



BISON GEAR

BOAR HEATER BOX

Owner's manual

DH-BOAR-03

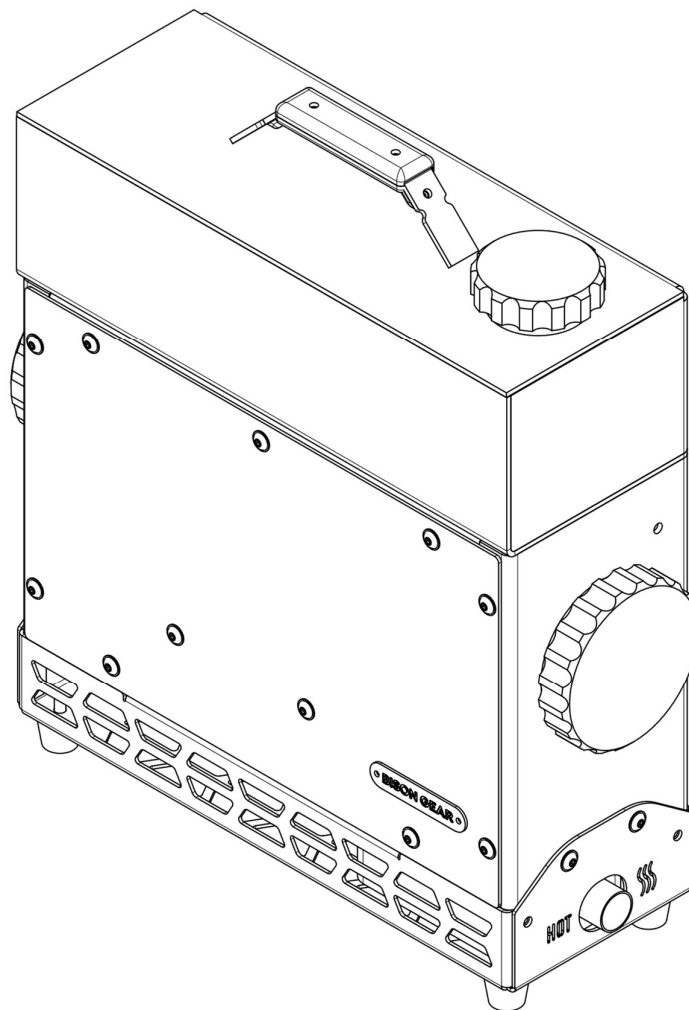




TABLE OF CONTENTS

1. INTRODUCTION.....	3
2. GENERAL INSTRUCTIONS AND OPERATING PRINCIPLE	4
3. SAFETY PRECAUTIONS	5
4. UNIT DESCRIPTION	7
5. THE BOAR DIESEL HEATER SET	8
6. CONTROL PANEL	9
7. IMPROVED HEATER EFFICIENCY DURING EXTREME WEATHER.....	10
8. USAGE PROCEDURE.....	11
9. ERROR CODES	13
10. BASIC PARAMETERS & SPECIFICATION OF HEATER	15
11. WARRANTY TERMS	16
12. VIDEO INSTRUCTION	17



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1. INTRODUCTION

Compact, aluminum and manufactured in Europe, the BOAR Heater Box is the perfect way to stay warm while camping off-season or in the mountains at high altitudes, so nothing limits your adventures.

It can work directly on your car's MOLLE panel or as a standalone device on the ground to heat a tent during cold nights, making your adventure more convenient and enjoyable.

The set includes a ready-to-use device with all necessary equipment, such as a heating pipe, control panel and power supply cables . Simply fill the diesel tank, connect to power source and enjoy the warm air.



2. GENERAL INSTRUCTIONS AND OPERATING PRINCIPLE

The DIESEL HEATER BOX with AUTOTERM AIR heater is designed to be used:

- for heating various confined spaces, such as vehicle driver's cabins, roof tents, ground tents, and camping trailers, up to -45°C .
- for outdoor activities where a reliable heat source is needed.

The heater operates independently of the vehicle engine.

Heaters built-in fan draws air through the air intake opening. The air heated by the heater is channeled to desired spaces via outlet channels.

Fuel is supplied by a separate fuel pump from BOAR Diesel Heater fuel tank.

The heater can be powered by a battery of the vehicle or a separate battery.

Temperature in rooms can be regulated by using a control panel, which sets heating parameters.



If the heater is handled improperly, there is a **possibility of a fire hazard** and **damage of property** because fuel and electrical components are being used. Always follow all safety precautions.

Basic parameters and specifications of the heaters can be found at the end of this manual (point 10).



3. SAFETY PRECAUTIONS



- **Make sure that the exhaust gases do not enter the air intake.**
- Make sure a fire extinguisher is nearby while using the unit.
- Do not use, where flammable vapors or gases or large amounts of dust may form and accumulate.
- Disable the heater, when the vehicle or unit is being fueled.
- Do not cover the heater with clothing, pieces of fabric and so on, and do not place such objects in front of the air intake pipe or output of the heated air.
- The installation arrangement must exclude the possibility of contact of the exhaust pipe with the air intake, fuel pipe, or other flammable objects.

- Do not touch the heater exhaust outlet.
-



- Do not install electric wiring (harnesses) of the heater near the exhaust pipe.
 - Disconnect the heater from power source during repair works on the heater.
 - Do not disconnect the power source when the heater is running.
 - When electric welding is carried out on the vehicle, or repair work is made on the heater, the heater must be disconnected from the battery or removed from the vehicle.
 - Do not use fuses rated differently from indicated in basic parameters table.
 - Do not use makeshift devices (wires etc.) instead of fuse.
-



- **Do not use the BOAR Diesel Heater Box in enclosed or unventilated spaces.**
- **Do not disconnect the heater from power before the purge cycle ends.**
- Avoid direct flow of exhaust gases into living areas.
- When the heater has been switched off, do not switch it on again for 5-10 seconds.



- **Do not cover the inlet, outlet or exhaust while the unit is operating.**
- Fill the fuel tank to a maximum of 95% of its capacity (4.4 L).
- Do not sit or step on the heater or put any objects on it and in it.
- **Electric wiring, the air intake, and the fuel pipe must be protected from contact with sharp edges of vehicle structures.**
- **Keep away from children.**
- **Use only diesel fuel.**
- **Do not operate the heater box without front cover.**



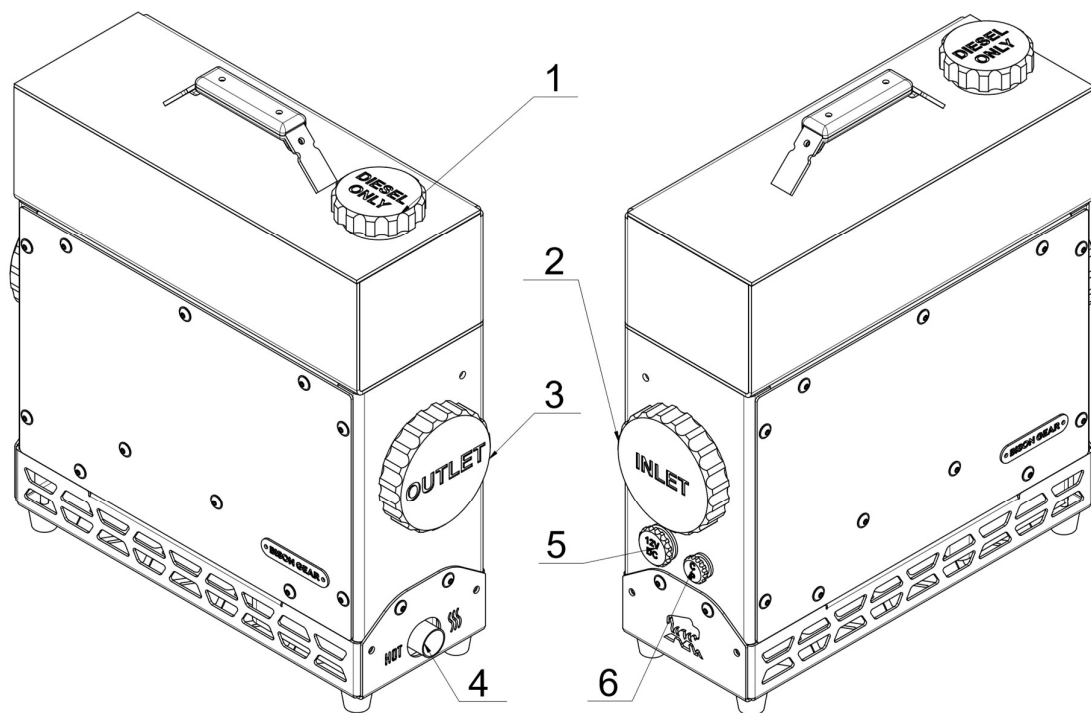
- In case of faults in the operation of the heater, contact specialized repair organizations authorized by BISON GEAR.

If the consumer fails to follow the requirements above, the warranty of the heater becomes null and void.



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4. UNIT DESCRIPTION



- 1 – Diesel tank cap
- 2 – Air inlet
- 3 – Air outlet
- 4 – Exhaust pipe
- 5 – Power supply (12 V DC) Connector
- 6 – Control Panel Connector



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5. THE BOAR DIESEL HEATER SET

1. BOAR DIESEL HEATER.
2. DC Power supply cable with fuse.
3. Control panel with the wiring.
4. Outlet heating pipe.
5. Elbow exhaust pipe.
6. Standard mounting panel.



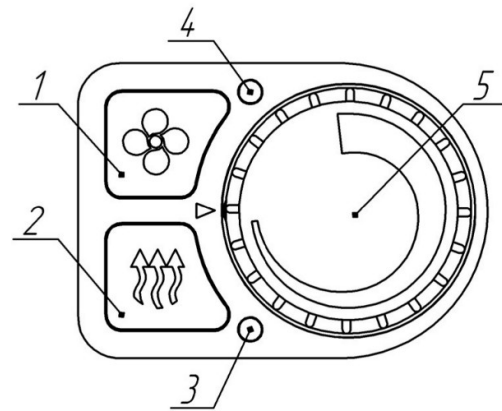
6. CONTROL PANEL

The standard diesel heater comes with a manual control panel, which allows you to adjust the basic heating parameters, such as the on/off mode, ventilation level, and temperature level. It also includes an additional housing with embedded magnets, making the control panel highly convenient to use.

Important: The controller must be protected from water. It is not waterproof and should always be shielded from weather conditions.

The following are located on the front of the control panel:

- 1 – Ventilation mode on/off button
- 2 – Heater on/off button
- 3 – Operation LED display
- 4 – Ventilation mode LED display
- 5 – Potentiometer knob



Using of control panel:

- **The button pos. 1 is designed to:**
 - switch the ventilation mode on and off.
- **The button pos. 2 is designed to:**
 - switch on the heater in heating mode (for an unlimited time) and switch the heater off.
- **The regulator pos.5 is intended for:**
 - regulations of speed of rotation of the fan on the ventilation mode,
 - regulations of heating capacity of a heater from "min" to "max" of kW on the heating mode.



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Control panel status:

The LED in Pos. 3 indicates the heater status:

- yellow light - heating mode
- fast blinking yellow – during purging
- slowly blinking red - in case of malfunction
- off - heater is not operational

The LED in Pos. 4 indicates the ventilation mode status:

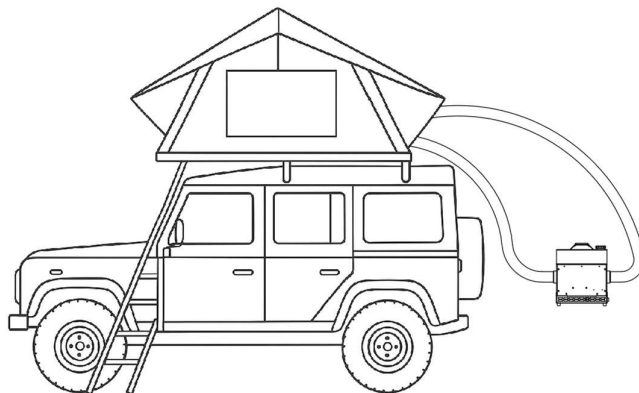
- green light - interior sensor is not connected and heater operates in ventilation mode
- green blink - ventilation mode off
- off - heater is not operational, with ventilation mode off

7. IMPROVED HEATER EFFICIENCY DURING EXTREME WEATHER

During severe weather conditions (very low temperatures), it is recommended to create a heating loop and reuse the heated air.

Connect the second pipe (sold separately) to the heater's air inlet, directing the previously heated air from the warmed space (for example: from tent, from vehicle etc.) back into the heater. This improves heating efficiency.

Maximum length of the air intake pipe 1,5 m.





8. USAGE PROCEDURE

Device start procedure:

1. Refuel the heater with diesel fuel.
2. Remove the inlet and outlet caps by unscrewing them counterclockwise.
3. Remove the cover from the exhaust.
4. Connect the magnetic end of the heating pipe to the heater box outlet. Place the other end of the pipe in the area you want to heat.
5. Remove the cap and connect the control panel plug to the heater box.
6. Remove the cap and connect the power supply plug to the heater box, then attach the second end of the cable to the 12 V DC vehicle battery or another 12 V DC power source.
7. If your heater box is mounted on a MOLLE panel, you must additionally place the elbow pipe on the exhaust outlet so that the exhaust gases are directed away from the vehicle.

If you are using the heater as a standalone device, you may skip this step.

8. **Make sure that all previous steps have been completed correctly.**
9. Press the on/off button (2) to start the heater. The heater will complete its start-up procedure automatically (up to one minute).
10. Adjust the temperature by turning the knob clockwise to increase or counterclockwise to decrease the temperature.



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Shutdown procedure:

To ensure long-lasting and reliable operation, always follow the shutdown procedure. It is recommended to read the instructions carefully before performing the steps.



!!!! WARNING !!!

DO NOT TOUCH EXHOUST PIPE – it is hot.

1. Press the on/off button (2) to shut down the heater.
2. Wait until the heater completes the shutdown procedure (this takes several seconds) and do not interrupt the process.
It is recommended to wait at least 20 minutes before starting disconnecting all the parts (cables, pipe, exhaust elbow pipe) from the heater box.
3. Disconnect the power supply cable from the battery and then disconnect the plug from the heater box.
4. Disconnect the control panel from the heater box.
5. **Make sure that the elbow exhaust pipe is not hot and then remove it.**
6. Disconnect the air pipe.
7. Install all the caps on the heater box (inlet, outlet, DC power connector, control power connector, exhaust pipe).



9. ERROR CODES

Fault code	PU-5 blinks	Description	Fault Cause	Recommended Solutions
01	1	Overheating of the heat exchanger	The sensor sends a signal to shut down the heater. Heat exchanger temperature in the sensor zone is over 250°C	Check the intake and outlet of the heating unit for unobstructed entry and exit of heated air. Check the integrity of the fan and its performance. Check the temperature sensor and replace it if necessary. Inspect the heat exchanger. Check and remove carbon deposits from the inside of the
02	12	Possible overheating at the intake temperature sensor. Sensor temperature (control unit) is more than 55 degrees.	Control unit is insufficiently cooled down during 5 min. purging before start-up; or overheating of the control unit during operation.	Check the intake and outlet of the heating unit for unobstructed entry and exit of air and re-start the heater to cool it down. Replace the control unit.
05	5	Faulty temperature sensor (AIR-2D) or flame indicator	Short circuit to the casing or open circuit in the wiring of the sensor.	Check sensor, replace if necessary
07		Overheat sensor - open circuit	Faulty sensor. Oxidation of contacts in the terminal block.	Check overheat sensor circuit for an open. Remove oxidation from the connector contacts.
08				See Fault Code 29.
09	4	Faulty glow plug	Short circuit, open circuit, faulty control unit.	Check glow plug, replace if necessary. Check the control unit, replace if necessary.
10	11	Electric motor of the air blower does not develop the necessary speed.	Increased friction in the bearings or contact between the impeller and fan shroud in the blower. Faulty electric motor.	Check electric motor, if possible correct the fault; replace air blower if necessary
12	9	Shut down, overvoltage more than	Faulty voltage regulator. Faulty battery.	Check battery terminals and wiring. Check the battery, charge it or replace if necessary.
15		Shut down, low voltage, less than 20V		
13	2	The heater does not start - two automatic start attempts failed.	No fuel in the tank	Fill the fuel tank.
			Fuel grade does not match the operating conditions at low temperatures.	Replace fuel.
			Insufficient supply of fuel.	Eliminate fuel line leakage or blockage. Check the performance of the fuel pump, replace if necessary
			Clogged exhaust duct or combustion air intake.	Clean air intake or exhaust duct of possible clogging.
			Insufficient pre-heating of the glow plug, faulty control unit.	Check the plug, replace if necessary. Check voltage supplied by control unit, replace if necessary.
			The impeller touches the fan shroud in the blower, and, as a result, flow of air into the combustion chamber is reduced.	Replace blower after determining its malfunction.
			The glow plug housing in CC is clogged. Clogged glow plug screen or it is not installed all the way into housing.	Clean the glow plug hole. Replace the glow plug screen, if needed, and install it in accordance with repair manual



Fault code	PU-5 blinks	Description	Fault Cause	Recommended Solutions
16	10	During the purge time, temperature sensor was not cooled down. Time for ventilation was exceeded.	During 5 min purge before start-up, temperature sensor was not sufficiently cooled.	Check the intake and output of the heater for unobstructed entry and exit of air. Check the integrity of the fan and its operation. Check the sensor, replace if necessary.
17	7	Faulty fuel pump	Short circuit or open circuit in the wiring of the fuel pump	Check the wiring of the fuel pump for short circuit and open circuit. Check the wires to overheat sensor, insulation integrity.
20	8	Heater does not start	Burnt out fuse on the power harness.	Check the fuse and replace if necessary.
			No communication between the controller and the control unit. Controller receives no data from the control unit.	Check the connectors and wire in the connecting harness. Remove oxidation from connectors. Check the controller and the connecting harness, replace if necessary. If the controller is operational, replace the control unit.
27	11	Motor does not rotate	Damaged bearing or rotor, foreign objects, etc.	Check connectors and wiring leading to the electric motor board and the control unit. Eliminate the fault, if possible.
28		Motor rotates. Speed is not regulated.	Faulty electric motor control board or heater CU.	Replace air blower.
08 / 29	3	Flame failure during operation of the heater.	Insufficient fuel supply. Faulty fuel pump. Faulty flame indicator.	Check for leaks or clogging of fuel lines, tighten the clamps on the fuel lines. Check combustion air intake and exhaust pipe. Check the amount of fuel supplied by the fuel pump, and replace it if necessary. If the heater starts, check flame indicator and replace it if needed.
30		Heater does not start	No communication between the controller and the control unit. Control unit receives no data from the controller.	Check connectors and the connecting harness. Remove oxidation of connectors. Check controller and connecting harness, replace if necessary. If controller is operational, replace control unit.
78	3	Flame failure during operation.	Air bubble in fuel system. Faulty fuel pump. Faulty flame indicator.	Check fuel lines for leaks or clogging. Tighten fuel line hose clamps. Check combustion air intake and exhaust duct.



10. BASIC PARAMETERS & SPECIFICATION OF HEATER

Characteristics	Models
	DH-BOAR-03
Rated voltage	12V
Fuel	diesel fuel EN590, depending on the ambient temperature
Heating unit	Autoterm AIR 2D 12V
Heating output	0.8 – 2 kW
Hot air flow	34 – 86 m ³ /h
Fuel consumption	0.10 – 0.24 l/h
Power consumption	10 – 29 W
Working/storage temperature	-45°C to +55°C
Working altitude	up to 4200 m
CO ₂ in exhaust gases	< 12%
Start-up and Shutdown	manual
Heater box dimensions	420 x 450 x 130 mm
Weight of the heater box	9 kg– without fuel 13 kg – with fuel
Fuel tank capacity	4.6 L
Fuse rating	20 A
Max length of air outlet pipe	5 m
Max length of air intake pipe	1.5 m

***** Standby power consumption of the heater – 0.06 W.**

Serial Number (S/N) is printed on the rating label applied on the heater box.



11. WARRANTY TERMS

The warranty terms of exploitation of heater outflows under reaching one of the following terms:

- the terms of exploitation attained 24 months from the date of purchase;
- the warranty resource to air heater - 2000 working hours;

The warranty does not apply to defects resulting from:

- improper use, which is not in accordance with valid, supplied instructions;
- force majeure: lightning strike, fire, flood, voltage fluctuations, accident;
- transport damages;
- exploitation, storage and transporting rules have not been met;
- repair or adjusting, if they are conducted by the organizations, not authorized by BISON GEAR on installation of the heater and warranty repairing;
- independent repair of heater or use of spare parts not approved by original manufacturer;
- use of wrong voltage;
- use of wrong fuel;
- failure of the heater due to combustion chamber impurity.



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12. VIDEO INSTRUCTION



<https://www.youtube.com/watch?v=dRKaWfS67Z4>



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Have a great time with the Bison Gear product!



Email: contact@bison-gear.com

Phone: **+48 505 642981**

AT Label

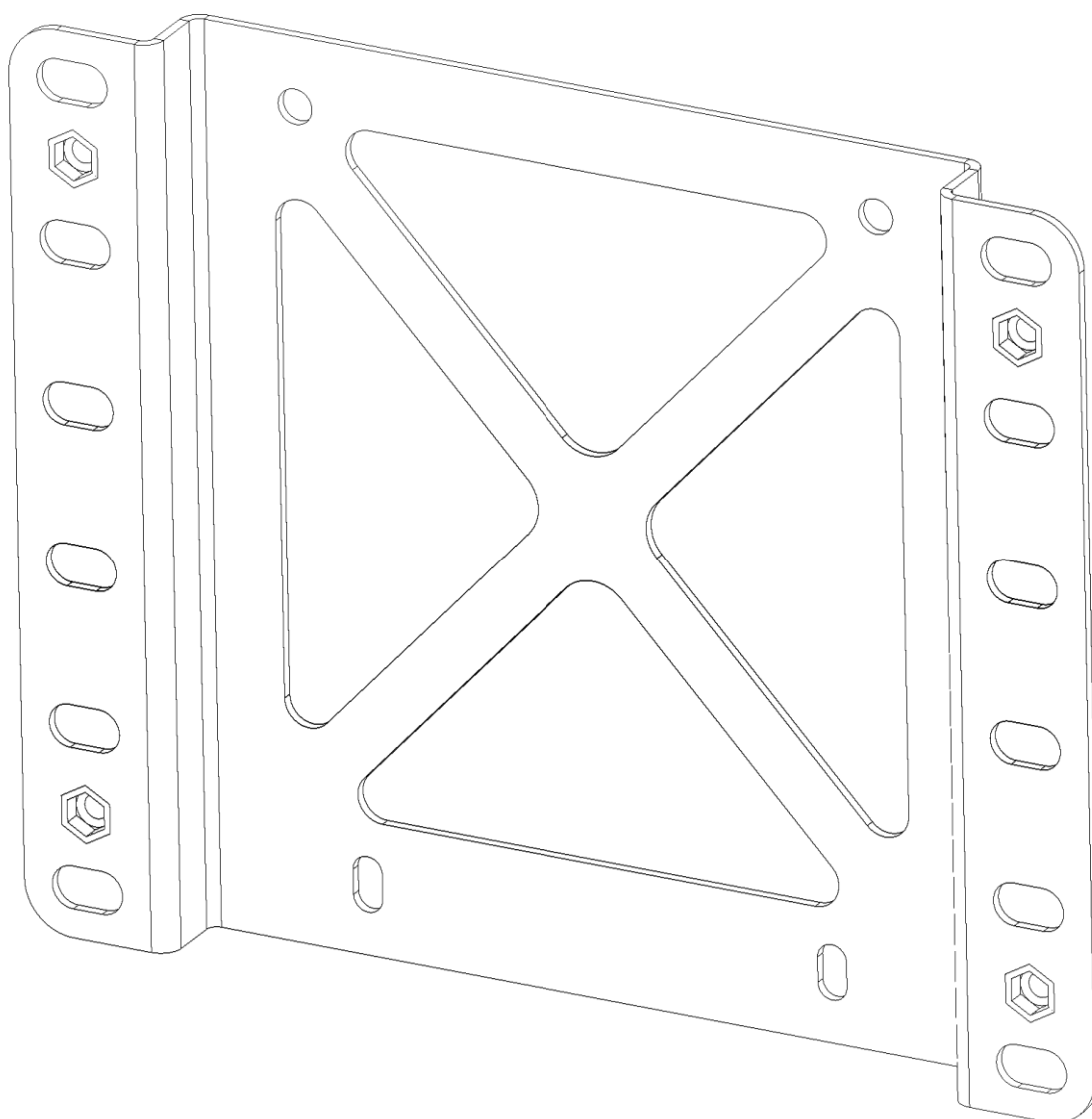




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Diesel Heater Standard mounting bracket Installation guide

DH-BOAR-STANDARD



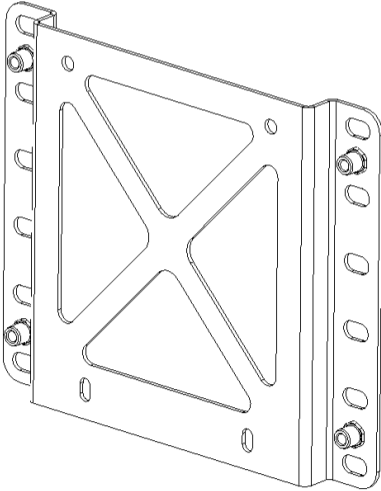

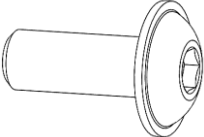
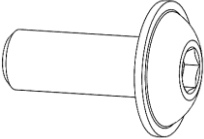


Before you start

Before installation:

- Familiarize yourself with these instructions.
- Ensure that all listed parts and hardware are included in the package.
- Gather the required tool.

Part list

LP	PART	QTY	IMAGE
1	Standard mounting panel	1	
2	Flange nut M6 DIN 6923	4	
3	Flange bolt M6x16 ISO 7380-2	6	
4	Flange bolt M5x20 ISO 7380-2	2	

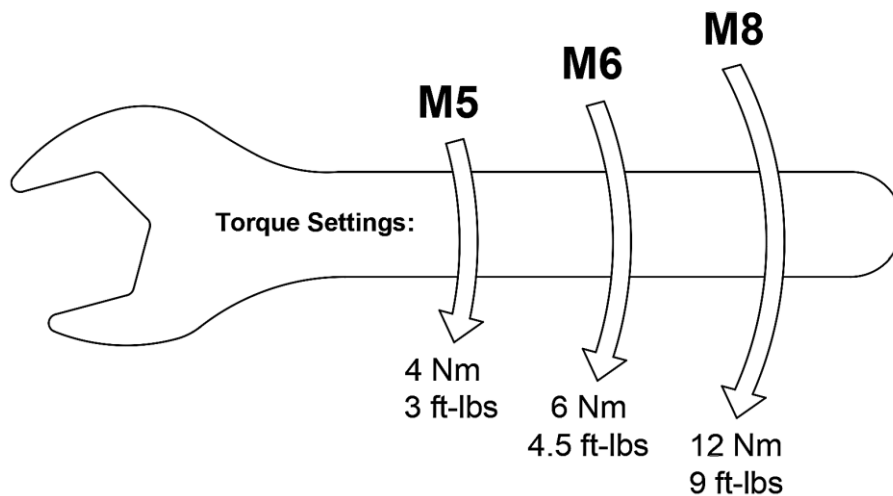


✂ List of necessary tools¹:

- 3 mm Allen Key (Hex)
- 4 mm Allen Key (Hex)
- 10 mm wrench

✂ Torque settings:

During assembly, use the recommended tightening torques for screw, unless other parameters are specified for a given connection.



¹ NOTE: The tools **are not** the part of the set.
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Installation:

The installation guide below describes how to mount the standard mounting bracket to the diesel heater box. This bracket allows the heater box to be attached to an external side panel of the vehicle.

The instructions below show how to mount all parts correctly.

It is divided for 2 parts:

PART 1 – refers to attaching the mounting bracket to the heater box

PART 2 – refers to attaching the mounting bracket to side panel – 2 methods

PART 1

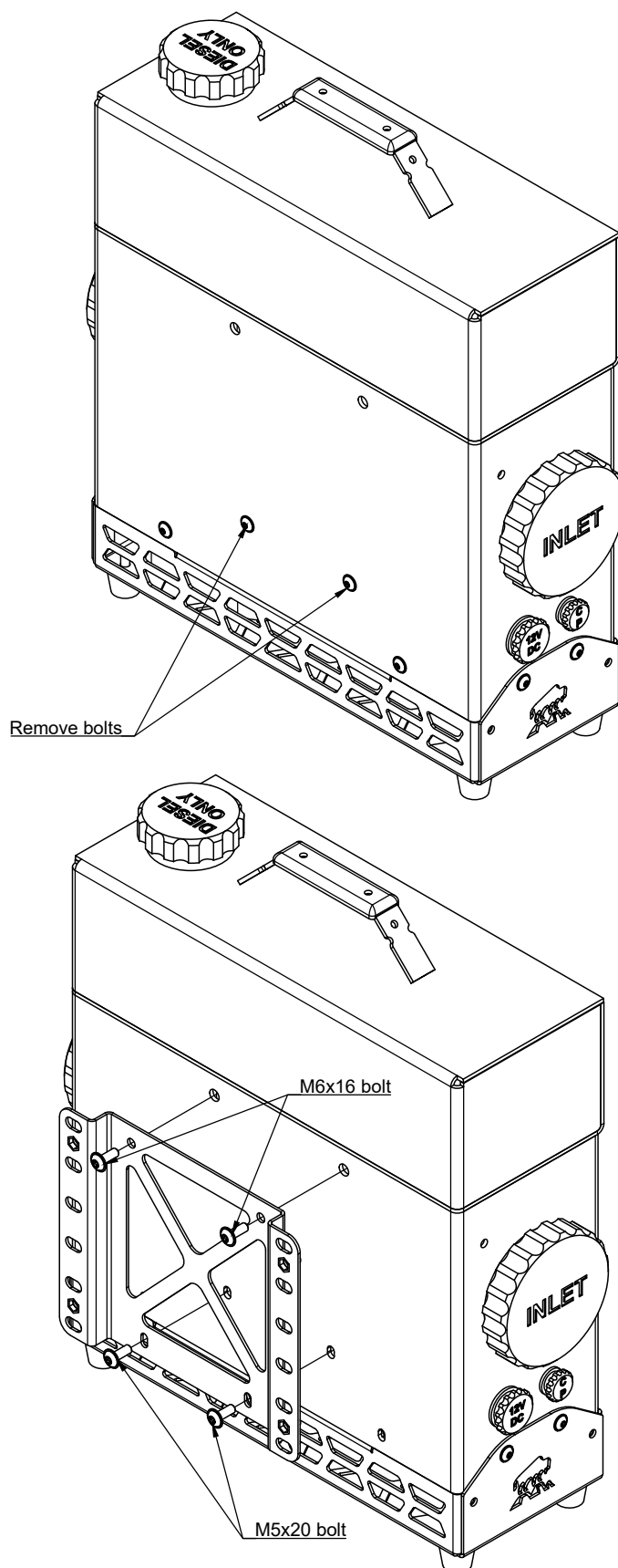
Before you begin attaching the bracket to the heater box, unscrew the two bolts as shown in the first picture below.

Place the bracket on the diesel heater box and secure it using the M6 and M5 bolts, as shown in the second picture below.

Remember to tighten the bolts.



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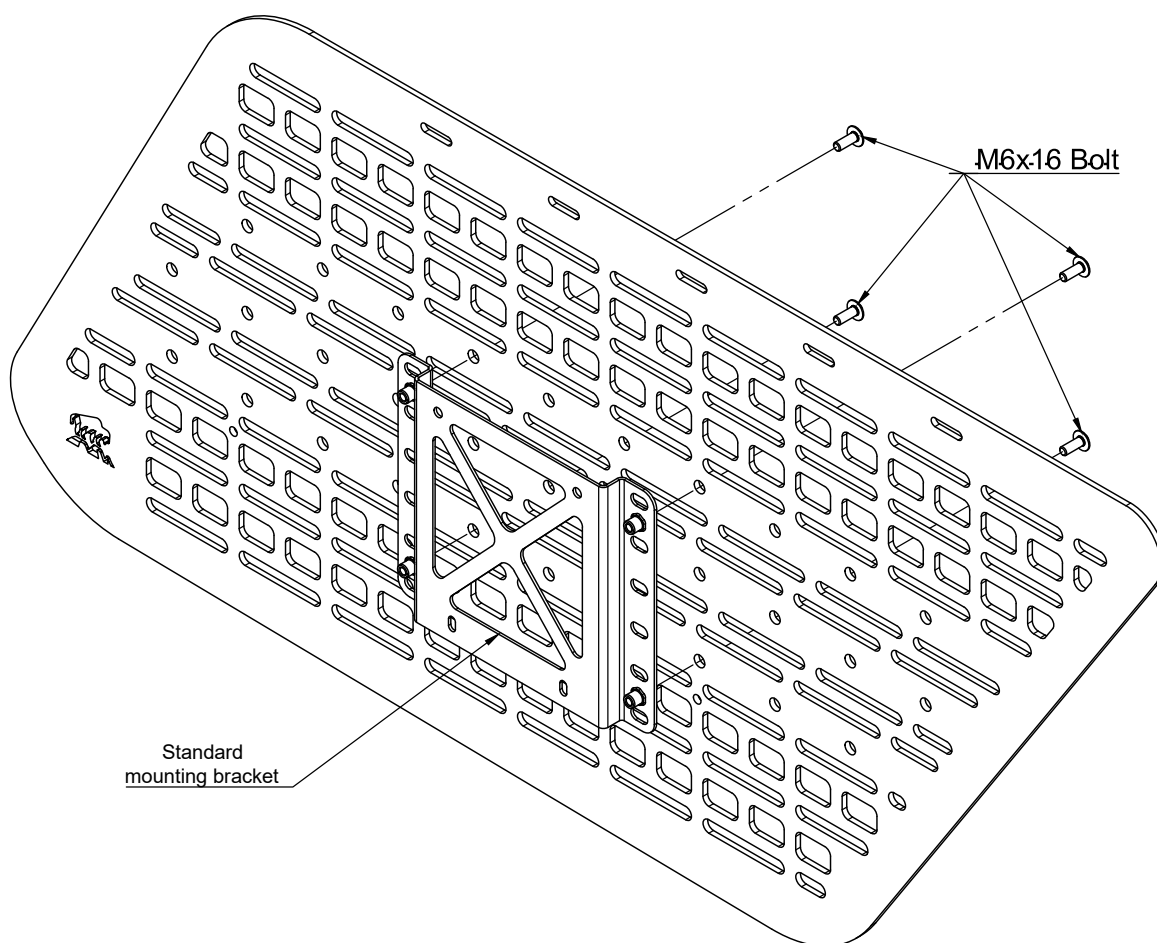




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PART 2

The first method of mounting is dedicated for BISON GEAR external panel. The basic bracket has a prepared holes with rivetnuts which refers to the panel perforation.



(The illustration does not show the heater box to provide a clearer view of the diagram. Remember to complete the first step before screwing the bracket to the panel.)

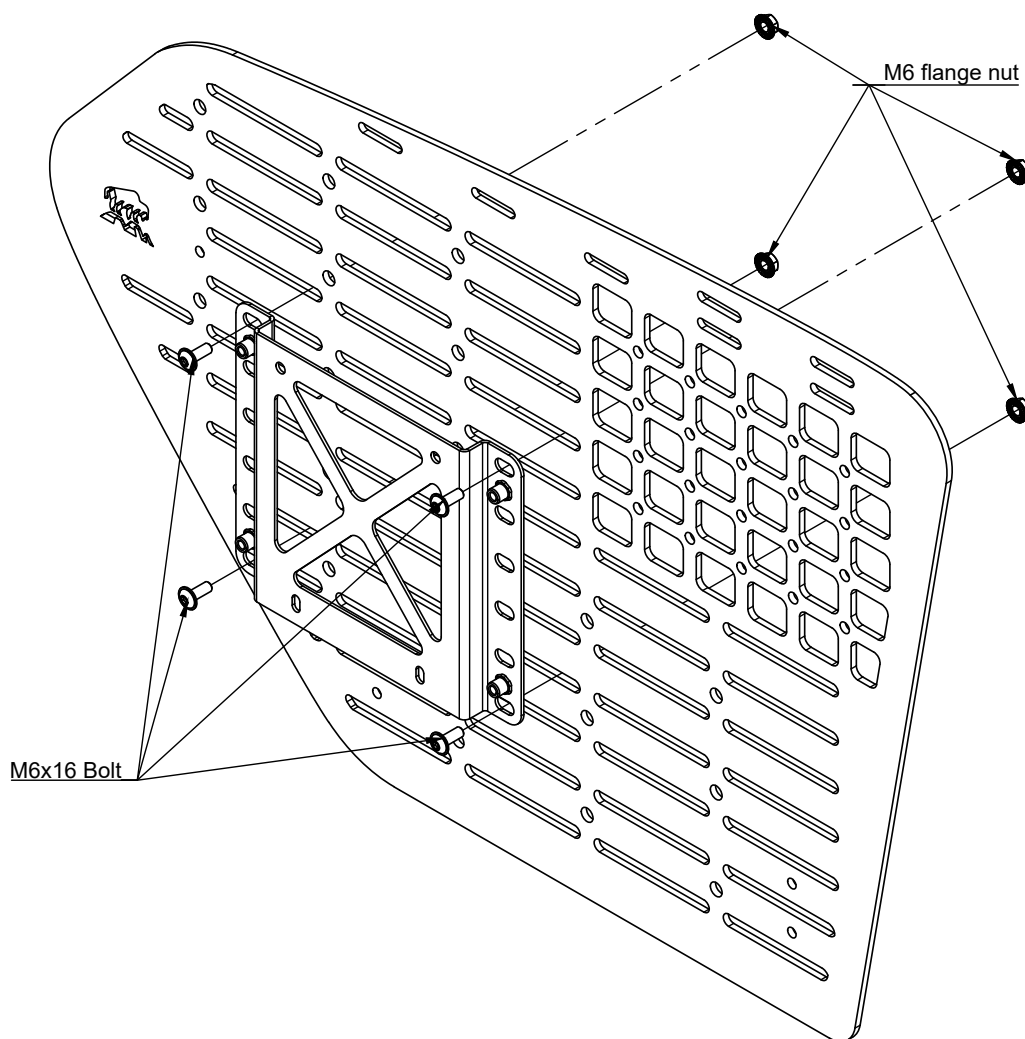


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The second mounting method is another universal way of attaching the heater box to an external panel. The basic bracket includes an additional slot that allows it to fit various panel perforations. Choose the position that works best for you and secure the bracket using M6 bolts and nuts.

The picture below shows an example of the mounting method.

The bracket should be secured with at least four bolts.



(The illustration does not show the heater box to provide a clearer view of the diagram. Remember to complete the first step before screwing the bracket to the panel.)



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Make sure that everything is mounted properly, and all the bolts are tightened. If everything is correct, your work is done.

After driving 50km, check all the bolts and retighten them if necessary.

Have a great time with Bison Gear products!



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