

Vehicle Heat Exchanger



There has been much interest expressed in this product. While making this heat exchanger for a friend of mine, I decided to make some bending jigs and templates as I suspect I may be asked to make some more. I have included a costing below. My apologies if I make it sound simple, but I am a plumber by trade. If you planning to make your own, I advise that you don't skimp on the fittings as the last thing you want to do is compromise your vehicle's cooling system.

The materials list to make the heat exchanger included:

- Roll of 3/8" Soft copper tubing to make up the coil.
- Brass hose type fittings and reducing bushes
- 3" Galvanised stop ends and threaded pipe
- Heat resistant rubber grommets (to prevent vibration and chafing of the coil and deflect flow of coolant inside the outer casing)
- Internal copper sleeve to help coolant circulate evenly over copper coil
- Heavy duty brackets to mount exchanger in engine bay
- If you do not have the right tools, you will require an engineering works to drill the stop ends and tap the threads to accommodate the brass fittings. The brass fittings also need to be machined to accommodate the internal copper piping.

The above list came to R1450.00. It may seem like a lot for such a simple looking product, but the copper and brass fittings are expensive and even the galvanised pipes and fittings when you get to 3 inch size are quite expensive. The bending and assembly takes a good 3 hours.

On the technical side, my bending jig allows the copper to compress while coiling to a minimum inside diameter of 3mm. I have done this so the copper pipe elongates when coiling so the surface area to water being heated is maximised. This means that any dirt particles less than 3mm can pass through the system if accidentally sucked in. (Using a suitable strainer on the intake will prevent any blocking problems especially if drawing water straight out of a river). The brackets I used are rated to a static load of 122kg each. The completed exchanger weighs in at 5.3kgs and holds 1.2litres of coolant. I trust that these brackets will be more than strong enough to support this weight, even on bad roads. The rubber lining on the clamps is rated to 110 degrees Celsius and also reduces the risk of chaffing from vibration.

The other bits and pieces you will require is a submersible pump (Less than R200) or better still a self-priming pump (about R1000) which you can fit permanently on the vehicle. You get one that is rated at 3.8 litres per minute. I think that is plenty flow rate as anything bigger than this will push too much water through the system and reduce the efficiency of the heating. I used Gardina type fittings for quick coupling, a ball-o-stop as the flow regulator and low pressure shower head from a solar bag type water heater. Use a thick walled (preferably reinforced) pipe for the water being heated as you do not want the pipe to kink when it gets warm. Again be sure to use proper radiator hose when plumbing the exchanger in to the cooling system. The electrics will vary from vehicle to vehicle, but essentially you need an in-line switch and suitable wiring to handle the amperage of the pump. Be sure to use your vehicles recommended antifreeze (Glycol) as this will also protect the unit from unnecessary corrosion.

As mentioned above, I have made the necessary jigs and templates to make these exchangers up, so if you don't want to go the project on your own I will be happy to make the heat exchanger up for you at a cost of R2100 plus postage. I will also look at putting a kit together with a pump and all the other bits and pieces if there is enough demand. You can then fit the kit yourself or have it fitted by your preferred vehicle accessory fitment centre. My e-mail address is agevers@mweb.co.za

This has really been a rewarding project. Have fun