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Caterham JPE Induction System Fitting Guide

Introduction

This kit was conceived for the limited edition Caterham Se7en Jonathan Palmer Evolution (JPE) but can be suitable for any vehicle running a Vauxhall XE engine with a high power output (up to 300BHP). Air is picked up by an intake blister mounted on the side of the nose fairing and feeds a high flow air filter housed in a composite filter canister. This then routes the air into an airbox mounted to the inlet trumpets via a bespoke backplate. The 'Caterham JPE Induction Kit' is available with Carbon Fibre or Glass Fibre pre-preg material options.

Testing showed that as well as significantly reducing the drive-by noise of the car (through attenuating induction noise), driveability was also improved. The test car demonstrated improved acceleration through gears (1.8s faster 40 to 100 mph), better throttle response and a higher ultimate velocity.

ReVerie Parts Included

The JPE induction kit includes the following ReVerie components:

- 'Hockenheim XE100' Airbox Kit (box, XE backplate & fittings)
- Daytona 230 Filter Canister Kit (with X Flow filter & 1x75mm, 1x58mm inlet cap)
- R500 Blister Intake (UK Passenger Side)
- Snorkels (1x58mm 45°, 1x75mm 45°)
- Ducting (58, 75 & 100mm)
- Hose Clips
- Choke Hole Template for Weber Alpha Throttle Bodies

Tools and Materials Required

No specialist tools or equipment are required to fit a ReVerie induction kit. For best results we recommend using the following tools:

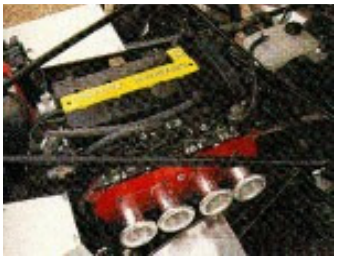
- Set of Spanners (for removal of trumpets)
- Flat Head Screwdriver (for hose clips)
- 3mm Allen Key (for airbox fasteners)
- Drill Bits (to drill clearance holes for the inlet trumpet fixings and pilot holes for the choke hole centres)
- Hole Saw or Dremel with grit/diamond tip cutter (to cut choke holes/snorkel entries)
- Rotary Sander (for careful enlargement of choke holes)

To make installation easier, having the following materials to hand is advisable:

- Thread Sealant (such as Loctite Threadlock)
- Air Filter Oil
- Spray Mount Adhesive
- A piece of A3 paper
- Self Adhesive Foam

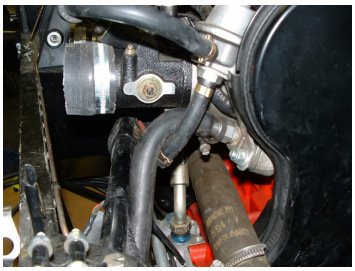
Instructions

Please read fully before starting installation. If using a flat backplate read the appendix.

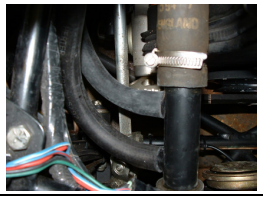


1. Remove existing air filter from the engine and leave trumpets attached to throttle bodies/carbs.

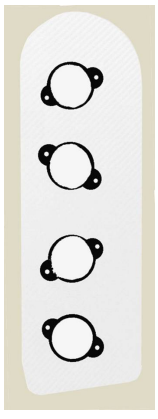
2. To allow for the installation of the induction system it is necessary to move the coolant bottle from its original position. ReVerie recommends mounting it on the engine bay bulkhead and lengthening and altering the coolant hoses, as shown.



3. Lengthen and alter the coolant hoses, as shown. Note particularly the hose coming off the inlet manifold and running down to the twin take off connector on rad hose (twist this round and down as shown).

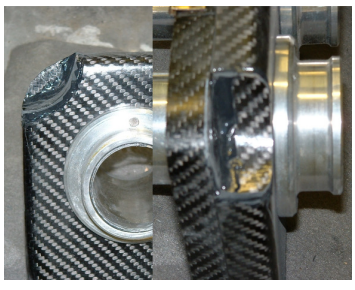


4. Offer up the airbox without its backplate to check for clearance. It is possible that the airbox may require some trimming to ensure it doesn't foul the front mudguard on full lock. Use of a template might make visualisation of this easier. Once happy that sufficient space is available bolt the airbox to the backplate ready for the next stage of fitting. Note that there should always be at least a 25mm gap between the airbox and trumpet mouths.



5. If running with Weber Alpha throttle bodies it is a simple task to mark out the backplate and this stage can be skipped.

   If Weber Alphas are not fitted, use a small amount of spray mount adhesive to attach the paper to the backplate. Remove the inlet trumpets from the carbs or throttle bodies and rub grease/vasoline around the trumpet mounting face. Carefully position the airbox so that the backplate is in the correct position relative to the throttle bodies or carbs (making sure that the airbox is at the correct height and angle to package inside the bonnet or fit through the bonnet aperture as applicable) and then push the backplate firmly against the greased surface to leave a clear imprint of the fixing and choke

	hole details. Note that if space is tight the airbox may require trimming before this stage can be achieved. If this is the case please follow the trimming instructions (Note 5.) shown below.
	6. If you are happy with the quality of imprint or are using the template, remove the backplate from the airbox. Mark the centres for the choke holes and all the fixing holes. Drill all the fixing holes to the appropriate size and small pilot holes for the choke hole centres. Then cut the choke holes. To cut a clean choke hole we recommend the use of a grit/diamond tipped hole saw or a Dremel with an appropriate attachment. The size of the choke hole can be increased by using a rotary sander with care (use 80 or 120 grit). Holes for other features (e.g. air flow sensors etc.) should also be cut at this stage. The location of these is best achieved through use of a template from the previous backplate used.
	7. Some throttle bodies, including Weber Alphas, require the trumpet bases to be pressed off the trumpets. The bases are often bonded in place and heat might need to be applied to weaken the adhesive. Once apart the trumpets can be pushed through the carbon backplate before being rebonded (with DP490) and pressed back together. In the case of the Weber Alpha system, the trumpet bases are threaded allowing direct fixing to the backplate via bolts.
	8. If the airbox requires trimming for packaging purposes (i.e. bulkhead/body in the way, fouling condition with steering on full lock etc.) this can be easily achieved. Whilst the composite can be cut using a hacksaw the cleanest cut is achieved by the use of a diamond or carbide cutting disc tool with a high rotational speed (such as a Dremel). It is best to take a rough cut first and then double check measurements before making a final precision cut.
	9. Bolt the backplate to the carbs/throttle bodies with the inlet trumpets in place or push the trumpets into silicon hoses and clamp as appropriate. Refit the airbox and ensure there are no foul conditions. Where the airbox protrudes through the bodywork small amounts of trimming might be required if the airbox is larger than the previous foam filter.
	10. The Weber Alpha throttle bodies cause the standard ReVerie XE backplate to interfere with the throttle cable. This might also be the case with some other systems. If the kit is ordered for the Weber Alpha system the backplate will be supplied with a minor modification to allow clearance (as shown). This is simply achieved cutting away the section causing a problem and bonding thin, flexible flat sheet carbon in place with DP490.

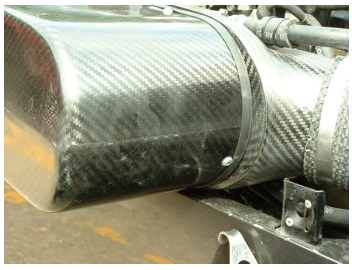
11. It is now possible to locate the 'Daytona' filter canister. ReVerie suggests cable tying this item to the 'X' brace to the rear of the anti-roll bar (as shown). To minimise any problems of wear and rattle it is recommended that a small amount of self adhesive foam is applied to the chassis frame in this area. The canister connects to the Airbox via a short length of micropore ducting (as shown).

12. Fitment of the nose blister requires patient marking and careful sanding of the components to ensure the best fit. Always remember – measure twice, cut once! Offer up the blister to the nose fairing so that it sits in the correct place (as shown). Then mark the outline of the blister using a marker that can be wiped off without damaging the paintwork. The snorkels should be located as far back on the nose fairing as possible and inclined so that they point rearwards. It is worth checking clearances behind the nose fairing before committing to a location.

Once happy with the position of the blister and snorkels it is possible to begin fettling parts for final fit. The blister may require light sanding in places to give a perfect fit due to variations in manufacture of the nose fairing. The snorkel holes can be cut out using a hole saw or Dremel and a drum sander or similar used to elongate and smooth the holes.

13. The snorkels can now be bonded in place using MMA310 adhesive. The area to be bonded on the nose and snorkels should be sanded with 180 grit and then thoroughly cleaned and degreased. Initially tape the snorkels in place and refit the nose to finally ensure that there is no risk of fouling on suspension components, chassis or the radiator bracket. Once the correct position and orientation is finalised mark around the mounting flange on the nose interior. Measure out the correct amount of each part of the adhesive and mix together well before applying it to the snorkel flange. Enough adhesive should be applied so that a small amount of adhesive is squeezed out of the edges of the flange when pushed into place. When in the correct position, fix the snorkels in place using a clamp or good quality tape. The adhesive will take 1 hours to cure at room temperature.

(NB. The nose fairing shown is not representative of the JPE installation)

	14. To fix the nose blister in place M4 bolts are used. The blister is supplied with angle brackets bonded in place & M4 deep threaded U-Nuts. Drill pilot holes through each bracket and offer the blister back up to the nose fairing. With care it should be possible to mark hole centres on the nose fairing through the pilot holes. These can then be drilled, again with a pilot, and an additional check made to ensure the holes line up. Open out the pilot holes to the appropriate size for the bolt being used and fasten the nose blister in position. If a perfect fit has not been achieved, it might be desirable to run a bead of flexible sealant around the edge of the nose blister to provide a clean join line and ensure no air can 'leak' from the blister.
	15. The 58 & 75mm lengths of micropore ducting are used to connect the snorkels to the 'Daytona' inlet cap. These can now be connected and held in position with the hose clips provided.
	16. The airbox can now be semi-permanently attached to the backplate. The deep threaded U-nuts and fixing holes can be moved to wherever is most appropriate for best access as shown (positions provided in factory items are only for guidance). Use thread sealant on all the bolts and screw into place so that they are all hand tight.
	17. To finally connect the induction system together the nose fairing has to be carefully replaced. The airbox should be firmly attached to the filter canister via micropore ducting and the inlet cap attached to the snorkels on the nose fairing. Also ensure that the cone air filter is in the canister with the screw heads on the hose clips in an easily accessible area.
	18. As the nose fairing hinges down into place it should be easy to locate the inlet cap into the rubber extension moulding on the cone air filter. Once in position and pushed fully home, tighten the hose clip to hold the inlet cap in position. Connect the engine management MAP air pressure sensor to the airbox with a length of 4mm vacuum hose through a grommet in the backplate.

	19. The induction system is now fully fitted. All connections should be checked, especially those that are downstream from the cone air filter. If any of the ducting were to come loose after filtration it is possible that debris could reach the engine and cause serious damage.
	20. Everything is now in place and the new induction system can be enjoyed!

For best performance the cone air filter, housed in the 'Daytona' Canister, should be cleaned regularly using detergent and lubricated with proprietary filter oil. If you have any queries or questions regarding installation, contact ReVerie using the details shown on this fitting guide.