

SCI

Technical Report:

FIREBALL



Ken Miles wheels through turn at Golden Gate Park race at San Francisco. Tires left large black marks the first time around, Miles thereafter followed the same tracks each trip through corner.

PERHAPS the strangest aspect, and incidentally, the real proof of the appeal that road racing has in the U. S., is the willingness of craftsmen of modest income to match their skill in building cars to compete against the best that money can buy.

The team of Dick Trautman and Tom Barnes, of Los Angeles, are representative of the U. S. specials builders. As metal-men employed by Frank Kurtis, they are very capable craftsmen. Both have modest incomes and a long association with racing has left them without any illusions about the cost of racing and even less about the cost of building a car.

If you ask the reason for their building a special, the answer is simple and direct, "We like road racing; we wanted a car to go racing with so we built it." Since this Ford-engined special was completed in 1952, it has raced in over thirty events. Although the big win has eluded them, it has won Saturday curtain raisers, and its excellent start/finish ratio has earned it an impressive number of seconds and thirds.

The scheduled performance test on this car couldn't

materialize due to the fact that the flathead coughed all its water in the main event at Pomona trying to overhaul Bill Murphy in the Kurtis Buick. However, the top speed of the car must be in the neighborhood of 140 mph with acceleration of the somewhat fierce variety.

To the initiated the Indianapolis speedway cars are, in construction detail and finish, the standard of the world for racing machinery. The Trautman-Barnes Special reflects this influence from Kurtis. From nose to tail, the car is flawlessly executed. It is impossible to find a poor weld, an out-of-round drill hole or a badly formed tube.

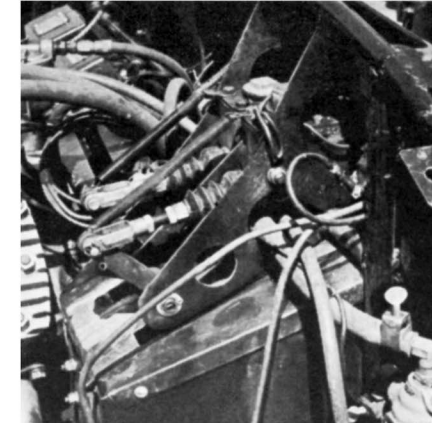
Of real interest in the design of this special is the way that the builders have come up with an extremely light car, 1900 pounds wet, with the extensive use of modified Ford parts.

The chassis frame is of the simple truss type but considerable ingenuity was necessary to adapt this particular form to the type of suspension used. The main tube of each side member is of round section, two inches in diameter and .083 wall. This tube runs straight back from the firewall to just aft of where it passes under the rear axle.

FLATHEAD

By RUSS KELLY

Master cylinder layout for hydraulically operated clutch and brakes. Slave cylinder is mounted on side of gearbox, activates cross shaft directly.

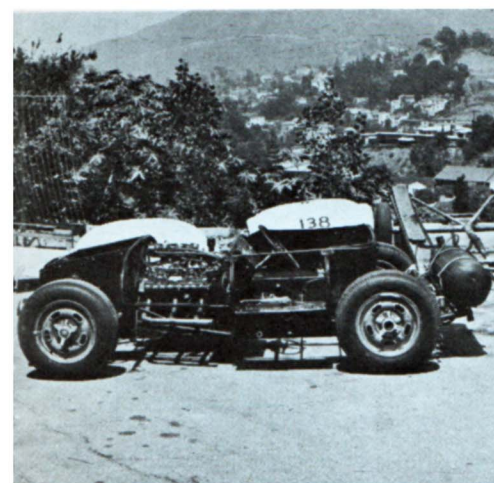


Then it kicks up and slightly inwards. A cross-member of the same dimension tubing ties the main tubes together in the rear and carries the gas tank mounting brackets. In front of the firewall the main tube kicks inwards and upwards. The smaller side-member tube is above the main tube, making this actually an inverted truss. It picks up the main tube at the very front of the frame and follows it on a horizontal plane to the rear of the cockpit. The necessity of stopping the truss at this point because of the rear axle layout leaves the main tubes unsupported aft of the cockpit. This has been partially relieved by a bolt-in section of tubing that runs from the rear of each main tube to the cockpit frame. The small tubes used are of .750 inch section and .083 wall. Bracing between the tubes of the side members is of a triangulated pattern. Cross members are of the same section as the main side member tubes.

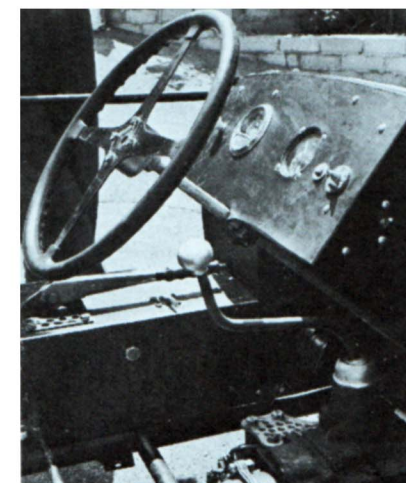
The unusual method of hanging the transverse springs used in the suspension also plays an important part in stiffening the chassis frame. Called "quad-pods" by Trautman, these hangers help tie the main tubes together front and rear.

This chassis layout is obviously strong in beam and the body frame work, braced by the cockpit paneling, contributes a great deal towards torsional rigidity. The weight of the chassis frame is less than 90 pounds.

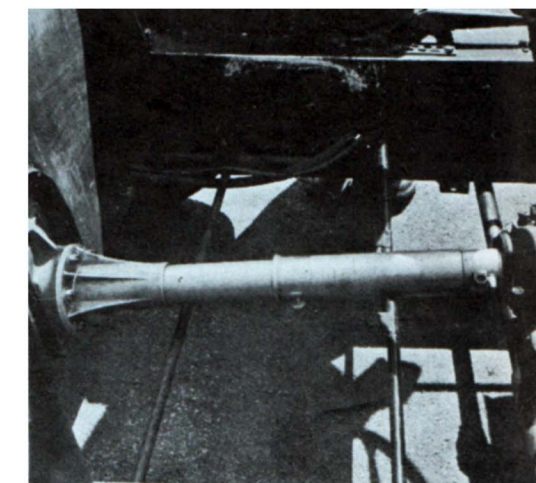
Suspension in the front is by transverse leaf spring and lower "A" frames. Most of the parts are extensively modified pre-ball-joint Ford. The "A" frames are 1949 Ford that have had a section removed to shorten them and then re-welded. The kingpin carrier and stub axle is also Ford. To obtain the proper distance between "A" frame and spring-eye, the king-pin carrier was cut off at the top and a short length of tubing welded on to accommodate the spring eye clevis bolt. The extra wide transverse leaf spring is specially made and is notable for its workmanship. Each leaf is delicately tapered at its end to guard against fracture and distributes its load evenly. The spring mount is constructed in such a manner that the height can be varied if it should be desirable to effect a weight transfer between front and rear wheels. Fifty-fifty Monroe telescopic shocks are used. The upper shock bracket is fabricated of sheet stock and is welded to the main frame tube. The lower bracket is welded to the "A" frame.



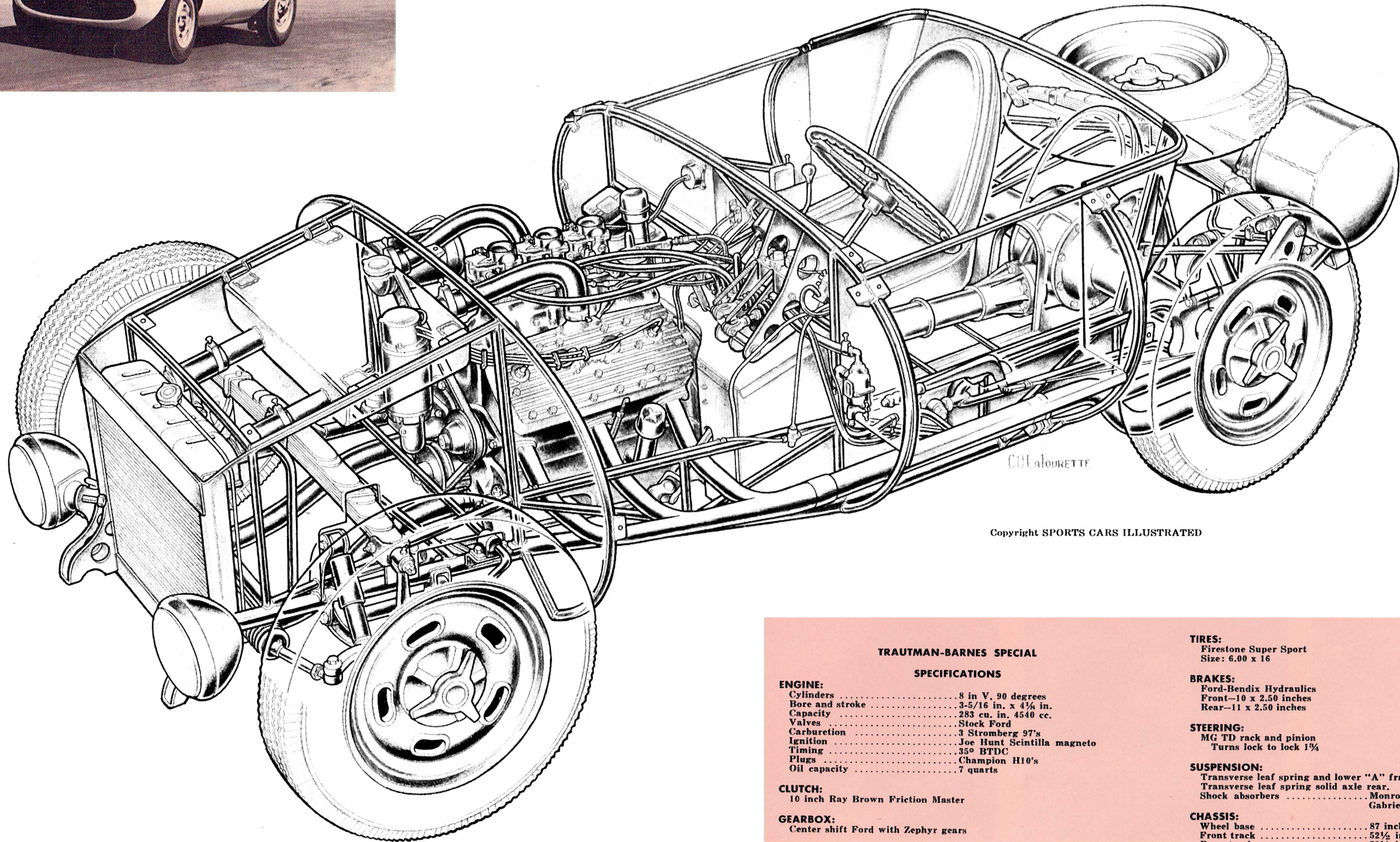
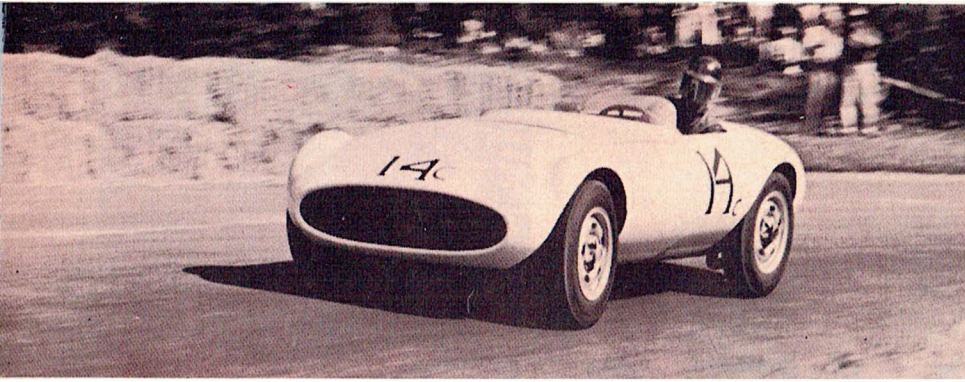
Layout of car with panels removed. In this state, Special might be a track roadster.



Unfinished cockpit reveals Ford gear box with Zephyr gears. Drilled plate holds slave cylinder.



Rear of engine is mounted through gearbox on transverse bar. Note shortness of driveshaft.



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Trautman Barnes Special

TRAUTMAN-BARNES SPECIAL SPECIFICATIONS

ENGINE:

Cylinders 8 in V, 90 degrees
 Bore and stroke 3-5/16 in. x 4 1/4 in.
 Capacity 283 cu. in. 4540 cc.
 Valves Stock Ford
 Carburetion 3 Stromberg 97's
 Ignition Joe Hunt Scintilla magneto
 Timing 35° BTDC
 Plugs Champion H10's
 Oil capacity 7 quarts

CLUTCH:

10 inch Ray Brown Friction Master

GEARBOX:

Center shift Ford with Zephyr gears

REAR AXLE:

Halibrand-Ford quick change.
 Available ratios:
 3.33, 3.48, 3.62, 3.78, 3.94, 4.11, 4.30

WHEELS:

16 inch Halibrand cast magnesium center locking wheels

TIRES:

Firestone Super Sport
 Size: 6.00 x 16

BRAKES:

Ford-Bendix Hydraulics
 Front—10 x 2.50 inches
 Rear—11 x 2.50 inches

STEERING:

MG TD rack and pinion
 Turns lock to lock 1 1/4

SUSPENSION:

Transverse leaf spring and lower "A" frames front.
 Transverse leaf spring solid axle rear.
 Shock absorbers Monroe fifty-fifty's front
 Gabriel Adjust-O-Matics rear

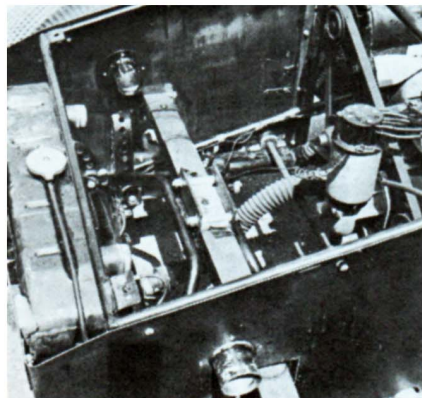
CHASSIS:

Wheel base 87 inches
 Front track 52 1/2 inches
 Rear track 52 1/2 inches

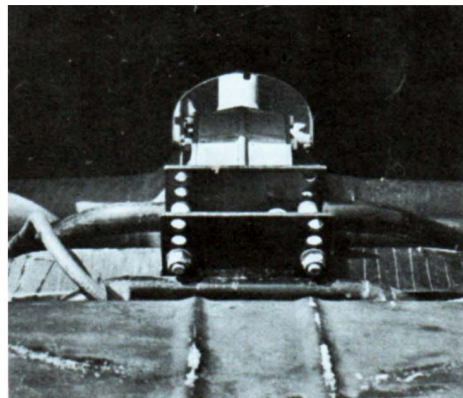
OVERALL:

Length 145 inches
 Width 60 inches
 Height 34 inches
 Ground clearance 7 inches
 Fuel capacity 20 gallons
 Weight 1900 pounds

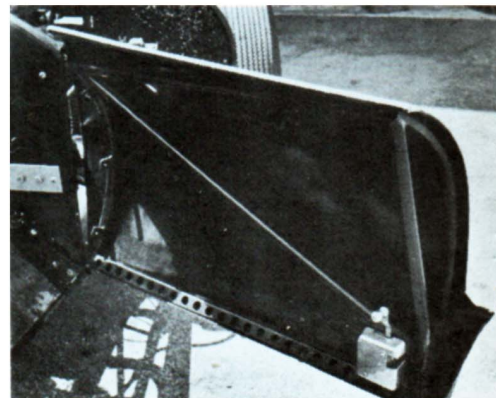
Chuck Daigh pushes hard to catch Bill Murphy in the Kurtis-Buick. Ford Special stayed with Murphy until engine blew up.



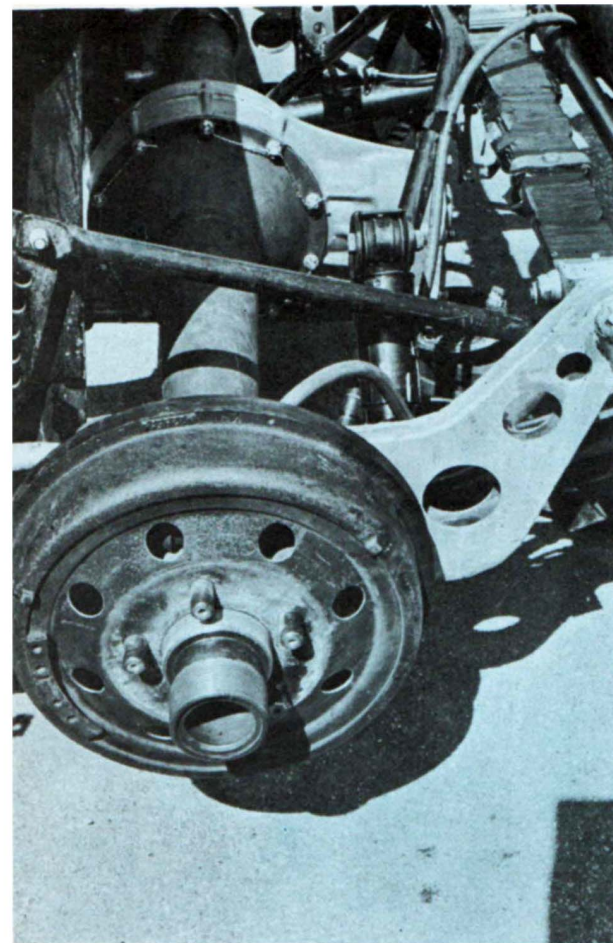
Weight distribution was controlled by placing engine well behind front suspension.



Height of rear spring can be increased or lessened by selection of drilled holes in spring plates.



The light concave door is well braced and rigid enough to stand on. It works too.



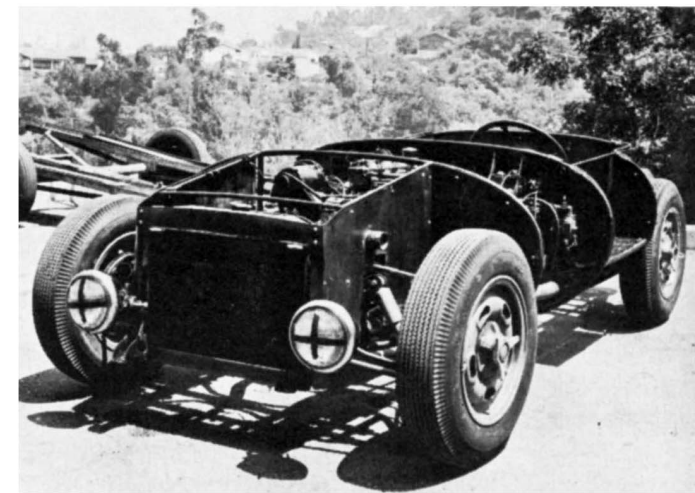
Elongated spring perch, drilled to save weight, allows spring to be located beyond rear axle. Holes in drum exhaust air taken in by backing plate scoop.

Steering is by MG TD rack and pinion. The track rods are also MG but they attach to Ford steering arms that have been considerably altered. In order to get the desired steering geometry with the track rods ahead of the axle center it was necessary to reverse the steering arms and bend them so that the point of attachment for trackrod to steering arm came inside the wheel between the brake drum and rim. The steering is quick by any standard, one and 3/4 turns from lock to lock and even though two universals are used between steering wheel and box, the system is absolutely without play. The stabilizer bar crosses the chassis behind the "A" frames.

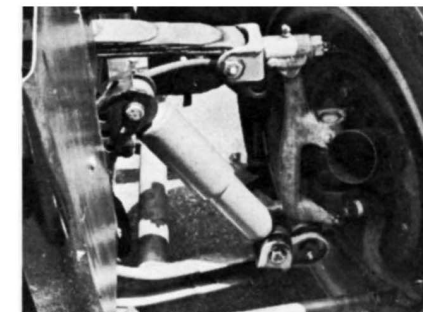
One look at the rear suspension dispels any lingering doubts about Trautman and Barnes knowing what they are doing. The builders realized that a quick change center section was a must. This meant the use of Ford final drive components. Ford final drive units are fine, but when the driveshaft is shortened, as it is with this car, suitable re-location of the radius rods can be a real problem. Stock radius rods solidly attached to the axle housing are fastened to and turn with the torque tube. Obviously, since they are solidly fixed to the axle housing, the practice of moving the radius rods out and attaching them to the chassis is asking for trouble because chassis roll in cornering will twist the housing between the radius rods and lift the inside rear wheel. The builders solved this problem by the use of floating radius rods. Tubing was welded around the axle housing at its extreme outer end and then machined as a register for a bearing incorporated in a

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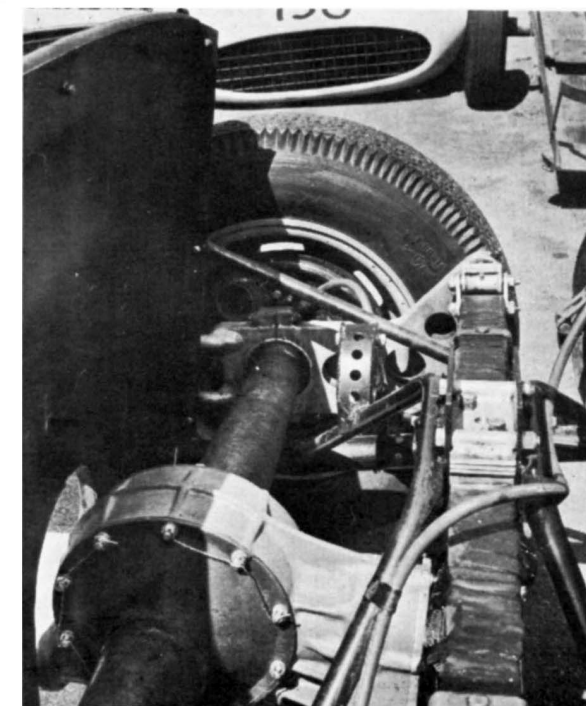
Three quarter view shows sectional braces. Front wheels are zero cambered. Low placed headlights are Flord.



Transverse spring acts as upper control arm. Large tubing scoops air to cool Bendix brakes. Note forward placement of steering arm.



Rear spring sits well behind sprint quick-change final drive. Note "quad-pod" spring hanger. Rear brakes are cooled same as front.



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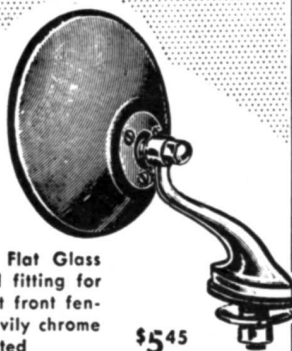
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Fireball Flathead

(Continued from page 37)

split fabricated box section. This box section, roughly the shape of a boom-crang, carries the double tube radius rod on its front half and the spring shackle attachment on its rear half. This leaves the rear axle independent of chassis roll. The transverse rear spring is located quite high in order to clear the quick change unit. Since some of the disadvantages of a short wheel base can be alleviated by using a longer spring base, the builders hung the spring as far as possible behind the axle center. Gabriel Adjust-O-Matic shocks are used in the rear and seem adequate for the job. A limited slip differential unit is fitted. Final drive ratios with the Halibrand-Ford set-up are almost infinite, making it well worth whatever trouble it is to install.

The brakes are pre-1949 Ford-Bendix units. In the front the steering arm location limits the drum diameter to ten inches, the shoes are 2.50 inch wide shoes. In the rear the drum diameter is 11 inches with 2.50 inch wide shoes. The drums are liberally drilled and arrangements are made to duct cooling air directly to them. The master cylinder is located on the firewall and is directly actuated by a pendant type lever. The hand brake operates by cable on the rear wheels only.

The gearbox is a center shift Ford unit incorporating Zephyr gears. Trautman feels that the low all-up weight of the car has had a great deal to do with the dependable service they have gotten from this unit. The plans for a new power plant include the installation of a Jaguar four speed box.

The clutch, a Ray Brown Friction Master, is hydraulically operated. The master cylinder is located on the firewall adjacent to the brake cylinder and is also actuated directly on the clutch cross shaft lever. Hydraulically operated clutches are sometimes heavy in use, but have a nice feel and the simplicity of layout can save a builder a lot of headaches.

The instrument panel is simple but adequate. It includes an electric tachometer, oil pressure, water temperature and fuel pressure gauges. The steel spoked wheel has a rubber rim and is installed at the typical speedway angle of 42 degrees. The two bucket seats have the sort of leather upholstery job that is seldom seen outside of a classic car.

The sight of a flat-head engine under the hood of a competition car these days is pretty startling — something like Bermuda shorts and high button shoes. But the way this car gets down the chutes and accelerates, you'd think that overheads were just a fad.

The reliability of this mill borders on the fantastic. It seems as though it hasn't been apart for so long that no one can remember what's in it.

The block is Ford and is bored to $3\frac{5}{16}$ inches and in company with a stroked crank ($4\frac{1}{8}$ inches), the displacement adds up to 283 cubic inches. The camshaft is a Russ Garnet regrind, but there are no available records of the timing. The tappets are the adjustable type and lift stock intake and exhaust valves. The intake and exhaust ports are "just polished." Pistons are Forged True's. The heads are Edelbrock's. A Navarro intake manifold carries three Stromberg 97 carburetors; a Bendix electric pump delivers the fuel. Sparks are supplied by a Joe Hunt Scintilla magneto and the plugs used are H-10's.

The radiator is a late model Mercury unit cut to the desired dimensions. Rubber-mounted, it is located well in front of the axle centers.

The envelope type body features some of the finest panel beating that ever turned up at a road race. Made of .064 aluminum stock, a close inspection didn't turn up any evidence that it had ever cracked or been repaired. The general shape of the body is simple, probably because the builders thought it's the way a racing car should be. Individual panels are numerous, nine in all that are quickly removable via Dzus fasteners. The nose piece carries the grill and covers the front wheels. The separate hood panel and two engine side panels makes it possible to get at the engine compartment quickly without removing the nose piece. On the driver's side the cockpit panel is removable; on the passenger side hangs a door that those harassed gentlemen at Le Mans would be delighted to see. Cross-braced with an adequate lock and hinges, it feels solid enough to swing on. The tail section is solid from the rear of the cockpit back and covers the spare tire that is carried directly above the differential.

This car has been in competition almost four years, proof in itself that it wasn't built in the woods by squirrels. You can name a half of million dollars worth of imported machines that have been raced into worn out hulks in this length of time. It's interesting also that the best cars of two years ago would not be able to stay with this car today. #