

# HOPPING UP the VALIANT

TO THOSE who follow performance, it is now obvious that among the current compact cars, the Valiant is the hot dog. The fact first became clear in the Daytona Beach Speed Week events late last winter. The big *new* news now is that the Valiant power kit is being made available as an accessory item.

It took what seemed like a long time after Daytona for the compact car makers to decide definitely about the marketing of optional performance equipment for their respective engines. It became unhappily clear to eager performance enthusiasts that the Daytona cars were little more than experimental machines (MOTOR LIFE, May 1960 issue), using practically handbuilt equipment. Apparently, at that time, there were neither the plans nor the means for furnishing any of the items to the public.

As it now stands, the Falcon has been dropped out of the compact performance race—at least by Ford—and the Corvair is resting with a very simple 15 hp increase for the 1960 models (hot cam and exhaust) and is possibly holding back its big guns for 1961.

Among the new compacts, however, Valiant is now another matter. Its power kit is something you can step up to the counter and buy, although the package is a bit different from earlier reports.

In order to distinguish between the Daytona kit and the one that is being made available, a brief analysis of the equipment used on the beach is necessary.

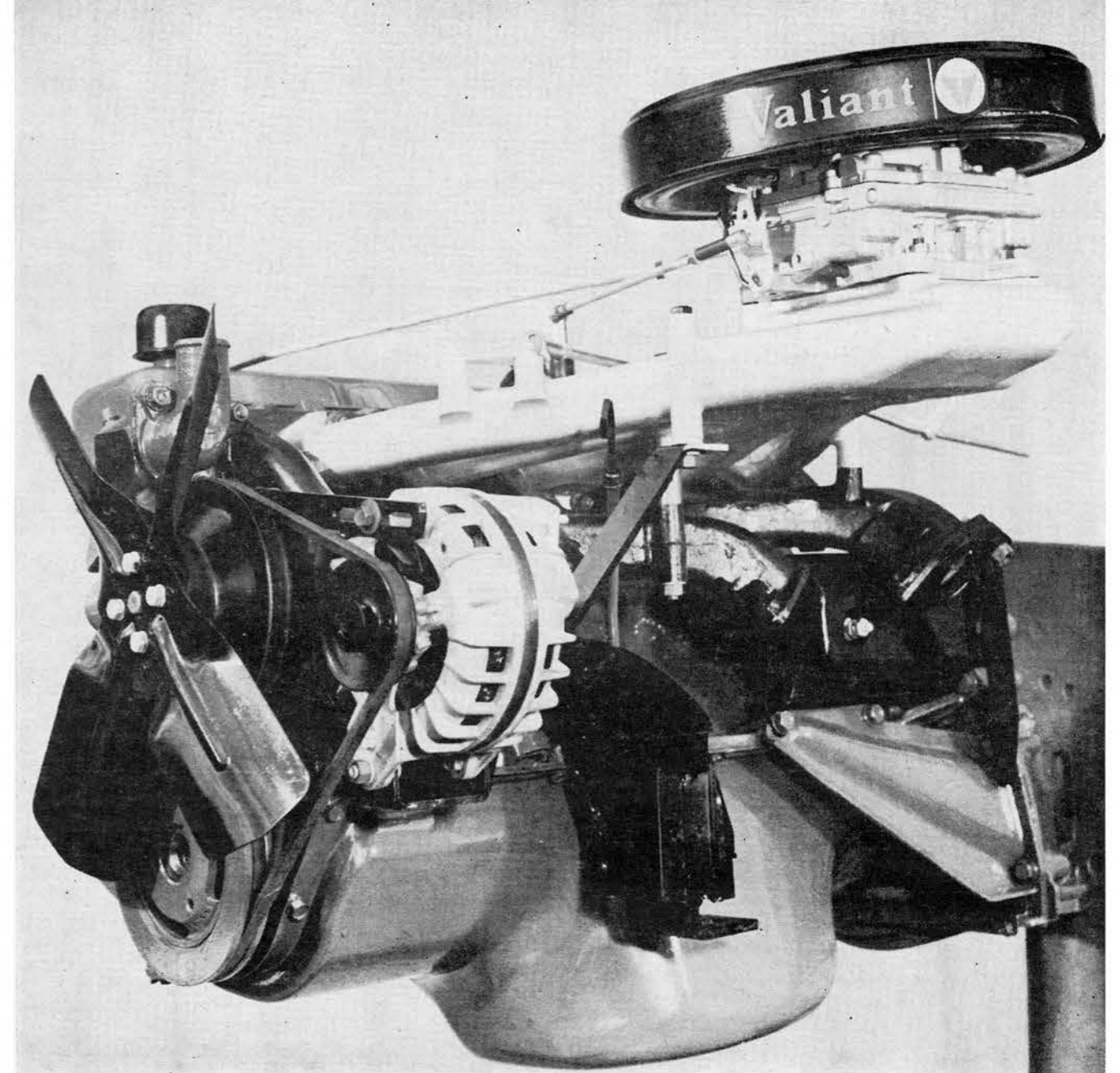
The high-performance Valiants used in Florida last February were obviously handbuilt. This was particularly evident in an inspection of the internal components recently by the MOTOR LIFE staff. Machine work that was definitely not of a production nature was noted on the crankshaft and pistons, in particular. It even indicated limitations placed on the pre-race preparations, probably for reasons of secrecy. The use of limited tooling of an engineering laboratory left very definite "trademarks" on the engines.

The evidence is shown in accompanying photographs of actual components from the Daytona Valiants. In addition to the regular large diameter balance holes drilled in the crankshaft cheeks, there appear two groups of seven very small diameter (pos-

sibly one-quarter inch) holes in complementary positions. There are many methods for removing metal from a crankshaft during the balancing process and they are all more efficient than a quarter-inch drill. Two one-quarter-inch holes in complementary positions could be used for the final "fine trimming" that could be part of a perfect job, but 14 small holes are more indicative of limited facilities.

Flat areas milled in the domed piston crowns had the appearance of machining with a very dull cutter. Although the die-cast autothermic aluminum alloy pistons have a production look about them—they resemble the domed pistons in 1949-53 V-8 Fords except for three rings instead of four—this final alteration which flattened a portion of the dome had a backyard look.

The camshaft, the third of the Daytona components studied, showed some of the Chrysler 300-F influence, doubtless as a result of the ram induction application. And while capable of winding up to 7,000 rpm, far beyond the 300-F, low-speed performance still was very good. This is evident from the timing and the lobe contour. The portion of the timing



NEW POWER KIT ADDS IMPRESSIVE LOOK TO VALIANT'S SLANTING SIX ENGINE WITH LARGER RAM MANIFOLDING AND FOUR-BARREL CARB.

that causes idle difficulties (overlap) totals only 48 degrees. The segment of the timing that utilizes ram induction to a high degree accounts for the intake valve closing 75 degrees after bottom dead center. Since the engine was intended to peak between 5,800 and 6,000 rpm, early exhaust blow down was desirable so the exhausts were opened 67 degrees early. Intake dwell totaled 280 degrees and exhaust duration 10 degrees less.

Even though dual valve springs were employed to prevent valve float, the contour of the cam lobes on the Daytona speed machines provided a comparatively gentle opening and closing rate to allow the 7,000-rpm figure without requiring excessive spring pressure. Harsher action,

which would have required heavier springs, would have shortened the life of the cam.

The engines that ran in the Valiants on the raceway developed 194 hp. Subsequent experimenting, with a different exhaust system, netted 203 hp.

Now we come to the power kit for production.

Original plans to install the special equipment of this kit on the production line had to be dropped because of unexpected demand for the new slant Six, which also runs the Plymouth and Dart, although in larger form. The kits are being distributed by Mopar Division of Chrysler Corporation as a dealer-installed option. This means, in turn, that the high-dome pistons (10.5-to-1 compression) will not

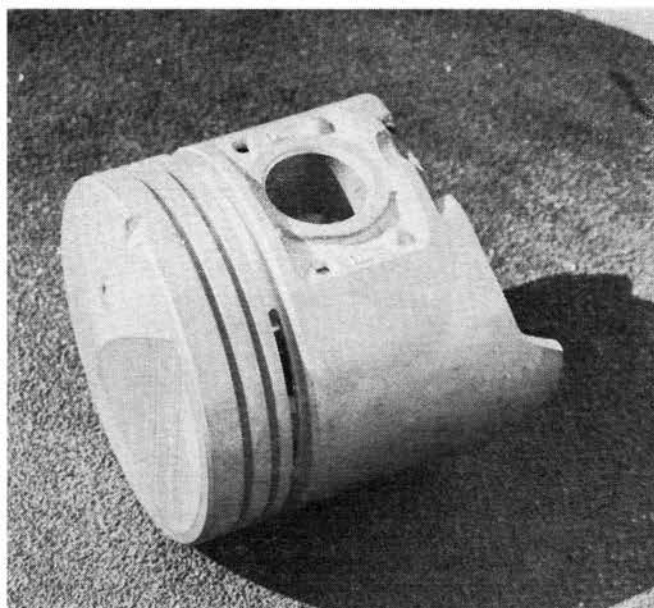
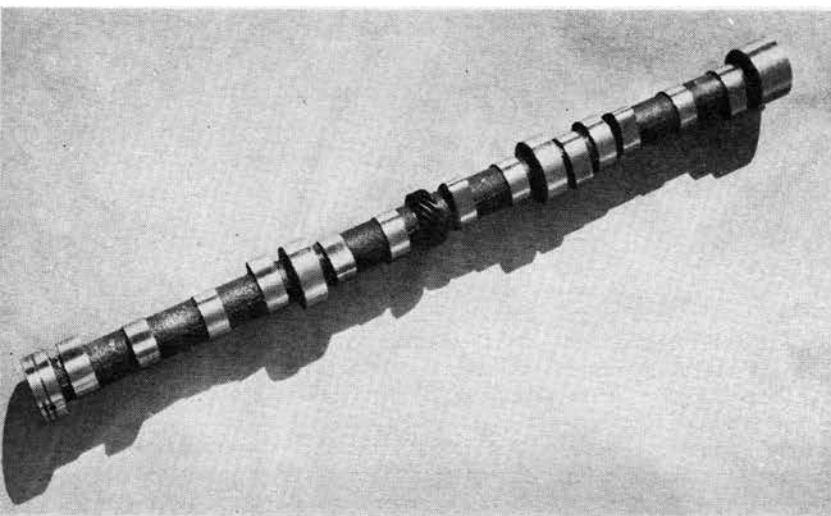
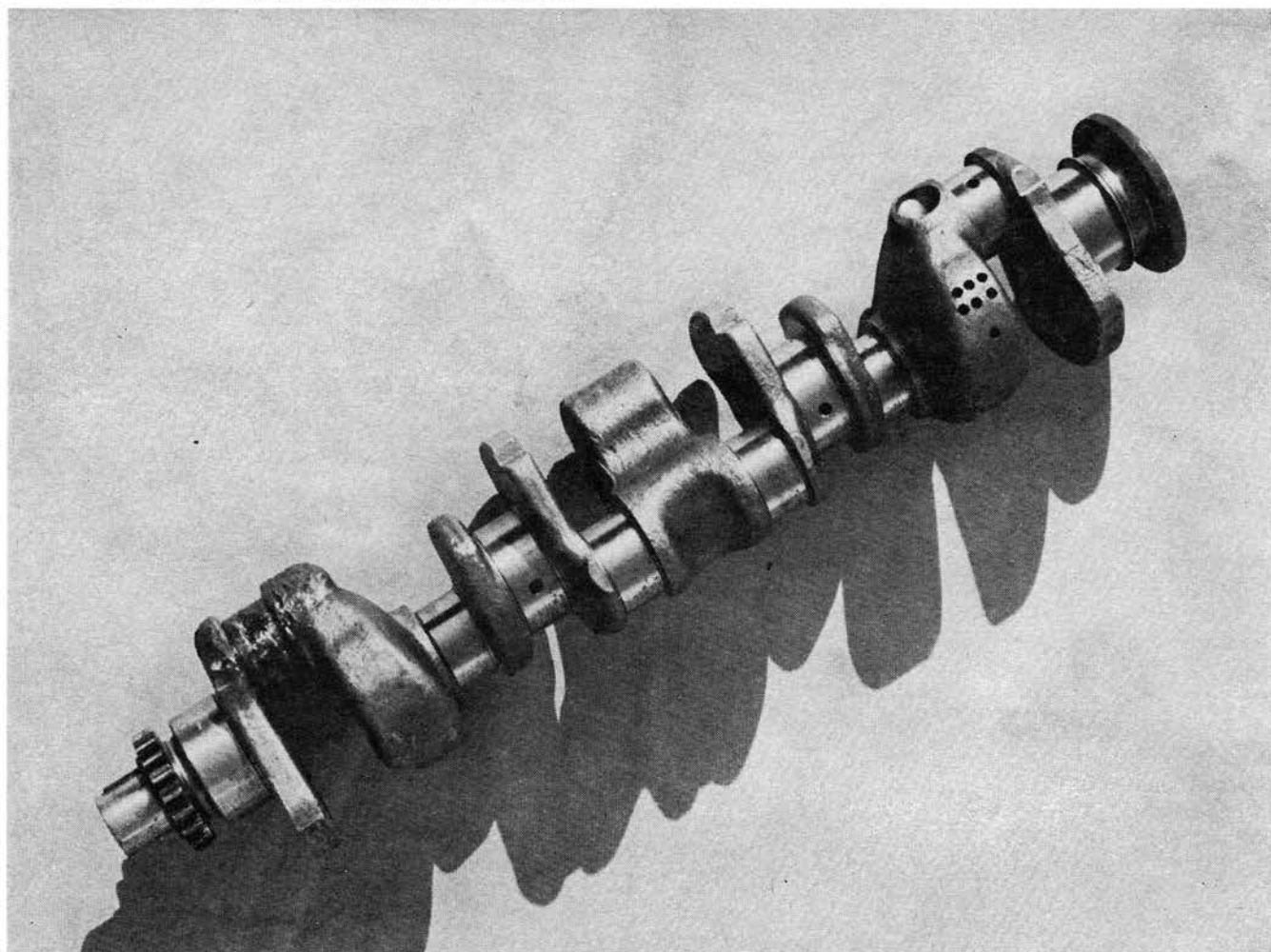
be practical to use, since these naturally must be selectively fitted to the engine in the assembly stage. An engine in a dealership could be torn down, of course, but the labor cost involved would be high.

It also was decided to use the single valve springs instead of the double springs of Daytona, more as a safety factor than anything else. These lower the valve float speed from 7,000 rpm to 6500 to 6600—which is considered a safer shift point for the clutch and transmission. Other than these two differences, the new Hyper-Pak, as it is called, will be generally equivalent to the Daytona engines. Generally equivalent, that is, with two limitations.

One of these is the benefit of the very

*For the first time there is a real power kit available for the hottest of the compacts*





**FIRST HOPPED-UP** Valiants made their appearance at the Daytona Speed Week equipped with these rather cobbled components. A close study of this equipment shows that the job was hurried and the result certainly not very "stock." The small drilled holes seen on the top crankshaft cheek indicate a none-too-efficient balancing procedure. The camshaft lobes show that there was a comparatively gentle opening and closing rate to allow for the 7,000 rpm figure on the Daytona machines. The flat area on the domed piston demonstrates that the milling process was done with a very dull cutter.

professional tuning the Valiants enjoyed at Daytona at the hands of Lee Petty. The other limitation or possible disappointment will be with those kit buyers who have difficulty in understanding the difference between torque and horsepower.

Although the 148-hp rating of the Valiant kit may be quite honest, and the car's performance very good in the 4500 to 5500 rpm ranges, torque at low rpm will suffer greatly with a long timing cam and an 8.5-to-1 compression ratio. The late intake closing of such cams demands that the compression ratio be high to compensate for the shortened compression stroke. Those who wish to investigate this aspect further, may profit from the special article on cams in this issue, pages 36-41.

The Valiant power kit, to describe it fully, consists of the inertia-ram aluminum intake manifold on which is mounted a big Carter Model AFB four-barrel carburetor. The cam kit includes the long-duration high-lift camshaft, light tubular pushrods, the high-tension single valve springs and dampers to prevent spring "surge." The exhaust components in the kit are the double manifold castings (each handling three cylinders), a 2½-inch Y-shaped header that connects to a reverse-flow low restriction muffler, and a two-inch tailpipe. There also are a number of small parts, such as those required to offset the starter for exhaust clearance, brackets, wiring, throttle linkage, and so forth. And, finally, they will include a heavy-duty woven clutch disk to handle the engine better at the 6,000-plus rpm shift points.

The precise retail price of the Valiant power kit was not available at the time of this writing. Factory sources, however, said it would list at from \$200 to \$250. That is quite a price, but, on the other hand, it is quite a package. And the Mopar division considers the whole thing a real "beast" to deliver—simply from the physical size with all that exhaust tubing.

No data is available at this stage on the production power kit's true output on the dyno with the stock 8.5-to-1 pistons. Yet it is promised that the advertised rating of 148 hp at 5200 rpm will be delivered. In view of the fact that the Dayton engines were reaching 194 hp at 5800 with 10.5-to-1 compression, Chrysler engineers are confident that the 148 hp target as installed in the car is no problem.

It then follows that the Hyper-Pak Valiant is certain to be a genuine threat in its class at drag strips. (It'll run in the C stock class.) The weight-horsepower ratio puts it right at the top of the class, and the major opposition it'll face has been turning the standing quarter mile in an elapsed time of around 17 seconds, with speeds in the 80-84 mph range. If the 2700-lb. Valiants can develop that honest 148 hp at the clutch, they should be able to turn 85 mph and clock elapsed times about 16 seconds. Further, there are export 3.90-to-1 rear-end gears to help. ●

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