

SEDATE IT AIN'T!

Programmed street power tuning turns Olds' venerable 4-4-2 into a tiger-tamer. Here's how!

BY MARTYN L. SCHORR

PROFESSIONAL speed tuners have been waging war against do-it-yourselfers, dealer-prep mechanics and bolt-in-and-on soupers for years. According to the "nit pickers" the average streetable supercar could run faster, quicker and more efficiently if it were professionally fine-tuned instead of quick-tuned to manual specifications and topped off with additional carburetion, a more radical camshaft, *ad infinitum*.

Impressed with some of the fine tuning work performed on Chevelles, Mustangs, Sting Rays and GTO's by Joel Rosen and Jack Geiselmann at Motion Performance, Inc., we decided to experiment a bit on a brand new Olds 4-4-2. Before the car arrived from Lansing (built especially for us for a 1000-mile road test) Joel and Jack agreed to test the dealer-prepared stocker, tune it to stock specifications for the test (CARS Magazine, April 1967) and then speed tune it for maximum street performance. Since their shop is equipped with the latest Sun 1020 scope and distributor machine and a Clayton chassis dynamometer, it was a simple chore to experiment, power-time and keep accurate rear wheel horsepower charts. Along with recommended power mods, the Motion crew also promised to pass on "hot tips" for 4-4-2 owners which have worked well on their customers' cars.

When the car arrived in New York it had 209 miles on the clock and was equipped with close-ratio four-speed transmission, 3.91-to-1 limited slip rear end, disc brakes and the standard 350-hp 400-cubic-inch engine. The only added attraction was a bonus in the form of the Cold Air induction package camshaft. This camshaft is factory-installed on W-30 engines which are also fitted with fresh-air induction ducts and a Rochester Quadrajets sealed air chamber. It is essentially Olds' factory racing package which competes against the GTO Ram-Air stock class drag car. The beauty part of the Olds setup, however, is that it's completely streetable and can be used for everyday transportation.

Before going into the tuning details we should mention that this camshaft (with special valve train) has a .474-inch lift, 308 degrees duration and

carries part numbers 397328-329. It can be identified by four orange code stripes and W-30 markings. Another interesting note about the 4-4-2 Olds is that automatic and manual shift models use different grind cams. The auto versions use a .430/.432-inch lift, 278/282-degree duration stick (one white stripe) while the manual shift models use a .472-inch lift, 286 degree duration model (two blue stripes).

Needless to say, for maximum street performance with a minimum cash outlay the W-30 cam should be used.

As the car was received from the local dealer it was obviously lacking something. It just wasn't right there. It was actually sluggish for a 4-4-2 and didn't pull strong over the standard torque curve. Over 5000 rpm performance was out of the question. The engine was tight and was obviously in dire need of



Equipped with 3.91 gears, close-ratio four-speed and sticky Wide Ovals, our super-tuned test car ran 102.50-mph, 14.10-second quarters. Joel Rosen made the mods and tuned car on Clayton dyno using the latest Sun 1020 equipment. Quicker advance curve (transistorized ignition) and modified Rochester Quadrajets made the difference. Engine pulled 170 rear wheel hp at 4000 rpm after modifications and super-tuning. Tri-power and headers are bolt-on naturals for street.





by **OLDSMOBILE**

BORE	4.000 IN
STROKE	3.975 IN
DISPLACEMENT	400 CU IN
HORSEPOWER	350
TORQUE	440 LB-FT
COMP RATIO	10.5 TO 1

PREMIUM FUEL

PRINTED IN U.S.A.

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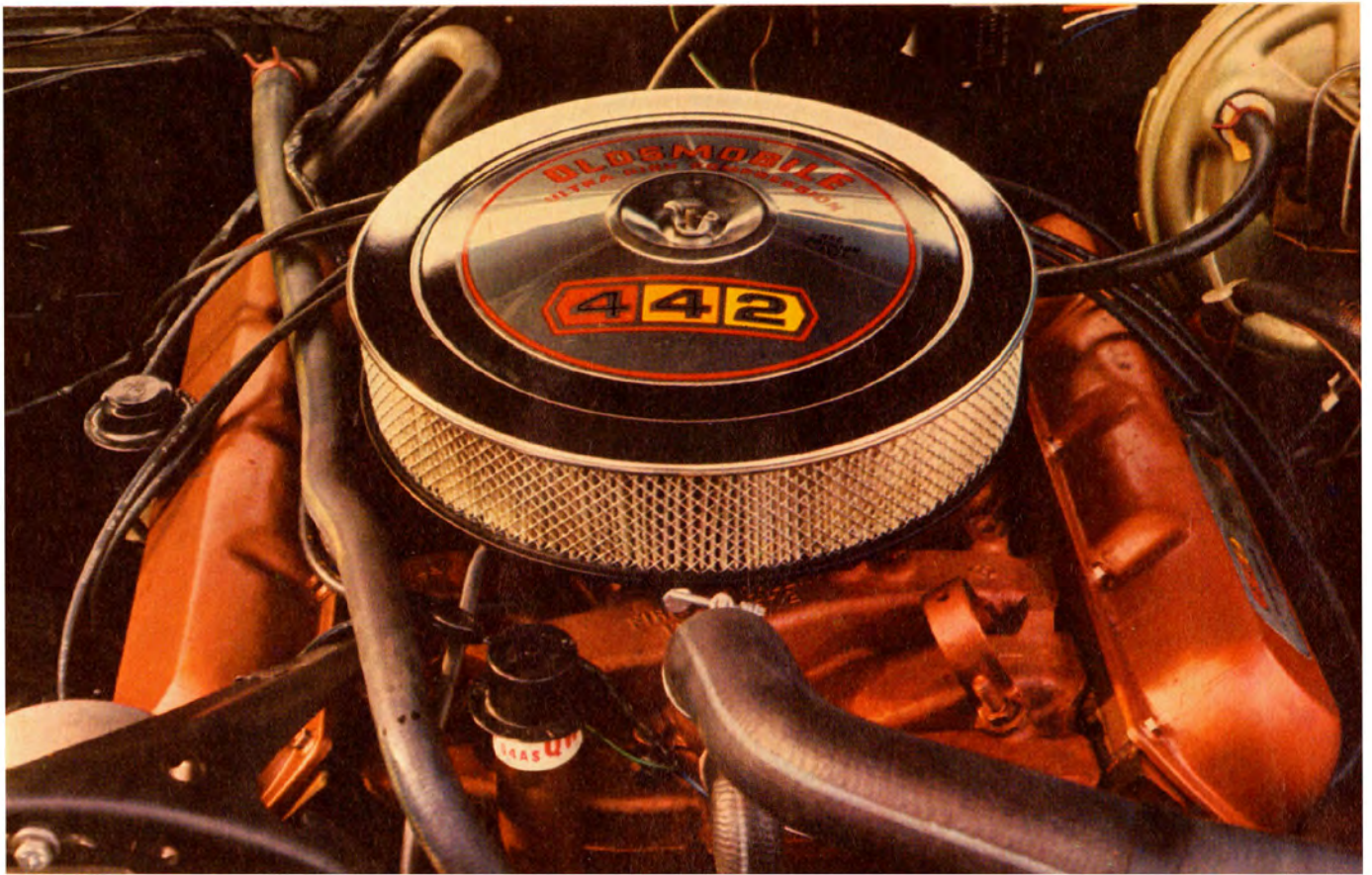
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442

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HORSEPOWER	350
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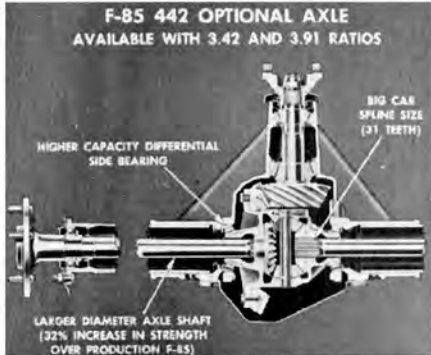
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Dyno tune facilities made it possible to pull max power from stock mill.



Full-load tests were run to 4000 rpm as engine was super-tight.



New HD limited slip rear is factory-available with up to 3.91 gears.



Stock suspension goodies account for the 442's superior handling qualities.

a good tune-up.

After checking with Oldsmobile engineers we learned that all 4-4-2 engines are assembled with rather tight clearances and they almost never really run until the engine has racked up 1000 miles. So we put some more break-in mileage on the engine, then brought it back to Motion Performance for a horsepower check and a factory manual tune-up.

In stock condition the engine would not pull more than 140 rear wheel horsepower on the Clayton dyno and broke up badly when tweaked to 5000-plus rpm. The car was set up to manual specifications and no other changes were made. A few more *passes* on the rollers and the horsepower at 4000 rpm (using 4000 rpm as a standard test) climbed by five to 145. Even with the additional output and the tune-up, the ignition was too slow and the engine still didn't feel right.

On the street the car was peppy for a stock 4-4-2 but still not as quick as it should have been considering the W-30 camshaft and valve train installation. We made a few runs down the quarter with the car in stock shape, recorded the figures, and put some more break-in mileage on the engine.

With approximately 500 miles on the

Dyno tuning and minor mods add 25 rear wheel hp



Factory tri-pot manifold and W-30 Cold Air kit are factory available on a do-it-yourself basis. It's the hot setup!

clock, the car was brought back to Motion for Stage II tuning. Joel and Jack handled the car as if it belonged to an average customer, making the same tried and true tuning mods that have become standard operating procedure in the shop.

Tests were run on the dyno under full load conditions (load is adjustable and is regulated by the dyno operator while he's tuning the engine) with the engine running at 4000 rpm. It was found that the mixture was on the lean side and that the plug range was too hot for extended running under full load conditions. The plugs were traded in for Champion J-10Y (stock gap) sparkers which have a broader heat range and an auxiliary gap which tends to prevent fouling under low-speed driving conditions. These plugs were chosen because new cars tend to foul plugs at low speeds and this particular car was equipped with the new Delco UHV capacitive discharge ignition system. This type of super-spark unit works well with the colder plugs as it is able to produce monster sparking to prevent normal cold plug street operation fouling. Full load tests after the Champion plug change showed absolutely no traces of plug breakdown.

The distributor used with the UHV ignition system is of magnetic pulse pointless construction. This distributor can be immediately spotted because of its red cap which is constructed of special alkyd stock to resist carbon tracking which is sometimes a problem with high output capacitive discharge units. As set up by the factory and double checked at the dealership, the distributor had a 12-degree curve (24 total crankshaft degrees). The distributor was dismantled, clearances checked, shaft lubed and the springs traded in for lighter ones pirated from a Chevy high-performance (Corvette) distributor. With the new springs in, the distributor was set up on the Sun machine, bolted back in the engine and the engine power-timed on the dyno. The new curve totaled out at 35 degrees with only the slightest trace of detonation (260 Sunoco fuel) under full load testing.

Further testing with an exhaust analyzer and on the drag strip proved that the mixture was too lean in the cruising range and that mid-range throttle response was not up to par. The Rochester Quadrajet 4MV (1-3/8-inch Primaries, 2-1/4-inch secondaries) was removed and dismantled, floats

were checked and the primary jets removed. To richen the cruising mixture slightly without killing road economy the primary jets were placed on a drill press and opened up .002-inch. The secondary jets, which are press-fit into the body, were not touched. Nothing else was modified on the carburetor itself, except for the blocking of the vacuum advance and PCV takeoffs, since the secondary barrels and the upper venturi flaps were opening on time—which is usually not the case!

Instead of bolting the carb back on the gasket-covered mount, Joel substituted a set of aluminum and composition-stock heat spacer plates for the stock gasket. This was done to prevent percolation and vapor lock. The crankcase vent tubing was removed from the valve cover and the carburetor inlet was blocked off with a screw fitting. A gasket and another breather cap were used to fill the opening left in the left side valve cover. This is standard procedure as the vents tend to lean out the mixture via dilution.

The car was put back on the dyno and power-timed. Immediately it was evident that the engine was first starting to live—like a big, fat shot of Adrenalin was just (Continued on page 60)

Factory Cold Air camshaft ups redline to 6200 rpm



The primary jets were opened up .002 inches to improve mid-range response.



Advance curve of pointless sparker was quickened using Chevy springs.



PCV "garbage" was done away with and the line to the quad blocked.



After the 35-degree advance curve was plotted, the vacuum takeoff was plugged.



Anti-percolation aluminum spacers were fitted between the carb and manifold.



Hole left after removal of PCV gear was fitted with a right-side breather.

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OLDS 4-4-2 continued

pushed through the carburetor! At this point the vacuum advance unit on the distributor and the carburetor were blocked, as the advance mechanism tended to overadvance the timing at high, high rpm. Considering the already high total timing we couldn't afford to risk playing games.

The car was obviously stronger than before and it craved for well over 5500 rpm performance. Running under full load, the engine was actually putting out to the tune of 170 rear wheel horsepower at 4000 rpm. Since the engine was still brand new and we didn't see any reason to run the car clear up to 6000 rpm on the floor, we called it quits. We did, however, take it back to the strip for tests. We let it all hang out a couple of times and realized that the engine would run clear to 6200 rpm, pulling like a bear right to the 6000 rpm marker. At 6200 the valves started to float and we let off.

Was it worth it? Well, we'll leave that up to you. With the car well tuned to factory specifications it would run to 60 mph from a standing start in an average time of 7.0 seconds and turn the quarter at 100 mph in 14.30 seconds. After the dyno tuning, the car was good for 6.5-second 0-to-60's and 102.50-mph, 14.10-second quarter-milers. The cost: \$30 plus plugs and parts. If the Olds was a customer's car Joel would have installed steel-cored Packard or Autolite wires in place of the carbon-core TVRS stockers. Once the stock wires get old they almost always break down and leak the juice. Since the car was going back to Olds the stock wires were retained.

Joel and Jack also volunteered some information for 4-4-2 owners who plan to make the street and strip scene. According to the "Dyno Duo," 4.33-to-1 gears are recommended along with lightweight tube headers, an explosion-proof flywheel and clutch assembly, a scattershield, some minor suspension tuning (Cure-Ride shocks, Traction Masters), the '66 factory tri-power manifold and W-30 cold-air induction package, and last but not least, a good set of "sticky shoes." That's the straight scoop, troops!

BARRACUDA continued

spy film, but the appearance of the two-door hardtop is about as sexy as a church pew. It looks somewhat Corvair-ish. With the two-door hardtop, it seems that Plymouth has taken the fins off their Fish.

The interior of our test car was

super-boss in some ways and very plain in others. The stock steering wheel did nothing to add to the visual performance image and the stock shifter handle did just about as much to add to the appeal of the car. However, we did like the instrument package including the dash-mounted tachometer and the 150-mph speedometer. The Jaguar lover in us flipped for the new "wood" panelled dash and doors, and the quick-opening GT gas filler injected a little of LeMans into our test car's image.

But aside from our rampant nit-picking, the main point is that the Barracuda with the 383 power option now has the power to compete with any and all supercars. Plymouth can work out the fine points later.

Four of every five traffic accidents in 1965 could have been avoided, according to The Travelers Insurance Companies. The major cause of death and destruction on U.S. highways, says Travelers, is driver error and lack of judgment.

Nearly 275,000 pedestrians were injured and 9000 were killed during 1965 in the United States, according to The Travelers Insurance Companies. This includes 300 persons who were injured while actually standing on a traffic safety isle!

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