

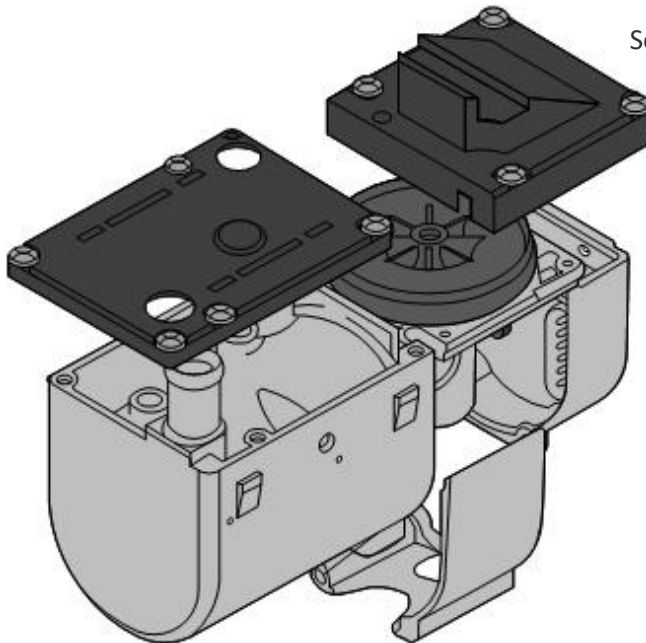


MV Hydro 5-S

WORKSHOP MANUAL

Ed 1.00

MV Heating UK Ltd
Unit 6
Second Avenue Business Park
Millbrook
Southampton
SO15 0LP



MV Heating UK LTD
+44 (0)2380 522345



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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+44 (0)23 8052 2345



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

Internal Structure Diagram

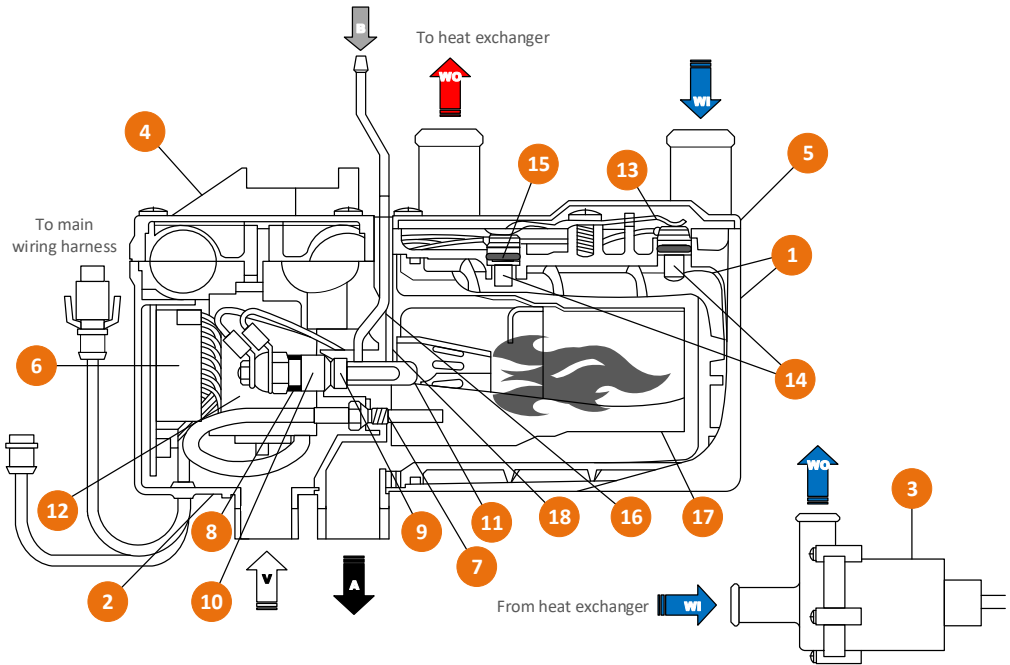


Figure 1

- | | |
|---|-------------------------------------|
| 1. Heat Exchanger Assembly | 2. Base Cover |
| 3. External Water Pump | 4. Fan Cover |
| 5. Top Cover | 6. E.C.U. |
| 7. Flame Sensor | 8. Holder |
| 9. Glow Pin | 10. Glow Pin Housing |
| 11. Glow Pin Screen and Seals | 12. Combustion Air Motor |
| 13. Leaf Spring | 14. Temperature and Overheat Sensor |
| 15. Temperature and Overheat Sensor O-Rings | 16. Combustion Chamber Gasket |
| 17. Combustion Chamber | 18. Combustion Chamber Seal |
- V: Combustion Air Inlet
 B: Fuel Inlet
 WI: Water inlet
 WO: Water outlet

Note: Figure 1 and Figure 2 share the above annotations

Overhaul Diagram

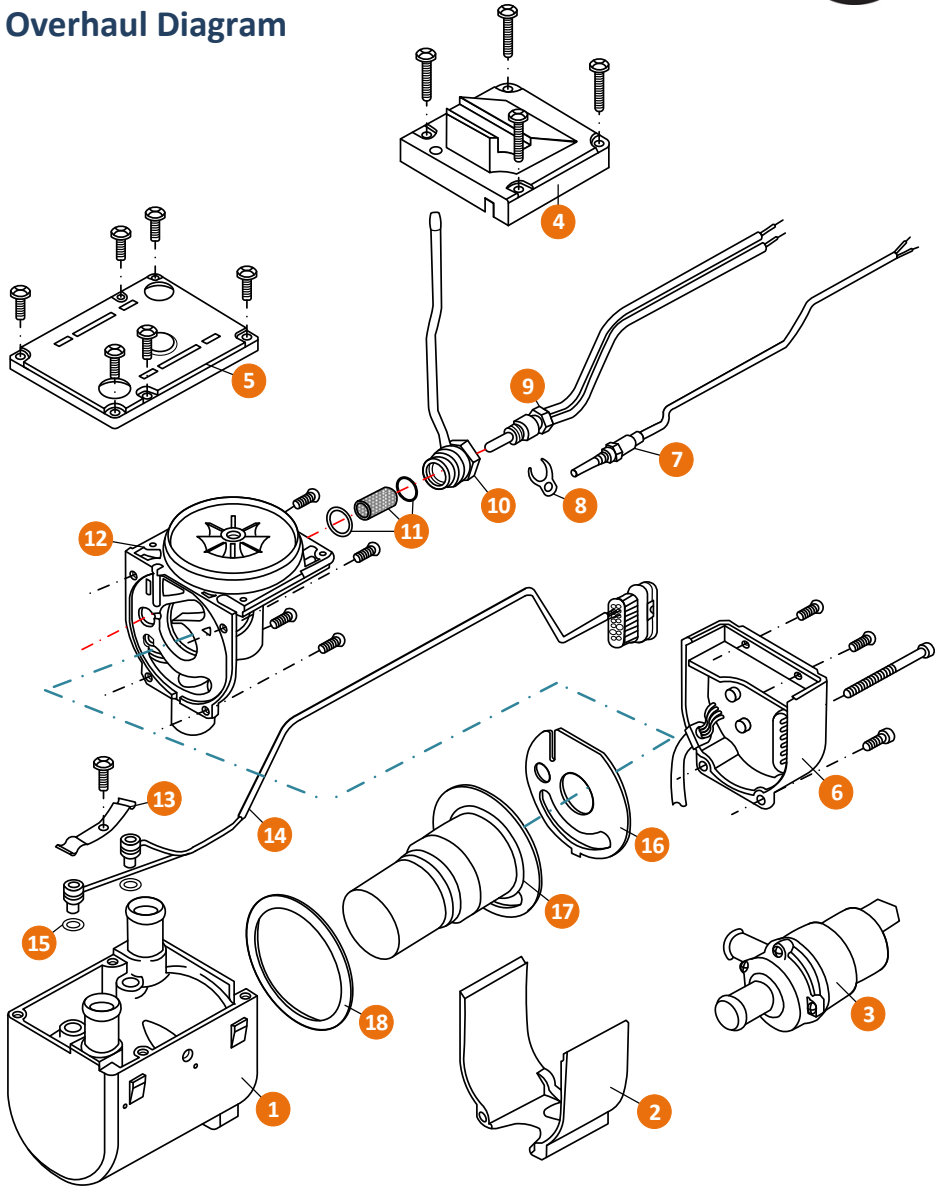


Figure 2

Main Connector into E.C.U.

Key:

- 1: Flame sensor (BLUE)
- 2: Flame sensor (BROWN)
- 3: Temperature & overheat sensor (BLUE)
- 4: Temperature & overheat sensor – Common (BLUE & RED)
- 5: Temperature & overheat sensor (RED)
- 6: (**Early models only**) Temperature & overheat sensor – common (RED)
- 7: Air motor (RED)
- 8: Air motor (BLUE)
- 9: Glow pin (WHITE)
- 10: Water pump (BROWN)
- 11: Water pump (PURPLE)
- 12: Glow pin (BROWN)
- 13: Air motor (YELLOW)
- 14: Unused/Empty

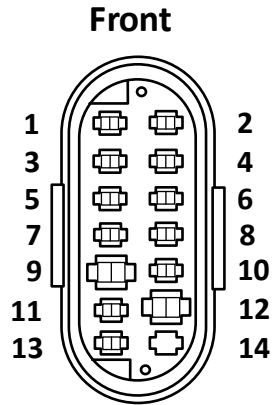
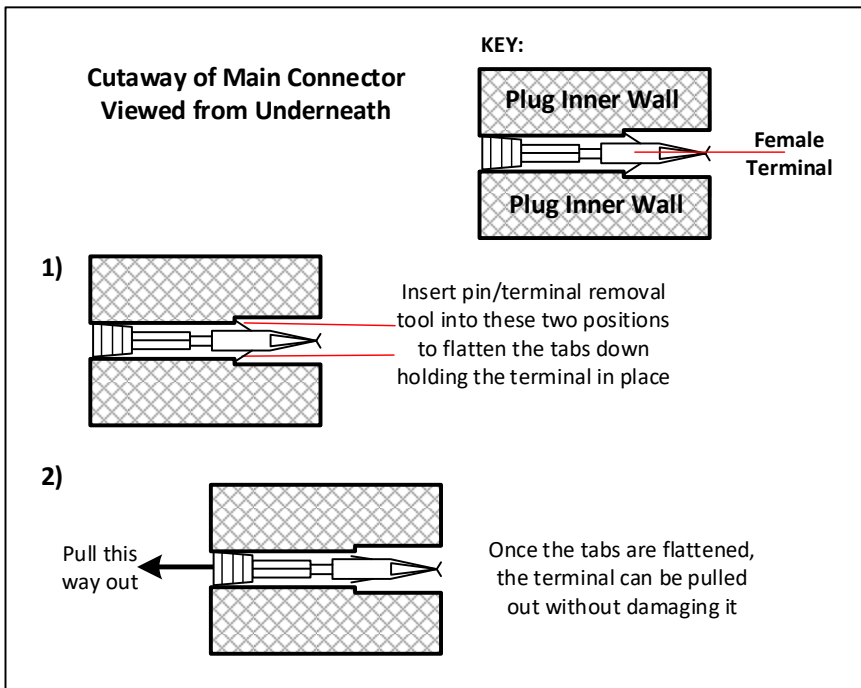
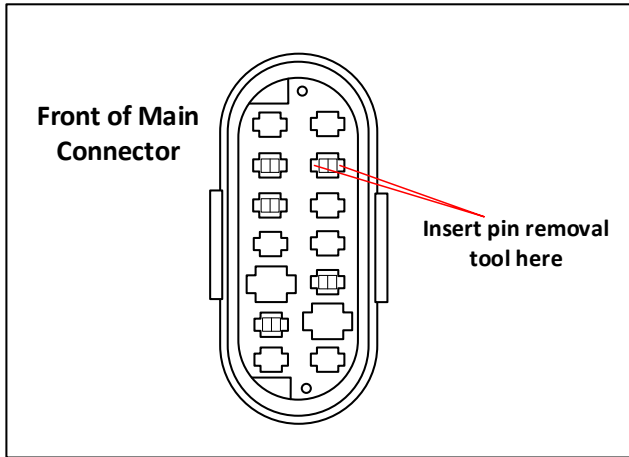


Figure 3

Removing Terminals from Connector





Heater Removal

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

1. Disconnect the vehicle's battery.
2. Disconnect the Hydro 5's main cable from the main wiring harness.
3. Disconnect the water pump cable.
4. Disconnect the fuel supply line from the heater's fuel inlet.
5. Disconnect the inlet and outlet water pipes from the heater. If service valves are not fitted, the system will need to be emptied.
6. Disconnect the combustion air intake and exhaust pipe from the bottom of the heater.
7. Remove the single M6 hex bolt from the center of the heater.
8. Remove the heater from its bracket.

Heater Installation

2. Locate heater onto the mounting bracket and secure with the single M6 hex bolt to 6 + 1 Nm.
3. Connect and secure the fuel supply line to the heater's fuel inlet.
4. Connect and secure the combustion air intake and exhaust pipe to the heater.
5. Reconnect the main wiring harness to the heater
6. Reconnect the water pump cable.
7. Reattach the inlet and outlet water pipes.
8. Refill and bleed the coolant supply.
9. Reconnect the vehicle's battery.

Fully bleed the fuel supply system, by turning the heater on and off. Ignition failure will occur until the system has been bled.



Removing and Refitting of Parts

Pre-Checks and Notes

- All gaskets, seals and O-rings 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 Top and Fan Covers

Tools:

- 1 x 4mm Allen Key

Removing the Top Cover:

- 1) Loosen and remove the 6 x Allen bolts located on the top of the top cover (2:5).
- 2) Remove the top cover.
- 3) Remove the 4 x Allen bolts located on the top of the fan cover (2:4).
- 4) Remove the fan cover.

Refitting the Top and Fan Covers:

- 1) Refit the fan cover onto the heater.
- 2) Refit the 4x Allen bolts into the fan cover (2:4) to 4.0 ± 0.4 Nm.
- 3) Refit the top cover onto the heater.
- 4) Refit the 6 x Allen bolts into the top cover (2:5) to 4.0 ± 0.4 Nm.



Part 2: The E.C.U. and Base Cover

Tools:

- 1 x Small Flat-Bladed Screwdriver
- 1 x 2.5mm Allen Key
- 1 x 4mm Allen Key

Removing the E.C.U.:

- 1)** Remove the 4 x Allen bolts on the front of the E.C.U. **(2:6)**.
- 2)** Slide the E.C.U. out as far as it will go.
- 3)** Use the small flat-bladed screwdriver to gently ease the two tabs off the side of the main connector inside the E.C.U. and separate the two.
- 4)** Gently insert a small flat-bladed screwdriver into the base cover **(2:2)** and remove it.

Refitting the E.C.U.

- 1)** Clip the base cover **(2:2)** back into position, paying attention to its orientation
- 2)** Plug the main E.C.U. connector back into place.
- 3)** Slide the E.C.U. into position.
- 4)** Refit and tighten the 4 x Allen bolts into the E.C.U. to 2.0 ± 0.2 Nm.



Part 4: The Glow Pin

Tools:

- 17mm Spanner
- 14mm Spanner
- Pin/Terminal Removal Tool

Removing the Glow Pin:

- 1)** Remove the top covers (Part 1), remove the E.C.U. and base cover (Part 2)
- 2)** Use a pin removal tool and insert it into the front of the main connector block for both the red & white terminals (No 9 & 12) in the slots at the side of the connector, bending the terminal tabs inwards to enable removal of the female terminal (refer to page 7 for more details).
- 3)** Hold the glow pin holder in place with a 17mm spanner
- 4)** Use a 14mm spanner to undo the nut on the glow pin

Refitting the Glow Pin.

- 1)** Insert the glow pin back into the holder and tighten with a 14mm spanner.
- 2)** Re-insert the glow pin terminals into the main connector at position 9 (white) and 12 (brown) as per figure 3.



Part 5: The Flame Sensor

Tools:

- 9mm Spanner
- Pin/Terminal Removal Tool

Removing the Flame Sensor:

- 1) Remove the top covers (Part 1), remove the E.C.U. and base cover (Part 2).
- 2) Use a pin removal tool in positions 1 & 2 of the main connector to free the flame sensor's terminals from the connector (refer to page 7 for more details).
- 3) Use a 9mm spanner to remove the flame sensor from its position.

Refitting the Flame Sensor.

- 1) Insert the flame sensor back into position and tighten to 8.0 ± 0.8 Nm.
- 2) Plug the flame sensor terminals into the main connector at position 1 (blue) and 2 (brown) as per figure 3.



Part 6: The Temperature and Overheat Sensor

Tools:

- Needle Nose Pliers
- Penetrating oil

Removing the Temperature and Overheat Sensor:

- 1) Remove the bolt retaining the leaf spring (**2:15**) and remove the leaf spring itself.
- 2) Use a pin removal tool to remove the pins from the terminal connector block as per figure 3.
- 3) Soak both sensors in an electrical safe penetrating solution to help aid the removal of the sensors.
- 4) Use a pair of pliers to gently remove the sensors from their position.

Note: Sensors can become stuck after sufficient use of the heater and can be easily damaged when attempting removal. Ensure sufficient soaking in penetrating oil to aid removal.

Refitting the Flame Sensor.

- 1) Push the sensors back into position in the heat exchanger, ensuring new O-rings (**2:15**) have been installed.
- 2) Plug the temperature and overheat sensor pins back into the main connector as per figure 3.
- 3) Replace the leaf spring and retaining bolt back into position.

Part 7: The Air Motor

Tools:

- 1 x Allen Key 3mm

Removing the Air Motor:

- 1) Remove the top covers (Part 1), remove the E.C.U. and base cover (Part 2).
- 2) Undo the 4 x Allen bolts holding the air motor in position.
- 3) Lift the air motor (**2:12**) away from the heater.

Refitting the Air Motor:

- 1) Place the air motor (**2:12**) back into position.
- 2) Replace and tighten the 4 x Allen bolts to 3.0 ± 0.3 Nm.



Part 8: The Combustion Chamber and Seals

Tools:

- None

Removing the Combustion Chamber and Gaskets:

- 1) Remove the top covers (Part 1), remove the E.C.U. and base cover (Part 2), remove the air motor (Part 7).
- 2) Remove the combustion chamber gasket (**2:16**) from the heat exchanger (**2:1**).
- 3) Remove the combustion chamber (**2:17**) from the heat exchanger
- 4) Remove the second combustion chamber seal (**2: 18**) from the heat exchanger.

Refitting the Combustion Chamber and Gaskets:

- 1) Refit the first combustion chamber seal (**2:18**) into the heat exchanger (**2:1**).
- 2) Refit the combustion chamber (**2:17**) on top of the first seal, paying attention to its orientation.
- 3) Replace a new combustion chamber gasket (**2:16**) on top of the combustion chamber.



Wiring Diagram

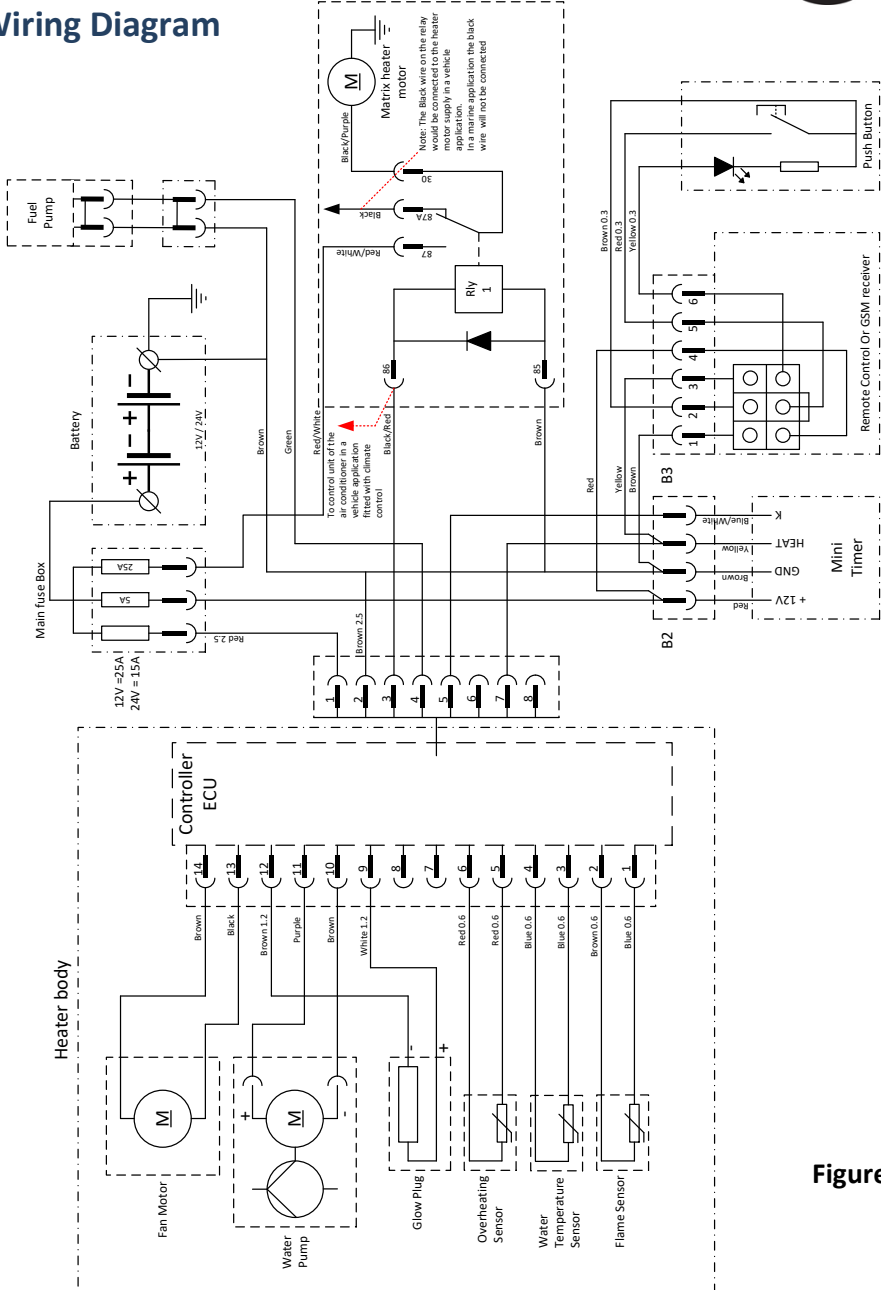


Figure 3



Part Numbers

Part (Voltage)	Part Number
1) Heat Exchanger:	H5Z-001
2) Base Cover:	H5Z-002
3) External Water Pump (12V/24V):	H5C-011/H5A-011
4) Fan Cover:	H5Z-021
5) Top Cover:	H5Z-020
6) E.C.U. (12V/24V):	H5C-017/H5A-017
7) Flame Sensor:	H5Z-012
8) Holder:	H5Z-013
9) Glow Pin (12/24V):	H5C-009/H5A-009
10) Glow Pin Housing:	H5Z-010
11) Glow Pin Screen and Seals:	H5Z-008
12) Combustion Air Motor (12V/24V):	H5C-020/H5A-020
13) Leaf Spring:	H5Z-016
14) Temperature & Overheat Sensor:	H5Z-014
15) Sensor O-Rings:	H5Z-015
16) Combustion Chamber Gasket:	H5Z-019A
17) Combustion Chamber:	H5Z-018
18) Combustion Chamber Seal:	H5Z-019B
19) Fuel Pump(12V/24V)	AHC-023/AHA-023



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