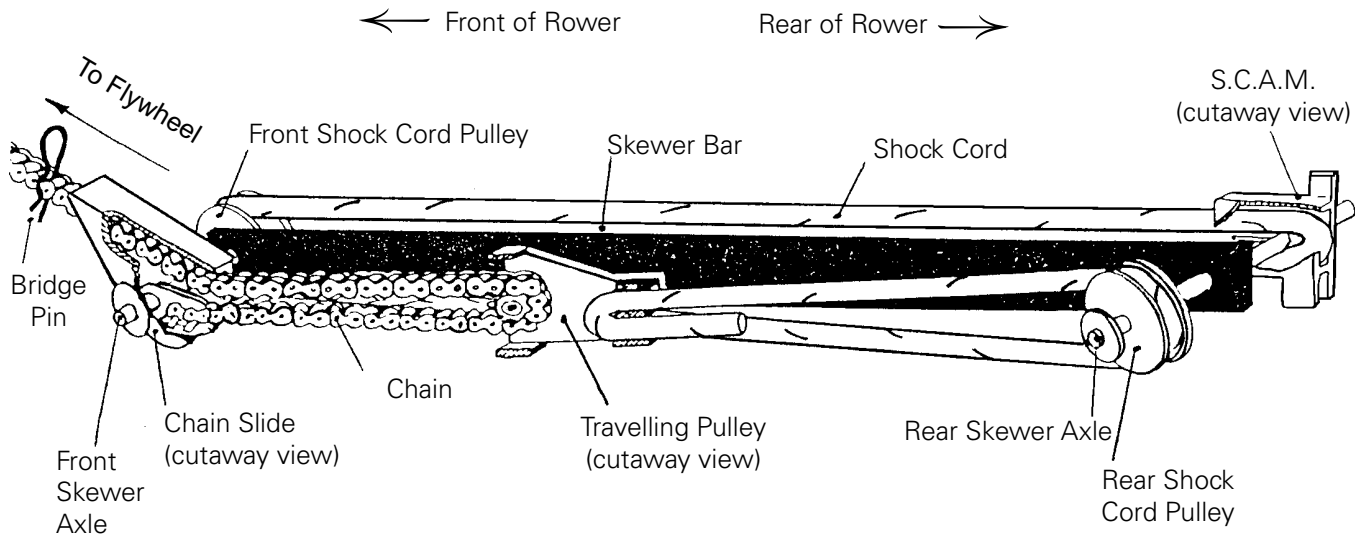


MODEL B SHOCK CORD REPAIR/SKEWER RETURN MECHANISM

The following is a step by step description of how to disassemble, inspect and reassemble your return mechanism. Even though you may have to do only part of this procedure to get your machine operating we recommend complete inspection of all the parts while you have the skewer out.

Read through the steps to familiarize yourself with what you will be doing. Gather all the necessary tools, clear your workspace and take your time doing the work.

Detail of Skewer - Figure A



1. DISASSEMBLY

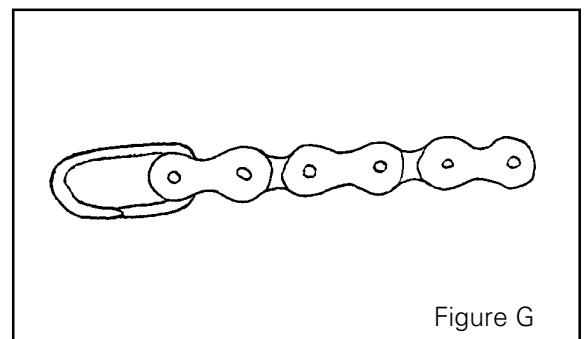
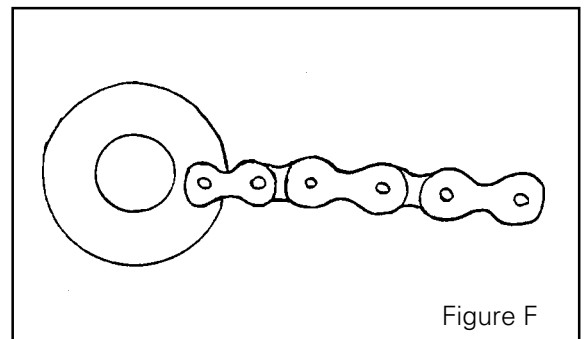
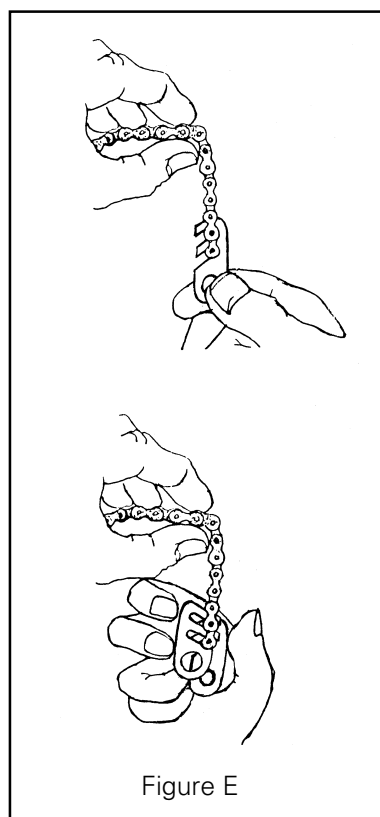
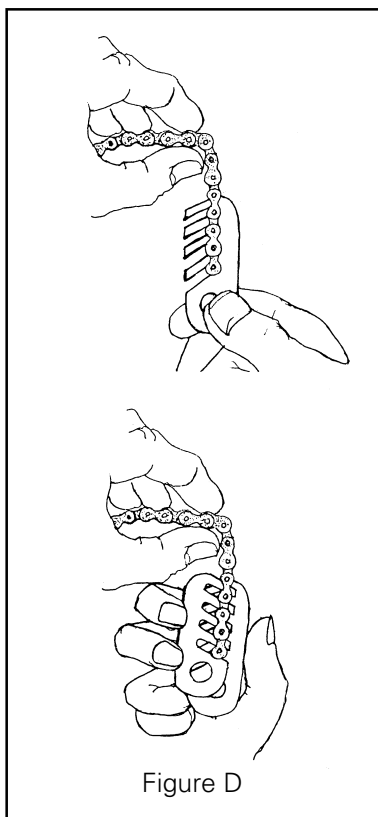
REMOVAL OF OLD PARTS

Tools & Materials Required:

Hammer	Cleaning solvent
Screwdriver	Concept2 chain oil
Pliers	Rags
Sharp knife	Tape

1. Pull the handle out a few feet from the chain guide and put the bridge pin through the chain where it emerges from the monorail. This will hold some slack in the chain for you. If your chain has gone slack already, this step will not be necessary.
2. Remove the handle by tapping the rounded end of the U-bolt to dislodge the two (2) 1/4"-20 nylon insert stainless steel nuts from the wooden handle. Use a 1/2" wrench to remove the two nuts from the U-bolt. Remove the U-bolt from the handle and chain, take the chain from the sprockets and let it rest on the floor.
3. Remove and save the four (4) #8 machine screws that hold the skewer in the monorail. Slide the skewer out of the front of the machine.
4. Lay the return mechanism on a flat surface, oriented as in Figure A. Take time now to note the routing of the shock cord and chain, comparing this to Figure A. Hold the skewer bar in one hand and operate the mechanism by pulling the chain out of the slide, noting the way the components move throughout the stroke.
5. Pull the chain out from the chain slide far enough to allow removal of the bridge pin. Slowly allow the chain to retract until the chain and shock cord are fully relaxed.

6. Remove the S.C.A.M. (Shock Cord Adjustment Mechanism) from the rear axle and unloop the shock cord from the front and rear shock cord pulleys.
7. Mark the end of the shock cord that is at the S.C.A.M. with a piece of tape, then detach the shock cord from the S.C.A.M. and the travelling pulley by pushing the ends of the cord out of these parts. Set the shock cord and S.C.A.M. aside for later inspection.
8. Now go to the front axle and, with a screwdriver or pliers, pry off the axle retaining clip that is holding the chain slide and chain in place. Pull the chain slide and chain off the axle. Set the chain slide aside for later inspection. The axle clip may be discarded as its purpose is to hold parts in place during assembly and shipping. It is difficult to replace without the right tool, and you will be using the skewer axle screws to serve the same function during assembly.
9. Look at the ends of your chain. Most chain end connectors consist of two fingered pairs of parts which engage the chain at its ends as in Figures D and E. If you do not have a fingered style attachment at the HANDLE end of the chain, but rather a stainless steel ring about the size of a thick quarter, please call Concept II for a free replacement. It has been found that this is not a reliable part and should be replaced with the fingered-style connector.



The end of the chain that connects to the front axle (dead end) will have one of three styles of connectors:
 1) The fingered style as in Figure E. 2) A steel disc with holes in it as in Figure F. 3) A steel "lap-link" as in Figure G. All three of these connectors are reliable for this end of the chain.

10. Remove the chain from the travelling pulley by either 1) removing the fingered dead end connector, or 2) removing the fingered handle connector after removing the vinyl cover (this is harder to do than #1 or #3), or 3) spreading apart and removing the laplink from the chain, and then pull the chain out of the travelling pulley. Set the chain and travelling pulley aside for later inspection.
11. Using the screwdriver or pliers, remove the two retaining clips holding the white shock cord pulleys in place. Remove the pulleys and set them aside for later inspection. Discard the retaining clips.

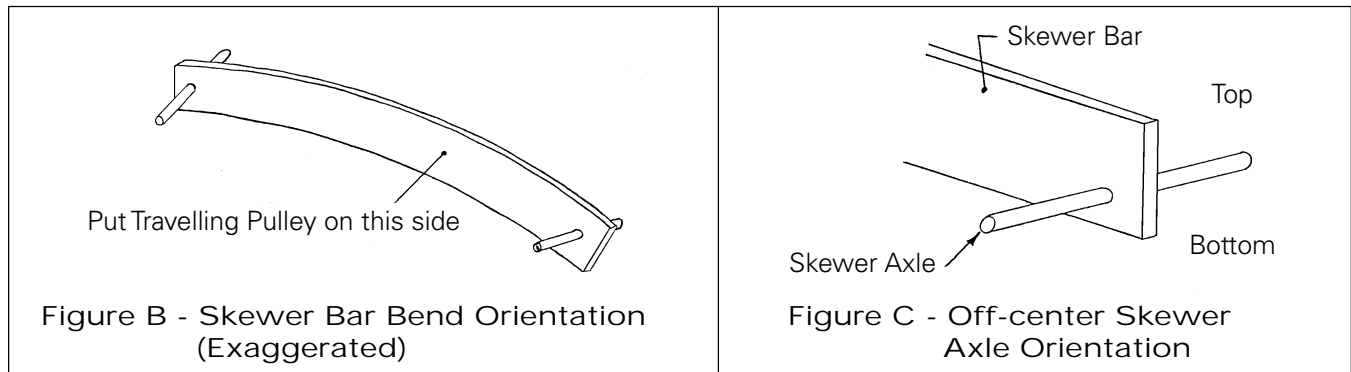
Your return mechanism is now fully disassembled.

2. INSPECTION OF PARTS

SKEWER BAR & AXLES

Wipe the bar and axles clean with a rag and some solvent. The only sign of wear you may see on the skewer bar is a polished area where the travelling pulley axle may have been rubbing against the bar, which should cause no problems with the operation of the mechanism. The axles should be clean and straight, especially where the shock cord pulleys are located.

Sight down the length of the bar. There should be no sharp bends that might interfere with the travelling pulley. The bar might have a gradual bend that runs its entire length. This situation is OK as long as the bar is oriented such that it bends away from the travelling pulley, as in Figure B.



Some skewer bars have a top and bottom. These assemblies have the axles located off-center of the skewer bar as in Figure C. Note that it is very important to have this style bar oriented as shown when reassembled.

Inspect the edges of the bar for rough spots that may abraid the shock cord. File if needed.

SHOCK CORD

Look over the entire length of the cord for places where the outer woven nylon casing is worn away, exposing the inner rubber fibers. Replace the cord if you have any areas like this, as its condition will deteriorate quickly from this state. It is normal to see some fuzziness of the casing where the cord runs over the pulleys. As long as the casing is intact, your cord is probably OK.

Measure cord and wrap it tightly with tape at ten(10) feet. Cut it with a knife or sharp scissors at this point.

TRAVELLING PULLEY

The travelling pulley consists of a black plastic housing, an axle, two retaining clips on the ends of the axle, a bearing pressed on the axle and a disk or cog pressed on the bearing. The chain enters the top of the travelling pulley, runs around the disk or cog and goes out the bottom of the pulley, as in Fig. A on page 3.

First make sure that all the above mentioned parts are present. Next, rotate the disk or pulley with your finger. It should turn with little or no resistance, and the bearing should not slide from side to side on the axle.

Inspect the housing for places where it may be worn through or cracked, or where the axle holes have elongated. If any of these conditions exist, it would be best to replace the travelling pulley.

CHAIN

Have a close look at the chain and check it for lubrication. If it seems dry or stiff, this is a good time to give it a thorough cleaning and lubrication. The "best" method would be to immerse the chain in a solvent, such as white gas or kerosene, scrub it energetically with a toothbrush, then dry and lubricate it.

CHAIN SLIDE

This plastic part is designed to give the chain a smooth, quiet exit from the monorail out to the flywheel. The chain will eventually wear through this part, which will leave the chain rubbing on the top inside edge of the monorail.

Take a close look at the inside surface of the slide where the chain runs. If it's flat and smooth, you are probably looking at a new or nearly new chain slide. Is the surface worn with grooves that match the shape of the chain? That is OK, as long as there is at least 1/8" of plastic left at the front tip before it wears through. If there is less than 1/8", the chain should probably be replaced. Bear in mind that this is an inexpensive part, and now is the best time to deal with it if there is a question.

SHOCK CORD PULLEY

Make sure that the outer surface that the shock cord runs on is round. Put the pulley on a skewer axle to see how well it fits. If there is more than 1/16" of play or if the pulley wobbles very much, it should probably be replaced. Smooth rotation of the pulleys can help to lengthen the life of the shock cord, and like the slide, this is an inexpensive part.

3. REASSEMBLY OF THE RETURN MECHANISM

All right. You've taken it apart, cleaned and inspected everything and gotten new parts where needed. Now comes the most important part, getting it back together RIGHT.

Take your time doing this. Read each step carefully and look at the pictures. Better yet, look at another return mechanism if there's one available. It will be helpful to have two people for some of the steps.

There are many ways to reassemble the mechanism that may look OK but, if done incorrectly, will result in early wearing of the components. **PLEASE TAKE YOUR TIME.**

1. Take the skewer bar/axles and recheck the bar for the long bend mentioned in the inspection step. Orient the bar on the surface in front of you with the bend AWAY from you, and if your skewer bar has a top and bottom, with the top up, as in Figure B and C on page 5.
2. Go to the end of the bar to your left, which we will call the front of the skewer. On the end of the front skewer axle that points away from you put a thin coat of lubricant. (Grease or Vaseline will last the longest. Concept II Chain Oil may also be used but will need to be reapplied more often). Slide on a shock cord pulley with the bushing side of the pulley (the side with no writing) against the skewer bar. Loosely screw one of the four(4) #8 screws into the axle end to hold the pulley in place.
3. Now go to the other end of the skewer bar (rear) and repeat the above procedure on the axle end pointed towards you. You should now have a skewer bar with two white pulleys at opposite ends and opposite sides to one another.
4. Look at Figure A to locate the top and bottom of your travelling pulley. Feed the chain through the travelling pulley such that the end of the chain going to the handle comes out the top front of the travelling pulley and the "dead end" of the chain, going to the front skewer axle, is coming out the bottom front of the travelling pulley as in Figure A. Reattach the handle connector or dead end connector to the appropriate chain end.
5. Place the chain slide over the top run of the chain, with the slide pointed away from the travelling pulley. Position the dead end connector between the two holes in the chain slide, then slip the connector and slide on the front axle opposite the front shock cord pulley, capturing the top run of chain between the axle and the slide. Put another #8 screw in the end of the axle to hold everything on and compare what

you have with the drawings. Be sure there are no twists or kinks in the chain.

Position the travelling pulley in the middle of the skewer bar and pull any chain slack out at the chain slide. Put the bridge pin through the chain at the front of the chain slide.

6. Pick up your shock cord and if you are reusing an old cord, locate the end that was in the S.C.A.M. To extend the life of the cord, this end will now go in the travelling pulley. Retape and cut the end if necessary, then put the end *in the top* shock cord hole in the travelling pulley and bring it *out the bottom* shock cord hole. Bring 2" - 3" of cord out the travelling pulley, then grasp the pulley in one hand and the two(2) runs of shock cord in the other hand and tug on them, seating the shock cord in the V-groove of the travelling pulley. See Figure A.
7. In a similar manner, route the other end of the shock cord through the S.C.A.M., leaving about 2" - 3" of excess cord and tugging the cord into the V-groove of the S.C.A.M. See Figure A.
8. It is time to route the shock cord over the shock cord pulleys. Look closely at the diagram. From the top hole of the travelling pulley, the shock cord goes straight back to the top of the rear shock cord pulley, then around and off the bottom of the rear shock cord pulley. From here, the cord goes diagonally under the skewer bar to the bottom of the front shock cord pulley, then around and off the top of the front shock cord pulley. Now go straight back (you'll have to pull on the cord some) to the rear skewer axle and position the S.C.A.M. as shown in Figure A, with the end of the cord coming out the bottom of the S.C.A.M. Be sure there is no twist in the shock cord. Put the last #8 screw in the end of the axle, and you are done.
9. Have a friend hold the skewer bar while you operate the mechanism by pulling the chain out the slide. Make sure that everything is running smoothly with no interference between moving parts. Look again at the drawings and be sure that your assembly looks the same. Satisfied? Good. Check again and then we'll put it back in the ergometer.

4. INSTALLING THE SKEWER

1. Carefully remove the four(4) #8 screws from the axles.
2. Slowly insert the skewer through the monorail so that the parts will be positioned as in Figure A.
3. Leave the loose end of the chain lying on the floor with the bridge pin still through the chain.
4. Insert the four(4) #8 screws through the holes in the monorail and thread them into the skewer axles. Lifting on the axles with a screwdriver may help align the holes. First tighten the screws on the right side (as you sit on the seat facing the wheel), followed by the screws on the left side.
5. Take the end of the chain and thread it through the chain guide, under and around one of the sprockets on the axle of the flywheel, and back out the chain guide.
6. Reattach the chain to the handle, being sure to fully tighten the two(2) 1/4"-20 Nylon insert stainless steel nuts that hold the U-bolt in the handle. Use a hammer to tap the nuts back into the wood of the handle.
7. Remove the bridge pin from the chain, and your machine is ready to row!