

# 348 HP GTO

... Pontiac's new middleweight with heavyweight punch!

BY ALEX WALORDY

PONTIAC's GTO engine has 100 cubic inches more than the nearest equivalent Ford, and is 72 cubic inches bigger in displacement than the belated 327 Chevelle. This is enough to make any performance conscious driver sit up and take notice. Again, because of the difference in weights and engine output, the GTO will run away and hide from a hot 1963 street 421 Catalina. Because of smaller frontal area and reduced weight it will also burn less fuel while putting out equivalent performance.

After an extensive road test, we can

vouch for the fact that the GTO doesn't bear the least resemblance to the 1963 Tempests as far as handling and cornering go. No more spins or axles swinging at odd angles. This car is every bit as good on the road or the handling course as the larger cars, with the added advantage of a very high power-to-weight ratio. Since you can break the rear wheels loose in most any gear, there is no difficulty in swinging the car into a corner if you have gone in a bit over your head. There is very little rubber in the steering, so that steering wheel

motions are relayed precisely, and you know at every moment what the GTO will be doing next.

Steering ratios are on par with the remainder of the industry, meaning that little old ladies can park it with ease. For those who don't mind a higher degree of effort, in return for quicker response and a more precise feedback, there is an optional 20:1 manual steering ratio available. Power steering provides a 17.5:1 steering ratio. Pontiac ought to lead off an industry wide parade of fast optional power steering. They lead the rest



Standing starts generate lots of smoke, but there isn't a trace of wheel hop. Super-tuned versions are natural class winners.



348 hp GTO is Pontiac's latest drag threat. Scoops are strictly decorative.



Plush buckets hold you in place during those 13-second trips down the track.



Single quad engine is rated at 325 hp, while tri-power version grinds out 348 hp.

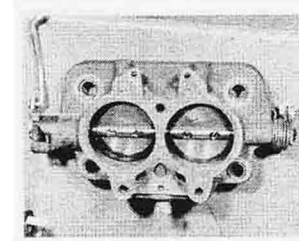
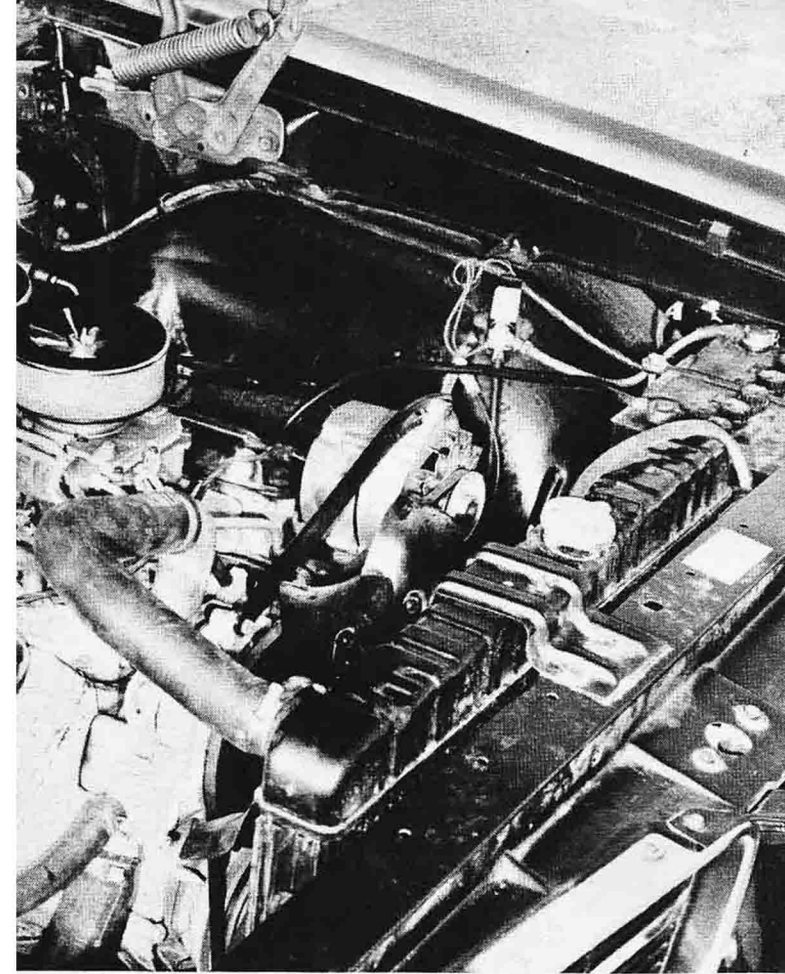
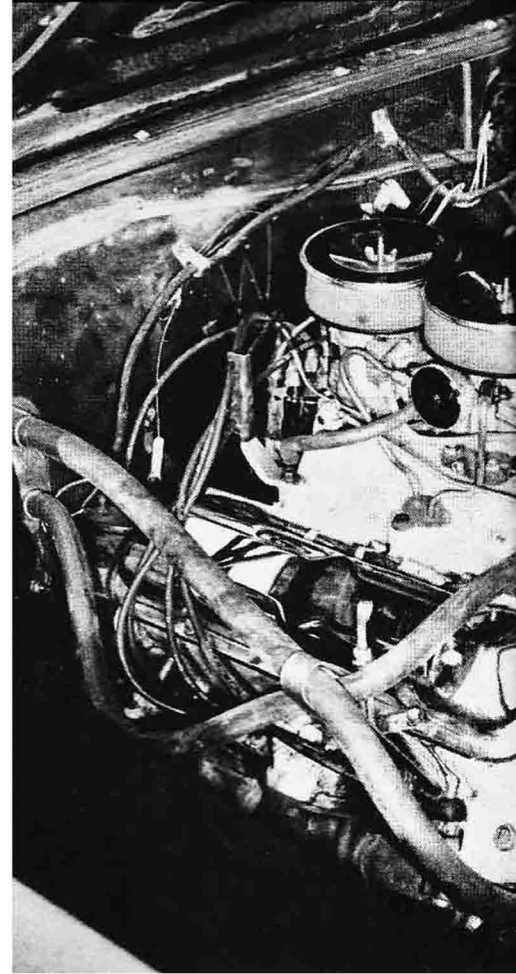
## 348 HP GTO

of the pack on power and styling, so they can certainly afford a long overdue move in this area as well. Quick steering is just as much a safety item as good brakes or a seat belt.

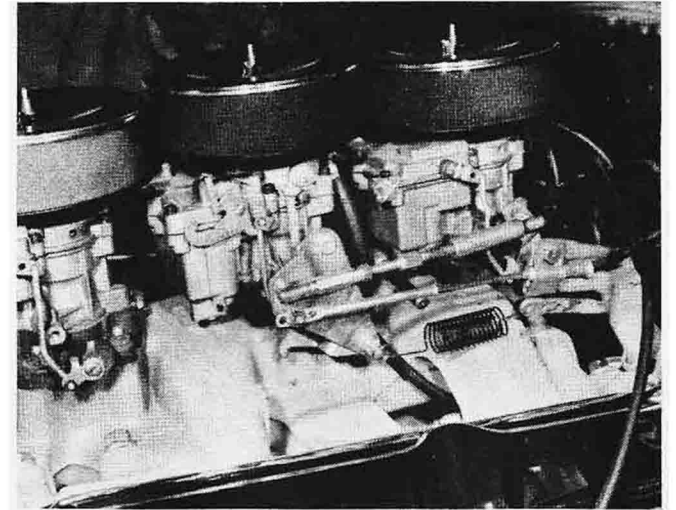
The power pack in a GTO can smoke tires in most any gear, and will lay down an even pair of black strips every time. There isn't a trace of squirely action regardless of whether you practice on black top or brushed concrete. A conventional rear axle and a one piece drive shaft have replaced the thin strand of spaghetti and trans axle combination.

It may seem like an old-fashioned step backwards, but drive it and you'll find little room for improvement. One prime advantage is that there is no wheel hop, regardless of whether you start slowly or rev up and pop the clutch! Four links connect the rear axle to the chassis; two running from the center out at the top, and two running more or less parallel to the boxed frame underneath. Now bear with us for an instant course in linkage design. Even though the link centers are close to the rear axle, the *effective* or instant center is way out

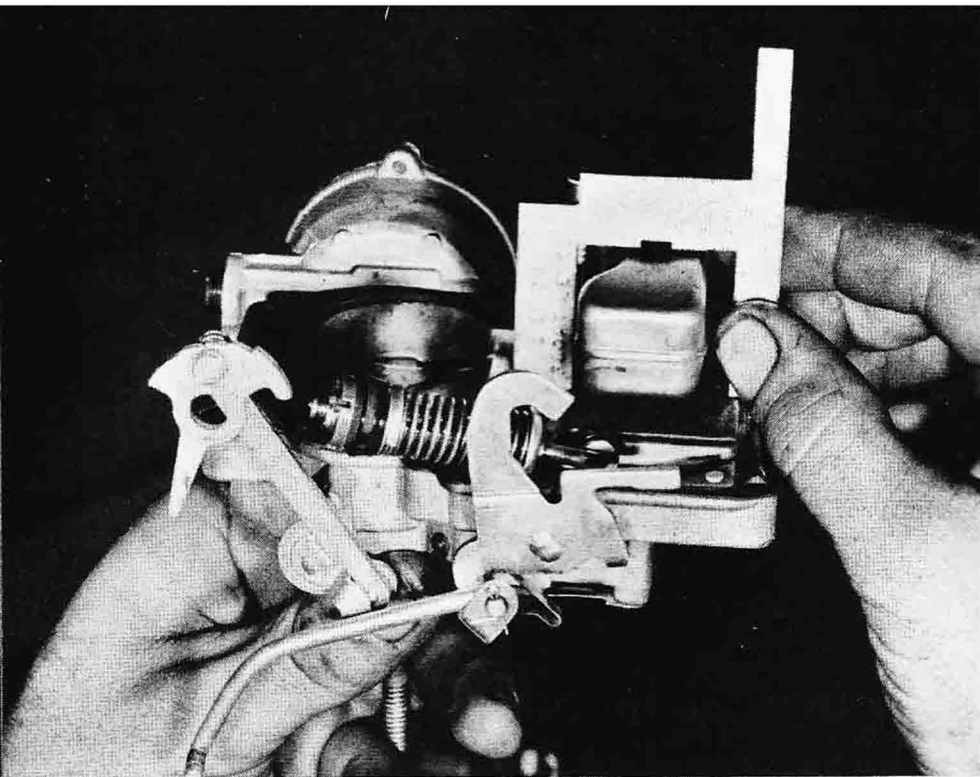
New Polyurethane air filters are far more efficient than the small wire mesh units used in the past. Compartment offers adequate space for the potent 421 cube mill. This particular engine was given the full super-tune treatment by Royal Pontiac.



The conversion to mechanical linkage requires changes in throttle shafts and levers. Do not remove the sealer at the throttle bores and valves! Sealer insures a snug fit for the throttle, improving idle and transition points.

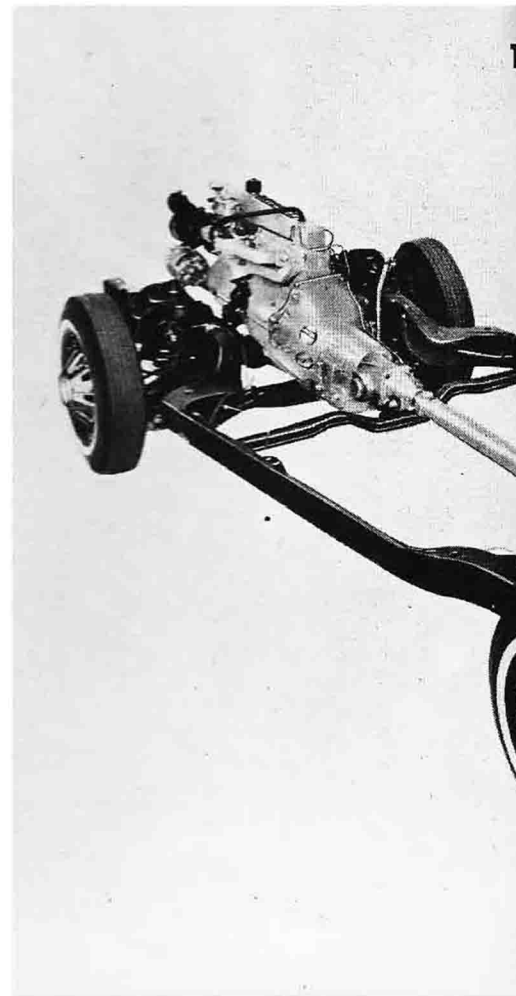


Above photo shows the mechanical linkage as set up by Royal on a 348 hp GTO. Cable-operated throttle is still used. Jim richens the center carb jets (below) from .065-inch to .070-inch. End carb jets are leaned out from .073-inch to .070.

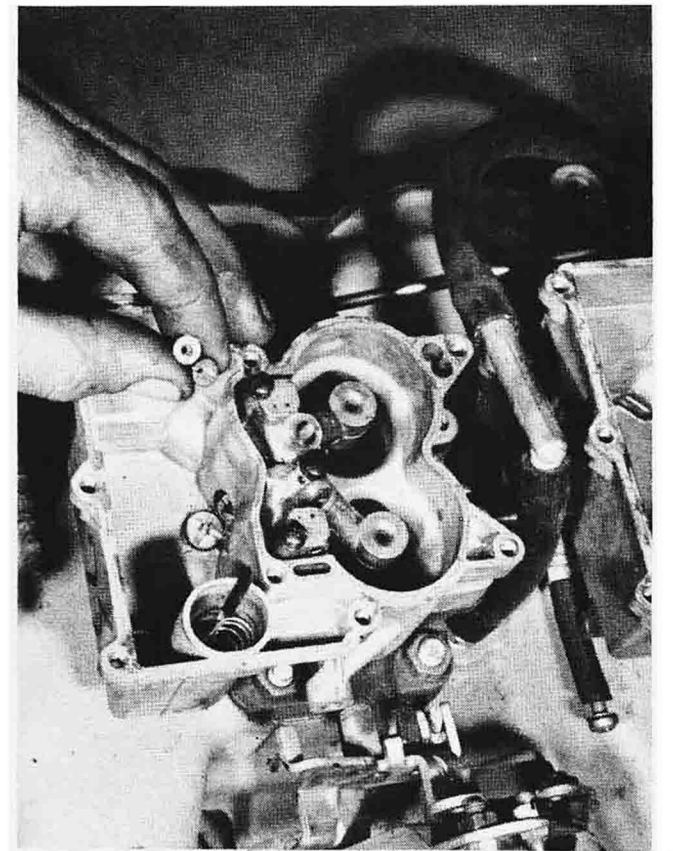


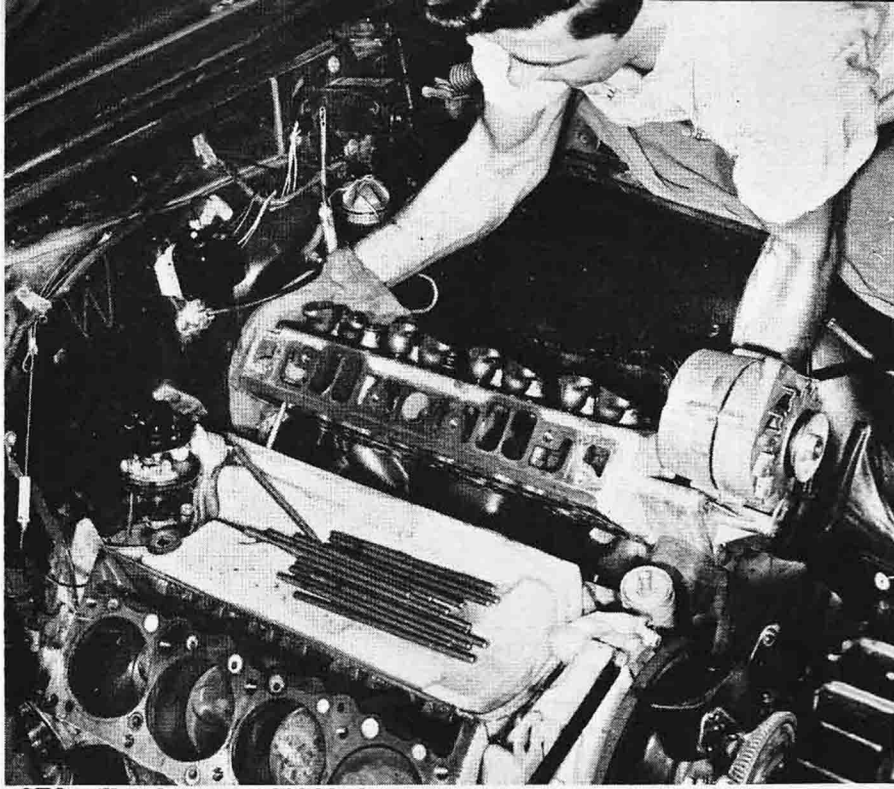
Here's Jim Wangers of Royal checking the float level with a gauge. Needle and seats on all tri-carb setups have sufficient fuel flow capacity.

Cutaway photo shows new Tempest rails and running gear for '64. Gone is the trans-axle and all the problems connected with this performance-hindering assembly.



## TEMPEST CHASSIS

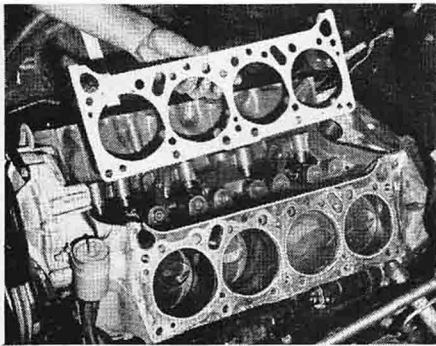




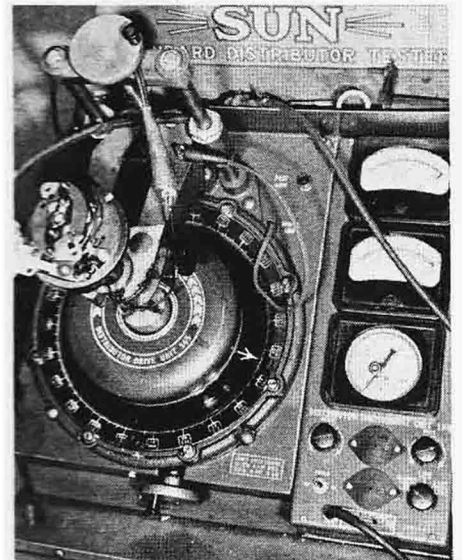
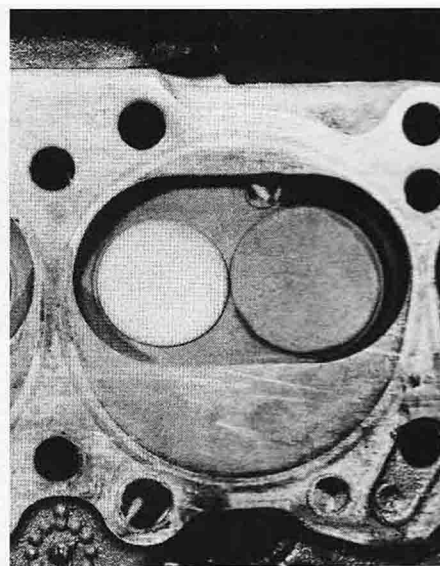
GTO mill makes use of 389 block with notched pistons and special 421 HO heads.

front and high enough to be in nearly line with the center of gravity. When the car comes out of the hole it just rises a little and moves out, just as though those 348 horses were hitched on to a tow rope and started pulling, smooth and straight.

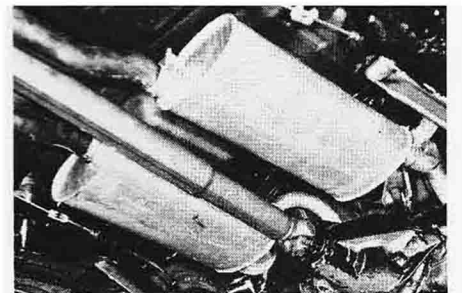
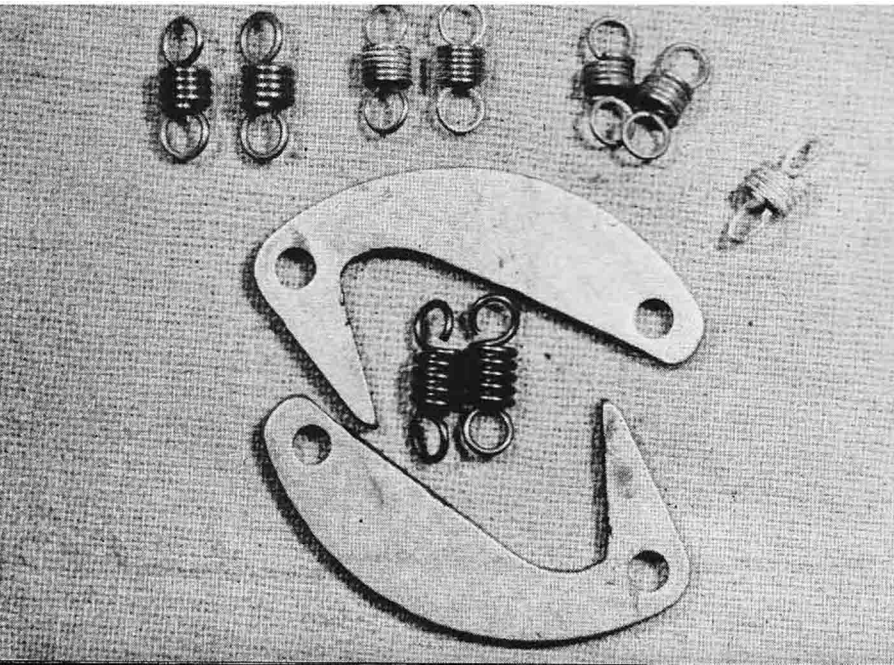
We know that Pontiac, following GM's management lead, has wisely stepped out of racing, and all that sort of thing, but the GTO is a little giant killer. It should do eminently well at the drag strip both in its class and probably in a few classes above that. In other words, Pontiac may be out of racing, but they are sure competitive! Just to see how competitive a GTO can really be, we called on Ace Wilson of Royal Pontiac in Royal Oak, Michigan. Since they have been the leading lights in souping the marque for many years, we thought they had something new under wraps. Ace's racing (Continued on page 63)



Royal adds extra-thin, aluminum-sprayed gaskets to raise the compression ratio. A coating of aluminum paint improves sealing. Intake valves are 1.88 inches, while the exhaust "poppers" are 1.60-inch. Big valve heads account for this engine's excellent breathing.



Using a Sun machine, Jim sets the points at 28 degrees (dwell) and the total distributor advance at seven degrees or 14 crank degrees. Photo at right shows the springs and plates used in the Royal-ized distributor. New GTO rear suspension is similar to the big "Poncho" setup. Rear end axle ratios from 2.56 to 4.30 are available from your friendly Pontiac dealer.



drawings to a pattern maker. The grille was cast in white metal from his patterns, insuring ample strength and fairly straight forward chrome plating.

The Super Cyclone's floating grille certainly satisfies all styling requirements in that it matches the opening shape. Headlights and center bar place a further accent on the same area and reinforce the feeling of width. Note how the headlight framing is used to provide a smooth transition of shape from one that blends with the body to one that matches the lights. Peaks act as a dividing line between the two shapes and provide a natural change-over.

Several neat items, some more successful than others, accent the sporty appearance of the car. The one most likely to catch on in the show circuit is a pair of port hole exhausts that exit at an angle from the rear fender panel. The design is adaptable to most any body location and certainly adds to the raciness of the car. For an actual competition machine, the collectors would certainly move ahead of the rear wheels or even connect to the front fender. A quick fill gas cap is always welcome on a car, but for maximum effect it should be made to look like the real thing, not like a gadget! Ditto for the very neat chrome wheels which are obviously bolt-ons, so why knock offs? In other words, it should be either, or, but not both. On the other hand, the "Rallye Pack" or instrument cluster mounted above the dash in a neat hooded container is both practical and feasible. The instruments can be readily seen, yet do not reduce visibility.

The startling interior includes four individual bucket seats trimmed in white rolls and pleats with plain panels on each side to offset them. There are two individual center consoles, one at the front and the other at the rear. It certainly adds to the feeling of comfort for the rear passengers or at least serves as a bundling board. Rear headrests form an alcove for the bucket seats and extend the full length of the deep package shelf. They are framed out with wood and covered with masonite in the center. The rounded sides are shaped out of wood. A layer of foam insures fullness for the naugahyde trim.

The paint job is exceptionally striking, with highlights of gold, pearl and black. The technique is quite interesting, for the base coat is black, followed by gold dust, and clear with pearl tinting. The paint job was completed in the unbelievably short time of seven days, which allows little drying and shrinkage time. It is quite

probable that drying was speeded up by frequent trips to the oven between coats. The Super Cyclone Comet stands out as a fine custom which is completely practical and free of gadgetry. The kind of car any one with a little sporting blood would like to call his own!

### 348 HP GTO, continued

specialists, Jim Wangers, Dick Jesse and Frank Rediker, had indeed been working on a tune up package that would make the 389 GTO move out and go even faster than as delivered. We were able to run comparison tests

between a stock GTO, as delivered from the factory and one which had received the Royal treatment.

The stock GTO is available with either a single four-barrel carb or three two's. Even in single four-barrel form the GTO is certainly a very live package indeed. In fact, this is the best all around transportation for a man who wants to go fast without having to tune his car at regular intervals. While the four-barrel is practical, we certainly wouldn't consider it competitive against a tri-power version at the drag strip. We'll concentrate on the latter from here on. (Four-barrel model will still run

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SPEED & CUSTOM • 63

away from any other compact or medium sized car on the street!)

One of the first things you should do is change the throttle linkage from vacuum operation to progressive mechanical operation. This will involve changes in the carburetor throttle shafts since the new levers are staked to them. The throttle valves should be centered within the bores and securely tightened. You'll find a coating of black sealing material around the throttle bore and the edge of the throttle valves. Removing or scraping this material will completely upset calibrations for a smooth transition

from idle to part throttle. For street driving you can set the progressive linkage so that much of the running is done on the center carb, thus saving appreciable amounts of fuel. On the other hand, for the strip the end throttle should be set up to open sooner. How much depends on your driving techniques. Excessive initial throttle opening results in bog.

Special attention should be paid to the flexible cable connection between the accelerator and throttle linkage. When working well, the linkage is perfectly smooth. Friction in the cable cannot be corrected by hanging on

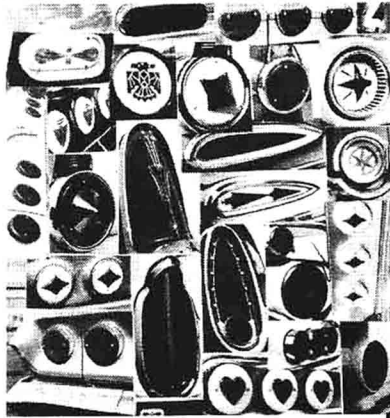
extra springs, but by lubrication and alignment of the cable sheath so that the cable comes out straight.

If you want a very rapid street machine which will be completely flexible not only in town driving, but also in the selection of fuel, you can now turn to a change in gear ratios for added torque and pickup. The choice depends largely on the transmission you have ordered. With the wide ratio transmission with which the car is normally delivered you have a 2.56 first, a 1.91 second, a 1.48 third and 1:1 fourth. With a 4.30 or 3.90 rear installed, you tend to very quickly run out of revs in both first and second. In fact, the feeling is one of going from first to first on the initial shift. Here the 3.55 gear is your best bet, or if you can raise rpm limits a bit, 3.73:1. With a close ratio transmission, which is a special order item, you can readily go from the stock 3.55 to a 3.90 rear. You'll have slightly more speed in first, second and third for the same rpm range, with some direct benefits in traffic. On the other hand, fourth will give you greater passing performance and more flexibility with the close ratio and 3.90 than with the 3.55 rear and the 2.56 transmission. Figure the overall ratios in each gear for both transmissions and you'll see why. Un-

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less you can go to a solid lifter cam and crank out appreciably more rpm than the current 5,200 limit, the 4.30 gear is not too useful. Several hundred rpm can be gained by lashing out the hydraulic lifters, and the gain in performance is noticeable, but running at the ragged edge means that a missed shift will be costly.

At this stage of the game you are the proud owner of a package that will leave in the dust most other cars on the road, can run on a good pre-

mium fuel, and isn't the least bit fussy as far as tuning. From here on in the car gets a lot faster, but more finicky in its appetite for fuel. It's 270 Sunoco and nothing but, if you plan to raise the compression ratio.

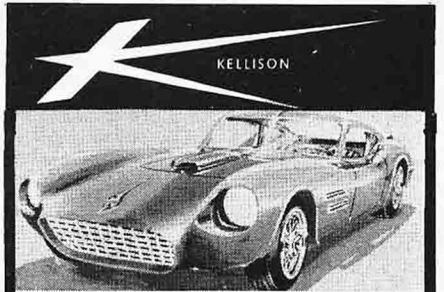
First step is to remove the heads and bring the combustion chambers down to the allowed 66.8 cc's, which will generally involve a cut of .030 to .035 inches. There is very little that can be done to this head short of a first-class valve job, since valve sizes already take up the entire center-to-center distance between guides.

Distributor changes begin with plugging off the vacuum advance. Total centrifugal advance is limited to seven degrees distributor (14 degrees crank). Set up on a test stand, the distributor advance should show 0 degrees at 700 rpm, four degrees at 1,000 rpm and seven degrees at 1,500. Thus, all of the advance is in early, and engine response is appreciably quickened. The points are set to a 28 degree dwell. Total advance, (initial plus centrifugal) is kept around 34-36 degrees depending on engine and ambient air temperatures.

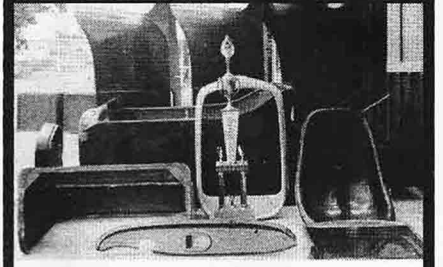
By this time, you are ready to tackle a little fine tuning by changing the jetting to .070 straight across the board, which in effect leans out the end carburetors and richens up the center one. Pump shots must be set up mainly by feel. If the car stumbles a bit, you can increase pump action. Too much pump shot will result in dull pickup. Similarly, jet settings will vary with road or drag strip requirements as well as your own choice regarding economy and power.

Some considerable improvements are also possible in the cam timing and valve train departments. As we mentioned above, the valve train can be set so that the valve lifters are near their fully extended position. Thus, pump-up is limited. However, the spring rates and component weights still bring on valve toss, though the limit's raised to 5,600 rpm.

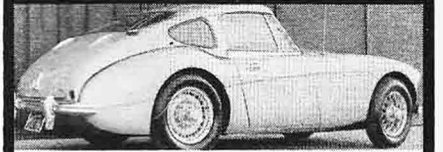
We naturally proceeded to needle Jim Wangers on the most natural engine swap for this car, a full-house 421 Super Duty Pontiac powerhouse. It would, in effect, be a straight bolt-in, with just about limitless potential. Jim tells us that a car of this type could possibly be assembled with available parts scrounged from local sources, but that there are no indications and little hope of it becoming even a limited-production item as of this writing. Royal Pontiac is developing quite a few goodies for the GTO, and if you need parts and info, a line to Jim Wangers or Dick Jesse should bring quick results.



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