MANUAL: Hand Held Automatic Dual Pressure Nozzles

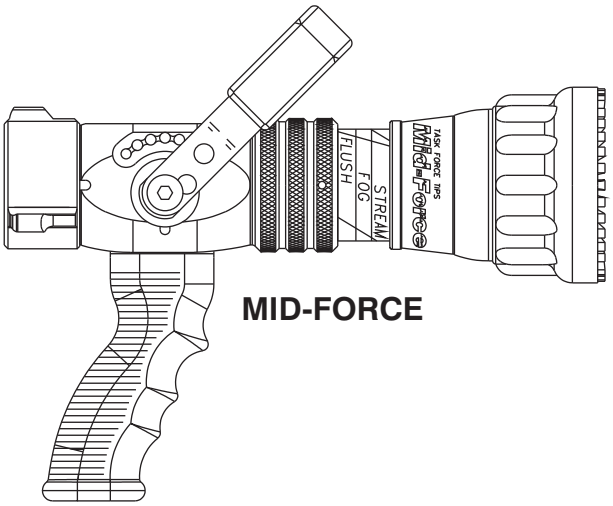
Mid-Force® and Dual-Force®

INSTRUCTIONS FOR SAFE OPERATION AND MAINTENANCE

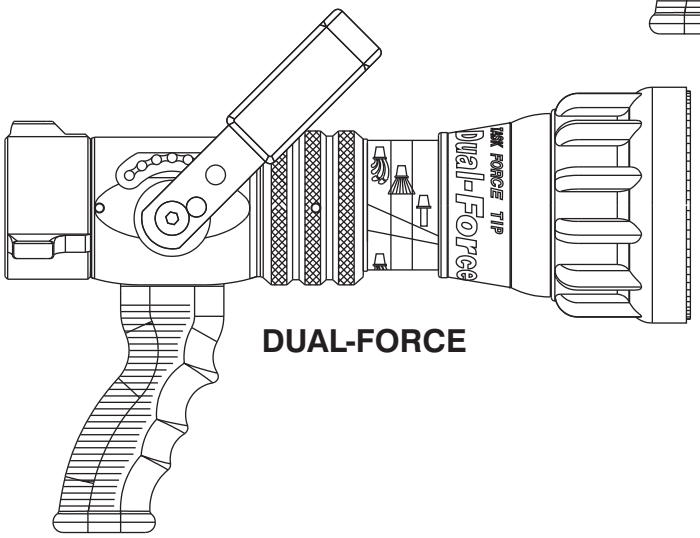
⚠WARNING ***Read instruction manual before use. Operation of this nozzle without understanding the manual and receiving proper training can be dangerous and is a misuse of this equipment. Call 800-348-2686 with any questions.***

⚠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

TASK FORCE TIPS

FIRE FIGHTING EQUIPMENT

TASK FORCE TIPS, Inc.
www.tft.com

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LIN-035 November 25,2003 Rev 7

1.0 GENERAL INFORMATION

The Task Force Tips MID-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 5.0 for saltwater use) as well as fire fighting foam solutions. Other important operating features are:

- Switchable from standard 100 PSI operation to low pressure
- Automatic pressure regulation at 100 PSI (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

1.1 VARIOUS MODELS AND TERMS

The TFT MID-FORCE and DUAL-FORCE nozzles are available in several different models. Some common models and operating features are shown in figure 1.

SERIES	FLOW RANGE (GPM)		NOMINAL PRESSURE (PSI)		STANDARD COUPLING*
	GPM	l/min	PSI	BAR	
MID-FORCE	70-200		100	7	1-1/2 NH
DUAL-FORCE	95-250		100	7	1-1/2 NH

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

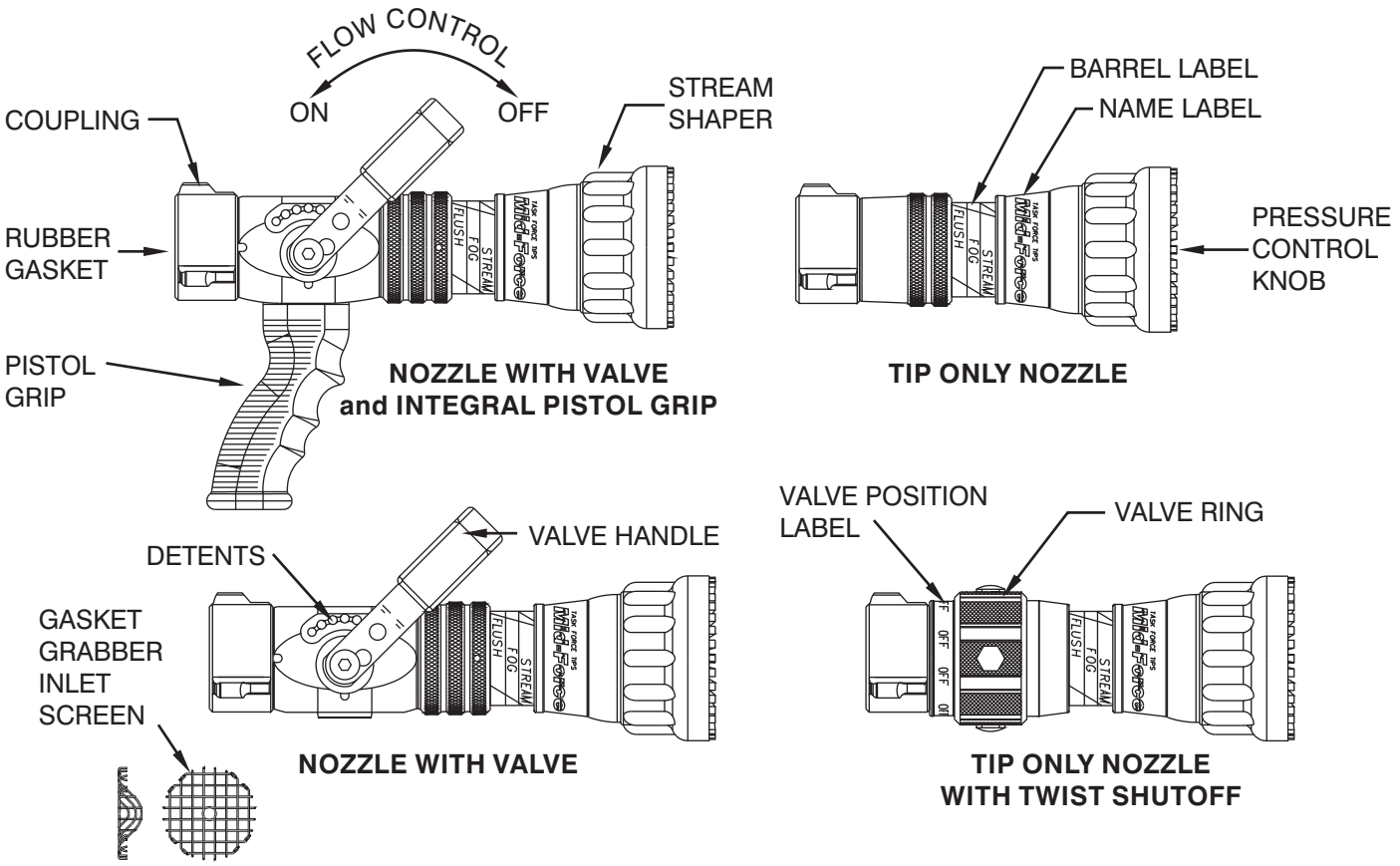


FIGURE 1 - COMMON MODELS AND TERMS

1.2 COLOR CODED VALVE HANDLE COVERS

The TFT MID-FORCE and DUAL-FORCE with lever type valve handles are supplied with black valve handle covers. The handle covers 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.

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

Preconnect #1 or Bumper Jump Line	Orange	Preconnect or discharge #5	Blue
Preconnect or discharge #2	Red	Preconnect or discharge #6	Black
Preconnect or discharge #3	Yellow	Preconnect or discharge #7	Green
Preconnect or discharge #4	White	Foam Lines	Red w/ White border (Red/White)

1.3 NOZZLE COUPLING

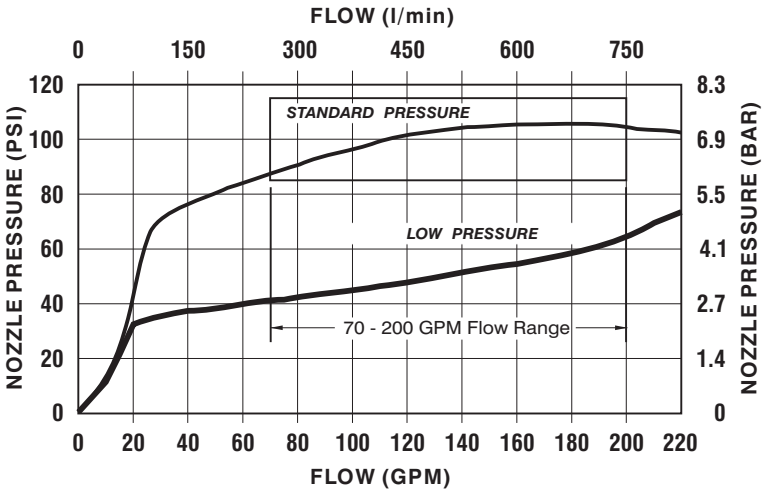
Rocker lug 1-1/2" NH full-time swivel is standard on models with lever type flow control. The coupling is the same on other models except it does not swivel. Other threads such as 1-1/2" NPSH can be specified at time of order.

⚠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.***

2.0 FLOW CHARACTERISTICS

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

Mid-Force *meets NFPA flow requirements.*



The charts in section 8.0 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.**

Dual-Force *meets NFPA flow requirements.*

For Nozzles Manufactured After December 1, 2003

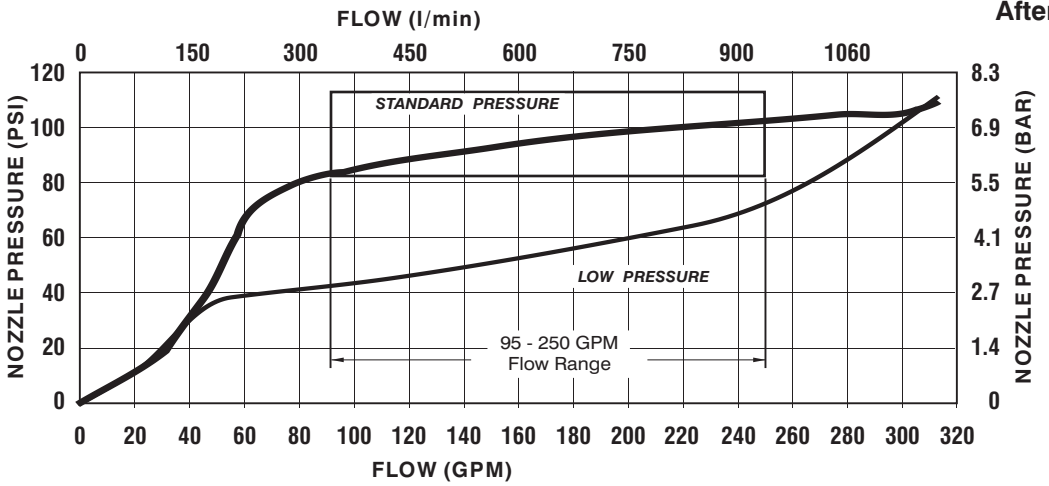


FIGURE 2 NOZZLE PERFORMANCE

⚠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, flushing, or pressure control knob 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.***

3.0 NOZZLE CONTROLS

3. 1 FLOW CONTROL

3.1.1 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.

3.1.2 TWIST SHUTTOFF

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.

3.1.3 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.

3.2 PATTERN AND FLUSH CONTROL

3.2.1 PATTERN CONTROL

The TFT's MID-FORCE and DUAL-FORCE 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.

3.2.2 FLUSH CONTROL

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.

⚠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.***

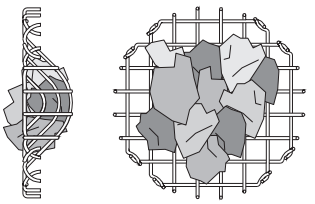


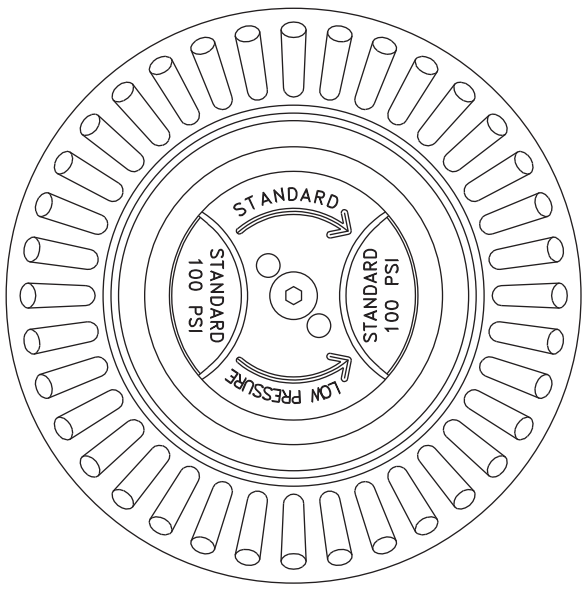
FIGURE 3 - GASKET GRABBER

3.3 STANDARD/LOW PRESSURE KNOB

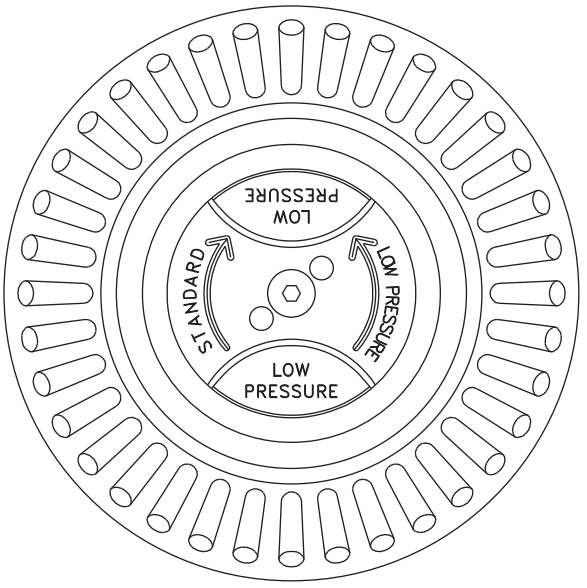
For situations where 100 PSI at the nozzle is impractical, the MID-FORCE or DUAL-FORCE may be switched to an low pressure mode. In the low pressure mode the nozzle pressure is reduced by about 50% while maintaining a usable stream and increasing the flow. The nozzle operator must be prepared for a change in reaction when changing modes. See figure 2 or the flow chart in section 8.0 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 100 PSI operation.

To obtain dual pressure capability, a knob is added to the front end of the baffle. This knob protrudes past the end of the nozzle when the shaper is rotated back. As a consequence, the knob and baffle may be damaged if subjected to impact such as from a drop. The knob and baffle portion of the nozzle does NOT meet NFPA 1964's rough usage requirement of a six foot drop onto concrete (paragraph 4-7.1). In the event of damage to this section the stream quality may be affected as well as nozzle pressure regulation.



Knob In
Standard Operating Mode



Knob In
Low Pressure Mode

FIGURE 4

4.0 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 8.0. 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 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
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

5.0 FIELD INSPECTION

TFT's MID-FORCE and DUAL-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.

⚠WARNING ***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 and Dual-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.

TFT Item#	Title
LHM-020	Mid-Matic & Mid-Force Service Procedure
LHD-020	Handline & Dual-Force Service Procedure

⚠CAUTION ***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.

6.0 WARRANTY

Task Force Tips, Inc., 2800 East Evans Avenue, Valparaiso, Indiana 46383 ("TFT") warrants to the original purchaser of its Dual-Force and Mid-Force 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 2800 East Evans Avenue, Valparaiso, Indiana 46383, 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.

7.0 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.

8.0 NOZZLE FLOW CHARTS

Mid-Force Flow And Nozzle Reaction Chart

STD = STANDARD PRESSURE MODE
LP = LOW PRESSURE MODE

PUMP DISCHARGE PRESSURE (PSI) / 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	67 32	129 45	63 29	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	97 48	152 56	91 44	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	125 63	174 66	114 57	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	151 78	192 76	136 70	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	175 91	207 86	157 81	189 75	--- ---	--- ---	--- ---	--- ---	222 113	--- ---
225	183 94	209 87	158 82	186 72	142 73	168 63	--- ---	--- ---	198 102	221 96	176 91	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 Flow And Nozzle Reaction Chart

7 bar = STANDARD PRESSURE MODE
LP = LOW PRESSURE MODE

PUMP DISCHARGE PRESSURE (KPA) / 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
350	80 4	210 8	80 3	190 7	80 3	175 6	80 4	245 10	80 4	225 9	80 3	205 8	85 4	310 12	85 4	285 11	85 4	225 10
520	115 6	350 14	110 5	315 12	105 5	285 11	85 6	420 17	120 6	380 15	115 6	345 14	135 175	535 23	130 7	485 20	130 7	450 19
700	245 14	460 19	225 12	405 16	210 11	365 15	275 15	540 24	255 15	490 20	240 13	445 18	320 19	695 33	300 17	630 29	285 16	580 25
860	350 20	540 24	320 18	475 20	290 17	430 18	410 25	650 30	365 22	575 25	345 20	520 23	510 31	805 41	460 28	750 36	430 26	690 32
1000	445 27	615 28	395 24	540 24	365 21	490 21	535 33	740 35	475 29	660 30	430 26	600 26	740 46	--- ---	635 40	--- --	570 35	775 38
1200	530 33	680 31	470 29	600 27	425 26	540 24	660 41	805 41	570 35	725 35	515 32	660 30	--- ---	--- ---	800 50	--- ---	710 44	845 45
1400	615 38	740 35	535 33	655 30	485 30	590 26	770 48	--- ---	660 41	785 39	595 37	715 34	--- ---	--- ---	--- ---	--- ---	840 51	--- ---
1550	695 43	790 40	600 37	705 33	535 33	635 29	--- ---	--- ---	750 46	835 44	665 41	770 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.

For Nozzles Manufactured After December 1, 2003

Dual-Force Flow And Nozzle Reaction Chart

STD = STANDARD PRESSURE MODE
LP = LOW PRESSURE MODE

PUMP DISCHARGE PRESSURE (PSI)	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 16	54 17	47 15	50 15	45 14	47 14	50 17	62 20	49 16	56 18	48 15	53 17	51 18	76 25	51 17	70 23	50 17	65 21	53 19	107 37	53 19	102 35	53 19	97 33
	75	59 23	91 31	57 22	80 27	56 21	72 24	61 25	110 38	60 24	98 33	59 23	89 30	63 27	141 51	62 26	127 45	61 25	116 40	65 28	206 82	65 28	194 76	65 28	184 71
	100	74 33	118 41	69 30	104 36	65 28	94 32	83 38	144 52	77 35	128 45	73 33	116 40	99 47	185 71	91 43	166 62	86 40	452 56	135 66	265 119	128 62	254 110	122 59	242 103
	125	100 47	141 51	89 42	124 44	82 38	112 39	119 58	172 65	107 51	152 56	98 46	138 50	152 76	221 90	136 67	199 78	126 61	182 70	245 128	299 149	223 115	288 139	207 106	279 130
	150	124 60	160 60	110 53	141 51	100 47	128 45	151 75	196 77	134 66	174 66	122 59	157 58	198 101	252 108	176 89	227 93	160 80	208 80	328 179	326 179	312 166	315 167	283 149	306 156
	175	146 72	178 68	128 63	157 58	116 56	142 51	179 91	217 88	158 79	193 75	143 71	175 66	238 124	274 126	210 108	251 108	190 97	230 95	— —	— —	340 195	340 195	331 183	329 182
	200	165 83	194 76	145 72	171 64	131 64	154 57	204 105	237 99	179 91	210 84	162 81	190 74	273 144	294 144	240 125	270 123	217 112	250 108	— —	— —	— —	— —	— —	— —
	225	183 93	209 84	160 80	184 71	144 71	166 62	227 117	255 110	199 101	226 93	179 91	205 81	307 163	311 163	268 141	287 138	242 126	268 121	— —	— —	— —	— —	— —	— —
	250	199 102	223 91	174 88	196 77	157 81	177 67	248 129	269 122	216 112	241 102	195 100	218 89	329 181	328 181	293 155	303 154	264 139	283 134	--- ---	--- ---	— ---	— ---	--- ---	--- ---

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.

Dual-Force Flow And Nozzle Reaction Chart

7 bar = *STANDARD PRESSURE MODE*
LP = *LOW PRESSURE MODE*

PUMP DISCHARGE PRESSURE (bar)	FLOW (l/min) REACTION (KG)	38mm HOSE						45mm HOSE						2" HOSE						2 1/2" 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 7	204 8	178 7	189 7	170 6	178 6	189 8	235 9	185 7	212 8	182 7	201 8	193 8	288 11	193 8	265 10	189 8	246 10	201 9	405 17	201 9	386 16	201 9	367 15
	5.2	223 10	344 14	216 10	303 12	212 10	273 11	231 11	416 17	227 11	371 15	223 10	337 14	238 12	534 23	235 12	481 20	231 11	439 18	246 13	780 37	246 13	734 34	246 13	696 32
	7.0	280 15	447 19	261 14	394 16	246 13	356 15	314 17	545 24	291 16	484 20	276 15	439 18	375 21	700 32	344 20	628 28	326 18	575 25	511 30	1003 54	484 28	961 50	462 27	916 47
	8.6	379 21	534 23	337 19	469 20	310 17	424 18	450 26	651 29	405 23	575 25	371 21	522 23	575 34	836 41	515 30	753 35	477 28	689 32	927 58	1132 68	844 52	1090 63	783 48	1056 59
	10.0	469 27	606 27	416 24	534 23	379 21	484 20	572 34	742 35	507 30	659 30	462 27	594 26	749 46	954 49	666 40	859 42	606 36	787 38	1241 81	1234 81	1181 75	1192 76	1071 68	1158 71
	12.0	553 33	674 31	484 29	594 26	439 25	537 23	678 41	821 40	598 36	731 34	541 32	662 30	901 56	1037 57	795 49	950 49	719 44	871 43	— —	— —	1287 88	1287 88	1253 83	1245 83
	14.0	625 38	734 34	549 33	647 29	496 29	583 26	772 48	897 45	678 41	795 38	613 37	719 34	1033 65	1113 65	908 57	1022 56	821 51	946 49	— —	— —	--- —	— —	— —	— —
	15.5	693 42	791 38	606 36	696 32	545 32	628 28	859 53	965 50	753 46	855 42	678 41	776 37	1162 74	1177 74	1014 64	1086 63	916 57	1014 55	— —	— —	— —	— —	— —	— —
	17.0	753 46	844 41	659 40	742 35	594 35	670 30	939 59	1018 55	818 51	912 46	738 45	825 40	1245 82	1241 82	1109 70	1147 70	999 63	1071 61	— ---	--- ---	--- ---	— ---	--- ---	--- ---

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.

9.0 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.

⚠WARNING ***Any Mid-Force or Dual-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.***

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