

Heater Core By-pass for US ELISE 2004+

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This article is written to attempt to address one of the issues of the Lotus Elise AC performance for Lotus Elise cars. My experience is with my own 2004 Elise (#SCCPC11115HL30062).

I have now installed the kit on a second 2004 Elise with very similar results to my own modified car (cooler cockpit).

I make no representations on whether this modification affects your warranty or not. If it did, my question would be why Lotus has not addressed this common AC issue even after repeated complaints to dealers. The modification is to allow a car to be used in warm weather with passable AC performance. Desperation is a strong motive. I personally have around 400-500 miles with this modification in place with no issues to date.

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. If you choose the optional switched potentiometer rather than the simple switch, you will have to unsolder and re-solder three wires. 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. The coolant bleed is easy as well. Estimated time to execute mod is 3 hours.

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 similar to the 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. I have verified that the blend door does close completely in my car.

My conclusion is that the heater core which is always hot (by design) is heat-soaking the climate control box so that the AC output is warmed before it ever gets to the vents in the cockpit.

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

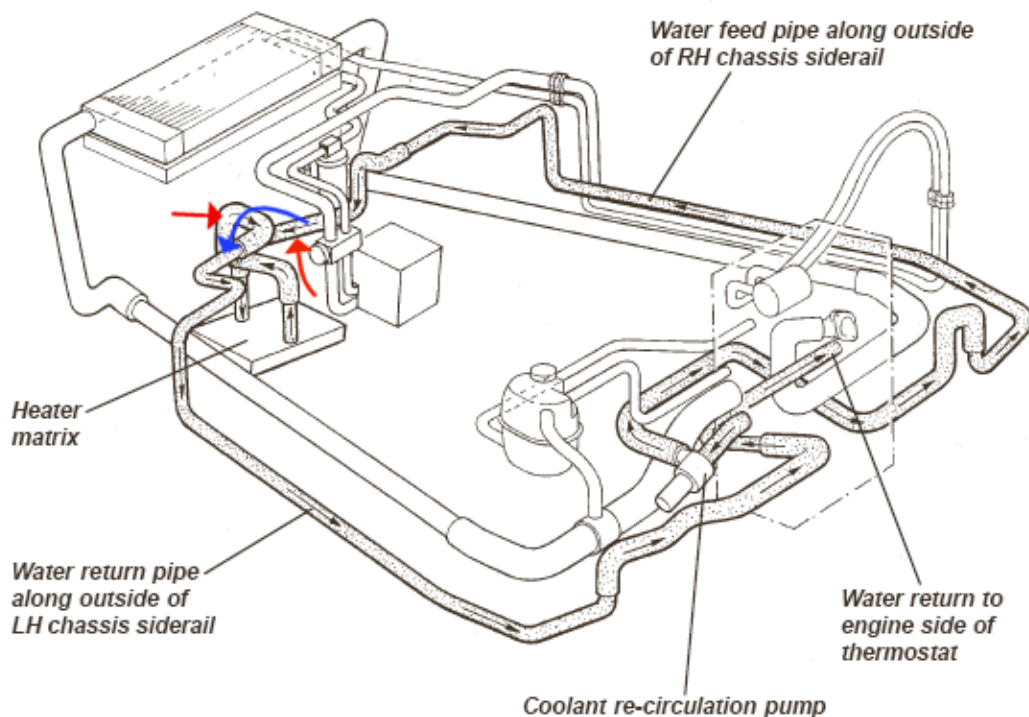
- 1) Must be controllable from the cockpit to turn the by-pass on or off

- 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)

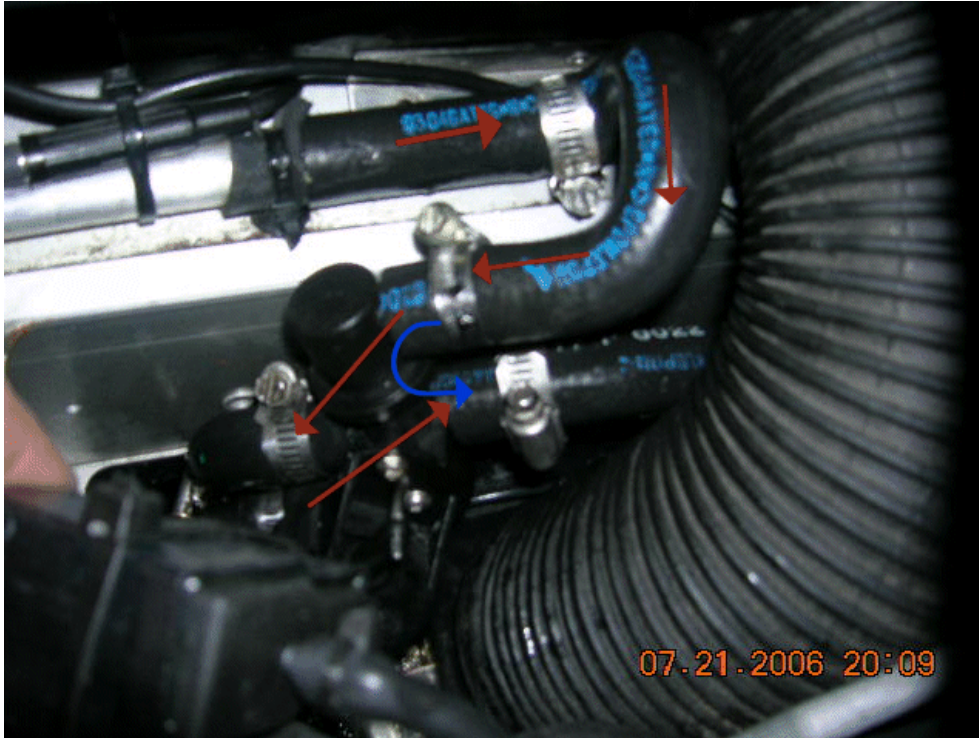
All requirements were met with the solution on the following pages. The total cost is approximately \$75 for the conversion. For requirement 4) only two heater hoses would have to be replaced to convert the car back to original. Two 5/8 heater hose repair nipples could be used to save the cost of new 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 for the US 111 cars. The diagram is functionally the same. (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 74776 or Motorcraft YG350	Heater Bypass Valve	1998 Ford Ranger w/4-port valve, any engine	20
EGR Vacuum Switch	1	Standard Motor Parts VS12	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

Vacuum Hose	8 in	1/8" or 7/64" ID			.5
Vacuum Hose	16"	3/16" ID			1.5
Extra long tie wrap	1		12" – for securing solenoid to wiring harness		
Large tie wraps	3		8 inch		.5
Small tie wraps	10		4 inch		1
Plastic or metal vacuum tee	1	3/8 x 3/8 x 3/16 – Motormite metal tee #47009	Hard plastic or metal vacuum tee		2
Electric wire for switch	2 ft, 8 ft		16 Gauge minimum. 2 ft of black for ground, 8 ft of some other color for 12VDC.		2
Add-on fuse holder and fuse (ATO blade style)	1		10 amp fuse holder. Several styles available. (pic on last pg.)		3
Solderless connectors	X		Crimp-on wiring connectors for switch and EGR valve. Plus two wire taps for power and ground, 1 butt connector		1
Self Adhesive Wire guides	3		Used to route wires under dash		1

High Temp Insulation	1.5 ft 3/4" ID		Use around your aluminum heater lines in climate box area		1
Vent Tube Insulation	1ft		Wrap around corrugated vent hose. Secure with duct tape (or the like)		.5
Heat Shrink tubing	6-8"		to handle wires size above for EGR and switch		1
Push/Pull Temp Potentiometer (Option)	1		Replaces OEM temp Pot to allow original look with bypass control		8
SPST Switch (option)	1		12 volt switch to fit in cockpit in a location of your choice		3
Red Line Water Wetter (optional)	1		Makes heat transfer of cooling system more efficient		8
Total (with options)					Approx \$75

End of Introduction Section