

LIGHTNING

Phantom

OWNER'S MANUAL

WARNING

The Lightning Bicycle design requires the use of different riding skills and techniques as compared to a standard bicycle.

Please read all instructions carefully to avoid damage to your bicycle or yourself.



LIGHTNING

Race-Bred Recumbents

INTRODUCTION

This manual contains information on how to properly adjust and operate your Lightning bicycle for maximum comfort, safety, and performance.

The recumbent position and seat require alternate adjustment methods. The unconventional design and closeness of the front wheel to your feet require that new riding skills must be acquired.

Carefully follow the instructions, and after a short period of time, you will have the new habits needed to ride your Lightning successfully.

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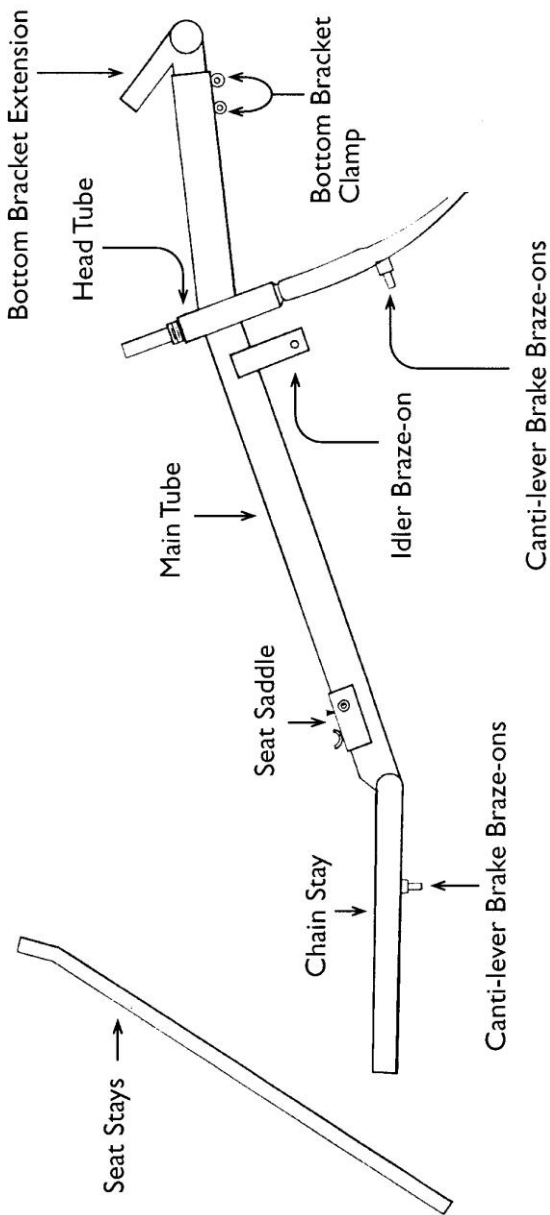
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Phantom

FIG. 1-0

1.0 THE PHANTOM ASSEMBLY

- A) Remove all items from the box and unwrap. Be careful to support the handle bars so that the cables are not kinked.
- B) Install the steering column onto the tilt steering mechanism.
- C) Place the tilt steering mechanism in a vertical position and engage the locking lever.

WARNING!

Ensure the tilt mechanism locking serrations are aligned before fully engaging the locking lever. See Fig. 2-2. Failure to follow this step could cause clamp failure while you are riding, resulting in a loss of control!

- D) Install the rear derailleur.
- E) Install the wheels in the dropouts, and check the tire pressure.
- F) Connect the seat to the frame using the plastic quick release clamps. (See Fig. 1-1).
- G) Install the seat foam into the seat bottom pocket, with the thicker foam portion toward the front.
- H) Install the pedals.
- I) Re-check the headset, brakes, and derailleurs for proper adjustment and operation.

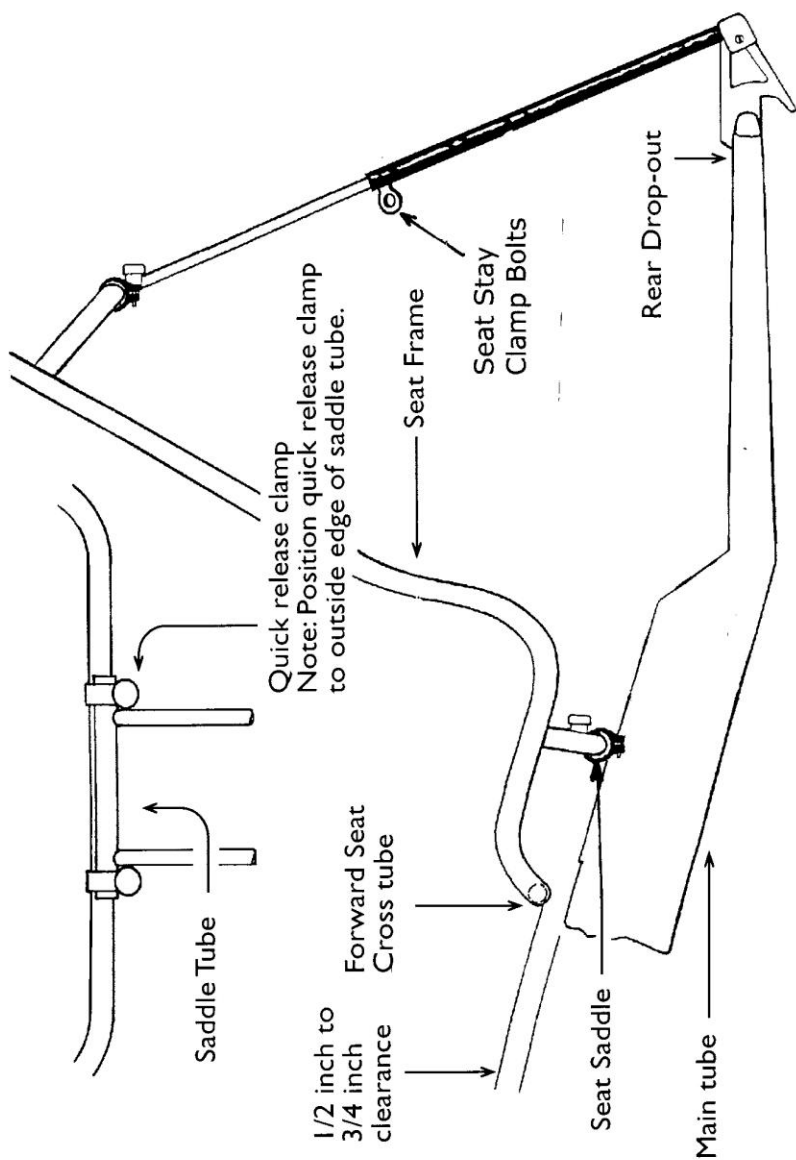


FIG. 1-1

2.0 ADJUSTMENTS BEFORE RIDING

2.1 CRANK ADJUSTMENT:

On Lightning Bicycles, the cranks are moved to accommodate differences in leg length. Adjust the cranks as follows:

NOTE:

Do not apply any grease to the bottom bracket extension tube, otherwise it might rotate under pedaling pressure.

- A)** Loosen the two Allen head bolts under the crank tube with a 5 mm Allen wrench.
- B)** Slide the cranks in or out until your legs are slightly bent at their furthest extension. (See Fig. 2-1). It's better to have the cranks too close when making the initial adjustment than too far away.
- C)** Verify the crankarms/chainrings are vertical using the alignment lines, then tighten the two Allen head bolts.

2.2 HANDLEBAR ADJUSTMENT:

- A)** Slightly loosen the stem clamp using a 5 mm Allen wrench.
- B)** Adjust the handlebars up or down so that there is approximately 2 inches (for V-bars) or 1/2 inch (for drop bars) of clearance between your knees and the handlebars (see Fig. 2-1).
- C)** Verify the handlebars are at right angles to the front wheel, then tighten the stem clamp.
- D)** Slide the cable housing on the stem up or down to prevent any tight cables during turning.
- E)** At this point you can adjust the handlebars forward or rearward using the tilt mechanism, then repeat steps A) thru D) above as needed (see Fig. 2-2).

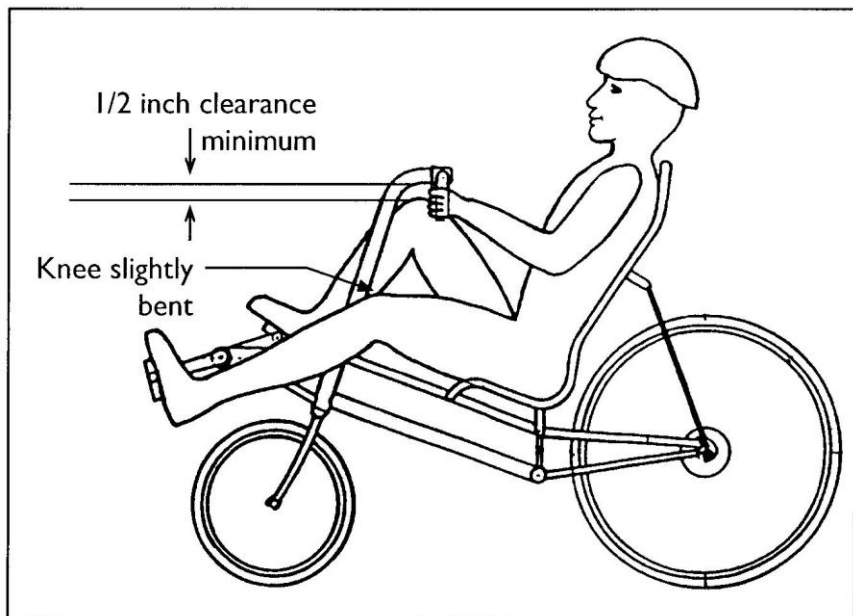


FIG. 2-1

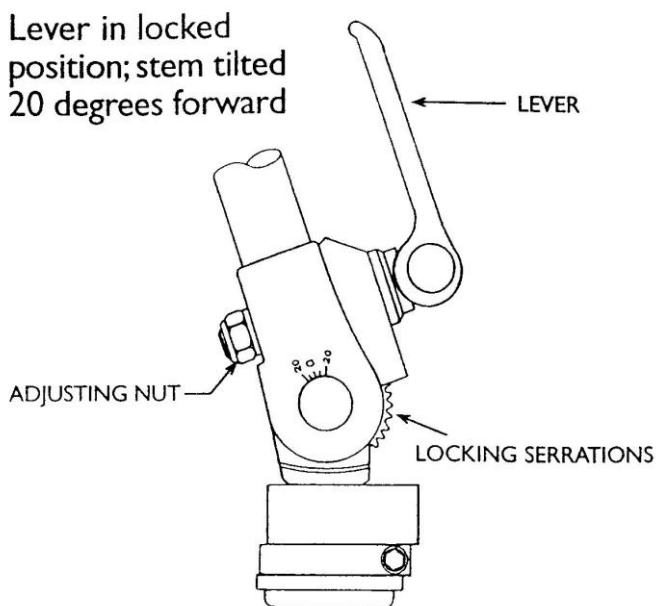


FIG. 2-2

WARNING!

DO NOT engage the clamp locking lever beyond the 20 degree forward position. If you tilt the handlebars forward for entry and exit, leave the lever fully released. Also ensure the tilt mechanism locking serrations are aligned before fully engaging the locking lever. Failure to follow these steps could cause clamp failure while you are riding, resulting in a loss of control!

3.0 RIDING

Find a straight, level road without much car traffic for learning how to ride. **DO NOT** attempt any U-turns or other sharp turns until you have mastered slow speed turning, explained in Step 3.3. Keep your speed at 10-15 mph, as this will prevent your feet from hitting the front wheel and is more stable than slower speeds. Finally, look into the distance, not at the front wheel.

3.1 PEDAL TYPE:

The Phantom comes with platform pedals which make learning to ride easy. If you install clipless pedals, follow these tips:

- A)** Don't engage when first learning how to ride.
- B)** Practice unclipping a few times before riding with clipless pedals. It is best if you practice this while leaning against a wall, or while someone is holding you up.

3.2 STARTING:

- A)** If this is your first experience with a recumbent bicycle, it is suggested that a friend helps you balance by holding onto the seat when starting.
- B)** For starting by yourself, the trick is to have one pedal in the straight up (power) position, with one foot on this pedal, and the other foot on the ground. Push hard against the upright pedal to get moving, then bring your other foot up and catch the other pedal.

3.3 SLOW SPEED TURNING:

WARNING!

During slow speed turns, the front wheel can be turned far enough so that your feet will hit it if you are pedaling. Practice the following carefully, and always pay attention to the front wheel when making U-turns, turning into a driveway, etc.

- A)** The easiest solution is to coast through the turn, and keep your foot on the side you are turning in the up position. For example: for a right turn, keep your right foot up. (See Fig. 3-1). This method requires you to have sufficient speed to coast through the turn.
- B)** To make turns and apply power, have your feet as in (A) and make short 1/3 rotation, back and forth pedal strokes. This method must be used when you are starting out and turning at the same time, such as a sharp right turn after stopping at a stop sign.

Both methods take some practice to master, but it will eventually become second nature. The interference is a problem only at speeds below 6 mph. Above this, the wheel is not turned enough to be a problem. Also, optional pedal extenders are available which make this interference less of a problem.

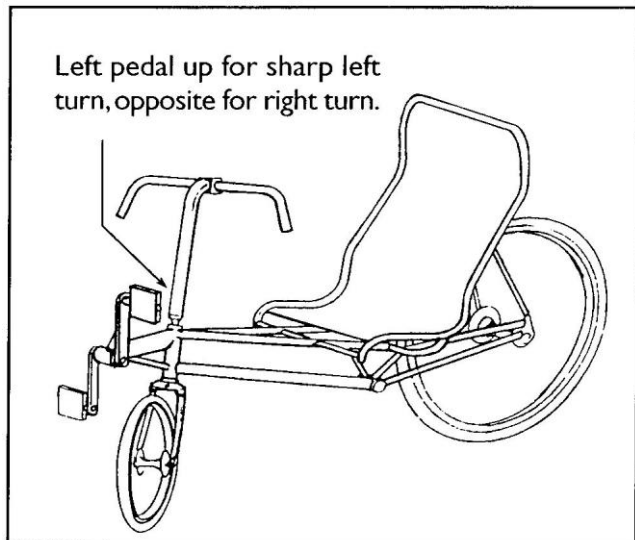


FIG. 3-1

3.4 HANDLING AND STABILITY:

A Lightning bicycle has fair stability and responsive steering. It is not necessary to aggressively hold onto the handlebars. A relaxed grip is best for riding in a straight line. One hand on the bars is adequate for relaxed cruising. As speed increases, the stability actually improves if maximum power is not applied to the pedals.

WARNING!

DO NOT apply excessive force to the handlebars.

There is no reason to pull extremely hard on them, as it will not make you go any faster. Large forces repeatedly applied to the handlebars may cause the stem to fail. If you want to lift your butt off the seat, do it by pushing down on the seat frame with one hand, NOT by pulling on the handlebars!

3.5 BUMPS:

For going over bumps or railroad tracks, follow these hints: Lean forward in the seat slightly so your back is not touching. This prevents the rear wheel impact from being transmitted to your back. A relaxed grip on the handlebars will allow the bike to move under you, thus transmitting less force from the bump. For some "wheel eating" potholes, the only solution is to slow down, or avoid them if possible. Another good solution is the optional suspension, which can be added anytime.

3.6 STOPPING:

Before you stop, shift down to a low gear. Being in a low gear makes it much easier to get started again. In emergencies, or just for fun if you want, the low center of gravity normally makes it possible to brake as hard as you want without any fear of flipping the bike. However, be careful of applying full braking on wet or sandy roads, as this could cause the tires to slip out.

3.7 CLIMBING HILLS:

Use a lower gear and spin! If your pedaling speed drops below 60 rpm, then your power also drops off. Pulling on the handlebars does not help any. One trick to try on long and/or steep hills for relief or extra power is this: Steer with one hand and push on your knee with your other hand as you pedal. As one arm gets tired, trade off and use the other one.

This "arm power" can add 10% more speed for short period. If you want to do extra training in order to climb hills better, then weight lifting (both upper and lower body), and one legged pedaling on the flats (to develop your backstroke muscles) help significantly

3.8 MUSCLE CONDITIONING:

- A)** *DO NOT* immediately ride your bike for long distances as it takes some time for your muscles to become accustomed to the recumbent position. Ride 5-10 miles on the first day, then increase by 5-10 miles per day thereafter. Your quadriceps and rear end muscles may be mildly sore while you are getting used to the bike. This is normal and should disappear once the daily miles you ride stabilize.
- B)** If your knees hurt constantly, this could be caused by improper crank adjustment. Try adjusting the cranks in or out slightly and see if the condition improves. Also, low rpm gear mashing can cause your knees to hurt.

3.9 SAFE RIDING

- A) If for some reason you fall over while moving, ***DO NOT PUT YOUR FOOT DOWN!*** It can be drawn underneath the seat, causing severe injury to your leg and knee. Instead, keep your feet on the pedals, and let the seat take the impact.
- B) **WEAR A HELMET!** If your head is worth less than \$50 (the price of a good helmet); you don't need one.
- C) **WET WEATHER:** Your brakes do not work as good in this condition, so allow for more stopping distance on down hills. Also, BE CAREFUL when cornering!
- D) **BE CAREFUL** when cornering fast on unfamiliar roads. Any gravel in the corner may cause a slide out. Because of the low Lightning seat position, it is possible to lean over more in a corner than a standard bike without realizing it.
- E) **PLEASE OBSERVE ALL TRAFFIC LAWS.** Cars like it when you are predictable, so don't make any sudden moves, and always signal your intentions.
- F) **WHEN RIDING IN HEAVY TRAFFIC**, bright colored clothes are a big help. A warning flag may also be a good idea.
- G) **FOR NIGHT RIDING**, buy a good lighting system. NightSun has the best lights for dark roads at Lightning speeds.
- H) **USE A MIRROR** to see traffic behind you, this is much easier and safer than turning around.
- I) **BE CAREFUL** on roads that have been repaved, leaving a lip where the new pavement drops off onto the old pavement at the shoulder. The small front wheel occasionally has problems negotiating this lip.

4.0 ACCESSORIES

4.1 WATER BOTTLE:

One set of water bottle braze-ons are standard under the seat. A second is standard on the stem extension. We recommend using a heavy duty (6mm) aluminum cage or rib type cages.

4.2 REAR RACK:

The custom Lightning specific rack works best, other similar racks also work with some bending of the attaching arms.

Use the aft set of threaded holes in the rear dropouts for attaching racks and fenders.

Attach the upper rack struts to the seat stay pinch bolts (see Fig. 4-1).



FIG. 4-1

4.3 PANNIERS

The best panniers to use are the Lightning Zero Drag type. They give better weight distribution and do not increase drag like other panniers. They easily mount on the Blackburn rack. However, any pannier that fits your rack will work.

4.4 SEAT BAG:

The best option is the Lightning seat bag. It has a large capacity, and is easily slipped on. It also has pockets for 1 or 2 hydration bladders.

4.5 MIRROR:

For safe riding we highly recommend using either a helmet mounted mirror or the Lightning brake lever mounted mirror as shown below.



5.0 MAINTENANCE

5.1 THE SEAT

The seat as received on new Lightning Bicycles is fairly tight. After an initial break-in period of riding, the seat will loosen up due to stretching of the material. The seat back should be tightened by taking the slack out of the string that runs along the sides.

CAUTION:

It is possible to wear a hole in the seat back, if it becomes loose enough to contact the rear tire.

The foam padding in the bottom of the seat is easily removable for washing the bike or any other reason.

5.1.1 SEAT ANGLE ADJUSTMENT

The angle of the seat back can also be adjusted to better suit your riding style. We recommend the seat be kept more upright when you are first learning how to ride, as it is easier to balance. Later on, the seat can be reclined backward for less wind resistance, or perhaps improved comfort. However, be aware that visibility and controllability are reduced somewhat with the seat reclined.

To adjust the seat back angle (ref. Fig. 1-1):

- A)** Slightly loosen the four plastic seat quick release clamps and the seat stay clamp bolts.
- B)** Adjust the seat to the desired angle.
- C)** Retighten the seat stay clamp bolts and seat quick release clamps.

After adjustment, the cranks may have to be moved slightly, since adjusting the seat angle also moves your legs forward or backwards. Finally, **BE SURE THE SEAT MESH IS TIGHT**, to prevent the seat mesh from contacting the rear tire while riding.

5.2 THE CHAIN IDLER:

The chain idler under the seat has a sealed bearings and does not normally require maintenance. It will develop a wear pattern to match the chain after a few hundred miles. This is normal and nothing to worry about. After about 10,000 miles or so it might show excessive wear or make excessive noise, it should be replaced at that point. A replacement idler is available from Lightning Cycles.

5.3 THE CHAIN TENSIONER

Perform the following steps to remove and install the chain tensioner. Refer to figure Fig. 5-1.

CAUTION:

The coil spring is under tension. To prevent the spring from losing tension, hold the back plate against the tensioner arm at all times.

REMOVAL:

- A)** While holding the back plate against the tensioner arm, remove the black nut and washer.
- B)** While the tensioner is off the frame, temporarily re-install the black nut and washer to keep the back plate in place.

INSTALLATION:

- A)** Remove the black nut and washer, then verify the small silver spacers are down in the back plate recess.
- B)** Place the tensioner onto the frame mounting plate, with the roll pin inserted into the small roll pin hole.
- C)** Reinstall the black nut and washer and tighten.
- D)** Verify the tensioner smoothly pivots. If it does not the black nut may have to be slightly loosened until smooth operation is achieved.

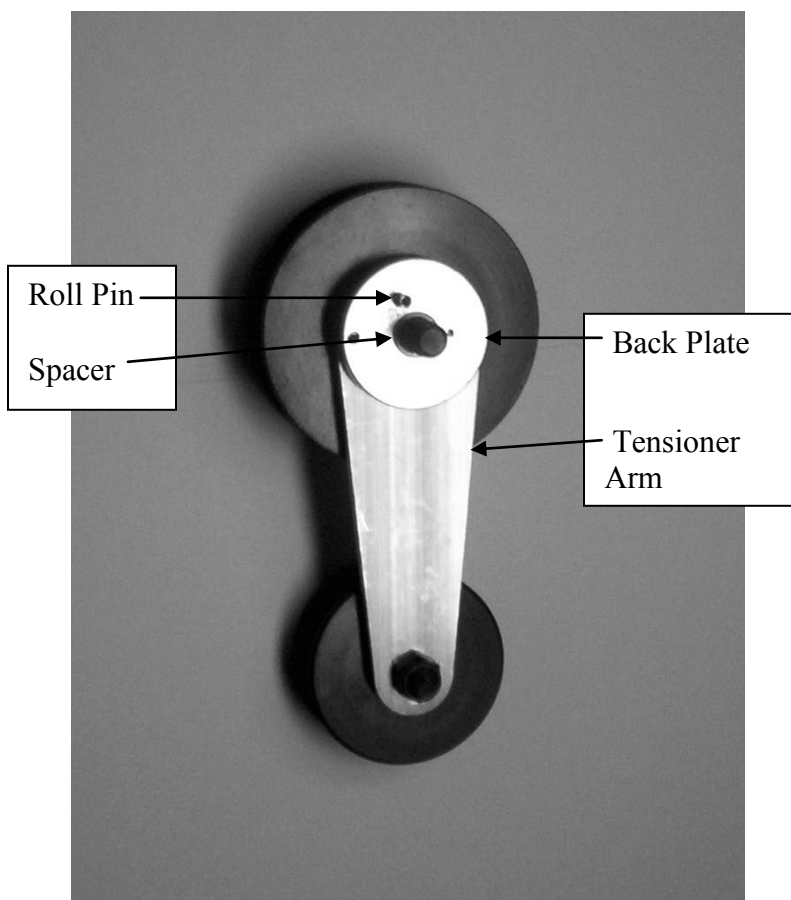


FIG. 5-1

5.4 CHAIN LENGTH ADJUSTMENT:

The chain tensioner will normally take up any chain slack resulting from fore and aft bottom bracket adjustments. If you decide to remove the chain tensioner and replace it with a single chain idler, then perform the following to ensure proper chain length.

The chain should be long enough to permit shifting onto the large front chain wheel-large rear sprocket combination, and at the same time, not so long that it goes slack when shifted onto small chain wheel-middle rear sprocket combinations.

This can be accomplished by adjusting the chain length so that the rear derailleur is in the position shown in Fig. 5-2 with the chain on the large chain ring-large rear sprocket combination.

NOTE:

The derailleur does not normally have sufficient take-up capacity to allow use of the small chainring-small rear sprockets.

CAUTION:

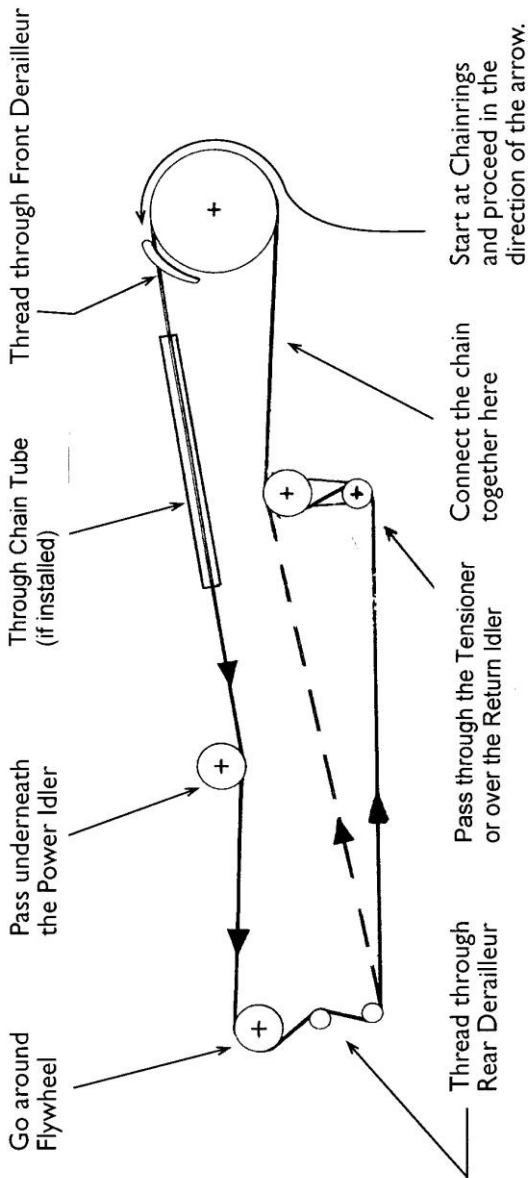
If the chain is not long enough to shift onto the large front chain ring-large rear sprocket combination; the rear derailleur and the chain will break.



FIG. 5-2

5.5 CHAIN THREADING

Refer to the following diagram if you remove and then re-install the chain.



CHAIN THREADING DIAGRAM

FIG. 5-3

5.6 PAINT

The paint on the frame is a very tough urethane coating which is highly resistant to scratching. It also maintains its luster for a long time but can be waxed with ordinary auto type waxes if desired.

5.7 BIKE PARTS

All of the other parts are standard bicycle components, and can be easily serviced by your local bicycle shop. The chain should be periodically lubricated. The brakes and control cables should be monitored and adjusted when necessary. Once a year, the headset, bottom bracket, pedals and hubs should be checked for smooth operation, and adjusted if needed. See Fig. 5-4 for rear derailleur cable routing instructions.

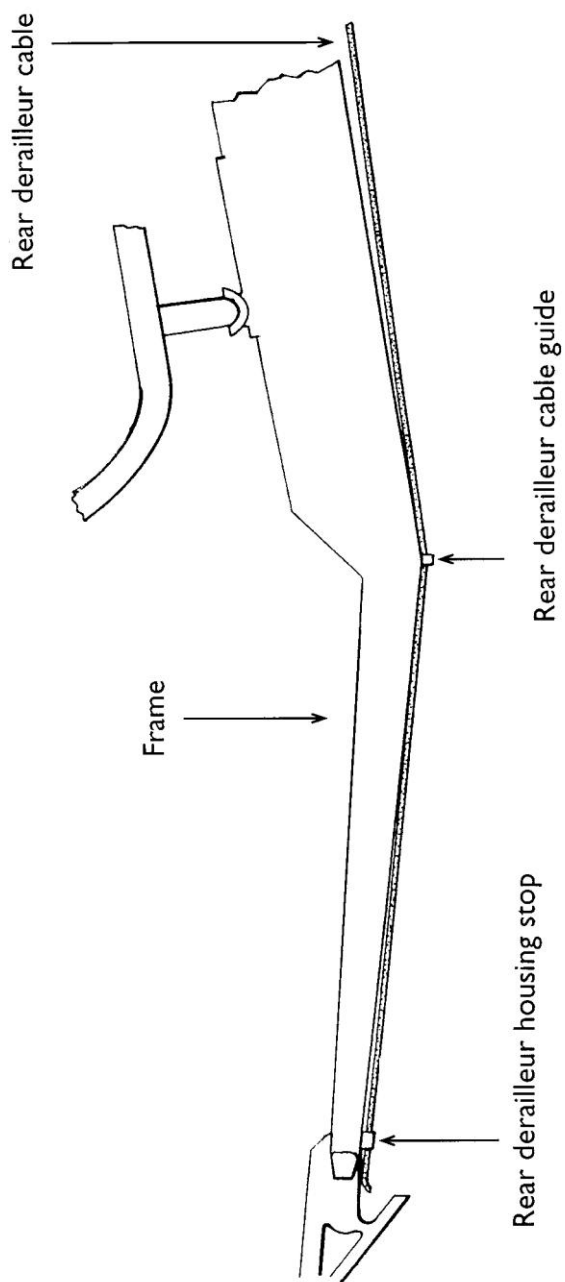
5.8 TILT MECHANISM

The tilt mechanism lever securing nut needs to be kept tight, to a torque of 50 to 100 in-lbs (See Fig. 2-2). Torque this nut at least once a year to ensure it is tight.

5.9 ZZIPPER FAIRING

Lexan is an extremely tough and crack resistant material. The Zipper fairing will withstand a great deal of abuse, even crashes, without breaking or cracking. However, it scratches easily. Thus, to preserve its appearance, these steps should be followed:

- A)** Clean the Zipper fairing with Windex or a mild detergent solution and a soft rag. Never use solvents of any kinds. Tooth paste is a good compound for smoothing out minor scratches.
- B)** Remove the Zipper fairing when placing the bike on a bicycle carrier rack.



REAR DERAILLEUR CABLE ROUTING

FIG. 5-4

5.10 FORK O-RING

An O-ring is installed between the fork and steerer tube, inside the frame (see Fig. 5-5). This O-ring slows down the steering response of the bike. If you want quicker steering, remove the O-ring. If you want even slower steering a second O-ring can be installed. Reinstall the O-ring(s) any time the fork is removed. Grease the O-ring and verify it is correctly positioned during re-assembly.

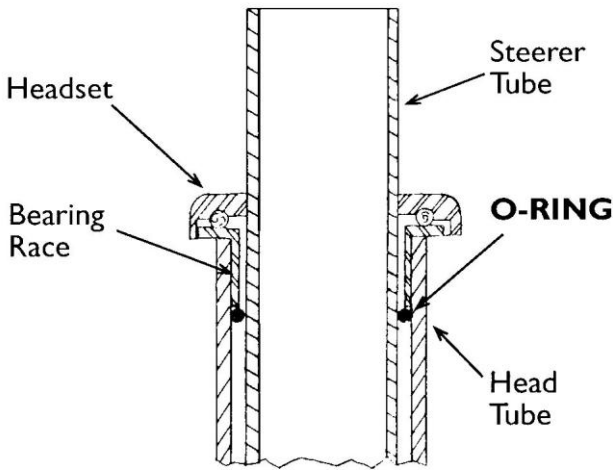


FIG. 5.5

FOR YOUR RECORDS

FRAME S/N:

BOUGHT FROM:

DATE OF PURCHASE:

SERVICING:

DATE

ITEM

[illegible]

LIGHTNING BICYCLE LIMITED WARRANTY

Lightning Cycle Dynamics (Lightning), a California Corporation, makes the following limited warranty concerning Lightning bicycles and framesets:

1) **WARRANTEE:** This limited warranty is effective **ONLY** :

* To the original purchaser of the bicycle or frameset, thus it **is not** transferable

* If the original purchaser weighs less than 220 lbs for Small/Medium, or 250 lbs for Large/X-Large, size bicycles and framesets.

2) All parts (including suspension parts, bushings, shock units, and fasteners), are warranted to be **FREE** from defects in materials and workmanship for **one year** from the date of purchase. The frame and seat frame are warranted to be **FREE** from defects in materials and workmanship for **five years** from the date of purchase. During the limited warranty period, all original parts determined by Lightning to be defective will be repaired or replaced, at the sole option of Lightning, free of charge. Lightning will additionally pay during these periods reasonable dealer labor charges arising solely due to replacement of defective parts /frames, and ground shipping of replacement parts/frames from Lightning.

3) All claims under this limited warranty must be made through a Lightning dealer or Lightning Cycle Dynamics during the warranty period.

4) **THIS LIMITED WARRANTY ONLY APPLIES** upon the bicycle being operated under normal conditions of use, and properly maintained. This limited warranty **DOES NOT APPLY** to normal wear and tear, and also **DOES NOT COVER** failure due to abuse, neglect, improper assembly, improper maintenance, alteration, collision, crash, misuse, or installation of unauthorized replacement parts. The installation of large motors, jumping, riding on severe terrain, severe climates, riding with heavy loads, commercial activities, or any similar activities, **WILL NEGATE** this limited warranty. Bending of frames, forks, handlebars, and rims is a sign of abuse or use inconsistent with the bicycles intended use, and **IS NOT COVERED BY THIS LIMITED WARRANTY.**

5) Lightning's liability under this limited warranty shall be no greater than the amount of the original purchase price of the bicycle or frameset, and in no event shall Lightning be liable for personal injuries, consequential, incidental, or special damages, nor for unauthorized transportation or incidental dealer labor.

6) Lightning does not authorize anyone, including it's authorized dealers, to extend any other warranties, express or implied, for Lightning.

7) This limited warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

March 2007

The ***LIGHTNING*** Legend

Lightning takes cycling out of 100 years of dark age design and into modern NASA-like engineering. All Lightnings are designed by top aerospace engineers, and hand built in California by skilled craftsmen with decades of experience building and operating jet aircraft, space satellites and large rockets.

Lightning's modern, high-tech integrated design results in a bicycle that is 3 times more comfortable, twice as safe and 30% faster. Only Lightning, among recumbent managers, has set multiple world records. For 23 years, Lightning has maintained an active racing team, using the same bikes we sell. Top level competition and elite riders put unique demands on bikes. This ultimate testing ground allows us to rapidly test and implement significant improvements for our models.

In the course of this unconventional product development program, Lightning race teams have logged thousands of competition miles worldwide, posting hundreds of race wins and setting numerous world records, including:

- ***First HPV (Human-powered Vehicle) to break 50, 55 and 60 mph – in 3 consecutive years!***
- ***San Francisco to Los Angeles record: 400 miles in 18 hours!***
- ***Seattle to Portland record: 192 miles in 7.5 hours (26 mph average)***
- ***Race Across America record: 2910 miles in 5 days, 1 hour (24 mph average)***
- ***Winner of 4 stages in the 1995 Paris-Brest-Paris***

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