

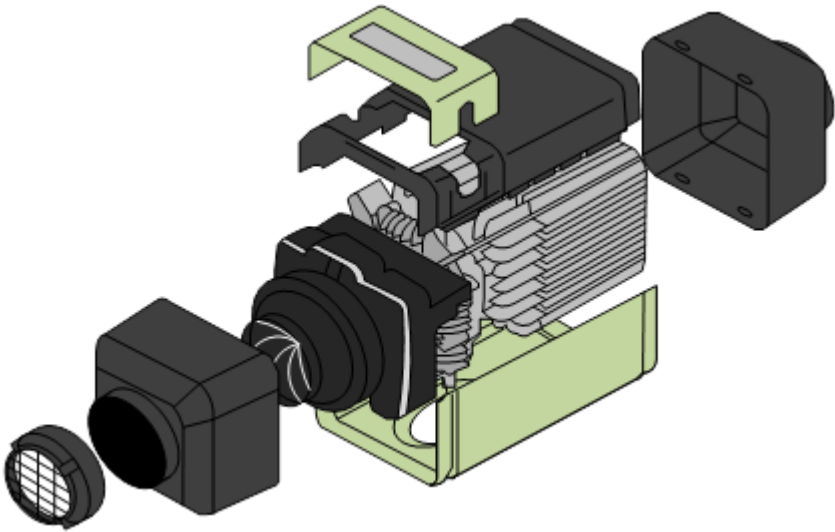


# MV Airo 5

WORKSHOP MANUAL

Ed 1.02

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## **Disclaimer:**

This manual is intended to give an overview of the internal workings of MV diesel heaters. As such, all work should be carried out by trained professionals at their own discretion. Any action you take upon the information in this manual is strictly at your own risk, and MV Heating will not be liable for any losses and damages in connection with the use of this information. Under no circumstances shall MV Heating or its affiliates, suppliers, or installers be liable for any indirect, incidental, consequential, special or exemplary damages, arising out of or in connection with these manuals. We do not take any warranties about the completeness, reliability and accuracy of this information. MV Heating assumes no responsibility or liability for any errors or omissions from these manuals.



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**Note:** The following flow charts will refer to the exploded diagrams, or figures as (F:P), where 'F' donates the figure, and 'P' donates the part in that figure. For example (2:4) would mean 'Figure 2: Part 4'.



## Heater Removal

To remove the heater from its installation positions, follow these steps:

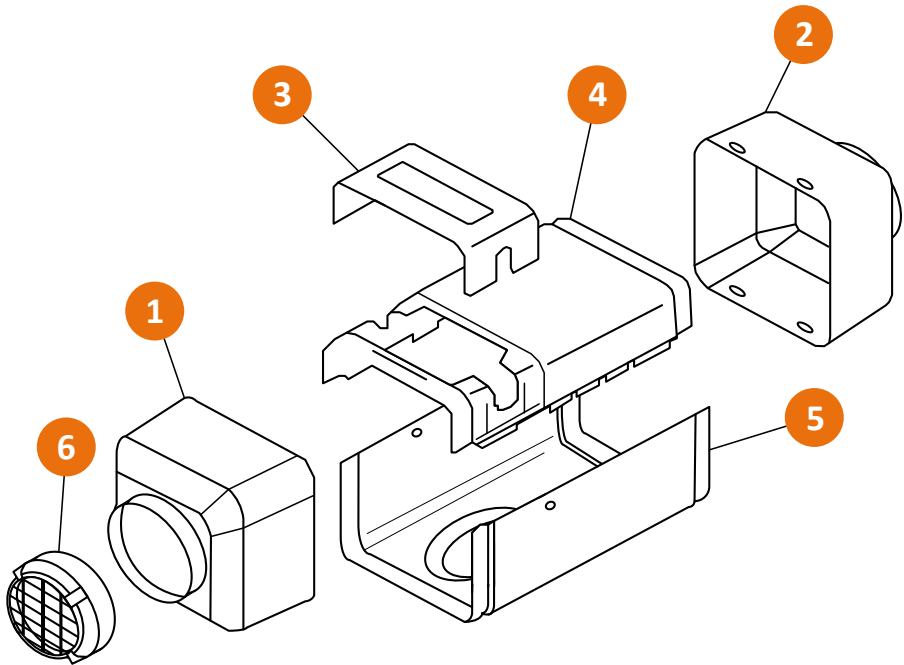
1. Disconnect the vehicle's battery.
2. Disconnect any ducting secured to the heater's inlet, or outlet caps.
3. Remove the ECU cover (**1:3**) from the top cover (**1:4**) to access the main heater connection.
4. Disconnect main wiring harness connector from heater.
5. Disconnect the fuel supply line from heater's fuel inlet.
6. Disconnect the fuel pump by **pressing the spring clip down** and pulling away the connector.
7. Disconnect the combustion air intake and exhaust pipe from the bottom of the heater.
8. Remove the four M6 nuts and washers from the base of the heater.
9. Remove the heater and discard the mounting gasket.

## Heater Installation

To reinstall the heater back into position, follow these steps:

1. Locate heater into position with a new mounting gasket and secure with the four M6 nuts and washers to 6 + 1 Nm.
2. Connect and secure fuel supply line to the heater's fuel inlet.
3. Connect and secure the combustion air intake and exhaust pipe to the heater.
4. Route the fuel cable to the fuel pump and reconnect it.
5. Connect the main wiring harness connector to the E.C.U. and replace the cover (**1:3**).
6. Reconnect the vehicle's battery.
7. Fully bleed the fuel supply system, by turning the heater on and off. Ignition failure will occur until the system has been bled.

## Heater Cases Diagram



**Figure 1**

**1. Inlet Cap**

**2. Outlet Cap**

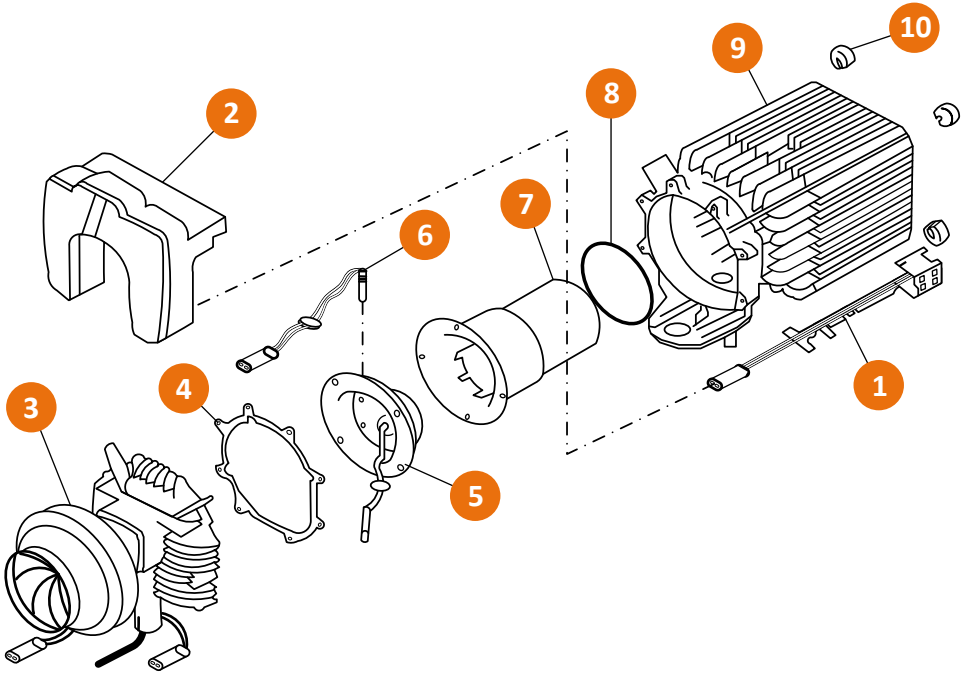
**3. E.C.U. Cover**

**4. Top Cover**

**5. Bottom Cover**

**6. Grill**

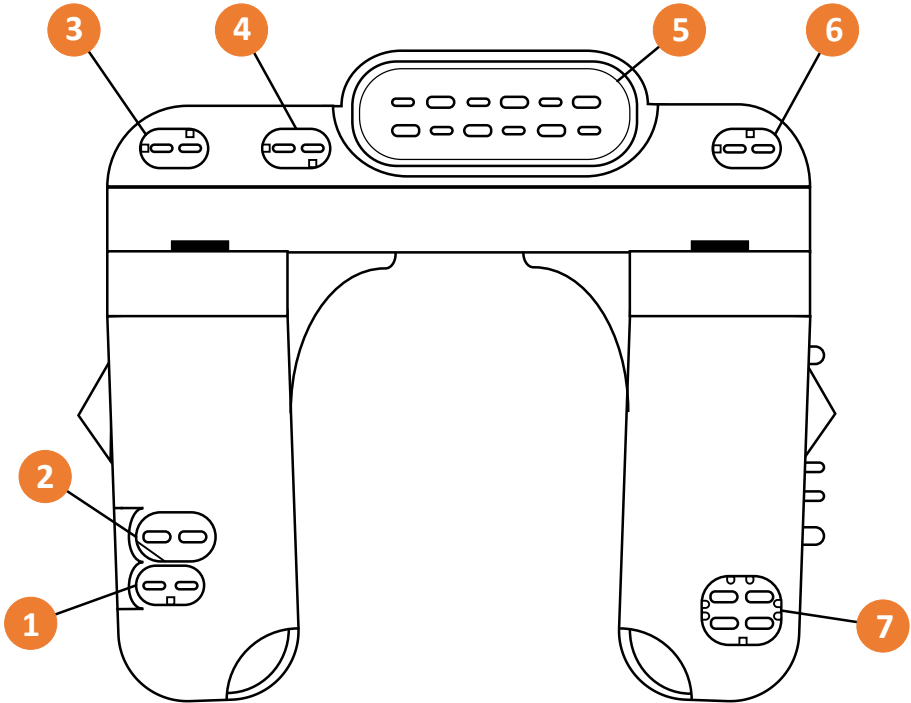
## Internal Structure Diagram



**Figure 2**

- |                       |             |                              |
|-----------------------|-------------|------------------------------|
| 1. Overheat Sensor    | 2. E.C.U.   | 3. Air Motor Assembly        |
| 4. Air Motor Gasket   | 5. Burner   | 6. Glow Pin (& Flame Sensor) |
| 7. Combustion Chamber | 8. 'O' Ring | 9. Heat Exchanger            |
| 10. Insulating Bush   |             |                              |

## E.C.U. Connections Diagram



**Figure 3**

- 1. Overheat Sensor
- 2. Glow Pin
- 3. Fuel Pump
- 4. Temperature Sensor
- 5. Main Wiring Harness
- 6. Empty
- 7. Air Motor



## Removing and Refitting of Parts

### Pre-Checks and Notes

- All gaskets located between the disassembled parts must always be discarded and replaced.
- All the parts that have been disassembled should be cleaned with appropriate cleaning fluid and blown dry with pressurized air.
- Any sealing compound on parts must be carefully and completely removed before attempting to refit.
- All disassembled parts should be Inspected for damage (cracks, distortion, wear, etc.) and replaced as required.

You should also regularly inspect all electrical connectors and wiring for corrosion, loose contacts, or wrong crimping, etc. and repair as required.





## Part 1: The Case Assembly

### Tools:

- 1 x Small Flat-Bladed Screwdriver

### Removing the Cases:

- 1) Remove the heater from its installation position.
- 2) Remove the inlet cap (1:1) with grill (1:6) (if attached) using a screwdriver to separate from bottom and top cases.
- 3) Remove the outlet cap (1:2) the same way, making sure it doesn't catch on the heat exchanger.
- 4) Remove the E.C.U. cover (1:3) and top case (1:2) together by sliding away from the bottom case.
- 5) Remove the bottom (1:5) case by pulling away from air motor lugs first.

### Refitting the Cases:

- 1) Ensure all four rubber insulating bushes (2:9) are located on the tabs of the heat exchanger (2:8) first before refitting the cases.
- 2) Replace bottom case (1:5), ensuring the air motor lugs sit inside the appropriate holes.
- 3) Replace top case (1:4), ensuring that the tabs are located inside the bottom case correctly.
- 4) Refit the outlet cap (1:2), ensuring that it is orientated correctly.
- 5) Refit the inlet cap (1:1), ensuring that it is orientated correctly.



## Part 2: The Overheat Sensor

### Tools:

- 1 x Small Flat-Bladed Screwdriver

### Removing the Overheat Sensor:

- 1) Remove the cases (**Part 1**).
- 2) Unplug the overheat sensor (**2:1**) from the E.C.U. (two blue wires).
- 3) Slide the overheat sensor off the heat exchanger (**2:9**). It can be a tight fit, and a small flat-bladed screwdriver can be used to ease it off as necessary.

### Refitting the Overheat Sensor:

- 1) Replace the overheat sensor onto the heat exchanger.
- 2) Plug the overheat sensor back into the E.C.U. (**2:2**), paying attention to its correct orientation.
- 3) Replace the cases (**Part 1**).



### Part 3: The E.C.U.

#### Tools:

- 1 x 3mm Hex Key

#### Removing the E.C.U.:

- 1) Remove the cases (**Part 1**).
- 2) Disconnect the overheat sensor plug (**3:1**), glow pin plug (**3:2**), and fuel pump plug (**3:3**) from the ECU.
- 3) Loosen the four-pin air motor plug (**3:7**) from the E.C.U. its size will prevent it from being fully disconnecting.
- 4) Remove the 2 x 3mm hex bolts from the top of the E.C.U.
- 5) The ECU can now be removed, allowing the final four-pin connector to also be fully disconnected.

#### Refitting the E.C.U.:

- 1) Insert the four-pin connector (**3:7**) into the appropriate slot in the ECU, paying attention to its orientation.
- 2) Reinstall the E.C.U. securing it in place with the 2 x hex bolts located on top. Tighten to  $3.0 \pm 0.3$  Nm.
- 3) Reconnect the rest of the connectors (**3:1**), (**3:2**), and (**3:3**), back into their correct connections, paying attention to their orientation.
- 4) Replace the cases (**Part 1**).



## Part 4: The Air Motor

### Tools:

- 1 x 4mm Hex Key

### Removing the Air Motor:

- 1) Remove Cases (**Part 1**) and E.C.U. (**Part 3**).
- 2) Remove the 8 x bolts located around the bottom of the air motor (**2:3**).
- 3) Carefully remove the air motor by tilting it to one side so that the combustion intake clears the heat exchanger.
- 4) The air motor gasket (**2:4**) can be removed and discarded once the air motor is clear.

### Refitting the Air Motor:

- 1) Place a new air motor gasket (**2:4**) around the end of the heat exchanger.
- 2) Refit the air motor (**2:3**) back into position.
- 3) Fit the 8 x hex bolts around the base of the air motor and tighten to  $4.0 \pm 0.4$  Nm.
- 4) Refit E.C.U. (**Part 3**) and cases (**Part 1**).



## Part 5: The Burner and Glow Pin Assembly Removal

### Tools:

- 1 x Small Flat-Bladed Screwdriver
- 1 x 5.5mm Socket Screwdriver
- 1 x Small Phillips Head Screwdriver

### Removing the Assembly:

- 1)** Remove the cases (**Part 1**) the E.C.U. (**Part 3**) and the air motor (**Part 4**).
- 2)** Using a flat-bladed screwdriver, gently push the glow pin grommet fully through toward the burner.
- 3)** Using the socket screwdriver, remove the 3 x 5.5mm hex screws from the burner (**2:5**), and place to one side.
- 4)** Use the flat-bladed screwdriver to gently push in the fuel inlet grommet toward the burner, being careful not to split it.
- 5)** Slightly lift the burner from the top away from the combustion tube and pull slightly toward the top of the heat exchanger.
- 6)** Rotate the burner 180° to the right (it will not fully rotate the other way) so the glow pin side faces up, and pull the burner out of the fuel inlet hole.



## Part 5 Cont'd: The Burner and Glow Pin Assembly Refit

### Tools:

- 1 x Small Flat-Bladed Screwdriver
- 1 x 5.5mm Socket Screwdriver
- 1 x Small Phillips Head Screwdriver

### Glow Pin Removal:

- 1)** Once the burner has been removed, use the Phillips head screwdriver to loosen the screw holding the glow pin (**2:6**) in place.
- 2)** Gently remove the glow pin from out of its housing (the glow pin can be tight to remove).
- 3)** Once out of its housing, feed the glow pin through the correct hole (the largest elongated one) located on the burner.
- 4)** The burner and glow pin can now be inspected, cleaned and replaced as necessary.

### Glow Pin Refit:

- 1)** Feed the glow pin back through the largest elongated hole on the burner and reinsert it fully into position.
- 2)** Tighten the small Phillips head screw onto the glow pin to  $0.8 \pm 0.08$  Nm to hold it securely in place.



## Part 5 Cont'd: The Burner and Glow Pin Assembly Refit

### Tools:

- 1 x Small Flat-Bladed Screwdriver
- 1 x 5.5mm Socket Screwdriver
- 1 x Small Phillips Head Screwdriver

### Refitting the Burner:

- 1) With the glow pin side of the burner facing upward, insert the fuel inlet of the burner back into the appropriate hole.
- 2) Rotate the burner 180° to the left so that it faces the correct way and gently push it toward the combustion chamber.
- 3) Insert and tighten the 3 x 5.5mm hex screws back into the burner to 2.5 ± 0.25 Nm to hold it in place.
- 4) Using the flat-bladed screwdriver, carefully push the fuel inlet grommet fully into position using some lubricant like WD40 as necessary.
- 5) Feed the glow pin back through the glow pin hole.
- 6) Fully insert the glow pin grommet into the hole to create a clean seal.
- 7) Refit the air motor (**Part 4**), E.C.U. (**Part 3**), and cases (**Part 1**).



## Part 6: The Combustion Chamber

### Tools:

- 1 x 3mm Hex Key
- 1 x Pliers

### Removing the Combustion Chamber:

- 1) Remove the cases (**Part 1**), the E.C.U. (**Part 3**), the air motor (**Part 4**), and the burner assembly (**Part 5**).
- 2) Undo the 4 x 4mm hex bolts from the top of the combustion chamber.
- 3) Using a pair of pliers, remove the combustion chamber (**2:7**). This can be stiff as the rubber O-ring can become bonded between the chamber and heat exchanger.
- 4) Remove the rubber O-ring (**2:8**) from its position inside the combustion chamber and discard.

### Refitting the Combustion Chamber:

- 1) Place a new rubber O-ring (**2:8**) into the recess of the combustion chamber.
- 2) Insert the combustion tube (**2:7**) back into the heat exchanger (**2:9**).
- 3) Replace and tighten the 4 x hex bolts into the top of the combustion chamber to  $4 \pm 0.4$  Nm to secure it in place.
- 4) Replace the burner assembly (**Part 5**), the air motor (**Part 4**), the E.C.U. (**Part 3**), and the cases (**Part 1**).





## Part Numbers

<b>Part (Voltage)</b>	<b>Part Number</b>
<b>1) Heat Exchanger:</b>	A5Z-001
<b>2) O-Ring:</b>	A5Z-002
<b>3) Combustion Tube:</b>	A5Z-003
<b>4) Burner Assembly:</b>	A5Z-004
<b>5) Gasket:</b>	A5Z-005
<b>6) Air Motor (12V/24V):</b>	A5C-006/A5A-006
<b>7) Insulation Bushes:</b>	A25Z-007
<b>8) E.C.U. (12V/24V):</b>	A5C-009/A5A-009
<b>9) Glow Pin (12V/24V):</b>	A5C-014/A5C-014
<b>10) Overheat Sensor:</b>	A25Z-016
<b>11) Inlet Cap:</b>	A5Z-027
<b>12) Outlet Cap:</b>	A5Z-028
<b>13) E.C.U. Cover:</b>	A5Z-024
<b>14) Top Cover:</b>	A5Z-025
<b>15) Bottom Cover:</b>	A5Z-026
<b>16) Grill:</b>	A5Z-029
<b>17) Fuel Pump (12V/24V)</b>	AHC-023/AHA-023



## Notes

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