

Model 88TM

Operating Instructions

**For 3" through 10"
(75mm—250mm)**

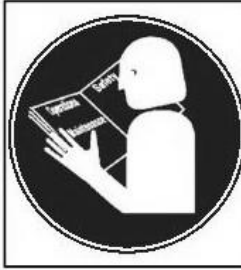


Your Model 88 is designed to give you years of trouble-free, profitable service. However, no machine is better than its operator.

Read, understand and follow all safety warnings and instructions provided with the product. Failure to follow the warnings and instructions may result in electric shock and/or serious injury. Save all warnings and instructions for future reference.

SAVE THESE INSTRUCTIONS!

General
PIPE CLEANERS



! WARNING
Read and understand operator's manual before using this machine. Failure to follow operating instructions could result in death or serious injury.

WARNING! Read and understand all instructions. Failure to follow all instructions listed below may result in electric shock, fire and/or serious personal injury. Replacement manuals are available upon request at no charge, or may be downloaded from our website, www.drainbrain.com. Instructional videos are available for download on our website, and may be ordered. If you have any questions or problems, please call General's customer service department at 412-771-6300.

SAVE THESE INSTRUCTIONS!

These instructions are intended to familiarize all personnel with the safe operation and maintenance procedures for the Model 88.

SAFETY SYMBOLS



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.



DANGER indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.



WARNING indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.



CAUTION indicates a hazard with a low level of risk which, if not avoided, will result in minor or moderate injury.



Electric shock resulting in death can occur if you plug this machine into an improperly wired outlet. If the ground wire is electrified, you can be electrocuted by just touching the machine, even when the power switch is off. A ground fault circuit interrupter will not protect you in this situation. Use a UL approved tester to determine if the outlet is safe.



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 of fumes.



Only wear leather gloves. Never use any other type of glove, such as cloth, rubber, or coated gloves. Never grasp a rotating cable with a rag. These items could become wrapped around the cable and cause serious injury.



Always wear safety glasses and rubber soled, non-slip shoes. Use of this safety equipment may prevent serious injury.



Never operate machine with belt guard removed. Fingers can get caught between belt and pulley.



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



This product can expose you to chemicals including lead, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

GENERAL SAFETY RULES



WARNING

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

SAVE THESE INSTRUCTIONS!

Work Area

1. **Keep 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 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. **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.
3. **Do not expose power tools to rain or wet conditions.** Water entering a power tool will increase the risk of electric shock.
4. **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.
5. **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.
6. **Test the Ground Fault Circuit Interrupter (GFCI) provided with the power cord to insure it is operating correctly before operating machine.** Machine must have a properly functioning ground fault circuit interrupter on the power cord. GFCI reduces the risk of electric shock.
7. **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.
8. **Only use proper three-wire extension cords in good condition which have three-prong grounding plugs and three-pole receptacles which accept the tool's plug.** Use of damaged, inferior, or other extension cords will not ground the tool. Increases the risk of electric shock and bodily injury or death.
9. **Keep all electric connections dry and off the ground.** Reduces the risk of electric shock.
10. **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.** Carrying tools with your finger on the switch or 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 clamps 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. **Only use 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.

Service

1. **Tool service must be performed only by qualified repair personnel.** Service or maintenance performed by unqualified repair personnel could result in a risk of 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 RULES



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Electric shock resulting in death can occur if you plug this machine into an improperly wired outlet. If the ground wire is electrified, you can be electrocuted by just touching the machine, even when the power switch is off. A ground fault circuit interrupter will not protect you in this situation. Use a UL approved tester to determine if the outlet is safe.



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

1. **Only wear leather gloves.** Never use any other type of glove, such as cloth, rubber, or coated gloves. Never grasp a rotating cable with a rag. These items could become wrapped around the cable and cause serious injury.
2. **Never operate machine with belt guard removed.** Fingers can get caught between belt and pulley.
3. **Do not overstress cables.** Keep leather-gloved hand on the cable for control when machine is running. Overstressing cables because of an obstruction may cause twisting, kinking, or breaking of the cable and may result in serious injury.
4. **Machine is designed for ONE-PERSON operation.** Operator must control foot switch and cable.
5. **Keep hands away from rotating cable.** Hand may be caught in the moving parts resulting in serious injury.
6. **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.
7. **Do not operate machine if operator or machine is standing in water.** Will increase risk of electrical shock.
8. **Wear safety glasses and rubber soled, non-slip shoes.** Use of this safety equipment may prevent serious injury.
9. **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.
10. **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.

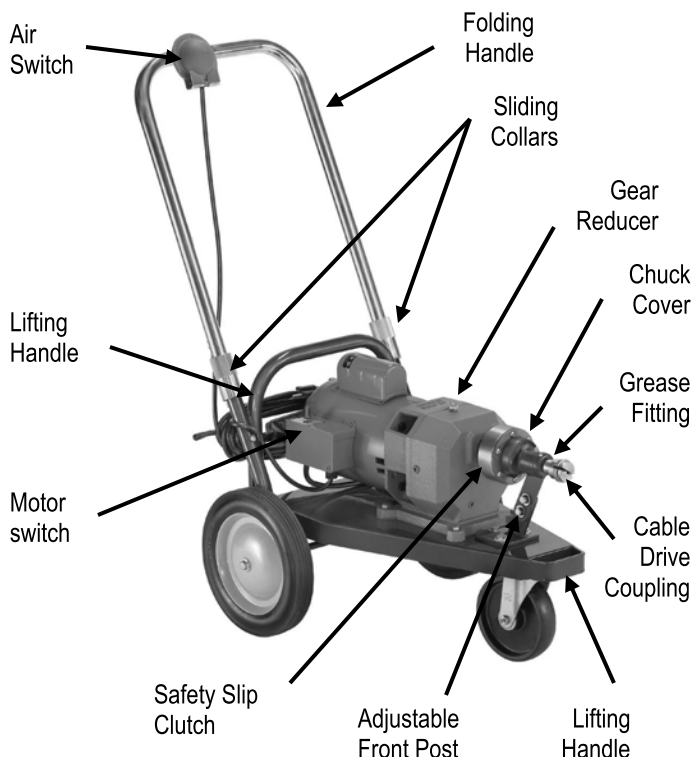
1. Plug into 120-volt receptacle.
2. Push test button. Indicator light will go out and power to machine should cut off.
3. If light does not go out when test button is pushed, equipment should not be used until proper repairs can be made.

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!** Tag the machine out of service and take it to a motor repair center or return it to the factory for repairs.



THE SECTION OF CORD BETWEEN THE WALL PLUG AND THE GFCI IS NOT IN THE PROTECTED CIRCUIT.

FEATURES

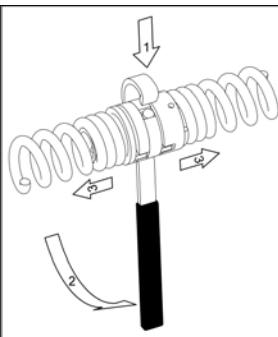
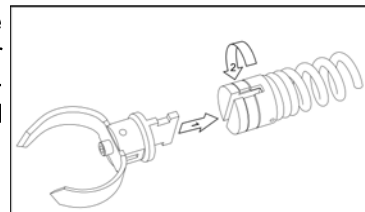


NOTE: Do not operate machine if warning labels on the switch box and power cord are missing or illegible.

Cables and Connectors

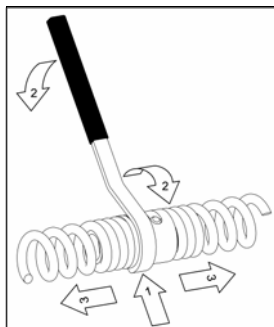
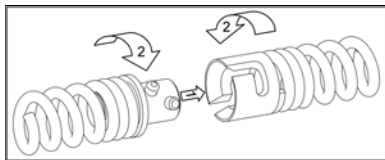
Your machine comes with one of three cable connectors; "G" connectors for General® cables, "L" connectors to match Electric Eel®-type cables, and "R" connectors to match Ridgid®-type cables.

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. Turn until the spring pin snaps into place.



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	Pipe Size	Cable Type	Typical Applications
*1-1/4"	3" - 10"	Proflex™	Large Drains, Long Runs, Roots
1-1/4"	3" - 6"	Flexichain™	Tight Traps, Difficult Bends, Roots
**7/8"	2" - 3"	Proflex™	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).

Sectional Cables With General® Connectors	
10GF	1-1/4" x 10 ft. Flexichain
10GP	1-1/4" x 10 ft. Proflex

Sectional Cables Compatible with Electric Eel® Connectors	
4LPS	1-1/4" x 4 ft. 1/2" Proflex/Extra Space
8LF	1-1/4" x 8 ft. Flexichain
8LP	1-1/4" x 8 ft. 1/2" Proflex
8LPS	1-1/4" x 8 ft. 1/2" Proflex/Extra Space
10LF	1-1/4" x 10 ft. Flexichain
10LP	1-1/4" x 10 ft. 1/2" Proflex
10LHD	1-1/4" x 10 ft. 5/8" Proflex
6L78	7/8" x 6 ft. 7/16" Proflex

General makes cables and cutters to fit equipment manufactured by others. We have no affiliation with these companies.

Cutter Application Chart (Table 2)

Cutter	Catalog #		Typical Applications
	"G" Connector	"L" Connector	
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.

OPERATION

Make sure the motor switch is in the 'OFF' position before connecting to power source!

Make sure you have 12 - 15 feet (3.6 - 4.5m) of clear area around the drain opening to allow the machine to operate safely.

1. Attach a cutter to the female end of a section of cable. Be sure the locking ring is aligned so that the plunger pin clicks into place. The Spear Head or 2" U-Cutter are good tools to start with to get the line open. After the water is flowing, switch to one of the larger cutters.
2. 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 section into the drain opening as far as it will go. Depending on the location of the clog or bends in the line, you may be able to put in several lengths of cable.
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.



DO NOT ALLOW TOO MUCH SLACK IN THE CABLE BETWEEN MACHINE AND DRAIN OPENING SINCE THIS CAN CAUSE CABLE WHIPPING.

5. Pull the machine back until slack is out of the cable. Put the motor switch in **forward**. Stand behind the machine and press the air switch. Machine will move toward drain opening. Allow cable to work its way through drain by itself.
6. If you have difficulty getting the cable through the trap, you can use the Cable Feeding Tool (Cat. # CF).



Place air switch on the floor beside drain opening. Press cable feeding tool so that it pinches the cable against edge of pipe. With motor switch in **forward**, step on the air switch and run machine until cable moves freely into drain.

7. 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.
8. If the cable begins to buckle or twist, stop by taking your hand off the air switch. The motor will spin in the opposite direction and relieve the twist. When you reach some resistance in the drain, move the motor switch to reverse and run for several seconds. Then switch to forward again. Allow cable to stop spinning before going in other direction. Repeat until water starts to flow.
9. After drain is clear, retract the cable by putting machine in reverse and backing machine away from drain opening. Allow cable to move out of drain at its own rate. Disconnect sections as they emerge from drain.

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.

SPECIAL OPERATIONS

FOLDING HANDLE

To make the Model 88 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.

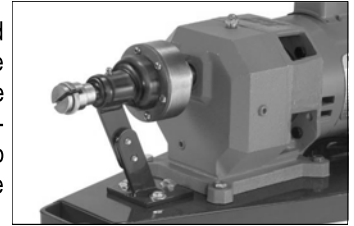
SAFETY SLIP CLUTCH

The safety slip 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 18-20 ft-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:



DISCONNECT FROM POWER SOURCE BEFORE ADJUSTING CLUTCH TENSION!

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.



MAINTENANCE



DISCONNECT MACHINE FROM POWER SOURCE BEFORE PERFORMING 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.



GEAR REDUCER MAINTENANCE

The Model 88 has an oil capacity of 1.25 pints. The manufacturer of the gear reducer recommends #2 EP oil when operating conditions are between 15 and 60 degrees F, and #4 EP oil when operating conditions are between 60 and 165 degrees F.

The Model 88 gear reducers are shipped with #4 EP oil. The oil should be changed after the first 1,000 hours of use, and thereafter every 12 months or 5,000 hours of use, whichever comes first. The following steps should be followed for refilling:



DISCONNECT FROM POWER SOURCE BEFORE LUBRICATING!

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).

Trouble Shooting Guide (Table 3)

Problem	Probable Cause	Solution
Cable tangles, 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.
	Safety Clutch tension too high.	Loosen Safety Clutch to allow to slip.
Motor stops while switch is depressed. Restarts when pedal is re-depressed.	Hole in air switch or hose.	Replace damaged component.
Motor turns in one direction but not other.	Reverse switch failure.	Replace reverse switch.
Motor turns but cable does not.	Safety Slip Clutch engaged.	Do not force cable.
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.

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