

Will My Bike Work Well With the FreeRadical?

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What makes a great bike to pair with Xtracycle's FreeRadical Bolt-On Bike Extender?

1. **Wheel Size:**
2. **Frame Material:**
3. **Chainstay Bridge Style**
4. **Dropout Style**
5. **O.L.D. - Over Locknut Dimension**
6. **Brakes, Especially Disc Brakes**
7. **Internally Geared Hubs, Singlespeeds, and Fixies**
8. **Electric Conversions**

1. Wheel size:

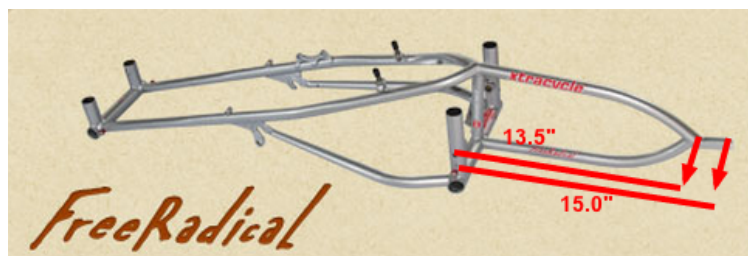
The FreeRadical is designed for 26" and 700c wheel size bicycles.

26" wheels are recommended! 26" wheels give you most tire size flexibility with the FreeRadical and are inherently stronger than the larger 700c standard. When running 26" wheels you can fit a tire up to 2.35" wide. The FreeRadical is not compatible with fat bikes like the Surly Pugsley, or with 29" mtb tires.

700c wheels will work, but will limit you to 35mm tires (in rare cases up to 38mm), and you will need a **700c Brake Adapter** to use v-brakes (linear-pull brakes). Disc brakes will not require that adapter.

Do I need heavy duty rims/wheels? Number of spokes/ultra strong rim only applies when you are doing extremely heavy load carrying or long-distance touring. We do recommend that you get your rear wheel properly tensioned and trued by a professional mechanic: this will greatly improve the longevity of the wheel.

Can I put the FreeRad on a small wheel bike? The main reason a FreeRadical cannot be used on smaller than 26" wheel bikes is that the length of the FreeRadical frame that inserts into your existing bike frame, and bolts near your bottom bracket, is too large for 20" or 24" wheel bikes. However, in rare cases, it may work. See dimensions below to check for yourself if the FreeRadical tongue will fit in your smaller-wheel bike frame.



Can I put the FreeRad on a recumbent bike? In general, no. The chain stays on most recumbents are in the wrong position for the FreeRadical, we recommend the CargoMonster made by TerraCycles as the best option for recumbent riders. Contact them for compatibility.

Can I use the FreeRadical to make an EdgeRunner (26" front, 20" rear)? No. The FreeRadical and your bike were designed to work with a specific wheel size, using too small of a wheel in the rear can cause the tail of the frame to drag, the bike's handling to be unpredictable, and your position on the bike to be very weird. Doing this voids your warranty.

2. Frame Material

Different people have different perspectives on material, but some like the pairing of the stiff aluminum bike frame with the more forgiving cromoly Xtracycle FreeRadical. Cromoly bike frames paired with FreeRadicals are very popular. Generally, we advise folks to stay away from carbon fiber, and butted, super-light, aluminum or steel road bike frames. Simply put, these frames may not be ready for the added stress of a longer wheelbase and

heavier loads. That said, bike frame failure due to Xtracycle installation is exceedingly rare.

3.Chainstay bridge

Ideally, your bike has kickstand bridge (sometimes called a chainstay bridge), which looks like the green frame below, once the FreeRad is installed.

Use first image under bullet number 1 above to help determine if your chainstay bridge is in the right location for the FreeRadical. Ideally, the chainstay bridge center is between 13.5" and 15" from the center of the rear dropout/rear axle of your bike frame.

If it doesn't, never fear, just get an additional **FAP - Front Attachment Plate** and use it and the included longer bolt to sandwich the chainstays.



4. Dropout style

Below is a picture of Xtracycle friendly, flat profile dropouts:



The sculpted/recessed dropouts shown below can pose installation problems (found on Moots, some older Breezers, and other bikes as well):



Remedying sculpted dropouts issues often requires removing material from the bike dropout or FreeRadical to get the two to 'mate.' This can void the warranty of one or both items, and is only recommended if you feel confident about assessing the strength of your modified bike frame/Xtracycle FreeRadical. For some bikes, this issue can be a showstopper, sad to say.



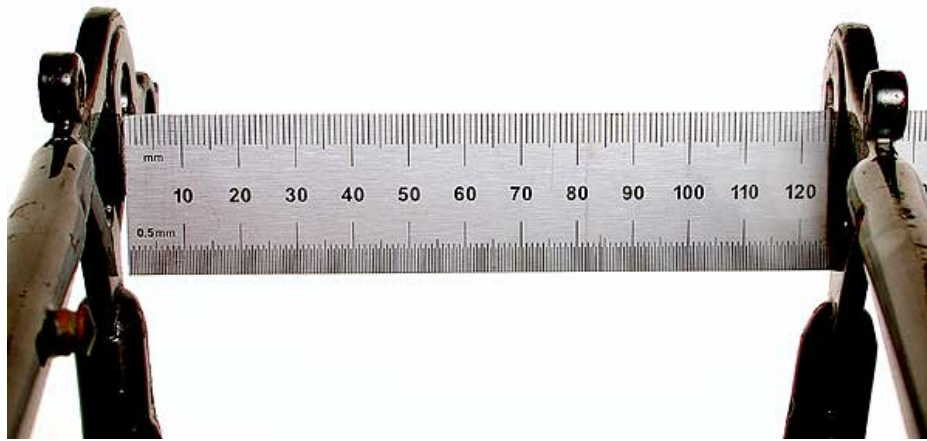
Some touring/trekking bikes are coming with longer derailleur hangers than standard. As you can see above, the horizontal tube of the FreeRad runs within a few millimeters of the derailleur hanger on a standard bike, so this added length can interfere with attaching the FreeRadical. If the distance between the center of the derailleur mounting hole and the center of the dropout is greater than 30mm you will likely have fit issues.

The best option is to remove the hanger and replace it with a shorter one if it is available. This maintains the dropouts width and avoids voiding the frame's warranty.

5. O.L.D. (over locknut dimension)

OLD stands for over locknut dimension - basically it's the width of the wheel (not including the axle). FreeRad is designed for bikes with an OLD of 135 mm (which is common in modern mountain bikes). FreeRads can work with narrower OLD bikes (like older 10 speeds, some road bikes, or bikes set up for internally geared hubs). Sometimes this requires stretching the rear stays of your bike to reach around the Xtracycle - which is less of a concern on a forgiving steel frame than for a less bend-friendly aluminum frame. If you are facing this - consider contacting [your nearest dealer](#), or [call us](#).

Here is a picture of someone measuring the OLD on their frame (which would be between the inner-most margins of the rear dropouts).



The image above comes from [Sheldon Brown's website](#), which has more helpful explanation of this topic.

6. Brakes, Including Disc Brakes

The FreeRadical is designed to work for V-Brakes or linear pull brakes. Disc Brakes work great, though they require a special setup.

Cantilever brakes (also called center-pull) are not suitable for the FreeRadical - the FreeRadical doesn't have a cable housing stop required for use with cantilever brakes.

Road-style caliper brakes are not suitable for the FreeRadical - there is no mounting point for caliper style brakes.

700c wheels require a [700c Brake Adapter](#) to use v-brakes (linear-pull brakes).

Disc brakes require a special arrangement of caliper adapter and disc brake rotor. Why is this the case? Disc brakes were adapted to the FreeRadical after it's initial design. Because of the unusual nature of the FreeRadical stays - using the ISO standard disc brake mount wasn't possible. The only placement of the disc brake mounting tab required the following arrangement: use a 160mm Rear Disc Caliper Adapter with a 203 mm rotor, as shown in the picture below. Also pictured is the [Disc Brake Caliper Protector](#) which we recommend for use with Disc Brakes.



NOTE: Avid has recently (as of 2012) made minor changes to rotor sizes (203 mm rotor became a 200 mm rotor for instance). For best results, we recommend following the recommendations above exactly - don't use the new Avid rotor standards, for risk of mis-aligned disc brakes.

7. Internally Geared Hubs, Singlespeeds, and Fixies

The FreeRadical can be used with 135mm spaced internally geared hubs, singlespeed hubs, and fixie hubs. In the case of internally geared hubs a tensioner (or old derailleur) should be used to maintain chain tension and allow clearance for the KickBack. Without this the KickBack (if used) will rub on the chain. If you're converting a fixie, chain tension can be adjusted by sliding the FreeRadical attachment back in your (presumably horizontal) dropouts to achieve proper tension: DO NOT USE A TENSIONER ON FIXIES.

8. Electric conversions.

When converting an electric bike, it is important to make sure the FAP will work with the chain stays. Due to the placement of the battery behind the seat tube, many electric bikes' chain stays will be too wide for the FAP to bridge - they must be 2.25" apart or less where the FAP will cross them. Another

important part to check is the OLD as mentioned before and the axle size - many e-bike hubs use axles that are larger than the 10mmx1 standard rear axle the FreeRadical is designed to work with. If you're converting a FreeRad to be electric, keep in mind that you're limited to 135mm hubs, and ALWAYS USE A TORQUE ARM unless it's a BionX hub. Since e-bikes travel at higher speeds than a regular cargo bike expect more wear and fatigue - keep the French Nuts and FAP bolt tight, and inspect the frame regularly for signs of fatigue or overload.