



MANUAL: Max Series Nozzles

*With Automatic Pressure Control
or Fixed Gallonage*

MAX-FORCE, MAX-MATIC & MAX-FLOW

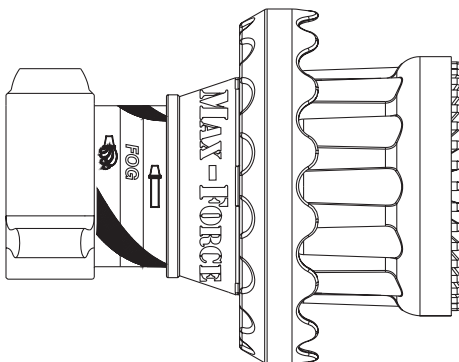
INSTRUCTIONS FOR SAFE OPERATION AND MAINTENANCE

This instruction manual is intended to familiarize firefighters and maintenance personnel with the operation, servicing and safety procedures associated with the Max Series firefighting nozzle.

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

WARNING

Read instruction manual before use. Operation of this device without understanding the manual and receiving proper training is a misuse of this equipment. A person who has not read and understood all operating and safety instructions is not qualified to operate the Max Series nozzle.



MAX-FORCE

Dual-Pressure Automatic

Normal Pressure Setting

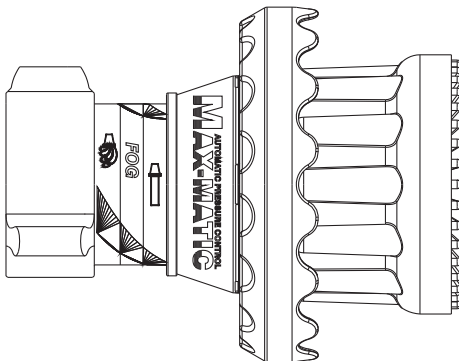
100 - 500 GPM @ 100 PSI

400 - 1900 LPM @ 7 BAR (700 KPA)

Low Pressure Setting

100 - 500 GPM @ 55 PSI

400 - 1900 LPM @ 4 BAR (400 KPA)



MAX-MATIC

100 PSI, Single-Pressure Automatic

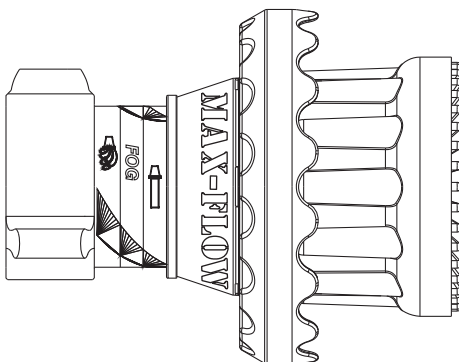
100 - 500 GPM @ 100 PSI

400 - 1900 LPM @ 7 BAR (700 KPA)

80 PSI, Single-Pressure Automatic

100 - 500 GPM @ 80 PSI

400 - 1900 LPM @ 5.5 BAR (550 KPA)



MAX-FLOW

500 gpm, Fixed Gallonage

100 - 500 GPM @ 100 PSI

400 - 1900 LPM @ 7 BAR (700 KPA)

TASK FORCE TIPS, Inc.
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TABLE OF CONTENTS

<p>1.0 MEANING OF SIGNAL WORDS</p> <p>2.0 GENERAL INFORMATION</p> <p>2.1 USE WITH SALT WATER</p> <p>2.2 VARIOUS TERMS</p> <p>2.3 PATTERN CONTROL</p> <p>2.4 FLUSH CONTROL</p> <p>2.5 STANDARD / LOW PRESSURE KNOB</p> <p>2.6 USE OF MAX SERIES NOZZLES</p> <p>2.7 USE WITH FOAM</p>	<p>3.0 FLOW CHARACTERISTICS</p> <p>3.1 STREAM TRAJECTORY DATA</p> <p>4.0 FIELD INSPECTION</p> <p>5.0 WARRANTY</p> <p>6.0 FLOW CHARTS</p> <p>7.0 EXPLODED VIEW AND PARTS LIST</p> <p>8.0 INSPECTION CHECKLIST</p>
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1.0 MEANING OF 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 Z535.4-1998 the definitions of the three signal words are as follows:



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



WARNING indicates a potentially 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.

2.0 GENERAL INFORMATION

The Task Force Tips Max-Force and Max-Matic nozzles are automatic pressure control nozzles. Automatic nozzles operate by sensing the pressure at the nozzle's inlet and adjusting the discharge opening to maintain a constant pressure throughout the flow range of the nozzle. While flowing, the stream pattern can be varied from wide fog to straight stream. Trapped debris can be removed while flowing.

All Max Series nozzles are constructed of hardcoat anodized aluminum and UV resistant rubber. This rugged construction is compatible with the use of fresh water as well as firefighting foam solutions. The Max-Force and Mid-Matic are intended for use on fixed or portable monitors. The coupling on the nozzle does not rotate, but can be removed for service.

The Max-Force operates at either a standard or low pressure as selected by the nozzle operator. The Max-Matic operates at a single pressure for a given flow range. The Max-Flow is rated at a fixed gallonage nozzle. Available pressures are as follows;

NOZZLE	FLOW RANGE	STANDARD PRESSURE	LOW PRESSURE
MAX-FORCE Dual Pressure Model	100-500 GPM 400-1900 LPM	100 PSI 7 BAR	55 PSI 4 BAR
MAX-MATIC, 100 psi Single Pressure Model	100-500 GPM 400-1900 LPM	100 PSI 7 BAR	
MAX-MATIC, 80 psi Single Pressure Model	100-500 GPM 400-1900 LPM	80 PSI 5.5 BAR	
MAX-FLOW, 100 psi Fixed Gallonage	500 GPM 1900 LPM	100 PSI 7 BAR	



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

Some volatile liquids can be ignited by static discharge.

Static build-up can occur from:

- Electrochemical separation of charge as water drains through low conductivity, refined products.
- Applying foam over a low conductivity liquid of sufficient depth to retain the charge created as the foam blanket drains.
- Streaming currents such as water or foam are introduced into the storage tank.¹

⚠️ 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 water²

⚠️ CAUTION

Nozzle must be properly connected. Mismatched or damaged threads may cause nozzle to leak or uncouple 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.

¹ Electrostatic Hazards of Foam Blanketing Operations by Peter Howels. Industrial Fire Safety July/August 1993

² The Fire Fighter and Electrical Equipment, The University of Michigan Extension Service, Fourth Printing 1983. Page 47.

2.1 USE WITH SALT WATER

Use with salt water 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.

2.2 VARIOUS TERMS

Figure 1 shows the Max-Force nozzle and some of its parts.

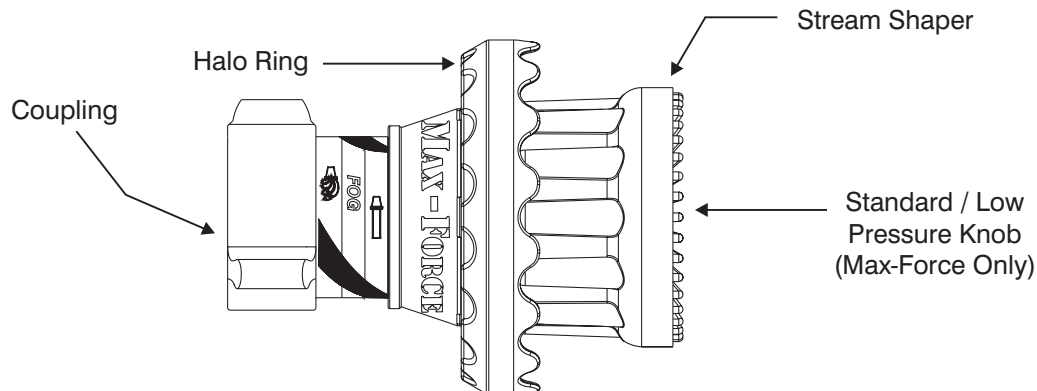


FIG 1 - Max Series Terms

2.3 PATTERN CONTROL

The nozzles have full pattern control from straight stream to wide fog. The nozzles incorporate a manual shaper, turning the stream shaper clockwise (as seen from the operating position behind the nozzle) moves the shaper to the straight stream position. Turning the stream shaper counterclockwise will result in an increasingly wider pattern.

Since the stream trim point varies with flow, the nozzle 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 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.

2.4 FLUSH CONTROL

Small debris may get caught inside the nozzle. This trapped material will cause poor stream quality, shortened reach and reduced flow. To remove this trapped debris the 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 up to 7/8" (9.5mm) 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 maintain stable operation of portable monitors.



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.

2.5 STANDARD/LOW PRESSURE KNOB (on dual pressure model)

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

To switch to the low pressure mode, shut off water flow to nozzle and turn knob at front of nozzle (see figure 2) counterclockwise (when viewed from front). Nozzle will now operate at reduced pressure. Repeat the process, except turn knob clockwise, to return to 100 PSI operation.

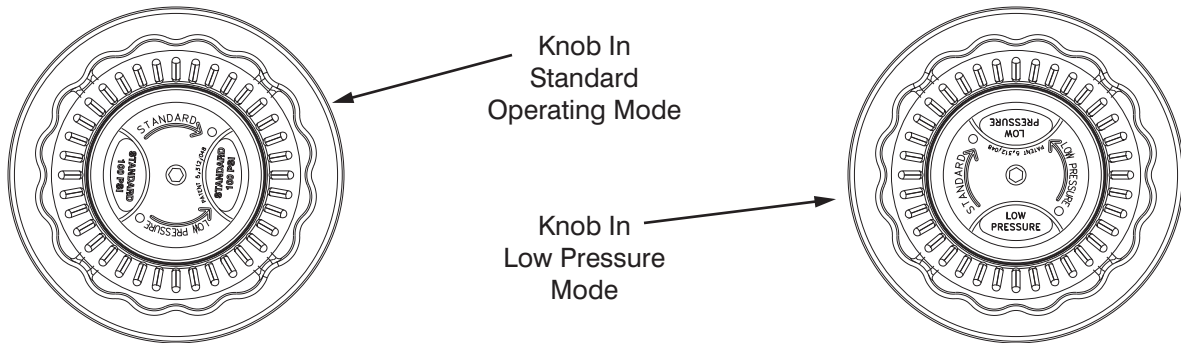


FIGURE 2 - Knob On Dual Pressure Max-Force

2.6 USE OF MAX SERIES 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 using a hydraulic equation such as:

Within its flow range, the nozzle pressure (NP) of the Max-Force nozzle may be approximated as 100 PSI in the standard mode. The Max-Matic nozzle may be approximated at 100 psi or 80 psi depending on the model. For additional information on calculating specific hose layouts, consult an appropriate fire service training manual, *A Guide to 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

2.7 USE WITH FOAM

The Max-Force & Max-Matic nozzle may be used with foam solutions. Refer to fire service training for the proper use of foam.



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.
 - Clear path to deliver foam, as hoses, other equipment and vehicles are deployed.



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.

3.0 FLOW CHARACTERISTICS

The graphs in figure 3A, 3B and 3C show typical performance of the various models of Max Series nozzles.



An inadequate supply of nozzle pressure and/or flow will cause an ineffective stream and can result in injury, death or loss of property.

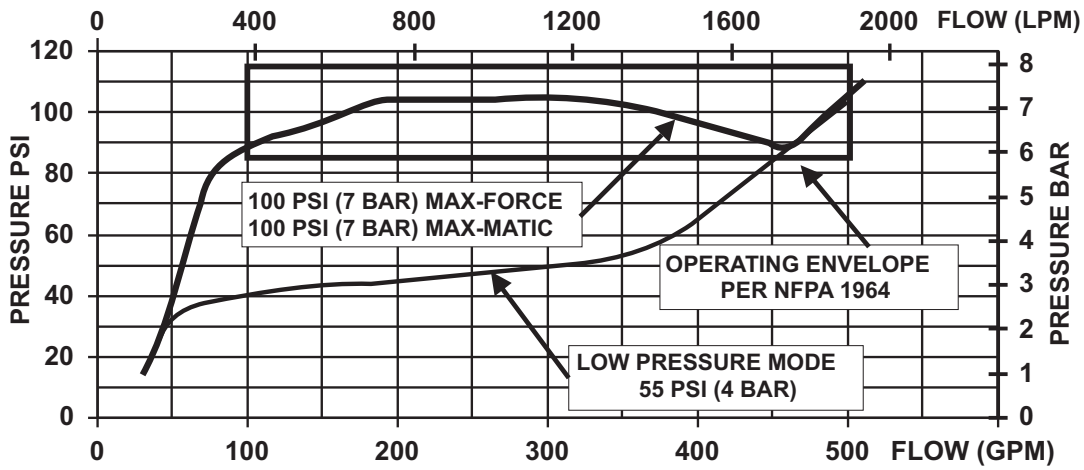


FIG 3A - Pressure Performance of 100 psi Max-Matic & Dual Pressure Max-Force

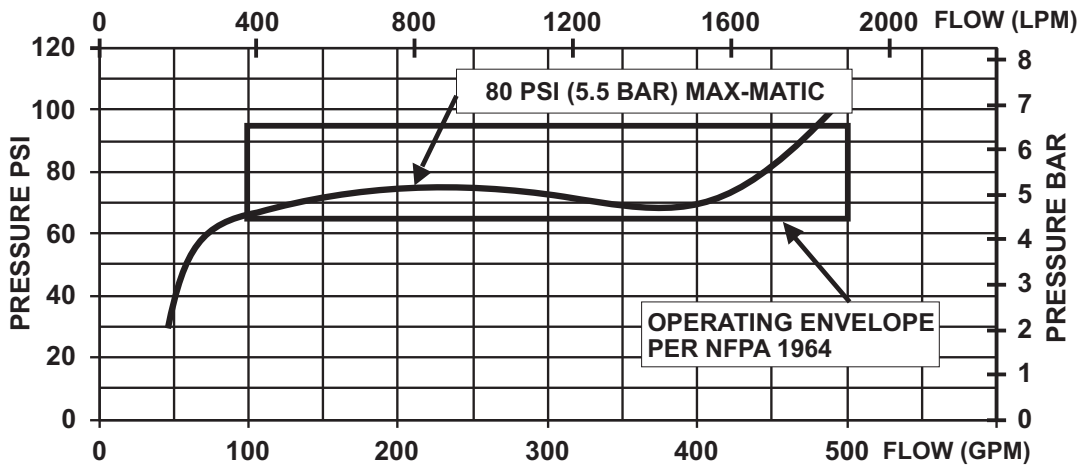


FIG 3B - Pressure Performance of 80 psi Max-Matic

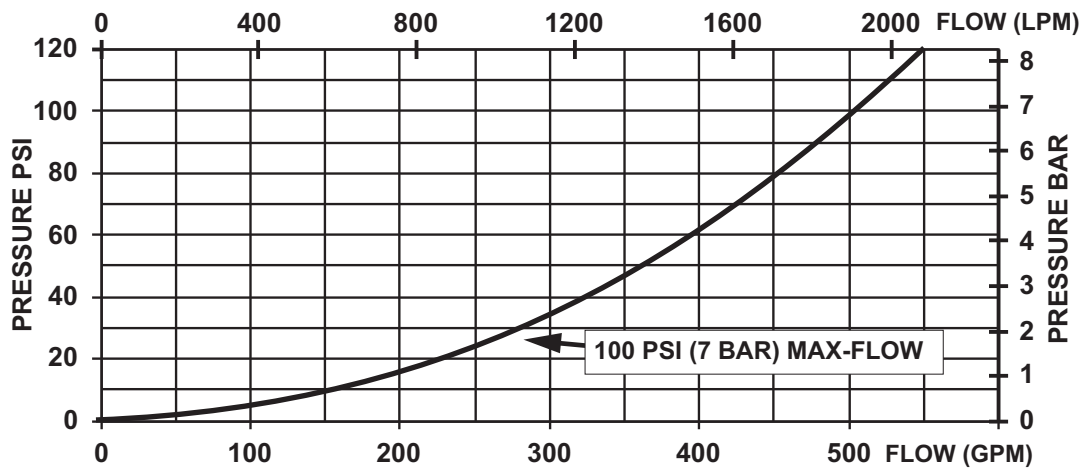


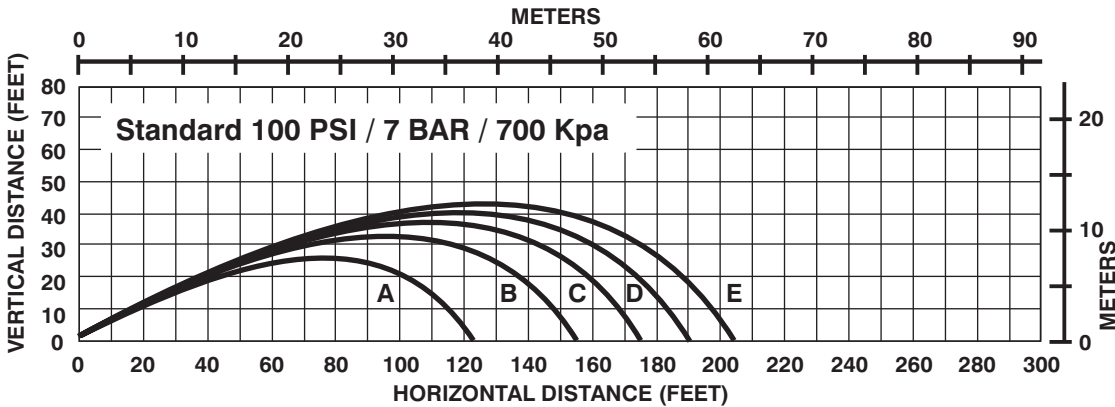
FIG 3C - Pressure Performance of 100 psi Max-Flow

3.1 STREAM TRAJECTORY DATA

Figures 3.1, 3.2 & 3.3 give the stream trajectory for the Max Series nozzles at various flows.

Notes on trajectory graphs:

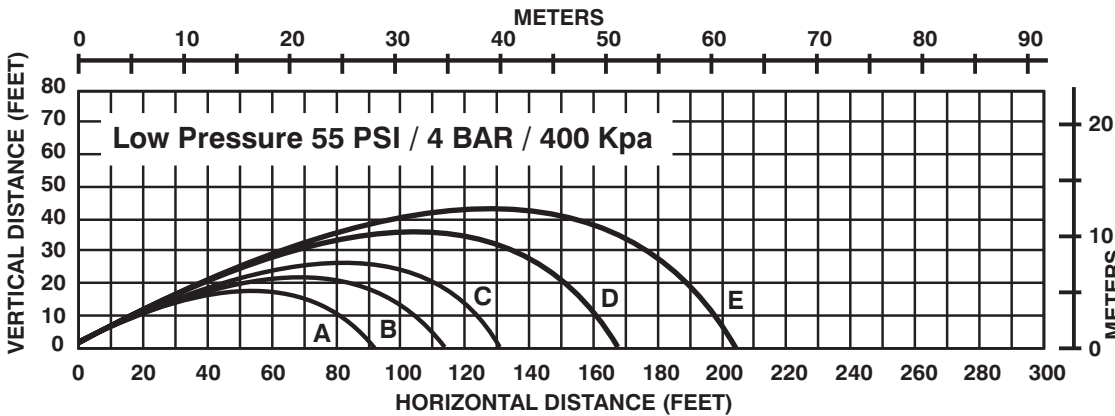
- Graphs show approximate effective stream trajectory at 30 degrees elevation in no wind conditions. Distance to last water drops approximately 10% farther.
- Trajectories shown are for water. The addition of foam is expected to decrease the reach by 10%.
- Tail or head winds of 20 MPH (30 KPH) may increase or decrease the range approximately 30%.



CURVE	GPM FLOW	LBS REACTION
A	100	50
B	200	100
C	300	160
D	400	200
E	500	260

CURVE	LPM FLOW	KGF REACTION
A	380	20
B	760	50
C	1100	70
D	1500	90
E	1900	120

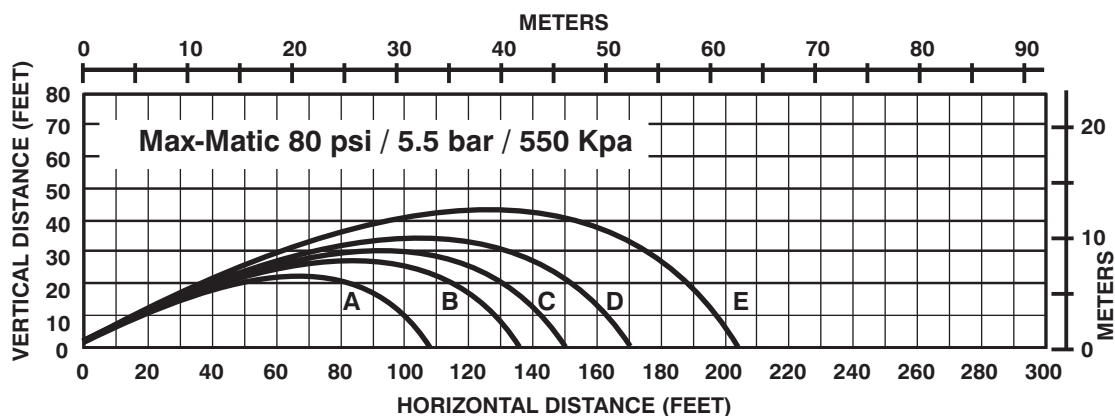
FIG 3.1 - Standard 100 PSI / 7 BAR / 700 Kpa



CURVE	GPM FLOW	LBS REACTION
A	100	30
B	200	70
C	300	110
D	400	160
E	500	260

CURVE	LPM FLOW	KGF REACTION
A	380	15
B	760	30
C	1100	50
D	1500	70
E	1900	120

FIG 3.2 - Low Pressure 55 PSI / 4 BAR / 400 Kpa



CURVE	GPM FLOW	LBS REACTION
A	100	40
B	200	90
C	300	130
D	400	200
E	500	260

CURVE	LPM FLOW	KGF REACTION
A	380	20
B	760	40
C	1100	60
D	1500	90
E	1900	120

FIG 3.3 - Max-Matic 80 psi / 5.5 bar / 550 Kpa

4.0 FIELD INSPECTION

TFT's MAX Series Nozzles 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 a MAX Series nozzle ⁷ 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.

⚠ 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.

5.0 WARRANTY

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

6.0 FLOW CHARTS

**MAX-FORCE
MAX-MATIC 100 PSI
ON BLITZFIRE**

PUMP PRESSURE (PSI)	2 ½" HOSE				3" HOSE			
	100 FT	150 FT	200 FT	300 FT	100 FT	150 FT	200 FT	300 FT
100	140	130	120	110	150	140	140	130
125	270	230	210	180	460	310	280	250
150	460	350	300	260	500	490	470	400
175	500	460	400	320	---	---	---	480
200	---	500	470	380	---	---	---	---

FLOWS IN GPM

**MAX-FORCE
LOW PRESSURE
SETTING
ON BLITZFIRE**

PUMP PRESSURE (PSI)	2 ½" HOSE				3" HOSE			
	100 FT	150 FT	200 FT	300 FT	100 FT	150 FT	200 FT	300 FT
100	380	350	320	270	410	400	390	370
125	420	400	370	330	460	450	430	410
150	460	430	410	370	500	490	470	450
175	500	470	440	400	---	---	---	480
200	---	500	470	430	---	---	---	---

FLOWS IN GPM

**MAX-MATIC 80 PSI
ON BLITZFIRE**

PUMP PRESSURE (PSI)	2 ½" HOSE				3" HOSE			
	100 FT	150 FT	200 FT	300 FT	100 FT	150 FT	200 FT	300 FT
100	310	250	230	190	410	390	350	280
125	420	380	330	270	470	450	440	410
150	460	430	410	340	500	490	480	450
175	500	470	440	390	---	---	---	480
200	---	500	470	430	---	---	---	---

FLOWS IN GPM

**MAX-FLOW 100 PSI
ON BLITZFIRE**

PUMP PRESSURE (PSI)	2 ½" HOSE				3" HOSE			
	100 FT	150 FT	200 FT	300 FT	100 FT	150 FT	200 FT	300 FT
100	380	360	340	300	420	400	390	370
125	430	400	380	340	470	450	440	410
150	470	440	410	370	---	500	480	450
175	500	470	440	400	---	---	---	490
200	---	500	480	430	---	---	---	---

FLOWS IN GPM

- NOTES:**
- 1) Number in each box indicates flow in gpm.
 - 2) Flows may vary with brand and condition of hose.
 - 3) Flows are approximate and include device loss for Blitzfire.
 - 4) Flows are approximate and do not reflect losses in pump piping or elevation changes.
 - 5) Nozzle reaction can be as high as 250 lbs. (500 gpm + 100 psi)

7.0 EXPLODED VIEW AND PARTS LIST

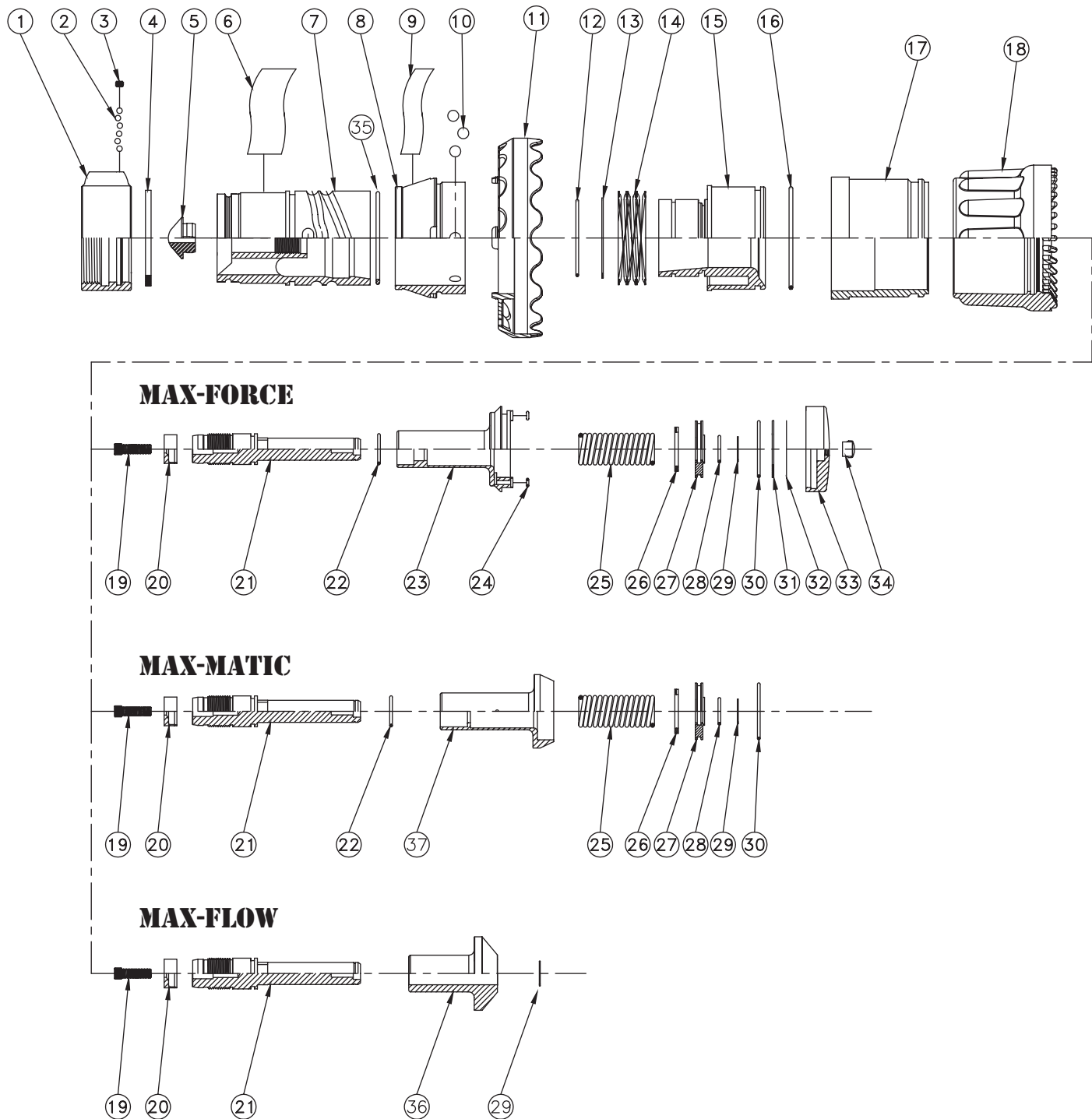


Fig. 4 - Max Series Nozzle Exploded View

7.0 EXPLODED VIEW AND PARTS LIST

#	Description	Qty	Part Number
1	2.5 NH COUPLING ROCKERLUG	1	M307N*
2	3/16" BALL - 302 STAINLESS STEEL	48	V2120
3	1/4-28 X 1/2 SOCKET SET	1	VT25-28SS500
4	2.5 COUPLING GASKET, 3.250 X 2.500 X .1875 CUT	1	V3190
5	T.O. PLUG	1	MD591
6	BARREL LABEL MAX-FORCE	1	MD740
	BARREL LABEL MAX-MATIC & MAX-FLOW 100 PSI	1	MD741
	BARREL LABEL MAX-MATIC 80 PSI	1	MD741-RED
7	FIN CAN/BARREL	1	MD545
8	SHAPER GUIDE	1	MD510
9	NAME LABEL MAX-FORCE	1	MD745
	NAME LABEL MAX-MATIC 100 PSI	1	MD746
	NAME LABEL MAX-FLOW	1	MD747
	NAME LABEL MAX-MATIC 80 PSI	1	MD748
10	.375" BALL - TORLON	3	VB375TO
11	HALO RING	1	MD515
12	O-RING-143 2-7/16 ID 3/32 C/S	1	VO-143
13	WS-250-SO2 SMALLEY RING 2.394/2.369 ID	1	VR4240
14	FLUSH WAVE SPRING	1	MD785
15	BARREL CONE	1	MD520
16	O-RING-236 3 1/4 ID 1/8 C/S	1	VO-236
17	SHAPER	1	MD500
18	BUMPER	1	Z700
19	5/16-18 x 1.0" SOC. HEAD CAP	1	VT31-18SH1.0
20	LOCKING SLEEVE	1	MD571
21	SHAFT	1	MD570
22	O-RING-118 7/8 ID 3/32 C/S	1	VO-118
23	MAX-FORCE BAFFLE	1	MD561
	MAX-MATIC BAFFLE	1	MD563
24	O-RING-104 VITON #514AD 1/8 ID 3/32 C/S	2	VO-104V**
25	CONTROL SPRING 100 PSI	1	MD760
	CONTROL SPRING 80 PSI	1	MD761
26	'C' SPACER .120 - 100 PSI	1	MD565
	'C' SPACER .090 - 80 PSI	1	MD566
27	SUBBAFFLE - 100 PSI	1	MD562
	SUBBAFFLE - 80 PSI	1	MD566
	SUBBAFFLE - 80 PSI - 5.5 BAR	1	MD564
28	O-RING-116 3/4 ID 3/32 C/S	1	VO-116
29	WST-75-SO2 SMALLEY RING .708/.695 ID	1	VR4245
30	O-RING-132 1-3/4 ID 3/32 C/S	1	VO-132
31	SPRING PLATE	1	MD555**
32	KNOB LABEL, 100 PSI STANDARD / LOW PRESSURE	1	MD752**
33	KNOB	1	MD560**
34	HEYCO BLACK DOME PLUG	1	VM4123**
35	O-RING 233	1	VO-233
36	MAX-FLOW BAFFLE	1	MD568
37	MAX-MATIC BAFFLE	1	MD563

* SPECIFY DESIRED THREAD AT TIME OF ORDER

** DUAL PRESSURE MODELS ONLY

8.0 INSPECTION CHECKLIST

TFT's Max-Force and Max-Matic nozzles 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) Shaper turns freely and adjusts pattern through full range.
- 4) Shaper turns into full flush and out of flush with normal flow and pressure restored.
- 5) Standard/low pressure knob turns freely and changes nozzle pressure. (if so equipped)



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.

TASK FORCE TIPS, Inc.
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