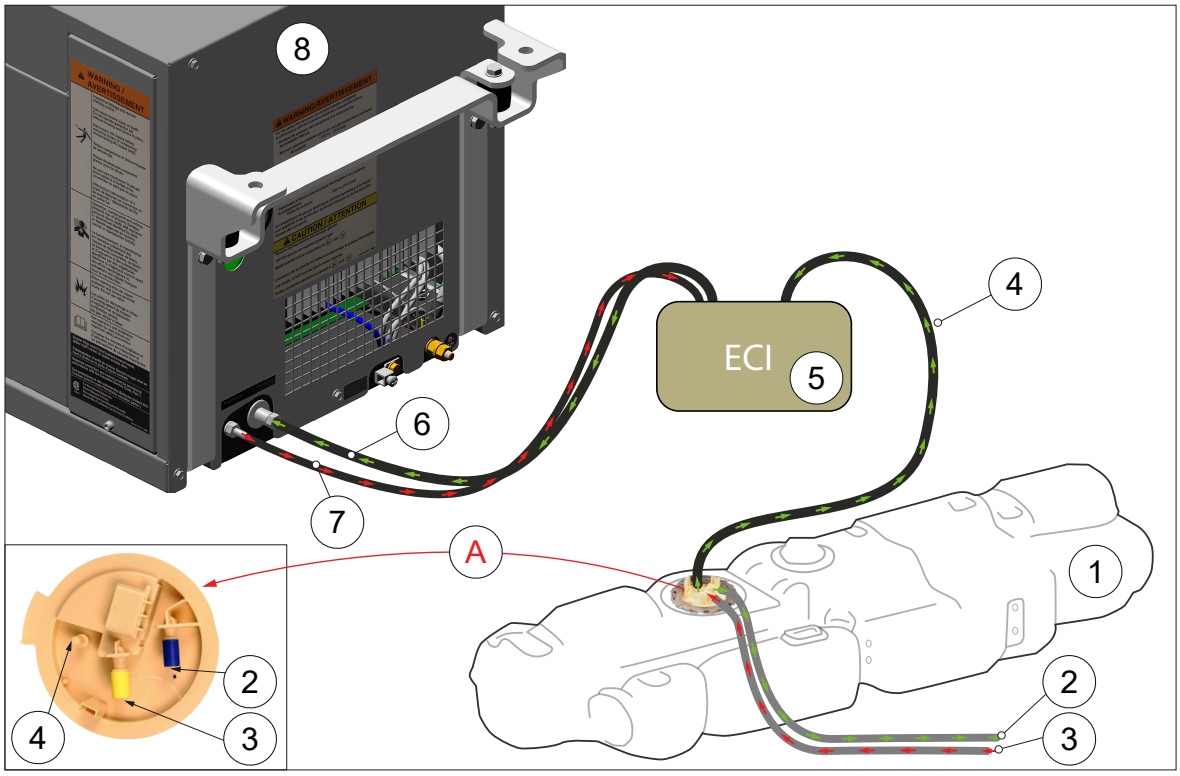
The generating set is suppled with fuel from an external additional tank (pos. 5).

The additional fuel tank has its own electrical fuel pump (max. delivery head 1 m (36 inches). The pump is activated via an integrated level sensor (resistive) as soon as the fuel level in the tank reaches 50%.

The internal tank pressure is monitored by an additional pressure switch that serves as an over-pressure (≥ 0.2 bar) or overfilling safety feature of the tank with fuel.

The pressure switch, level sensor and electrical fuel pump are controlled by the engine control unit of the generating set.

Overview



Pos	Description
A	Vehicle fuel tank sensor
1	Vehicle engine main tank
2	Fuel line from the main tank to the vehicle engine
3	Fuel return from the vehicle engine to the main tank
4	The fuel supply to the ECI additional tank for the generating set is via the additional connection for the auxiliary heater (Pos. 4) on the fuel tank sensor of the vehicle tank (A). (The original Mercedes part must be used for the fuel supply line.)
5	ECI additional tank with its own fuel pump for supplying fuel to the generating set.
6	**Fuel supply line** to the generating set (max. length up to 6 m with an inner Ø of at least 7 mm). **Note:** To ensure trouble-free operation of the machine, an additional fuel prefilter in the fuel supply line (Pos. 6) with the following specifications is recommended between the additional tank (Pos. 5) and the generating set (Pos. 8): filter fineness 600 µ, filter area> 30 cm².
7	**Fuel return line** from the generating set to the additional tank (max. length up to 6 m with an inner Ø of at least 7 mm)
8	Generating set

10 Electrical system

10.1 Battery

DANGER

Danger to life from accidentally starting the machine

Accidentally starting the machine can lead to serious or fatal injury.

- Do not connect the battery until you have been prompted to do so by the installation check and setup.

DANGER

Danger to life, danger of injury or danger of property damage due to incorrect use of batteries.

- Do not place tools or other metal objects on the battery.
- Before performing work on the electrical equipment, always disconnect the negative battery terminal.
- Never swap the positive (+) and negative (–) battery terminals.
- When installing the battery, first connect the **positive cable** and then the **negative cable**.
- When removing the battery, first disconnect the **negative cable** and then the **positive cable**.
- It is imperative to prevent short circuits and mass contact of current carrying cables.
- If faults occur, check the cable connections for good contact.

DANGER

Danger of explosion from flammable substances.

There is a danger of explosion from flammable gases.

- Keep batteries away from open flames and incendiary sparks.
- Do not smoke when working with batteries.

CAUTION

Danger of chemical burns

Chemical burns can occur when using batteries for the electrical operation.

- Protect your eyes, skin, and clothing from corrosive battery acid.
- Immediately rinse areas affected by splashed acid with clear water and consult a physician if necessary.

Temperature limits of normal batteries:

- From approx. +60 °C, the self-discharge increases significantly and the service life decreases significantly.
- From approx. -22 °C, half-charged batteries can freeze. A frozen battery must be thawed prior to charging.
- Fully charged batteries have a freezing threshold of approx. -60 °C.

Conclusions concerning the charge state of a battery are possible from measuring the voltage when loaded (min. 1 A). A discharged battery has the rated voltage at the terminals when unloaded!

10.1.1 Battery recommendation for generating set

Recommended max. battery capacity of a 12-V lead battery during starting.						
Engine type	Power, 12-V starter	Max. permissible capacity	Low-temperature measuring current [A] as per			
			EN[1)]	SAE[2)]	DIN[3)]	IEC[4)]
1B30VE	1.0 kW	55 Ah	420 A	450 A	255 A	290 A

[1)] European Standard 60095-1

[2)] Society of Automotive Engineers, United States standard

[3)] German Institute for Standardization (DIN) 43 539 Part 2

[4)] International Electrotechnical Commission) 95-1

NOTICE

The required battery capacity may deviate, depending on the installation case (e.g., resistances in the hydraulic system).

NOTICE

In the case of lead batteries, a self-discharge of approx. 5% of the total capacity per month must be taken into account.

10.1.2 Charging the battery

The vehicle manufacturer must ensure that suitable means are available for charging the battery of the generating set.

10.1.3 Installation location

The positioning must be verified by temperature measurements.

NOTICE

- The max. ambient temperature of the batteries is +60 °C
- Installation of the battery easily accessible for maintenance work
- Secure the battery mount against inherent movement
- Ventilation of the battery installation compartment
- Mounting of electrical switches in the vicinity of the battery is not permitted due to sparking and the potential explosion hazard.

10.2 Electrical connections on the generator

DANGER

Danger of injury from voltage.

Serious injury can occur during work on electrical equipment.

- Work on electrical equipment with a rated voltage of more than 50 V may only be performed by certified electricians as per IEC 60050[IEV 195-4-1].

WARNING

Danger of injury from electric shock.

Lack of personal protective equipment can lead to serious injuries.

- Work on the machine should only be carried out by qualified electricians.
- Before carrying out the work, completely de-energize the machine and disconnect it from the battery.

WARNING

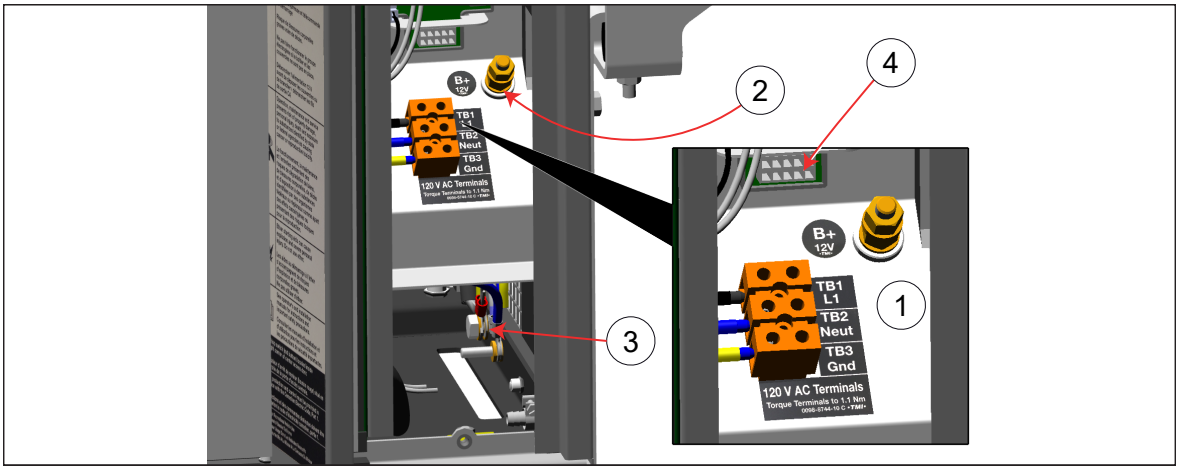
Danger of injury from electric shock.

Insufficient protection of the electrical lines against being touched can lead to serious injuries. Only operate the machine if:

- All connection lines are sufficiently insulated
- The contact points are protected against being touched
- The machine is fully installed as per the connection and wiring plans

AC output connection point on the generator

The AC output, the AC terminal block, on the generator (Pos. 1) is the interface at which the generated electrical energy is taken for use by the consumers in the vehicle. For battery positive (Pos. 2) and battery negative (Pos. 3), please observe the following safety instructions under*10.1 Battery, page 34*.



Preparation:

- Check that the generator's terminals are compatible with the intended loads.
- Select cable cross-sections in accordance with the technical specifications.

Connecting the AC output (Pos. 1)

- First connect the protective conductor Gnd (TB3) to ensure safe grounding.
- Connect the phase conductor L1 (TB1) according to the voltage specifications.
- Connect the neutral conductor Neut (TB2) correctly.
- Tighten all connections firmly (1 Nm) and check that they are properly seated.

Connection point for the control panel wiring harness (Pos. 4)

- Connect the wiring harness of the control panel. See accessories under *10.4 Generator monitoring, page 37*.

Functional test:

- Use the control panel to start the generator and measure the voltage at the terminals.
- Ensure that there is no overheating or loose connections.
- Connect the load and carry out a test run.

Conclusion:

- Attach protective covers and double-check all connections.

10.3 Device for isolating the power grid and generator

To prevent simultaneous connection of the power grid and generator from being connected to the vehicle's electrical system at the same time, a safe and standard-compliant switching device is required in the vehicle.

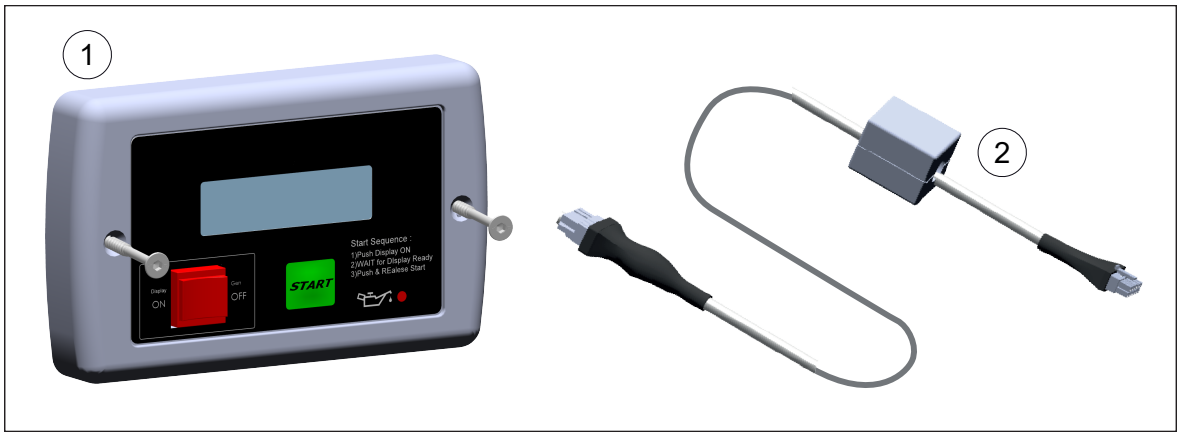
This prevents dangerous reverse feeding and ensures the electrical safety of the vehicle, its occupants, and the public power grid.

This is not only necessary from a technical point of view, but is also a legal requirement in accordance with US regulations, in particular the **National Electrical Code (NEC), Article 551 for residential vehicles and UL Standard 1008** for transfer switches (ATS or MTS).

10.4 Generator monitoring

10.4.1 Control panel

The control panel (Pos. 1) and the corresponding plug-in wiring harness (Pos. 2) are optionally available from HATZ.



installation of the control panel:

The control panel must be protected with the corresponding screws and mounted in a suitable place in the vehicle where it is easily accessible. Before installation, connect the control panel to the wiring harness in accordance with the **wiring plan, see operating instructions, wiring plan**.

Make sure that all connections are secure and insulated to avoid short circuits. Start the generator and carry out a functional test of the control panel.

For further information on starting the generator, see the **operating instructions, Chapter Operating and operation**.

11 General limits of use

The engine output decreases as the ambient temperature and/or the altitude increases. Therefore, it may be necessary to operate fewer machines under these conditions.

Reduction in output with increasing ambient temperature

At ambient temperatures of more than 25 °C (77 °F), the rated engine output drops by approx. 6% every 5.5 °C (42 °F).

Reduction in output with increasing altitude

Altitude above sea level	Maximum output
Below 500 ft (152 m)	3200 W (rated output)
2500 ft (762 m)	2980 W
5500 ft (1676 m)	2640 W
Above 5500 ft (1676 m)	2640 W minus 112 W every 1000 ft (305 m)

12 Maintenance

12.1 Accessibility of service points

When installing the generating set, make sure that all service points are easy to access and that the maintenance sticker is clearly visible on the generating set. If the original maintenance sticker is covered after installation, the supplied replacement sticker must be attached to the machine in a clearly visible location.

Poor accessibility to service points can lead to maintenance work not being performed or not being performed in a timely manner, which can lead to greater wear and premature failure of the generating set.

12.2 Maintenance intervals

Detailed information on maintenance intervals and carrying out maintenance work can be found in the **Diesel Engine Manual**.

13 Checking the machine installation (checklist)

13.1 Checking the installation before commissioning

Before commissioning the generating set, check the following points:

- Correct storage of the generating set?
- Is there sufficient space between the system and the vehicle installation space?
- Is the generator separated from the vehicle interior by vapor- and fire-resistant materials?
- Is there a ground clearance of at least 305 mm?
- Is the system protected from environmental influences (dust, driving rain, corrosive substances, rockfall)?
- Are the supply and exhaust air ducts correctly dimensioned and laid?
- Are the air inlet and outlet openings free of blockages?
- Are maintenance and service hatches easily removable for regular maintenance work in accordance with the operating instructions?
- Is the engine equipment easy to access via the maintenance hatch (stop switch, engine oil drain plug, air or fuel filter, spark arrester)?
- Are the exhaust connections gas-tight and their suspensions and brackets securely fastened?
- Does the exhaust pipe end at least 25 mm beyond the vehicle circumference and at least 153 mm from each vehicle opening?
- Are the exhaust pipes laid to avoid collisions?
- Are the cable ducts into the vehicle interior sealed to keep out exhaust fumes?
- Are the AC outputs properly connected?
- Does the battery capacity meet the minimum requirements?
- Does the machine comply with noise, exhaust, safety regulations and all relevant legal requirements (e.g. noise emission, exhaust emission, low voltage, electromagnetic compatibility, functional safety, etc.)?

13.2 Checking the temperature on the generator

Check the following points during operation of the generator:

Preparation:

Take the temperature measurement in a well-ventilated room where carbon monoxide cannot accumulate. The room should be protected from drafts that could affect the temperature measurements.

Temperature measurements:

- Use shielded thermocouples no larger than 0.25 mm² (No. 24 AWG).
- Measure the system's air inlet temperature with a thermocouple mounted approximately 1 inch (25 mm) from the front face of the air inlet
- Measure the ambient air temperature with a thermocouple at a distance of at least 1.2 m from the system and at the same height. Take care to ensure that the thermocouple is not affected by warm air from the system or by sunlight.

Conducting the test:

- Close all housing doors of the system.
- Start the system.
- Run for at least 90 minutes at a constant load of 2-3 kW
- If an air conditioner is used as a load, make sure that it does not cycle during the test.

Data recording:

- Temperature recording every 15 minutes, see the following table

Thermocouple position	Temperature C° (F°)				
	Time of measurement				
1					
2					

Test requirement:

- The intake air temperature must not exceed the ambient air temperature by more than 15 °F (8 °C); if it does, take measures to reduce air recirculation.

Note: On very hot days, the performance of the system may be significantly affected if the rise in air temperature during this test is close to the maximum permissible rise.

13.3 Checking the accessibility of the operating and service points

It must be possible to carry out operating and maintenance work easily. Good accessibility increases the reliability and service life of the engine.

Service personnel fail to recognize poorly accessible maintenance points as service points, thus shortening the engine's service life.

Accessibility to operating and service points must be checked personally by carrying out the necessary operations.

Operating points:

See type sheet and operator's manual

Service points:

See installation drawings and operator's manual as well as chapter "Accessibility of service points"

- Dipstick
- Oil filler
- Oil drain
- Oil filter
- Oil screen
- Air filter
- Cylinder head cover
- Cooling air passages
- Battery
- Fuel main filter
- Fuel prefilter
- Diagnostics interface

13.4 Installation log

Inspection of the installation and the installation report of the engine in series machines are carried out by **Hatz Ruhstorf** or the responsible Hatz representative. Please contact the relevant subsidiary for further information.

The warranty commitment for the engine in series machines is linked to the installation log.

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