



## Walnut Blaster

Carbon is one of the most abundant elements on Earth. It can be found everywhere and is an important part of many things. Without carbon to hold us together, we humans would be little more than large puddles of water on the floor. As important as carbon is to us and our planet, I know one place where I would rather not find it. That's in the form of hard-to-remove deposits on the back side of intake valves.

How do you deal with carbon deposits? Do you tell your customers "they all do that" when you hear complaints about driveability? Do you tell your customers that they will have to live with the problems that these deposits can cause? Or have you decided to try the several different methods that have been developed to remove the deposits?

Probably the most basic method of removing valve carbon deposits is to disassemble the cylinder head and manually clean the valve, using a wire wheel or other cleaning device. Because you're holding the valve in your hand, you know when the deposits have been removed and the valve is clean, just by looking at the valve.

While the manual valve cleaning method is pretty easy on a lawn mower motor, it gets a little more complicated on a modern automobile engine. The amount of time and labor that it takes just to remove the cylinder head and get the intake valves into your hands may make this method too expensive for the car owner and impractical for the technician.



## Blast Off

Rather than remove the intake valves for cleaning, why not remove the deposits while the valves are still in place in the cylinder head? One such method is to bombard the valves with a high pressure spray of crushed walnut shells. You may have become familiar with this cleaning method when BMW dealerships used it several years ago to correct valve deposit problems their cars were having at that time.

Since then, some engines from other manufacturers (both import and domestic) have also developed problems related to intake valve deposits. The Carbon Blaster II from the Kent-Moore Automotive Division of SPX Corporation was developed to remove the deposits on several of these engines.

The Carbon Blaster II sprays crushed walnut shells at the valve deposits through a nozzle, much like a sand blaster. The crushed shells are softer than ordinary blasting sand, however. They do a good job of removing the carbon deposits, without the risk of damaging the intake valve or intake port.

An assortment of specially machined intake port plates are available from Kent-Moore to adapt the Carbon Blaster II to different engines and port designs. The port plates seal the intake port, assuring that all of the used walnut shell material is returned to the tool reservoir during the cleaning process.

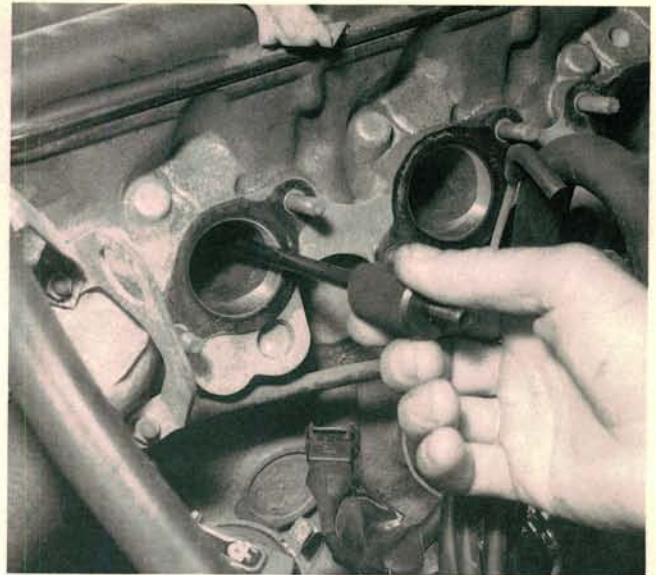
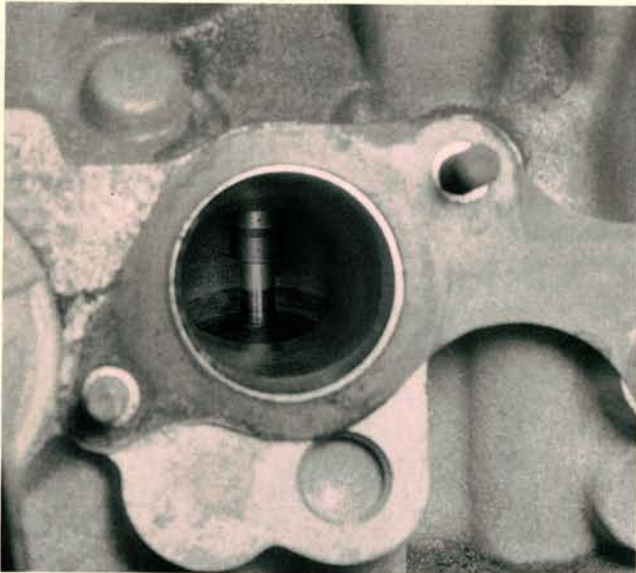
We chose a Volvo 240 with an eight-valve cylinder head for our tool demonstration. The owner complained of poor cold engine performance, and stated that he needed to start the engine several times each morning before it would stay running.

The owner was a regular customer, so we knew that scheduled maintenances had been performed. All engine adjustments had also been checked and verified. A perfect candidate for a carbon blast.

We got a good look at the intake valve deposits after the intake manifold was removed. The deposits were much lighter than we had expected (about 1/16-inch thick). To be truthful, we were a little skeptical about whether our carbon blasting job was going to take care of the Volvo's driveability problems. But what the heck, the manifold was already off, and there was no point in turning back now.

The owner was contacted about a week after the job was completed to check on his before and after driving impressions. He stated that all of his cold driveability problems had disappeared and that the car now ran more like it did when it was new. We had obviously misjudged how heavy the valve deposits needed to be before they could affect driveability.

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Circle No. 200



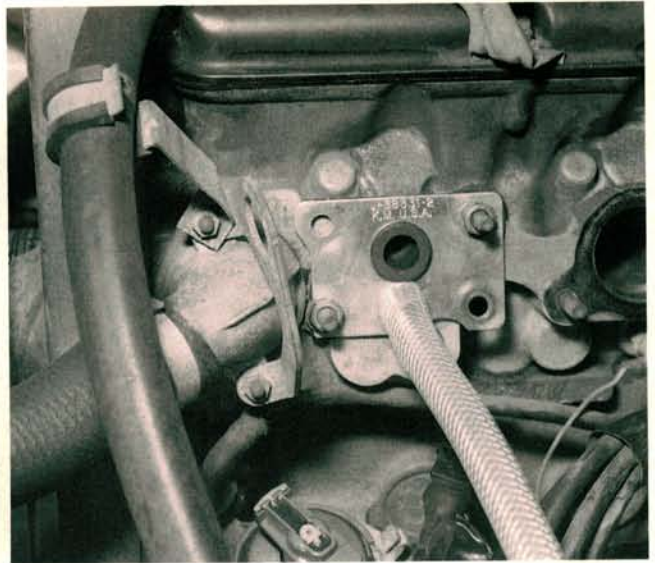
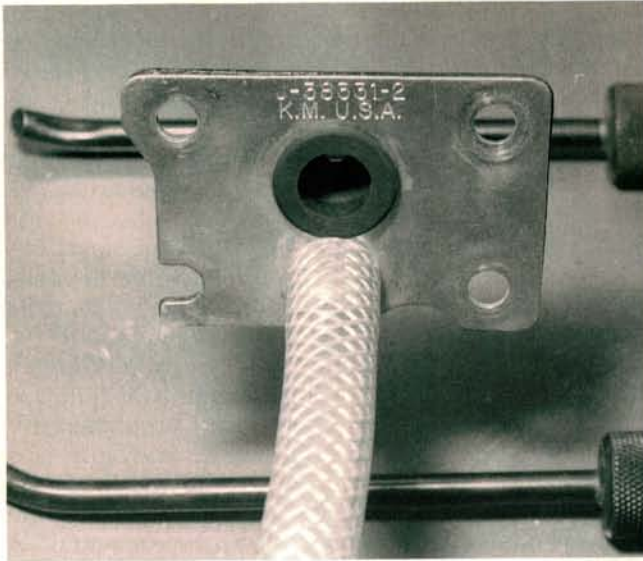
1 Turn the crankshaft over to TDC on number 1, then verify that the number 1 intake valve is closed. On this four cylinder Volvo engine, we cleaned the intake valves for cylinders 1 and 4 before turning the crank another 360 degrees to do the two remaining valves (cylinders 2 and 3).



2 Before you go any further, move the blast nozzle around inside the port to get a feel for where the valve stem is located. This will help you do a thorough cleaning job by feel alone. You won't be able to see what you are doing when the intake port plate is installed.



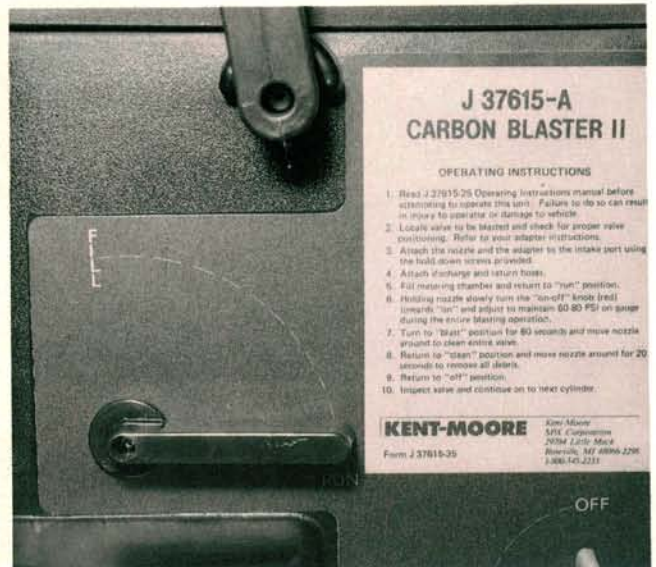
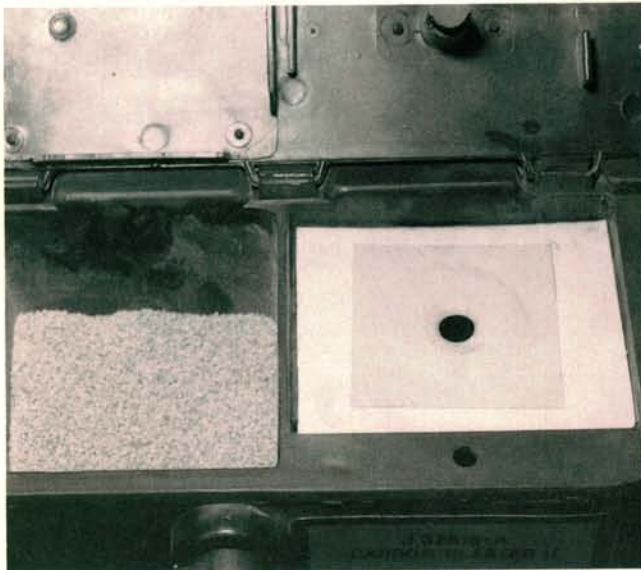
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3 Different blast nozzle tips are available to accommodate different intake port and valve designs. A replaceable rubber grommet ensures a tight seal between the nozzle and the port plate. We tried different nozzles until we found the one that did the best job.



4 Different port plates are designed to fit specific engines. Select the correct plate, then place it over the intake port opening and install the nuts and washers. The port plate has a rubber gasket on one side to seal it to the port opening. Attach the return hose to the port plate if you haven't already.

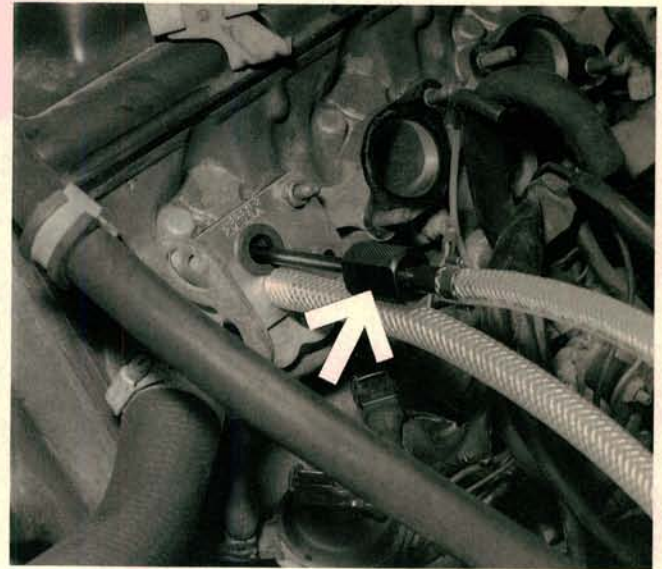


5 Open the top of the carbon blaster. The left side of the blaster houses a walnut shell reservoir. Fill the reservoir with clean material before you start. The used material bag sits in the right side of the blaster housing. The return hose directs the used material into an opening in the bag.



6 A lever on the side of the blaster casing dumps a pre-measured amount of shell material into the blast chamber. One turn of the lever to the "FILL" position should give you enough crushed walnuts to clean one intake valve. Return the lever to the "RUN" position before you begin blasting.

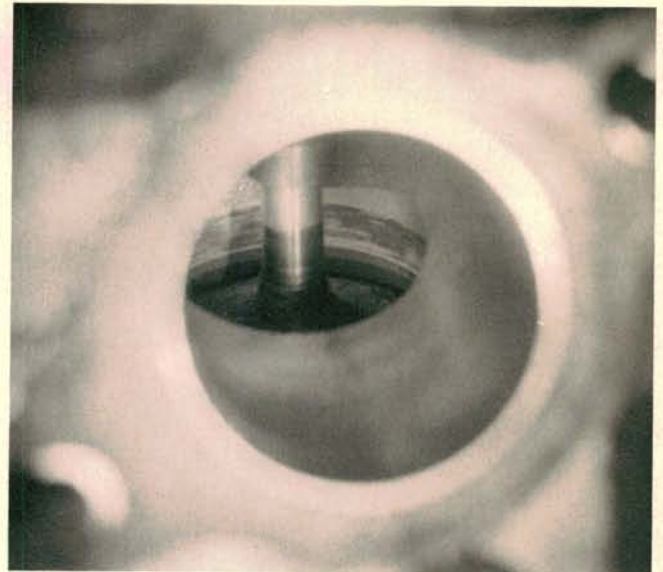
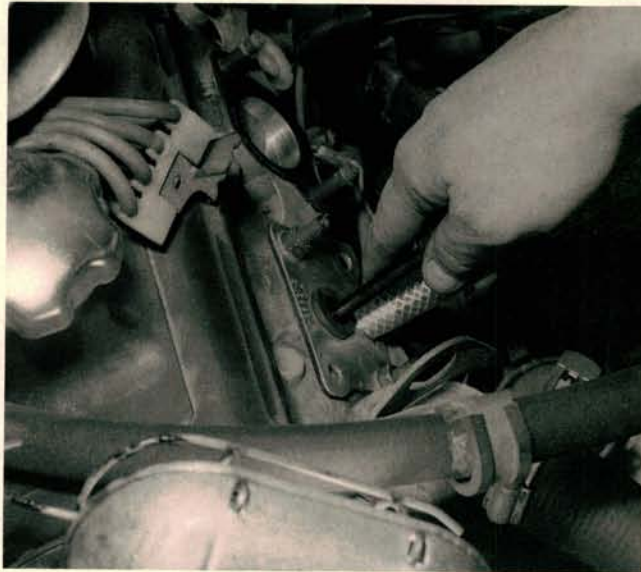




Slide the blast nozzle through the rubber grommet and locate the valve stem by feel. The blast nozzle has a large flat on its handle. When the flat is facing up, the nozzle tip is pointing down. Using the handle flat will help you aim the nozzle at the back side of the intake valve.



Unless your arms are extra long and you can do two things at once, have an assistant turn the blaster's red knob to the "ON" position while you hold the blast nozzle in the port plate grommet. Inlet air pressure must be maintained at 60-80 PSI. The blaster uses lots of air, so inlet pressure may drop while you clean.



Turn the white knob to the "BLAST" position, then slowly move the nozzle around the valve to remove the carbon. Kent-Moore claims that all carbon should be removed after 60 seconds of cleaning. We found that heavier deposits required a second reservoir fill and a little more time to finish the job.



Move the white knob to the "CLEAN" position, then move the nozzle inside the port for another 20 seconds. This sends compressed air to the port and blows leftover debris to the collection bag. Remove the port plate and inspect the valve surface. Reinstall the plate and repeat the process if any deposits remain.