

High-performance rocker arms have been in use on street and racing engines for many a moon (according to the Lone Ranger's faithful pal), but unlike the products of yesteryear, the rocker arms of today have a lot more responsibility. Whereas early model mills revved in the neighborhood of 3500 rpm, today's powerplants are cranking 7500-plus. With this higher speed, we find that loading between rocker arms and valve ends has also increased. This means more friction, heat, and wear, and a demand for better lubrication.

When one thinks about the rocker arm ratios involved with overhead valve engines, the higher spring pressures, crazy pushrod angles, and super-high-lift cams, it's not hard to realize that those rockers are virtually being jacked up off the heads. Large screw-in rocker studs or heavy-duty stands will take up some of this increased loading, but much of it is imparted to the rockers themselves. This is why

ably go into billet or forged aluminum with all the trick features thrown in. If it's the mass market—the tens of thousands of guys seeking something better than stock—then he will find ways to cut corners and still come up with a better-than-average product that will give you what you want.

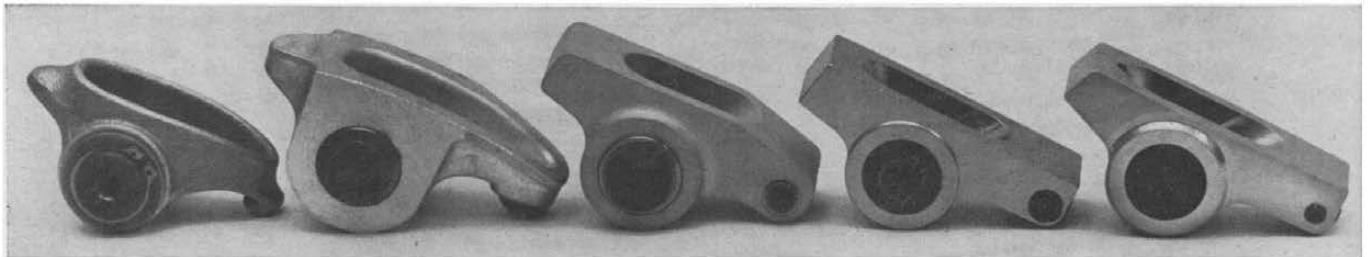
Cast ductile iron is used by both Gotha and Thomas Automotive Products in a number of their rocker arms, probably because they feel that, in addition to being inexpensive, this material has excellent bearing qualities and strength, and can be locally hardened to provide wear resistance. Available with adjustment screws, they will work with solid or hydraulic lifters, and come in standard or "high-lift" ratios. These units are suggested for the fellow with a good street engine that is occasionally used on the drag strip.

Gotha also produces a line of forged steel rocker arms for most engines. This rocker was developed to provide

either steel-backed bronze bushings with hard-chrome-plated shafts that are case-hardened and centerless-ground, or needle-bearing-fitted shafts.

At the other end of the rocker spectrum we find manufacturers using lightweight alloys, along with roller tips for actuating the valves. A gent by the name of Harland Sharp, of Custom Speed Parts Manufacturing in Ohio, claims to be the first to offer billet aluminum rocker arms for racing engines, along with other advanced changes. Harland introduced his first set at the beginning of 1961, using solid bar stock for constant density and tensile strength. These initial units featured steel pads for the valve stems to ride on and inserts for the pushrod ends. As wilder cams came into being, valve guides took a beating, due to the higher lift ratios and prolonged timing. In '64, Sharp switched to a 1/4-inch-wide roller tip, 3/8-inch in diameter, and roller-bearing-equipped trunnion shafts. He later changed to a

ROCKER ARM ROUNDUP



custom replacement rocker arms are generally stronger than those offered by the factories. In addition to possessing superior strength, most custom rockers are lighter in weight and feature needle-bearing-equipped trunnions. Some have roller tips to reduce friction and wear, and a few are even adjustable to make valve adjusting simpler than ever. There are quite a few rockers on the market, so let's take a look at some of them.

Of the rocker arms illustrated here, you will note that some are cast of aluminum or iron, one is of forged steel, others are of billet or forged aluminum, and one is cast magnesium. There are many reasons why manufacturers might select any of these materials and methods, so we'll try to cover some of these also. Note that some feature roller tips, while others do not; a number use needle-bearing trunnions, some do not, and so on.

Initially, one must consider the market a manufacturer is after. If he's after the serious racer, or the guy who just wants the best (there are more racers, believe us), then he will prob-

If you're building a "hottie" for street or strip, maybe those old rockers will work—and maybe they won't. Here's the straight dope on valve flippers

Text and photos by Bud Lang

a "more reliable, high-strength, super-stiff rocker arm," one that would meet the needs of the serious racer. They don't use light alloys because they feel that these materials "lack the stiffness inherent in steel and require hardened inserts which increase the manufacturing costs and reduce reliability." They likewise do not use roller tips, claiming that size limitations in passenger car engines dictate a much-too-small roller which tends to skid rather than roll. Gotha profile-grinds the rocker noses to actuate the valves and, depending on the application, utilizes

3/8-inch-wide roller to prevent "valve overriding" caused by long pushrods and higher lifts. Sharp hardens the roller tips, trunnions, and bearing cages on all rockers to eliminate wear and cracking.

Another outfit manufacturing aluminum alloy rocker arms of billet material is Crane Engineering Company. Designed for racing engines, though they'll work as well in normal use, these rockers are beneficial in many ways, as are most other custom rockers. They increase valve guide life, due to their large-diameter roller tips of .478-inch and .375-inch width; allow an increase in rpm through reduced oscillating weight; reduce valve train friction through a needle-bearing fulcrum; give more accurate and permanent valve lash adjustment; and furnish more accurate, precise valve timing and actuation due to rigidity and design, according to Harvey Crane. With respect to buttons versus roller ends, Crane's contention is that buttons cause friction, resulting in premature valve guide wear. It seems logical that the larger the roller diameter, the greater the chance that

the roller will "roll." But even if it slips a little, this action would appear better than drag with regard to cutting friction. It all goes back to what you're after and can afford to pay for. All components in Crane rockers are heat-treated to suitable specifications.

Mickey Thompson Equipment Company produces forged aluminum rocker arms with two different roller tips and a button tip. The latter type is offered in answer to the demand for a good aluminum rocker arm at a reasonable price. For a few bucks more, the guy can get them with roller tips. Speaking of rollers, their standard unit is .200-inch wide, .550-inch in diameter. The M/T heavy-duty roller has a width of .380-inch and a diameter of .600-inch. In addition to benefits such as strength and increased rpm availability, M/T also lists a reduction in friction. All components are of selected materials and properly heat-treated. Like most other manufacturers, they offer special steel adjustable nuts with set screws

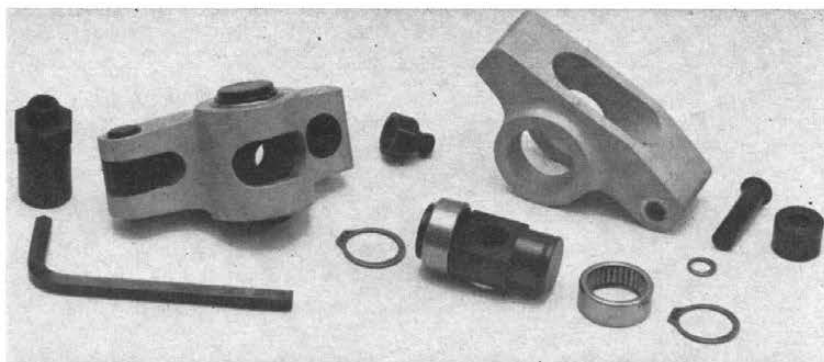
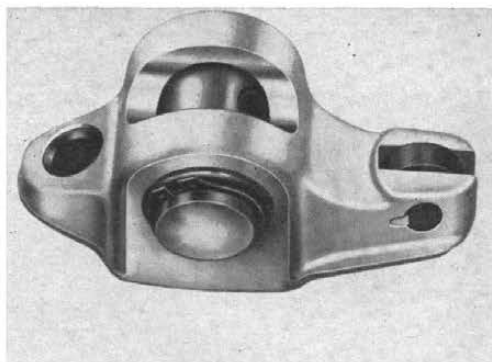
designed for locking purposes.

Another firm engaged in manufacturing custom billet aluminum rocker arms is Iskenderian, the people who brought fame to both T-shirts and racing cams. They use extruded aluminum bar stock and, like others, selected an alloy that would give both strength and ductility. According to Ed: "With today's high valve spring pressures and high-lift, long-duration cam profiles, it is necessary to go to needle-bearing-equipped rockers in order to eliminate the galling that would occur with a plain shaft." Because the greatest load on a rocker arm is concentrated in the rocker body about the trunnion shaft and along the shaft out to the roller tip, Isky has designed their rocker arms with an arched rib. This is to eliminate deflection and repetitive valve lash adjustment. They use a 3/8-inch-wide, .550-inch-diameter roller, with all parts hardened. Isky also incorporates a deeper pushrod button to help prevent loss of the pushrod. An-

other step they take to ensure dependability is that all steel surfaces are centerless-ground to eliminate any possibility of fracture planes developing in the aluminum parts after the parts are pressed together.

In addition to cast iron rockers, Thomas also produces a line of cast aluminum and magnesium rocker arms for a variety of engines. They are available with standard trunnion shafts or with needle-bearing-equipped shafts, again with contoured valve stem buttons or 3/8-inch-wide, .600-inch-diameter roller tip. Like the other lightweight rockers, theirs cut down on the overall valve train weight.

When you analyze the selection of rocker arms presented here, it's easy to see that there are components designed to fit every pocketbook and, like camshafts, every application. You must balance these two factors—cost versus usefulness—in the cold light of logic. Then get with the rocker crowd. ■ ■



At upper left is one of Mickey Thompson's forged aluminum roller tip rockers. He also offers a button-tip model. Both M/T and Isky units (upper right) feature arched ribs along the arm for additional strength. Like most, Isky's feature caged needle bearings on the trunnion shaft. Rocker hold-down nuts come with socket head screws that tighten down against the studs, preventing nut from backing off. Gotha produces three types: a forged steel unit fitted with needle-bearing trunnion, a forged rocker with steel-backed bronze bushing and adjustment screw, and a cast iron rocker with adjustment screw. At lower left is a pair of Crane billet rocker arms. Of aluminum stock, they come with needle trunnions and roller tips. Harland Sharp offers a large line of aluminum billet rockers, supplies to camshaft manufacturers.

