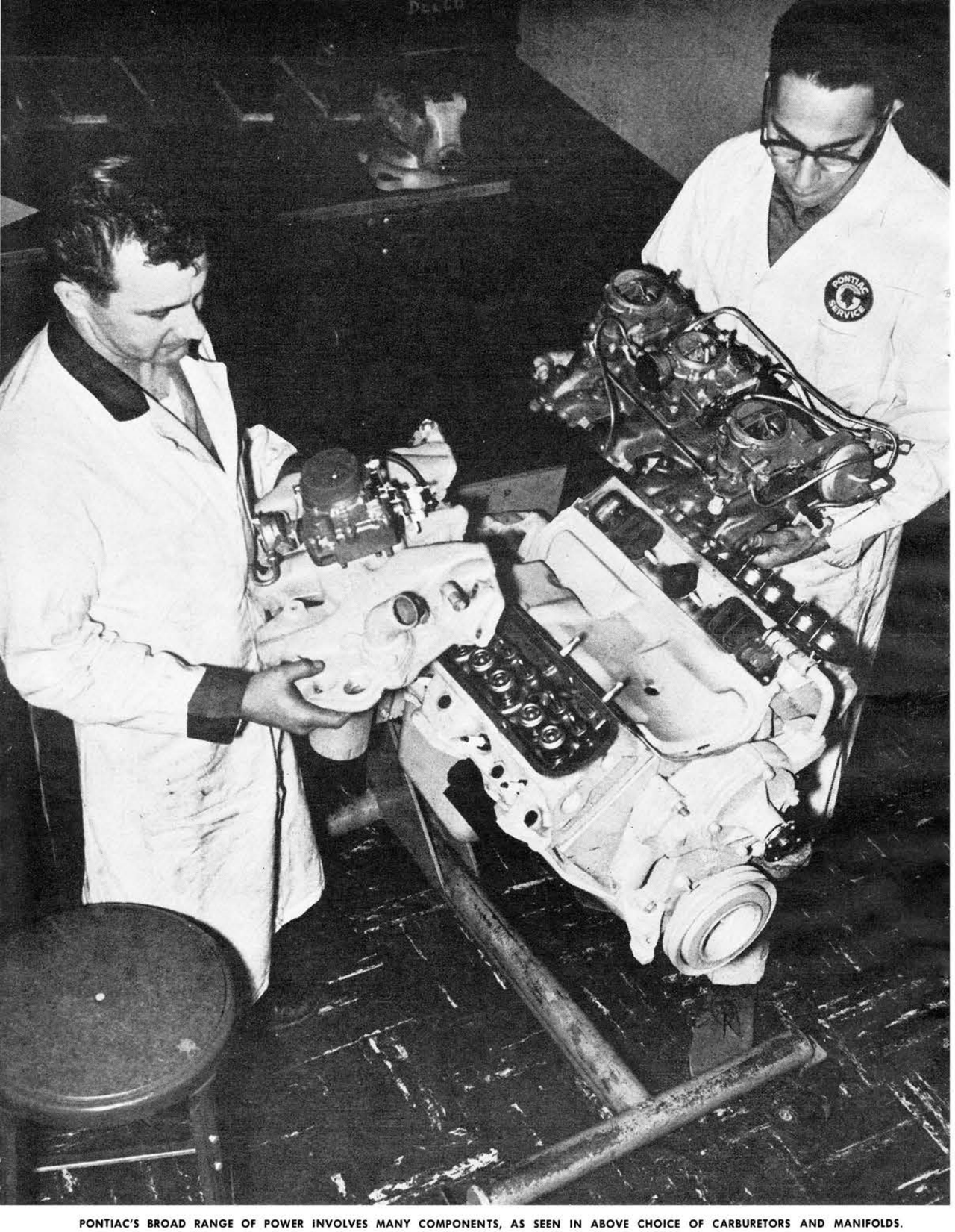

PONTIAC'S BROAD RANGE OF POWER INVOLVES MANY COMPONENTS, AS SEEN IN ABOVE CHOICE OF CARBURETORS AND MANIFOLDS.

HOW TO SELECT:

PONTIAC OPTIONS FOR SPEED OR ECONOMY

By John Christy

Of course there's the mild more-mpg setup, but for those who care, Pontiac has only three really important choices—hot, hotter, and hottest!

ONE MIGHT be led to believe that while Pontiac offered a corn-crib full of various styles, bodies and series from the near-Sybaritic to starkly functional, the Pontiac buyer was faced with little or no choice in engine options.

That is one would be led to believe so if one didn't follow the races—but even the race follower might justly assume that there were only a couple of options from lukewarm to sizzling hot and that if you wanted it hot it would be a case of Bonneville (the car not the salt) or bust.

If truth be known, about the only thing the Pontiac buyer has no choice in is the wide track—he and his garage can take that one or leave it alone. As far as anything else goes, the Pontiac prospect can stir up just about any kettle of broth he feels his purse and tastes can stand.

True, Pontiac offers one size and one size only in the engine department, a muscular, rugged 389-cubic-inch V-8 strongly reminiscent of an outsize 283 Chevrolet. But this versatile piece of machinery comes in no less than seven different versions from a penny-pinching 215 hp to a hustling stable housing a rated 348 horses.

This amazing range is accomplished by mixing in the proper proportions three different carburetor setups, three assorted camshafts and three different types of pistons giving as many different compression ratios. Mix into these ingredients three types of transmissions, two rear ends (open or self-locking) with six varying rear end ratios and you can begin to see that choosing a body style, series and paint job is only the barest beginning.

Readers with a mathematical bent will see that the permutations or multiple combinations of this series can be absolutely enormous, especially mixed or combined at whim rather than according to the book. Such mixing would be completely impossible for the factory or individual dealer; consequently the manufacturer has chosen those combinations that work best, grouping them into two standard power teams and five optional teams with one standard and two normally optional rear ends for each team. These can all be purchased either immediately or on short notice from any dealer in any model or body style.

Rear end options other than those recommended can of course also be ordered but the wait will probably be a bit longer. There really isn't much point in messing around with the order of things, though, since what the factory gives you provides just about anything you'll want from docile, every-day, go-to-meetin' transportation to a machine that will, in absolute show room condition, get you into the 135-plus mph bracket—always assuming that you've the right combination of guts, tires and immunity from the law to go that fast.

Let's see how these combinations go together.

The first power option is the standard powerplant for the Catalina, Ventura and Star Chief models and as an economy option known as the 425-E in the Bonneville. This one puts out a relatively modest 215 hp (advertised) at 3600 rpm and 390 lbs.-ft. of torque at 2,000 revs. It uses the mildest of the three camshafts, a two-barrel carburetor and pistons giving a compression ratio of 8.6-to-1 which means you can use current regular grade fuel, assuming a good brand is used, with a maximum spark setting of 22 degrees at 3600 revs. Teamed with it is the choice of normal synchromesh which is standard, or the heavy-duty synchromesh or hydramatic. The rear end that comes as standard with either of the two manual transmissions is 3.23-to-1, with 3.08 or 3.42-to-1 as listed options. The Hydramatic is equipped with the 2.69-to-1 axle in all but the Bonneville and wagon versions. The Bonneville standard rear end is 2.87-to-1 when the automatic transmission is used. The 3.08-to-1 option is the only listed alternative.

The reason, of course, for the lower numerical ratios being used for the automatic transmission is simply that the four speeds in that unit give a greater range of torque multiplication and both of the two lower speeds are geared lower than is first gear in either the normal or heavy duty synchromesh box. With the lowest numerical ratio of 2.69 the car should do in the neighborhood of 110 mph and with the 3.42 axle, top speed would be a shade over 90 mph at peak hp engine speed.

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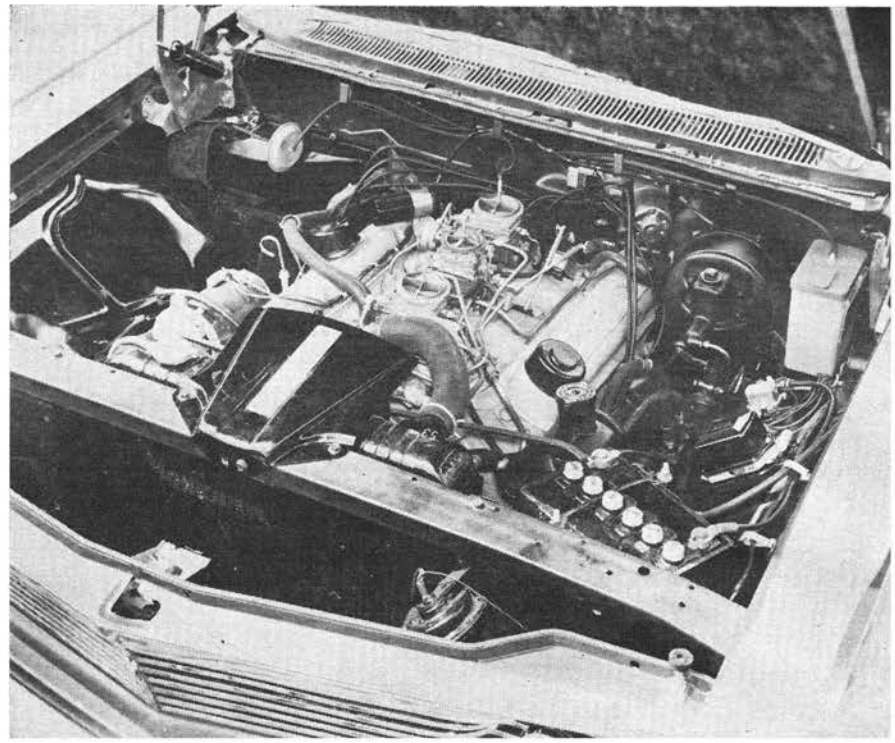
PONTIAC OPTIONS

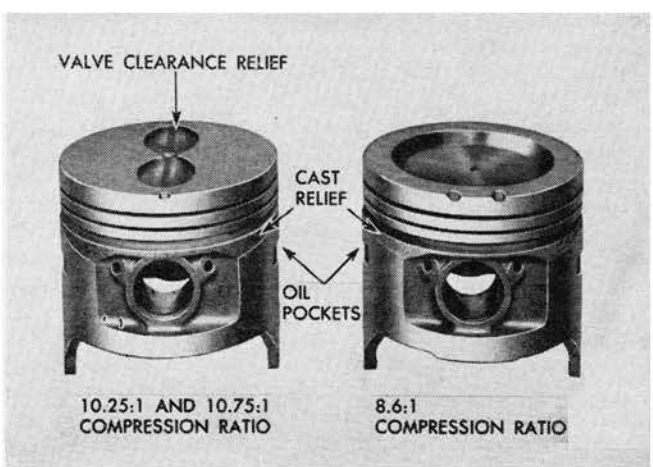


TEMPEST 425-A engine is as hot as they come, developing 348 hp in triple-carbureted form. Compression ratio is 10.25 to 1 and a wild cam is used (see diagram, page 45).

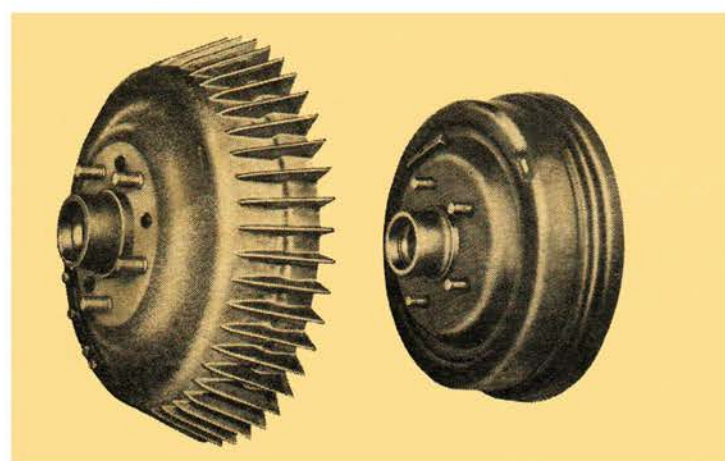
The next option is the regular Tempest 425, listed somewhat laconically as "equipped with four-barrel carburetor." Since the jump in horsepower is a long leap from 215 to a listed 281 hp, there's more than meets the eye. This one still has the 8.6-to-1 pistons so that isn't the answer. The clue lies in the peak hp figure of 281 at 4400 rpm and a peak torque rating of 407 at 2800 rpm. Part of the added power comes from the increased venturi area of the four barrel but not all 56 horses and not an additional 800 rpm. Some of the horses also come from the dual exhaust but again not all. The real answer lies in the camshaft. The economy engine is equipped with a 252-degree duration stick while the so-called four-barrel unit has one that shows 273 degrees duration on the intake side and 282 degrees on the exhaust. Overlap is 28 degrees on the economy shaft and 55 degrees on the normal or Bonneville shaft. All the extra breathing area in the world wouldn't add 56 horses unless the valves could take advantage of it. The intermediate cam takes care of this. This option can still digest the stuff in the first or inexpensive pump at the corner gas station if that's what you want, although it may use a bit more of it than will the 425-E. You'll probably be better off using the contents of the middle pump in the long run.

Transmission and rear end options are exactly the same as for the 215-hp engine if either of the two synchromesh transmissions are used. Adding the hydramatic creates a new situation since it is accompanied by another internal chance.

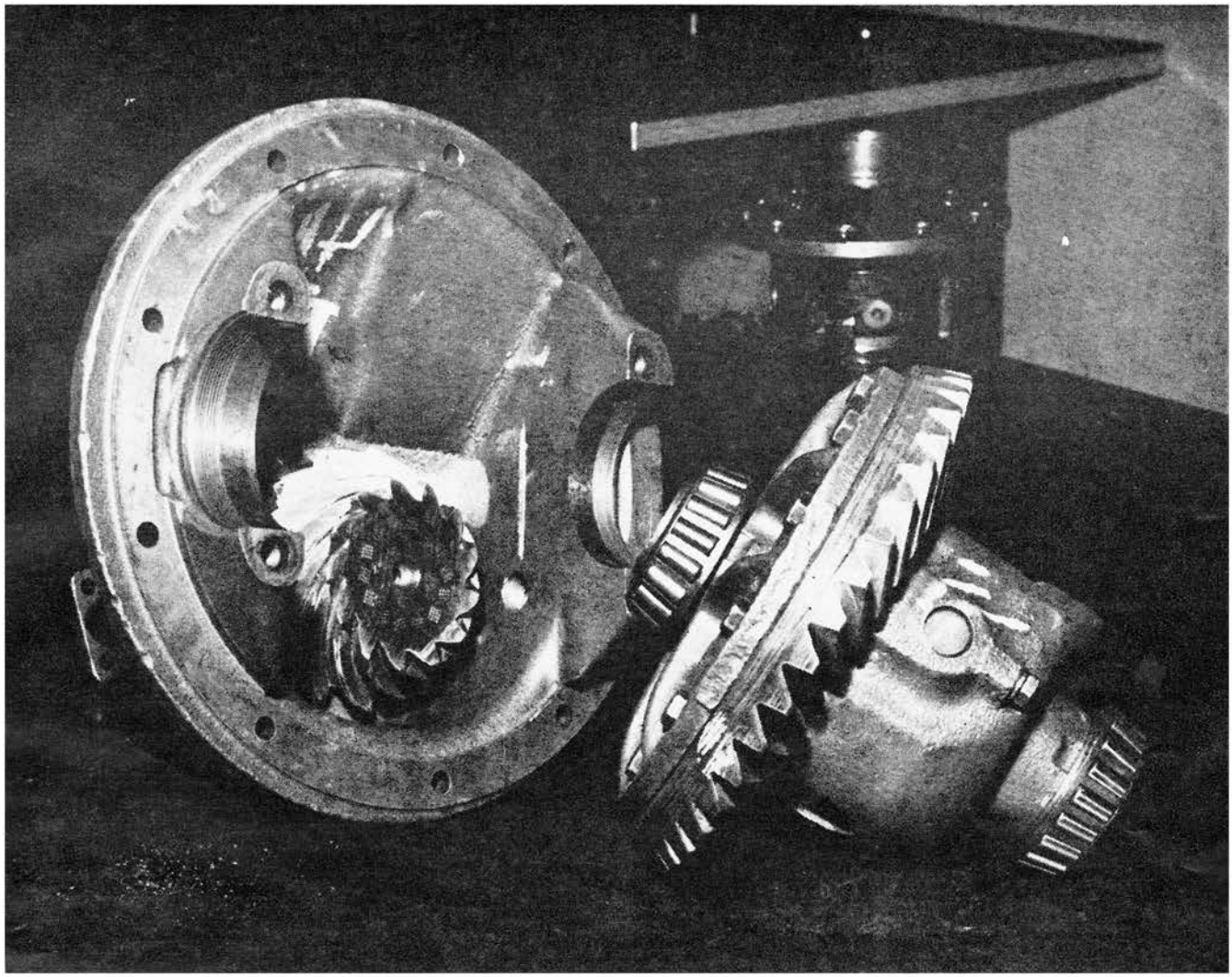
If you ask for the hydramatic and more engine than is given in the 425-E you can have a choice of two engine options, again listed as "two-barrel" and "four barrel" and they are NOT the same as the 281-hp unit as might be expected. The two-barrel—



PISTON Modifications help make the difference. With a concave top (right) compression ratio is lowered, along with fuel needs. For hotter engines opposite changes have been made (left).



STOPPING power becomes a problem as the engines get wilder. The special finned front brake drums are almost a necessity on the high performance Pontiacs. Rear drums are shown at right.



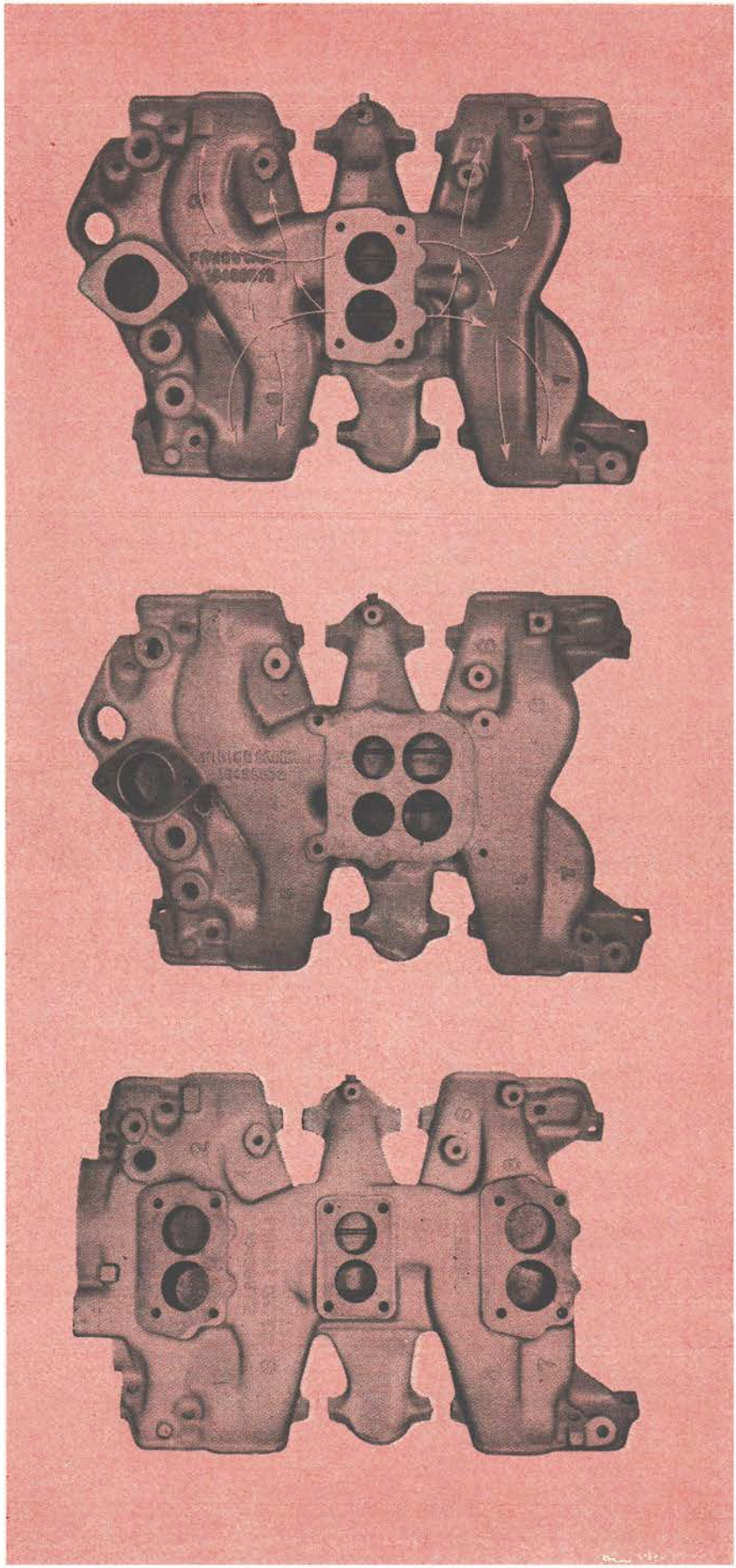
REAR END gear sets are a most important link in the Pontiac power chain. Six varying ratios are offered in this department. They are available with either a straight differential or with a limited slip unit. The latter is the disassembled unit pictured above.

meaning the carburetion, not the number of cylinders—puts out 283 hp at 4400 rpm and 413 lbs.-ft. of torque at 2800. It sounds a bit odd but it isn't really. This engine uses the so-called "hydramatic cam" as does the 281 hp mill. With the cam, however, is a healthy boost in compression ratio to 10.25-to-1. In other words, another combination of bits and pieces has been used to gain much the same effect as was gained by allowing the 215-hp "economy engine" to breathe better.

The next step up the ladder is accomplished by taking the 283-hp engine and giving it more breathing *area*. With the cam it has the ability to use the area and with the additional squeeze given by the 10.25 pistons—requiring the use of premium fuel—the power is upped another 20 horses to 303 hp, though at an additional 200 rpm allowed by the bigger entry and exit passages allowed by the four-barrel carburetor and the dual exhaust. As mentioned, these engines are listed for the hydramatic only. The normally used rear end is the 3.08-to-1 unit with 2.87 and 3.23-to-1 ratios offered as options. Use of the 2.87-to-1 axle should put the car into the 120-plus mph class while the 3.23 rear end should give a very quickly reached 110 to 115 mph.

There's still more to this variant, though. Another 15 horses can be had according to the factory. This is done through the use of a progressively linked triple two-barrel carburetor set-up similar in outward appearance to such proprietary systems as the Edelbrock triple-carb manifolds for other cars. Instead of using a solid mechanical hook-up, however, Pontiac uses vacuum to open the two outboard carburetors, a mechanical linkage system going only to the center or primary carburetor which alone of the three carbs contains a choke and idling circuit. Thus, at low speeds, this unit uses the almost-miserly carburetion of the two-barrel 281 engine with the accompanying easy bite on the fuel bill but also gives as much breathing area at the top end as that particular cam can use. A little extra poke is achieved by raising the compression ratio another half of a point to 10.75-to-1. When used with the manual transmissions this one also comes with the same gearsets in the rear end that are fitted to the mildest of the engines. The gears that come with the Hydramatic equipped 318 are the same as for the other automatic units. With this jump in power, though, the heavy duty manual transmission is all you can normally get, even though you might like the closer and slightly higher ratios of the normal synchro box. If you want to take the chance of destroying the gearbox, however, you might be able to sandbag a dealer into swapping boxes but this will undoubtedly void the warranty, at least insofar as gears are concerned. In any case, top speeds will be similar to those of the two warm versions noted earlier, peak engine speeds being for all practical purposes identical, though acceleration will be considerably better.

Now we come to the two hot dogs of the line. Properly "breathed on," suspended and lightened versions of these were



seen last spring flying in close formation around Daytona's tri-oval at 150 mph and a fully street-equipped version sizzled down the soft, slippery beach in the high 130's. This one is known to the trade as the Tempest 425-A and comes in two slightly differing versions—four-barrel and triple two-throat. Internally the two are identical. Both have the 10.75-to-1 pistons and both are equipped with a fairly wild cam, with solid lifters. This shaft has 283 degrees duration on the intake and a wild 293 degrees of duration on the exhaust with 60 degrees of overlap. Peaking speed is not certain at this point but an educated guess would be 4800 to 5000 rpm with a peak torque figure above 430 at about 3200 rpm. The factory says that with the quad-throat carburetor the engine develops 333 horses with the triple two-throat manifolding 348 horses live where 215 once were stabled.

This is almost, but not quite, admitted by the manufacturer to be a competition car for those who would go dragging or for those who wish a sound base on which to build a stock car, whiskey runner or whiskey-runner catcher. The transmission options are either hydramatic or heavy-duty manual. In the case of the former the rear end is geared 3.23-to-1 and with the synchro box the gears are 3.42-to-1, the lowest gearing listed for the car. An additional option is offered on special order for the manual-geared car of 3.64-to-1, a cog obviously suited only for dragging and short-track stock car racing. Set up this way there is no reason to believe this car should not do the standing quarter between 15 and 16 seconds, ticking the trap somewhere near 90 mph. If the Bonneville is your meat and you can lay hands on a 2.69 gear there is no reason to believe you can't approach 150 mph.

When you pack the kind of poke available from the hottest Pontiac there are certain other options that become mandatory and the men from

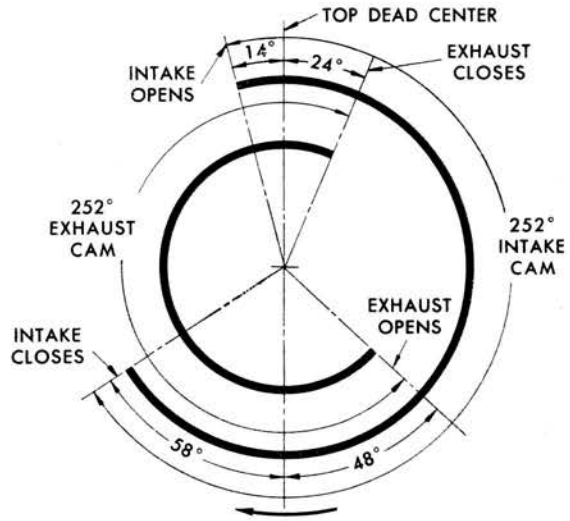
INTAKE MANIFOLDS are offered in three forms. With the two-barrel-carburetor unit (top) each throat feeds four cylinders. The four-barrel type (center) sees two-throat sets feeding four cylinders each. On the triple unit (bottom) distribution is the same as the two barrel with extra fuel fed to each group of four cylinders from the end carburetors on demand only.

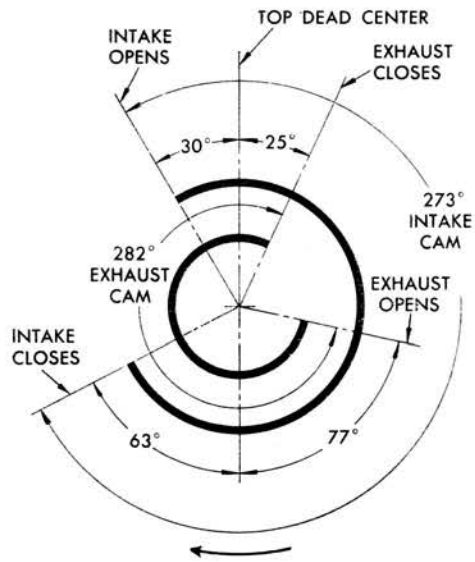
Pontiac have provided them in some measure. If a car is to go it must also be able to stop and with this sort of go the standard braking is woefully inadequate, even with power assists. The usual wear with Pontiac is a 14-inch wheel with a six-inch wide rim. This poses two problems, to wit: excess wheel speed in terms of rpm and, worse, brake shrouding which prevents the brakes from cooling. There are two options to remedy the situation . . . a regular production option of 15-inch wheels with 5½-inch rims and special order option 15-inch wheels with six-inch rims.

In addition to these wheel options there is a special heavy duty Moraine brake set-up that utilizes deeply finned, aluminum muffed drums on the front and heavy-duty but unfinned drums on the rear. These brakes are entirely adequate and are virtually fade-proof. Take our word for it, if you plan on packing the full load, plan also on using the Moraine brakes with or without power assist.

With all the power available it is best to be able to put as much of it on the road as possible and to this end, Pontiac provides a limited slip differential called Safe-T-Track. This operates on a cam and clutch principle. The spider shafts are single units with two spider gears per shaft. These shafts are notched at the center so when they cross the gears they normally lie in the same plane. The shaft ends ride in the differential case in V-shaped openings and, under normal conditions, ride in the V. However, when undue differential action occurs they ride out of the V's and exert pressure outward toward the axles, forcing a set of spring-loaded clutches to bind, locking the axle halves together. In turning a normal corner there is full differential action but the second the torque load of one axle shaft becomes excessive the locking effect takes place. With the fully power-packed Pontiac, especially when equipped with that 3.64 "dragging gear" it is a good piece of equipment to have along.

In any case, whether you want your Pontiac mild, lukewarm or wildly loaded, the Pontiac dealer can provide. As we said, if you want to stir the pot yourself and know the friendly parts man, the sky's the limit but there's really no need since the cooks at Pontiac have already built as standard just about all the rational combinations you can find. Of course if you want to go on from where Pontiac left off, there are people who are ready, willing and able to help. •





CAM VARIETY is shown in these timing diagrams. Mild unit at top is for economy engine, Hydramatic cam is at center and hot type at bottom is for hot 425-A engine.