

Elliott offers a complete line of precision tube tools, including:

**tube
expanders**

Boiler Expanders
Heat Exchanger Expanders
Condenser Expanders
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**tube rolling motors
& torque controls**

Electric
Pneumatic

**tube
cleaners**

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(Internal/External Drives)

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("Shoot-Thru" Devices)

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(Rotating Flex Shaft)

**additional
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Tube and Joint Testers

Tube Plugs
(High & Low Pressure)

**retubing
tools**

Tube Gauges
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Spear Type Tube Pullers
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CYCLGRIP Tube Extractors
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Magic Vise
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Single Blade Reamers



FLEXIBLE SHAFTING
(Wet & Dry)

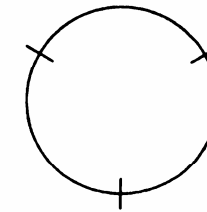
**SAFETY AND
OPERATING INSTRUCTIONS**



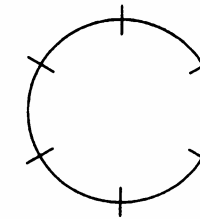
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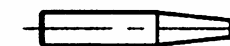
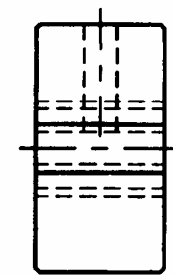
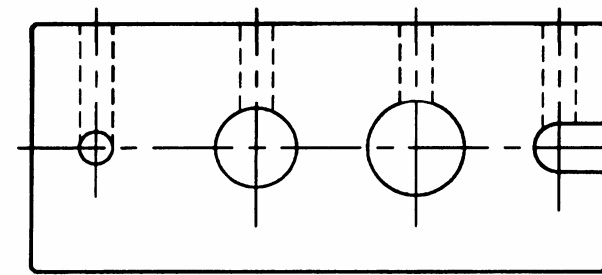
Crimp locations
0511 0512
@ 120° intervals



Crimp locations
0513 0514 0515
@ 60° intervals



W900-00



FLEXSHAFT REPAIR

Flexshaft Repair Instructions Instructions for Both the Tool and Motor Couplings Using the Elliott Crimping Block Assembly Part Number W900-00

1. Cut the outer casing back approximately 1" (25.4mm) for clearance to allow the core to be cleaned up at the break. Grind the end of the core taking care not to overheat the wire strands. Using a hacksaw to square the broken end will cause the wire strands to flex and unwind.

Note: The compression fitting on the motor coupling should not be removed from the casing, if the excess length of casing is trimmed from the tool coupling end of the flexshaft.

2. Slightly bevel the circumference of the core to remove any burrs.
3. Insert the replacement coupling onto the core. Be sure the core is fully engaged to the full drilled length of the coupling.

Note: When replacing the motor coupling, insure that the square washer has been placed onto the core before inserting the motor coupling.

4. Locate the assembly of the core and coupling in the proper hole location of the crimping block. Position the assembly in the crimping block with the core end of the coupling, flush with the side of the block.
5. Insert the drive pin into the proper hole above the coupling to be crimped.
6. Strike the pin with a hammer. Care must be taken with this operation, excessive force will deform the coupling and cause the core to distort and unwind.
7. For flexshaft sizes 0513, 0514 and 0515, rotate the coupling in the crimping block approximately 60° and strike the pin again. Repeat this operation around the coupling. For flexshaft sizes 0511 and 0512, rotate the coupling in the crimping block approximately 120° and strike the pin again. Repeat this operation around the coupling.
8. The coupling is now secure with equally spaced crimping locations holding the core.

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INTRODUCTION

Thank you for purchasing this Elliott product. More than 100 years of experience have been employed in the design and manufacture of this machine, representing the highest standard of quality, value and durability. Elliott tools have proven themselves in thousands of hours of trouble free field operation.

If this is your first Elliott purchase, welcome to our company; our products are our ambassadors. If this is a repeat purchase, you can rest assured that the same value you have received in the past will continue with all of your purchases, now and in the future.

The Elliott Wet/Dry Flexible Shafting has been designed for cleaning tubes in the following types of equipment:

- Heat Exchangers
- Condensers
- Chillers
- Boilers
- Evaporators
- Air Conditioners

Tube cleaning increases plant operation efficiencies and reduces fuel costs. For best results use the charts on pages 16 & 17 to keep track of your cleaning maintenance program.

If you have any questions regarding this product, manual or operating instructions, please call Elliott at 800-332-0447 toll free (USA only) or 937-253-6133, or fax us at 937-253-9189 for immediate service.

When the flexshaft is used in a bend or radius configuration, the maximum torque capability of the core is reduced. The following charts demonstrate the effect that bending has on the flexshaft. (See charts below)

MAXIMUM SHAFT TORQUE RATINGS FOR WET SHAFTS

Inch Pounds of Torque to Flexshaft Fatigue

Flexshaft Prefix No.	Straight	Radius 4"	Radius 6"	Radius 8"	Radius 10"	Radius 12"	Radius 15"	Radius 20"	Radius 25"
0511*(xx)	16	2	3	3	4	4	4	4	4
0512*(xx)	105	11	14	17	20	22	23	25	26
0513*(xx)	210	21	25	34	39	42	45	48	52
0514A*(xx)	295	25	36	47	55	57	59	68	74
0514*(xx)	580	N/A	53	74	95	107	119	131	140
0515*(xx)	1155	N/A	N/A	105	139	168	200	221	242

Newton-Meters of Torque to Flexshaft Fatigue

Flexshaft Prefix No.	Straight	Radius 102mm	Radius 152mm	Radius 203mm	Radius 254mm	Radius 305mm	Radius 381mm	Radius 508mm	Radius 635mm
0511*(xx)	1.8	0.2	0.3	0.3	0.5	0.5	0.5	0.5	0.5
0512*(xx)	11.9	1.2	1.6	1.9	2.3	2.5	2.6	2.8	2.9
0513*(xx)	23.7	2.4	2.8	3.8	4.4	4.7	5.1	5.4	5.9
0514A*(xx)	33.3	2.8	4.1	5.3	6.2	6.4	6.7	7.7	8.4
0514*(xx)	65.5	N/A	6.0	8.4	10.7	12.1	13.4	14.8	15.8
0515*(xx)	130.5	N/A	N/A	11.9	15.7	19.0	22.6	25.0	27.3

*Length of shaft in feet completes the part number. (Available in standard lengths of 15', 25', 35', and 50'. Consult factory for additional lengths.)

MAXIMUM SHAFT TORQUE RATINGS FOR DRY SHAFTS

Inch Pounds of Torque to Flexshaft Fatigue

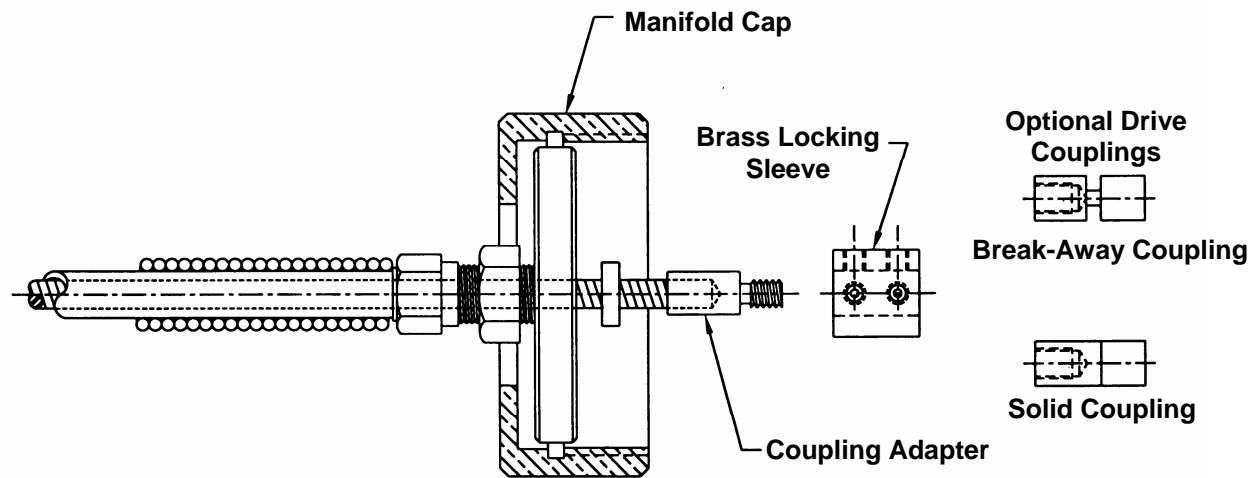
Flexshaft Prefix No.	Straight	Radius 4"	Radius 6"	Radius 8"	Radius 10"	Radius 12"	Radius 15"	Radius 20"	Radius 25"
0534*(xx)	580	N/A	N/A	N/A	95	107	119	131	140

Newton-Meters of Torque to Flexshaft Fatigue

Flexshaft Prefix No.	Straight	Radius 102mm	Radius 152mm	Radius 203mm	Radius 254mm	Radius 305mm	Radius 381mm	Radius 508mm	Radius 635mm
0534*(xx)	65.5	N/A	N/A	N/A	10.7	12.1	13.4	14.8	15.8

*Length of shaft in feet completes the part number. (Available in standard lengths of 25', 35', and 50'. Consult factory for additional lengths.)

DIAGRAM B



TOOL TIP

When finished with the shafting, remove as much moisture as possible from the shaft cable and oil shafting thoroughly to avoid rust during storage.

SAFETY

1. **Stop the Machine Immediately if the Flexshaft Starts to Coil.** Flexshaft damage will occur if flexshaft is operated in a coiled position.
2. **Use the Proper Flexshaft** to fit the tubes to be cleaned. Never use a flexshaft that is too small or too short. Flexshaft failure will result if too great a resistance is placed on the flexshaft. Refer to the chart below for sizing information. (See Fig. 1 and 2)

WET SHAFTS

Fig. 1

Prefix Part Number	Casing Outside Diameter		Tube Inside Diameter	
	Inch	mm	Inch	mm
0511*(xx)	.250	6	5/16 – 3/8	8 – 10
0512*(xx)	.375	10	7/16 – 1/2	11 – 13
0513*(xx)	.500	13	9/16 – 1	14 – 25
0514A*(xx)	.625	16	3/4 – 1-1/2	19 – 38
0514*(xx)	.750	19	1 – 2	25 – 50
0515*(xx)	1.000	25	2 and Over	50 and Over

*Length of shaft in feet completes the part number.

(Available in standard lengths of 15', 25', 35', and 50'. Consult factory for additional lengths.)

DRY SHAFTS

Fig. 2

Prefix Part Number	Casing Outside Diameter		Tube Inside Diameter	
	Inch	mm	Inch	mm
0534*(xx)	7/8	22	1 and Over	25 and Over

*Length of shaft in feet completes the part number.

(Available in standard lengths of 25', 35', and 50'. Consult factory for additional lengths.)

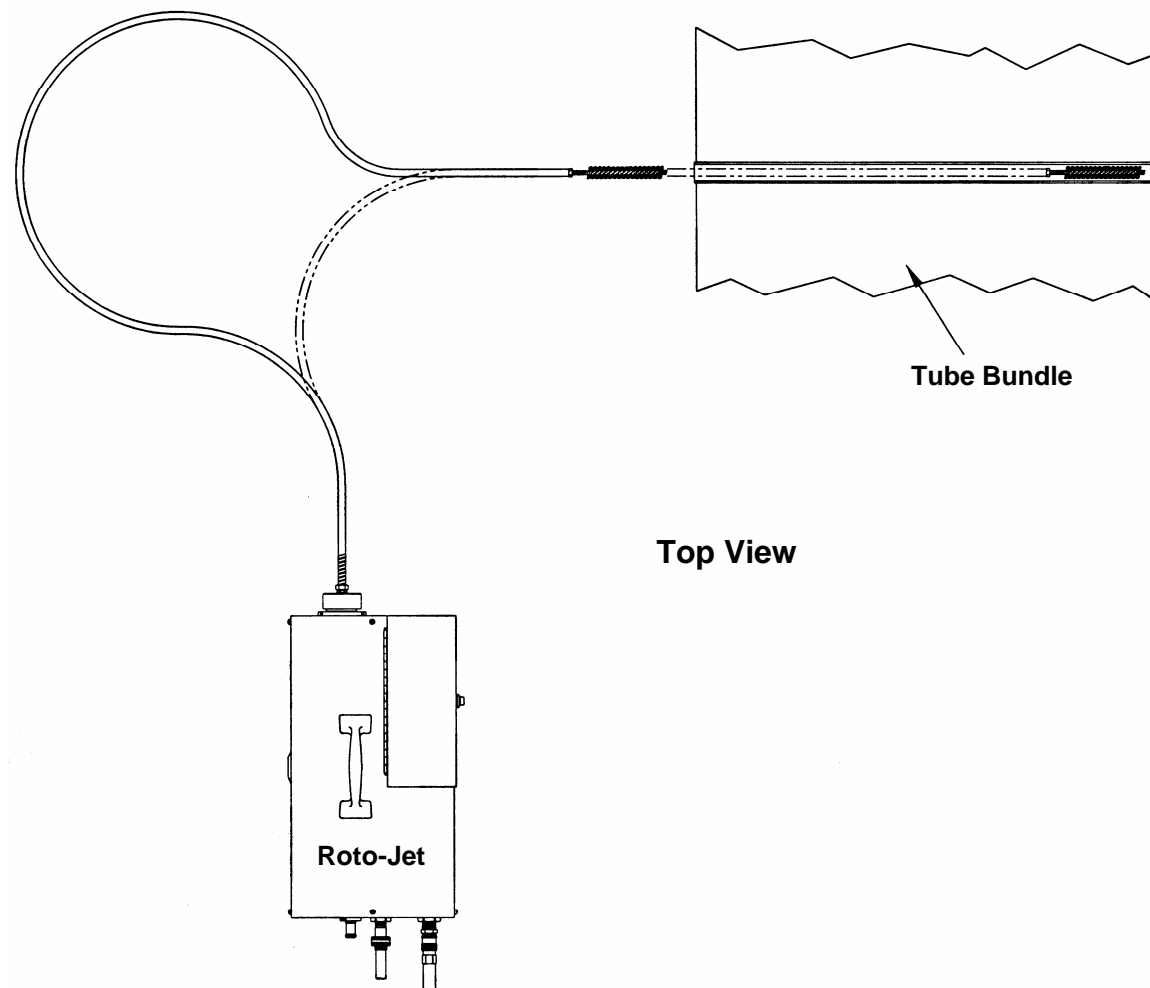
OPERATION

TOOL TIP

Always select a smaller size of cleaning device for heavy tube deposits. With the exception of the Elliott Turbo Brush, never use a brush or cleaning device larger than the internal diameter of the tubes.

Position the machine at a **right angle** to the tube sheet or cleaning area. This will keep the flexshaft at the proper radius. **NEVER OPERATE THE MACHINE IN THE VERTICAL POSITION.** (See Diagram A below).

DIAGRAM A



Position the “O” ring in the recess of the flexshaft connection manifold.

Prepare the flexshaft by loosening the four (4) set screws located in the brass locking sleeve using a 3/32” Allen wrench. Thread the breakaway or solid square drive into the coupling adapter that is swaged on the core of the flexshaft. Position the brass locking sleeve equally over the coupling adapter and the breakaway or solid square drive. Firmly tighten the four (4) Allen set screws. (See Diagram B page 8)

Insert the square drive into the manifold of the machine. Rotate the flexshaft by hand to properly seat the square drive of the flexshaft into the manifold. Thread the brass manifold cap onto the manifold of the machine and firmly **hand tighten**.

Attach the chosen cleaning device to the tool coupling swaged to the core of the flexshaft at the opposite end from the manifold connection and firmly tighten the device.

Turn on the water supply.

Layout the flexshaft as straight as possible. **DO NOT** start the machine with the flexshaft in a coiled position.

The shafting is now ready to operate.



WARNING



This shafting drives high speed, rotating cleaning devices. It is recommended that the operator wear safety glasses with side shields or full face shield eye protection, gloves and water repellent, nonskid foot wear. Avoid contact with objects other than the tube when the shafting is in operation.