

Cycle

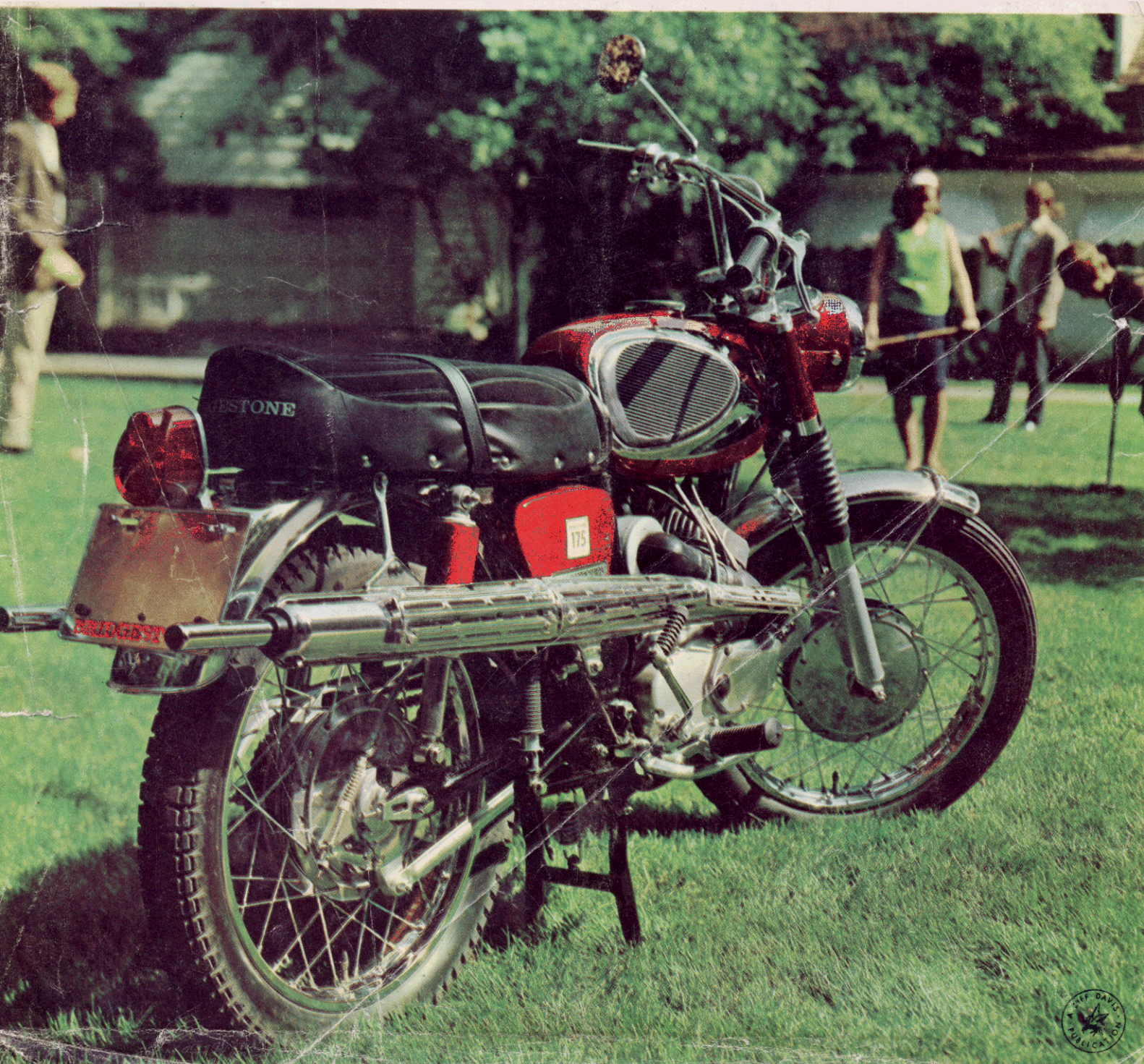
JANUARY 1967 • 50 CENTS

Oils and Additives

Buying Woods Wear

AWA 250 TRIALS-BRIDGESTONE 175-HERCULES 100

Three On/off-The-Road Tests ■ A Day at the Scrambles Races



BRIDGESTONE 175

HURRICANE SCRAMBLER

A dual rotary-valve engine, 5-speed transmission, modern and well-mannered suspension, and a fine finish may not be everything-but they're close.

Bridgestone's 175 Hurricane Scrambler is a logical development of the 175cc "Dual Twin" touring machine the company introduced a couple of years ago. More and more, motorcyclists look to the woods for riding fun, and for safety from the hordes of automobiles that clutter the nation's highways. Today's motorcyclist, in many if not the majority of instances, wants a bike he can use either on pavement or out on little-used trails. It need not be a full-fledged scrambler; that would make the bike impractical for street riding. The basic requirement is for a highway machine, with modifications to give it added ground clearance, low-speed pulling power, etc. And that is a pretty good capsule description of the Bridgestone Hurricane Scrambler.

In the "scrambler," as was and is true of the pure touring Bridgestone 175, the engine is the most interesting feature. This engine, which is packed with little items that should delight the technically inclined, was the first mass-produced two-stroke "twin" to have rotary-disc inlet valves. Most such engines have nothing more elaborate than a hole in the back of each cylinder. When the piston skirt's lower edge comes up and clears the hole, the mixture is drawn into the crankcase. Similarly, the piston skirt closes the port when it comes back down. A great system from the standpoint of simplicity, but not without its drawbacks. For one thing, there is a tendency for the charge drawn into the engine to escape again as the piston moves back down. This can be countered, to a very large extent, by adjusting the size and timing of the intake port. But it can only be adjusted to work well over a limited range.

A disc-type rotary valve is much less handicapped. By using this device, an engine designer can get any opening and closing points needed for the intake period. As a result, the power range will always be a bit wider, for any given

level of output, when rotary valves are used. You may not care about the technical ins and outs of the matter, but you will care about the engine's wide-range pulling power.

Another point that will, sooner or later, be of some importance to the buyer is that the Bridgestone engine comes apart and goes back together in rapid, zip-zip fashion. The mechanic, down at your local dealer's shop, can do even a total overhaul very quickly, and labor charges account for a large part of such repair bills.

There are reasons, too, why the frequency of repairs should be low. The Bridgestone engine, like most modern two-strokes, has its crankshaft running in ball bearings, with caged rollers at the connecting-rod big-ends. Up at the piston-pin ends of the connecting rods, there are caged needle-roller bearings, and we consider this important. Piston-pin bearings, in two-stroke engines, are rather poorly lubricated. To make matters even worse, they are subjected to high temperatures. The plain bushings once universally used, and still found in some engines, do not like the combination of heat and scanty lubrication. They wear rapidly, and when worn they clatter and cause a lot of internal unpleasantness. Needle-rollers, like those in the Bridgestone, do a lot for reliability.

General over-heating and an occasional piston seizure has also, in the past, been something of a problem with high-output two-stroke engines. There are various ways in which designers have overcome such problems. Bridgestone uses a very direct method. Aluminum is a material that transfers heat (as from a cylinder to air) particularly well, so they have simply made the entire cylinder out of aluminum. As in the case of the rotary valves, all-aluminum cylinders with hard-chrome plated bores had been developed in racing; Bridgestone was the first to apply this to a touring motorcycle. These cylinders "cool" very ef-





ficiently, and as they expand at the same rate as the aluminum pistons, seizures will not occur unless something is dreadfully wrong.

Like most modern two-strokes, the Bridgestone engine is fitted with an automatic oiling system. A small variable-delivery pump, engine driven, injects oil into the intake air-stream just behind the carburetor. This keeps the intake valve disc and its chamber well lubricated, and the oil manages somehow to find its way around to the various bearings. It all seems a trifle haphazard, compared to piping the oil directly to the bearings, but it works about as well as the traditional oil-in-fuel mixtures and it relieves the owner of the measuring/mixing chore.

Rapid (relatively speaking) ignition point-breaker wear has always been a problem in two-stroke engines. In most, the breakers are mounted right at the end of the crankshaft, and turn at crankshaft speed. Thus, the rubbing speed-between cam and fiber point-block is high, and that accelerates wear. The Bridgestone engine, however, has a separate gear-driven generator, with the point cam down at the end of its armature. This is driven at half engine speed, as in a 4-stroke engine, which substantially reduces point wear. Another benefit is that the Ignition system is freed from the effects of crank flexing at high en-

gine speeds. On many engines, the cam is right out the end of a long crankshaft extension, and moves around when the crank flexes. When that occurs, the spark timing wanders something shocking. Bridgestone's remote-mounted ignition was probably forced on them by space requirements, but this is one of those instances where necessity created virtue.

When the Bridgestone 175 was introduced, it was especially unusual in having a two-way transmission. With the flip Of a lever, you could have a 4-speed "rotary-shift" transmission, in which neutral was between 1st and 4th and you could get 1, 2, 3, 4, N, 1, 2, etc. endlessly by pressing down on the shift lever. Pull the "sportshift" lever, which is mounted high on the side of the transmission, over the other way and you had a 5-speed gearbox, with a conventional ratchet change and neutral between 1st and second. There was another neutral between 4th and 5th, too, and while the first neutral (the one you wanted) was almost impossible to find, the second unwanted neutral seemed impossible to avoid. No longer is that the case. A revised shifting drum gives you the same 4-speed rotary system, but those who use the 5-speed option (which you still get by moving the little lever over) will find that the pattern is now N, 1, 2, 3, 4, 5. No more problems with finding neutral,

and no more missing the shift between 4th and 5th.

Actually, we cannot think why anyone would want to use the transmission as a 4-speed unit, but we are told that people do. They must ride mostly in town. The 5th speed is an overdrive that we cannot imagine being without when cruising down the highway. Especially with the new Scrambler, which comes with a 15/38 countershaft/mainshaft combination in place of the touring model's 16/38. That gives an overall Sth-gear ratio of 6.86:1 for the street machine and 7.35:1 for the scrambler. The difference in engine rpm at any given cruising speed is not too great, however, because the Hurricane Scrambler has a 3.00-18 rear (and front) tire instead of the 2.75-18 rear tire on the street version.

The "Scrambler's" tires, incidentally, have only a hint of knobby about them. In fact, the front tire shown in Rockford Motors (Bridgestone's distributor) ads has a ribbed road-going tread. But the two examples we had for testing were outfitted with tires, front and rear, having a fairly coarse block-pattern tread. These do an acceptable job on firm dirt, but surely aren't much in sand or very loose soil. Still, if a rider uses his head at all, and doesn't just go plunging ahead into anything, the bike will usually get



from here to there without the benefit of roads.

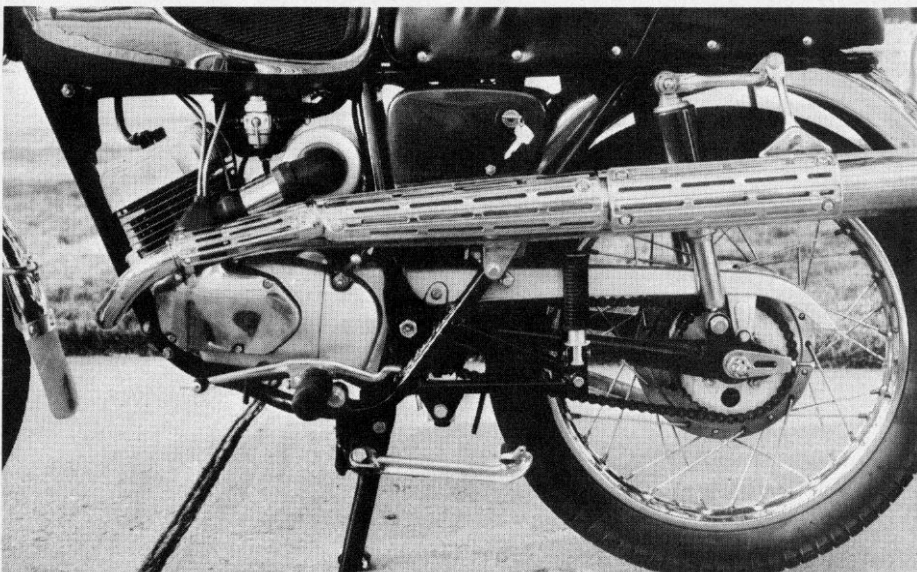
Out there the really soft slogging is where the Bridgestone Scrambler lets you know it really isn't a scrambler at all. **You** get a healthy 20 bhp from the 177cc engine, but even with the help of the rotary valves, the power peak is up at 8000 rpm. Worse, the engine's peak torque comes at 7500 rpm. Both power and torque practically disappear if you let the rev's fall below 4000 rpm, so the only way you can get through the soft stuff is to blast along, engine shrieking, and hope for the best. Don't stop for anything; you may have to carry the bike out on your back.

On the other hand, it must be said that the Bridgestone Hurricane, unlike some of the "funny-scramblers" is steady enough under plowed-field conditions to permit blasting-through tactics. The bike's fork-angle and trail (64" and 3.29", respectively) are more nearly what one would expect of a scrambler than a street-bike. In a heavyweight motorcycle, this would result in rather slow, heavy handling. It merely lends added stability to a lightweight like the Bridgestone, on or off the road. Given a set of tires better suited to rough-ground conditions, the Bridgestone Hurricane would be very convincing as a scrambler. But of course that would reduce its effectiveness as a dual-purpose motorcycle.

Measures taken to adapt the 175 Dual-Twin to woods riding do not stop with the tires. The normal, low-level exhaust system has been replaced with a set of upswept high-pipes and mufflers. The arrangement on the Scrambler is nicely up away from rocks and stumps, but it is possible to scorch your shins. Vented guards prevent direct contact with the exhaust pipes, or mufflers, but these only work well in highway cruising. In slow-going, the guards gather heat from the exhaust faster than it can be passed off into the air, and they become too warm for comfort. We suppose it is a price one must pay; sport and comfort are not always compatible.

One of the more important modifications has been the fitting of a skid-plate under the engine. Nothing is quite so discouraging as having the sharp end of a big rock hang through a crankcase, and a good, heavy-steel plate is quite a good guarantee that it will not happen. We do wish that the rear edge of this plate extended down far enough to prevent snagging of the center-stand. A couple of times, we were caught halfway across a log, unable to move forward another inch. because the stand was caught.

You may notice that each of the mufflers has a "stinger" extension. These were added, so we were informed, be-



PHOTOGRAPHY: NOEL WERRETT

cause without them, the oily exhaust coats the rear fender. We might also warn you that removing these stingers makes the exhaust just a trifle too noisy, so don't take them off just because you think the bike looks better without them.

There may be times when you will be tempted to hacksaw-away the brace across the handlebars. These bars are marvelous from the standpoint of comfort and control, but the brace cuts right across one's line of vision to the speedometer. To stay "legal" on low speed-limit city streets requires a lot of peering over and under the brace.

We have nothing but good things to say about the bike's seat. It is wide and soft enough to be comfortable, and Bridgestone has very thoughtfully made the upper covering on the Hurricane's seat a non-slip suede. Consequently, this Bridgestone is a bike that you can con-

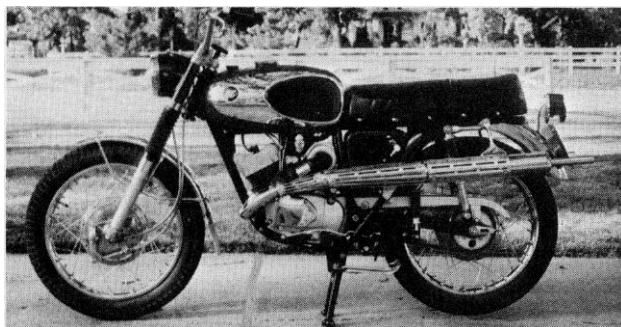
trol while out banging around in the bushes; you don't have to hang-on for dear life at the same time.

Good things can likewise be said of the bike's suspension system. It is a fine balance of springing and damping; soft enough to be comfortable while cruising down the road, yet damped so that there is little "bottoming" when riding hard in the rough. Indeed, the only time we were able to make the suspension hit the limit of travel was in jumping the bike-and there are few that do not present you with a clank or two under such treatment.

And if you ride much where the air is especially dusty, the Bridgestone's fine air-filtration system will save its engine from an early grave. Each carburetor is housed in a sealed chamber, and the chamber is connected (via a large-diameter tube) to a canister behind the en-

gine containing a big, fiber-type filter element that will stop any air-borne particle large enough to damage the engine's internals.

Like all the Bridgestone motorcycles we have seen, the finish on this 175 Hurricane is exceptionally good. Not in the sense that anything is hand-fitted; this bike is the result of careful mass-production techniques, and doesn't need "old-world craftsmanship." Everything fits, and works properly. You know it from the solid feel of the machine, and the way controls operate. Especially, you get a feeling of confidence from the way the rev's climb, climb, climb. And from the smooth, positive gear-change. After a few thousand miles, it may all take a change for the worse, of course, but we don't think it will. The Bridgestone is just too nice to flatter only to deceive. We like it; you will too. ©



BRIDGESTONE 175 SCRAMBLER

Engine type	2-stroke twin, rotary valves
Displacement	177cc
Bore & stroke	50mm x 45mm
Compression ratio	9.5:1
Maximum horsepower	20 @ 8000 rpm
Ignition	Battery and coil
Starting system	Kick
Electrical system	Alternator
Clutch	Wet multi-disc
Transmission	4-speed rotary or 5-speed return, footshift
Gear ratios..	(1) 22.6 (2) 14.4 (3) 10.7 (4) 8.62 (5) 7.35
Frame	Cradle, single downtake
Suspension, front	Telescopic
Suspension, rear	Swinging arm
Brakes	Twinn leading shoes (front), single leading shoe (rear), full-width
Tires	3.00" x 18" (front and rear), full-width
Instrumentation	Speedometer/odometer
Wheelbase	48.6"
Overall length	74.2"
Overall width	26.8"
Overall height	40.2"
Seat height	31.2"
Ground clearance	6.3"
Weight (dry)	271 lbs
Maximum speed (claimed)	85 mph
Price	\$650.00

EVALUATION SUMMARY

ENGINE

Starting	GOOD
Throttle response	GOOD
Vibration	EXCELLENT

SUSPENSION

Shock dampening	GOOD
Riding comfort	GOOD

TRANSMISSION

Shifting speed & smoothness	EXCELLENT
Clutch action	GOOD
Gear spacing	GOOD

BRAKES

Stopping ability	GOOD
Lever pressure	GOOD
Smoothness & stability	GOOD
Fade resistance	

PERFORMANCE

Acceleration	GOOD
Maneuverability and handling	EXCELLENT
Off-the-road handling	GOOD
Overall performance	GOOD

CONTROLS

Location	GOOD
Smoothness	GOOD

APPEARANCE

Paint & trim	EXCELLENT
Materials	EXCELLENT
Workmanship	EXCELLENT

GENERAL

Instruments, readability	FAIR
Lighting	GOOD
Warning device	GOOD
Stand, side &/or center	GOOD
Seat comfort	GOOD
Riding position	GOOD
Service accessibility	GOOD
Noise & muffling	GOOD