

Tests: Kawasaki GPz1100, KX500,
Yamaha Virago 500 and IT490

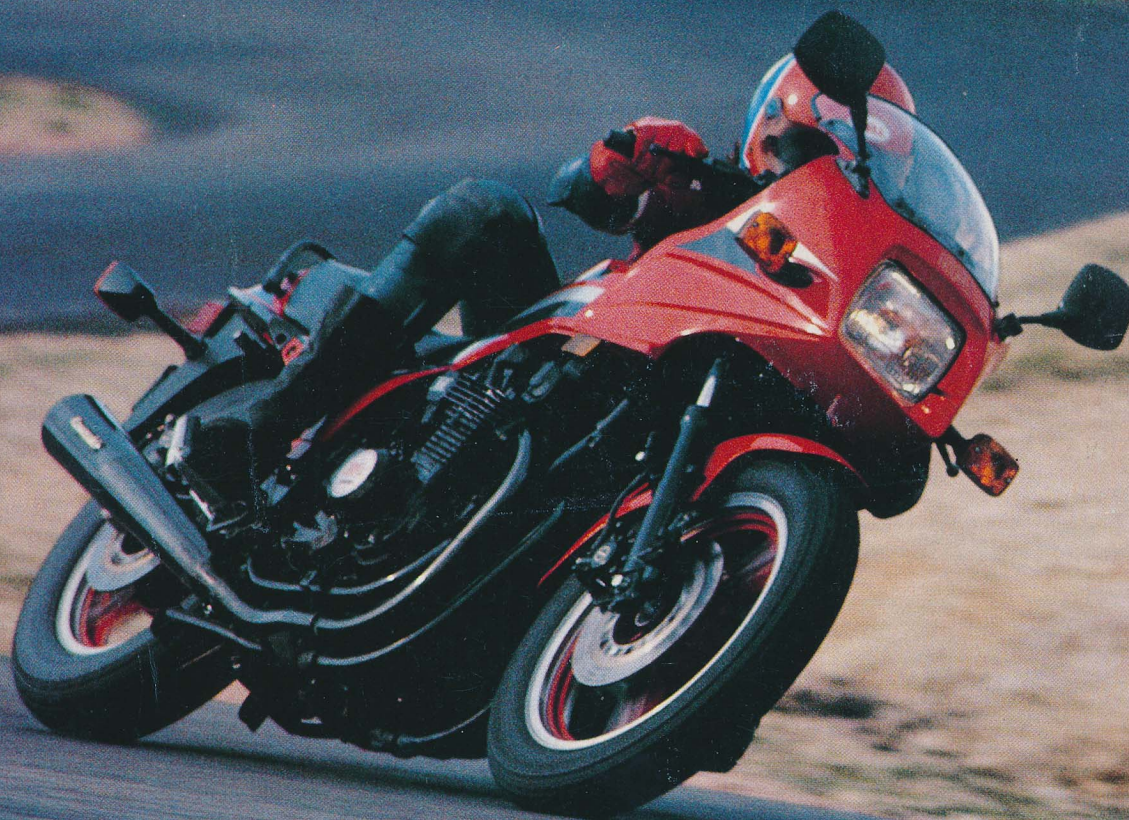
Quarter-mile speed secrets

CYCLE WORLD

JUNE 1983

\$1.75 £1.15

Kawasaki GPz1100
A ride on the wild side



CYCLE WORLD

JUNE 1983

VOL. 22 NO. 6



TESTS

- 40 KAWASAKI GPz1100**
A Trip to the Cam Grinder's Breathes New Life into Kawasaki's Aging Superbike.
- 50 YAMAHA IT490K**
Be Prepared to do Some Wrenching Before the Big IT Gets the Power It Deserves.
- 74 YAMAHA XV500 VIRAGO**
The Pleasures of a Middleweight Twin, the Price of Looking Like a Big Twin.
- 80 KAWASAKI KX500**
It Looks Like Last Year's Factory Racer, But Something Got Lost in the Translation.

COMPETITION

DAYTONA '83

- 64 BIG ENOUGH TO DO THE JOB**
Kenny Roberts Uses a Tractor Motor For His Second Daytona 200 Win Ever.
- 66 FAST ENOUGH TO DO THE JOB**
Freddie Spencer and His Interceptor Overwhelm the Superbike Competition.
- 70 RETURN OF THE NATIVE**
The Battle of the Twins Goes to Jay Springsteen and the Harley XR1000.

TECHNICAL

- 56 JOCKEYING FOR NUMBERS**
How Drag Strip Testing is Affected by Rider Weight, Skill and Sponsorship.

FEATURE

- 46 "A LITTLE NUTTY, OF COURSE."**
The Story of Rollie Free, the 150 mph Vincent and Racing's Most Famous Photo.
- 85 CLUB UPDATE**
Current Addresses of Every Motorcycling Organization Known to Cycle World-Kind.

EVALUATIONS

- 32 COMPAC POCKET SHOPPERS**
How to Get the Groceries Home.
- 33 SHOEI HELMET**
Stylish, Convenient, Comfortable.

DEPARTMENTS

- | | |
|-----------------------|-----------------------|
| 5 UP FRONT | 34 SUMMARY |
| 8 LETTERS | 38 NEW IDEAS |
| 18 BOOK REVIEW | 94 RACE WATCH |
| 23 ROUNDUP | 102 SERVICE |
| | 114 SLIPSTREAM |

COVER

*The Kawasaki GPz1100
Photographed by Steve Kimball*



The pleasures of a middleweight Twin, the price of looking like a big Twin.



YAMAHA XV500 VIRAGO

■ When the Virago 500 began its trip down the drawing boards, Yamaha's designers must have figured the task was more like play, a working vacation perhaps. The original Virago was a 750, an air-cooled V-Twin with shaft drive and full cruiser treatment, as in stepped seat, small tank and high bars. The model hit the target market right on center and the Virago 750 was Yamaha's sales hit of the year.

Traditional looks, traditional engine configuration, so it made perfect sense to take another old-time favorite, the 500 Twin, and scale down the Virago theme



to fit the smaller engine. Lower seat, lower price, proven looks and engineering, it's bound to work.

And so it does, but with some reservations.

They have little to do with the mechanical package. The 500, like the 750 and 920 Vees, is air cooled, but the angle of the vee is 70° for the small engine vs 75° for the larger ones.

Good reasons here. The best balanced vees are 90°, and the closer together you go from there, the less good the balance gets while the package itself becomes smaller and more easily packaged. Because the Virago 500 is small, the tighter angle allows a shorter wheelbase with room for suspension travel, etc.

The same applies to the Yamaha's other two 70° Vees, the Vision 550 Twin

and the Venture 1200 Four. Except that those two engines produce more power and thus need water-cooling and counterbalancer shafts.

The Virago 500 is not as highly tuned or stressed, so like the other air-cooled Vees it neither has nor needs water jackets or counterbalancers. The 500 shares concept with the 750 and 920 but no parts. The two valves per cylinder (37mm intake, 32mm exhaust) are opened via aluminum rockers by a single camshaft running in the cylinder head casting. Intake valve lift is 7.2mm, exhaust valve lift 7.7mm, and valve lash is adjusted with screw tappets. The cams are driven by link-plate chain off each end of the plain-bearing crankshaft.

Cast-iron sleeves are pressed into the aluminum cylinder castings. The cast

pistons are moderately domed, producing a 9.3:1 c.r., and use internally-tapered wrist pins located in the center of the pistons, with no offset. Bore is 73mm, stroke 59mm for 494cc of displacement.

Primary drive is straight-cut gear to the clutch basket. From there, power is transmitted through the clutch hub to the transmission mainshaft, through one of the five gears to the driveshaft and through another set of bevel gears to the rear wheel. The engine spins in the same direction as the wheels. Two 23mm Mikuni CV downdraft carbs are positioned between the cylinders. Along with the carbs there is a small, two-chamber tank that serves as part of the YICS (Yamaha Induction Control System). We've seen YICS before, on inline Fours, in which the intake ports of the engine are connected by small passageways intersecting each port just past the intake valve. An inline Four has regularly paced pulses in the intake tract and these passageways take advantage of the pulses to (in effect) boost the charge entering each cylinder in sequence.

Another form of YICS appears on the Yamaha two-strokes, where the regular but more widely spaced intake pulses are stored and reinforced in a container now popularly known as a boost bottle.

For the Virago 500, Yamaha uses another form of YICS, this one shared with the 550 Vision. Because a V-Twin has an irregular firing order the Virago's secondary ports aren't connected. Instead each cylinder has its own chamber in a YICS tank, connected by a passageway leading to the intake port just above the intake valve. When the valve shuts, the mixture still entering the port escapes up the passageway into the YICS chamber, which is precisely sized so pressure continues to build up until the intake valve opens again. When the valve opens, the pressure in the YICS chamber rushes into the cylinder—again in the form of a jet stream—and swirls the mixture entering through the intake port proper.

The rest of the engine package is simple enough: electronic ignition, wet sump, exhaust system with an expansion box (located just behind and below the engine), dual mufflers.

The engine is a stressed member of the frame, and there are no downtubes or engine cradle tubes. The four forward cylinder studs extend above the cylinder head and attach to a plate suspended from the frame's backbone. That backbone is formed of stamped steel plates, welded together in box section and curving from steering stem to swing arm pivot. The rear of the engine bolts to the backbone in two places, one above and one below the swing arm pivot.

The backbone is sealed and serves as the air intake system. A rubber plenum, located under the seat and left sidecover,

feeds air into the backbone, which forms a still air box. A pleated paper air cleaner fits into the backbone just above the carburetors.

A single rear shock bolts to the backbone, under the front of the seat, and runs down and back to a triangulated steel swing arm. The frame rear subsection, which supports the seat and tail section, bolts to the backbone tube on the top and the footpeg carriers on the bottom. The swing arm pivots in tapered roller bearings.

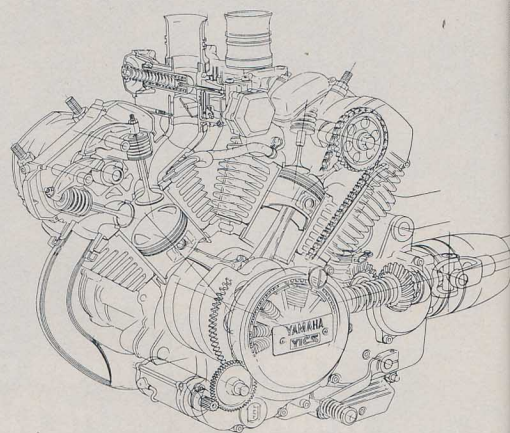
The leading-axle non-adjustable forks have 36mm stanchion tubes held by a steel lower triple clamp and an aluminum upper clamp. These clamps are different in more than material. The lower triple clamp has less offset than the top triple clamp, so the steering head angle is different from the fork rake. The difference is 1.5°, the steering head set at 29°, the forks set at 27.5°, producing a long 4.9 in. of trail. Two rubber-mounted risers bolt to the top triple clamp and hold the tubular steel pullback handlebars. The front wheel is 1.85 in. wide and holds a 3.00-19 Bridgestone L303 tire, the rear rim is 2.5 in. wide and holds a 130/90-16 Bridgestone G509 tire. Both wheels are cast aluminum in the now common swirl pattern used on most Yamaha Virago and Maxim models. An 11.75 in. disc is used for the front brake and a 7.1 in. drum is used in back.

Because the lowest part of the teardrop-shaped gas tank is lower than the carburetor float bowls, an electric fuel pump is used to feed the carbs. The pump supplies more fuel than the carburetors need, the surplus recirculating to the gas tank. According to Yamaha engineers, this recirculation system lowers gasoline temperatures an average of 50°. Lowering fuel temperatures can reduce evaporative emissions, which will be controlled on California motorcycles in 1984.

Instruments include a 120-mph speedometer and a 10,000 rpm electric tach (redline is 8500 rpm), with a simple row of warning lights positioned below the instrument faces. Those lights indicate turn signal and high-beam use, low oil level and neutral selection. There isn't a fuel gauge; the gas tank petcock has a reserve position.

Comes now a persuasive case for simplicity. Because the two are very different motorcycles from the same factory, the Virago 500 and Vision 550 can be considered as two ends of same scale. Yamaha claims a modest 33 bhp for the Virago, an impressive 68 bhp for the Vision. However, the Virago's claimed torque is 30.4 lb.-ft. at 7000 rpm against the Vision's 34 lb.-ft. at 8000 rpm, and with tanks half full the Virago weighs 402 lb. and the Vision weighs 482 lb.

Power requires weight, tuning means



Like the larger Virago V-Twins, the 500 has single overhead cams, two valves per cylinder and shaft drive. It has the pull of a larger engine.

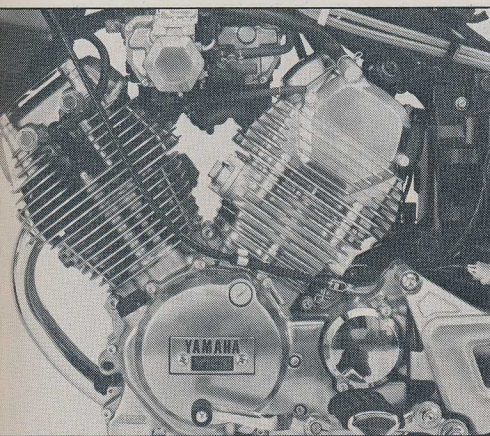
the power grows out of rpm, and torque is mostly a function of displacement.

And at the drag strip the Virago turned 13.70 sec. for the quarter mile with a trap speed of 93.55 mph and the Vision (*Cycle World*, April 1983) did 13.05 sec. at 99.33 mph. More to the point in daily living, in top gear acceleration the Virago is actually quicker; 40-60 mph in 5.4 sec. vs 5.8 for the Vision.

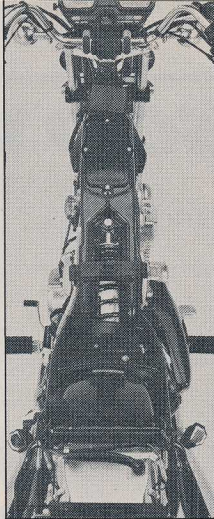
Sure, the sporting Vision is quicker and faster and the more complex package can justify itself . . . to the rider who wants it.

(It's also interesting to note how close are the middleweight and big Twins, from Yamaha, Honda, Harley, BMW, Triumph, et al. Be they 1000, 750, or 500cc, they all turn the quarter mile in the high 12s to high 13s while the big Fours are much quicker than their smaller brothers.)

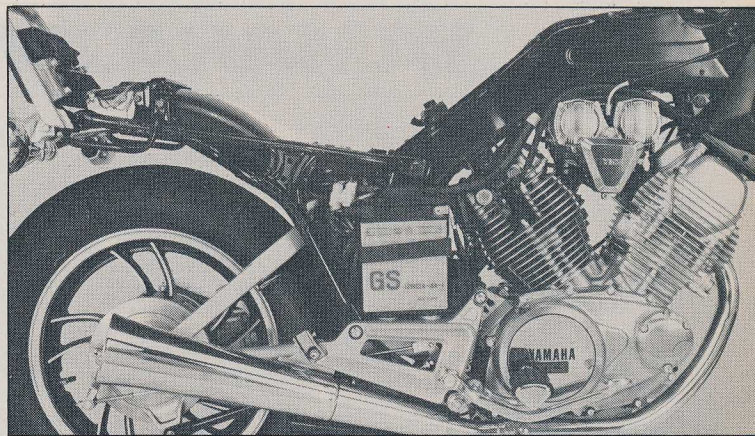
At any rate, the Virago's strong mid-range and easy-on torque supply make it great fun to ride on the street. It's perfectly happy tooling down the road at less than 3000 rpm, and will leave traffic behind when short-shifted at 4000 rpm. It's equally happy when run to the redline in every gear, the power delivery strong and steady with an extra kick of bhp above 6000 rpm. The 500 is more willing to rev quickly than the larger Viragos and stays smoother in the process. The 500 responds whenever the throttle is opened, no matter where the engine is in the rpm range. There isn't any surge at steady throttle when threading through traffic jams, and there's no hesitation off idle when the throttle is opened quickly. And all the time there's that intriguing V-Twin exhaust note, muffled on the 500 but there just the same, the off-cadence



Two Mikuni downdraft CV carbs and a two-chamber YICS tank fit between the cylinders of the Virago's 70° V-Twin engine.

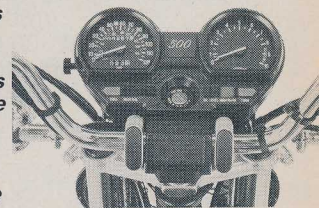


Single rear shock bolts at one end to the frame backbone and at the other end to the triangulated swing arm, with no linkages. Plate on top of backbone covers the air cleaner.



Virago's stamped-steel, box-section backbone frame uses the engine as a stressed member, with no engine cradle. The backbone also serves as the air intake system.

Virago instruments are clean and simple. Speedometer goes to 120 mph and the tach is redlined at only 8500 rpm. Rubber-mounted handlebars reduce vibration.



beat that says, well, *motorcycle*.

Some notes on smoothness, or maybe on size: We have all read and heard at great length about counterbalancers, rubber mounts, offset crankpins, frames tuned to absorb engine shake and other ways to cure or dissipate the vibrations inherent in any Twin.

Know what works? Size, or more accurately lack of size. The technical advances mentioned above are advances. They do quell the tremors. But when an engine has smaller pistons it also has smaller tremors and the uncomplicated little Virago is smoother than the 750 or 920 Viragos or the Honda Shadow 750 or Harley 1000. There are vibrations, sure, but what the rider gets is little more than a reminder of an engine at work. No problem here, the mirrors even remain clear at cruising speed.

The Virago 500 is also a narrow engine, just 13.5 in. across, and the combination of narrowness, light weight and the broad powerband encourages sporty riding. The Virago is an in-between size, feeling more a full-size motorcycle than a 450 or 400 and seeming incredibly light compared to most 550s, especially 550s with Inline Four engines. The light weight and short wheelbase make the Virago nimble, good for cornering, and make it more easily disturbed by sidewinds and wind blasts from semi-trailers on the highway, not so good for straight-line touring. But the Virago is stable at top speed and in fast, sweeping corners. The suspension is not adjustable (except for rear shock preload) and comes set up a bit on the stiff side. The trade-off is a choppy ride over repetitive bumps in the roadway.

Speaking of trade-offs, we've arrived

at the Virago 500's downside. It began back on the drawing board, when the Virago 500 was scaled down.

The cruiser look began as a chopper look and choppers were originally built from Really Big Twins. Low seats, kick-out front ends, stretched wheelbases and the riders could easily lean back, put their feet up and stretch out. Those first Specials, Customs, etc. had the look but not the dimensions. Since then the Big Four has learned to deliver the looks after amending the style to allow for more compact machines. This works up to a point; the Yamaha XS1100 and Honda CB1000C, for example, can be cruised and ridden while the Honda 650 Night-hawk has cruiser elements while still being fine in daily use.

The Virago 500, though, doesn't have the wheelbase or any of the other distances to be both a cruiser and a good place on which to go riding. Riders of average height found the 500 cramped. The bars come back too far and the ends rotate inward toward the tank, making the bars into tillers. The bend of the bars cock the rider's wrists at an unusual angle and, because the control pods are shaped to follow the handlebar contours, makes it harder to reach the controls with the thumb. The horn button, for example, is tucked down and inward on the left control pod, and the one time one rider needed the horn, all he got with his thumb was a blank space on the control pod. The footpegs had some riders searching for someplace to put their feet during long rides, and the one-position-only seat didn't help riders avoid feeling cramped. Those are the prices of the Virago's style.

The horn—or, more correctly, the

horns—are loud enough when the button is finally located. The headlight was everything a headlight should be—bright penetratingly and perfectly aimed. The turn signals are self-cancelling, and can be manually over-ridden by pushing down on the side-to-side signal switch. Over-riding the signals often caused the switch to hang-up the next time the rider wanted to signal a turn, and it took prodding and poking at the switch before the signals lit again.

The Virago's brakes are good enough, being very controllable throughout our stopping tests. From 60 mph, the bike needed 119 ft. to stop; from 30 mph, 30 ft.

On the *Cycle World* mileage test loop, the Virago 500 returned 51 mpg in the standard combination of open highway, country road and city traffic. Ridden hard on backroads, mileage dropped to 47 mpg. The fuel tank holds 2.9 gal., which gives the Virago a total range of between 136 and 148 mi., depending upon how it's ridden. Reserve is usually good for 16-20 mi. at highway speeds.

So what have we in this Virago 500? We have a V-Twin simpler and lighter than the Yamaha Vision, and, at a suggested list price of \$2299, less expensive as well. The flip side of that is that the Virago isn't as quick or fast as the dragstrip. The Virago is fun to ride, feels light and agile, sounds neat, gets good gas mileage. It also compromises rider comfort with styling, styling far enough into the cruiser mode to deter riders who don't care for that look, yet perhaps too conservative to appeal to hard-core cruiser fans.

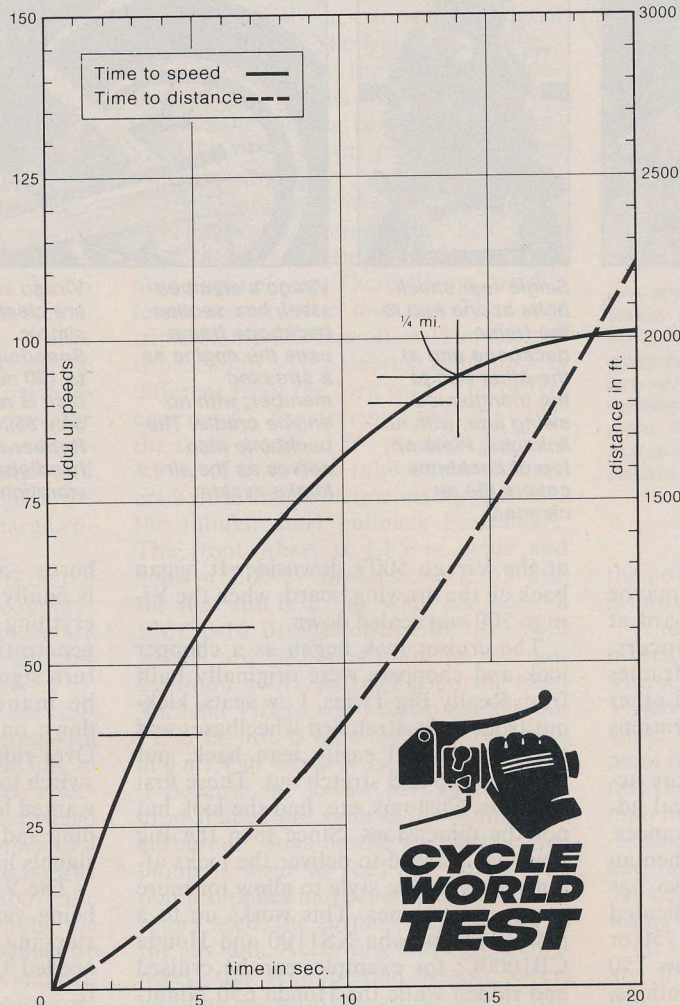
The Virago is indeed a motorcycle in the middle, good as it may be. ☐

YAMAHA XV500 VIRAGO

SPECIFICATIONS

List price \$2299
 Engine sohc air-cooled
 70° V-Twin
 Bore x stroke 73 x 59mm
 Displacement 494cc
 Compression ratio 9.3:1
 Carburetion (2) 34mm
 Mikuni CV
 Air filter pleated paper
 Ignition transistorized
 electronic
 Claimed power 44 bhp @
 8000 rpm
 Claimed torque 30.4 lb.-ft.
 @ 7000 rpm
 Lubrication wet sump
 Oil capacity 3.2 qt.
 Fuel capacity 2.9 gal.
 Starter electric
 Electrical power 210w @
 5000 rpm
 Battery 12v12ah
 Headlight 60/55w
 Primary drive straight-cut
 gear
 Clutch multi-plate, wet
 Final drive shaft
 Gear ratios, overall: 1
 5th 5.77
 4th 6.97
 3rd 8.71
 2nd 11.35
 1st 16.21
 Suspension:
 Front telescopic fork
 travel 5.9 in.
 Rear single-shock
 swing arm
 travel 3.9 in.
 Tires:
 Front 3.00-19
 Bridgestone L303
 Rear 130/90-16
 Bridgestone G508
 Rear wheel revs.
 per mi. 824
 Brakes
 Front 11.75-in. disc
 Rear 7.1-in. drum
 Brake swept
 area 128 sq. in.
 Brake loading (160lb.
 rider) 4.4 lb./sq. in.
 Wheelbase 55.5 in.
 Rake/Trail 29°/4.9 in.
 Handlebar width 29 in.
 Seat height 29.4 in.
 Seat width 11 in.
 Footpeg height 12.3 in.
 Ground clearance 6.5 in.
 Test weight (w/half-tank
 fuel) 402 lb.
 Weight bias,
 % front/rear 45/55
 GVWR 900 lb.
 Load capacity 498 lb.

ACCELERATION



PERFORMANCE

Standing 1/4-mile 13.70
 sec. @ 93.55 mph
 Top speed in
 1/2-mile 101 mph
 Fuel consumption 51 mpg
 Range (to
 reserve tank) 122 mi.
 Acceleration:
 0-30 mph 2.1 sec.
 0-40 mph 3.1 sec.
 0-50 mph 4.1 sec.
 0-60 mph 5.5 sec.
 0-70 mph 7.4 sec.
 0-80 mph 9.8 sec.
 0-90 mph 12.4 sec.
 Top gear acceleration:
 40-60 mph 5.4 sec.
 60-80 mph 6.9 sec.
 Calculated speed in gears @
 8500 rpm:
 1st 38 mph
 2nd 55 mph
 3rd 72 mph
 4th 89 mph
 5th 108 mph
 Speedometer error:
 30 mph indicated 27 mph
 60 mph indicated 55 mph
 Braking distance:
 from 30 mph 30 ft.
 from 60 mph 119 ft.
 Engine Speed
 at 60 mph 4750 rpm

