TEST REPORT--

OLDS TRIPLE TWO-BARRELS

The four-barrel carburetor has been top dog for a couple of years now. But GM has a new way to feed an engine—three two-throats in a linkage setup that's revolutionary. This is how it works

BY BARNEY NAVARRO

IF A PROPHET in the year 1950 had said that triple two-barrel carburetion would be a Detroit production line feature in a few years, he would have had few if any believers. At that time, 175 hp was considered sufficient for any automobile. Any desire for more power was looked upon as absurd.

Despite the opinions of the past, the 1950 concept of a hot rod is "cold" indeed when compared to the power output of the 1957 Oldsmobile with triple carburetion called the J-2 "Rocket." Three hundred horsepower from a displacement of 371 cubic inches displays two figures that dwarf those of the past. Although it might be felt that a 371-cubic-inch engine should produce more power when it is compared with some other contemporary engines, we must bear in mind that the .8 horsepower per cubic inch output results from an engine that isn't hopped up to the very limit for racing.

Perhaps of greater importance than horsepower is the torque rating. This figure is 412 pound feet at 2800 rpm, an engine speed that is more useful to us than the rpm at which maximum power is developed. It is this traditional high torque at low rpm that has most impressed the buying public and given Oldsmobile its reputation for high performance.

Though the triple carburetion of the Oldsmobile may resemble the type used for hot-rodding, it's a far cry from being identical. Actually the only similarity lies in the fact that three dual throat carburetors are employed. Due to the great difference between this factory installation and the custom hot rod layouts, it will be necessary to compare certain points of each one. If this is not done, our coverage of the Olds assembly may serve as an endorsement for all custom triples causing many auto enthusiasts to be confused. Conversely, a prospective Olds purchaser may shy away from the factory triple because of past dissatisfaction with a custom layout.

Owner dissatisfaction is not always an indication of inferiority or poor design. More often, whether or not a multiple carburetion installation pleases is dependent on the individuals driving habits and personal opinions. Different drivers expect different performance characteristics and some will tolerate certain disadvantages in order to receive much sought after benefits. If we wish to be honest in our appraisal of any carburetion system it is necessary to point out both advantages and disadvantages. There is no such thing as carburetion that is completely perfect.

Being very much aware of the bad features that can be incorporated in a triple carburetion system, the Oldsmobile engineers took great pains to eliminate most of them. Until the advent of progressive linkage, synchronized throttles were common practice with all triple carburetion. But synchronizing throttles so that they all open simultaneously causes idle difficulties and poor throttle response at low rpm. A drag race enthusiast may not mind such faults but a passenger car produced for mass consumption just can't be balky, so with the general public to please, Oldsmobile settled for a progressive throttle linkage.

Unlike the custom linkages that can be purchased at speed shops, the Olds type is not completely mechanical in actuation. It has no direct connection between the center carburetor and the two end ones. The center carburetor is the only one that is connected to the throttle pedal. The end carburetors are opened by the action of a vacuum operated diaphragm after the center carburetor is opened 60 degrees or more. A vacuum switch is mounted on the center carburetor to effect this control.

The most amazing, we found, is the vacuum source that controls the throttles. Expecting to find a venturi vacuum system like the Ford products or manifold vacuum control as is common practice with four-barrel installations on General

Motors products, learning that the vacuum source was the windshield wiper pump proved quite startling. Equally amazing is the fact that the vacuum operated throttles can't be "feathered." They have only two positions, wide open or closed.

This all-or-nothing arrangement seemed quite acceptable with the Oldsmobile that we drove despite preconceived prejudices. The test car was Hydra-Matic equipped so whenever the throttle pedal was floored at low speeds the transmission would downshift so there was no way of discovering whether a flat spot occurred. A stick shift model should prove rather annoying to a driver who makes a habit of flooring the throttle at low speeds. It would seem that a venturi vacuum operated throttle actuating diaphragm would be much more satisfactory for a stick shift. This belief is founded on the observed removal of progressive linkage custom triples from various automobiles and their replacement with factory four-barrels.

Many drivers feel that progressive linkage completely eliminates the dead powerless feeling that results from too much carburetion at low rpm. They soon find out that a progressive arrangement doesn't help if all of the carburetor throats are opened suddenly at a speed where two throats are sufficient. A progressive triple should receive enough throttle pedal depression at low rpm to open the center carburetor only. If a driver can accept this fact, he can live with progressive linkage and enjoy it; however, the drivers that can do this are in the minority.

Proof of this fact is well illustrated by the Detroit abandonment of the progressive four barrel.

All of the first four-barrel carburetors that were developed for the 1952 models were equipped with progressive linkage. The secondary throttles were opened mechanically after the primaries opened beyond a certain point. This arrangement has been abandoned on the majority of single four-barrel installations in favor of manifold- or venturi vacuum-operated rear throttles. These carburetors open the rear throttles only when the velocity through the primary venturii is great enough or the manifold vacuum is high enough to indicate that more carburetion can be beneficial.

Examination of the automotive choke system on the Olds triple reveals another distinct departure from the usual custom three carburetor layout. Instead, a similarity to the four-barrel system becomes apparent when the choke inter-lock is viewed. Four-barrel carburetors are fitted with an interlock that prevents opening of the secondary throttles if the choke is in a choking position. This is necessary because only the primary throats are fitted with a choke.

If the secondary throttles could be opened with the primary throats choked, the action of the choke would be partially nullified. The driver of a custom three-carburetor manifold fitted with an automatic choked carburetor in the center of the manifold, will find that the throttle should not be floored until the automatic chokes get hot enough to shut off. Flooring the throttle produces miserable results so the driver either learns to conform to requirements or cusses the manifold and carburetors.

When driving an Olds triple no thought needs to be given to the choke's incompatibility with the unchoked carburetors. You may floor the throttle all you please without the end carburetors opening while the center carburetor is choked, since the center carburetor is the only one so equipped. Incorporated in the choke is a mechanical interlock that prevents the vacuum switch from operating the end carburetors even if the center one is wide open.

Such mechanical "brains" are a must if our modern simplified driving theme is to be maintained. Maintaining this theme makes it possible to produce a car that appeals to the greatest number of buyers so it would be foolish to suggest that the added complications should be eliminated.

While we are at the top end of the carburetors, some mention should be made of the air cleaner. This is usually a weak point in the custom installation because of limited size and the absence of intake silencing. The Olds cleaner is a massive single unit affair that attaches to all three carburetors. Although it succeeds in silencing the inlet noises while operating on the center carburetor, a noticeable roar can be heard when the end carburetors are open. Though far from being silent, the noise is a whisper compared to some hot rod triples.

Removal of the air cleaner for servicing of the carburetors is not as simple a procedure as with a four-barrel. In addition to a wing nut above each carburetor, a support bracket must be detached on each side of the cleaner. The foregoing procedure merely releases the cleaner from the engine and would make it possible to remove it if the engine was mounted on a display stand instead of in the engine compartment of the car. The final operation for air cleaner removal consists of detaching two radius rods that reach from the fire wall to points on the front fenders adjacent to the radiator.

Now that the air cleaner is removed, it is inadvisable to tinker with the carburetors unless you have the 17-page Oldsmobile triple-carburetion manual and the various gauges for checking linkage positions and float levels. One exception to the foregoing is adjustment of the idle jets. Unlike the custom triples that have two idle jets at each carburetor so that the novice becomes thoroughly frustrated after 30 minutes of struggling for a smooth idle, the Olds triple has but two idle jets and they are located at the center carburetor.

The odds of maintaining a smooth idle after adjusting two idle jets are many times better than when there are six of them to collect gum and dirt. We use the figure six for comparison because this is the number of idle jet adjustments with a custom triple using conventional dual-throat carburetors.

A horsepower rating of 300 has been mentioned earlier. This output is 23 hp higher than the conventional engine equipped with a four-barrel carburetor. Such a comparison implies that the 23 hp gain is due solely to the increased carburetion area. If you read the "fine print" you'll find that a difference in compression ratio also exists. The four-barrel equipped engine has .050 gaskets which results in a 9.25-to-1 compression ratio, whereas the triple job has .025 head gaskets giving a 10-to-1 ratio.

(Note: A .025 of an inch difference in gasket thickness raises the compression ratio considerably more than milling the heads a like amount.)

Although very little fault can be found with the Olds triple carburetion, the 10-to-1 compression ratio proved to be rather impractical in our test. This took place during one of those California days when the air temperature was 90 degrees fahrenheit. After a moderately hard run through the gears, the combination of high compression and hot dry air produced auto ignition after the key was turned off. In fact the hood was lifted immediately after this experience and the hot wire from the coil to the distributor was removed so that no spark could be delivered to the plugs. The starter was again engaged with the result that the engine actually fired a few "licks" with no spark at all.

In the eastern part of the U.S. where heat is accompanied by high humidity, this difficulty may not be apparent, but the western deserts may cause trouble unless the petroleum companies raise the octane ratings considerably during the summer months.

Although we would like to see a few minor changes in the Olds triple carburetion, it is felt that the basic idea has great possibilities. Dual throat carburetors are always turn sensitive so a switch to individual float chambers for each throat would eliminate this fault thereby producing a carburetion system that would closely compete with injection.

Detroit's present crop of injection systems are all born of compromises so they cannot be considered as ideal designs. Until the high cost of an ideal design can be either acceptable or surmounted, multiple carburetion with one float per throat may well be the solution to the large carburetion requirements of our present day engines. •

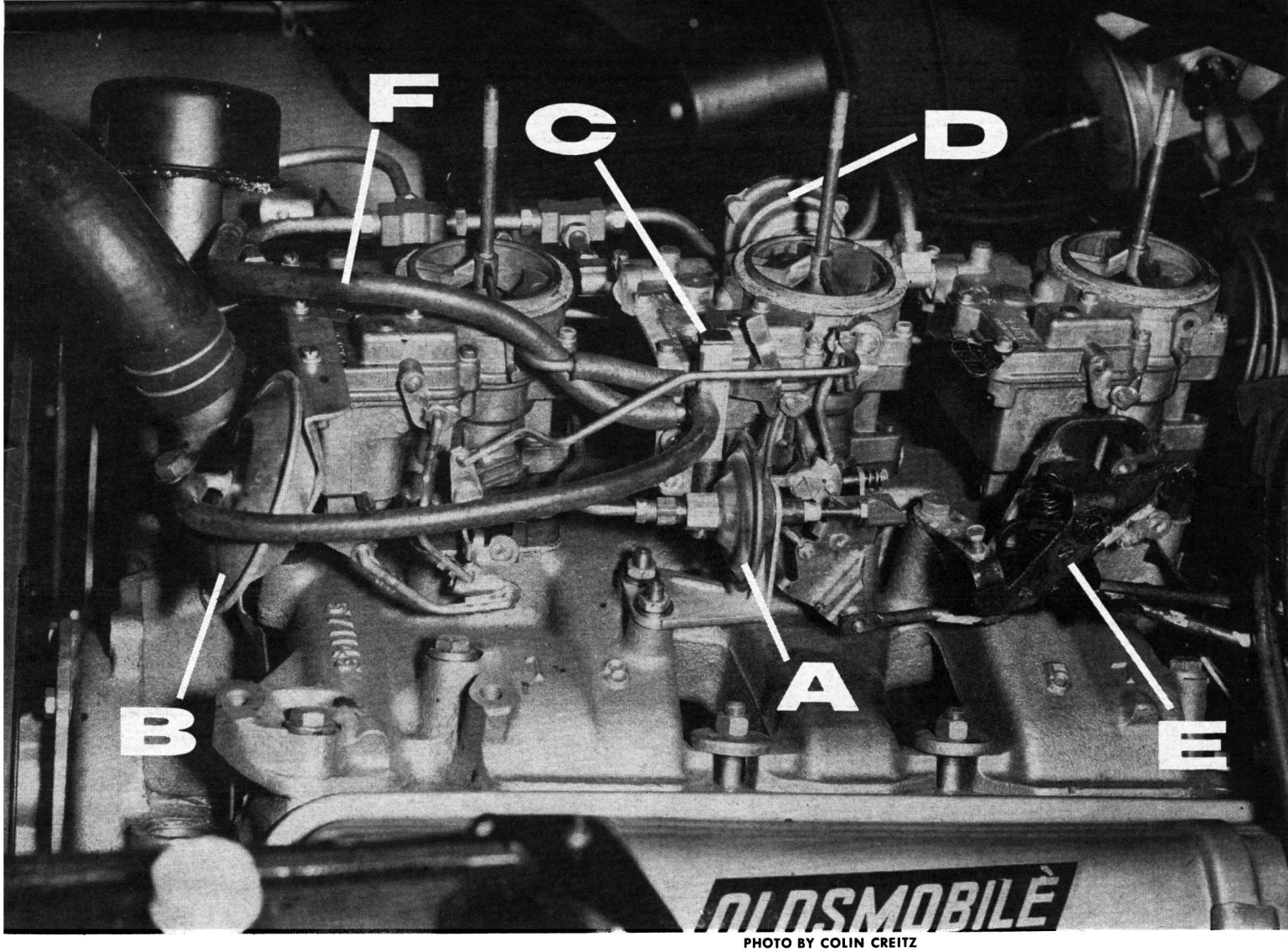

PHOTO BY COLIN CREITZ

A— Vacuum operated dash pot is used to prevent rapid closing of the center carburetor when foot is suddenly lifted off accelerator pedal, a condition which would normally kill the engine.

B— Vacuum operated diaphragm which opens throttles of the two end carburetors.

C— Vacuum switch that routes vacuum to throttle diaphragm.

D— Automatic choke. This unit is used on the center carburetor only.

E— Downshift over-travel linkage. Although this unit is mounted adjacent to the rear carburetor, it is connected to the center carburetor only. This linkage allows cars with automatic transmissions to be downshifted (passing gear) by further depression of the throttle, even though throttles may be wide open at the carburetors.

F— Vacuum line from windshield wiper pump to vacuum switch.