# Rodders Test GOLDEN HAWK

# HOT ROD

The Automotive "HOW-

**Beginning:**

**BUILDING a FLATHEAD the RIGHT way**

*by Don Francisco*

APRIL 1956 25c

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# HIGH-FLYING HAWK


BY RACER BROWN

Golden Hawk" is the name applied to the Studebaker-Packard Corporation's 1956 high-powered "sports type" passenger car. The name and the components that make up performance factors were obviously chosen in an attempt to clip the tail feathers off a few other high-flying but ground-bound "birds."

The entire "Hawk" line, which includes four engine options, can best be described as controversial when speaking of appearance. Either you like 'em or you don't. Judging from the number of strangers who asked questions, looked, stooped, squinted, gave advice, etc., the vast majority voiced approval of the styling. But even if the lines do nothing for you, there are a few practical advantages of the long, low design.

Our test car had the same basic 352 cubic inch (4 inch bore, 3½ inch stroke) overhead valve V8 engine that powered last year's Packards. It was also equipped with power steering, deluxe heater-defroster, signal-seeking radio, power-operated windows and seats and Packard's Ultramatic torque converter type automatic transmission. The engine is rated at 275 brake horsepower at 4600 rpm and 380 pounds-feet of torque at 2800 rpm. Wheelbase is 120½ inches and overall length is 203 13/16 inches with 34 7/8 inches of overhang at the front. Inside, five people could be seated with three in front and two in back, but because of the low seat and rather large hump over the transmission, two in front could be accommodated more comfortably for long distances.

The idea of a relatively small car with ample passenger space, powered by a large displacement, high-output engine is a good one. Hence, the "Golden Hawk" should be able to out-perform other cars with equal passenger space. With the low center-of-gravity and with fairly large brakes, overall roadability should be good. But what happens to the handling characteristics when an engine-transmission combination that tips the scales at well over 900 pounds, is installed in a relatively light chassis? In the opinion of a necessarily nameless but honest Studebaker engineer, the handling of the "Golden Hawk" took a turn for the worse as compared to others in the "Hawk" line. That same opinion was expressed by others who also felt that the extra weight of the Packard engine and transmission, being primarily over the front wheels, would result in a grossly exaggerated and unfavorable front-to-rear weight distribution, which would make driving the car a delicate and risky job under any condition other than in a straight line. Read on and see how our findings dispel these rather premature opinions.

In the first place, the "Golden Hawk" is no heap of feathers. Our test car, which was a production model, weighed 3740 pounds with a full tank of fuel but without driver or passengers. Of this, 2200 pounds or 59 per cent of the total weight was on the front wheels and 1540 pounds or 41 per cent was on the rear wheels. These figures are entirely compatible with present-day passenger car practice and should serve to dispel the doubts of anyone who believes that the

"Golden Hawk" is any more "nose heavy" than other makes.

Our test car had 2030 miles on the odometer when we received it, so we drove it around a few days, for an additional 500 miles to help with the "loosening up" campaign. Then we took it to Paxton Products Division of McCulloch Motors Corporation in Inglewood, for a blast on their 300 horsepower Clayton chassis dynamometer. Maximum road horsepower was 132 at 3300 rpm, equivalent to 84 mph in high gear. This may seem quite low for the 352 cubic incher, but remember that advertised values are established by a bare engine at the flywheel, which is a far cry from an engine burdened with a fan, air cleaner, charging generator, power steering pump, mufflers and tailpipes and with the power routed through a fluid coupling and torque converter. Frankly, we expected a bit more from the engine but upon investigation, we found that the fuel/air mixture ratio was too lean for the extraction of maximum power. Had we corrected the mixture and thrown in a fresh set of spark plugs, maximum road horsepower would have been closer to 150. Power output at lower speeds left little doubt that all those cubic inches were working in the best interests of good acceleration. This confirmed our earlier impressions that, from a standing start, the "Golden Hawk" would be hard to beat, even with the Ultramatic.

We were able to further explore the car's acceleration qualities by attending the new Long Beach drag strip. After several runs through the level standing quarter-mile course, the average speed at the end of the quarter was 79.8 mph and the average elapsed time was 17.5 seconds. Fortunately, a fellow with an overdrive-equipped "Golden Hawk" was present and we were able to compare his times against ours. By locking out the overdrive and using all three forward speeds, he was consistently able to turn better than 83 mph, about one mph short of the strip's class record. His average elapsed time was correspondingly better than ours, being 16.8 seconds. As it happened, it was our friend's first try with his new "Hawk" and he, too, was plagued with a lean mixture condition that caused the engine to "flatten out" in the higher speed ranges. If it hadn't been for this, the strip record for the class may well have been broken.

In order for us to obtain the best acceleration times from our "Golden Hawk," it was first necessary for us to do a bit of experimenting with the Ultramatic. This unit is slightly different in operation from other torque converters; in the "Golden Hawk," the transmission is manually controlled by a conventional

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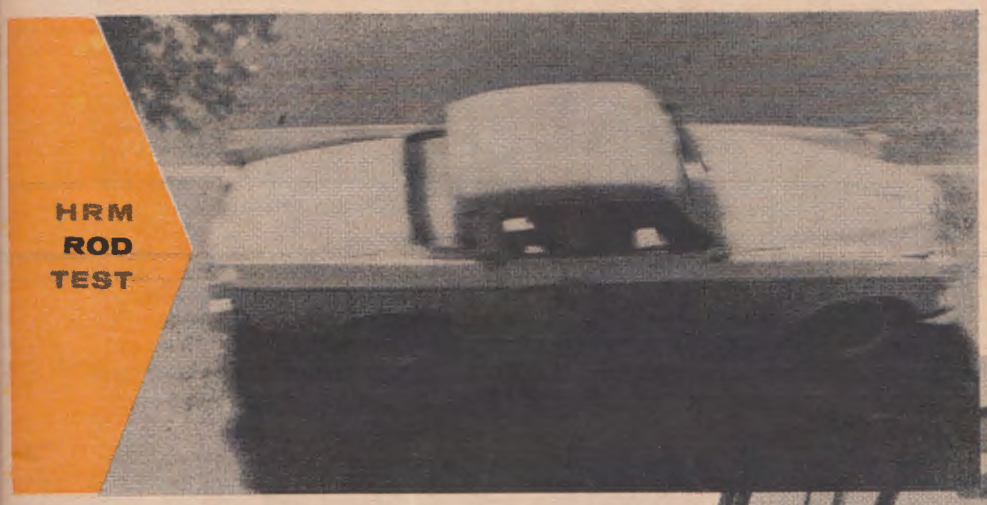
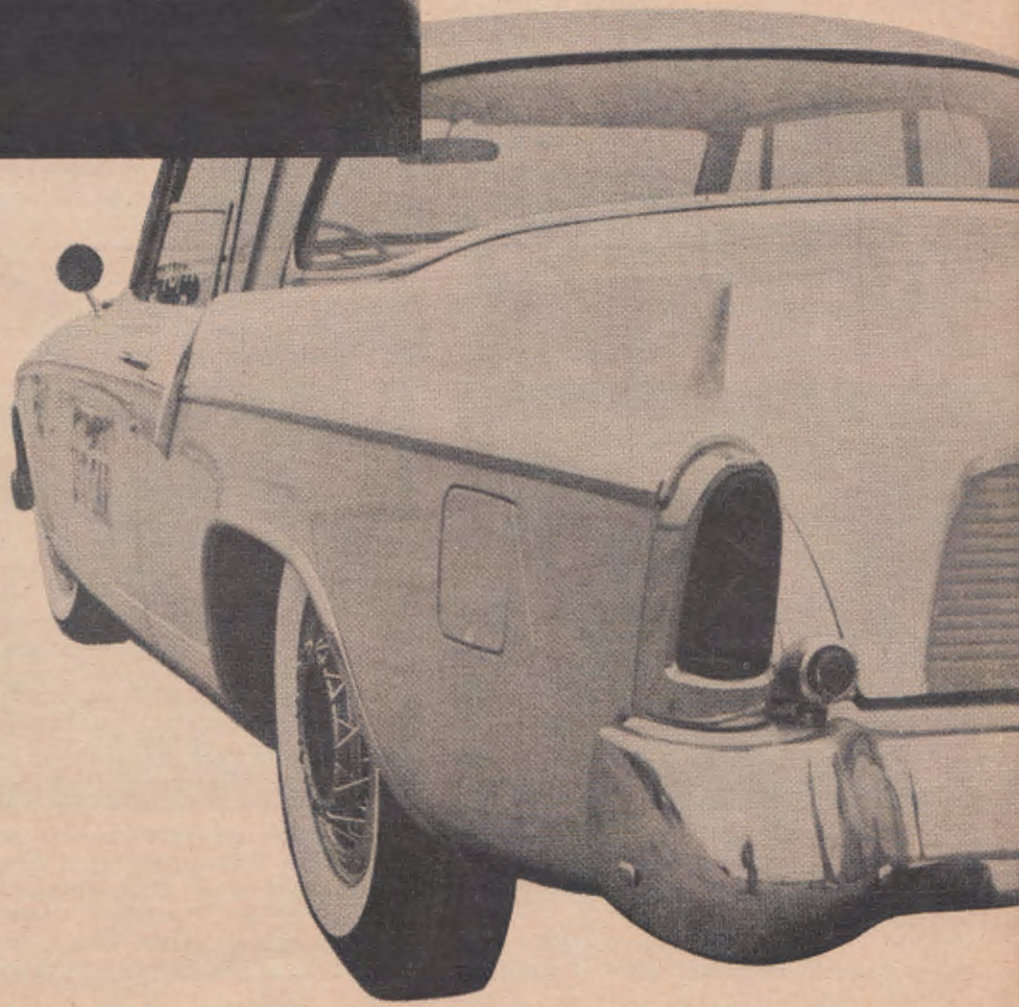
HRM ROD TEST



*FAR LEFT.* ***Test*** *crew pauses above cloud level on way* ***to*** *Mt. Wilson summit.*

*CENTER.* ***"At speed"*** *on the curvaceous roads, "Golden Hawk" proved quite agile.*

*BELOW. Most everyone approved of the "Hawk" styling, even to fiberglass rear fins.*



*Even on the most vicious turns, the Studie stayed stuck. The most noticeable trait was the lean on left turns . . .*

steering column selector and indicator quadrant, while in the new Packards, the same torque converter is operated by means of an electrically controlled push-button panel, á la jukebox. By moving the selector to "lo" when starting, the transmission will remain in low until the selector is moved to either "low drive" or "high drive," at which time a shift to the second speed is made followed by another shift into high "lockup." When starting with the selector in "low drive," the transmission first shifts into low, then makes the above shifts into intermediate and high "lockup." In this position, the transmission is a three-speed affair with all shifts made automatically. In the "high drive" position, starts are made in intermediate followed by a single automatic shift into high "lockup."

It should be explained that the intermediate or second speed, is not an intermediate "gear" as such. Instead, it is the torque converter reduction in high, but before the "lockup" occurs. When the transmission shifts into the third speed in "low drive" or the second speed in "high drive," it mechanically "locks out" the torque converter. Consequently, the term high "lockup" means that the transmission is in direct drive with no reductions. If a full-throttle start is made in "low drive," a detent holds the transmission in low until the throttle and the detent is released, permitting normal upshifts to be made. A full-throttle start in "high drive" starts the car in intermediate, the detent and the shift to low being inoperative in this position. A downshift into low may be accomplished manually by moving the selector to the "lo" position at any speed below about 45 mph for the purpose of "compression braking." In high, the "lockup" is released at about 20 mph while decelerating, which provides a good degree of "compression braking" in either of the "drive" positions. For passing purposes, the transmission will downshift into low when the throttle is floored at speeds of about 45 mph or less if the selector is in "low drive." In "high drive," the "lockup" is released, putting the torque converter into action when the throttle is floored below about 45 mph.

Thus, the Ultramatic is quite a versatile, if complicated, piece of machinery. For best performance in town or on the highway, "low drive" should satisfy most requirements. For "economy-run" drivers, "high drive" yields the most in miles-per-gallon while delivering adequate low speed performance. The one disadvantage found in the Ultramatic is that there is no way to hold the transmission in the intermediate speed. This feature is desirable for fairly fast mountain driving, for example, permitting a certain amount of "compression braking" when entering a turn and a good ratio with which to accelerate out of a turn.

The ratios of the Ultramatic are as follows: Low—torque converter plus 1.82 gear reduction, the same as low in "low drive"; intermediate — torque converter reduction only; high "lockup"—direct drive; reverse — torque converter plus 1.63 gear reduction. Maximum torque converter reduction ratio at stall speed is 2.9 at 1650 rpm. Rear axle gear ratio in Ultramatic equipped "Golden Hawks" is 3.07. Incidentally, automatic transmissions, under one name or another, have accounted for 90 per cent of Studebaker's passenger car production so far this year. That is, until a recent West Coast run on overdrive equipped "Hawks" wiped out the factory's supply of overdrive gearboxes, which brings up another point.

The policy-makers at Studebaker-Packard can take justifiable pride in the fact that they have more than one transmission type to offer prospective customers. In a car built primarily as a performance package with passenger space, the "Golden Hawk" needs something besides an automatic transmission to bring out its best qualities. Consequently, the rugged Packard three-speed transmission and overdrive is standard equipment on "Golden Hawks" with the Ultramatic as the only transmission option. The gearbox ratios are 2.49 in low, 1.59 in second, direct in high and the overdrive provides a .722 step-up. The standard rear axle gear ratio with the overdrive is 3.92, which results in a final drive ratio of 2.83. In conjunction with the overdrive is an 11-inch diameter Long semi-centrifugal pedal operated clutch. With either form of transmission, the remainder of the drive train consists of an open (Hotchkiss) two-piece driveshaft with a universal joint at each end and one to join the two sections and a semi-floating type rear axle assembly using hypoid final drive gears. This gearbox and the more favorable rear axle gear ratio was what spelled the difference between the speeds turned by our friend's "Golden Hawk" and our test car at the drag strip. So for once in automotive history, it's possible to have your cake and eat it too; maximum accelerative performance with the overdrive locked out, and what should be quite good fuel economy with the overdrive in operation. Also, it isn't likely that premature wear will occur in the engine by using the overdrive, because how can you "lug" a 352 cubic inch engine in a 3700 pound car?

But back to the rest of our acceleration times. By flooring the throttle and holding the brakes with the selector in either "low drive" or "lo" positions, we found that the zero to 60 mph runs could be made all the way in low without a shift. At a true 60 mph in low, the tachometer registered 4800 rpm, child's play for this engine. Our average zero to 60 mph time was 10 seconds flat. For our zero to 80 mph runs, we started in "low drive" the same as before, released the throttle at between 4800 and 5000 rpm so the shift to intermediate could be made, then buried our foot in the throttle again until a true 80 mph was reached. The average zero to 80 mph time was 17.7 seconds. After these runs, it was evident that the spark plugs had had enough of the lean fuel/air mixture condition mentioned earlier. If this had been corrected, I believe that about five or six per cent would have been lopped off the times. Twice during preliminary runs, we forgot to release the throttle in low to permit the shift to intermediate with the result that the tachometer kept climbing to 5600 rpm, at which time the hydraulic valve lifters loudly announced their retirement by "pumping up." At about 5200 rpm, there were clatterings from the valve department but this was apparently a valve spring "surge" because no "float" or "pump up" occurred until 5600 rpm was reached.

We drove the car over our usual course and in so doing, it became evident that the "Golden Hawk" possesses good (but not race car) handling qualities. The Saginaw recirculating ball type integral power steering was precise and any miscalculations in aim were very easily corrected, making directional control of the car quite simple at all times. This steering required more driver effort to turn the wheel than with other types and because of this and the 20 to 1 overall steering ratio, a very definite "feel-of-the-road" was maintained. The car was driven for a short distance with the power steering pump drive belt loosened, which permitted me-

*. . . and right turns, but this caused no difficulty in maintaining the directional stability of the car.*

chanical steering actuation and it was found that as long as the car was moving the steering wasn't excessively "heavy," but parking under this condition was a chore that required brute force. However, the standard Ross cam and twin lever mechanical steering gear has an overall ratio of 24 to 1, which is more favorable for non-power steering, but some of the response and precision of control is lost. It was our experience that the optional power steering with its "quicker" ratio is practically a "must" for the "Golden Hawk." The only fault we found was one that is common to most power steering units; a conscious effort was required to return the steering wheel to a neutral position after going through a turn. In all probability, this minor trait would vanish if the factory specified one to 2½ degrees of *negative* caster was changed to one to 1½ degrees *positive* caster. Prospective buyers had better make up their minds beforehand whether or not power steering is necessary, because it's a major (and expensive) operation to install it at a later date.

The tenacity with which our "Golden Hawk" stayed stuck to the road through the most violent road race maneuvers was considered exceptional. Only in the fastest turns did the rear end show any signs of "breaking loose," this being a simple matter to correct. Although the front end had a "heavy" feel to it in turns, it showed no tendencies to "wash out" into a slide. As long as the road surface was good, there were no ill effects, but sharp fast turns over rough roads produced a certain amount of "wallowing" in the front end. There was also a considerable amount of "body lean" in turns in spite of the relatively low center-of-gravity. This action was generated in the front end and speaks for the need of a stiffer anti-roll stabilizer. Usually, when there is a large degree of "lean," the front end isn't too responsive to steering corrections because the suspension geometry is pretty well loused up in this attitude. But with our "Golden Hawk," the "lean" had no effect on directional stability or steering responsiveness. On the straights, the Studie was a completely stable automobile, even at speeds well past the idiotic point.

The car is suspended in front by the conventional independent method of unequal length wishbones and coil springs with the direct-acting tubular Monroe or Delco shock absorbers located in the center of the springs. At the rear, a pair of fore-and-aft semi-elliptic leaf springs are used and are rigidly mounted at their front ends with compression shackles at the back. Direct-acting Monroe or Delco tubular shocks are mounted at an angle of about 30 degrees from the vertical. The front spring rate is 296 pounds per inch while the rear spring rate is 90 pounds per inch. This is definitely on the "soft" side for the weight of the car and would have accounted for very good riding qualities if the travel of both front and rear springs had been increased to prevent "bottoming" over moderate dips and bumps. The shock absorbers provided very good bump and dip control and the addition of stiffer shocks would be of questionable value.

As with other cars with a similar rear suspension layout, torque imparted to the rear axle causes the axle to rotate about its center in the opposite direction of wheel rotation, twisting the springs into most unbecoming shapes. The result is that the rear axle oscillates and the wheels jump madly up and down, traction goes down the chute and universal joints, transmissions and rear ends are shattered. This was never a problem with our Ultramatic "Hawk" but with an overdrive, it assumes major proportions during fast starts. As a consequence, a pair of torque-absorbing radius arms, like, for example, "Traction Masters" is a virtual necessity to prevent this destructive occurrence. Those desiring or requiring better roadability can haggle with their Studebaker dealers over the availability of a "kit" consisting of stiffer front and rear springs and a stiffer anti-roll front stabilizer. Now that Studebaker and Packard have fully merged, it's an even-money bet that within two or three years, the equivalent of the present "Hawk" line will feature a torsion bar suspension layout similar to that of the '55-'56 Packards. We're all for this.

Our test procedure at times calls for treatment that is abusive, which rapidly

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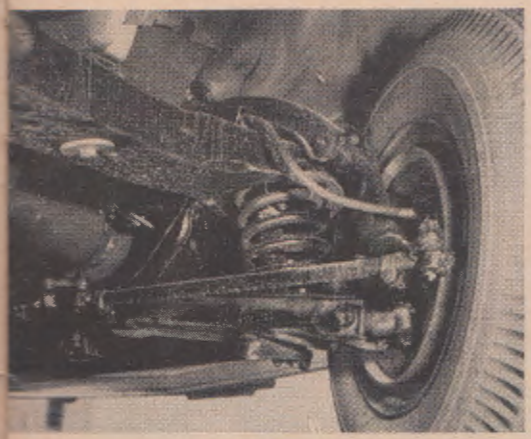
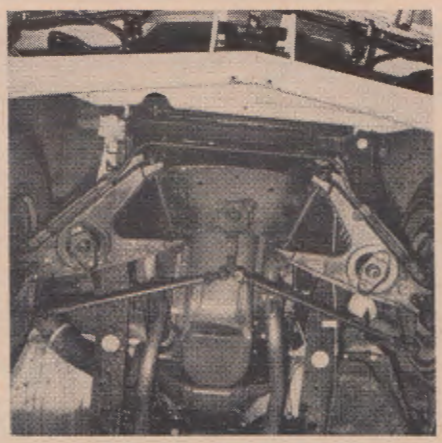
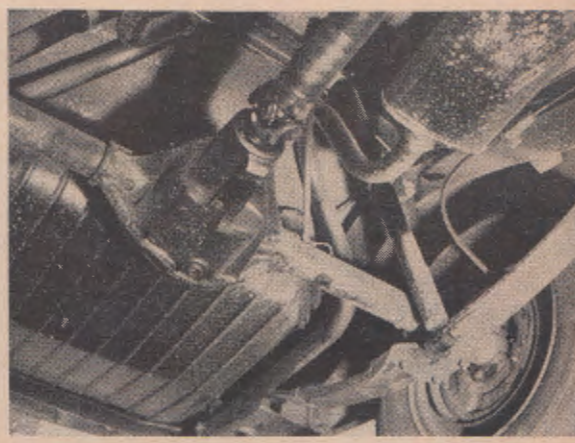


*Front suspension is conventional independent system, using unequal length wishbones, coil springs with shock in center.*



*Worm's view of lower wishbones, stabilizer bar, front crossmember to which is mounted pivoting arm of center steering.*



*Rear suspension is by parallel semi-elliptic springs, angularly mounted shocks. Open driveline and hypoid drive gears are used.*

## PERFORMANCE CHART
## '56 STUDEBAKER
## "GOLDEN HAWK"

| Engine RPM | MPH* | Road Horsepower |
|---|---|---|
| 2000 | 52 | 90 |
| 2500 | 65 | 112 |
| 3000 | 77 | 129 |
| 3300 | 84 | 132 |
| 3500 | 89 | 129 |
| 4000 | 101 | 112 |

*In high gear "lockup."
All dyno runs made in "low drive."

### ACCELERATION

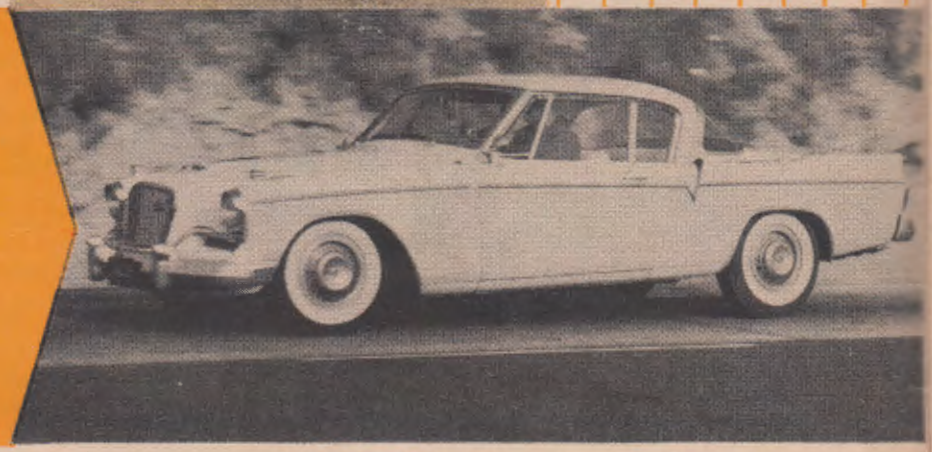
Average 0 to 60 mph.....10.0 secs.
Average 0 to 80 mph.....17.7 secs.
Standing quarter-mile .....17.5 secs.

### FUEL AND OIL CONSUMPTION

City driving.....12.5 mpg
Highway driving.....16.5 mpg
Mountain driving.....13.3 mpg
Average 1000 mile test.....13.1 mpg
Oil consumption.....nil

### STATISTICS

Weight .....3740 lbs.
Weight distribution: 59% (2200 lbs.) front
41% (1540 lbs.) rear
Braking area.....195.25 sq. in.
Braking effectiveness, front.....62%
rear .....38%
Ratio of car weight to brake lining area:
19.2 lbs. per sq. in.
Transmission type.....Packard Ultramatic
Rear axle gear ratio.....3.07



brings out and sometimes magnifies inherent faults of a car. In normal operation, a car is seldom, if ever, called upon to display its rigidity and resistance to stresses and strains imposed by deliberately abusive driving methods. As a case in point, we retired with our "Golden Hawk" to a favored stretch of dirt road that contains undulating dips, bumps and choppy "washboard" sections that are diagonal to the road. Here we found that the Studie was structurally quite sound; there were no major creaks or groans of protesting frame and body components nor was there any feel of "racking." Also, the directional stability of the car was not diminished under these conditions, denoting a good degree of frame rigidity.

Bendix duo-servo brakes, having a front diameter of 11 inches and a rear diameter of 10 inches, are standard on the "Hawk" line. The "Golden Hawks" and "Sky Hawks" have Budd composite drums that contain a steel center section and a cast iron drum with radial fins. The fins double the area in contact with the surrounding air, as compared to a conventional drum, thus reducing the tendency to "fade" by a sizeable margin under prolonged and severe brake applications. In normal and moderately severe use, the brakes of our test car were indeed excellent. Only under the most extremely severe conditions did any degree of "fade" occur, which was accompanied by rather erratic and unpredictable "pulling" to left or right. The brake lining area of the "Golden Hawk" is 195¼ square inches and represents a favorable 19.2 pounds of car weight per square inch of lining area, a figure almost without equal in present-day American passenger cars.

Driving the "Golden Hawk" required some "getting used to" for it is somewhat different from other cars of more conventional design and styling. First, the seats are quite low and one's legs are more nearly horizontal than in a "chair height" seat. Frankly, I find that this position is much more compatible with long distance driving. The steering wheel position is also low, being almost in one's lap, but it is placed about three inches too far to the right to be completely comfortable. This

was a bit disconcerting at first because, habit prevailing, everyone who drove the car tried to "center" themselves with the wheel only to find they were too far away from the left hand armrest and window sill for any support. Later, everyone shifted their position closer to the left door and let the wheel position fall where it may. Another point of conflict was the location of the brake pedal, being below and slightly to the right of the steering column. This required "cocking" the right leg slightly to reach the pedal to prevent interference between the upper leg and steering wheel and was not compatible with the exertion of full pedal pressures. Obviously, left-foot braking was much easier, but what to do when there is a clutch pedal to contend with? Aside from these two faults, everything else in the cockpit is good or better. For example, forward visibility is really excellent because the driver is quite close to the windshield and there are no vertical posts or wrap-around windshields to block or distort vision. The front fenders were always in view. The rear fenders, to which fiberglass "fins" have been attached were visible by either a glance rearward or into the rear-view mirror.

The instrument panel is a hot rodder's delight. All the instruments have white markings on black backgrounds and are mounted in a simulated engine-turned panel that extends the full width of the dash. The instruments consist of a coolant temperature indicator with degree markings (instead of the usual "cold," "normal," "hot" indications), genuine ammeter and oil pressure gauges (instead of a batch of blinking and almost meaningless lights), a fuel level indicator, an electric zero to 6000 rpm tachometer (that approaches its limit of usefulness with the Packard engine), a zero to 160 mph combination speedometer-odometer (in the best of stock trim, about 30 mph of this would go unused) and, of all things, a very handy vacuum gauge for those who drive and tune their engines by the indications of this instrument. (Prospective buyers shouldn't be discouraged by the relatively low vacuum indications at idle speeds; it's the camshaft that causes this.) But seriously, it's an imposing, compact and functional group of instruments, instantly legible by day or by night. The accessory switches are located on the lower edge of the dash panel on the driver's side and are three-position toggles with identifying markings. The hand brake "T" handle is sensibly located on the right side of the steering column. The entire layout was done with a purpose; namely to make driving the "Golden Hawk" more of a pleasure than a chore.

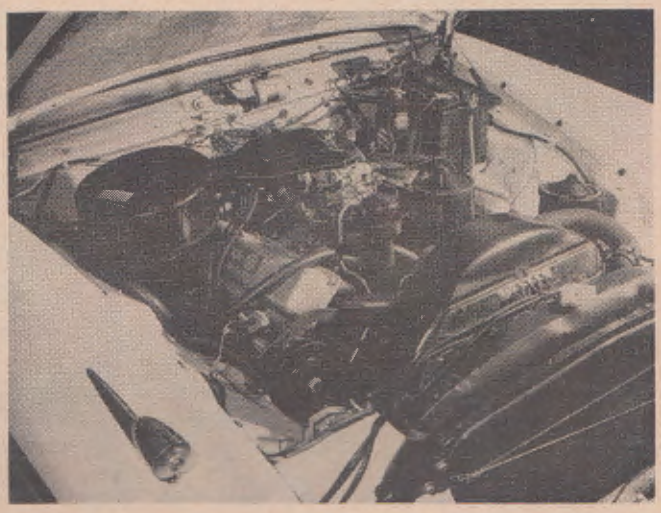
Our test car didn't show signs of being an exceptional penny-pincher as regards fuel economy. The piper must be paid those pennies, even when the large displacement engine is just loafing most of the time. Our tank mileage for the acceleration and drag strip runs and the dyno checks averaged out at 10.1 miles per gallon. In normal city traffic, we averaged 12.5 mpg, in the mountains we averaged 13.3 mpg and on a 200-mile run on the highway at conservative speeds, we averaged 16.5 mpg. Our overall mileage for more than 1000 miles was 13.1 mpg. Oil consumption during our test was nil. An average driver even remotely concerned with fuel economy should certainly be able to top these figures without trying. The gang that drove the car, including HRM's Wally Parks, Bob Greene, Bob D'Olivo, Car Craft's Ray Brock and myself, have, as a group, more lead in the accumulative right foot than any other bunch ever assembled under one roof. We like the feel of the "punch" and are willing to pay for it. For our test, we used Mobil "Special" gasoline.

When the rather heavy hood-grille combination is raised, one beholds a staggering amount of engine. It seems that every available inch is filled by the Packard engine, which is just plain BIG. We hot rodders have grown almost immune to things like this, but when the Detroiters do it, we are somewhat shocked and we feel that our domain has been invaded. But regardless of who does the deed, we agree with the idea and the results. However, a merger of an engine and chassis like the "Golden Hawk" does result in a few problems. For example, although the carburetor and ignition are easy enough to reach, a change of spark plugs is not easy, especially on the left side where the number seven plug is particularly inaccessible due to the proximity of the steering gear. Removal and replacement of the cylinder heads, front timing chain cover, oil pump and pan are about on a par with other cars.

The engine of our test car always performed smoothly and very quietly, aside from the fan noise at high speeds. There was never any valve lifter "clatter" when the engine was cold or after a fast run. At idle speeds, there was a slight but not annoying roughness that was traced to the camshaft, but this disappeared completely at 1000 to 1200 rpm. The single WCFB-2394S Carter four-throat carburetor was sensitive and responsive at all speeds and hot or cold starts were made with no

(*Continued on page 54*)

*Arrow points to bellcrank arm that connects throttle linkage to transmission. Holes in arm adjust transmission shift points.*



*Big Packard V8 loads engine compartment to the roof, which makes routine maintenance a bit difficult but not impossible.*

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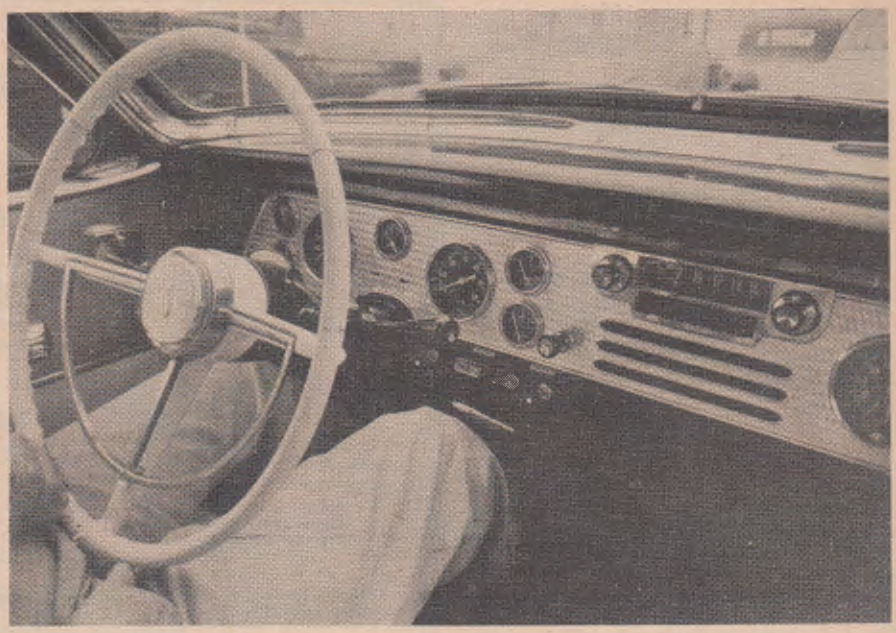

*Excellent instrumentation, convenient accessory operation is provided in the "Hawk."*

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## THE '56 STUDEBAKER

trouble. It contained, however, a fault that is common to most four-throats with large capacity float chambers; during hard turns the fuel in the chambers sloshes around, uncovering the main metering jets causing the engine to "gasp" for fuel. This can be overcome by gradually squeezing the throttle to the floor, which supplies the engine with sufficient fuel from the accelerating pump circuit. The only other significant fact that emerged was that the one lonely carburetor contained venturi diameters that were not large enough to permit the big engine to "breathe" properly in the higher speed ranges. This was first detected on the dynamometer when the good showing obtained at lower speeds tapered off at the top end. Later, it was confirmed during the acceleration runs when, after the initial and very healthy "jump" off the line, the engine felt as though it were "laboring" above 3000 rpm. This can be checked by observing the relatively high vacuum reading (between three to five inches of mercury) when the engine is turning 4000 rpm or so with both primary and secondary throttles fully opened.

Happily, there is a good cure for the above situation. The double four-throat intake manifold of the '55 and '56 Packard "Caribbean" will drop right in place, requiring at most a minor bit of intake port alignment. There is a great variety of larger and smaller carburetors that will mount on this manifold but another Carter WCFB-2394S will work out nicely and, if the fuel/air mixture is properly attended to, will yield an increase of from 10 to 12 per cent in maximum power and a gain of 200 or 300 rpm in peaking speed. Maximum torque won't be affected, except to shift the peaking speed a bit higher and spread out the rpm range in which near-maximum torque is developed. The installation and mounting of another offset Studie oil bath air cleaner would be a simple matter. The intake manifold change, plus the addition of a good set of "scavenge" type exhaust headers to replace the stock dual cast iron manifolds should be among the first modifications made. By reducing the restrictions on both the intake and exhaust sides, these changes will bring out the inherently good "breathing" characteristics of which the engine is capable. Another modification which would help in this direction to some extent is a good porting and polishing job to take advantage of the large stock valve sizes (2 inch diameter intake, $1\frac{11}{16}$ inch diameter exhaust).

Aside from the compression ratio, valve timing, valve spring pressures, intake manifolding and spark plugs, the "Golden Hawk" engine is identical with the engines of the 1955 Clipper "Custom," Packard and Packard "Caribbean" which were thoroughly dissected in the August '55 HRM. In "Golden Hawk" form, a compression ratio of $9\frac{1}{2}$ to 1 is used. For more "urge," the heads can be milled .030 of an inch, which will boot the compression ratio to an even 10 to 1, about maximum with the stock valve timing and present day gasolines. By changing to a reground camshaft, the compression ratio could be a bit higher; about 10.3 to 1 would do it, which can be accomplished by milling the heads .045 of an inch. The stock valve timing, incidentally is as follows: Intake opens 14 degrees before top center, closes 62 degrees after bottom center, duration 256 degrees, lift at valve .398 of an inch. Exhaust opens 54 degrees before bottom center, closes 18 degrees

(*Continued on page 56*)

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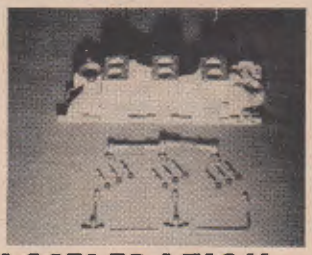

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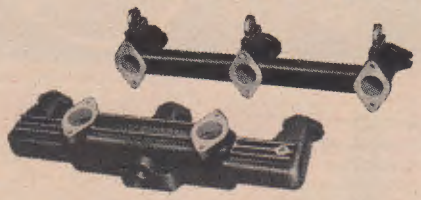

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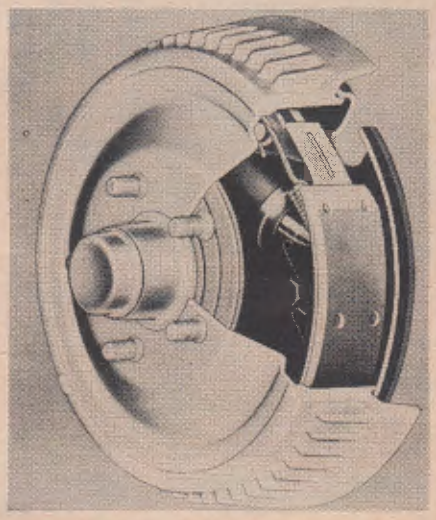
continued

## THE '56 STUDEBAKER

after top center, duration 252 degrees, lift at valve .388 of an inch.

For the "big bore" kids, about the easiest way to increase the piston displacement would be to bore the cylinders to 4⅛ inches and use '56 Packard pistons and rings. This will raise the already huge number of cubes from 352 to 373. The 4⅛ inch bore diameter should be considered maximum. If anyone wished to take advantage of the new and very good welded stroker crankshafts that are available, he could, by increasing the stroke ¼ of an inch to 3¾ inches, and by using the 4⅛ inch bore, raise the displacement to the nice round figure of 400 cubic inches. That should be enough for the most avid cubic inch devotee.

Tuning the stock engine is relatively simple because only the fuel/air mixture



*Composite Budd drums with radial fins are used on "Golden Hawk." Brakes on car were excellent, greatly resisted fade.*

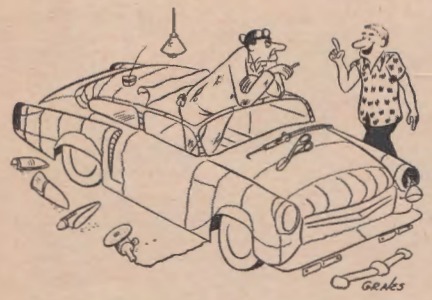
and the ignition need be considered. The lean mixture condition mentioned earlier is probably typical of most "Golden Hawks" and may be cured in one of two ways. The simplest method is to raise the Carter metering rod holder from 1/32 to 1/16 of an inch, after the air cleaner and metering rod cover have been removed from the carburetor. The other method is to drill, or preferably ream the main metering jets to a larger diameter in steps of .001 of an inch. The use of either method requires that the mixture be checked with a combustion analyzer for best results. The stock spark advance curve leaves little to be desired except to set the initial advance with a timing light so that the spark occurs at seven to nine crankshaft degrees before top center for use with the best gasolines. The Champion N18-67B "long reach" 14 mm plugs should be thoroughly sandblasted, cleaned and regapped at 2500 to 3000 mile inter-

vals. If city driving is the rule, the plug electrode gap should be .033 to .038 of an inch. For sustained highway operation, .024 to .027 of an inch will do the job and if fuel economy is the prime objective, try a gap of .045 of an inch.

One point that should be mentioned is that the shift points of the Ultramatic are governed by the length of the link from the carburetor to a bellcrank at the back of the engine. One arm of the bellcrank has three holes in it to accept the link and these can be tried in order to find the most desirable shift points. For best performance, a fairly high rpm is desirable before a shift occurs and for this purpose, the bottom hole in the bellcrank arm seems to work out best.

The general construction, the fit of the doors, hood and trunk, the quality of the finish (synthetic enamel), upholstering and trim were all good. There wasn't a sign of a leak after the car had been exposed to torrential downpours for a couple of days and during this period, the two-speed electric windshield wipers proved their worth over the more conventional vacuum-operated wipers. Body squeaks and rattles were at a minimum, even after the "washboard" treatment. One discordant note was the lock and latch release of the trunk lid. This thing must've been designed for the grip of a gorilla. It took both hands to operate the release but once the lid was raised a bit, the stiff countersprings did the rest. However, I understand this minor complaint has been corrected in subsequent cars.

In all, the "Golden Hawk" is a very neat and tidy package and one that is loaded not for bear but for some of the mythical four-wheeled predators that roam the streets and highways. A factory-tuned version has lapped the 2½ mile banked ova! Studebaker-Packard test track at speeds approaching 130 mph. This gives some idea of what a prospective buyer may expect. At a stoplight or on the highway, a sharp, well-tuned "Golden Hawk" is capable of giving complexes to the competition. Although the factory calls it a "sports type" car, we like to think of it as a production-line hot rod. But regardless of what it is called, the "Golden Hawk" represents passenger car performance at its best.

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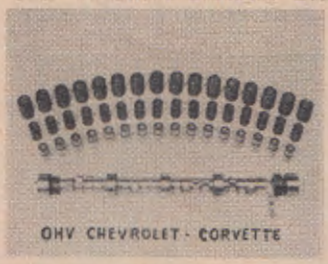


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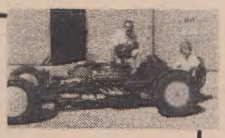

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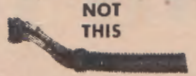

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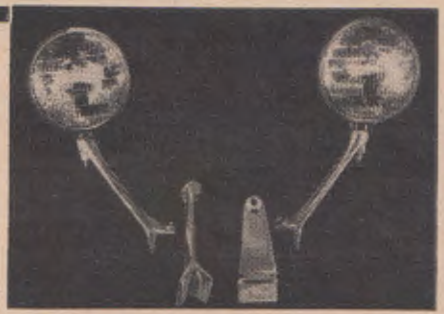

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