

# Operating Instructions

Please read and save these instructions. Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage! Retain information for future reference.

## TURBO CHAIN CUTTERS TYPE 0 - IV

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### DESCRIPTION

USB Turbo chain cutters were developed and precisely manufactured in Germany to meet the highest technical standards. This enables our valued customers to enjoy superior results at affordable prices.

Turbo chain cutters are hydro-dynamic tools that are used to remove obstructions such as roots, grease, and scaling from sewer lines. In contrast to tools with hydraulic drives ("slow spinners"), Turbo chain cutters are described as "fast spinners" - they achieve their effectiveness by virtue of their high speed (approx. 6,000 – 10,000 RPM).

The water, supplied by a pressurized hose, drives the turbine and propels the Turbo chain cutter through the sewer line. The water is channeled separately and has no contact with the cutter's internal bearings. For this reason, the USB Turbo chain cutters can also be operated using recycled water. 100% of the pressurized water is converted into energy and, therefore, effective cleaning of sewer lines is possible even with low pump outputs.

### SPECIFICATIONS

<u>Model</u>	<u>Guide Skid</u>	<u>Min. Pump Output Rqd.</u>	<u>Hose Connection</u>	<u>Length</u>	<u>Shpg. Wt.</u>
Turbo 0	None	14 GPM	1/2"	4"	2 lbs
Turbo I	Rigid	14 GPM	1/2"	6 3/4"	3 lbs
Turbo II	Rigid	18 GPM	3/4" to 1"	9 1/2"	8 lbs
Turbo II	Flexible	50 GPM	3/4" to 1"	20"	18 lbs
Turbo III	Flexible	60 GPM	1"	28 1/2"	49 lbs
Turbo IV	Flexible	80 GPM	1"	38"	112 lbs

### GENERAL SAFETY INSTRUCTIONS

<b>WARNING!</b>
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**TURBO CHAIN CUTTERS MUST NOT BE USED FOR ANY PURPOSE OTHER THAN THOSE FOR WHICH THEY WERE DESIGNED**

1. For your own safety, read all of the instructions and precautions before operating tool.
2. The service staff must be trained in the proper operation of the tool.
3. Wear proper apparel. Do not wear loose clothing, rings, bracelets, or other jewelry which may get caught in moving parts of the tool.
4. Wear safety shoes with non-slip soles.

## GENERAL SAFETY INSTRUCTIONS (Continued)

5. Wear safety glasses complying with United States ANSI Z87.1. Everyday glasses are **NOT** safety glasses.
6. Be alert and think clearly. Never operate tools when tired, intoxicated or when taking medications that cause drowsiness.
- 7. Before using the USB Turbo chain cutter, thoroughly flush and clean the sewer line.**
8. It is recommended that sewer inspection cameras be used to monitor the operation of the Turbo chain cutters.
9. Tests of the cutter's operation are always conducted in a properly closed pipe and never in the open or in the manhole.

## OPERATION

1. Prior to each application, make sure that the cutter head is firmly connected to the Turbo chain cutter (check set screws).
2. The size of the guide skid must be appropriate for the sewer line inner diameter.
3. In order to ensure a uniform rotary motion of the turbine, the chains must be of equal length.
4. Make sure that the extension pipe for the rigid guide skid is tightened firmly with Loctite® Blue Thread Locker. Check that all securing bolts and set screws are tightened firmly before each use.
5. Move the Turbo chain cutter **against** the flow of the sewer, towards the upstream manhole, in order to remove the obstructions from the sewer line.
6. If only a hissing sound can be heard, pull the sewer hose back a little to allow the turbine to regain momentum. Repeat this procedure until the Turbo chain cutter can pass through this section of pipe smoothly without encountering obstacles. After this is accomplished, move to the next obstruction. This ensures that no snags or kinks are created behind the Turbo chain cutter.
7. Never ram the Turbo chain cutter to pass offsets or pipe deformations. Retrieve the Turbo chain cutter. Using the punch provided, turn the spindle at the back of the Turbo clockwise to reduce the flexible guide skid by the amount of offset required. If the offset is more than ½", shorten the chains accordingly.
8. Occasionally, bring the Turbo chain cutter back to the manhole and make sure that the guide skid and hose are attached securely.
9. If the Turbo chain cutter no longer appears to be functioning properly, or if the turbine is not making its familiar "turbine whining" sound, bring it back to the manhole. Occasionally, roots with long tendrils can get caught in the head, causing the cutter to jam and rendering it inoperative. Ramming the cutter or increasing the pressure will not help in this situation – instead, the roots must be manually removed from the head.
10. To prevent damage to the Turbo chain cutter, guide skid, HP-swivel, etc., shut off the water at approximately 5 ft. from the manhole. Pull the chain cutter back to the manhole by hand, allowing the wheels on the cutter to smoothly move it out of the sewer line. In order to prevent damage to the HP-swivel joint, **DO NOT** pull up on the hose until the Turbo chain cutter is completely out of the sewer line.

## **OPERATION (Continued)**

11. The Turbo chain cutter is a low maintenance tool and does not require lubrication.

### **ADJUSTING TURBO CHAIN CUTTERS WITH FLEXIBLE GUIDE SKIDS (including Turbo II-Flex)**

**Note:** One skid has measurements engraved on its side – in order to provide an approximate measurement.

Using a tape measure, the exact measurement can be attained by following the procedure given below:

1. Rest the Turbo chain cutter on the tip of the cutter head in front of the Turbo.
2. Using the punch provided, turn the spindle at the back of the Turbo chain cutter - counter-clockwise to expand the flexible guide skid or clockwise to reduce it.
3. After adjusting the cutter to the desired dimension, check the measurement by placing the cutter on one skid and measure from a flat surface to the point of the cutter. Double this measurement - the product is the overall cutting dimension. For example, in an 8" pipe, the correct measurement should be 3-5/8" to provide an overall cutting diameter of 7-1/4". The dimension can be as close to 8" as possible, depending on the extent of the offsets.
4. **FOR THE TURBO II FLEXIBLE ONLY:** After the desired measurement is set, firmly tighten the **GREEN BOLT** on the skid with engraved measurement numbers. This will prevent the skid from collapsing in the sewer line while in operation. The M6 elastic lock nut can be loosened and tightened six or seven times before it should be replaced.

### **CHANGING THE SINGLE CHAIN RETAINER**

1. Using hex wrench provided, loosen all set screws in the cutter head by turning counter-clockwise.
2. Insert one punch into the appropriate hole in the cutter head and another into the hole in the chain retainer.
3. In order to unscrew the head, firmly hold the punch in the chain retainer and slowly turn the punch in the cutter head counter-clockwise. After two or three turns, the cutter head can be unscrewed by hand.

**WARNING!** To avoid personal injury, wear gloves while unscrewing the cutter head.

4. Remove spacers and chain retainer by hand.

### **CHANGING THE CHAIN AT THE CHAIN RETAINER**

1. Using the punch provided, knock out the bushing holding the chain onto the chain retainer.
2. Pull the used chain from the chain retainer.

## OPERATION (Continued)

3. Prepare a new piece of chain that is approximately 1/4" shorter than half of the inside pipe diameter. Use the punch to: (1) knock out the pin from the chain link; then, (2) carefully, the bushing. Slide the open chain link into the chain retainer and secure it with the bushing from the chain
4. Measure the length of chain from the skid to the center of the Turbo chain cutter, multiply by two to double-check it compared with the pipe inside diameter.
5. For Turbo cutters with dual chain retainers (the front cutter can hold two chains), perform the following steps:
  - a. Loosen the two set screws that hold the chain in and slide the chain out from the retainer. Repeat this step for the other chain as well.
  - b. After the worn chain has been removed, measure new chain lengths based on the inside pipe diameter where the cutting occurs. When replacing the chain, make sure that the chain is even on both sides and that a smaller chain is in the front hole, so that blockages can be penetrated more effectively.
  - c. Make certain that **Loctite® Blue Thread Locker** is applied to the set screws. This will prevent the set screws from backing out during operation.

## CHANGING ROTATION NOZZLE INSERTS

1. Perform steps 1 - 4 of "Changing Chain Retainer".
2. Pull off the turbine wheel carefully and straight.
3. Replace the rotation nozzle inserts using the hex wrench provided.

## CHANGING THE RIGID GUIDE SKID

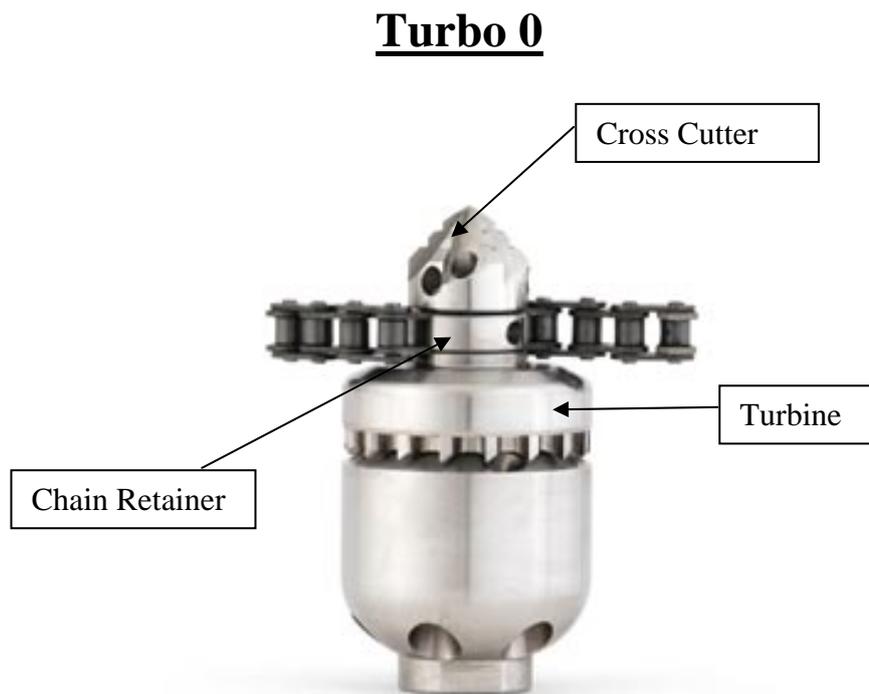
1. Using a SW 32 (1-1/4" open end) wrench, unscrew (counter-clockwise) the extension pipe completely from the back of the rigid guide skid. If the extension pipe is too difficult to unscrew, heat the extension pipe thread at the Turbo housing using a hair dryer and loosen the extension pipe – then turn pipe counter-clockwise. To make your work an easy task, tighten one skid into a vice.
2. Pull out the rigid guide skid from the Turbo chain cutter.
3. Extension pipes for 6", 8", 10" and 12" rigid guide skids have different lengths. Slide the rigid guide skid completely into the open guides at the turbine housing and secure it by firmly tightening the extension pipe onto the turbine housing.
4. Always use Teflon tape or **Loctite® Blue Thread Locker** to secure the extension pipe into the turbine housing

## MAINTENANCE

### SWIVEL

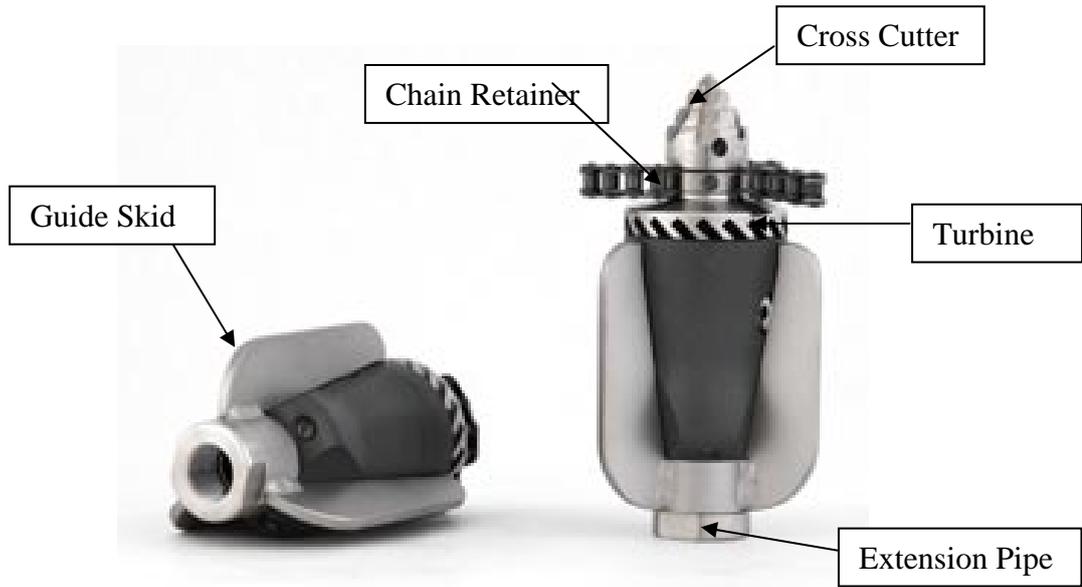
1. Frequently check the HP Swivel joint to ensure that it is still screwed tightly into the nozzle.
2. Also, test the HP Swivel joint to ensure that the swivel still moves smoothly with some resistance and that no friction within the bearings is evident.
3. To add grease to the internal parts of the HP Swivel, remove the set screw (s) on the outside of the swivel. Once this is done, the internal parts should be visible.
4. With a grease gun, add the necessary amount of grease so that the swivel turns easily with no friction or grinding of the bearings.
5. Insert both set screws back into the swivel and tighten with **Loctite® Blue Thread Locker**.

### ILLUSTRATIONS

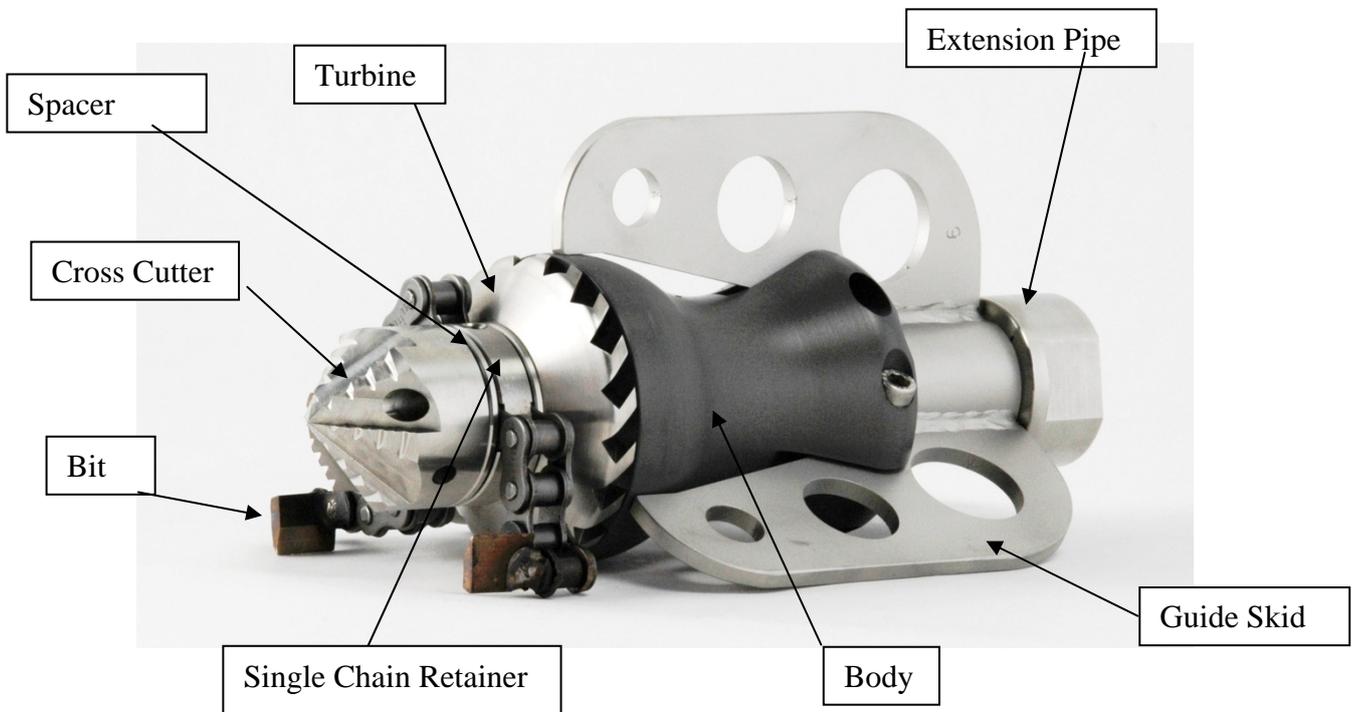


**ILLUSTRATIONS (Continued)**

**Turbo I**

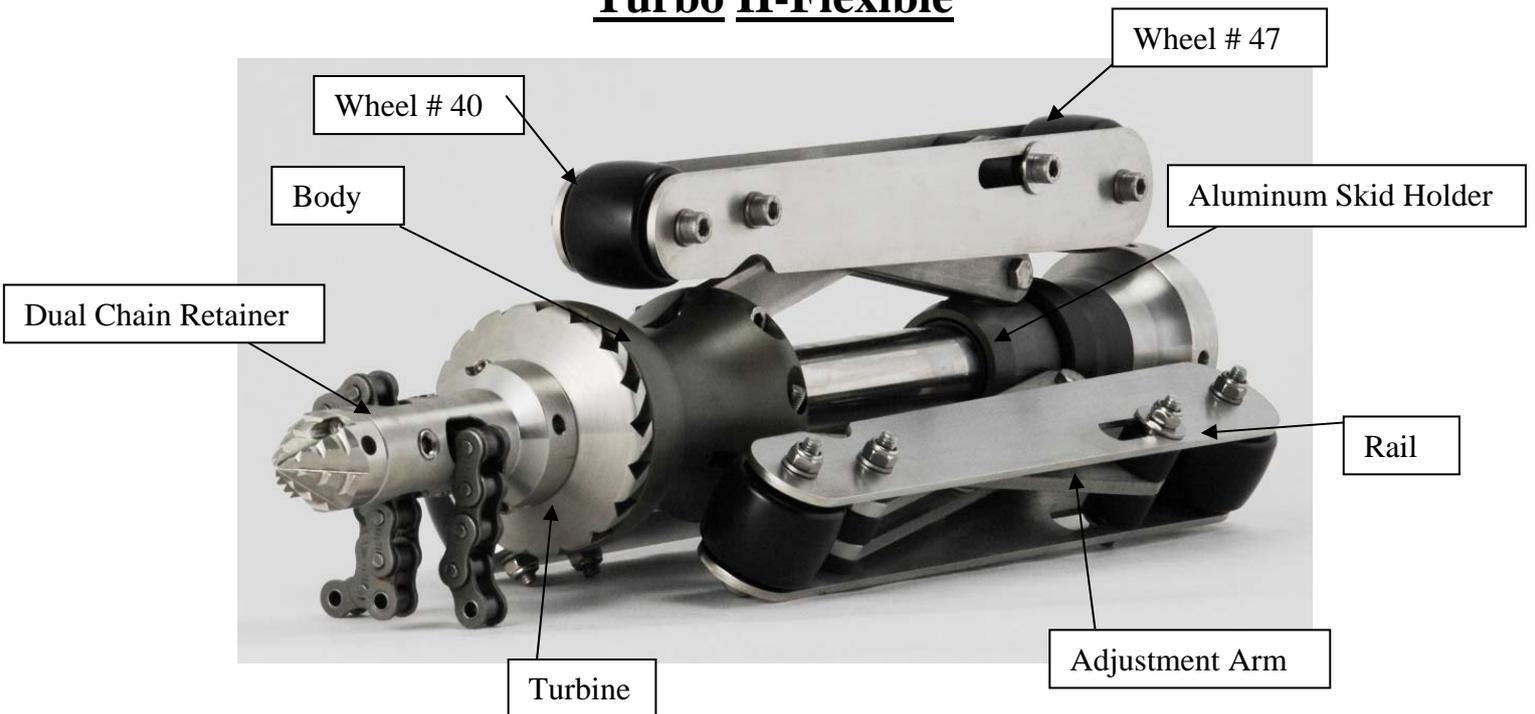


**Turbo II-Rigid**

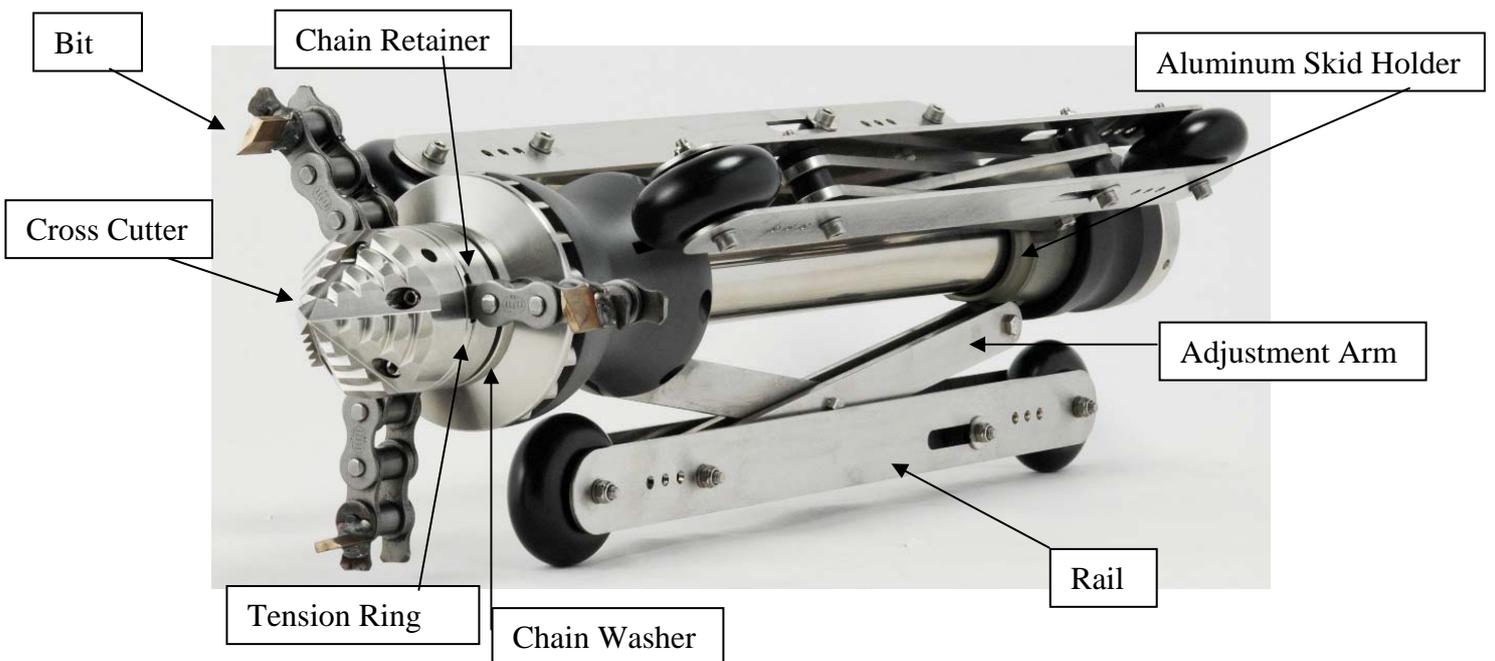


**ILLUSTRATIONS (Continued)**

**Turbo II-Flexible**

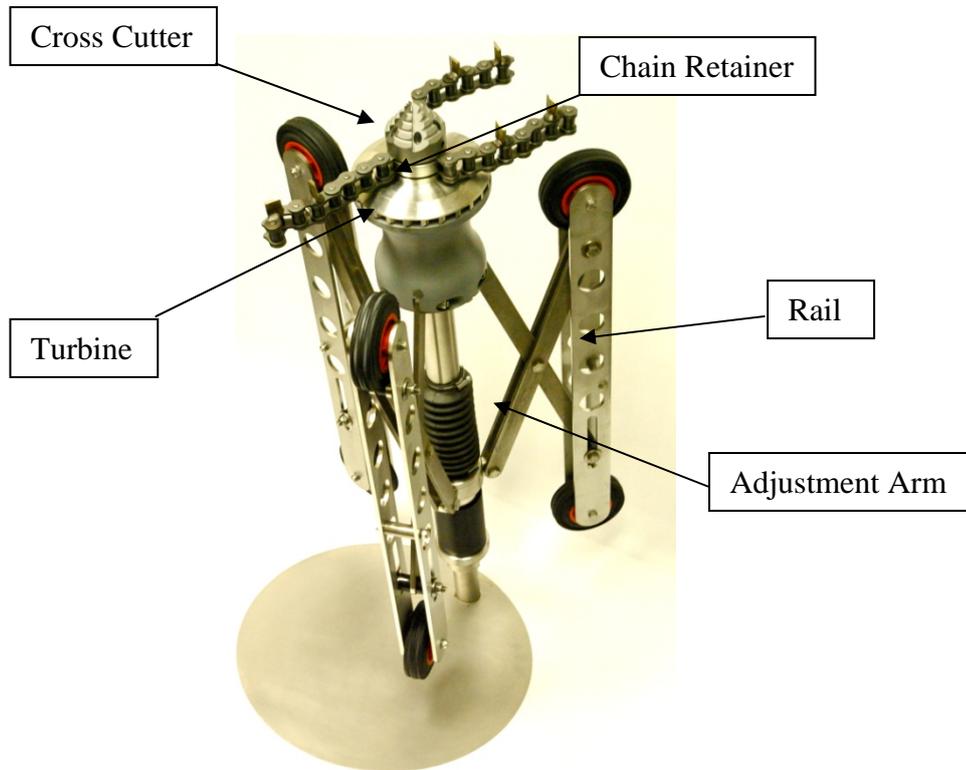


**Turbo III**



## ILLUSTRATIONS (Continued)

### Turbo IV



## LIMITED WARRANTY

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## **LIMITED WARRANTY (Continued)**

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