

## BUILD YOUR OWN CLASS "H" SPORTS CAR

For the Sports Car enthusiast with a limited budget and a "desire to build his own", no car offers so much appeal as a Class "H" Sports or Racing Car built of Crosley components. This is an increasingly popular class, because of the low initial cost, low up-keep and performance equal to, or above, the most expensive European cars in this class.

These cars are built around the marvelous Crosley engine which has a single overhead camshaft (much like the English Climax engine) a 2-1/2 bore and a stroke of 2-1/4", providing a stock displacement of 724 cc. which permits "clean up boring" in excess of .030" without exceeding the F. I. A. 750 cc. Class "H" limits. In stock form with 7.8:1 compression ratio, it develops 26.5 brake horsepower at 5400 R. P. M. with reasonable modification or hop-up, it can develop between 45 and 55 horsepower and a useful R. P. M. range in excess of 8500 R. P. M. The complete engine weighs only 152 lbs. with the later model starter and generator. By replacing these larger units with the earlier small starter and generator, the total weight can be brought down to 139 lbs.

Other Crosley components commonly used are: running gear, consisting of transmission, drive shaft, rear axle, front axle, brakes (other than early model mechanical), springs (modified), radiator, and steering assembly.

### SUGGESTED PROCEDURE

The cheapest and easiest way to get started is to buy a used Crosley. The body model is unimportant as the entire body will be discarded since it is entirely too heavy and awkward. Unless you want the car for street use (non-competition), do not buy the car with the mechanical drum type brakes as S. C. C. A. racing rules clearly state brakes must be hydraulic. Crosley cars were made with two types of hydraulic brakes:

1. Spot discs made by Goodyear-Hawley. These are extremely light and while there is quite a bit of controversy about their use, the writer and many others have found them to be very satisfactory in competition.
2. The later model used 9" drum type hydraulic brakes which are excellent and have only one disadvantage -- weight.

Cars in running shape with hydraulic brakes are generally available in the price range of \$75.00 to \$125.00. Be sure that the car you select has a cast iron block as some of the earlier Crosleys used a block which was fabricated from steel stampings which is all right in theory, but evidently Crosley's manufacturing techniques were inadequate, as a large percentage of these engines develop leaks.

The first thing to do is to strip off the body and discard it, which will leave the chassis and running gear in all of its "Naked Glory" - - a sight very inspiring to any enthusiastic car builder. Unfortunately the Crosley chassis is too high and too weak and flexible for a good sports or competition machine. However, it has been and can be used if its limitations are understood. If you must use it, the least you must do is to weld or bolt an additional cross member to the very rear of the chassis. This can be done by welding 1/8" steel plates to the end of a piece of 2" steel tubing (approximately 29" long) which in turn can be bolted into the bumper support holes by properly drilling holes in the 1/8" steel plates mentioned above (see sketch). Also on some models the flexibility of the chassis caused the pedal pivot rod to pull out of its mount on the transmission side - - to eliminate this drill and tap the end of the rod so that it can be fastened to the transmission bracket with a bolt and washer.

The stock wheelbase of most Crosleys is 78" and they have a wheel track or tread of 40". The wheelbase is quite satisfactory though many change it to 80 - 82". The tread however is too narrow and should be increased to about 44 - 46". On the rear this is done by machining aluminum spacers about 2" thick which are drilled with four holes on the bolt-circle diameter and extra long wheel bolts then sandwich it between the wheel and brake drum. A much easier way is to remove the rivets holding the hub cap spring clips and simply reverse the wheels. The only thing that is wrong with this is that you end up with the tire valves on the inside of the wheel. Another way is to cut off the rivets holding the wheel to the rims, turn the rims around and re-rivet. Front tread is best increased by cutting the axle in the middle and having a good shop weld in an enforced center section of 4 - 6".

On the subject of track and wheels, while Crosley wheels are very satisfactory, some prefer larger wheels and tires in order to give greater effective rear end gear ratio. To this end Nash-Metro 13" wheels can be used which will give you a selection of tire sizes 5.20, 5.60 and 6.00. The bolt hole diameters of these wheels are the same as Crosley, but the bolt holes themselves must be enlarged. Also, since there is a slight difference in the vertical plane of the bolt hole face and the center of the rim, spacers must be used on the front wheels in order to preserve the "king pin angle" to "tire contact" relationship, in the rear it is not important though if you wish, rear spacers can be made slightly wider.

Should you desire to make a new chassis or purchase one, we have shown two excellent designs which you can either construct or have constructed for you (the Jabro Jr. Multi-Tube one can be purchased in finished form).

The front end of all Crosleys are fitted with two parallel semi-elliptic springs which can be used by either re-arching (because of the lighter weight of our special) or by removing one or more leaves, starting with the shortest to soften the suspension. On most Crosleys, the rear springs are 1/4 elliptic - if you want the chassis to be real low, reverse these rear springs to leading type

(see drawings) these also must be lightened or re-arched. If you have a Hot Shot model, the rear springs are coils, these are excellent but must be used with a Panard Rod (anti-sway bar). It must be parallel to the rear axle, pivoted to the frame on the left side, and pivoted to the rear axle housing near the right rear wheel - - try to keep it somewhat level with the rear axle. The Panard Rod is also a good idea on the  $\frac{1}{4}$  elliptic type springs. Be careful and don't get your suspension too soft - remember that this is a Sports Car.

Steering can be left stock as the steering ratio on a Crosley is fairly fast for a car of this short wheelbase. Obviously the steering angle will have to be reduced (steering wheel lowered to conform to your body outline in your new lower sitting position), and if necessary shorten shaft.

If your engine is in good shape and you intend the car for street use, you can leave it "as is". If you wish to modify it some, the first step would be to change the intake manifold and carburetor set-up. Do that as recommended by Braje (see list of suppliers). From there on, up to all out competition racing, it is up to you. Everything can and has been used, from one to two carburetors and from Ford V-8 60 carburetors to Amals, S.U. and Webers as well as outboard motor carburetors. Obviously there is no agreement on what is the best carburetor system for a competition car, and this is one of the many things that make the sport interesting as you have the right to try to prove your own theories.

Generally on competition cars a fabricated tubular intake and exhaust header is used. The intake and exhaust ports in the block can be cleaned up and are sometimes enlarged. This enlargement is a matter of personal choice and again a point of no agreement as to its relative value. Valves should be left stock, though it is important that you use the late model heavy springs (available from Service Motors, Thermo King or Braje) together with Thompson Roto-Caps used on all springs. Camshaft can be either stock or special from any of the many excellent cam grinders - - take your pick.

Stock connecting rods are usually used, though excellent alloy (Italian) rods can be obtained from Antonio Pompeo. Bearings, bushings, piston rings and pins can be obtained from your automotive supplier as well as the companies listed on our list of suppliers. Pistons can be stock or if you intend to run in competition should be special with a compression ratio of 9.5:1 to 10:1. Center main bearings 2, 3, and 4 should be reinforced with steel channels (can be done by Braje). If you are out for serious competition work, I suggest that you get a cast steel crank shaft from Thermo King or a forged steel shaft (these are difficult to locate). Forged steel Italian crank shafts can be obtained from Antonio Pompeo. To my knowledge these come only in stroked 2 and  $4\frac{1}{2}$  mm. If you compete under S.C.C.A. you can not use the  $4\frac{1}{2}$ mm. You can use the 2 mm. if you use original stock bore of  $2\frac{1}{2}$ . The 2 mm. stroked shaft with standard Crosley pistons will give you a compression ratio of approximately 10 to 1.

The use of cast aluminum four quart oil pan is recommended if the car is to be used in competition. In addition to the greater cooling effect, these cast oil pans help strengthen the crank case assembly. These can be obtained in the American version from Braje or the Italian version from Pompeo.

A Crosley distributor, in good condition, is very satisfactory; however, if you wish you can get a special distributor from Mallory.

Many very successful cars use the stock Crosley transmission which is unquestionably the lightest transmission ever made. However, under no conditions of competition where your R. P. M.'s exceed 6,000 should you ever try to use the Crosley clutch. Check with your automotive parts house, and he can help you locate a "cage" type clutch that can be used. (I believe there is one made for one of the small tractors). If you desire to change to one of the 4 speed transmissions like a MG, Morris, Fiat or something else, you will generally want to use the clutch for that respective transmission. Adaptors for some of these transmissions are available through Tony Pompeo.

The original Crosley radiator is very satisfactory and may be used "as is" (vertical), if it can be used within your body contour. For street use, you should use the fan, but for competition using the fan is not necessary. The radiator may be placed sideways and used as a "cross-flow" radiator by blocking off the filler cap and using a small separate header tank for filling and expansion. This "cross-flow" is very satisfactory.

The preceding outline is of necessity not a step by step detail, it being assumed that anyone undertaking to build a car will have a certain amount of ingenuity and ability to solve some of the problems on the spot. It is the intention of these instructions to give you only the main outline based on experience with Class "H" Crosley cars, thus saving you many of the pitfalls you might otherwise encounter.

Body design and construction is usually largely a matter of personal taste and choice. Remember that if you are building a car for competition, KEEP IT LIGHT. The drawing illustrates a very successful, attractive, light and accessible body which writer can furnish either complete or in unit form. The center section, if desired, can be constructed by almost anyone using flush rivets and sheet aluminum. This construction is possible by the average builder since there are no compound curves in this area.

There is a great satisfaction in owning a car which you have built yourself. By using a little thought and ingenuity, almost anyone handy with tools can build a very attractive small sports car from Crosley and Jabro 750 components.

Write for information on the new Jabro 750 Mark 11 competition model!!!!!!