



CORSA VXR STAGE 3 CONVERSION

Vauxhall tuning experts Courtenay Sport take us through their Stage 3 intercooler and exhaust upgrade for the Corsa VXR.

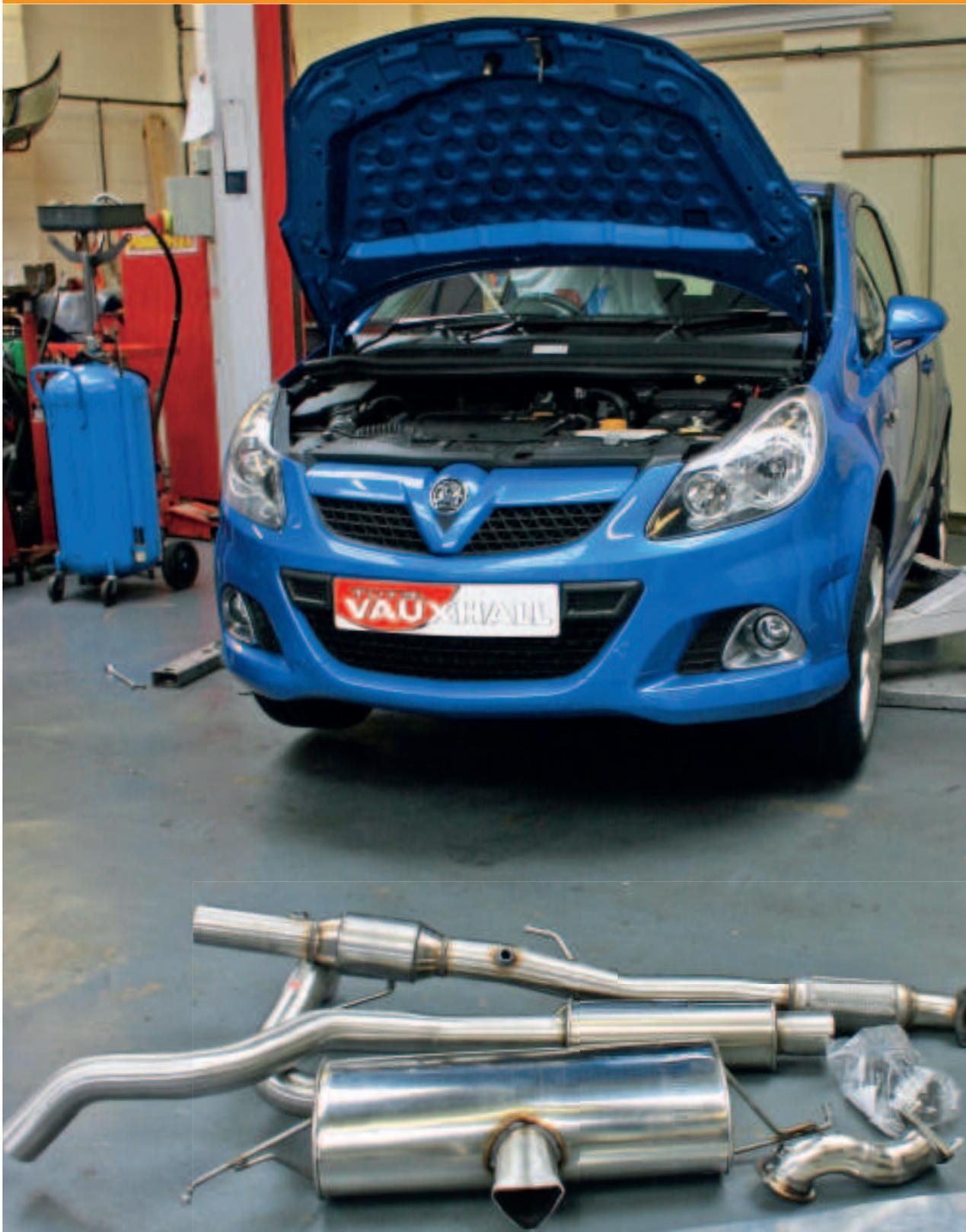
Words and photos: Dougie

With 190 bhp in standard form, the Corsa VXR is quick, although it has the potential to go much quicker with a few modifications. Courtenay Sport have developed a range of upgrades for the car's excellent 1.6-litre Z16LER turbo engine. There are three levels of tuning available at the moment: Stage 1, 2 and 3. In this feature we show Courtenay fitting a full Stage 3 package, and then testing it.

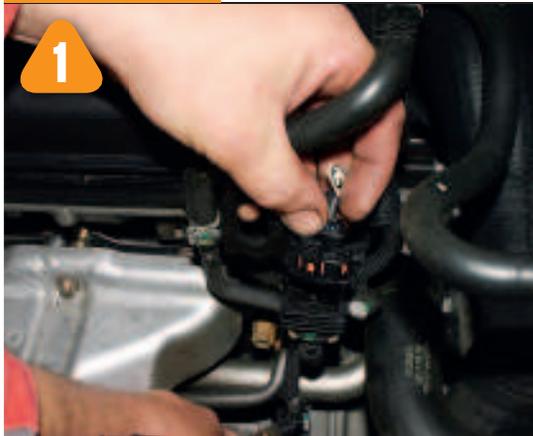
The Stage 3 upgrade consists of a huge high-flow intercooler, a 70 mm Magnex exhaust system including front pipe, exclusive Courtenay software and rolling road set up. Other parts being fitted are Courtenay's silicone hose kit (larger hoses are needed for the intercooler), performance panel filter and cool running thermostat.

With the exception of the mapping, it's possible you could fit all of these items yourself, providing you have a decent level of experience with DIY mechanics and a good set of tools. The new Corsa is of a surprisingly simple design, and for anyone wanting to order and fit these parts themselves, this makes it an easy car to work on.

One thing to remember before starting work is that turbo cars get VERY hot, so you're probably best letting it sit overnight before attempting anything. It's vital to allow the car to completely cool down before attempting to work on it.

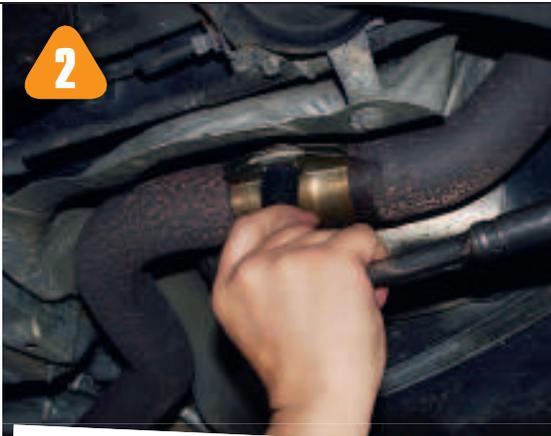


EXHAUST SWAP



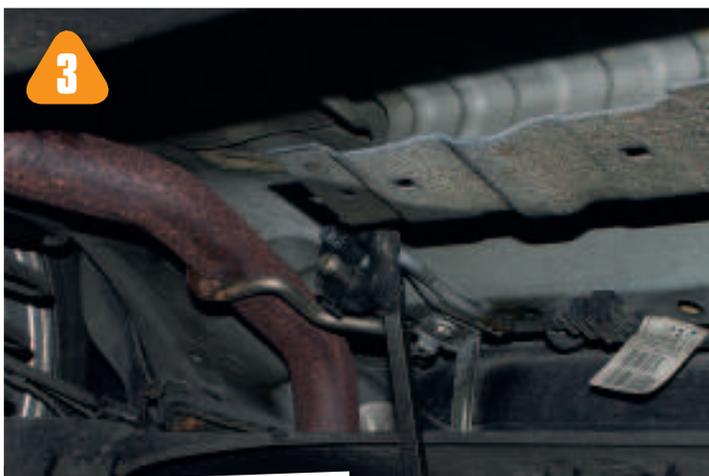
1

Unplug the lambda sensors from inside the engine bay. Jack the car up and support it on axle stands, or use a hydraulic ramp. Then using a spanner, from underneath the car, unscrew the sensor located in the exhaust system. The sensor in the front pipe can be left in place.



2

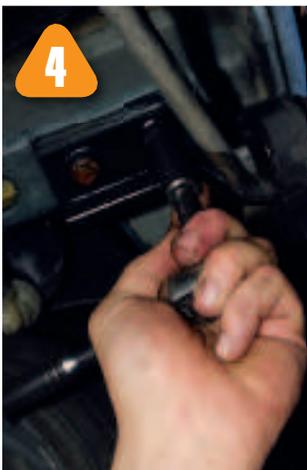
Slacken the clamp holding the exhaust system to the back box, and pull the two apart.



3



Lever the exhaust rubber from the bracket above the rear axle. Spraying the rubbers with lubricant first will make them easier to remove.



4

There are two rubbers at the rear holding the back box in place. The complete bracket should be removed on the driver's side. It's held in place with two bolts. With these removed, the back box can be lifted clear.



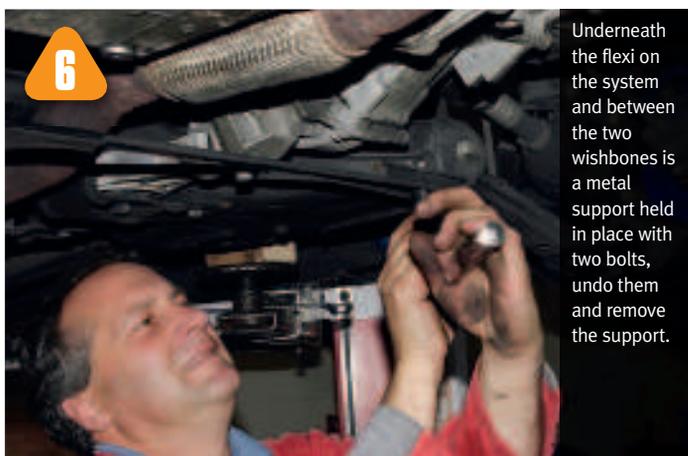
5



Moving to the front of the car, there is a spring clamp holding the catalyst to the manifold. It's hard to see, but easy enough to get a socket on the spring loaded bolt (the one with green paint). Slacken the clamp off and pull the catalyst clear.

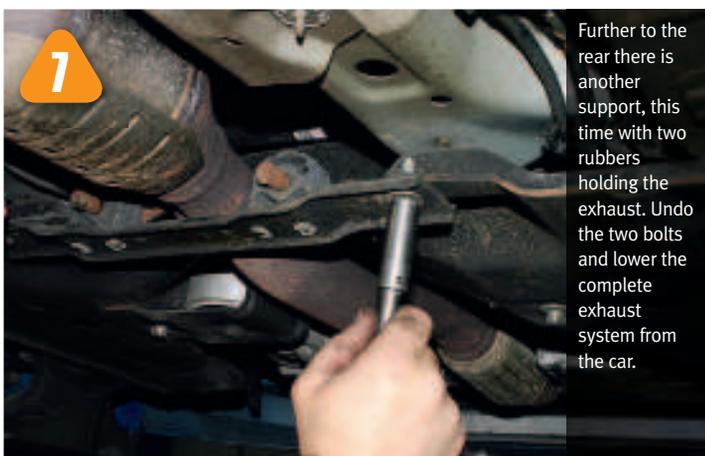


TECH NOTE



6

Underneath the flexi on the system and between the two wishbones is a metal support held in place with two bolts, undo them and remove the support.



7

Further to the rear there is another support, this time with two rubbers holding the exhaust. Undo the two bolts and lower the complete exhaust system from the car.



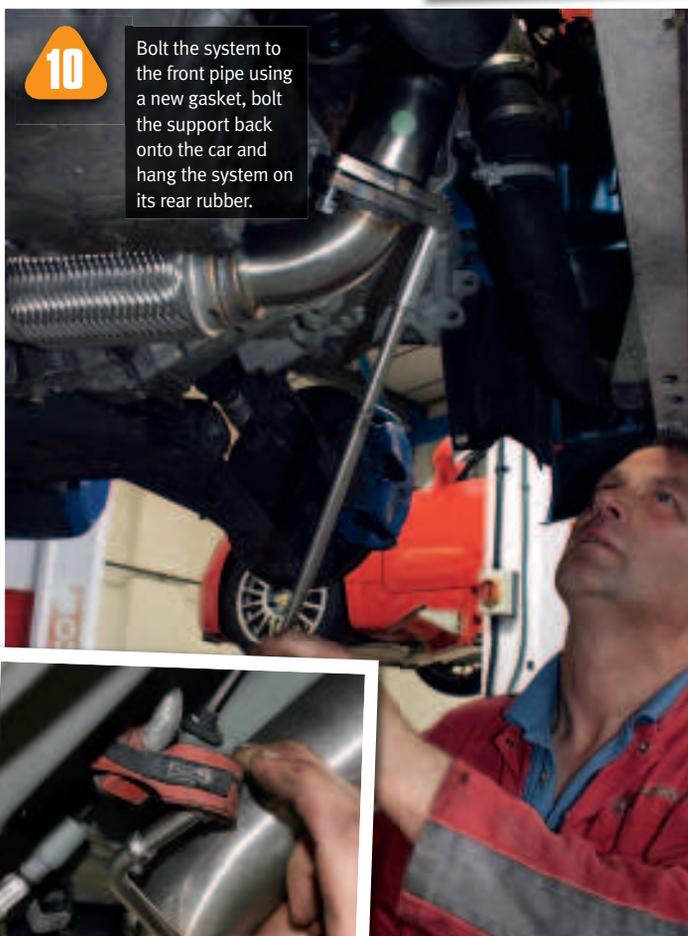
8

With the exhaust clear, remove the lambda sensor from the front pipe and refit it in the new Magnex item.



9

Using the original spring clamp (right), fit the cat-replacement front pipe to the manifold and then the support with the rubbers on it to the system (below).



10

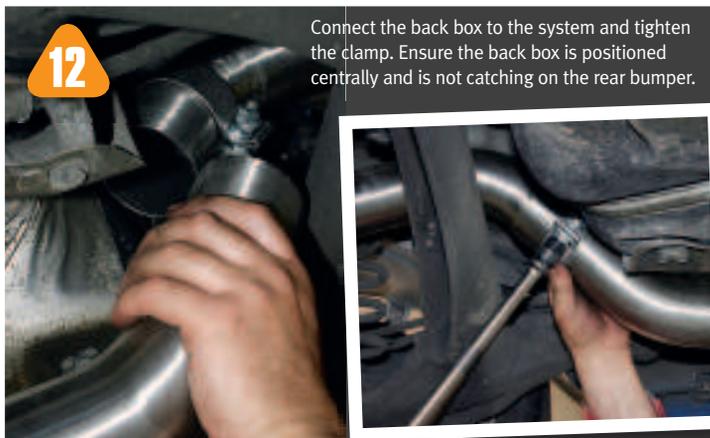
Bolt the system to the front pipe using a new gasket, bolt the support back onto the car and hang the system on its rear rubber.



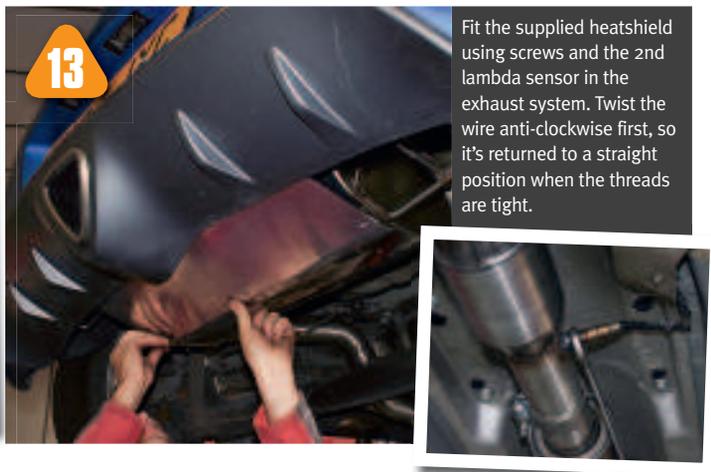
11

The metal bracket that holds the back box must be turned in the opposite direction to fit the Magnex back box. Fit this, and hang the back box on the two rear rubbers.



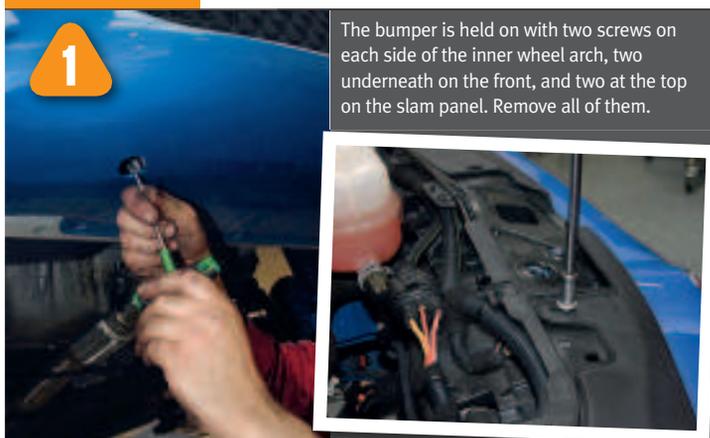


12 Connect the back box to the system and tighten the clamp. Ensure the back box is positioned centrally and is not catching on the rear bumper.

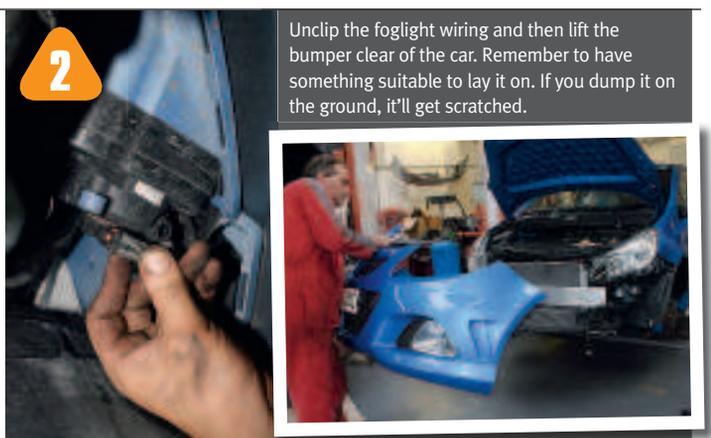


13 Fit the supplied heatshield using screws and the 2nd lambda sensor in the exhaust system. Twist the wire anti-clockwise first, so it's returned to a straight position when the threads are tight.

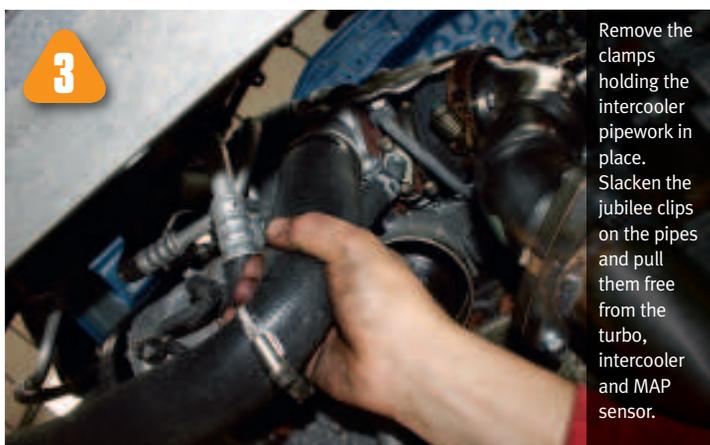
INTERCOOLER



1 The bumper is held on with two screws on each side of the inner wheel arch, two underneath on the front, and two at the top on the slam panel. Remove all of them.



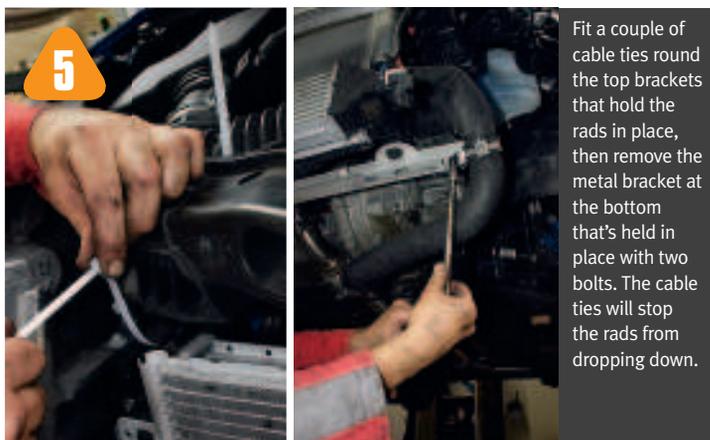
2 Unclip the foglight wiring and then lift the bumper clear of the car. Remember to have something suitable to lay it on. If you dump it on the ground, it'll get scratched.



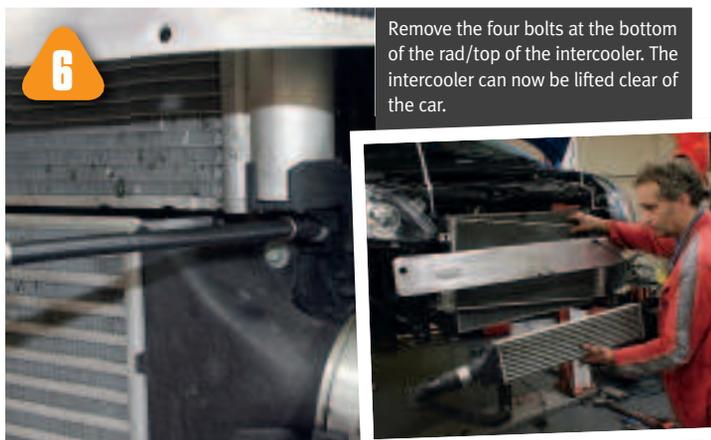
3 Remove the clamps holding the intercooler pipework in place. Slacken the jubilee clips on the pipes and pull them free from the turbo, intercooler and MAP sensor.



4 There are two rivets holding the plastic panel in front of the intercooler in place. Drill both of them out, undo the four other bolts and lift the panel clear.



5 Fit a couple of cable ties round the top brackets that hold the rads in place, then remove the metal bracket at the bottom that's held in place with two bolts. The cable ties will stop the rads from dropping down.



6 Remove the four bolts at the bottom of the rad/top of the intercooler. The intercooler can now be lifted clear of the car.



TECH NOTE

7

The new intercooler can be slid in from the bottom, up in front of the rad, and located in the original rubber grommets. With this in place, refit the metal support bracket.

8

To refit the plastic panel new bolts must be fitted in the holes where the original rivets were drilled out when it was removed.

9

Attach the metal/silicone hoses from the turbo to the intercooler, along with the original clamp.

10

Do the same on the other side, from the intercooler round to the MAP sensor as shown. Make sure all the clips are fully tightened – you don't want to blow any hoses off. Refit the front bumper.

11

Unclip the wiring plug from the airflow meter, unclip the airbox, and fit the new panel filter. Remember to spray the filter with the supplied oil first.

12

Fit the last two silicone hoses from the airflow meter to the turbo, and from the MAP sensor to the throttle body.

13

Drain the coolant by releasing the spring clip on the bottom radiator hose. Catch the coolant in a bucket as it can be re-used. Unclip the hose from the thermostat housing. The housing is held in place with three 10 mm bolts, undo these and lift it out.

14

Taking care not to stab yourself, using a set of long nose pliers, push and turn the old 'stat to remove it. Do the same to fit the new one. Slot it back into place, tighten the bolts up, refit the hoses and refill will coolant.

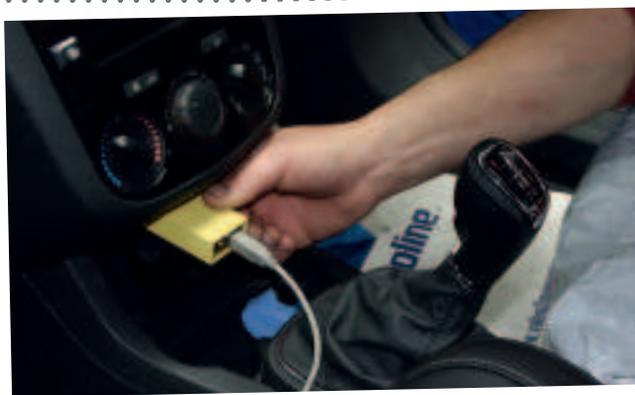
THE MAPPING

With the modifications fitted, Courtenay then do a second complete diagnostic check of the car to make sure there are no fault codes present. They then load the Stage 3 map onto the ECU. They have a huge number of maps written for modern Vauxhall turbos - although engines may seem identical, many operate within different parameters.

To ensure the map is right for the car, it's road tested with Tech II connected to check the level of 'knock' on each of the cylinders. Knock is also referred to as detonation, where the mixture ignites by a source other than that of the spark plug. It can be caused by a number of things relating to fuel, air and spark among others and if it's not dealt with it creates 'hot spots' in the combustion chamber, causing pistons to break up, i.e. engine failure.

The maximum the ECU can adjust is 12 degrees of ignition timing. If a map is showing that the ECU is having to retard the ignition under boost by six degrees, then the engine has lost half of its operational safety margin. If the level is too high, then a new map will be loaded. Courtenay strive to ensure the level is as low as possible, hence the reason they have such a wide range of maps.

The road test on our car was successful, with hardly any incidence of knock retard at all. Once complete, the car is brought back in for a session on the rolling road to check the power it's making. Our test car made 240 bhp and 250 lb/ft torque. On the road, in comparison to standard it's a revelation and gives the Corsa VXR the performance it thoroughly deserves.



COSTS

STAGE 3 PACKAGE, FITTED £2359

Includes: Magnex 70 mm exhaust system including front pipe and sports cat, high flow intercooler, Stage 3 software, rolling road set up. (Prices for individual parts below are for supply only, not fitting).

EXHAUST £899

INTERCOOLER £675

SILICONE HOSE KIT £98.50

COOL STAT £23.50

COMPANY BACKGROUND

Courtenay turbocharged their first Vauxhall – a Mk1 Astra GTE - way back in 1984, and it wasn't long before they'd applied their expertise to every model in the range. The company started out as a franchised Vauxhall dealer, but moved to concentrate solely on tuning in 1990.

Notable project cars include Max Power's Project Thunder Carlton GSi 12v, which was turbocharged by Courtenay, and Vikki Bulter-Henderson's 20XE Nova, which was used in one of Jeremy Clarkson's videos.

Company founder Chris Courtenay sold the business to employee Jon Shield in 1999 and he continues to run it today, along with partner Sarah Hunter. Today, the company continues to develop tuning packages for all modern Vauxhalls, as well as offering servicing and a huge range of performance parts.

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