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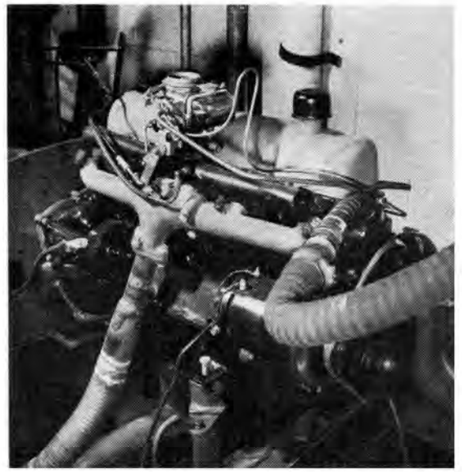
MAKING THE FALCON FLY



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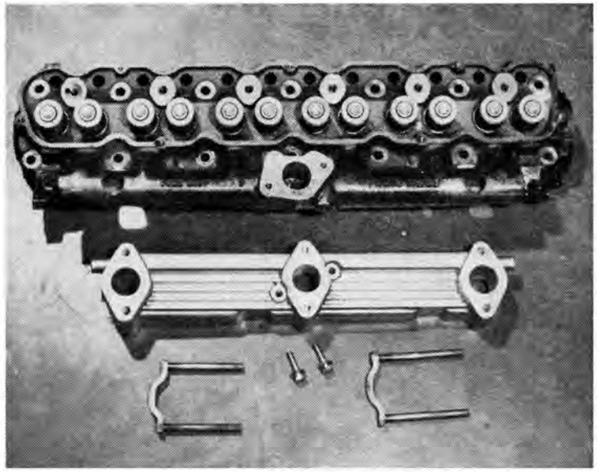

Stroppe's aluminum manifold adaptor will soon be offered by Ford as part of an optional package for the Falcon. Adaptor locates from the stock center carburetor flange with hole saw used to open two new inlets into manifold. Irregularities must be filed off stock manifold.

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By RAY BROCK

With the three largest automobile manufacturers in this country now producing compact models, car enthusiasts suddenly find that there are three all-new small displacement engines available for them to play with. It is only natural that pieces of speed equipment be manufactured to fit these new engines and at this early date, we have already picked up information on three well known names in the speed field who are concentrating plenty of effort on the Falcon engine.

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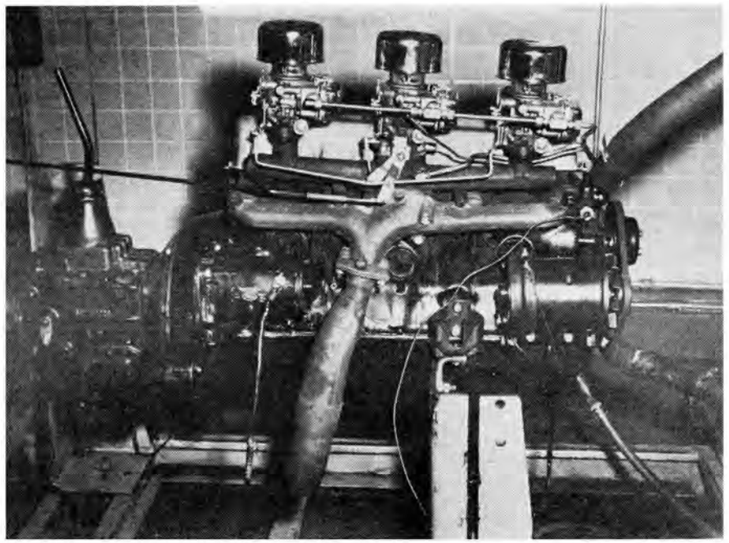

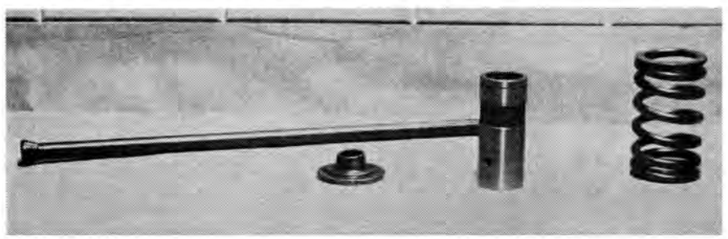

ABOVE—Extensive testing on Holman & Moody engine dyno revealed that Falcon engine is very responsive to minor changes in compression, carburetion and camshaft. Observed horsepower of stock engine was 66; with H & M Power Pack, 113 hp.

UPPER LEFT—To increase breathing ability of 144-inch six, H & M welded two carburetor flanges to the Falcon intake manifold. An extra pair of stock Holley carburetors were used with all operating in unison, not progressively.

LEFT—Stock Falcon valve train will start to float at 4200 rpm, resulting in loss in power. H & M Power Pack cam kit includes lightweight lifters, tubular pushrods, steel retainers and stronger single valve springs for 6000-plus rpm's.

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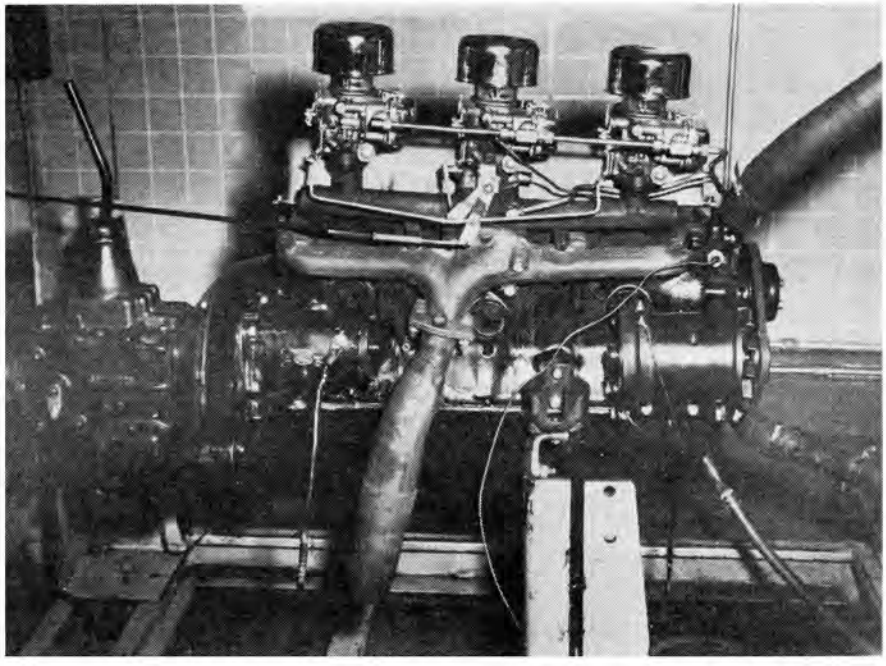

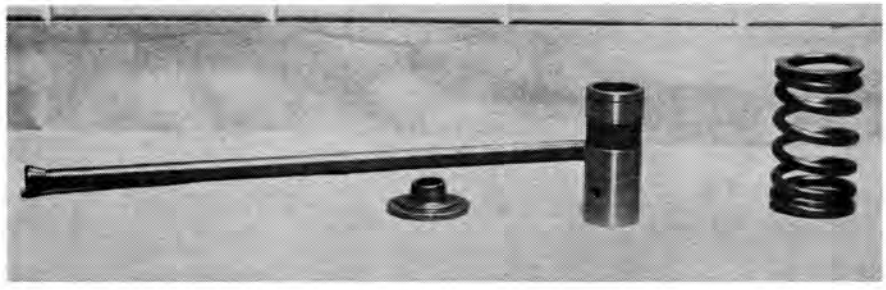

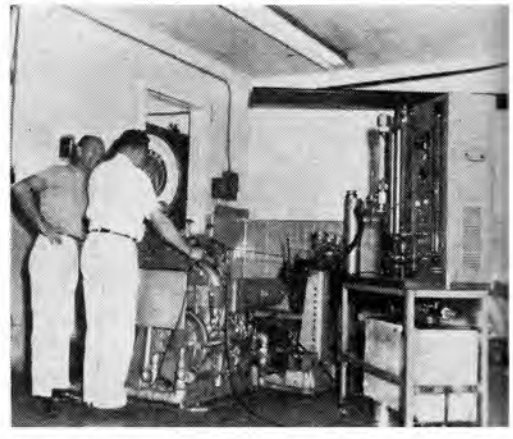

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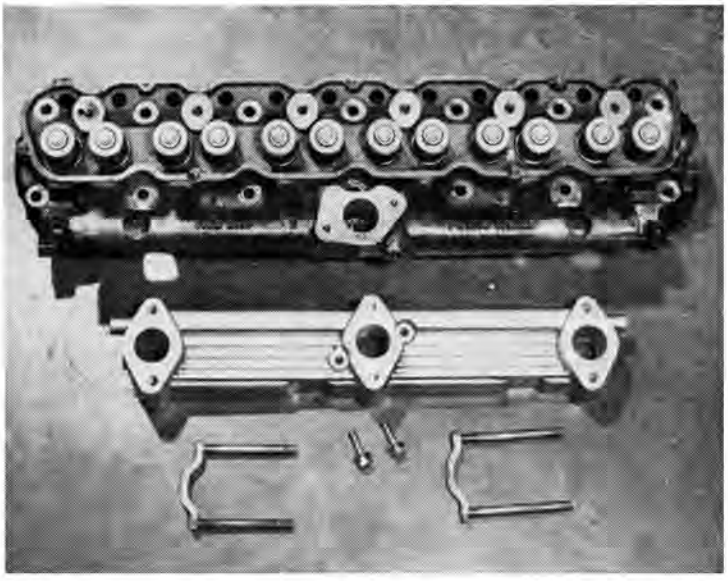

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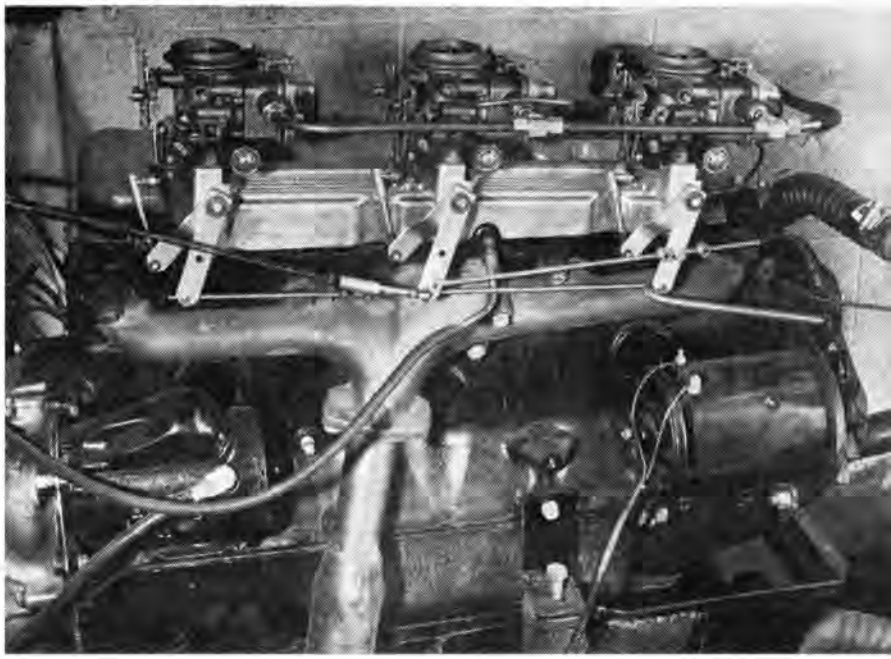

As shown at upper left, the aluminum adaptor has recessed grooves for neoprene O-rings to form an effective seal between the adaptor and cast iron intake manifold. New openings are midway between the ports on end pairs of cylinders. Water from the engine passes the length of the aluminum adaptor to pre-heat fuel charge for better economy. In operation on the dyno, right, adaptor with extra carburetors forms a neat package with the stock Ford bell-cranks using a sliding link for progressive throttle.

MAKING THE FALCON FLY continued

unison. Holman & Moody sell their Falcon triple carburetion setup as part of a kit. The intake manifold is fitted with three carburetors, the head is milled for increased compression, a special H & M camshaft kit is included and heavy-duty bearing inserts are furnished.

Holman & Moody made before and after tests of the Falcon engine, both in the car and on their dyno, to find out just how much their modifications improved performance. A stock Falcon engine was lifted from a chassis after 300 miles of break-in running. It was set on the dyno just as it came from the car, tuned to factory specifications and then tested for power. Maximum horsepower observed was 66.4 at 4150 rpm. At 4200, valve float or spring surge could be heard and power fell off. Ford's rating of this engine is 90 hp at 4200 rpm but this rating includes corrections to 60° F. temperature, a normal sea level barometric reading of 29.92 HG. and dry air. Laboratory corrections can often add many horsepower to an observed dyno reading. No attempts were made to improve power readings by enrichening the fuel mixture or power timing the distributor. The power observed, 66.4, is therefore a close approximation of what the average Falcon on the road is producing.

The next step was to modify the engine with the H & M Falcon Power Pack. The engine was completely disassembled and checked. Clearances were increased on rod and main journals of the crankshaft for increased lubrication, rod end clearance was increased, piston clearance was increased for less drag, heavy-duty copper-lead bearings replaced the stock steel-backed babbitt type and the engine was carefully assembled. Head modifications included the addition of two more carburetor flanges, milling .070 for 9.6:1 compression, a mild port job and a precision valve job. Stock valves were used. A Holman & Moody cam kit number FOHM 6250-1 was installed with lightweight barrel lifters replacing the heavier Mae West type Falcon lifters, tubular pushrods replaced the stock solid pushrods, single valve springs with 98 pounds pressure versus 52 stock were used and steel spring retainers were used for increased strength. The combination of lifter, pushrod, spring and retainer used was 70 grams lighter per valve than a stock setup.

Three stock Holley carburetors were used and so was the stock ignition although the latter was of necessity since nothing else was available when the test was made. The stock Falcon ignition has no centrifugal advance, only vacuum, and when the engine is fitted with three carburetors, manifold and venturi vacuum is so low that the ignition advance is not nearly enough as the rpm's increase. The ignition was advanced manually on the dyno so that the proper amount was available at each rpm reading.

The maximum observed horsepower was 113 at 6000 rpm with 116 ft/lbs of torque at 4000 rpm. Corrected for temperature, humidity and barometric pressure, H & M estimate the rating approximately 128 hp and 131 ft/lbs of torque. Comparing the observed horsepower figures, 66.4 versus 113, the engine modifications resulted in a 70% boost in maximum power. Even at 6000 rpm, there was no sign of valve float and the engine could be revved much higher although the power maximum had been reached.

Another Holman & Moody cam under development but not ready for the market as we go to press boosts the power output even more and promises to produce nearly one horsepower per cubic inch (144) at 6500 rpm when corrected for temperature, humidity and barometer. Observed horsepower is better than 120. So, this gives you an idea of what the Falcon engine can do when modified for all-out competition.

Stroppe and Associates also tested a Falcon engine before and after installation of their clamp-on triple intake setup. The stock engine was run several hours on the dyno at various engine speeds for break-in time and then spot checked for horsepower with factory timing and carburetor jetting.

Timing proved to be too slow, the mixture was too lean and the engine wouldn't hold steady power on the dyno so both were changed to improve the power output. The .052 stock carburetor main jets were replaced with .055 jets and the initial spark timing was increased from 6° to 10°. With these changes made, a maximum power reading of 72.3 was observed at 4000 rpm. No laboratory corrections were made to compare the test figures to Ford's 90 hp rating.

The next step was to install the triple carburetion. The stock ignition vacuum advance deficiency was corrected by using a Scintilla magneto with centrifugal advance weights. The advance curve of the Scintilla closely matched the vacuum advance of the stock distributor with a single carburetor and had 29° total advance. Three stock Falcon Holley carburetors were used but all three had the .052 main jets replaced with .055 jets. No other changes were made to the engine. It was completely stock except for triple carburetion, larger jets and the magneto with nearly stock advance curve. Maximum power observed was 87.4 at 4500 rpm, an increase of 15.1 horsepower over the stock test. Had the mixture not been enrichened and the spark advanced in the stock test, horsepower improvement would have been even more. As it was, the two extra carburetors were responsible for a 21% power boost. Milling the head for increased compression and the use of a hotter cam would give a much larger power increase. With the progressive linkage, economy should be nearly as good as before in everyday use.

Stroppe sent his triple carburetion setup to the Ford Motor Company after completing tests and they conducted tests of their own. The results were so good that Ford is buying the idea from Stroppe and will offer the triple setup as a regular production option for Falcons along with a hotter cam and increased compression. A horsepower figure has not been released at this time but it is rumored to be around the 125 hp mark. A different ignition will also be part of the kit.

Edelbrock's triple intake setup is a cast aluminum clamp-on type adaptor. The head must be taken off the engine before

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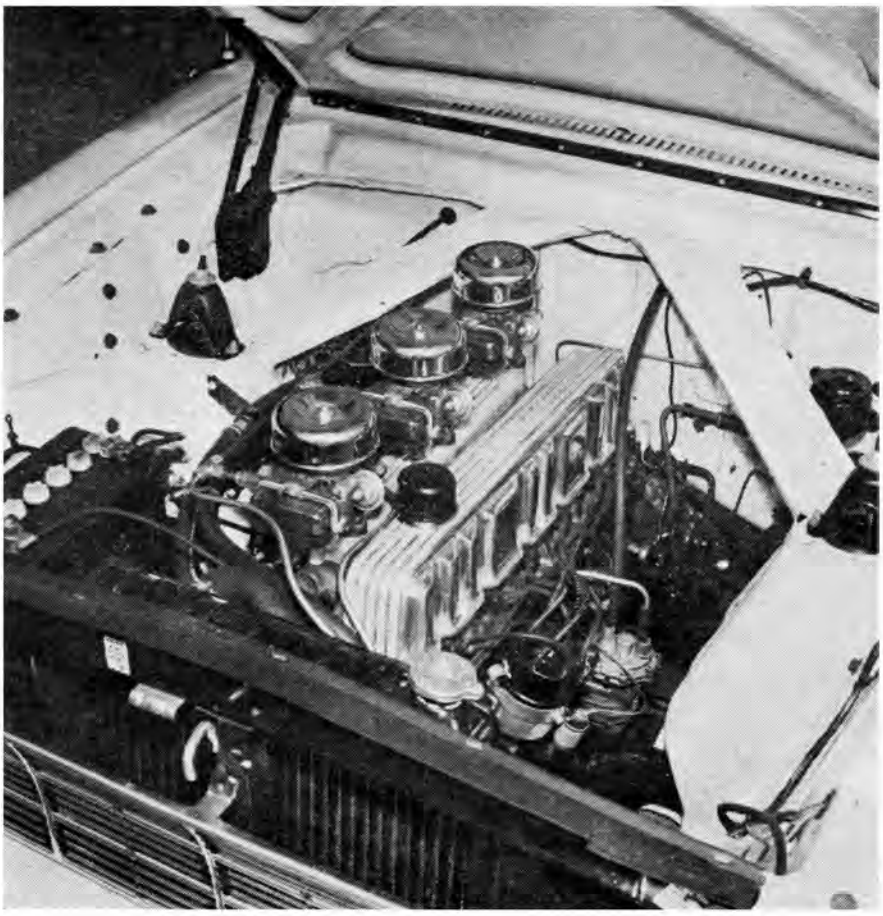
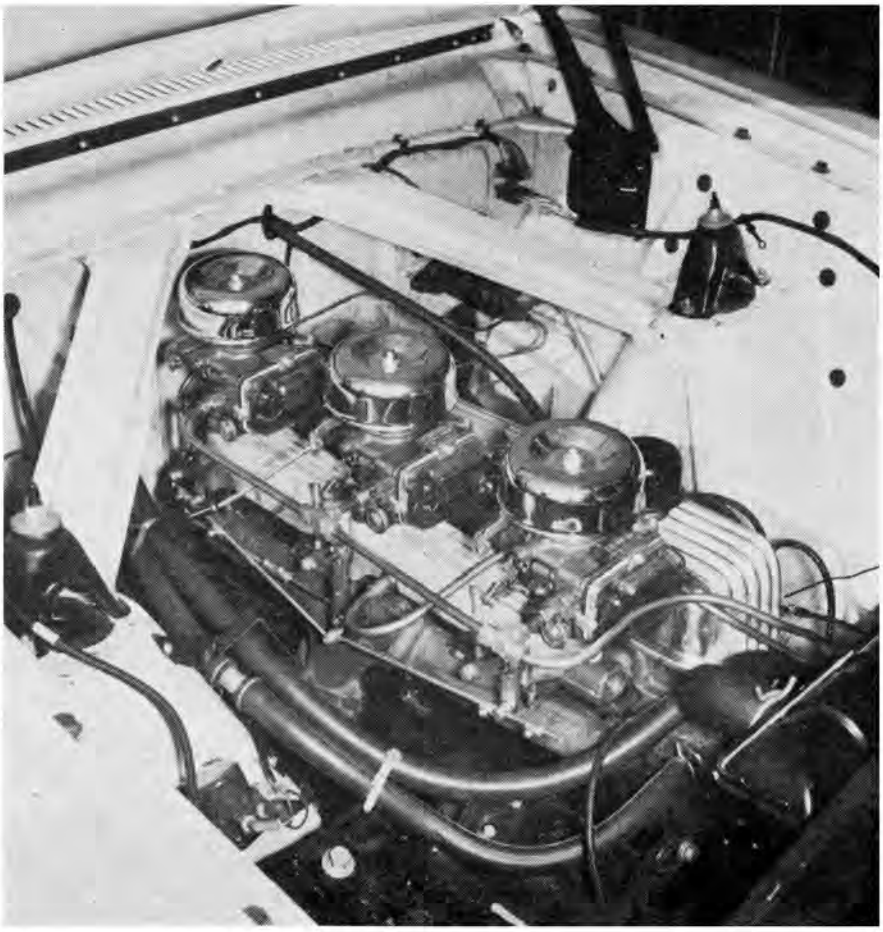
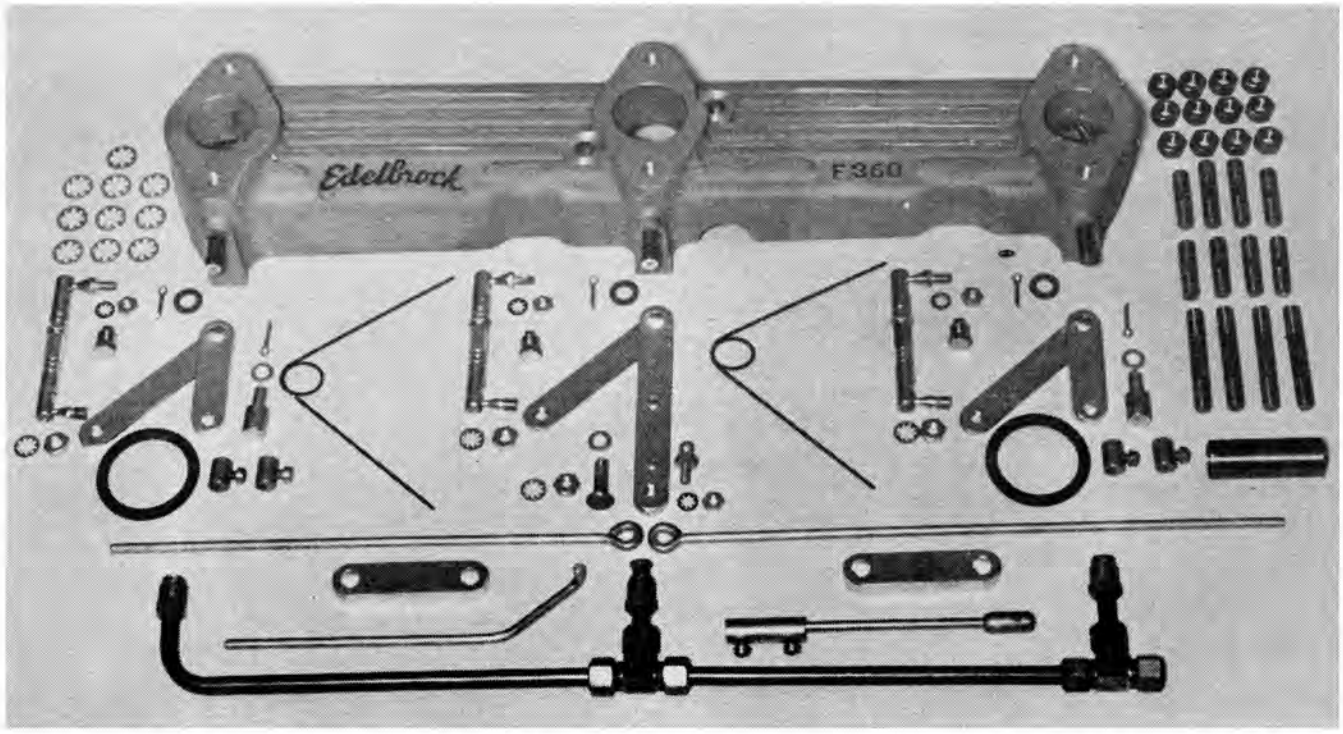




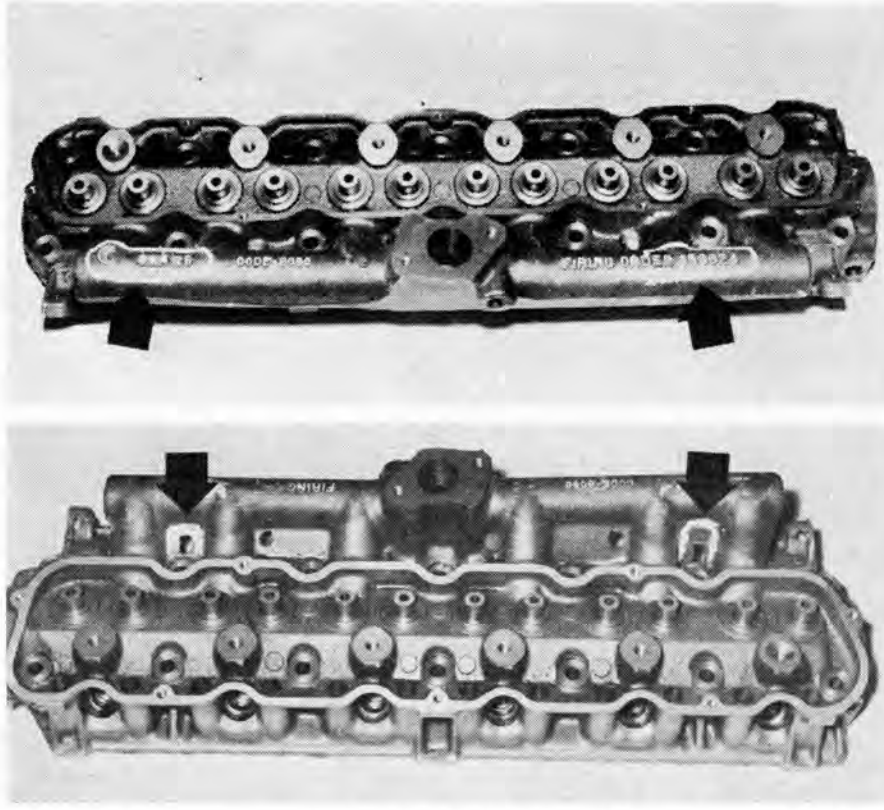
UPPER RIGHT—Edelbrock manufactures an aluminum triple intake adaptor and a finned aluminum rocker arm cover for Falcon. Notice that Mallory distributor is used in place of stock Falcon ignition to get centrifugal advance feature.

RIGHT—Edelbrock's triple intake adaptor uses stock Holleys with manual choke in center carburetor only. Rear air cleaner just touches the body brace unless the edge is rolled under slightly. Mileage in normal use is not lessened by triples.



Complete Edelbrock triple intake kit includes all necessary pieces for installation except extra carburetors and air cleaners.

MAKING THE FALCON FLY continued



TOP—The head must be removed so that the intake manifold can be reworked to accept the aluminum adaptor. Raised letters and numbers on manifold must be removed but radius must be maintained. This is a good time to mill head for extra compression. BOTTOM—Casting flashing must also be removed from indicated area so that there will be ample room for the hold-down clamp studs to pass between manifold log and cylinder head. Valves and rocker assembly should be removed to protect them from grit.

installing the manifold adaptor otherwise cast iron chips will get into the engine. While the head is off the engine, it is a good opportunity to mill the head and Edelbrock recommends a .060-inch cut which will raise the compression from the stock 8.7:1 to approximately 9.4:1.

Edelbrock's intake system uses three Falcon carburetors and the stock .052 jets are retained. This system was not dyno checked to see how much power increased but was checked on a Falcon with automatic transmission. The Falcon was used to road test all changes and to work out the progressive linkage to perfection. After the triple intake was engineered to Vic Edelbrock's satisfaction, we borrowed the car for a couple of days to see just how well the system operated. Highway mileage tests, most of which were at California's maximum legal speed of 65 mph with numerous passing and full throttle accelerations thrown in for good measure, produced an overall mileage figure of 25.2 miles per gallon. This was with an automatic transmission and 3.10 axle ratio. Under ideal conditions and especially with a standard transmission, 30 mpg should be a breeze since the center carburetor only is used 99% of the time. The increased compression also helps mileage although premium grade fuel is required.

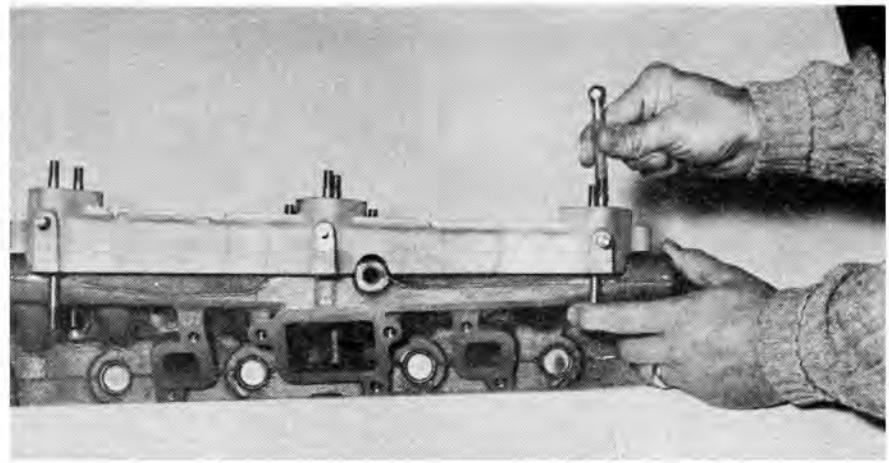
The increased power available when the two extra carburetors are called upon is very noticeable and improves acceleration at all speeds but more particularly at higher engine speeds. The time needed to

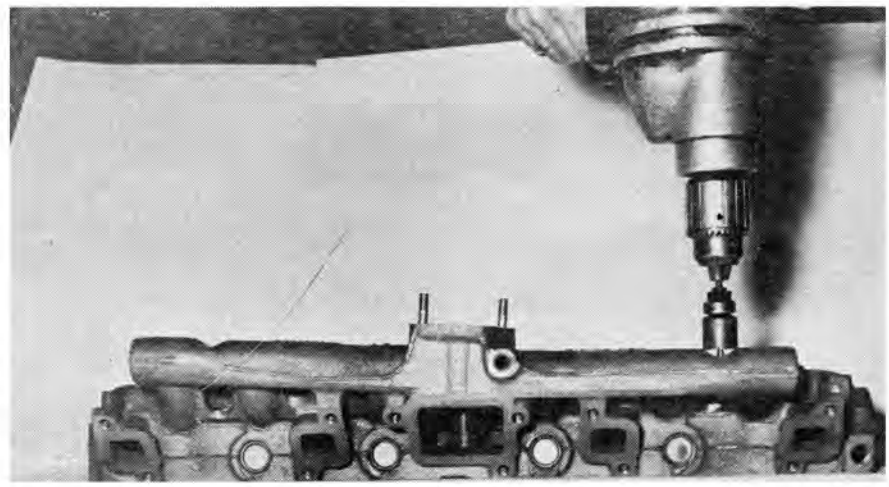
pass another car on the open road is just about halved. We spent most of last month driving compacts for our road test and became fairly familiar with them so we immediately noticed the improvement in power that Edelbrock's Falcon possessed. The progressive linkage is so smooth that it is hard to feel when the two extra carburetors open. The setting is made so that they start to open when the center carburetor is at about half throttle. All three carburetors reach wide open at the same time.

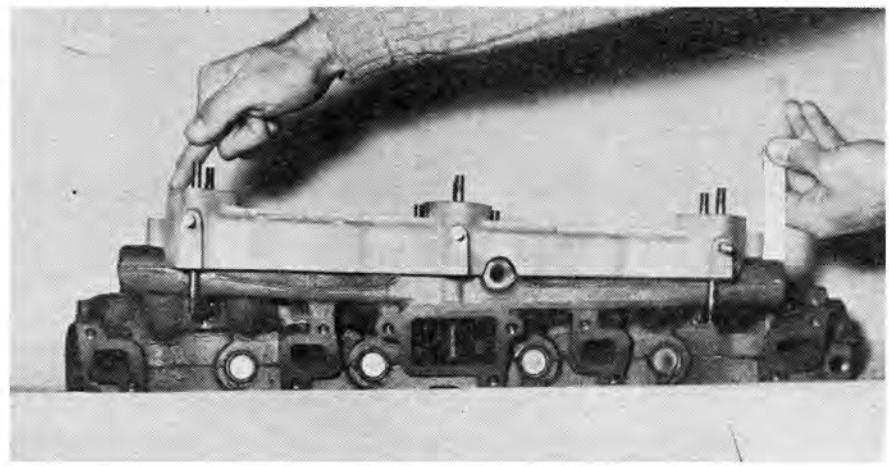
Edelbrock also recognized the weakness of the stock Falcon ignition when three carburetors are used so called Mallory Ignition Company in Detroit for help. Mallory rushed a Falcon ignition into production and sent one to Edelbrock. It has centrifugal advance weights only, no vacuum, and supplies the proper advance curve for the best power results. This ignition may not be available yet through all Mallory dealers but will be soon.

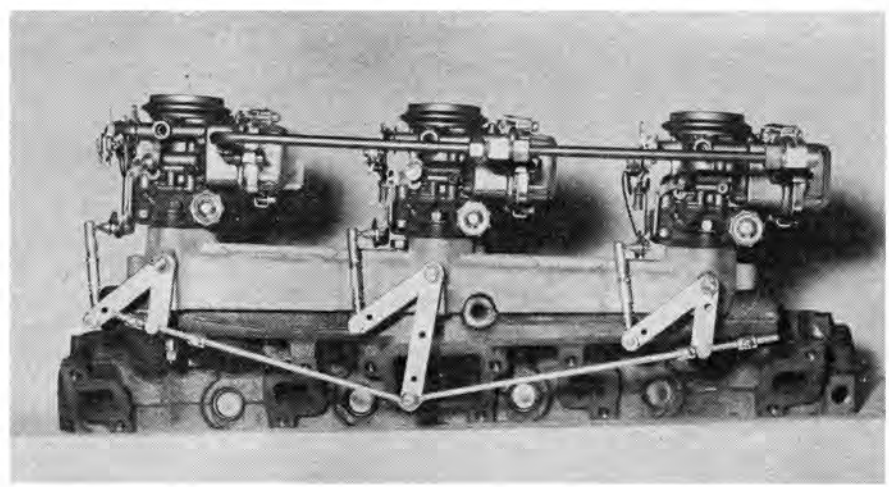
Edelbrock also makes a finned, cast aluminum rocker arm cover for the Falcon and as the pictures show, it and the manifold adaptor make the Falcon engine a very impressive appearing powerplant.

With these three companies hard at work on the Falcon and numerous cam grinders beside Holman & Moody offering hot cams for the little sixes, a number of Falcon owners will undoubtedly get into the swing of things real soon and do their best to make the little inchers move out in rapid fashion. Chevy's Corvair offers an optional engine kit and Valiant will probably follow so we will see a whole new class of racing in the future. The lightweight engines are ideal for boats, small streamliners and sports cars so should become quite popular. The fellows seem to have already proven that Falcon has a lot of potential.









TOP—To get the exact position for the two new intake risers, place proper studs in stock manifold flange, slip adaptor over them and scribe pattern on manifold.

Next, remove special manifold adaptor and determine center of scribed opening. Use 1⅛-inch hole saw, or if not available, drill and file to proper dimension.

To fit the manifold adaptor, leave O-rings out, stack shims supplied in kit on stock intake flange until either end will rock 1/16-inch. This gives proper O-ring crush.

BOTTOM—Completed installation. Progressive linkage is very smooth with two extra carburetors starting at half throttle; all three reach wide open position together.