

## **Heater Core By-pass for US ELISE 2004+**

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**This article is written to address one of the issues of the Lotus Elise AC performance in my car. My experience is with my 2004 Elise (#SCCPC11115HL30062). I make no representations on whether this affects your warranty or not. If it did, my question would be why Lotus has not addressed this common issue even after repeated complaints to dealers. This mod is to allow my car to be used in warm weather. Desperation is a strong motive.**

**The experience level required to do this modification is moderate. It will require cutting heater hoses and vacuum hoses, installing clamps and vacuum tubing and wiring a simple switch. Finally, the cooling system will have to be refilled for lost fluid and the cooling system bled as recommended by Lotus. But don't be scared off, it's really a straightforward mod, just a bit messy and requires working in some tight places.**

**You can skip the rest of this page if you aren't interested in the details of the whys. Some people want to know, some just want the fix.**

**Specifically, my car suffers from poor AC performance. It blows cold for the first 20 minutes or so, and then the vent temperature creeps up to the point where the AC output is outside temperature or even warmer. With the AC off, it blows warm air through the vents in the cockpit even when the temperature is set to full cold.**

**My conclusion is that the heater core which is always hot (by design) is either heat-soaking the AC system so that it warms the AC output or the blend door does not close fully which allows air to travel through the heater core even when the temperature in the car is set to full cold.**

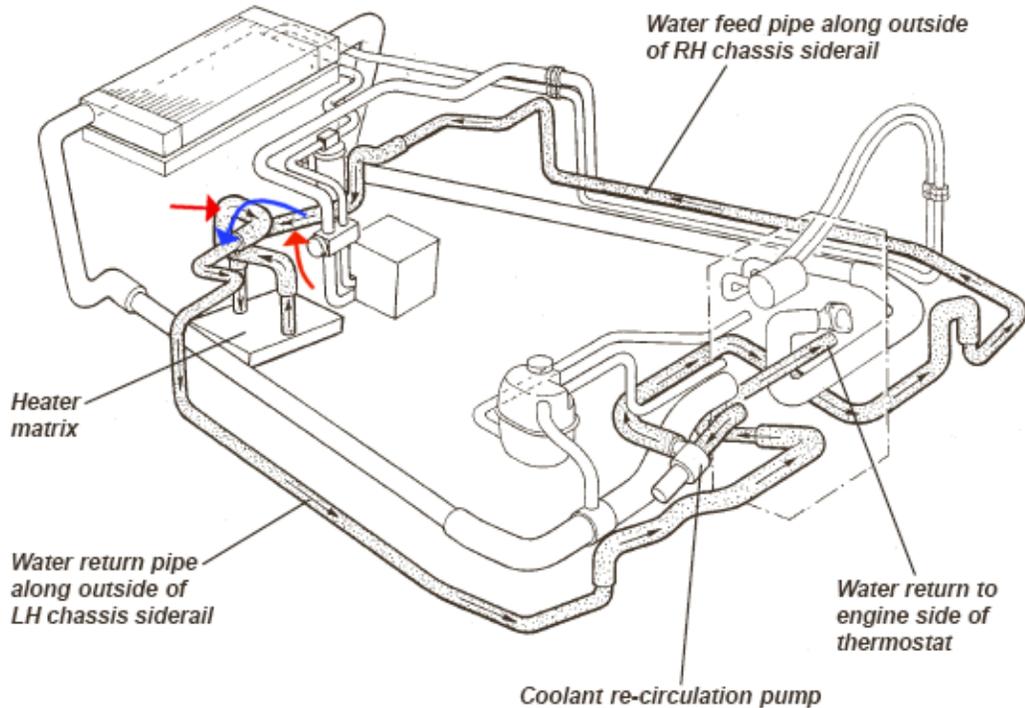
**My solution for this issue was to create a heater core bypass system with the following requirements:**

- 1) Must be controllable from the cockpit to turn the by-pass on or off**
- 2) Must return to the non-bypass mode whenever the engine is turned off. This is required to support the feature where the car can run an electric circulating pump after engine shutdown to prevent hot spots in the engine from overheating.**
- 3) Must be light, operate reliably, and be built from readily available parts**
- 4) Must be reversible (no permanent modification to the car other than readily replaceable parts)**

**All requirements were met with the solution on the following pages. The total cost is approximately \$60 for the conversion. For requirement 4) only two heater hoses would have to be replaced to convert the car back to original. Two 5/8 heater hose repair nipples could be used to save the cost of new hoses.**

The red arrows indicate the two hoses that will be cut. The blue arrow indicates the flow when the bypass is switched on. This diagram does not have the heater core in the correct position. It actually resides on the passenger side of the HVAC unit. The diagram is functionally the same as my car. (Diagram found on the net)

Heater Circuit



Valve installed in car. Red arrows indicate normal flow, blue arrow is bypass flow.



## Kit components



## Parts List:

Name	Qty	Part #	Description	Application	Approx. Cost (\$)
Bypass Valve	1	Four Seasons 74809 or Motorcraft YG350	Heater Bypass Valve	1998 Ford Ranger w/4-port valve, any engine	20
EGR Vacuum Switch	1	unknown	Electrically controlled solenoid	1990 Chevy Astro Van, smallest engine size	17
Heater hose clamps	4	Appropriate to fit heater hose lines, approximately 1.5" diameter	Worm drive clamps		4
Heater hose clamps	2	Suitable for securing large vacuum hose, approximately 1" in	Worm drive clamp		2

		<b>diameter.</b>			
<b>Vacuum Hose</b>	<b>3 ft</b>	<b>1/8" or 7/64"</b>			<b>2</b>
<b>Large tie wraps</b>	<b>10</b>		<b>8 inch</b>		<b>1</b>
<b>Small tie wraps</b>	<b>10</b>		<b>4 inch</b>		<b>1</b>
<b>Snap-off vacuum tee</b>	<b>1</b>	<b>Capable of handling 1/2" hose and 1/8" hose (see picture)</b>	<b>Hard plastic vacuum tee</b>		<b>2</b>
<b>SPST Switch</b>	<b>1</b>	<b>12 volt switch to fit in cockpit in a location of your choice</b>			<b>3</b>
<b>Electric wire for switch</b>	<b>2 ft, 10 ft</b>		<b>16 Gauge minimum. 2 ft of black for ground, 10 ft of some other color for 12VDC.</b>		<b>3</b>
<b>Add-on fuse</b>	<b>1</b>		<b>10 amp fuse holder. Several styles available. (pic on last pg.)</b>		<b>3</b>
<b>Solderless connectors</b>	<b>Assortment</b>		<b>Crimp-on wiring connectors for switch and EGR valve</b>		<b>2</b>
<b>Red Line Water Wetter (optional)</b>	<b>1</b>		<b>Makes heat transfer of cooling system more efficient</b>		<b>8</b>
<b>Total (with options)</b>					<b>68</b>

**End of Introduction Section**