

STOP DONT PANIC READ THE INSTRUCTIONS

DIESELHEAT AIR HEATER INSTALLATION MANUAL



Taken at Derwent Bridge TAS by Lostnomads

We pride ourselves on your successful installation and use of your new heater. If you have any questions not answered by this manual please give us a call on **0418 130 971**

 **dieselheat**

Dieselheat Eberspacher AS3 D2L and M3 D4L, D4R Installation Instructions

Congratulations on purchasing a high quality Eberspacher diesel heater from Dieselheat. Your kit contains everything you need to complete a professional, quiet, reliable installation.

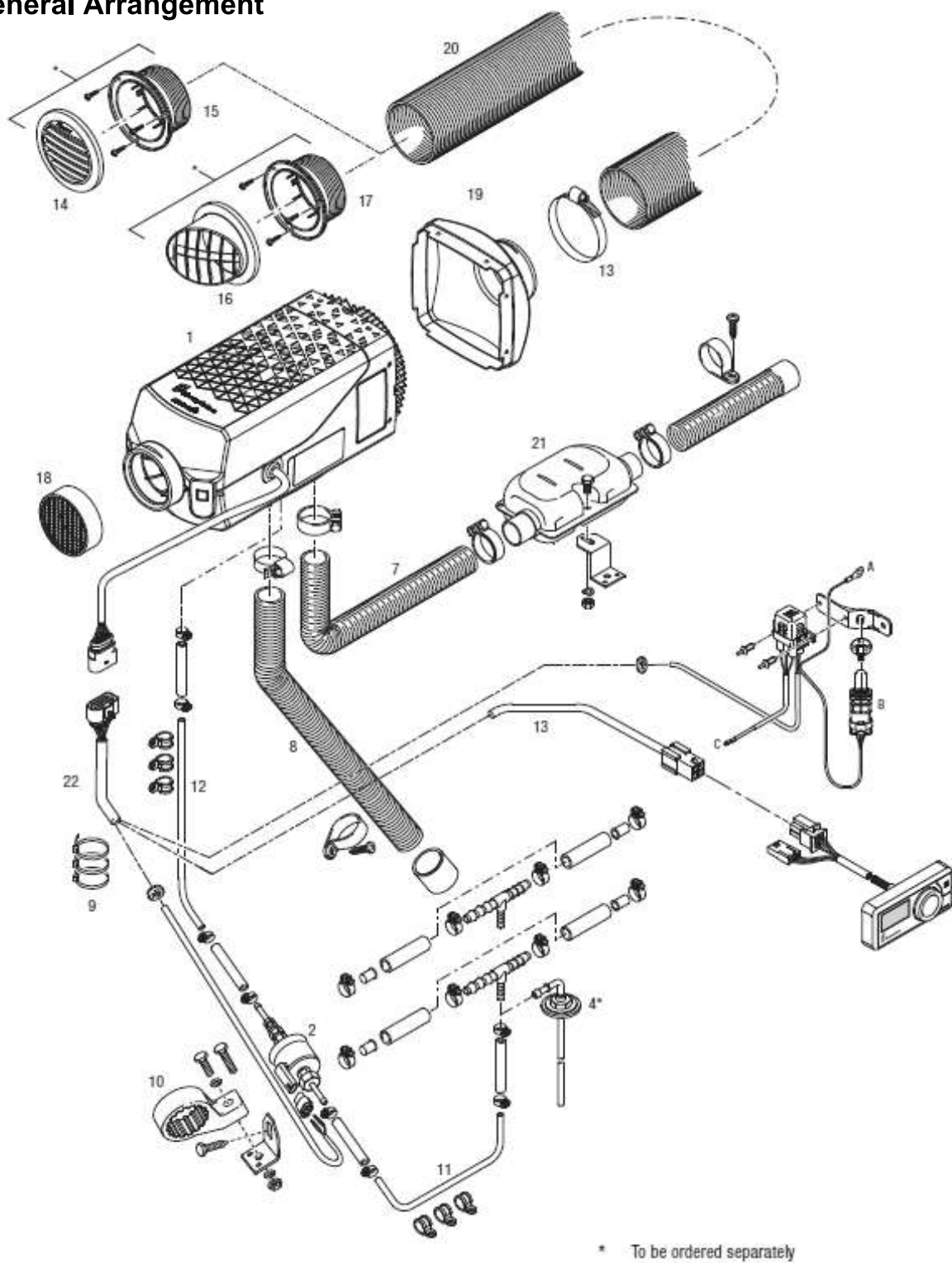
Remember, help isn't far away. Read the instructions first, but please feel free to call us if you need further assistance.

This is a hybrid instruction manual consisting of relevant excerpts from the Eberspacher Technical manual and the Dieselheat installation manual. Everything you need for a typical installation should be here. If you wish to read the full Eberspacher technical manual which includes specifications, safety notices and many other details it can be found on the Dieselheat website - see QR code with link below.



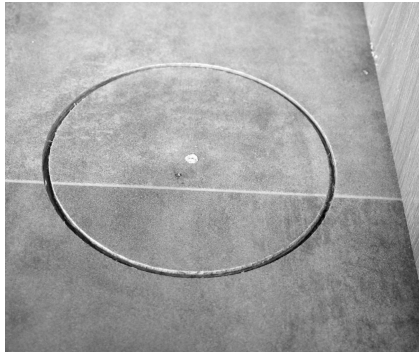
Eberspacher Technical Manual

General Arrangement



TIPS FOR A GREAT JOB

- Be super careful when putting screws into cabinets and from the bottom up in the floor. Floors and cabinets can be as thin as 12mm, so long screws can protrude through.
- When drilling holes with a hole saw in cabinets, always drill in from both sides to avoid splintering the cabinet. Drill in from the first side until the pilot drill comes through, then back drill from the other side.



- Run all cabling under the floor or, in places where it can be damaged (storage areas), run it through split corrugated conduit.



The hot air end of the heater is the one with the aluminum core showing (check by looking in the end). The cold air end is the one with the fan visible inside the end.



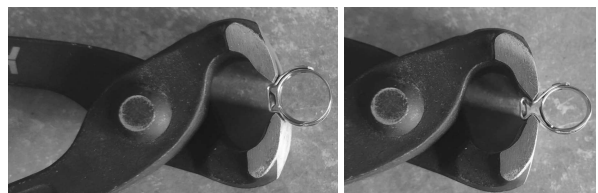
Outlet (hot end)



Inlet (cold end)

Fuel lines are joined by inserting the nylon fuel line or pump/filter/heater fuel spigots into the black rubber joiners and then clamping the outside. We recommend using a small smear of silicone grease or vaseline on the connections before assembling. This allows the black rubber joiner to easily slide over the fuel line, pump, filter, etc.

If supplied single-use ear clamps are closed using nail pincers, as shown:



When joining the fuel line onto the fuel filter, fuel pump or heater as shown below, try to push the nylon line all the way into the joiners so it touches the spigot.



SIMPLE MISTAKES TO AVOID

- Connect the heater directly to the battery. Do not connect via any existing fuse boxes or wiring. The heater needs plenty of power to start and existing wiring often isn't thick enough.
- Never install a switch on the power wiring. This will cause voltage drop and if the switch is switched off when the heater is running, the cool down cycle will not occur, which damages the heater.
- Ensure all the fuel connections are well sealed and cannot allow air ingress.
- Don't forget the vaseline or silicone grease on all the fuel line connections.
- Do not put ducting on the return air side of the heater. Let it draw air from the compartment in which it is installed. This will prevent the compartment heating up.
- Don't forget to drill 3mm drain holes in any low points in the exhaust to allow condensation to drain.
- When starting for the first time, it will take up to 5 or 6 attempts to prime the fuel line. Let the heater try and start twice, then if it hasn't started, it will display an error. Turn it off and on again to reset it and retry to start it.

Tools

This is what we use when we do an installation at Dieselheat. You can get away with less, but having these tools makes it easier!!!

Power tools

- Cordless drill
- Angle grinder with 1mm disk (for cutting exhaust)
- Rattle gun and bits (for Tek screws)

Drilling, mounting

- 60mm hole saw (for vents)
- 12mm drill bit (for control cable, wiring)
- 127mm or 146mm hole saw (for mounting plate hole. As an alternative, you can use a multi tool or jigsaw or drill lots of small holes beside each other)

Wiring

This is all optional and only required if you want to shorten or adjust the loom.

- soldering iron, solder, heat shrink
- wire cutters
- wire strippers

Fuel

- Nail pincers (fuel line clamps)
- Sharp knife or snips (to cut fuel line)
- silicone grease or vaseline (fuel connections)

General

- Screwdriver set
- Spanner set

Installation Consumables

Every installation is different. The following consumables are not supplied as part of the kit and need to be provided by the installer.

- short screws for attaching cables to the back of cabinets, screwing down mounting plate, etc.
- small P clips for attaching cables to floor and cabinets
- extra cable ties
- split corrugated conduit for wiring
- metal Tek screws to mount exhaust to chassis, etc.

Part A - Fixed Points

Install all the parts that are end points and have fixed locations first.

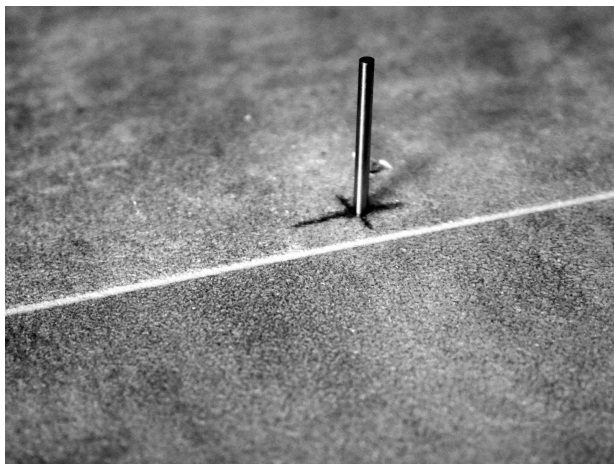
Step A1 - Select a location for the heater and make the hole in the floor

Mount the heater under a seat area, under a bed, or in a low traffic area. Measure your proposed location carefully above and below the floor to check you have clearance for the heater above and for the ring on the mounting plate below. Avoid chassis rails, water tanks, gas pipes, etc.

Ensure the heater will have enough space between the air inlet and the nearest wall or any solid objects. Allow 30mm for D2L and 50mm for D4L, D4R.

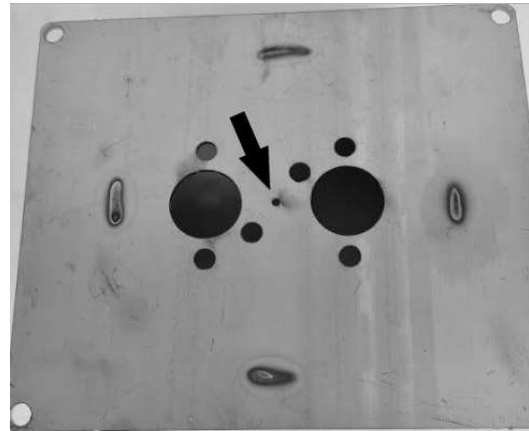
Make sure there is space on the outlet side to fit the ducting, allow space for the back of the outlet vent which can also protrude back towards the heater if they are close.

Use things that penetrate the floor, like water pipes, other wires, the edge of the RV, etc., as references and measure above and below the floor to locate the heater. After measuring, mark the spot and drill a small hole with a 2mm drill bit. Leave the bit in the hole.



This enables you to exactly locate the installation point above and below the floor.

Dieselheat Mounting Plate (silver 146mm hole): The heavy duty mounting plate supplied has a small hole in the middle. This is designed to allow you to fit it over the drill bit to check clearances. Place the mounting plate over the drill bit and check everything will fit above and below the floor.



Eberspacher Mounting Plate (black 127mm hole): The Eberspacher mounting plate does not have a hole in the middle to position over the drill bit so just place it in the middle by sight/judgment and check everything will fit above and below the floor.



Hold the heater in place above the proposed location and check clearances again.

Once you are sure the location is clear, drill/cut the hole for the mounting plate.

If you don't have a large hole saw, you can make the hole by drilling lots of 5mm to 6mm holes very close together or by using a jigsaw or multi tool.

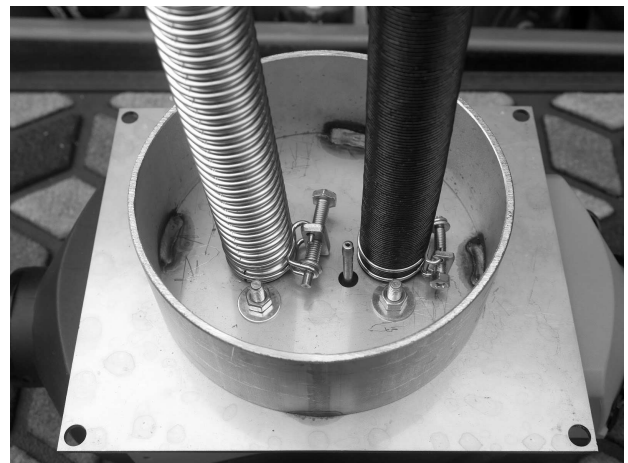


Step A2 - Set up the heater

Mount your heater mounting plate onto the heater using the 4 x 6mm nuts and washers. Make sure the rubber seal is between the heater and the mounting plate.



Install the exhaust pipe and air inlet pipe onto the heater while it is still upside down on your bench. It is much easier to do it this way than from under your RV.



Note: The air inlet spigot on the heater is always the one that is closer to the fuel inlet pipe.

Step A3 - Install the heater

3.7 Permissible installation positions

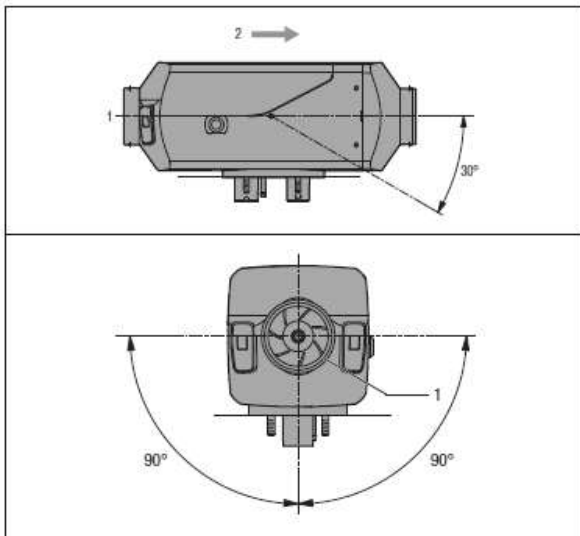
The heater should be preferably installed in the normal position – as shown in the drawing.

Depending on the installation conditions, the heater can be tilted by max. 30° (downwards flow direction!) or turned to either side by max. 90° around its own longitudinal axis (exhaust connection horizontal) as shown in the sketch.

i Note

In heating mode, the standard or maximum installation positions shown can differ by up to +15° in all directions, due to tilted vehicle or boat positions, without impairing the heater's function.

3.8 Normal position horizontal (exhaust connection downwards) with tolerable swivel range



- 1 Hot air intake opening (impeller)
- 2 Direction of flow

Put a bead of silicone or sikaflex around the underside of the mounting plate, then put the exhaust pipe and inlet pipe through the hole in the floor before placing the heater into its correct position. Secure the mounting plate with screws making sure there is a good seal so no exhaust gas can leak through.

Place a thick bead of silicone or sikaflex around the outside of the ring under the floor to protect the floor edges.



Step A4 - Install the hot air and return air vents

Check the diameter of your air vents - for Eberspacher they can vary. Sizes for saws are as below:

Cutting out the opening for the connection sockets

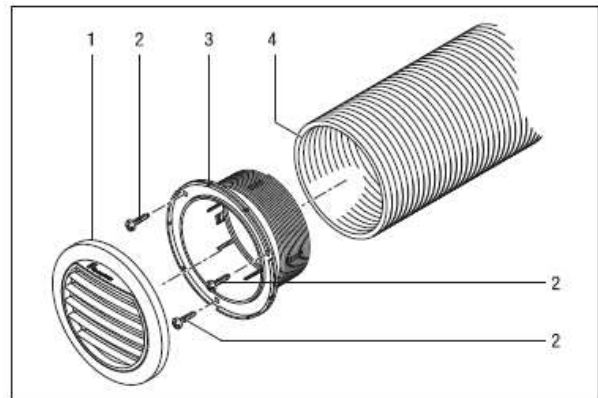
Use a keyhole saw to cut out an opening for the connection socket at the planned place of installation (vehicle floor or wall).

Pipe connection socket Ø 60 mm – keyhole saw Ø 67 mm

Pipe connection socket Ø 75 mm – keyhole saw Ø 92 mm

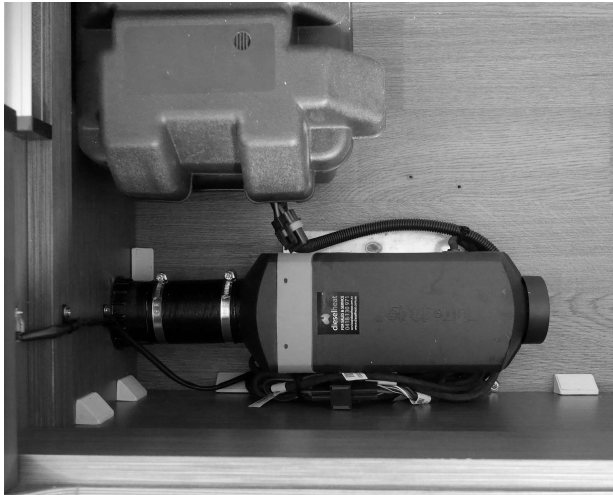
Pipe connection socket Ø 90 mm – keyhole saw Ø 92 mm

Using a hole saw drill holes for the hot air vent and the inlet air vent. Think about the outlet location to minimise the duct length.



Do not put ducting on the return air side of the heater, let it draw air from the compartment in which it is installed. This will prevent the compartment heating up.

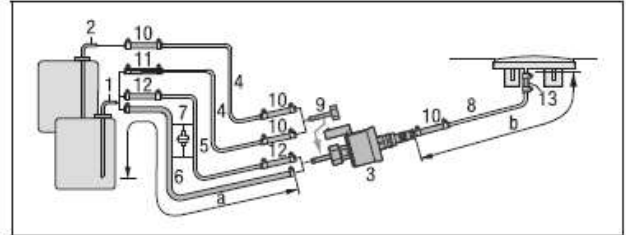
Note: This is the last of the major drilling holes, now is a good time for a first vacuum/sweep.



Step A5 - Set up your fuel pump and install

Note: For the D2L, D4L, D4R heater the fuel pump outlet is on the other end from the power cable connection.

Fuel feed point with tank connection – ascending pipe, integrated in the vehicle tank or in the tank fitting



- 1 Tank connection for metal tank – di = Ø 2 mm, da = Ø 6 mm
- 2 Tank connection for tank fitting – di = Ø 2 mm, da = Ø 4 mm
- 3 Metering pump
- 4 Fuel pipe, 4 x 1 (di = Ø 2 mm)
- 7 Fuel filter – only required for contaminated fuel.
- 9 Connection fitting, da = Ø 4 mm
- 10 Fuel hose, 3,5 x 3 (di = Ø 3.5 mm), approx. 50 mm long
- 13 Adapter, Ø 4.5 / 3.5

Permissible line lengths

Intake side

Airtronic S3 a = max. 5 m

Airtronic M3 a = max. 2 m

Pressure side

Diesel heaters

For intake line di = Ø 2 mm, b = max. 6 m

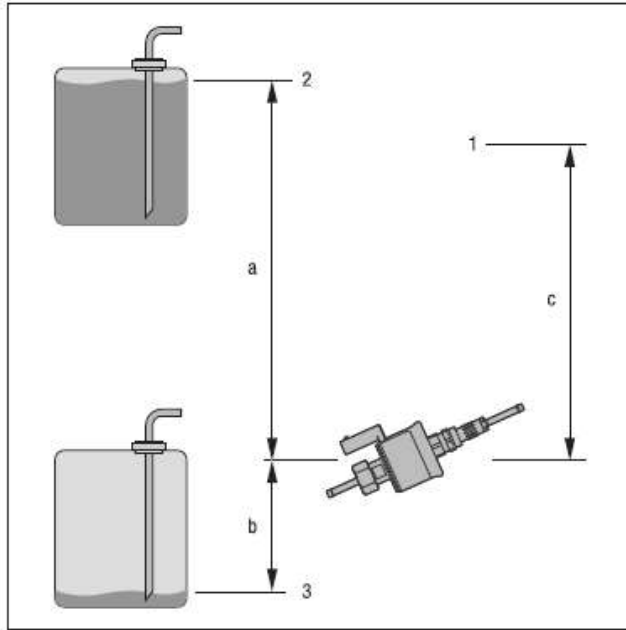
For intake line di = Ø 5 mm, b = max. 10 m

The D2L and D4R have a quiet pump, so location isn't a big issue, place it in a convenient spot between the heater and the fuel tank. If the floor is thin (12mm) use a metal screw onto a chassis cross member as a short wood screw may not hang on well enough to the plywood floor. Allow space for the fuel pipes to return back up onto the underside of the floor.

As noted in the diagram above:

D2L max inlet pipe is 5m and outlet pipe is 6m when using the supplied 2mm fuel line.

D4L, D4R max inlet pipe is 2m and outlet pipe is 6m when using the supplied 2mm fuel line.



- 1 Connection at the heater
- 2 Max. fuel level
- 3 Min. fuel level

Allowable suction and pressure head of the metering pump

Pressure head from vehicle tank to metering pump:

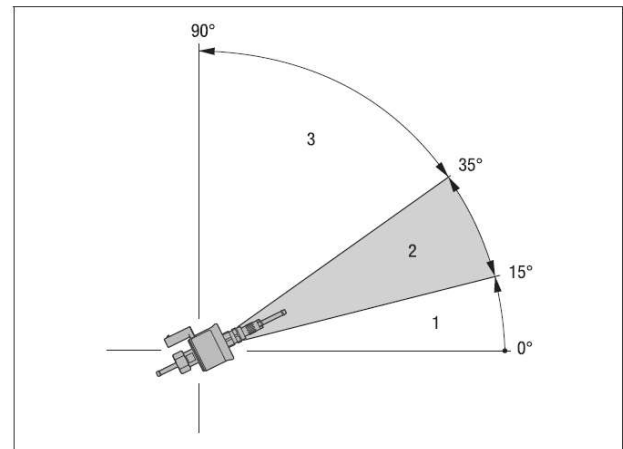
a = max. 3000 mm

Suction head in pressure-less vehicle tank:

b = max. 1000 mm for diesel

b = max. 500 mm for petrol

It is important to get the angle on the fuel pump correct, the outlet should be between 15 and 35 degrees upwards to allow air to purge from the pump.



- 1 Installation position between 0° – 15° is not allowed
- 2 Preferred installation position within the range 15° – 35°
- 3 Installation position within the range 35° to 90° is allowed

Step A6 - Install the fuel tank

Wafer Tank

Follow the instructions provided with the tank and bolt the wafer tank to your front box, mounting bracket, etc.



Easy fit tank

These tanks are designed to be inside. Pre-drill holes in the base of the splash box and apply silicone or sikaflex to the underside

around the holes before screwing it down. Screw or rivet the breather pipe so it is above the tank.



Dieselheat Motorhome and van fuel pickup Installation



Vehicle Fuel Pickups

There are many options for vehicle fuel pickups, refer to the Dieselheat website for information on connecting to your vehicle fuel system.

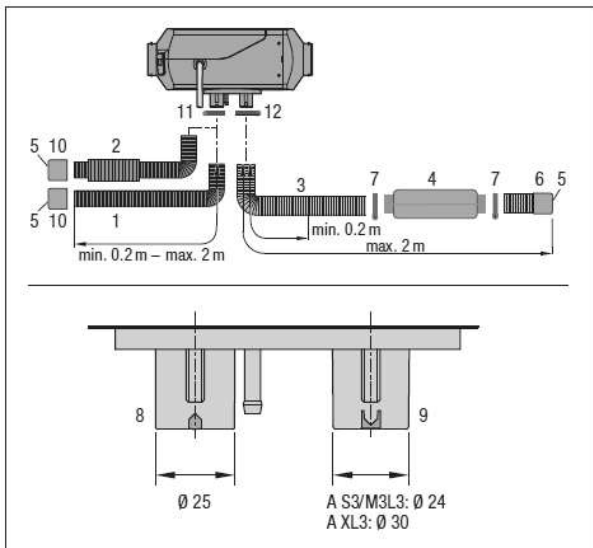


Part B - Make the connections

Well done!!! You have done the hardest parts, now you just need to connect it all together.

Inlet and Exhaust

The exhaust pipe consists of 2 lengths of exhaust pipe joined by the muffler.



- 1 Combustion air hose, di = 25 mm
- 2 Combustion air intake silencer
- 3 Exhaust pipe, di = 24 mm
- 4 Exhaust silencer
- 5 Inlet and outlet opening – protect from wind, snow, dirt and water
- 6 End sleeve, exhaust gas
- 7 Hose clip
- 8 Combustion air connection socket
- 9 Exhaust connection socket
- 10 End sleeve, combustion air
- 11 Hose clip
- 12 Exhaust pipe clip

The exhaust position and routing varies for each installation, depending on the location of the heater and what obstructions there are. Generally:

- use as much of the supplied exhaust pipe as possible, as longer exhausts are quieter.
- do not extend the exhaust beyond the lengths shown in the above diagram.
- aim to take the exhaust out to the off side (away from the door), but do not

worry if it doesn't quite reach the edge of the RV.

- the outlet of the exhaust should point down and back to avoid water/mud/dust from the wheels getting into it.

IMPORTANT: If the exhaust has any low points, drill a 3mm hole in the bottom at the low point of the pipe to drain any condensation that forms.



Ensure the exhaust cannot come into contact with any water pipes, wiring, gas pipes or the timber floor. The exhaust must be well secured using the supplied straps.

Inlet Air Silencer

The air silencer (purchased separately or as part of premium kits) goes on the end of the combustion pipe and is secured with a cable tie up under the chassis in an area that is protected from stones and water.



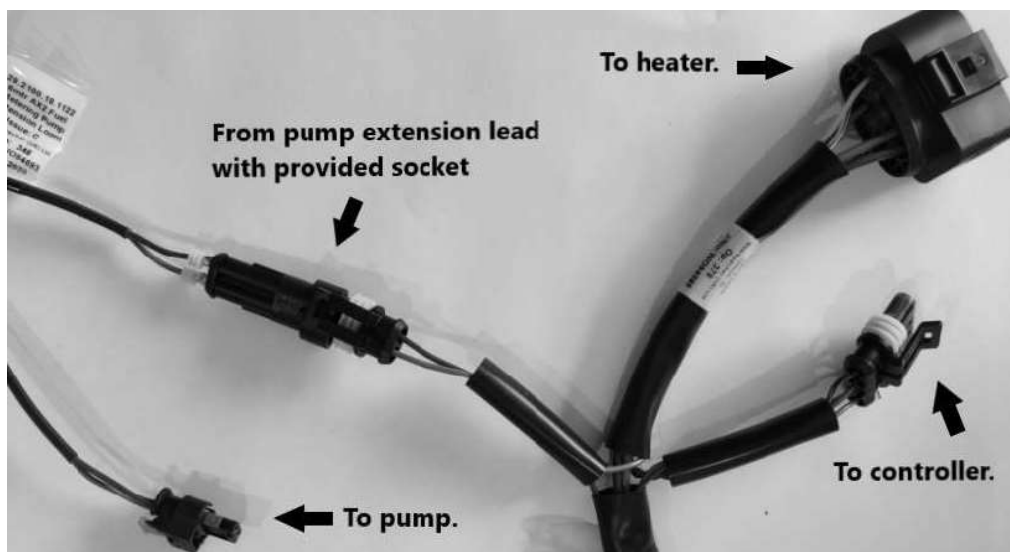
Wiring - Alternative 1



Loom alternative 1 has a central connector and then separate wires for power, fuel pump and controller.

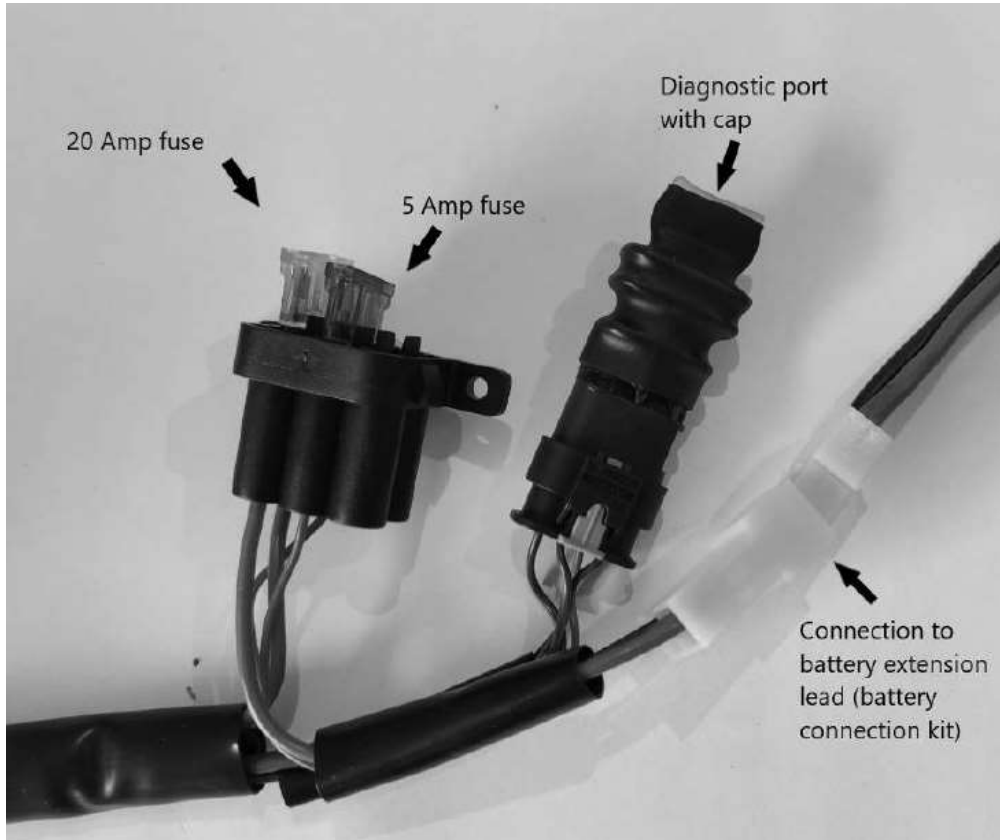
The fuel pump loom does not have the end connector installed to allow easy routing of the cable.

Central Connector



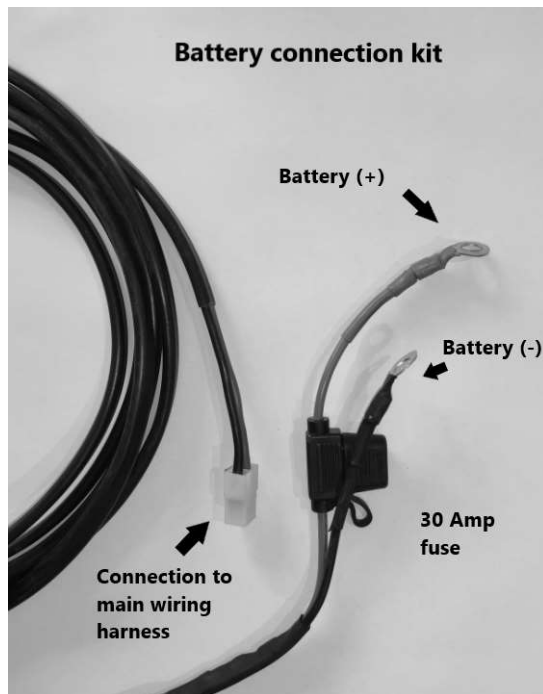
Central connector, do not modify this part of the loom.

Power Connection



The power wire connects to the batteries via the spade connectors in the wire plug.

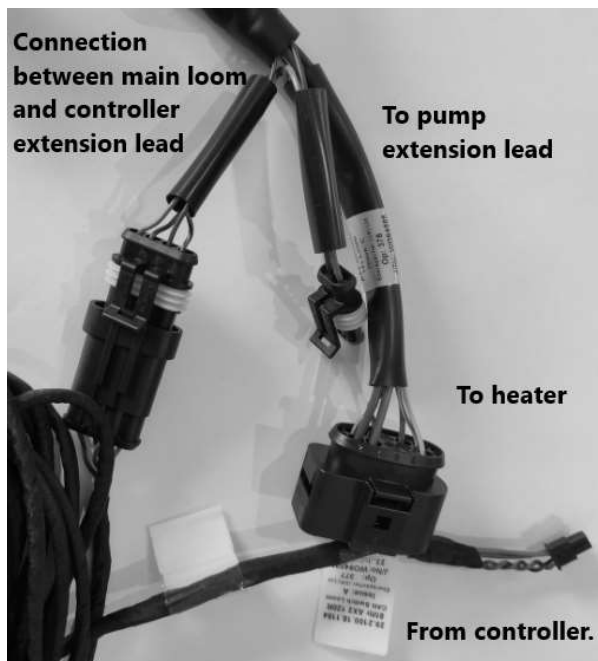
Note the diagnostic port and cap must not be removed.



It is recommended to install a 30A fuse at the batteries to protect the main power cable should it be damaged. This fuse is provided in the Dieselheat premium kits but is not in standard kits.

We recommend soldering all lugs and terminations in the main power wiring.

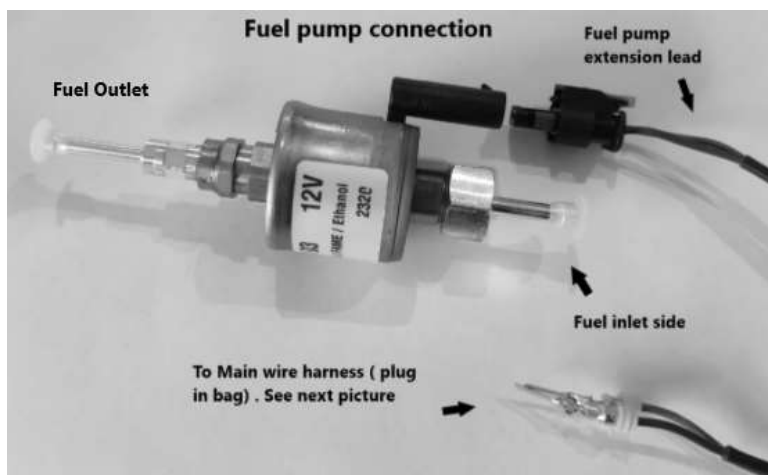
Easystart Pro Controller



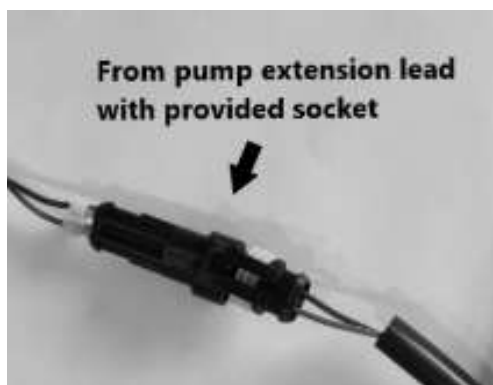
The cable on the Easystart Pro controller has two plugs, the square section plug connects to the controller extension lead whilst the rectangular section plug is not used (unless the application requires an optional external temperature sensor)

The controller extension lead should not be cut or modified. Bundle the surplus cable and strap it out of the way.

Fuel Pump Connection



Once the fuel pump is installed connect the fuel pump extension lead plug into the inlet side socket of the pump as shown in the picture below.



Route the fuel pump extension lead all the way to the main wiring harness. In most cases the fuel line and fuel pump cable can be encased in the same corrugated split conduit. The fuel pump wires are not polarised. To assemble the socket push the pins in until you hear a click and the rubber protectors are all the way into the back of the socket. Note the pins only go in one way, so if they refuse, rotate them 90 degrees and try again.

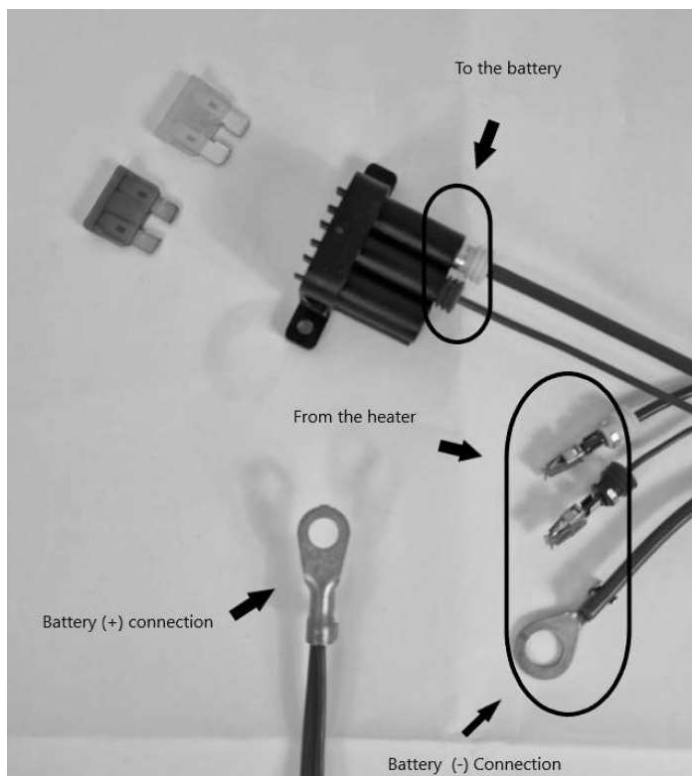
Inspect the socket from the front and check both metal connectors are fully forward.

Wiring - Alternative 2



Wiring alternative 2 has all the cables pre connected to the main plug and these split into 3 main wires, controller, fuel pump and power.

Power Connection

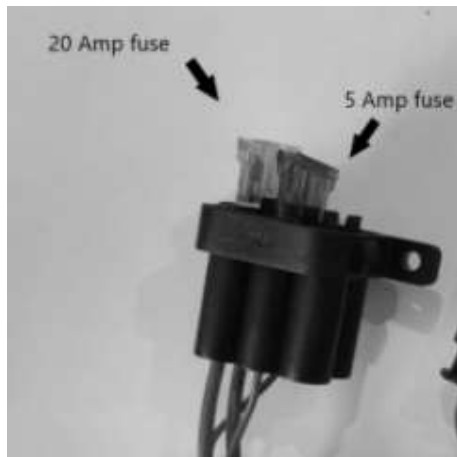


For assembling the connection to the battery with the inline fuse holder provided in this kit you will need a crimping tool as well as a wire cutter.

You will find two lengths of wire (one 4mm² and one 1.5mm²) with the pins already crimped in one end of them. Push each pin into a slot of the fuse holder until the coloured rubber is all the way in and you hear a click (so each one will end up making contact with a different fuse). Strip the wires at the other end and join them together with a battery terminal.

The two red cables coming from the main wiring harness need to be crimped (as shown in the picture) and pushed in the fuse holder in line with the previously installed wires of the same size.

Use the 5 amp fuse for the 1.5mm² wire (controller fuse) and the 20 amp fuse in the 4mm² (heater fuse). Connect the negative terminal (brown) to the battery.



If the supplied cable doesn't reach the batteries it needs to be cut and joined as close as possible to the heater to avoid voltage drop (**If the battery cables are cut short it is imperative to avoid cutting the diagnostic port wires that are bundled together**). To choose the wire gauge please refer to the following list:

- up to 5 m = cable cross-section 4 mm²
- from 5 m to 8 m = cable cross-section 6 mm²

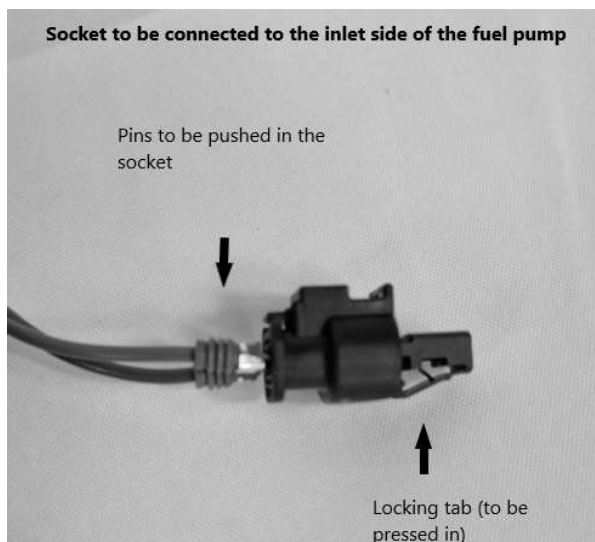
Soldering connections is recommended to ensure good electrical connection with minimal voltage drop.

Diagnostic port with end cap



This must be left as is (the cap has to remain connected for the heater to be able to function) and should be installed in an accessible position for future diagnostic and troubleshooting purposes.

Fuel Pump Connection

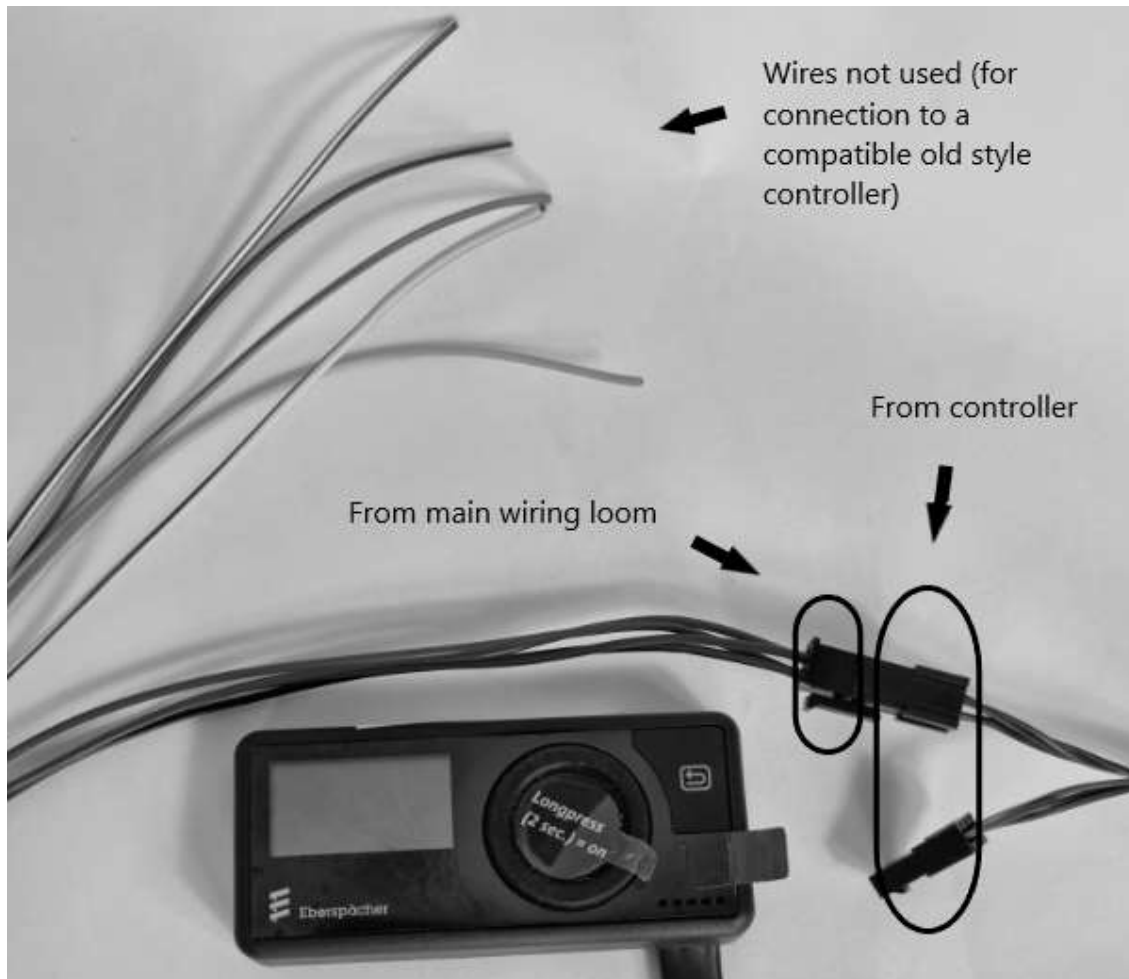


Route the fuel pump extension lead all the way to the fuel pump. In most cases the fuel line and fuel pump cable can be encased in the same corrugated split conduit.

The fuel pump wires are not polarised. Insert the fuel pump wires into the supplied socket/plug. The socket has a small locking tab to lock the wires in place. Ensure the wires are all the way in (the green rubber should not protrude out the back of the plug) and the metal connectors should both be all the way in at the front of the plug. The metal connectors only go in one way, so if they are refusing, rotate them and try again until they can be inserted.

EasyStart pro controller connection

The controller cable has two plugs, the square section plug connects to the controller extension lead whilst the rectangular section plug is not used (unless the application requires an optional external temperature sensor). **The controller extension lead should not be cut or modified.** Bundle the surplus cable and strap it out of the way.



Finishing Off

All cable holes should be sealed with silicon, all fuel lines, power cables, combustion pipes, exhaust pipes should be cable tied or clipped securely in place.

Make sure that the exhaust is separated from the combustion air and the fuel inlet. Make sure the exhaust cannot contact any other wiring, pipework etc. as it will melt plastic.

Put at least 2L of Diesel in the fuel tank to ensure the fuel straw is down into the fuel.

First startup procedure

Note: The first time you turn on power to the heater you need to input some initial configuration settings. Check the Easystart Pro Installation Guide and follow these instructions. Failure to follow these instructions may result in the heater not working properly.

We specifically suggest setting Display Sensor to 'Controller', Indicator Sensor to 'Controller' and Temp Offset to '0' to ensure the thermostat works properly.

When you have finished the install it is time to start the heater, insert the fuses into the fuse holder, configure the heater as per the Easystart Pro Installation Instructions and then start the heater as per the Eberspacher Easystart Pro Controller Instructions.

The heater will run through its internal safety check, the fan will spin and the dosing pump will start to tick, depending on the length of the fuel line it may take a little time for the heater to prime the fuel line and then start.

The heater will try to start 2 times over about 6 min and then go into alarm or display an error. Switch the heater off and restart it, you may need to do this 5-6 times before the heater gets fuel and starts.

Simple Fault Finding

If your heater hasn't started after 5-6 resets we normally have 2 problems.

Fuel

- check whether you can see fuel in the fuel filter
- check for air bubbles in the fuel line

If the fuel filter or line is dry or there are air bubbles in the fuel line, it is because you have a loose fuel connection or other fuel supply issue. Recheck all connections, check the fuel pump is facing the right way, ensure the tank has sufficient fuel for the pickup to be immersed, and check any quick disconnects are closed properly.

Power

The heater requires 9 Amps to start, so it is important that it has a good power supply.

The batteries may have good voltage when there is no load, but may drop under load. Check the battery voltage when the heater is trying to start. Plug into power to get your charger working. Make sure your cables go directly to the battery and not via any existing wiring.

New Installation Troubleshooting Guide

When you turn on the heater, it does a self test. If any faults are found, the controller will immediately display a fault and the error memory should be read (see instructions below). If there are no errors found when you turn on the heater, the heater will go through 2 start attempts over a period of about 6 minutes.

Out of fuel/priming new heater	If you run out of fuel or are priming a new heater, the fuel line will fill with air and the heater will need to be primed. 1. Turn the heater on and wait 6 minutes while it makes two attempts to start. 2. Once a fuel supply error is shown turn off the heater and turn on again. 3. Repeat steps 1 and 2 up to 6 times to allow the heater to re-prime.
Heater starts, tries to ignite but cannot ignite and blows smoke from the exhaust.	Smoke normally indicates the heater is getting fuel but is not igniting. • Check batteries and power to the heater. Measure the voltage at the heater using a multimeter. It should be at least 12.5V or voltage drop between the batteries and the heater should be less than around 0.5V as it starts (with the glow plug on). If it exceeds this, check power wiring. • Check the heater is wired directly to the batteries with no kill switches, fuse boxes or skinny wiring to cause voltage drop. • Plug into power. If this helps, check batteries and wiring.
Heater tries to start but will not ignite. No smoke, fuel pump ticking.	This would indicate a fuel supply issue. • Follow the Out of Fuel procedure (see above). • Use a torch on the fuel line to see if fuel can be seen or is advancing up the fuel line. Each tick of the fuel pump should advance the fuel approx. 2cm up the fuel line. • If fuel is not advancing up the fuel lines, check the fuel lines and fuel tank. Look for blockages, improperly closed quick disconnect fittings, damaged fuel line, split or damaged fuel filter, loose connections.
Heater shows an error code when turning on.	If an error code or message is displayed when the heater is turned on follow the procedure below to read your error messages (and unlock the heater).

Unlocking your D2L

If the heater does not start after approx. 10 attempts, it will lock out. This is a safety feature and requires the error memory to be cleared before further starts can be attempted. In this situation generally there will be an issue with the install which should be identified and corrected before trying to start the heater. To read the error memory and unlock a heater, follow the instructions on the web page linked to the QR code below.



Reading Errors/Unlocking



List of Error Codes