



Rhoades vs. Lightfoot: Which Four-Wheeler is Right For You?

Article by Gordon Koppang



Top Row: Rhoades Car 4W2P coupe

Bottom left: Lightfoot Duo 42
Bottom Right: Lightfoot MicroCar

People looking to buy a two-seat quadracycle will likely choose between a Rhoades Car and a Lightfoot. The Rhoades two-seater comes in two lengths – coupe and long-frame. Lightfoot builds three quadracycle models: the Duo 32 and 42 and the MicroCar. I have left the narrower Duo 32 out of this comparison because it cannot be ridden solo without the addition of a stabilizer wheel.

What sets Rhoades National Corp. and Lightfoot Cycles apart is that they're actually open for business. When the phone rings, they answer it; if you send them an email, they send a reply. Very reassuring. There are other builders: Quadracycle Inc. and CosyCycle in the United States, and in Canada, Quadracycle International and Momentum Quadracycles. Unfortunately, these builders do not have people to answer telephone and email inquiries.

There's a difference between building a few bikes and being in the bike building business.

The more I think about it, the more I appreciate how difficult it is to survive as a low-volume bike-maker in North America. Selling pedal-powered vehicles in the land of freeways and urban sprawl is a hard way to get a living. Both Rhoades and Lightfoot deserve respect for staying in business and for resisting the temptation to move production to China or India. The two companies have developed very different cultures, and very different strategies for survival. Lightfoot has chosen the path of idealism and passion; Rhoades has taken the way of tough-minded pragmatism.

Rhoades Cars are built on the theme of rugged simplicity. The Tennessee-made four-wheelers are at home on the utility end of the sport-utility continuum, alongside rickshaws and delivery bikes. Don't look for chromoly or aluminium frames, the boys in Tennessee stick with common steel. The frames are powder coated – and you can have any color you want, as long as it's blue. Dupont “Post Office” blue, to be exact. If you're a slave to fashion, the Rhoades Car is not for you.

Lightfoot frames are made of chromoly steel and are backed by a lifetime warrantee. You can have your frame painted Red Wagon or Cobalt blue, or for an extra charge, you can choose among six optional colors. Lightfoot uses high-end cycle components for their gears, shifters and brakes, and their seats are purpose built for cycling (not boating).

Frame Layout:

Consisting of two center-rails joined by front and rear cross members, the frame of the Rhoades 4W2P locates riders in the side-to-side center of the bike. The Rhoades Car is wider and heavier than either the Duo or the MicroCar, but it's also the most stable.

Lightfoot four-wheelers are essentially two recumbent bicycles held in parallel by stout cross members (one at the steering stems and another just behind the seats). This design locates rider and passenger weight at the “edges” of the vehicle. On the Duo models, rider and passenger are actually astride the outside perimeter of the bike. Imagine taking a convertible for a spin while sitting astride the driver's door. The Lightfoot design saves weight but compromises stability for solo riders. A solo rider can operate the Duo 42,

however, when the passenger seat is empty right hand turns must be taken with care or the bike will tip.

With the MicroCar, Lightfoot has addressed stability concerns by widening the stance of the wheels so that they run a few inches “outside” the frame. The MicroCar is more tolerant of solo riding than the Duo, but it’s still not as stable as the Rhoades 4W2P.

Tail of Three Quads		
		<p>Top Row – Rhoades Car 4W2P</p> <p>Note the distance between the edge of the seats and the rear wheels.</p>
		<p>Bottom Row – Lightfoot Duo 42 (left) and MicroCar (right).</p> <p>On the Duo 42, half the rider’s body weight is carried outside the frame of the bike.</p> <p>Note the wider stance of the MicroCar.</p>

The base price for the Rhoades Car two-seater is \$1843.00, but you can’t compare that price with the base price of the Lightfoot Duo (\$4200.00) or the Lightfoot MicroCar (\$5750.00). Every Lightfoot quad comes with disk brakes on all four wheels. The base price of a Lightfoot quad includes proper seats and gears. The base price for the Rhoades 4-wheel coupe gets you one speed (no gears), a brake on one rear wheel, and plastic seats unfit for use. Equipping your Rhoades Car 4W2P with adequate gears, brakes and seats will set you back an additional \$976.00 – bumping the practical base price to \$2819.00

A Note on Gearing:

The number of gears a four-wheeler has is less important than the “size” of the gears. A very low or “small” gear is good for hills and a “large” or high gear helps take advantage of down hills and tailwinds. The size of a gear (how high or low it is) is expressed in “gear inches.” To understand gear inches, think of a kid’s tricycle; the pedals are attached directly to the front wheel. One turn of the pedals gives one turn of the wheel. A tricycle with a 20" front wheel will travel twice as far with one turn of the pedals than a tricycle with a 10" front wheel. On the other hand, the tricycle with the 10" front wheel will be easier to pedal up hill than the tricycle with the 20" front wheel.

Lightfoot's Duo models use a single, very long, loop of chain to transmit power from crank to wheel. The Duo has 3 sprockets at the pedals and 8 at the rear wheel giving 24 gears. The Duo has a 19-inch bottom gear and a 99 inch-high gear. The Lightfoot MicroCar uses compound gearing (two loops of chain) to provide an ultra-low 9-inch bottom gear and an Autobahn sized 150-inch top gear! The MicroCar is geared 3 x 8 x 8. A triple chainring (three sprockets) at the pedals turn a loop of chain connected to an 8-speed cluster at the mid-shaft. The mid-shaft turns a second loop of chain and another 8-speed cluster at the rear wheel.

Rhoades Car offers 1-speed, 6-speed and “36-speed” gearing. Unless you plan to ride your Rhoades Car *exclusively indoors* (in a factory or shopping mall) choose the “36-speed” option. The compound gearing on the Rhoades Car uses two loops of chain and two gear clusters (see photo). Driven by a single front sprocket at the crank, the first loop of chain turns a 7-speed cluster. That cluster is keyed to an intermediate shaft and single sprocket. The intermediate sprocket turns a second loop of chain and a 6-speed cluster fitted to the rear axle. This arrangement (7 x 6) yields 42 ratios not 36. With the optional compound gearing, the Rhoades car has a 15-inch bottom gear and a 77.5-inch high gear.



Photo by Joey Wallace

Tennessee Times Table 6 x 7 = 36

Show here is Rhoades Car's optional "36 speed" gearing as fitted to a single seat model. The front loop of chain is just visible in the bottom right of the picture (look for the red idler sprocket). A 7-speed cluster is keyed to the small intermediate sprocket. That sprocket turns the second loop of chain and the 6-speed cluster on the rear axle. The same set-up is used on the two seat models.

The funny looking thing in front of the seat is a water bottle holder installed by the owner.

The Lightfoot Duo and the Rhoades Car "36 speed" have similar gear ranges. The top gear on the Rhoades Car is 5.16 times bigger than its bottom gear, while the top gear on the Duo is 5.21 times bigger. Overall, however, the Lightfoot Duo is geared about 20% higher than the Rhoades Car. The Duo's 26" rear wheels (vs. 20" for the Rhoades) probably make the difference.

Rhoades Car owner Thomas Richardson posted this note to the Rhoades Car Yahoo Group on November 22, 2007:

One handbrake is not enough to achieve emergency stops; I have to use Flintstone braking in an emergency. My recommendation to anyone buying an RC: Spend the extra \$\$\$ and buy the second brake.

A bike intended to carry two adults in real-world conditions needs brakes on at least two wheels. If you're buying a Rhoades Car, do yourself a favour and order the "Dual Brake & Positive Traction Combo". This gives you the extra rear brake and sends power from driver and passenger to both rear wheels instead of one. The "Positive Traction" set-up is easily the Rhoades Car's best "technical" feature.

With the positive traction option, a straight-through axle transmits power continuously to both rear wheels of the Rhoades Car. The axle turns the hubs.

Both hubs contain a “one-way” or roller clutch bearing. The one-way bearing transmits power from the axle to the hub, but also acts as a free-wheel mechanism, allowing the hub and wheel to overrun the axle when coasting. Because both hubs contain a roller clutch bearing, the outside wheel is always free to overrun the axle in turns. Unlike ratchet-type freewheels that turn before they “catch”, one-way bearings lock as soon as force is applied to them. The use of roller clutch bearings eliminates “slop” from the drive of the Rhoades Car.

Carrying Capacity:

		<p>Top Row: Duo 42 with cargo hammock” and optional wheel covers (left).</p> <p>A 2003 model MicroCar with optional utility cargo box (right).</p>
		<p>Bottom Row: Zip ties secure a plywood deck to the rear of this 4W2P. Plenty of room for three 68-litre Rubbermaid totes.</p>

The Lightfoot Duo and MicroCar come equipped with a “fabric cargo hammock” suitable for loads up to 75 lbs. An optional aluminium platform is available for loads up to 150 lbs. Using fabric keeps weight down. When you’re not carrying anything, you’re not carrying a heavy cargo shelf for nothing. Lightfoot quads carry cargo down low – at axle height. Keeping the centre of gravity low improves stability. The Duo and MicroCar locate cargo between the rear wheels. If the item you want to carry is wider than 28 inches, you’ll need a trailer.

The Rhoades Car two-seater can handle larger and heavier cargo than can be carried on a Lightfoot quad. The rear deck of the Rhoades Car extends past the rear wheels and can accommodate items that are wider than the bike. You could, for example, stack 8-foot 2x4s across the rear deck! The Rhoades 4W2P coupe can handle a combined load (riders plus cargo) of 800 pounds. That's 100 pounds more than the Lightfoot MicroCar and 200 pounds more than the Duo.

When I was a kid, the whole family (four of us) squeezed into the cab of a '67 Chev' half-ton and drove hundreds of miles into Northern Alberta. I suppose my dad thought the roads up North would be too rough for the family car – a Volkswagen Beetle. We would have been much more comfortable in a station wagon, but we survived the entire trip on a bench seat in the painted steel confines of a Chev' 10 (“every unhappy family is unhappy in its own way”). My point is – deciding between a Rhoades Car and a Lightfoot Duo or MicroCar comes down to knowing how you plan to use your four-wheeler.

If you're planning daytrips two or three hours from home, the Rhoades Car will serve you well. If long-distance touring is your thing, the Lightfoot is almost certainly the better choice. If you're trying to average 50 miles per day, the cost of a Lightfoot may be worth it just for the lighter weight and better seats. On the other hand, if trips to the grocery store, kids, heavy loads and rough use, are part of your plan, the Rhoades Car is definitely the way to go.

Of course, the best way to compare a Rhoades Car and a Lightfoot quad is to ride them wheel-to-wheel for a few days. Until then, many questions remain. If you shell out for a Lightfoot, do people still ask, “Did you build that yourself?” I wish I knew. Until full and fair comparisons can be made, we'll have to rely on educated guesses.

	Lightfoot Duo 42	Lightfoot MicroCar	Rhoades Car 4W2P Coupe
Frame	Chromoly steel	Chromoly steel	2" square tube 16 gauge common steel
Finish	Powdercoat	Powdercoat	Powdercoat Dupont Post Office Blue
Number of Gears	3 X 8	3X8 X 8	7 X 6
Gearing (range)	19 to 99 gear-inches	9 to 150 gear-inches	15 to 77.5 gear inches with 46T sprocket
Shifters	SRAM X.7	SRAM X.7	SunRace
Derailleurs	SRAM 7.0	SRAM 7.0	Shimano (Front) SunRace (Rear)
Crankset	Truvative Blaze 22-32-44T	Truvative Blaze 22-32-44T	One-piece steel crank. Single sprocket with: 24, 28, 32, 39, 42 or 46T
Bottom Bracket	Truvative Gigapipe	Truvative Gigapipe	Supplier unknown
Brake Levers	Avid 7	Avid 7	Pyramid Pro Tech Seven with park brake
Brakes	Avid 7 Mechanical Disc All Four Wheels	Avid 7 Mechanical Disc All Four Wheels	Quad QMD-6 Mechanical Disc Rear Wheels Only
Wheel rims	Alex DM-24 ¹	Alex DM-24 ¹	Made in China, supplier unknown ²
Wheel hubs	Shimano Deore	Shimano Deore	Supplier unknown
Tires	Kenda Kontact 1.75	Kenda Kontact 1.75	Cheng Shin 20 x 2.125 diamond tread whitewall
Claimed Base Weight	96 lbs ³	115 lbs (Light Build approx. 98 lbs) ³	115 lbs ³
Seat Height	23"	23"	17.5" (44.5 cm)
Wheelbase	70"	70"	57"
Total Length	94"	89"	87"
Wheel track	35.5"	37"	50"
Total Width	53.5"	42.4"	55"
Cargo Area	28" x 28"	28" x 18"	43"w x 24"d
Claimed Load Capacity	Riders plus cargo up to 600 lbs	Riders plus cargo up to 700 lbs	Riders plus cargo up to 800 lbs
Base Price	\$4200.00	\$5750.00	\$1843.00
Warrantee	Lifetime frame. All other claims subject to analysis and approval.		2 years frame, 6 months other parts.

All specifications are subject to change. These are current as of November 2007.

Notes:

1. All Lightfoot quads are fitted with 20" front and 26" rear wheels. Optional composite wheels are made by Aerospoke Corporation in Milford, MI See <http://www.aerospoke.com/products.php>
2. Rhoades Car uses 20" wheels front and rear. The steel rims and 80g spoke wheels are made in China. Black, 5-spoke mag wheels are offered as a no-charge option. I can't confirm it, but I believe the mags used by Rhoades Car are made by Skyway Wheels in Redding, CA. See <http://www.skywaywheels.com>. Rhoades Car owners report that these wheels break under rambunctious use.
3. Base weights are determined using the lightest possible configuration of the bike. For the Rhoades Car, that means plastic seats, one-wheel drive, one rear brake, and single speed gearing. A Rhoades 4W2P fitted with a driver's side mirror, two deluxe seats, dual breaks, "36-speed" gearing and positive traction weighs 159 lbs. The weight of your bike will vary depending on the options and accessories you choose.