

FIGARO PROJECT PART 6 HEAT, COOLING AND MORE

A new radiator and replacement coolant hoses had long been on our Figaro's project list. Unfortunately, fitting them did not go entirely to plan. REPORT: SIMON GOLDSWORTHY

We've spent the last couple of issues at The Figaro Shop in Didcot, replacing the dash top and carrying out a number of other small improvements. With the interior now reassembled, there was just time for a quick inspection underneath by their experts before we headed back home to Lincolnshire. Workshop Manager Mark White kindly put the car up on a ramp for this during his lunch break – above and beyond the call of duty!

Thankfully he did not turn up any disasters, though it was an extremely useful exercise. For one thing it confirmed our thoughts that the steering rack would need replacing or reconditioning shortly, the amount of power steering fluid escaping being more than just the occasional drop. It was clear that the underneath needed a comprehensive rust-proofing too, with some brackets starting to corrode. Mark also suggested that the rear tie bar bushes would soon be due for replacement, highlighted a radiator bleed hose that had been chewed by mice and pointed out that the inhibitor bush on the gearbox had all but disintegrated. This last item was important because without the bush, the inhibitor switch could stop the car from starting if it thought the gearbox was in Drive.

To this list we could add a new radiator as I'd previously noted that the one on the car was well past its sell-by date. I had already bought a set of silicone coolant hoses on the recommendation of Simon Smith from the Figaro Owners Club, who had inspected the car for us and advised that failed rubber hoses were causing more problems for owners as their cars aged. So now I added an exchange radiator to the list, as well as a new inhibitor bush for the gearbox.

Once back at base, I set about replacing the bush, then removing the radiator and changing the hoses. As always happens, this threw up one or two other jobs that needed doing as well, most of them relatively minor, but one of them something of a disaster.

The first job was to drain the coolant. This is made easy on the Figaro because there is a drain tap in the bottom of the radiator. Next, I put the front of the car up on ramps so that I could access the engine bay from both above and below. I did once have a large car on those ramps, and shortly after I had been working underneath, I watched in horror as the car rolled off them of its own accord. The fault was mine on two fronts – I



1 The Figaro Shop's Workshop Manager, Mark White, put our car up on the ramp to give it a once over. One of the things he pointed out was that the bush on this gearbox inhibitor switch had broken up.

2 With the rod free to move around, the Figaro's electronics could be fooled into thinking the car was in Drive rather than Park and refuse to start. A new bush was cheap enough and relatively easy to fit.



3 This radiator bleed hose had been badly chewed by mice. If this one was in such poor condition, how could we be sure of those that were hidden from view? That's why they all had to be changed.



4 Back home, the Figaro was lifted rather than driven onto ramps, which explains how one was placed the 'wrong' way round to ensure the car could not roll off by accident.



5 The engine bay is so cramped that items had to be removed one at a time to gain access to the hoses and the radiator. Removing the battery was a safety measure as well as to provide elbow room.



6 This showed that the battery tray had plenty of surface rust. The tray itself was painted grey rather than body coloured, and was secured to the chassis rail with bolts. The rail beneath was sound.



7 Simon took the fan assembly off the radiator while it was in the car. That gave greater access and visibility to study the task in hand, but made the removal more difficult than it needed to be.



8 There is an oil cooler in the bottom of the radiator for the gearbox oil, pictured here from underneath the car. The rubber pipes to this are simply a push fit held on with regular hose clamps.



9 The other end of those rubber oil-coolant pipes attach to this steel pipe assembly which in turn is secured to the gearbox with banjo bolts. The metal pipes were rusted, but not terminally so.



10 Simon had the battery tray and the pipes blasted and powder coated, after first wrapping the unions in tape to protect them. The blasters used a low pressure on the potentially delicate pipes.



11 The old radiator came out with just one sheared bolt. It really was in a very sorry state, with large sections where the cooling fins had disappeared and others falling off at the slightest touch.

had not put a chock behind the rear wheels, and the tyres on the American leviathan were too big to sit safely on the UK-scale ramps. Since then, I have always preferred to jack a car up and push the ramps under the wheels with one facing forwards and the other backwards. This looks a little odd, but means it is impossible for the car to roll off no matter how much I shake it. I feel happier with a car like this even if it is on tiny 12in wheels like the Figaro.

After draining the coolant, I next wanted to take the battery out. Partly this was because I would be leaning over to work in the engine bay, and I wanted to remove

any danger of dropping or inadvertently putting down a tool which might short out across the terminals. The battery had to be disconnected anyway because with all that rummaging in the engine bay to remove hoses and the radiator, there was a risk of moving live wires or touching live connections. It also improved access on the nearside. With the battery out, I could see that the battery tray underneath was covered in surface rust. It was not structurally affected, but was unsightly. Since this was bolted to the chassis rail rather than welded, I took the tray out as well for repainting, and to inspect the state

of the chassis rail beneath – fortunately this was sound and the paint was intact.

Next to come off was the expansion tank, which needed a good clean. This was followed by the top hose, together with the small breather hose that had in some ways been the catalyst for this whole operation after being chewed by mice. The fan assembly is held to the radiator by four bolts, and the radiator is in turn held to the front panel by four more. They can be removed as a unit, but I decided to take the fan out on its own first so that I had a better view of the radiator fixings from both above and below. It was so tricky to do this way

« though that when the new radiator goes back in, I will attach the fan to it first.

I now had easy access and clear sight to reach and remove the bottom hose. However, the Figaro also has a gearbox oil cooler in the bottom of the radiator. This is serviced by two pipes that are simply a push fit secured with hose clips. The rubber oil pipes are connected to two metal pipes, which in turn feed into the gearbox via banjo bolts. These pipes were a bit rusty, but didn't look beyond saving.

With all this out of the way I could finally remove the radiator. Unfortunately, this is held on by small M6 bolts with 10mm heads and despite my best efforts, one bolt on the nearside sheared. Sod's Law dictated that there was not enough room in the engine bay to get a drill in to take out the remains. In the end, my flexible drill drive came to the rescue, as there was just enough room to get this in and work progressively up through the bit sizes until I could get an M6 tap in and clean out the thread.

As for replacing all the coolant hoses, it was tricky to see where they all went – the Figaro engine bay is a very cramped affair with air conditioning, power steering, an automatic gearbox and a turbo all packed into a little FWD configuration. Tracing the pipes around the car showed that there was a metal pipe from the back of the water pump area that comes across the front of the engine bay to the radiator bottom hose. Just before this join, there are two smaller take-off points on the metal pipe, one leading up to the turbo and another that runs across the engine on the nearside of the car to feed the heater.

Both of these take-off points had very short lengths of hose that connected them with further metal pipes, and the problem was that I didn't think there would be enough flexibility in such short lengths to manoeuvre the old ones out and the new ones in. There was no option but to take the downstream metal pipes off as well. The one up to the turbo was easy enough, being secured with an easily accessible 24mm banjo bolt. The one running back to the heater was a nightmare though, with a single 10mm bolt holding a bracket to the engine with very difficult access.

Having now disturbed the pipe running to the heater, I tackled the feed and return hoses to that next. These attach to stubs that exit the heater matrix through the front bulkhead. The one on the nearside came off easily enough, but this revealed that the stubs from the heater were plastic, not metal as I had expected. And not fresh plastic, but browned stuff that looked aged and brittle. So when the clip on the offside hose started to twist as I undid it, instead of forcing the thread I cut the wire with snips. It was all to no avail though, because when I took hold of the hose to see if it would move, it came away from the car with the



12 With access in the engine bay so tight, not even a compact cordless drill could get in to tackle the sheared bolt. Fortunately a flexible drive made it just about possible to drill out the remains.



14 In such cases, the answer was to remove the metal section too and fit the hose off the car. One thing that did impress on the Figaro was how easily things undid. Well, nearly everything...



16 Unfortunately, with the end of the job in sight, one of the plastic stubs from the heater matrix broke off. This was a disaster, as replacement would mean taking out the dash. Again.

now broken plastic stub still attached.

I have to say that I showed remarkable self-control, not swearing at my luck or throwing things around the garage, but instead tidying my tools away and calling it a night. Why do I say that this was impressive? Because instead of being almost ready for a straightforward reassembly of the cooling system, I was now faced with removing the entire dash so that I could change the heater matrix. And I had only just taken the dash out to replace the top with a new leather-clad item, so this would be repeating a full day's work. I did think about bypassing the heater for now, joining the two hoses with a length of copper pipe I had, but the stubs were 16mm outside diameter, so the 15mm



13 Some of the new hoses were so short that there was no way they'd be flexible enough to squeeze between the two metal pipes when the gap between the ends was as narrow as this.



15 Most of the metal pipe ends were in good shape, but one had a build-up of paint and rust that promised to make getting a leak-free union difficult. Cleaning up with a wire brush in the drill solved that.



17 Meanwhile, the reconditioned radiator had arrived. We had to return our old unit as an exchange to avoid paying a surcharge, common practice with many reconditioned items.

copper pipe would not have been a tight enough fit. Whoever decided that plastic was a suitable material for the heater, given its inaccessible location and the fact that it would go through thousands of heating and cooling cycles, really should take a long hard look at themselves in the mirror... **CM**

Costs this issue

Gearbox inhibitor bush: £5.99
Coolant hose and clip set: £220.00
Exchange radiator: £205.00
Postage: £12.49
Exchange radiator postage: £16.62
Total: £460.10