MUSTANG

Is it more than a one-off sports car? Just another styling study? Ford's Mustang may mean a new approach in American engineering. If people keep demanding combined performance and economy, Detroit will supply both. This may be a blueprint of the future.

FORD'S TAUT, KNEE-HIGH MUSTANG seems to be a guided tour through the minds of Dearborn engineers. It's a firm, practical indication of developments they'll try to put into passenger cars in the next few years, and it's also a course of action they'll try to follow for a future American sports car.

Today, the Mustang's stressed-skin body, V-4 engine, adjustable steering and foot controls, independent springing, and other engineering innovations will make just a ripple in the automotive goings-on of Detroit, but the impact should hit squarely and cause excitement in three or four or five years. Unlike so many styling projections and dream cars offered so far, this one is crammed full of usable ideas.

The fact that the Mustang is a two-passenger sports/competition roadster shouldn't obscure its broader points of usefulness. And although none of the Mustang's technical aspects are "breakthroughs" or even terribly original, the mere fact that Detroit takes note of their existence is a reassuring sign.

Here, then, is good news for all automotive sideliners who've too long asked the question, "Why don't they . . . ?"

BODY AND CHASSIS

The Mustang's space frame is made up of one-inch-OD steel tubing. This supports a seamless aluminum skin, stressed to take some of the usual torsional forces, and more important, designed so the cockpit becomes an integral part of the body. The total unit is very light and strong. Seats aren't adjustable, but the controls are. Also, since the engine's in the rear, the body hangs over more in front – a necessary weight compensation.

The body, which was conceived with major emphasis on aerodynamics, carries a full belly pan and also has air scoops on the sides to feed air to two radiators. These scoops were what Ford considered the best compromise between low air resistance and good cooling.

Two clever items stand above the cockpit. First, the roll bar is part of the body/frame structure. Second, the windshield has a slight lip on top to direct air over the driver's and passenger's heads.

The total package gives a curb weight of 1500 pounds – or about 740 pounds less than the Triumph TR-4.

ENGINE/TRANSMISSION

The Mustang's engine is essentially the same used in the current German Taunus 12-M. It's the one Ford hoped would power the Cardinal. Taunus pulls 50 hp from 1183cc; Mustang's rewarm gets 106 hp from 1500cc.

Two radiators cool the V-4, one set on each side of the car just behind the rear wheel wells. To save horsepower, thermostatically controlled electric fans force air through the radiators when the car's not in motion. Since the Mustang was designed for use either on the road or on the track, two versions of the engine were built. The milder uses one single-barrel carburetor (89 hp), and the competition job uses two twin-throat Webers. The engine itself stands just behind the cockpit – in front of the transmission/differential – and its placement was calculated for the best possible weight distribution.

Transmission is fully synchronized, and has four speeds. Control is by means of a cable system linked to a short lever. This transaxle system, in unit with the engine, can be taken out of the car through the bottom – by simply removing one bolt-on crossmember. Although the unit stands on regular mounts in normal driving, it can be bolted solid for competition.

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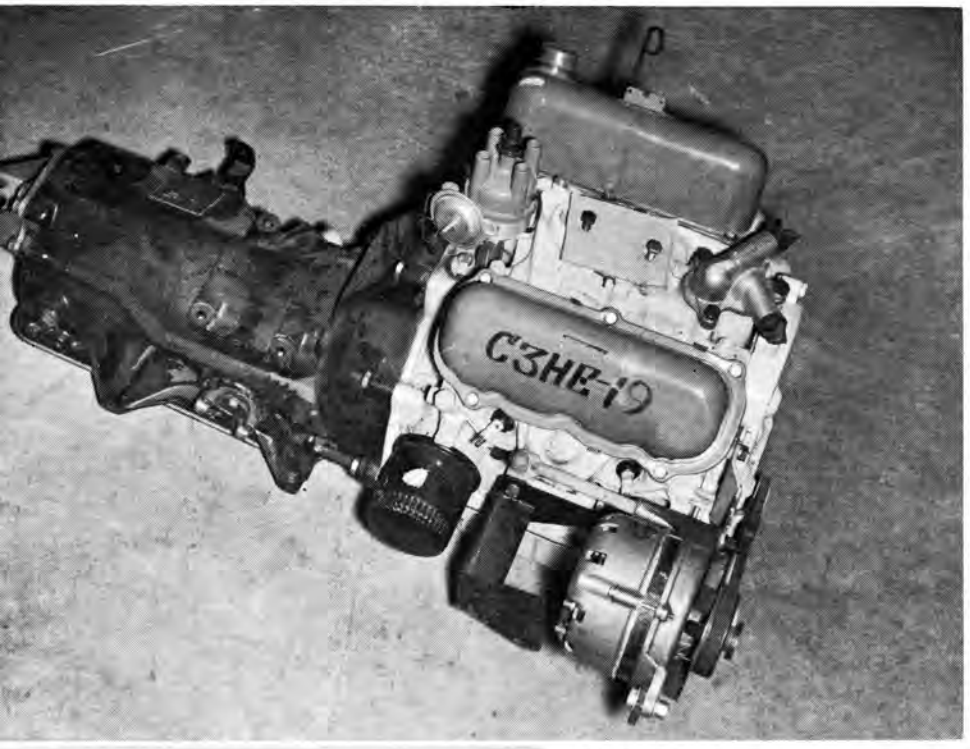
***(LEFT)** Light alloy bearing carriers are part of adjustable, independent rear suspension system.*

***(FAR LEFT)** Mustang's headlights swing into nose to lessen drag. Body is one piece of aluminum, fits over steel tube frame.*



(ABOVE) Mustang's engine is based on V-4 originally developed for the Cardinal and now used in the Taunus 12-M. Transaxle setup was revamped for Mustang, is very little altered.

(LEFT) German Taunus drives through front wheels. Entire engine/transaxle assembly forms one rigid unit. This powerplant develops 50 hp from 1183 cubic centimeters, is cast iron.

(BELOW) Mustang's cockpit, integral part of body, lends strength to the design. Pedals and steering wheel are adjustable, while seats aren't.

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SUSPENSION

Running on four live axles, the Mustang's front suspension setup has double wishbones made up of stressed, welded tubes. Again, the idea is minimum weight with maximum strength. Coil springs, in combination with adjustable, take-apart shock absorbers, form compact units. At the rear, welded tubes are also used, this time in a link arrangement, with an A-frame upper arm and a combined A-frame trailing strut lower arm. The pivot axis of these suspension arms is adjustable, and the suspension geometry can be varied. As in front, the coil springs and shocks form one piece, and the springs are adjustable for riding height. One clever touch is that the rear setup is designed to take various sizes of stabilizer bars, which lets the driver tailor the car's roll stiffness any way he wants.

ADJUSTABLE CONTROLS

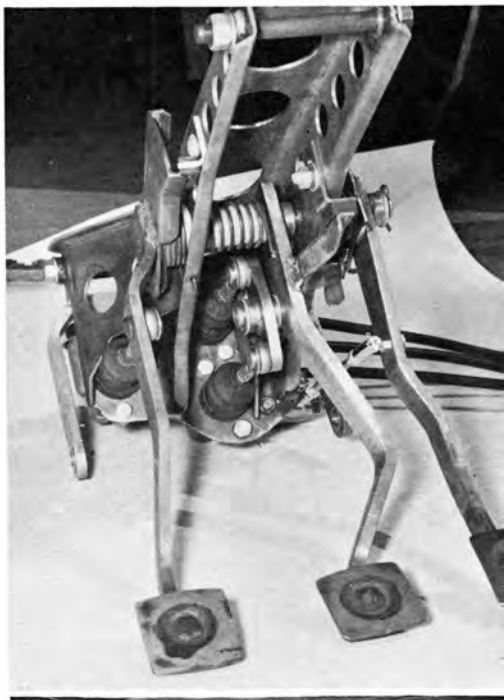
One of the major advances brought out in the Mustang is its adjustable controls. As mentioned, the seats are stationary. The controls move. The steering wheel, for instance, has an adjustment range of three inches – may be pushed or pulled that distance. This, of course, is nothing new: Sports cars have had the feature for years. But together with an adjustable pedal cluster, the system is highly tractable. All three foot controls – gas, brake, and clutch – are mounted on a single pod, and the pod slides through a distance of four inches. What makes this movement possible are flexible hydraulic tubes for the brake and clutch, and a flexible cable shaft for the accelerator. The entire unit is suspended under the cowl, leaves plenty of leg room on the floor, and has a lock release on the dashboard.

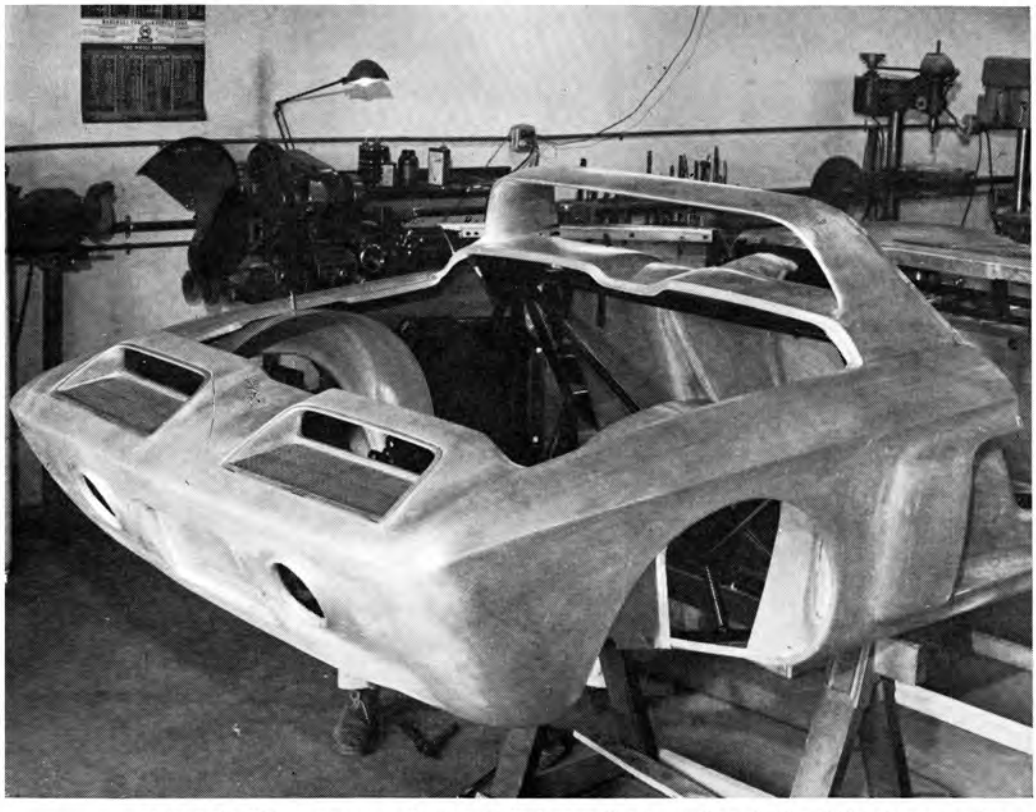
GENERAL NOTES

Much of what's good about the Mustang's design comes directly from the car's light weight. A claimed gas mileage of 35 mpg in normal driving, a top speed of 117 mph – these are possible because of such innovations as stressed-skin construction and overall weight reductions. Thus the Mustang's impact will come when Detroit begins manufacturing cars that can combine solid economy with solid performance. No one's building that sort of car now, but someone's going to start soon. Ford may be first – at least their pioneer work seems encouraging. And the Mustang, the first expression of a new thought in Detroit, may by then have turned its present ripple into a wave. **/MT**

*(**ABOVE**) In an effort to make the Mustang as aerodynamic as possible, developers H. L. Misch (left) and Gene Bordinat kept frontal area low. Side scoops feed two radiators. Alloy wheels and extremely light components keep curb weight down to 1500 pounds.*

*(**RIGHT**) Pedal cluster moves on track, uses flexible connections. All three pedals are in same plane, making for minimum foot movement to switch quickly from gas to brake.*





*(**ABOVE**) Roll bar is integral part of design, adds strength to body. Tube frame and one radiator are visible through rear deck opening. Engine and transmission unit go into car and are removable through bottom, and one crossmember unbolts to get V-4 in and out. Troutman-Barnes did the bodywork in their Los Angeles shop, keeping to Ford's specs.*

*(**RIGHT**) Front springing also stresses light weight, consists of adjustable suspension arms, has provision for different sizes of stabilizer bars. Shocks are take-apart variety, ride in coil springs. Overall height can be varied, as can roll stiffness.*