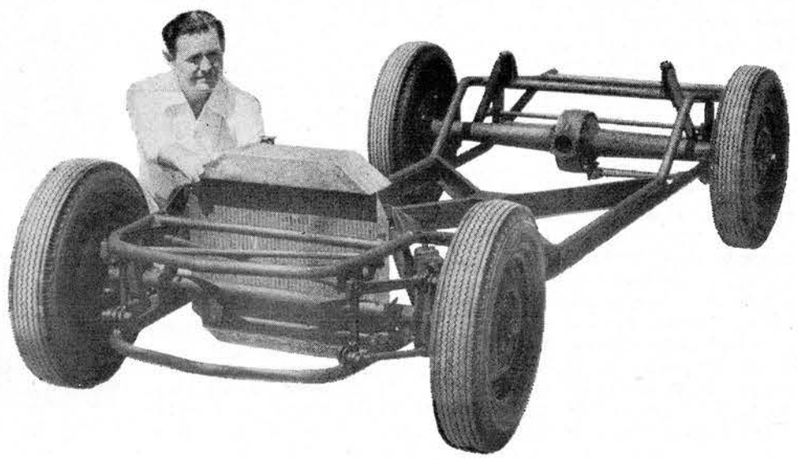
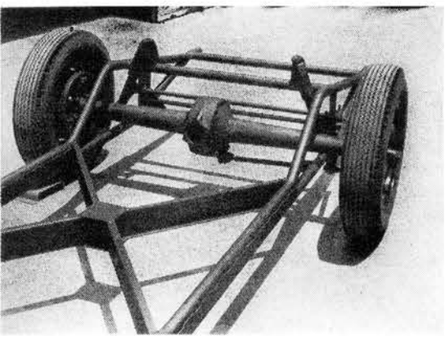
SOLUTION OF SPORTS CAR BUILDERS' PROBLEMS ARE FOUND IN THE NEW . . .

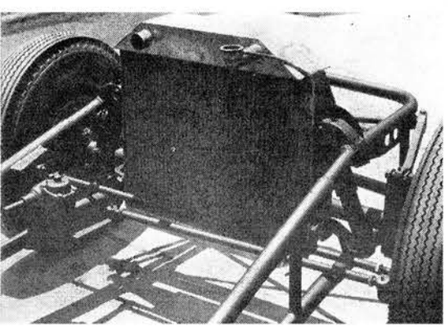


KURTIS 500 KK



PARALLEL torsion bars on rear axle thoroughly proven on Indianapolis cars

STEERING gear assembly is the same as that used on Indianapolis 500B race car



Text and Photos by Bob Canaan

SINCE JULY 1951, when we first began publication of HOP UP Magazine, our offices have been deluged with letters from readers requesting information on home car construction. Each day brings a new load. Each load brings new and more complex questions. Some ask how to build lakesters, others track or sports cars, and still others just good street jobs. No matter what the type of car, the questions are always the same general type:

"What stock frame would you consider best for conversion?"

"I am going to build a tube frame job; what diameter tubing should I use?"

"Which type of springing do you consider the best, cross spring, coil, elliptic, or torsion bar?"

"What is the best type of steering gear for my car?" And so on.

As you can see, there are hundreds of different cars being built that would require special consideration before we could give honest answers. Unfortunately, as yet, no one has written a book on chassis design and construction which would be helpful to the average builder. Few of us have the shop facilities to do the necessary tube bending, machining, welding, casting and so on, that would be required to build a chassis.

Imagine our delight when Frank Kurtis, builder of Indianapolis winners, told us of his plan to build a chassis in kit form. It was to **be of the same** general design as those built for Indianapolis this year, but built on a mass production basis to bring the cost within reason. Here at last, we felt, might be the answer to our readers' dilemma. Here could be a chassis the average guy could afford.

We have followed the design and development of this project with great interest. Frank, who is convinced there are hundreds of hot rod enthusiasts with the mechanical ability to assemble cars from these kits, has tried to give them a chassis in which to install their own pet engine, or transmission, sturdy enough to make a good 200 mph lakester; light enough to make a good track or sports car; simple enough to make either a ready made Fiberglas body (such as those made by Glasspar) or a home made fiberglas or aluminum body easily adaptable.

How well he has succeeded can best be told by the photographs. By examining the photos of the Indianapolis race cars and then the ones of the new Kurtis frame, you can see how closely they follow one another. Naturally, the Indianapolis cars are more elaborate, but basically the two are the same. The most noticeable difference is, of course, the frame side rails. On the race cars the rails are made from seven inch hat sections, which are made into a box section by addition of a .064 aluminum outer cover plate. On the new frame, these box section side rails have been replaced by 2 one and

three-quarter inch tubes tied together by 2 one inch plates running their full length on both sides of the tubes. The reason for using tubing on the new chassis (which is to be known as the 500 KK Model) is to allow the home car builder to bring his body width all the way out to the outside of the wheels as is done on a fully streamlined lakes job. This makes for a much larger cockpit and door opening areas which the deeper frame side rails would tend to limit.

A moment ago we mentioned using the chassis for a 200 mph lakes car. Frank feels this is feasible because this type of suspension has proven most satisfactory on the racing cars at speeds in excess of 170 mph under adverse conditions.

To describe the 500 KK chassis a little more in detail, these are some of the highlights. The complete frame is constructed of inch and three-quarter seamless steel tubing, using a 3 inch channel cross member between the two side rails. All welding is done by the arc welding process. Torsion bar springing is used both front and rear. Rear torsion bars are approximately 41 inches long and run parallel across the rear of the frame just behind the rear axle. Front torsion bars are about 33 inches long and cross one above the other at about 15 degrees. Both ends of the torsion bars on the front and the rear have a spline which fits into the torsion arm and adjustment clamps. By removing either the arm or the clamp and rotating it one or more notches, a wide choice of ride adjustments is possible. The bars themselves are not securely fastened to the frame, but are carried in bronze oilite bushings. Aircraft type Hieme bearings connect the torsion bar arms to the front and rear axle towers, and insure a sturdy, trouble-free connection. The front axle is constructed of 2 inch O.D. steel tubing with generous king pin retaining spools welded into each end. Special steel castings which we call 'towers' reach up to the torsion bar arm above and down to the radius rod tubes below the axle in the manner shown in the photographs. The front axle is held in correction position by means of a sway bar tube which attaches to the frame. This front-end setup is the same as used on the Indianapolis cars. Tubular shock absorbers are used both front and rear. On the race cars, additional vane type shocks were also used. Steering is by means of a Ford gear box with a pitman arm 8 inches in length, which is again the same setup as used on the race cars. Ford hydraulic brakes are used as is a Ford rear-end. Mr. Kurtis tells us the rear-end is supplied minus the innards as he believes most car builders will prefer to run the gear ratio they favor. Ford 16 inch wheels are supplied, however, no tires or tubes are included. Here again most builders would rather use tires best suited to the type of car they intend building. A special custom oversize radiator with a 2 inch core is fitted and outlets can be altered to suit the engine you intend using.

The chassis is 40 inches wide by 158 inches long, having a tread of 56 inches front and 58 inches rear. Wheel base is standard at 100 inches. This wheel base was chosen because of its use by so many Fiberglas body manufacturers, and because it makes a good wheel base to tread ratio. Mr. Kurtis did not mention this, but we think it would not be too difficult for the home car builder to remove a section from each frame side tube and reweld the tubes together again should he for some reason or another desire a shorter wheelbase on his chassis.

One other thing we should mention before we close. It will no doubt be of interest to the man of limited financial means to know that you can buy this chassis piecemeal. That is, you can buy the frame as a complete unit, then when

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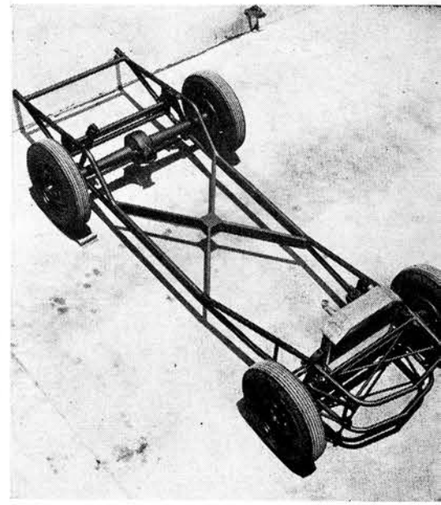
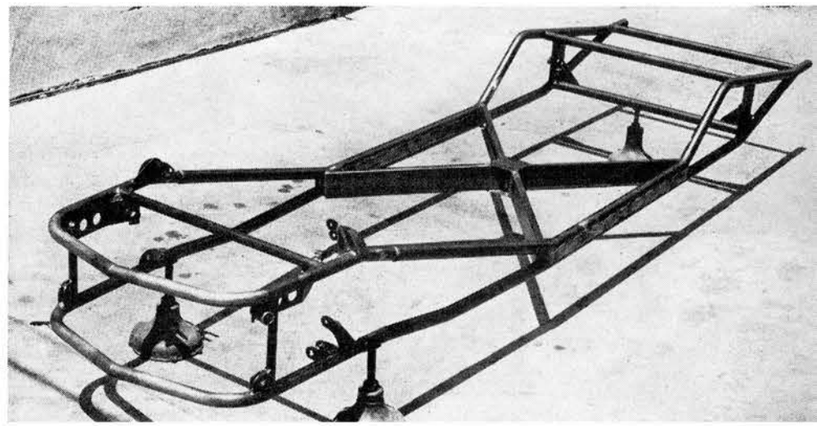
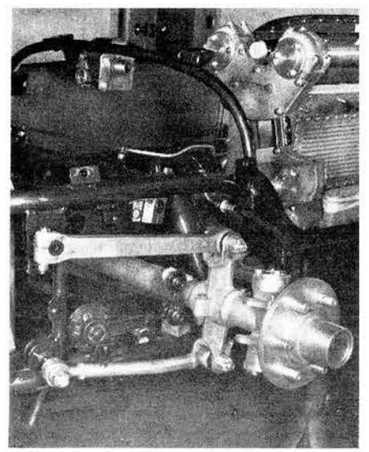


BIRDSEYE view of the frame and running gear after assembly is completed

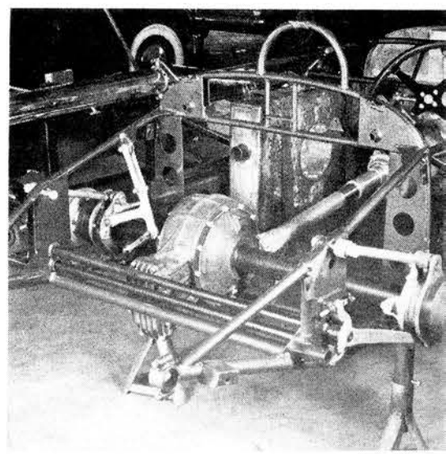


BARE frame as shown here can be purchased as a separate unit for only $399

INDIANAPOLIS car and 500KK have same front axle and torsion bar setup



REAR section shows transverse torsion bars and sway bar mounted to chassis



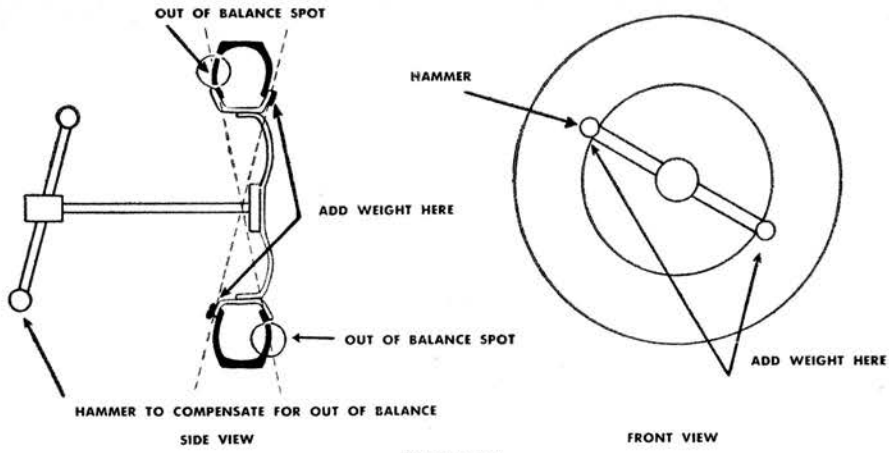


FIGURE IV

FIGURE IV shows how hammer on wheel balancer indicates where the weight is to be applied for a correction of the dynamic balance irregularities

With the advent of the low pressure tire and the life-guard tube the life of the tire balancer was made even more complicated. The large masses of rubber at a great distance from the center of the wheel on the low pressure tire make them very susceptible to irregularities. Recaps and re-treads also are a problem. Many times the cap is put on crooked or heavier in places. These faults are not only bad for balance but can also cause run out. When the life guard tubes were introduced it was found that they were almost impossible to balance. This was because of the great mass of the tube inside the inner tube. A mass of this quantity free to move about inside the tire is very hard to compensate for. Lately the lifeguard tubes have been coming out with webbing inside of them to hold the tube in place. This seems to have helped the problem to some extent for now a fairly good job of balance can be obtained with a low pressure tire equipped with a life guard tube.

You have seen, we hope, through these articles what wheel alignment, shock absorbers and wheel balance can mean to you. Mileage, both gas and tire, safety, and a good ride can all be had by taking care of your car. The money that you may spend for these things which you can not see is certainly not lost. It will be repaid to you many fold. By having a competent man do the work with good equipment I am sure that you will class it as money well spent.

KURTIS 500 KK

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you can afford more, you can buy the complete front axle setup, minus the Ford front spindles, brake assemblies, drums, etc. The same with the rear end. We bring this out because many readers have a source of used parts of the Ford variety or can buy them at the nearest junk yard.

Well, that's it. Just how well this particular setup will fit into the car you plan to build is up to you. We at HOP UP Magazine, although it is not our policy to endorse any particular manufacturer's product, think Kurtis has a good idea. It may well help many would-be home car builders over the rough spot of not having the knowledge or the equipment to build a good chassis. Let's hear what you think of this plan of America's No. 1 chassis designer and builder.