

LINEAR

MANUFACTURING, INC.

ALUMINUM RECUMBENT BICYCLE

OWNER'S MANUAL



LINEAR MANUFACTURING INC., 32744 KESTREL AVE. GUTTENBERG IA 52052, PH. 319-252-1637

OWNER'S RESPONSIBILITY

IT IS THE OWNER'S RESPONSIBILITY TO:

- (1) Be certain that all assembly instructions have been followed.
- (2) Make all necessary adjustments.
- (3) Carefully read and follow safe riding rules.
- (4) Check out your recumbent before riding.
- (5) Perform all required maintenance.
- (6) Know how to operate all standard and accessory equipment on your recumbent.
- (7) Make certain that anyone using the recumbent has been fully instructed in its operation.
- (8) Conform to all applicable traffic, registration and equipment laws. Only you will be responsible for any damage to the bicycle or injury to the rider if these rules are not followed.

SAFE RIDING RULES

Every bicycle rider should know the difference between the right way of riding and the wrong way. Too often the inexperienced bicycle rider uses unsafe riding techniques or tries stunt riding, and the usual result is a fall along with possible injury. Your recumbent is designed for enjoyable use in normal riding conditions, not for stunts or experimentation. Also, remember that proper clothing is necessary for safe riding. When riding, always wear shoes, avoid loose fitting clothing, and wear light colors when riding in the evening hours. Use only accessories suited for your bike. The following rules are required by law in many areas. Check your local law enforcement agency regarding these and any additional rules that may apply to you.

1. Obey all applicable vehicle operation laws, traffic regulations, signs, signals, and markings.
2. Whenever you ride alone, ride on the right hand side of the road. When riding in pairs or large groups, ride single file along the right hand side of the road. Set up a sensible distance between yourself and the rider in front. Don't weave in and out. Don't tailgate.
3. Be extremely careful at all intersections. Walk your bike across busy intersections, and watch for cars when making a turn.
4. Watch out for car doors opening or for cars pulling out into traffic from streets, alleys, and driveways.
5. Use proper hand signals to indicate turns or stops. Get in the habit of always signaling so it will become an automatic reaction. Keep both hands on the handlebars except when giving hand signals.
6. Watch out for drain grates, soft road shoulders, and other road hazards.
7. Be aware of riding conditions when operating your bicycle on or off the road. Be extra cautious when riding on wet pavement, gravel, or leaf-covered pavements. It will take more distance to stop your bicycle when riding on these types of surfaces, and your bike may skid in a turn.
8. Never carry passengers - except in a protective child carrier properly mounted to maintain safe control of bicycle.
9. Never carry packages that interfere with your vision or control.
10. Always give pedestrians the right of way. Always ride on marked bikeways where available. (Check local ordinances regarding riding bikes on roadways and sidewalks.)
11. Most accidents happen at dusk. Be doubly careful when riding during these hours. Make certain your bicycle complies with local equipment laws for night operation.
12. Drive a safe bike. Always keep your bicycle in good mechanical condition. For instructions on Operation, Adjustment and Maintenance, see the appropriate sections of this manual.
13. Ride your bike defensively; watch out for other vehicles.
14. Always wear an approved helmet, even on short rides. Helmets can greatly reduce the chances of injury in many types of accidents.

LINEAR ALUMINUM RECUMBENT BICYCLE CLWB OWNERS MANUAL

Note: in the instructions, right and left hand sides of the bike are as you would be seated in the riding position on the bike.

Tools needed: 3 & 5mm hex key (allen wrench)
15mm wrench (or adjustable wrench)

1. Upon receiving your bike, carefully open the shipping carton and examine the contents. You should find several assemblies, the frame/handlebar, wheels/tires, seat, and steering link, and Linear bag with reflectors, pedals, shifter chain, rack adapter if ordered.

The order of assembly isn't important. You may choose to mount the wheels and tires first so that the frame does not get scratched by the floor.

2. **MOUNTING THE WHEELS** - If you have a quick release brake do the following. Release the rear brake assembly so that the wheel and tire will fit through it more easily. Using your hand, squeeze the brake pads together and using your other hand, pull downward and outward on the cable release lever (the small silver lever on the right hand side of the brake assembly where the cable comes into the unit). The cable **DOES NOT** have to be loosened to accomplish this step. This method of releasing the brakes will be needed if you ever have a flat or need to remove the wheel/tire from bike. The front wheel goes into the front fork in a conventional manner using the quick release skewer to hold it in place. The rear wheel goes into the slots on the rear "drop outs" (the curved part of the frame that goes downward with the derailleur mounted to it). Be sure the wheel axle seats into the slot all the way to the rear. The lock washer goes on the outside of the frame, just under the nut that holds the axle in place. This prevents the nut from loosening up and the axle moving forward in the frame slots. Be sure to tighten both nuts on the rear axle using the 15mm wrench.

3. **ADJUSTING THE SACHS SHIFTING/BRAKE LEVERS**-Adjust the angle of the brake levers to your riding style and comfort then tighten the locking clamps. After adjusting the brake levers, using a 3mm hex key, tighten the Sachs shifters on the handlebars so they will not rotate. To adjust the Sachs shifter for the rear hub, twist the shifter on the left handlebar to the "3" (highest gear) position. Take the cable that runs to the rear hub (the one with the small, black block on it). Make sure the chain coming out of the hub is fully "relaxed" with no tension on it. Taking the black block in one hand and the chain in the other, simply slide the chain into the block until all slack is removed.

This should be properly adjusted for shifting. To remove this block (for wheel/tire removal or readjustment) press on the small, silver bar on the block while pulling the chain out of the block. The silver bar is a release mechanism. **NOTE:** The threaded end of the adjuster chain **DOES NOT SCREW INTO THE BLOCK**; it simply slides in and is held in place by the mechanism.

4. **MOUNTING THE SEAT** - The seat assembly is mounted to the seat adjuster block using the quick release skewer. Line up the holes in the front seat mount with the holes in the adjuster block and insert the skewer into the seat mount from the right hand side. The skewer "nut" goes into the left hand side of the seat mount. **DO NOT TIGHTEN THIS NUT YET!** The seat braces are the next item to be hooked up. The bottom ends of the rods have "quick connect" fittings that go over the ball ends that are mounted to the rear frame close to the axle nuts. Pull upward on the fittings and slip them over the balls. Release the fittings and make sure the slots go over the "shank" of the ball ends. This locks the seat braces into place. **IF YOU DO NOT LOCK THE FITTINGS, THE BRACES MAY COME LOOSE WHILE RID-ING!** After installing the braces, adjust the seat location by removing the quick connect pin on the adjuster block, move the seat forward or backward to suit your riding style and size, replace the pin in the adjuster block, and tighten the skewer. **NOTE:** Put lever on skewer pointing down or to the rear to eliminate the possibility of hitting your leg on it. Use a small cable tie around the rear derailleur cable and the right seat brace to keep the cable from rubbing on the tire. (Do not tighten the cable tie – leave it loose enough so that when you remove and replace the seat you can slip the cable tie back onto the brace).

5. **MOUNTING THE STEERING LINK** - The steering link has a "front" & "rear" end. The larger section of the tubing goes to the front. Pull back on the quick release fittings at the end of the link and put the ends over the balls on the fork and handlebars. **MAKE SURE FITTINGS LOCK ON THE BALLS! FAILURE TO LOCK THEM MAY ALLOW THE LINK TO DROP OFF WHILE RIDING!** After installing the link, adjust the length to suit your seat position by pulling the quick release pin in the handlebar block and in the link and moving the block to the desired position. Replace the pins in the block and link making sure they go all the way in. Using the 5mm hex key, tighten the bolt that runs through the handlebar block horizontally at the front of the block. There is no need to over-tighten this bolt, it only needs to be tightened enough to keep the handlebars from feeling "loose." When you have ridden your bike and have found the right position for the seat and handlebars, you may experience some "rattling" from the steering link. To eliminate this noise, make sure the set screw in the collar on the steering link is tightened. If there is still some noise, look at the end of each of the fittings on the link and find the two adjusting set screws (one on each end) unless you have a Linear with the new quick release ends which have no set screws. Using the 3mm hex key, tighten these set screws in small increments until the "slack" is removed. Ride the bike and readjust as necessary.

6. **SIMPLE GUIDELINES FOR PROPER ADJUSTMENT OF QUICK RELEASE LEVERS**

A. MANUFACTURER'S RECOMMENDATION - No matter who made the device, always follow, and instruct your customers to follow, the advice given in owner's manuals regarding its products. Most QR axles will, however, operate safely and securely under the below guidelines.

B. EMBOSSING THE ENDS - When properly tightened, the metal of the QR device should emboss (make a visible impression in) the aluminum.

C. CURVED LEVERS - Almost all QR devices have curved levers and the concave side should face the bicycle when it is in the closed position.

D. TIGHTENING THE DEVICE - With the lever in the open position, tighten the cone-shaped nut at the opposite end of the axle so that when moving the lever toward the closed position, you feel some resistance to motion when the lever is a bit past the center of its full travel. Close the lever all the way to the end of its travel.

E. TIGHTENING FORCES - While the lever should close tight, do not over tighten: too tight and you could stretch or otherwise cause damage. Do not exert more than 45 pounds force (lbs.) when closing the lever. More than this, and you will overstress the parts.

F. RELEASING FORCES - Although the release is called quick, opening should not be too easy. The lever must not release until at least 12 lbs. of force are applied. Open the lever and tighten the cone-shaped bolt some more. Repeat the process until the minimum opening force is achieved. Do not allow the lever to become so tight it take more than 25 lbf. to open the QR device; damage could result if the lever needs that much force to open.

G. MEASURING NECESSARY FORCE - You do not need complex testing equipment to measure your exertion of force on the QR lever. To "educate" yourself on how much 12 lbf. feels, push on a bathroom scale or a supermarket produce scale. When the scale reads 12 pounds, you'll know how much force you will need. Remember: The lever requires at least 12 pounds of opening force to assure adequate tightness and safety, but should require no more than 25 pounds of opening force, nor should the closing force be greater than 45 pounds.

H. FINAL CHECKS - While the final position of the lever has little importance aerodynamically, it should be carefully placed to avoid interfering with other parts or accessories or with the operation of the bicycle. Many manufacturers suggest pointing the lever rearward to avoid snagging. This is particularly important off-road, where a snag on a vine, branch or other protruding object may pull open the lever, which may cause loosening and failure of the product.

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The Linear CLWB is a great piece of equipment....not only design, but workmanship as well. There are not many "accessories" that you need other than those that you would use on a "wedgie," bag, pump, etc.

TIPS/MODIFICATIONS-

ADJUSTING SEAT ANGLE - WE RECOMMEND THAT YOU DO NOT CUT YOUR RODS, AND TO PURCHASE THEM DIRECTLY THROUGH US OR YOUR BIKE DEALER. IF YOU START CHANGING THE DESIGN, WARRANTY WILL NOT APPLY. YOU CAN ORDER ADJUSTABLE SEAT RODS BY CALLING LINEAR OR YOUR BIKE DEALER.

TIRES - The tires that come on your Linear are super tires. If you would like to have a little less rolling resistance and possibly more speed, you might consider changing sizes and types of tires. I am currently using a 1" front tire by Primo and a 1-3/8" rear tire also by Primo. Both these tires are 100PSI tires and have a herringbone tread. The standard rims work great, no need to change anything.

WATER BOTTLE CAGES/PUMPS - There are two places that you can easily mount cages on the compact - the top of the frame or the seat braces. You can tap the last seat adjuster hole using a 1/4"x20 tap, drill another hole to correspond with the other hole in your bottle cage and tap it, then enlarge the holes in your cage to fit 1/4" bolts (we recommend button head allen bolts or allen head bolts for appearance). Point the top of the cage to the front so that the bottle is tilted slightly upward on the bike. If you prefer, you may mount the cages on the seat braces. The easiest method is to use stainless hose clamps (small ones) and clamp the cages on the front, side, or rear of the braces (by using them pointing toward the front - less reaching to get to them). To mount a pump, a suggestion would be to secure it to the seat brace with either tie wraps or velcro straps. Put the handle end up so that it doesn't slide down and hit the ground. (Be sure to carry extra tie wraps in case you need your pump and have to replace it on the brace). One of the 12 gram cartridges will inflate one of the small 16" fronts and part of a 20" rear. It's handy for fast, tube changing flats.

REAR VIEW MIRROR - Mirrors are a necessity because it is not easy to turn around and look over your shoulder as on a "wedgie." It is also not easy to mount a mirror on the Linear. Helmet mirrors work well, too, just make sure you use something so you are able to see traffic coming from behind.

FAIRING - We recommend that you order through ZIP DESIGNS. You can talk to Carl by calling 888-946-7276.

RACK ADAPTER - Linear modified them specifically for your bike depending on the size. We use a derailleur block and a tall tube. Mount the block to main frame of the bike behind the seat. A standard rack should clamp onto the post. IT SHOULD NEVER SLANT DOWN AND RUB ON THE WHEEL.

HEADLIGHT MOUNT - Take the cap off the front fork. The headlight mount goes there. You can call Linear or your local bike shop to order one.

CHAIN IDLER - Mounts on the frame by unscrewing a single bolt to widen the block. Mount it to your frame and screw the bolts in to tighten the block. The block should be secure and not move. Apply the lower chain over the top of the back wheel.

BAR ENDS - Are used when a person has trouble reaching the brakes. You can go to your local bike dealer to purchase them and have them installed.