TASK FORCE TIPS®
FIRE FIGHTING EQUIPMENT

Master Force

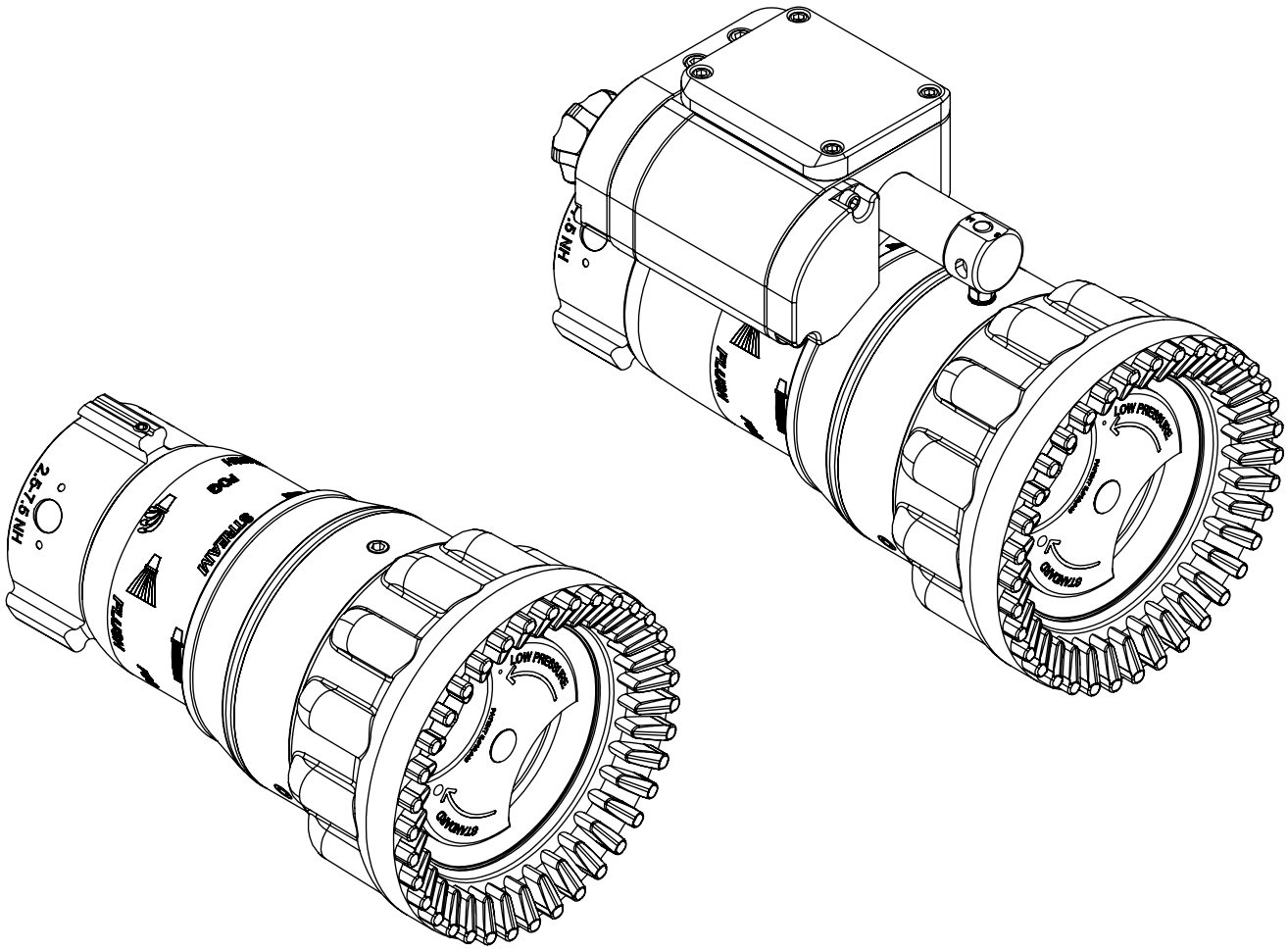
Automatic Dual Pressure Nozzles

INSTRUCTION FOR SAFE OPERATION AND MAINTENANCE

⚠WARNING **Understand manual before use. Operation of this device without understanding the manual and receiving proper training is a misuse of this equipment. Obtain safety information at tft.com/serial-number.**

This equipment is intended for use by trained and qualified emergency services personnel for firefighting. All personnel using this equipment shall have completed a course of education approved by the Authority Having Jurisdiction (AHJ).

This instruction manual is intended to familiarize firefighters and maintenance personnel with the operation, servicing, and safety procedures associated with this product. This manual should be kept available to all operating and maintenance personnel.



TASK FORCE TIPS LLC
MADE IN USA · tft.com

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⚠ DANGER

PERSONAL RESPONSIBILITY CODE

The member companies of FEMSA that provide emergency response equipment and services want responders to know and understand the following:

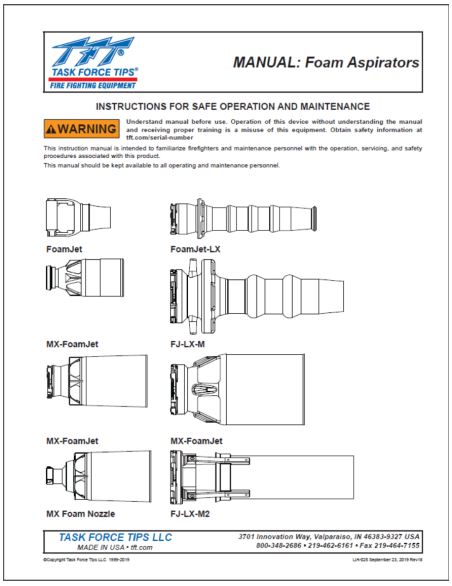
1. Firefighting and Emergency Response are inherently dangerous activities requiring proper training in their hazards and the use of extreme caution at all times.
2. It is your responsibility to read and understand any user's instructions, including purpose and limitations, provided with any piece of equipment you may be called upon to use.
3. It is your responsibility to know that you have been properly trained in Firefighting and /or Emergency Response and in the use, precautions, and care of any equipment you may be called upon to use.
4. It is your responsibility to be in proper physical condition and to maintain the personal skill level required to operate any equipment you may be called upon to use.
5. It is your responsibility to know that your equipment is in operable condition and has been maintained in accordance with the manufacturer's instructions.
6. Failure to follow these guidelines may result in death, burns or other severe injury.

FEMSA

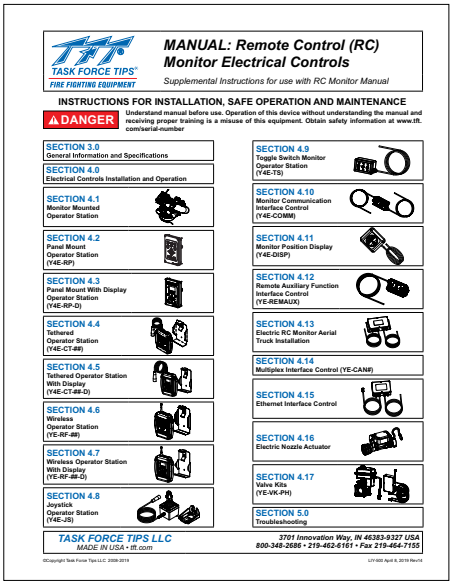
Fire and Emergency Manufacturers and Service Association
P.O. Box 147, Lynnfield, MA 01940 • www.FEMSA.org

SUPPORTING MATERIALS

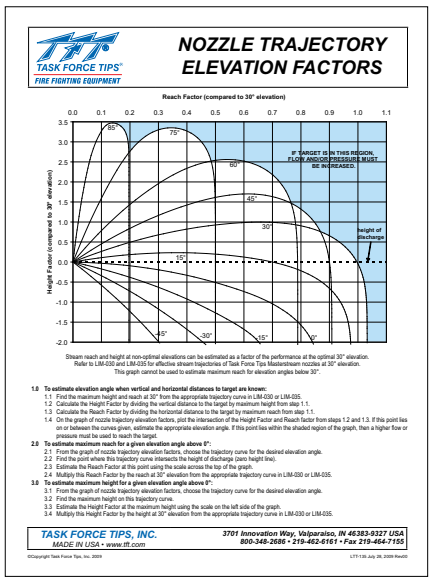
The following documents contain supporting safety and operating information pertaining to the equipment described in this manual.



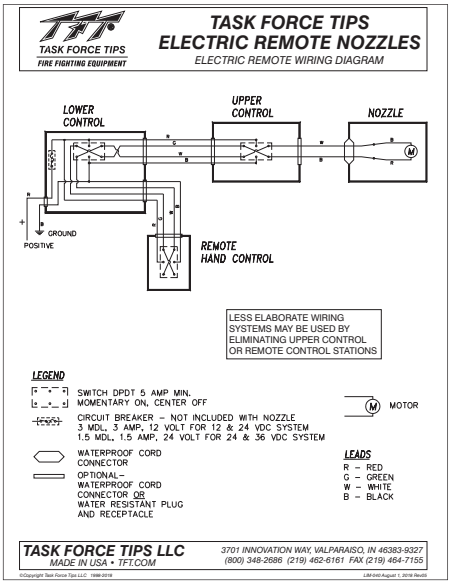
LIA-025 Foam Aspirator Manual



LIY-500 Remote Control (RC) Monitor Electrical Controls



LTT-135 Nozzle Trajectory Elevation Factors



LIM-040 ER Nozzle Wiring Diagram

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1.0 MEANING OF SAFETY SIGNAL WORDS

A safety related message is identified by a safety alert symbol and a signal word to indicate the level of risk involved with a particular hazard. Per ANSI Z535.6, the definitions of the four signal words are as follows:

DANGER **DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.**

WARNING **WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.**

CAUTION **CAUTION indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.**

NOTICE **NOTICE is used to address practices not related to physical injury.**

2.0 SAFETY

DANGER **An inadequate supply of pressure and/or flow will cause an ineffective stream and can result in injury or death. Choose operating conditions to deliver adequate fire suppression. See flow graphs.**

WARNING **This equipment is intended for use by trained personnel for firefighting. Use of this equipment for other purposes may involve hazards not addressed by this manual. Seek appropriate guidance and training to reduce risk of injury.**

WARNING **The stream exiting a nozzle is very powerful and capable of causing injury and property damage. Make sure the nozzle is securely attached and pointing in a safe direction before water is turned on. Do not direct water stream to cause injury or damage to persons or property.**

WARNING **Inadequately supported nozzle reaction force can result in injury or death. The mounting must be capable of supporting the maximum nozzle reaction force as stated in the nozzle's manual.**

WARNING **Equipment may be damaged if frozen while containing significant amounts of water. Such damage may be difficult to detect visually. Subsequent pressurization can lead to injury or death. Any time the equipment is subject to possible damage due to freezing, it must be tested and approved for use by qualified personnel before being considered safe for use.**

WARNING **Application of water or foam solutions on energized electrical equipment could cause electrocution. Serious injury or death could result. Assume circuits are energized until confirmed to be de-energized. Do not apply water or foam to energized electrical equipment.**

CAUTION **Mismatched or damaged waterway connections may cause equipment to leak or uncouple under pressure. Failure could result in injury. Equipment must be mated to matched connections.**

CAUTION **Dissimilar metals coupled together can cause galvanic corrosion that can result in the inability to uncouple the connection, or complete loss of engagement over time. Failure could cause injury. Per NFPA 1962, if dissimilar metals are left coupled together, an anti-corrosive lubricant should be applied to the connection and the coupling should be disconnected and inspected at least quarterly.**

NOTICE **To prevent mechanical damage, do not drop or throw equipment.**

3.0 GENERAL INFORMATION

The Task Force Tips Master Force series automatic nozzles operate by sensing the pressure at the nozzle inlet and adjusting the discharge opening to maintain a constant pressure throughout the flow range of the nozzle. The Master Force operates at either a standard or low pressure as selected by the nozzle operator.

The Master Force are deluge nozzles with clean, far reaching straight stream capability. Stream pattern can be varied from straight stream to a dense, wide fog pattern. Turning the shaper past the wide fog setting allows flushing the nozzle of debris without shutting down flow. The Master Force nozzles are intended for use on fixed or portable monitors.

3.1 VARIOUS MODELS AND TERMS

Master-Force nozzles are available in several different models and inlet connections. Basic body styles are shown below.

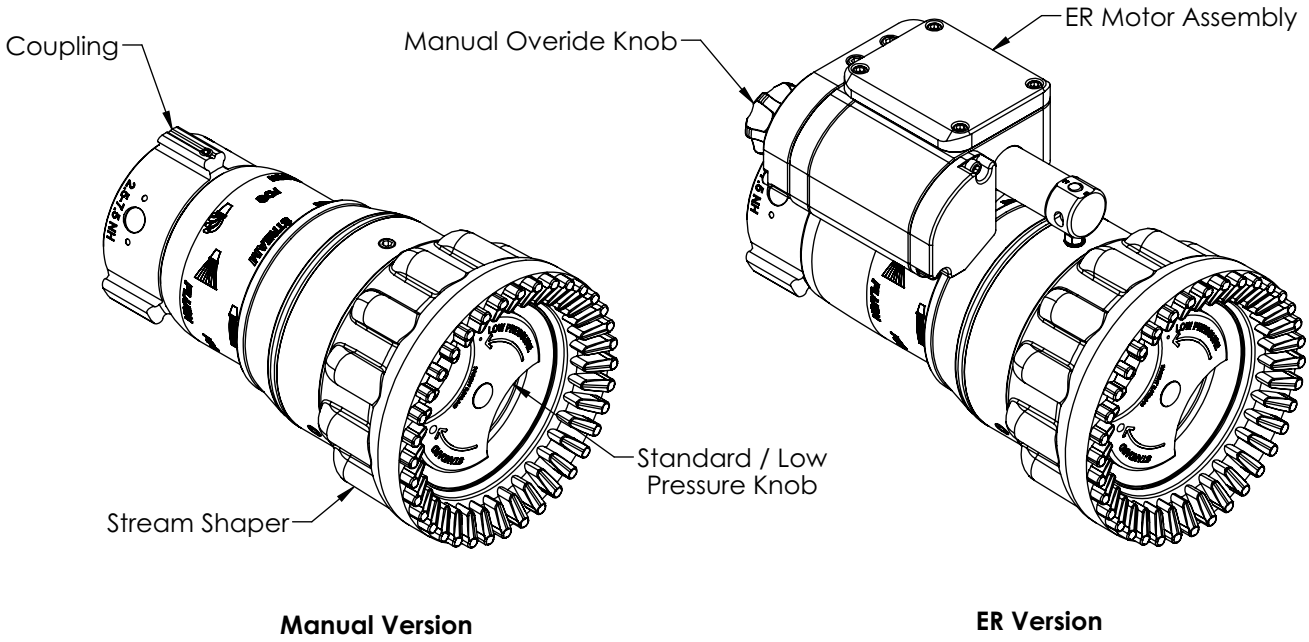


Figure 3.1

3.2 MECHANICAL SPECIFICATIONS

	Manual Version	ER Version
Weight	9.5 lbs (4.3kg)	14.2 lbs (6.4kg)
Flow Range	300 - 800 GPM (1100 - 3000 L/min)	
Operating Pressure (Standard Mode)	100 psi (7 bar)	
Operating Pressure (Low Mode)	55 psi (3.7 bar)	
Maximum fog angle	103°	
Operating temperature range of fluid	33 to 120°F / 1 to 50°C	
Storage temperature range	-40 to 150°F / -40 to 65°C	
Materials used	Aluminum 6000 series hard anodized MIL8625 class 3 type 2, stainless steel 300 series, nylon 6-6, nitrile rubber	

Table 3.2

3.3 ELECTRICAL SPECIFICATIONS

Nominal Operating Voltage	12 or 24 VDC
Maximum Voltage	32 VDC
Minimum Voltage - 12 Volt System	9 VDC at monitor
Minimum Voltage - 24 Volt System	18 VDC at monitor

Table 3.3

3.4 USE WITH SALT WATER

Use with salt water is permissible provided the equipment is thoroughly cleaned with fresh water after each use. The service life of the equipment may be shortened due to the effects of corrosion, and is not covered under warranty.

3.5 ELECTRIC INSTALLATION

For nozzle installation, refer to LIY-500 Remote Control (RC) Monitor Electrical Controls (shipped with TFT monitors or available at tft.com).

⚠WARNING **This device is not rated as ignition proof, explosion proof, or intrinsically safe. Use only in locations with adequate ventilation and no hazard of flammable vapor buildup.**

3.6 AUTOMATIC NOZZLE OPERATION

Automatic nozzles operate by sensing the pressure at the nozzle inlet and adjusting the discharge opening to maintain a constant pressure throughout the flow range of the nozzle. For example, when the pressure at the inlet increases, the exit area is automatically increased until the inlet pressure returns to the nominal pressure of the nozzle.

3.7 PATTERN CONTROL

TFT nozzles have full pattern control from straight stream to wide fog. Turning the stream shaper clockwise (as seen from the operating position behind the nozzle) moves the shaper to the straight stream position.

For ER versions, press and hold the FOG or STRAIGHT STREAM buttons on the nozzle controls to move the stream shaper. Release the button when the desired pattern is reached.

Since the stream trim point varies with flow, the stream should be “trimmed” after changing the flow to obtain the straightest and farthest reaching stream. To properly trim the stream, first open the pattern to narrow fog. Then close the stream to parallel to give maximum reach. Turning the shaper further forward will cause stream crossover and reduce the effective reach of the nozzle.

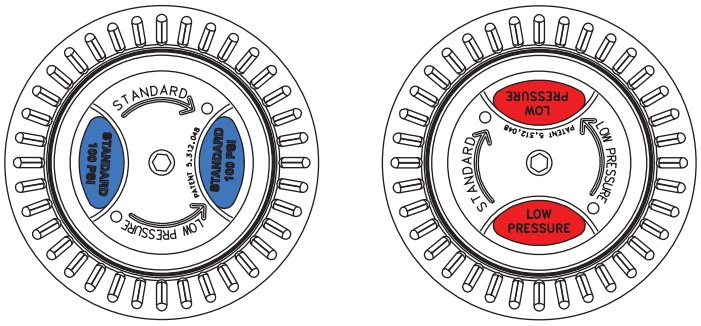
NOTICE **Turning the shaper further forward will cause stream crossover and reduce the reach of the nozzle.**

⚠CAUTION **Dents or nicks in the nozzle tip can seriously affect the stream reach or pattern, which may increase the risk of injury due to exposure. Care must be taken to avoid dents or nicks in the nozzle tip.**

3.8 STANDARD/LOW PRESSURE KNOB

For situations where 100 PSI at the nozzle is impractical, the Master Force dual pressure knob may be switched to low pressure mode. In the low pressure mode, the nozzle pressure is reduced by about 50%, while maintaining a usable stream and increasing the flow. The nozzle operator must be prepared for a change in reaction when changing modes.

To switch to the low pressure mode, shut off water flow to the nozzle and turn knob at front of nozzle counterclockwise (when viewed from front). Nozzle will now operate at reduced pressure. To return to 100 PSI operation, shut off water flow to the nozzle and turn knob clockwise.



Knob In Standard Operating Mode

Knob In Low Pressure Mode

Figure 3.8

4.0 FLUSHING DEBRIS

Small debris may get caught inside the nozzle. This trapped material will cause poor stream quality, shortened reach and reduced flow. To remove this trapped debris, the manual nozzle can be flushed as follows:

1. While still flowing water, turn the SHAPER counterclockwise past the full fog position, allowing debris to pass through. Increased resistance will be felt on the SHAPER as the nozzle goes into flush.
2. Rotate the SHAPER clockwise and out of flush to continue normal operation.

Electric Remote Nozzles are flushed from the control panel by pushing the FOG button twice. Smart Stream controls both stream shape and flush. Requiring a second button push avoids unintentional flush.

To Flush an Electric Remote Nozzle:

1. While flowing water, push and hold FOG to move the nozzle to full fog.
2. Push the FOG button a second time to move the nozzle to flush by increasing the opening size further than the largest flow position.
3. Push the STRAIGHT STREAM button to return the nozzle to normal flow and adjust the stream shape as desired.

During flush the nozzle reaction will decrease as the pattern becomes wider and the pressure drops. The nozzle operator must be prepared for an increase of nozzle reaction when returning the nozzle from the flush position to maintain stable operation of portable monitors.

⚠WARNING **Large amounts or pieces of debris may be unflushable and can reduce the flow of the nozzle resulting in an ineffective flow. In the event of a blockage, it may be necessary to retreat to a safe area, uncouple the nozzle and remove debris.**

5.0 USE WITH FOAM

The nozzle may be used with foam solutions. Refer to fire service training by the Authority Having Jurisdiction (AHJ) for the proper use of foam.

⚠WARNING **For Class B fires, lack of foam or interruption in the foam stream can cause a break in the foam blanket and greatly increase the risk of injury or death. Follow procedures established by the AHJ for the specific fuel and conditions.**

⚠WARNING **Improper use of foam or using the wrong type of foam can result in illness, injury, or damage to the environment. Follow foam manufacturer's instructions and fire service training as directed by the AHJ.**

5.1 FOAM ASPIRATING ATTACHMENT

A low expansion aspirating attachment may be used with nozzles to increase the expansion ratio. These foam tubes attach and detach quickly from the nozzle. As expansion ratio is increased, the reach of the nozzle will decrease due to the greater amount of bubbles in the stream and their ability to penetrate the air. Generally, the straight stream reach with foam is approximately 10% less than with water only. Actual results will vary based on brand of foam, hardness of water, temperature, etc. For specific information, see LIA-025 (MANUAL: Foam Attachments for TFT Nozzles).

6.0 FLOW CHARACTERISTICS

6.1 FLOW CHART

Within its flow range, the Master Force automatic nozzle operates at the nominal pressure of 100 PSI (7 BAR, 700 KPA). The following chart shows the typical performance of this nozzle.

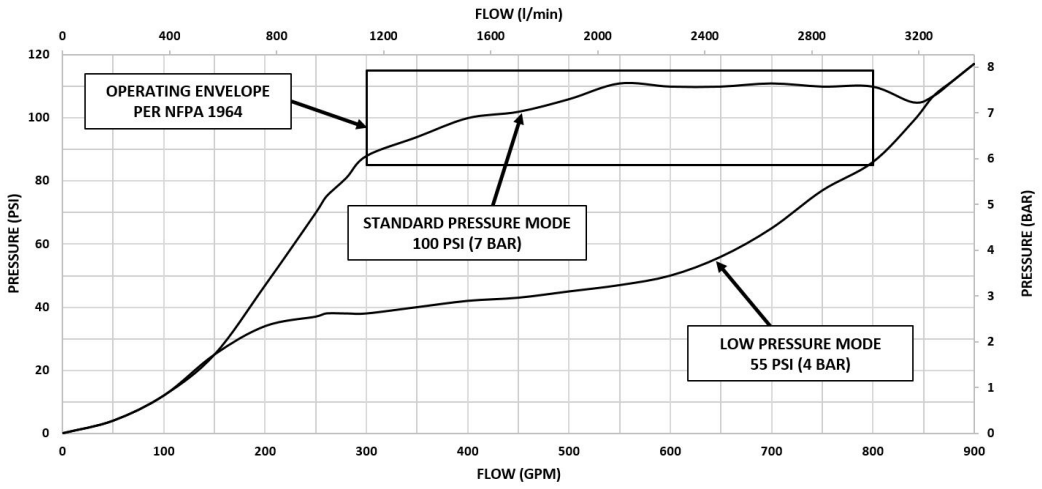


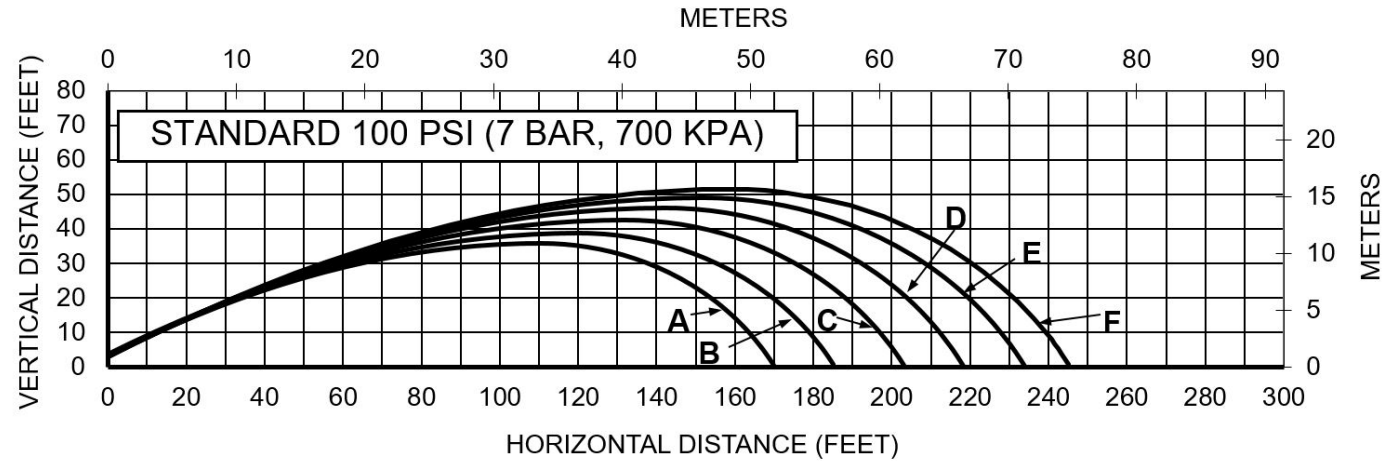
Figure 6.1A

6.2 REACH AND TRAJECTORY

Tables and graphs in this section give the stream trajectory for the Master-Force nozzle at various flows.

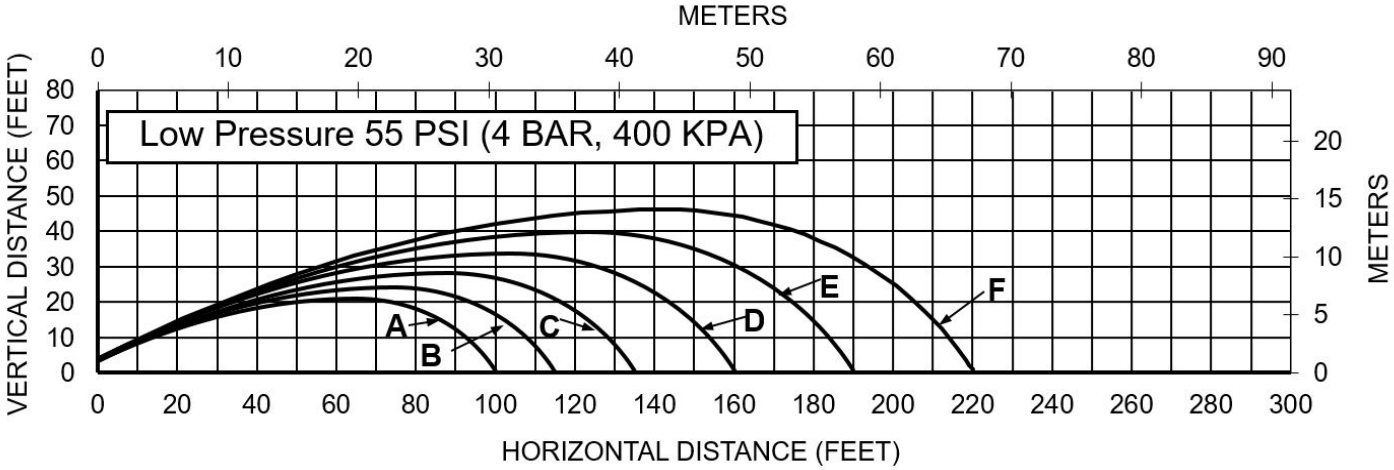
Notes on trajectory graphs:

- Graphs show approximate effective stream trajectory at 30 degrees elevation in no wind conditions. Distance to last water drops approximately 10% farther.
- To estimate trajectories at elevations other than 30 degrees, refer to document LTT-135, available at tft.com.
- Trajectories shown are for water. The addition of foam is expected to decrease the reach by 10%.
- Tail or head winds of 20 MPH (30 KPH) may increase or decrease the range approximately 30%.



CURVE	GPM FLOW	LBS REACTION
A	300	160
B	400	210
C	500	260
D	600	320
E	700	370
F	800	420

CURVE	L/min FLOW	KGF REACTION
A	1100	70
B	1500	95
C	2000	120
D	2300	145
E	2700	170
F	3000	190



CURVE	GPM FLOW	LBS REACTION
A	300	60
B	400	140
C	500	185
D	600	225
E	700	300
F	800	385

CURVE	L/min FLOW	KGF REACTION
A	1100	30
B	1500	65
C	2000	85
D	2300	100
E	2700	140
F	3000	175

7.0 WARRANTY

Task Force Tips LLC, 3701 Innovation Way, Valparaiso, Indiana 46383-9327 USA (“TFT”) warrants to the original purchaser of its products (“equipment”), and to anyone to whom it is transferred, that the equipment shall be free from defects in material and workmanship during the five (5) year period from the date of purchase. TFT’s obligation under this warranty is specifically limited to replacing or repairing the equipment (or its parts) which are shown by TFT’s examination to be in a defective condition attributable to TFT. To qualify for this limited warranty, the claimant must return the equipment to TFT, at 3701 Innovation Way, Valparaiso, Indiana 46383-9327 USA, within a reasonable time after discovery of the defect. TFT will examine the equipment. If TFT determines that there is a defect attributable to it, TFT will correct the problem within a reasonable time. If the equipment is covered by this limited warranty, TFT will assume the expenses of repair.

If any defect attributable to TFT under this limited warranty cannot be reasonably cured by repair or replacement, TFT may elect to refund the purchase price of the equipment, less reasonable depreciation, in complete discharge of its obligations under this limited warranty. If TFT makes this election, claimant shall return the equipment to TFT free and clear of any liens and encumbrances.

This is a limited warranty. The original purchaser of the equipment, any person to whom it is transferred, and any person who is an intended or unintended beneficiary of the equipment, shall not be entitled to recover from TFT any consequential or incidental damages for injury to person and/or property resulting from any defective equipment manufactured or assembled by TFT.

It is agreed and understood that the price stated for the equipment is in part consideration for limiting TFT’s liability. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above may not apply to you.

TFT shall have no obligation under this limited warranty if the equipment is, or has been, misused or neglected (including failure to provide reasonable maintenance) or if there have been accidents to the equipment or if it has been repaired or altered by someone else.

THIS IS A LIMITED EXPRESS WARRANTY ONLY. TFT EXPRESSLY DISCLAIMS WITH RESPECT TO THE EQUIPMENT ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND ALL IMPLIED WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE. THERE IS NO WARRANTY OF ANY NATURE MADE BY TFT BEYOND THAT STATED IN THIS DOCUMENT.

This limited warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

8.0 MAINTENANCE

TFT nozzles are designed and manufactured to be damage resistant and require minimal maintenance. However, as the primary firefighting tool upon which your life depends, it should be treated accordingly. Do not drop or throw equipment.

When reassembling the automatic nozzles after repairs or for preventive maintenance, coat the seal on the piston, the inner bore of the cylinder and the shaft slide surface with a waterproof lubricant such as Molykote #112 Silicone Grease. Lubrication is required to assure continued smooth operation. The frequency of lubrication will depend on frequency of usage and storage conditions. Nozzles must be checked regularly to assure proper operation.

Contact factory for parts lists and exploded views for particular models. Each nozzle is identified by a serial number located on the nozzle's stream shaper.

8.1 FIELD LUBRICATION

All Task Force Tips nozzles are factory lubricated with high quality silicone grease. This lubricant has excellent wash out resistance, providing long term performance in firefighting nozzles. If your agency has unusually hard or sandy water, the moving parts of the nozzle may be affected. Foam agents and water additives contain soaps and chemicals that may break down the factory lubrication.

The moving parts of the nozzle should be checked on a regular basis for smooth and free operation, and for signs of damage. IF THE NOZZLE IS OPERATING CORRECTLY, THEN NO ADDITIONAL LUBRICANT IS NEEDED. Any nozzle that is not operating correctly should be immediately removed from service. The nozzle can be returned to the factory at any time for a complete checkup and re-lubrication with silicone grease.

The field use of Break Free CLP (spray or liquid) lubricant will help to temporarily restore the smooth and free operation of the nozzle. These lubricants do not have the washout resistance and long-term performance of the silicone grease. Once Break Free CLP is applied, re-application will be needed on a regular basis until the nozzle can be returned to the factory for a complete checkup and re-lubrication with silicone grease.

⚠CAUTION **Aerosol lubricants contain solvents that can swell O-Rings if applied in excess. The swelling can inhibit smooth operation of the moving parts. When used in moderation, as directed, the solvents quickly evaporate without adversely swelling the O-Rings.**

8.2 SERVICE TESTING

In accordance with NFPA 1962, equipment must be tested a minimum of annually. Units failing any part of this test must be removed from service, repaired and retested upon completion of the repair.

8.3 REPAIR

Factory service is available with repair time seldom exceeding one day in our facility. Factory serviced equipment is repaired by experienced technicians, wet tested to original specifications, and promptly returned. Any returns should include a note as to the nature of the problem and whom to reach in case of questions.

Repair parts and service procedures are available for those wishing to perform their own repairs. Task Force Tips assumes no liability for damage to equipment or injury to personnel that is a result of user service. Contact the factory or visit the web site at tft.com for parts lists, exploded views, test procedures and troubleshooting guides.

Performance tests shall be conducted on the equipment after a repair, or anytime a problem is reported to verify operation in accordance with TFT test procedures. Consult factory for the procedure that corresponds to the model and serial number of the equipment. Any equipment which fails the related test criteria should be removed from service immediately. Troubleshooting guides are available with each test procedure or equipment can be returned to the factory for service and testing.

⚠CAUTION **Any alterations to the product or its markings could diminish safety and constitutes a misuse of this product.**

NOTICE **All replacement parts must be obtained from the manufacturer to assure proper operation of the device.**

9.0 EXPLODED VIEWS AND PARTS LISTS

Exploded views and parts lists are available at tft.com/serial-number.

10.0 OPERATION AND INSPECTION CHECKLIST

BEFORE EACH USE, the nozzle must be inspected to this checklist:

1. There is no obvious damage such as missing, broken or loose parts, damaged labels etc.
2. Debris screen is free of debris
3. Coupling is tight and leak free
4. Nozzle operates freely through full range and regulates flow
5. Nozzle flow is adequate as indicated by pump pressure and nozzle reaction
6. Shaper turns freely and adjusts pattern through full range
7. Shaper detent (if so equipped) operates smoothly and positively.

BEFORE BEING PLACED BACK IN SERVICE, nozzles must be inspected to this checklist:

1. All controls and adjustments are operational
2. Shut off valve (if so equipped) closes off the flow completely
3. There are no broken or missing parts
4. There is no damage to the nozzle that could impair safe operation (e.g. dents, cracks, corrosion or other defects)
5. The thread gasket is in good condition
6. The waterway is clear of obstructions
7. Nozzle is clean and markings are legible
8. Coupling is retightened properly
9. Shaper is set to desired pattern

NFPA 1962: Standard for the care, use, inspection, service testing, and replacement of fire hose, couplings, nozzles and fire hose appliances. Quincy, MA: National Fire Protection Agency

Equipment failing any part of the checklist is unsafe for use and must have the problem corrected before use or being placed back into service. Operating equipment that has failed the checklist is a misuse of this equipment.