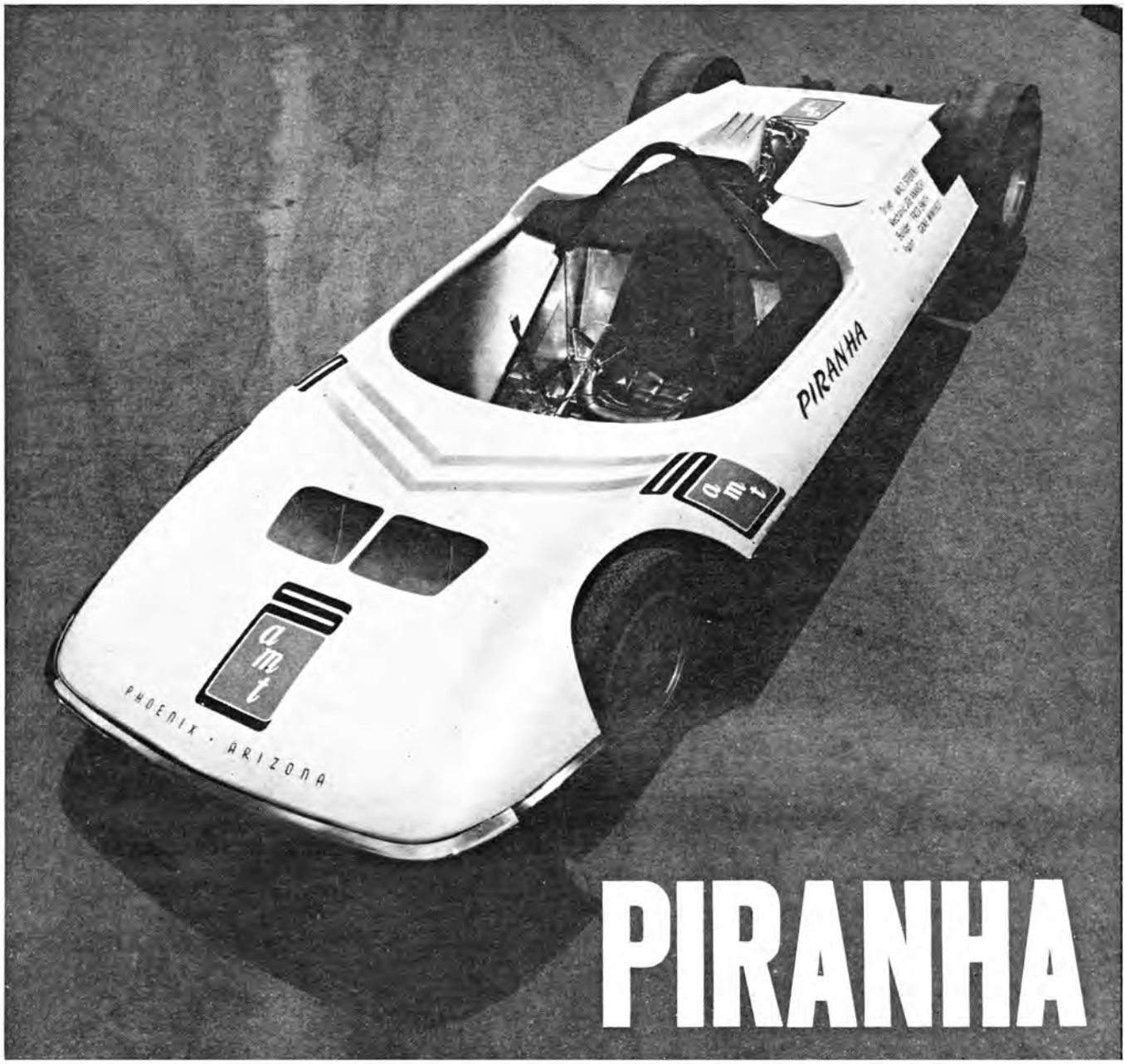


WAYNE THOMS

THIS FEROCIOUS flying fish, an exercise in the use of Cycolac plastic as auto body material, turned 182.64 mph and 8.81 sec. e.t. in the quarter-mile, making it the fastest of full-bodied cars. More docile Cycolac-bodied cars are in the offing.

The Cycolac Shell Game Makes a Stunning Funnycar

BY WAYNE THOMS

IF PRODUCTION of a hundred million miniature automobiles means anything, then the AMT Corp. should have little difficulty in adjusting up to the real thing. And that is exactly what the firm is going to do—on a limited-production scale with a sports-type coupe. To whip up interest in what's coming, AMT's Speed and Custom Division in Phoenix, Ariz., has built a drag race car of the variety more commonly known as Funnycar, though it may be classified as a sports car or fuel dragster under some racing rules.

As everyone who follows auto competition knows, the Funnycar closely resembles its conventional street automobile counterpart, and the funny part is that the street version only goes about one-half as fast as the race car.

AMT calls its new machine the Piranha, and the body shell is a close replica of the car that will be produced, except for the obvious alterations that were made to accommodate racing slicks and the supercharged, fuel-burning Chrysler Hemi in the rear. The dragging Piranha managed a neat 182.64 mph, 8.81 e.t. quarter-mile in its first public appearance in June, a performance which stunned spectators and made it the fastest full-bodied car in the quarter. The production version will be considerably more sedate, with a Corvair engine and civilized weather protection from a top that features gullwing doors and a recessed rear window.

One of the most significant points of the AMT-Piranha exercise, and the area where race car and production car are on an equal footing, is the body

material, Cycolac ABS (acrylonitrile, butadiene, styrene), a most remarkable material, the use of which leads directly to a brief history of the Piranha.

The project commenced when Marbon Chemical, a division of Borg-Warner, desired to demonstrate the automotive potential of its product, Cycolac. A sports car was engineered, designed and constructed, the body vacuum formed from Cycolac and the result designated CRV-1 (Cycolac Research Vehicle). As a dream car on the practical side, it attracted favorable comment wherever it was displayed. Recently AMT acquired manufacturing rights, initiated the program with the Cycolac-bodied Piranha drag car, and is rushing ahead to start production of the street coupe at the Phoenix plant.

Building plastic-bodied vehicles on a limited scale is nothing new, but the use of Cycolac decidedly is. And the fact that the material is loaded with automotive potential could have far reaching implications within the auto industry. As a matter of fact, there have been various auto applications of Cycolac, including dash panels on some makes and the 1966 Pontiac grilles (Cycolac can be chromium plated). Among other industries, the telephones currently being made in the U.S., luggage, cameras, sports equipment, radio and TV cabinets, office machines, vacuum cleaners, kitchen appliances, hair dryers, pipe and fittings, and lawn sprinklers are but a few of the varied uses for Cycolac.

CYCOLAC HAS BEEN described as "a Cinderella material that has done more to enhance consumer appreciation of plastic than any other product." There are at least 15 grades of the material, each with its own processing and performance properties. As it was applied to the two experimental CRVs built, the practicalities of vacuum forming a car body in two halves (upper and lower) at the same time, including bucket seats, dash, center console, glazing ledges, armrests and other interior details, was considered a major achievement.

The first Marbon-backed CRV was constructed on a tubular chrome-molybdenum steel chassis. After some 40,000 highway test miles, Cycolac's resistance to engine heat and cracking at stress points where it joins the frame has been well established. CRV-2 employed the same kind of 2-piece body, but with a 1-piece reinforced plastic backbone chassis—the same type of construction the production model will utilize. Built to be raced in sports car competition, CRV-2 received a couple of nasty crash jolts that knocked other cars out of the running, but inflicted no serious damage to the CRV, due in no small part to Cycolac's strength and resiliency. Another factor that added crash strength was the basic method of joining chassis and body halves. The two body components are bolted together along the periphery of the front and sides and attached to the plastic frame for a short space along the front, sides and rear. By keeping the area of contact between frame and body to a minimum, and thus reducing the stresses which would be transferred from the body to the frame, good collision damage protection is afforded, permitting the body to deform and return to its original shape with little or no structural damage. The plastic structural inner shell provides engine compartment, front and rear trunk areas, and door sill supports. Cemented to it are mounting plates for front and rear cage units that attach suspension systems, steering, transaxle and engine.

The drag race Piranha, which was designed and constructed by AMT personnel in Phoenix, has been put together in a slightly different manner, utilizing a tubular chrome-molybdenum space frame, the main tubes 1.375 x 0.049 in., the diagonals 0.75 x 0.049 in. Chassis designer Fred Smith, 24, whose experience belies his age, has put his extensive knowledge of dragster construction to work (he built race cars for Don Garlits in Florida), turning out a frame that is extremely light (68 lb. bare) and stiff. The tubular front axle is suspended on leading links from a transverse torsion bar. The bar is enclosed in a tube and is anchored in the center, twisting from that point. Additionally, radius rods which lead from the frame forward, attach to brackets atop the axle.

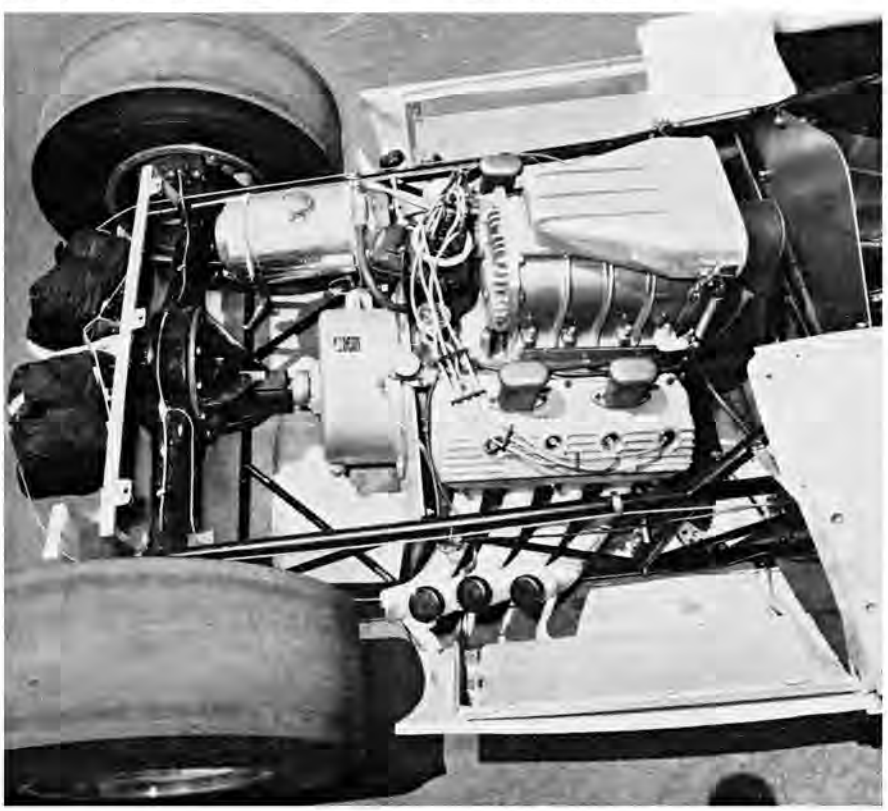
EXTENSIVE USE of aluminum and magnesium throughout the car—engine mounts, body mount tubing, foot controls, brackets and engine accessories—have kept the car's weight down to 1550 lb. wet. Combine this with the GMC-supercharged Chrysler Hemi engine's estimated 1400 bhp on 95% nitro and a healthy acceleration machine is a foregone conclusion. (Standard engine displacement is 392 cu. in.; this one is 396 after 0.03-in. overbore.)

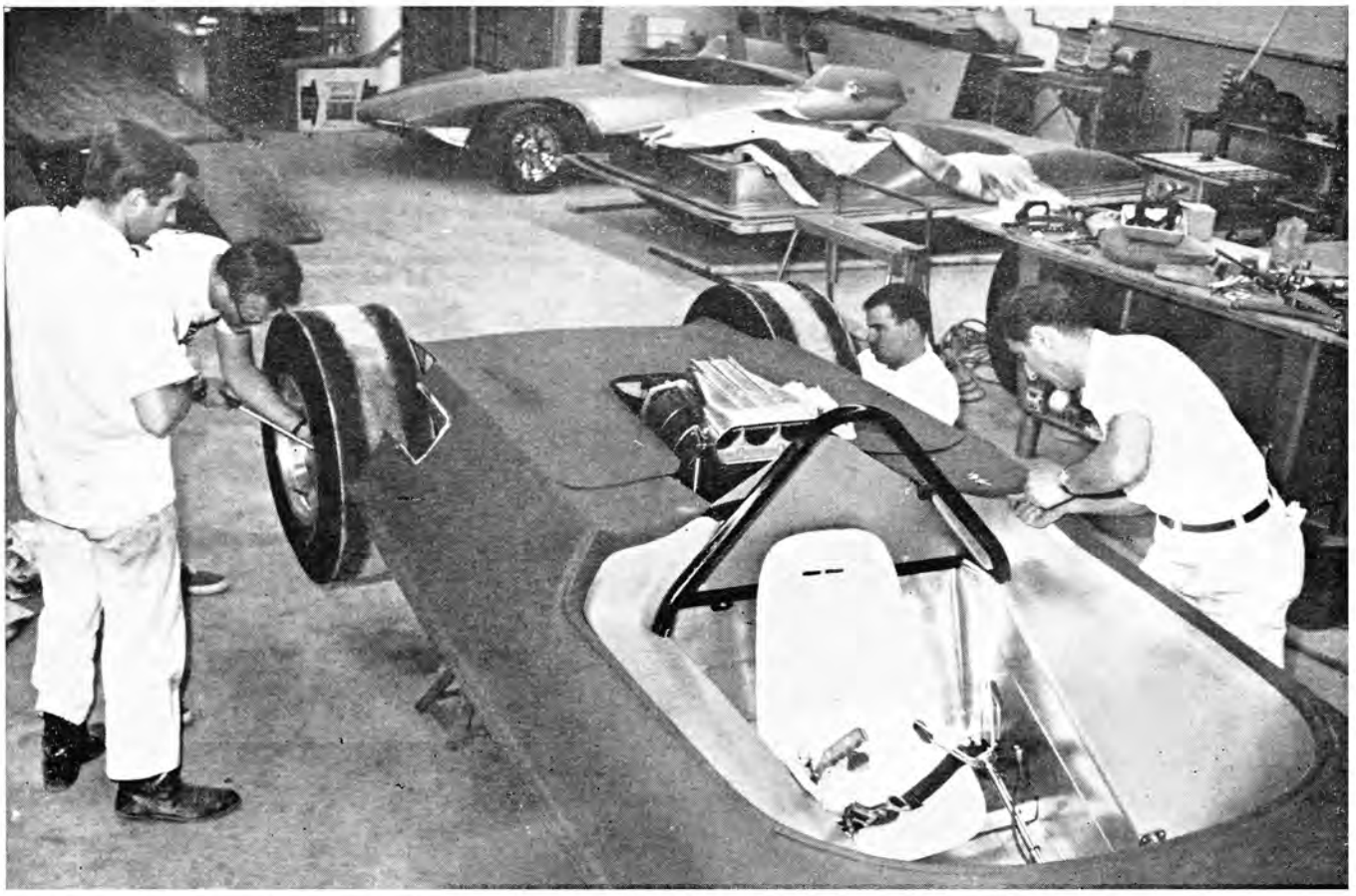
Smith has joined the engine to the Olds rear end through a special coupler that eliminates a U-joint, thus enabling engine placement as far to the rear as possible. There is no transmission; a Schiefer double-disc clutch is turned either on or off.

One aspect of rear-engined drag cars has been weird handling. The Piranha is said by driver Walt Stevens to handle very well, and Smith attributes much of the good quality to the fact that he mounted the engine with 8° rake, which effectively lowers the roll center so that the car is not adversely affected by torque. It does not, says Smith, "get snaky."

Piranha drag car dimensions are: ▶

THIS STANDARD 392-cu. in. Chrysler Hemi was bored out to 396 cu. in., given GMC supercharging. It produces an estimated 1400 bhp on 95% nitro.





THE FINISHING touches were put on the Piranha in AMT Corp.'s Speed and Custom Division shops in Phoenix, Ariz. The car heralds a more sedate production, to be powered by a 140-bhp engine, instead of the blown Chrysler Hemi.

PIRANHA

Wheelbase, 120 in.; front and rear tread, 56 and 54 in.; body width, 65 in.; overall length, 148 in.; height to top of rollbar, 39.5 in.; and body height (behind driver), 29 in. Because of the drag application, wheelbase and body have been lengthened beyond dimensions that will be used on the production coupe.

Cycolac Piranha bodies are thermoformed on conventional vacuum equipment from extruded 0.25-in. thick sheet. The dragging Piranha was varied, using 0.187-in. material in a move to save all the weight possible. Some of the material qualities include high impact strength (golf club heads are being made of Cycolac), tensile strength from 5000 to 8000 psi, surface little affected by abrasion, good resistance to stains and to chemicals (except for a few that are solvents), and the ability to retain original properties at extremes of temperatures such as an auto body might encounter—sub-zero to 225° F. In addition, the material can be welded by a special process. All in all, it's quite a remarkable material, similar to Uniroyal Royalex used for Cord Sportsman bodies. Application by AMT of Cycolac to the Piranha race car and ultimately to a low-volume production machine is only the beginning of what could be major utilization of the material by the auto industry. ■

MARBON'S CRV-4 body is vacuum formed from Cycolac plastic and mounted on a one-piece chassis of the same material. The car has disc brakes, 4-speed transmission and a Corvair engine.