



Current Tools

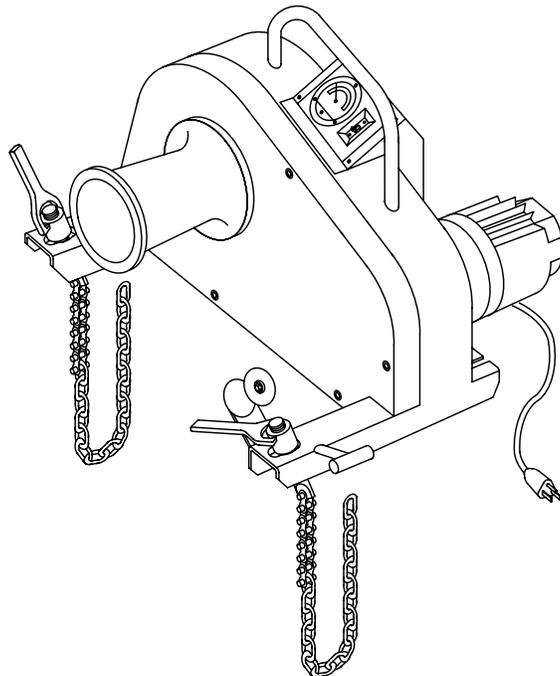
FOR THE PROFESSIONAL ELECTRICIAN

Model 88 Series Cable Puller

8,000 lb. Maximum Pulling Force

and

Model 8845 Cable Pulling Package



Operating, Maintenance, Safety and Parts Manual

10/14 REV. 6



Read and understand this material before operating or servicing the Cable Puller or any of component Cable Pulling Package. Failure to understand how to safely operate and service these units may result in serious injury or death.

This manual is free of charge. All personnel who operate the Cable Puller or any component of the Cable Pulling Package should have a copy of this manual and read and understand its contents. To request a copy of this manual or replacement safety decals, or for technical assistance, call or write to the address below. All information, specifications and product designs may change due to design improvements or updates and are subject to change without notice. Current Tools does not assume any liability for damages resulting from misuse or incorrect application of its products.

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Safety Alert Symbol

THIS SAFETY SYMBOL is used to call your attention to instructions that concern your personal safety. It means: ATTENTION! BE AWARE! THIS IS AN IMPORTANT SAFETY INSTRUCTION!

Read, understand, and follow these safety instructions. Failure to follow these safety instructions may result in injury or death.

DANGER

Immediate hazards which, if not avoided, WILL result in serious personal injury or death.

WARNING

Hazards or unsafe practices which, if not avoided, COULD result in serious personal injury or death.

CAUTION

Hazards or unsafe practices which, if not avoided, COULD result in minor personal injury or property damage.

RETAIN SAFETY INFORMATION



This manual should be read and understood by all personnel who operate or service this Cable Puller or any component of the Cable Pulling Package. Failure to understand how to operate and service this equipment could result in serious injury or death. This equipment should only be operated and serviced by qualified personnel.



IMPORTANT SAFETY INFORMATION

⚠ DANGER

Do NOT operate cable puller in wet or damp locations.
Do NOT expose to rain.

⚠ DANGER

Do NOT operate in an explosive atmosphere.

⚠ WARNING

Do NOT use cable puller as a hoist or for lifting, supporting or transporting people or loads. Use only for its intended purpose as a cable puller.

⚠ WARNING

Do NOT wrap rope around any body parts. Do NOT wrap rope around wrists.

⚠ WARNING

ALWAYS keep rope away from operator's feet.

⚠ WARNING

Do NOT exceed load rating of cable puller, rope, or accessories.

⚠ WARNING

ALWAYS inspect rope before each use.

⚠ WARNING

ALWAYS disconnect cable puller before servicing.

⚠ WARNING

ALWAYS plug the Model 88 Cable Puller into a grounded receptacle with a 15 amp GFCI protected circuit. Do NOT modify the plug provided with the Model 88 Cable Puller.

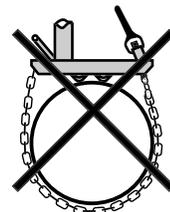
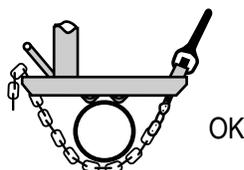
⚠ WARNING

ALWAYS inspect the structural integrity of any supports, conduit, anchoring system etc. that will hold the cable puller during the pull. These supports should be able to withstand the maximum pulling force of the cable puller with a safety factor of 3:1. *Example: 8,000 lb. puller with be anchored to a support that can withstand 24,000 lbs. of pull.*

⚠ WARNING

⚠ WARNING

ALWAYS ensure cable puller is properly secured before operating.
ALWAYS attach to supports that are at least 2" and not more than the 10" in diameter.
NEVER attach to PVC conduit of any size.



See mounting chain installation section of this manual for proper mounting of cable puller and tie-down chain installation.

IMPORTANT SAFETY INFORMATION *continued . . .*

▲ WARNING

Pulling Rope should be the only thing to contact the capstan. NEVER let swivels, grips, etc. come in contact with the capstan.

▲ WARNING

Keep as much rope confined in conduit as possible. This will help prevent injury should the rope break and whip violently.

▲ WARNING

Rope must ALWAYS be pulled over a rotating sheave. If a sheave does not rotate, turn cable puller off immediately and determine problem before continuing the pull.

▲ WARNING

This cable puller is equipped with an anti-reversing pawl. The pawl will make a clicking sound when the capstan is rotating. If you can not hear the clicking sound as the capstan rotates, immediately turn the cable puller off and do not use until repaired.

▲ WARNING

ONLY use 3/4" or larger double-braided composite pulling rope, or a pulling rope with a minimum average breaking strength of 26,000 lbs.

▲ WARNING

NEVER allow the rope to slip on a rotating capstan for more than a couple of seconds. The rope will wear in that spot and the rope could break under pressure. If you need to stop the pull, turn the cable puller off and tie the rope off to hold it in place until you restart your pull.

▲ WARNING

Keep all body parts, hair, loose clothing, etc. away from rotating parts and pinch points. Keep hands away from capstan.

▲ WARNING

NEVER allow the rope to overlap on the capstan. If this condition begins to occur, immediately release the tailing force on the rope so that the rope can feed back toward the conduit or cable tray. If this does not remedy the overlap, turn off the cable puller immediately.

▲ WARNING

Rope should approach capstan as shown in Figure 1.

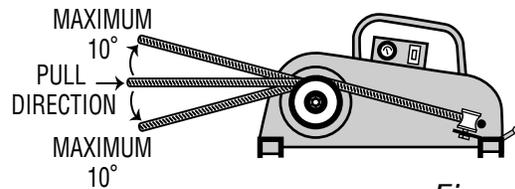
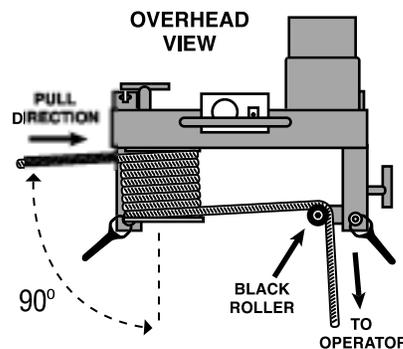


Figure 1

▲ WARNING



ALWAYS use black roller to guide rope so that operator stands at 90° angle to the cable puller and out of the direct line of tight pulling rope.

ALWAYS wrap rope beginning at housing end of capstan as shown in illustration.

Rope should approach capstan at 90° angle. See illustration.

IMPORTANT SAFETY INFORMATION *continued . . .*

▲WARNING

Some components of the cable pulling package exceed 50 lbs. and will require more than one person to lift, transport, and assemble.

▲WARNING

ALWAYS inspect pins to be sure they are fully inserted through holes and have spring clips properly attached. Do NOT substitute any other object for factory supplied pins.

▲WARNING

Do NOT mount the Model 88 Cable Puller to square columns or I-beams. The mounting chains will not tighten properly on these structures.

▲WARNING

The ONLY approved method to secure the Model 88 Cable Puller is with the 2 mounting chains provided. Do NOT attempt to use any other object to secure the cable puller.

▲WARNING

Inspect mounting chains for wear before each installation. NEVER alter the mounting chains or handle.

▲WARNING

▲WARNING

Never tighten chain as shown in Figure 2A. This causes side loading of the chain and can result in failure of the chain or screw causing components to come loose and possibly cause serious injury or death. Figure 2B shows the proper alignment of screw and chain for tightening.

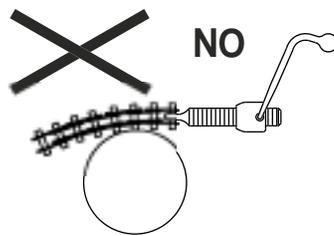


Figure 2A

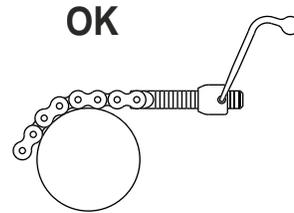


Figure 2B

▲WARNING

When making a vertical cable pull, keep the area underneath the cable pull clear of all personnel.

▲CAUTION

Do NOT alter this cable puller. Doing so will void the warranty. Guards and safety features are provided for your protection.

▲CAUTION

Do NOT use an extension cord longer than 100 ft. Extension cord should be a minimum of 12 gauge wire with ground.

IMPORTANT SAFETY INFORMATION *continued . . .*

▲ CAUTION

Wear eye protection when operating cable puller.

▲ CAUTION

Inspect all components of the pulling system before beginning any cable pull. This includes the cable puller and any accessories (sheaves, swivels. etc.) Replace any worn or defective components.

▲ CAUTION

Be careful during assembly and disassembly of the pulling system components. Have control of components before removing any pins.

SPECIFICATIONS — Model 88 Cable Puller

Model No.	88 Cable Puller
width	- 20 1/2"
length	- 24 3/4"
height	- 16"
weight	- 101 lbs. (includes two mounting chains)

maximum pulling force - 8,000 lbs.

speeds (approx.)	no load	-	16 ft/min.
	4,000 lbs.	-	9 ft/min.
	6,000 lbs.	-	7 ft/min.

motor - 120 volts AC, 60 hertz, 15 amps

FEATURES

- Heavy duty all welded unitized steel frame
- Permanently mounted force gauge allows operator to monitor the pulling force
- Circuit breaker on/off switch — helps protect motor
- Safety pawl on capstan sprocket to prevent reverse rotation
- Tapered capstan to help avoid rope overlap
- Simple design provides for easy maintenance — only one guard covers all sprockets and chains
- Tailing rope safety roller for operator safety — lets operator stand out of the direct line of tight pulling rope
- Three handles for carrying or positioning puller
- Simple electrical system for easy maintenance

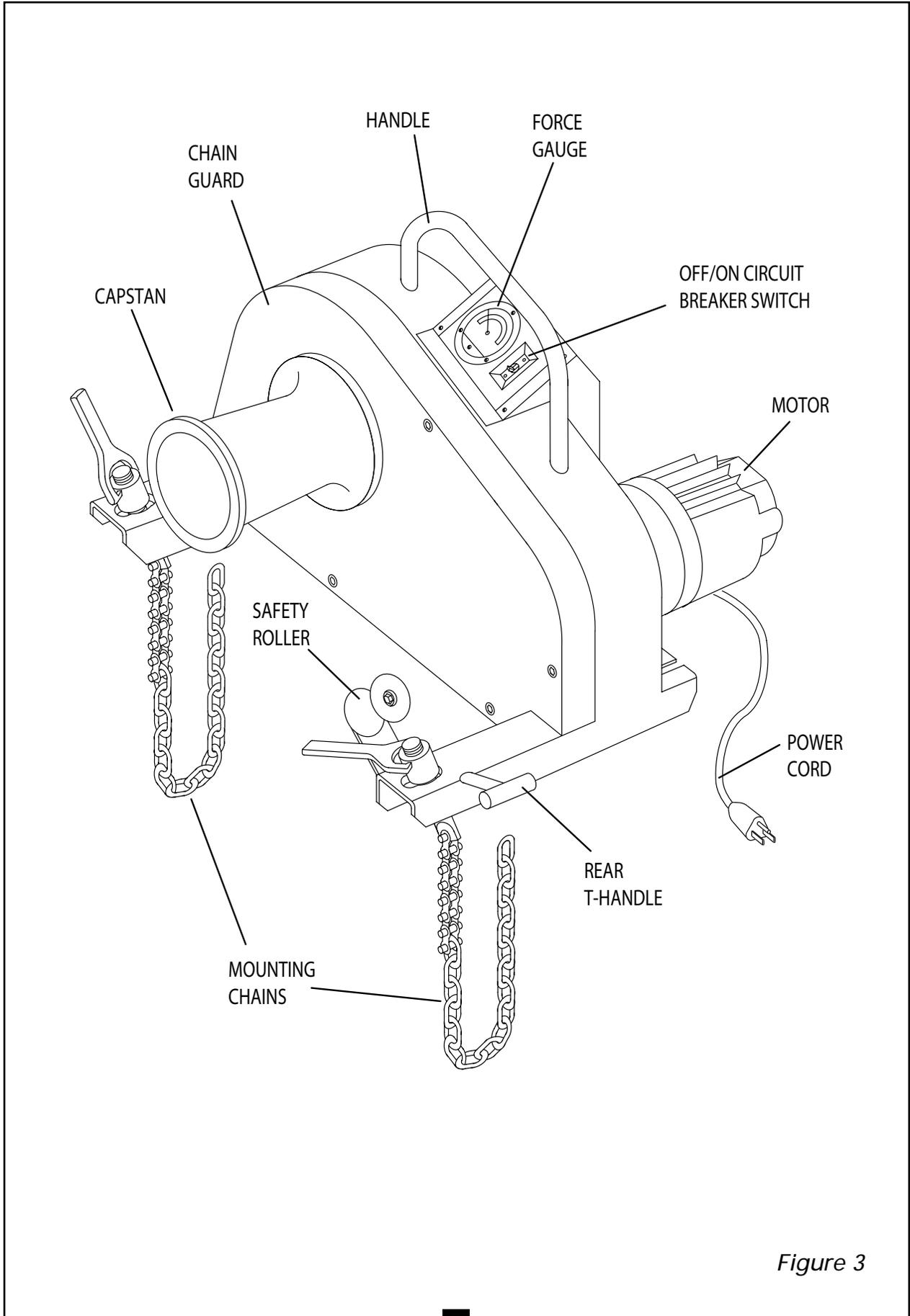
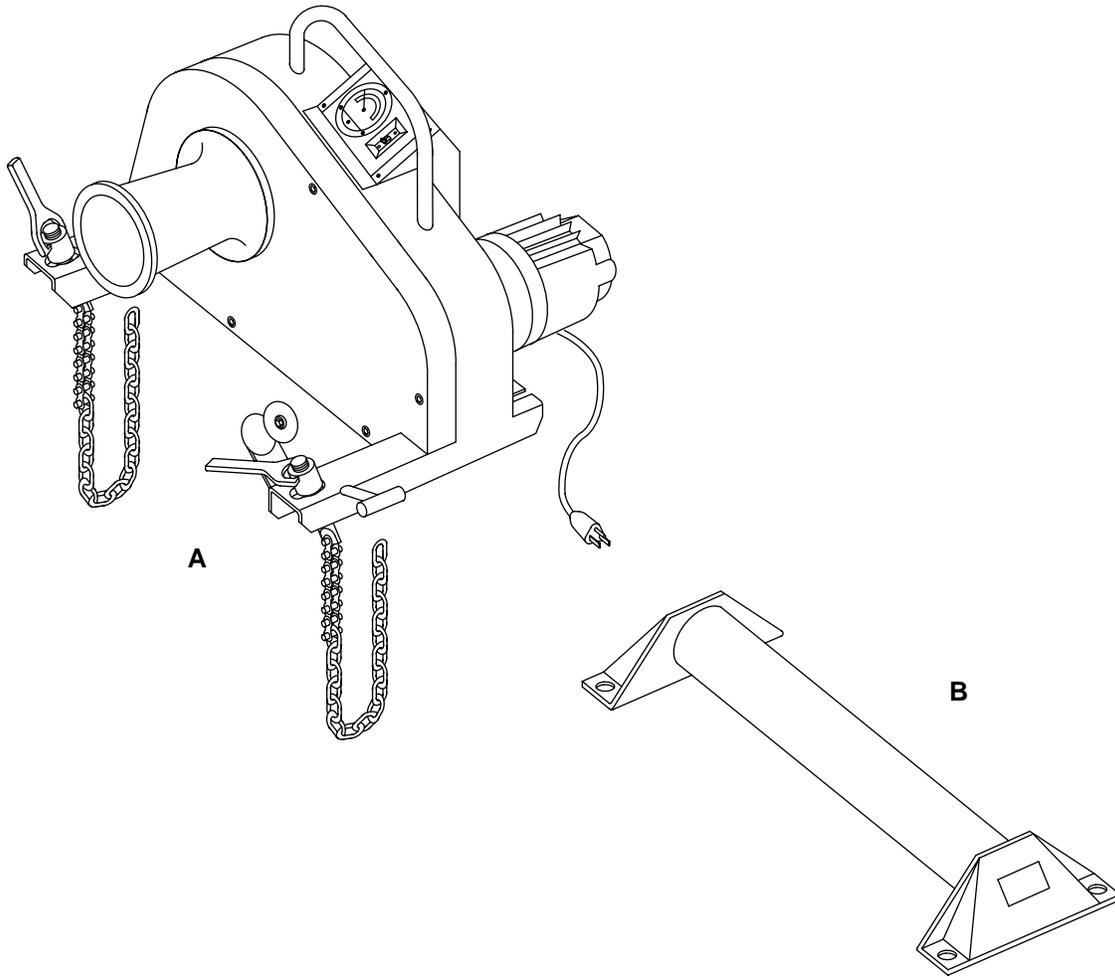


Figure 3

COMPONENTS LISTING

Cable Puller Package



CAT. NO.	KEY	DESCRIPTION	PULLER ONLY 88	PULLER WITH FLOOR MOUNT 8845	WT.
88	A	Cable puller with chains	1	1	101
8045	B	floor mount		1	16

CABLE PULLING BASICS

Model 88 Cable Puller and Accessories

The Model 88 Cable Puller has a maximum pulling force of 8,000 lbs. Therefore, all of the accessories used to make a cable pull with this unit must be rated to meet or exceed the forces generated. This includes, but is not limited to pulling rope, sheaves, swivels, grips, etc. Be aware that the pulling force on a sheave and its anchoring system can be as great as twice the pulling force generated by the cable puller.

WARNING

Do NOT exceed load rating of cable puller, rope, or accessories.

CAUTION

Inspect all components of the pulling system before beginning any cable pulling. This includes the cable puller and any accessories (sheaves, swivels. etc.)
Replace any worn or defective components.

Power Requirements

The Model 88 Cable Puller motor is rated at 120 volt – 60 hz – 15 amps.

WARNING

ALWAYS plug the Model 88 Cable Puller into a grounded receptacle with a 15 amp GFCI protected circuit.

DO NOT modify the plug provided with the Model 88 Cable Puller. If needed, have a 15 amp GFCI receptacle installed by a qualified electrician.

CAUTION

If an extension cord is used, it should be a minimum of 12 gauge wire with ground and a maximum length of 100 ft.

Force Gauge

The Model 88 Cable Puller is equipped with an integral force gauge. To adjust the pulling force needle to zero (Ø) prior to a pull, run the puller for 1 minute with no load. While the puller is running (with no load), use adjustment screw on face of force gauge to set needle to zero pounds of force.

The operator should always monitor the force gauge throughout the entire cable pull. The force gauge has 3 color sections to help you identify operating conditions. These sections are:

<u>Color</u>	<u>Condition</u>
Green	Puller can be run continuously
Yellow	50% duty cycle; 15 minutes on / 15 minutes off
Red	Overload Condition – Do NOT operate puller Correct overload condition or set up a tandem pull (See page 21.)

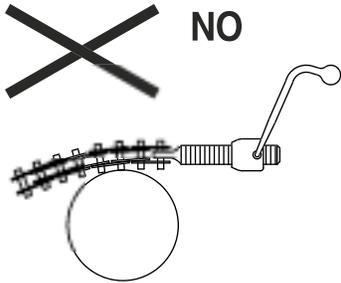
Mounting Chain Installation

The Model 88 Cable Puller is designed to be mounted using the two mounting chains provided. The handles on the chains should provide sufficient leverage to tighten the chains securely. No other tools are needed. Be sure to check the mounting chains for kinks and twists before you tighten them. See Warning below for proper mounting chain installation.



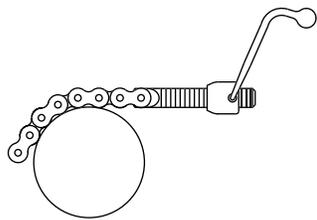
WARNING

Never tighten chain as shown in Figure 4A. This causes side loading of the chain and can result in failure of the chain or screw causing components to come loose and possibly cause serious injury or death. Figure 4B shows the proper alignment of screw and chain for tightening.



NO

Figure 4A



OK

Figure 4B

- A – Loosen the mounting chain handle so that only 3 or 4 threads remain engaged.**
- B – Wrap the chain around the floor mount, conduit or structural support able to withstand the maximum pulling force of the cable puller with a safety factor of 3 to 1.**
- C – Pull the loose end of the mounting chain tight and hook the closest chain link into the recessed area.**
- D – Tighten the chain handle. Repeat this process for second mounting chain.**

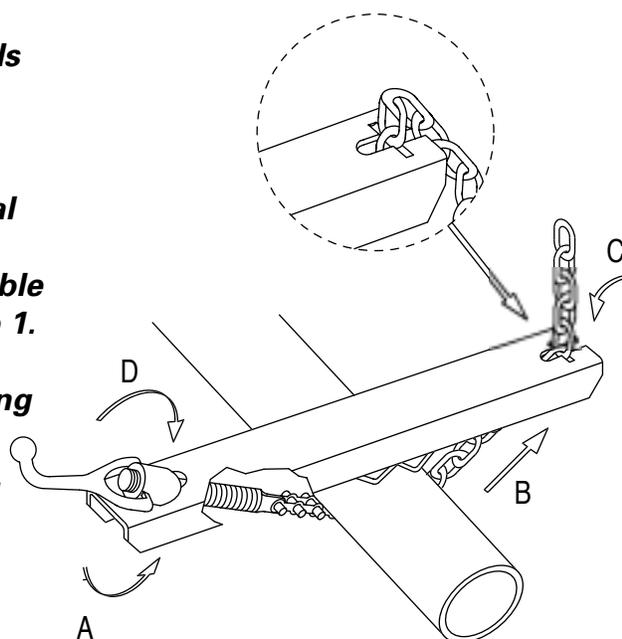


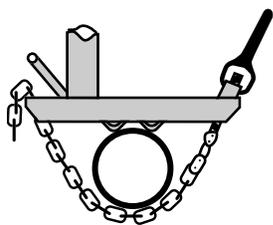
Figure 5

! WARNING

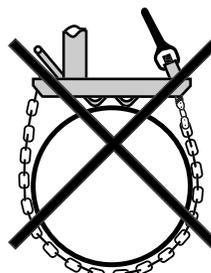
Be sure threads do not bottom out before chain becomes tight.

! DANGER !

ALWAYS ensure cable puller is properly secured before operating.
ALWAYS attach to supports that are at least 2" and not more than the 10" in diameter.
NEVER attach to PVC conduit of any size.



OK



TOO WIDE

 **WARNING**

1. The only approved method to secure the Model 88 cable puller is with the 2 mounting chains provided with the Model 88 cable Puller. Do NOT attempt to use any other object to secure the puller.
2. Inspect mounting chains for wear before each installation.
3. NEVER alter the mounting chains or handle.

 **WARNING**

ALWAYS inspect the structural integrity of any supports, conduit, anchoring system etc. that will hold the cable puller during the pull. These supports should be able to withstand the maximum pulling force of the cable puller plus a safety factor of 3:1. Example: 8,000 lb. puller should be anchored to a support that can withstand 24,000 lbs. of pull.

 **WARNING**

Do NOT mount the Model 88 Cable Puller to square columns or I-Beams. The mounting chains will not tighten properly on these structures.



FLOOR MOUNT

The Model 8045 Floor Mount is made to fit the Current Tools Model 88 Cable Puller. The floor mount is to be mounted only to a concrete floor using the method described below.

Safety Information

1. ALWAYS mount to a smooth, flat concrete floor with a minimum 3000 psi rating.
2. Mount only to a concrete floor. **NEVER** mount to cinder blocks, brick, etc.
3. Wedge anchors must be at least 12" away from edge of concrete.
4. ALWAYS use new anchors. **NEVER REUSE ANCHORS.**
5. Use only 5/8" x 6" wedge anchors or equivalent with a tension and shear rating of 2,500 lbs. (Current Tools part #8045-3)
6. **CAUTION** ALWAYS wear eye protection when installing anchors.

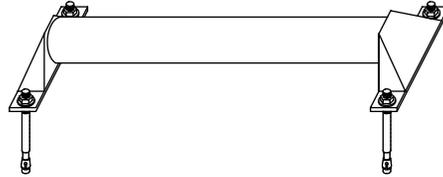


Figure 6A

WARNING

ALWAYS place the floor mount close to the conduit. This will reduce the possibility of injury should the rope break. See Figure 6B.

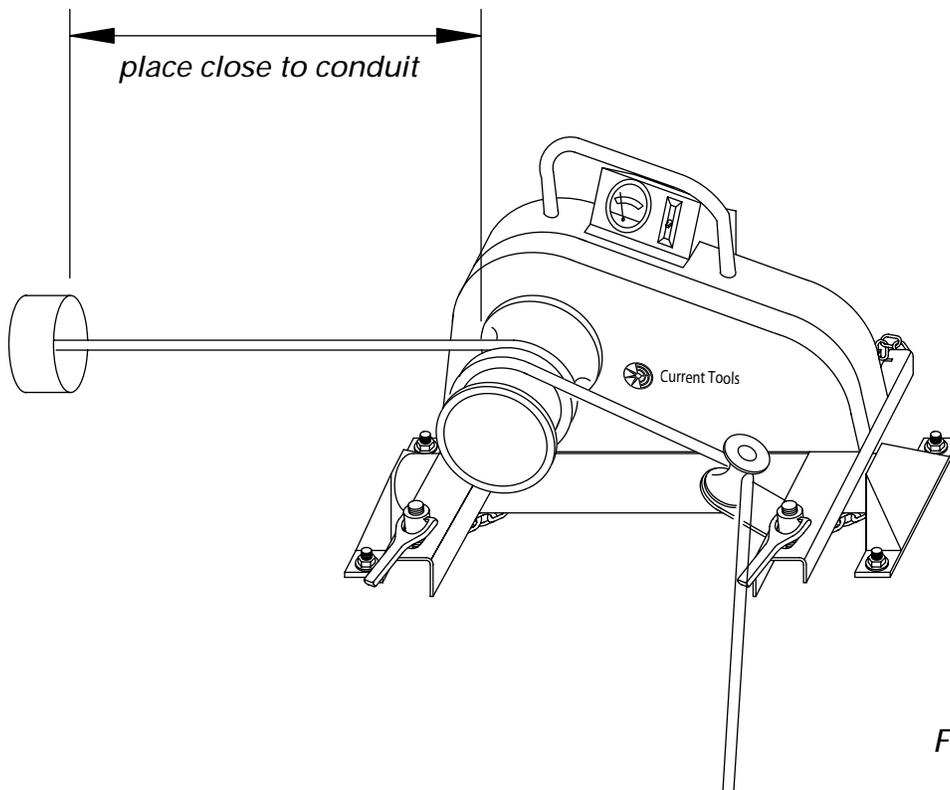


Figure 6B

! CAUTION

The pulling direction should **ALWAYS** be parallel to the base of the floor mount. See Figure 7.

CORRECT
PULLING
DIRECTION

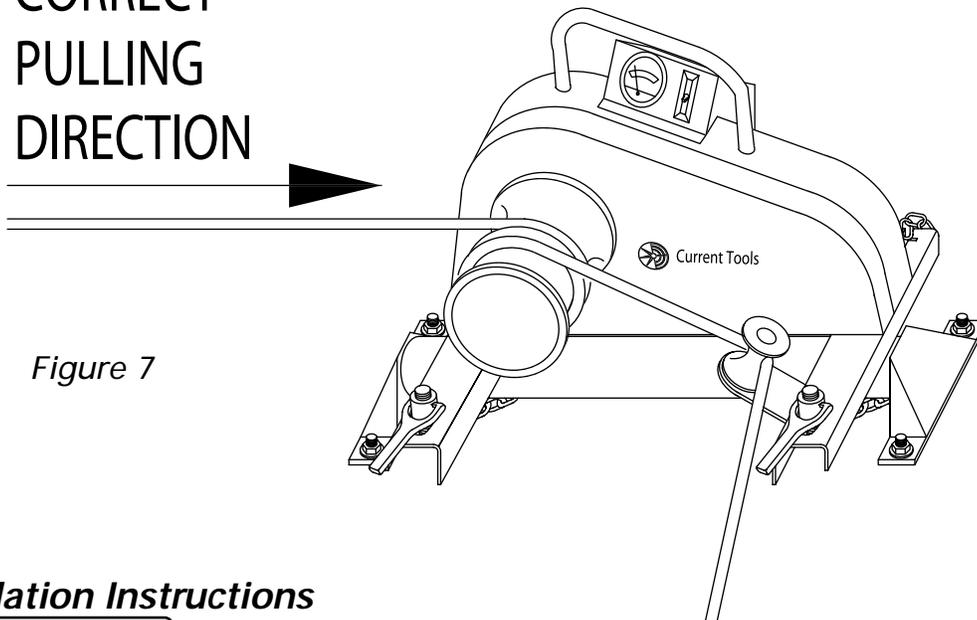


Figure 7

Installation Instructions

1. **!** CAUTION Wear safety glasses.
2. Follow the safety instructions provided by the drill manufacturer.
3. Use only 5/8" diameter solid carbide tipped bits that meet ANSI B94-12.
4. Using the floor mount as a template, drill four 5/8" holes a minimum of 6" deep but not closer than 1 1/4" to the bottom (opposite surface) of the concrete. Be sure to drill the holes perpendicular to the work surface and do not ream the holes or let the drill bit wobble.
5. Clean the holes with compressed air and a wire brush. Clean holes are necessary for proper performance.
6. Assemble the washer and nut on the anchor so the top of the nut is flush with the top of the anchor.
7. Next, drive the 4 wedge anchors through the 4 floor mount holes and into the concrete holes making sure the nut and washer rests solidly against the floor mount.
8. Tighten the anchors with a torque wrench to 75–90 ft. lbs.
Note: If anchor spins, pull up on the anchor using the claw end of hammer and then torque. If spinning still occurs, Do NOT use this location; reposition the floor mount and repeat this installation procedure.
9. Place the Model 88 Cable Puller so that the "V" positioning units on the bottom of the puller legs straddle the floor mount. Mount puller to the floor mount using the mounting chain installation procedure found on pages 11, 12, & 13 of this manual.



! DANGER

Do NOT operate cable puller in wet or damp locations. Do NOT expose to rain.

! DANGER

Do NOT operate in an explosive atmosphere.

! WARNING

Do NOT use cable puller as a hoist or for lifting, supporting or transporting people or loads. Use only for its intended purpose as a cable puller.

Rope Set-Up

As shown in the overhead view, *Figure 8A*, the pulling rope must approach the capstan at a 90° angle. This will help avoid rope overlap.

Make several wraps of the pulling rope around the capstan, beginning at the housing end of the capstan. See *Figure 8A*.

Next, guide the pulling rope around the black safety roller as shown in *Figure 8A*. This will enable the operator to stand at a 90° angle to the cable puller and out of the direct line of tight pulling rope.

Also note the pulling rope should approach the capstan as indicated in *Figure 8B*.

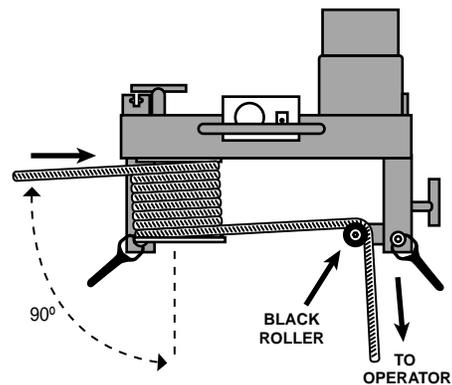


Figure 8A

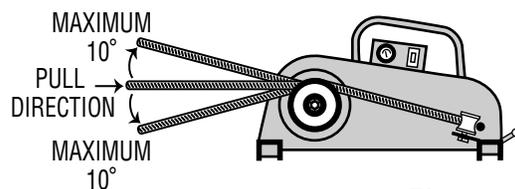


Figure 8B

WARNING

ALWAYS use black roller to guide rope so that operator stands at 90° angle to the cable puller and out of the direct line of tight pulling rope. See Figure 8A.

ALWAYS wrap rope beginning at housing end of capstan as shown in Figure 8A.

Rope must approach capstan at a 90° angle. See Figure 8A.

Rope should approach capstan as shown in Figure 8B.

WARNING

Rope Requirements: Use only 3/4" or larger double braided composite pulling rope, or a pulling rope with a minimum average breaking strength of 26,000 lbs.

Be sure to inspect rope for damage before each cable pull.

CAUTION

Wear eye protection when operating cable puller.

Pulling Operation

1. Be sure the cable puller power switch is in the **off** position.
2. Operator should monitor the force gauge throughout the entire cable pull.
3. Hold the tailing end of the pulling rope and pull slightly. Turn the cable puller **on**.

Note: The tailing rope is that portion of the pulling rope that has passed the capstan and is now excess to the pull. By pulling on the tailing rope the operator can control and vary the pulling force. It should require no more than 10 lbs. of tailing force by the operator to engage the pulling rope on the capstan. If the rope slips on the capstan, turn the puller off and add an additional wrap of rope around the capstan. Also note that with the tailing force at a constant pull, each additional wrap of rope around the capstan will approximately double the pulling force of the cable puller.

WARNING

NEVER allow the rope to slip on a rotating capstan for more than a couple of seconds. The rope will wear in that spot and the rope could break under pressure. If you need to stop the pull, turn the cable puller off and tie the rope off to hold it in place until you restart your pull.

WARNING

This cable puller is equipped with an anti-reversing pawl. The pawl will make a clicking sound when the capstan is rotating. If you can not hear the clicking sound as the capstan rotates, immediately turn the cable puller off and do not use until repaired.

WARNING

NEVER allow the rope to overlap on the capstan. If this condition begins to occur, immediately release the tailing force on the rope so that the rope can feed back toward the conduit or cable tray. If this does not remedy the overlap, turn off the cable puller immediately. **There is no known solution for rope overlap.**

4. As the rope is tailed it should mound on the floor between the operator and the cable puller.
5. Turn the cable puller switch to the **off** position when the pull is completed.

WARNING

Keep all body parts, hair, loose clothing, etc. away from rotating parts and pinch points. Keep hands away from capstan.

Do NOT wrap rope around any body parts. Do NOT wrap rope around wrists.

ALWAYS keep the tailing rope away from the operator's feet.

Note: The Model 88 Cable Puller is equipped with a circuit breaker switch. If the amperage rating of the breaker is exceeded the puller will stop. Before restarting the pull, allow the motor to cool and determine the cause for the overload condition. Correct before restarting the pull.

 **WARNING**

Rope must ALWAYS be pulled over a **rotating** sheave. If a sheave does not rotate, turn cable puller off immediately and determine the problem before continuing the pull.

 **WARNING**

Pulling Rope should be the only thing to contact the capstan. NEVER let swivels, grips, etc. come in contact with the capstan.

 **WARNING**

NEVER allow the rope to overlap on the capstan. If this condition begins to occur, immediately release the tailing force on the rope so that the rope can feed back toward the conduit or cable tray. If this does not remedy the overlap, turn off the cable puller immediately. **There is no known solution for rope overlap.**

 **WARNING**

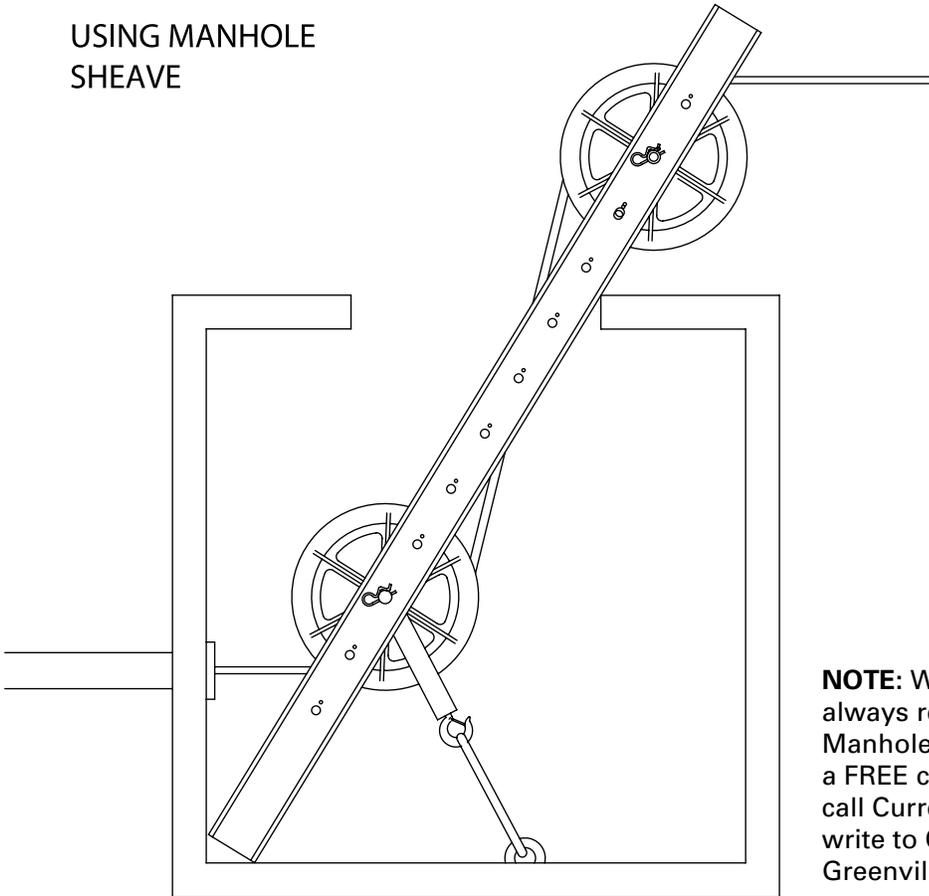
Keep as much rope confined in the conduit as possible. This will help prevent injury should the rope break and whip violently.

 **WARNING**

When making a vertical cable pull, keep the area underneath the cable pull clear of all personnel.

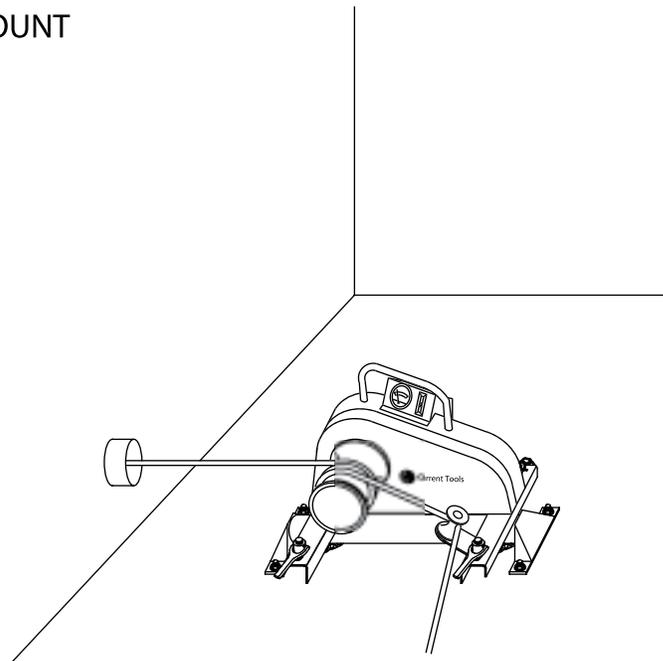
COMMON SET-UPS

USING MANHOLE SHEAVE



NOTE: When using Manhole Sheave, always refer to Model 308/310/312 Manhole Sheave instruction sheet. For a FREE copy of this instruction sheet, call Current Tools at 800-230-5421 or write to Current Tools; PO Box 17026; Greenville, SC 29606

USING FLOOR MOUNT



TANDEM PULLING

If the amount of pulling force required to make a pull exceeds the load rating for a single cable puller, two cable pullers may be used in tandem to make the pull. See *Figure 9 below*. Be sure to use a separate rope and set of accessories for each cable puller. Each set of rope and accessories should meet or exceed each cable pullers maximum pulling force.

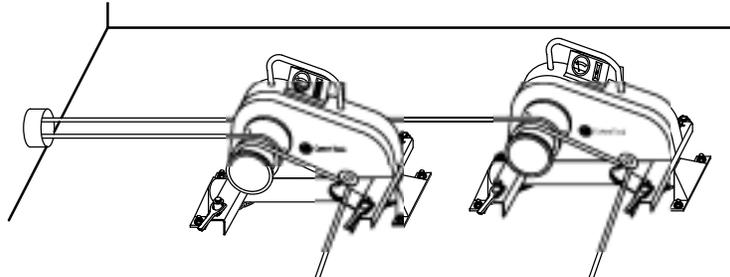


Figure 9

MAINTENANCE

WARNING

Unplug the cable puller before servicing.

CAUTION

Do NOT alter this cable puller. Doing so will void the warranty. Guards and safety features are provided for your protection.

Capstan

Replace the capstan if it is grooved more than 1/16" deep.

Lubrication

Front and Rear Drive Chains — Lubricate the inside of both drive chains every 20 hours of operation with 90 wt. gear oil.

Capstan Shaft, Rear Drive Shaft and Ratchet Pawl — Grease every 10 hours with a good quality multi-purpose (M.P.) grease. These grease fittings are located on the side of the cable puller. See *item #39 on Model 88 Cable Puller exploded view*.

Inspection

Important: After the first 5 hours of operation remove the cover and inspect both chain tensioners. Adjust as needed.

Front and Rear Chain Inspection — Every 40 hours of operation the front and rear drive chains should be removed and inspected for excessive wear or binding.

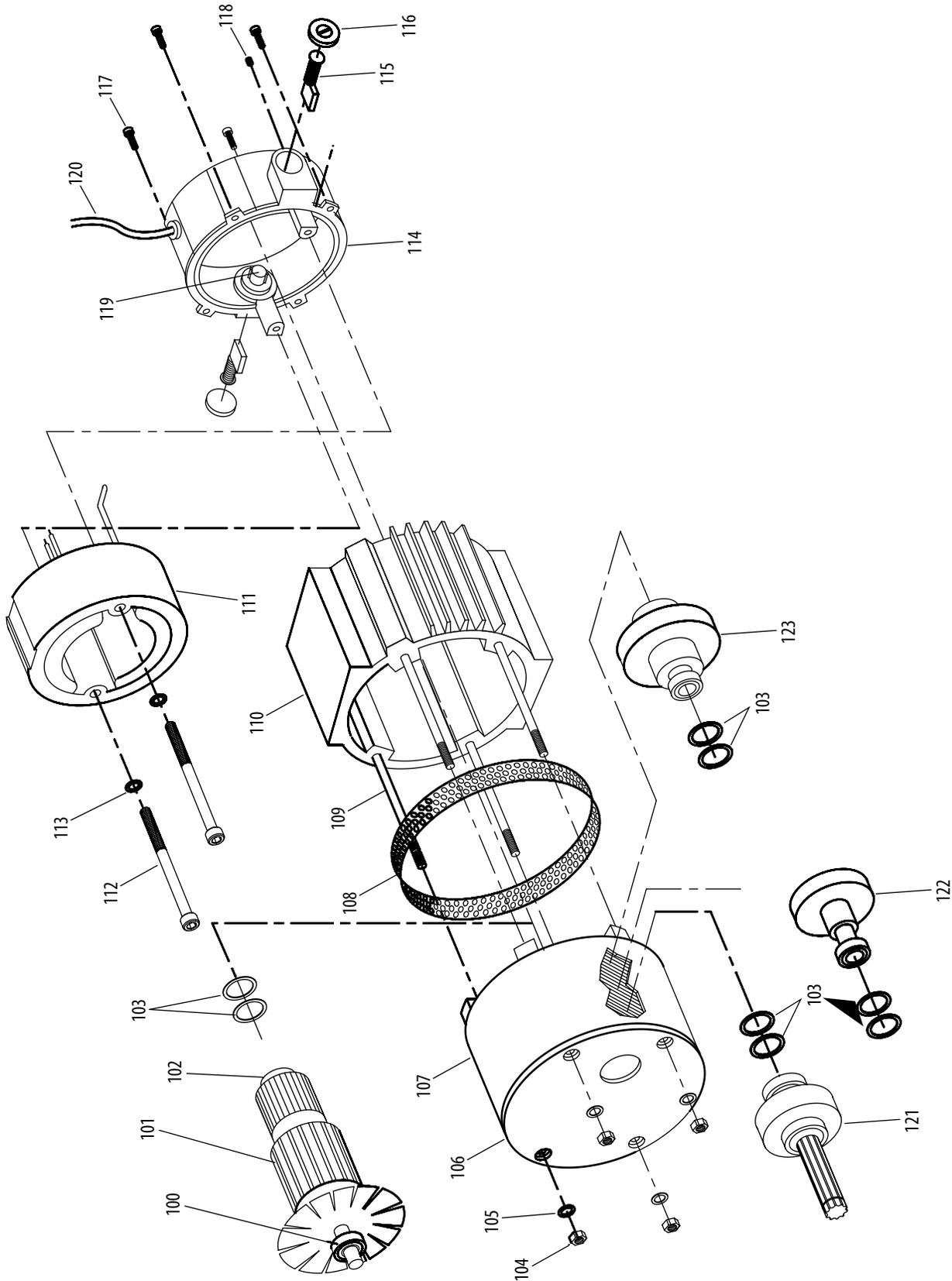
Motor Brushes – Inspect the two motor brushes every 30 hours. Replace if less than 3/8" long. Always replace both brushes at the same time.



PARTS LIST – MODEL 88 CABLE PULLER

ITEM #	PARTS DESCRIPTION	QTY	PART #
1	PULLER HOUSING	1	88-53
2	CHAIN GUARD	1	88-32
3	FLAT HEAD SOCKET CAP SCREW	5	88-1
4	#60 SPROCKET	1	88-54
5	CAPSTAN SPROCKET BOLT	4	88-55
6	STAR LOCK WASHER	4	88-56
7	CAPSTAN	1	88-33
8	CAPSTAN BUSHING	1	88-57
9	SPACER – JACKSHAFT	1	88-58
10	CAPSTAN WASHER – STEEL	1	88-59
11	CAPSTAN BOLT	1	88-60
12	#60 CHAIN MASTER LINK	1	77-010
13	#60 CHAIN	1	88-61
14	#60 IDLER SPROCKET	1	88-62
15	#60 IDLER SPROCKET BUSHING	1	88-63
16	CHAIN TENSIONER ARM	2	88-64
17	TENSIONER ARM COTTER PIN	2	88-2
18	#40 CHAIN	1	88-65
19	#40 IDLER SPROCKET BUSHING	1	88-66
20	#40 IDLER SPROCKET	1	88-67
21	KEP NUT	4	88-68
22	MOUNTING CHAIN ASSEMBLY	2	88-21 L
23	#40 CHAIN MASTER LINK	1	77-032
24	#40 SPROCKET – MOTOR	1	88-69
25	MOTOR SHAFT RETAINING RING	1	88-25
26	JACKSHAFT & SPROCKET WELDMENT	1	88-19
27	JACKSHAFT PHENOLIC WASHER	2	88-70
28	ROLLER BEARING – JACKSHAFT	2	88-35
29	INNER RACE – JACKSHAFT	2	88-36
30	PAWL	1	88-27
31	PAWL SPRING	1	88-26
32	HEX NUT	3	88-71
33	SAFETY ROLLER	1	88-18
34	SOCKET HEAD SHOULDER BOLT	1	280-2D
35	POWER CORD	1	450-4
37	WASHER – PHENOLIC	1	88-37
38	BOLT	2	88-38
39	GREASE FITTING	3	88-39
40	HEAVY DUTY RETAINING RING	1	88-40
41	JACKSHAFT WASHER – STEEL	1	88-41
42	MOUNTING CHAIN HANDLE ASSEMBLY	2	88-42
44	PULLER MOTOR	1	88-44
45	PULLER FORCE GAUGE	1	88-17
46	COVER	1	88-46
47	CIRCUIT BREAKER SWITCH	1	88-47
48	SLOTTED PAN HEAD MACH. SCREW	2	88-31
49	COVER SCREW	4	77-004
50	GAUGE ASSEMBLY SCREW	3	88-50
51	STAR LOCK WASHER	4	88-51
52	FLAT WASHER	2	88-52
53	CAPSTAN SHAFT WASHER – PHENOLIC	2	88-48
54	BEARING SPACER	1	88-74

EXPLODED VIEW – MODEL 88 CABLE PULLER MOTOR

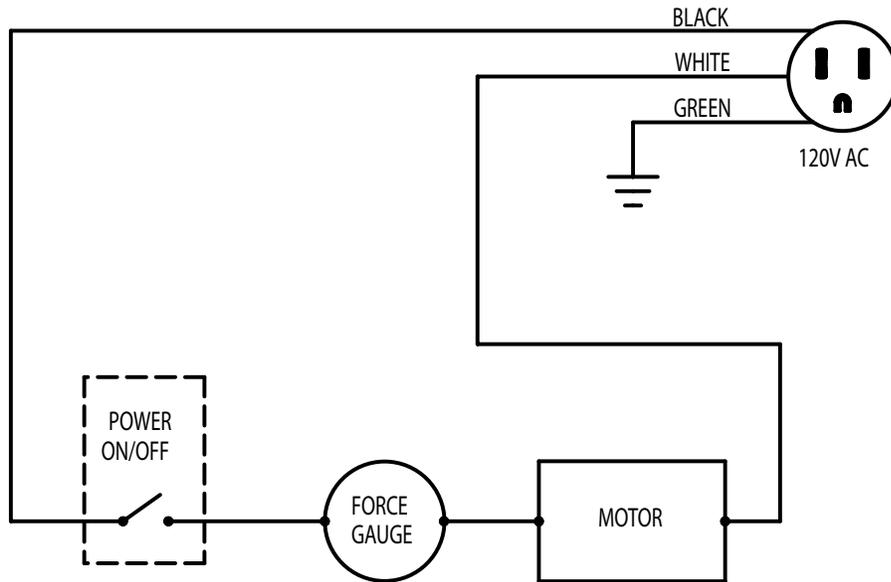




PARTS LIST – PART #88-44 CABLE PULLER MOTOR

ITEM #	PARTS DESCRIPTION	QTY	PART #
100	ARMATURE BEARING – FRONT	1	88-44A
101	ARMATURE	1	88-44B
102	ARMATURE BEARING – REAR	1	88-44C
103	BELLEVILLE WASHER	8	88-44D
104	NUT	4	88-44E
105	LOCK WASHER	4	88-44F
106	MOTOR END PLATE	1	88-44G
107	GEAR BOX HOUSING	1	88-44H
108	FAN SCREEN	1	88-44I
109	THREADED STUD	4	88-44J
110	MIDDLE MOTOR HOUSING	1	88-44K
111	FIELD	1	88-44L
112	SCREW	2	88-44O
113	LOCK WASHER	2	88-44N
114	END CAP HOUSING	1	88-44P
115	BRUSH	2	88-44Q
116	BRUSH CAP	2	88-44R
117	SCREW	4	88-44S
118	SET SCREW	2	88-44T
119	BRUSH HOLDER	2	88-44U
120	MOTOR CORD	1	450-4
121	OUTPUT SHAFT GEAR ASSEMBLY	1	88-44W
122	2ND GEAR ASSEMBLY	1	88-44X
123	1ST GEAR ASSEMBLY	1	88-44Y

WIRING SCHEMATIC – MODEL 88 CABLE PULLER



WIRING DRAWING – MODEL 88 CABLE PULLER

