

**421-inch V8, four-speed,
aluminum sheet metal,
3200 pounds with 54%
on the rear wheels. If
production plans hadn't
been cancelled, here's the**

TEMPEST

THAT COULD HAVE BEEN KING

by RAY BROCK

In Challenge Cup race for modified sports cars during NASCAR Speedweeks, 421-inch Tempest driven by Paul Goldsmith ran away from all competition in rainsoaked 250-miler.

Last month HOT ROD had a rundown on Pontiac's limited-production draggin' special which used a number of unusual methods to drop the weight of a Catalina coupe down to a little over 3300 pounds. This month we have little brother Tempest and if you think that Catalina was a drag strip special, wait 'til you get the lowdown on this latest bomb.

This, too, is a limited-production automobile for the simple reason that just shortly after Pontiac got everything ready to go into high gear on the production line, orders from General Motors' top management specified that all divisions stay away from racing and emphasis of high performance. A number of component pieces for the hot Tempests were already built by the time this edict was made and several orders had already been accepted so Pontiac filled these orders — a couple of dozen cars. But, from what we can learn, no more will be built.

This means that a few of the most amazing "stock" cars ever to roll up to the starting line will be campaigning on strips throughout the country this year. What class they'll run is anybody's guess. NHRA is classifying them Factory Experimental since they will not be available to everybody. Some non-NHRA strips in the South are letting them run as Super Stocks and roars of protest have already been registered. We've heard that quite a few of the name stock car drivers in the South have formed an alliance and refuse to race against these Tempests because the few times they've tried, the Tempests have murdered them.

Just what is this "monster" Tempest that has drivers of Super Stockers staying awake nights for fear they'll have to run against it? One of them ran in a 250-mile Challenge Cup race at the Daytona International Speedway during NASCAR's Speedweeks and we had the opportunity to check it out pretty thoroughly. The Tempest was owned and prepared by Ray Nichels' Garage of Highland, Indiana, and driven by Paul Goldsmith. The Tempest showed its taillights to everybody including \$20,000 Ferraris and hybrid 427-inch Corvette Sting Rays in a drizzling rain storm. But the place where this car really shines is on the drag strip.

Of the few cars that have been built, some are coupes and some are station wagon models. From the exterior, they look like regular 1963 Tempests but beneath all that sheet metal and paint, there are a number of differences. From the firewall back, the body is standard but ahead of this dividing line, aluminum is the password. Inner and outer fender panels, hood, radiator, bumper and miscellaneous brackets — they're all aluminum.

Beneath the hood rests Pontiac's top-rated 421-inch V8 with a tag of 420 horsepower. It is equipped with dual four-barrels, hot camshaft and all the heavy-duty engine parts needed to make it a real bomb. Goldsmith's car at Daytona used cast iron exhaust manifolds but the rest of these Tempests that will be seen running on drag strips this summer will

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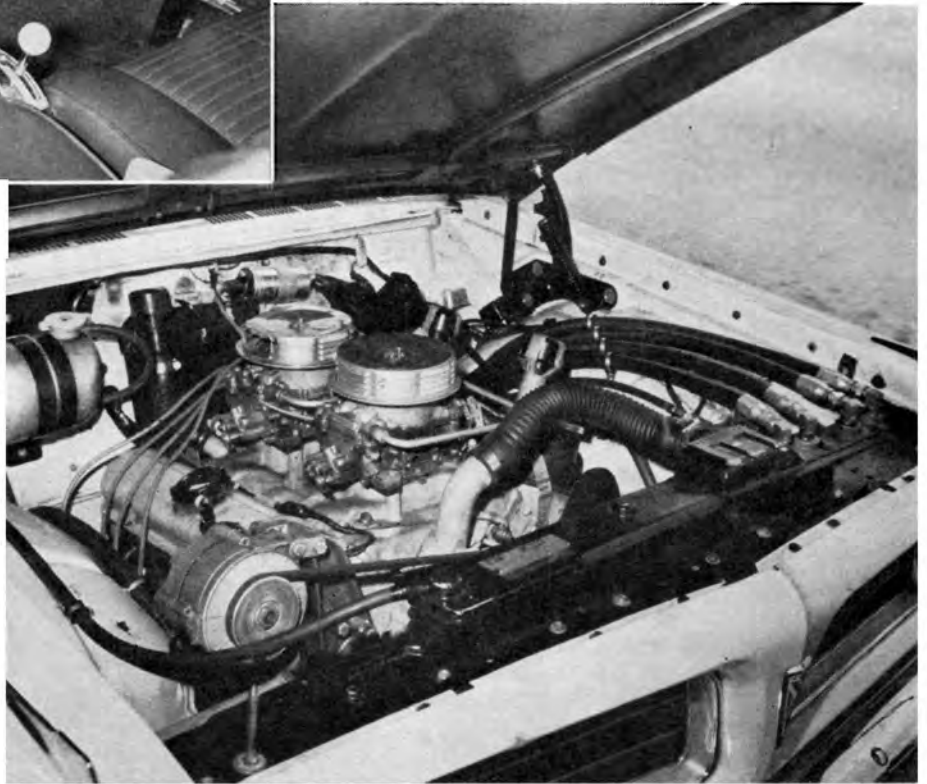




Nichels-prepared Tempest was equipped with roll bars and heavy-duty suspension components for Daytona oval. Extra instrument panel attached to dash gave driver accurate information on engine, transmission and differential oil temperatures. Each of the three oil supplies was fitted with a radiator to keep temperatures below critical point. Shift lever in console had positions for four forward speeds and reverse. Clutch was needed only to start.

photos by Bob D'Olivo

RIGHT - The 421-inch high performance engine is the same as that used in large Pontiacs, is rated 420 horsepower. Front sheet metal is aluminum, as is radiator. Hoses to right of photo carry oil between trans, rear axle to radiators behind grille. Third radiator not visible cools engine oil. They're Nichels' extras.



BELOW - On display at Stevens Pontiac in Daytona after 250-mile win, the Tempest was outfitted just like a Grand National NASCAR racer with heavy-duty chassis pieces, roll bars and open exhaust. Car averaged 145.161 for race.



undoubtedly use the cast aluminum exhaust manifolds.

The routing of exhaust manifolds in the Tempest chassis had quite a bit to do with the rest of the layout on this car. The big V8 fits the '63 chassis with no trouble but there was a problem of room where the left exhaust manifold ducked down beneath the car. Since the Tempest uses a transaxle unit with the transmission in the rear, Pontiac engineers decided to gain more room for the left manifold by moving the starter motor and flywheel to the transaxle unit.

Another interesting feature is that this car does not have a conventional

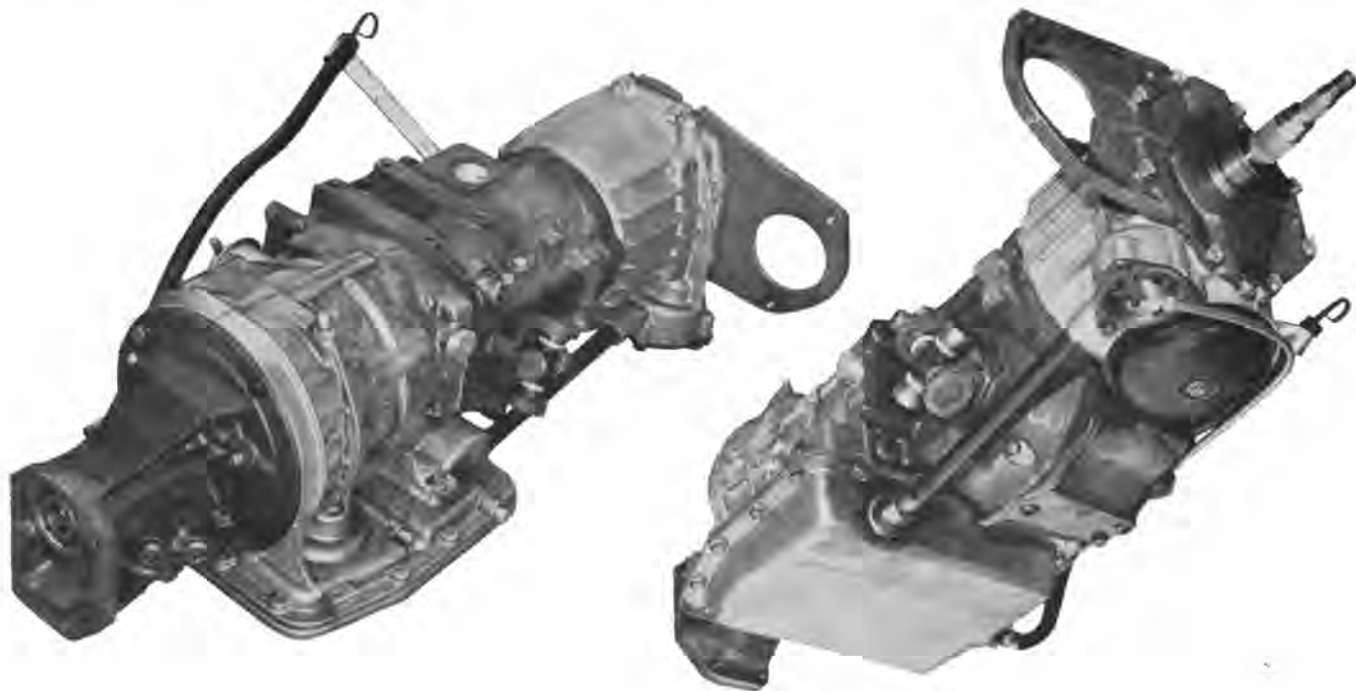
rear of the torque converter. Power transmitted through the converter goes forward into the extra automatic unit which has a planetary gear set that will give either 1.38:1 or 1:1 ratios. The output shaft from this unit goes forward through the hollow pinion again, through the hollow shaft in the front automatic unit where it then reverses its path of power flow back through the standard unit with a planetary gear set of 1.66:1 and 1:1 ratios plus a reverse unit. Then the power path goes on into the pinion gear.

It all sounds confusing but the secret of the power flow back and forth is that all the shafts used are hollow with

clutch disc is splined to fit the hollow shaft which transmits power forward into the extra planetary unit. The throwout bearing is operated by a hydraulic unit which attaches to the rear of the transaxle unit.

Whether equipped with a torque converter or clutch, operation is the same once the car is in motion. A floor-mounted shift lever has four forward positions (one reverse) and shifts are controlled by selecting the gear you want with the lever. Upshifts and downshifts are accomplished the same way; just move the lever to the gear you want. Shifts are instantaneous and sure.

TEMPEST THAT COULD HAVE BEEN KING *continued*



transmission. It is a four-speed unit but it was devised by an ingenious mating of a pair of the Tempest two-speed automatic TempesTorque transmissions. In standard Tempests, the TempesTorque box mounts ahead of the rear axle unit with the torque converter behind the axle transmitting power through hollow pinion and transmission shafts. For this special Tempest, some of the innards from an automatic were placed in a special aluminum case that was added to the rear of the transaxle unit, between the rear axle and the torque converter.

Reading from the front of the car back, here's the way the motion goes: From the driveshaft, a solid shaft goes through the front automatic unit, through the hollow pinion, through the extra automatic unit to a hub on the

the exception of the main solid shaft between driveshaft and torque converter. With the ratios we've given in the two planetary units, the four-speed ratios are: 2.30, 1.66, 1.38 and 1:1. Reverse is 1.66:1. Those of you who are familiar with four-speed Borg-Warner ratios will recognize that this Tempest gear spread is quite similar to the "high" B-W ratios of 2.20, 1.66, 1.31 and 1:1.

Now we've been talking about an automatic transmission and a torque converter and this is the way some of these Tempests are built. But, there are others running around which use a conventional clutch in place of the torque converter. The solid shaft from the driveshaft splines into a hub in the pressure plate which is in turn bolted to a regular cast iron flywheel. The

ABOVE—The unit as seen from below and the rear of the car. Large square pan is oil sump for standard unit and round cap covers bottom of extra unit. Drain tube from extra unit returns oil to standard sump where regular pump furnishes pressure for both units. Small shaft at right drives either torque converter or flywheel, the splined hollow tube carries power flow back to gears.

ABOVE LEFT—Viewed from top and driveshaft end, the four-speed transaxle unit looks like this. Aluminum case ahead of cast iron differential section is where standard TempesTorque fits. The aluminum case behind axle is the extra two-speed planetary unit that was added. Cast plate at rear is where starter motor attaches to engage ring gear on either the flywheel or torque converter.

With the torque converter, operation is the same as any automatic; you can sit at the starting line with the engine revved up and hold the car with the brakes waiting for the flag to drop. With the standard clutch arrangement, the clutch is used only to get the car moving in first gear, then all subsequent shifts are made with the lever and no clutch action. The clutch must be disengaged again only when the car comes to a stop.

The starter motor is mounted to a cast iron bracket on the rear of the transaxle unit and its pinion engages a ring gear on either the torque converter or the flywheel, depending upon which type of unit is used. With the starter in the rear of the car, it's only natural for the battery to be placed in the rear too. It mounts in the rear of the trunk behind the right rear wheel.

With all the power of the 421-inch V8 abusing the driveshaft, automatic units and axles, you'd think that Pontiac would have had to beef up all of these components considerably over those used by standard Tempests. Surprisingly enough, the curved driveshaft between engine and transaxle is the same one used for the 326-inch V8. No trouble has been experienced with this shaft to date. As for the automatic units, they have different clutch material and increased line pressure to give solid shifts. Aside from a special cyanide heat treat to the gears of the planetary units, they too are of stock dimensions. Axle shafts for the swing rear are the heavy-duty items that have been available for Tempests since 1961.

The particular car Goldsmith drove at Daytona was beefed in the suspension and brake departments for competition on the high speed track but the drag versions that will be seen around the country will use standard components beneath the car. Total car weight is in the near vicinity of NHRA's legal minimum of 7.5 pounds per cubic inch which figures out at about 3160 for the 421 engine. The important part of this weight figure though is the way it's split up between front and rear. With sedan models, we understand that 52% of the weight is on the rear wheels and for station wagon Tempests the rear wheel figure is around 54%. Even though the wagon is a little heavier, it should be no trouble to get the wagon down near the 7.5 pound figure. The "Swiss Cheese" Catalina has 53½% of its total weight on the front wheels.

We have seen a few of these Tempests in action on the drag strip and they are real terrors. We don't know just how they've been fixed up in the rear suspension department by the owners but we suspect that they have heavy-duty rear springs and shocks because when the power is turned on they



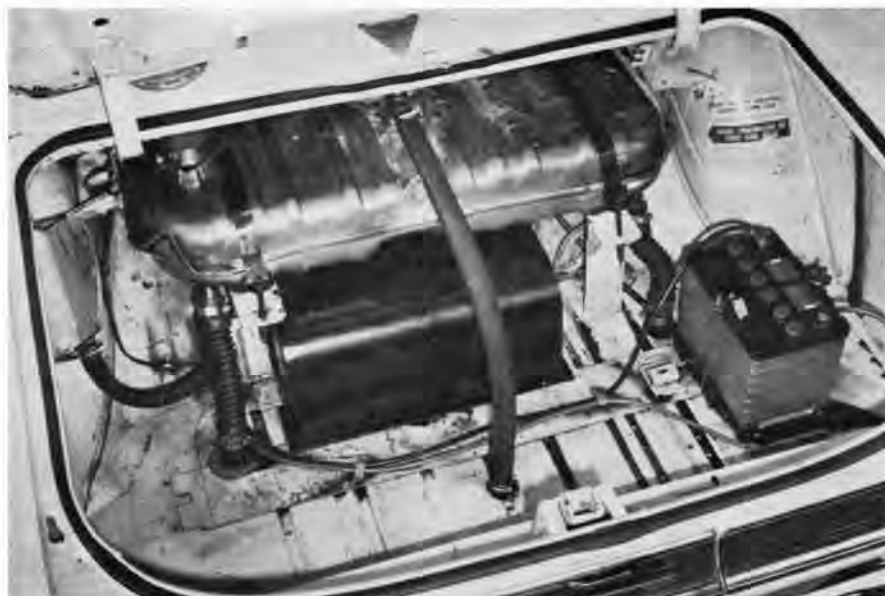
Nichels' mechanics attached an aluminum bracket to rear A-frame, then mounted a power steering pump with belt drive from pulley on right swing axle to circulate oil between transaxle unit and radiator. Undercar fuel tank has large notch in front to make room for the extra length of clutch assembly and throwout slave.

don't even spin a tire, they just go. The rear wheels don't show an appreciable amount of camber change with springing of the swing axles when the car starts out.

These cars seem to have little trouble getting under the 12-second elapsed time mark and speed runs well over 120 mph for the quarter. It looks as though Pontiac management had some real serious plans about dominating the Super Stock division at the drags be-

fore somebody in a higher position put the lid on performance. The few that did get built will certainly be crowd pleasers at the strips where they appear and we can't say that we blame the boys driving other brands for staying away from the starting line when one of these "compacts" is getting ready to run.

Tempest already has a model called Le Mans; this one would be a natural with a model name of "Le Monster."



Black sheet metal cover encloses the flywheel and clutch assembly which mounts several inches farther to the rear than in a standard Tempest due to extra unit between axle housing and clutch. Extra fuel tank was fitted for Daytona race only. Standard battery location for 421-inch Tempests is in trunk behind right wheel.