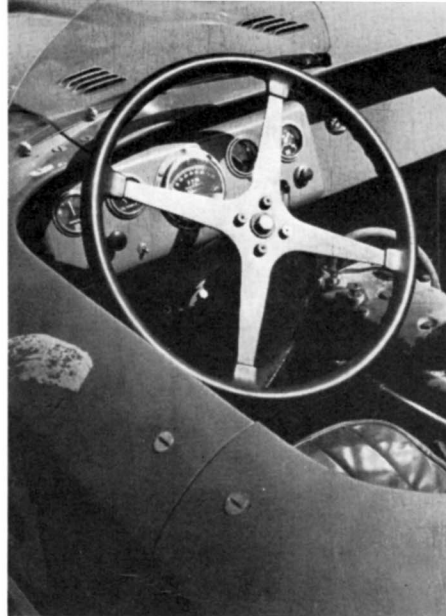
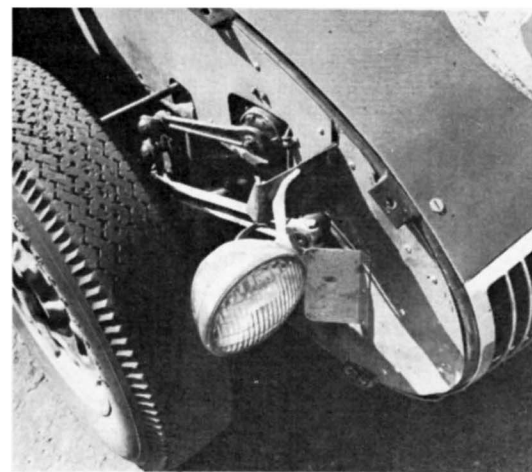


By RUSS KELLY

**Frank Kurtis designed it, Bill Murphy and his crew bolted it together. Some call it the Murphy Buick, others call it the Murphy Kurtis. Either way you slice it.....**



Gauges left to right are: ammeter, oil temp., Keltronic tach, water temp., oil pressure. Gauge far right is injector fuel pressure.



The Murphy Buick minus right front fender shows one Houdaille 50/50 shock absorber and torsion arm. Shocks on front end total four. Others are Gabriels.

# MURPHY

# BUILT A BOMB

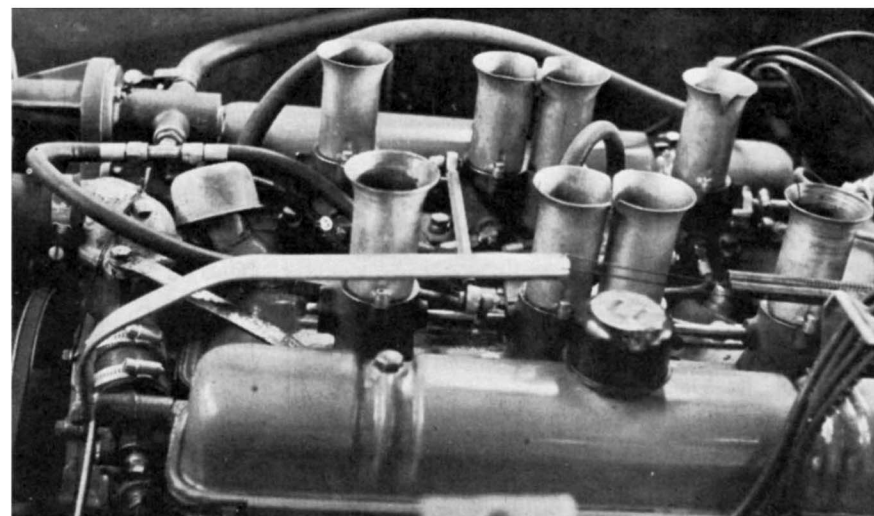
**T**HE lack of a winning American sports racing car is more keenly felt now in road racing than ever before. Race attendance is still growing and the newcomers to the sport are again kicking around that old question that hardened bench racers thought was dead. Why aren't American cars winning our road races?

It's a good question and one that can, given the right amounts of chauvinism and yo-yoism, start a fist-fight.

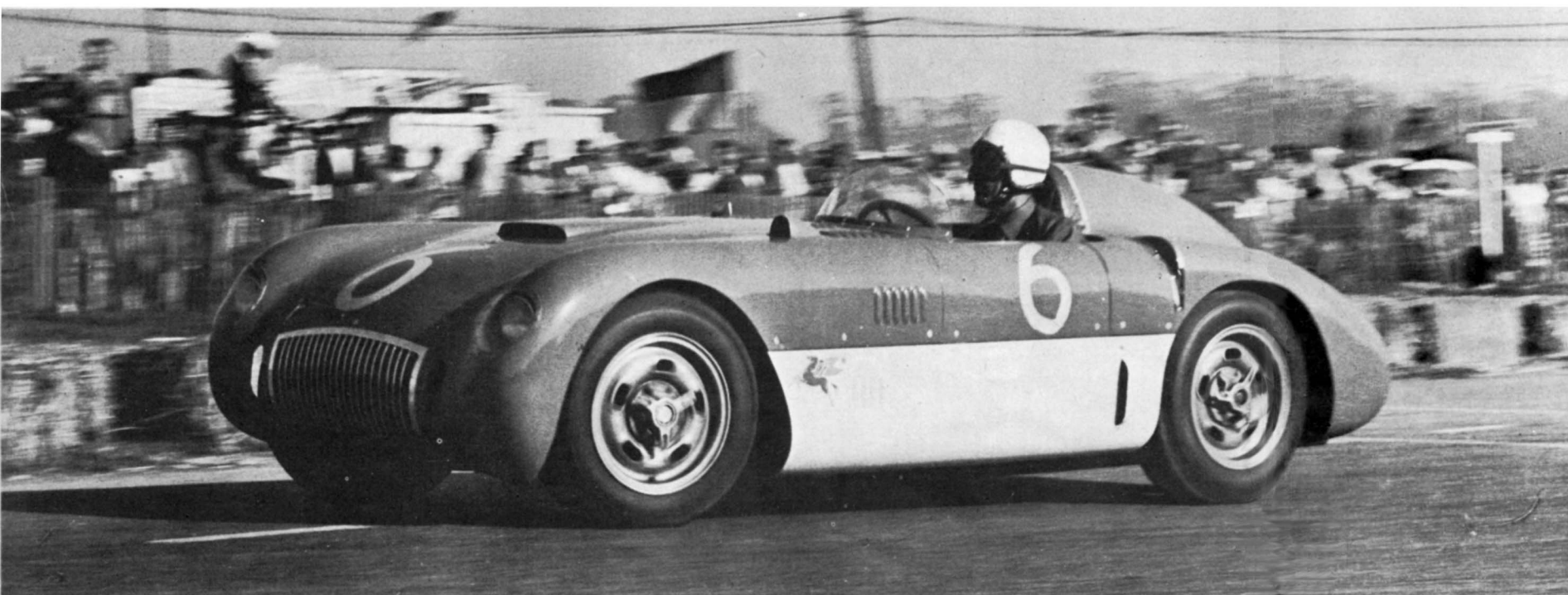
Money alone isn't the answer. You can spend a million

dollars building or developing a car and still fall on your face, but on the other hand, if you haven't got that extra change to buy the best safety wire, you might just as well stay home. In all the technical fields that apply to road racing the U.S. is certainly not behind, but something seems to happen to all this know-how before the car gets to the track. Apparently the trouble is faulty application of what we have and what we know.

Bill Murphy, of Culver City, California, must have felt



Injection set-up plus new heads brings hp from 260 to 315. Horns protruding from injectors are for ram effect.



Bill Murphy behind the wheel of the Kurtis-Buick charges at full noise at Bakersfield. Moments later brakes refused to release, and car was forced to retire.

business. Murphy uses an engine that he knows. He's a Buick dealer and the engine in his racing car is no stranger to him: it's part of the family. Jack Reilly, his racing mechanic, has been with him three years. Reilly is young, enthusiastic, doesn't know everything in the world and admits it. He's actually grown with the development of Murphy's car, and it makes a good team. Sam Hanks, national champion in big cars in 1953, works for Murphy when he's not busy piling up points on the dirt tracks. It would be hard to believe that some of all that Hanks knows about racing hasn't rubbed off on Murphy. The idea that an American track driver is handicapped when it comes to getting around a road course is almost funny. The guy who learned to race by putting his foot in it and turning left is capable of turning right too. Last, but not least, is Murphy's attitude. There's no hurry or worry, he's not trying to impress anyone and doesn't feel any pressure.

The Kurtis Buick in its present form has been such a consistent performer and receives such serious consideration in pre-race discussions as a possible winner that SCI contacted Murphy to do a full scale technical report on the car. The Willow Springs race course was selected as the test site.

A brief rundown on the Kurtis-Buick specifications is in order here. An envelope type body is used to enclose the tubular chassis. The brakes are Halibrand disc type. Torsion bar suspension with solid axles is used front and rear.

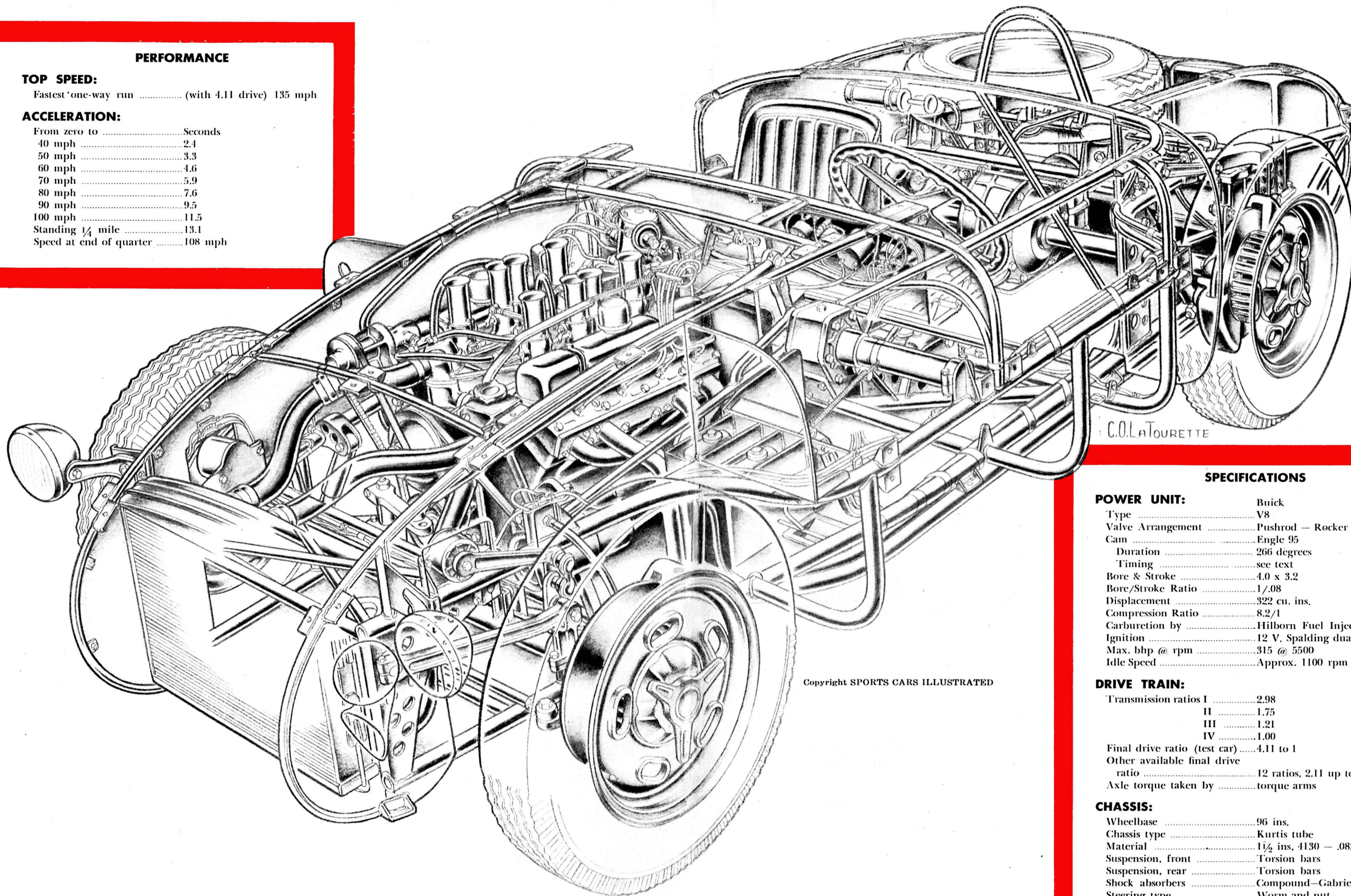
## PERFORMANCE

### TOP SPEED:

Fastest one-way run ..... (with 4.11 drive) 135 mph

### ACCELERATION:

From zero to .....	Seconds
40 mph .....	2.4
50 mph .....	3.3
60 mph .....	4.6
70 mph .....	5.9
80 mph .....	7.6
90 mph .....	9.5
100 mph .....	11.5
Standing 1/4 mile .....	13.1
Speed at end of quarter .....	108 mph



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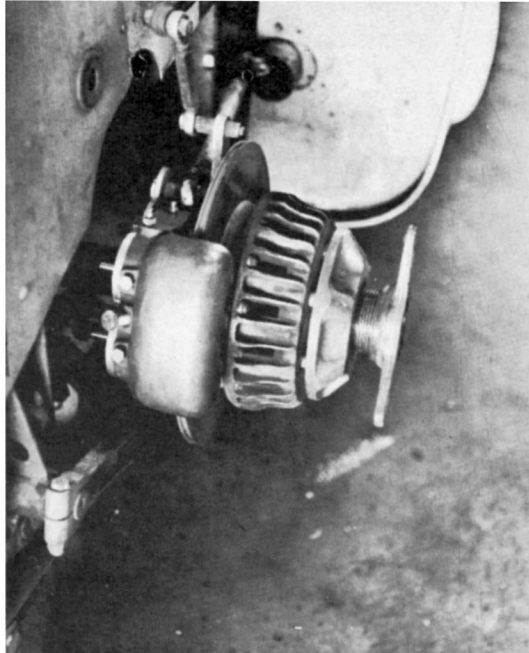
## SPECIFICATIONS

POWER UNIT:	
Type .....	Buick V8
Valve Arrangement .....	Pushrod — Rocker arm
Cam .....	Engle 95
Duration .....	266 degrees
Timing .....	see text
Bore & Stroke .....	4.0 x 3.2
Bore/Stroke Ratio .....	1/.08
Displacement .....	322 cu. ins.
Compression Ratio .....	8.2/1
Carburetion by .....	Hilborn Fuel Injection
Ignition .....	12 V. Spalding dual
Max. bhp @ rpm .....	315 @ 5500
Idle Speed .....	Approx. 1100 rpm

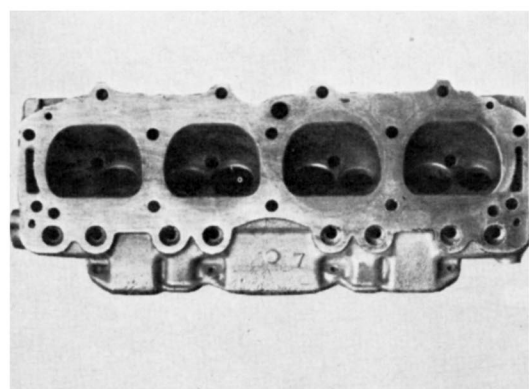
DRIVE TRAIN:	
Transmission ratios I .....	2.98
II .....	1.75
III .....	1.21
IV .....	1.00
Final drive ratio (test car) .....	4.11 to 1
Other available final drive ratio .....	12 ratios, 2.11 up to 6.5
Axle torque taken by .....	torque arms

CHASSIS:	
Wheelbase .....	96 ins.
Chassis type .....	Kurtis tube
Material .....	1 1/2 ins, 4130 — .083 wall
Suspension, front .....	Torsion bars
Suspension, rear .....	Torsion bars
Shock absorbers .....	Compound—Gabriel & Houdaille
Steering type .....	Worm and nut
Steering wheel turns L to L .....	2 1/2
Brake type .....	Halibrand spots
Wheel type .....	Pin-drive Magnesium
Tire size .....	Varies 6.50 to 7.50
Rim width (outside) .....	6.00 K

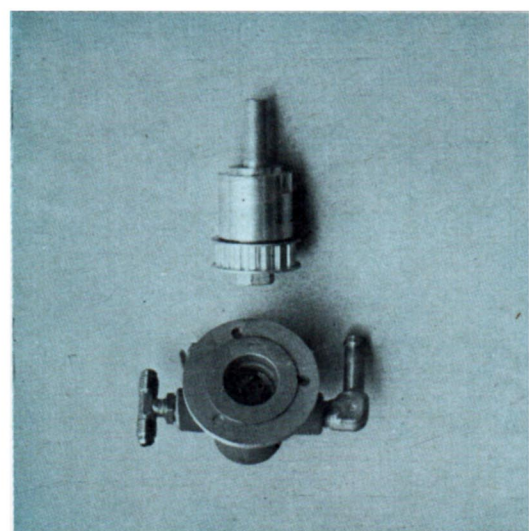
**MURPHY'S BOMB: 0 to 60 in 4.5 seconds**



Halibrand spot brakes on Kurtis-Buick have heavy metal finning to soak up heat built up by the disks.

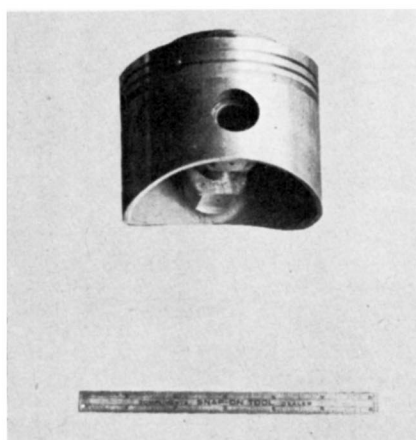


Chamber side of special head fitted to the Murphy car. Note large size of intake valve seats to take new valves.

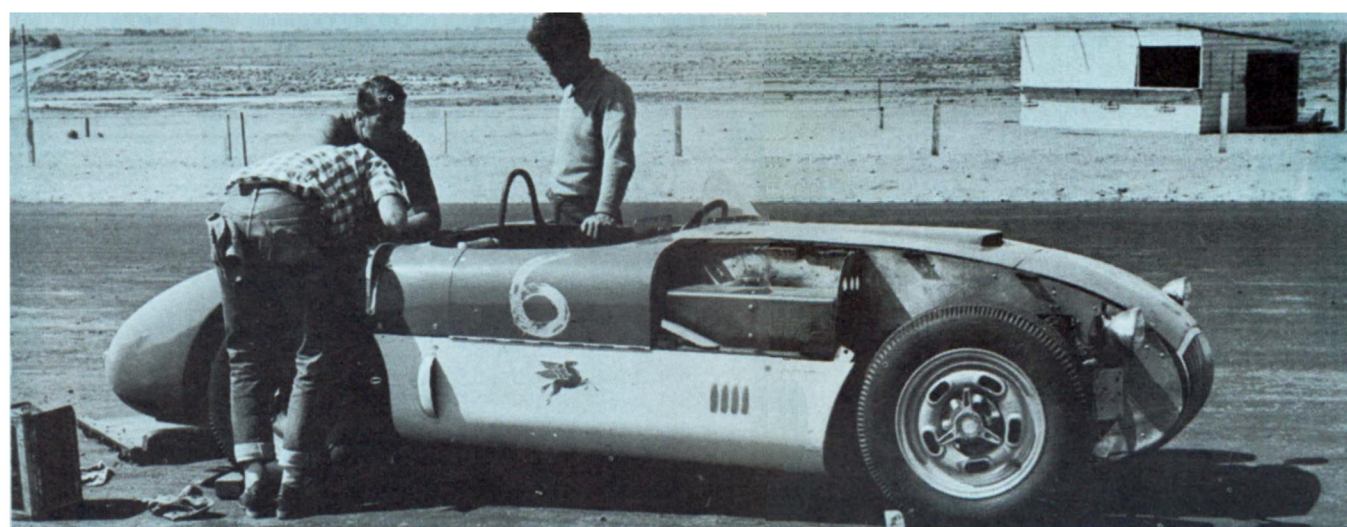


This light weight fuel pump supplies constant fuel flow to fuel block, and thence to injector jets.

Special short racing pistons were made by JE. Upper groove take compression rings, lower takes oil ring.



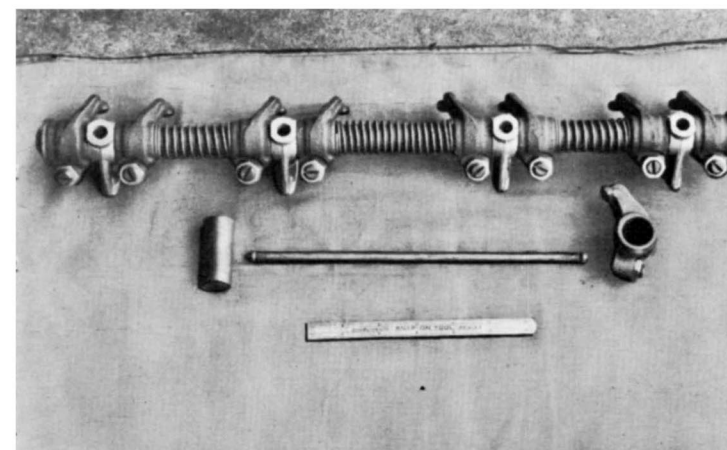
BELOW: The Kurtis Buick gets a final drive gear changed. Car ran a 4.11 throughout test.



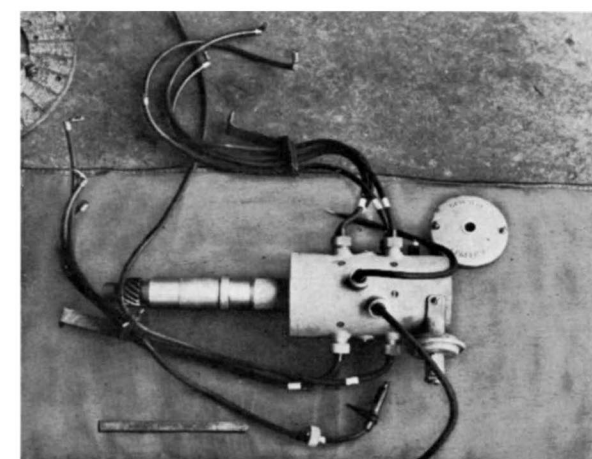
Test weight of the car was 2250 pounds. The fuel injection V-8 Buick engine pulls 315 bhp on a water brake at 5500 rpm and revs freely to 6000 rpm. A 4.11 to 1 final drive gives a top speed in excess of 135 mph. A Jaguar gearbox gives four speeds forward.

The peculiar chuffle-snuffle exhaust of a big, hairy American V-8 that chilled your spine when Bill Pollack went by you in the old Cad-Allard No. 14 (see page 12, this issue) is missing with this Buick engine.

In the acceleration tests, it screamed up and down the rev scale like a two-liter, but here any comparison with a 121 incher ends. Zero to 60 mph times were consistently under five seconds. Once by exercising considerable skill in avoiding wheel spin, Murphy managed an amazing 4.6.



Valve train setup. This special rocker kit with adjustable tappets is used on Kurtis. It's available from Buick dealers.



High tension to plugs is supplied by this Spalding 12 volt setup. It is driven conventionally on the rear of the camshaft, and contributes immensely to the high rpm of mill.

Zero to 100 mph is reached at a screaming 6000 rpm — plus in third in 11.5 seconds and the standing quarter, even with the time lost for the shift into fourth, comes with an elapsed time of 13.1 and a speed of 108 mph.

When you first slip into the cockpit behind the wheel, the ancestry of this car becomes apparent. Foreign sports cars favor the arms more or less straight forward to the wheel position; in the Kurtis-Buick the impression is that you're sitting over the wheel.

Clutch, brake and throttle are positioned normally. Air pressure in the fuel tank from a hand pump is used to prime the injection pump and once primed, the engine fires readily. The low rpm idle with port injection leaves something to be desired as far as smoothness is concerned, but in throttle response, it couldn't be better if it read your mind.

In the time that I spent driving the Kurtis-Buick, it was impossible to criticize the handling. The cornering is incredibly flat; the steering is positive beyond belief. The tremendous amount of hp available at the rear wheels calls for caution in cornering but should be easy to become accustomed to because of the completely predictable temperament of the car.

This handling of the K-B forced me to revise my purely academic opinion that Ettore Bugatti carried the solid front axle to the limits of its development. Willow Springs is far from being a billiard table course and can be considered representative of usual conditions. This makes you wonder just how necessary, complicated, expensive, independent suspension really is. It would be foolish to say that the solid front axle is better than any other form of suspension, but to hold the same opinion about it that I did before driving Murphy's car isn't very sensible either.

Every now and then someone will naively ask what it is like to go fast. After I haul off to tell them, I find there's nothing exciting to say. Speed is relative. Sixty mph down a one-way street the wrong way can seem awfully fast. One hundred and twenty down the straight in a race can actually seem slow. Perhaps I've never ever gone really fast, because I usually spend my time down the straight wondering if all the little gadgets inside the engine are going to keep rotating. Approaching a corner is a somewhat different matter because any fool knows that it's the sudden unplanned stop that puts dents in things and at the corner you have to do something or an immovable object will do it for you. This can be exciting, but nothing compares to the thrill of rapid acceleration, and here the K-B really delivers. In about four seconds, or at 5000 rpm in second, you're traveling 80.6 feet per second and being boosted along in the grip of 1300 pounds thrust. Five seconds later you're traveling approximately 127.5 feet per second and approximately 1270 pounds thrust is still being exerted to get you going even faster. This is when you become consciously aware that you are juggling in delicate balance forces as savagely destructive as TNT. The wind pulls the flesh on your cheeks back taut; the engine howls for your attention so that the next shift will be at just the right instant to maintain this illusion that you are annihilating time and space. Perhaps the head-shrinkers are right — this drag racing should be investigated.

The chassis frame that forms the base for the K-B is fabricated of 4130 steel tubing that has a wall thickness of .083. It is of simple truss form with two longitudinal members on each side with the upper tube stepped out to comply with FIA cockpit width regulations. The lower tube runs straight from front to rear. Most of the cross tubes are of the same section as the main tubes, 1.5 inches. Extreme chassis rigidity, a must with independent suspension, is not called for with solid axles, but this structure impresses you as one that would not easily turn into a tangled ball of twisted tubing in an accident.

(Continued on page 64)



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## Murphy Bomb

(Continued from page 37)

The chrome-moly tubular front axle is carried by forged arms trailing back from torsion bars that angle to the rear across the frame forming a shallow x in front of the axle tube. This particular layout of the torsion bars usually comes in for a well earned double-take. With the torsion bars at this attitude to the axle tube, the arc followed by the axle end of the trailing arm is impossible for the axle to follow. This exerts a bending moment on the torsion bar as well as twisting action. Reasonably enough this would be greatest in full bump and rebound, and, therefore, would have a strong dampening effect in these positions. The torsion arms attach to the top of the axle tube. A wide angle V fabricated of tubing, the ends of which are attached to the lower axle tube at its center, locates the front suspension laterally.

Steering on the K-B is also of the unusual arrangement type. The box itself is located high up near the fire wall with the pitman arm extending upward. A long drag-link runs forward over the engine to a bell crank on a vertical shaft that is attached to the chassis frame ahead of the axle. A "T" arm is fitted to the bottom of this vertical shaft at about axle level to which are attached the tie-rods. This "T" arm effectively takes care of the "lead" necessary when one wheel turns in relation to another by having one tie rod overlap the other, thus increasing or decreasing the effective length of the tie-rod(s) as it moves from side to side.

Rear suspension is also by torsion bars. Here, however, the bars run parallel to the solid rear axle at approximately the axle center line in static load position. A quick-change center section is used with a Ford ring-gear and pinion. The shock absorber set-up is the same pattern as in the front with two Gabriels and two Houdaille's being used. Since a Panhard rod controls through an arc, it imposes a strain on the torque arms.

This is avoided and considerable space is saved by the use of stabilizing linkage that allows only up and down movement of the rear axle.

Most of the body paneling is quickly removable for easy maintenance. Cooling ducts direct air into the driver's side of the cockpit and onto the front and rear brakes.

The brakes are spot type discs. In the foot operated part of the system four 2¼ inch pads to each wheel are actuated by a single master cylinder. The hand brake operates four pads of the same diameter on each of the rear wheels from its own separate master cylinder. It's been pretty common knowledge that brake problems haven't helped the chances of the K-B in winning races. Other than the purely mechanical aspect is the psychological handicap; good reliable brakes are wonderful. Even just reliable brakes are good, but they *have* to be predictable. During a race this business of clamping on the binders and finding that three wheels are out to lunch and one wheel is ferociously trying to make up for the ones that have gone Dixie is what the English call "slightly sobering." After the last heart-breaking session at Bakersfield where the brakes refused to release, Murphy decided on some modifications and feels now that the brake situation will improve.

The Buick engine shows Murphy's attitude toward what he wants to do quite plainly. This 90 degree V-8 has progressed from a bored and stroked hop-up that last year pulled 260 bhp, to a stock displacement engine that leans on the engine dyno to the tune of 315 bhp that are mighty husky horses. This is with a hyper-conservative compression ratio of 8.2 to one. So far the only engine failure has been a connecting rod that came out of the engine looking like a pretzel.

Highest point on the engine is the Spalding 12 volt ignition. Driven conventionally from the stock position on the rear of the camshaft, it has proved dead reliable and must contribute a great deal to this V-8's willingness to rev.

Next comes the most interesting part of this amazing engine, the fuel



Kelly, with Reilly as recorder, charges down back turn at Willow Springs.

injection. You could be arrested for calling what this engine does at low rpm an idle, but Jimmy Valentine couldn't touch the throttle without getting caught. This throttle response is present throughout the entire engine range and contributes a great deal towards making all the horsepower that's available at the rear wheels usable.

The unit is a Hilborn, manufactured by Fuel Injection Engineering of Santa Monica, California. Stu Hilborn, contacted about the further possibilities of constant flow fuel injection for gasoline engines, is confident that the idle characteristics can and will be improved. Apparently, the relatively low port velocity of the air at an idle and the difficulty of supplying fuel at proper pressures are contributory factors.

The special heads differ from stock only in valve size and port shape. The pent-roof combustion chamber carries both intake and exhaust valves on one side of the chamber with the spark plug placed near the center with little room left between it and the intake valves seat. Reilly says these heads are responsible for about 30 bhp increase over the heads previously used.

Other than JE racing pistons, the rest of the engine components are General Motors. A Buick rocker arm, pushrod and follower kit is used and the camshaft is an Engle 95 re-grind. Intake valve opening is at 26 degree BTDC; closing, 60 degrees after bottom center. The exhaust valve opens 64 degrees before bottom center and closes 22 degrees after top. The dry sump oil system utilizes a modified Buick pump for scavenging that drives directly from the stock pump. The oil tank is located in the right fender well and has a capacity of four gallons.

The more time that is spent with this car, the more the conviction grows that this car is the most representative example of an American sports racing car to date.

One look at the horsepower curve prompts admiration for Reilly and the Buick engine. A few minutes driving puts Frank Kurtis in a new light as a chassis designer, but it's significant that enthusiasts identify the car as the Murphy-Buick or Murphy-Kurtis, not as the Kurtis-Buick or Buick-Kurtis.

Eastern race fans will get a chance to see this car in action this summer if all goes well. This should prove interesting to some of the big time equipment owners that we so seldom see here on the West Coast.

When I asked Murphy if he intended to continue indefinitely in sports car racing, I got a quick grin that must have sold a lot of Buicks and a "Sure" that's easy to believe. #

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