

Fitting the Bell Auto Services (B-A-S) TDV6 EGR Blanking Kit to a 2006 model Discovery 3 TDV6 HSE

Before I describe how I did this, I must first thank other members of the Disco3.co.uk forum (namely J.moore and Discoeast) whose procedures I printed and followed. I have written the procedure again because the B-A-S kit is different to the one they used, as will become clear when you read on. Also, a great big thanks goes to Pete from Bell Auto Services for allowing me to test the blanking kit on my car.

I must also add a disclaimer:

You do this modification at your own risk. I won't be held responsible for what I have written here. This is what I did and it worked for me but, it may not work for you.

My D3 is a MY06 model and is now out of warranty. Personally, I wouldn't do this mod to a car that was still in warranty as any dealer worth his salt should fix any EGR problems for free. I once suffered an EGR problem when my car was still in warranty and it was all sorted for me but I feel that these valves are a problem just waiting to happen again so I have done the mod in the hope that it will prevent the loss of power that is usually associated with EGR faults – sods law says it'll happen again when I'm towing our caravan around France on holiday!

Here's a picture of the kit that Pete at Bell Auto Services supplies:



The kit doesn't just blank off the EGR pipes at the valve ends – the pipes are removed completely and blanks fitted to the EGR valves and the butterfly housing. You will need all 4 O-rings – 2 are fitted to each of the butterfly housing blanks (the 2 bigger ones in the picture).

Remember, reference to *right hand* and *left hand* is as viewed from the rear of the car, not from where you are stood (at the front facing rear I hope!!). I didn't want to use the terms 'nearside' and 'offside' because they have different meanings depending on which side of the road you drive!

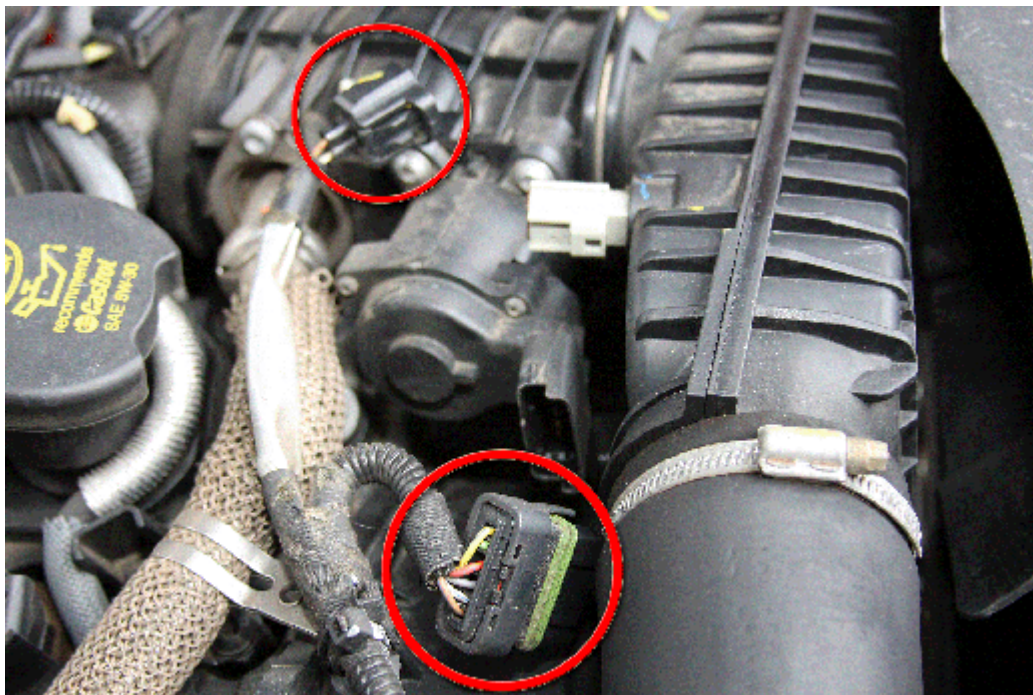
Right, let's get to work. First remove the oil filler cap, and then remove the engine top cover by gently pulling up on each corner.

Refit the oil filler cap – you really don't want to drop anything down there do you!



View of engine with top cover removed – right hand EGR valve shown in inset

Now unplug the EGR butterfly valve actuator and air box connectors



Butterfly valve connector (lower) and air box connector (upper)

At this point, it's a good idea to spray some WD40 onto the bolts securing the EGR pipes to the valves. The bolts get pretty corroded because of where they are and we don't want them to shear off do we!

Have a good look at the clip securing the air box to the EGR butterfly valve housing to see how it's fitted and make a note (mental or otherwise) of this. Now remove the clip. Apparently, you can do this by inserting a screwdriver in the upper looped part of the clip and twisting; but I found I also had to pull the left hand lower part of the clip out of the groove in the air box before it would come out.



Air box to EGR butterfly housing securing clip

Loosen the jubilee clip securing the air inlet pipe to the right hand side of the air box then disconnect the pipe from the air box.

Note. The jubilee clip is secured to the pipe with some sort of retaining clip and will not slide down the pipe so just loosen it enough to clear the lip on the air box.



Air inlet pipe to air box jubilee clip

Completely undo the bolt securing the lower part of air box and remove the air box.

Note. Be careful here. This bolt is fairly long and although it can probably be removed completely, to do so means pulling it forward into the cooling fan blades. There's not a lot of room and I felt that I would probably drop it so I held it in place with my fingers so it came away with the air box.



Air box lower bolt

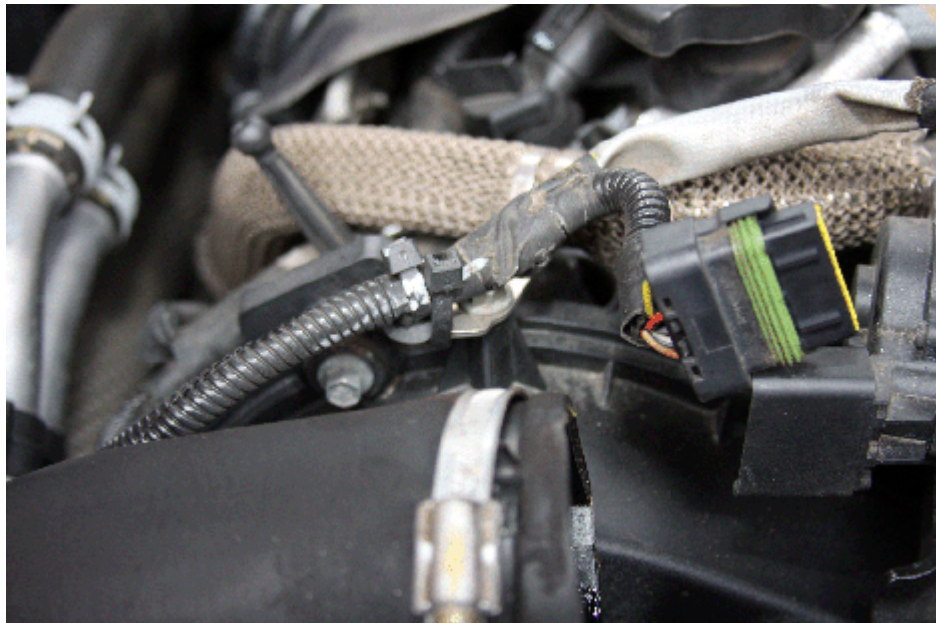
Warning. From now on, take great care not to drop anything into the now open EGR butterfly housing. If anything ends up in there and the engine is started, severe damage is likely to result. Not only that, be very careful where you put the air box – you may not notice if anything falls into it or your kids decide it would make a good receptacle for bits of gravel etc.



Air box removed

Remove the cabling from the right hand and left hand EGR pipe brackets. On my car, the right hand cables were secured with tie-wraps (see upper photo below), but the other side was secured with a push-in plug thing (see lower photo). Yours may be different.

Warning. If you have to cut tie-wraps, try not to cut the cables!



Tie-wraps – right hand EGR pipe bracket

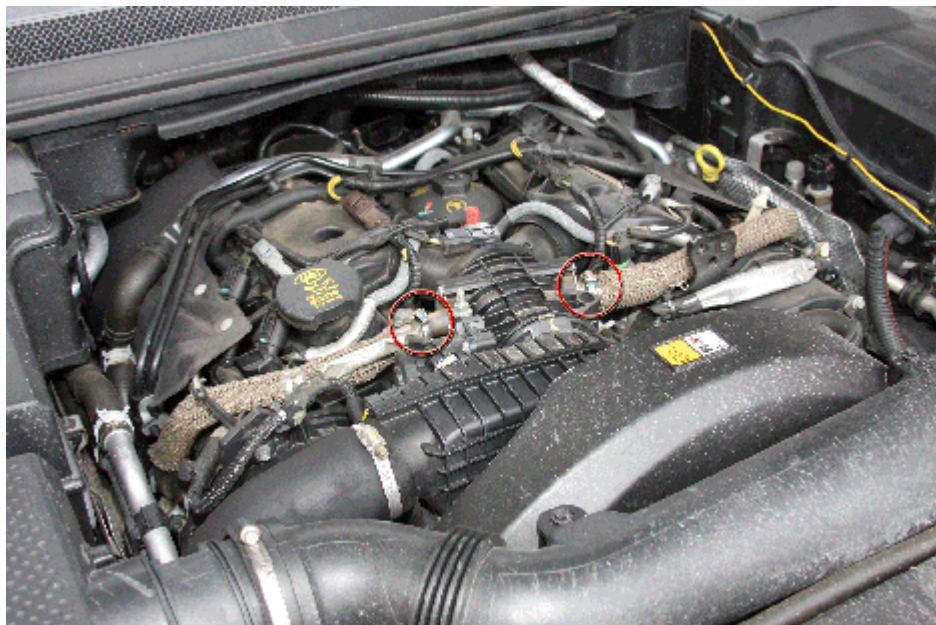
Remove the 8 mm bolts securing the right and left hand EGR brackets to the plastic casings.

Note. This is the left hand bracket.



Left hand EGR pipe bracket

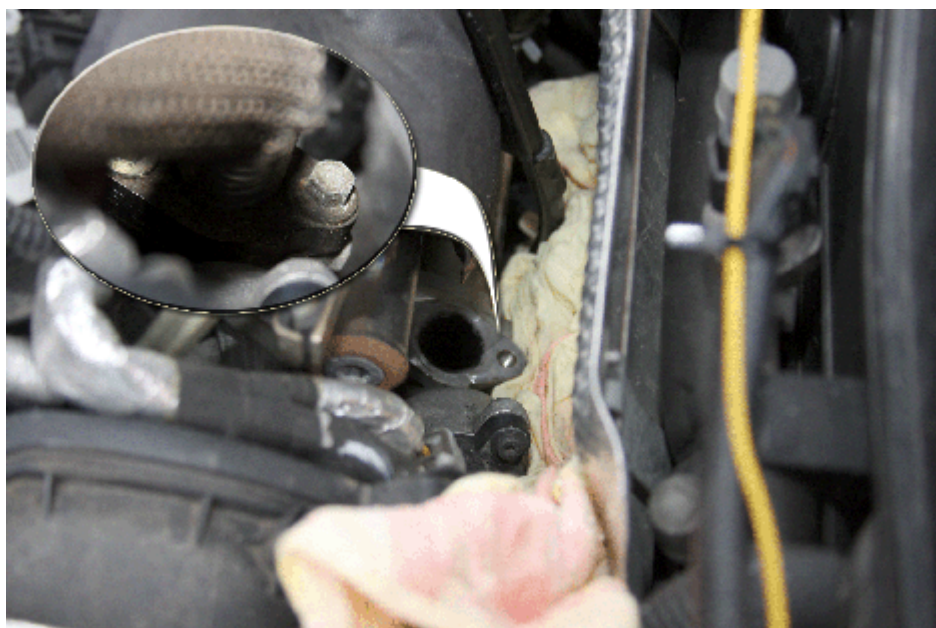
Using a suitable screwdriver, unclip the EGR pipe clamps either side of the EGR butterfly housing. Insert the screwdriver under the little clip across the top of the clamp and twist. Later on we'll be removing the stub pipes and flanges from the butterfly housing when the bolts are easier to get to. (The yellow wire in the upper right corner of the photo is the FBH remote timer control wire in case you're wondering).



EGR pipe clamps

Things get a lot trickier from now on so you need to take some precautions. Access to the left hand side EGR valve is pretty tight and the right hand side is worse. It's a good idea to stuff some rag down beside the valves so if you drop anything (I dropped the gasket!) it can't go anywhere.

Remove the bolts securing each EGR pipe to its valve and remove both pipes. I undid both bolts completely and carefully pulled each pipe out, with the bolts in the pipe flange. You could also put grease in your socket and get the bolt out that way – whatever works for you. Don't lose the bolts or the gaskets – you'll need them!



EGR pipe flange bolts

Now to fit the blanking plates to the valves. There is a small 'indent' in each plate that matches an indent in each pipe flange. Match them up to ensure the indent is in the right place when you fit the blank. Put the gasket on the underside of the plate. You can use gasket goo if you want – I didn't but only because I didn't have any!

I didn't find this at all easy but with care and perseverance, it can be done. I inserted one bolt into the hole that would be nearest the engine block in the first blanking plate and gasket then, holding the plate and gasket in one hand and holding the bolt in place with a grease-filled socket and suitable extension in the other hand, I manoeuvred the whole lot into place until I was able to get the bolt to drop into its hole. Do up that bolt a little then fit the other one using the grease-filled socket. Tighten both bolts and then repeat the procedure for the other valve blanking plate. The arrow in the photo below shows the indent in the left hand EGR valve. Just to the right side of the red circle you can see the dip-stick tube – there's a bit of insulation that I had to fold back and tuck behind the dip-stick tube to keep it out of the way. Don't forget to put it back to where it was.



EGR valve blank fitted – indent arrowed!

Once you have fitted both blanking plates, whatever you do, don't forget to remove the rags you stuffed down beside the valves or your precious D3 is likely to go up in flames when you take it for a test run!

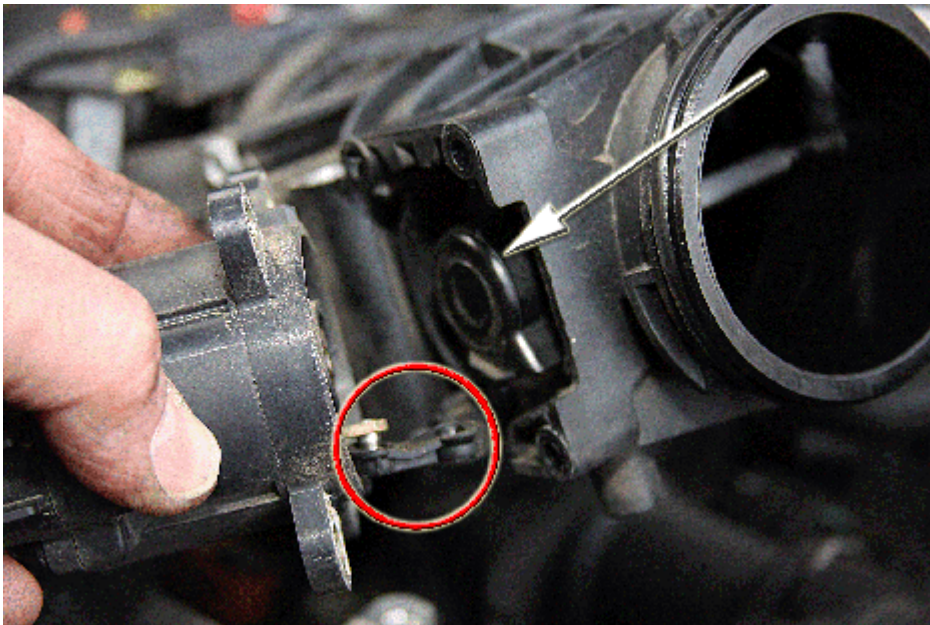
Right, now for the bit that I was least looking forward to doing – removing the butterfly from the actuator shaft!

First thing to do is remove the long bolt securing the butterfly housing (circled in yellow in the photo below). Once that's out, carefully raise the front of the butterfly housing. You should find that although it's a bit stiff, the bits of the 'Y' duct circled in the photo below will swivel at the points where they connect into the rest of the ducting. Don't raise it too far like I did or you will snap the lugs on the connector (arrowed in the photo) that secure it to something back there. Everything seems to work OK so I don't seem to have caused a problem (other than the connector now flops about a bit!)



Raising the butterfly housing. It will swivel where circled but don't go mad or you'll break whatever is holding the connector(arrowed) to the back of the 'Y' shaped duct like wot I did!

Now remove the 4 TORX screws securing the actuator to the butterfly housing and remove the actuator.



Removing the actuator. The little black thing (circled) is the bit that links the actuator arm to the butterfly spindle.

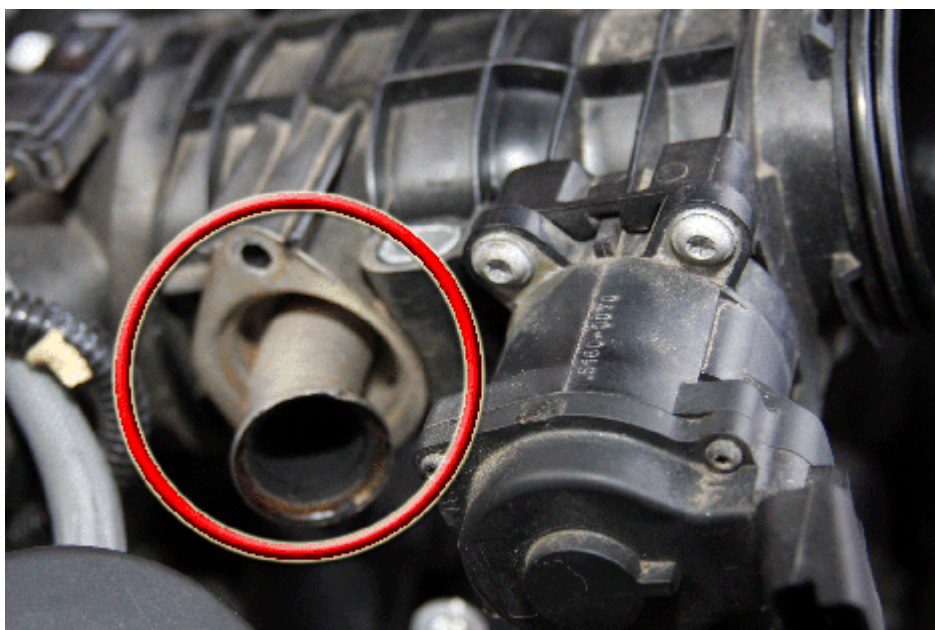
OK, now to get the spindle out of the butterfly! I inserted a screwdriver under the black part on the end of the spindle – the part the actuator arm connects to (arrowed in the picture above) and used that as a lever to pull the spindle out of the butterfly. It's a tight fit so you will need to use a bit of force to get it moving and I must admit, my heart was in my mouth while I did this but eventually, it did begin to move. Be careful though – the edges of the butterfly housing where the actuator fits are fragile and I managed to crack one slightly but no real harm done. There is a cut-out portion at the bottom of the housing and I eventually put the screwdriver in there and under the end of the butterfly spindle – the housing body is more substantial there and able to withstand the amount of pressure you will have to use to get the spindle moving.

As the spindle is withdrawn, it becomes less of a tight fit in the butterfly and you will eventually be able to complete pulling it out by hand – holding on to the butterfly with the other hand of course and pulling that out of the front of the housing.

Right – the rest is easy-peasy now!

Refit the spindle to the housing and replace the actuator, ensuring you connect the little black link arm to the protrusion on the end of the spindle. You should find that as you locate the actuator into its fitted position, the little black link arm sort of folds up toward you into the actuator housing, pushing the spindle into what would have been the butterfly valve open position. Secure the actuator with the 4 TORX screws. Remember you are screwing these into plastic so don't over-tighten them!

Now remove the TORX screws securing the two stub pipes to the butterfly housing and remove the stub pipes, ensuring that their O-ring seals don't get left behind in the housing.



Removing the stub pipes. Remove the TORX screws and pull the pipes out. The O-ring seals might get left behind in the housing – dig them out as well.

Here's a picture of one of the stub pipes.



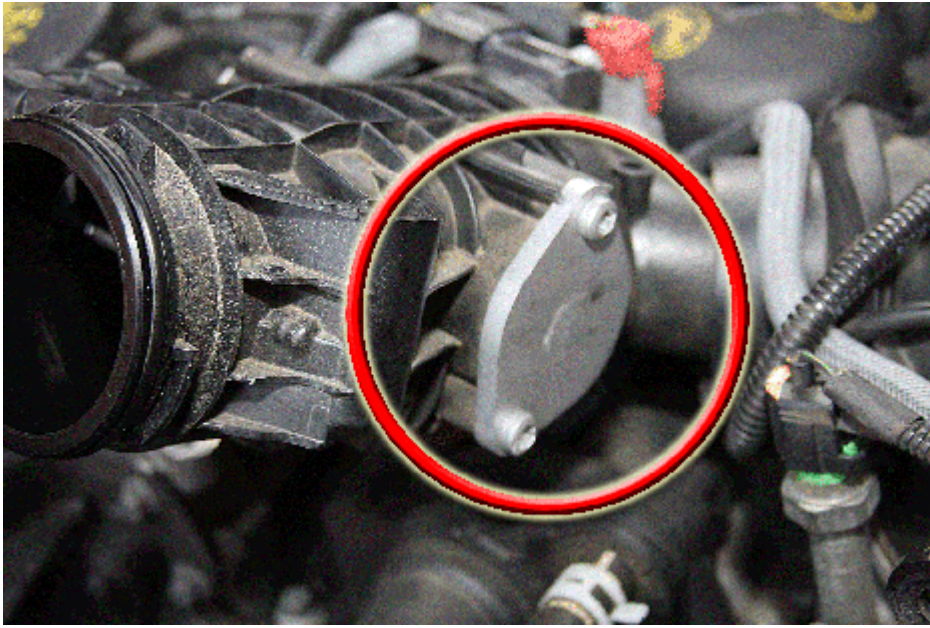
Look at the gunk on it! This is what the EGR valves are making your engine eat on a daily basis! Ugh!

The inside of the butterfly housing looks like this too. If I could have taken the housing off the car, I would have cleaned it but I couldn't so I didn't – reason being I didn't want to run the risk of dislodging any pieces of c@@p that would then end up in the engine. Mind you, I suppose that some of this gunk must break free every now-and-then and end up in the cylinders so maybe I was being a bit over-cautious.

Anyway, the choice to clean or leave alone is entirely yours!

These stub-pipes also present quite a large obstruction to the air flow to the engine. When fitted, they meet in the middle of the air intake duct. The engine must be able to breathe much more freely now they are out!

Fit 2 O-ring seals to each of the 2 blanks from the kit, and then fit each blank to the butterfly housing, securing them with the TORX screws. Again, don't over tighten them – you are screwing them into plastic don't forget!



Stub pipe blank fitted.

Push the butterfly housing back down into place and secure it in place with the long bolt (see photo on page 8).

Refit the air box. I held the long bolt that secures the bottom of the air box in place with my fingers while I positioned the air box and pushed it onto the front of the butterfly housing. Screw the long bolt in a bit to get it started, and then refit the clip that secures the air box to the butterfly housing. Ensure that you fit it the same way round that it was fitted before (you did make a note of this on page 3 didn't you?) and that it locates correctly in the groove in the air box.

Refit the inlet pipe to the right hand side of the air box and tighten the jubilee clip.

Now tighten the air box lower securing bolt.

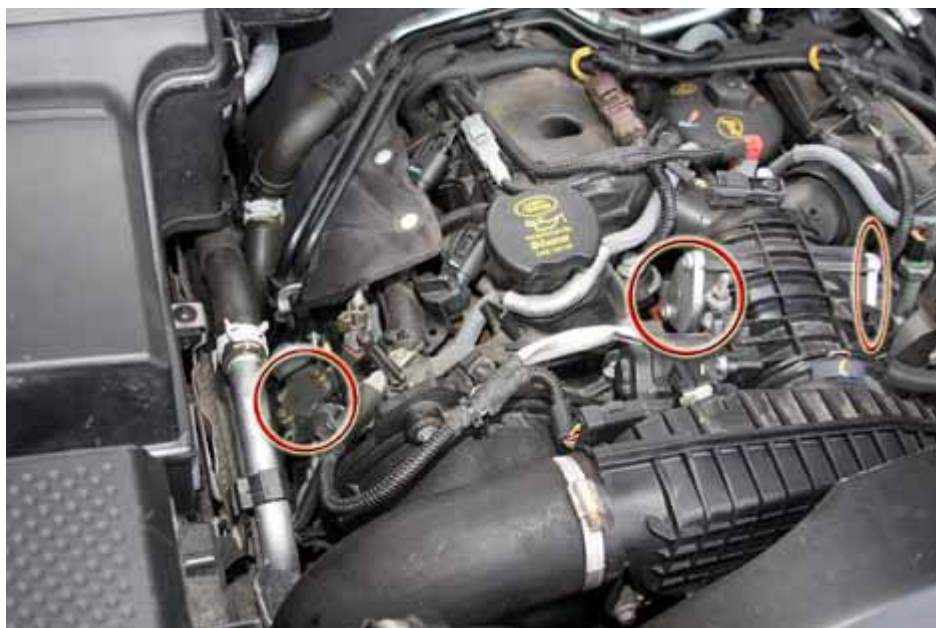
On page 5, you removed the cabling from the brackets on the EGR pipes. One problem with this kit is that because the brackets are part of the EGR pipes, you end up with nothing to secure the cabling to. The brackets wouldn't be impossible to take off the pipes but as I have saved all the removed parts (just in case!) I didn't want to jigger anything up by removing them.

What I did was to put an almost closed tie-wrap around each bolt, and then refitted each bolt, trapping the tie-wrap beneath it. I then put another tie wrap through the small loop I had left in the first one and used this to secure the cabling again. A bit Heath-Robinson but it seems to have worked! This is a photo of the right hand side to show you what I did:



Reconnect the EGR actuator plug and the air box plug.

Have a good look round to ensure you haven't left anything lying around the engine (especially any old rags you may have stuffed down by the EGR valves!!) and to satisfy yourself that everything is connected and tight. Your engine bay should now look like this:



Job done! EGR blanks circled.

Once you're satisfied everything is as it should be, refit the engine top cover then take your D3 for a spin to make sure all is well.

You should have these bits left over:



Put them somewhere safe in case you need to refit them for any reason.