

## Installation and Removal of your PowerCrank™

1. If you are a man (most women rarely need this advice) change into old clothes and clean your chain and chain rings! If you do not you may find yourself in trouble with your wife, girlfriend, mother, or if you are really talented at making a mess and rent your living space, your landlord. If you ladies forget this step, I expect, it is unlikely that your husband, boyfriend, or father will notice. You may also want to wear something like latex, gloves while doing this work. An alternative clean approach is to let your local bike shop (where they are paid to get dirty) do this.

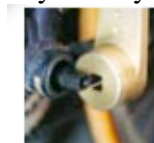
2. Remove your present cranks from your bicycle. Save your crankshaft attachment bolt (and washer). Some types of crank axles (spindles) are incompatible with PowerCrank™ (see example). If you have one of these you will need to replace your bottom bracket. If you have Shimano splined cranks you will need to remove the "dust cover" to be able to use your attachment bolt and washer (see Figures 1) or, as an alternative you can go to your bike store and get two replacement bolts. If you ordered the wrong adapter type for your spindle you can return the cranks for a replacement or you will need to replace the bottom bracket assembly. If you replace your bottom bracket assembly, a cheap one will do and the size will need to be determined by your bicycles physical dimensions but a good starting size is 110-112 mm, unless you have a triple chain ring option where you may need an even longer spindle. Too wide and the pedals will be wider apart than many like, too narrow and the cranks will rub against the frame and not work properly.



3. Reattach your chain rings to the PowerCrank™ spider. The PowerCrank™ spider will fit chain rings with standard 130 mm BCD. If you need to purchase 130 mm BCD chain rings, we recommend that you increase the size of your large chain ring at least 4 or 5 more teeth than your present chain ring, as you will soon want and need it. If you have the triple chain ring option you will need properly sized spacers (about 3/16 inch thick) that properly positions your 74 mm BCD inner ring in relation to the others. Your old cranks may or may not have these spacers, depending on its design. Check with your bike shop if you have difficulty.



4. You must remove the retaining dust caps from your PowerCrank™ to install them. Newer model retaining dust caps are not interchangeable as the spider side are left threaded and the non-drive side are right threaded. Caution: If you take the crank arms apart to see how they work (another common symptom of chronic testosterone poisoning, see your doctor), replace them very carefully so as to not damage the clutch. If they do not go back together completely or easily see trouble shooting below.



5. CAUTION. If you have a splined variety spindle it is very important that the splines line up with the keyways because, if they are not lined up properly, when you tighten down the spindle bolt you can damage the keyways such that you will not be able to later engage the splines when they are properly lined up. Place the crank assembly over the squared or splined end of the crankshaft, align carefully and push snugly. If the assembly rubs up against the bottom bracket housing you should replace your bottom bracket assembly with a longer spindle

size. As an alternative, in tapered square spindles, shims can be used to move the PowerCrank™ away from the bottom bracket.

6. Replace your chain on the chain ring then readjust your front derailleur, if necessary. This step is necessary now to help you support the spindle in order to properly tighten the spindle bolt in the next step.
7. Secure the crank to the crankshaft using the bolt (and washer, if applicable) that you had previously removed. Ensure the bolt and washer fit properly in the hole and does not damage the threads needed to remove your PowerCrank™. On newer models the spindle bolt must be one that uses an 8 mm allen wrench for tightening. Tighten very tightly. Some customers have had problems with the bolt continuing to loosen with use. This can occur with both types of adapter types (tapered square and splined) but this seems to occur more often with the Shimano splined type. Why some have this problem and others don't is not entirely clear but is probably related to failure to adequately seat the spindle adapter on the spindle and to tighten enough. Therefore, check the tightness of this bolt after each ride in the beginning until you are certain no loosening is occurring with use. If loosening continues make sure your spindle adapter is mating properly with your spindle and you are tightening adequately or try using a moderate thread adhesive (like blue LocTite™) to keep in place.
8. Screw on each retaining dust cap (a coin works well on the earlier models, the correct size monster allen key for the recent ones, whatever you use, bring it along on your first couple of rides in case the cranks work themselves loose). Remember, on the new models the spider side retaining end cap is left threaded. Be careful to ensure the caps screw on cleanly as the steel threads of the retaining end cap can gaul the aluminum threads of the spindle adapter. The retaining dust cap keeps the clutch assembly aligned correctly on the bearing surface. The retaining end caps should be screwed down completely and when in place should allow the crank arms to still spin around easily in the backwards direction. If your model has set screws, tighten them down. While the new design should prevent the retaining dust caps from working off during use, they have been known to come off, probably due to vibration.
9. Reattach your pedals. Caution, if you are not careful about how you screw in your pedals the steel threads of the pedal can gaul the threads of the aluminum crank arm, eventually making your cranks unusable.
10. Before riding the first time, go to instruction booklet for hints and cautions.



### Adjustable Crank Instructions

The adjustable cranks can be adjusted in 2.5 mm increments. The method of adjustment is self explanatory. When the moveable part is flush with the crank arm end it will be 185 mm. Move 4 increments for 175 mm or 6 increments for 170 mm, etc. The figure shows correct adjustment for 175 mm crank length. Removal You will sometime in the future want to remove your PowerCrank™ to put them on another bicycle or to reinstall your regular cranks for a race. You should do this a couple of days before the race because, when you go back to your regular cranks, they will feel very strange and you will want a short period to readapt. Removal is very simple. Newer Models (Model2, Cranks with retention dust caps with a hollow center)



1. Insert your 8 mm allen wrench through the retaining end cap access hole and unscrew the bolt. As it comes loose it will push the adapter off the spindle.
2. If necessary, remove the retaining end cap to remove the spindle bolt to use in the reapplication of your regular cranks back on your bicycle.
3. See Storage below.

### Cranks with solid retention dust caps

1. Loosen the set screws and remove the retention dust caps.
  1. **Shimano splined bottom bracket instructions:** A normal crank removal tool will not push off your crank because this tool works by pushing against the end of the spindle and the splined spindle is hollow, so there is nothing to push against. Here is the solution. Simply loosen the bolt a few turns but don't remove it. The bolt then acts as the end of the spindle for the crank removal tool. Then use a normal crank

removal tool to pull out some on the crank. If, when doing this, it gets hard but is not loose enough to remove by hand, you may have to loosen the bolt some more turns and try again until the cranks are loose enough to remove by hand.

2. **Tapered square bottom bracket instructions:** Remove the crankshaft attachment bolt and washer. Because of the deepness of the hole it is easy to forget this bolt is there, since it is not readily visible. If you forget this step, step 3 will be very difficult! Using an appropriate sized crank puller, screw it into the provided 22 mm threads all the way. Because of the deepness of your PowerCranks™ spindle adapter your crank puller will probably have to be threaded as deep as it will go in order to allow it to push against the crankshaft to remove the cranks. If you cannot reach the axle with your crank puller reinsert the bolt and use it to make the whole less deep as Noted above in 2. a.
2. Use the crank puller to remove the spindle adapter.
3. See Storage below.

## Maintenance

Your PowerCranks™ are almost maintenance free. They do have two enemies however, water and dirt. While designed to minimize the ability of both water and grit to enter into the clutch mechanism, if these do the clutch could eventually be damaged. Water will rust these parts and to minimize this possibility, the clutches should be kept well oiled or greased. Dirt or grit can damage the clutch directly. While PowerCranks™ can be ridden in the rain without damage they should not be left outside at night or out in the rain. If ridden in very severe rainy weather or dust storms or through lakes or steams or left in the rain, disassemble the crank arm from the spindle adapter, clean and dry the clutch and bearing surface then re-oil or grease. (This drying can be easily done by placing the crank arm into a warm oven and drying the other parts with a dry cloth) If you suspect dirt contamination, one should disassemble the crank arm from the spindle adapter and clean the clutch and bearing surface, then re-oil or grease. Only in the instance of known contamination should it be necessary to remove the clutch from the bearing race for cleaning. Otherwise, you should keep the clutches lightly oiled, the main purpose being to prevent oxidation (rusting) of the clutches which will be worse than any dust. If you have to remove the clutch from the bearing race be extremely careful about replacing it as the small outer bearings can become dislodged (see troubleshooting) which can prevent your being able to replace the crank arm on the shaft, or, if it falls out, causing decreased performance or clutch failure. Should your clutch fail after the warrantee period you may return it to PowerCranks, LLC for replacement for a reasonable charge.

## Annually.

Simply remove the crank arm from the spindle adapter. While oil or grease is not really necessary for proper clutch function (after all, when pedaling correctly there is no motion between the parts) it is necessary to repel water and prevent rust. Therefore, ensure there is an adequate amount of bicycle grease or oil in the clutch. Do not pack the clutch with grease as this can prevent proper functioning. **DO NOT USE WATER BASED OR PARAFFIN CONTAINING CHAIN LUBRICANTS, SUCH AS WHITE LIGHTING, AS THESE WILL DAMAGE THE CLUTCH.**

## Storage

PowerCranks™ need to be stored in a manner that will prevent rust from forming in the clutch. Do not store outside on a bicycle, exposed to the elements or in other damp or moist environments.

*Site Design By Andrew*

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WHO IS FRANK DAY?