

Model 88™

Operating Instructions

**For 3" through 10" lines
(75mm – 250mm)**



Your Model 88 is designed to give you years of trouble-free, profitable service. However, no machine is better than its operator. We therefore suggest you read these instructions through carefully before using your machine on the job. This will enable you to operate the Model 88 more efficiently and more profitably. Failure to follow these instructions may cause personal injury to operator or damage to equipment.

SAVE THESE INSTRUCTIONS!

General
PIPE CLEANERS

Safety Instructions



WARNING



Machine must be plugged into properly grounded outlet. Failure to follow instructions may result in serious injury or death.



Do not operate power tools in explosive atmospheres, such as in the presence of flammable liquids, gases, or dust.



Wear leather gloves provided with the machine. Never grasp a rotating cable with a rag or cloth glove.



Use safety equipment. Always wear safety glasses and rubber soled, non-slip shoes.



Never operate machine with guard removed. Fingers can get caught in the mechanism.



Do not overstress cables. Overstressing cables may cause twisting, kinking, or breaking of the cable and may result in serious injury.

READ AND UNDERSTAND ALL INSTRUCTIONS!

Failure to follow all instructions listed below may result in electric shock, fire and/or serious personal injury.

Call General's customer service department at 412-771-6300 if you have any questions.

SAVE THESE INSTRUCTIONS!

Work Area Safety

1. **Keep your work area clean and well lit.** Cluttered benches and dark areas invite accidents.
2. **Do not operate power tools in explosive atmospheres, such as in the presence of flammable liquids, gases, or dust.** Power tools create sparks which may ignite the dust or fumes.
3. **Keep bystanders, children, and visitors away while operating a power tool.** Distractions can cause you to lose control.

Electrical Safety

1. **Grounded tools must be plugged into an outlet, properly installed and grounded in accordance with all codes and ordinances.** Never remove the grounding prong or modify the plug in any way. Do not use any adapter plugs. Check with UL approved tester or a qualified electrician if you are in doubt as to whether the outlet is properly grounded. If the tool should electrically malfunction or break down, grounding provides a low resistance path to carry electricity away from the user.
2. **Machine must have a properly functioning ground fault circuit interrupter on the power cord.** Before using, test the Ground Fault Circuit Interrupter (GFCI) provided with the power cord to insure it is operating correctly. GFCI reduces the risk of electric shock.
3. **Avoid body contact with grounded surfaces such as pipes, radiators, ranges and refrigerators.** There is an increased risk of electric shock if your body is grounded.
4. **Don't expose power tools to rain or wet conditions.** Water entering a power tool will increase the risk of electric shock.
5. **Do not abuse the cord.** Never use the cord to carry the tools or pull the plug from an outlet. Keep cord away from heat, oil, sharp edges or moving parts. **Replace damaged cords immediately.** Damaged cords increase the risk of electric shock.
6. **When operating a power tool outside, use an outdoor extension cord marked "W-A" or "W".** These cords are rated for outdoor use and reduce the risk of electric shock.
7. **Use only three-wire extension cords which have three-prong grounding plugs and**

three-pole receptacles which accept the tool's plug. Use of other extension cords will not ground the tool and increase the risk of electric shock.

8. **Use proper extension cords.** Insufficient conductor size will cause excessive voltage drop and loss of power.
9. **Extension cords are not recommended unless they are plugged into a Ground Fault Circuit Interrupter (GFCI) found in circuit boxes or outlet receptacles.** The GFCI on the machine power cord will not prevent electric shock from the extension cords.
10. **Keep all electric connections dry and off the ground. Do not touch plugs or tools with wet hands.** Reduces the risk of electric shock.

Personal Safety

1. **Stay alert, watch what you are doing and use common sense when operating a power tool. Do not use tool while tired or under the influence of drugs, alcohol, or medication.** A moment of inattention while operating power tools may result in serious personal injury.
2. **Dress properly. Do not wear loose clothing or jewelry. Contain long hair. Keep your hair, clothing, and gloves away from moving parts.** Loose clothes, jewelry, or long hair can be caught in moving parts.
3. **Avoid accidental starting. Be sure switch is off before plugging in.** Plugging in tools that have the switch on invites accidents.
4. **Remove adjusting keys or switches before turning the tool on.** A wrench or key that is left attached to a rotating part of the tool may result in personal injury.
5. **Do not overreach. Keep proper footing and balance at all times.** Proper footing and balance enables better control of the tool in unexpected situations.
6. **Use safety equipment. Always wear eye protection.** Dust mask, non-skid safety shoes, hard hat, or hearing protection must be used for appropriate conditions.

Tool Use and Care

1. **Use clamp or other practical way to secure and support the workpiece to a stable platform.** Holding the work by hand or against your body is unstable and may lead to loss of control.

2. **Do not force tool. Use the correct tool for your application.** The correct tool will do the job better and safer at the rate for which it is designed.
3. **Do not use tool if switch does not turn it on or off.** Any tool that cannot be controlled with the switch is dangerous and must be repaired.
4. **Disconnect the plug from the power source before making any adjustments, changing accessories, or storing the tool.** Such preventative safety measures reduce the risk of starting the tool accidentally.
5. **Store idle tools out of reach of children and other untrained persons.** Tools are dangerous in the hands of untrained users.
6. **Maintain tools with care. Keep cutting tools sharp and clean.** Properly maintained tools, with sharp cutting edges are less likely to bind and are easier to control.
7. **Check for misalignment or binding of moving parts, breakage of parts, and any other condition that may affect the tool's operation. If damaged, have the tool serviced before using.** Many accidents are caused by poorly maintained tools.
8. **Use only accessories that are recommended by the manufacturer for your model.** Accessories that may be suitable for one tool may become hazardous when used on another tool.
9. **Keep handles dry and clean; free from oil and grease.** Allows for better control of the tool.

Tool Service

1. **Tool service must be performed only by qualified repair personnel.** Service or maintenance performed by unqualified repair personnel could result in injury.
2. **When servicing a tool, use only identical replacement parts. Follow instructions in the Maintenance section of this manual.** Use of unauthorized parts or failure to follow Maintenance Instructions may create a risk of electric shock or injury.

Specific Safety Information

1. **Be sure that the unit is plugged into a properly grounded receptacle.** If in doubt, check receptacle before plugging in machine. Check the power cord to see that there are no cuts or frays, and that the grounding prong on the plug is still in place.

2. **If the power cord supplied with the machine is not long enough, be sure to use a 3-wire heavy-duty extension cord no more than 50 feet long and in good condition.** Using lighter cords can result in severe power loss and motor overheating.
3. **Wear leather gloves provided with the machine. Never grasp a rotating cable with a rag or cloth glove.** Could become wrapped around cable and cause serious injury.
4. **Never operate machine with guard removed.** Fingers can get caught in the mechanism.
5. **Do not overstress cables.** Overstressing cables because of an obstruction may cause twisting, kinking, or breaking of the cable and may result in serious injury.
6. **Machine is designed for one-person operation.** Operator must control switch and cable.
7. **Be careful when cleaning drains where cleaning chemicals have been used. Avoid direct contact with skin and eyes.** Drain cleaning chemicals can cause serious burns as well as damage the cable.
8. **Do not operate machine if operator or machine is standing in water.** Will increase risk of electrical shock.
9. **Wear safety glasses and rubber soled, non-slip shoes.** Use of this safety equipment may prevent serious injury.
10. **Before starting each job, check that the cable is not broken or kinked, by checking for wear or breakage.** Always replace worn out (kinked or broken) cables with genuine GENERAL replacement cables.
11. **Only use this tool in the application for which it was designed. Follow the instructions on the proper use of the machine.** Other uses or modifying the drain cleaner for other applications may increase risk of injury.

Ground Fault Circuit Interrupter (GFCI)

Your machine is equipped with a ground fault circuit interrupter, which protects you against shock if a short circuit should occur. Check that receptacle is properly grounded. Test the GFCI before each use.

1. Plug into 120-volt receptacle.
2. Push test button. Indicator light will go out and power to machine should cut off.
3. If light does not go out when test button is

pushed, equipment should not be used until proper repairs can be made.

4. To restore power after test, push reset button. With the reset button depressed, if the machine doesn't start, stops while running, or if the operator experiences a mild shock, **do not use the machine!** Take it to a motor repair center or return it to the factory for repairs.



Note: The section of cord between the wall plug and the GFCI is not in the protected circuit.

Cables and Connectors

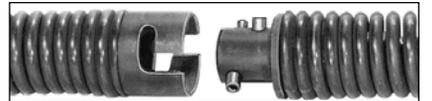
Your machine comes with one of two cable connectors; "G" connectors for General® cables, and "L" connectors to match Electric Eel-type cables.

To couple the "G" cables, slide the tab on the male connector into the slot in the female connector, then turn the ring until the button pops up.



To disconnect, push the button in with the coupling wrench. Then turn the ring until it lines up with the slot in the connector and slide cables apart.

To couple "L" cables, line up the solid pin in the male connector with the L-shaped notch in the female connector. Depress the spring pin and push the male connector into the female connector.



To disconnect, push down the spring pin with the coupling wrench. Turn the male connector a quarter turn, then pull the cables apart.

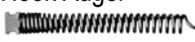
Cable Application Chart (Table 1)

Cable Size	Cable Type	Pipe Size	Typical Applications
*1-1/4"	Proflex™	3" – 10"	Large Drains, Long Runs, Roots
1-1-4"	Flexichain™	3" – 6"	Tight Traps, Difficult Bends, Roots
**7/8"	Proflex™	2" – 3"	Small Drains (No Roots)

*Proflex cables are available in 4, 8, and 10 ft. lengths. Heavy-duty 5/8" inner spring and extra space outer spring sections also available.

**Available only with "L" Connector (Part #6L78). Adapter required (Part #78L-CDC).

Cutter Application Chart (Table 2)

Cutter	Catalog #		Typical Applications
	"G" Conn.	"L" Conn.	
Spear Head 	G-SHD	L-SHD	Starting tool, gets the water flowing
Hook Auger 	G-HA	L-HA	Starting tool, to remove loose objects.
2" U-Cutter 	G-2UC	L-2UC	Starting tool, for cutting and scraping.
3" Heavy Duty Side Cutter 	G-3HDSC	L-3HDSC	Finishing tool, for scraping inside edges of pipe.
3" Heavy Duty Saw Blade 	G-3HDB	L-3HDB	Heavy duty tool for cutting roots.
4" Rotary Saw Blade 	G-4RSB	L-4RSB	For cutting roots.
Retrieving Tool 	G-RTR-2	L-RTR-2	For removing loose objects and broken cables.

Note: There are no fixed rules for what cutter to use. If one tool doesn't take care of a stoppage, simply try another.

Operating Instructions

1. Use LEATHER gloves only, when handling the cable. A cloth glove might get caught between the coils of the cable while it is rotating.
2. Insert cutting tool in female connector at the front of the cable section. A good tool to start with is the Spear Head or 2" U-Cutter. On cables with "G" connectors, be sure the connector locking ring is turned far enough for the plunger pin to click into place. On cables with "L" connectors, twist the cables until the plunger pin pops out.
3. Push the cable section and cutter into the pipe. If first cable goes easily, push several sections into the pipe until resistance is met. Then attach the male end of the last cable to the machine.
4. On machines using the "G" cables, you can connect the male connector of the cable to the machine by twisting the knurled ring on the Cable Drive Coupler until the plunger pin clicks into place. On machines using "L" cables, twist the cable until the plunger pin springs out.

5. Pull the machine back until the slack is out of the cable. With the motor switch in the **Forward** position and, while standing behind the machine, press down on the switch mounted on the handle and walk with the cable into the line. Do not allow slack in the cable since this will cause cable whipping. If the cable starts to buckle or twist, take your hand off the switch and the motor will spin in the opposite direction to relieve the twist.



DO NOT PUSH THE MACHINE FASTER THAN THE CABLE FEEDS INTO THE LINE. IF YOU DO, THE CABLE WILL WHIP AND MAY KINK.

6. When all but the last two or three feet of cable section have fed into the line, stop the machine. If you are using the "G" connectors, simply twist the knurled ring on the Cable Drive Coupler 90° and detach the cable from the machine. If you are using the "L" cables, disconnect the cable from the machine using the Coupling Wrench.
7. Pull the machine back from the drain opening about ten feet. Attach the female coupling of the next section to the male coupling of the cable in the line. Then connect the male coupling of the cable to the machine. Repeat until you have reached the stoppage.
8. If the section is not feeding through a trap or bend, remove the switch from the handle of the machine and place it near the drain opening so it can be used as a foot pedal. Then take the Cable Feeding Tool and press it against the cable at the drain opening. Step on the foot

pedal, and the cable's rotation against the Cable Feeding Tool will work the section through the trap. Never try to force a cable through a P-trap smaller than 4" in diameter.



9. If the motor begins to slow down or the clutch starts to slip, you have probably reached the stoppage. Stop the machine and switch motor in reverse. Run machine for a few seconds. Then stop and switch to forward rotation. Repeat this procedure until water starts to flow. This is often the best way to work through the stoppage.
10. Run the machine in reverse to pull sections out of the line. After the line is opened with a Spearhead or 2" U-Cutter, follow with larger blades which scrape the inside edges of the pipe, assuring a real cleaning job.



Hint: It's often helpful to have a small stream of water running in the line to wash the cuttings away while the machine is in operation and after.

FOLDING HANDLE

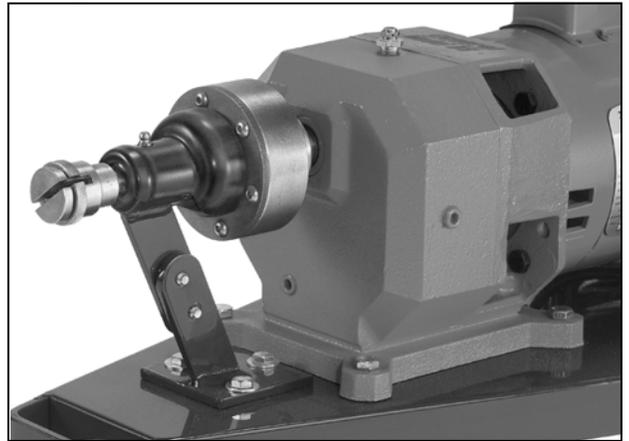
To make the Hot-Rodder more compact, it is equipped with a folding handle. By lifting up the sliding collars on each side of the handle, you can fold it forward. When the handle is raised, the collars will drop into position, locking the handle in place.

SAFETY CLUTCH

The safety clutch is located between the motor and the Cable Drive Coupler. It is designed to protect your cables from breakage and is factory preset to slip at 100 in. lbs. of torque. Under normal usage of your machine, no adjustments need to be made to the clutch. If you find it necessary to change the

clutch tension, the following procedure should be used:

1. Remove the clutch cover and loosen the screw in the large hex nut on the front of the clutch. Turn the nut in to increase tension and out to reduce it. Then tighten the screw.
2. If you do not intend to change the tension on the clutch very often, you can fold over one of the metal tabs on the washer between the nut and the body of the clutch so that it presses firmly on the hex nut. You can, of course, alter the pressure on the clutch at a later date by bending the tab back up, adjusting the nut, and bending a different tab against the nut.
3. Remember that the clutch is put on the machine to protect your cables! Therefore, do not tighten to the point where sections will be damaged before the clutch slips.



GEAR REDUCER

Model 88 gear reducers are filled with lubricant to the proper level before leaving the factory. Should it become necessary to remove the lubricant in the field, the following steps should be followed for refilling:

1. Remove the Vent/Fill plug at the top of the gear reducer.
2. Remove the Level plug at the middle of the side of gear reducer.
3. Use a funnel or other device to add lubricant until it appears at the side opening (Capacity: 1.25 pints).

MAINTENANCE

To keep your machine operating smoothly, it is essential that all bearings and bushings be lubricated. Oiling moving parts is particularly important where machine comes in contact with sand, grit, and other abrasive material.

CABLE MAINTENANCE

To get maximum service from your cables, be sure that they are clean and well oiled. This not only

provides running lubrication, but greatly extends the life of the cables as well. Our SNAKE OIL is ideally suited for this purpose, since it not only lubricates the cables, it deodorizes them as well.

TROUBLE SHOOTING GUIDE (Table 3)

Problem	Probable Cause	Solution
Cable kinks or breaks.	Operator forcing the cable.	Do not force the cable. Let the cutter do the work.
	Too much slack between machine and drain.	Do not allow slack between machine and drain.
	Cable used in wrong size drain line.	A cable that is too large or too small in diameter for a line is more likely to kink. (Consult Table 1—Cable Applications.)
	Cable exposed to acid	Clean and oil cables regularly.
Cable tangles or kinks.	Operator forcing the cable.	Do not force the cable. Let the cutter do the work.
Motor stops while foot pedal is depressed	Hole is pedal or hose.	Replace as required.
Motor turns in one direction but not other.	Reverse switch failure.	Replace reverse switch.
Ground Fault Circuit Interrupter trips and will not reset.	Damaged power cord or extension cord.	Replace cords.
	Short circuit in motor.	Take motor to authorized repair center.
	Faulty ground fault circuit interrupter.	Replace Ground Fault Circuit Interrupter.
Motor turns but cable does not.	Safety Clutch engaged.	Do not force cable.

PARTS LIST

Cat. No.	Description	Cat. No.	Description
88-100	Frame Complete	88-235	Spring Washer (2)
88-101	Frame Only	88-240	Locking Washer
88-110	Axle	88-245	Clutch Shaft (5/8")
88-120	5" Caster	88-300-1	Motor & Gear Head Complete
88-120-1	6" Caster	88-300-2	Motor & Gear Head Complete
88-121	Caster Bolts (4)	88-301	Motor (1725 RPM) Disc. (See 88-300-1)
88-130	Front Bearing Post	88-301-1	Motor (3450 RPM)
88-130-A	Bushings (2)	88-301-2	Motor (1750 RPM)
88-130-B	Grease Fitting	88-302-1	Gear Head Only (7 to 1 Ratio)
88-130-C	Post Adjusting Bolts (2)	88-302-2	Gear Head Only (3.5 to 1 Ratio)
88-131	Post Bolts, Nuts, & Washers (3)	88-302-A	Gear Head Vent Cap
88-150-1	Handle Hinge Assembly	88-302-1-A	Gear Head Vent Cap
88-150-1-A	Hinge Top	88-303	Gear Head Mounting Bolts (4)
88-150-1-B	Hinge Bottom	88-305	Motor Mounting Bolts, Nuts & Washers (4)
88-150-1-C	Hinge Roll Pins (2)	88-310	20 ft. Power Cord with GFCI
88-155-1	Handle Locking Sleeve	88-311	Air Foot Switch & Rev. Switch Complete
88-160-2	Handle with Pedal Holder (from Serial #1270 and Over)	88-311-A	Box Only with Cover & Screws
88-160-2-A	Locking Collar Shop Screw	88-311-B	Foot Pedal and Hose
88-170	10" Wheel	88-311-C	Clamps (2)
88-171	Hat Type Push Nuts (2)	88-311-D	Foot Pedal
88-172	Spacer Washers (2)	88-311-E	Power Switch Diaphragm
88-190	Plastic Clutch Face Cover	88-311-F	Air Hose (11 ft.)
88-200	Clutch Assembly	88-311-G	Reverse Switch
88-201	Clutch Housing with Set Screws (Through Serial #1797)	88-311-H	Rubber Boot (Rental Units Only)
88-201-1	Clutch Housing with Set Screws (Serial #1798 & Over)	GFI-88	Ground Fault Circuit Interrupter
88-205	Drive Plate	5/8 G-CDC	Cable Drive Coupling with "G" Connector for 5/8" Shaft
88-205-A	Round Socket Head Bolts 1"x1/4" (6)	1/2 G-CDC	Cable Drive Coupling with "G" Connector for 1/2" Shaft
88-210	Clutch Hub with Roll Pin	5/8 L-CDC	Cable Drive Coupling with "L" Connector for 5/8" Shaft
88-215	Adjustment Nut	1/2 L-CDC	Cable Drive Coupling with "L" Connector for 1/2" Shaft
88-215-A	Brass Slotted Head Screw 1/2" (2)	7/8 L-CDC	Cable Drive Coup. for 6L78 7/8" Cables
88-220	Friction Disc (2)	88-DECAL	Set of Safety Decals
88-225	Spacer Bushing	88-VIDEO	Instructional Video
88-230	Fixed Plate		

SEE BACK COVER FOR SCHEMATIC DIAGRAM