

ONE OF THE IMPORTANT performance developments in Detroit's 1963 crop has been the introduction of new "police" engine options by the big-volume companies. We call them police engines for want of a better term. Some writers have termed them "high-torque" engines; Pontiac calls them "421 H.O."

Essentially what the engineers have done . . . they've taken one of their big-inch cylinder blocks and selected a combination of carburetion, camshaft, compression, and exhaust equipment that gives them the best possible compromise between brute horsepower and torque — and the smoothness, silence, and flexibility that make an engine a joy to live with in everyday driving.

The companies are coming to realize that there's a fair-sized market for this type of engine today. A lot of buyers want top acceleration and a high-winding engine, but they aren't really willing to put up with the noise, rough idle, critical tuning, poor low-end torque, poor cold starting, and heavy fuel consumption of these various factory Super/Stock racing engines. Also, many of them want the convenience of an automatic transmission — which isn't usually available with the S/S engines. These new police engines are an attempt to meet this demand.

We haven't had a chance to sample all of the new ones yet, but it'll be hard to top Pontiac's new 421-cubic-inch H.O. Tri-Power package. This is a fantastic powerplant. It develops more actual horsepower and torque at the clutch than some S/S engines we've tested recently (as they come off the assembly line). It'll wind to 5400 rpm without a murmur. It starts pulling real torque as low as 1500 rpm, and has a terrible wallop between 3000 and 4000. And yet this engine is as smooth and quiet and flexible in normal driving as a conventional power-pack option. It idles smoothly at 800 rpm. There's no whisper of valve clatter with the hydraulic lifters. You can putter along in traffic in high gear at 1000 rpm without bucking. You can punch the throttle wide open at this speed, and the car will pick up immediately without stumbling or coughing. At normal city and highway speeds it's dead smooth — and very responsive. The engine will start up cold at the first flick of the starter and warm up fast. Fuel consumption is nothing like a Tempest — but it's quite a bit less than the out-and-out racing engines when running on the road.

What magic equipment did Pontiac use to get all this? Nothing very complicated. The block and lower end are pretty much the same as the "421" competition engine, but with smaller clearances. The cylinder heads are the same used on the '60-61 competition engines. These have 1.92-inch intake valve, compared with the standard 1.88-inchers, and the ports are somewhat larger than the standard heads for the 389-cubic-inch engines. (The '62-63 competition heads have 2.02-inch intake valves and still larger ports.) Flat-top, cast-aluminum pistons give 10.75-to-1 compression ratio. The new hydraulic-lifter camshaft has considerably longer duration and overlap than the standard power-pack

split-flow type used on the competition V-8s, but exhaust restriction is much less than with the standard manifold castings. The headers dump into twin 2¼-inch headpipes to the conventional reverse-flow mufflers.

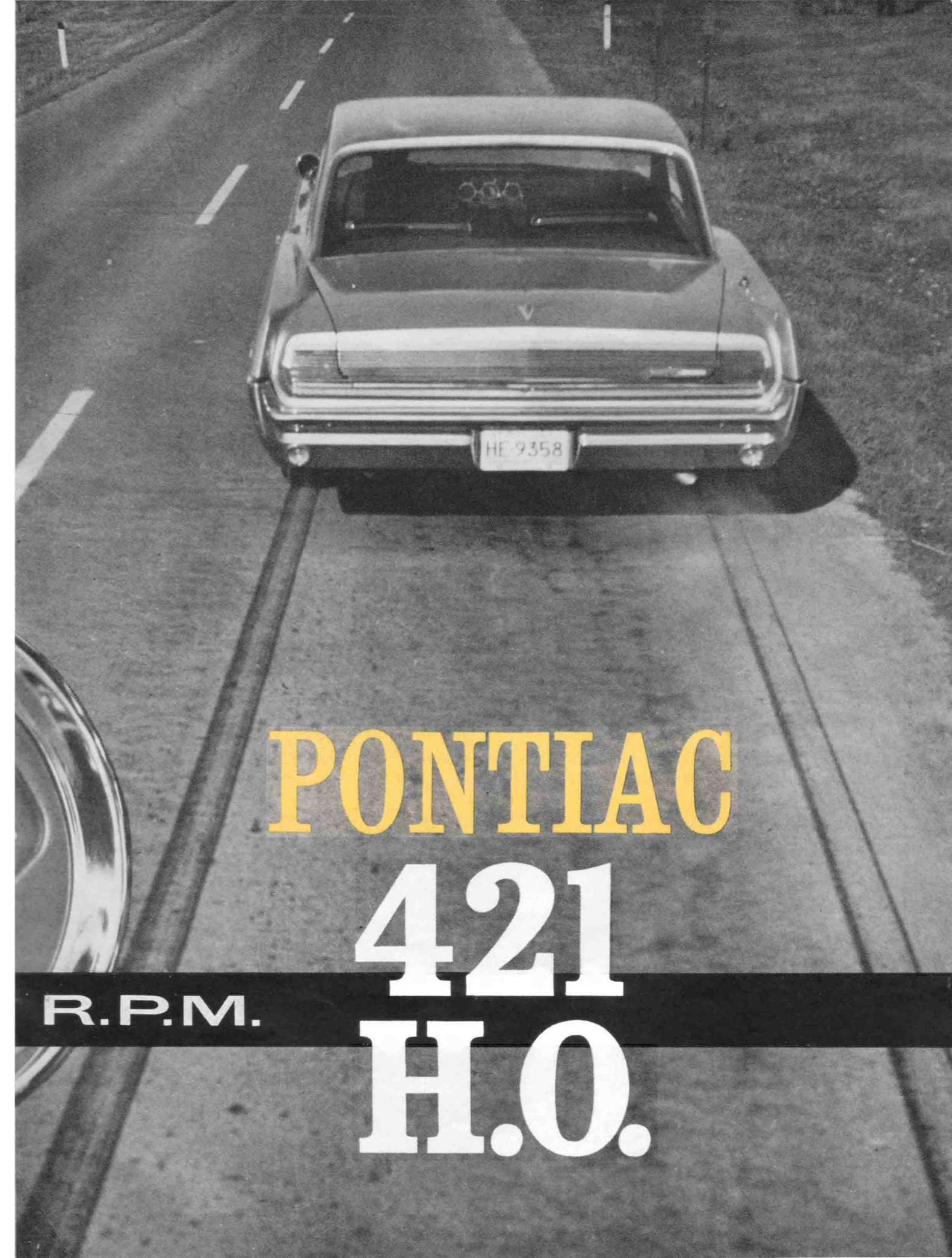
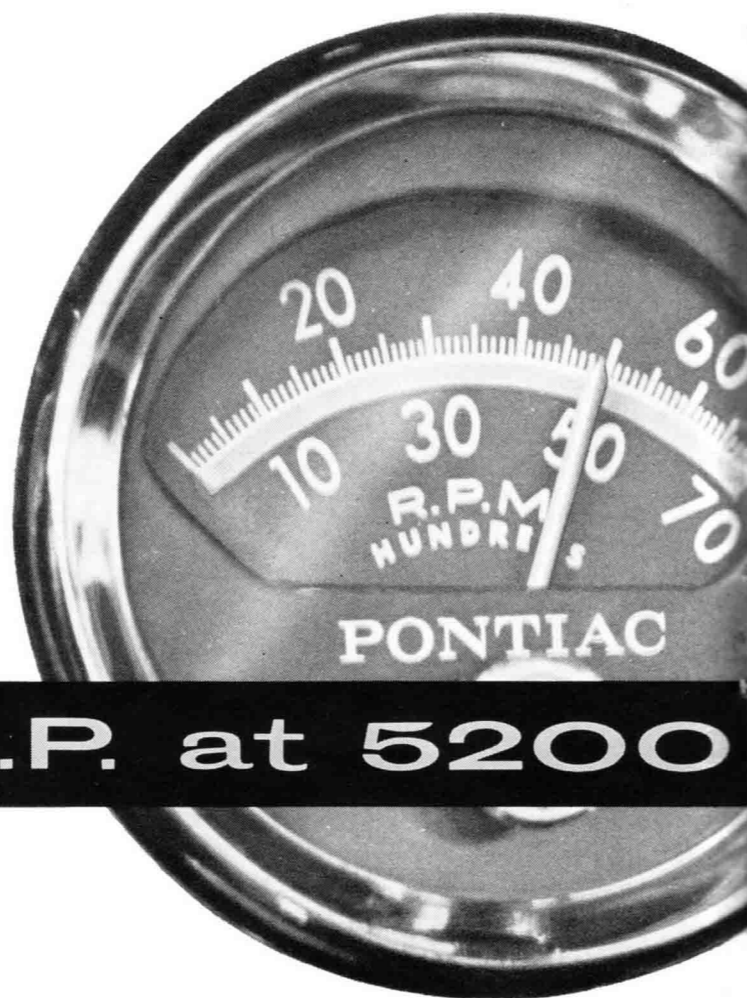
Pontiac rates this new combination 370 hp at 5200 rpm, with a maximum torque of 460 pounds-feet at 3800. The same engine with single four-barrel carburetion (Carter AFB carb) rates 353 hp at 5000 rpm. Those are apparently not optimistic ratings by any means.

Our test car was a standard Grand Prix hardtop coupe with just about everything but air conditioning. From the standpoint of weight, it was no high-performance car — at 4190 pounds with half-full gas tank — but we wanted to test a combination that was a true luxury road machine in every sense of the term. This combination tended even more to put the engine on its good behavior. Transmission was the Warner four-speed option with aluminum case and the close ratios (2.20 to 1 low). The standard 3.42 rear end used with the Grand Prix had the optional Safe-T-Track differential.

Performance? Here's what we got with a gross test weight of 4550 pounds, and shifting at 5300-5400 rpm:

0-30 mph	3.0 secs.
0-45 mph	4.6
0-60 mph	6.6
Standing ¼-mile	15.1 & 94 mph

Needless to say, we were pleasantly surprised to get this kind of acceleration in a 4500-pound car that had such a smooth, flexible engine. It just goes — without any fuss or bother. Our 0-60 time might have been a shade better if



PONTIAC

421

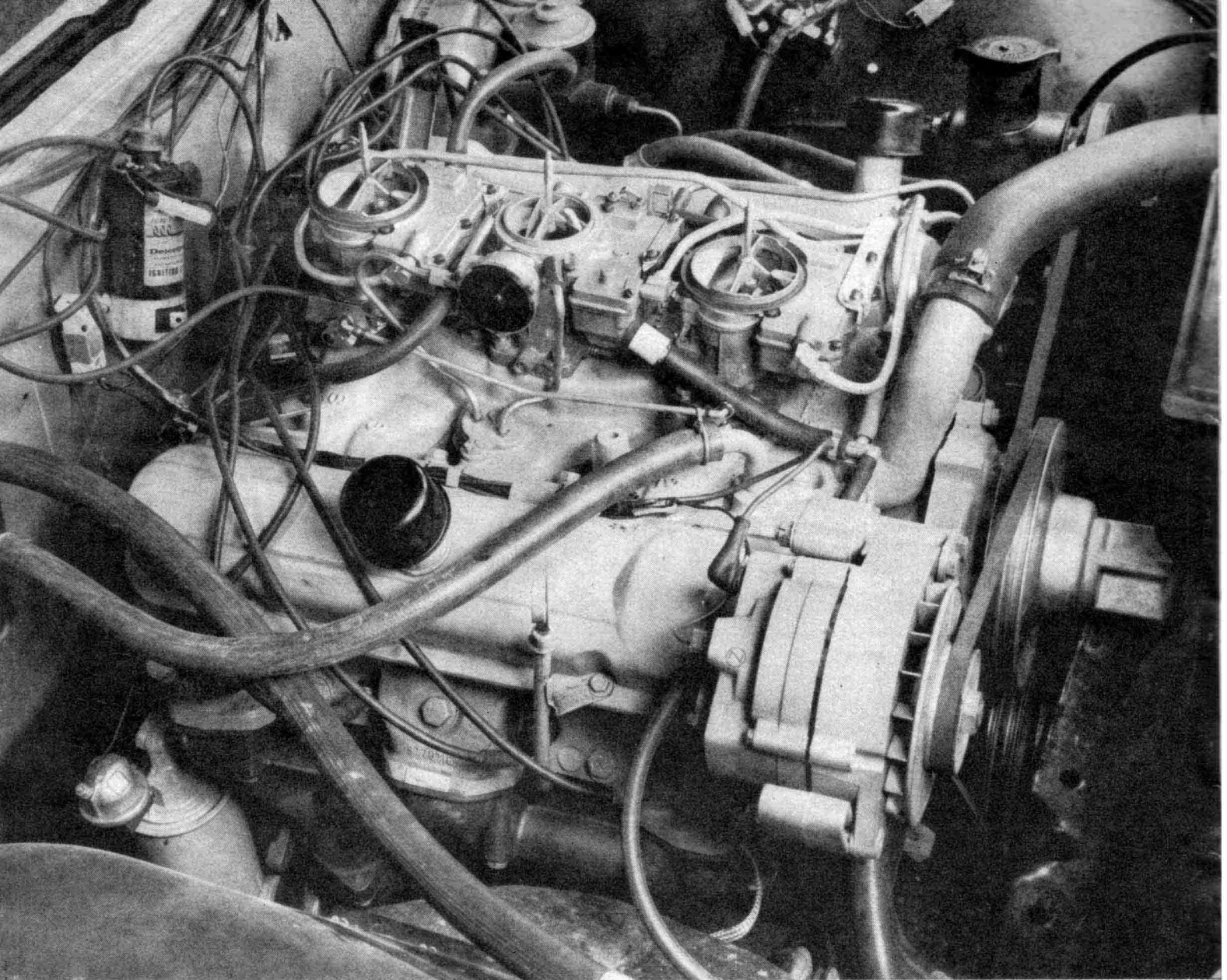
H.O.

370 H.P. at 5200

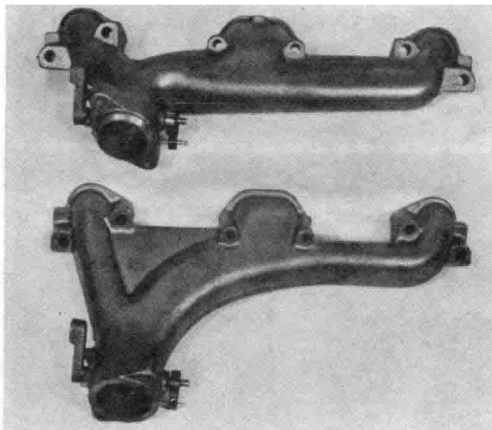
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cam, but despite the duration it uses the same 4.00-inch lift. Duration is rated 292 degrees on the intakes and 302 degrees on the exhausts, with 65-degree overlap. Stiffer dual valve springs are used to get a higher lifter "pump-up" speed. Total spring pressure with the valve open is about 225 pounds. Carburetion is the well-known "Tri-Power" setup, with three two-throat Rochesters (optional for several years). The streamlined exhaust headers are also taken from the earlier "425 A" engines. They're not the elaborate

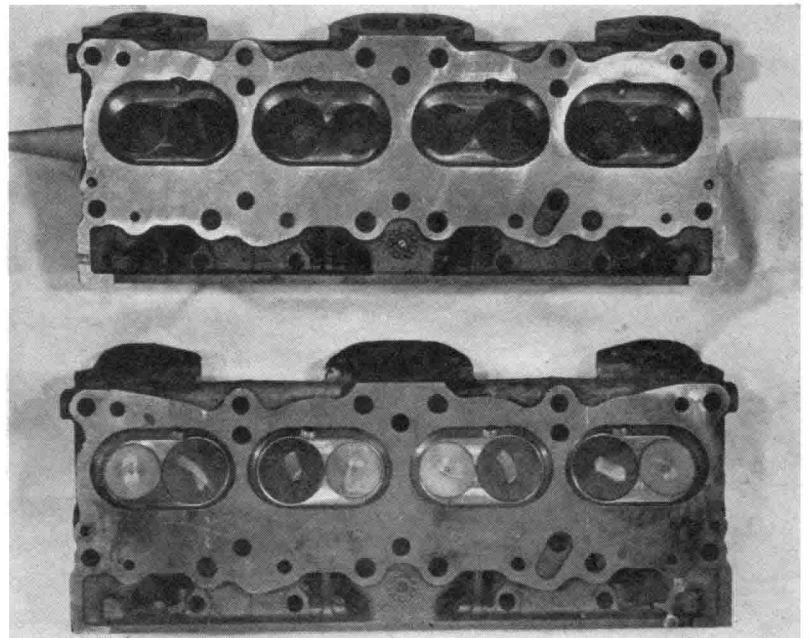
by Roger Huntington



DE-TUNED VERSION OF PONTIAC'S FAMOUS 5/8 "421" MILL PROVED TO BE WELL SUITED FOR STREET USE, SHOULD BE A HOT-SELLING OPTION.



Standard "389" exhaust manifold (top), and "421" unit, which offers less restriction, better flow.



More inches need more breathing room, hence the larger valves and bigger ports of the 421 H.O. engine (bottom) as compared to standard "389."

PONTIAC 421 H.O. *continued*

it hadn't been necessary to shift at 55-58 mph. The hydraulic valve lifters would start to foul up around 5300 rpm, so we couldn't depend on getting a good run all the way out to 60 mph in low gear (5550 rpm). Pontiac Engineering had installed the "421" engine in the Grand Prix especially for this test, so it had very few miles on it when we got it. At first the lifters would pump as low as 4900 rpm, but, with more miles, the performance gradually built up — and the lifters would eventually run out to 5400 rpm, or even 5500 on occasion.

The 0-30 time was limited somewhat by traction. The engine had plenty of punch to burn off the line as hard as we wanted, even with the 3.42 gears. But we didn't have the bite to pick up speed too quickly with the tires ringing. We got better times (and higher peak readings on the accelerometer) by coming off the line with less static rpm, just allowing a whisper of wheel spin — and then letting that big engine take over from 1500 rpm. Note: This would probably not have been the case with a hotter, long-duration cam. You generally have to burn off the line to get optimum standing-start acceleration with these hot S/S engines.

Pulling up in low gear, we felt the torque coming in with a terrific surge around 3000 rpm. We calculated the actual maximum torque output at the clutch on our slide rule, using accelerometer readings against the calibrated speedo. This worked out to about 415 pounds-feet at 3400 rpm. This is commendably close to the advertised 460 pounds-feet at 3800. We've tested only a few factory engines in the last eight years that have put out over 400 pounds-feet of torque.

The peak horsepower reading was very good, too. Maximum at the clutch appeared to be approximately 320 hp at 4600-4800 rpm. This had dropped off only 10-15 hp at 5200 rpm — but the accelerometer needle nose-dived above 5300, when the lifters started acting up. This output of 320 honest horses on the road, with all accessories and mufflers hooked up, compares very favorably with the lab output of 370 hp — running under ideal conditions. Pontiac engineers seem to have the knack for putting out engines that measure up near their advertised ratings.

We liked the gearing combination, with the 3.42 rear end

and close ratios in the four-speed. This gave car speeds at 5200 rpm of 56 mph in low, 74 mph in second, 94 in third — and a potential 125-130 mph in high gear before the lifters quit. In this gear combination, second cog becomes a very useful answer for quick passing at normal highway speeds, or at lower speeds in town. Third is all right if you don't need maximum acceleration, or if the car you're passing is doing over 60 mph. But, actually, with some 400 pounds-feet of torque in the range from 3000 to 4000 rpm, you don't *need* to do much shifting if you don't want to. You have more acceleration in high than most modern power-pack V-8s have in the kick-down gear!

A majority of buyers will want this engine with the four-speed floor-shift gearbox. But just in case you're wondering how the performance with Hydra-Matic compares: Under ideal traction conditions, as on a drag strip and with special traction tires, the four-speed manual has it all the way. But it's a different situation on the street, with lower-traction tires. In this case, the fluid coupling will get off the line more quickly than the friction clutch. Tires break loose fairly easily with the clutch; the smoother coupling will get away with a minimum of wheelspin. At higher speeds, slip and pumping losses in the Hydra-Matic — plus the longer shifting time — begin to take their toll. The Hydro should get a bulge of a good car length coming off the line, but the four-speed manual will pass it around 70 mph or so. The 0-60-mph times should be about the same on both cars. But the four-speed has an edge in both terminal speed and elapsed time in the quarter-mile. Incidentally, the *four*-speed Hydro — available only in the Star Chief and Bonneville series — is a little quicker off the line than the three-speed.

Needless to say, the ride in the Grand Prix is out of this world. But in this case, you pay a heavy price in handling. The car has a nose-heavy weight distribution, and the understeer was so great that we couldn't get the car into a "power-oversteer" situation even with 320 horses. The front end plowed pretty badly in corners. Fortunately, Pontiac offers optional heavy-duty springs and shocks for all models that cure much of this understeer. We advise it if you expect to throw the car around at all.

The optional aluminum brakes (on aluminum wheels) are flawless: no fade, quick, powerful stops from highway cruising speeds — as often as you need — and no tendency to pull to one side. These aluminum wheel/drum units are a valuable option at \$116.

continued



CLOSE-RATIO FOUR-SPEED COUPLED TO A STANDARD 3.42 LIMITED-SLIP DIFFERENTIAL GIVES EXCELLENT ACCELERATION OVER A WIDE RANGE.



PONTIAC GRAND PRIX

2-door, 5-passenger hardtop

OPTIONS ON CAR TESTED: "421 H.O." engine, 4-speed manual transmission, limited-slip differential, all power accessories, FM radio, aluminum wheels

BASIC PRICE: \$3489

PRICE AS TESTED: \$4675.19 (plus tax and license)

ODOMETER READING AT START OF TEST: 2840 miles

RECOMMENDED ENGINE RED LINE: 5200 rpm

PERFORMANCE

ACCELERATION (2 aboard)

0-30 mph	3.0 secs.
0-45 mph	4.6
0-60 mph	6.6

Standing start 1/4-mile 15.1 secs. and 94 mph

Speeds in gears @ 5200 rpm

1st	56 mph	3rd	94 mph
2nd	74 mph	4th	124 mph

Speedometer Error on Test Car

Car's speedometer reading	31	62	94
Weston electric speedometer	30	60	90

Observed miles per hour per 1000 rpm in top gear

Stopping Distances — from 30 mph, 34 ft.; from 60 mph, 147 ft.

SPECIFICATIONS FROM MANUFACTURER

Engine

Ohv V-8, 90-degree
Bore: 4.094 ins.
Stroke: 4.00 ins.
Displacement: 421 cu. ins.
Compression ratio: 10.75:1
Horsepower: 370 @ 5200 rpm
Torque: 460 lbs.-ft. @ 3800 rpm
Horsepower per cubic inch: 0.88
Ignition: 12-volt coil

Gearbox

4-speed manual, all-synchro;
floor shift

Driveshaft

One piece, open tube

Differential

Hypoid — semi-floating
Saf-T-Track limited-slip
Standard ratio: 3.42:1

Suspension

Front: Independent, single
lower arm; coil springs;
direct-acting tubular shocks

Rear: Rigid axle; four-link control
arm layout; coil springs;
direct-acting tubular shocks

Steering

Recirculating ball
Turning diameter: 42.5 ft.
Turns: 5.5 lock to lock

Wheels and Tires

5-lug cast-aluminum wheels
8.00 x 14 4-ply tubeless tires

Brakes

Hydraulic, duo-servo Bendix
type; self-adjusting
Front: 11-in. dia. x 2.5 ins. wide
Rear: 11-in. dia. x 2.0 ins. wide
Effective lining area: 174 sq. ins.

Body and Frame

Box-type "perimeter" frame
Wheelbase: 120 ins.
Track: front, 62.5 ins.; rear, 64
ins.
Overall length: 212 ins.
Curb weight: 4190 lbs.