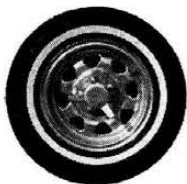




# SHARPENING THE DART

our power-complex shows up!



**A**FTER A SAMPLE OF THE outstanding performance of the modified Slant Six in the TorqueFlite Dart dragster (see page 58), the *Car*

Life editors persevered in convincing their friendly, local Dragmaster dealer that the same sort of responsiveness could be obtained from a stock, or nearly so, 1963 Dodge Dart sedan. Although those 125-mph, 10.5-sec. ¼-miles are a little bit out of reach, proportionately good performance certainly should be available, provided the engine was given a similar treatment.

The optional 225-cu. in., 145-bhp Dart engine is capable, in stock form, of propelling a 2890-lb. sedan along at completely adequate velocities. However, there are those among us who yearn for that "little bit extra," no matter how well the standard equipment is operating. Some people just like to have an engine that can produce above and beyond the call of

what is normally expected of a car.

To provide for this demand, Dodge at one time produced a very limited number of Hyper-Pack kits (CL, April 1961) which boosted the horsepower of the 225-Six to 196 @ 5200 rpm. These were dealer-installed packages and consisted of 268° cam, valve springs, pushrods, intake and exhaust manifolds, muffler and exhaust pipe and a 4-barrel Carter AFB carburetor. This transformed the Lancer into a real tiger.

The kit was quietly discontinued later in 1961, more's the pity, but with the increasing availability of the necessary equipment from independent suppliers, equivalent performance is once more available. The hitch here is finding out what works best with what.

Taking a new Dart convertible, we first equipped it with Traction Master torque reaction links and semi-competition shock absorbers, both to improve the already-good handling. A set of Offenhauser Sales Corporation's 13-in. aluminum wheels were installed, for no other reason than to give the car

a more distinctive, custom appearance.

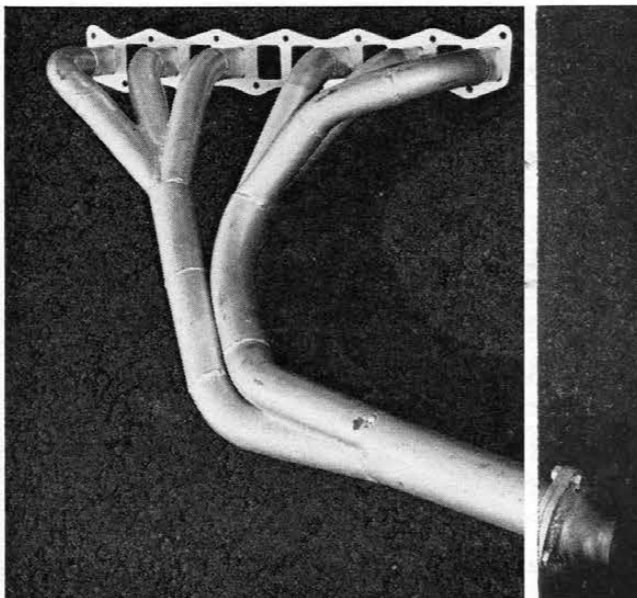
The Dragmaster boys approached the engine fresh from their dragster success. They first installed an Iskenderian 505A camshaft and Isky valve lifters, lightweight pushrods and extra-tension springs. Ports and head were worked up accordingly, following the pattern of the Slant Six used in the dragster. Next installed was a set of Jahns 11.5:1 compression racing pistons with centered pins and 0.007 bore clearance. On the outside, they bolted up a Carter AFB 4-barrel carburetor to an aluminum Weiland intake manifold. A set of tubular individual headers was welded up by Horse-Power Engineering for the car but was not installed, as the crew ran out of time. A less-restrictive exhaust system is a sorely needed item on this engine so the headers will soon be installed.

Finally, to take advantage of the engine's higher rpm potential, a 3.90:1 rear axle gear set was installed. The original TorqueFlite transmission was left unmodified as it was felt this could handle the extra horsepower without giving trouble.

First time out, a horrible truth was discovered. Where the 505A cam profile worked great for 5000-7000 rpm operation, it didn't have enough low-rpm torque to move the Dart GT at more than a snail's pace UNTIL 5000 was reached. This problem was solved by another, slightly milder, Iskenderian cam, the E-1, which gave a much-better low and mid-range torque while still allowing a high-rpm top end.

Another small annoyance was the clattering of the wide-clearance pistons. A clearance of 0.004 is really all that is needed for this type of vehicle; and, a more normal offset pin mounting would have quieted the clatter.

EXHAUST HEADER will be installed later.



The resulting package is very nearly the same as the Hyper-Pack, although our 1963 Dart GT didn't do nearly as well as the Lancer tested in 1961. Our Dart, even with the cam change, was still sluggish on the bottom end and didn't begin to perform until all four barrels were open and the engine churning somewhere near 3000 rpm. Here the automatic, with its torque converter, helped get the car under way smoothly but its low-rpm shift points (approximately 4000 rpm, w.o.t.) just wouldn't let the Six get up to howling speed. Holding the car in each gear, by pushing the transmission buttons one at a time, to 6000 rpm produced best acceleration.

Comparison of the stock '63 145-bhp sedan (see Road Test, March CL), the '61 Hyper-Pack Lancer and our modified '63 Dart GT:

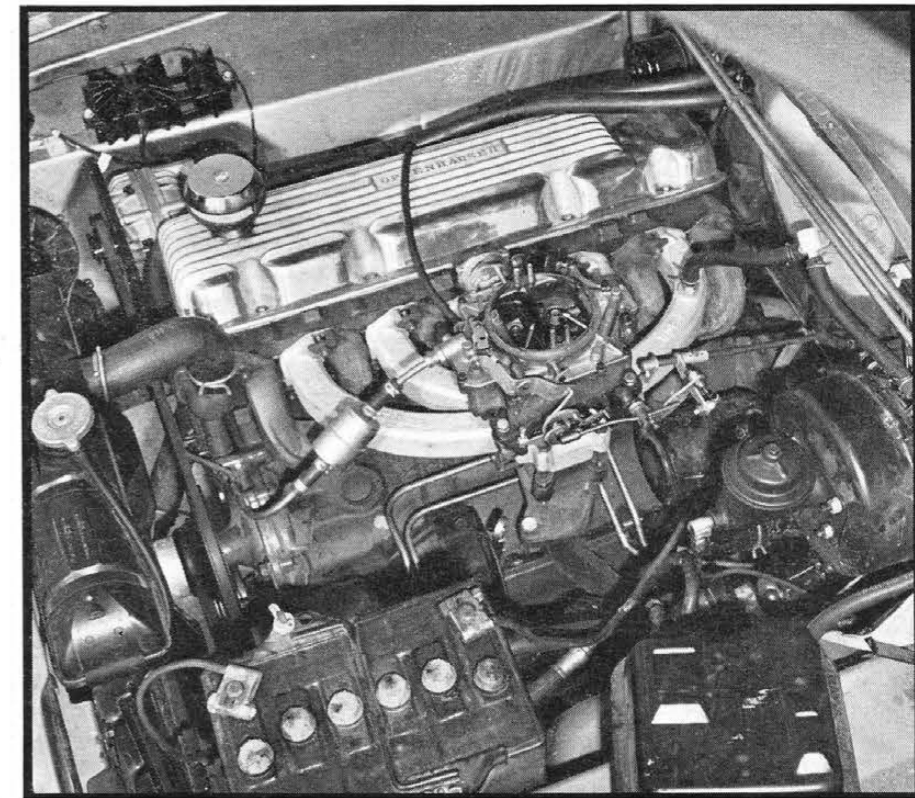
	Hyper-Pack	Stock '63	Mod. Dart
Curb weight	2670	2890	3020
Axle ratio	3.90	3.23	3.90
Transmission	manual	manual	auto.
0-40 mph, sec.	4.2	5.7	4.9
0-60	8.6	13.3	10.0
0-80	16.4	24.4	19.1
Stand ¼-mile, sec.	16.4	19.3	17.8
speed at end, mph 80	72	75	

Undoubtedly, more fine-tuning could be done which should produce even better results. With this gear ratio and engine equipment, there's little reason why the Dart GT couldn't be turning in 16-sec. quarters.

—Dennis Shattuck

## A SIMPLE KIT

**J**IM KUHL, of Mt. Clemens, Mich., believes in neck-snapping performance in his road cars. But he doesn't believe you should have to pay a \$4000 first cost and 9 mpg fuel con-



4-BARREL CARBURETOR, transistor ignition help transform the Dart into a tiger.

sumption to get it. He believes the Detroit compacts have plenty of performance potential—with a few simple modifications. His favorite raw material is the slanted 6-cyl. engine in the Chrysler compacts (Valiant, Lancer, Dart). Jim feels this engine has the potential to run like a big-incher with a minimum of hop-up work and has a simple kit that makes it do just that. He has been able to increase carburetor venturi area radically while using the stock intake manifold. He

mills down the standard carburetor mounting flange, chops a large opening in the top of the manifold in this area, then bolts on a new flange to mount a big Carter AFB 4-barrel unit. Total venturi area is increased from the stock 1.42 sq. in. (with the Ball & Ball single-throat) to 6.06 sq. in. with the Carter! Carburetion restriction is cut to practically zero—and, yet the air flow-controlled secondary barrels prevent too much over-carburetion.

The standard compression ratio on

DART CONVERTIBLE makes a fine base for engine tuning. Suspension additions help improve handling, too.





DART GT hardtop is used for Stanford Bros. performance demonstrator.

## THE DART

this engine is only 8.2:1, which holds down performance. Although increasing compression can be done with special dome-top pistons, Jim merely mills the head 0.100 in. to raise the ratio to 9.5:1. Many late Detroit cylinder heads don't have sufficient thickness for a 0.100-in. mill. Fortunately the Chrysler Six does—so Jim bases his kit price on an exchange, milled head.

Kuhl solves the camshaft problem by regrinding the stock 232° camshaft for a duration of 270° and 50° overlap (with a heat treat after the regrind to prevent premature wear). These timing figures are taken with a nominal valve lash of 0.020 in. Jim says you can lengthen the effective duration to around 300° by tightening the lash down to 0.010. (With closer clearances the valves will start to open a little sooner and close later.) The longer duration and overlap reduce low-end torque, but help the high end, so are recommended for the drag

strip; go back to 0.020 lash for the street.

Incidentally, Jim has found the stock lifters, pushrods, valve springs and keepers to be entirely adequate for high-rpm performance with this hot camshaft. He can buzz to 6000 rpm with no trouble. And there has never been any excessive or premature wear between cam lobes and lifters.

The last area for attention is the exhaust system. The extinct factory Hyper-Pack kit used special streamlined cast iron split headers (which are no longer in production). Fabricated tubing headers would have raised the price of Kuhl's kit excessively and, besides, he wanted to retain the exhaust heat to the intake manifold for street flexibility. So he has replaced the standard 1.5- and 1.75- in. piping with big 2-in. pipe all the way through, and has replaced the stock reverse-flow muffler with a low-restriction straight-through type. Noise level is slightly higher but the changes have probably reduced back-pressure at least 50%.

What does all this do on the street

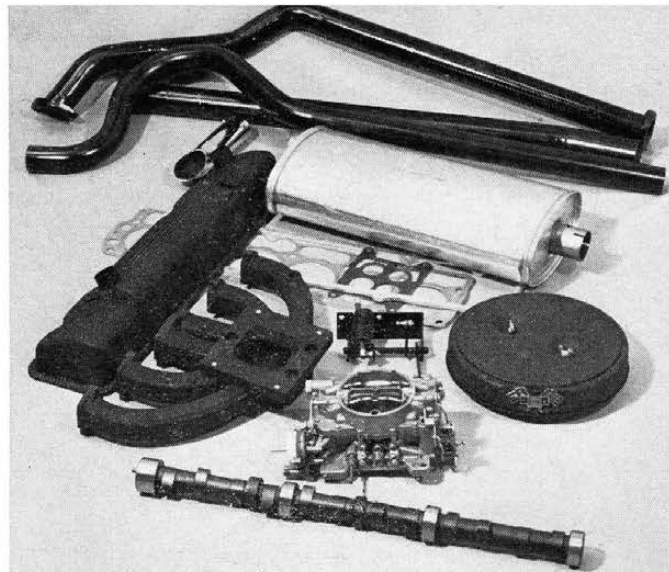
and highway? Before-and-after road tests on a 1963 Dart GT coupe belonging to the Stanford Dodge agency in Lincoln Park, Mich., were taken by stopwatch readings against a calibrated speedometer, followed with some accelerometer readings to permit calculation of the true horsepower output at the flywheel. Entirely standard, with a 225-cu. in. engine, 3-speed Torque-Flite automatic transmission, 3.55:1 rear end gears, the car weighed 2830 lb. with half a tank of gas. The data:

	Stock	Modified
0-30 mph. sec. ....	3.8	3.0
0-60 mph. ....	12.6	9.2
Standing ¼ mile ..	18.8 @	17.2 @
	72 mph	81 mph
True maximum hp ..	105 @	155 @
	3800 rpm	4800 rpm

The performance improvement was highly impressive in view of the relatively cheap, simple changes made. Acceleration figures might have been a shade better, but the ignition was starting to break down around 5400 rpm. The car was brand new and Jim hadn't replaced the carbon resistor spark plug leads. New copper leads let him go on out to 6000. And the accelerometer definitely indicated that the optimum shift point was well over 5400. A lighter experimental car (a '62 Lancer) turned 16.54 sec. elapsed time at 83.5 mph on the Detroit drag strip last fall.

Kuhl gets a modest \$225 for the kit components (with exchange cylinder head) plus \$50 for installation in his own shop. Black crackle finish on the rocker cover, intake manifold and air cleaner cover, plus identification emblems on rocker cover and air cleaner, are part of this neat installation. Complete do-it-yourself instructions are supplied with the kits. (Address: Kuhl Enterprises, P.O. Box 511, Mt. Clemens, Mich.) —Roger Huntington

KUHL'S KIT contains cam, carburetor and crackle-finishing.



NEAT INSTALLATION of Carter AFB 4-barrel on modified stock intake.

