

"Swift and Sharp, It Doth Pierce My Very Soul . . ."

HAMTRAMCK AND Highland Park have had a resistance movement going for some time. Competitors of Dodge Division have been regularly installing V-8 engines in their compact cars to upgrade their performance as the interior decorators reworked their living quarters. Dodge, instead, elected to stick by its excellent Slant Six for the Dart, an engine developing 101 bhp from 170 cu. in. but more often installed with lengthened stroke for 225 cu. in., producing 145 bhp.

Nor was this a particularly shortsighted decision. Dodge management felt, and the engineers agreed, that the Dart with the 6 cyl. was highly com-

petitive, offered more than adequate power and excellent balance—an appraisal which *Car Life* has found to be justified. The sales curve was certainly impressive enough, indicating that the car-buying public shared the feeling.

The pressure from the sales department, however, began to mount. The celebrated "Dodge Boys" are an aggressive bunch in any man's league and a lost sale here and there was something they took seriously. So, their pleas prevailed and corporate engineers developed a V-8 engine to give new dash to the Dart.

As can be seen from the accompanying chart, the new engine is dropped right in the midst of the highly competitive small V-8 range of engines,

varying in size from 259 to 289 cu. in. It has been developed from the Chrysler 318-cu. in. powerplant, but reduced in displacement to 273.5 cu. in. and in weight by some 55 lb. The latter is achieved by thinwall casting and other advanced foundry techniques, with cast iron rather than aluminum, and staggered valves have been discarded for a more normal (and lighter) in-line arrangement.

The block is of tin-alloyed, gray cast iron and weighs 149 lb. after machining and fitting with main bearing caps and bolts. The bore has been reduced to 3.625 in. (from 3.906-in. in the 318) which, with the short 3.31-in. stroke, arrives at 4.4 liters displacement. Casting the new block requires 12 cores, cured in heated core boxes to reduce

the possibility of distortion. A special tappet chamber core eliminates some unnecessary metal from the top of the block.

The crankshaft is durable forged steel, 25 in. in length, with main journals of 2.5 in. diameter and is, in fact, the same shaft as used in the 318s. Five babbitt and steel bearings are used, with thrust taken on the No. 3 bearing. Rod journals are 2.125 in. in diameter and the forged connecting rods are designed on 6.123-in. centers, and in a tapered I-beam section for maximum strength and minimum weight.

Piston pins are full floating and retained by spring steel lock rings, with pin bores offset by 0.06 in. from piston centerline to prevent slap. Two com-

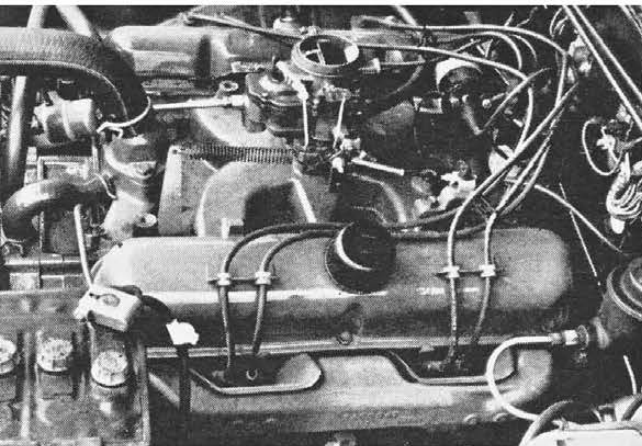
pression rings and a 3-piece oil ring, utilizing two chrome-plated steel rails separated by an expanding spacer, are used on the aluminum alloy pistons. The pistons have flat heads, slightly notched in four spots to permit extra valve and head clearance and for interchangeability between banks. Piston skirts have two steel inserts cast in for consistent expansion rates within the cylinder bores.

Cylinder heads are chromium-alloyed iron castings of 41 lb. each, formed from only four cores. They differ substantially from those used on the staggered-valve 318. A large single core forms the intake and exhaust ports for the entire head, insuring accurate placement of port openings.

Combustion chambers are designed

in a modified wedge, providing an 8.8:1 compression ratio with the flat-head pistons. Spark plugs are placed near the center of volume for equalized flame travel and combustion. The overhead valves are set at a rather large 18° angle from the bore axis (to reduce width) and are operated via mechanical tappets and tubular push rods. The malleable iron rocker arms are, of course, a new design with the in-line valve arrangement.

Valves have tulip-shaped heads for good seating ability and rubber cup seals to shield stems from excessive oil splash; head diameters are 1.78 in. intake, 1.50 in. exhaust. Lash is adjusted by a screw in the push rod end of the identical intake and exhaust rocker arms. Support brackets for the



DART'S LIGHTER weight V-8 has thinwall cast iron block of design similar to Dodge's 318. Flat, single plane intake manifold helps keep down overall height while special exhaust manifolds fit the wider engine into the Slant Six's compartment. With 273 cu. in., the small V-8 develops 180 bhp at 4200 rpm and 260 ft.-lb. of torque.

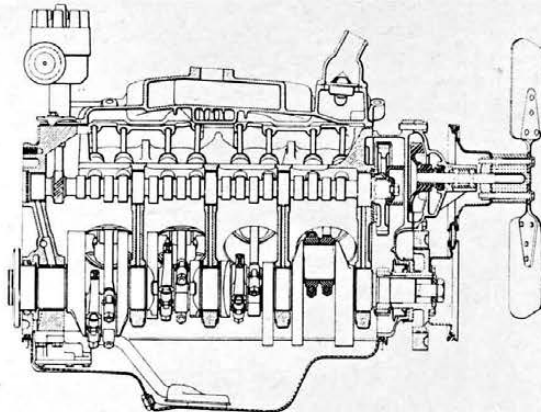
DART GT V-8

rocker shaft and valve guides are cast integrally with the heads and the shaft is secured by stamped retainers and screws.

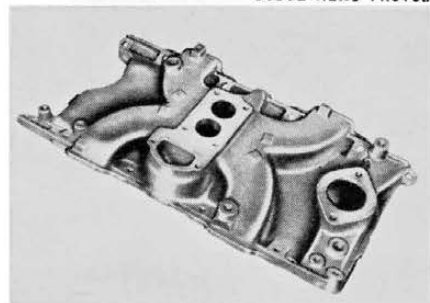
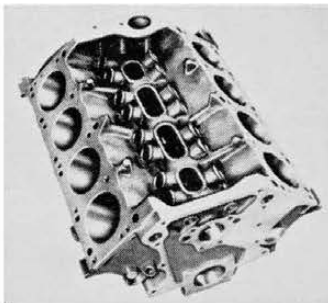
Dodge engineers call the intake manifold a "single plane design," which evidently was a necessary development to fit the V-8 under the Dart's low hood. It is a shallow arrangement, cast up from three cores—one each for chamber, heat cross-over passage and water outlet passage. To avoid the tallish configuration of the normal cross-over manifold, this unit directs the fuel-air charge from each carburetor bore to the cylinders on that side from a plenum chamber; a compensating relief hole eliminates surge problems.

An automatic choke, 2-barrel carburetor with venturi sizes of 1.40 and 1.06 in. is mounted atop the manifold, covered with a paper element-type air cleaner and operated by a cable-type throttle linkage to dampen transmission of engine vibration.

Exhaust ports are located just under the head covers and have quite different manifolds on each side. A 3-branch low-runner manifold with center outlet is installed on the right side, but the left side has a high-runner type which extends to the rear before bending downward in an S-shape to clear the steering gear. This does cause a tight fit for the spark plugs on that side, but they are shielded by a large lip extension of the metal exhaust manifold gasket. Dodge engineers say the efficiency is relatively equal despite the



DODGE NEWS PHOTOS



differing configurations. Both manifolds have ball-joint seating connections at the exhaust pipe flanges for proper alignment.

Cooling system flow is rearward in the block, thence up to the heads, returning forward around each valve seat and into the radiator top tank via the thermostat housing at the front of the intake manifold. Such a "series" flow pattern, according to Dodge engineers, maintains uniform metal temperatures throughout the engine. The system has a 17-qt. capacity, 4 qt. more than with the Six.

Oil is pumped from the sump up the rear of the block to the right oil gallery, where it is taken by drilled passages to main bearings and camshaft bearings. Additional passages feed the left gallery to lubricate that tappet bank. Holes drilled in the head and block, intersecting the No. 2 and 4 camshaft journals, lubricate the rocker shaft and valve rocker arms.

The engine is somewhat shorter than the 6-cyl. unit it replaces and is mounted against the Dart's firewall. This necessitates a spacer pulley to mount the fan and permits a slight bit of rearward weight juggling to keep the 550 lb. V-8 from having a more adverse effect on front/rear distribution.

Rated 180 bhp at 4200 rpm, with 260 lb.-ft. of torque at 1600 rpm, the 273 produces some 25% more power than the 225 Six. In the *Car Life* test car, a GT convertible, it was found to wind up easily to the power peak, although the power curve fell off rapidly

after that. It has a willingness to rev even higher, largely because of the mechanical lifters, but there was no point in doing so. During one speedometer calibration run for 90 mph, the test drivers failed to notice that the car was still in 3rd gear until they saw the tachometer pointer at 4700 rpm. Minimum noise, then, was a bonus even with this mechanical tappet design.

The new engine is not quite so light, on a lb./bhp ratio, as either the Ford or the Chevrolet engines in this class (although it is an improvement over the 225 Six), nor does it fare quite so well as the 283 and 289 in bhp/cu. in. But much of this can be traced to the milder camshaft duration, which in turn indicates to us that it could easily be tuned to match those competitors. It is also noteworthy that the torque peak is much lower in the 273 than for its competitors, a closely related function of camshaft timing, although the power peak is not quite so far off. Another significant feature is intake valves larger than any other engine in this class and exhaust valves equaled only by Studebaker and Chevrolet's 283.

It might be gilding the lily to long for the breathing freedom which a 4-barrel carburetor and manifold would give to this engine, and it is reasonable to expect Dodge to come out with one at a later date. Such a refinement would vastly improve the car's chances in the H/S class at the drag strip, where it might make a se-

4.2-4.7 LITER ENGINE COMPARISON

	Stude	Ford	Dodge	Chevrolet	Amer. Mtrs	Ford	Stude	Ford HP	Stude R-1
Cu. in.	259	260	273	283	287	289	289	289	289
Bore	3.563	3.80	3.625	3.875	3.75	4.00	3.563	4.00	3.563
Stroke	3.250	2.870	3.312	3.00	3.25	2.870	3.625	2.870	3.625
Bhp @ rpm	180 @ 4500	164 @ 4400	180 @ 4200	195 @ 4800	198 @ 4700	195 @ 4400	210 @ 4500	271 @ 6000	240 @ 4800
Torque @ rpm	260 @ 2800	258 @ 2200	260 @ 1600	285 @ 2400	280 @ 2600	282 @ 2400	300 @ 2800	312 @ 3400	305 @ 3200
Carburetion	1x2	1x2	1x2	1x2	1x2	1x2	1x2	1x4	1x4
Cam duration	246	252	240	292	243	252	246	306	260
Comp. ratio	8.5	8.7	8.8	9.25	8.7	8.7	8.5	11.0	10.25
Lifters	mech.	hydr.	mech.	hydr.	hydr.	hydr.	mech.	mech.	mech.
Valve dia., int./exh.	1.65/1.53	1.59/1.39	1.78/1.50	1.72/1.50	1.78/1.40	1.67/1.45	1.65/1.53	1.67/1.45	1.65/1.53
Main brg. dia.	2.50	2.248	2.50	2.30	2.499	2.248	2.50	2.248	2.50
Bore spacing	4.500	4.380	4.460	4.400	4.750	4.380	4.500	4.380	4.500
Block length	22.31	20.84	21.40	21.78		20.84	22.31	20.84	22.31
Weight, lb.	685	482	550	580	615	485	685	485	685
Bhp/cu. in.	0.695	0.630	0.660	0.690	0.690	0.675	0.728	0.938	0.830
Lb./bhp	3.81	2.94	3.06	2.98	3.11	2.49	3.26	1.79	2.85

rious contender if not an outright winner. A more radical grind for the camshaft also should be called for, since the present 'shaft is almost unbelievably mild for the engine's output.

As interesting is the newly-developed engine, the new 4-speed manual transmission to which it is hooked should receive nearly equal attention. This unit demonstrates, to enthusiast and dufer alike, just what all this "four-on-the-floor" business is about.

It is the same gearbox used with the fire-breathing 426 Ramcharger engines but with different ratios fitted. Weighing in at 120 lb., the transmission incorporates reverse gear within the main case (as opposed to the T-10's tailshaft location) and hefty gears with wide-faced teeth to accommodate the high-torque engines. Main and countershaft are separated by 3.5 in. at the centerlines. Ratios for the Dart are 3.09 first, 1.92 second, 1.40 third and 1.00:1 high.

Although first gear is somewhat lower than necessary, the transmission proved to have admirable spacing between gears for this particular installation. Up- or down-shifting was effortless, although without looseness, but decisiveness is called for on the part of the driver, and changes in engine rpm were in easy steps either way.

The Hurst-supplied shifting mechanism, virtually identical to that in last month's biggest-Dodge test car, uses a spring-loaded gate to prevent accidental engagement of reverse (3.00:1 in this application). It is quick and posi-

tive, performing faultlessly except for one movement (which may have been a matter of adjustment): The separation between first and third was too minuscule, resulting in many instances of engaging third when starting from rest.

Instead of the bent bar steel shift lever supplied with the larger engines, the Dart uses a thick, round shifting stick, angled rearward and topped with a fistful of white ball. Fore and aft movement of the lever produces quite a limited throw, which adds to the enjoyment of using this gearbox.

While a comparison of transmission ratios fails to take into consideration such factors as synchronizers and gear design, it is interesting in showing what is offered competitively. Buyers have a 4-speed choice of:

MAKE	LOW	2ND	3RD	HIGH
Dodge	2.66	1.91	1.39	1.00
Dart	3.09	1.92	1.40	1.00
Warner-Gear T-10	2.20	1.64	1.31	1.00
	2.36	1.78	1.41	1.00
	2.54	1.92	1.51	1.00
Chevrolet Muncie A	2.20	1.64	1.31	1.00
Muncie B	2.56	1.91	1.48	1.00
Ford (W-G T-10)	2.73	2.07	1.51	1.00
Ford (New Design)	2.32	1.69	1.29	1.00
Falcon (English Ford)	3.16	2.21	1.41	1.00
Corvair	3.20	2.18	1.44	1.00

The combination of 273 engine and 4-speed transmission is indeed a happy one. Those who have tried this transmission with the 6-cyl. engine are also high in praise of that combination, which makes even better sense in view of that engine's lesser power output.

A 9.5-in. dry-plate clutch with an effective plate pressure of 1425 lb.

connected the engine and transmission in the test car. This unit has a new design release bearing with 25% larger balls, sealed lubricant and pressed-in liner. It was smooth in operation, requiring relatively light pressure at the pedal, and provided a positive take-up of power without slipping or grabbing.

Chassis changes have been made to accommodate the increased torque forces and weight changes of the V-8 installation. Front torsion bars, still 34.8 in. long, have been increased in diameter by 0.02 in. to 0.85 in. to maintain the 90 lb./in. spring rate which the Dart has had in the past. Rear semi-elliptic springs have an additional half-leaf added to the normal 4 (but 6 for wagons) and larger diameter eyes at each end. Spring rates at the rear wheels remain 120 lb./in., somewhat firmer than most domestic cars of this class. Shock absorbers have been re-calibrated, to settings roughly equivalent to heavy duty units for the Six. These changes are made for every Dart ordered with the V-8 engine (which adds a total of some \$100 to the base price).

Unfortunately, the test convertible did not have these modifications, but merely had undergone a factory engine-swap so that the test could appear at about the same time the cars reached the showrooms. Nor did the test car have the 7.00 tires which are standard with the V-8 change, retaining instead the 6.50-13s with which the Sixes are shod. The handling and roadability qualities of the production

DART GT V-8

V-8, then, cannot be accurately evaluated here even though a few observations can be made.

Should a Dart owner replace his Six with the 273 V-8, he would find that the handling was only mildly affected. His car, like our test car, would be a bit too weak in shock damping and he would experience a bit of suspension bottoming in bounding over pot-holed roads. There would be a somewhat more noticeable nose-heaviness, largely because the standard Dart Six doesn't exhibit an appreciable amount of it. The degree of change, of course, would depend in large measure on the body style of his car—our convertible seemed almost pleasant because of the

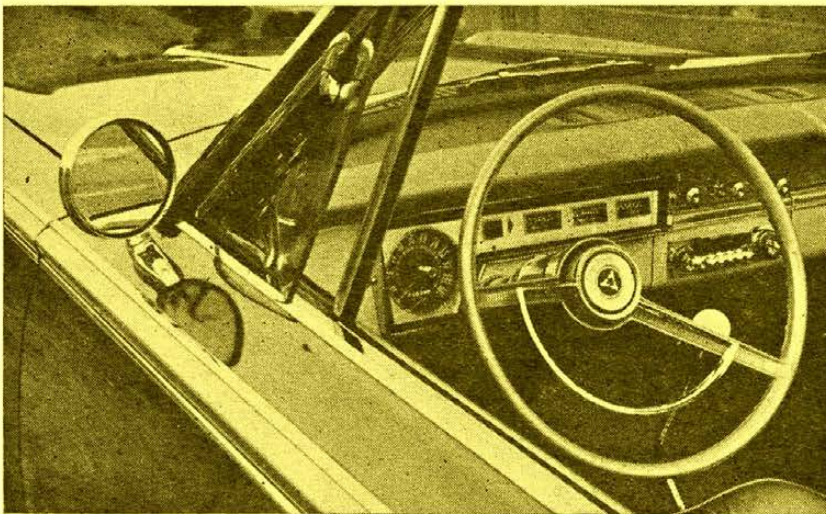
heavier curb weight and better distribution thereof.

The Dart has always had impeccable road manners anyway and, in view of the V-8's addition of only 55 lb., it is reasonable to expect the car to continue these characteristics with the production modifications specified. Dodge does not use an anti-roll bar, which would be about the only addition an owner might want to make on the car.

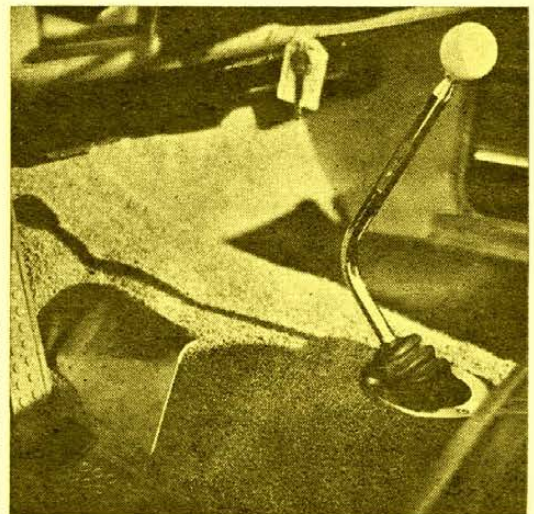
There is, somewhat sadly, one area which Dodge engineers neglected. That is the brakes, unchanged from those on the Six. The 9-in. composite drums, 2.5 in. wide in front and 2.0 in. behind, are barely up to the strains of modern day usage. Maximum deceler-

ation on the test car registered between 18 and 21 ft./sec./sec., about average for domestic cars, and showed signs of fading. In addition, the rear wheels had a tendency to lock up, although this might be less of a problem with the stiffened rear suspension and larger tread patch of production V-8's 7.00-13 tires. The car is such a well-balanced design in so many other respects that it is all the more pity that the best available brakes aren't used to complete the picture. The gross effective 153.5 sq. in. of lining would appear to be none too much.

Standard rear axle ratio with the V-8 is 2.93:1, and our test car was quite at home whizzing down the highway. Steady speeds at the high side of the dial were effortless, even though the 225 has never exhibited any less agility around the upper legal limits. The 273 does have many additional rpm in hand, however, where the Six would be closer to its peak. Cruising



SCOTT MALCOLM PHOTOS



DELIGHTFUL DART convertible has easily removable top and interior accommodations to please most any driver. Sturdy shift lever connects Hurst linkage to 4-speed transmission.



speeds returned 17.8 mpg regularly.

Directional stability was never a problem except for one instance of strong, gusty, mountain crosswinds which would have made a Sherman tank somewhat skitterish. Dodge's power-assist steering is precise and permits positive positioning on any line selected through bends, but doesn't have enough road feel to avoid that completely "dead" wheel feeling. There was a tendency, too, for the assist to lag behind muscle effort at the wheel at idle rpm, perhaps related in some manner to the increased weight on the front wheels.

Seating position in the GT model's bucket seats is quite good, with the cushions placed a compromise 8.4 in. off the floor. Both the cushions and the back can be tailored a bit for the fussy driver by the simple expedient of taking a crescent wrench to the underside mountings. Only the steering wheel's skinny rim causes a discordant,

out-of-character note even though it was well placed for the straight arm style of most of our drivers. In the rear, knee and foot room was adequate if not overly generous but most passengers tended to be conscious of the convertible top bow bending overhead like a lurking rollbar.

In common with its big brother tested last month, the Dart imparts a masculine image to the driver—from the angular bright metal wear plate protecting the rug over the transmission tunnel beside the accelerator to the throttle lever-type door handles, it had a subtle feeling of leather and tweed. Yet, not too unsurprisingly, the womenfolk around the office liked it because it was "chic." The lean, lithe lines were little changed this year, although we must add that we disliked the added exterior gingerbread which the stylists had fastened about to distinguish '64 from '63.

There is a temptation to conclude

that Dodge doesn't build a boring or bland vehicle. During the past 18 months, *Car Life* has lived with several Dodges—from Polaras and Darts to Challengers and Safari Wagons—and each time it has been a pleasantly memorable experience. Even our long-term road test Polara, as slanted for the utilitarian market as any, was enjoyable for its responsiveness and handling ease.

Yet, as tempting as such a conclusion might be, it must be borne in mind that the cars we prefer to test are those which actually are interesting to the enthusiast reader. And the Dart GT V-8 is just that. It is a responsive, nimble and enjoyable machine, with a throaty song of power extending through four octaves of smooth gearbox modulation. Given a 4-barrel carburetor and a hotter camshaft grind, it might even play "The Star Spangled Banner" with the keyboard automatic at the weekend drag meet. ■

CAR LIFE ROAD TEST



1964 DODGE Dart GT V-8

SPECIFICATIONS

List price.....	\$2667
Price, as tested.....	3343
Curb weight, lb.....	3150
Test weight.....	3460
distribution, %.....	58/42
Tire size.....	6.50-13
Tire capacity, lb @ 24 psi.....	3600
Brake swept area.....	254.5
Engine type.....	V-8, ohv
Bore & stroke.....	3.63 x 3.31
Displacement, cu. in.....	273.5
Compression ratio.....	8.8
Carburetion.....	1 x 2
Bhp @ rpm.....	180 @ 4200
equivalent mph.....	102
Torque, lb-ft.....	260 @ 1600
equivalent mph.....	39

EXTRA-COST OPTIONS

Synchromesh 4-speed trans., wsw tires, w.s. washers, radio, tinted windshield, outside mirror, power steering.

DIMENSIONS

Wheelbase, in.....	111.0
Tread, f & r.....	55.9/55.6
Overall length, in.....	196.3
width.....	69.8
height.....	54.0
equivalent vol., cu. ft.....	420
Frontal area, sq. ft.....	21.0
Ground clearance, in.....	5.8
Steering ratio, o/a.....	18.8
turns, lock to lock.....	3.5
turning circle, ft.....	38.6
Hip room, front.....	2 x 22
Hip room, rear.....	46.4
Pedal to seat back, max.....	42.0
Floor to ground.....	12.7
Luggage vol., cu. ft.....	17.3
Fuel tank capacity, gal.....	18.0

GEAR RATIOS

4th (1.00) overall.....	2.93
3rd (1.40).....	4.10
2nd (1.92).....	5.62
1st (3.09).....	9.05

PERFORMANCE

Top speed (4200), mph.....	102
Shifts, @ mph (manual).....	
3rd (4300).....	74
2nd (4300).....	54
1st (4300).....	34

ACCELERATION

0-30 mph, sec.....	3.3
0-40.....	5.5
0-50.....	8.2
0-60.....	12.1
0-70.....	16.4
0-80.....	21.6
0-90.....	28.2
Standing 1/4 mile, sec.....	17.5
speed at end, mph.....	72

FUEL CONSUMPTION

Normal range, mpg.....	16-19
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SPEEDOMETER ERROR

30 mph, actual.....	30.0
60 mph.....	57.3
90 mph.....	82.6

CALCULATED DATA

Lb/hp (test wt).....	19.4
Cu ft/ton mile.....	114
Mph/1000 rpm.....	24.1
Engine revs./mile.....	2490
Piston travel, ft./mile.....	1375
Car Life wear index.....	34.2

PULLING POWER

70 mph (3rd), max. gradient, %.....	14.8
50..... (2nd).....	21.0
30..... (1st).....	37.5
Total drag at 60 mph, lb.....	134

