ET Series

Oil Field Pipeyard Cleaning Motors & Heads



Tube & Pipe Cleaners \circ Tube Testers \circ Tube Plugs \circ Tube Removal \circ Tube Installation



Operating and Maintenance Instructions



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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 control, 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 ET Series has been designed for the following types of equipment:

Oil Field Pipes

Tubular Products

If you have any questions regarding this product, manual or operating instructions, please call Elliott at +1 800 332 0447 toll free (USA only) or +1 937 253 6133, or fax us at +1 937 253 9189 for immediate service.

SAFETY GUIDELINES

Read and save all instructions. Before use, be sure everyone using this machine reads and understands this manual, as well as any labels packaged with or attached to the machine.

- Know Your Elliott Tool. Read this manual carefully to learn your tool's application and limitations as well as the potential hazards specific to this tool.
- Never grab or attempt to stop the cleaner motor, rotor, or the cleaning heads while they are rotating. Operator injury could occur.
- Exhaust air or water will exit the tube being cleaned. Make sure that no one is near the end of the tubes being cleaned before you activate the cleaner in any tube. Rope, signs, and safety tape are all good devices to assure that no one enters this area.
- · Keep Work Area Clean and Well Lit. Cluttered, dark work areas invite accidents.
- Dress Properly. Do not wear loose clothing or jewelry. Wear a protective hair covering to contain long hair. It is recommended that the operator wear safety glasses with side shields or a full face shield eye protection. Gloves and water repellant, nonskid footwear are also recommended. Keep hands and gloves away from moving parts.
- Use Safety Equipment. Everyone in the work area should wear safety goggles or glasses with side shields complying with current safety standards. Wear hearing protection during extended use, respirator for a confined space and a dust mask for dusty operations. Hard hats, face shields, safety shoes, respirators, etc. should be used when specified or necessary. Keep a fire extinguisher nearby.
- Keep Bystanders Away. Bystanders should be kept at a safe distance from the work area to avoid distracting the operator and contacting the blade.
- Use The Right Tools. Do not force a tool or attachment to do a job or operate at a speed it was not designed for.
- Use Proper Accessories. Use Elliott accessories only. Be sure accessories are properly installed and maintained.
- Check for Damaged Parts. Inspect guards and other parts before use. Check for misalignment, binding of moving parts, improper mounting, broken parts or any other conditions that may affect operation. If abnormal noise or vibration occurs, turn the tool off immediately and have the problem corrected before further use. Do not use a damaged tool. Tag damaged tools "Do Not Use" until repaired. A damaged part should be properly repaired or replaced by an Elliott service facility. For all repairs, insist on only identical replacement parts.
- Keep Hands Away from All Moving Parts.
- Do Not Overreach. Maintain Control. Keep proper footing and balance at all times.
- Stay Alert. Watch what you are doing, and use common sense. DO NOT use a tool when you are tired, distracted or under the influence of drugs, alcohol or any medication causing decreased control.
- Unplug Tool. Unplug tool when it is not in use, before changing accessories or performing recommended maintenance.
- Maintain Tool Carefully. Keep tools sharp and clean for best and safest performance.



SAFETY GUIDELINES

Follow instructions for lubrication, maintenance and changing accessories. For more information see "Maintenance" section. Periodically inspect the tool cord and extension cords for damage. Have damaged parts repaired or replaced by an Elliott service facility.

- Store Idle Tools. When not is use, store your tool in a dry, heated, secured place. For more information see "Maintenance" section.
- Maintain Labels and Nameplates. These carry important information and will assist you in ordering spare and replacement parts. If unreadable or missing, contact an Elliott service facility for a replacement.

RECEIVING & INSTALLATION

Tool Function

Elliott internal tube cleaners are mechanical devices that remove minerals, scale, soot, or other deposits from the ID of tubular heat exchangers, including but not limited to water tube or fire tube boilers. The basic cleaner consists of a drive motor, cutter head or brush head, head coupling or universal joint, and an operating hose to supply the source of power. This power source may be compressed air of 90 to 100 PSI (125 PSI Maximum), or water of 140 to 150 PSI (175 PSI Maximum) depending upon the design of the motor. The volume (CFM or GPM) will be determined by the physical diameter of the motor. The drive motor, powered by either water or air as designed, rotates and turns the cutter head or brush which has been coupled to the motor via a straight head coupling or a universal joint. As the cleaning head rotates the operator forces it through the tube or, if of a self-feed design, it pulls it's self through the length of the tube ID. Minimum radial requirements must be observed. This rotational action allows the cleaning heads to pulverize the deposits or to scrape them away. Removal of these deposits allows the tube to transfer heat in a more efficient way, increasing the efficiency of the heat exchanger it is part of.

Set-Up

Connect the drive motor to the male thread (NPT) of the operating hose. It is important to remember that any compressed air must be as dry as possible, yet be lubricated. A filter lubricator should be installed between the compressor and the operating hose for pneumatic cleaners. Elliott offers an in-line shut off valve that is connected between the motor and the operating hose. A second shut off valve should also be installed between the compressor or pump and the operating hose. The cutter head or brush head is connected to the drive motor via a threaded coupling. Make sure all threaded connections are tightened securely as the equipment will be subjected to severe vibration during operation. The internal tube cleaner is now ready for use.



RECEIVING & INSTALLATION

6070 Filter Lubricator Set-Up With Hand Valve



6070 Filter Lubricator Set-Up With Foot Valve



RECEIVING & INSTALLATION

6055 Filter Lubricator Set-Up With Hand Valve



6055 Filter Lubricator Set-Up With Foot Valve



ET Series Cleaners 9

OPERATION INSTRUCTIONS

Never let the cleaning head exit either end of the tube while it is still rotating. Operator injury or cleaner damage may result. Measure the length of the tube and mark the operating hose to avoid this.

- Insert the cleaning head and motor into the tube to be cleaned. Open the shut off valve at the compressor or pump and the operating hose will become pressurized. Regulate the lubricator to drip 15 to 30 drops per minute into the operating hose (pneumatic only) to lubricate the compressed air. An oil mist should be seen in the exhaust air. The in-line shut off valve can now be opened to activate the drive motor. This will cause the cleaning head to rotate which will start the cleaning process.
- 2. The operator feeds the operating hose into the tube allowing the cleaning head and motor to travel into the tube. Some cleaning heads are a self-feeding design and will pull themselves through the tube. The operator must control the rate of advancement of both types of cleaning heads. Too fast a rate of feed will cause the cleaner to miss sections of deposit or possibly load up with deposit. Too slow of a feed rate will allow the cleaning heads to rotate in a clean section of tube. Both conditions can lead to cleaner damage or tube damage. The operator must determine the optimum feed rate based on the type of cleaning equipment being used as well as the amount and type of deposit encountered. Listening to the pitch of the motor and the sound of the cleaning head in the tube is one way to determine if the cleaner is operating in a clean section of tube or in a dirty section of tube. Each will have a distinct sound.

Drill Pipe Recommendation Chart

Size	Weight	Tube Joint ID	Tube ID	Connection	Spring Head	Swing Arm Head	Motor	Operating Hose
2-3/8"	6.65#	1.750"	1.815"	2-3/8"IF/NC26	-	ET1840	ET3178	85HD075-XX
2-7/8"	10.40#	1.500"	2.151"	2-7/8" HTPAC	ETSRA1470	ET1470	ET3150	85HD050-XX
2-7/8"	10.40#	1.500"	2.151"	NC26 2-3/8 IFSH	ETSRA1470	ET1470	ET3150	85HD050-XX
2-7/8"	10.40#	1.750"	2.151"	HT-26	ETSRA1470	ET1470	ET3150	85HD050-XX
2-7/8"	10.40#	1.975"	2.151"	2-3/8HTSLH90	ETTO	C13PY*	ET3200	85HD075-XX
2-7/8"	10.40#	2.000"	2.151"	2-7/8"IF NC31	ETTO	C13PY*	ET3200	85HD075-XX
2-7/8"	10.40#	2.125"	2.151"	2-7/8"IF NC31	ETTO	C13PY*	ET3200	85HD075-XX
2-7/8"	10.40#	2.156"	2.151"	2-7/8"AOH	ETTO	C13PY*	ET3200	85HD075-XX
3-1/2"	13.30#	2.563"	2.602"	XT-38	ETSL3370A	ET3370A	ET3250	85HD100-XX
3-1/2"	13.30#	2.563"	2.764"	3-1/2"IF NC38	ETSL3370A	ET3370A	ET3250	85HD100-XX
3-1/2"	13.30#	2.563"	2.764"	3-1/2"HT-38	ETSL3370A	ET3370A	ET3250	85HD100-XX
3-1/2"	13.30#	2.563"	2.764"	3-1/2"XT-38	ETSL3370A	ET3370A	ET3250	85HD100-XX
3-1/2"	13.30#	2.688"	2.764"	3-1/2"IF NC38	ETSL3370A	ET3370A	ET3250	85HD100-XX
3-1/2"	15.50#	2.563"	2.602"	3-1/2"IF NC38	ETSL3370A	ET3370A	ET3250	85HD100-XX
3-1/2"	15.50#	2.563"	2.602"	NC-38	ETSL3370A	ET3370A	ET3250	85HD100-XX
4"	14.00#	2.688"	3.340"	XT-39	ETSL3270ALA	ET3270ALA	ET3250	85HD100-XX
4"	14.00#	2.688"	3.340"	4" FH NC40`	ETSL3270ALA	ET3270ALA	ET3250	85HD100-XX
4"	14.00#	2.688"	3.340"	HT-40	ETSL3270ALA	ET3270ALA	ET3250	85HD100-XX
4"	14.00#	2.688"	3.340"	XT-M 38	ETSL3270ALA	ET3270ALA	ET3250	85HD100-XX
4"	14.00#	2.813"	3.340"	XT-39	ETSL3270ALA	ET3270ALA	ET3250	85HD100-XX
4"	15.70#	2.688"	3.340"	XT-39	ETSL3270ALA	ET3270ALA	ET3250	85HD100-XX
4-1/2"	16.60#	3.000"	3.826"	4-1/2"XH NC46	ETSL970LA	ET970LA	ET3275	85HD100-XX
4-1/2"	20.00#	3.000"	3.640"	4-1/2"XH NC46	ETSL970LA	ET970LA	ET3275	85HD100-XX
5"	19.50#	3.250"	4.276"	4-1/2"IF NC50	ETSL770SA	ET770SA	ET3275	85HD100-XX
5"	19.50#	3.750"	4.276"	XT-50	ETSL770SA	ET770SA	ET3275	85HD100-XX
5"	25.60#	3.250"	4.000"	4-1/2"IF NC50	ETSL770SA	ET770SA	ET3275	85HD100-XX
5-1/2"	21.90#	3.500"	4.778"	5-1/2" FH	ETSL770SA	ET770SA	ET3275	85HD100-XX
5-1/2"	24.70#	3.000"	4.670"	5-1/2" FH	ETSL770SA	ET770SA	ET3275	85HD100-XX
5-7/8"	23.40#	4.250"	5.153"	XT-57	ETSL770SA	ET770SA	ET3275	85HD100-XX
5-7/8"	26.30#	4.250"	5.045"	XT-57	ETSL770SA	ET770SA	ET3275	85HD100-XX
5-7/8"	28.70#	4.250"	4.875"	CTM57	ETSL770SA	ET770SA	ET3275	85HD100-XX

* Will be supplied with a barrel style cleaning head Replace "XX" with "25" or "50" to indicate 25' or 50' length.

Tubing Pipe Recommendation Chart

Size	Weight	Drift	Connection	Head	Motor	Operating Hose
3/4"	1.50#	.648"	3/4"CS	D6701840	D67000-18	85HS012-XX
1"	2.25#	.848"	1"CS	ET2940	ET29A	85HS025-XX
1-1/4"	3.02#	1.184"	1-1/4"CS	ET12240	ET31	85HS037-XX
1-1/2"	3.64#	1.406"	1-1/2"CS	ETTC14	ET3150	85HD050-XX
2-1/16"	3.25#	1.657"	2-1/16"CS	ETTC11	ET3162	85HD075-XX
2-1/16"	3.25#	1.657"	2-1/16"GST	ETTC11	ET3162	85HD075-XX
2-3/8"	4.70#	1.901"	2-3/8"CS	ETTC16PY	ET3200	85HD075-XX
2-3/8"	4.70#	1.901"	2-3/8"EUE8rd	ETTC16PY	ET3200	85HD075-XX
2-3/8"	5.95#	1.773"	2-3/8"PH6	ETTC17PY	ET3178	85HD075-XX
2-7/8"	6.50#	2.347"	2-7/8"CS	ETP9PY*	ET3250*	85HD100-XX
2-7/8"	6.50#	2.347"	2-7/8"EUE8rd	ETP9PY*	ET3250*	85HD100-XX
2-7/8"	7.90#	2.229"	2-7/8"PH6	ETP15PY	ET3225	85HD075-XX
3-1/2"	9.30#	2.867"	3-1/2"CS	ETP6APY	ET3275	85HD100-XX
3-1/2"	10.30#	2.797	3-1/2"CS	ETP6APY	ET3275	85HD100-XX
3-1/2"	9.30#	2.867	3-1/2"EUE8rd	ETP6APY	ET3275	85HD100-XX
3-1/2"	12.95#	2.625"	3-1/2"PH6	ETP7SPY	ET3275	85HD100-XX
4-1/2"	12.75#	3.833"	4-1/2"CS	ETP3SPY	ET3350	85HD100-XX
4-1/2"	12.60#	3.833"	4-1/2"LT&C	ETP3SPY	ET3350	85HD100-XX
4-1/2"	12.75#	3.833"	4-1/2"EUE8rd	ETP3SPY	ET3350	85HD100-XX
4-1/2"	15.50#	3.701"	4-1/2"PH6	ETP3SPY	ET3350	85HD100-XX
4-1/2"	19.20#	3.515"	4-1/2"PH6	ETP4SPY	ET3350	85HD100-XX

1100 Series Air Motor



	Motor OD	Motor OD	Motor OD	Motor OD	Mator OD	Matar OD	Motor OD	Motor OD		1	2	3	4	5	6	7	8	9	10	11		
Motor		Tube ID	Body	Front Bearing	Ball Thrust Bearing	Thrust Washer	Front Plate	Rotor	Blade (4 Req.)	Shell	Rear Plate	Rear Bearing	Machine Coupling	Hose Conn.	Rotor Thread							
112200-2812	2-13/16"	4.000" - 4.670"	112202-2812	112250	P112254	112237	112207	112205	D45108	D45106	112227	112209	D45131	1" NPT	7/8"-9 UNC							
112600-3750	3-3/4"	4.875" - 5.153"	112602-3750	112650	112554	112637	112607	112605	D45708	D45706	112627	112609	D45731	1" NPT	1-1/8"-12 UNF							

ET 3000 Series Air Motor



	Motor Tube	Motor	Tuba	1	2	3	4	5	6	7		
Motor	OD	ID	Case Assembly	Thrust Plate	Rotor	Blade	Cylinder Assembly	Rear Cap & Bearing	Machine Coupling	Conn.	Rotor Thread	
ET3150	1-3/8"	1-1/2"	ET31501	ET1707	ET31505	ET1806 (4)	ET31502	ET31503	ET31504	1/2" NPT	9/16"-12UNC	
ET3162	1-1/2"	1-5/8"	ET31621	ET1807	ET31625	ET1806 (4)	ET31622	ET31623	ET31624	3/4" NPT	5/8"-11UNC	
ET3178	1-5/8"	1-3/4"	ET31781	ET31787	ET31785	ET1806 (4)	ET31782	ET31783	ET31784	3/4" NPT	5/8"-11UNC	
ET3200	1-7/8"	2"	ET32001	ET2307	ET32005	ET2306 (4)	ET32002	ET32003	ET32004	3/4" NPT	5/8"-11UNC	
ET3225	2-1/8"	2-1/4"	ET32251	ET1507	ET32255	ET21506 (5)	ET32252	ET32253	ET32254	3/4" NPT	3/4"-10UNC	
ET3250	2-5/16"	2-1/2"	ET32501	ET21407	ET32505	ET21406 (5)	ET32502	ET32503	ET32504	1" NPT	7/8"-9UNC	
ET3275	2-5/8"	2-3/4"	ET32751	ET21307	ET32755	ET21306 (5)	ET32752	ET32753	ET32754	1" NPT	7/8"-9UNC	
ET3350	3-5/16"	3-5/8"	ET33501	ET20707	ET33505	ET20706 (5)	ET33502	ET33503	ET33504	1" NPT	1-1/8"-12UNF	

ET Midget Series Air Motor



			1	2	3	4	5		
Motor	Motor OD	Tube ID	Body	Rotor	Blade (4-Req.)	Rear Head	Machine Coupling	Hose Conn.	Rotor Thread
D67000-18	0.562"	0.610" - 0.729"	D67001-18	D67005	D67008	NA	D67031	1/8" NPT	#12-24
ET29A	13/16	7/8"	ET2901A	ET2605	ET2606	ET2903A	ET2904	1/4" NPT	3/8"-24UNF
ET31	1-1/32"	1-1/8"	ET3101	ET3105	ET3106	ET3103	ET3104	3/8" NPT	7/16"-20UNF

ET Series Single Unit Cutter Heads



		2	3	4	5	6	Motor Chaft
Cutter	Tube ID	Cutter Pin	Cone Cutter	Straight Cutter	Adapter	Universal Coupling	Jaw Tap
ET2940	7/8" - 27/32"	ET2944	ET2947	NA	ET2943	ET2651	3/8"-24UNF
ET3140	1-1/8"	ET3144A	ET2837	NA	NA	ET6651	7/16"-20UNF
ET12240	1-1/4" - 1-1/2"	ET2544S	ET947	NA	NA	ET3151	7/16"-20UNF
ET1740	1-1/2"	ET2844	ET1097	ET1088	ET1743	ET31551	9/16"-18UNF

ET Series Spring-Loaded Cutter Heads





		Clocod		1	2	3	4	5	6	7	8	- "	
Cutter	Tube ID	Closed	Expand To	Long Cutter Pin	Cone Cutter	Long Arm	Arm Pin	Spider	Pin Lock	Spring	Coupling	Coupling Thread Tap	# Of Arms
ETSRA1470	1-1/2"	1-3/8"	2-3/8"	ET1474 (3)	ET2947 (3)	ET1472 (3)	ET1475 (3)	ETSRA1471	ETSRA1476	ETSRA1479	ETSRA1473	9/16"-12UNC	3
ETSL4470	2-5/16"	2"	3-3/8"	ET4474 (3)	ETC19 (3)	ET4472 (3)	ET4475 (3)	ET4471	ETSL4476	37-917	ETSL4473	5/8"-11UNC	3
ETSL4470A	2-5/16"	2"	3-3/8"	ET4474 (3)	ETC19 (3)	ET4472 (3)	ET4475 (3)	ET4471	ETSL4476	37-917	ET4473A	3/4"-10UNC	3
ETSL3370A	2-3/4"	2-1/4"	3-5/8"	ET3374 (3)	ET637 (3)	ET3372 (3)	ET3375 (3)	ET3371	ETSL3376	37-10529	ETSL3273	7/8"-9UNC	3
ETSL3270ALA	3"	2-1/2"	4"	ET3474 (4)	ET2837 (4)	ET3472 (4)	ET3275AP (4)	ET3271	ETSL3276	37-10529	ETSL3273	7/8"-9UNC	4
ETSL970LA	3-1/4"	2-3/4"	4-7/8"	ET974 (4)	ET637 (4)	ET972 (4)	ET975 (4)	ET971	ETSL976	37-10529	ETSL773	7/8"-9UNC	4
ETSL770SA	3-1/4"	2-3/4"	5-1/2"	ET774S (4)	ET747 (4)	ET772S (4)	ET775 (4)	ET771S	ETSL776S	37-10529	ETSL773	7/8"-9UNC	4
ETSL770SB	3-1/4"	2-3/4"	5-1/2"	ET774S (4)	ET747 (4)	ET772S (4)	ET775 (4)	ET771S	ETSL776S	37-10529	ETSL773B	1-1/8"-12UNF	4

ET Series Swing Arm Cutter Heads





		Clocod	Closed		1	2	3	4	5	6	7		"
Cutter	Tube ID	Closed	Expand To	Long Cutter Pin	Cone Cutter	Long Arm	Spider	Pin Lock	Arm Pin	Head Coupling	Coupling Tap	# Of Arms	
ET1470	1.815" - 2.151"	1.375"	2.375"	ET1474 (3)	ET2947 (3)	ET1472 (3)	ET1471	ET1476	ET1475 (3)	ET1473	9/16"-12 UNC	3	
ET4470	2-5/16"	2"	3-3/8"	ET4474 (3)	ETC19 (3)	ET4472 (3)	ET4471	ET4476B	ET4475 (3)	ET2383	5/8"-11UNC	3	
ET4470A	2-5/16"	2"	3-3/8"	ET4474 (3)	ETC19 (3)	ET4472 (3)	ET4471	ET4476B	ET4475 (3)	ET2383B	3/4"-10UNC	3	
ET3370A	2-3/4"	2-1/4"	3-5/8"	ET3374 (3)	ET637 (3)	ET3372 (3)	ET3371	ET3376	ET3375 (3)	ET2043	7/8"-9UNC	3	
ET3270ALA	3"	2-1/2"	4"	ET3474 (4)	ET2837 (4)	ET3472 (4)	ET3271	ET3276	ET3275AP (4)	ET2043	7/8"-9UNC	4	
ET970LA	3-1/4"	2-3/4"	4-7/8"	ET974 (4)	ET637 (4)	ET972 (4)	ET971	ET976	ET975 (4)	ET543	7/8"-9UNC	4	
ET770SA	4-3/4"	2-3/4"	5-1/2"	ET774S (4)	ET747 (4)	ET772S (4)	ET771S	ET776S	ET775 (4)	ET543	7/8"-9UNC	4	
ET770SB	4-3/4"	2-3/4"	5-1/2"	ET774S (4)	ET747 (4)	ET772S (4)	ET771S	ET776S	ET775 (4)	ET543B	1-1/8"-12UNF	4	

ETP Series Cutter Heads



			Expand To	1	2	3	4	5	6	
Cutter	Tube ID	Closed		Cage	Cone Cutter	Straight Cutter	Cutter Pin	Pin Plate	Head Coupling	Coupling Tap
ETP15PY	2-1/4"	2-1/16"	2-7/16"	ETP1591PY	ET2487 (3)	ET2488 (6)	ET2484PY	ETP1592	ET183	3/4"-10UNC
ETP15SPY	2-1/4"	2-1/16"	2-7/16"	ETP1591SPY	ET2487 (3)	ET2488 (9)	ET2484SPY	ETP1592	ET183	3/4"-10UNC
ETP9PY	2-1/2"	2-1/4"	2-13/16"	ETP991PY	ET1587 (3)	ET1588 (6)	ET1584PY	ETP992	ET21483	7/8"-9UNC
ETP7SPY	2-3/4"	2-9/16"	2-15/16"	ETP791S	ET1087 (3)	ET1088 (9)	ET184S	ETP792	ET983S	7/8"-9UNC
ETP6APY	3"	2-11/16"	3-1/8"	ETP691AY	ET1087 (3)	ET1088 (6)	ET184E	ETP692A	ET983S	7/8"-9UNC
ETP4SPY	3-1/2"	3-3/16"	3-13/16"	ETP491S	ET787 (3)	ET788 (9)	ETP884	ETP492	ET883D	1-1/8"-12UNF
ETP3SPY	3-3/4"	3-9/16"	4-3/16"	ETP391S	ET887B (3)	ET888B (9)	ETP884	ETP392	ET883D	1-1/8"-12UNF

ETTC Series Cutter Heads



				1	2	3	4	5	6	0
Cutter	Tube ID	Closed	Expand To	Cage	Cone Cutter	Straight Cutter	Short Cutter Pin	Long Cutter Pin	Head Coupling	Coupling Thread Tap
ETTC14	1-1/2"	1-3/8"	1-23/32"	ET1781	ET1787	ET1788 (2)	ET1884	ET1584	ET1783	9/16"-12UNC
ETTC11	1-3/4"	1-5/8"	2"	ET1881	ET1587	ET1588 (2)	ET1884	ET1584	ET1883	5/8"-11UNC
ETTC17PY	1-7/8"	1-11/16"	2"	ET2281TC17PY	ET2287 (3)	ET2288 (6)	NA	ET1584PY (3)	ET2383	5/8"-11UNC
ETTC16PY	2"	1-13/16"	2-3/16"	ET2381PY	ET1787 (3)	ET1788 (6)	NA	ET1584PY (3)	ET2383	5/8"-11UNC
ETTC13PY	2-1/8"	1-15/16"	2-5/16"	ET381APY	ET1787 (3)	ET1788 (6)	NA	ET1584PY (3)	ET2383	5/8"-11UNC

MAINTENANCE INSTRUCTIONS

To reduce the risk of injury, always unplug your machine before performing any maintenance. Never disassemble the machine or try to do any rewiring on the machine's electrical system. Contact Elliott for all repairs.

The proper performance and service life of every machine depends on how well it is maintained. The following should become a regular routine of operations.

- 1. Before using any tube cleaner, inspect all components for any signs of wear or damage.
 - a.) Replace any components that are worn or damaged.
 - b.) Lubricate the motor with clean, lightweight machine oil and rotate the rotor by hand. If any drag or rubbing is felt, or if the rotor hangs up at any point, the motor should be disassembled for further inspection.
- 2. After each use, and especially if the equipment will not be used for a prolonged period of time, lubricate the internal components of the motor. If possible, store the cleaner components in a container of clean oil. Excess lubrication will not damage the motors or the cleaning heads.



WARRANTY

Should any part, of Seller's own manufacture, prove to have been defective in material or workmanship when shipped (as determined by Seller), Seller warrants that it will, at its sole option, repair or replace said part f.o.b., point of manufacture, provided that Buyer notifies, in writing, of such defect within twelve (12) months from date of shipment from the manufacturing plant.

On request of Seller, the part claimed to be defective will be returned, transportation, insurance, taxes and duties prepaid, to the factory where made, for inspection. Any item, which has been purchased by Seller, is warranted only to the extent of the original manufacturer's warranty to Seller. Seller shall not be liable for any damages or delays caused by defective material or workmanship.

No allowance will be made for repairs or alterations made by others without Seller's written consent or approval. If repairs or alterations are attempted without Seller's consent, Seller's warranty is void.

THE WARRANTIES PROVIDED IN THE OBLIGATIONS AND LIABILITIES OF SELLER HEREUNDER, AND THE RIGHTS AND REMEDIES OF BUYER HEREUNDER ARE EXCLUSIVE AND IN SUBSTITUTION FOR, AND BUYER HEREBY WAIVES ALL OTHER WARRANTIES, GUARANTEES, OBLIGATIONS, CLAIMS FOR LIABILITIES, RIGHTS AND REMEDIES, EXPRESS OR IMPLIED, ARISING BY LAW OR OTHERWISE, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTY FOR MERCHANTABILITY AND FITNESS FOR PURPOSE.

Seller's total liability is limited to the lower of the cost of repair or replacement.

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