



Jeep Geek

GARAGE

TECH TIPS & BUILD UPS

Installing a Cowl Induction In Your Jeep XJ

by Brian Ritchey

There are many options in the way of performance intakes for Jeep Cherokee's today. Many of them involve removing the factory air box and installing a "cold air intake" with a high flow cone air filter. These kits may help by increasing airflow, but the engine's intake air is drawn from inside the hot engine compartment. In addition, the Cherokee's inherent overheating issues lend to a very hot engine compartment. This hot air intake can actually reduce the performance of the engine.

Trail Head Off Road (THOR) has come up with a solution for this with their Cowl Induction kit. This kit uses a similar high flow air filter but moves the filter outside of the engine compartment into the cowl. Cooler air can then be drawn directly into the engine from outside the engine bay, thereby enhancing performance.

Cowl induction is used in many forms by race and sports cars to improve performance. When at highway speeds and faster, a high-pressure "bubble" forms just forward of the windshield. By placing the intake near this high-pressure bubble, the engine actually receives a "forced" intake charge as the higher-pressure forces air into the lower pressure of the intake. This means less work by the engine goes into pulling in air and subsequently goes into power output. Additionally, the combination of the colder intake charge and the ease of induction tend to increase fuel mileage in most vehicles.

In a Jeep, high-speed performance is not necessarily the goal for most people. For many of us, performance on the trail is of utmost concern. This is where the THOR 4x4 kit shows an added feature over its competitors. By moving the intake to the cowl, you remove some of the risks involved in crossing deep water.

When fording through water, vehicles tend to push a "bow wave" ahead of the front bumper, which can be higher than the actual depth of the water. The factory intake box has its intake just above the top of the bumper, which could allow water from the bow wave directly into the intake causing devastating effects to the engine. By moving the filter to the cowl, it not only raises the height of the intake but also places it back further away from the bow wave. The water level would have to be up over the hood before reaching the filter, at which point the driver is probably in a lot more trouble.

Installing the THOR 4x4 Cowl Induction kit is fairly simple and requires basic hand tools and common power tools. Installation is generally takes about two hours.



1) These are the contents of the kit.



2) Begin by removing the two screws that hold the evap solenoid bracket to the firewall. Also remove the wiring harness from the plastic loops along this area of the firewall. Place the heat shield in place and mark the approximate location of the hole. You may have to bend the side of the heat shield slightly to get a good fit.



3) A larger circle was then drawn on the approximate center of the hole marking. This circle is about 4.5" to match the largest diameter of the filter. This is just a starting point for your hole as you will end up trimming quite a bit more to fit the filter due to the angle of the firewall.



4) There are many ways the starting hole can be cut into the firewall. A 4.5" hole saw can be used, but these can be expensive if bought new and difficult to control using a hand drill. An air grinder with a cut-off wheel can be used but may require more work to get a round hole. Here it was decided to start by using a 1" hole saw at several points inside the perimeter of the 4.5" circle. No matter what method you use, take precautions and cover the engine compartment to keep metal debris off of your engine and components, and to protect from damage by flying sparks.



5) A jig saw was then used to cut away the edges of the holes.



6) Now take your filter and the short tube and assemble them. The short tube will make it easier to handle the filter while trimming the hole in the firewall for proper fit.



7) Due to the angle of the firewall, most of the trimming will take place at the upper side of the hole (arrow). Trim a little at a time and check the fitment with your filter. When the hole is large enough, the filter will hit the back wall of the cowl when installed. Here you can see the filter fully inserted into the firewall.



9) With the filter fully installed in the firewall, place the heat shield over the tube and install the four supplied self-drilling sheet metal screws using a power drill. You can then install the 90° elbow, power tube, and factory intake elbow. Use some white lithium grease when installing the rubber components to help them slide on.



8) Here you can see the filter fully installed. As you can see, it is protected from direct exposure to the elements because the cowl is only open to the outside on the driver's side of the rig.



10) To get a proper fitment on the factory intake elbow, you will need to fit the supplied hose clamp under the tabs in the rubber that retained the original plastic clamp.



11) Very Important: When reinstalling the factory intake elbow on the throttle body, make sure that the clamp is rotated so as to not interfere with this tab on the throttle linkage (arrow).



13) Reinstall the evap solenoid bracket to the two holes in the heat shield using the original screws. In this example, the wiring harness had to be pushed down and the bracket brought over the top of the harness.



12) The plastic Crank Case Ventilation (CCV) tube will need to be relocated to the power tube. To do this, pull the hard plastic hose from the fitting on the factory air box and from the hose coming off of the valve cover. You can then use a hack saw or possibly a box cutter to shorten the hard plastic hose to, and then connect the rubber hose from the valve cover to the nipple on the power tube.



14) Check your dipstick for interference with the power tube. You may need to bend it slightly to clear the tube.

You can now remove your factory air box by removing the two screws and one nut in the bottom of the box (under the filter).

Our first impressions of the installed THOR 4x4 Cowl Induction kit are good. When starting the engine, a dull whoosh of air can be heard from under the dash but quickly fades once the engine is idling. At speed on the road, the sound was hardly noticeable except when under hard acceleration. We did notice a slight increase in throttle response, and on the trail we had increased confidence in crossing deep water holes with less worry of drowning the engine.

For more information on the THOR 4x4 Cowl Induction kit or to place an order, contact Mike at THOR 4x4 through his website at www.thor4x4.com.