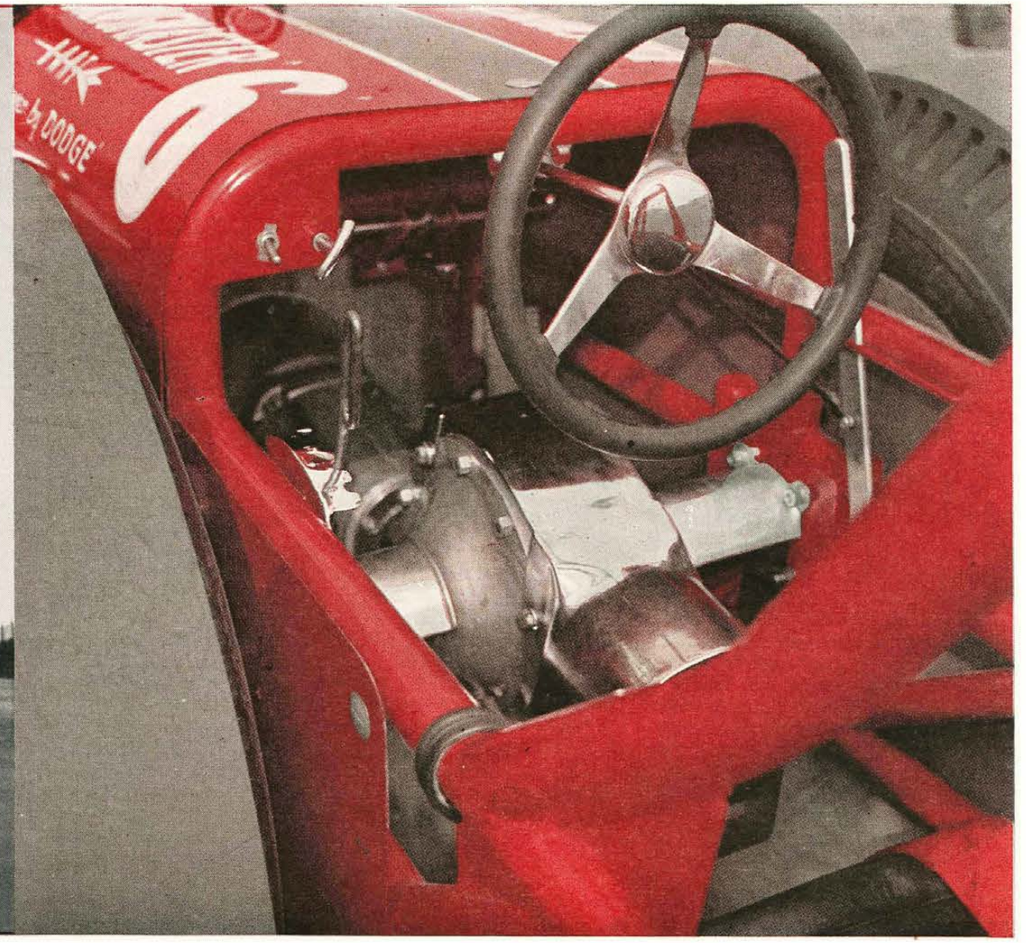
BY GORDON H. JENNINGS

EXPERIMENT FOR FUN

MULTIPLIED POWER of the TorqueFlite Dart causes a slight front wheel lift as car surges off the starting line.



COCKPIT CONTROLS are: shift quadrant, on/off switch, fuel shutoff, throttle, steering wheel and brake.

why not automatic transmissions for dragsters, too?

AUTOMATIC TRANSMISSIONS, the darlings of the indifferent and/or inept, were invented for the driver who did not really want to drive, and was willing to pay the price of shiftlessness. That price was, in the early development of the automatic, quite high. Not only was there the initial cost, but also the constant expense of poor fuel economy. And, beyond this, there was the considerable loss in performance that seemed unavoidable with an automatic transmission.

Today, the entire picture has changed: operating efficiency has been improved so much that the better automatics are nearly on an equal footing with manual-shift transmissions. This has closed the gap in fuel economy and more important, from our viewpoint, it has made the automatic an attractive item for pure performance. In fact, we sometimes wonder why anyone bothers with the old cog-boxes; the automatic-equipped car is much more pleasant to drive and the result sheets for the past year's stock-sedan drag races will show that, if anything, the automatics now have a slight edge in performance.

All of this being true, as it is, one might logically ask why no serious attempt has been made to use an automatic transmission in a rail-type dragster? Actually, this idea has been kicked around a lot, but always argued down on the grounds that an automatic was too heavy, would absorb too much power and would be altogether too likely to blow up in a spray of hot oil under the load and high-rate twirling coming from a highly modified engine. And no one could see any way of coming off the starting line with the engine turning fast enough to get the job done; a torque converter would hold the on-line engine speed down to not much more than 2000 rpm, at best, and any engine that will pull strongly at 2000 rpm certainly isn't going to have much on the upper end. With competition as fierce as it is, a great "banzai!" leap from the chute is an absolute necessity and the automatic did not look too good from that angle. Also, there was the fact that the Class A dragsters did not really need a transmission and that the Class B and C machines were doing very well with 2-speed manual transmissions. The consensus seemed to be that an automatic might work, but that it would offer no advantage even if it did and was, therefore, just not worth the trouble.

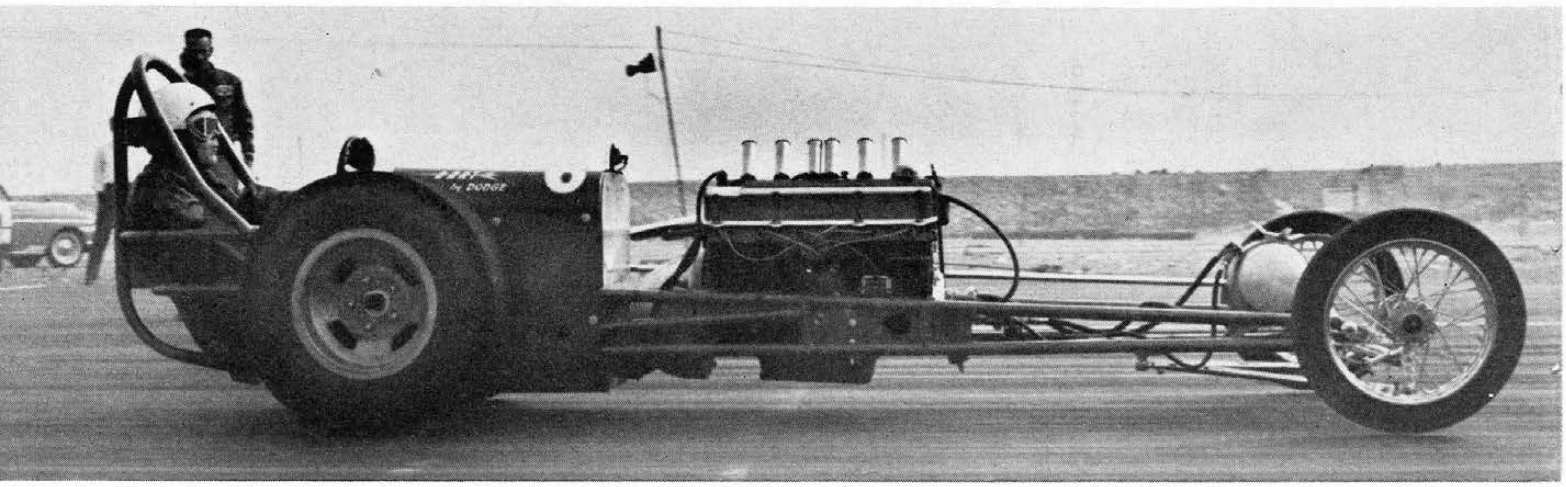
This conclusion, however logically arrived at, just may be entirely wrong. The crew at Dragmaster has been rummaging around in its Mopar parts bin again (the same bin that yielded the parts for the remarkably successful Dragmaster Dart) and has come up with an experimental dragster, the TorqueFlite Dart. Actually, the car has been in existence for some months, but has been run with a 2-speed manual transmission. In a way, this is most fortunate, for little has been changed apart from the transmissions, and it is possible to make some interesting comparisons.

The car was originally built to prove that the little (225 cu. in.) Slant-Six Dodge engine would run with V-8s in the same class and, in that respect, it has done very well. As was true of the Dodge V-8 engine used in the Dragmaster Dart, the Slant-Six engine was actually very lightly modified. Dodge's stock crankshaft has once again proven adequate at much higher than designed-for loads, and standard bearings are used at both rods and mains. Initially, there was a problem with the connecting-rod bearings failing at high crank speeds, but this was quickly found and cured. Oil starvation was the culprit: the rod bearings are fed from the mains, as is standard practice, and only the upper half of the main bearing has an oil groove, so that oil was being pumped through the feed-holes to the rods only half of the time, also standard practice.

At the crank speeds attained by the modified Six, the oil is thrown from the rod journals faster than it is being supplied, so that the bearings were running dry at the very time when more, and not less, oil is needed. The cure was simple: a groove, the same width as the bearing oil-groove and a few thousandths deep, was ground in the main journal. Oil, under pressure, is fed into this groove and because the groove connects with the oil-feed hole, the rods get full-time lubrication. Given this additional lubrication, the Slant-Six becomes a perfectly reliable 7000-rpm engine, even though, in the 225-cu. in. version, the stroke is a longish 4.125 in. Other than grooving the main journals, the only significant modification in the engine's lower end is in the rods, which have had their I-beam shanks boxed in with welded-on chrome-moly plates.

Good power output was achieved with very little more effort than went into insuring reliability. The ports were cleaned up and polished, but enlarged only slightly as there isn't enough surplus metal in the cylinder head to permit much carving. Oversize valves, borrowed from a 1955 Chevrolet, are used. The installation of these valves, which have a slightly smaller stem diameter than those in the Dodge, required that the cast-in stock guides be bored considerably oversize and Chevrolet guides pressed in.

The valve gear, operated by one of ▶



OFF AND RUNNING, the Slant Six TorqueFlite Dart turned in a best run of 10.5 sec. e.t. and 127 mph.

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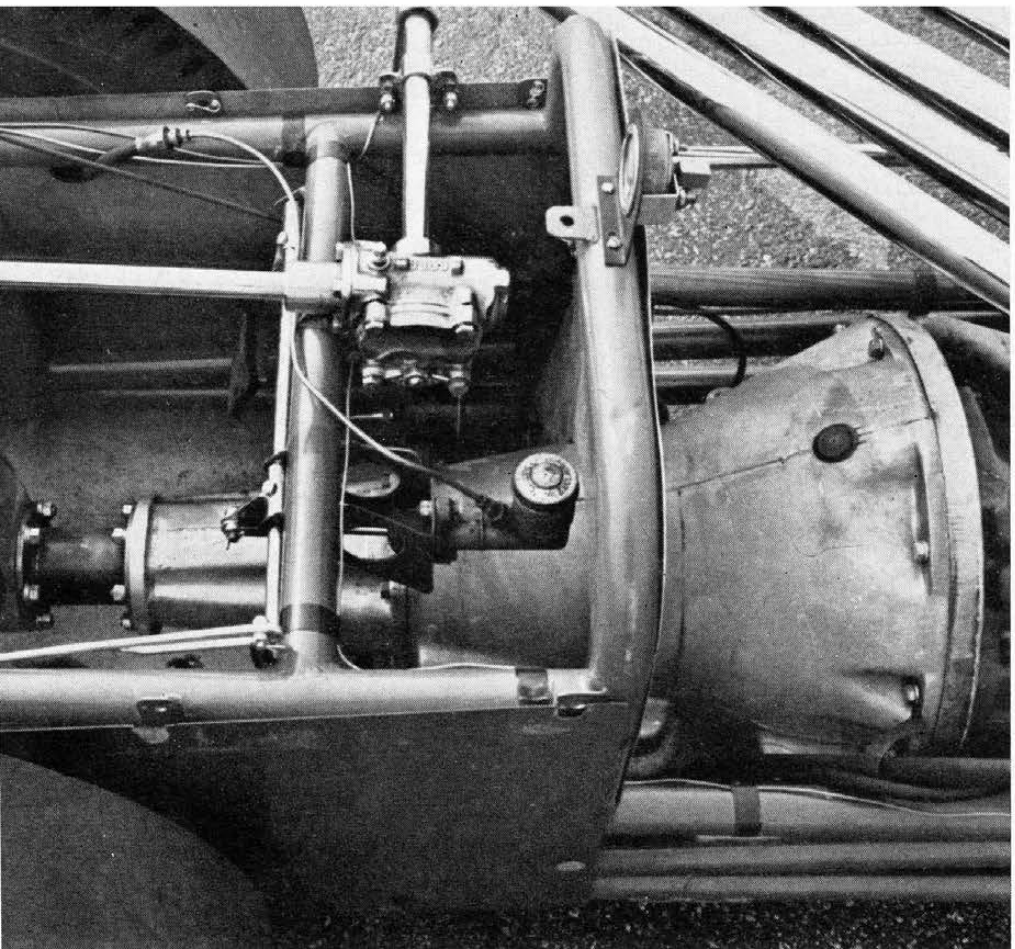
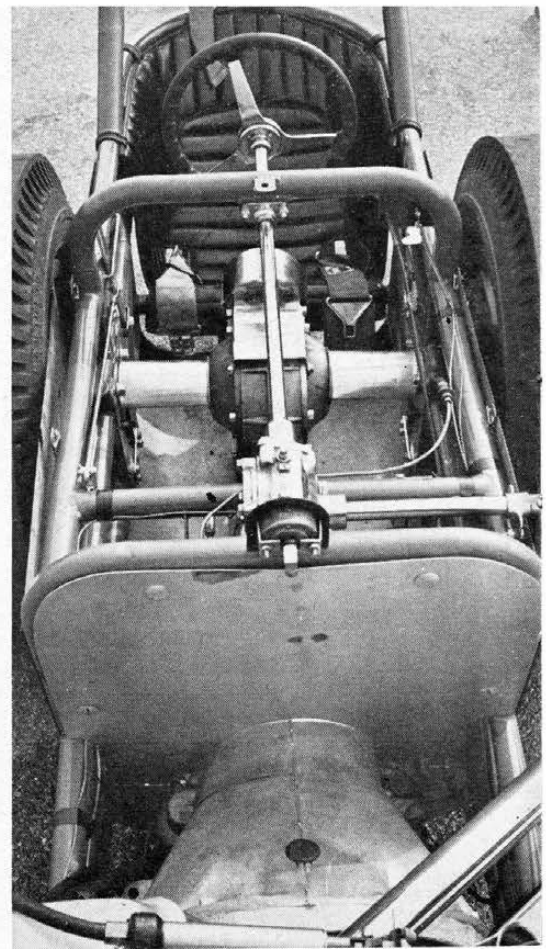
Iskenderian's 505-A flat-tappet cams, is fairly standard. Stock tappets are used, in conjunction with pushrods from Dodge's Hyperpack, for the 225 engine. Valve retainer washers, of the light-alloy type, are also Isky's, as are the inner valve springs. The outer coils are from the big Dodge V-8. Standard rocker-arms, which are a bit long and heavy but very strong, have thus far proven satisfactory, but may be, in part, responsible for the valve-crash that occurs at about 7500 rpm. Perhaps this valve-crash is a good thing; the piston speed at 7500 rpm is a staggering 5160 ft./min., which would be high even in a custom-built racing engine and that is asking a lot of even Dodge's sturdy Slant-Six.

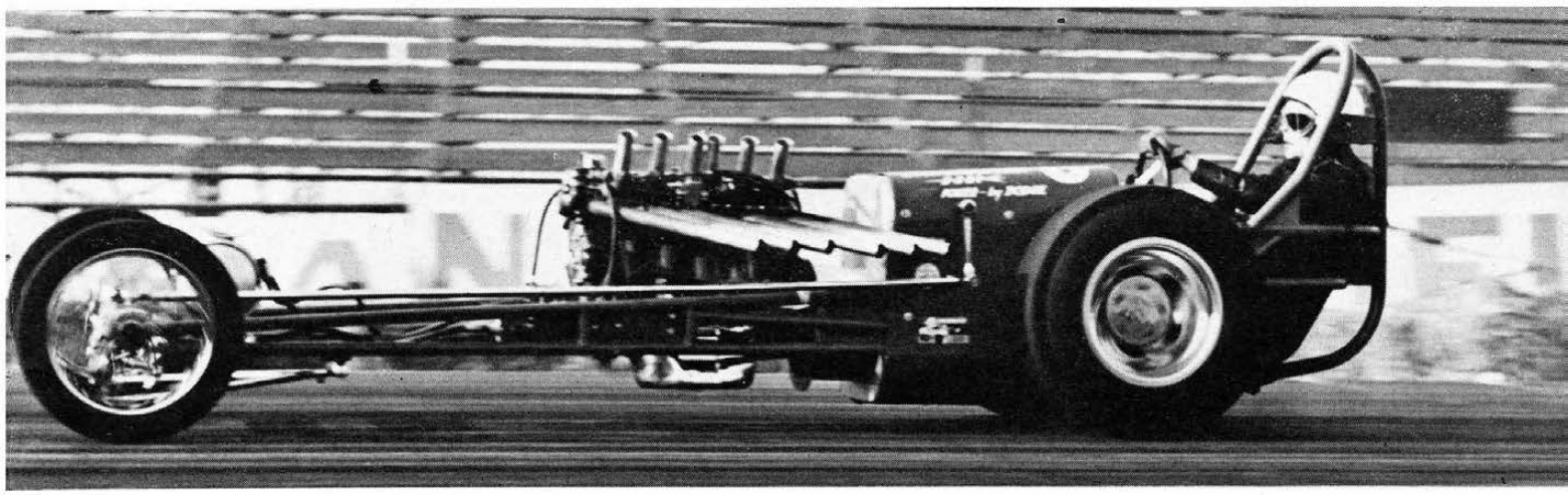
Mixture for the engine is supplied by a Hilborn fuel injection system. The injection pump is driven from the forward end of the camshaft, being mounted on a plate welded to the timing chain cover. The long throttle body, which houses the injector nozzles, throttle valves and carries the intake trumpets, is made up of reworked pieces from a setup originally intended for a Maserati. To make room for the exhaust pipes, which are on the same side of the head as the intake, a 12-port, plate-type manifold has been made to carry all the plumbing. The intake has short, up-curled stubs that terminate in yet another manifold plate—which carries the throttle body. The exhaust goes straight out underneath. It looks a trifle strange, but it works very well and one can't argue with results.

The engine is mounted in one of Dragmaster's justifiably well-known

AUTOMATIC TRANSMISSION installation was achieved with a minimum of special work. Transmission is heavy-duty Ramcharger unit.







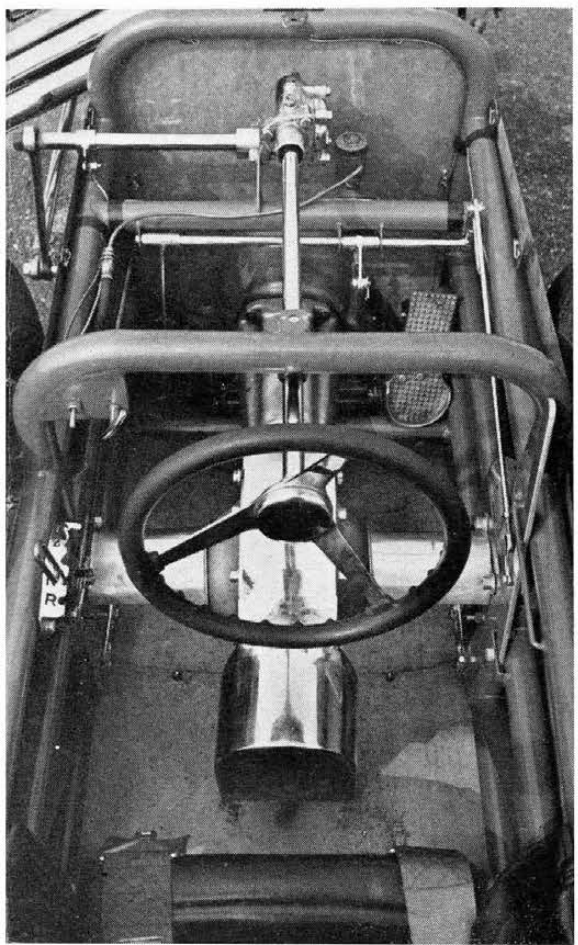
BEST STARTS were made by turning engine 6000 rpm, nudging shift lever into the "Drive" notch.

Dart chassis, (see road test and analysis, September CL). The frame is multi-tubular and has gusseting around the engine mounts, suspension and rear axle attaching points. The front axle is located by a wishbone, which has its point fixed to an X-brace under the frame, and by the torsion-bar links. Small friction-type dampers hold the axle tightly enough so that it does not patter too severely; the heavy-spoked motorcycle wheels carried on the front axle have no brakes, so it does not really matter if they bounce about a little. The rear wheels have a single, double-spot disc brake. This unit is actually mounted inside the left wheel, but acts through the one-piece, tubular axle to apply stopping power at both wheels. The brake is sufficiently powerful to dispense with the need for a parachute.

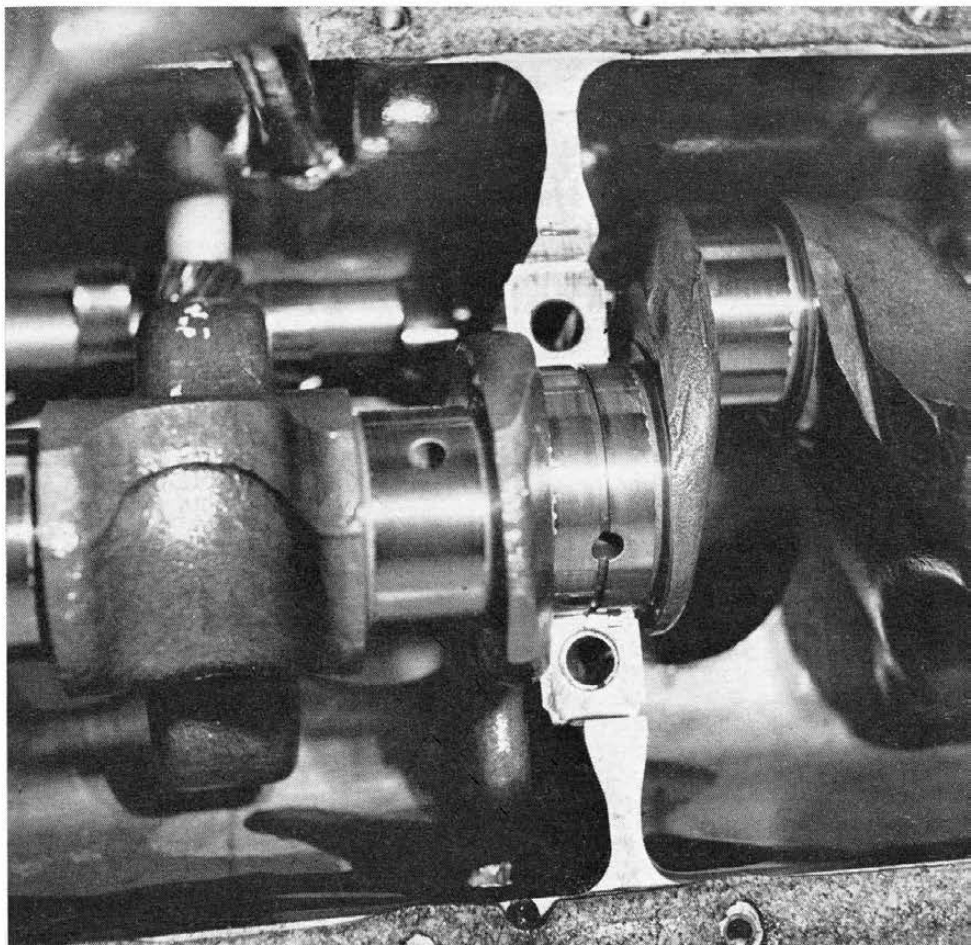
No special effort has been made to save weight with the Slant-Six Dart. Although usually labeled for C/Dragster competition, the true classification is a matter for conjecture, as the National Hot Rod Association competition rules can also be read to mean that the car belongs in Class D. The Dragmaster crew did not concern itself too much with the rules; it simply wanted to show that Dodge's little Six could be made to run fast. Anyway, between the ambiguity of the rules and the unusual nature of the car, strip operators never know quite where to put it. If the rule book's more favorable interpretation is followed, the Slant-Six Dart goes into Class D, where it usually confounds the strip operators by trouncing not only the Class D cars, but most (and sometimes all) of the C/Dragsters as well. In fact, the car, equipped with its original 2-speed manual transmission, holds a couple of strip records for C/Dragsters.

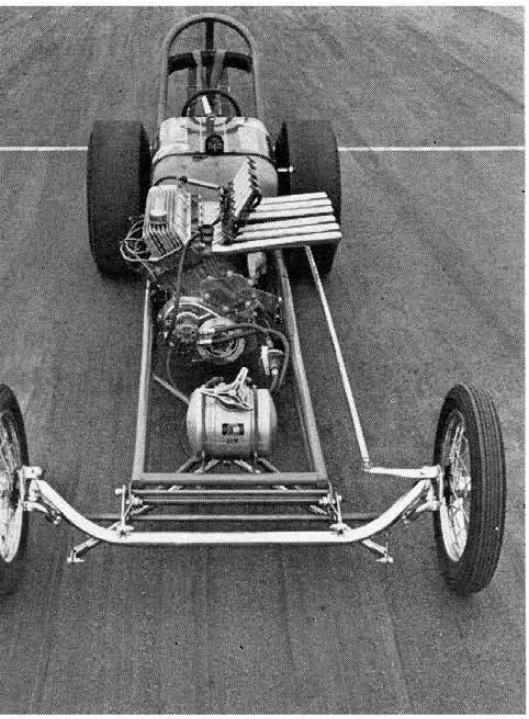
Although a few especially good runs produced elapsed times of less than 11 sec. (10.70 e.t. and 126 mph on a ▶

SPARTAN COCKPIT has adequate room for driver.

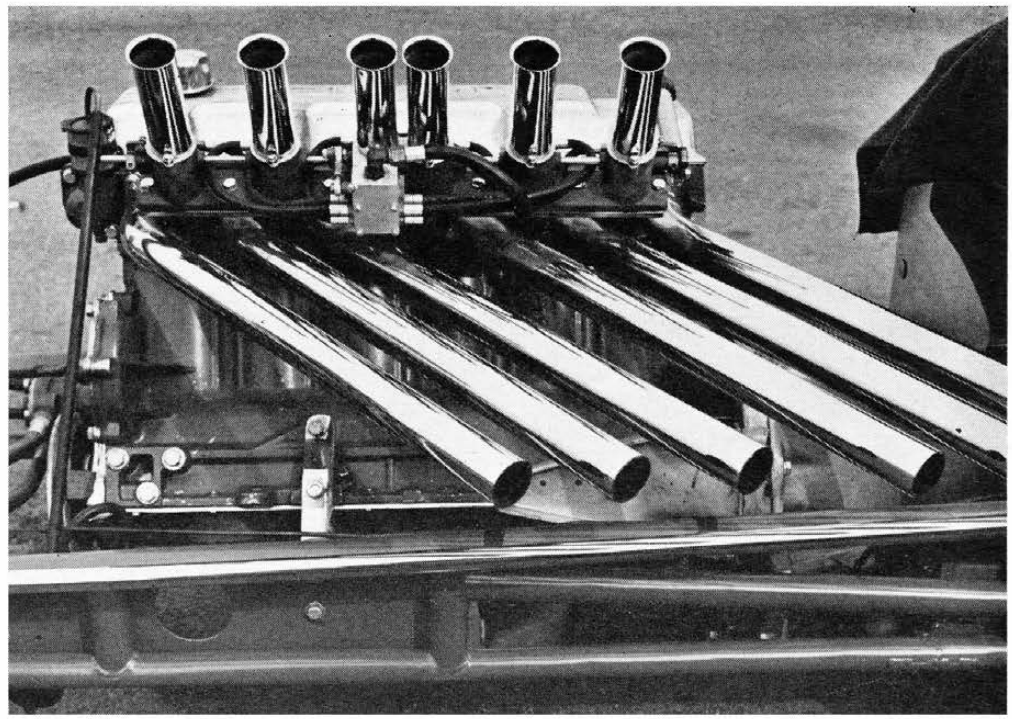


MAIN BEARING journal grooves improve oil flow—the only change to the stock crankshaft!





STACKS ADD more slants to Six.



INJECTOR BODIES mount on a stub-manifold which bolts to the 12-port head.

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good day at the Lions Associated Drag Strip in Long Beach, Calif., and an absolute best run of 10.64), most of the runs made with the car were fractionally over the 11-sec. mark, with terminal speeds of 122-124 mph.

With such a small engine, running a cam that brings in the power at a fairly high speed, it was not too easy to get a good, clean run with the car. It was necessary to kick the engine wide open and then drop the clutch very hard, which would bounce the front wheels up in the air and set the rear wheels spinning. As long as the wheels could be kept smoking until the car was off the line and moving nicely, the run would be good; let the tires bite hard just once and it would pull the engine down and the e.t. would go up drastically. Another thing that added to the e.t. was the shift into top gear: if this was hurried, the engagement dogs would sometimes burr and the transmission would refuse to go into high. This meant, in effect, that unless a lot of spare parts and human labor were available between runs, all of those shifts had to be made carefully—and not too fast.

With a pattern of performance established, the decision was made to change to an automatic transmission (a decision that may have been influenced by the shifting problems with the manual box). Out of the Mopar bin came one of Dodge's Ramcharger TorqueFlite transmissions, a unit that has demonstrated, time and again, that it has what is required for drag racing. The TorqueFlite has three geared multiplications; 1.00, 1.45 and 2.45:1, with a maximum torque multiplication of 2.2:1 with the converter at "stall." An aluminum-alloy casing is used for this transmission so the total weight is only 170 lb.

In the Ramcharger version of the TorqueFlite transmission, full-throttle automatic shifts occur at 5600 rpm and this was not altered in the dragster transmission. Clearances in the torque converter were opened somewhat, in an attempt to get the stall speed up a bit, but experience with the TorqueFlite has shown that too much of this will cause excessive slip at all speeds and a very high rate of heat buildup—which has, in one early experimentally modified transmission, literally melted the internals. Accordingly, transmission changes are made very cautiously; the TorqueFlite has been efficient and reliable in Super/Stock racing so there was little point in hacking about inside a transmission that was already doing the job. In any case, the TorqueFlite is completely controllable and the driver can shift at any engine speed that takes his fancy. He may, by getting carried away, break his engine, but the transmission will take almost anything, as the automatic dragster has proved.

Installation of the automatic presented no special problems. The TorqueFlite transmission is neither heavy nor bulky so it dropped very neatly into the space that had been occupied by the manual box. The transmission was coupled to the Halibrand quick-change drive unit by trimming off part of the tail-shaft and its housing and the tail-shaft was connected to the final drive through a splined sleeve coupling. A large piece of aluminum plate was welded to what was left of the shortened tail-shaft housing and this was bored to take the tail-shaft steady bearing. Also, it carries six studs for the flanged end of the short housing that actually links the transmission and rear end.

The control hookup was also quite uncomplicated. The box of machinery that sorts out messages at the push-buttons and sends signals to the transmission was discarded as being too bulky for the dragster. Substituted was a simple lever and notched quadrant, which push/pull a control cable leading down to the transmission. Another control links the throttle to the transmission's oil-pressure regulator. Basically, the whole rig works exactly like any automatic-shift Dodge. The driver can just poke it into drive and go, or he can shift it manually (but with the lever, not push-buttons). Even reverse is operative and it really staggers onlookers to see this dragster maneuvering around the pits, trundling smoothly along among the cars and trailers, and even backing up when the occasion demands. Given a

self-starter (which could easily be provided) and a radiator, the TorqueFlite Dart might actually be used for transportation around town.

Originally, it was supposed that the automatic dragster would be driven in the same manner as an automatic stocker: brought up to the line, held with the brake on and the engine speed brought up to load the drive until time to go, after which the brake would be released and the throttle banged open. It was a good theory, but it didn't work out in exactly that way. The Hilborn "lawn-sprinkler" injection system has its flow regulated, in large measure, by the throttle, and wide-open (or anything near it) throttle with the engine loaded down to 2000 rpm by the torque converter was too much. The mixture was so rich that great clots of soot would fly from the pipes, and acceleration for the first few feet off the line, before the engine could pick up speed and clear itself, was decidedly slow. That was at the automatic-equipped car's first running. The following week, we met with the Dragmaster crew, headed by none other than the old campaigner, Jim Nelson, to try the car ourselves.

The shortcomings of the conventional approach had already been demonstrated and the necessity for finding a better method of getting away from the line was obvious. After some discussion and a couple of abortive attempts to jump out of the hole from an idle, we decided to try blipping the engine to clear it, and then simply trip it into "drive" with the engine at about 3000 rpm. Nothing like this had been tried before, but the car was light and the TorqueFlite transmission very, very strong, so we reasoned that the scheme had at least a 50/50 chance of working.

Work it certainly did. The first run was clean, and fast, with an e.t. of 11.4-sec. and a terminal speed of 123 mph. Subsequent runs were made, using more throttle on the line, until we were dropping it into drive at about 6000 rpm. The technique is simple: crank it up tight, and then simultaneously nudge the lever into drive and shove the throttle full-on. The transmission promptly whacks into low and the wheels begin to spin, lifting the front wheels a few inches from the strip surface and holding them there for the first 15-or-so feet. Upon reaching 5600 rpm in low, the transmission bangs into 2nd and the front wheels float some more. Another 5600 rpm in 2nd and it surges into high, engine churning strongly and the car striving forward. A few of these runs demonstrated that it was no trick at all to get runs well under 11 sec. and up to 125 mph; we got a best run of 10.5 sec. and 127 mph. And, all of this was done without touching the shift-lever after leaving the line. You just sit there and steer, and it is the nicest, smoothest ride you are ever likely to get out of a dragster.

A lot of work remains to be done. The transmission would benefit from the addition of the latest factory-developed modifications for Super/Stocks, and the engine also obviously has room for improvement. We would not be at all surprised to see the car running the ¼-mile in well under 10-sec. and reaching 135 or even 140 mph down at the end. The inherent mechanical strength is there and so is the potential performance. And it seems very likely that the car may set a new trend in small-engined dragsters; once the competition has seen that automatic come hurtling off the starting line and down the strip, it is going to begin to think thoughts that may cause the manual shift transmission virtually to disappear from the drag strips. As long as there are automatics like the TorqueFlite with the capability of out-performing the manuals there can be little doubt but that the future high-performance car is going to be shiftless. Stick-shift artists may not like it, but progress is progress and will not be denied. ■