



The Great Breakaway Conspiracy

In a wide-trackin' Pontiac Trans-am, you, too, can find happiness.

Text and photos by Eric Dahlquist

Pontiac is not in racing. Hold that thought. And yet, like their sister GM Division, Chevrolet, they build competitive machinery; cars which are not pure racers but possess the potential of being. It has taken Ford six long, expensive years to realize if you're in the business of selling automobiles, by design or accident, GM's way is superior to fielding mega-dollar racing teams to systematically obliterate the opposition in every phase of wheeled combat. After all, Pontiac is in No. 3 sales spot heading for a one-million-unit-year in '69, so they're doing something right.

The right thing for Pontiac or anyone else is to look good in street/drag performance and lately, Trans-Am, categories where the iron is not far removed from the production-line womb. The reasons are patently obvious. Face it, when the average car nut sees something he owns or can actually buy, putting away the competition, he identifies like mad. Last season, through the expedient of rather bizarre homologation gymnastics, long-frustrated Pontiac buffs heralded the startling performance of Craig Fisher in a Canadian Firebird that was really a Z-28 Camaro with new sheetmetal. Under the banner of Toronto, Canada, heavy-equipment czar, Terry Godsall, Fisher's Indian was in effect an opening statement that Pontiac would have a contender for '69. Appropriately enough, Pontiac's sprinter came to be called Trans-Am Firebird since none of the other would-be competitors had sufficient foresight to get the name "Trans-Am" copyrighted.

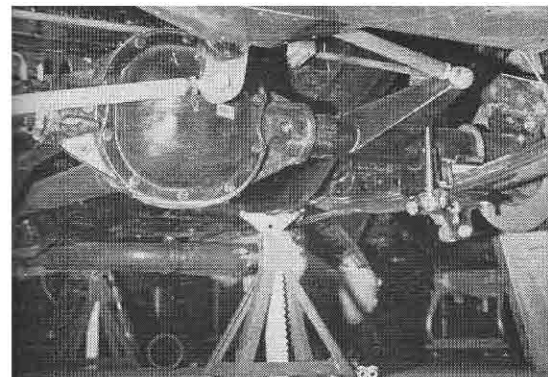
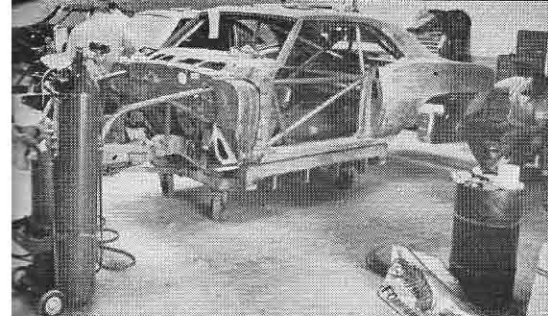
Preparations for the 1969 Trans-Am season commenced before 1968 was finished. Godsall, sort of a Northern Howard Hughes, lured Shelby team driver Jerry Titus away from Ford by establishing what has since come to be known as T/G (Titus/Godsall) Racing, a firm that would not only campaign a pair of Firebirds but build for sale ready-to-go racers. Of course, the creation of T/G racing did not happen by accident, Pontiac was already on its way toward producing the necessary hardware. Anticipating the factory's direction, T/G contracted with the engine development firm

of Al Bartz (remember the all-aluminum Chevy 427, MT September, '68) to work up a short-deck version of Pontiac's famous 4.120 x 3.750-inch bore/stroke, 400 cubic inch Ram-Air IV engine.

Simultaneously, Pontiac had introduced their new '69½ Trans-Am Firebird, a gussied-up hardtop with dual hood-scoops, functional side scoops, identifying decals and naturally, a rear-deck spoiler. Remember, "it don't mean a thing, if it ain't got that wing."

On the face of it, Pontiac's 350-inch engine seemed to present an easier path for destroking; but their Ram-Air IV already possessed four-bolt mains and was soon to receive new, better-flowing heads. Pete Estes, still Chevrolet chief at the time, commented tersely on hearing of the project: "They've got their work cut out. I lived with that engine and I know." The hang-ups Estes referred to were (a) short life expectancy over 6500 rpm due to poor oiling, and (b) underlying everything, a fourteen-year-old engine design that seemed pressed to compete with the overpowering small-block Chevy as both Ford and American Motors had already learned painfully.

The first Pontiac Bartz completed was literally pieced together retaining the 400's 4.120-inch bore diameter but diminishing the stroke to 2.83 inches with long Carillo forged-steel connecting rods to make up the difference. By this time Al had received a set of Pontiac's new heads that positioned the pushrods squarely in the center of the port, à la Ford's famous NASCAR 427. In a single swoop, Pontiac had nearly tripled the diameter of the intake port as well as spacing out the exhausts so that mixture had a straight shot at the 2.19-inch diameter intake valve, took a quick tour of the combustion chamber and exited directly out the 1.73-inch exhaust valve. Pontiac had sufficient faith in their Ram-Air IV camshaft to convert it from hydraulic to mechanical tappet design, retaining the .520-inch lift and 308° duration on the intake and 320° for the exhaust. Interestingly, although Al experimented with seven other camshaft grinds, he re-



Rear axle (above) is controlled by familiar Watts-link mounted on frame instead of axle to reduce unsprung load. Delco-Moraine discs are used all around with Koni adjustable shocks. 'Bird's frame was stiffened with bridge-truss (top) and roll cage (right). Superior Prod. wheel, S-W gauges are used. Anticipating the season, Jerry Titus (opposite page) bridges street/track cars.



turned to the Ram-Air IV because it possessed the broadest torque curve to 8000 rpm without valve float.

Feeling that the basic Pontiac oil system, if not superior to other designs, would at least be adequate if reworked slightly, Bartz restricted the rocker-arm bleed-holes at the main bearings to keep excessive lubricant from collecting in the valve covers. This, coupled with his .0015-inch bearing clearances, maintained good lower-end lubrication. Forty hours of dynamometer testing, showed the setup reliable for a consistent 375 horsepower @ 8000 rpm.

Another 400 engine with a scraped core (dropped water jacket) and 1½ inches milled from each deck put out 405 horsepower and was the intermediate stop to the third powerplant, the first regular Trans-Am Pontiac 303 engine. This had appropriately-sized combustion chambers and bearing journals (2.50-inch vs. 3.0) and correct length connecting rods (6.625-inch vs. 6.080). Just scaling down the equipment from 400 to 303 size was good for 20 ponies, performance Al qualified by commenting that although this method is relatively inexpensive, it is not always most efficient. Miniaturization aside, the third engine not only produced the best power but ran 300 miles testing before finally expiring. Which brings us to the final configuration as it will be seen on the grid.

The 303 block is 9.080 inches from the crank center to the highest point, 1/16-inch higher than a 327 Chevy. The 4.12 x 2.87-inch bore/stroke combination figures out to 303 cubic inches when maximum tolerances are figured in, giving Pontiac a unique displacement number. It has smaller, lighter, new design, forged-steel connecting rods good to 8300 without failure (because they have a wide base to resist bending loads), and forged crankshaft. The Ram-Air IV, three, four-bolt main bearing cap arrangement is retained. Pistons are 12.5:1 TRW forged aluminum with deflectors — there are right- and left-hand types. The piston deflector fills a combustion chamber that is almost identical to the new Ram-Air IV 400 cylinder head, but smaller.

Capping the powerplant is an open-plenum ram manifold Bartz worked up from a cross-ram-log prototype to approximate the design Pontiac did not have available at the time. Similar to the Z-28 Chevy, the manifold draws on dual 600 cfm Holley four-throat carburetors. With the first race of the series still 90 days away, the future of the 303 was at once bright and clouded. Bright, because it was pulling over 430 horses and that anyone buying a 303 would get all the good pieces except the forged pistons which would be swapped for sand-cast 10.0:1 units. Clouded, because SCCA was going to hold Pontiac to its 1000-unit-sales rule before the engine would be allowed and they might be forced to miss the first few meetings.

As Bartz cycled and recycled the countless power runs on the 303, Titus and company fell to the task of constructing six race cars; one each for Jerry and co-driver Craig Fisher, plus a backup, and three for sale. All the 108-inch wheel-base Firebirds were stripped completely and the double-channel sub-frames are arc-welded entirely where the factory spots every few inches. Contemporary roll-cage design is such that the primary driver's compartment section (1½-inch, .090 wall chrome moly steel) and the secondary stringers (1½ x .060-inch chrome moly) that go forward to pick up the front of the frame and back to tie-in both ends of each rear spring, form a unit looking much like a steel girder bridge and as strong.

Because all rubber bushings have a certain amount of compliance, a questionable quality for competition, oilless nylon-bushed, aluminum spacers replace them throughout the car. The real change in the front suspension geometry was that the normal F-bird spindle was exchanged for a forged-steel number with a higher placed axle stub. Moving the axle 2¾-inches up on the spindle lowered the car and improved camber deflection curve, and, coupled with other geometry changes, created what is in effect, Group 7 suspension characteristics. Brakes front and rear are the same Delco-Moraine binders found on the Z-28 and are optional

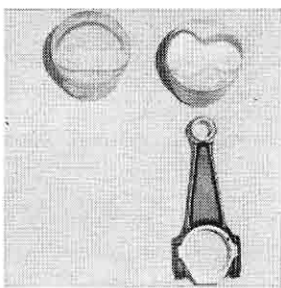
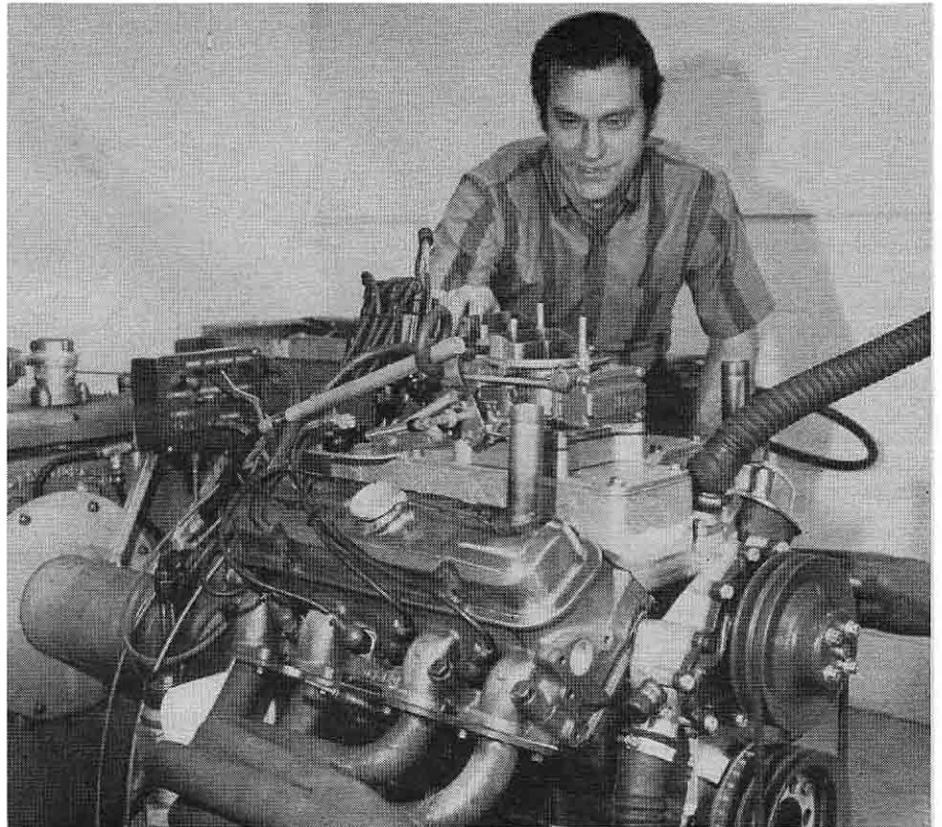
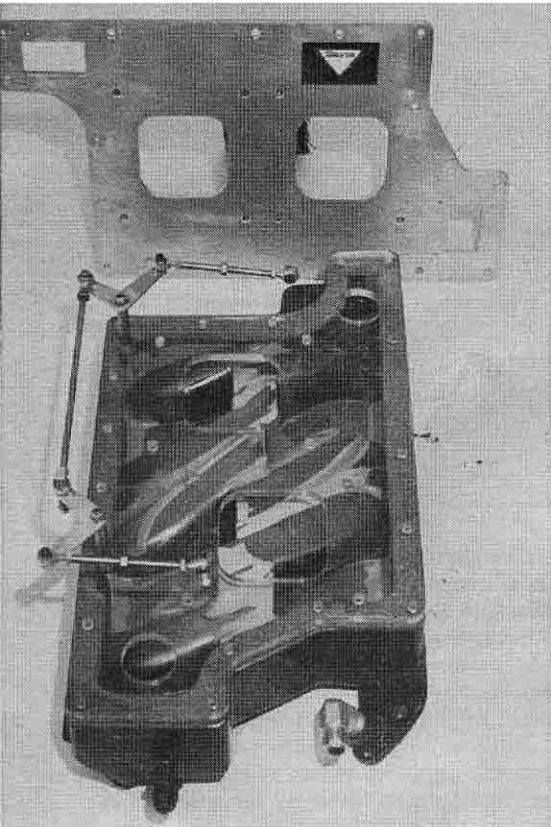
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for street-driven 303s. Koni adjustable shocks are used on all four corners.

Probably the single most interesting suspension feature is the Watts-link arrangement on the rear axle. It differs from most similar designs in that the pivot is on the frame rather than the axle housing to reduce unsprung weight. Although the per-unit cost is \$400 more than a common Panhard rod, it tends not to transmit road shock to the chassis under load. The rear axle is an A-B combination, that is, the large center section from a B-bodied Pontiac

(Bonneville, say) used with A-body axle tubes (Tempest).

How far T/G had come since the program's inception was underscored when the 2935-pound car hit the Willow Springs road course with high 34-second laps, two seconds quicker than the best '68 Mustangs had gone. Titus's optimism was tempered by the knowledge that Ford had probably improved these marks with better aerodynamics and more power. Chevrolet has never been behind. Still, banking on solid reliability and exceptional handling, Jerry anticipated parity with all competitors. "We're not going out with the idea we can't win," he reflected in a quiet moment. And that is why you never count Pontiac out. /MT



Big heat from Pontiac (above right). Al Bartz throttles her one more time. Manifold (above left), had plastic cover to see air flow. 303 pistons are unique from 400 with higher deflector (left). New rods are forged and have wide section at base to frustrate bending. Intake side of Trans-Am head compared with 400 shows tunnel ports (below left). Exhaust (below right) has wide space ports.

69 1/2 PONTIAC 303 TRANS-AM ENGINE PARTS

Engine assembly — 9795580
 Heads (complete) — 546184
 Crankshaft (forged steel) — 546270
 Connecting rods (forged steel) — 546217
 Pistons (forged aluminum) — 478483 (right),
 478484 (left)
 Lifters — 5232075
 Manifold — 546232
 Pushrod — 546518
 Oil Pump — 545763

