

MANUAL: ThunderFog, QuadraFog and QuadraCup

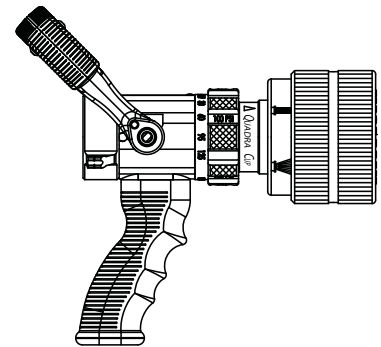
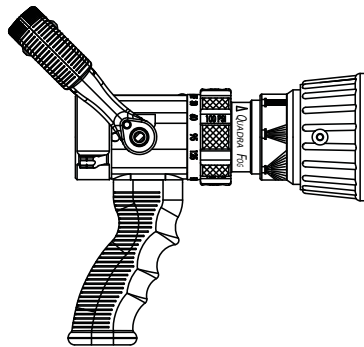
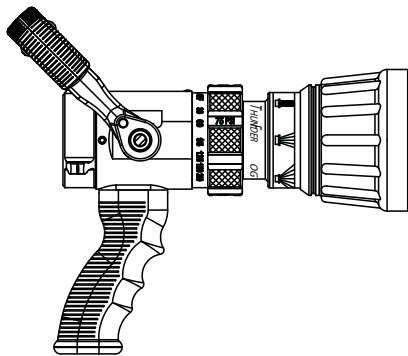
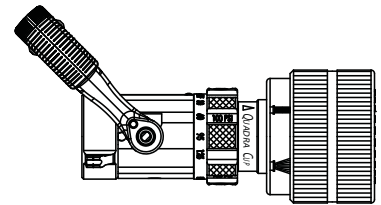
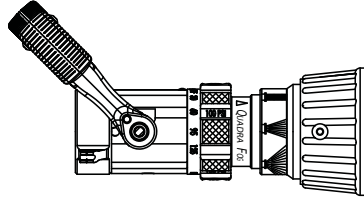
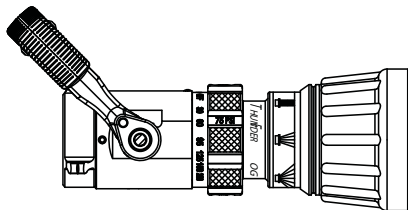
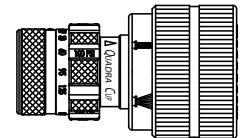
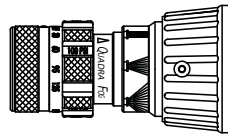
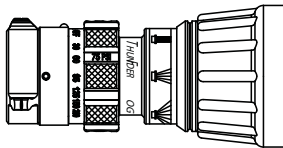
INSTRUCTIONS FOR INSTALLATION, SAFE OPERATION AND MAINTENANCE

⚠ 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.

This instruction manual is intended to familiarize firefighters and maintenance personnel with the operation, servicing and safety procedures associated with the ThunderFog, QuadraFog and QuadraCup fire fighting nozzles.

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



ThunderFog Series

QuadraFog Series

QuadraCup Series

Table Of Contents

- 1.0 MEANING OF SIGNAL WORDS
- 2.0 GENERAL INFORMATION
 - 2.1 VARIOUS MODELS AND TERMS
 - 2.2 MECHANICAL SPECIFICATIONS
 - 2.3 NOZZLE COUPLINGS
 - 2.4 COLOR CODED VALVE HANDLE COVERS
- 3.0 FLOW CHARACTERISTICS
- 4.0 NOZZLE CONTROLS
 - 4.1 BALL VALVE SHUTOFF
 - 4.2 SELECTOR RING
 - 4.2.1 FLOW SETTING
 - 4.2.2 FLUSH SETTING
 - 4.2.3 SHUTOFF SETTING (TIP ONLY)
 - 4.3 PATTERN CONTROL
 - 4.4 QUADRACUP NOZZLES
- 5.0 FIREGROUND USE
- 6.0 FIELD INSPECTION
- 7.0 REPAIR
- 8.0 EXPLODED VIEWS AND PARTS LIST
- 9.0 ANSWERS TO YOUR QUESTIONS
- 10.0 INSPECTION CHECKLIST
- 11.0 WARRANTY



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

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 Z535.6-2011, 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, may 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 physical injury.

2.0 GENERAL INFORMATION

This manual describes nozzles calibrated at 100 psi (7 bar) and 75 psi (5 bar). Contact factory for data specific to models that operate with metric flow calibrations.

Thunderfog, Quadrafog and QuadraCup are economical, lightweight, and dependable nozzles. Their rugged construction is compatible with the use of fresh water (see section 6.0 for saltwater use) as well as firefighting foam solutions. Other important operating features are:

- Quick-acting pattern control from straight stream to wide fog
- Fixed fog teeth
- Stainless Steel spinning fog teeth available on some models
- Easily flushable while flowing to clear trapped debris
- Quick-change rear valve seat
- TFT's five-year warranty and unsurpassed customer service



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 on pages 8 - 11 or call 800-348-2686 for assistance.



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.



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.



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.



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

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



Improper use of foam can result in injury or damage to the environment. Follow foam manufacturer's instructions and fire service training to avoid:

- Using wrong type of foam on a fire, i.e. Class A foam on a Class B fire.
- Plunging foam into pools of burning liquid fuels.
- Causing environmental damage.
- Directing stream at personnel.



There is a wide variety of foam concentrates. Each user is responsible for verifying that any foam concentrate chosen to be used with this unit has been tested to assure that the foam obtained is suitable for the purpose intended.



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. Assure that:

- Application rate is sufficient (see NFPA 11 or foam manufacturer's recommendations).
- Enough concentrate is on hand to complete task (see NFPA for minimum duration time requirements).
- Foam logistics have been carefully planned. Allow for such things as:
 - Storage of foam in a location not exposed to the hazard it protects.
 - Personnel, equipment and technique to deliver foam at a rapid enough rate.
 - Removal of empty foam containers.
 - Keeping clear path to deliver foam as hoses, other equipment and vehicles are deployed.



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

2.1 VARIOUS MODELS AND TERMS

Selectable Flow: A nozzle with a discharge orifice that can be set to a user selected position. In each position the nozzle acts as a fixed orifice nozzle.

Fixed Flow: A nozzle with a discharge orifice that is a fixed opening size. The user can set the opening to flush positions, or on tip only models to the OFF position.

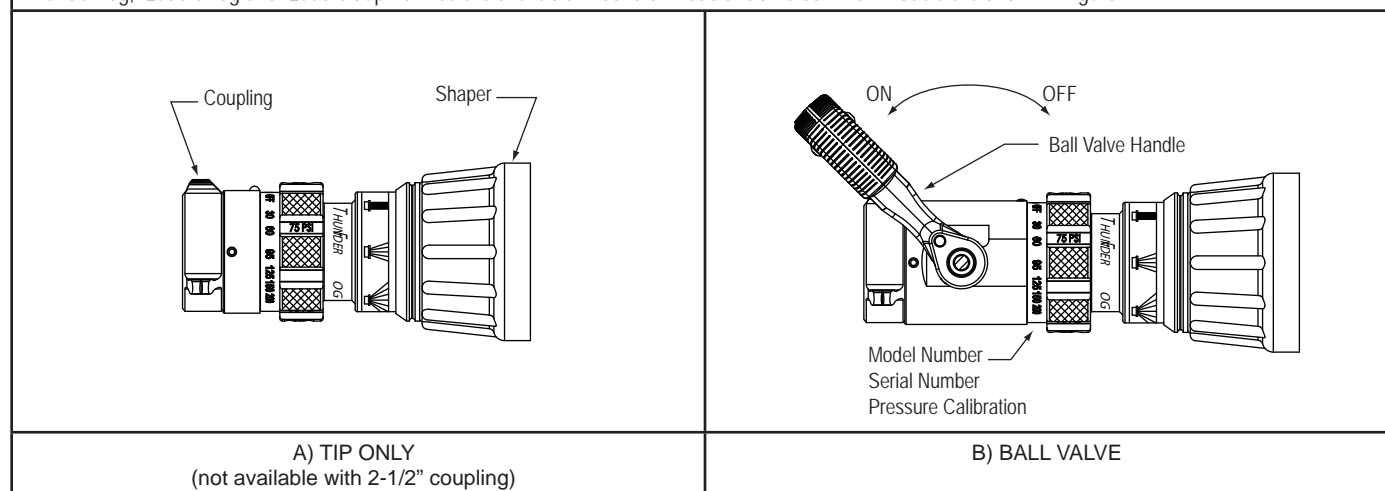
Tip Only: a nozzle without an integral ball shutoff valve.

Thunderfog, Quadrafog and QuadraCup nozzles are available in a variety of flow ranges and configurations. All models deliver the selected flow when the rated pressure is supplied to the nozzle. Flow settings and recommended hose sizes are:

SERIES	RECOMMENDED HOSE SIZE		FLOW SETTINGS @100 PSI (7bar)		NOZZLE TYPE
	INCHES	MM	GPM	l/min	
1" QUADRAFOG	3/4, 1	19, 25	5, 10, 24, 40	20, 40, 100, 150	Selectable Flow
1.5" QUADRAFOG	1-1/2	38	30, 60, 95, 125	115, 230, 360, 475	Selectable Flow
1.5" QUADRACUP	1-1/2	38	30, 60, 95, 125	115, 230, 360, 475	Selectable Flow, Foam
1.5" THUNDERFOG	1-1/2 to 1-3/4	38 to 45	30, 60, 95, 125, 150, 200	115, 230, 360, 475, 550, 750	Selectable Flow
2.5" THUNDERFOG	1-1/2 to 2-1/2	38 to 64	95, 125, 150, 200, 250	360, 475, 550, 750, 950	Selectable Flow

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

ThunderFog, QuadraFog and QuadraCup nozzles are available in several models. Some common models are shown in figure 1.



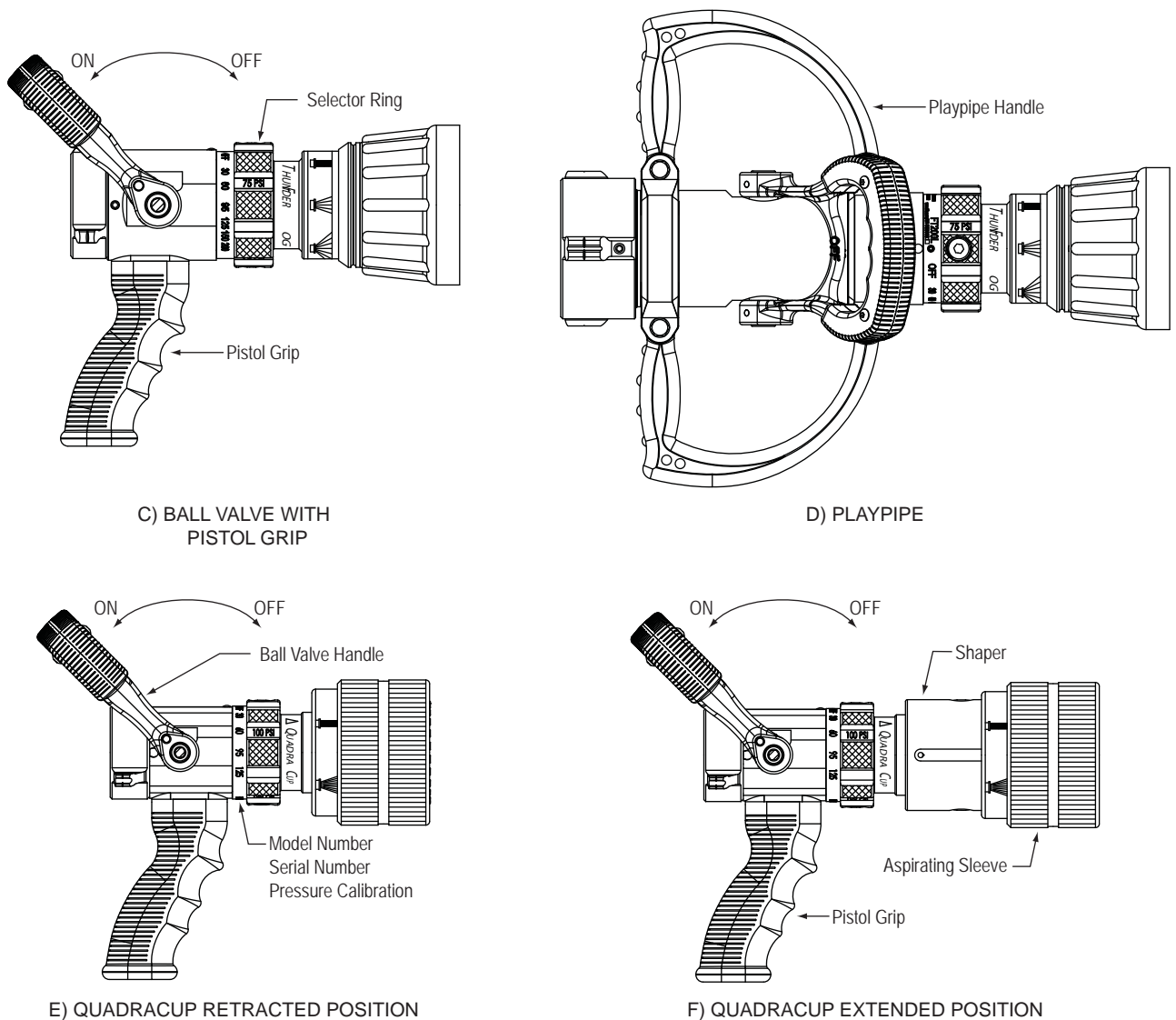


FIGURE 1
BASIC NOZZLE CONFIGURATIONS AND TERMS

2.2 MECHANICAL SPECIFICATIONS

Maximum nozzle inlet pressure with valve shutoff	1" Quadrafog 800 psi	55 bar
	1.5" Quadrafog & Quadracup 300 psi	21 bar
	1.5" & 2.5" Thunderfog 300 psi	21 bar
Operating temperature range of fluid	33 to 120 F	1 to 50 C
Storage temperature range of fluid	-40 to 150 F	-40 to 65 C
Materials used	Aluminum 6000 series hard anodized MIL 8625 class 3 type 2, stainless steel 300 series, nylon 6-6, nitrile rubber	

2.3 NOZZLE COUPLING

NH (National Hose Threads per NFPA #1963) threads are standard on all nozzles. Other threads such as NPSH (National Pipe Straight Hose threads per ANSI/ASME #B1.20.7) 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.

⚠ 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.

2.4 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:

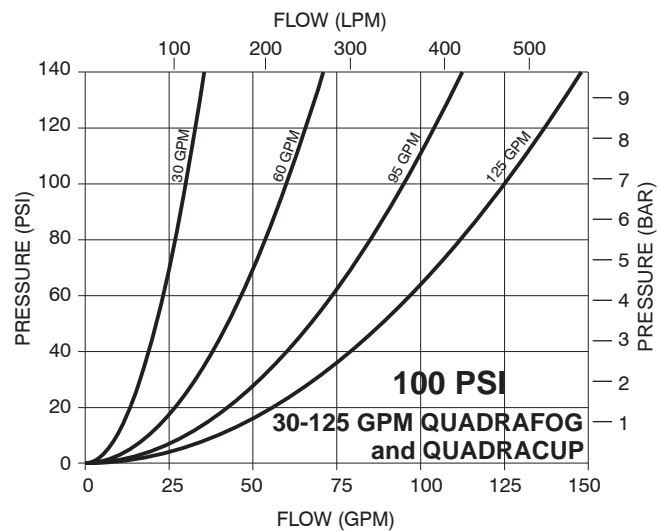
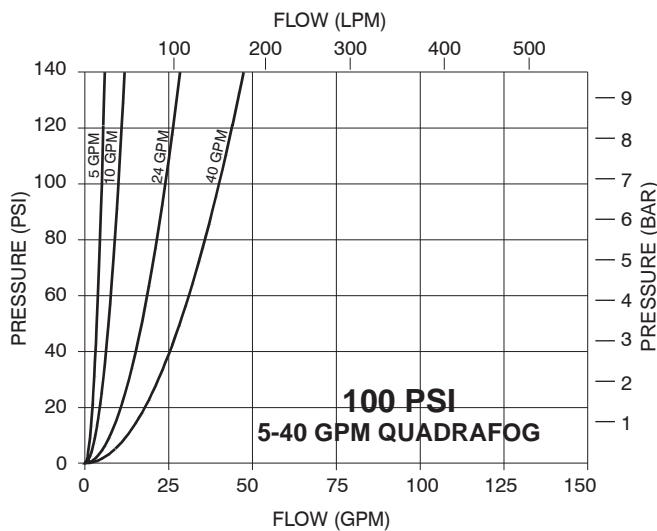
Preconnect #1 or Bumper Jump Line	Orange
Preconnect or discharge #2	Red
Preconnect or discharge #3	Yellow
Preconnect or discharge #4	White
Preconnect or discharge #5	Blue
Preconnect or discharge #6	Black
Preconnect or discharge #7	Green
Foam Lines	Red w/ White border (Red/White)

Other Colors Available:

- Gray
- Pink
- Purple
- Tan

3.0 FLOW CHARACTERISTICS

At each flow setting the nozzle is set to a predetermined fixed orifice. Relationship of flow and nozzle pressure at each setting is shown in figure 2. Contact the factory or visit the website (www.tft.com) for range and trajectory data.



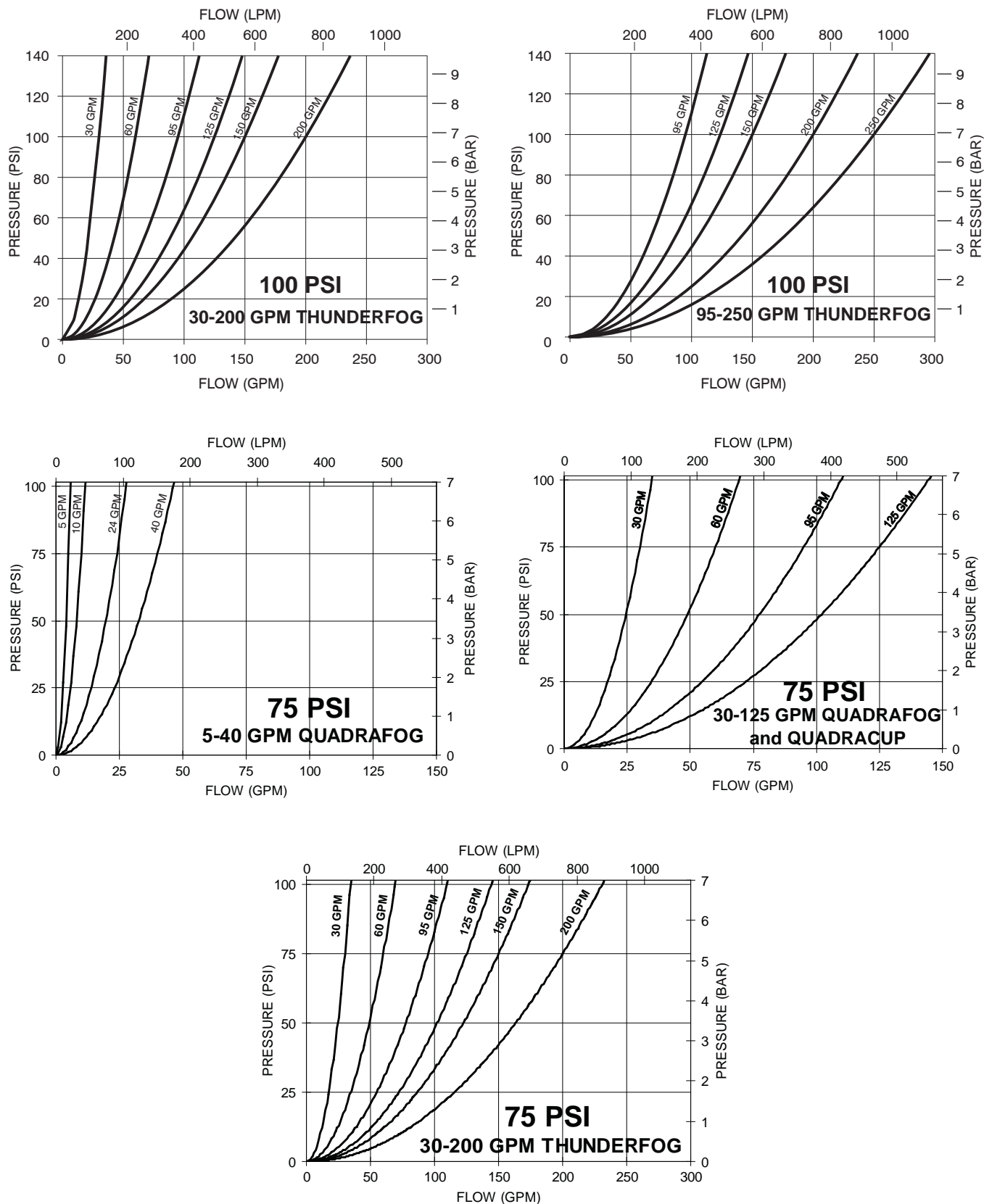


FIGURE 2 NOZZLE FLOW CHARACTERISTICS

The charts in this document give specific examples of pump pressure and flow for various hoses and lengths. Losses may vary due to differences in hose construction resulting in flows different than shown. For situations or lengths of hose not listed on the chart, approximate flows can be calculated using conventional hydraulics.

4.0 NOZZLE CONTROLS

4.1 BALL VALVE SHUTOFF

Models with a ball valve are shut off when the valve handle is fully forward. Pulling back on the handle opens the valve. Open valve slowly to avoid sudden changes in nozzle reaction. Close valve slowly to prevent water hammer. Note: In partially open positions a ball valve will cause turbulence and adversely affect stream quality.

4.2 SELECTOR RING

4.2.1 FLOW SETTING

The selector ring is marked with various flow settings. Turn the selector ring so the desired setting lines up with the silver indicator pin. A spring-loaded detent is provided at each flow setting. The nozzle will flow the indicated amount when the pressure at the nozzle is 100 PSI (7 bar) or 75 PSI (5 bar) on low pressure versions.

4.2.2 FLUSH SETTING

Debris may become trapped in the nozzle causing poor stream quality, shortened reach and reduced flow. To remove trapped debris, the nozzle can be flushed as follows: While still flowing water, rotate the selector ring into the flush position. This will open up the nozzle, allowing debris to pass through. Rotate the selector ring out of flush to continue normal operations. The nozzle operator must be prepared for a change in nozzle reaction when returning the nozzle from the flush position to retain control of the nozzle.



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 nozzle and remove debris.

4.2.3 SHUTOFF SETTING (TIP-ONLY MODELS)

On tip-only models the selector ring has a shutoff setting to stop the nozzle flow. To shut off the nozzle, rotate the selector ring clockwise (as seen from the operating position behind the nozzle) into the "OFF" position. Rotate counterclockwise into a flow setting to open nozzle.

4.3 PATTERN CONTROL

The Thunderfog, Quadrafog and QuadraCup nozzles have full pattern control from straight stream to wide fog. Turning the 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 furthest reaching stream. 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.

4.4 QUADRACUP NOZZLES

The QuadraCup nozzle is capable of producing aspirated foam as well as a conventional straight stream and wide protective fog pattern. The QuadraCup functions just like the QuadraFog nozzle when the gray sleeve is in the retracted position as in figure 1E.

To use the aspirating feature of the QuadraCup, the nozzle operator need only slide the gray sleeve portion of the nozzle forward as in figure 1F. Rotation of the shaper when the sleeve is extended will provide the nozzle operator control of reach and aspiration. If an immediate wide protective fog pattern is needed, the sleeve can be retracted instantly to its regular position.

5.0 FIREGROUND USE

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 is being generated. The flow rate depends largely on the pump discharge pressure and hose friction loss. The pump discharge pressure may be calculated using a hydraulic equation such as:

$$\text{PDP} = \text{NP} + \text{FL} + \text{DL} + \text{EL}$$

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

For additional information on calculating specific hose layouts, consult an appropriate fire-service training manual, such as A Firefighters Guide To Nozzles published by Task force Tips, or call TFT's "Hydraulics Hotline" at 800-348-2686.

6.0 FIELD INSPECTION

Thunderfog, Quadrafog and QuadraCup 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.

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

Performance tests shall be conducted on the nozzle after a repair, or anytime a problem is reported to verify operation in accordance with Task Force Tips test procedures. Consult factory for the test 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.



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

All 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.

7.0 REPAIR

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 wet tested, and promptly returned. Repair charges for non-warranty items are minimal. Any returns should include a note as to the nature of the problem and whom to reach in case of questions.

Task Force Tips assumes no liability for damage to equipment or injury to personnel that is a result of user service.

Repair kits and repair parts are stocked for immediate shipment. Contact the factory or visit the website at www.tft.com for parts lists, exploded views, test procedures and trouble shooting guides.

8.0 EXPLODED VIEWS AND PARTS LIST

The following pages contain exploded drawings and parts list for the following nozzles:

1" QUADRAFOG SERIES DQ40, DQS40 & DQS40P	pages 10-11
1.5" QUADRAFOG AND QUADRACUP SERIES	pages 12-13
1.5" & 2.5" THUNDERFOG SERIES	pages 14-15

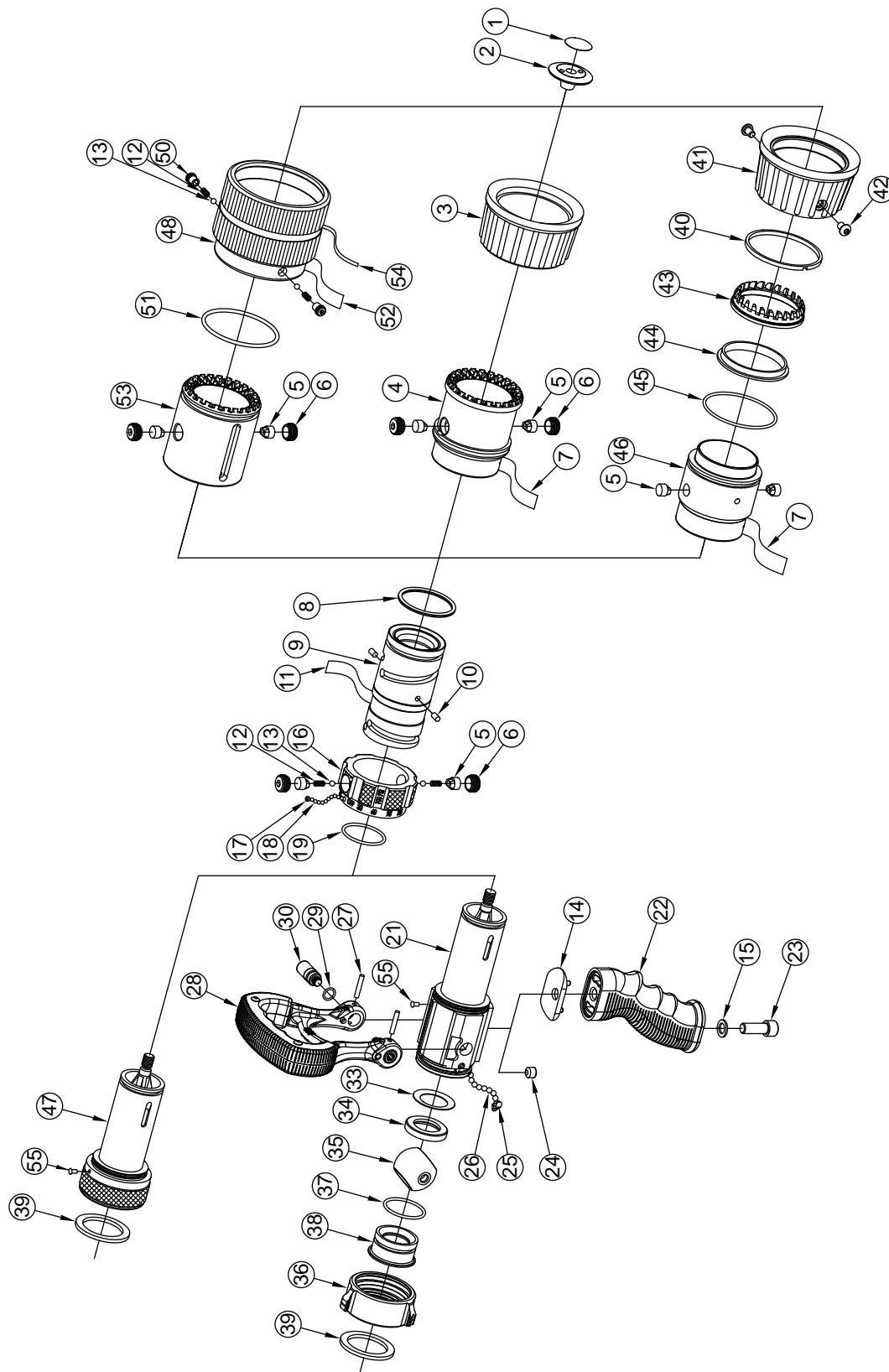
This exploded view diagram illustrates the assembly of a handheld ultrasonic cleaning device. The components are numbered 1 through 40. The assembly includes a main body (19) with a handle (25) and a trigger switch (24). The handle features a trigger switch (24) and a safety lock (38). The main body (19) houses the internal components, including a motor (22) and a transducer (23). The transducer is connected to a series of ultrasonic horns (29, 30, 31, 32, 34, 35) which are used for cleaning. The device also includes a protective cap (33) and a base (36). The exploded view shows the relationship between these components, including the handle, trigger switch, safety lock, main body, motor, transducer, ultrasonic horns, protective cap, and base.

Ref #	Description	Qty	Order #
1	DQ Deflector Label	1	DL10
2	DQ Deflector	1	DQ210
3	DQ Bumper	1	DQ275
4	Head	1	DQ220
5	DQ Pattern Label	1	DL200
6	Cup	2	DQ260
7	V Follower	2	DQ265
8	O-Ring 123	1	VO-123
9*	Gallorage Sleeve DQ	1	DQ240
			DQ241
10	Name Label	1	DL241
11	DQ Key Pins	2	DQ250
12	3/16" Torlon Ball	1	V2120-Torlon
13	Spring #C0180-032-0310-S	1	VM4195
14	Detent Screw	1	D290
15*	Index Ring	1	DQ230
			DQ231
17	VSL-149-S02 Smalley Ring	1	V4245
18	O-Ring 021	1	VO-021
19*	DQ Base	1	DQ201
			DQ205**
20	Trunnion	2	D07540
21	O-Ring 010	2	VO-010
22	DQ Handle Subassembly	1	DQ680
23	5/32 x 7/8 HDP Spirol Pin	2	V1900
24	3/8-16 x 7/8" Socket Head Cap Screw	1	VT37-16SH1.0
25	Pistol Grip Small R	1	HM692-BLK
26	3/8-16 x 5/16" Socket Set Screw	1	VT37-16SS312
27	Port Plug	1	B770
28	3/16" SS Ball 302	26	V2120
29	Stem	1	DQ280
30	Belleville Washer	1	D07590
31	75 Front Seat	1	D07570
32	75 Ball	1	D07530
33**	75 Coupling	1	D07597**
34	O-Ring 120	1	VO-120
35	75 Rear Seat	1	D07580
36	1.0" Coupling Gasket	1	V3040
37	Spacer	1	HM693-D
38	Flat Washer	1	VM4901
39	Stop Pin	2	D07550
40	6 x 1/4 SS Drive Screw	1	VT06E00DS250

* - CONSULT FACTORY FOR SPECIFIC PART NUMBERS

** - STATE DESIRED THREAD WHEN ORDERING

1.5" QUADRAFOG AND QUADRACUP SERIES



Ref #	Description	Qty	Order #
1	Deflector Label	1	FL10
2	Deflector	1	FT210
3	Bumper	1	FT270
4	Head	1	FT220
5	'V' Follower	2	JT263
6	Cup	2	FT260
7	Pattern Label	1	FL200
8	Quad Ring	1	VOQ-4225
9	Gallonge Sleeve	1	FT240
			FT241*
10	Key Pins	2	FT252
11	Name Label	1	FL241
12	Helical Spring	2	VM4195
13	3/16" Torlon Ball	2	V2120-TORLON
14	Pistol Grip Spacer	1	HM693-F
15	3/8" Flat Washer	1	VM4901
16	Index Ring	1	FT230
			FT231*
17	8-32 x 1/8" Set Screw	1	VT08-32SS125
18	1/8" Acetal Ball	50	VB125AC
19	O-Ring	1	VO-127
21	Quadrafog Base	1	FT202
22	Pistol Grip	1	HM692-BLK
23	Socket Head Screw	1	VT37-16SH1.0
24	Set Screw	1	VT37-16SS312
25	Port Plug	1	B770
26	Stainless Steel Balls	34	V2120

Ref #	Description	Qty	Order #
27	Spirol Pin	2	V1900
28	FQ Handle Subassembly	1	FQ860
29	O-Ring	2	VO-012
30	Trunnion	2	F10040
31	Stop Pin	2	F10050
33	Bellville Washer	1	F10090
34	Front Seat	1	F10070
35	Ball	1	F10030
36	Coupling	1	F10097
37	O-Ring	1	VO-126
38	Rear Seat	1	F10080
39	Gasket	1	V3130
40	O.D. Wear Ring	1	FT267
41	Spinning Tooth Bumper	1	FT265
42	¼-20 x 3/8 Button Head Screw	2	VT25B20BH375
43	Spinning Teeth	1	FT222
44	I.D. Wear Ring	1	FT227
45	O-Ring	1	VO-145
46	Spinning Teeth Head	1	FT225
47	FQ Base Kit	1	FQ805
48	Cup	1	F675
49	3/16" Torlon Ball	2	V2120-TORLON
50	Detent Screw	2	D290
51	O-Ring	1	VO-231
52	Pattern Label QuadraCup	1	FL205
53	Foam Head	1	FT226

* - CONSULT FACTORY FOR SPECIFIC PART NUMBERS

** - STATE DESIRED THREAD WHEN ORDERING

This exploded view diagram illustrates the assembly of a handheld ultrasonic welding tool. The components are numbered 1 through 54. The main body (17) houses the motor (19) and the ultrasonic transducer (20). The transducer is connected to the welding head (21) via a horn (22). The welding head is equipped with a heating element (23) and a pressure roller (24). The tool is powered by a battery pack (32) connected to the main body (33). The handle (34) is designed for ergonomic use. The diagram shows the assembly of the main body, the welding head, the battery pack, and the handle, along with various internal components like gears, bearings, and seals.

Ref #	Description	Qty	Order #
1	Deflector Label	1	JL10
2	Deflector	1	JT210
3	Bumper	1	JT270
4	Fixed Head	1	JT220
5	Cup	2	FT260
6	V Follower	4	JT263
7*	Pattern Label	1	*
8	O.D. Wear Ring	1	JT267
9	Bumper (Spinning Teeth)	1	JT265
10	¼-20 x 3/8 Button Head Screw	1	VT25B20BH375
11	JT Spinning Teeth	1	JT222
12	ID Wear Ring	1	JT227
13	O-Ring 149	1	VO-149
14	Head (Spinning Teeth)	1	JT225
15	O-Ring 227	1	VO-227
16*	Gallorage Sleeve	1	*
17	Key Pins	2	JT250
18*	Name Label	1	*
19	Spring #C0180-032-0310	2	VM4195
20	3/16" Torlon Ball	2	V2120-TORLON
21	Cup	2	JT260
22*	Index Ring	1	*
23	1/8" Acetal Ball	54	VB125AC
24	#8-32 x 5/32 Socket Set Screw	1	VT08-32SS156
25	O-Ring 130	1	VO-130
26	JTS 250 Base	1	JT204
27	140 Trunnion	2	F14040
28	O-Ring 014	2	VO-014

Ref #	Description	Qty	Order #
29	5/32 x 1 1/8 HDP Spirol Pin	2	V1920
30	FT Handle Subassembly	1	FT860
31	140 Stop Pin	2	F14050
32	3/8-16 X 1 Socket Head Cap Screw	1	VT37-16SH1.0
33	Pistol Grip	1	HM692-BLK
34	F140 Grip Spacer	1	HM693-J
35	3/8" Flat Washer	1	VM4901
36	3/8-16 X 1 Socket Head Cap Screw	1	VT37-16SS312
37	3/16" SS Ball	36/38	V2120
38*	1/4-28 Socket Set Screw	1	VT25-28SS187*
			VT25-28SS250*
39	Universal JT Base	1	JT205
40	1/8X1/4 SS Button Head	1	VT12E00RI250
41	Stem	1	JT280
42	Belleville Washer	1	J14090
43	140 Front Seat	1	F14070
44	140 Ball	1	F14030
45	O-Ring - 140	1	VO-140
46**	1.5" Coupling	1	F14097**
47	1.5" Coupling Gasket	1	V3130
48	Backup Plate	1	JT275
49	O-Ring 129	1	VO-129
50	140 Rear Seat	1	F14080
51	140 2 ½" Rear Seat	1	J14080
52	O-Ring 032	1	VO-032
53**	2.5" Coupling	1	J14097**
54	2.5" Gasket	1	V3190

* - CONSULT FACTORY FOR SPECIFIC PART NUMBERS
** - STATE DESIRED THREAD WHEN ORDERING

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.

10.0 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) Coupling is tight and leak free.
- 3) Valve operates freely through full range and shuts off flow.
- 4) Nozzle flow is adequate as indicated by pump pressure and nozzle reaction.
- 5) Selector ring turns into all positions including flush.
- 6) Shaper turns freely and adjusts pattern through full range.



Any 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.

11.0 WARRANTY

Task Force Tips, Inc., 3701 Innovation Way, Valparaiso, Indiana 46383-9327 USA ("TFT") warrants to the original purchaser of its ThunderFog, QuadraFog and QuadraCup series nozzles ("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.