



MANUAL: Hand Held Automatic Dual Pressure Nozzles

Mid-Force, CAFS-Force and Dual-Force

INSTRUCTIONS FOR SAFE OPERATION AND MAINTENANCE

⚠ WARNING

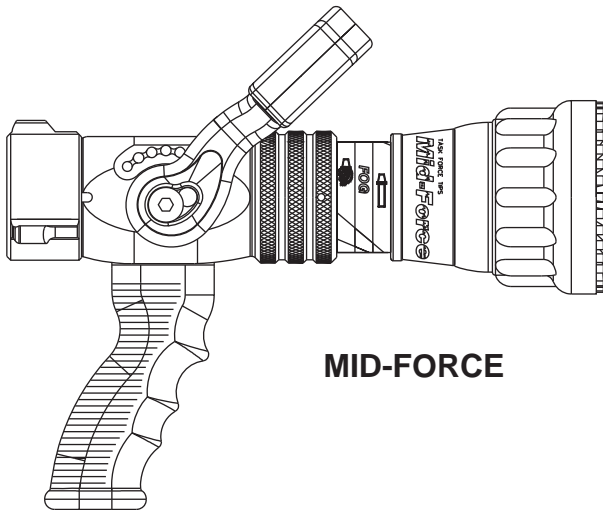
Read instruction manual before use. Operation of this nozzle without understanding the manual and receiving proper training can be dangerous and is a misuse of this equipment. Call 800-348-2686 with any questions.

⚠ WARNING

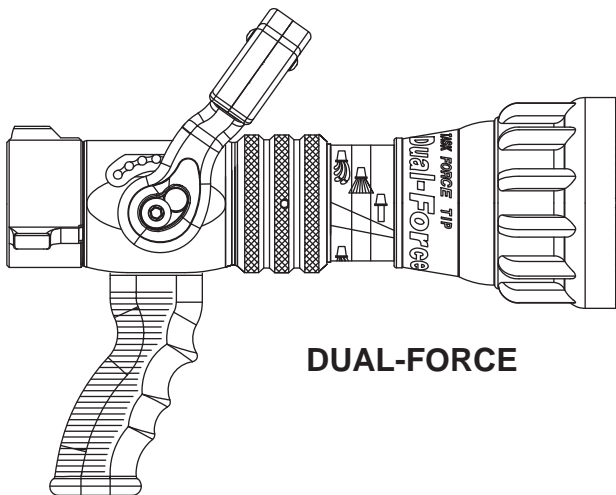
This instruction manual is intended to familiarize firefighters and maintenance personnel with the operation, servicing and safety procedures associated with the Mid-Force and Dual-Force fire fighting nozzles.

⚠ WARNING

This manual should be kept available to all operating and maintenance personnel.



MID-FORCE



DUAL-FORCE

⚠ 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.



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

TASK FORCE TIPS, INC.
MADE IN USA • www.tft.com





3701 Innovation Way, Valparaiso, IN 46383-9327 USA
800-348-2686 • 219- 462-6161 • Fax 219-464-7155

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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 standard Z535.6-2006, the definitions of the four signal words are as follows:


	DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.
	WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.
	CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
	NOTICE is used to address practices not related to personal injury.


2.0 GENERAL INFORMATION


The Task Force Tips MID-FORCE, CAFS-FORCE and DUAL-FORCE nozzles are designed to provide excellent performance under most fire fighting conditions. Their rugged construction is compatible with the use of fresh water (see section 7.0 for saltwater use) as well as fire fighting foam solutions. Other important operating features are:


- Switchable from standard operation to low pressure
- Automatic pressure regulation (meets NFPA 1964 automatic nozzle pressure requirements)
- Slide valve with valve handle detent flow control for excellent stream quality at all valve positions
- Quick-acting pattern control from straight stream to wide fog
- “Power fog teeth” for full-fill fog
- “Gasket grabber” inlet screen to keep large debris from entering nozzle
- Easily flushable while flowing to clear trapped debris
- TFT’s five-year warranty and unsurpassed customer service

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


 **WARNING** Nozzle reaction will vary as supply conditions change: such as opening or closing other nozzles, hose line kinks, changes in pump settings, etc. Changes in spray pattern or flushing will also affect nozzle reaction. The nozzle operator must always be prepared in the event of those changes. Failure to restrain nozzle reaction can cause firefighter injury from loss of footing and/ or stream protection.

 **WARNING** If nozzle gets out of control or away from operator, retreat from nozzle immediately. Do not attempt to regain control of nozzle while flowing water. Injury from whipping can occur.

 **WARNING** Water is a conductor of electricity. Application of water solutions on high voltage equipment can cause injury or death by electrocution. The amount of current that may be carried back to the nozzle will depend on the following factors: Voltage of the line or equipment; Distance from the nozzle to the line or equipment; Size of the stream; Whether the stream is solid or broken; Purity of the water¹

 **CAUTION** Fire streams are capable of injury and damage. Do not direct water stream to cause injury or damage to persons or property.

 **CAUTION** Do not couple aluminum to brass. Dissimilar metals coupled together can cause galvanic corrosion that can result in inability to unscrew threads or complete loss of thread engagement.

 **CAUTION** The nozzle may become damaged if allowed to freeze while containing water. Always drain after use to avoid damage and possible loss of use.

¹ The Fire Fighter and Electrical Equipment, The University of Michigan Extension Service, Fourth Printing 1983. Page 47.

2.1 VARIOUS MODELS AND TERMS

SERIES	FLOW RANGE		NOMINAL PRESSURE		STANDARD COUPLING*
	GPM	L/min	PSI	BAR	
MID-FORCE	70-200	265-760	100	7	1-1/2 NH
MID-FORCE	70-200	265-760	75	5	1-1/2 NH
DUAL-FORCE	95-300	360-1150	100	7	1-1/2 NH
DUAL-FORCE	95-300	360-1150	75	5	1-1/2 NH
CAFS-FORCE1	70-200	265-760	75	5	1-1/2 NH
CAFS-FORCE2	95-250	360-950	75	5	1-1/2 NH

* Other threads, coupling sizes, or connector styles can be specified at time of order.

WARNING Nozzle must be mated to a hose line with matched threads. Mismatched or damaged threads may cause nozzle to leak or uncouple from hose under pressure and could cause injury.

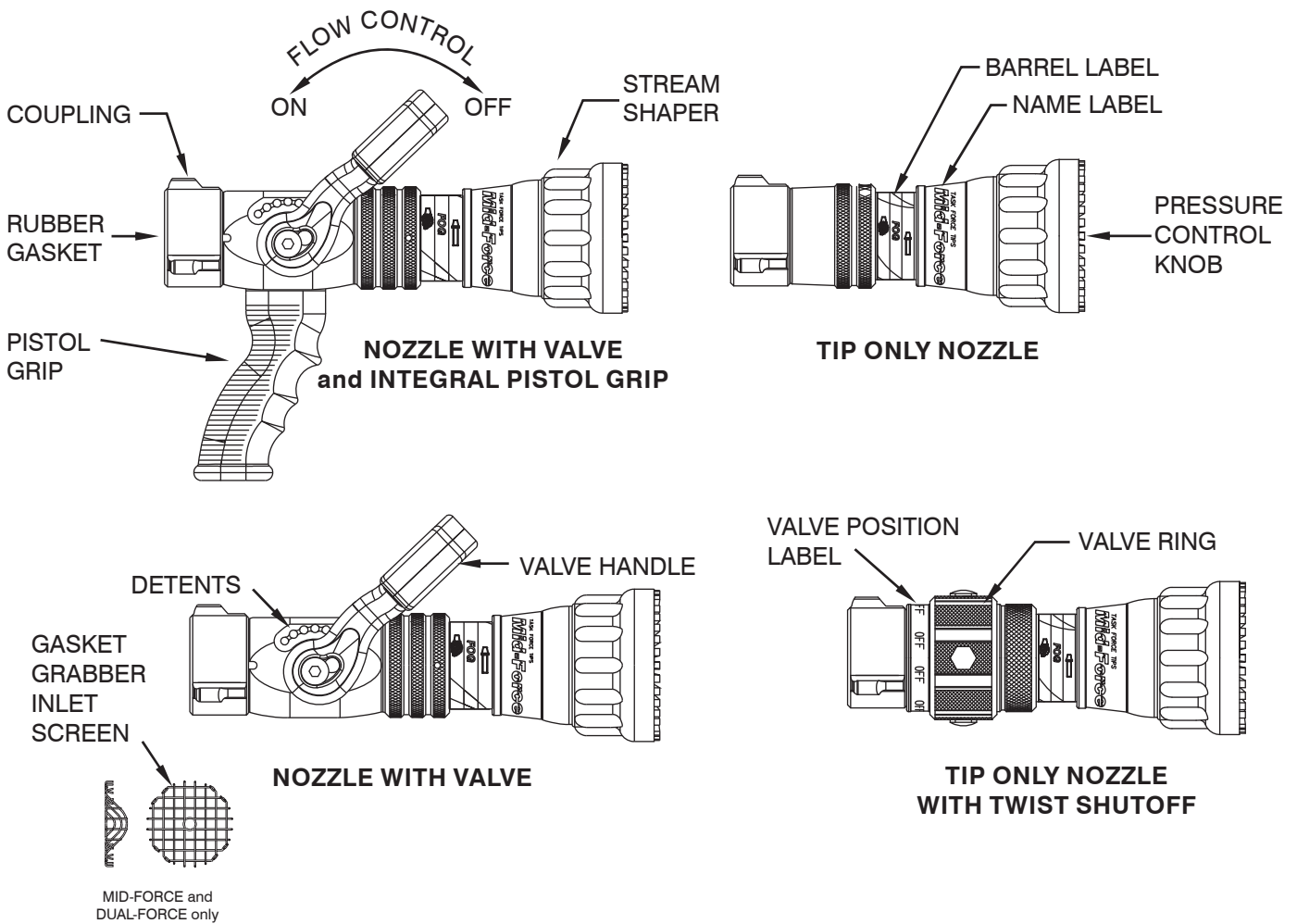


FIGURE 1 COMMON MODELS AND TERMS

2.2 COLOR CODED VALVE HANDLE AND PISTOL GRIP

The TFT ULTIMATIC, MID-MATIC & HANDLINE with lever type valve handles are supplied with black valve handle covers and pistol grips. The handle covers and pistol grips are available from TFT in various colors for those departments wishing to color code the nozzle to the discharge controls. A colored handle cover set will be sent upon receipt of the warranty card by TFT. Your department's name can also be engraved on the covers (see warranty card for more information).

Handle covers are replaceable by removing the four screws that hold the handle covers in place. Use a 3/32" allen wrench when replacing screws. Pistol grip is replaceable by following TFT instruction sheet LTT-108.

For standardization NFPA 1901 (A-4-9.3) recommends the following color code scheme:

Preconnect #1 or Bumper Jump Line	Orange	Other Colors Available:
Preconnect or discharge #2	Red	• Gray
Preconnect or discharge #3	Yellow	• Pink
Preconnect or discharge #4	White	• Purple
Preconnect or discharge #5	Blue	• Tan
Preconnect or discharge #6	Black	
Preconnect or discharge #7	Green	
Foam Lines	Red w/ White border (Red/White)	

2.3 NOZZLE COUPLING

Rocker lug 1-1/2" NH full-time swivel is standard on models with lever type flow control. The coupling is the same on other models except it does not swivel. Other threads such as 1-1/2" NPSH can be specified at time of order.

CAUTION Nozzle must be mated to a hose line with matched threads. Mismatched or damaged threads may cause nozzle to leak or uncouple from hose under pressure and could cause injury.

2.4 MECHANICAL SPECIFICATIONS

Maximum nozzle inlet pressure with valve shutoff	300 psi	21 bar
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	

3.0 FLOW CHARACTERISTICS

The graphs in figure 2 show the typical performance of MID-FORCE, CAFS-FORCE and DUAL-FORCE nozzles.

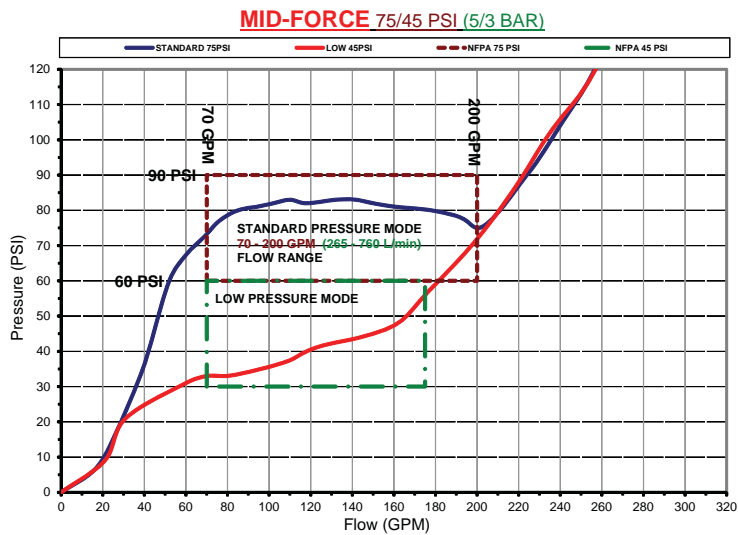
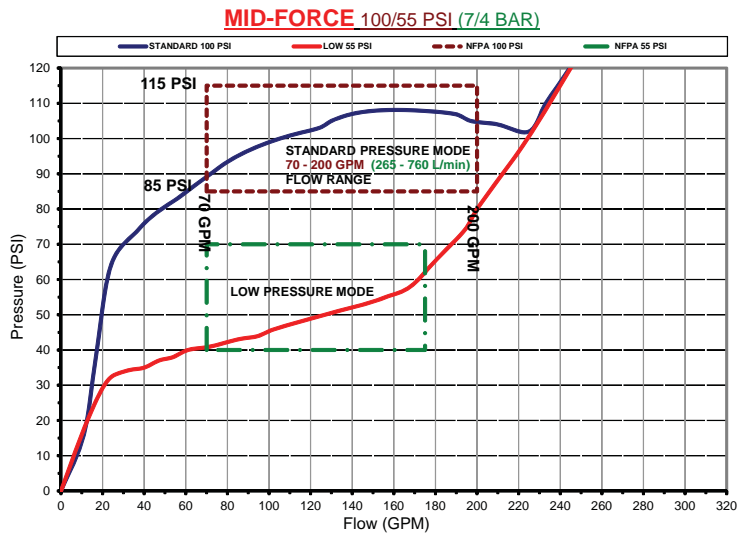
DANGER An inadequate supply of nozzle pressure and/or flow will cause an ineffective stream and can result in injury, death or loss of property. See flow chart in section 8.0 or call 800-348-2686 for assistance.

WARNING Failure to restrain nozzle reaction can cause firefighter injury from loss of footing and/or stream protection. Nozzle reaction will vary as supply conditions change: such as opening or closing other nozzles, hose line kinks, changes in pump settings, etc. Changes in spray pattern or flushing will also affect nozzle reaction. The nozzle operator must always be positioned to restrain the nozzle reaction in the event of those changes.

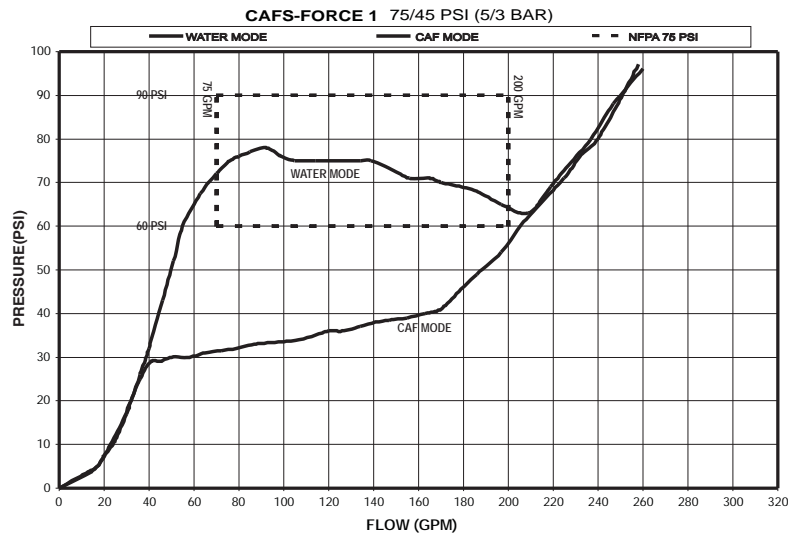
WARNING Injury from whipping can occur. If nozzle gets out of control or away from operator, retreat from nozzle immediately. Do not attempt to regain control of nozzle while flowing water.

CAUTION Fire streams are capable of injury and damage. Do not direct water stream to cause injury or damage to persons or property.

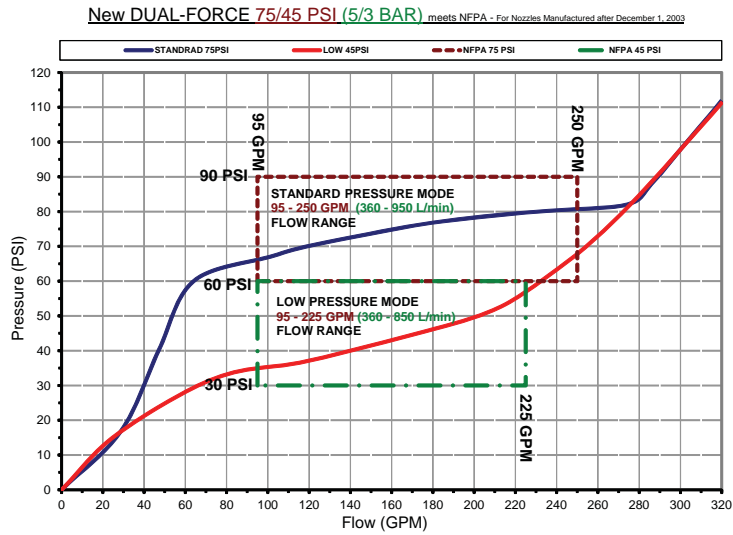
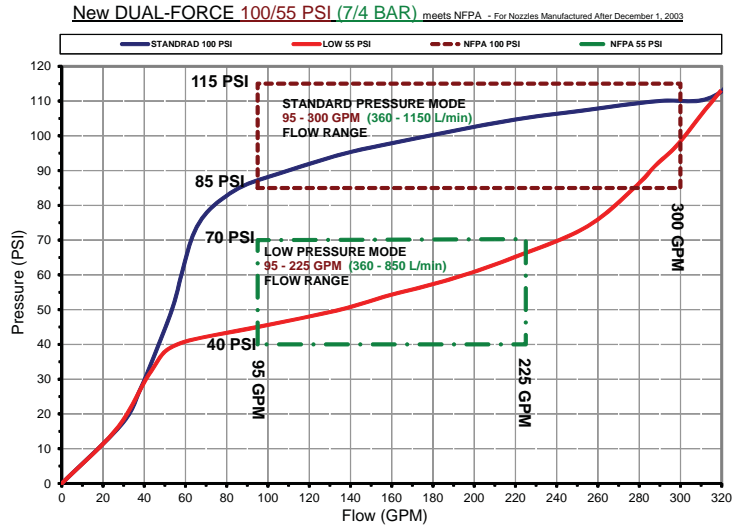
Mid-Force meets NFPA flow requirements.



CAFS-Force 1



The charts in section 10.0 of this document give specific examples of maximum flow rates for particular situations. Friction losses may vary due to differences in hose construction resulting in flows different than those shown. For situations or lengths of hose not listed on the chart, approximate flows can be calculated using conventional hydraulics. NOTE: Within the flow range, the nozzle inlet pressure may be approximated to be 100 PSI, when used in the standard pressure mode, or 75 PSI in low pressure mode.



CAFS-Force 2

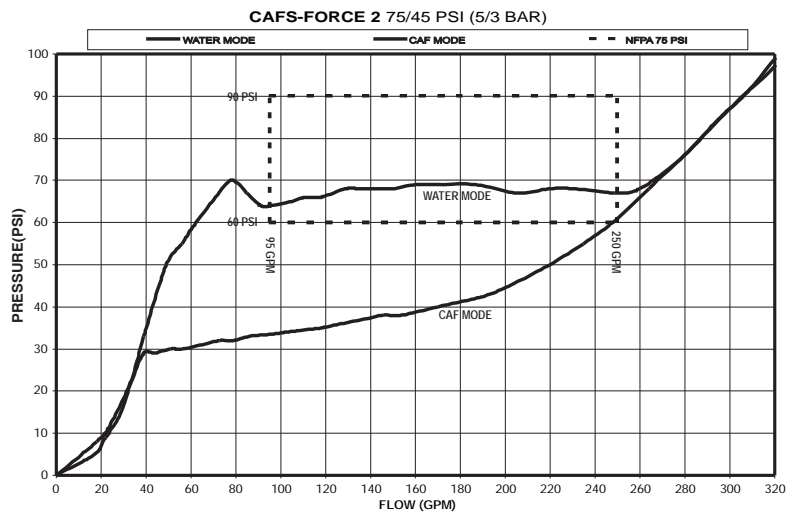


FIGURE 3 - NOZZLE PERFORMANCE
(on pages 6 - 7)

4.0 NOZZLE CONTROLS

4.1 FLOW CONTROL

4.1.1 LEVER TYPE FLOW CONTROL

On models that use a lever type valve handle, the nozzle is shut off when the handle is fully forward. The valve handle has six detent flow positions. These detent positions allow the nozzle operator to regulate the flow of the nozzle depending on the need or what can be safely and effectively handled. TFT recommends the use of a pistol grip for easier handling. For additional stress reduction, a hose rope or strap may also be used. This permits more effective use and ease of advancement, while minimizing strain and fatigue.

4.1.2 TWIST SHUTOFF

On models that use a twist flow control, the valve is opened or closed by rotating the valve ring. Rotating the ring clockwise (as seen from the operating position behind the nozzle) closes the valve, while counterclockwise rotation opens it. Detents are provided at four intermediate positions and the position of the valve is shown by the exposed valve position label.

4.1.3 TIP ONLY NOZZLES

Tip only nozzles have NO shut off valve contained within the nozzle and MUST be used with a separate ball valve attached to the nozzle.

4.2 PATTERN AND FLUSH CONTROL

4.2.1 PATTERN CONTROL

TFT's ULTIMATIC, MID-MATIC and HANDLINE 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. Turning the SHAPER counterclockwise will result in an increasingly wider pattern.

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

The nozzle reaction is greatest when the shaper is in the straight stream position. The nozzle operator must be prepared for a change in reaction as the pattern is changed.

4.2.2 FLUSH CONTROL MID-FORCE and DUAL-FORCE MODELS

Small debris passes through the gasket grabber and 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 nozzle can be flushed as follows; while still flowing water, turn the SHAPER counterclockwise past the full fog position (increased resistance will be felt on the SHAPER as the nozzle goes into flush). This will open the nozzle allowing debris to pass through. Rotate the SHAPER clockwise and out of flush to continue normal operation. 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 retain control of the nozzle.

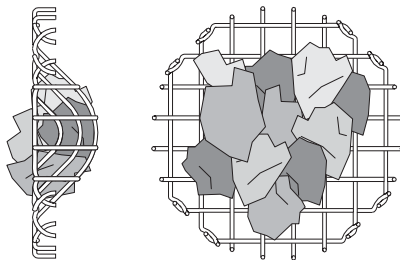


FIGURE 3 - GASKET GRABBER

WARNING Large amounts of debris 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 nozzle and remove debris.

4.3 STANDARD/LOW PRESSURE KNOB MID-FORCE & DUAL-FORCE

For situations where the standard pressure setting at the nozzle is impractical, the MID-FORCE or DUAL-FORCE may be switched to a 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. See figure 2 or the flow chart in section 10.0 for actual performance.

To switch to the low pressure mode, shut off water flow with valve and turn knob at front of nozzle (see figure 4) counterclockwise (when viewed from front). Reopen valve to flow water at reduced pressure. Repeat the process, except turn knob clockwise, to return to standard pressure operation.

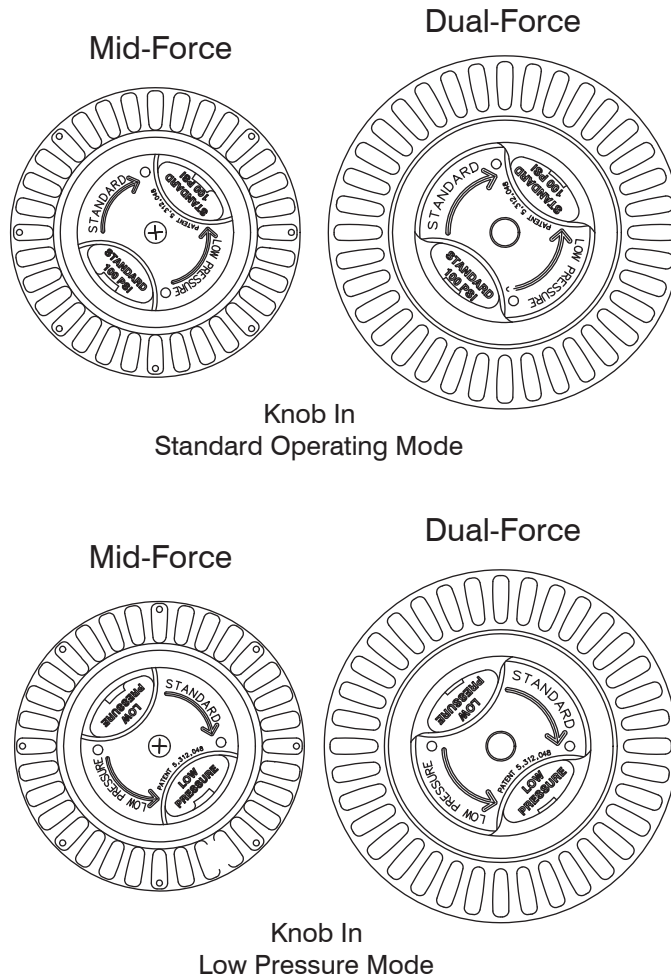


Figure 4.3

5.0 USE OF MID-FORCE and DUAL-FORCE NOZZLES

IT IS THE RESPONSIBILITY OF THE INDIVIDUAL FIRE DEPARTMENT OR AGENCY TO DETERMINE PHYSICAL CAPABILITIES AND SUITABILITY FOR AN INDIVIDUAL'S USE OF THIS EQUIPMENT.

Many factors contribute to the extinguishment of a fire. Among the most important is delivering water at a flow rate sufficient to absorb heat faster than it is being generated. The flow rate depends largely on the pump discharge pressure and hose friction loss. The pump discharge pressure may be found by use of the chart in section 10.0. It can also be calculated using a hydraulic equation such as:

Within its flow range, the nozzle pressure (NP) of the MID-FORCE or DUAL-FORCE nozzle may be approximated as 100 or 75 PSI in the standard mode. For additional information on calculating specific hose layouts, consult an appropriate fire service training manual, A Guide to Automatic Nozzles, or call TFT's "Hydraulics Hotline" at 800-348-2686.

$PDP = NP + FL + DL + EL$ <p> PDP = Pump discharge pressure in PSI NP = Nozzle pressure in PSI FL = Hose friction loss in PSI DL = Device loss in PSI EL = Elevation loss in PSI </p>
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IT IS THE RESPONSIBILITY OF THE INDIVIDUAL FIRE DEPARTMENT OR AGENCY TO DETERMINE PHYSICAL CAPABILITIES AND SUITABILITY FOR AN INDIVIDUAL'S USE OF THIS EQUIPMENT.

6.0 CAFS-FORCE 1 & CAFS-FORCE 2

The CAFS-FORCE 1 and CAFS-FORCE 2 nozzles are optimized for use with compressed air foam systems, CAFS. They have a streamlined flow path with no gasket grabber. The CAFS-FORCE nozzles have two settings: Standard pressure/Water and Low Pressure/CAFS. See Figure 5. The CAFS-FORCE tip can be removed to use the valve as a smoothbore. See Section 3.0 Flow Characteristics for CAFS-FORCE Nozzle flow characteristics.

Hose handling techniques with compressed air foam (CAF) differ considerably from liquid filled hoses as a result of the added energy stored by pressurized air. The authority having jurisdiction must establish safe CAF operational procedures and insure appropriate training.



Use of compressed air foam (CAF) with hand held nozzles can cause sudden surges in nozzle reaction force resulting in risk of injury or death from loss of footing or hose whipping. Be prepared for sudden changes in nozzle reaction caused by:
Slug loading (Loss of foam concentrate sends slugs of air and water into the nozzle)
Sudden release of built-up pressure in the hose when opening a nozzle

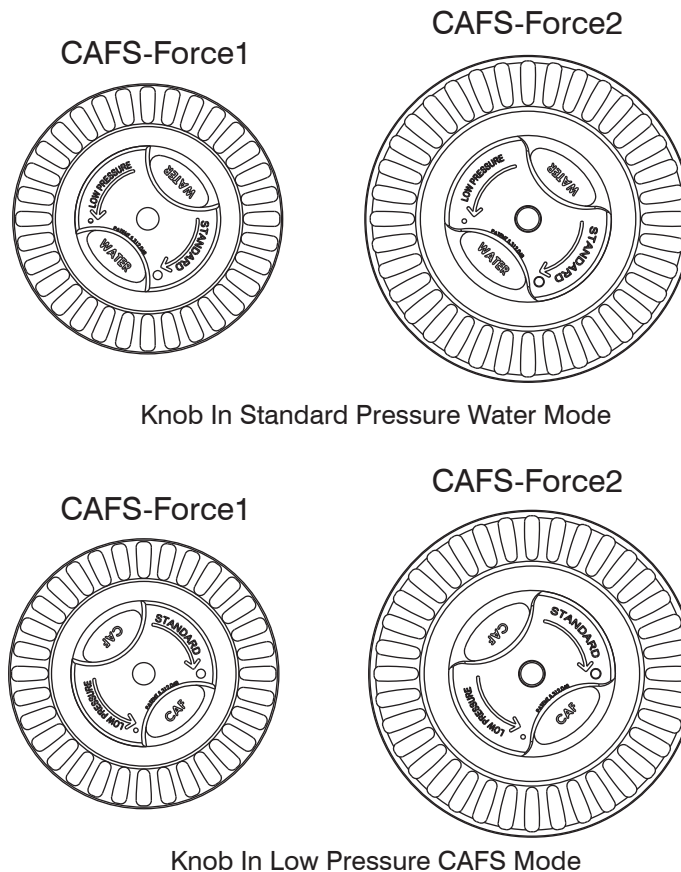


Figure 6

7.0 FIELD INSPECTION

TFT's MID-FORCE, DUAL-FORCE and CAFS-FORCE are designed and manufactured to be damage resistant and require minimal maintenance. However, as the primary fire fighting tools upon which your life depends, they should be treated accordingly. Use with saltwater is permissible provided nozzle is thoroughly cleaned with fresh water after each use. The service life of the nozzle may be shortened due to the effects of corrosion and is not covered under warranty.



Nozzle must be inspected for proper operation and function according to inspection checklist on the last page before each use. Any nozzle that fails inspection is dangerous to use and must be repaired before using.

Performance tests shall be conducted on the Mid-Force, Dual-Force and CAFS-Force nozzle 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 nozzle. 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. Factory service is available with repair time seldom exceeding one day in our facility.

Factory serviced nozzles are repaired by experienced technicians to original specifications, fully tested and promptly returned. Any returns should include a note as to the nature of the problem, who to reach in case of questions and if a repair estimate is required. Repair parts and service procedures are available for those wishing to perform their own repairs.

TFT Item#	Title
LHM-020	Mid-Matic, Mid-Force, Metro1 & CAFS-Force1 Service Procedure
LIH-020	Handline, Dual-Force, Metro2 & CAFS-Force2 Service Procedure



Any alterations to the nozzle and its markings could diminish safety and constitutes a misuse of this product.

All Task Force Tip nozzles are factory lubricated with high quality silicone grease. This lubricant has excellent washout resistance and long term performance. If your department has unusually hard or sandy water, the moving parts 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 signs of damage. IF THE NOZZLE IS OPERATING CORRECTLY, THEN NO ADDITIONAL LUBRICATION IS NEEDED. Any nozzle that is not operating correctly should be immediately removed from service and the problem corrected.

8.0 WARRANTY

Task Force Tips, Inc., 3701 Innovation Way, Valparaiso, Indiana 46383-9327 (“TFT”) warrants to the original purchaser of its nozzles and other equipment (“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, 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

9.0 ANSWERS TO YOUR QUESTIONS

We appreciate the opportunity of serving you and making your job easier. If you have any problems or questions, our toll-free “Hydraulics Hotline”, 800-348-2686, is normally available to you 24 hours a day, 7 days a week.

Mid-Force 100/55 PSI

STD = STANDARD PRESSURE MODE
LP = LOW PRESSURE MODE

Flow And Nozzle Reaction Chart

FLOW (GPM) REACTION (LBS)	1 1/2" HOSE						1 3/4" HOSE						2" HOSE					
	150 ft.		200 ft.		250 ft.		150 ft.		200 ft.		250 ft.		150 ft.		200 ft.		250 ft.	
	STD	LP	STD	LP	STD	LP	STD	LP	STD	LP	STD	LP	STD	LP	STD	LP	STD	LP
50	21 8	55 17	21 7	50 16	21 7	46 14	21 8	65 21	21 8	60 19	21 7	54 17	22 8	82 27	22 8	75 24	22 8	68 22
75	31 13	93 31	29 12	83 27	28 12	75 24	32 14	111 38	32 14	100 33	31 13	91 30	36 15	141 51	35 15	128 45	34 15	119 41
100	65 30	121 42	59 27	107 36	55 25	97 32	72 34	143 52	72 34	129 45	67 32	117 40	84 41	184 72	79 38	167 63	75 36	153 56
125	93 45	143 52	84 40	126 44	77 37	114 39	108 54	172 65	108 54	152 56	97 48	138 50	135 69	213 90	122 62	198 79	113 57	182 70
150	117 59	163 61	105 52	143 52	96 47	130 46	141 72	195 77	141 72	174 66	125 63	158 58	196 101	---	168 87	220 95	151 78	205 84
175	140 72	180 69	124 63	159 59	112 57	143 52	174 90	213 90	174 90	192 76	151 78	175 66	---	---	212 109	---	187 97	223 98
200	162 84	196 78	141 73	173 66	128 65	156 58	204 105	228 102	204 105	207 86	175 91	189 75	---	---	---	---	222 113	---
225	183 94	209 87	158 82	186 72	142 73	168 63	---	---	---	198 102	198 102	203 83	---	---	---	---	---	---

CAUTION: Changing to Low Pressure mode will typically increase nozzle reaction.

(1) Number on top in each box indicates flow (GPM), and number on bottom indicates nozzle reaction (LBS). (2) In Standard mode, the average nozzle pressure is 100 PSI. (3) Flows may vary with brand or condition of hose. (4) Flows are approximate and do not reflect losses in preconnect piping.

Mid-Force 7/4 BAR

Flow And Nozzle Reaction Chart

7 bar = STANDARD PRESSURE MODE
LP = LOW PRESSURE MODE

FLOW (LPM) REACTION (KG)	38mm HOSE						45mm HOSE						50mm HOSE					
	45M		60M		75M		45M		60M		75M		45M		60M		75M	
	7 bar	LP	7 bar	LP	7 bar	LP	7 bar	LP	7 bar	LP	7 bar	LP	7 bar	LP	7 bar	LP	7 bar	LP
3.5	80	210	80	190	80	175	80	245	80	225	80	205	85	310	85	285	85	225
	4	8	3	7	3	6	4	10	4	9	3	8	4	12	4	11	4	10
5.2	115	350	110	315	105	285	85	420	120	380	115	345	135	535	130	485	130	450
	6	14	5	12	5	11	6	17	6	15	6	14	17	23	7	20	7	19
7.0	245	460	225	405	210	365	275	540	255	490	240	445	320	695	300	630	320	580
	14	19	12	16	11	15	15	24	15	20	13	18	19	33	17	29	16	25
8.6	350	540	320	475	290	430	410	650	365	575	345	520	510	805	460	750	430	690
	20	24	18	20	17	18	25	30	22	25	20	23	31	41	28	36	26	32
10.0	445	615	395	540	365	490	535	740	475	660	430	600	740	---	635	---	570	775
	27	28	24	24	21	21	33	35	29	30	26	26	46	---	40	---	35	38
12.0	530	680	470	600	425	540	660	805	570	725	515	660	---	---	800	---	710	845
	33	31	29	27	26	24	41	41	35	35	32	30	---	---	50	---	44	45
14.0	615	740	535	655	485	590	770	---	660	785	595	715	---	---	---	---	840	---
	38	35	33	30	30	26	48	---	41	39	37	34	---	---	---	---	51	---
15.5	695	790	600	705	535	635	---	---	750	835	665	770	---	---	---	---	---	---
	43	40	37	33	33	29	---	---	46	44	41	38	---	---	---	---	---	---

CAUTION: Changing to Low Pressure mode will typically increase nozzle reaction.

(1) Number on top in each box indicates flow (LPM), and number on bottom indicates nozzle reaction (KG). (2) In Standard mode, the average nozzle pressure is 7 bar. (3) Flows may vary with brand or condition of hose. (4) Flows are approximate and do not reflect losses in preconnect piping.

Mid-Force 75/45 PSI

STD = STANDARD PRESSURE MODE

LP = LOW PRESSURE MODE

Flow And Nozzle Reaction Chart

FLOW (GPM) REACTION (LBS)	1 1/2" HOSE						1 3/4" HOSE						2" HOSE					
	150 ft.		200 ft.		250 ft.		150 ft.		200 ft.		250 ft.		150 ft.		200 ft.		250 ft.	
	STD	LP	STD	LP	STD	LP	STD	LP	STD	LP	STD	LP	STD	LP	STD	LP	STD	LP
50	43 14	69 20	43 14	62 18	42 13	57 16	45 15	84 25	44 15	74 21	43 14	67 19	45 15	84 25	45 16	97 29	45 15	89 26
75	55 22	104 32	53 21	92 27	51 20	83 24	59 24	121 39	57 23	110 34	55 22	101 30	64 27	155 53	62 26	140 47	60 25	128 42
100	78 35	127 42	72 32	113 35	68 29	103 31	91 41	153 52	82 37	136 45	77 34	123 40	122 56	182 71	105 48	171 63	97 44	162 56
125	108 50	149 50	96 43	131 43	86 39	119 38	134 62	174 65	118 54	159 55	105 48	145 48	203 89	204 89	166 75	192 79	146 67	181 70
150	136 63	166 60	119 54	148 50	106 49	134 44	173 78	191 78	148 68	174 66	132 60	162 57	ó ó	ó ó	210 95	210 95	189 85	199 85
175	162 73	180 70	138 64	163 57	124 57	147 50	206 91	206 91	175 79	189 77	155 71	175 66	ó ó	ó ó	ó ó	ó ó	215 99	214 99
200	183 82	192 79	157 72	174 65	140 64	160 55	220 104	220 104	201 88	202 87	176 80	188 76	ó ó	ó ó	ó ó	ó ó	ó ó	ó ó
225	204 90	204 89	174 79	184 73	155 71	170 62	--- ---	--- ---	214 98	214 98	196 86	199 85	ó ---	ó ---	ó ---	ó ---	ó ---	ó ---

CAUTION: Changing to Low Pressure mode will typically increase nozzle reaction.

(1) Number on top in each box indicates flow (GPM), and number on bottom indicates nozzle reaction (LBS). (2) In Standard mode, the average nozzle pressure is 100 PSI. (3) Flows may vary with brand or condition of hose. (4)

Mid-Force 5/3 BAR

Flow And Nozzle Reaction Chart

7 bar = STANDARD PRESSURE MODE
 LP = LOW PRESSURE MODE

FLOW (LPM) REACTION (KG)	38mm HOSE						45mm HOSE						50mm HOSE					
	45M		60M		75M		45M		60M		75M		45M		60M		75M	
	5 bar	LP	5 bar	LP	5 bar	LP	5 bar	LP	5 bar	LP	5 bar	LP	5 bar	LP	5 bar	LP	5 bar	LP
3.5	163 6	261 9	163 6	235 8	159 6	216 7	170 7	318 11	167 7	280 10	163 6	254 9	170 7	318 11	170 7	367 13	170 7	337 12
5.2	208 10	394 15	201 10	348 12	193 9	314 11	223 11	458 18	216 12	416 15	208 10	382 14	242 12	587 24	235 12	530 21	227 11	484 19
7.0	295 16	481 19	273 15	428 16	257 13	390 14	344 19	579 24	310 19	515 20	291 15	466 18	462 25	689 32	397 22	647 29	367 20	613 25
8.6	409 23	564 23	363 20	496 20	326 18	450 17	507 28	659 29	447 25	602 25	397 22	549 22	768 40	772 40	628 34	727 36	553 30	685 32
10.0	515 29	628 27	450 24	560 23	401 22	507 20	655 35	723 35	560 31	659 30	500 27	613 26	613 26	613 26	795 43	795 43	715 39	753 39
12.0	613 33	681 32	522 29	617 26	469 26	556 23	780 41	780 41	662 36	715 35	587 32	662 30	662 30	662 30	662 30	662 30	814 45	810 45
14.0	693 37	727 36	594 33	659 29	530 29	606 25	833 47	833 47	761 40	765 39	666 36	712 34	666 36	666 36	666 36	666 36	666 36	666 36
15.5	772 41	772 40	659 36	696 33	587 32	643 28	---	---	810 44	810 44	742 39	753 39	742 39	742 39	742 39	742 39	742 39	742 39

CAUTION: Changing to Low Pressure mode will typically increase nozzle reaction.

(1) Number on top in each box indicates flow (LPM), and number on bottom indicates nozzle reaction (KG). (2) In Standard mode, the average nozzle pressure is 7 bar. (3) Flows may vary with brand or condition of hose. (4) Flows are approximate and do not reflect losses in preconnect piping.

For Nozzles with: Serial # TFT-H465101 and over or Manufactured after 12/01/2003

DualForce 100/55 PSI

Flow And Nozzle Reaction Chart

STD = STANDARD PRESSURE MODE
LP = LOW PRESSURE MODE

FLOW (GPM) REACTION (LBS)	1 1/2" HOSE						1 3/4" HOSE						2" HOSE						2 1/2" HOSE					
	150 ft.		200 ft.		250 ft.		150 ft.		200 ft.		250 ft.		150 ft.		200 ft.		250 ft.		150 ft.		200 ft.		250 ft.	
	STD	LP	STD	LP	STD	LP	STD	LP	STD	LP	STD	LP	STD	LP	STD	LP	STD	LP	STD	LP	STD	LP	STD	LP
50	48	54	47	50	45	47	50	62	49	56	48	53	51	76	51	70	50	65	53	107	53	102	53	97
	16	17	15	15	14	14	17	20	16	18	15	17	18	25	17	23	17	21	19	37	19	35	19	33
75	59	91	57	80	56	72	61	110	60	98	59	89	63	141	62	127	61	116	65	206	65	194	65	184
	23	31	22	27	21	24	25	38	24	33	23	30	27	51	26	45	25	40	28	82	28	76	28	71
100	74	118	69	104	65	94	83	144	77	128	73	116	99	185	91	166	86	152	135	265	128	254	122	242
	33	41	30	36	28	32	38	52	35	45	33	40	47	71	43	62	40	56	66	119	62	110	59	103
125	100	141	89	124	82	112	119	172	107	152	98	138	152	221	136	199	126	182	245	299	223	288	207	279
	47	51	42	44	38	39	58	65	51	56	46	50	76	90	67	78	61	70	128	149	115	139	106	130
150	124	160	110	141	100	128	151	196	134	174	122	157	198	252	176	227	160	208	328	326	312	315	283	306
	60	60	53	51	47	45	75	77	66	66	59	58	101	108	89	93	80	80	179	179	166	167	149	156
175	146	178	128	157	116	142	179	217	158	193	143	175	238	274	210	251	190	230	---	---	340	340	331	329
	72	68	63	58	56	51	91	88	79	75	71	66	124	126	108	108	97	95	---	---	195	195	183	182
200	165	194	145	171	131	154	204	237	179	210	162	190	273	294	240	270	217	250	---	---	---	---	---	---
	83	76	72	64	64	57	105	99	91	84	81	74	144	144	125	123	112	108	---	---	---	---	---	---
225	183	209	160	184	144	166	227	255	199	226	179	205	307	311	268	287	242	268	---	---	---	---	---	---
	93	84	80	71	71	62	117	110	101	93	91	81	163	163	141	138	126	121	---	---	---	---	---	---
250	199	223	174	196	157	177	248	269	216	241	195	218	329	328	293	303	264	283	---	---	---	---	---	---
	102	91	88	77	81	67	129	122	112	102	100	89	181	181	155	154	139	134	---	---	---	---	---	---

CAUTION: Changing to Low Pressure mode will typically increase nozzle reaction.

(1) Number on top of each box indicates flow (GPM), and number on bottom indicates nozzle reaction (LBS). (2) In Standard mode, the average nozzle pressure is 100 PSI. (3) Flows may vary with brand or condition of hose. (4) Flows are approximate and do not reflect losses in preconnect piping.

For Nozzles with: Serial # TFT-H465101 and over or Manufactured after 12/01/2003

DualForce 7/4 BAR

Flow And Nozzle Reaction Chart

7 bar = STANDARD PRESSURE MODE

LP = LOW PRESSURE MODE

FLOW (l/min) REACTION (KG)	38mm HOSE						45mm HOSE						50mm HOSE						64mm HOSE					
	45M		60M		75M		45M		60M		75M		45M		60M		75M		45M		60M		75M	
	7 bar	LP	7 bar	LP	7 bar	LP	7 bar	LP	7 bar	LP	7 bar	LP	7 bar	LP	7 bar	LP	7 bar	LP	7 bar	LP	7 bar	LP	7 bar	LP
3.5	182	204	178	189	170	178	189	235	185	212	182	201	193	288	193	265	189	246	201	405	201	386	201	367
	7	8	6	7	6	6	8	9	7	8	7	8	8	11	8	10	8	10	9	17	9	16	9	15
5.2	223	344	212	303	212	273	231	416	227	371	223	337	238	534	235	481	231	439	246	780	246	734	246	696
	10	14	10	12	10	11	11	17	11	15	10	14	12	23	12	20	11	18	13	37	13	34	13	32
7.0	280	447	246	394	246	356	314	545	291	484	276	439	375	700	344	628	326	575	511	1003	484	961	462	916
	15	19	13	16	13	15	17	24	16	20	15	18	21	32	20	28	18	25	30	54	28	50	27	47
8.6	379	534	310	469	310	424	450	651	405	575	371	522	575	836	515	753	477	689	927	1132	844	1090	783	1056
	21	23	17	20	17	18	26	29	23	25	21	23	34	41	30	35	28	32	58	68	52	63	48	59
10.0	469	606	379	534	379	484	572	742	507	659	462	594	749	954	666	859	606	787	1241	1234	1181	1192	1071	1158
	27	27	21	23	21	20	34	35	30	30	27	26	46	49	40	42	36	38	81	81	75	76	68	71
12.0	553	674	439	594	439	537	678	821	598	731	541	662	901	1037	795	950	719	871	6	6	1287	1287	1253	1245
	33	31	25	26	25	23	41	40	36	34	32	30	56	57	49	49	44	43	6	6	88	88	83	83
14.0	625	734	496	647	496	583	772	897	678	795	613	719	1033	1113	908	1022	821	946	6	6	1287	1287	1253	1245
	38	34	29	29	29	26	48	45	41	38	37	34	65	65	57	56	51	49	6	6	88	88	83	83
15.5	693	791	545	696	545	628	859	965	753	855	678	776	1162	1177	1014	1086	916	1014	6	6	1287	1287	1253	1245
	42	38	32	32	32	28	53	50	46	42	41	37	74	74	64	63	57	55	6	6	88	88	83	83
17.0	753	844	594	742	594	670	939	1018	818	912	738	825	1245	1241	1109	1147	999	1071	6	6	1287	1287	1253	1245
	46	41	35	35	35	30	59	55	51	46	45	40	82	82	70	70	63	61	6	6	88	88	83	83

CAUTION: Changing to Low Pressure mode will typically increase nozzle reaction.

(1) Number on top of each box indicates flow (GPM), and number on bottom indicates nozzle reaction (LBS). (2) In Standard mode, the average nozzle pressure is 100 PSI. (3) Flows may vary with brand or condition of hose. (4) Flows are approximate and do not reflect losses in preconnect piping.

For Nozzles with: Serial # TFT-H465101 and over or Manufactured after 12/01/2003

DualForce 75/45 PSI

Flow And Nozzle Reaction Chart

STD = STANDARD PRESSURE MODE
LP = LOW PRESSURE MODE

FLOW (GPM) REACTION (LBS)	1 1/2" HOSE						1 3/4" HOSE						2" HOSE						2 1/2" HOSE					
	150 ft.		200 ft.		250 ft.		150 ft.		200 ft.		250 ft.		150 ft.		200 ft.		250 ft.		150 ft.		200 ft.		250 ft.	
	STD	LP	STD	LP	STD	LP	STD	LP	STD	LP	STD	LP	STD	LP	STD	LP	STD	LP	STD	LP	STD	LP	STD	LP
50	48	71	47	65	45	60	84	49	75	48	70	51	107	51	96	88	50	88	53	157	53	148	53	140
	16	20	15	18	14	16	25	16	22	15	20	18	33	17	29	26	17	26	19	52	19	48	18	45
75	64	104	60	91	58	82	126	67	112	63	101	88	162	81	145	133	76	133	123	230	116	221	111	212
	25	31	23	27	22	24	39	26	34	25	30	36	54	33	47	42	31	42	52	89	49	83	46	77
100	96	130	85	114	77	103	115	103	139	93	126	148	203	132	182	166	121	166	252	269	224	260	206	251
	39	41	34	35	31	31	48	42	44	38	39	64	72	57	63	56	51	56	114	120	101	112	92	105
125	122	151	108	133	98	120	149	131	162	119	147	197	232	173	212	194	158	194	300	300	290	290	282	281
	52	49	45	42	40	37	64	56	54	50	48	88	90	76	77	69	69	68	150	150	140	140	131	131
150	145	170	124	149	115	135	177	156	182	141	165	239	256	210	234	218	189	218	343	341	317	335	307	307
	63	57	54	48	48	43	78	68	63	61	55	108	108	94	92	84	81	81	185	185	167	173	157	157
175	165	187	144	164	130	148	203	178	201	160	182	276	276	242	255	236	217	236	356	355	349	348	342	342
	72	65	62	55	56	48	91	79	71	70	63	127	127	109	108	98	94	94	210	209	198	197	186	186
200	183	202	160	178	144	160	227	198	217	178	197	295	295	270	272	243	223	254	369	368	362	361	356	354
	81	72	70	61	62	53	102	88	80	79	70	145	145	123	123	110	107	107	235	234	222	221	210	209
225	200	216	174	190	157	172	249	216	231	195	211	312	313	289	288	266	269	269	6	6	375	373	368	367
	89	80	77	66	68	58	113	97	90	87	77	163	163	138	138	121	120	120	6	6	245	245	232	232
250	216	229	188	202	169	182	269	234	244	210	223	329	336	304	304	284	284	284	---	---	6	6	380	378
	97	88	83	72	74	63	123	106	99	94	85	181	180	154	154	133	134	134	---	---	---	---	255	255

CAUTION: Changing to Low Pressure mode will typically increase nozzle reaction.

(1) Number on top of each box indicates flow (GPM), and number on bottom indicates nozzle reaction (LBS). (2) In Standard mode, the average nozzle pressure is 100 PSI. (3) Flows may vary with brand or condition of hose. (4) Flows are approximate and do not reflect losses in preconnect piping.

For Nozzles with: Serial # TFT-H465101 and over or Manufactured after 12/01/2003

Dual-Force 5/3 BAR

Flow And Nozzle Reaction Chart

7 bar = STANDARD PRESSURE MODE

LP = LOW PRESSURE MODE

FLOW (l/min) REACTION (KG)	38mm HOSE						45mm HOSE						50mm HOSE						64mm HOSE									
	60M		75M		75M		60M		75M		75M		60M		75M		45M		60M		75M		45M		60M		75M	
	5 bar	LP	5 bar	LP	5 bar	LP	5 bar	LP	5 bar	LP	5 bar	LP	5 bar	LP	5 bar	LP	5 bar	LP	5 bar	LP	5 bar	LP	5 bar	LP	5 bar	LP	5 bar	LP
3.5	182	269	178	246	170	227	189	318	185	284	182	265	193	405	193	363	189	333	201	594	201	560	201	594	201	560	201	530
	7	8	7	8	6	7	8	11	7	10	7	9	8	15	8	13	8	12	9	24	9	22	9	24	9	22	8	20
5.2	242	394	227	344	220	310	276	477	254	424	238	382	333	613	307	549	288	503	466	871	439	836	439	871	439	836	420	802
	11	14	10	12	10	11	13	18	12	15	11	14	16	24	15	21	14	19	24	40	22	38	22	40	22	38	21	35
7.0	363	492	322	431	291	390	435	594	390	526	352	477	560	768	500	689	458	628	954	1018	848	984	1018	848	954	848	780	950
	18	19	15	16	14	14	22	24	19	20	17	18	29	33	26	29	23	25	52	54	46	51	46	54	46	51	42	48
8.6	462	572	409	503	371	454	564	693	496	613	450	556	746	878	655	802	598	734	1136	1136	1098	1098	1098	1098	1136	1098	1067	1064
	24	23	20	19	18	17	29	29	25	24	23	22	40	41	34	35	31	31	68	68	64	64	64	68	64	64	59	59
10.0	549	643	481	564	435	511	670	780	590	689	534	625	905	969	795	886	715	825	1298	1291	1200	1268	1268	1298	1200	1268	1162	1162
	29	27	24	22	22	20	35	34	31	29	28	25	49	49	43	42	38	37	84	84	76	78	76	84	76	78	71	71
12.0	625	708	545	621	492	560	768	852	674	761	606	689	1045	1045	916	965	821	893	1347	1344	1321	1317	1317	1347	1321	1317	1298	1294
	33	31	28	25	25	22	41	39	36	32	32	29	58	58	49	49	44	43	95	95	90	89	90	95	90	89	84	84
14.0	693	765	606	674	545	606	859	912	749	821	674	746	1117	1117	1022	1030	920	961	1397	1393	1370	1366	1366	1397	1370	1366	1347	1340
	37	34	32	28	28	24	46	44	40	36	36	32	66	66	56	56	50	49	107	106	101	100	100	107	101	100	95	95
15.5	757	818	659	719	594	651	942	973	818	874	738	799	1181	1185	1094	1090	1007	1018	1419	1419	1419	1412	1412	1419	1412	1393	1389	
	40	38	35	30	31	26	51	49	44	41	39	35	74	74	63	63	55	54	111	111	111	111	111	111	111	111	105	105
17.0	818	867	712	765	640	689	1018	1026	886	924	795	844	1245	1272	1151	1151	1075	1075	1438	1438	1438	1438	1438	1438	1438	1438	1431	
	44	41	38	33	34	29	56	55	48	45	43	39	82	82	70	70	60	61	116	116	116	116	116	116	116	116	116	

CAUTION: Changing to Low Pressure mode will typically increase nozzle reaction.

(1) Number on top of each box indicates flow (GPM), and number on bottom indicates nozzle reaction (LBS). (2) In Standard mode, the average nozzle pressure is 100 PSI. (3) Flows may vary with brand or condition of hose. (4) Flows are approximate and do not reflect losses in preconnect piping.

11.0 INSPECTION CHECKLIST

Nozzle must be inspected for proper operation and function according to this checklist before each use.

Check that:

- 1) There is no obvious damage such as missing, broken or loose parts, damaged labels etc.
- 2) Gasket grabber is free of debris.
- 3) Coupling is tight and leak free.
- 4) Valve operates freely through full range and regulates flow.
- 5) "OFF" position does fully shut off and flow is stopped.
- 6) Nozzle flow is adequate as indicated by pump pressure and nozzle reaction.
- 7) Shaper turns freely and adjusts pattern through full range.
- 8) Shaper turns into full flush and out of flush with normal flow and pressure restored.
- 9) Standard/low pressure knob turns freely and changes nozzle pressure.



Any Mid-Force, Dual-Force and CAFS-Force nozzle failing any part of the inspection checklist is unsafe and must have the problem corrected before use. Operating a nozzle that fails any of the above inspections is a misuse of this equipment.