

## Black Top Zetec breathing easier

Ever since I have had my 2002 4/4 (last 2 years) I have followed with interest various discussions on improvements to the cars performance. We all understand that the 4/4 is not an all out 'Thrashmobile' but I have always been one for getting the best out of what I already have. The following solution has been very satisfying and certainly appears to increase the breathing and also seems to remove what I thought was a vibration from the gearbox on acceleration I know believe this may have been a starvation of air to the engine as it has now all but disappeared.

The discussions I have read suggest that the starting point is to improve the 'breathing' and the exhaust side of this little 'Revver'. There seems to be plenty of aftermarket Induction Kits from Pipercross, ITG and K&N to name a few for the Ford Focus 'racers' but these all appear to end up with a conical filter that has to be strapped/fixed in the engine bay and inevitably has to extract hot air from behind the radiator and the engine bay. From what I hear from other discussions, not the ideal solution. So I decided that I would have a go at it myself and what follows is a description of my alternative solution.

Firstly the standard air filter and the air box.

This as we know is from the Ford Focus and appears to work well in the position ahead of the engine and accepts the inlet from the camcover breather (I have also read that shortening the distance from the throttle to the EMC sensor may be problematic so why take the risk. However, it all seems to go a bit 'wobbly' when you follow the convoluted path the air take as it is taken from the bottom of the car through a somewhat narrower flexible pipe and then around a couple of tight bends. Part of this is obviously from the Ford Focus and must follow the contours of the front wing of this Ford. So it makes sense to find a smoother route culminating in a 'Ram Air' system that will force cold air into the system through a reasonable sized duct.



### Here is my 'fix'

Remove the airbox taking care to remove the airflow sensor cable and releasing the jubilee clip to the end of the large hose from the throttle housing and gently 'jiggling' it out from its carrier. I had elected to replace the standard filter with one from K & N (these were very reasonable purchased direct from K & N Online and arrived in a huge box the very next day!) this has no doubt the majority of the improvement but it is worth making the most of it by improving the ducting. Once the airbox is removed the top of the ducting can be seen protruding through the aluminium cast platform that holds it. To remove this simply cut the large cable tie that holds this to the cross frame (being careful of the electric fan cables!) and jiggling it free from below. (It is a good idea to jack and secure the front of the car to a reasonable height to allow simpler access).

Once removed now the fun begins...the airbox has to be very subtly modified. The underside of the airbox that fits onto the duct has a hole that has a number of 'fillets' that serve no obvious purpose and are to be removed to allow the new pipe and 'fitting' to fit around the outside of this rather than

internally as the original arrangement. This is easily done with a sharp knife or junior hacksaw. This is the only modification required to the Airbox. The new duct fitting is formed from a Rainwater fitting available from builders merchants (mine came from Wickes!). The fitting is normally used to join 65mm downpipes together and is perfect as it has the diameter required to take the Airbox flange and the reduced diameter to fit the 63mm Silicone Ducting that was purchased for the new duct. (Available from Car Enthusiast shops and I got mine from [www.cbsonline.co.uk](http://www.cbsonline.co.uk) by the metre.) The silicone duct then fits neatly on this and I used some Amalgam tape or a cable tie can be used. Before this is done the Rain fitting has to be 'tailored' for the job by reducing the depth of the larger diameter section so that the upstand is around (4 cms or 1 ½ inches) otherwise the airbox will not bed down on the carrier properly. Currently I have left this as a 'close'fit between fitting and airbox as there appears no requirement for an airtight seal at this point.



One of the fillets removed from the Airbox

Once done, pass the duct with fitting attached into the hole in the carrier (if you are using cable ties it may be necessary to do this after the duct and fitting is dropped into the hole due to the tight clearance for the silicone ducting). Now we need to secure the bottom end of the hose with a suitable fitting. Again the Rain fittings provide an ideal solution in the form of a circular to square down pipe adaptor! I elected to alter the shape by cutting a wedge of the square section and this allows it to be strapped to the front axle and 'present' a wide section to 'scoop' cold air from under the car. (Although this was complicated due to the under body cowling that is fitted to my 'Le Mans 62' Anniversary model of a 4/4) I used two long cable ties criss-crossing holding it secure with the duct cut to a suitable length to form a 'smooth' path and ensuring clearance from the bottom radiator pipe (although as the duct is silicone this will not be a real problem) and also ensuring clearance from the auxiliary belts. Some tweaking may be available for other cars as there may be more space to fit the end.



A more direct route

I estimate the cost to be well under £ 70 (including the filter) and certainly cheaper (and easier) than alternatives and still retains the majority of the standard components.

I hope you have success with the above and happy motoring.

*Keith Hofgartner*

*As a note I have yet to try the modification to the Air Valve that has been published in the past to alleviate the dreaded overrun that effects Zetec'd 4/4s The above modification has not improved (or worsened!) this problem. At least I found where to put it when I make a modification plate after grovelling underneath the car*

