PERFORMANCE: SOHC STOCKERS

It looks as if Ford will be running its overhead-cam 427-cu. in. engine on the NASCAR tracks next season. The new NASCAR rules stipulate a minimum production of 500 units to make a model eligible for Grand National racing (in line with internationally accepted GT rules). That's a healthy production volume for a hand-built engine in a high labor cost economy, but Ford intends to do it. In fact, anyone can purchase a sohc 427 engine now for around $2200, and receive it in a crate after a few weeks' wait. Ford will run the engine in the intermediate-size Fairlane body for the NASCAR tracks, to take advantage of the 2 sq. ft. or so less frontal area than the Galaxie—even though the minimum weight is identical at 4000 lb. It is also expected that the engine will be installed in at least 50 Galaxies, to make that combination eligible for drag racing in the NHRA Super/Stock class. Ford intends to get a lot of racing mileage out of the sohc 427 in 1967.

It's about time. This is a tremendous engine, with the potential to force obsolescence on Chrysler's pushrod Hemi. However, Ford must put enough of them out in the field for racing people to start experimenting.

One of the stock class run-offs at the recent NHRA National Championship drags in Indianapolis gave a beautiful demonstration of the effect weight distribution can have on elapsed time. This was in the A/Stock Automatic class. Major competitors were '66 Dodge and Plymouth Street Hemis and '63 Plymouth 426 wedge cars with light aluminum front end sheet metal. (That was the last year that special lightweight body panels could be legally used on stock cars.) The '66 cars with steel bodies and the heavy Hemi engines weigh roughly 500 lb. more than the '63 wedge aluminum models. But, the free-breathing Hemi develops enough additional horsepower to make up the difference. This was indicated by the fact that the two types of cars turned identical 118.11-mph trap speeds on the trophy run. (This suggests approximately 500 bhp for the wedge and 580 bhp for the Hemi.) But, examine their elapsed times: The heavier Hemi had only about 44% of its static weight on the rear driving wheels, and turned a rubber-burning 12.13 e.t. on that run. The lighter '63 Plymouth wedge had nearly a 50/50 weight distribution and pulled 11.91 sec. with the same weight/bhp ratio.

Obviously, it doesn't pay to lose sight of basic physical principles when selecting and setting up a drag car.

Speaking of physical principles, something interesting in regard to high-speed racing turned up on the high-banked Daytona Speedway. This track has 31° banked turns and so a car can develop centrifugal forces in excess of 2 Gs before the sidewise force component on the tires reaches its limit (around 1.3 coefficient) of traction. But, on a banked track, the centrifugal force has a downward component that puts additional loading on the tires. This becomes almost equal to the total weight of the car at 180 mph.

So, when the 4000-lb. NASCAR racers are cornering at 180 mph on those 31° Daytona banks, the four tires are developing about 5200 lb. of side thrust, to balance centrifugal force, and the total vertical load on the tires is about 7800 lb.! No wonder tire wear and blowouts are major problems, and why the cars need such sturdy springs and shocks. In effect, they're 8000-lb. cars in the turns!

An engineer who was connected with Chrysler's automotive gas turbine development program has pointed out some of the advantages for the basic g.t. type of engine that have not been generally appreciated.

For one, the g.t. offers great promise as the long-sought "lifetime" engine—one that wouldn't require any attention for at least 100,000 miles. With a minimum of moving parts and rubbing friction wear, this engine is a natural. Though it is by no means a lifetime engine in its present state of development, the potential is there in a far greater degree than in the piston engine. Additionally, g.t. engines are more comfortable at high speed and power levels than piston engines. This may be vital for tomorrow's 100-mph superhighways. Remember that current piston engines operate most of their lives at perhaps a tenth of their rated power capacity and at less than half their rated speed. They wear out fast at near full speed and power, as well as giving off annoying vibration and noise. They're just not "comfortable" in this work. Gas turbines, on the other hand, are just as smooth and quiet and long-lasting at full speed and power as at idling speed. This makes them ideal for turnpike cruisers that operate most of the time in this range.

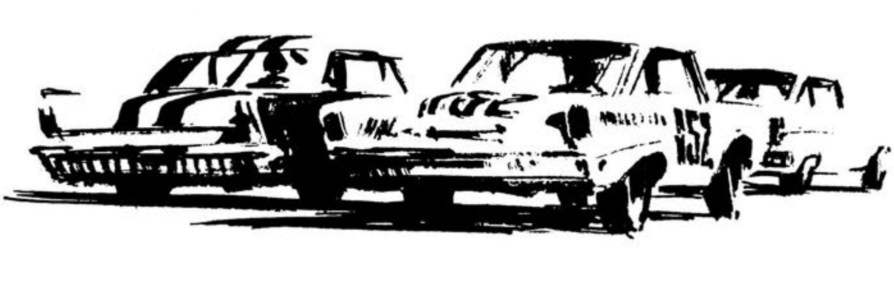
Chrysler still is very serious about a practical g.t. passenger car. It may well arrive sooner than anticipated.

Impending national anti-smog regulations are having a great influence on passenger car engine design. These are the maximum limits for unburned hydrocarbon and carbon monoxide emissions that will be imposed on all cars in 1968. Many '67 models are getting ready for this. One point of attention is the quench area in the cylinder. This is the shallow area between the cylinder head and piston top (at top center) that acts to chill the last part of the air/fuel mixture that burns, and thus control detonation at high compression ratios. (Which is nothing more than a spontaneous explosion of this "end gas," due to excessive heat and pressure.) But, while the quench area chills this mixture, it also prevents some of the gas from burning by actually quenching the flame front. And this, of course, increases the unburned hydrocarbon emission level (which is said to create smog). Reducing the quench tends to increase the engine's octane appetite; but careful design so far has managed to keep this under control.

Oldsmobile's new Climate Control option, which attempts to maintain a constant 100° F carburetor inlet air temperature, is aimed primarily at reducing emissions. The idea is that the carburetor can be jetted much leaner when it isn't required to allow for long warm-ups of a cold engine. With the new setup Olds gets warm air from the exhaust muff within seconds after a cold start. The carburetor can be jetted for warm air only, rather than warm air and cold air. Emission levels are cut significantly. Overall fuel economy is slightly improved with the leaner warm-air jetting.

This principle of carburetor air temperature control will appear much more frequently on American cars within the next few years; in fact, anti-smog regulations eventually may force it on all cars.

—Roger Huntington



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