

MINI BIKE GUIDE

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MONTGOMERY WARD T555

A three wheeler that



Where all the interest in three-wheelers comes from, we don't know—but it's certainly there. These surprising machines are the hottest thing on the recreational vehicle market right now. Everybody is building them and everybody is selling them. We must not be surprised since it wasn't so long ago that MBG was apt to scoff at a machine with more than one wheel in the front and one at the back. But, then, we've been wrong before.

So, we quickly accepted when we got a call from Ted Falen, of Montgomery Ward, inviting us to meet him in Omaha, Nebraska. He didn't dangle with the opportunity to see his company's new three-wheeler being made. In addition to watching the manufacturing process, he wanted to arrange a test of the machine (Tee, Five, Fifty-five) as the machine is being called, in different (for us "California boys") surroundings. As it

turned out, it was a little more different than we should have wished for—but more so that later.

During this expedition, we spent quite a bit of time discussing the "where's" and "whyfor's" of the three-wheeler business. When we're wrong, we want to know how. It's Ted Falen's conclusion that the success of the three wheeler is simply an extension of the "mini-bike syndrome". Mini-bikes took off, according to popular agreement, because people were looking for ways to better utilize the family's free time. The little machines appealed to many people because of their simplicity, light weight, and the fact that they didn't look *too* much like a motorcycle. Of course, the persuasive powers of mobility-hungry youngsters had something to do with it and things have changed since then—but that's another story.

Three-wheelers have nearly all the at-

tractions of mini-bikes (albeit, sacrificing some of the light weight and portability) with one important characteristic that mini-bikes don't have. You don't have to balance a three-wheeler. All by itself, it stands upright. This means that mom, who use to stay in the camp knitting, can now go out with dad on the motorcycle and the kids on the mini-bikes. Although she may not be able to match dad's hill climbing ability, nor the kids' maneuverability, still she can do most of what they can do. And while sitting down, too.

Yet it is not altogether accurate to make a direct comparison with mini-bikes and motorcycles. Three-wheelers are a whole new kick. They have something of dune buggies; a dash of drag racing; more than a hint of all terrain vehicles; and, of course, they borrow most of the components and much of the construction techniques from mini-



comes apart and stays together



bikes. With all this going for them, it is not surprising that mom has to share the fun with the rest of the family. In fact, if she is not careful, she just might wind up back at the camp with her sitting.

In fact, the machine that started it all, the Dunecycle from All American, can now be found, driven by Superhot McCulloch's, tearing up race tracks wherever race officials are brave enough to let them in.

Racing three-wheelers are not for mom. Actually, they are not for most of the people interested in this type of transportation. The present crop of three-wheelers are viewed as trail machines, fun and simple.

And that's how we approached the Montgomery Ward three-wheeler. It is not often that we have the opportunity to see how a machine is made before we buy and test it. Obviously, we were being asked to see it being made in an

attempt to influence the result of the test. And there is no doubt that it did have an influence. We were very much impressed with what we saw. If all our test machines were made this way, we would have much less to complain about, and that includes some that bear the Ward label.

The T555 is made, under contract, at Central States Tool and Die Company. Central States has an advantage over many manufacturers, they have the machinery to make their own dies—something that most manufacturers have to pay for. In fact, while watching some destruction tests on parts of the frame, we happened to notice one of the workers trimming the length of short tubes on a huge, precision lathe. We asked what he was up to and were told that he was making sure that the steering tubes were the right length. While it seems like a small thing, it indicates a concern for

accuracy that would be nearly impossible for a company without all that expensive machinery.

We are not sure that a test is the right place to talk about manufacturing. However, we learned a number of things in Omaha that relate to the machine and, at the same time, reveal some interesting facts of life. We have often wondered why some manufacturers would appear to skimp on apparently inexpensive items. It seemed to us that it is nearly as inexpensive to do the job right as it is to risk the wrath of angry customers. When questioned about this, the stock answer is that MBG doesn't know much about manufacturing techniques and what we suggest would cost the consumer too much to be practical.

Well, in Omaha we were face-to-face with people who *did* know something about manufacturing and we are now confirmed in our original belief. It is

almost as cheap to do it right as it is to do it wrong. The manufacturer simply needs to be convinced of the need—apparently a magazine test has little impact in most cases.

Which brings us back to the T555. The Montgomery Ward three-wheeler is the first we have seen that has sub-assemblies that can be disconnected for easy transportation. The unwieldy size of the average three-wheeler is a major drawback for people without a truck or a trailer.

We were watching the destruction test of the steering head sub-assembly (one we selected at random). We were told by Jim Hicks of Central States how the design had evolved. Originally the tubing had been 1½" diameter, 12 gauge wall, which might seem plenty hefty enough. Subsequently, 1-5/8" tubing with 10 gauge wall, which is even bigger and thicker, was used. The Montgomery Ward and Central States people thought this would give an additional margin of strength (there were some minor design changes, too). All this is no big deal except our curiosity was piqued about the cost of this change, since it is the kind of thing we sometimes urge on manufacturers after a test.

Hicks shuffled through his papers and came up with a less-than-10-cents increase in material costs per machine. Tooling costs for the new design were negligible when spread out over the production run. It is a rough rule of thumb to triple manufacturing costs to arrive at retail prices so, for about 25 cents, the customer has a much stronger machine. Makes you wonder about all those other "impossibly expensive" improvements to other machines, doesn't it.

This evidence of concern for quality was all around the Central States shop. However, the most carefully-built machine can be a pile of junk if the design is not right in the first place. Our main concern was an examination of the Montgomery Ward three-wheeler.

In overall appearance, it is not so much different from other American-made three-wheelers (with the exception of the Sperry Rand Tri-Cart, which is like nothing else currently on the market). It has the large All Terrain Vehicle tires that we have come to expect on the rear of these machines. There is a single backbone main frame member that starts at the steering head and goes all the way back to the trailer hitch (that's right, a trailer hitch). A sub-frame is mounted on the main frame member to carry the seat and to provide a mount for the axle hangers at the rear. The engine mount plate is also

carried on the sub-frame. The plate has a hanger to give the axle inboard stability. Of course, sealed ball bearings are used at all three axle mounting points (on three-wheelers, where the axle is driven by the engine, the wheels are fixed to the axle and do not revolve around it as they do on two-wheelers).

As a general rule, we have found that live axles, that is to say, one-piece axles, are not very good on three-wheelers. This is because when the machine goes around a corner, the outside wheel must turn faster than the inside wheel—otherwise the machine tends to push in a straight line. To overcome this problem most three-wheeler designs call for a split axle (two halves) driving through a differential. The differential allows either wheel to turn at a different rate.

Another problem appears when steering a three-wheeler. Most of the weight is on the rear end (this can be demonstrated by lifting the front end quite easily, even with an adult sitting in the seat). This means that the front wheel needs a little assistance when maneuvering around tight spots, since it does not have much bite. Rear-ward turns can be made, however, if the machine is equipped with two independently-operated brakes, one on each side of the axle. The inside wheel can be braked down (or even stopped) while the outside wheel pushes around. Of course, it

can only be done this way if the axle is split and a differential is used. This maneuverability is doubly important on a three-wheeler because of its width.

The Ward three-wheeler scores on both counts. It has a differential and it has dual, independently-operated brakes. In one direction at least, our test machine would turn in its own width.

Power for our test machine came from a Briggs and Stratton five horse engine driving through a Comet symmetrical torque converter. The torque converter has become accepted wisdom for three-wheelers and, because of their enormous ground friction, we doubt if they would ever have gotten off the ground (pun intended) without this type of transmission.

However, unlike domestically made mini-bikes, the engine situation for three-wheelers is still pretty fluid, although the American industrial engine seems to have the edge. The five horse B&S is a real workhorse and we were pleased, if a little surprised, to see it pushing the Ward three-wheeler. It seems that the powers-that-be at Briggs smile with favor on three-wheelers while frowning mightily on two-wheelers. Just like you, the logic escapes us.

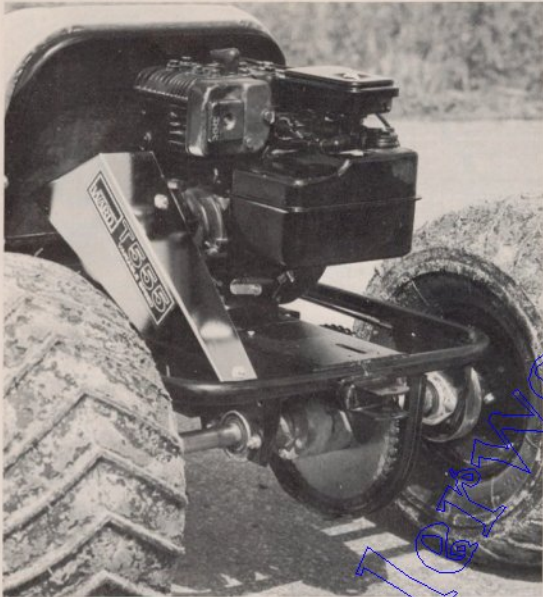
The driven pulley of the torque converter is mounted below the engine, on a jackshaft, and the belt area is covered by a steel guard. The final drive is on the left



hand side of the machine (opposite to the engine's PTO) and uses long-lasting No. 420 roller chain. Incidentally, Ward must have been worried about liability law suits if this chain ever got loose. It is almost entirely caged by a strong guard running from back of the seat, down around the rear sprocket, and back up to the sub-frame, while the jackshaft sprocket has its own steel guard. The rear sprocket guard has the added advantage of keeping rocks away from the chain.

Before we leave the rear end, one further observation. The jackshaft assembly can be moved back and forth, via an adjustment bolt, for proper chain tension. The mounting bolts holding the jackshaft bracket have to be loosened, which is somewhat of a hassle, but it's a heck of a lot better than having to wait until the chain is slack enough so that a link can be removed.

On this model of the Ward three-wheeler, there is no fiberglass. Most three-wheelers use fiberglass to provide a seat, some styling around the rear end, and protection from mud. However, fiberglass is expensive and, unless very hefty, subject to cracks. There is some talk about adding a fiberglass-styled three-wheeler to the Ward line, later, but in the meantime their customers will have to make do with a somewhat Spartan appearance. As consolation,



they'll be able to count change from \$350.

The seat is wide enough to accommodate even a lardy rider and is really comfy. Some lateral support is given by high sections on the outside, preventing the rider from sliding out of the seat. The seat is plywood backed and bolted to the frame—we would have preferred seeing a steel back and having it welded to the frame, just for peace of mind. Certainly the seat is well supported and turns out to be much more comfortable in use than its appearance indicates.

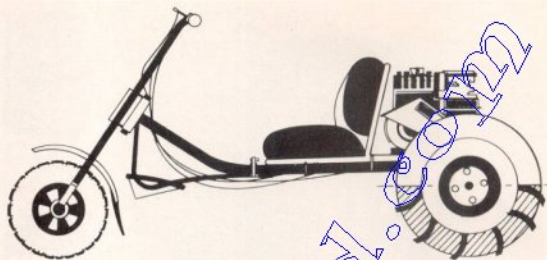
Ahead of the seat is the disassembly point where the front end can be separated from the rear end for transportation. It consists of two hefty triangular plates, one welded to the main member tube from the front end and the other welded to the main member tube to the rear end. Each corner of the triangular plates is through-bolted with 3/8" aircraft quality bolts and lock nuts.

Considerable testing and changing went into the final development of this system and, from all appearances, it is over-engineered with a large safety margin. As mentioned earlier, the forward section of the main frame member is 1-5/8" in diameter with a 10 gauge wall. This is triangulated by the footrest support tube. The bend in the main member tube is kept gentle and sweeping to avoid deformation and reduced strength. The footrest support tube butts up against the triangular plates and then extends backwards to the seat frame.

There is little doubt in our mind as to the strength of the frame at this point but disassembling the machine is no quick-release deal. To separate the two halves the three bolts must be removed and the brake lever and throttle taken off the handlebars. Still, it's a lot better than having to buy a new truck to haul the machine around.

The footrests are interesting though ugly. A loop is welded to the tube that runs down below the footrest main member. Welded into this loop are two sheet metal "stirrups". This method, rather than pegs, was chosen to protect the feet of the rider.

Front fork treatment is strictly "early mini-bike" although it is very strong and seems to fill the bill as far as steering ability is concerned. The rake of the front fork is much less than some three-wheelers and, thus, there is less plowing action when steering into a turn. Also, the steering head is massive and there are ball bearings top and bottom. However, the front end treatment is strictly minimalist with the forks running



MONTGOMERY WARD T555

Manufacturer: Central States Tool & Die Co., 4241 N. 30th St., Omaha, Nebraska 68111.

ENGINE

Engine type	Briggs & Stratton 4-stroke carb	Vacue-Jet	
Bore	2-9/16"	Flywheel magnet	
Stroke	2-7/16"	Lubrication	Splash
Displacement	12.57 cu. inches	Fuel capacity	3 quarts
Horsepower @ rpm	5 hp @ 3000	Fuel requirement	Regular
Compression ratio	NA		

TRANSMISSION

Transmission type	Torque converter	Final drive	No. 420 chain
Primary drive	V-belt	Gear ratios	Automatically variable, from 5.4:1 high to 18:1 low
Clutch type	Centrifugal		

CHASSIS

Frame type	Single backbone, seat/engine, rear sub-frame	Rear	8-inch pressed steel
Wheelbase	50 inches	Tires,	
Overall length	66 inches	Front	14" dia. knobby
Suspension,		Rear	18" dia., 8" read ATV/LP
Front	Rigid	Brake(s)	Dual, rear axle mntd.
Rear	Rigid (low pressure tires)	Ground clearance	6 inches
Wheels,		Seat height	12 inches
Front	6-inch split rims	Handlebar height	22 inches
		Dry weight	145 pounds

PRICE AS TESTED \$345.00



straight from axle to where they bend around to become handlebars. The crown plates are formed from a single steel stamping with the front section providing a place for the model name. On the upper crown plate is a toggle ignition kill switch.

Front wheel is a relatively small diameter 6-inch split rim aluminum unit mounted with a modest 14-inch diameter tire. There is a chromed front fender and this is equipped with a mud guard. Throttle controls are good but

the brake levers should be bigger and should have knobbed ends. And the serious rider will convert the kill switch to the handlebar-mounted, push-button type that can be operated by a thumb.

When we accepted the invitation to go to Omaha for a "different" test, we had no idea that the people out there had a direct line to the management upstairs. We expected different terrain, different scenery, but we were totally unprepared for the show they arranged. The night we arrived, they took us to dinner at the top of a fourteen-story hotel and proceeded to lay on the most hair-raising electrical storm you have ever seen. It was fantastic—better than anything Disney ever thought of. And it rained, and it rained, and it rained. With the water pouring down the windows and the lightning flashing all around (even below) us, we were sitting with our mouths open while they treated it all as something to be expected. With this kind of power at their fingertips, we began to feel that this could be the first

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It's a Wards...

TERRAIN-CYCLE

For Hills, Sand, Snow, Mud & Open Country Ward's new T-555 is a fun style three wheel-cycle for the whole family to enjoy all year long. It takes most terrains, even light snow, sand, and shallow streams. Powered by a big 5 h.p. Briggs & Stratton... this three-wheeler is fun to run. Ward's terrain cycle can be quickly separated into three parts for easy loading.



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**MONTGOMERY
WARD**

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