

PONTIACS ON A DIET

The big indian from Detroit, once the chief of the quarter-mile, is back on the war path with a healthier-than-ever 420 hp engine and a severe reducing schedule

by Roger Huntington

Most drag racing authorities have been counting Pontiac out of the Super/Stock picture for this summer. Too heavy. Last year's cars, even with the aluminum front ends, weighed a shade over 3600 pounds with five gallons of gas. This is 'way too much to compete on even terms with the lightweight Chevys and MoPars, at least when everybody is limited to 427 cubic inches. And where else could Pontiac go? They had already knocked off about 200 pounds with their aluminum.

Well I'm here to tell you that Pontiac will be right in there pitching this summer! I've seen their latest 421 cubic inch drag strip package and it's quite a shocker. This is the wildest and most extensive example of weight saving that I've ever seen out of Detroit.

This is a skeleton car. Production-line versions will come to the drag strip starting line at only a little over 3300 pounds (without driver) — and with dealer-installed Plexiglas all around it will be well under 3300! We know Pontiac has the horsepower. Some of the sharper mechanics were pulling nearly 500 horses with last year's 421 dual 4-barrel engine. And the '63 version is hotter. With this potential weight and power you can bet some of the Ponchos will be in the 11's on e.t., and over 120 mph by the end of the summer. That should be very competitive.

The car I saw belongs to the famous Royal Pontiac dealership team in Royal Oak, Michigan. They're getting it ready for campaigning through the Midwest and East this summer. It was one of the first four or five off the Pontiac assembly lines in late January.

These cars can never be expected to be plentiful, however. Production will be sharply limited because of the high cost of building them by hand. For the lucky few who do get them, though, the price is about \$1000 cheaper than last year's 421 drag job. They should deliver for under \$4000. The factory will lose money on every one. But I'm betting a handful of these new '63 421's will do such a job on the nation's drag strips that it will be worth every cent to Pontiac sales.

Let's see how engineers have done the impossible... starting at the front

(where weight saving is most important for traction).

All of last year's aluminum components have been retained. This includes the hood, splash pan, inner and outer front fender panels, radiator bulkhead stamping, and front and rear bumpers and brackets. But the metal gages are a little thinner this year, so the parts are probably 10 to 20 percent lighter. (You can practically dent the fenders with your thumb!) Last year's front end was said to save 159 pounds over the equivalent steel parts. Special thin front cast-iron brake drums save a few more pounds up there.

A lot of weight has been taken out of the exhaust system. The cast aluminum split-flow, dual-outlet headers are now being installed as standard equipment. Last year they were over-the-counter. Total weight of the two header castings is 27 pounds, which compares with 72 pounds in cast iron. You might be able to save another 5 to 7 pounds by fabricating your own headers from steel tubing, but the small saving would hardly be worth the bother. Royal always uses the factory aluminum headers.

Incidentally, these aluminum headers are not suitable for extended street and highway driving. Road cruising above

70 mph will definitely cause excessive melting around the ports. In fact, a few weeks on the drag strip will assure you a very efficient porting job! In addition, the special castings that bolt on the bottom of the headers — which adapt to the exhaust pipes and have the capped openings for the cutouts — are now aluminum instead of cast iron. When these castings are uncapped the exhaust makes a narrow turn to get out the 3-inch opening — which might give some restriction. But the Royal team always pulled their best power with this setup.

Another exhaust idea that saves a lot of weight is the use of only one outlet pipe and muffler. They just take a crossover pipe from the left header outlet, and tap it into the main outlet line near the frame crossmember. Does the job very nicely.

More weight is saved in the drive line. The bellhousing is now aluminum, plus the transmission tailshaft housing and the front casting of the rear axle center section. The Warner T-85 heavy-duty 3-speed synchro transmission comes standard with the package (with Hurst floor shifting linkage). This has the new aluminum tailshaft housing.

When the Warner T-10 4-speed is ordered the thing is all aluminum, main gearcase and tail housing. This saves 20 to 25 pounds over the cast iron transmission.

But certainly the most impressive part of this whole car is that crazy frame. The standard Pontiac frame is a square "perimeter" type, with side rails that run outside the floor area, and with all sections carefully boxed for maximum torsional stiffness. This is that same basic frame on the drag job — but there's not much left of it to recognize! In most areas the bottom side of the box section is removed, leaving an inverted U section. And these side sections are punched full of huge holes. The frame looks like so much Swiss cheese!

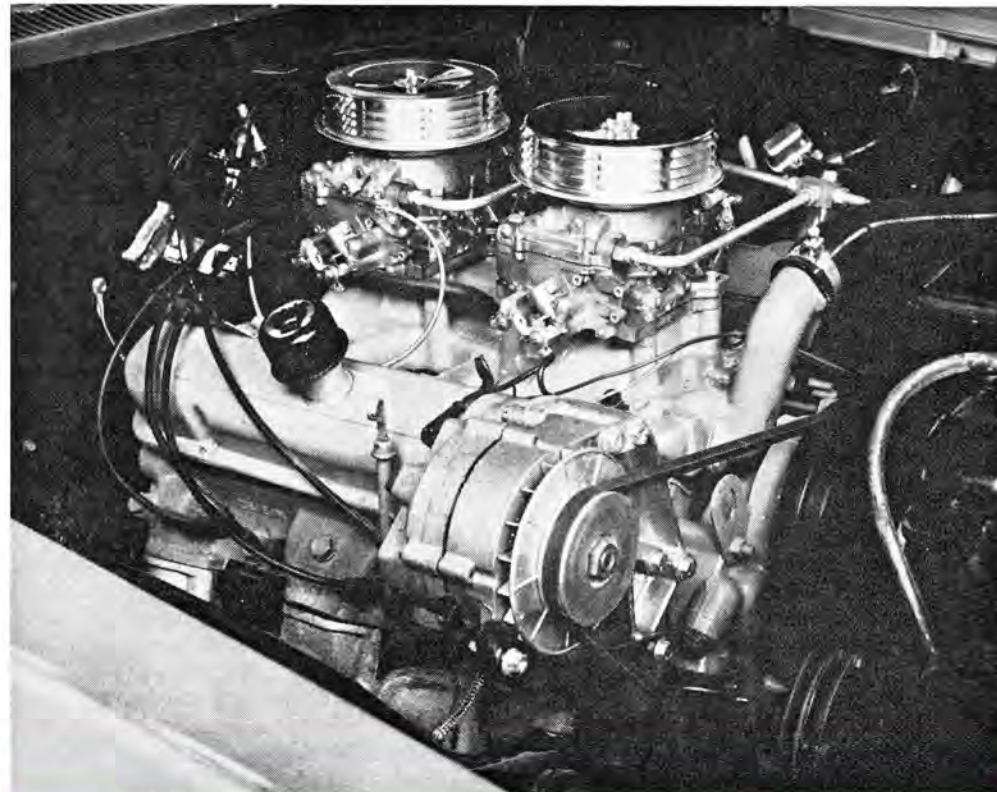
Needless to say, this frame is not very stiff. But it doesn't need to be in dragging. The body shell contributes the bulk of the torsional and beam stiffness to the overall car structure anyway. This is no way to control body squeaks and rattles and door fits. But who cares? This is a special car. If the reduced frame stiffness introduces additional lateral weight transfer problems

it will be easy enough to correct it with suspension adjustments. I wouldn't even estimate how much weight has been saved in the frame alone.

Then there's the body. Contrary to earlier information, the Catalina coupe bodies used for the drag jobs are all steel — and the panels are of the standard thickness gage. This includes the deck lid. Using aluminum or special thin-gage steel for these parts was considered too costly. But they've gotten a similar result by omitting all sealer material, sound deadener and insulation from the whole body. The weight of this stuff can approach 100 pounds on a car like the Pontiac. Most of the top Super/Stock boys are pulling this out of their cars. Pontiac is doing it for you. Naturally no heater or radio is used with the package. A little more weight is saved by omitting the splash shields around the front inner fender panels.

Original plans called for topping off the body lightening job with a set of Plexiglas or Lucite panels to replace the heavy glass in all windows, including windshield and backlight. This

continued on following page



ABOVE — Rated at 420 hp, '63 Pontiac 421 super-duty engine puts out close to 500 horses when set up by knowledgeable mechanics. Powerplant features larger ports, increased compression, lightened valves and stronger springs.

RIGHT — Ace Wilson Jr. (left), proprietor of Royal Pontiac, and Jim Wangers inspect super-duty drag strip vehicle. Pontiac should roll up to the lights at less than 3300 pounds, 350 pounds below '62 "lightweight."



70 mph will definitely cause excessive melting around the ports. In fact, a few weeks on the drag strip will assure you a very efficient porting job! In addition, the special castings that bolt on the bottom of the headers — which adapt to the exhaust pipes and have the capped openings for the cutouts — are now aluminum instead of cast iron. When these castings are uncapped the exhaust makes a narrow turn to get out the 3-inch opening — which might give some restriction. But the Royal team always pulled their best power with this setup.

Another exhaust idea that saves a lot of weight is the use of only one outlet pipe and muffler. They just take a crossover pipe from the left header outlet, and tap it into the main outlet line near the frame crossmember. Does the job very nicely.

More weight is saved in the drive line. The bellhousing is now aluminum, plus the transmission tailshaft housing and the front casting of the rear axle center section. The Warner T-85 heavy-duty 3-speed synchro transmission comes standard with the package (with Hurst floor shifting linkage). This has the new aluminum tailshaft housing.

When the Warner T-10 4-speed is ordered the thing is all aluminum, main gearcase and tail housing. This saves 20 to 25 pounds over the cast iron transmission.

But certainly the most impressive part of this whole car is that crazy frame. The standard Pontiac frame is a square "perimeter" type, with side rails that run outside the floor area, and with all sections carefully boxed for maximum torsional stiffness. This is that same basic frame on the drag job — but there's not much left of it to recognize! In most areas the bottom side of the box section is removed, leaving an inverted U section. And these side sections are punched full of huge holes. The frame looks like so much Swiss cheese!

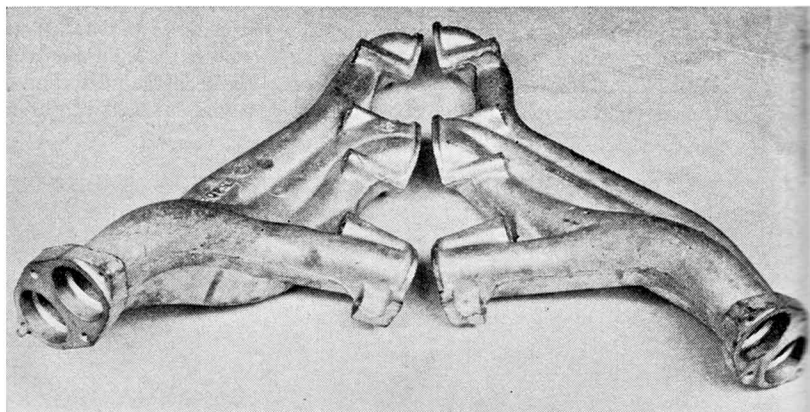
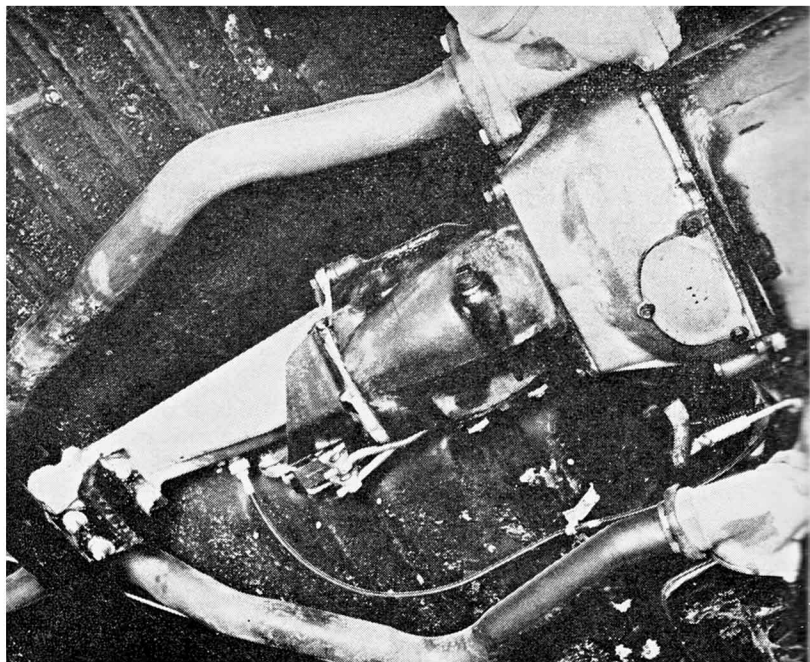
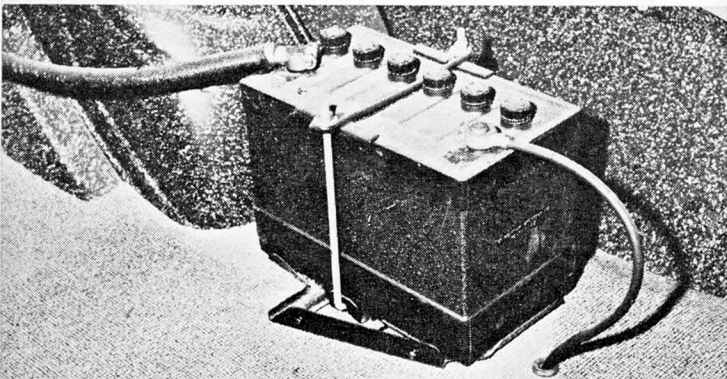
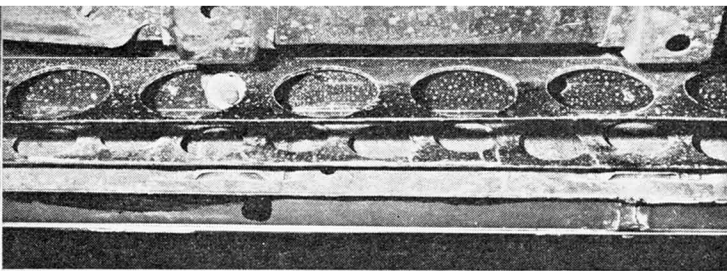
Needless to say, this frame is not very stiff. But it doesn't need to be in dragging. The body shell contributes the bulk of the torsional and beam stiffness to the overall car structure anyway. This is no way to control body squeaks and rattles and door fits. But who cares? This is a special car. If the reduced frame stiffness introduces additional lateral weight transfer problems

it will be easy enough to correct it with suspension adjustments. I wouldn't even estimate how much weight has been saved in the frame alone.

Then there's the body. Contrary to earlier information, the Catalina coupe bodies used for the drag jobs are all steel — and the panels are of the standard thickness gage. This includes the deck lid. Using aluminum or special thin-gage steel for these parts was considered too costly. But they've gotten a similar result by omitting all sealer material, sound deadener and insulation from the whole body. The weight of this stuff can approach 100 pounds on a car like the Pontiac. Most of the top Super/Stock boys are pulling this out of their cars. Pontiac is doing it for you. Naturally no heater or radio is used with the package. A little more weight is saved by omitting the splash shields around the front inner fender panels.

Original plans called for topping off the body lightening job with a set of Plexiglas or Lucite panels to replace the heavy glass in all windows, including windshield and backlight. This
continued on following page





TOP—Lower portion of standard box-section frame side rails has been removed and remaining structure looks like that Li'l Old Swiss Cheese Maker has been at work. Some rigidity is sacrificed for big saving in weight.

ABOVE—Battery takes new position over right wheel in trunk for better front/rear weight distribution, 1½ per cent more weight on rear, 55-45 with gas, no spare.

TOP RIGHT—Standard 421 drag package includes Warner T-85 heavy-duty 3-speed transmission with bell-housing and tailshaft housing of aluminum. New gear-set provides ratios of 2.09 to 1 in low and 1.45 in second.

RIGHT—Cast aluminum headers weigh in at 27 lbs. total compared with 72 lbs. for cast iron set. Heat of high output operation actually melts aluminum slightly.

photos by Wally Chandler

PONTIACS ON A DIET continued

standard glass in the Catalina body weighs about 85 pounds total—and the Plexiglas would cut that by about 50 percent. As it turned out, supply problems hampered the early plans, and the plastic panels were expensive to install on the assembly line. So these Plexiglas parts have been made a service package for dealer installation. You can expect a weight saving of around 40 pounds.

So what do you get when you add it all up, or subtract it, rather? We put Royal's new 421 Super/Stock on the scales with 4 to 5 gallons of gas and full cooling system, including the spare tire and jack—just as the car came off the assembly line. Result: 1799 pounds on the front wheels, 1564 pounds on the rear. This gives a total weight of 3363 pounds, with 53½ percent of that weight on the front wheels. And these weights agree very well with the factory shipping weight of 3308 pounds on this package.

Shipping weight is without any fuel

or water. Four gallons of gasoline and 16 quarts of water would come to about 57 pounds. And, of course, we can go still farther with this weight. We still haven't included the Plexiglas window panels or removal of the spare tire and tools. These would total close to 100 pounds weight saving.

So this car should be racing at less than 3300 pounds! That's 320 to 350 pounds less than last year's "light-weight" car.

The 53½ percent of the total on the front wheels might seem like a lot with all the weight saving in the front end. But don't forget that we've saved weight in the rear too, and that doesn't help the distribution. Pontiac tried to help this by putting the battery in the trunk over the right wheel. This would have the effect of changing the front-rear distribution by about 1½ percent. In other words the front-rear balance would be about 55-45 with the battery in the conventional engine compartment mounting. On the other hand, removing

the 50 pound spare wheel and tire from the trunk would do the same thing! The car will likely end up running on the strip with an effective 55-45 weight distribution.

The driver's weight will have little effect because it's just about in the middle of the wheelbase. The cars might e.t. better with the spare left in the trunk—and maybe even an extra 5 or 10 gallons of gas in the tank would help! These things all add up.

But so much for weight. Fortunately there's a lot more to Pontiac's 1963 Super/Stock story than weight. They're stronger in the engine room. Breathing is improved by opening up the head ports slightly and re-contouring them. Valve sizes are the same. Perhaps the biggest change is an up in compression ratio from 11 to a nominal 12.0 to 1 on the standard 421 drag strip engine. The combustion chamber is reshaped to get this higher compression, with the same pistons used as last year. Frank Rediker, Royal's chief mechanic,

says his actual compression ratio with these pistons will be about 12.7 to 1 when he gets all the combustion chamber cc's and deck clearances where they belong. In addition, Pontiac will also supply domed 13.0 to 1 forged pistons to special order on these '63 drag strip engines. These will give about the same actual compression as the standards when all rated volumes are right. (But you wouldn't want to do much fudging with the 13:1 pistons, or you'd need 145-octane aviation gas to run!) The new crankshaft for the '63 421 engine is cast instead of forged.

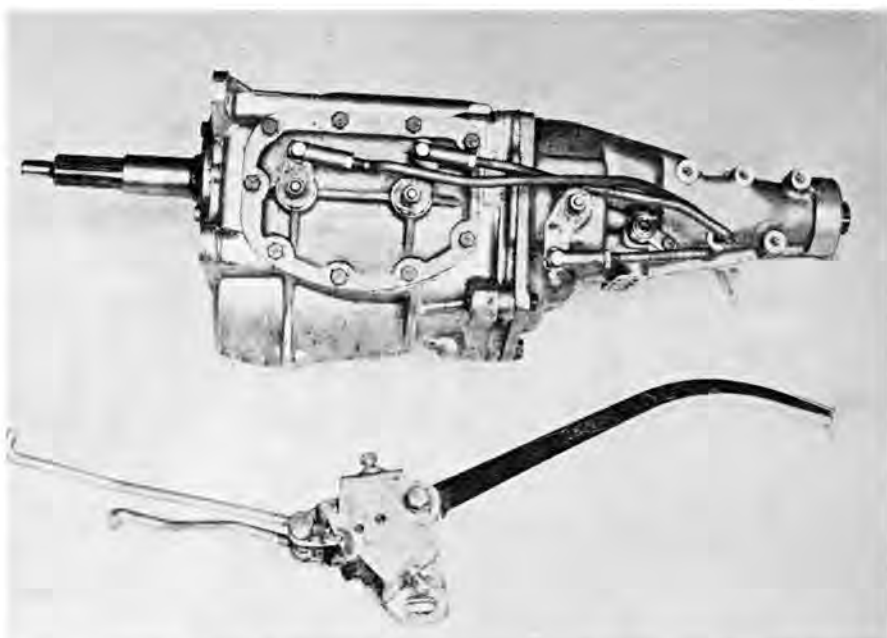
Another special Pontiac problem last year was that they couldn't wind the engine as tight as the Chevy 409's, 406 Fords and the 413 Dodges and Plymouths. Many of these owners were shifting above 7000 rpm but the big 421 Pontiac was all done at about 6400. Of course, this was still well above the peak of the power curve but it's well known that you have to wind way over the peak to get best acceleration through the gears.

Pontiac engineers have tackled the problem by lightening valve reciprocating weight with a careful "tulip" job on the valve heads. Also, new dual valve springs are used with higher tension and improved surge characteristics. A lot of camshaft work was done too, but the engineers found the No. 10 McKellar grind to still be the best all-around compromise for the drag strip. This has 308 degrees duration on the intakes and 320 degrees on the exhausts.

Just what these valve train changes will do for useable RPM's remains to be seen. Royal's driver, Jim Wangers, hopes to be able to go to 6800 rpm or better if need be this summer.

It might be mentioned here that it is important that this No. 10 McKellar cam be broken in carefully on a new engine. The car comes off the assembly line with standard heavy-duty valve springs with lower tension that eases cam loads on break-in. These are good for about 5200 rpm. Then you switch to the new high-tension springs when you want to race. These come in a box in the trunk. Also, you break in on the street with a standard 6-psi fuel pump. A 12-psi racing pump comes with the car. They're rating this new engine 420 hp at 5600 rpm.

The suspension on this car is tuned for optimum weight transfer on the drag strip. Rear coil springs are softer than standard, with stiffer front springs — to allow the body to settle back coming off the line. And this is greatly helped by fitting front shocks with zero rebound control (damping) — and rear shocks with no compression control. Thus there's no appreciable shock resistance to the backward tilting of the



TOP — Most buyers seem to want optional Warner T-10 4-speed with 2.20 low gear, all-aluminum case and weight 15 to 20 lbs. less than T-85. Both are equipped with Hurst floorshift linkage, well known for lightning-fast shift on the strip.

ABOVE — For street use, exhaust system is held to single tailpipe and muffler. Weight saving balances against efficiency where it isn't important as on strip.

body on hard acceleration. And yet you have enough damping in the opposite direction to prevent excessive pitching and bouncing of the body at high speeds.

The whole idea is to let the body pitch back, with as little resistance as possible, when you jump off the line. Whether this actually does anything for bite is a debatable point. I personally have my doubts. But the Pontiac engineers are buying it. All the hot boys do it. The factory has done everything possible to put you in the winner's circle.

One other development: This 421 drag strip package comes standard with the Warner T-85 3-speed transmission and a new set of gears has ratios of 2.09 to 1 in low and 1.45 in second. I suspect these are the same gears used in the Dodge-Plymouth S/S package. The longer low gear has been found to

be very effective on these very hot, lightweight cars — even better than the 2.20 low on the close-ratio 4-speed. The car is easier to control out of the chute, and you can go that much farther before you have to shift. A number of big names will use the 3-speed this summer. With the advanced Hurst Synchro-Lock shift linkage the critical 1-to-2 move should be a cinch. Royal, however, is switching to the aluminum 4-speed. All this feeds to the 4.30 Safe-T-Track rear end. And you'll find a set of special lightweight 14 x 7-inch steel wheels in the trunk to mount wide-tread drag tires. You can even buy drag tires from some Pontiac dealers!

They're just not doing things around Detroit like they used to. The factories are catering to the customers' demands and the end results are like nothing you've ever seen before.