

The background of the slide is an abstract, dynamic composition of flowing, curved lines in various shades of red, orange, and brown. The lines create a sense of movement and depth, resembling a stylized architectural or organic structure. The colors transition from bright red on the left to darker, more muted tones on the right.

# Spare Parts Training

October 13-14, 2008

# Principles Background

- **Mechanical Engineering degree  
University of Minnesota**
- **Research and development engineer  
for Jet Edge from 1984 to 1996**
- **Started Fedtech Inc. a waterjet cutting  
shop in 1995 with Dave Fox**
- **1999 started marketing and selling  
waterjet spare parts under Fedtech  
Parts**
- **2001 Accustream incorporated**



# FedTech



- **Sister Company to Accustream**
- **Largest Cutting Shop in USA**
- **900 HP available for wj cutting**
- **R&D site for Accustream parts and products**
- **55 Employees**

# AccuStream Facility



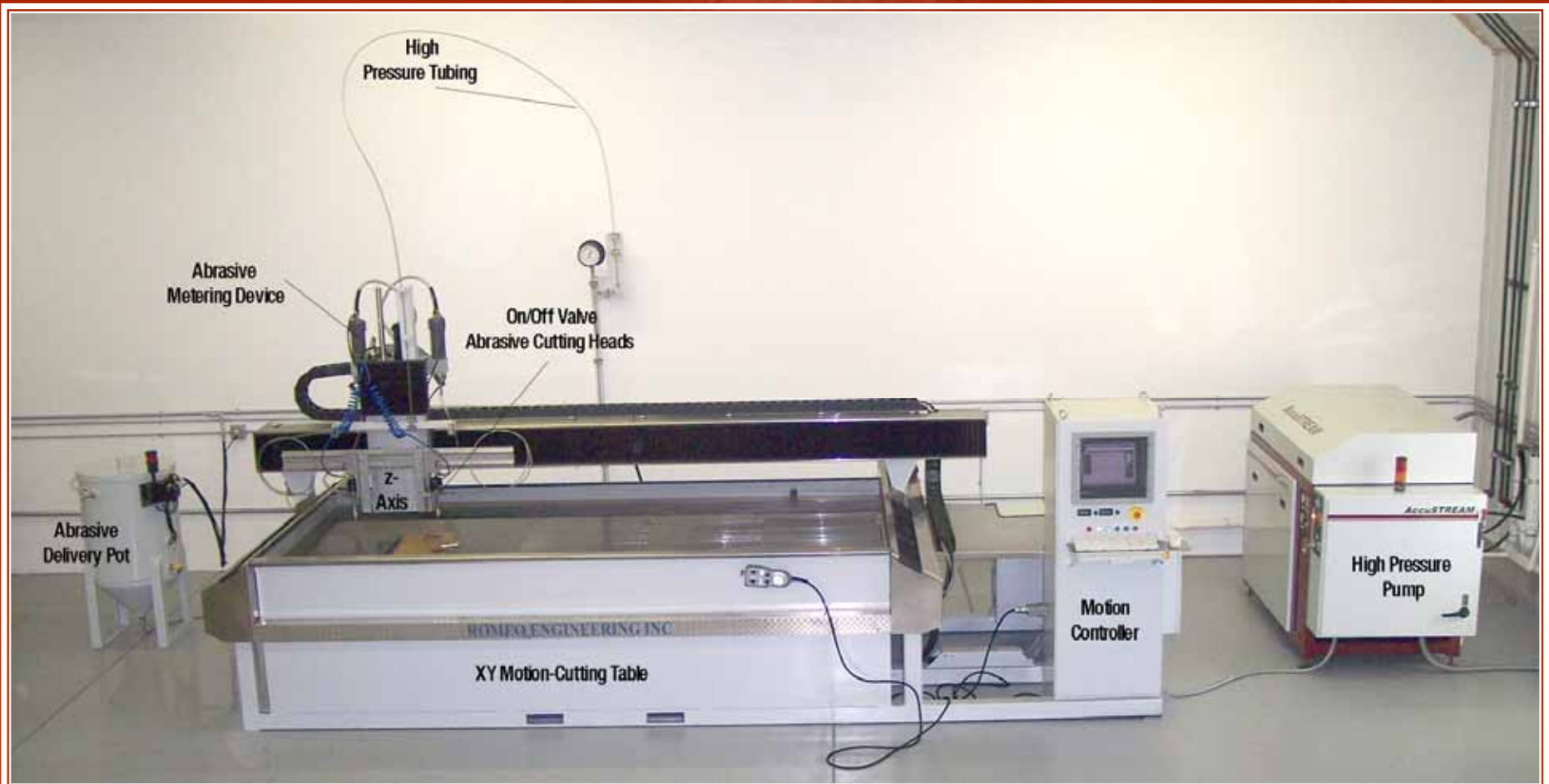
- St. Paul, MN USA
- 3,600 sq ft Office Space
- 22,000 sq ft Intensifier Manufacturing & Testing Space

# What We Do

- Engineer
- Manufacture
- Inspect & Test
- Market, Sell & Support



# Anatomy of a Waterjet



# Types of Waterjets

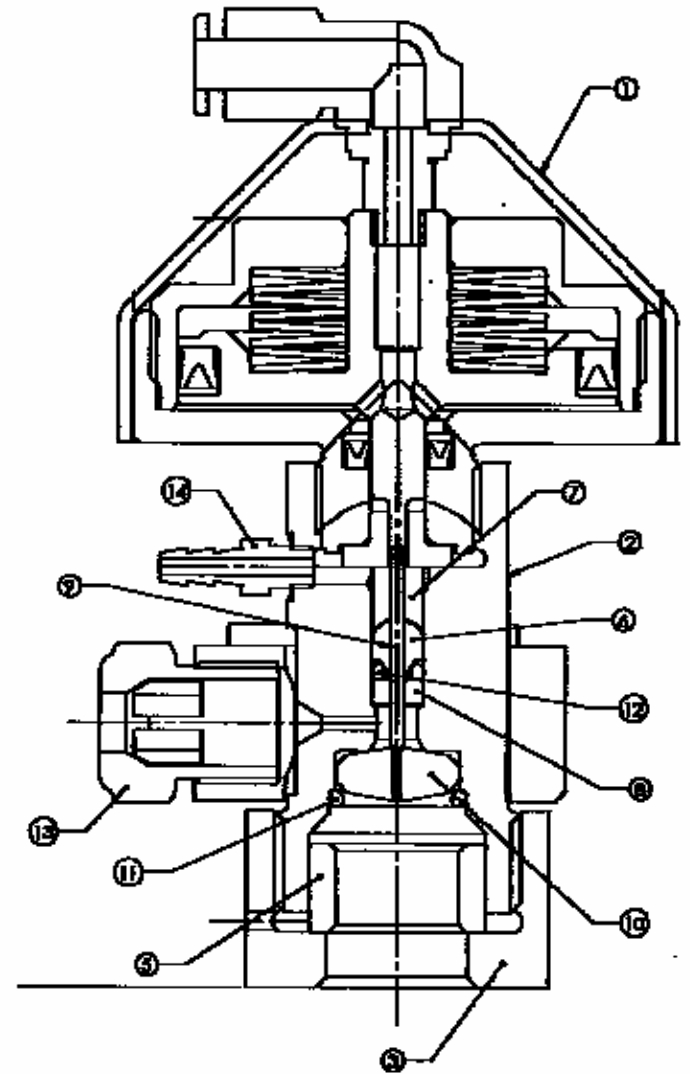
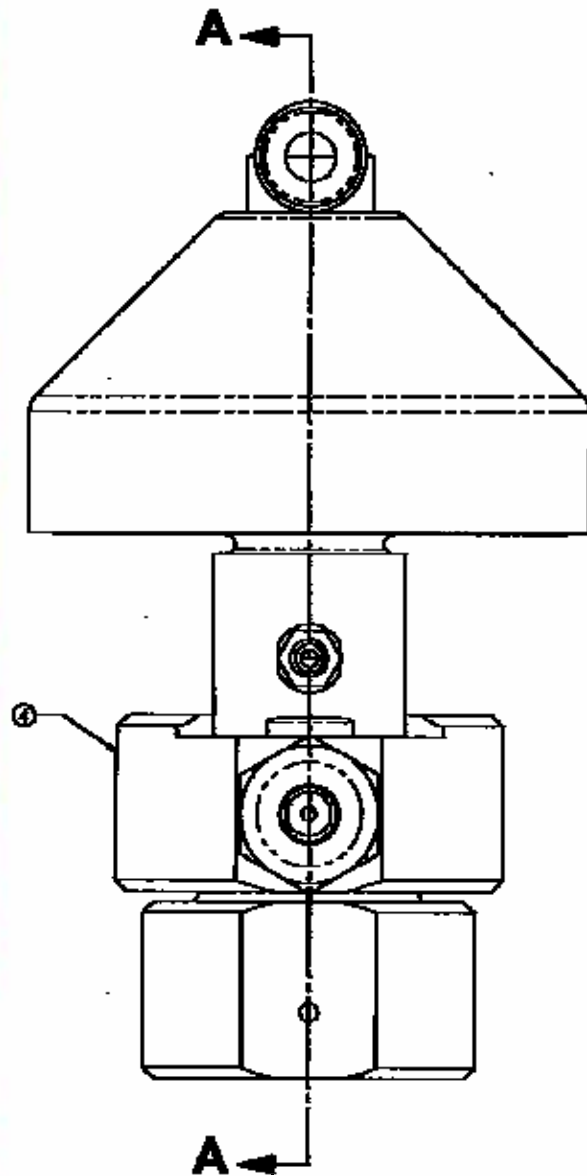


# Who's Who Of Waterjet

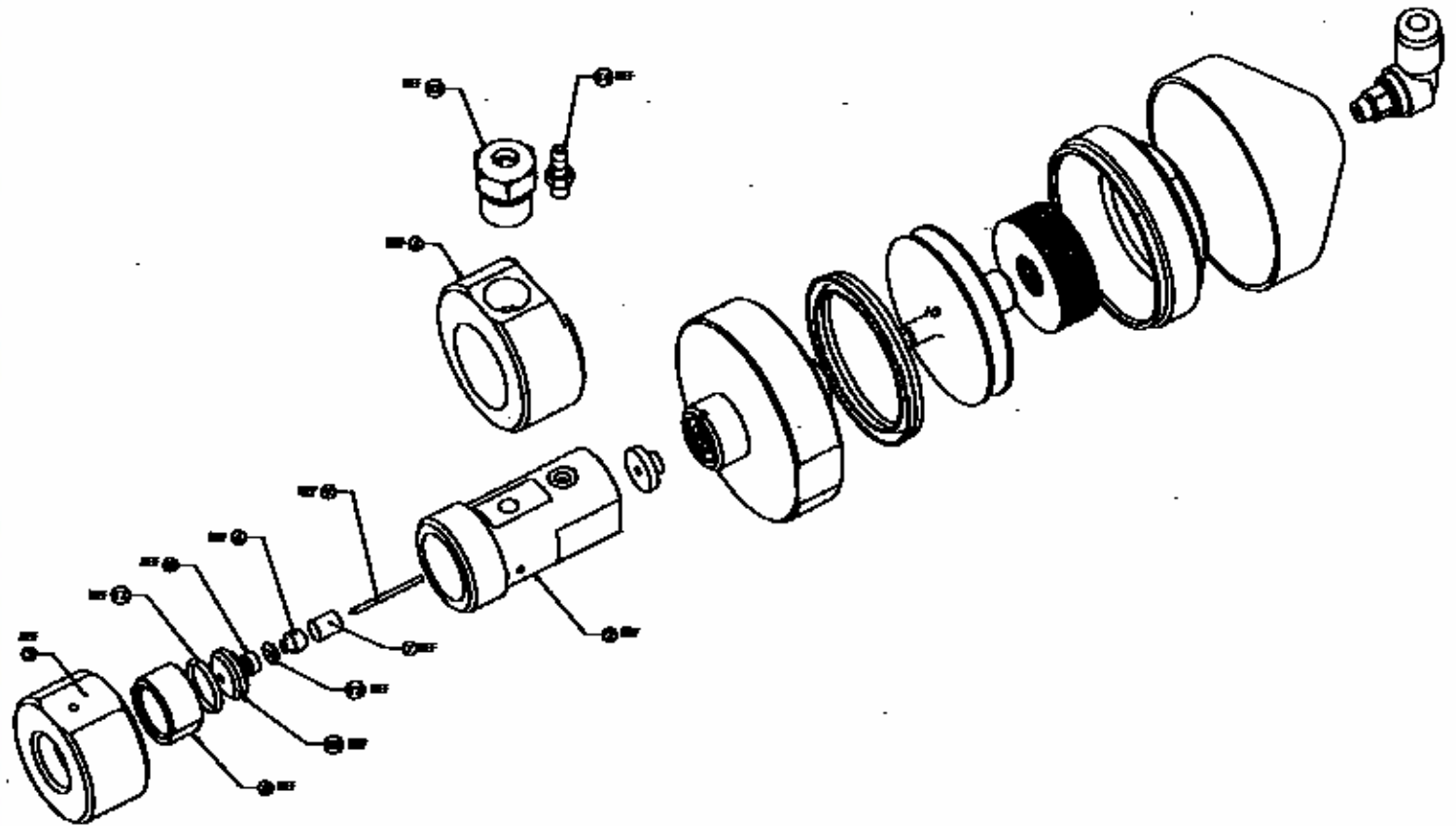
- American Companies
  - Flow International
  - Omax Corporation
  - KMT Waterjet
  - Jet Edge Waterjet
  - Many Integrators
- European Companies
  - Flow International
  - KMT Waterjet
  - WSI
  - Bohler
  - UDE
  - Bystronics
  - Many Intergrators
  - Others?



# Function of On/Off Valve



# Function of On/Off Valve

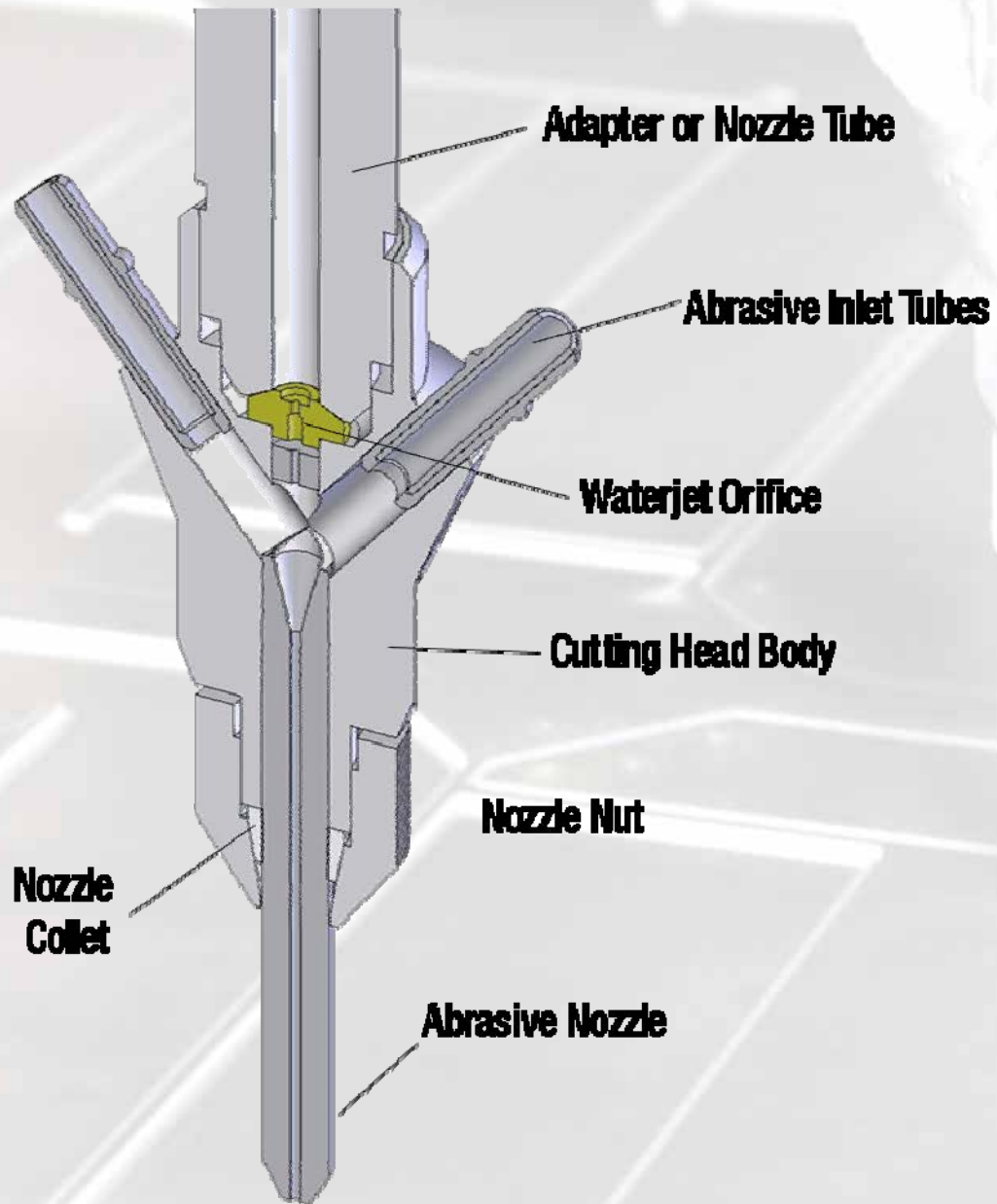


# AS Parts for Flow Valves

- Insta 1
  - Repair Kits
  - Air Actuator
  - Valve Body
  - Retainer Cap
- Insta II
  - Repair Kits
  - Air Actuator
  - Valve Body
  - Retainer Cap
- Mini Jet (87psi)
  - Repair Kits
  - Valve Body



# Overview of Cutting Heads



# Abrasive Cutting Heads

➤ Angled Inlet



➤ 90 Degree Abrasive Inlet



# AS Parts for Flow Cutting Heads

- Paser 3
  - Complete Head
  - Nozzle Tubes
  - Orifices
- Paser ECL
  - Nozzle Tube
- AS Dialine
  - Details to come



# Hydraulic Intensifier Pump Overview



Model shown is AS-60125

## 1 Advanced Intensifier Design (AIT)

AccuStream Intensifiers are built with design features to maximize maintenance intervals, simplify component replacement and minimize actual cost of operation. All pumps will operate at continuous cutting pressures up to 60,000 psi. A higher output flow rate allows the pumps to supply UHP water to more heads or to feed larger cutting head orifices.

## 2 PLC Controls

The programmable logic controller (PLC) monitors the sensors and provides a warning or shuts the pump down if necessary. A touch panel provides easy operator interface for controlling the pump.

## The Flexibility of Waterjet

From prototype to production waterjet can effectively and efficiently cut both hard and soft materials including:

- Stainless Steel
- Aluminum
- Titanium
- Exotic Alloys
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- Foam
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- Stone
- Glass
- Gasket Materials
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- Insulation
- Food

... and much more!

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Switching between high pressure cutting and low pressure piercing of brittle materials can be done on the pump panel or remotely.

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Pumps can be operated remotely by the motion control. Larger pumps include a key switch which allows the operator to select whether the pump is in the local or remote mode.

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Motors are totally enclosed force cooled (TEFC) for moisture and contamination resistance, inverter rated and premium efficiency. Fifty horsepower and larger pumps include wye-delta soft start to minimize current draw at start-up. Electrical consumption and peak current are minimized.

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Pressure compensated pumps are selected for reliability and have continuous ratings that far exceed their use in the intensifier pump. Output hydraulic pressure is held steady to maintain ultra-high pressure water as required at the cutting heads.

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A safety dump valve relieves system pressure in case of a shutdown.

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Fifty horsepower and larger pumps use a smaller hydraulic pump to recirculate oil through a heat exchanger and oil filter. Oil is kept cool when the pump is in standby. The oil filter and heat exchanger are not exposed to high pulsations from the output of the intensifier.

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Inlet water passes through a series of filters before the intensifier. Pressure gages on either end of the filters indicate when filter elements need changing. Larger pumps include a boost pump to meet the higher flow requirements.

## 10 Attenuator

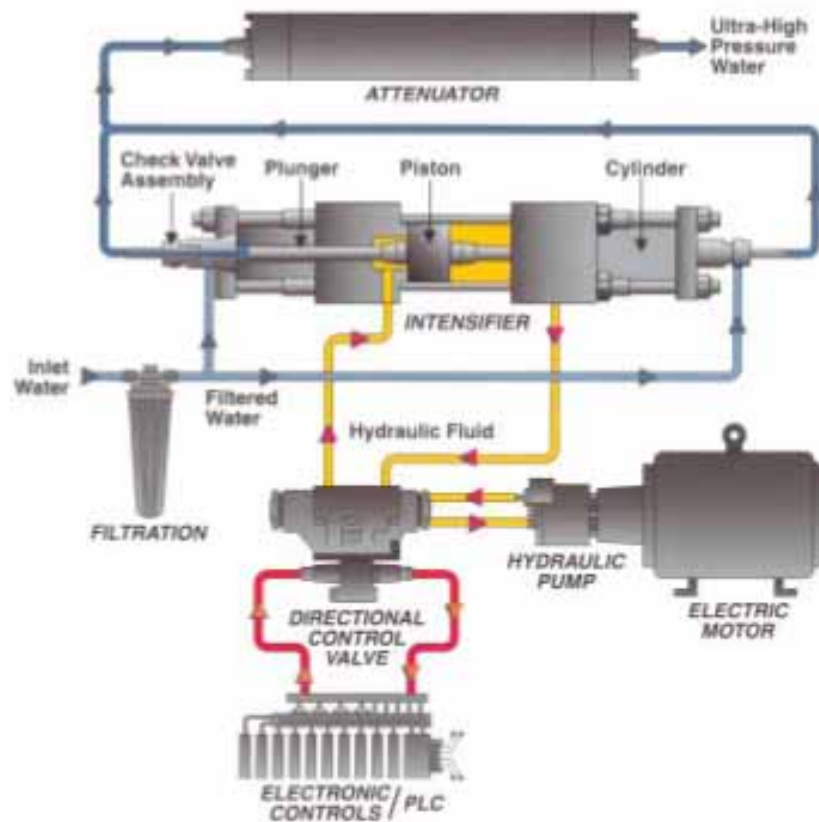
The attenuator evens the output pressure from the pump so that cut edge quality is as smooth as possible. All AccuStream pumps have a large volume attenuator.

## 11 Covers

Covers have sound insulation to keep pump sound to a comfortable level of less than 75 dBA. Covers are standard on large pumps and optional on thirty horsepower and smaller pumps.

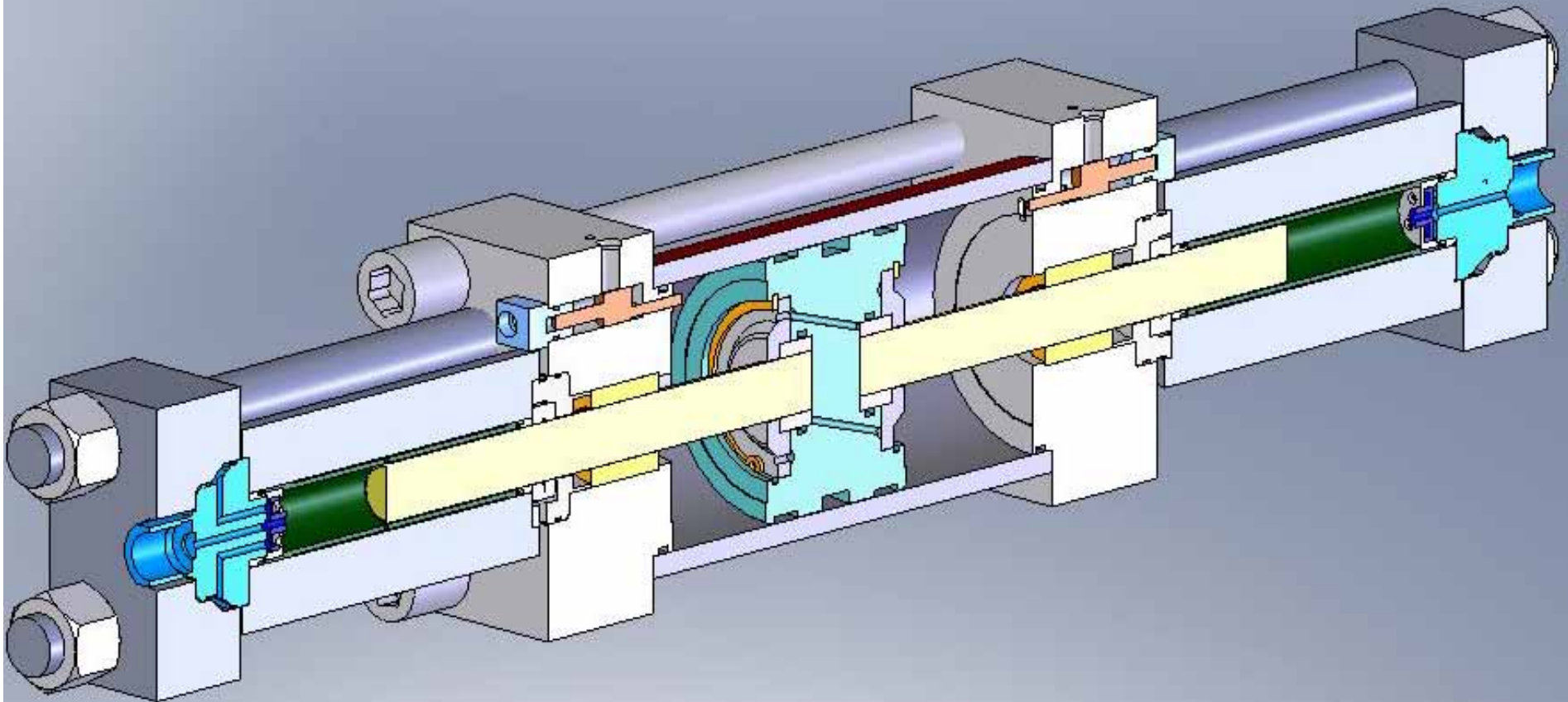


# Hydraulic Pump Overview

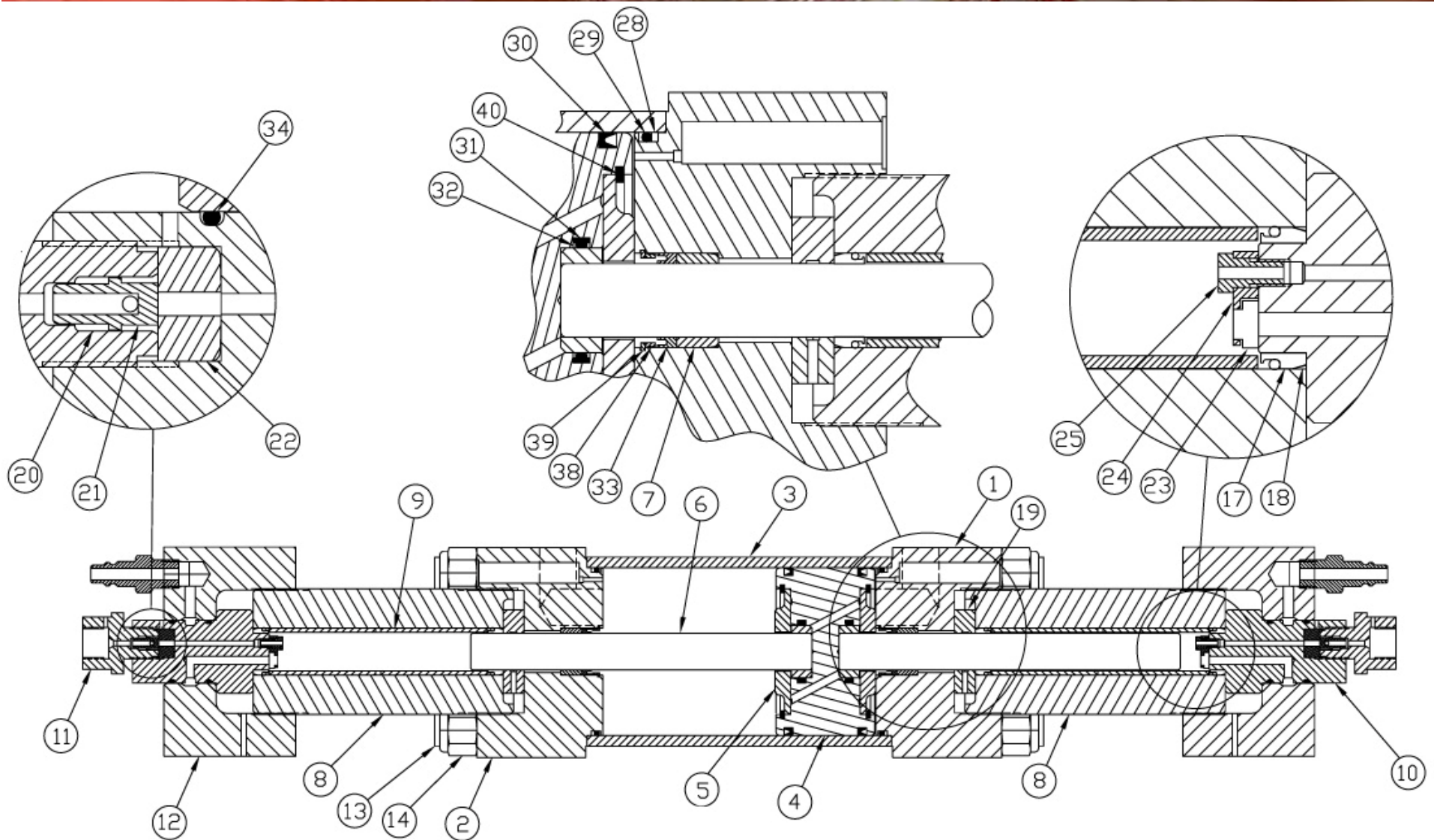




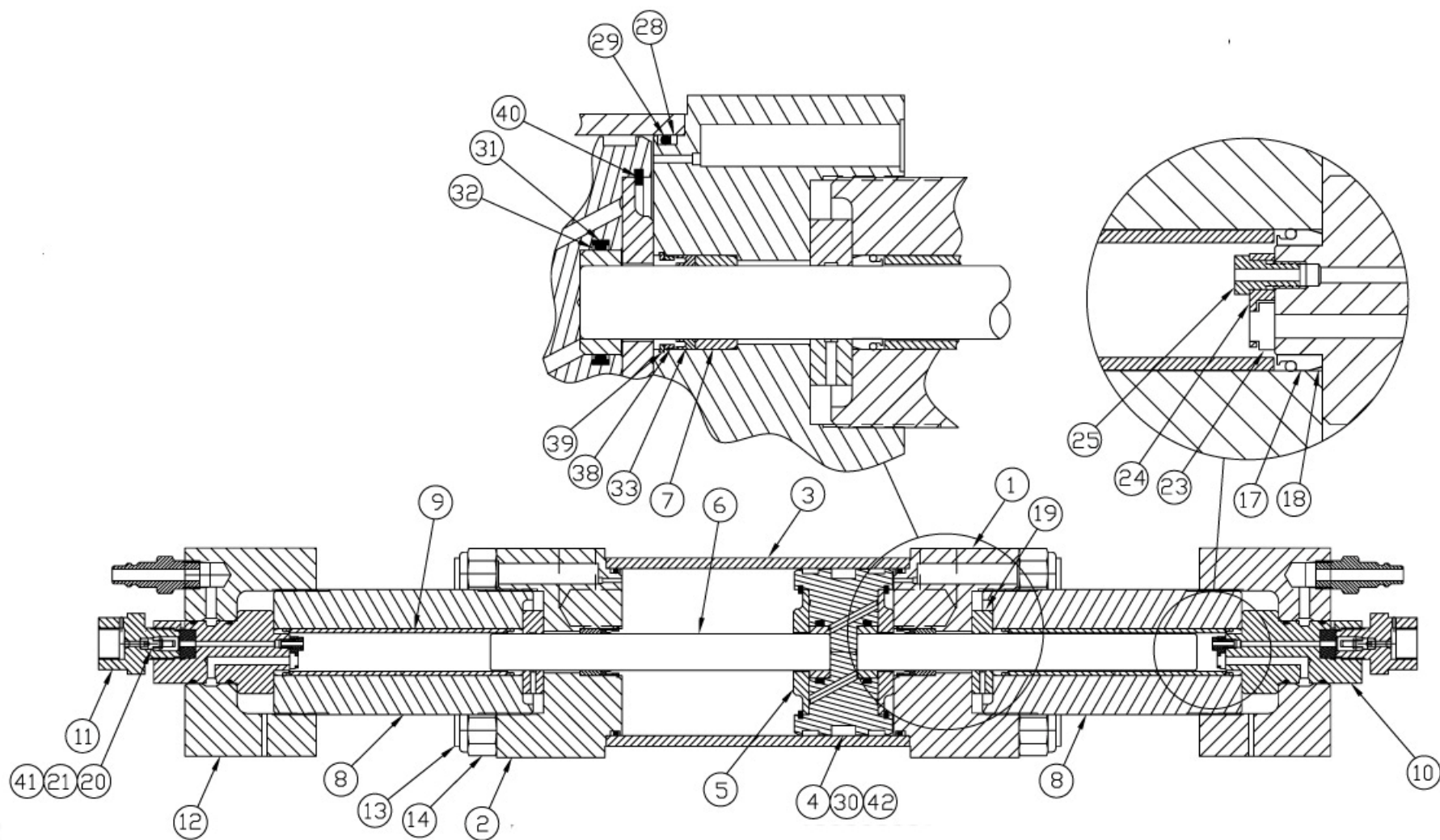
# Intensifier Overview



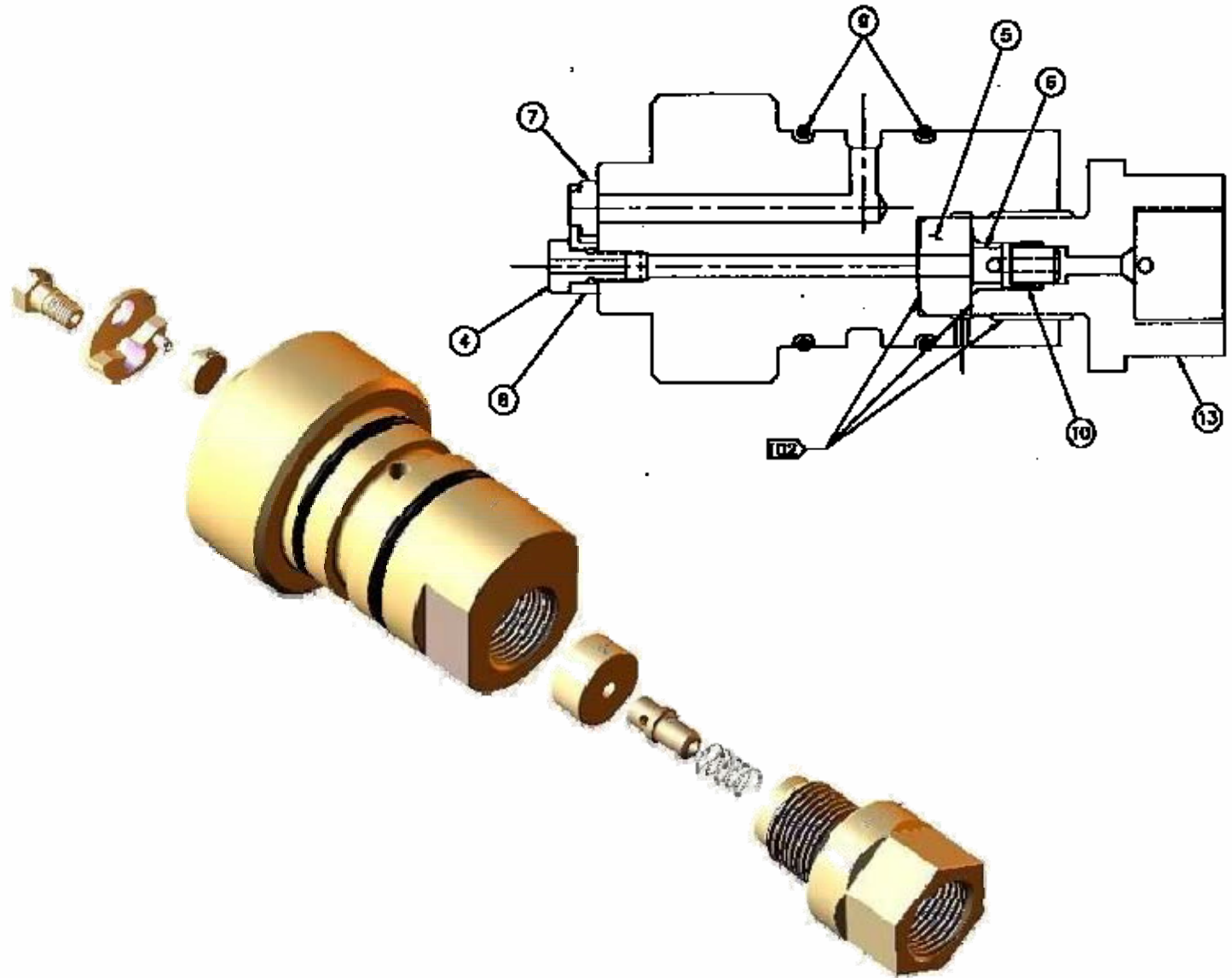
# Flow Intensifier Overview



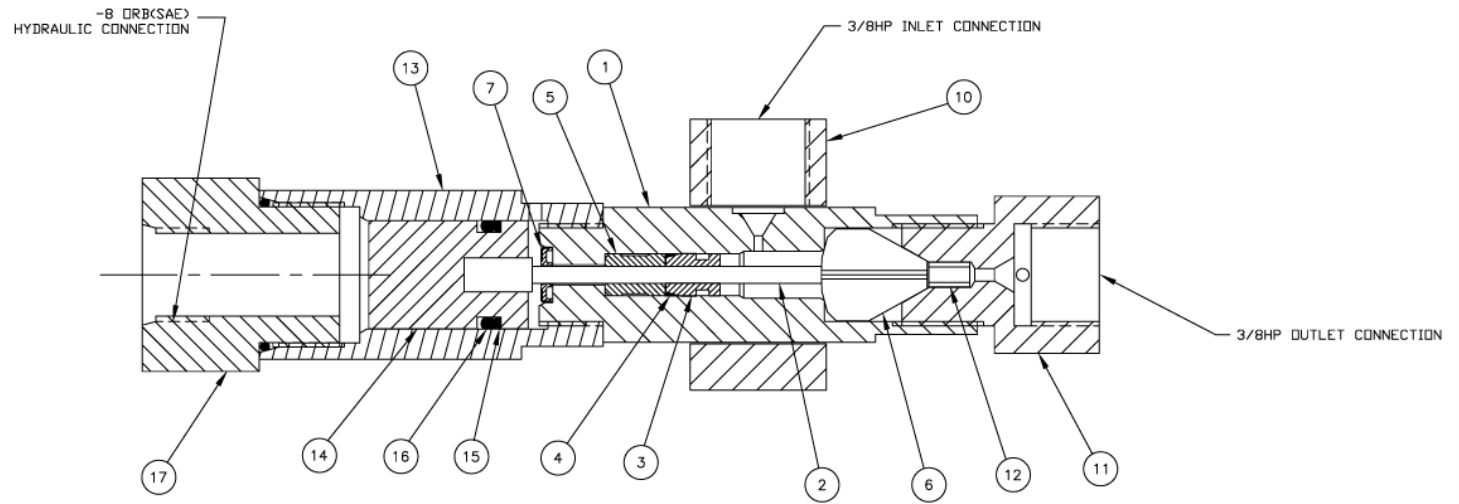
# AS Upgraded Flow Intensifier Overview



# Check Valve Operation



# Bleed Down Operation



# Attenuator

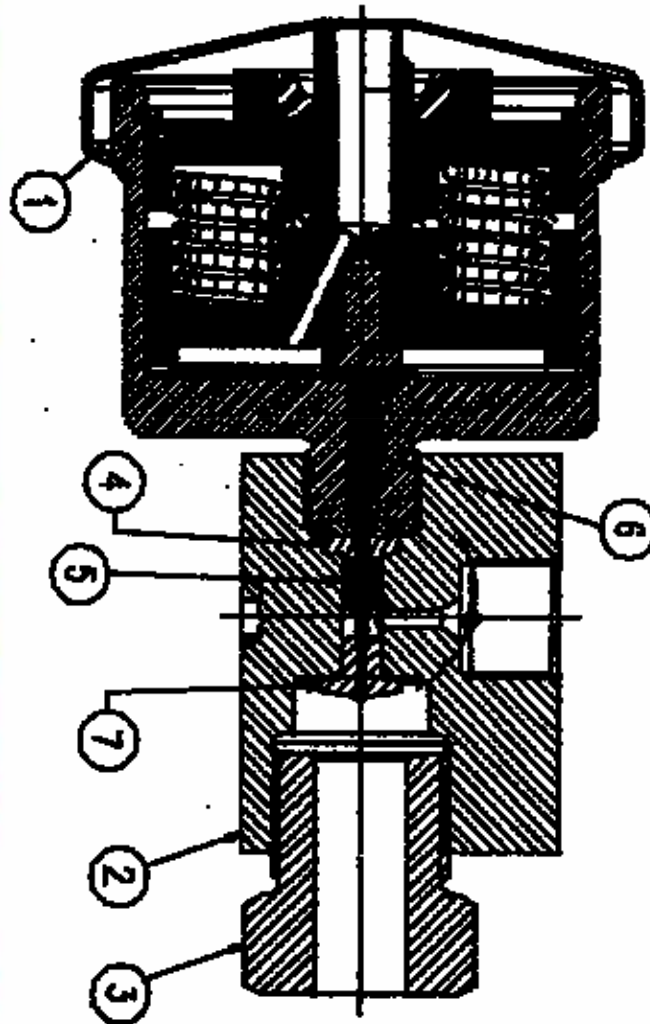


# AS Parts for Flow Intensifiers

- **Short Block**
  - **Flow Original**
  - **AS upgrade**
- **Long Block**
  - **Either short block**
  - **Mechanical or electrical**
- **Attenuator**
  - **1 liter**
  - **2 liter**



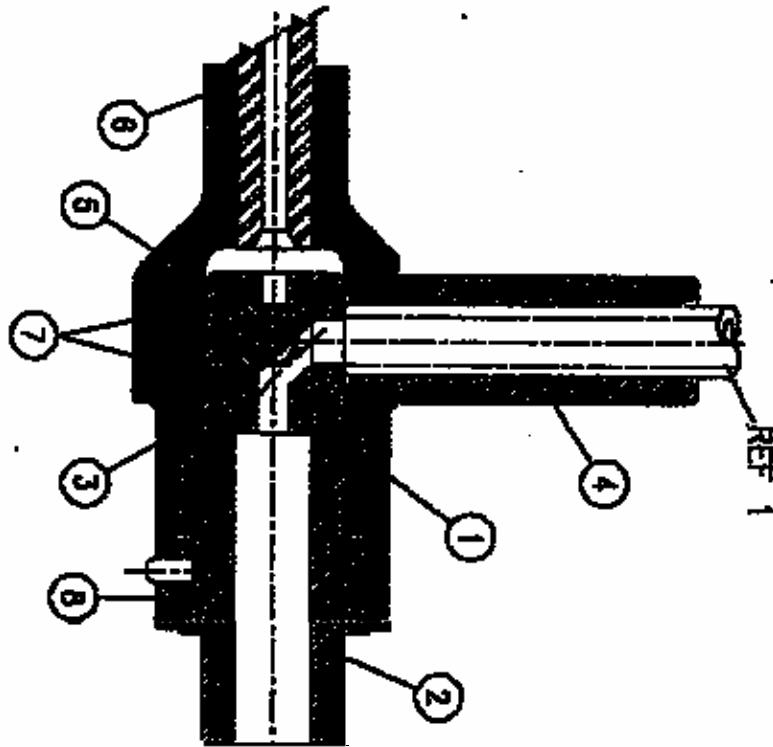
# KMT On/Off Valve



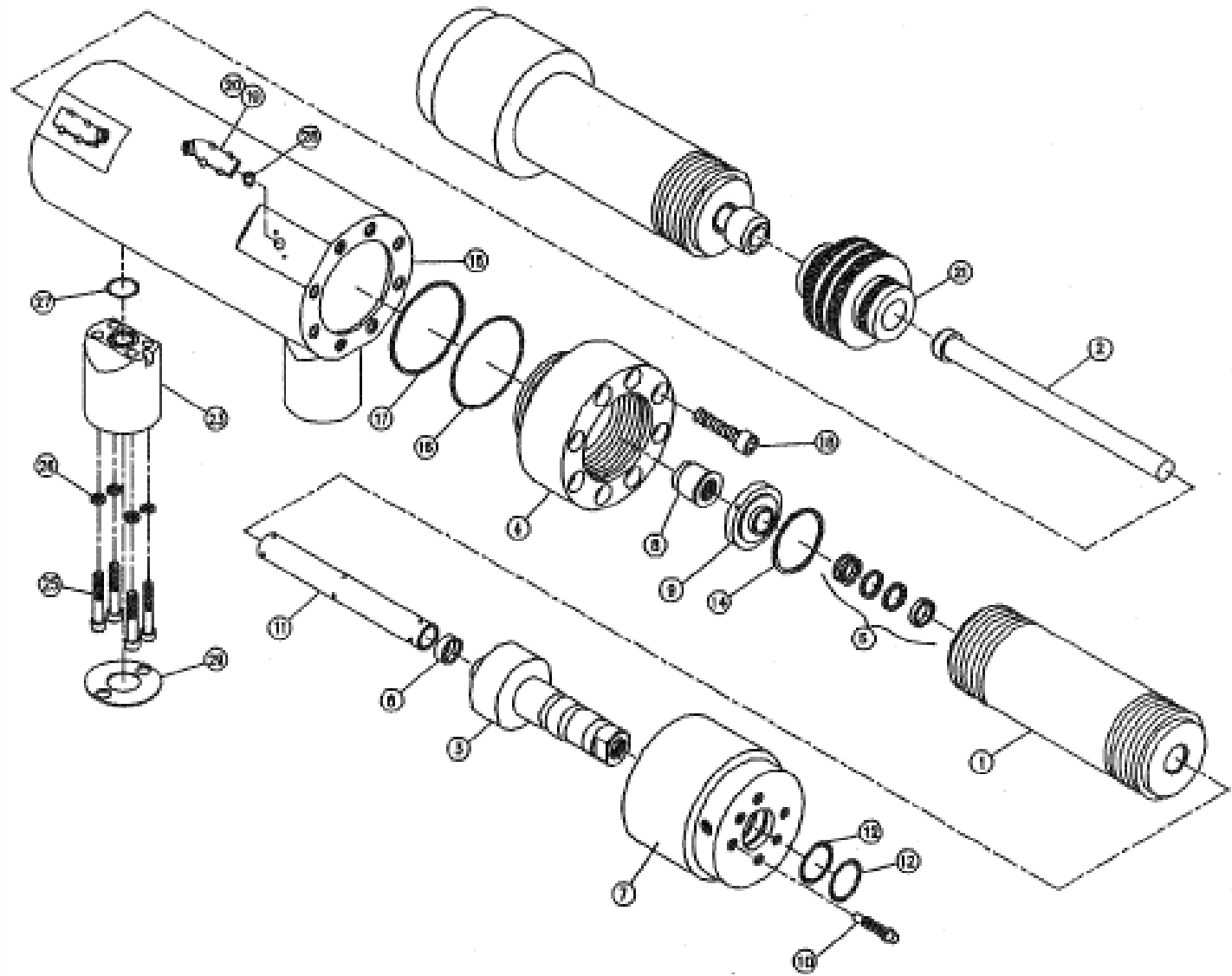
Item	Part Number	Description
1	10177855	Cylinder Assembly, Pneumatic Control Valve
2	10189181	Valve Body
3	BV701184	HP Gland Fitting, 0.5938
4	10188233	Brass Backup Ring, 0.048 x 0.082 x 0.170
5	10178978	Seal Assembly, HP Valve, 0.25
6	BV901184	Valve Stem, 0.080
7	10178697	Valve Seat, 0.50 x 0.04



# KMT Cutting Head (Autoline)



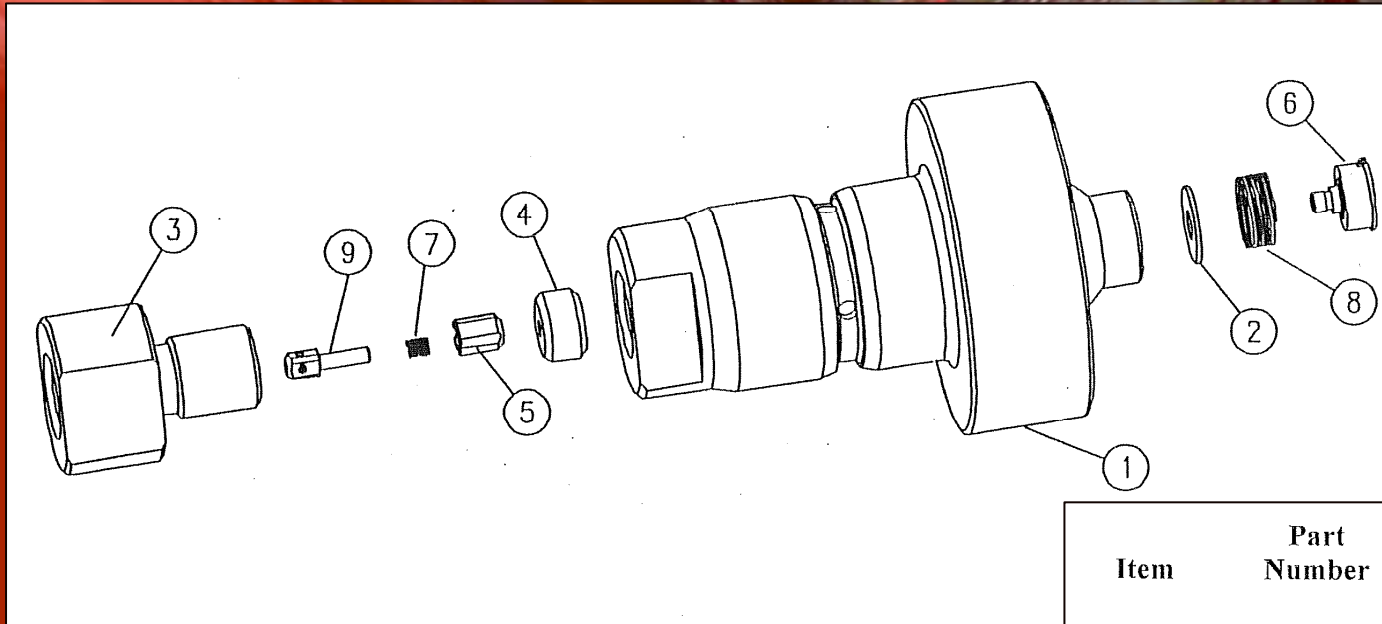
# KMT SL5 Intensifier



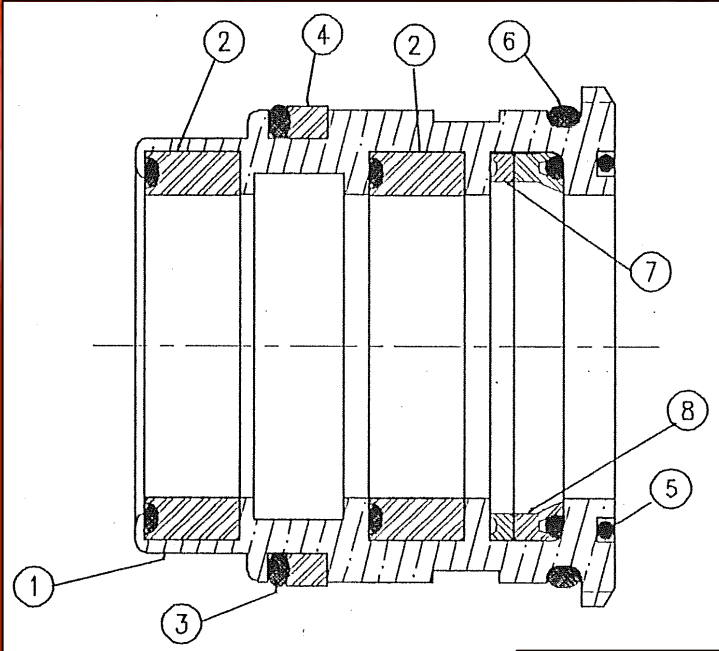
# KMT SL5 Intensifier

Item	Part Number	Description	Quantity	Item	Part Number	Description	Quantity
1	05144647	HP Cylinder Body, 1.125 x 8	2	15	05034764	Hydraulic Cylinder, 6.22 x 4.03 x 14.96	1
2	05119151	Ceramic Plunger, 0.875	2	16	05034855	Backup Ring, 3-3/4 x 4	2
3	80072349	Sealing Head Assembly	2	17	10075000	O-Ring, 3-3/4 x 4 x 1/8	2
4	05034772	Hydraulic Cylinder Head	2	18	05141106	Socket Head Screw, M14 x 60	16
5	05149703	HP Seal Assembly, 0.875	2	19	05127584	Proximity Switch, 20-250V AC/DC	2
6	05144696	Spacer, Sealing Head	2	20	10183572	Socket Head Screw, M6 x 1.00 x 22 mm	4
7	80073646	HP Cylinder Nut, HSEC	2	21	05132253	Piston Assembly, 4.03 Diameter	1
8	05130091	Hydraulic Cartridge Seal Assembly	2	23	05049812	Strut, 3.00 x 4.00	2
9	05007786	Bushing Retainer Flange	2	25	05079652	Socket Head Screw, M10 x 1.5 x 85 mm	8
11	20418805	Liner, HP Cylinder	2	26	05061486	Lock Washer, M10	8
12	10074920	O-Ring, 1-3/4 x 1-15/16 x 3/32	4	27	10074409	O-Ring, 1 x 1-1/4 x 1/8	2
13	80070352	Jackbolt, 7/16-20 x 2.31, 3/8 Hex Head	12	28	05144183	Spacer, Proximity Switch	2
14	05034798	Retaining Ring	2	29	05081872	Gasket, Steam/Upper Drip Pan	2

# KMT SL5 Sealing Head



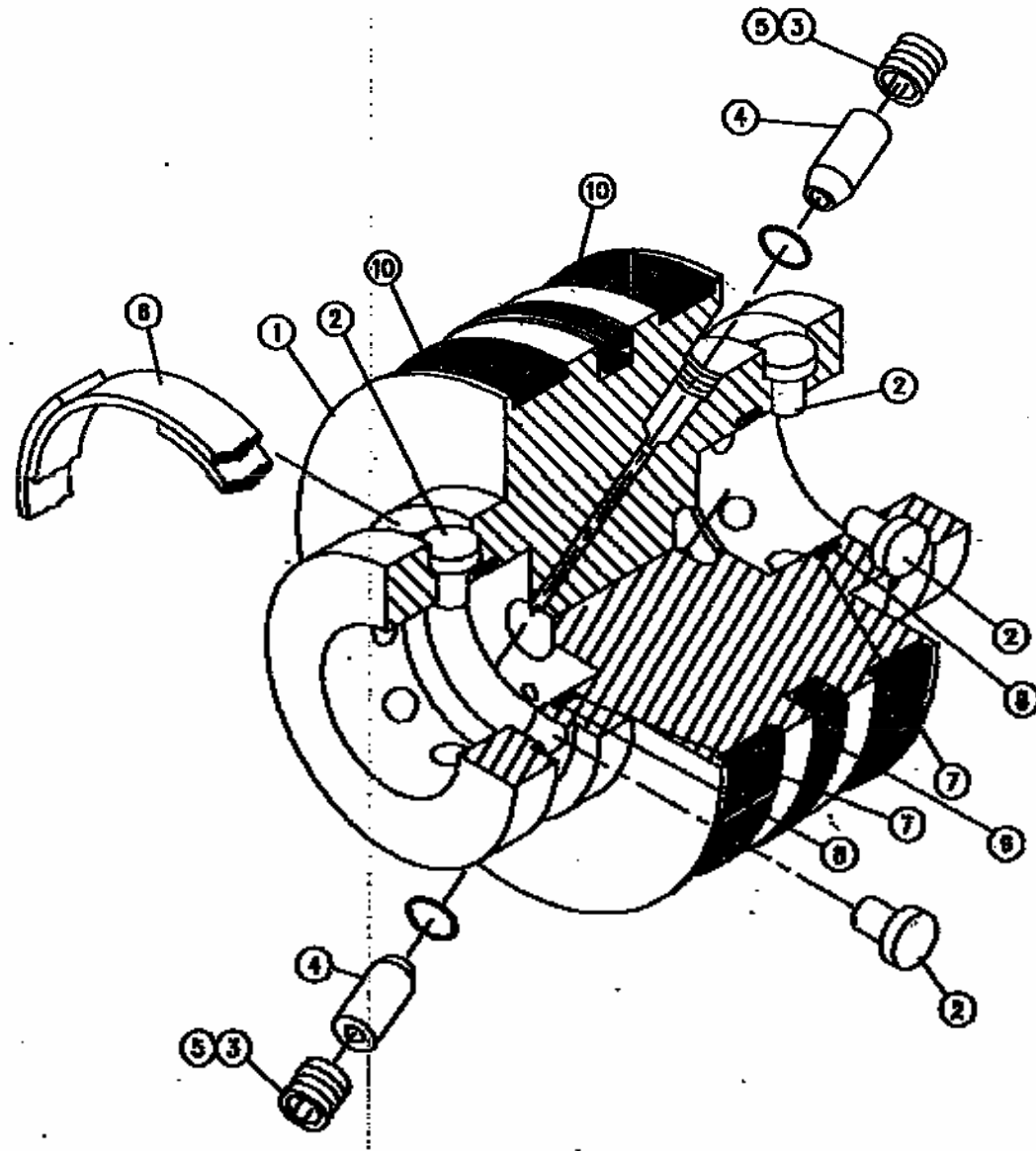
Item	Part Number	Description
1	49834039	Sealing Head Body
2	05144662	Inlet Poppet Valve
3	05116777	Gland Nut
4	05112768	Seat
5	05116561	Discharge Poppet Valve
6	05144670	Poppet Retainer
7	05147863	Compression Spring
8	49884562	Compression Spring
9	05116751	Poppet Pin



# KMT Hydraulic Cartridge Seal

Item	Part Number	Description	Quantity
1	05130109	Seal Bushing, 1.36 x 0.89	1
2	05015060	Packing Ring W/O-Ring, 1.125 x 0.875	2
3	10193522	O-Ring, 1-3/16 x 1-3/8 x 3/32	1
4	05050760	Backup Ring, 1.188 x 1.375	1
5	05129481	O-Ring, 1 x 1-1/8 x 1/16	1
6	05013024	O-Ring, 1-1/4 x 1-3/8 x 1/16	1
7	05129515	Backup Ring, 1.127 x 0.891	1
8	05027255	Packing Seal, U-Cup W/O-Ring	1

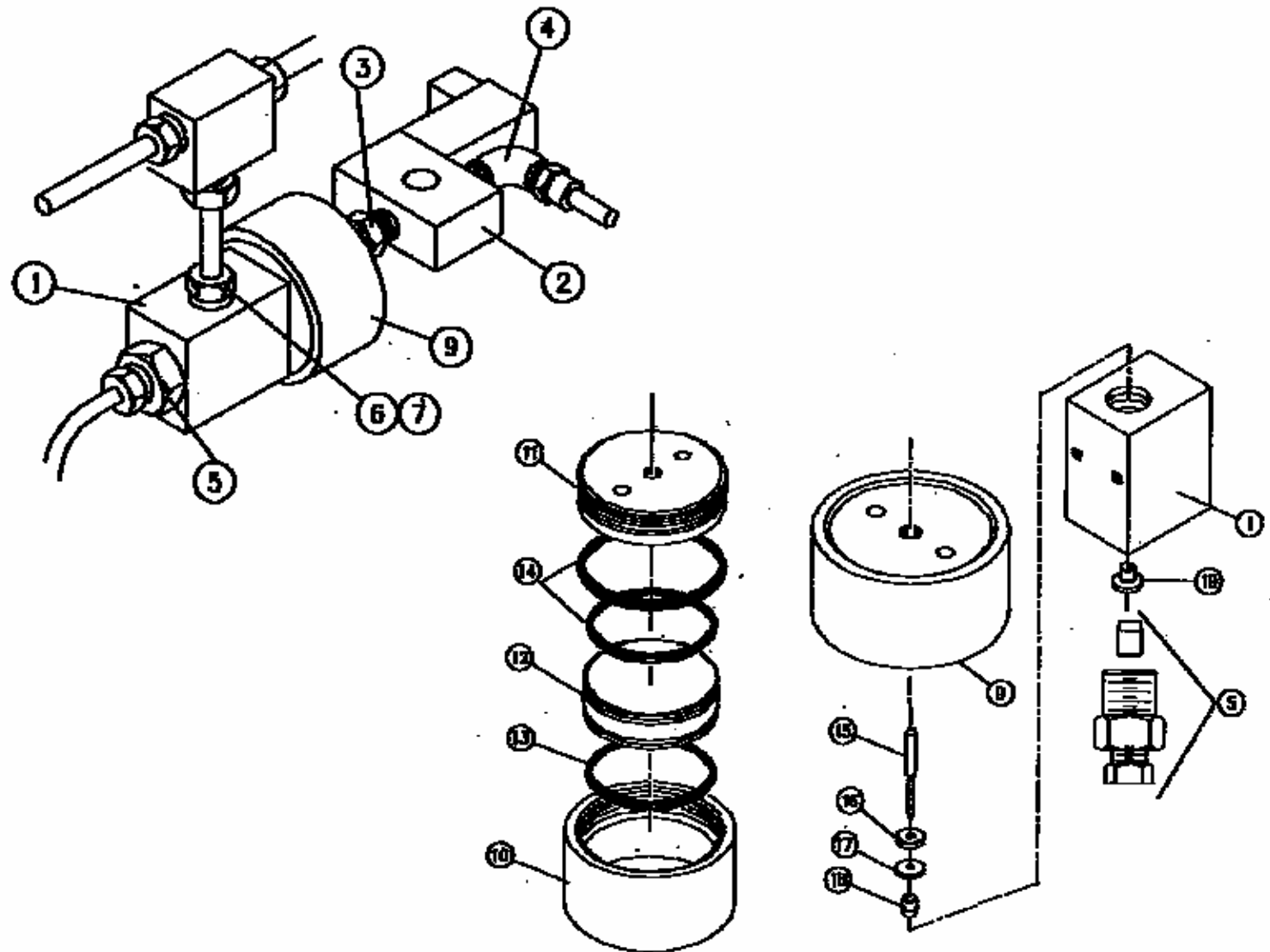
# KMT Hydraulic Piston Assembly



# KMT Hydraulic Piston

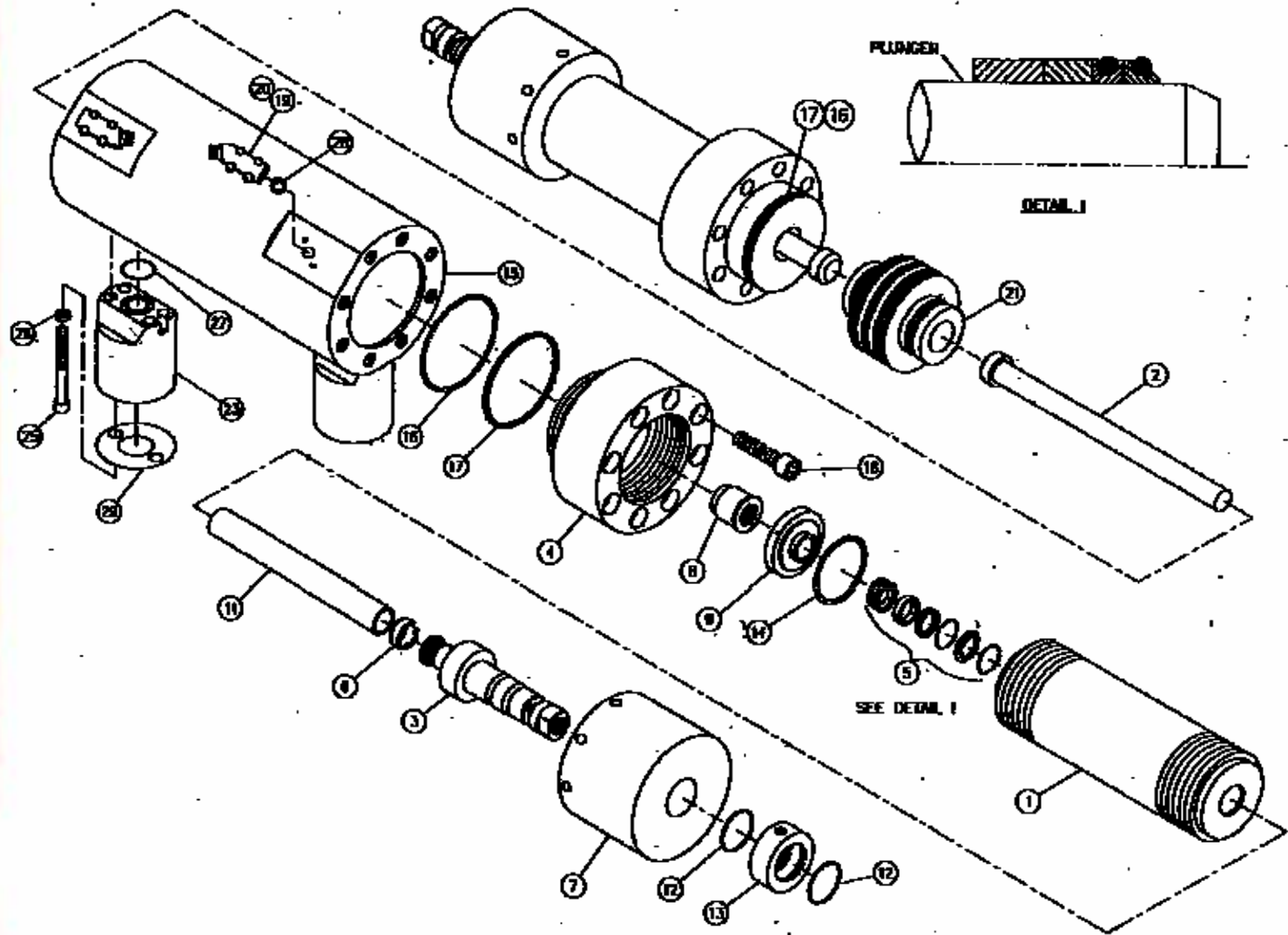
<b>Item</b>	<b>Part Number</b>	<b>Description</b>	<b>Quantity</b>
1	05132261	Hydraulic Ram Piston, 4.03	1
2	05074380	Plunger Retainer Pin, Clevis, 0.25 x 0.43	12
3	05049887	Set Screw, Socket, 3/8-16 x 3/8	2
4	10148757	Check Valve Cartridge W/O-Ring	2
5	49877509	Adhesive, Thread Locker	--
6	05088364	Flat Snap Ring, 0.032 x 0.375 x 2.010	2
7	05049994	Backup Ring, 1.50 x 1.25	2
8	05087713	O-Ring, 1-1/4 x 1-1/2 x 1/8	2
9	05117965	Seal Assembly, Hydraulic Piston	1
10	05117940	Bearing Ring, Hydraulic Piston	2

# KMT Bleed Down Valve

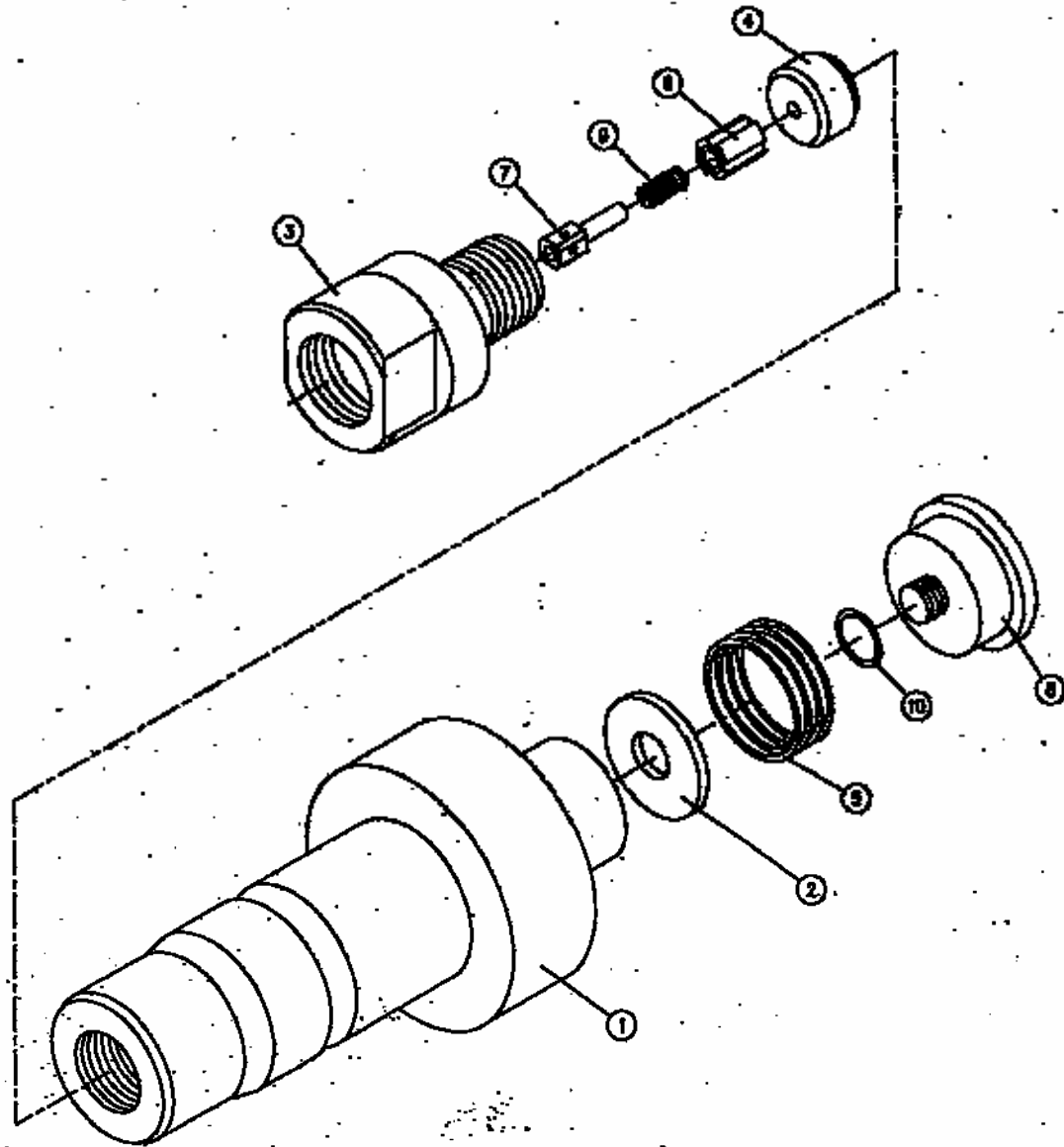




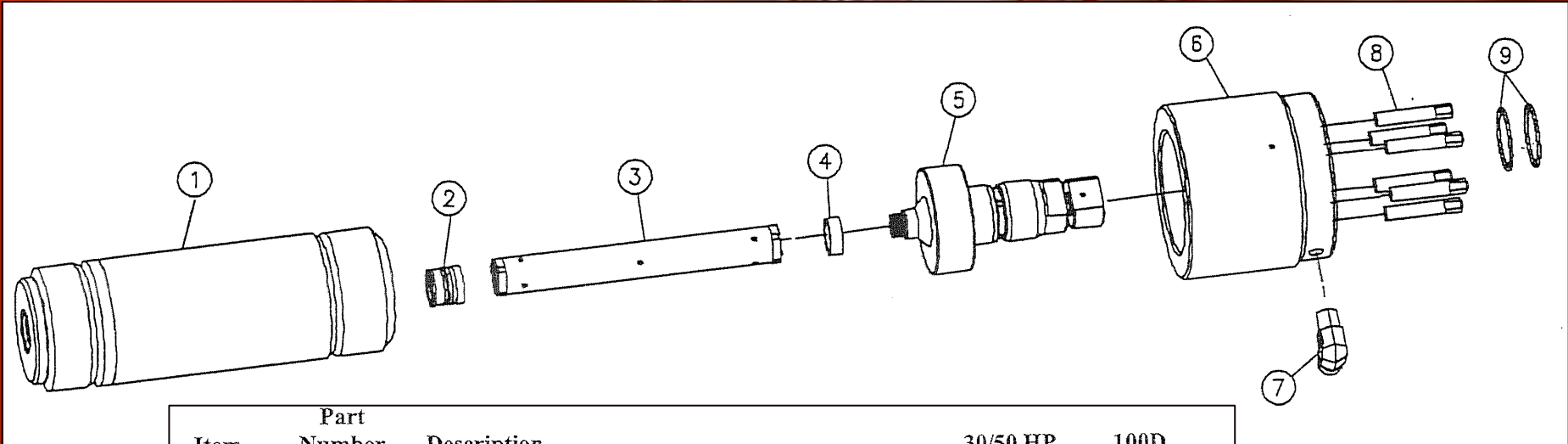
# KMT SL4 Intensifier



# KMT SL4 Sealing Head

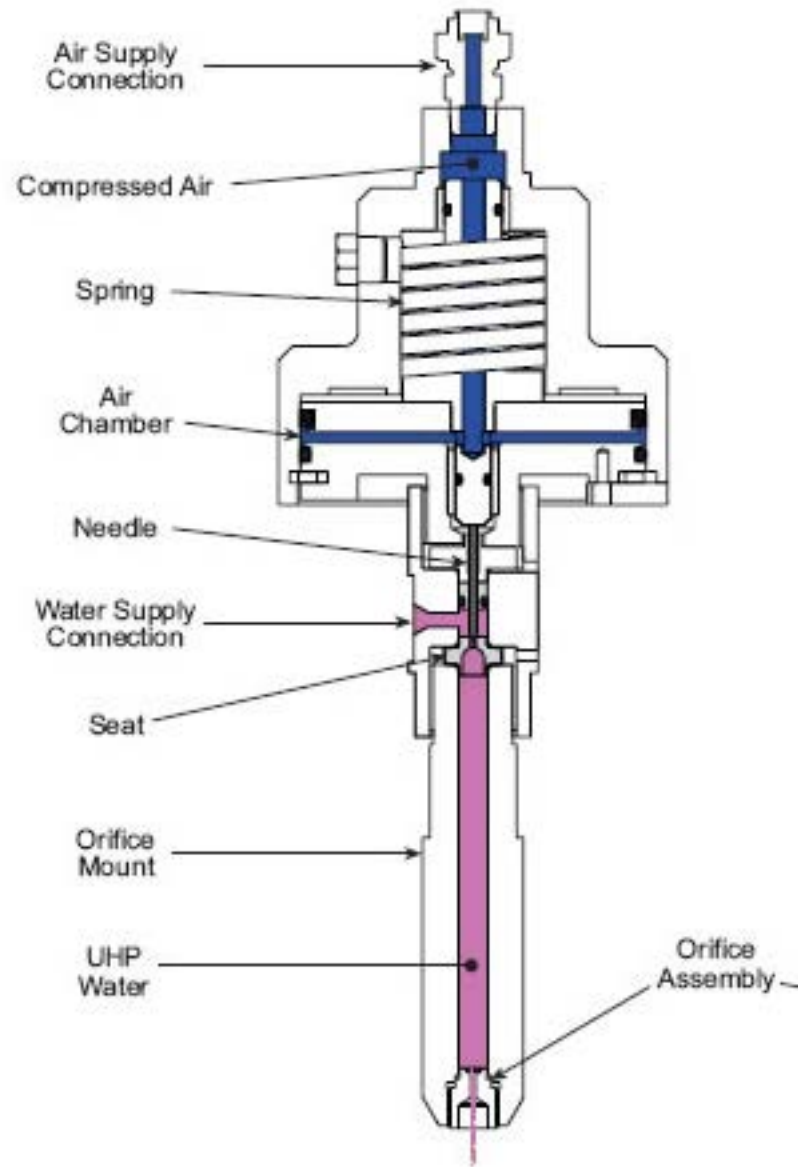


# Conversion Kit SL5



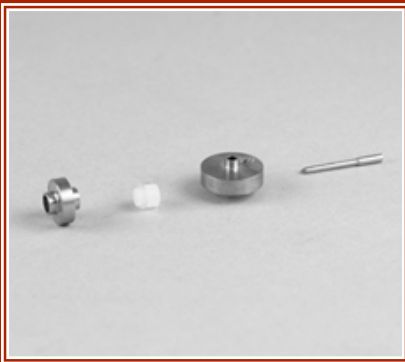
Item	Part Number	Description	30/50 HP	100D
1	05144647	IIP Cylinder Body	2	4
2	05149703	HP Seal Assembly	2	4
3	80080021	Cylinder Liner	2	4
4	05144696	Seal Spacer	2	4
5	80072349	Sealing Head Assembly	2	4
6	80073646	HP Cylinder Nut, HSEC	2	4
7	80072101	Adapter, Pipe/JIC, 90D	2	4
8	80070352	Jackbolt, 7/16	12	24
9	10074920	O-Ring	4	8
	051059453	EEPROM Memory Module	--	1

# Jet Edge On/Off Valve (Omnijet III)



# AS Parts Jet Edge On/Off Valve

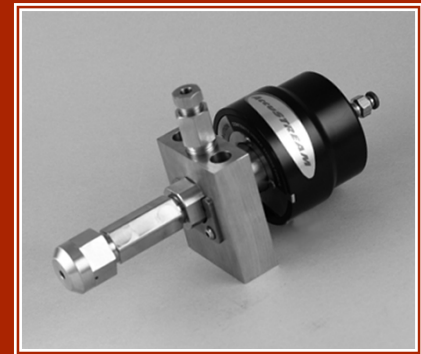
- Repair Kit



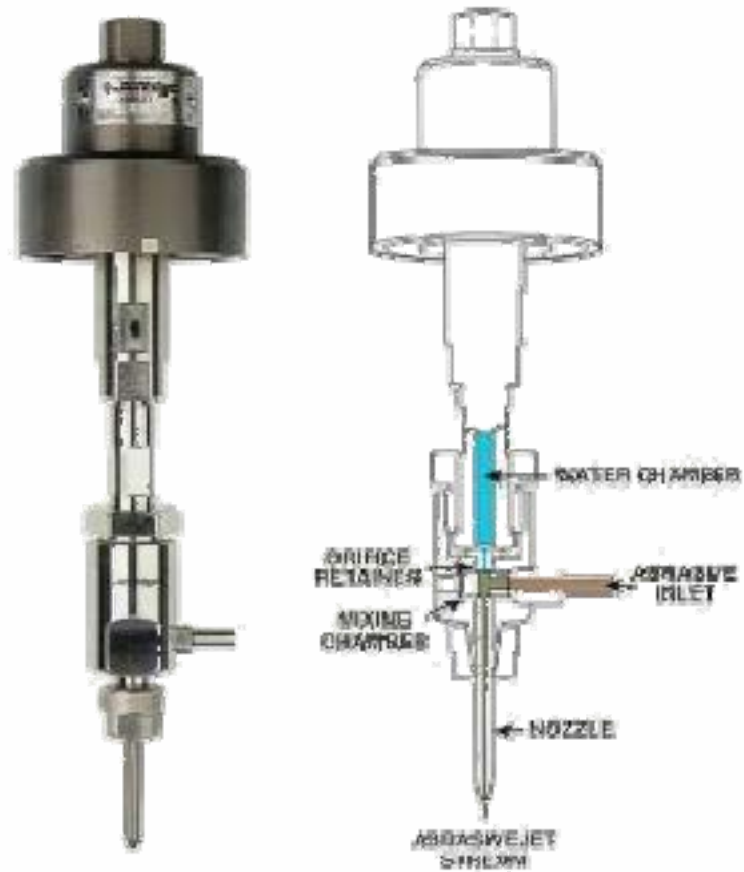
- Valve Body



- Actuator



# Jet Edge Cutting Head (Permalign II)



# Jet Edge Intensifier Pumps

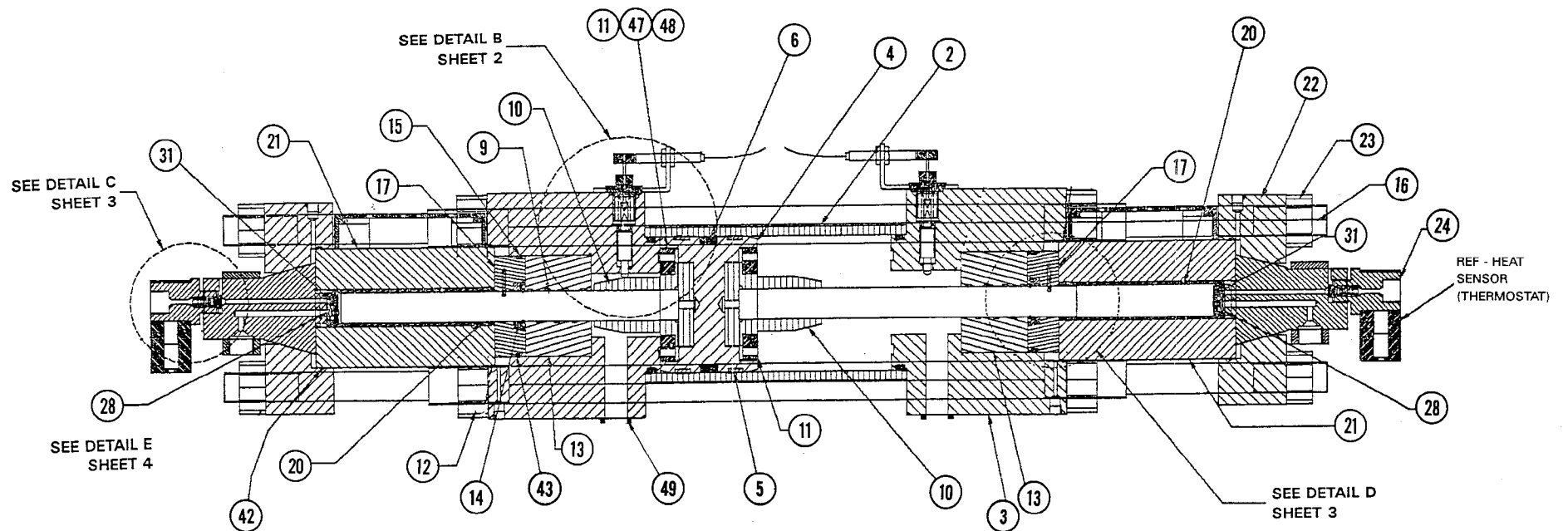


# Jet Edge Intensifier Pumps

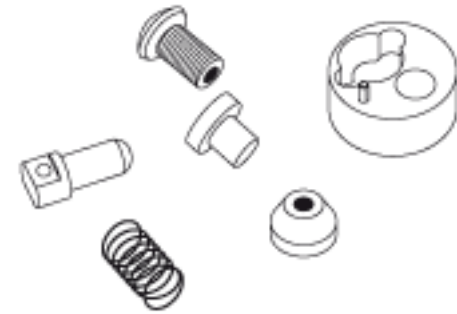
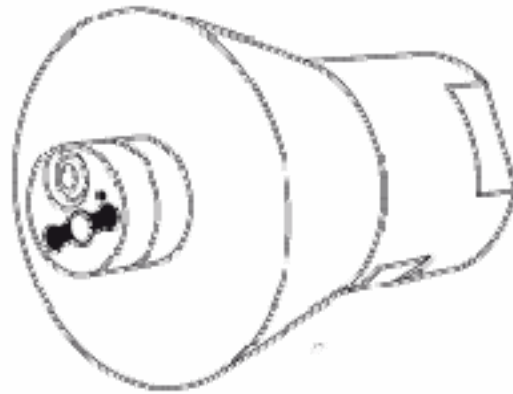
- **75S-150 HP Pumps**
  - **1" Plunger**
  - **1" Check Tubes**
  - **1" Cylinders**
- **30-75D HP Pumps**
  - **.875" Plunger**
  - **.875" Check Tubes**
  - **.875" Cylinders**



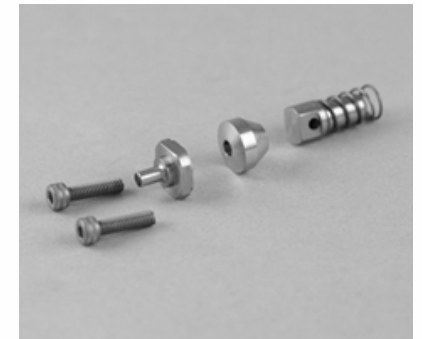
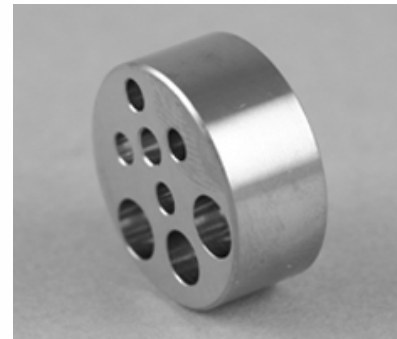
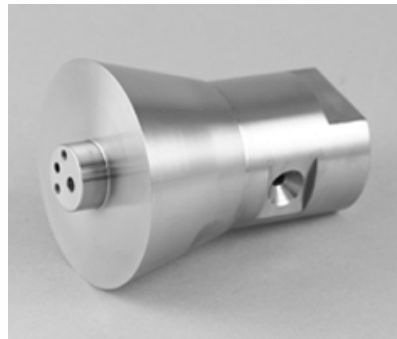
# Jet Edge Intensifier Overview



# Jet Edge Check Tubes



- New Style Check Tube

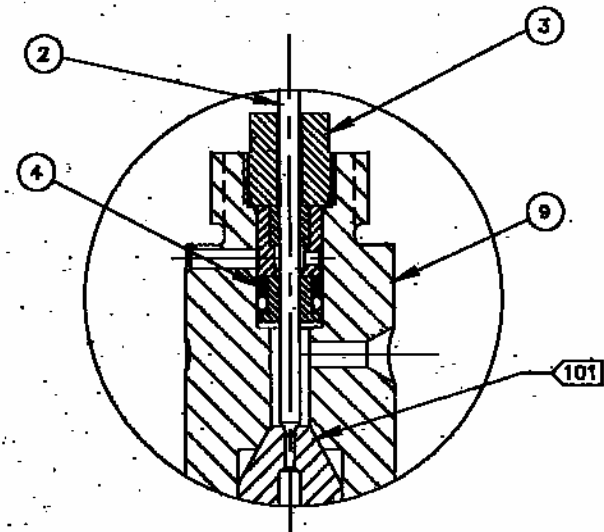
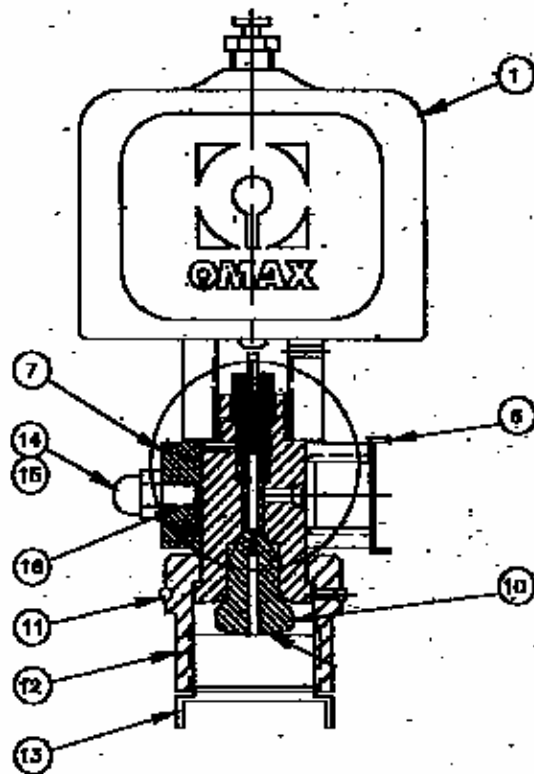


# Omax Waterjet



# Omax On/Off Valves

Integrated



# Omax On/Off Valves



Non-Integrated

# Omax Abrasive Cutting Head

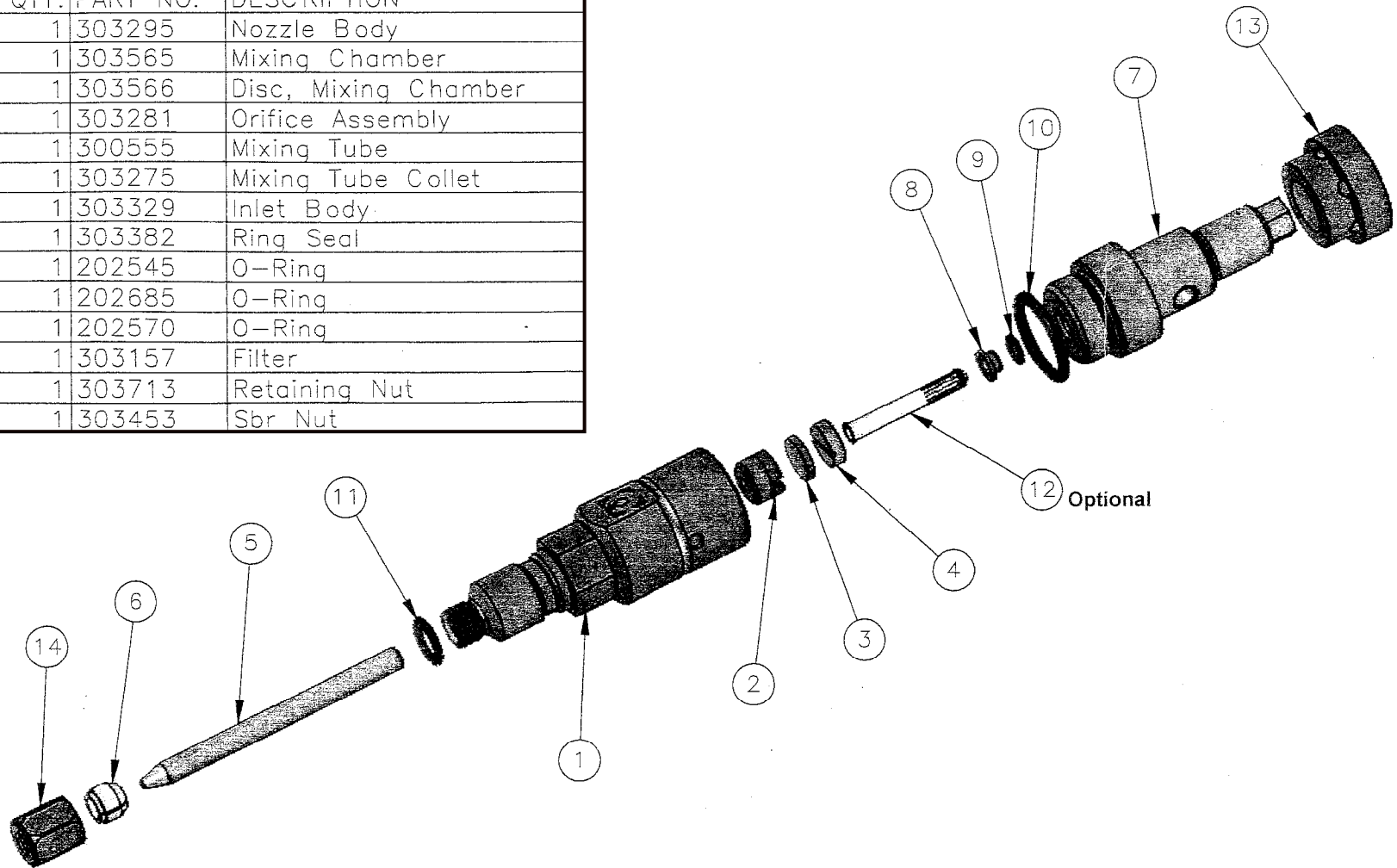
(The Maxjet 5)



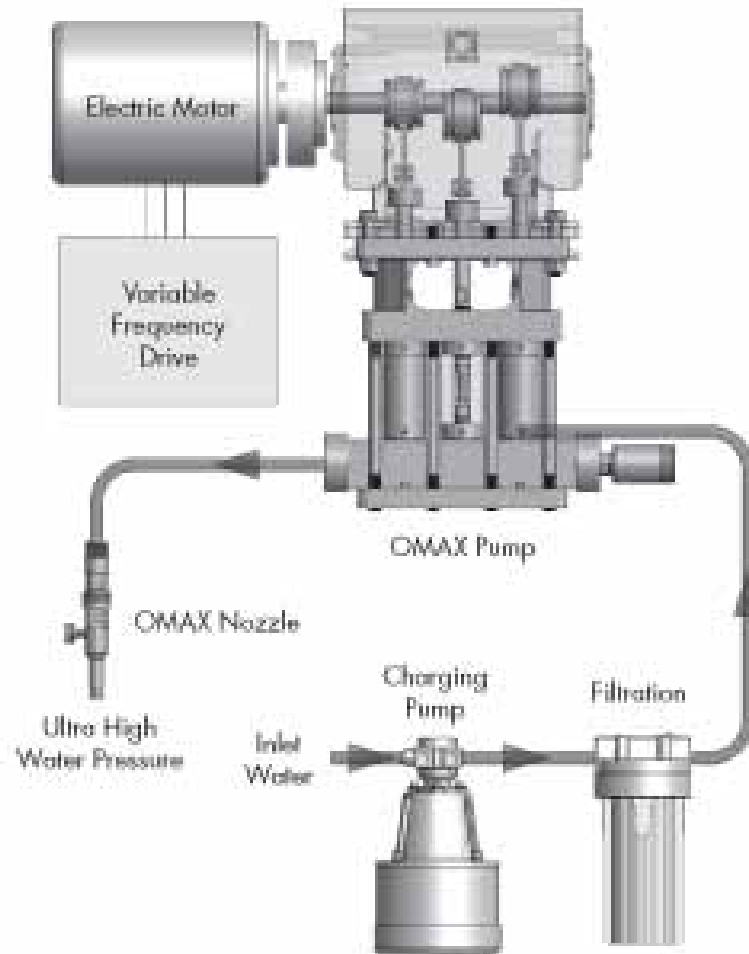
# Omax Abrasive Cutting Head

(The Maxjet 5)

303446-14 Tilt-A-Jet MaxJet5 Nozzle			
ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	303295	Nozzle Body
2	1	303565	Mixing Chamber
3	1	303566	Disc, Mixing Chamber
4	1	303281	Orifice Assembly
5	1	300555	Mixing Tube
6	1	303275	Mixing Tube Collet
7	1	303329	Inlet Body
8	1	303382	Ring Seal
9	1	202545	O-Ring
10	1	202685	O-Ring
11	1	202570	O-Ring
12	1	303157	Filter
13	1	303713	Retaining Nut
14	1	303453	Sbr Nut



# Omax Direct Drive Pumps

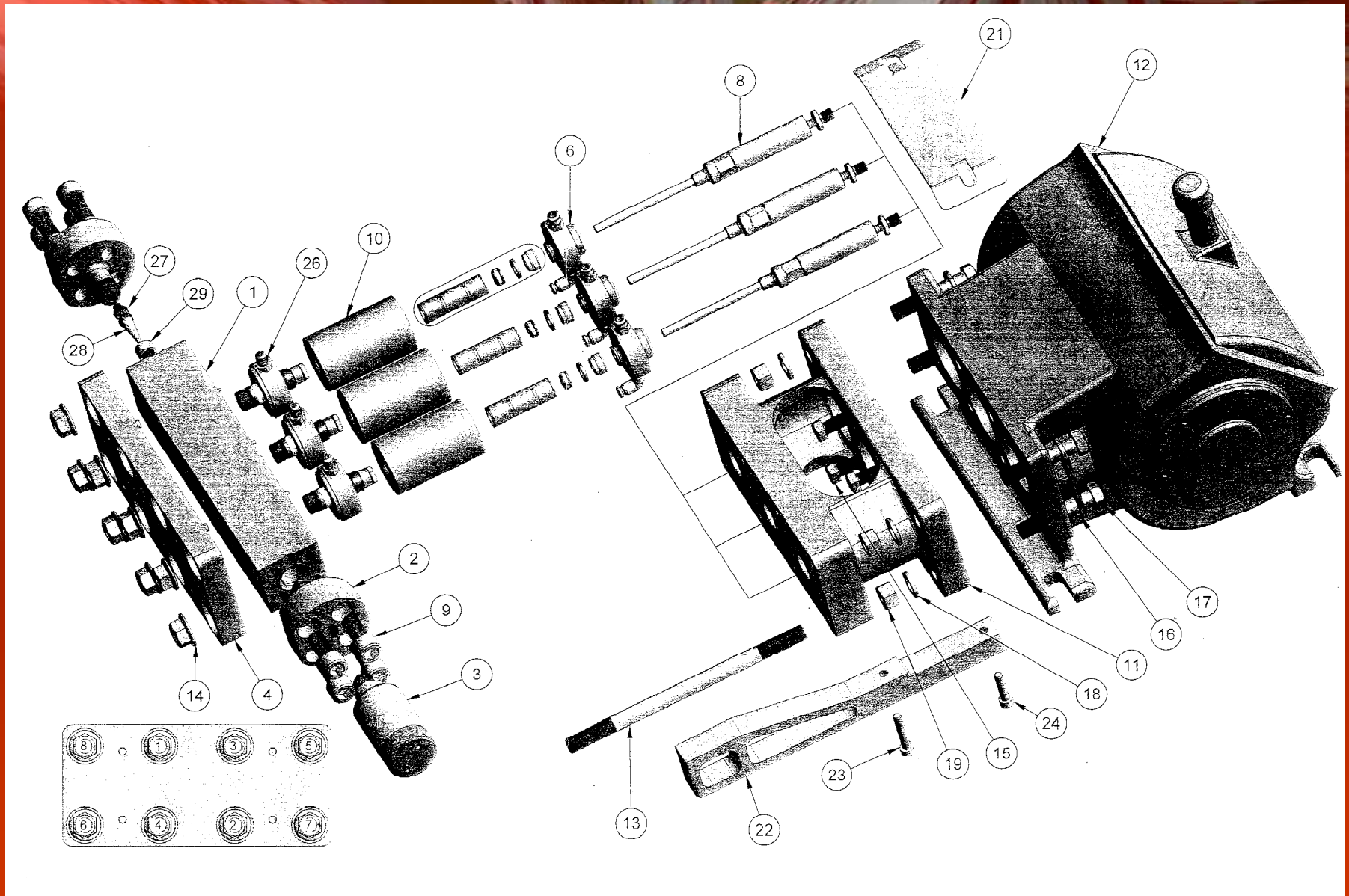




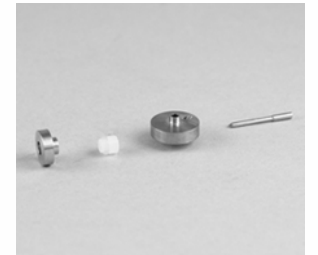
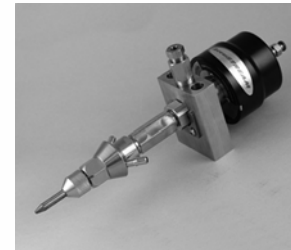
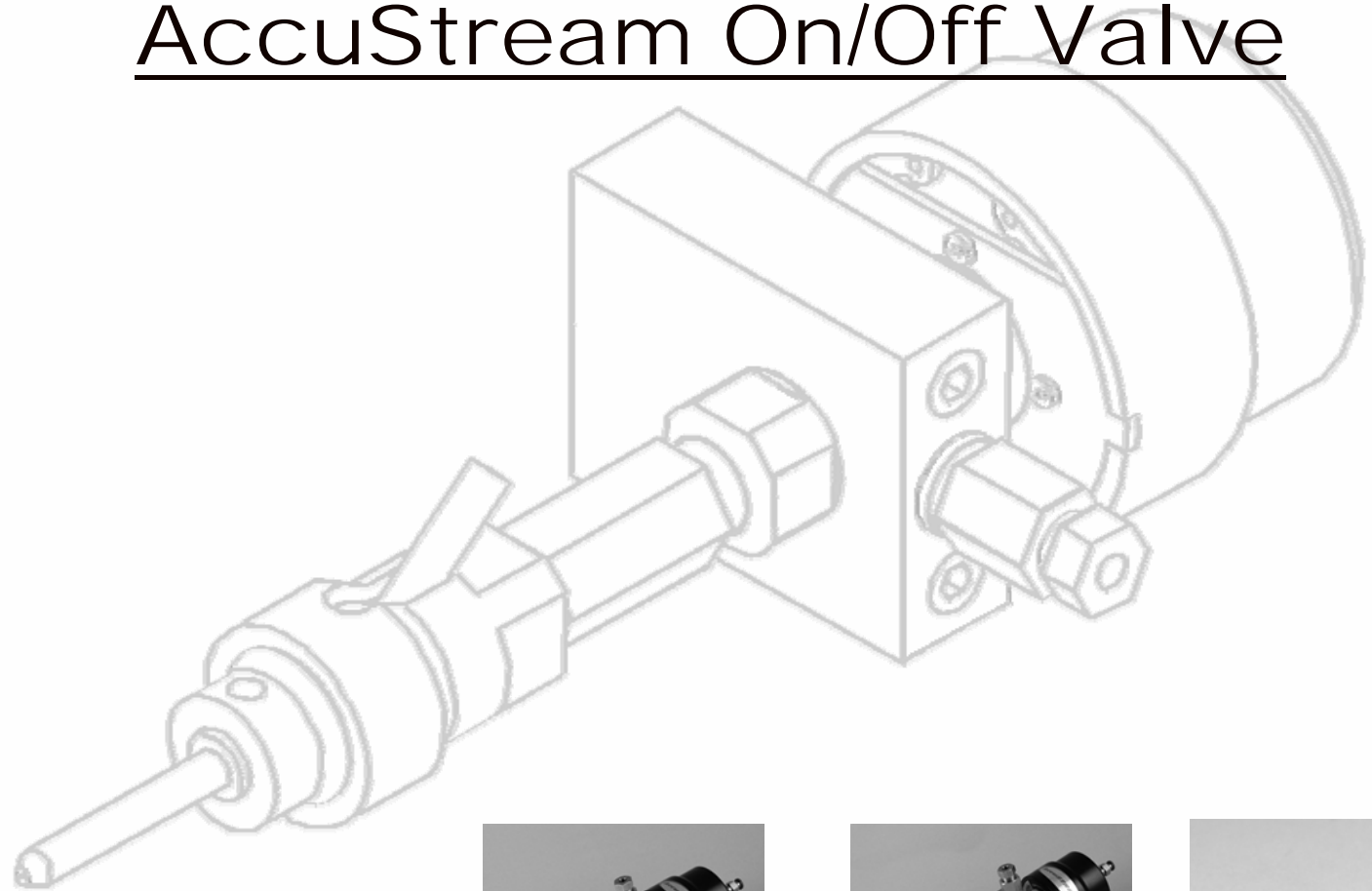
# Omax Direct Drive Pumps



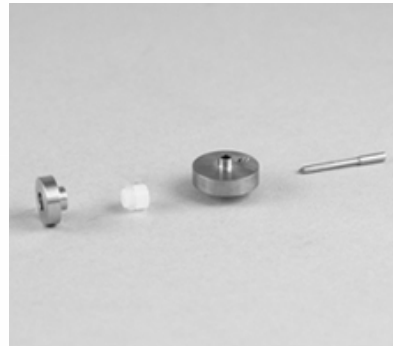
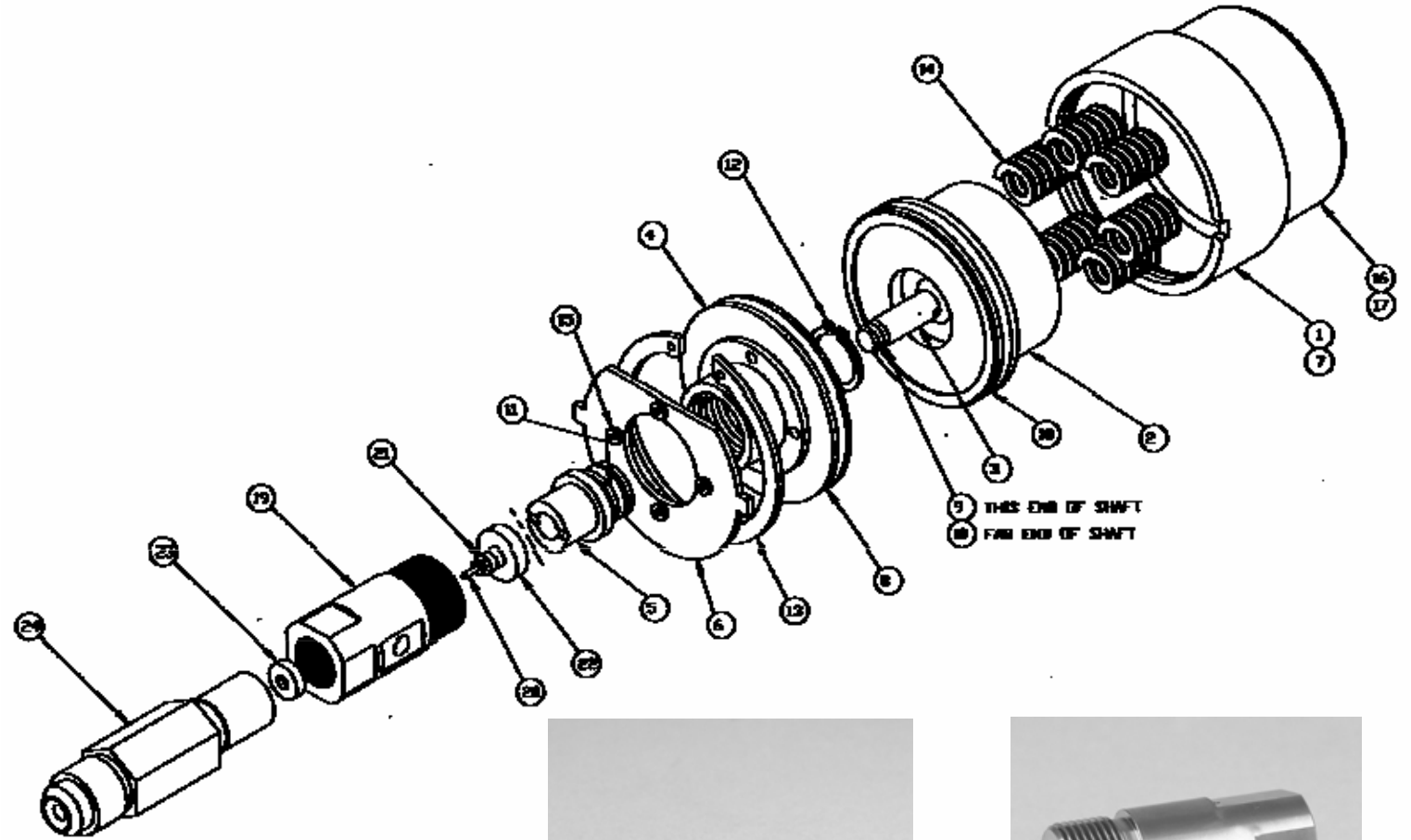
# Omax Direct Drive Pumps



# AccuStream On/Off Valve



# AccuStream On/Off Valve



# AccuStream On/Off Valve





AccuStream  
A2 Abrasive  
Cutting Head





## AccuStream Swivels





# Abrasive Regulator

## **Water Resistant**

Innovative new design keeps abrasive dry, improving uptime.

## **Compact Design**

The lightweight and compact design allows the unit to be positioned close to the cutting head.

## **Exclusive Adjustment**

The adjustment dial offers a broad range of settings to ensure the precise amount of abrasive is being delivered.

## **Rapid Response**

The metering system provides rapid response to ensure abrasive is delivered at the right moment, guaranteeing a consistent, smooth cut.

## **Monitoring Performance**

Clear tube allows easy monitoring of cutting performance. Abrasive flow chart provides easy guideline for operators.

## **Monitoring Performance**

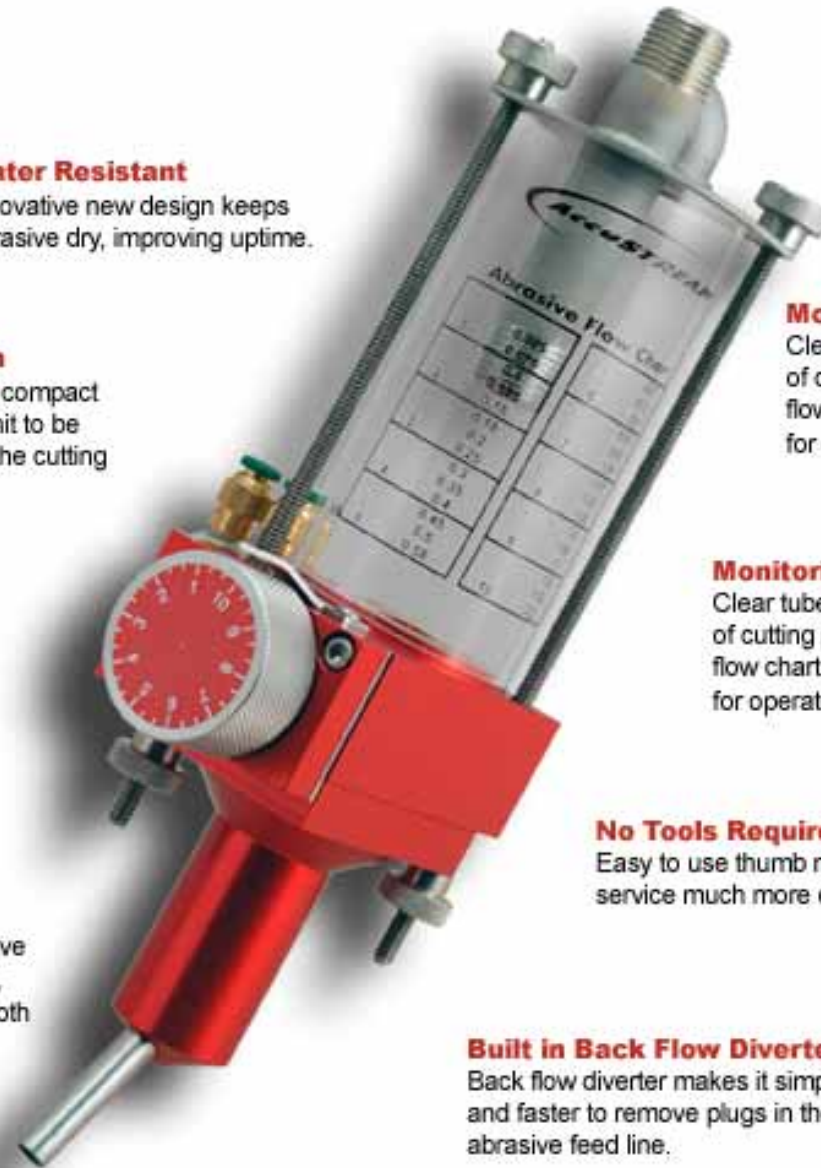
Clear tube allows easy monitoring of cutting performance. Abrasive flow chart provides easy guidelines for operators.

## **No Tools Required**

Easy to use thumb nuts make service much more convenient.

## **Built in Back Flow Diverter**

Back flow diverter makes it simple and faster to remove plugs in the abrasive feed line.



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