LOW-BUDGET SCREAMER

PART III

If you would like to know how a car and engine are prepped for the salt, follow HRM's Project Olds as we wrap it up and head for Bonneville

Text and photos by Lee Kelley

In order to help celebrate the 20th anniversary of the Bonneville National Speed Trials, the staff of *Hot Rod* Magazine decided to enter the Project Olds in competition at the salt flats. Now that's a simple enough decision to make, but preparing the car for competition is something else again. The participants at Bonneville only get to race on the salt one week out of a year, so the rest of the year is spent getting their cars ready, and the machinery that makes it is pretty tough. Our work was cut out for us if we were to have any chance at all in class competition. Incidentally, the Olds falls in the middle of C/Production, where the record is 161.026 mph.

Our first step in preparing the car was to bring the chassis and related components up to Southern California Timing Association specifications for the high speed trials. Since we had earlier installed a 360-degree driveshaft loop, we were okay in that department, and our hood pins met the hood safety hold-down requirement, so we were off on the right track. Our major problem was the addition of an approved rollbar, but Autopower Corporation, San Diego, California, came to the rescue. Owner Trigg Stewart and shop foreman Roger Sanders were very cooperative in installing a rollbar assembly (.190-inch wall) which met SCTA specs (and, more important, it met our own; because if something goes wrong in a car traveling 160 mph, it's nice to know that the rollbar isn't made out of spaghetti). Roger also added an additional bar between the two main uprights to serve as a seat brace in case the seat decided to break over backward during an accident.

With the rollbar secured, we now had a place to mount one of our two fire extinguishers (you can't be too careful). We positioned the extinguisher on the additional crosspiece behind the front seat and then used copper tubing to pipe the extinguisher into the engine compartment. In case of engine fire, just reach behind the seat and press the trigger. Clever! It's a Bonneville requirement. Our second extinguisher was mounted within easy reach on the front floorboards.

Jim Deist of Deist Drag Chutes helped us set up our seat belt and shoulder harness arrangements, and we certainly appreciated his cooperation. Stock automotive seat belts and shoulder harness will not pass SCTA inspection, so Jim showed us how to mount our belts (available through him and very heavy-duty) and how to secure them properly. He also supplied us with a parachute (just a safety precaution, but at 160 we want every edge).

After talking to several veterans of the salt (Ray Brock and Ak Miller included), we decided to leave the sus-

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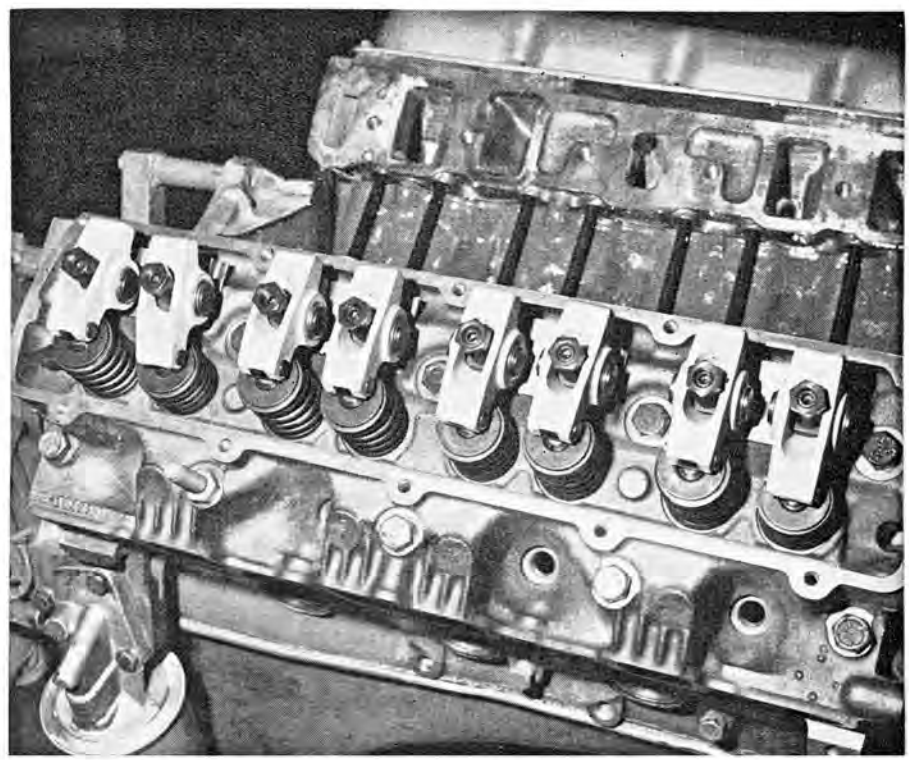

Project Oldsmobile is ready for Bonneville, but is the salt ready for HRM's Olds? That's the question that faces us as we head for the Speed Trials to try for a new C/Production class record. Our goal is to run 175 or better. Modifications to our "hot" 350 engine include this sanitary roller bearing rocker arm setup on the stock Olds heads. Iskenderian extruded aluminum rockers were our choice.

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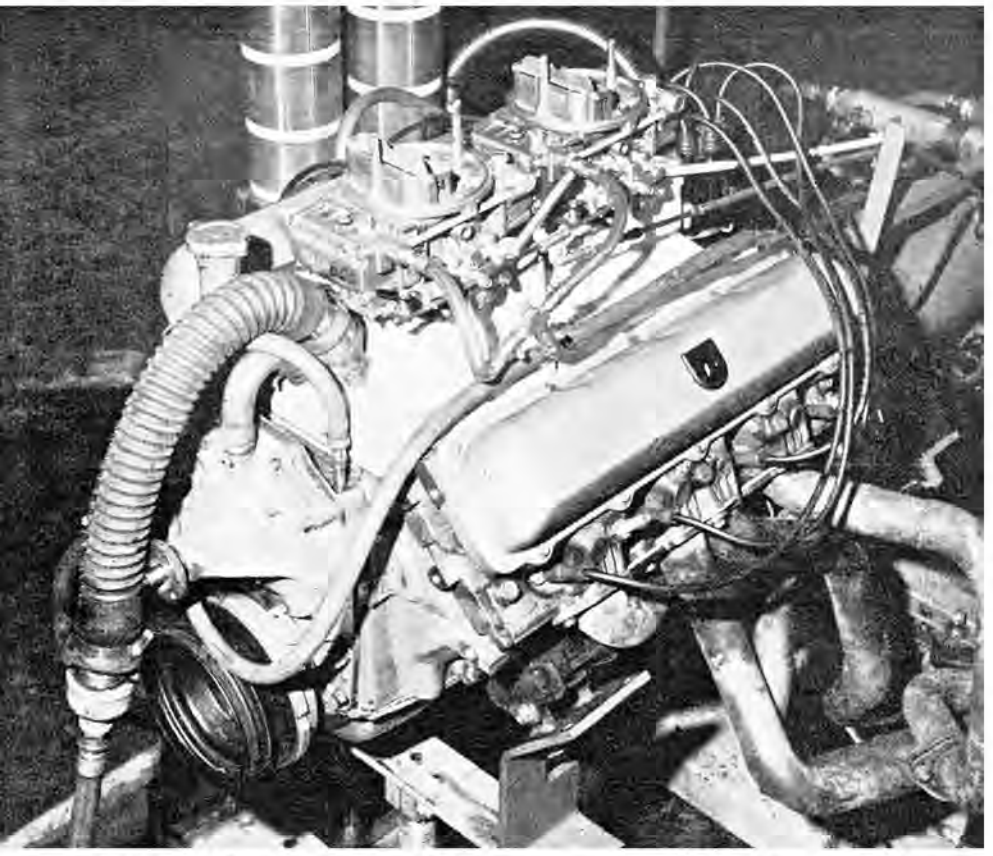


Modified Olds 350 equipped with dual Holley 1850's on an Offenhauser manifold was run on engine dyno and produced very respectable 400 hp at 6000 rpm. Belanger headers and Iskenderian 550 cam, M/T pistons and Valley Head Service heads aided.

pension on the Olds stock. To lower the front end of the car, we used Firestone Bonneville tires, 23 inches tall (5.50 x 15). On the rear, we used 28½-inch-tall Firestones (9.00 x 15). Since these tires are designed for Bonneville high speed trials only, we did not mount them on the car for street use. We changed our gear ratio from the 4.66 that we used for drag racing to a conservative 3.08 that should put us over 160 mph at 5800 rpm.

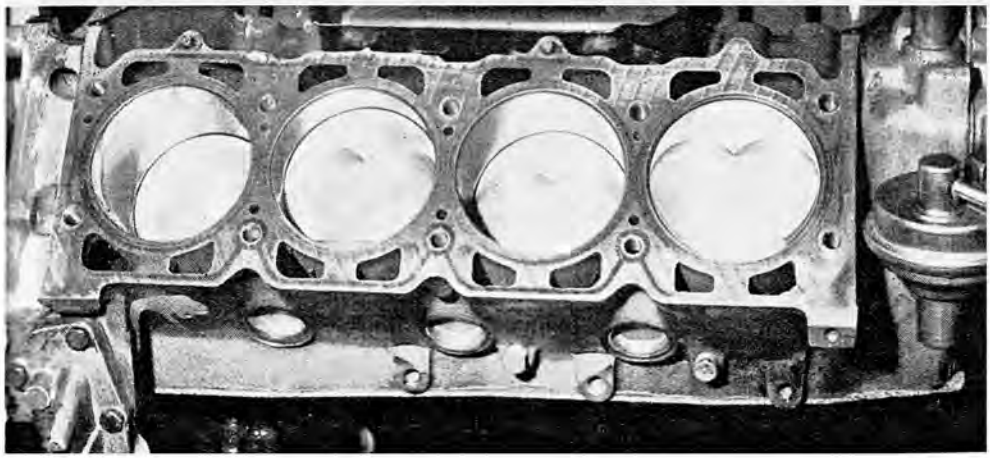
With most of the safety details ironed out, we proceeded with the most vital part of our Bonneville adventure — the engine. We decided to drive the car to Bonneville with the stock 325-hp engine and run it just to see how fast a production line stock car could go and then change engines, putting in a modified 350 that should catch us a big fat record. Or so we hoped! We had a spare 350 Olds engine (the 310-hp version that originally came in the test car), so we went to work on it. The block was deburred to get rid of all sharp edges and possible trouble spots and then thoroughly washed with a detergent (any laundry soap powder will do). The block's oil galley and crankcase cavity were then painted with a rustproof, heat-resistant sealer paint to trap any small metal particles too small to be seen that might eventually find their way onto the bearing surfaces. The crank was taken to Reath Automotive, where Joe Reath radiused the oil holes and micro-polished the main and rod journals. We decided to use the stock rods, but we had Don Alpenfels of Don's Boxed Rods install bronze bushings in them so that we could use full-floating pins. Don also gave our rods .005-inch extra side clearance for better oil flow and cooling. Mickey Thompson supplied a set of forged domed pistons, and after Bob Fleckenstein at Edelbrock Equipment Company balanced our crank assembly, the shortblock was ready to go together.

Stock Olds bearings were used in reassembling the engine. There was .001-inch extra bearing clearance over stock due to the crank work, which would work out fine in our competition engine. Piston-to-cylinder-wall clearance checked out at .005-inch. Grant cast iron rings were used so that the engine would "seat in" quickly. With the shortblock assembled, we were ready for the heads and valve train, and that is one of the most interesting parts of the story.

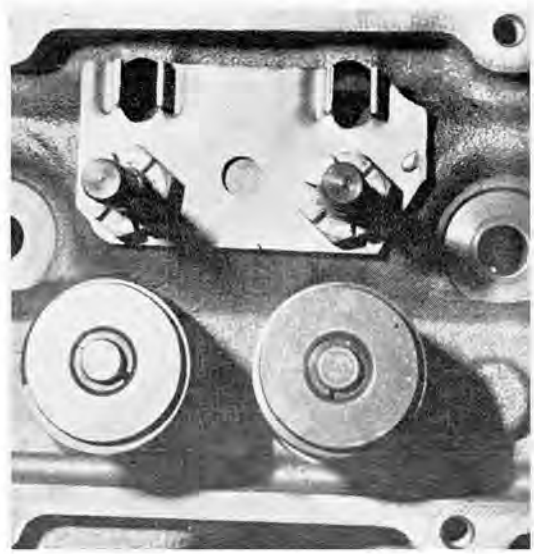
We were planning to turn the Olds engine into the 7000 rpm range and possibly a bit higher, and we felt that the stock rockers would gall at those high rpm, especially with the strong valve spring pressures we were going to run. So we decided to install a different set of rockers on the Olds heads. First, we sent the heads to Larry Ofria at Valley Head Service, Canoga Park, California, for a port and polish job. Larry looked at the Olds heads and stated that although they were very good for production line heads, they could definitely benefit from a good porting job. He proceeded to open up the intake and exhaust ports slightly and remove all the restrictions in them. All sharp curves in the stock heads were eliminated by carefully reshaping the contour of the ports. Next, Larry polished the ports and checked to see if all the porting had been uniform and that no unwanted restrictions remained. The combustion chambers were then ground and polished to remove any sharp edges and prevent any carbon build-up — two things which could lead to preignition and a damaged engine. Larry cautioned us that porting and polishing a set of heads is not a job for an amateur. More harm than help can be done if the grinder's in the wrong hands, so leave the porting to the professionals. It's cheaper in the long run.

After the porting job was completed, Larry did a complete valve job on the heads and applied a special undercut to the valves to permit a mushrooming gas entry effect and a quicker gas/air flow into the cylinders. He then replaced the stock Olds rocker studs (actually $^5/_{16}$-inch bolts) with Isky/Chevy screw-in studs by boring and tapping the Olds $^5/_{16}$-inch holes out to $^7/_{16}$-inch. Since the pushrod holes in the Olds heads were quite large and wouldn't allow proper pushrod/rocker arm alignment with a solid lifter cam without using the stock rockers, Larry took a set of Pontiac pushrod guide plates from a 400 cubic inch engine and locked them down under the screw-in stud jam nut. They worked perfectly. The Pontiac guide plates are available with four pushrod holes and four studs per plate or two pushrod holes and two studs per plate. We used the four-holer because it was a little beefier, but we had to cut it into two pieces because the distance between the two sets of studs on an Olds and Pontiac head are slightly different. The Pontiac two-holer would work just as well.

With the heads finished and the rocker studs and guide plates installed, the final step was the selection of rocker arms. We chose the new Iskenderian extruded aluminum roller-bearing rocker arms, which feature a 1.5-to-1 ratio instead of the stock Olds 1.6-to-1 ratio. A word of caution: The modifications we made on our Olds heads and valve train will work fine



Mickey Thompson forged aluminum pistons gave our little 350 added compression that is needed at Bonneville. Valley Head Service gave the 350 heads a complete port and polish job that included removing all obstructions in the intake and exhaust ports and smoothing them for easy gas/air flow. Autopower Corporation installed a combination rollbar/front seat support that also doubled as an anchor point for the Deist shoulder harness. Jim Deist supplied all the safety belt hardware, as well as a parachute. The most interesting part of the project was the installation of the rocker arms on the Olds heads. Pontiac pushrod guide plates had to be modified to fit under Isky studs.



in a competition machine, but for street use, it would be unwise to use them. The reason? The roller tips of the rocker arms ride on the back half of the valve stems (due to the fact that we used a different ratio rocker arm than the Olds heads called for), and this could cause excessive wear if run continually.

For a cam, we chose Iskenderian's 550 hard-faced overlay with .550 lift and 330 degrees duration. With this cam, we had to use ⅛-inch-longer tappets because the wild grind on the cam let the stock tappets fall below the oil holes in the tappet bosses, causing a loss in oil pressure. We also ended up with pushrods that were ½-inch longer than stock. The cam was installed "on the marks" (standard procedure), and then it was degreed in, at 2 degrees retard, by installing Isky offset cam gear bushings. This suited us just fine, because we were looking for top end horsepower and the retarded cam position was to our benefit. Once the cam was installed, we torqued the heads down and adjusted the rockers to .025-inch (both intake and exhaust). Then we checked for piston-to-valve clearance in the overlap position with the piston at TDC. We had .075-inch on the intakes and .090-inch on the exhausts — okay for Bonneville but not very good for drag racing, where one missed shift would put the engine out of commission with a bunch of bent valves. We prelubed the engine by turning the oil pump shaft with an electric drill (Valvoline 50-weight racing oil was our lubricant choice), and we were ready for the dyno.

A quick trip to Offenhauser's engine dyno and we were ready for some super (we hoped) horsepower readings. Ollie Morris installed an Offy dual four-barrel 360-degree manifold with two Holley 1850's (600 cfm), turned on the water, and we had our first problem — water, water everywhere. Seems that we had used a Victor gasket set for a 330 Olds (vintage '67), and although the head gaskets seemed to fit, they left a tiny water hole open at the edge of each head. The water doesn't go inside the engine, but it sure splashes around on the outside! We took the heads off and replaced the gaskets with Olds steel shim gaskets and were once again ready for the dyno. After a couple of runs, we were sure that our engine would get the job done. We recorded 400 hp (uncorrected) at 6000 rpm, and the engine was just beginning to sound healthy. The cam and valve train assured us of sound operation past 7500 rpm, so we were looking tall for Bonneville. The 1850 Holleys were left with stock out-of-the-box jets, but we did set the float levels a little higher than stock. The Offy manifold/Holley carburetor combination looked very strong on the top end. Besides being a very good Bonneville engine, our 350 Olds would stand up very well in Modified Production classes if we had allowed more piston-to-valve clearance.

With the engine all packed and ready, we were set for Bonneville. One last change that was made to the car was the addition of a Conelec electronic fuel pump (47 gallons per hour steady flow) at the rear of the car, near the gas tank. We used both the Conelec and the stock fuel pump to feed the hungry Holleys. Can our stock 325-hp Olds run over 150 mph at the salt? Will our super 350 (400-hp) be able to set a C/Production record? Can an Oldsmobile better 170 mph in basically stock form without a lot of streamlining "tricks"? See our next month's Bonneville coverage for the answers to these and other pressing questions, as HRM's Project Olds roars off into the sunset chasing all those "salt bunnies" that inhabit Wendover, Utah. Wish us luck! ■■