

Issue: No Heat from Right Side – Heater Core Restricted

Description

Owners may experience insufficient cabin heat on the right (passenger) side of the vehicle.

Models Affected

2014-2015 Mitsubishi Mirage

Identifying the Condition

Note: This condition is more easily identified in colder ambient temperatures.

1. Place a temperature probe into the left and right instrument panel vents (Figure 1).



Figure 1: Mirage Left and Right Instrument Panel Vents

2. Set the vehicle HVAC controls as follows:

Mode	Air flow to instrument panel vents only
Temperature	MAX HEAT (89° on models with climate control)
Blower Speed	HIGH
Air Selection	Outside Air

3. Verify the engine is at a normal operating temperature (coolant 195° F or higher). Hold the engine at a fast idle (2000 RPMs) or drive the vehicle at a steady speed.
4. Observe the air temperature of both vents for several minutes.

Vehicles with Restricted Heater Cores Will Exhibit These Symptoms

- Right vent cannot maintain a minimum of 140° F or 120° F above ambient temperature
- Left vent temperature is 20° F or more warmer than the right vent temperature

Case Study: 2014 Mitsubishi Mirage

A Mirage with an internally restricted heater core will exhibit poor heat output and a distinct temperature decline from left to right across the instrument panel. Figure 2 below shows the heat temperatures observed in a 2014 Mirage *with its original heater core and engine coolant*. The pattern of declining temperatures from left to right can be seen in this example...

Vehicle: 2014 Mitsubishi Mirage
Odometer: 77,000 miles
Coolant: 195° F
Ambient: 25° F



Figure 2: 2014 Mirage Heat Temperatures with OEM Heater Core

Below are the output temperatures of this Mirage **after** replacing the OEM heater core:



Figure 3: 2014 Mirage Heat Temperatures with Replacement Heater Core

Mirages with unrestricted heater cores produce adequate heat in cold temperatures with no temperature variation across the instrument panel.

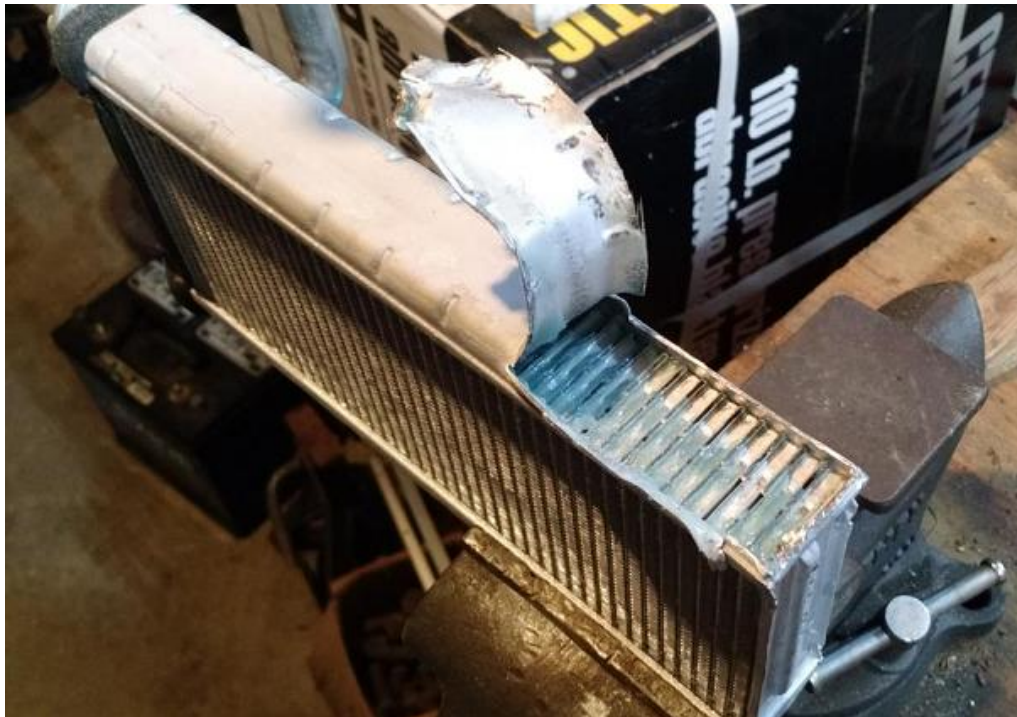
Mirage Heater Core Examination

The OEM heater core removed from the 2014 Mirage in Figure 2 was examined to inspect for internal restrictions. The tanks were removed to expose the internal passages of the heater core. The results are shown in the following series of photos.

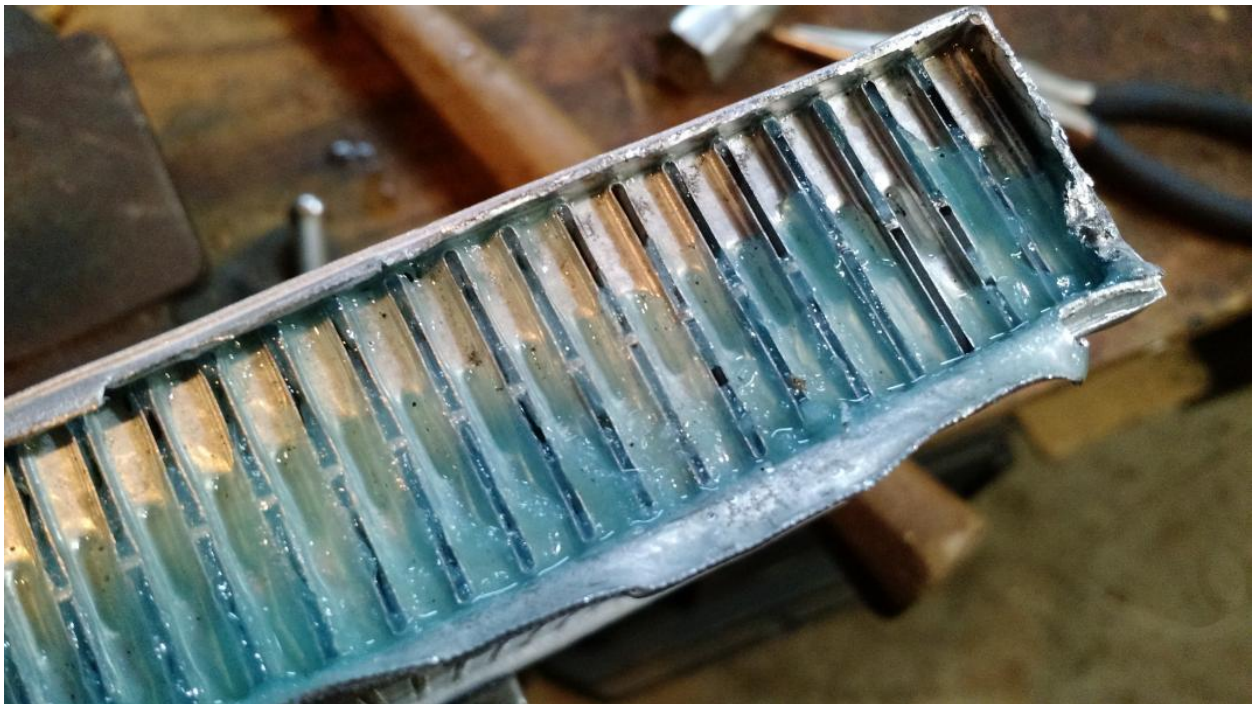
Here is the OEM heater core removed from the vehicle...



Here is the tank removal process in progress. Snips were used to carefully open the tanks without disturbing the internal structure of the heater core...



Below are two photos of the **outlet** side of the heater core. An unknown substance is present in this area resulting in a coolant flow restriction on the right (passenger) side of the core...



Here is a view with the entire **outlet** side of the heater core exposed. The unknown substance is present on nearly all of the right (passenger) half of the core...



Here is a view of the **inlet** side of the heater core. It shows a much smaller amount of the unknown substance compared to the outlet side...



This image shows where the area of restriction was identified in the OEM heater core...



Conclusion

This examination of the OEM Mirage heater core confirms that an internal restriction on the passenger side of the core was the cause of reduced heater output in this vehicle. The restriction has resulted from an unknown substance collecting on the outlet side of the heater core passages. Replacement of the OEM heater core restored this vehicle's normal heater output.

NOTES

1. There are varying degrees of reduced heat output in Mirages with this condition. The reduction of heater performance is proportional to the restriction level in the heater core.
2. Based on long-term (1 year+) monitoring, the poor heat output condition worsens over time in the affected vehicles.
3. This condition is developing in vehicles with OEM engine coolant being maintained according to Mitsubishi's maintenance schedule. The issue is not related to the use of incorrect or improperly maintained coolants.
4. Because this condition develops gradually over time, owners may be unaware of the issue without using a controlled test to measure the heat output. Many owners assume poor heat output is a normal characteristic of a subcompact vehicle with a small engine.
5. A partially restricted heater core will remain unnoticed until the vehicle is operated in colder weather when heat demand is the greatest.
6. Front seat passengers are usually the first to notice a lack of heat output. By the time the driver notices reduced heat on the left side of the cabin, the restriction inside the heater core has advanced to a significant level.
7. Flow testing the heater core in the vehicle may be inconclusive. Coolant will still flow in/out of an affected heater core. However, the coolant only flows freely through the driver's side of the heater core, resulting in the low heat condition on the passenger side of the core.

Unknown Substance Found in Mirage Heater Core

The OEM heater core examined had an unknown substance which had collected on the passenger **outlet** side of the core. This material has a consistency similar to petroleum jelly...



BASF engineers reviewed these photos and were asked for an opinion on where this material may have originated. Below is their response.

"We can't say anything definite without an analysis of the material. However, the substance may be created within the heater core itself, the cause being residual substances used in manufacturing that react with the OEM coolant and subsequently deposit the reaction product on the colder, outlet side of the heater core. We recommend replacing the affected heater core and using Glysantin G64 coolant in the future, which was designed specifically for preventing such deposits."

At least one other manufacturer is having similar issues with restricted heater cores caused by residual manufacturing substances. A Technical Service Bulletin from Volkswagen (TSB 80-15-04) describes a condition where *"excess flux from the cooling system is causing a restriction in the heater core leading to low heat output on the passenger side of the vehicle."* VW advises technicians to replace the affected heater core, flush the cooling system, and use an alternate coolant to prevent the condition from recurring. *NOTE: The Volkswagen problem could be similar to the issues in the Mirage and is worth mentioning here for reference.*