

MURZAN

PI-50 Ball Pump



OPERATION and SERVICE MANUAL



**IMPORTANT DOCUMENTS
DO NOT DISCARD**

MURZAN INC.

2909 Langford Road, Building 1-700, Norcross, Georgia 30071 U.S.A.

PHONE: (770) 448-0583 FAX: (770) 448-0967

W W W . M U R Z A N . C O M

Dear Customer:

Thank you for your purchase of the MURZAN PI-50 Ball Check Sanitary Pump.

The MURZAN PI-50 Ball Check Sanitary Pump is USDA listed, FDA approved, And meets general 3-A requirements, to provide you with all your sanitary pumping needs.

This manual provides easy to follow operating procedures, adjustments, cleaning, assembly and disassembly steps, to insure long life of your ball check sanitary pump.

By carefully reading this manual, and by following the appropriate preventive maintenance schedule, your PI-50 Ball Check Sanitary Pump will provide you with years of reliable service.

Sincerely,

Luis Uribe
Manager, Sales Engineering

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1.0 AIR QUALITY

The Murzan PI-50 Ball Check Sanitary Pump is powered with compressed air at a maximum pressure of 100PSIG. DO NOT EXCEED THIS LEVEL, as damage to the system or personal injury may occur.

Murzan pumps use a non-lubricated air valve system to meet the stringent USDA and FDA standards required for pneumatically operated diaphragm pumps in the food and pharmaceutical industries. Only with a Murzan pump do you get this unique feature.

Murzan pumps have been engineered to provide the highest standard of performance and reliability in handling your sanitary products. One way we insure the most hygienic system possible is by equipping all Murzan pumps with an oil free, non-lubricated air valve. The patented, non-lubricated Murzan air valve does not exhaust contaminated oil vapor into your plant environment as a lubricated air valve will. A clean, well filtered air supply is essential for the proper operation of the air valve, and for the prevention of contaminants being expelled into the plant environment. A dirty oil laden air supply is by far the most expensive and overlooked problem we find in working with our customers.

Oil and other contaminants that enter the pump, drastically reduce the life of the air valve, shaft bushing assembly, shaft, and block gaskets. The results are a much higher frequency of parts replacement and repair, with a corresponding increase in maintenance expenses. As pump parts become worn due to contamination, the pump loses efficiency and requires increased air volume to move the product. This puts additional strain on the air supply and brings increasing amounts of oil to the pump. The use of filters will pay for themselves in a very short time through reduced parts usage and maintenance man hours.

To insure the maximum efficiency of your Murzan pumping system while maintaining sanitary pumping conditions, we highly recommend the Deltech 800 series coalescent filters as point of use filtration for all Murzan equipment. We have found these filters to be an excellent product from the stand point of both efficacy and utility. The design of this filter insures the removal of 99% of the contaminants, including oil, before the air passes through the filter cartridge, dramatically increasing the life of the cartridge and insuring extremely efficient filtration.

If you need assistance in obtaining further information on the Deltech filters, please don't hesitate to contact Murzan, Inc.

2.0 SYSTEM COMPONENTS

The drawing on the page to follow gives the operator a general listing of the Murzan PI-50 components. This listing will aid the operator in identifying components for operation, cleaning, maintenance and servicing. Additional drawings are contained within this manual, as they apply to specific aspects of this system.

3.0 BASIC OPERATION

The Murzan PI 50 is a pump with wetted parts constructed of 304 or 316 stainless steel and FDA approved Buna-N elastomers.

When using the pumps in a permanent installation attached to plant piping, always use flexible couplings on both the suction and discharge ports of the pump to reduce vibration due to the reciprocating nature of the pump.

The suction pipe should never be less than 2" in diameter. Larger diameters may be used if extremely viscous materials are to be pumped.

Non-collapsible reinforced hose must be used on the suction side of the pump if hoses are to be used in place of piping.

All fittings must be tight in order to eliminate air and product leaks. This will allow the pump to run as efficiently as possible.

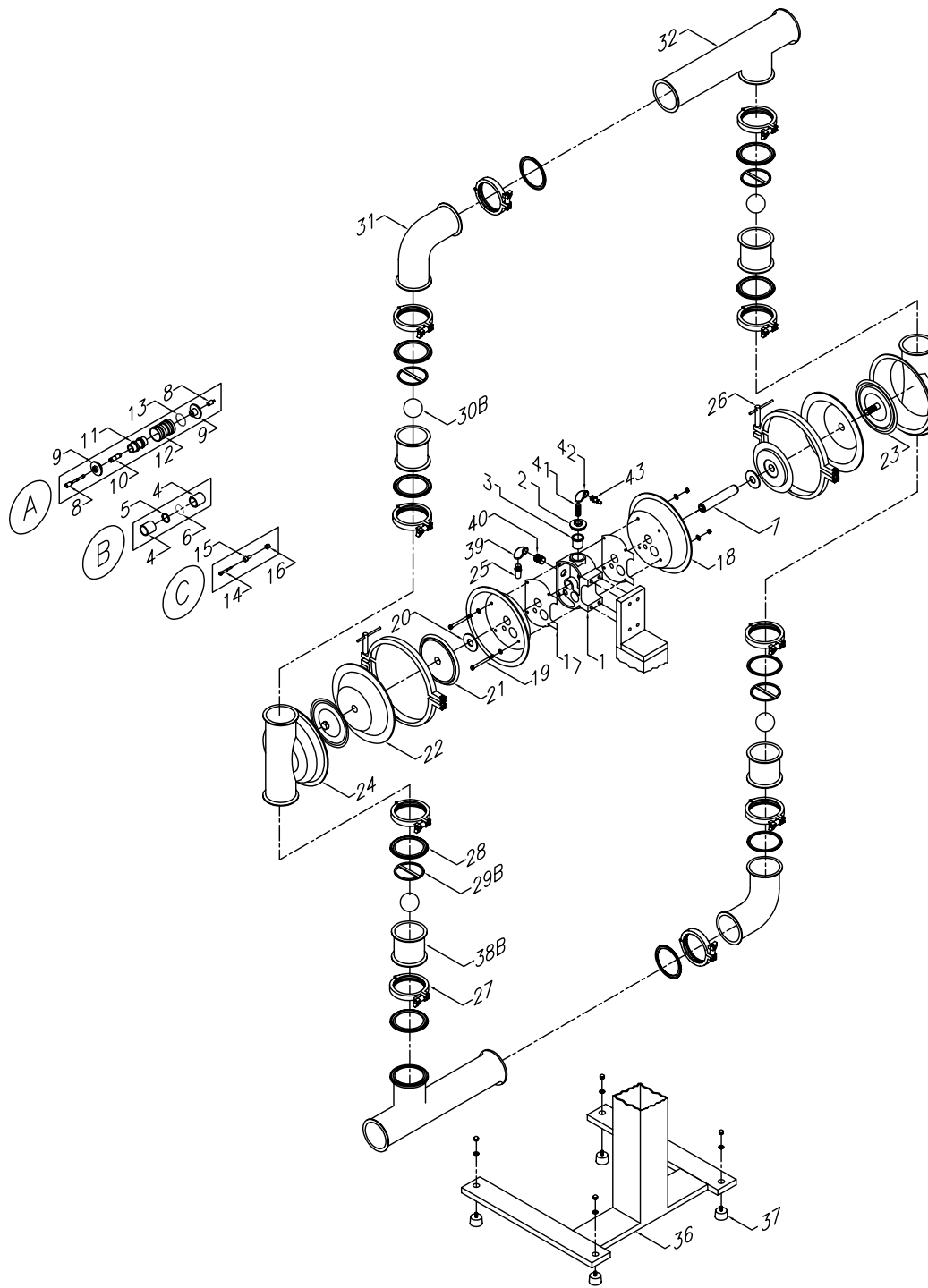
The Murzan pump is capable of handling 3/8" solids with the ball cages in place and 1" solids when they have been removed. A strainer should be used if solid sizes are greater than above.

Caution: Do not exceed 120 psig air supply pressure.

Pump discharge rate can be controlled by:

1. Limiting the volume and/or pressure of the air supply to the pump. An air regulator installed at the air inlet will serve this purpose.
2. Throttling the pump discharge by installing a valve in the discharge line of the pump. When the discharge pressure equals or exceeds the air supply pressure, the pump will automatically stall, eliminating the need for pressure relief valves. Pump damage will not occur when the pump is stalled.

Caution: Maximum temperature limits are based upon both mechanical and corrosive factors. Certain products will significantly reduce maximum safe operating temperatures. Please consult the factory when product compatibility is in question.



PI50 BALL PUMP PART ID

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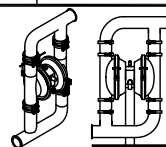
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ASSOCIATED DOCUMENTATION
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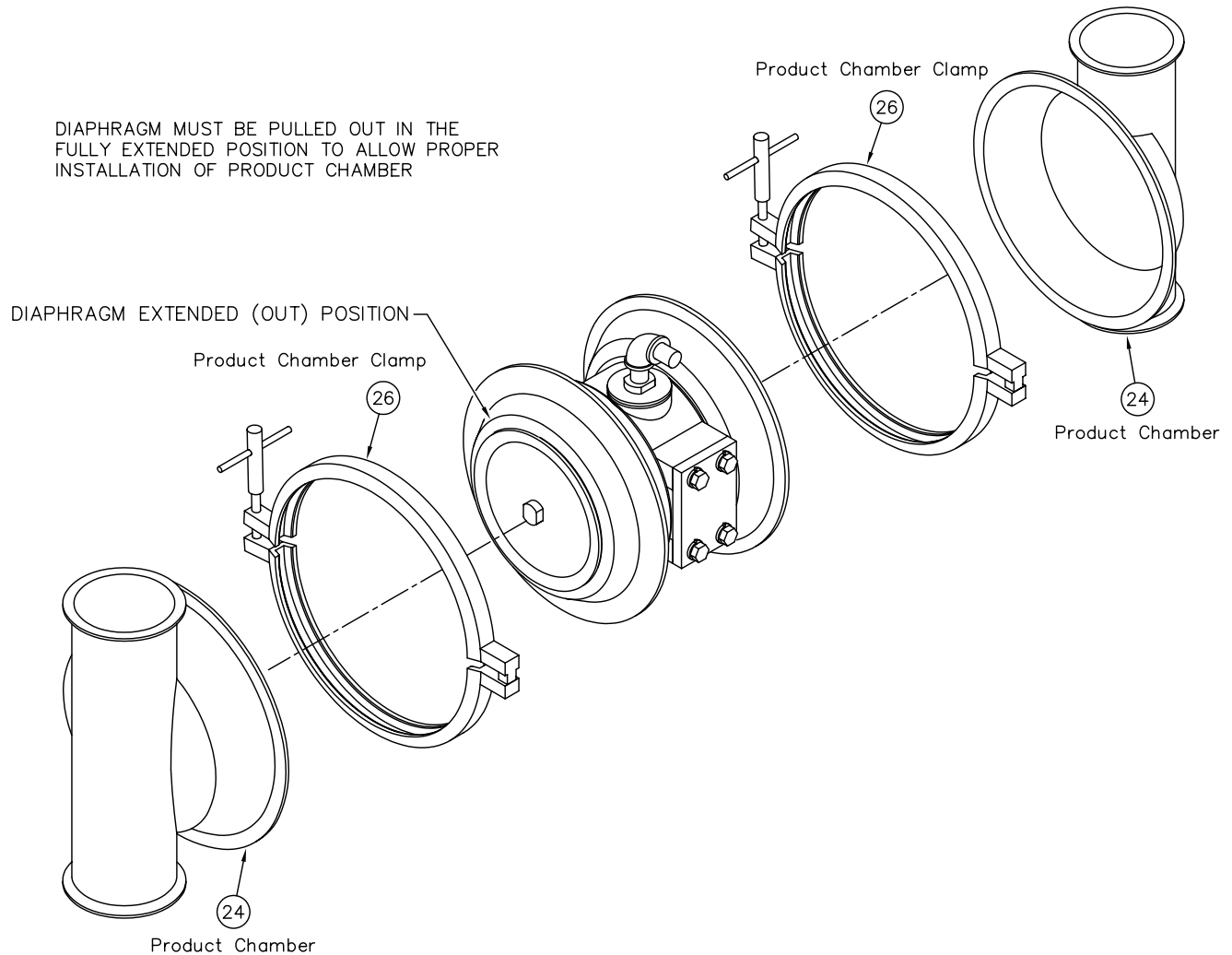
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CHECKED BY:	LU
DATE:	25OCT99
SCALE:	NONE

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DRAWING No.	PLO0091-



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DIAPHRAGM MUST BE PULLED OUT IN THE FULLY EXTENDED POSITION TO ALLOW PROPER INSTALLATION OF PRODUCT CHAMBER



Pump Assembly and Part Identification

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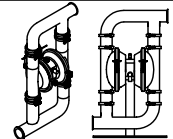
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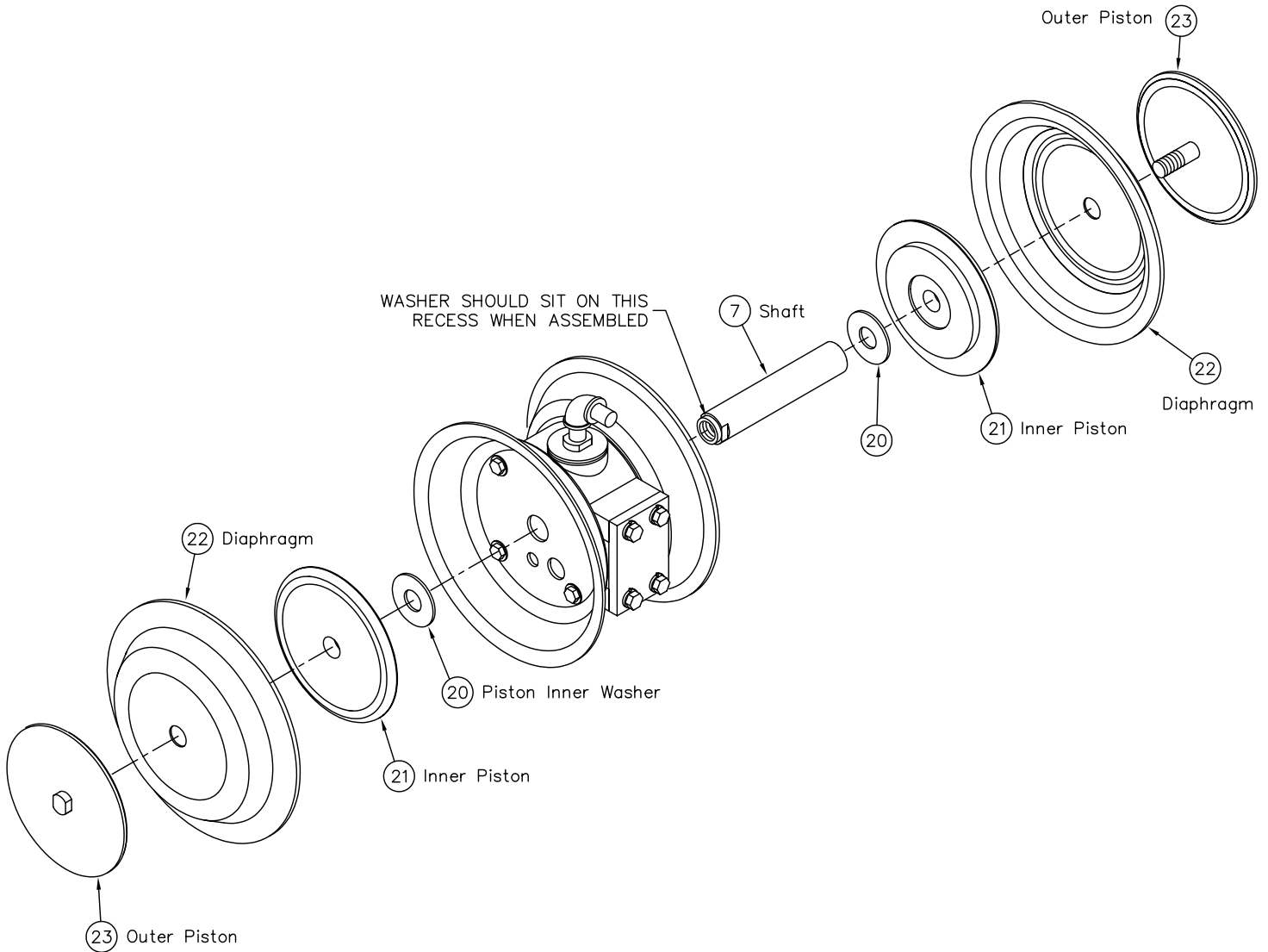
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DRAWN BY:	JUN CHEN
CHECKED BY:	L. URIBE
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DESCRIPTION:	PRODUCT LITERATURE PUMP ASSEMBLY AND PART ID
DRAWING No.	PLO0079B



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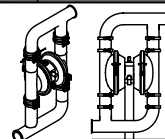
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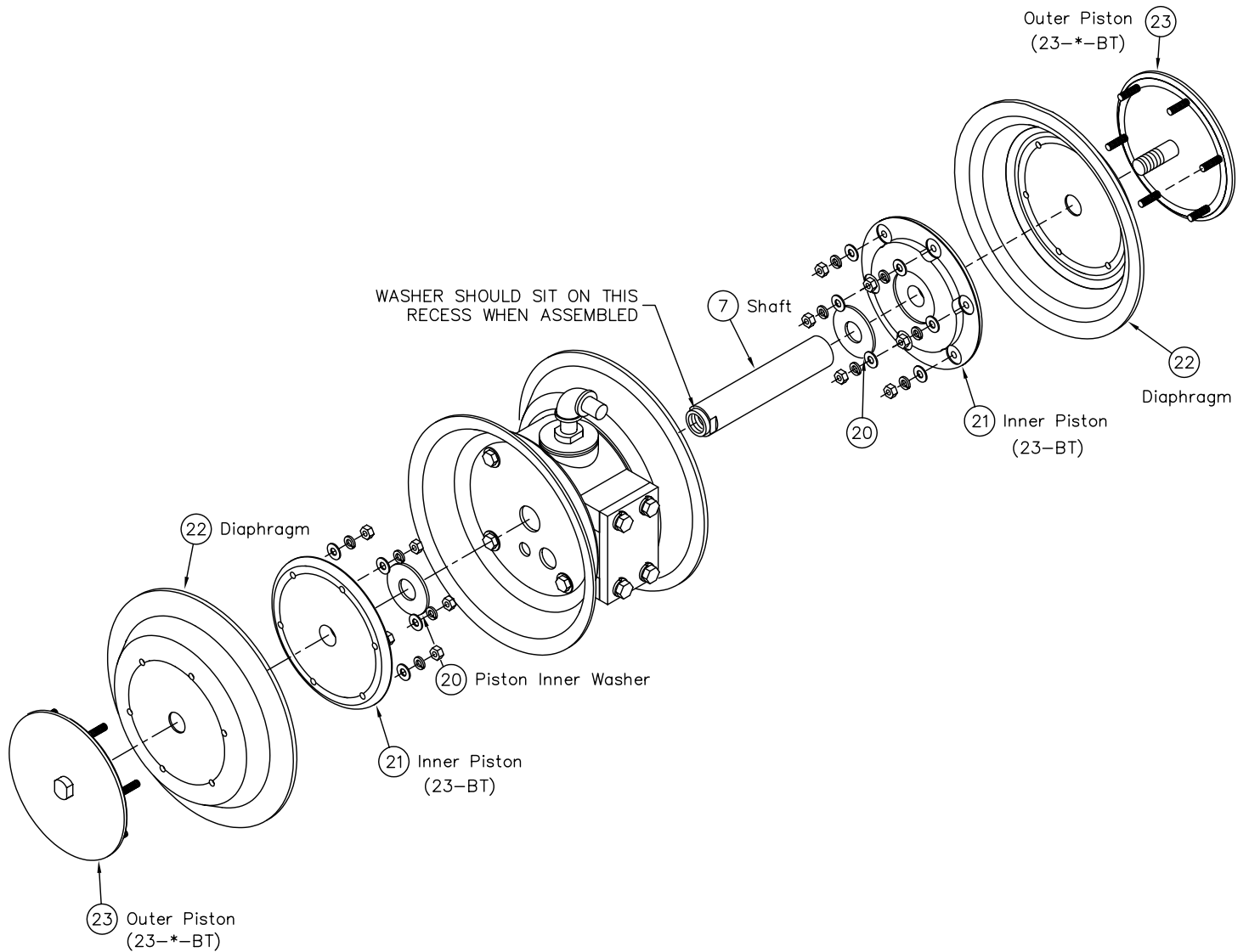
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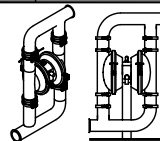
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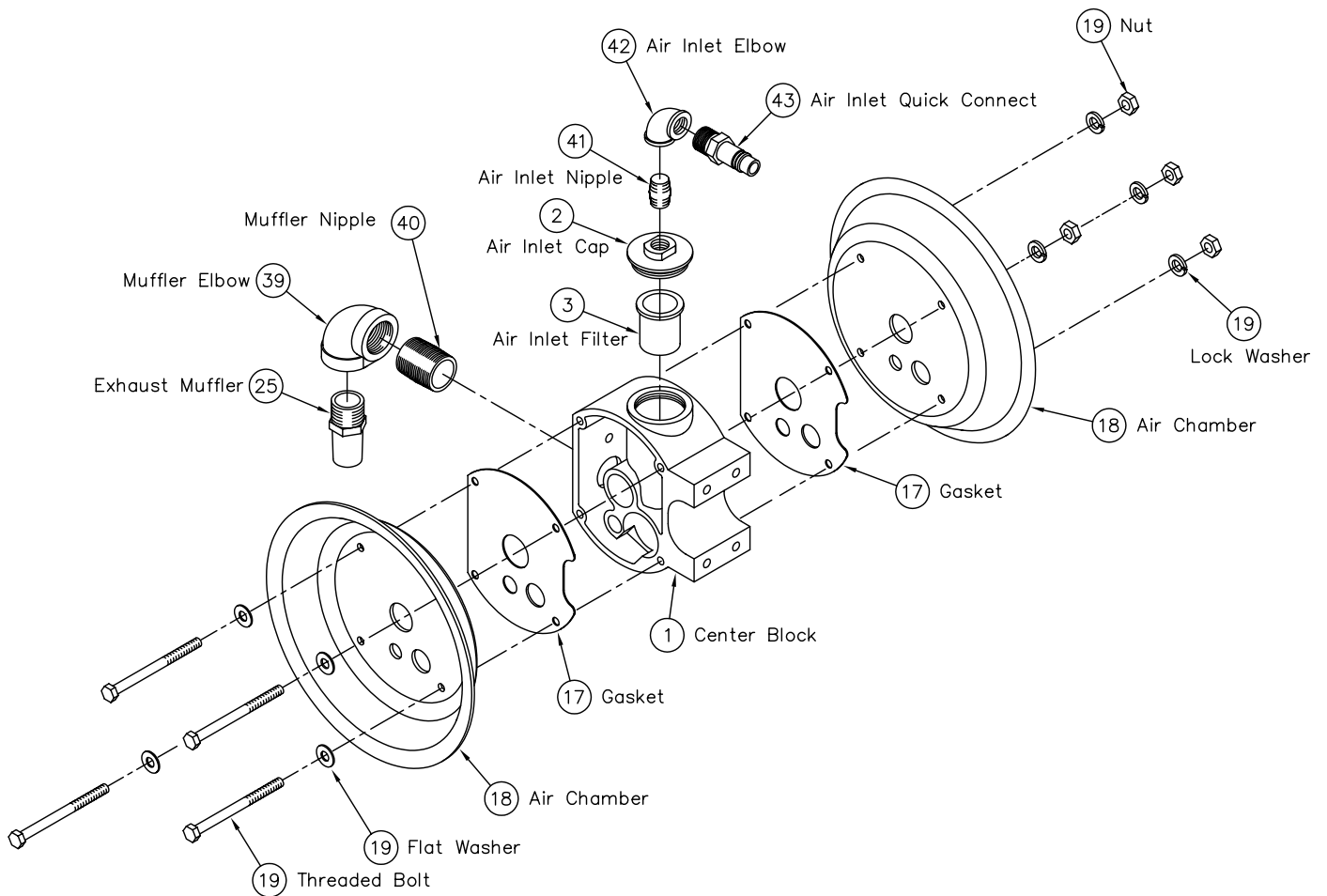
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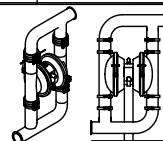
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DRAWN BY: JUN CHEN
 CHECKED BY: L. URIBE
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4.0 MAINTENANCE & CLEANING

In general, cleaning requirements and guidelines are set by governmental agencies such as the USDA or FDA in the United States. Each user of Murzan Inc. equipment is responsible for ensuring that their cleaning process and procedures meet the applicable governmental and industry standards. All Murzan equipment is designed and manufactured to meet sanitary requirements of materials to the 3A standard. Murzan Inc. makes every effort to provide equipment that will easily meet governmental cleaning requirements and facilitate internal and external cleaning processes for the customer, however, strict compliance with governmental regulations regarding specific processes and suitable chemicals is the sole responsibility of the customer.

5.0 PUMP DISASSEMBLY

Before attempting any maintenance, disconnect the air supply. Be sure to wear and use Safety Equipment and understand all Safety Procedures. Drawings are provided at the end of this section. To begin system disassembly, you will need the following tools:

- ❑ (1) Flat Head Screw Driver (1/4" to 3/8" head)
- ❑ (1) Torpedo Level
- ❑ (1) Ratchet
- ❑ (1) 1/2 " Socket
- ❑ (1) 9/16" Socket
- ❑ (1) 9/16" Combination Wrench
- ❑ (2) 3/4" Open End Wrench
- ❑ (1) 5/8" Locking Pliers with Straight Jaw
- ❑ (1) 5/8" Locking Pliers with Curved Jaws
- ❑ (1) Steel Pry Bar

- ① Remove check clamps from the discharge manifold.
- ② Remove the manifold clamps and gaskets allowing the tee and ells to be separated for visual inspection.
- ③ Remove ball guide and gasket.
- ④ Remove check clamps from suction manifold and repeat steps 2, 3, and 4.
- ⑤ Loosen and remove product chamber clamps allowing the diaphragm to be exposed. All "wetted" portions of the pump are now exposed for cleaning and inspection.
- ⑥ To remove diaphragms, place a 3/4" wrench on both of the outer pistons (flats provided) and loosen. This will allow the diaphragms, inner piston, outer piston, and drive shaft to be removed.

6.0 PUMP ASSEMBLIES A, B, AND C

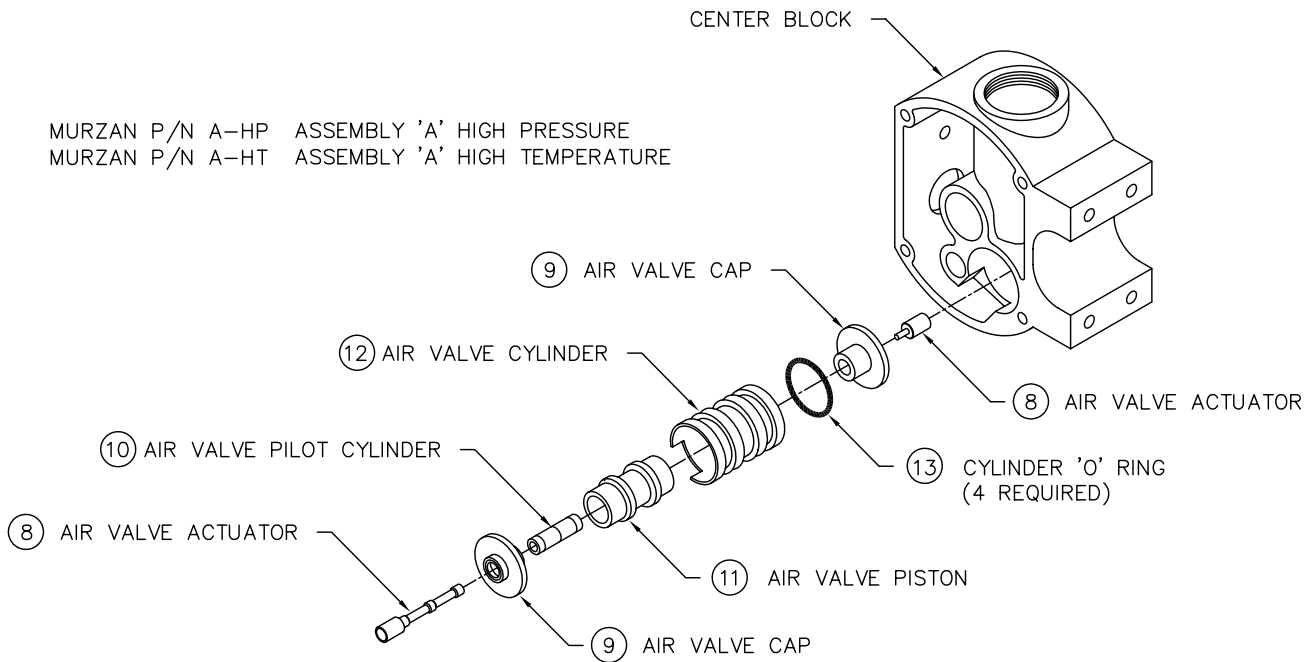
The drawings to follow show the Murzan Assemblies A, B, and C for reference.

7.0 PUMP RE-ASSEMBLY

- ① To reassemble suction and discharge manifolds, place the gaskets between the manifold tees and ells and attach clamps. Do not tighten completely. Place manifold on a flat surface to ensure proper alignment and then secure the clamps.
- ② Assemble a diaphragm and piston plates to one side of the drive shaft. Push this assembly through the center block and attach opposite diaphragm and piston assembly and tighten securely.
- ③ Place product chamber over diaphragm and against air chamber. Use a level to ensure that the chamber is perpendicular to the floor and then attach the product chamber clamp. Using a steel bar, pull the opposite diaphragm assembly through to the exposed air chamber. Do not place the bar directly on the diaphragm. Always place it on the inner piston. Fold diaphragm back until it is flush with the air chamber. Place the product chamber over the diaphragm and secure clamp.
- ④ Place valve ball, mushroom, or flapper and gasket into product chamber.
- ⑤ Place discharge manifold on product chamber without gaskets in place. Check for alignment. If the manifold is not flush, loosen clamps and align until they are flush. Install gaskets and secure chamber clamps.
- ⑥ Place valve ball, mushroom, or flapper and gasket into both sides of the suction manifold. Mount flush against the product chambers and secure clamps.
- ⑦ Make sure that all clamps have been properly tightened and then reconnect the air supply line to the pump. Run it dry for a moment to make sure that it shifts even

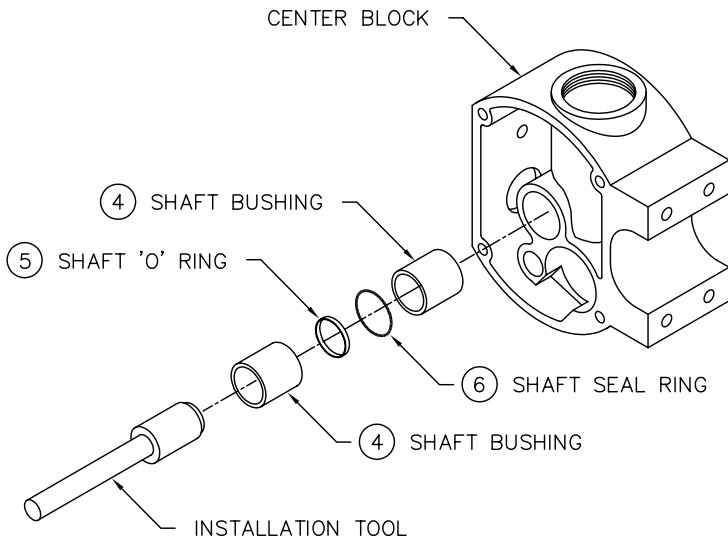
NOTE: Occasionally, over-tightening clamps during the re-assembly process can cause a misalignment in the chambers, housings, elbows, etc. If this should occur, loosen (do not remove) ALL clamps, then tighten each one up a little at the time. Never tighten one clamp all the way.

MURZAN P/N A-HP ASSEMBLY 'A' HIGH PRESSURE
 MURZAN P/N A-HT ASSEMBLY 'A' HIGH TEMPERATURE

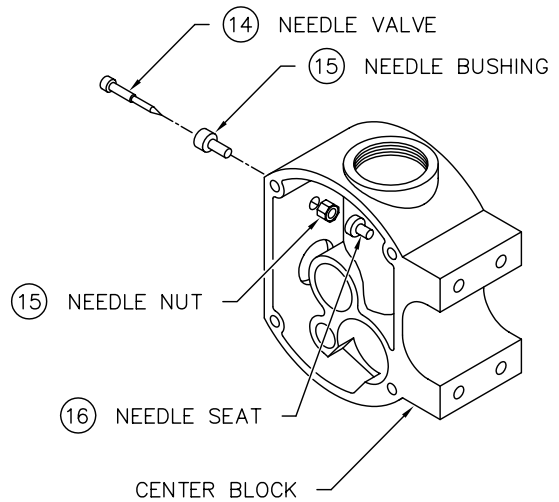


Assembly 'A'

CENTER BLOCK IS SHOWN FOR REFERENCE ONLY.



Assembly 'B'



Assembly 'C'

MURZAN Pump Assemblies A, B and C

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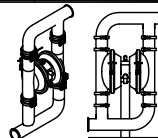
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 CHECKED BY: C. COBIAN
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 SCALE: NONE

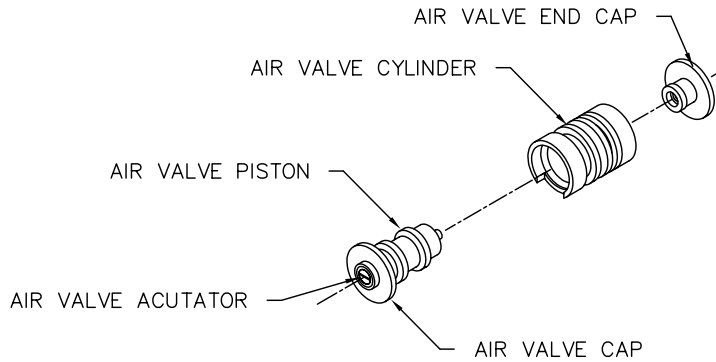
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 MURZAN PUMP ASSEMBLIES A, B, AND C

DRAWING NO. **PLO0005A**



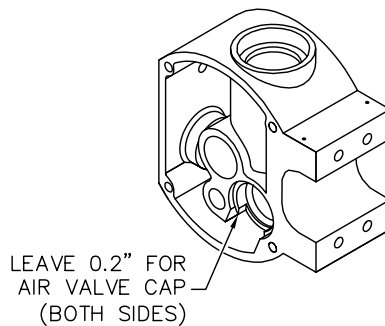
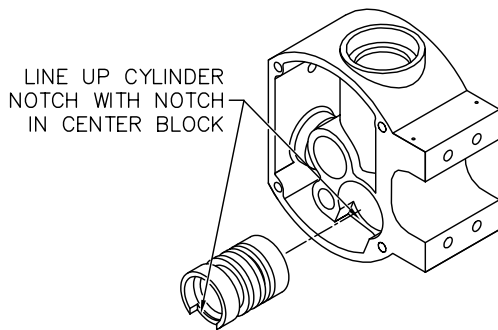
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Step 1, Dis-assemble Assembly "A"



INSERT TWO FLAT HEAD SCREW DRIVERS INTO AIR VALVE ACTUATOR SLOTS, TWIST COUNTERCLOCKWISE TO LOOSE THE AIR VALVE CAPS FOR DIS-ASSEMBLE

Step 2, Press Valve Cylinder into Centerblock

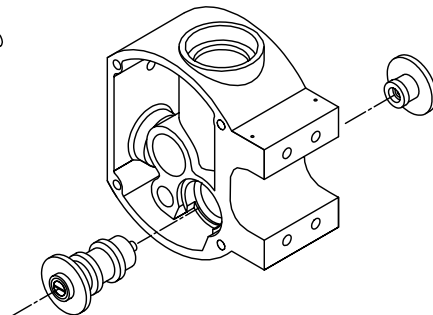
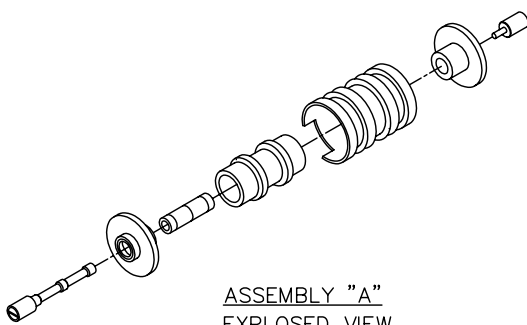


APPLY SOME FOOD GRADE LUBRICANT ON THE O-RINGS ON THE AIR VALVE CYLINDER

LINE UP AIR VALVE CYLINDER NOTCH WITH NOTCH IN CENTER BLOCK

PRESS THE AIR VALVE CYLINDER INTO CENTERBLOCK, LEAVE 0.2" ON EACH SIDE FOR AIR VALVE CAPS

Step 3, Re-assemble Air Valve



RE-ASSEMBLE THE AIR VALVES USE TWO FLAT HEAD SCREW DRIVERS TO TIGHTEN THE AIR VALVE ACTUATOR. MAKE SURE THAT THE AIR VALVE CAPS LINE UP WITH THE OUTER SURFACES OF THE CENTER BLOCK

Murzan Assembly "A" Installation

Page 1 of 1

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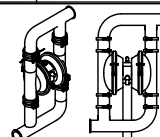
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3. PARTS OF THE ASSEMBLIES ARE NOT SOLD INDIVIDUALLY.

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CHECKED BY:	L. URIBE
DATE:	28MAR2000
SCALE:	NONE

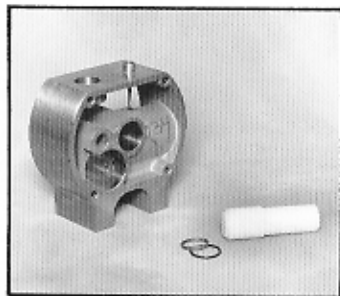
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DRAWING No.	PL00129-



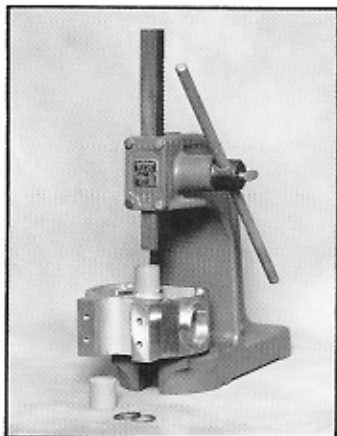
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MURZAN PUMP ASSEMBLY "B"

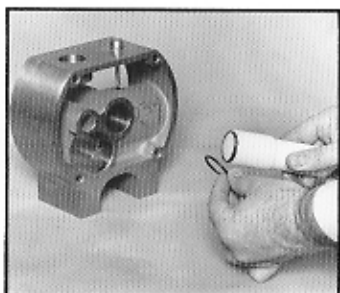
Shaft Bushing and Seal Reassembly Instructions



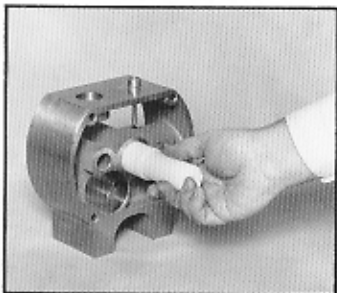
STEP 1 Clean centerblock shaft hole of any dirt, grease or metal burrs.



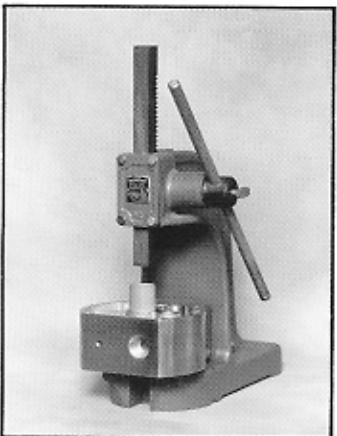
STEP 2 Press one of the shaft bushings into the centerblock so that it is flush with the face of the center block.



STEP 3 Place the shaft seal onto the step of the special shaft seal tool. Next place the "O" ring over the shaft seal ring. Lightly moisten the shaft hole in the centerblock, this allows the "O" ring to easily slide into the centerblock.



STEP 4 Using the special shaft seal tool slide the seal with the "O" ring into the centerblock. The seal and "O" ring must butt up against the bushing already in place. Do not push the bushing out. Slightly turn the special shaft seal tool while removing it from the centerblock.



STEP 5 Press the remaining bushing into the centerblock, flush with the centerblock face.

STEP 6 Push the shaft (#210) into the bushings. The shaft should slide freely in the bushings but have a tight sliding fit at the shaft seal.

Note: Make sure that the seal is on the inside of the "O" ring and against the bushing. If not remove both and repeat step 3.

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8.0 TROUBLESHOOTING

This section describes possible problems that could be encountered with your PI-50 Ball Check Pump, as well as a list of possible causes and/or solutions.

Product is slow to pump out of drum

(Also see “Pump will cycle, but has low flow rate”)

Increase lower air pressure for more down force

Increase or Decrease pump air volume regulation for proper pump speed

Pump will not cycle

Check for adequate air supply, pump pressure regulator and pump air volume settings.

Check Control Panel filter element and bowl

Pump may have “centered itself”, try using the Pump Restart Switch

Check for blocked product chamber, discharge lines or hoses

Check for torn diaphragm, worn air valve assembly, or warped outer piston

Pump stops during Operation

Check for torn or loose diaphragm assembly

Check for worn pump air valve assembly or shaft bushing assembly

Check for blockage in valves, product chamber, discharge lines or hoses

Pump does not restart after stopping (intermittent operation)

Check for adequate air supply and pump air pressure

Pump may have “centered itself”, try using the Pump Restart Switch

Excessive head pressure or blockage in the discharge line or hose

Check for worn pump air valve assembly or shaft bushing assembly

Pump cycles but has no product flow

Check for suction side air leak or blocked suction line

Check for blocked, stuck, or missing suction or discharge valves

Pump cycles but has low product flow

Check for adequate air supply and pump air pressure

Check for suction side air leak or partial blockage suction line

Check for blocked, stuck, or missing suction or discharge valves

Check for worn pump air valve assembly or shaft bushing assembly

Product comes out of air exhaust

Check for loose diaphragm assembly

Check for warped inner or outer pistons

The use of an invasive product (such as oil, alcohol, etc) run through the PI-50 without the use of a bolted diaphragm assembly.

9.0 SPARE PARTS & ASSEMBLIES

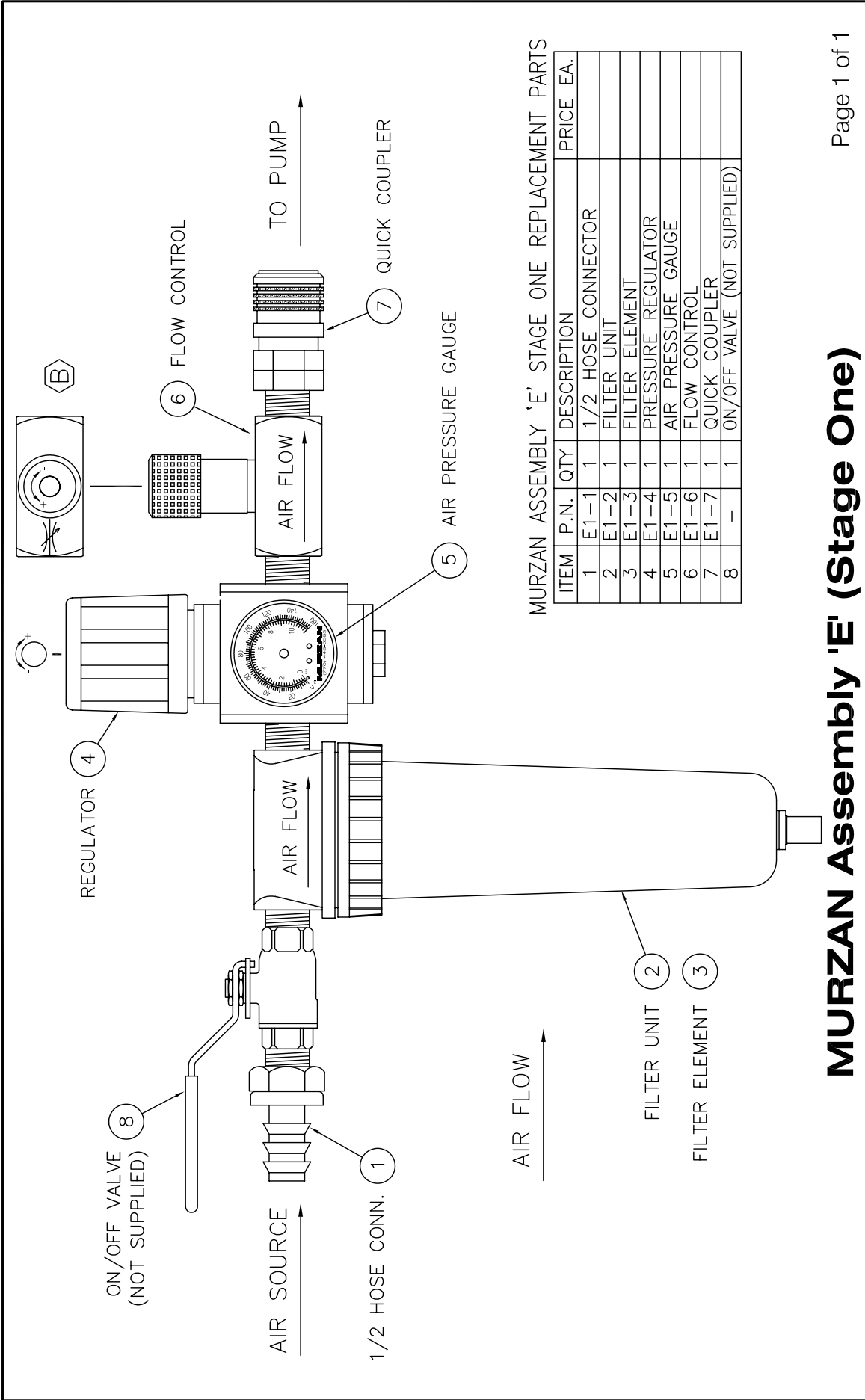
In many processing facilities requiring high product output, You may find it necessary to purchase a Spare Parts Kit, to alleviate any possible down time that could occur.

Many of our customers have ordered two (2) units, to ensure no total down time, in the event of equipment cleaning, maintenance, or due to component fatigue. However, this is not always a feasible choice. A spare parts kit will eliminate the need for ordering, shipping, receiving and paper work for those components that will eventually fail.

The Kits to follow contain those components that typically need replacing over years of continuous service. These may be purchased separately as well as in the Kit form.

Additional components can be ordered, if necessary, as shown in the “Pump Disassembly and Re-assembly Section” of the manual, as well as the “Spare parts replacement listing.

MURZAN INC		
BALL PUMP		
EXPLODED VIEW PARTS LIST		
ITEM #	DESCRIPTION	QTY
1	CENTER BLOCK	1
2	AIR INLET CAP	1
3	AIR FILTER	1
4	SHAFT BUSHING	2
5	SHAFT O RING	1
6	SHAFT SEAL RING	1
7	SHAFT	1
8	AIR VALVE ACTUATOR	1
9	AIR VALVE CAP	2
10	AIR VALVE PILOT CYLINDER	1
11	AIR VALVE PISTON	1
12	AIR VALVE CYLINDER	1
13	CYLINDER O RING	4
14	NEEDLE VALVE	1
15	NEEDLE BUSHING WITH NUT	1
16	NEEDLE SEAT	1
17	BLOCK GASKET R/L	2
18	AIR CHAMBER	2
19	AIR CHAMBER HARDWARE	1 SET
20	PISTON INNER WASHER	2
21	PISTON INNER	2
22	DIAPHRAGM	2
23	PISTON OUTER	2
24	LIQUID CHAMBER	2
25	MUFFLER	1
26	CLAMP LARGE	2
27	CLAMP BAND	10
28	MANIFOLD GASKETS	10
29B	BALL STOP	4
30B	BALL	4
31	MANIFOLD ELBOW	2
32	MANIFOLD TEE	2
36	BASE	1
37	BASE HARDWARE	1 SET
38B	BALL HOUSING	4
39	MUFFLER ELBOW	1
40	MUFFLER NIPPLE	1
41	AIR INLET NIPPLE	1
42	AIR INLET ELBOW	1
43	AIR INLET QUICK CONNECT	1



MURZAN ASSEMBLY 'E' STAGE ONE REPLACEMENT PARTS

ITEM	P.N.	QTY	DESCRIPTION	PRICE	EA.
1	E1-1	1	1/2 HOSE CONNECTOR		
2	E1-2	1	FILTER UNIT		
3	E1-3	1	FILTER ELEMENT		
4	E1-4	1	PRESSURE REGULATOR		
5	E1-5	1	AIR PRESSURE GAUGE		
6	E1-6	1	FLOW CONTROL		
7	E1-7	1	QUICK COUPLER		
8	-	1	ON/OFF VALVE (NOT SUPPLIED)		

MURZAN Assembly 'E' (Stage One)

PROPRIETARY INFORMATION
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DRAWN BY: G. DELCONTE
 CHECKED BY: T. DELOACH
 DATE: 28SEP98
 SCALE: NONE

CUSTOMER: MURZAN INCORPORATED

LOCATION: NORCROSS, GEORGIA 30071 U.S.A.

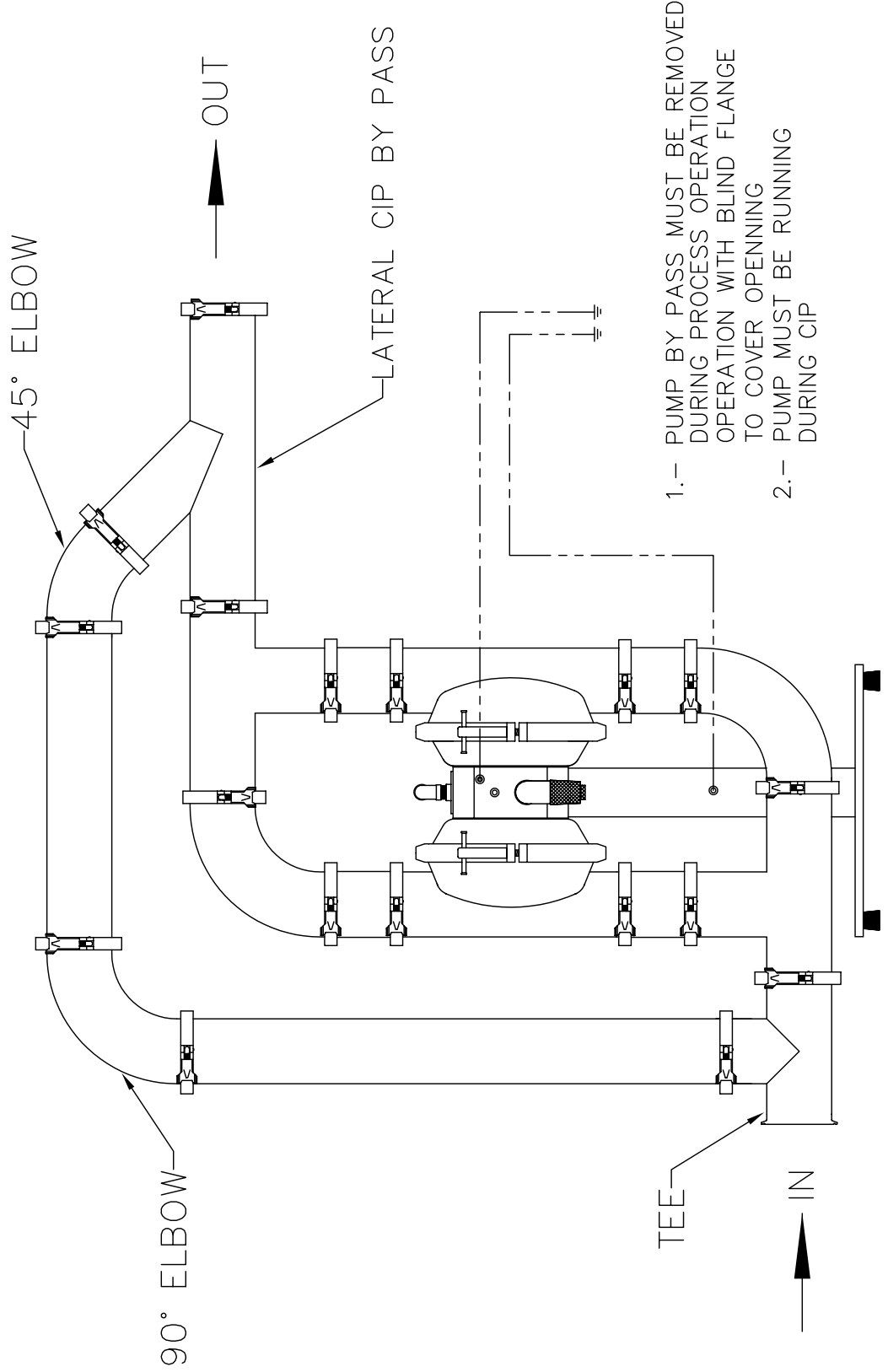
DESCRIPTION: MURZAN ASSEMBLY 'E' (STAGE ONE)

DRAWING NO. **PLO0049C**

NOTES:
 1. THIS DRAWING IS FOR REVIEW ONLY.

REV	DESCRIPTION	DATE	BY	APP
C	ADDED RECOMMENDED ON/OFF VALVE	07NOV99	JC	LU
B	CHANGED FLOW CONTROL	22OCT99	JC	LU
A	CLEARIFIED FLOW CONTROL DIRECTION	09FEB99	JC	TD

MURZAN INC.
 2909 LANGFORD RD. 1-700
 NORCROSS, GA. 30071 USA
 TEL: (770) 448-0583 FAX: (770) 448-0967



- 1.- PUMP BY PASS MUST BE REMOVED DURING PROCESS OPERATION
- OPERATION WITH BLIND FLANGE TO COVER OPENING
- 2.- PUMP MUST BE RUNNING DURING CIP

PUMP CIP BY-PASS SETUP

<p>PROPRIETARY INFORMATION</p> <p>THIS DOCUMENT IS THE PROPERTY OF MURZAN, INCORPORATED. THE INFORMATION CONTAINED HEREIN IS CONFIDENTIAL AND PRESENTED TO SAID CUSTOMER FOR REVIEW OR APPROVAL. UNDER NO CIRCUMSTANCES SHOULD THIS DOCUMENT BE REPRODUCED OR LOANED TO ANY THIRD PARTY WITHOUT THE WRITTEN PERMISSION OF MURZAN, INCORPORATED</p>	<p>ASSOCIATED DOCUMENTATION</p>	<p>NOTES:</p> <p>1.</p>														
<p>DRAWN BY: JUN CHEN</p> <p>CHECKED BY: LU</p> <p>DATE: 05JUNE99</p> <p>SCALE: NONE</p>	<p>CUSTOMER: MURZAN</p> <p>LOCATION: NORCROSS, GEORGIA U.S.A.</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;">REV</td> <td style="width: 40%;">NEW DRAWING</td> <td style="width: 10%;">DATE</td> <td style="width: 10%;">JUN</td> <td style="width: 10%;">BY</td> <td style="width: 10%;">LU</td> <td style="width: 10%;">APP</td> </tr> <tr> <td style="text-align: center;">-</td> <td></td> <td style="text-align: center;">05JUNE99</td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	REV	NEW DRAWING	DATE	JUN	BY	LU	APP	-		05JUNE99				
REV	NEW DRAWING	DATE	JUN	BY	LU	APP										
-		05JUNE99														
<p>DESCRIPTION: PUMP CIP BY-PASS SETUP</p> <p>DRAWING NO. MD000086-</p>		<p>MURZAN INC. 2909 LANGFORD RD. 1-700 NORCROSS, GA. 30071 USA TEL: (770) 448-0583 FAX: (770) 448-0967</p>														

TERMS OF PAYMENT

Terms of payment are as specified in the quotation. If terms of payment are not specifically stated to be otherwise, they are net thirty (30) days from the date of shipment.

PRICES

Prices are firm for thirty (30) days unless stated otherwise.

Prices do not include any Federal, State or local sales or use taxes or insurance which may apply to sale.

All prices are F.O.B. Norcross Georgia.

Typographical and stenographic errors are subject to correction.

DELIVERY

All shipping dates are tentative based on current equipment availability. Murzan, Inc. is not responsible for damages or losses due to delays for any cause.

CHANGES

Notice the changes in orders must be made and confirmed in writing.

INSPECTION OF EQUIPMENT

Upon arrival of the equipment at the customer's facilities, or at any other place at which the customer has ordered the equipment delivered in accordance with the order, the customer shall immediately inspect the equipment and shall give written notice to Murzan, Inc. within five days after arrival of the equipment of any claim that the equipment does not conform with the specifications or the terms of the order.

RETURNS

Orders accepted by the customer cannot be returned without prior written consent from an authorized individual of Murzan, Inc. and a Returned Goods Number, and will be subject to 25% Restocking Charge. Shipping charges on authorized returns are to be prepaid by the Customer unless otherwise specified.

CANCELLATIONS

In the event this quotation results in an order which is canceled or terminated by the customer, the customer agrees to pay to Murzan, Inc. an amount in cash equal to 20% of the total price of the order or contract, plus the actual cost of labor, materials, overhead and related direct costs and expenses incurred by Murzan, Inc. in connection with the order, it being impossible to ascertain or estimate the entire or exact cost, damage or injury which Murzan, Inc. may sustain by reasons of cancellation, and such sum is agreed to as reasonable compensation and not as a penalty.

LIMIT OF LIABILITY

Murzan, Inc. is not liable or responsible for any loss, damage, injury to person or property or any direct or consequential damage arising from sale, installation, or use of this equipment.

Murzan, Inc. shall not be held liable for any losses or damages to the customer resulting from the improper operation, care or cleaning of this equipment.

Murzan, Inc. is not liable for any damage to process or product due to failure of the equipment.

TITLE

In the event the customer fails to pay as agreed in the purchase contract, Murzan, Inc. shall have the right to immediate possession of the property and to enter upon the premises where the property may be located and remove same.

ASSIGNABILITY

The customer may not assign any of its rights or obligations under the order without the prior express written consent of Murzan, Inc.

WARRANTY

Murzan warrants to the original purchaser that equipment of Murzan manufacturing is free from defects in material and workmanship for a period of one (1) year from date of shipment.

Murzan guarantees to repair or replace F.O.B. Murzan, Inc., any such equipment found to be defective, provided written notice of the alleged defect is received within one year from date of shipment.

EXCLUDED FROM THE FOREGOING GUARANTEE ARE DAMAGES CAUSED BY ORDINARY WEAR AND TEAR, EROSION AND CORROSION, OR BY MISUSE, ABUSE OR IMPROPER HANDLING BY THE PURCHASER OR ANY THIRD PARTY.

MURZAN, INC. MAKES NO ADDITIONAL WARRANTIES, EXPRESSED OR IMPLIED, WHETHER OF MERCHANTABILITY, FITNESS FOR PURPOSE, OR OTHERWISE, OTHER THAN THAT STATED ABOVE. MURZAN, INC. SHALL NOT BE RESPONSIBLE FOR ANY INDIRECT SPECIAL OR CONSEQUENTIAL DAMAGES, NOR FOR ANY OTHER CLAIMS ARISING OUT OF THE SALE OR USE OF ITS EQUIPMENT, BEYOND THE REMEDY STATED ABOVE.

Equipment, parts or accessories manufactured by others carry the guarantee of the manufacturer only. Any warranties or claims which differ from the foregoing are unauthorized by Murzan, Inc. and become the warranty safety of the party making them, unless specifically authorized in writing by an officer of Murzan, Inc.

Should any provision of the foregoing be held ineffective, the remaining provisions shall continue in full force and effect.

EXCLUSIONS AND OPTIONS

Installation, rigging, mounting, erection, electrical and pneumatic installation, and startup are not included unless specifically stated otherwise in the quotation.

Supervisory assistance is available for installation, erection, or startup at current Murzan, Inc. rates, plus all travel and living expenses.

RISK OF LOSS

Murzan, Inc. shall not be liable for damages arising from its failure to make or delay in making delivery because of fire, flood, strikes, riots, embargoes on freight of any government, accidents, insurrections, lockouts, breakdown of machinery, loss or damage of goods in transit, Acts of God, or any other circumstances or unavoidable cause beyond the control of Murzan, Inc. In no case shall Murzan, Inc. be responsible for any liability, loss or damage after delivery of the equipment in good order and condition to the carrier or carriers at any point of shipment.

GENERAL

These terms and conditions of sale cannot be supplemented or altered by any language contained in any purchase order or other customer's document unless accepted in writing by Murzan, Inc.

The sale shall be governed by, constructed and interpreted in accordance with, the laws of the State of Georgia, USA, and the buyer hereby submits to the non-exclusive jurisdiction of the courts of Georgia., and waives any objection due to the lack of jurisdiction.