

COMPETITION CONVERSION



**Matchless Twin,
National Hare and
Hound replica,
rated by**

Dick Day—ASSOCIATE EDITOR

Photos by Felix Zelenka, Bob D'Olivo

"TAKE IT OUT and give 'er hell," was Sales Manager Guy Louis's exact farewell, as photographer Bob D'Olivo and I climbed aboard one of the hottest combinations to ever come out of California Distributor Frank Cooper's Ajay and Matchless shop here in Los Angeles . . . a much-modified 33-cubic-inch Matchless "Scrambles" vertical twin.

With almost every distributor or dealer waiting for their new '53 models, we took advantage of this chance to deviate from our pattern of "strictly stockers," to test a piece of machinery that has been modified for cross-country racing. This same Matchless twin has literally been showing the boys the way, when it came to Hare and Hounds and Scrambles. I say this only because I am one of the boys that viewed this swinging-arm-suspended billy goat from over my steering dampener.

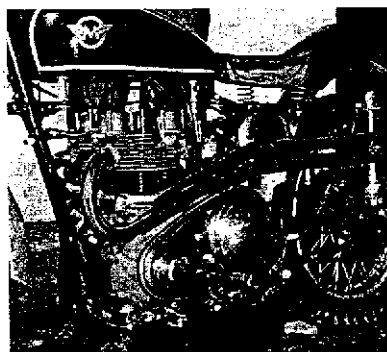
Just for kicks, let's take a gander at the records that these twin barrelled bombs were able to establish in '52. Bud

Ekins was able to load his living room mantel with five first place Hare and Hound trophies, three first place Scrambles cups, and several second and third place awards. Recently, we learned that, plus all these glittering goodies, he was named the 1952 High Point Hare and Hounder plus receiving the High Point Scramble Perpetual Award for AMA district 37. One of the biggest victories brought home with this machine was the Rams National Billy Goat Hare and Hound which Johnny McLaughlin won, with Ekins bringing up a fast third.

Now it was our turn to see why this desert jackrabbit could be tooled through bottomless sand at 65 miles per hour with such ease of handling. Once, out in the toolies, we took a short 20-mile jaunt on an off-breed road to let the newly fitted rings and valves seat in a little. Even with the 6.25:1 gearing the Matchless was pulling, it seemed to be versatile enough for pavement riding. There was a very

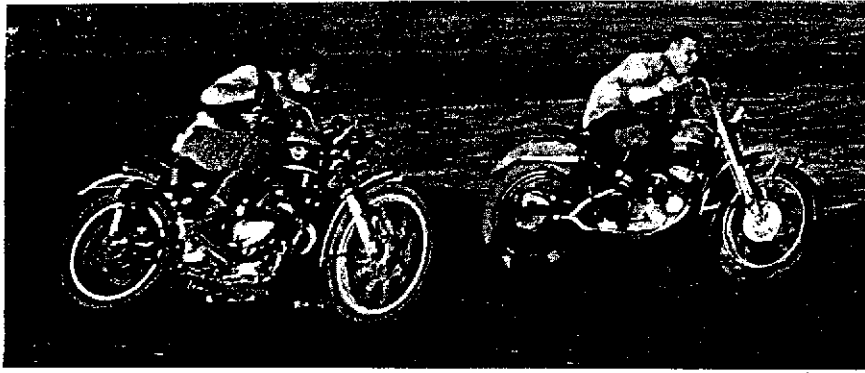
noticeable vibration point at approximately 60 to 65 miles per hour, a point that would vary, of course, with stock gearing. The riding position was most comfortable. There was no strain on the rider's back or arms, a very important factor in long runs. Several fellow club members were given the guinea-pig act as to the riding position and saddle height. Their comments were always—"Great." Upon entering the hills it was necessary to cross several gullies and choppy ground. Our "shutter bug" for this month had never been cow-trailing before and when asked what he thought of the riding comfort for the passenger, he said, looking down at the massive rear suspension, "Nice springs . . ." That isn't half of it, for here's a rear fork that has a slow and soft full-length travel. This swinging-arm rear system reflects thoroughness by the fact that each rear shock unit is additionally cushioned with two ounces of 20-weight hydraulic fluid. The test model had 40-weight oil in its rear forks, which tends to make the rear more rigid for cross-country racing by a stiffer dampening action of the rear section. The front forks were filled with 20-weight—strictly a matter of personal preference.

Transporting the photographer to the top of a nearby hill for a vantage point for photos, I was about to learn my first lesson on the vertical twin. Without the taps fully opened, the Matchless lugged down in power and, with a spit back from the carburetor, came to a sudden halt in low cog. Returning to the bottom of the hill, we started up once again with the engine singing, this time maintaining sufficient rpm's that sent us bounding over the top. With its present modifications, the twin was not a lugger in the true sense of the word but was fully up to the job when kept buzzing. Making a few runs up a long steep hill gave forth an enlightening experience. This machine's handling qualities and the lightness of the front end left the front wheel practically at rest for the complete



Chromed twin exhaust pipes are built by Cooper Motors for the "Flying M," cost approximately \$20.00 exchange. Straight pipes are made to contour of the machine, but need protective leg shield. Note clearance under the small scrambles gas tank that allows repairs

Sod was literally torn out by the roots when churned over with Avon Gripster rear tire. 21 inch front wheel adds ground clearance to lower front frame which eliminates hanging up in shallow holes or on steep knolls as this



Mixing it up with some of the boys around a short 1/8-mile track proved that the "Stick" could hold its own, and the transmission offered very versatile gear ratios for any type of dirt riding

climb, only dabbing here and there. This is a good example of the traction afforded by the 4.00 x 19 Avon Gripster tire mounted on the rear. The weight distribution of this machine is such that after riding for any length of time, anyone could become an up-on-the-rear-wheel jockey very easily. High speed cornering on the "Matchstick" was great, once you became acquainted with the squirrely feeling of the Gripster's outer edge nobbies.

Once, choosing a little more hill than the alloy acrobat could conquer, I was forced to eat crow. The trip down was completed with comparative ease. The brakes, combined with the front and rear suspension, allowed a choice of speed upon descending and not once did the machine feel as though it wanted to sneak out of control. Loading up the camera gear and the photographer, we set out to find some deep sand and soon came across a twisting wash that offered every conceivable type of gully, water hole, and soft sand. Fortunately, entrance could be made by crossing a set of abandoned railroad tracks, a vicious gimmick for testing suspension. Here the Twin performed like a master. Several trips were made over the tracks without the faintest tick of the crash plate. One could hardly ask for better ground clearance.

Once down in the deep sand, I started off full-bore and found the old vet climbing to the surface in seconds. Dropping into second gear gave the feeling that someone had given you a big shove from the rear. Popping it into third was like an overdrive. Letting the bike have its head at 55 mph proved that this was her shining hour. Shifting down into second gear for a sharp, blind bend found us headed for trouble, for, as fast as you can read this line, the screaming sand hog had bounded over a deep, wide hole. The result was a fast sharp impact but the sting was almost completely absorbed by that marvelous rear suspension. Gripping the handlebars slightly loose, we toured through this half-mile stretch around 65, just gliding on the surface. Ahead, I spied the reflection of some water. After the tidal wave had subsided, it was pleasing to note that the Matchless, although completely doused, hadn't dropped a beat.

Shifting back down into second gear.

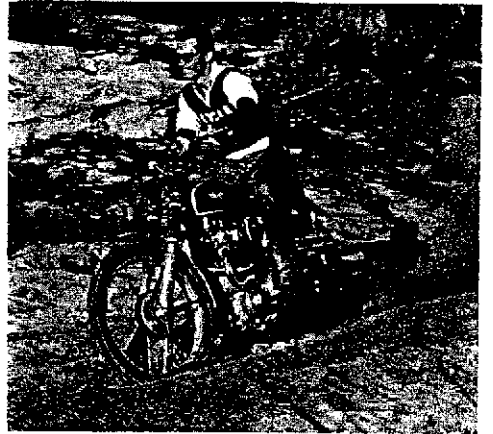
we made a quick mud-slinging jaunt over 100 yards of soft muddy creek bed. Pulling to a halt, I found myself a believer. The terrain just covered would put a Detroit proving ground to shame but only served as a compliment to the ability of the bike in question.

Going back to the weight distribution, the engine is a squatty unit with no feeling of being top-heavy. The ultimate in traction is obtained by the combination of the severe rear tire and ideal gearing. Rear suspension and the light front end let the rider work easily from a standing position with a feeling of ease and security that I've never experienced before. One very noticeable point was brought to light. When shutting the Twin completely down, as upon entering a corner, there is no coasting period, as with a single, for it comes to a fairly sudden stop. You either have it on or off. This necessitated slipping the clutch slightly to keep the engine revolutions up while negotiating some of the soft, sandy bends.

Checking for demerits at this time we found that the bolt holding the float chamber to the mixing body of the carburetor had become loose, letting the gas seep out like mad. Breaking out the old "King Dick" adjustable spanner, this was remedied in short order. Following a few fast pictures, we loaded up the gear and headed back for Frank Cooper's shop. Taking a short cut through Baldwin Hills, we chanced across a few sand-lot racers practicing on a fifth-mile track that they had carved out of the country-side. The temptation was too much, for after observing for a couple of laps, the Matchless mill was soon spinning about 6,000 rpm's, mixing it up with the boys and doing a good job of holding its own.

Pulling into the driveway back at the shop, looking much as though we had just finished the Jack Pine, little helches of blue smoke began puffing from under the cylinder head . . . a blown right gasket. This could not be determined as a direct demerit for the bike, for following the ring job prior to the test, the head bolts had apparently not been pulled up quite tight. Replacing the gasket was only a matter of thirty-minutes work. The test model had a small scrambles tank which left ample space for the engine to be disassembled with only the disconnection of

the gas line. One big feature of this versatile little twin is the fact that each cylinder is a separate unit. When faced with a situation such as this, it only necessitates removing one cylinder head plus the intake manifold, carburetor and the overhead valve cover. This type of trouble happens very little but being able to work on one cylinder at a time without disturbing both barrels is definitely a time saver and a clever bit of design on the manufacturer's part. After replacing the head gasket and buttoning up all the components, I was about to see one of the most unique valve adjustments ever witnessed. Loosening a small lock nut that clamps the rocker spindle, it is only necessary to insert a screwdriver at the slotted end of rocker arm and turn slightly. The rocker arm is actuated by a cam which raises and lowers this unit until .006 clearance is obtained for adjustment. This is such a simple operation that any new owner, with only a small degree of mechanical aptitude could perform the task. Replacing and tightening down the overhead valve cover are all that is necessary



In deep sand the "Matchstick's" low-slung weight showed up noticeably in superior handling. Third gear would net a good 60 mph through deep stuff, purring like a kitten

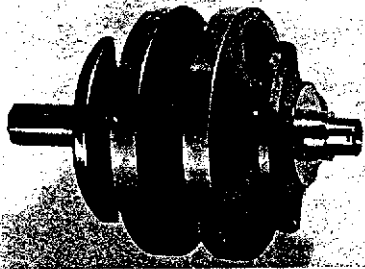
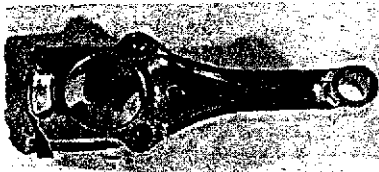
to button up this thirty-minute job.

While we're still on this technical kick, let's go inside of the bored out 33 cubic inch powerplant and pick up some of the fine engineering points, starting first with the crankshaft that is cast as one unit. One look at the massive crankshaft, with dual flywheels and bobweights, and it's evident that there is brute strength in its large bearing surfaces. The shaft has one main babbit-type bearing where it passes through a center partition in the crankcases. Heavy duty roller bearings support the crankshaft on the timing and primary side of the crankcases. The connecting rods of the Matchless reflect a finish on a par with your own bathroom mirror, factory-polished with the same gloss that many of us put on our first VL or 101 Scout innards. The crankcases are cast in almost a complete sphere, the ultimate contour for strength. On the right side crankcase of this particular machine there

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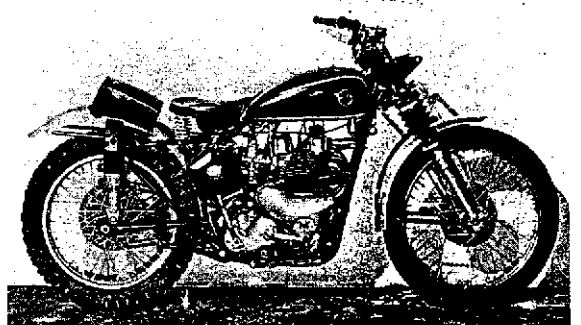
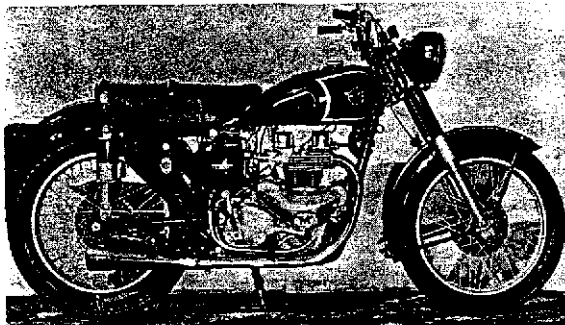


Stock handlebars were great for leverage and position. Brakes worked smooth and lent to ease of selecting groove while descending. Mag is controlled manually by spark lever on bars



Connecting rods are polished to lessen oil friction. Note upper end of lower section of rod has been drilled and fitted with steel bosses that anchor cap studs for added strength

Standard to scrambles modifications: dual saddle replaced with Terry solo and pillion, stock fenders replaced with aluminum alloy guards, 4-gallon tank exchanged for 3-gallon scrambles tank, twin cross-over headers substituted for stock exhaust system, 3.00 x 21 front wheel and tire preferred to standard 3.50 x 19 size. All electrical equipment, tool boxes, center stand and chain guard are removed. Throttle and clutch have dual cables for quick change-over in case of one breaking, and large sprocket has been fitted to rear wheel, which relieves a large amount of stress on the clutch



is an ugly dented scar, a battle wound from one of last year's Hare and Hounds. The dent is concaved approximately $\frac{1}{4}$ of an inch and almost one inch in diameter. There was a slight oil seepage for a few days then it stopped, although there is undoubtedly a crack inside. The point is merely mentioned to indicate the strength of design. Oil lead-in lines to the crankcase are somewhat of a bad feature on the twin, in that they're as vulnerable as Durante's nose, where they fit on the timing case cover. It's easy to see how they could be mashed while traveling through a rock-studded dry wash. On the test machine the oil line had been covered with a fairly heavy rubber aircraft hosing, acting as a cushion for rocks that the lower section might come in contact with. Guy Louis informed me that they are in the process of building a small protective crash shield for this area of the bike which would entirely eliminate fear of mishap. The oil pressure that this engine carries is almost fantastic. Gage-tested, the pressure registered 180 pounds at running speeds and 80 pounds with engine idling. Each cylinder is a separate unit and houses all internal oil line passages, there being no outside tubing. The barrels are centrifugally cast, eliminating blow holes in the cast iron metal. The push rods, also being located in the cylinder, eliminate several outside parts such as: covers, seals, etc. Also, the cylinders being separate components give a greater circulation of air in between each unit, doing away with the familiar air pocket that is found on various other makes. Each separate cylinder is held down by four full-length head bolts extending through the cylinder to the case proving very satisfactory when packing in a few speed goodies, especially more compression. The cylinder head is cast of aluminum alloy metal. Huge light gray fins give the impression that there ought to be more cylinders under all that area. The pistons fitted to these special models are made exclusively for, and sold by, Cooper Motors for the scrambles twins. The size of the slugs enables the use of stock 21 cubic inch hard chromium plated rings. Pistons are manufactured for the following sizes: when the barrels are bored, the stock scrambles pistons are fitted, then there are two more sets of slugs that are .020 and .040-inch over the original scramble bore. Thus, the owner is not left hanging when in need of a re-bore. The scram-

bles pistons are manufactured of light aluminum and have $\frac{3}{16}$ -inch thickness at the top with a compression ratio of 8.5 to 1. When this engine is completely assembled and sitting in the frame, it looks about half again as wide as other twins and twice as condensed from top to bottom. Comparing measurements with others disclosed that variation was usually only $\frac{1}{2}$ -inch wider and somewhat shorter in height. This height of the engine differs mainly because of the deep spigotted cylinders that fit well into the crankcases when assembled. Sitting in the frame as low as it does drops the center of gravity of the overall machine down low, which is another main item for ease of handling.

Nine a.m. Monday morning found the weather fair and the road test crew gathered at their favorite spot around the first electric timing eye, sipping black coffee in anticipation of the regular speed run. With everything all set, we warmed the low-g geared Matchless up and took off up the strip for the inaugural run. Reaching the end of the approach area, I turned and set sail for the timing traps. In fourth gear, the little bomb was really screaming when, upon entering the trap, it developed a bad sputtering. On the way back to the timer, I let the machine peak out in third gear, for here again the miss was dominant, although not quite so severe. Little did we realize that the first time of 35.10 miles per hour was going to be our fastest time of the day. Checking the plugs, they showed to be burning beautifully and definitely not the trouble. We pulled the carburetor bowl off and checked all the components, but with no indication of trouble. On pavement, the bike felt a little sluggish and slow getting under way, hinting of a flat spot in carburetion. This could be attributed to the $1\frac{1}{2}$ -inch carburetor that had replaced the stock 1-inch venturi. With all Hare and Hounds in this area being usually laid out in the Mojave desert, and passing through the surrounding mountains, we are constantly running at altitudes ranging from 3,000 to 5,000 feet. The test machine has been set up with a larger carburetor to compensate for the thin air at those altitudes. When run at almost sea level, it has a tendency to suck in a little too much air compared to the gas consumption and give the flat, over-carburetted feeling. Do a switch, though, and take the bike up to a higher altitude and it should be perfect. Generally speaking, the stock 1-inch pot will be

the best when running at lower altitudes. Considering the gearing of 6.25:1, 85 miles per hour seems quite respectable.

The Matchless has one of the most massive heavy-duty rim and spoke set-ups of any bike on the U.S. market today, and it would take some very harsh usage to tweak this rim. There was no sign of clutch slippage throughout the entire test and the transmission was absolutely tops. At first, I missed a few shifts because of being used to a shorter moving shifting lever. After getting acquainted with the distance of travel, missing a shift was practically impossible. Light toe pressure and the easy location of neutral were most noticeable. This gearbox is a direct take-off on the "Boy Racer" model except that it is not a full ballbearing throughout.

Utilizing an S-bend at the end of our paved speed strip afforded a proving ground for determining whether or not the rear swinging-arm suspension would have a tendency to walk on a hard surface while cornering. The answer was negative. The brake figures were not outstanding but it must be remembered that the bike

is rigged strictly for competition and that neither the narrow front tire nor the accented nobby Gripster on the rear are the best for braking efficiency over pavement. Both brake levers, front and rear, worked easily and progressively. With a more conservative tire tread fitted to the machine, it is believed that the model would show up a much lower braking figure in view of the springing range.

Putting Editor Bob Greene on the pillion pad, we took off down the road, leaving the test crew securing the timing equipment, in search of some near-vertical hills. We found that the choicest area was a knoll offering two good 60 degree grades of about 25 feet in height on each side of the road. I made a run at the steep hill and with a minimum of work found myself on top of the grassy crest. Back at the bottom, Bob, still not quite believing his eyes, climbed aboard and bounded over the hill in the same fashion and, upon returning, his only comments were . . . Huh, no strain!

With the conclusion of this obstacle, the test on the modified Matchless drew

to an end. It had mounted every conceivable challenge that would either make or break it when it came to competition events. Tabulation at the bottom of the test sheet tallied out as such: Performance, good; comfort, traction and handling qualities, the ultimate. For owners who are now riding a stock 30.50 Matchless Twin, or enthusiasts contemplating buying this machine, the complete modification set up, identical to the test machine, can be acquired for the nominal fee of \$85 including labor, and the exchange of such parts as exhaust pipes, fenders and the front wheel. For the conversion on just the engine alone such as bore, pistons, and rings, \$21.50 will give you those extra suds when grabbing a handful of throttle. And . . . for those of you who are already riding and competing on these Scrambles twins, "Please, gang, don't tear the course up so much. It's rough on us guys back here . . ."

Price of new stock Matchless 30.50 cubic inch Vertical Twin, \$875 plus tax and license fees at Los Angeles.

PERFORMANCE SUMMARY

Acceleration		Turning Circle		Maximum in third		Maximum in high	
1/4-mile drag	15.83 secs.	Minimum diameter	11 ft. 6 ins.		72.58 mph		85.10 mph
57 miles per hour average				Braking			
1/40-mile drag	8.25 secs.			From 25 to stopped,			
43 miles per hour average				rear brake only			41 ft. 9 ins.
Slow Running		Mileage		From 25 to stopped,		From 25 to stopped,	
High gear without snatch	11 mph	Under competition circumstances	34 mpg	front brake only			38 ft. 5 ins.
		Speed		From 25 to stopped,			
		Maximum in low	39.30 mph	both brakes			23 ft. 6 ins.
		Maximum in second	50.14 mph				

GENERAL SPECIFICATIONS

ENGINE. Vertical Twin (stock model) 30.50 cubic inch displacement; bore 2 1/2 inches; stroke 2 7/8 inches; compression ratio, 7 to 1. (Test model) 33 cubic inch displacement; bore, 2 3/4 inches; stroke, 2 7/8 inches; compression ratio, 8.5 to 1. Two separate deep finned aluminum alloy cylinder heads, stellite tipped valves and cast-in cast steel valve inserts seats. Individual cylinders deeply spigoted into the die-cast spherical crankcases. Stock aluminum alloy pistons replaced with special cam-ground aluminum pistons when bored out; forged light alloy highly polished connecting rods, twin flywheel crankshaft with two bob weights on each side of shaft, cast in one unit and of exceptional strength. Crankshaft is supported with Vandervell center main and big end bearings (babbitt type). Crankshaft on timing case side and on primary side has heavy roller main bearings.

CARBURETOR. Amal one-inch diameter venturi, air cleaner choke lever on handlebar (has been removed) (test model has Amal 1 1/2-inch diameter venturi).

TRANSMISSION. Oil lubricated, heavy weight, four speed with enclosed positive stop foot gear change and kick starter. A constant mesh, direct gear to gear system eliminates usual spool or sliding gear. Shifting by dogs similar to synchromesh.

LUBRICATION. Circulating dry sump system, twin gear type oil pumps running directly off end of camshafts. Built-in filter in oil tank easily replaceable. Oil system through internal passages. Only outside leads are flexible mounted pipes from oil tank to engine. Pressure lubrication to top end.

IGNITION. Gear driven flange mounted Lucas magneto. Manually operated at handlebar.

ELECTRICAL EQUIPMENT. New long type heavy duty six-volt generator is gear driven, voltage regulator. High and low beam headlight, tail-light and parking light (test model has all this equipment removed).

CLUTCH. New heavy duty five stud with fiber inserts. Multiple disc dry type.

DRIVE. Prestretched "mark ten" Renolds racing chain. Shock absorber on engine sprocket. Single row 1/2-inch pitch x 3/4-inch wide roller primary chain. Rear chain is 3/8-inch pitch x 3/8-inch wide roller, same size as American big twins.

FRAME. Single loop front section with rear suspension swinging arm set in large wide journal bearings. Huge rear main springs are 6 inches long x 3 inches in diameter. 3 1/2 inches of travel on rear swinging arms.

FORKS. Teledraulic, fitted with metered pistons for constant control with oil on both sides of piston to buff counter-recoil as well as recoil. This same system applies to rear forks.

HANDLEBARS. Chrome plated, competition type rigid mounted. Left bar; clutch, compression release (removed on test model), spark control, dimmer switch (dimmer has been removed). Right bar; front brake, throttle, choke lever, and horn (choke and horn have been removed).

WHEELS. Mounted on Timken-type tapered roller bearings, safety washers on hubs prevent spokes from tearing out. Rear wheel, 3/8-inch spokes and heavy duty rim.

BRAKES. Internal expanding 7-inch front and rear; shoes 7/8-inch wide. Brakes can be quickly adjusted by hand, screw type lock nuts are adapted to both front and rear brake controls.

TIRES. 19 x 3.25 front; 19 x 4.00 rear; Dunlop triple stud tread. (Test model has Avon gripster 4.00 x 19 rear; 3.25 x 21 Dunlop triple stud tread front.)

TANK. Pressed steel, four U.S. gallon capacity. (Test model mounted with 3 U.S. gallon scrambles tank.) Single filler cap.

INSTRUMENTS. Smith's 120-mph illuminated speedometer, ammeter and lightswitch in headlight shell. (Test model has ammeter and lightswitch removed.)

SADDLE. Terry, with chromium plated coil springs, separate sponge rubber pillion seat.

FINISH. High temperature black baked enamel finish, very hard and durable.

TOOL KIT. Dual tool boxes, one on each side of rear fender. Complete set of tools, grease gun, tire irons, and ignition tools. Tire pump mounted on left side of frame. (Test model has all this equipment removed.)

OVERALL LENGTH. 85 1/4 inches.
OVERALL WIDTH. 29 1/2 inches.
WHEELBASE. 55 1/4 inches.
GROUND CLEARANCE. 7 inches.
SADDLE HEIGHT. 32 1/2 inches.
WEIGHT (dry). Stock twin weighs 400 lbs., after modification twin weighs approximately 360 lbs.