



This

Come for a dizzy spin in this tiny, fast and rugged acrobat on wheels. Its performance and antics amaze even its designer.

By Joseph Hines

RESIDENTS along a road outside Wheatland, Pa., near the Ohio border, are getting popeyed watching the daily performance of a new car. Some of its tricks would make any sensible mule hesitate.

The Mighty Mite is its name. The Marines are testing it as a quarter-ton transport vehicle for airborne assaults.

PSM photographer Bill Morris has covered about every type of new car, civilian and military, produced during the last 13 years. He saw the first demonstration of the original jeep in 1941. He doesn't excite easily.

Bill got his first look at the Mighty Mite outside the Mid-America Research Corporation's plant at Wheatland, Pa. Ben F. Gregory, veteran racing driver

and inventor, and an advocate of front-wheel drive for more than 30 years, was boasting about the prowess of his baby. He designed the original model of the Mite.

"It's got four wheels and looks like a small jeep to me," said Bill. "What's so different about it?"

"Jump in, Mr. Morris," Gregory said.

As the Mite started, I jumped back.

"Stay put," called out a mechanic. "He'll clear us. The thing has a turning radius of only 12½ feet."

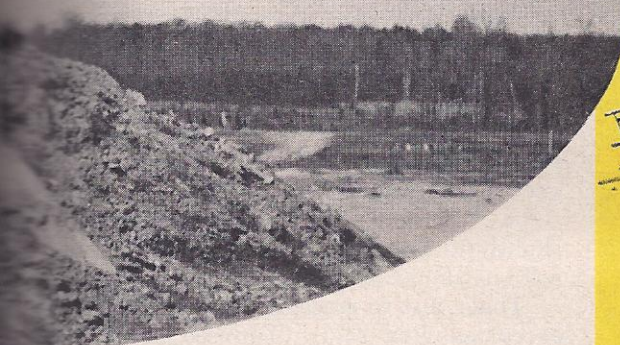
A neat circle and the lightweight Mighty Mite was off toward the road.

One of the Mite's many weight-saving devices is an air-cooled engine. Because it was available for the first experimental models, a four-cylinder, horizontally opposed German Porsche, developing 44 horsepower at 4,000 r.p.m. was used.

Little Car Has Big Ideas

IN UNIFORM

IN CIVVIES



THE MIGHTY MITE tops an 87 percent grade at Marine Corps proving ground, Quantico, Va. Designed as a rugged, lightweight combat vehicle that can be lifted by helicopter, the new little car is also scheduled for a civilian career, as shown in drawings at right and below.

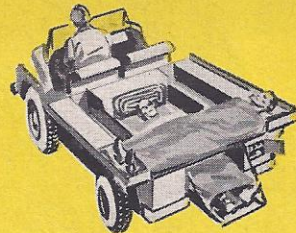
This probably will be replaced by a modified, American Lycoming aircraft engine of 65 horsepower at 2,600 r.p.m.

While we were looking over one of these Lycoming jobs, the Mighty Mite drove right into the shop. After tight-circling us, Gregory drove off through a maze of jigs, jamming on the brakes as he was headed for a crash through an office partition.

Bill Morris climbed out. His face was flushed, his thick mop of white hair wind-blown. He was breathing hard as the



FOREST-FIRE TRUCK



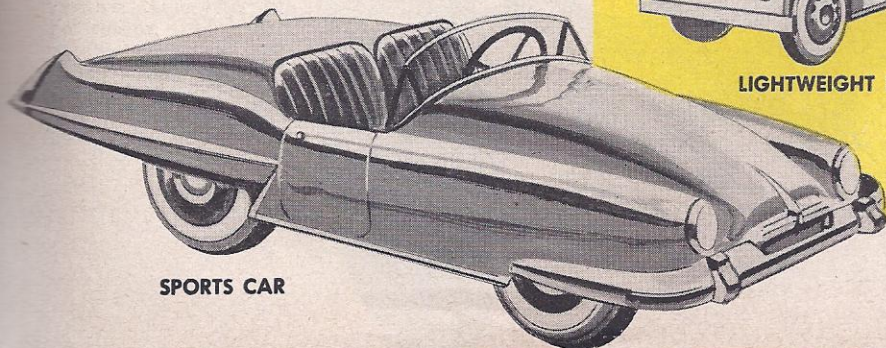
RESCUE TRUCK



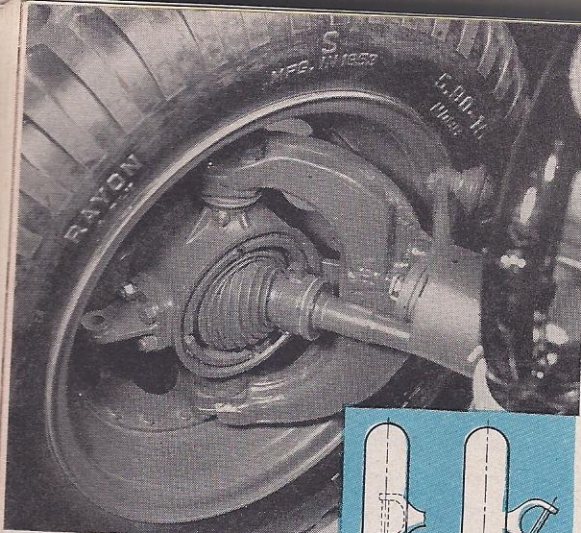
LIGHT DUMP TRUCK



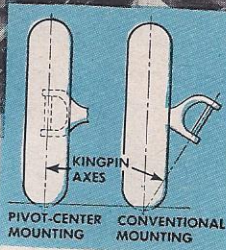
LIGHTWEIGHT PANEL TRUCK



SPORTS CAR



FRONT WHEELS are pivoted on vertical kingpins centered inside the hubs.



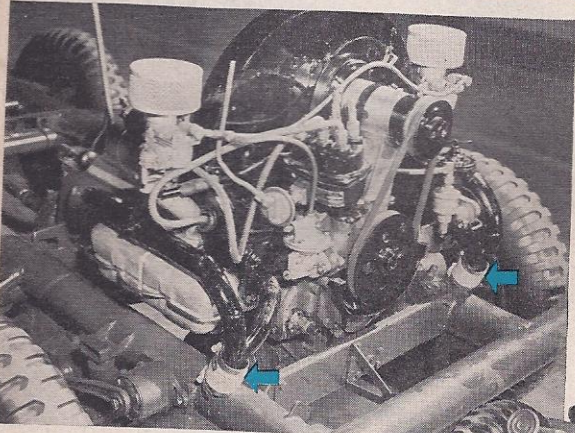
words came out, "Yes—yes it—it's different from a jeep. What a ride!"

Now it was my turn. We were doing better than 50 on smooth pavement when I saw double railroad tracks crossing the road ahead. Instead of slowing down, Gregory put on more speed. He told me to watch the steering wheel. I did. He had taken both hands off the wheel. I gripped a handle by the windshield. I didn't need to. The car didn't swerve or sway; the steering wheel didn't even wiggle. If I hadn't seen the tracks, I would have sworn that we were still on smooth pavement.

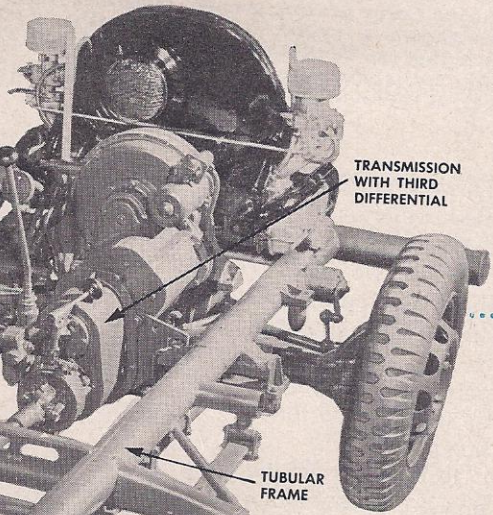
More Tricks to Come

"Now watch this," he said. His hands were off the wheel again. With one finger he spun the wheel sharply to the right. I braced myself. The car turned slightly to the right, but straightened itself out almost immediately.

"That's just to reassure you for what's to come," Ben said. "You see, left to

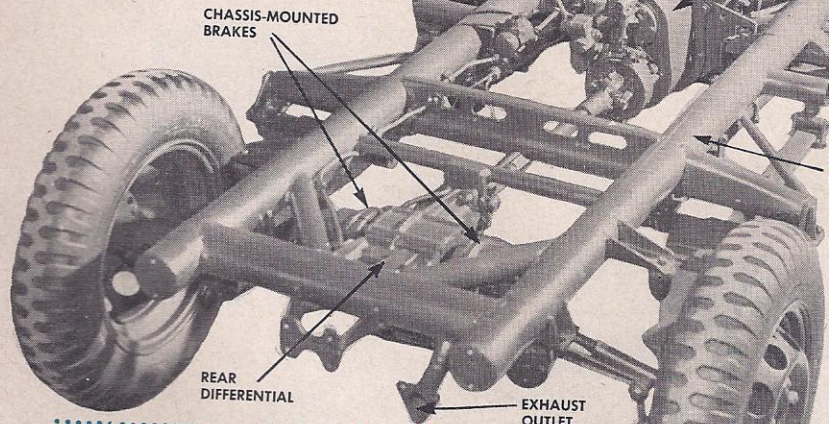


AIR-COOLED engine reduces weight. It exhausts into tubular frame (arrows) as muffler.



TRANSMISSION WITH THIRD DIFFERENTIAL

TUBULAR FRAME

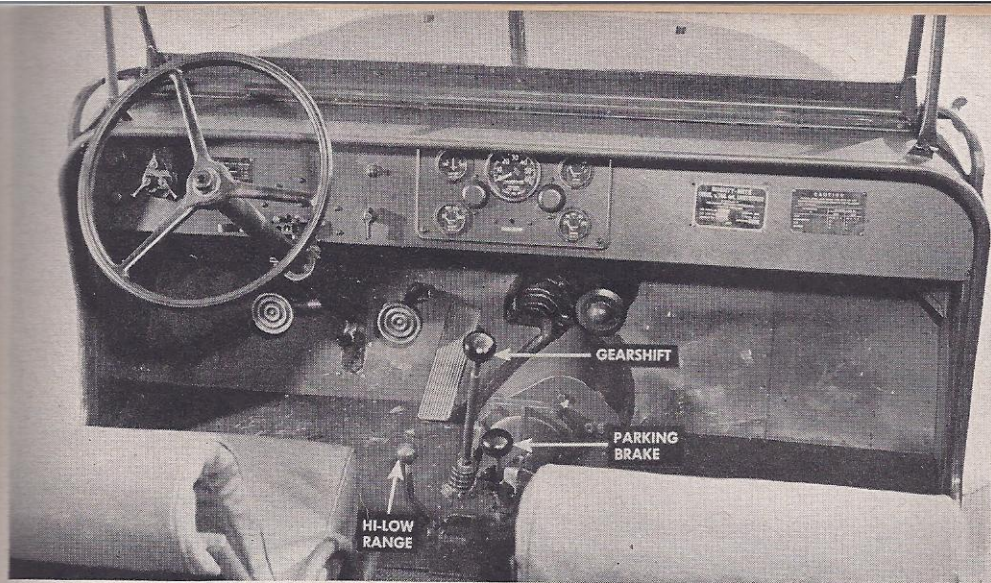


CHASSIS-MOUNTED BRAKES

REAR DIFFERENTIAL

EXHAUST OUTLET

MITE'S SKELETON shows its unusual frame. Rear end resembles that of flossy sports car described on page 108: Brakes are in-board; flanking differential; drive axles carry no weight.



WHAT THE DRIVER SEES. For compact stacking in transport plane, car reduces to 45-

inch height. Seats and windshield fold back, steering column lowers onto cushion.

themselves, those front wheels just want to go straight ahead."

Then the tricks came fast. Through king-size potholes, over a rough and rutted shoulder, then down into an eight-inch-deep drainage ditch between the road shoulder and a sharp climbing embankment. Up on the embankment and then straddling the ditch—all with one-finger steering. And over the roughest of it I felt none of the tail-bone shocks you get in a jeep.

We approached a wide part of the road. Gregory slowed down, but we still made a U-turn at a good clip.

"That," he said, "was to show you that

the Mighty Mite has four-wheel drive at all times—even on sharp turns on smooth pavement."

"What's the gimmick?" I asked.

"A third differential, in the transmission, between the front and rear differentials," he explained. "It prevents wrap-up by compensating for the different distances the front and rear wheels have to travel in taking a curve."

Now there was a steep embankment on our right going down about 15 feet.

"That's an 85 percent grade," he said. "We've measured it."

Before I could ask why, I got the answer. We were going down it, slowly. At

FACTS ON THE MIGHTY MITE

Model: utility truck, ¼-ton lightweight; four-passenger (two on seats, two on rear fenders).

Engine: air-cooled, 4-cyl., 79 cu. in., horizontally opposed, overhead valve; 44 hp. at 4,000 r.p.m.; twin carburetion.

Weight: 1,496 lb.; per hp. 34 lb.

Transmission: three-speed forward in Hi-Lo range, with No-spin differential; positive four-wheel drive at all times.

Brakes: four-wheel, chassis-mounted, conventional two-shoe hydraulic with built-in self-adjusting features; sealed against water and dirt.

Electrical system: 24-volt, 1 battery.

Radius of turning circle: 12½'.

Springs: cantilever leaf, front and rear; each wheel independently sprung and suspended.

Ground clearance: 9¼".

Dimensions: height, 58"; over-all length, 96"; width, 58"; wheelbase, 64".

Adjustment: 3" in steering column to suit size of driver.

Body construction: front fenders, hood, cowl and side panels, 16-gauge aluminum sheet; cargo body and rear fenders, 20-gauge steel, rigidized for strength.

Tires: 5.90 by 15, cross-country, 4-ply.



BUILT-IN BALANCE, fore and aft as well as side to side, enables Mighty Mite to run on any

three wheels. In an emergency, a wheel can be changed without using a jack.

the bottom he braked to a stop. The car was standing almost straight up on its nose.

"Let me see you get out of this," I challenged.

Gregory shifted into low speed, Lo range. (The Mighty Mite has three speeds forward, which, with Hi and Lo ranges, makes six.) There was a grinding of power. A slight shuddering and the front wheels pulled us out onto the level ground. We were off again.

Off again was right. This was the Mid-America's proving ground—a driving nightmare of trenches, ridges, humps, bumps, crisscross gullies and deep hog wallows. Up and down we went, leaping into the air, leaning over at fantastic angles. As we nosed down into a mudhole the right rear wheel shot up into the air. Next only the front left and the right rear wheel were touching ground.

No-Spin Differential Does It

Gregory realized that these wheels-dangling-in-air antics puzzled me. "Only the wheels that have traction get power—all the power," he explained. "No-spin differential, you know."

Back at the plant, there came another believe-it-or-not demonstration. A me-

chanic removed the right rear wheel. The Mighty Mite didn't flop down on its wheelless hub. A driver got in and took off. Fast, slow, in tight circles, it didn't make any difference. The wheelless corner stayed up.

Car's Performance Explained

The mystery of this performance was explained by Herbert A. Blenkle, chief engineer.

It is a matter of balance. The vehicle is designed so that its center of gravity is at the intersection of lines drawn diagonally from opposite wheels. Removing one wheel doesn't move the center of gravity enough to throw the car off balance.

There is also what Blenkle calls "pivot-center steering." Because the pivot, inside the hub, is directly in line with the wheel, as in a bicycle, the wheel always wants to go straight ahead. As in a bike, there is no twisting tendency when a wheel hits a bump. The result, as Blenkle explains it, is that the steering wheel doesn't have to fight the road. The scheme, he says, gives the feel of power steering without auxiliary power to do the work.

Independent suspension of each wheel

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This Little Car Has Big Ideas

[Continued from page 92]

makes its contribution. Each wheel is insensitive to the movement of other wheels. Adding to a smooth ride is the fact that the front suspension arms face forward and the rear suspension arms face rearward, with their pivoting points close to the center of the frame. Thus, since upward thrust of both front and back wheels as they hit a bump is near the center, there is no bucking—the car remains level. And there are no axles in the true sense. The individual drive axles to each wheel carry no weight, only torque to the wheels.

Combined with this suspension is a spring system that takes only the dead weight of the vehicle—and has a full eight inches of vertical travel before hitting bottom. The springs do not have to absorb twisting, side shock and torsion as in ordinary cars.

New Seat Smooths Ride

Then there is the No-spin differential. This is a complex gearing arrangement that gives traction where it is needed. If a wheel loses traction, it doesn't spin faster, using power to no purpose. Even if three wheels lose traction, all engine power is transmitted to the fourth wheel.

As for the smooth ride, a lot of credit for that goes to a new type of seat called Flotation Motion. The bottom and back are all one spring—they give as one unit, with the back taking up 30 percent of the body weight.

Another feature, now being tested by the Marines, is a flotation kit. This consists of a rubber bladder that fits around the vehicle and is inflated from the exhaust. Lightweight paddles are attached to the rear wheels. And the Mighty Mite is a motorboat.

END