BOLT-ON POWER

By JOSEPH B. DALE

Photos by BILL SCHROEDER

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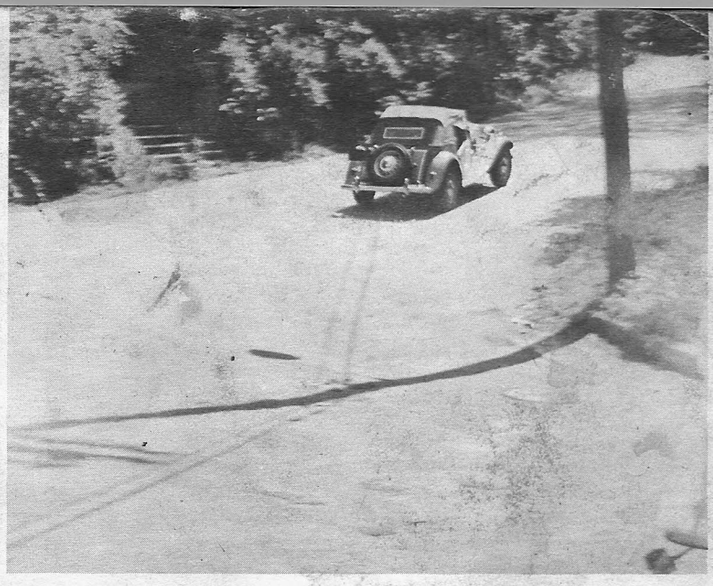
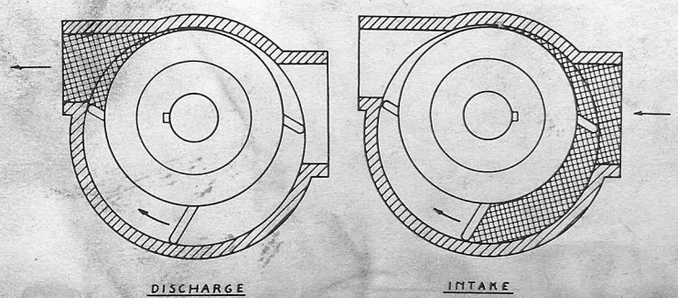


Joe Dale's MG TD levels winding hill with ease after installation of a Judson supercharger. Actual working time to install blower was less than four hours.



Rotating drum in supercharger case is eccentric to the axis of case. Mixture enters the intake port when the volumetric capacity between the two (of four) rotor blades at that point is greatest. As the rotor rotates, the volumetric capacity between the two blades is reduced thereby compressing the mixture. When the volumetric capacity between each two blades reaches a minimum, the lead blade passes the exhaust port and releases the pressurized mixture.

HILL CLIMB TESTS SHOW ADDITION OF SUPERCHARGER BETTERS MG PERFORMANCE

"Supercharging gives your engine more power . . . increased torque . . . faster acceleration . . . less gear shifting . . extra power when you need it." These words from the Judson Research and Manufacturing Company literature sounded sweet if somewhat optomistic at first reading, but that was before mounting their new positive displacement rotary-vane supercharger on my 13,000-mile-old MG TD. After putting it through its paces and comparing notes on its present vs past performance, there can be no doubt about the value of blowing.

Of course, supercharging the automobile engine for more power is not a recent development. The principle was understood and was translated into practice in automobiles and airplanes in the early 1900's. From the first supercharged Chadwick Six in 1906 to the last blown Graham in 1941, many stock production American cars were equipped with one type or another of the power-adding devices. Despite a long record of successful use all over the world, however, a number of unfounded myths seems to have delayed public acceptance of the blower.

Basically, the performance potential of any internal combustion engine depends on its volumetric efficiency, or ability to take in air and fuel in the proper explosive mixture. In the stock engine this efficiency falls off drastically just as it is most needed as engine rpm climb. In addition, the unblown engine relies solely on the suction created by the intake stroke of each piston to move the explosive mixture, or charge, into each cylinder.

There are several types of blowers for automobile engines including centrifugal, lobe and rotary vane designs. The centrifugal supercharger forces the mixture into the manifold by rotating a fan-like disc at high speed. Because of its design, the centrifugal blower seemed destined to be considered only for high rpm, constant-speed applications. Until the introduction of the McCulloch variable-geared supercharger none had proved satisfactory for stock engine use. The lobe-type blower builds up pressure within the manifold and its effectiveness fades as the engine's demands grow greater at high rpm. The rotary-vane blower compresses the mixture within the supercharger case itself insuring high efficiency throughout the engine's speed range.

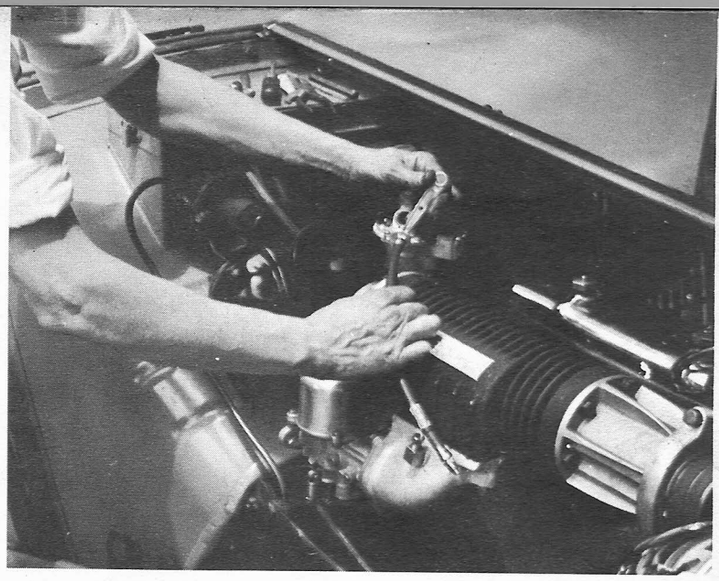
In the blown engine all cylinders receive a uniform mixture regardless of engine speed and the induction of the charge no longer depends on the suction of the piston. Rather the mixture is forced into each cylinder under a pressure greater than the normal 14 pounds per square inch available at sea level. A stock engine, blown to produce a boost of six pounds, should show at least a 30 percent horsepower increase.

In effect, a supercharger is a mechanical device for increasing an engine's compression ratio without requiring the use of special fuels. The increased compression ratio is achieved in two stages; the first within the blower, the second within each cylinder.

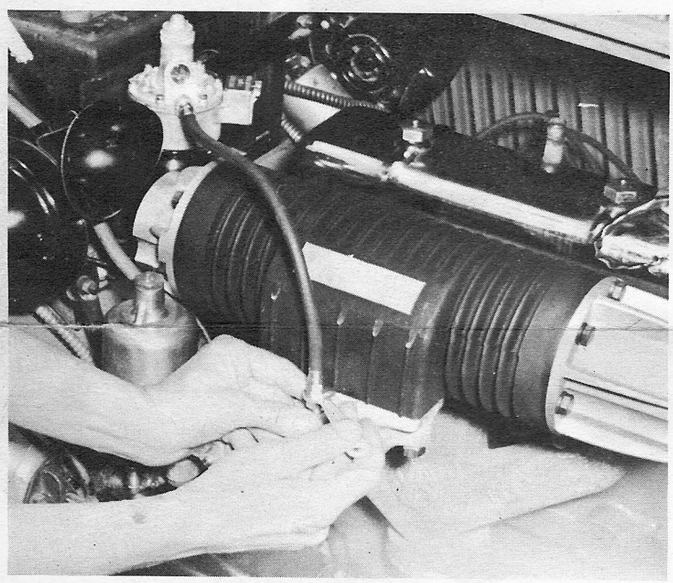
The actual compression ratio increase is dependent on the amount of pressure boost produced by the supercharger and

(*Continued on last page*)

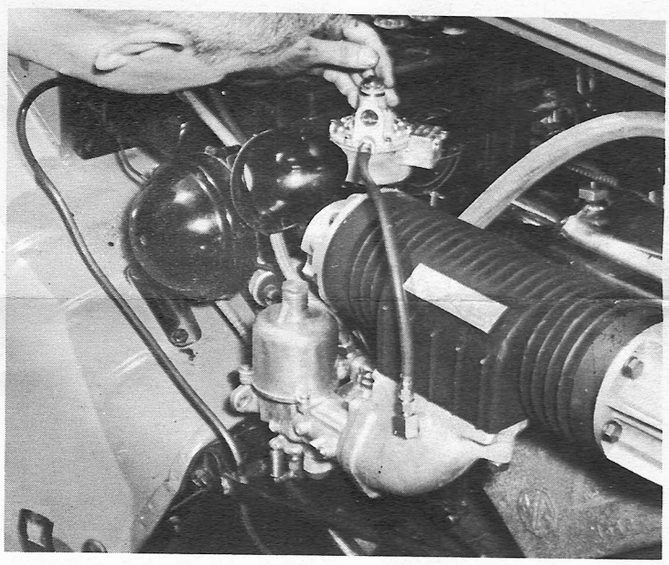
12. Loosen support bar holding battery and insert flat plate on the oiler bracker between the battery and support bar. A special . . .



13. . . . flex hose, also supplied with the supercharger installation kit, is next mounted between the oiler and the fitting in the . . .



14. . . . supercharger, providing lubrication to the bore of the case. The main rotor bearings are greased and sealed at the factory.



15. . . . start the engine and adjust lubrication rate of the oiler to approximately one drop of oil every five seconds at idle speed.

Bolt-On Power

the horsepower output of a blown engine will increase in direct proportion to the amount of boost. The Judson MG-26 supercharger operates at a controlled pressure of 6 to 6.5 psi, raising the actual compression ratio in my MG TD to 10.1-1. The turbulence caused in the passage of the fuel-air mixture through the supercharger permits operation at this compression ratio without difficulty.

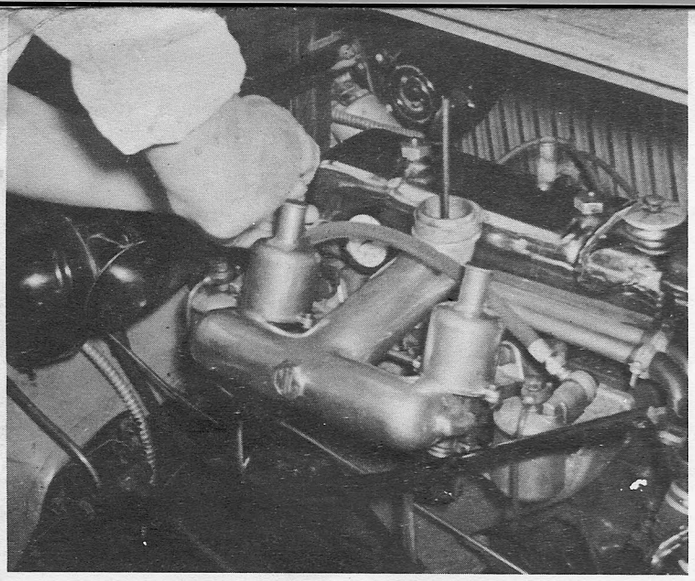
In order to compare the performance of my MG TD in both the blown and unblown versions, several standing-start runs were made up a half-mile-long, steep and winding hill. The hill could be negotiated in 55 seconds by the unblown MG at a constant 2000 rpm in third gear for most of the run and 3000 rpm in second for the last few hundred feet. In another run, the unblown version climbed the hill in second gear all the way, turning a constant 3000 rpm, in identical time—55 seconds.

The blown MG levels the hill in 43 seconds at a constant 3000 rpm, using fourth gear all the way except for the last few hundred feet where I dropped back into third. In third gear it would be possible to rev to 5000 rpm with ease, but for comparison purposes engine speed was purposely held to 3000 rpm.

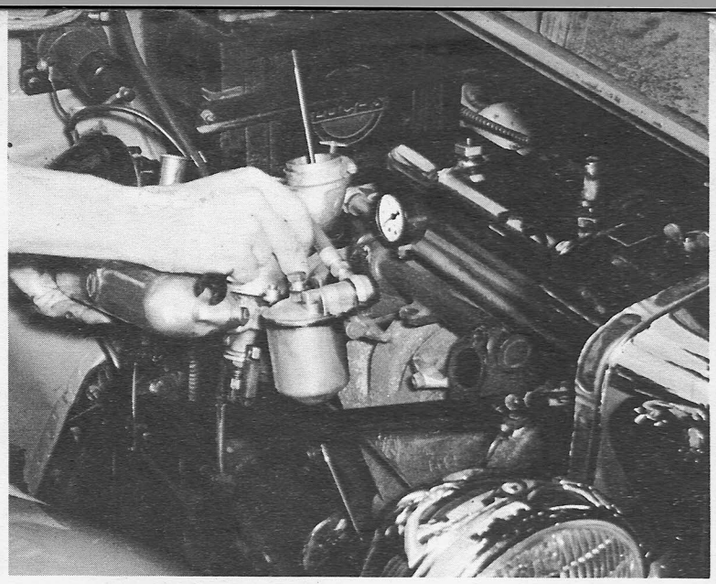
It seems safe to say that the Judson will produce an increase in performance in direct proportion to the performance of the engine before it was supercharged. Although the method used to compare the blown and unblown engine may vary, some preferring dynamometer tests for instance, the relative difference between the two is obvious

As to whether a supercharged car is suitable for everyday driving, one need only check the statement in Judson's literature that "less gear shifting" is required. It's true. In normal traffic encountered in home to work driving, I've found considerably less shifting is needed to get the car from point to point.

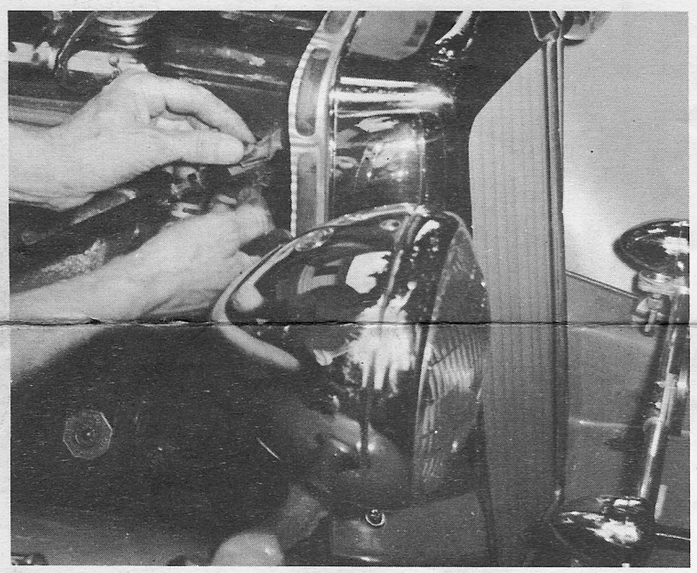
One Judson blower owner summed up the improved performance in his car this way, it's "like adding two more cylinders". He may not be precisely correct, but he is too close for much real argument. None from me, at any rate.



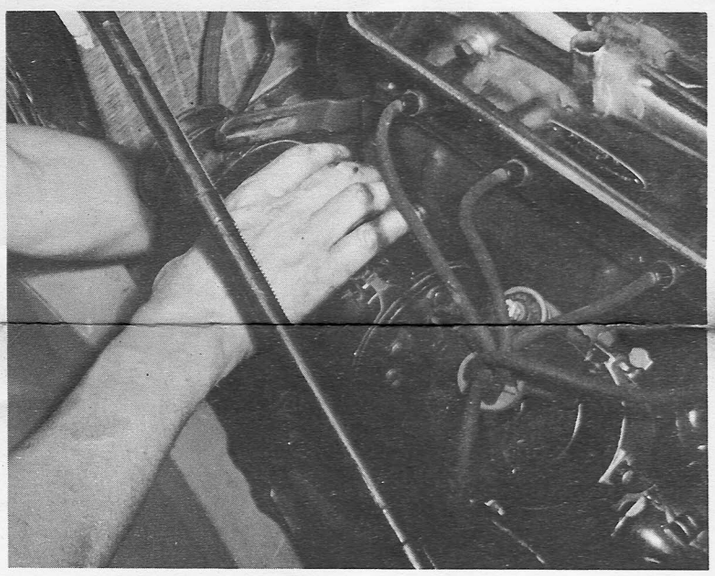
1. The MG hood may be taken off, by removing two screws at rear of hood, to provide working room but it is not necessary. The air . . .



2. . . . cleaner, fuel lines and carburetor linkage are first removed. The stock carburetors are then unbolted and removed as a unit.

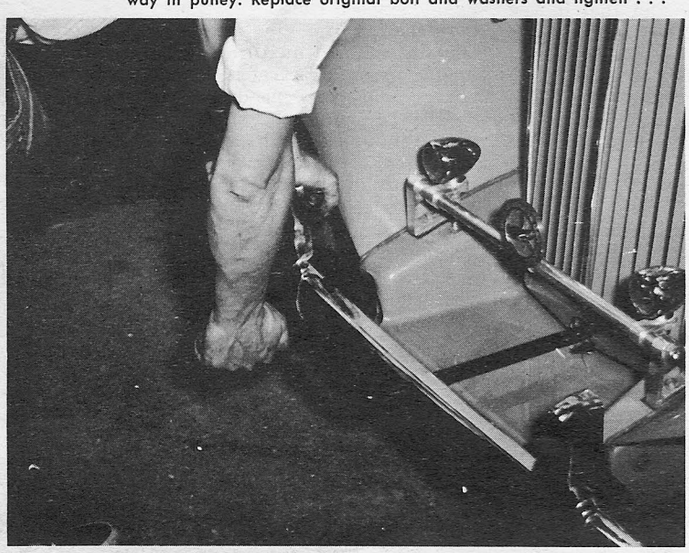


3. The radiator brace on the right side is removed from the top of the radiator only and is placed against the bottom of the fender.



4. On left-side of engine: generator is loosened and belt removed. Crankshaft pulley bolt is removed and pulley is replaced with . . .

5. . . . Judson pulley making sure original key is lined up with key-way in pulley. Replace original bolt and washers and tighten . . .



6. . . . with hand crank while car is in gear. Aligning stud is used to aid in mounting blower; discarded later. (Continued on Next Page)