FLOATERS FOR FAST CARS

The rigors of racing strain stock components and usually one of the first parts to need attention is the rear axle. Full-floating axles are the solution to the problem.

Text and photos by RAY BROCK

A few years ago, a national stock car champion told us that the only stock parts on the chassis of his car were the master cylinder and the steering gear. This was not an admission that he was a cheater but it was to illustrate the fact that stock car chassis' must be modified considerably to withstand the severe abuse they are subjected to on race tracks. All organizations that sanction stock car races permit and even demand that various components be beefed up to many times their stock strength.

This need for heavy-duty pieces related to stock car racing has been responsible for many shops to specialize in designing and building heavy-duty components for several types of cars. One such shop is Holman & Moody of Charlotte, North Carolina. We stopped in to see the H & M operation last winter on the way home from Daytona's Speedweeks and were amazed at the number of items being made just for racing.

One item that caught our eye was a full-floating rear axle housing for late model cars. For those of you who do not fully understand just what a full-floating ("floater" in racing jargon) axle is, here is a simple explanation. All of our conventional U.S. automobiles use a steel axle housing with the outboard end holding a bearing which supports the axle shaft. This axle, in turn, must support the weight of the car at that particular point. This is a semi-floating axle. A full-floating axle carries only the driving force to the wheel while the weight of the car is supported by bearings on the housing. The obvious advantage of a floater is the fact that the axle shaft only has to drive the wheel. Shock loads of bumps and chuck holes are not absorbed by the axle shaft; the sturdy housing takes the punishment.

An added advantage to a racing type floater are the much larger bearings which can be used. Stock rear axle bearings are designed for cruising down the highway and generally fail early when subjected to the speeds, side thrust and shock

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Floater stub and hub used with double-row sealed ball bearings are shown in various stages of manufacture. Stub, top, is machined from chrome moly steel, hub from steel casting. This unit was designed to use all stock brake components.

FLOATERS FOR FAST CARS continued

Floater stub welds to the stock axle housing. New unit for drag machines will bolt to the existing flange and require machining only on axle flange.

From left: hub, sealed double-row ball bearings, spacer and assembled hub. The modified back side of the axle flange holds the spacer and bearing in place.

loads encountered on a race track. Fully-floating axles have large double-row bearings which are better suited for the extremes of racing.

Although the floaters we saw at H & M were designed for stock car racing, there are some definite advantages that should make them appealing to gas classes, modifieds and even dragsters at the strips throughout the country. First of all, the floaters have a true safety hub. With or without axle, the wheel supports the car. Secondly, it is a simple and quick operation to pull both axles from the housing so that the car can be towed on the ground without ring and pinion and driveline turning. Towing a heavy car on the ground with a good tow bar is much safer than using a trailer. Thirdly, there is less rolling friction with the larger float bearings than with standard stock car bearings.

When preparing these units for stock cars, H & M cut off the stock backing plate flange and bearing bore, then replace it with a special floater stub which is welded to the axle housing. At this point, note that the rear wheel tred could also be narrowed if this was for a special drag machine. The stub is machined from chrome moly steel and one model is made to accept the stock backing plate. Another model requires reworking the backing plate. The stub has an inner bore slightly larger than the axle shaft and the outer bore is machined to accept the bearings and seals. The outer end of the stub is threaded to take a large spanner nut, and notched for a lock ring.

The floater hub is made from cast steel and machined on the inner bore to accept bearings and seals. The outer end of the hub has a flange and is bored to match the bolt pattern of the axle that is to be used. Long studs are pressed into this hub and when in the car extend through the axle flange, the brake drum and the wheel.

Stock heavy-duty rear axles of the particular model car being fitted are machined to work with the floater hub. First, studs are pressed out, the stock bearing and retainer plate are removed, then the shoulder against which the stock bearing seats is trimmed off. The inner face of the axle is cut down to a flat surface so that it will draw up flat against the hub. Next, the stud holes are reamed slightly larger so that they will slip over the longer studs in the floater hub. When this axle is in place, the machined surfaces of the hub and the back side of the axle flange mate to prevent grease from leaking inside the brake drum.

You will notice that there are actually two different types of bearings used in the hubs in the pictures on these pages. One unit uses a sealed double-row ball bearing while the other uses two individual tapered roller bearings. The double-row ball bearing was originally used and worked out perfectly well at such places as the Daytona Speedway and Atlanta Speedway.
For use with heavy-duty floater assembly, housing must be cut off, chamfered for weld bead and then bored to a diameter that allows press fit for stub. At right, axles are shown in three stages: stock, stock minus bearing and studs, reworked to fit floater hub. Back side of flange is precision ground to seal lubricant.

but H & M later found that by using the tapered rollers with a larger inner diameter, they could increase the wall thickness on the floater stub and increase strength. While the first hub can be used with stock brake backing plates, the larger hub requires that the plate be reworked. Although the latter unit is more expensive due to extra machining operations, it is a much stronger unit and rather than make two separate models, all future units for race tracks will be of the heavier variety.

The original unit which uses the sealed double-row ball bearings has not been discarded though, it is being re-designed to work as a bolt-on item for drag strip cars. Whereas the heavy-duty track unit requires the car owner to ship a housing and two axles to H & M for modifications, the bolt-on lighter unit will be exactly as the name implies. One exception is that the back side of the axle flanges will have to be machined to match the floater hub. Prices are not firm yet on the bolt-on unit but they should be approximately $150, about half that required for reworking a housing for track use. This is not a cheap unit in price or workmanship but when installed, should be a valuable addition to any performance automobile.