UltraMAX™
Maintenance & Repair Manual
Fluid Section Module

Model numbers:
UPLS-2300/UPLS-2300-SS
UPLS-2400/UPLS-2400-SS

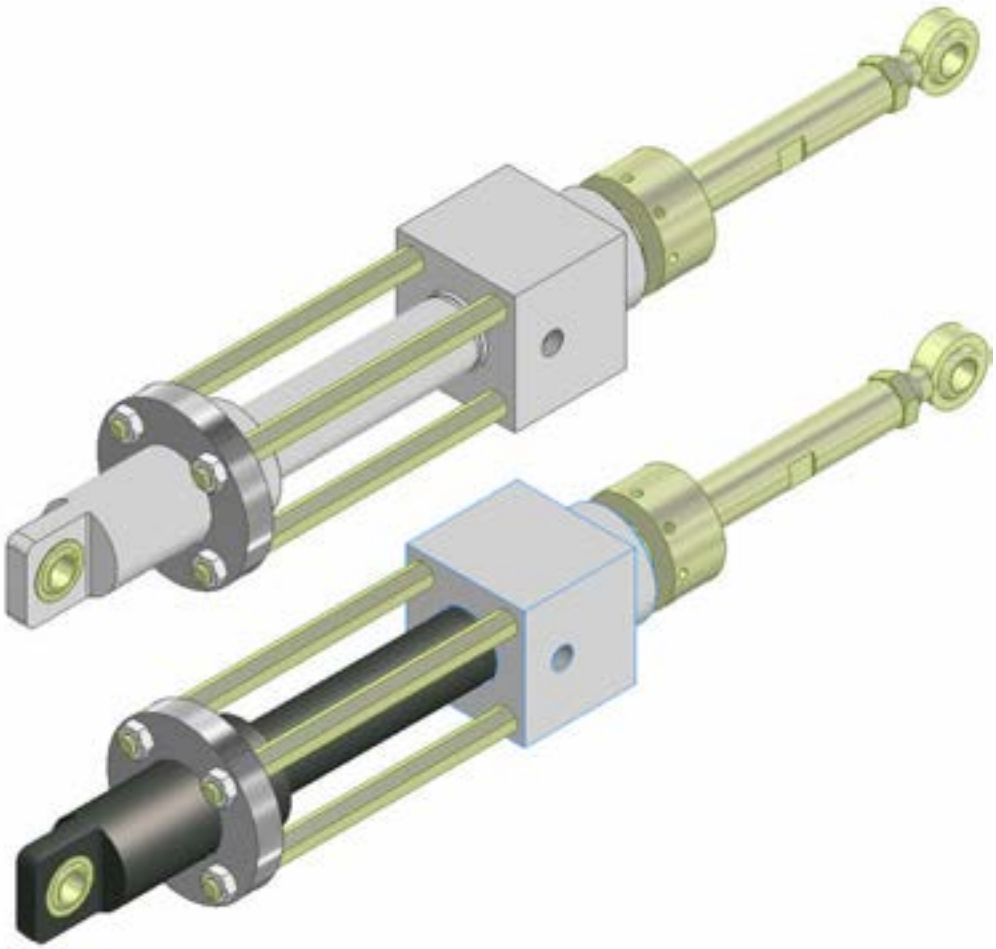


TABLE OF CONTENTS

CHAPTER 1-Safety and Warning Information

Operating Your Polyester System Safely

1. Introduction

Any tool, if used improperly, can be dangerous. Safety is ultimately the responsibility of those using the tool. In like manner, safe operation of polyester processes is the responsibility of those who use such processes and those who operate the equipment. This manual outlines procedures to be followed in conducting polyester operations safety. This system has been specifically designed for use of Polyester Resin, Gel-Coat, and Methyl Ethyl Ketone Peroxides (MEKP) applications. Other formulations or blends considered for use in this equipment is strictly prohibited without the expressed consent by Magnum Venus Plastech Inc. Magnum Venus Plastech cannot eliminate every danger nor foresee every circumstance that might cause an injury during equipment operation. Some risks, such as the high pressure liquid stream that exits the spray tip, are inherent to the nature of the machine operation and are necessary to the process in order to manufacture the end-product. For this reason, ALL personnel involved in polyester operations should read and understand the Safety Manual. It is very important for the safety of employees involved in the operation that equipment operators, maintenance and supervisory personnel understand the requirements for safe operation. Each user should examine his own operation, develop his own safety program and be assured that his equipment operators follow correct procedures. Magnum Venus Plastech hopes that this manual is helpful to the user and recommends that the precautions in this manual be included in any such program. Magnum Venus Plastech recommends this Safety Manual remain on your equipment at all times for your personnel safety. In addition to the manual, Magnum Venus Plastech recommends that the user consult the regulations established under the Occupational Safety & Health Act (OSHA), particularly the following sections:

1910.94 Pertaining to Ventilation.

1910.106 Pertaining to flammable liquids

1910.107 Pertaining to spray finishing operations, particularly Paragraph (m) Organic Peroxides and Dual Component Coatings.

Other standards and recognized authorities to consult are the National Fire Protection Association (NFPA) bulletins as follows:

NFPA No.33 Chapter 14, Organic Peroxides and Dual Component Materials

NFPA No.63 Dust Explosion Prevention

NFPA No.70 National Electrical Code

NFPA No.77 Static Electricity

NFPA No.91 Blower and Exhaust System

NFPA No.654 Plastics Industry Dust Hazards

Type of Fire Extinguishing equipment recommended: Fire Extinguisher – code ABC, rating number 4a60bc.

Extinguishing Media – Foam, Carbon Dioxide, Dry Chemical, Water Fog.

Copies of the above bulletins are available, at a nominal charge from:

National Fire Protection Association
470 Atlantic Avenue
Boston, MA 02210

Research Report No.11 of the American Insurance Association deal with “Fire, Explosion and Health Hazards of Organic Peroxides”. It is published by:

American Insurance Association
85 John Street
New York, NY 10038

Local codes and authorities also have standards to be followed in the operation of your spraying equipment. Your insurance carrier will be helpful in answering questions that arise in your development of safe procedures.

1.2 Personal Safety Equipment

Magnum Venus Plastech recommends the following Personal Safety Equipment for conducting safe operations of the Polyester Systems:

Magnum Venus Plastech recommends that the user consult the state and local regulations established for all Safety equipment listed.

2.0 Material Safety

2.1 Hazards Associated with Laminating Operations

The major hazards which should be guarded against in polyester laminating operations are those associated with:

1. The flammability and explosion dangers of the catalyst normally used – Methyl Ethyl Ketone Peroxide (MEKP).

2. The flammability dangers of clean-up solvents sometimes used (Magnum Venus Plastech recommends that clean-up solvents be non-flammable), and of resin diluents used, such as styrene.

3. The flammability dangers of catalyst diluents, if used. (Magnum Venus Plastech recommends that catalyst not be diluted.

4. The flammability dangers of the uncured liquid resins used.

5. The combustibility dangers of the cured laminate, accumulations of over spray, and laminate sandings.

6. The toxicity dangers of all the chemicals used in laminating operations with respect to ingestion, inhalation and skin and eye hazards.

2.2 Catalyst (Methyl Ethyl Ketone Peroxide)

MEKP is among the more hazardous materials found in commercial channels. The safe handling of the "unstable (reactive)" chemicals presents a definite challenge to the plastics industry. The highly reactive property which makes MEKP valuable to the plastics industry in producing the curing reaction of polyester resins also produces the hazards which require great care and caution in its storage, transportation, handling, processing and disposal. MEKP is a single chemical. Various polymeric forms may exist which are more or less hazardous with respect to each other. These differences may arise not only from different molecular structures (all are, nevertheless, called "MEKP") and from possible trace impurities left from the manufacture of the chemicals, but may also arise by contamination of MEKP with other materials in its storage or use. Even a small amount of contamination with acetone, for instance, may produce an extremely shock-sensitive and explosive compound.

Contamination with promoters or materials containing promoters, such as lamin sandings, or with any readily oxidizing material, such as brass or iron, will cause exothermic "redox" reactions which can become explosive in nature. Heat applied to MEKP, or heat build-up from contamination reactions can cause it to reach what is called its Self-Accelerating Decomposition Temperature (SADT).

Researchers have reported measuring pressure rates-of-rise well in excess of 100,000 psi per second when certain MEKP's reach their SADT. (For comparison, the highest pressure rate-of-rise listed in NFPA Bulletin NO.68, "Explosion Venting", is 12,000 psi per second for an explosion of 12% acetylene and air. The maximum value listed for a hydrogen explosion is 10,000 psi per second. Some forms of MEKP, if allowed to reach their SADT, will burst even an open topped container. This suggests that it is not possible to design a relief valve to vent this order of magnitude of pressure rate-of-rise. The user should be aware that any closed container, be it a pressure vessel, surge chamber, or pressure accumulator, could explode under certain conditions. There is no engineering substitute for care by the user in handling organic peroxide catalysts. If, at any time, the pressure relieve valve on top of the catalyst tank should vent, the area should be evacuated at once and the fire department called. The venting could be the first indication of a heat, and therefore, pressure build-up that could eventually lead to an explosion. Moreover, if a catalyst tank is sufficiently full when the pressure relief valve vents, some catalyst may spray out, which could cause eye injury. For this reason, and many others, anyone whose job puts them in an area where this vented spray might go, should always wear full eye protection even when laminating operations are not taking place.

Safety in handling MEKP depends to a great extent on employee education, proper safety instructions and safe use of the chemicals and equipment. Workers should be thoroughly informed of the hazards that may result form improper handling of MEKP, especially in regards to contamination, heat, friction and impact. They should be thoroughly instructed regarding the proper action to be taken in the storage, use and disposal of MEKP and other hazardous materials used in the laminating operation. In addition, users should make every effort to:

A. Store MEKP in a cool, dry place in original containers away from direct sunlight and away from other chemicals.

B. Keep MEKP away from heat, sparks and open flames.

C. Prevent contamination of MEKP with other materials, including polyester over spray and sandings, polymerization accelerators and promoters, brass, aluminum and non-stainless steels.

D. Never add MEKP to anything that is hot, since explosive decomposition may result.

E. Avoid contact with skin, eyes and clothing. Protective equipment should be worn at all times. During clean-up of spilled MEKP, personal safety equipment, gloves and eye protection must be worn. Fire fighting equipment should be at hand and ready.

F. Avoid spillage, which can heat up to the point of self-ignition.

G. Repair any leaks discovered in the catalyst system immediately, and clean up the leaked catalyst at once in accordance with the catalyst manufacturer's instructions.

H. Use only original equipment or equivalent parts from Magnum Venus Plastech in the catalyst system (i.e.: hoses, fitting, etc.) because a dangerous chemical reaction may result between substituted parts and MEKP.

I. Catalyst accumulated from the purging of hoses or the measurement of fluid output deliveries should never be returned to the supply tank, such catalyst should be diluted with copious quantities of clean water and disposed of in accordance with the catalyst manufacturer's instructions.

The extent to which the user is successful in accomplishing these ends and any additional recommendations by the catalyst manufacturer determines largely the safety that will be present in his operation.

2.3 Clean-Up Solvents and Resin Diluents

WARNING

A hazardous situation may be present in your pressurized fluid system! Hydrocarbon Solvents can cause an explosion when used with aluminum or galvanized components in a closed (pressurized) fluid system (pump, heaters, filters, valves, spray guns, tanks, etc.). The explosion could cause serious injury, death and/or substantial property damage. Cleaning agents, coatings, paints, etc. may contain Halogenated Hydrocarbon Solvents. Some Magnum Venus Plastech spray equipment includes aluminum or galvanized components and will be affected by Halogenated Hydrocarbon Solvents.

A. There are three key elements to the Halogenated Hydrocarbon (HHC) solvent hazard.

a. The presence of HHC solvents. 1,1,1 – Trichloroethane and Methylene Chloride are the most common of these solvents. However, other HHC solvents are suspect if used; either as part of paint or adhesives formulation, or for clean-up flushing.
b. Aluminum or Galvanized Parts. Most handling equipment contains these elements. In contact with these metals, HHC solvents could generate a corrosive reaction of a catalytic nature.

b. Equipment capable of withstanding pressure. When HHC solvent contact aluminum or galvanized parts inside a closed container such as a pump, spray gun, or fluid handling system, the chemical reaction can, over time, result in a build-up of heat and pressure, which can reach explosive proportions.

When all three elements are present, the result can be an extremely violent explosion. The reaction can be sustained with very little aluminum or galvanized metal; any amount of aluminum is too much.

A. The reaction is unpredictable. Prior use of an HHC solvent without incident (corrosion or explosion) does NOT mean that such use is safe. These solvents can be dangerous alone (as a clean-up or flushing agent) or when used as a component or a coating material. There is no known inhibitor that is effective under all circumstances. Furthermore, the mixing of HHC solvents with other materials or solvents, such as MEKP, alcohol, and toluene, may render the inhibitors ineffective.

B. The use of reclaimed solvents is particularly hazardous. Reclaimers may not add any inhibitors. Also, the possible presence of water in reclaimed solvents could feed the reaction.

C. Anodized or other oxide coatings cannot be relied upon to prevent the explosive reaction. Such coatings can be worn, cracked, scratched, or too thin to prevent contact. There is no known way to make oxide coatings or to employ aluminum alloys, which will safely prevent the chemical reaction under all circumstances.

D. Several solvent suppliers have recently begun promoting HHC solvents for use in coating systems. The increasing use of HHC solvents is increasing the risk. Because of their exemption from many State Implementation Plans as Volatile Organic Compounds

(VOC's), their low flammability hazard, and their not being classified as toxic or carcinogenic substances, HHC solvents are very desirable in many respects.

WARNING: **Do not use Halogenated Hydrocarbon solvents in pressurized fluid systems having aluminum or galvanized wetted parts.**

NOTE: **Magnum Venus Plastech is aware of NO stabilizers available to prevent Halogenated Hydrocarbon solvents from reaction under all conditions with aluminum components in closed fluid system.** ***TAKE IMMEDIATE ACTION…*** **Halogenated Hydrocarbon solvents are dangerous when used with aluminum components in a closed fluid system.**

A. Consult your material supplier to determine whether your solvent or coating contains Halogenated Hydrocarbon Solvents.

B. Magnum Venus Plastech recommends that you contact your solvent supplier regarding the best non-flammable clean-up solvent with the heat toxicity for your application.

C. If, however, you find it necessary to use flammable solvents, they must be kept in approved, electrically grounded containers.

D. Bulk solvent should be stored in a well-ventilated, separate building, 50 feet away from your main plant.

E. You should allow only enough solvent for one day's use in your laminating area.

F. "NO SMOKING" signs must be posted and observed in all areas of storage or where solvents and other flammable materials are used.

G. Adequate ventilation (as covered in OSHA Section 1910.94 and NFPA No.91) is important wherever solvents are stored or used, to minimize, confine and exhaust the solvent vapors.

H. Solvents should be handled in accordance with OSHA Section 1910.106 and 1910.107.

2.4 Catalyst Diluents

Magnum Venus Plastech spray-up and gel-coat systems currently produced are designed so that catalyst diluents are not required. Magnum Venus Plastech, therefore, recommends that diluents not be used. This avoids the possible contamination which could lead to an explosion due to the handling and mixing of MEKP and dilettante. In addition, it eliminates any problems from the dilettante being contaminated through rust particles in drums, poor quality control on the part of the diluents suppliers, or any other reason. If, however, diluents are absolutely required, contact your catalyst supplier and follow his instructions explicitly. Preferable, the supplier should premix the catalyst to prevent possible "on the job" contamination while mixing.

WARNING

If diluents are not used, it should be remembered that catalyst spillage, gun, hose and packing leaks are potentially more hazardous, since each drop contains a higher concentration of catalyst, and therefore will react quicker with over spray and the leak.

2.5 Cured Laminate, Overspray and Laminate Sandings Accumulation

A. Remove all accumulations of overspray, FRP sandings, etc. from the building as they occur. If this waste is allowed to build up, spillage of catalyst is more likely to start a fire, in addition, the fire would burn hotter and longer.

B. Floor coverings, if used, should be non-combustible.

C. Spilled or leaked catalyst may cause a fire if it comes in contact with an FRP product, over-sprayed chop or resin, FRP sandings or any other material with MEKP.

To prevent this spillage and leakage, you should:

1. Maintain your Magnum Venus Plastech System. Check the gun several times daily for catalyst and resin packing or valve leaks. REPAIR ALL LEAKS IMMEDIATELY.

2. Never leave the gun hanging over, or lying inside the mold. A catalyst leak in this situation would certainly damage the part, possibly the mold, and may cause a fire.

3. Inspect resin and catalyst hoses daily for wear or stress at the entry and exits of the boom sections and at the hose and fittings. Replace if wear or weakness is evident or suspected.

4. Arrange the hoses and fiberglass roving guides so that the fiberglass strands DO NOT rub against any of the hoses at any point. If allowed to rub, the hose will be cut through, causing a hazardous leakage of material which could increase the danger of fire. Also, the material may spew onto personnel in the area.

2.7 Toxicity of Chemicals

A. Magnum Venus Plastech recommends that you consult OSHA Sections 1910.94, 1910.106, 1910.107 and NFPA No.33, Chapter 14, and NFPA No.91.

B. Contact your chemical supplier(s) and determine the toxicity of the various chemicals used as well as the best methods to prevent injury, irritation and danger to personnel.

C. Also determine the best methods of first aid treatment for each chemical used in your plant.

2.8 Treatment of Chemical Injuries

Great care should be used in handling the chemicals (resins, catalyst and solvents) used in polyester systems. Such chemicals should be treated as if they hurt your skin and eyes and as if they are poison to your body. For this reason, Magnum Venus Plastech recommends the use of protective clothing and eye wear in using polyester systems. However, users should be prepared in the event of such an injury. Precautions include:

1. Know precisely what chemicals you are using and obtain information from your chemical supplier on what to do in the event the chemical gets onto your skin or into the eyes, or is swallowed.

2. Keep this information together and easily available so that it may be used by those administering first aid or treating the injured person.

3. Be sure the information from your chemical supplier includes instructions on how to treat any toxic effects the chemicals have.

WARNING

Contact your doctor immediately in the event of any injury and give him the information you have collected. If your information includes first aid instructions, administer first aid immediately while you are contacting your doctor.

Fast treatment of the outer skin and eyes that contact such chemicals generally includes immediate and thorough washing of the exposed skin and immediate and continuous flushing of the eyes with lots of clean water for at least 15 minutes or more. These general instructions of first aid treatment, however, may be incorrect for some chemicals; that is why you must know the chemicals and treatment before an accident occurs. Treatment for swallowing a chemical frequently depends upon the nature of the chemical.

NOTE: **Refer to your System User Manual for complete and detailed operating instructions and service information.**

3.0 Equipment Safety

WARNING

Magnum Venus Plastech suggest that personal safety equipment such as EYE GOGGLES, GLOVES, EAR PROTECTION, and RESPIRATORS be worn when servicing or operating this equipment. Ear protection should be worn when operating a fiberglass chopper to protect against hearing loss since noise levels can be as high as 116 dB (decibels). This equipment should only be operated or serviced by technically trained personnel!

WARNING

Never place fingers, hands, or any body part near or directly in front of the spray gun fluid tip. The force of the liquid as it exits the spray tip can cause serious injury by shooting liquid through the skin. NEVER LOOK DIRECTLY INTO THE GUN SPRAY TIP OR POINT THE GUN AT OR NEAR ANOTHER PERSON. (TREAT THE GUN AS IF IT WERE A LOADED PISTOL.)

3.1 Emergency Stop Procedures

The following steps should be followed in order to stop the machinery in an emergency situation

1. The ball valve located where the air enters the power head of the resin pump, should be moved to the “OFF” or closed position. To do this, simply rotate the lever on the ball valve 90 degrees. Doing this will cause all the system air to bleed out of the system in a matter of a few seconds, making the system incapable of operating

NOTE: Step 2 is a precautionary step and should be followed whenever the above mentioned ball valve is activated to the stop mode. Failure to do so, can damage the regulators and components on reactivating to the “ON” position.

2. Turn all system regulators to the “OFF” position (counter-clockwise) position

NOTE: Verify that the Catalyst relief line, located on the catalyst manifold, and the resin return line, located on the resin filter, are secured relieving catalyst and resin fluid pressure.

3. Catalyst pressure in the catalyst pump can be eliminated by rotating the ball valve on the catalyst manifold 90 degrees to the “open” or “on” position.

Note: The “open” or “on” position is when the ball valve handle is parallel (in line) with the ball valve body. The “closed” or “off” position is when the ball valve handle is perpendicular (across) the ball valve body.

4. Resin pressure in the resin pump can be eliminated by rotating the ball valve on the resin filter 90 degrees to the “open” or “on” position. Place a container under the ball valve to catch any resin that is ejected out of the valve.

3.2 Grounding

Grounding an object means providing an adequate path for the flow of the electrical charge from the object to the ground. An adequate path is one that permits charge to flow from the object fast enough that it will not accumulate to the extent that a spark can be formed. It is not possible to define exactly what will be an adequate path under all conditions since it depends on many variables. In any event, the grounding means should have the lowest possible electrical resistance. Grounding straps should be installed on all loose conductive objects in the spraying area. This includes material containers and equipment. Magnum Venus Plastech recommends grounding straps be made of AWG No.18 stranded wire as a minimum and the larger wire be used where possible. NFPA Bulletin No77 states that the electrical resistance of such a leakage path may be as low as 1 meg ohm (10 ohms) but that resistance as high as 10,000 meg ohms will produce an adequate leakage path in some cases. Whenever flammable or combustible liquids are transferred from one container to another, or from one container to the equipment, both containers or container and equipment shall be effectively bonded and grounded to dssipate static electricity. For further information, see **National Fire Protection Association** (NFPA) 77, titled "Recommended Practice on Static Electrical". Refer especially to section 7-7 titled "Spray Application of Flammable and Combustible Materials". Check with local codes and authorities for other specific standards that might apply to your application. NEVER USE HARD MATERIALS SUCH AS WIRE, PINS, ETC., TO CLEAR A PLUGGED GUN. HARD MATERIALS CAN CAUSE PERMANENT DAMAGE. DAB WITH A BRISTLE BRUSH, BLOW BACKWARDS WITH AIR UNTIL CLEAR WHILE WEARING A PROTECTIVE EYE SHIELD. REPEAT AS MANY TIMES AS NECESSARY. DO NOT PERFORM ANY MAINTENANCE OR REPAIRS UNTIL YOU HAVE FOLLOWED THE PRECAUTIONS STATED ABOVE. IF YOU, AS AN EQUIPMENT OPERATOR OR SUPERVISOR, DO NOT FEEL THAT YOU HAVE BEEN ADEQUATELY TRAINED OR INSTRUCTED AND THAT YOU LACK THE TECHNICAL KNOWLEDGE TO OPERATE OR PERFORM MAINTENANCE ON A PIECE OF MAGNUM VENUS PLASTECH EQUIPMENT, PLEASE CALL MAGNUM VENUS PLASTECH BEFORE OPERATING OR PERFORMING MAINTENANCE ON THE EQUIPMENT. IF YOU HAVE ANY QUESTIONS REGARDING THE ABOVE PRECAUTIONS OR ANY SERVICE OR OPERATION PRECEDURES, CALL YOUR MAGNUM VENUS PLASTECH DISTRIBUTOR OR MAGNUM VENUS PLASTECH.

NOTICE: All statements, information and data given herein are believed to be accurate and reliable but are presented without guaranty, warranty or responsibility of any kind express or implied. The user should not assume that all safety measures are indicated or that other measures are not required.

DANGER: Contaminated catalyst may cause Fire or Explosion. Before working on the catalyst pump or catalyst accumulator, wash hands and tools thoroughly. Be sure work area is free of dirt, grease or resin. Clean catalyst system components with clean water only.

DANGER: Eye, skin and respiration hazard. The Catalyst, MEKP, may cause blindness, skin irritation or breathing difficulty. Keep hands away from face. Keep food and drink away from work area.

WARNING: Please refer to your catalyst manufacturer's safety information regarding the safe handling and storage of catalyst. Wear appropriate safety equipment as recommended.

CHAPTER 2-Getting Started

The MVP UPLS-2300/2400 Fluid sections are used in multiple configurations. This manual only covers the disassembly/assembly of the fluid section itself. Generic references are used when referring to other components that may be connected to the fluid section. Please refer to the specific unit manual for these.

As you disassemble the equipment, lay out the components in the correct order and direction, and have all current component drawings available to refer to prior to disassembly. This will help in the reassembly.

Please contact your local MVP Distributor or download the current drawings at

WWW.MVPIND.COM

ITEMS AND TOOLS NEEDED

.

- ¼" wooden dowel-6"
- 12" adjustable wrench
- Set of open end wrenches
- Pliers
- Wire brush
- Table mounted, soft jawed vice.
- Approved lubricant and grease for material being used.
- Semi Permanent Loctite (Blue) or equivalent liquid thread lock.
- Fluid Section Repair Kit *(Please reference drawing sets that were included with the unit for part numbers.)*
    - ***Note:*** *The* **–SK** *(Seal Kit) only comes with seals and o-rings. The* **–RK** *(Repair Kit) comes with seals, o-rings, balls and springs.*
    - ***Note:*** *The Kalrez o-rings that are used on the UPLS-2300-SS Fluid Section are not included in any repair/seal kit and must be ordered separately.*

WARNING!!

Due to high pressures and temperatures that are associated with some materials please refer to **CHAPTER 7-System Start Up**, before running a new or rebuilt fluid section.

CHAPTER 3-Disassembly

REMOVAL OF THE FLUID SECTION

- ***Caution***: *When removing Resin Pump Fluid Section and Resin Surge Chamber, be sure to release fluid pressure from the system before disconnecting hoses or tie rods. Release Surge Chamber charge before removing Surge Chamber. System may be under pressure and could cause injury*.

- Remove Pickup Wands from drums and drain or, shut off supply to Fluid Sections.
- At this point it is advisable to switch the supply lines to approved solvent to flush the system if possible.
- Set operating pressure at 0 psi.
- Open recirculation valve and/or gun to purge pressure from fluid sections. Let drain until as much fluid as possible had been purged.
- Turn air pressure to a very low setting, just enough to cycle the Fluid Sections.
- Cycle the Fluid Sections a few times very slowly to remove as much material from the cylinder(s) as possible or if flushing with solvent, until solvent is being purged out.
- Remove Pickup Wand assembly/feed hoses from bottom of Fluid Section.
- Remove Surge Chamber/Filter Assembly from bottom of Fluid Section.
- Remove the upper pin from the slave arm.
- Remove the lower pin from the base mount.

You can now remove the Fluid Section from the Proportioner unit and take it to a work area for maintenance.

FLUID SECTION DISASSEMBLY PROCEDURE

Using a table mounted vise, clamp the Outlet Body between the jaws as illustrated (Fig. 3.0)

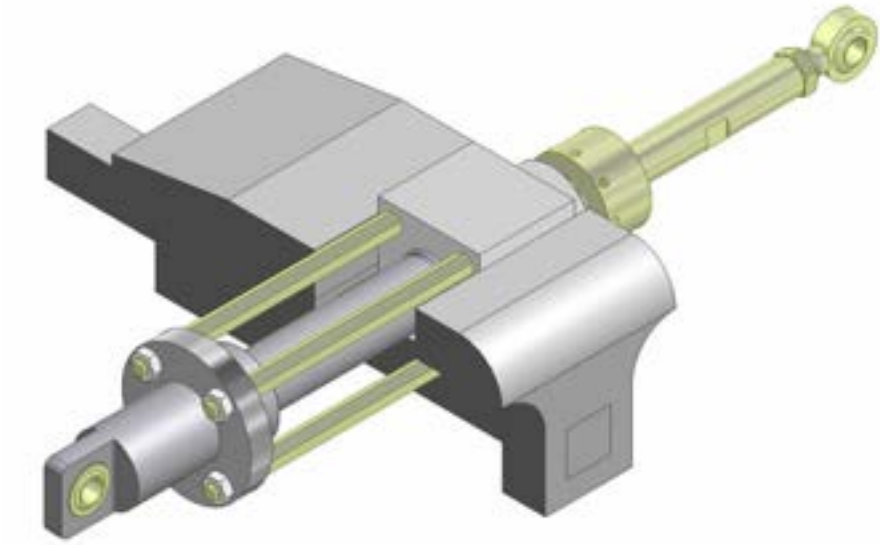


FIG 3.0

Remove the Rod Adapter, leaving the Hex Nut, and the Ball Joint Rod End in place. (FIG 3.1)

- ***Caution***: *If the Hex Nut, and the Ball Joint Rod End have to be removed, carefully measure the distance from the end of the Ball Joint Rod End to the top of the Rod Adapter to insure that it is installed back in the same position. If this is not put back to factory specifications(2 threads showing), damage to the Chrome Ball, Foot Valve Spring and the Ball Stop can result. (FIG 3.11)*

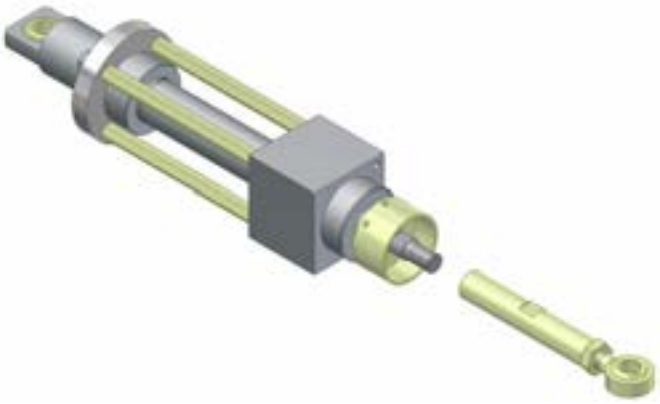


FIG. 3.10

FIG. 3.11

Remove the 4 Hex Nuts, Foot Valve Collar and Foot Valve from the bottom of the Fluid Section. Note the orientation of the Foot Valve inlet relative to the Outlet Body for assembly purposes. (FIG 3.2)

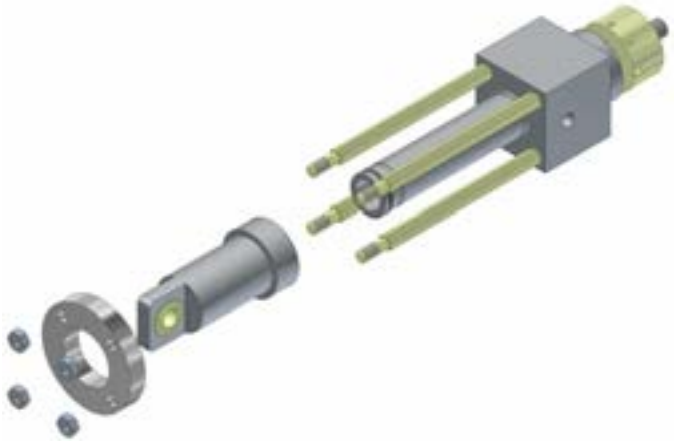


FIG 3.20

Remove the Cylinder and remove the two O-rings and discard. (FIG 3.21)

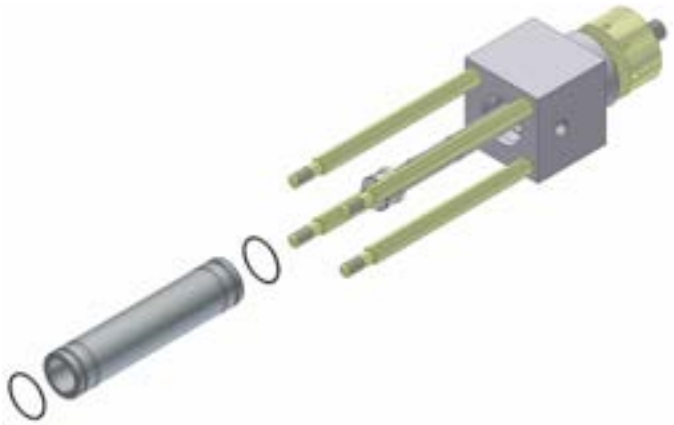


FIG 3.21

Remove the 4 Cylinder Tie Rods from the Outlet Body. (FIG 3.22)

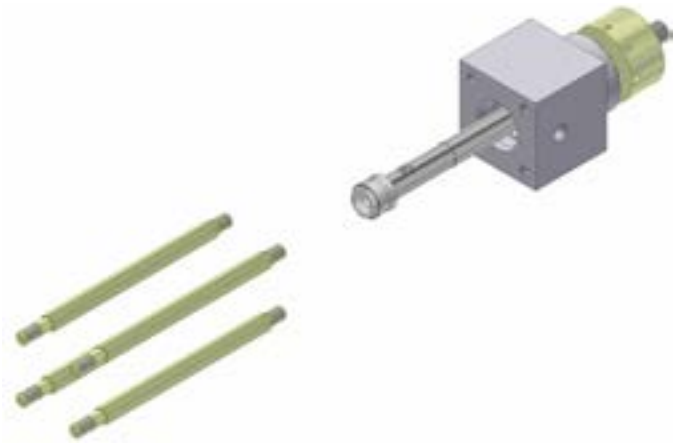


FIG 3.22

Remove the Packing Nut from the Outlet Body. (FIG 3.23)

FIG 3.23

Remove the Piston Rod Assembly from the Outlet Body. (FIG 3.24)

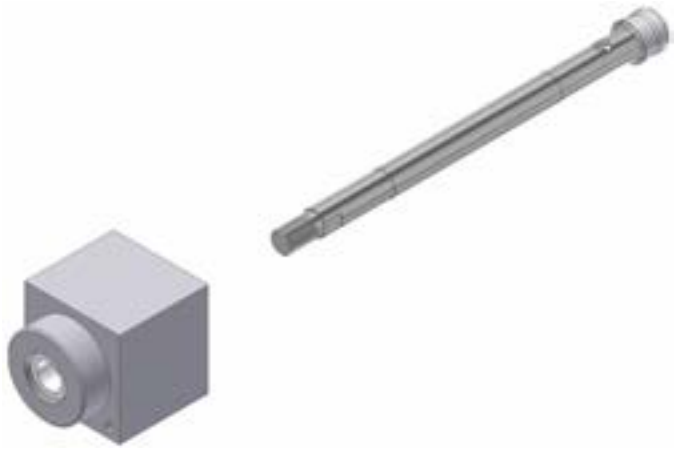


FIG 3.24

Using the 1/4" Wooden Dowel, push the Wave Springs, Male Compression Ring, Piston Rod Packing Set, Female Compression Ring and the Guide Bushing, through the top of the Outlet Body. (FIG 3.25)

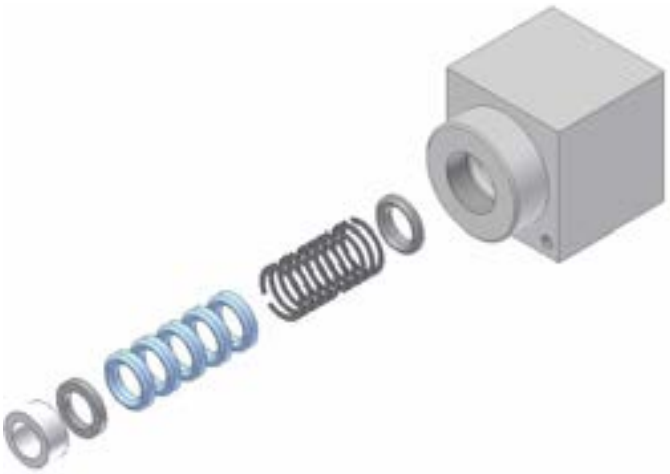


FIG 3.25

PISTON ROD DISASSEMBLY

PISTON ROD DISASSEMBLY UPLS-2300-SS ONLY

The UPLS-2300-SS Piston Body has an additional O-ring seal near the ball seat. During disassembly of the Piston Rod Assembly, ***DO NOT REMOVE THIS O-RING!*** The O-ring is not in the **–SK** or **–RK** kits and must be ordered separately.

Wipe down the Piston Body with the approved solvent and inspect the O-ring. Under normal conditions this O-ring will not have to be replaced. If the O-ring is nicked, torn or broken, it must be replaced. (FIG 3.80)

FIG 3.80

PISTON ROD DISASSEMBLY (Barrel Type Piston Seal)

Using the appropriate wrenches, remove the Piston Body from the Piston Rod. (FIG 3.81)

- ***Caution***: *When you remove the Piston Body the Chrome ball may fall out. If only using the* ***-SK*** *Seal Kit, the Chrome Ball must be reused. Do not drop or dent this ball as it will be permanently damaged and must be replaced*

Remove the Piston Body, Barrel Seal, Chrome Ball and Piston Ball Spring. (FIG 3.81)

FIG 3.81

Remove the Barrel Seal from the Piston Body. (FIG 3.82)

FIG 3.82

PISTON ROD DISASSEMBLY (Cup Style Type Piston Seal)

Using the appropriate wrenches, remove the Piston Body from the Piston Rod. (FIG 3.85)

- ***Caution***: *When you remove the Piston Body the Chrome ball may fall out. If only using the* ***-SK*** *Seal Kit, the Chrome Ball must be reused. Do not drop or dent this ball as it will be permanently damaged and must be replaced*

Remove the Piston Body, Cup Seal assembly, Chrome Ball and Piston Ball Spring. (FIG 3.85)

FIG 3.85

Remove the Piston Cup Compression Ring, Upper Piston Cup, Piston Cup Spacer, Lower Piston Cup and Piston Cup Backup Ring from the Piston Body. (FIG 3.86)

FIG 3.86

FOOT VALVE DISASSMBLY

FOOT VALVE DISASSEMBLY UPLS-2300-SS ONLY

The Stainless Steel Foot Valve has an additional O-ring seal near the ball seat. During disassembly of the Foot Valve Assembly, ***DO NOT REMOVE THIS O-RING!*** The O-ring is not in the **–SK** or **–RK** kits and must be ordered separately.

Wipe down the Foot Valve Body with the approved solvent and inspect the O-ring. Under normal conditions this O-ring will not have to be replaced. If the O-ring is nicked, torn or broken, it must be replaced. (FIG 3.90)

FIG 3.90

Using pliers, compress the Ball Stop and remove from the Foot Valve. Remove the Foot Valve Spring and the Chrome Ball.

- ***Caution***: *If only using the* ***-SK*** *Seal Kit, the Chrome Ball must be reused. Do not drop or dent this ball as it will be permanently damaged and must be replaced.* (FIG 3.91)

FIG 3.91

CHAPTER 4-Cleaning and Inspection

PARTS CLEANING

Determine which parts are going to be reused and then discard the rest.

All parts can be cleaned in most solvents, when cleaning the Guide Bushing, it is advisable not to let the part soak in Acetone for any length of time.

Using a wire brush, thoroughly clean all threads and remove residue from all components.

- ***Caution:*** *When cleaning the Foot Valve and Piston Body do not damage the Kalrez o-ring that is on the ball seat.*

O-RING SEAT -SS OPTION

In the case of the –SS (Stainless Steel) version of the fluid section, inspect the Kalrez O-ring that is seated in the Foot Valve and the Piston Body. If possible do not remove, doing so may damage the O-ring. If the O-ring looks to be in good condition, wipe off will solvent and leave in the Foot Valve/Piston Body.

If either of these O-rings are damaged and needs to be replaced, it must be ordered separately from the repair kit or seal kit.

PARTS INSPECTION

After all the parts have been thoroughly cleaned, they need to be inspected. Spending time and money to repair the entire fluid section will be all for nothing if a faulty part is not replaced and could possibly give poor performance and/or do further damage to the entire assembly.

Ball Joint Rod End

- Ensure that the bearing swivels and rotates freely,

Packing Nut

- Threads must be clean and not marred up.

Male Compression Ring and Female Compression Ring

- Check for wear on inside diameter. (FIG 4.1)

FIG 4.1

Outlet Body

- Threads must be clean and not marred up. Area where the Piston Rod Packing assembly is placed must be clean with no buildup.

Piston Ball Spring

- Ensure the spring is not bent.

Chrome Ball (Piston Body)

- Ball must not be dented, pitted or scratched.

Piston Rod

- Threads must be clean and not marred up.
- Check spring guide to make sure it is straight.
- Ensure there is no buildup inside the chamber.
- Check polished part of shaft for wear.

Piston Body (Non Stainless Steel)

- Threads must be clean and not marred up.
- Check ball seat for abnormal wear or damage. See Fig (FIG 4.2)

FIG 4.2

Piston Body (Stainless Steel)

- Threads must be clean and not marred up.
- Check ball seat for abnormal wear or damage. See Fig (FIG 4.3)
- –SS Option. Check Kalrez O-ring on the ball seat for tears. Remove if damaged. (FIG 3.80)

FIG 4.3

Cylinder

- Cylinder bore should be clean and free from scratches, pits.
- O-ring areas should be clear of buildup.

Ball Stop

- Ball stop should not be bent in any way.

Foot Valve Spring

- Ensure the spring is not bent.

Chrome Ball (Foot Valve)

- Ball must not be dented, pitted or scratched.

Foot Valve

- Threads must be clean and not marred.
- Check ball seat for abnormal wear or damage. See Fig (FIG 4.4)
- Ball Stop groove must be clean.
- –SS Option. Check Kalrez O-ring on the ball seat for tears. Remove if damaged. (FIG 3.80)

FIG 4.4

CHAPTER 5-Assembly

Assembly of the Fluid Section is opposite the disassembly procedure above. Having a clean and organized work area is helpful.

FOOT VALVE ASSEMBLY

-SS VERSION ONLY!
If the Kalrez O-ring (O-K-115) has been removed from the Foot Valve, insert replacement back into the groove in the seat area making sure it is seated properly. (FIG 5.1)

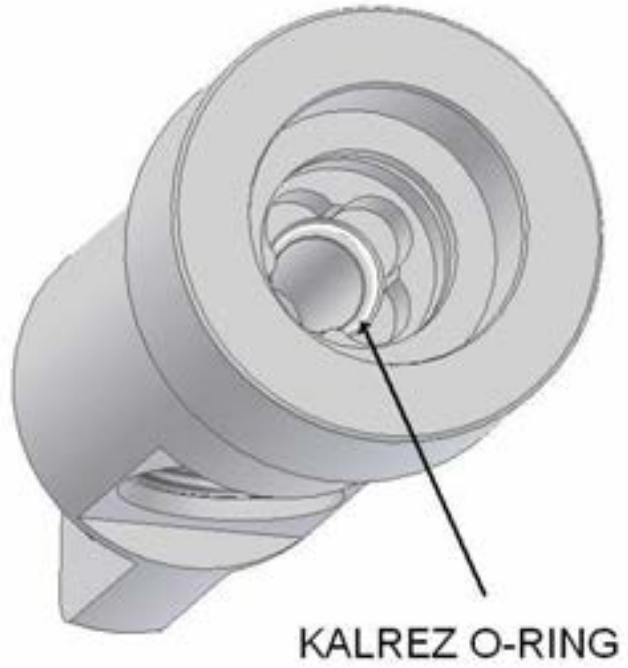


FIG 5.1

Place the Chrome Ball gently into the Foot Valve

- ***Caution***: *Do not drop or dent this ball as it will be permanently damaged and must be replaced*
- ***Note:*** *If the Fluid Section is to be used with a Polyester/Vinylester resin system then a fine coat of Red Grease should be applied to the ball before installing into the Foot Valve. The Chrome Ball on an Epoxy or Urethane system should be clean and in good condition with no lubricant or grease. If in doubt contact the material manufacturer for recommendations.*

Place the Foot Valve Spring on top of the Chrome Ball.

Using a set of pliers, compress the Ball Stop and place it on top of the Foot Valve Spring. Once it is centered, compress the Foot Valve Spring until you can lock the Ball Stop into the appropriate groove in the Foot Valve. (FIG 5.11)

FIG 5.11

Remove Foot Valve assembly from the vice and put aside.

PISTON ROD ASSEMBLY

Place the Piston Rod into the vise using the flats at the top of the rod. Placing it vertically in the vise will aid in installation.

Insert the Piston Ball Spring into the end of the Piston Rod and place over the dowel pin, and then place the Chrome Ball on top of the Piston Ball Spring.

- ***Caution****: Do not drop or dent this ball as it will be permanently damaged and must be replaced*
- ***Note:*** *If the Fluid Section is to be used with a Polyester/Vinylester resin system then a fine coat of Red Grease should be applied to the Chrome Ball before installing into the Piston Rod. The Chrome Ball on an Epoxy or Urethane system should be clean and in good condition with no lubricant or grease. If in doubt contact the material manufacturer for recommendations.*

FIG 5.3

PISTON BODY ASSEMBLY

Depending on how the unit was configured from the factory, there are 2 distinct seal designs that are used. The Barrel seal (FIG 5.50), or the Cup seal. (FIG 5.52)

-SS VERSION ONLY!
If the Kalrez O-ring (O-K-013) has been removed from the Piston Body, insert replacement back into the groove in the seat area making sure it is seated properly. (FIG 5.4)

FIG 5.4

When using the Cup style seals there are 2 ways to configure them in the assembly.

- Standard Piston Cup configuration. Both Cups facing the same direction.
- Optional Piston Cup configuration. Cups facing opposing directions.
- Barrel type seal.

CUP STYLE SEAL INSTALLATION

- ***Note:*** *If the Fluid Section is to be used with a Polyester/Vinylester resin system then a liberal coat of Red Grease should be applied to the Piston Cups before installing on to the Piston Body. The Piston Cups on an Epoxy or Urethane system should be clean and in good condition with no lubricant or grease. If in doubt contact the material manufacturer for recommendations.*

STANDARD CONFIGURATION Reference (FIG 5.50) for stack configuration.

Place the Piston Cup Backup down over the Piston Body. Install with the ridges up.

Place the first Piston Cup down over the Piston Body facing up.

Place the Piston Cup Spacer over the Piston body, the small end of the Piston Cup Spacer should go down inside the Piston Cup that is in place and the ridges on the Piston Cup Spacer should be facing up.

Place the second Piston Cup down over the Piston Body facing up, same orientation as the first.

Place the Piston Cup Compression ring over the Piston Body.

FIG 5.50

OPTIONAL CONFIGURATION Reference (FIG 5.51) for stack configuration.

Place the Piston Cup Spacer over the Piston body, the small end of the Piston Cup Spacer should be facing up and the ridges on the Piston Cup Spacer should be facing down.

Place the first Piston Cup down over the Piston Body facing down.

Place the Piston Cup Backup down over the Piston Body. Install with the ridges up.

Place the second Piston Cup down over the Piston Body facing up

Place the Piston Cup Compression ring over the Piston Body.

FIG 5.51

BARREL TYPE SEAL INSTALLATION

- Place the Piston Barrel Seal onto the Piston Body. (FIG 5.52)

FIG 5.52

INSTALLING THE PISTON BODY/PISTON SEAL ONTO THE PISTON ROD.

- Place 1-2 drops of thread lock on the Piston Body threads.
- Screw the Piston Body and Piston Barrel Seal/Cup Seal Assembly into the Piston Rod. (FIG 5.80/5.81)
- Before tightening down, make sure the Piston Cup Compression Ring is lined up with the Piston Rod. (FIG 5.82)
- ***Caution:*** *If using the Piston Cup Design, the Piston Cup Compression Ring will be damaged if not correctly installed/aligned and then tightened down.*

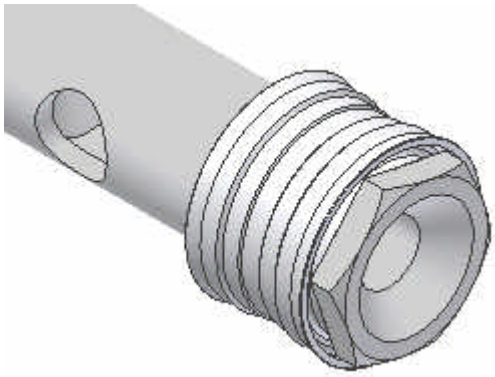


FIG 5.80

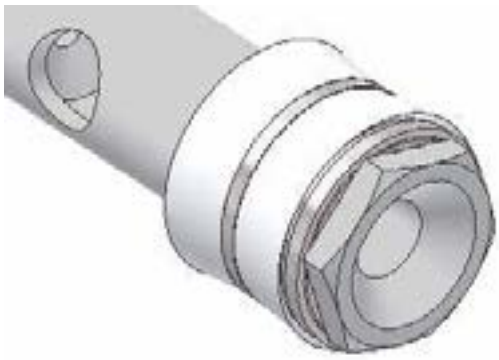


FIG 5.81

5.82

Using the appropriate wrenches, tighten the Piston Body down onto the Piston Rod.

- ***Note:*** *Make sure the Piston Ball Spring and Piston Ball are lined up correctly in the bore of the Piston Rod.* (FIG 5.9)
- ***Caution****: Over tightening the piston body using cup style seals will damage the seals*

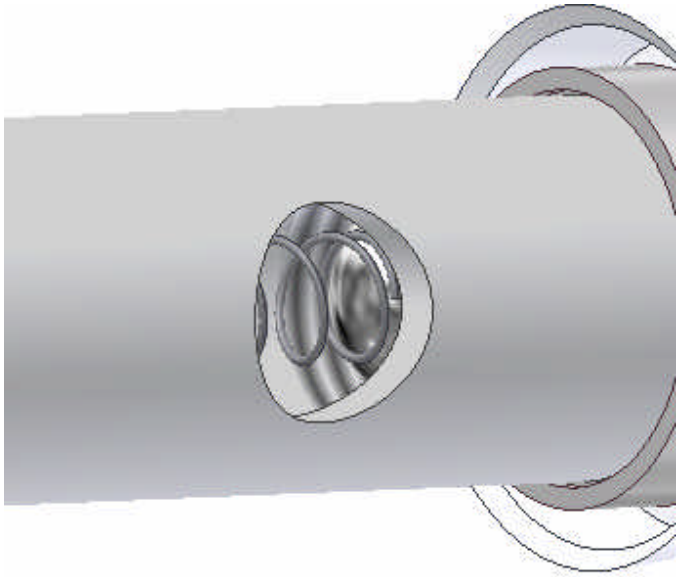


FIG 5.9

Remove Piston Rod assembly from vise and set aside.

OUTLET BODY ASSEMBLY

Place a liberal amount of grease inside the chevron area of all the packings. (FIG 6.1)

- ***Note:*** *If the Fluid Section is to be used with a Polyester/Vinylester resin system then a liberal coat of Red Grease should be applied to the Piston Rod Packing before installing on to the Outlet Body. The Piston Rod Packing on an Epoxy or Urethane system should only use approved lubricant. If in doubt contact the material manufacturer for recommendations.*

FIG 6.1

Gently slide Piston Rod assembly thru bottom of Outlet Body. (FIG 6.20)

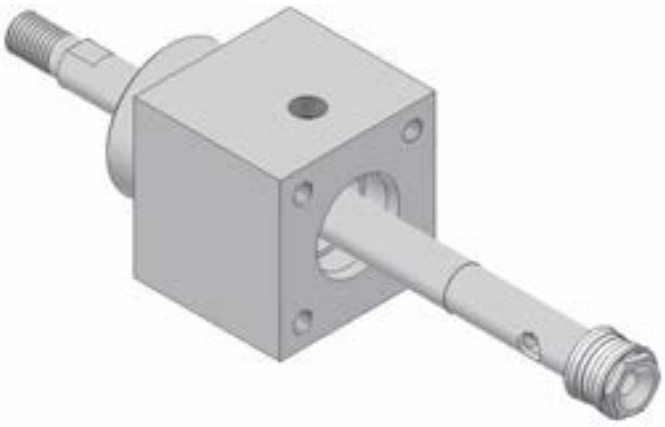


FIG 6.20

Slide Wave springs over the Piston Rod assembly. Offset the openings of the Wave Springs so that all the ends are staggered. (FIG 6.21)

FIG 6.21

Slide the Male Compression Ring over the Piston Rod assembly. (FIG 6.22)

FIG 6.22

Slide the Piston Rod Packings over the Piston Rod assembly. (FIG 6.23)

FIG 6.23

Slide the Female Compression Ring over the Piston Rod assembly. (FIG 6.24)

FIG 6.24

Slide the Guide Bushing over the Piston Rod assembly. (FIG 6.25)

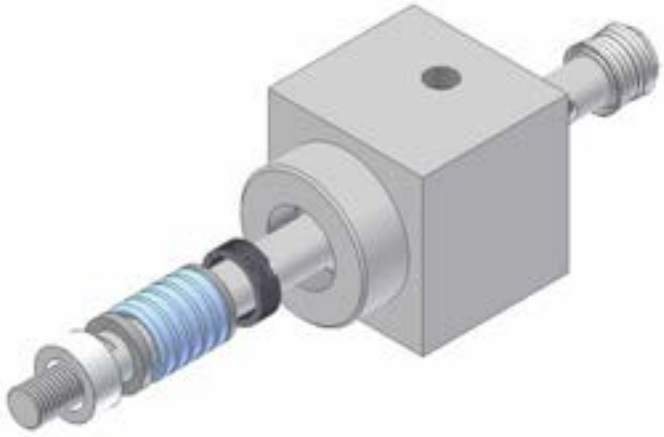


FIG 6.25

Coat the threads of the Packing nut with approved lubricant and gently slide the Packing Nut over the Piston Rod assembly. (FIG 6.26)

FIG 6.26

Slowly work the Packing assembly into the Outlet Body until the Packing nut can be threaded approximately 2-3 threads. Do not tighten the Packing Nut at this time. (FIG 6.27)

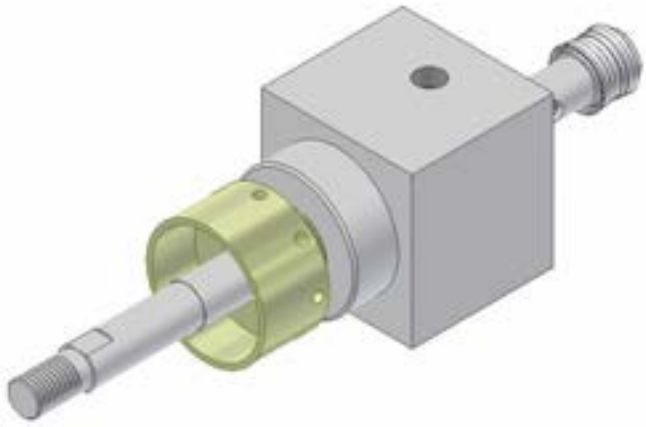


FIG 6.27

Look up into the bottom of the Outlet Body and confirm that every thing is straight and aligned. (FIG 6.28)

FIG 6.28

CYLINDER INSTALLATON

Before installing the Cylinder Tie Rods, place a small amount of lubricant on the threads that will go into the Outlet Body. Install the Cylinder Tie Rods and tighten with a wrench. (FIG 6.30)

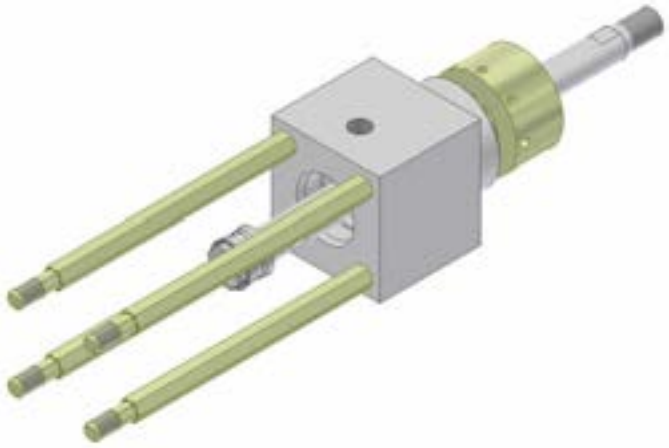


FIG 6.30

Place the O-rings on the Cylinder Tube and lightly coat them with approved lubricant. (FIG 6.31)

FIG 6.31

Slide the Cylinder Tube over the Piston Rod assembly until the top of the Cylinder Tube bottoms out on the Outlet Body. FIG (6.32)

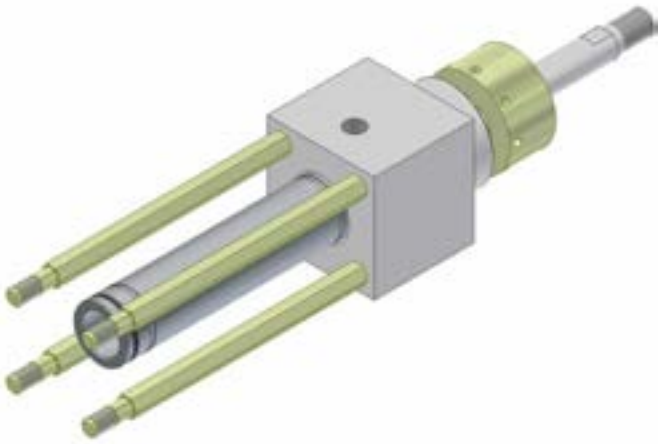


FIG 6.32

Install the Foot Valve assembly and the Collar. Then install the Hex Nuts onto the Cylinder Tie Rods. (FIG 6.33)

- ***Note:*** *Before tightening the Hex Nuts, check the orientation of the inlet port on the Foot Valve assembly making sure it is in the correct position.*
- ***Caution****: Do not overtighten the Hex Nuts.*

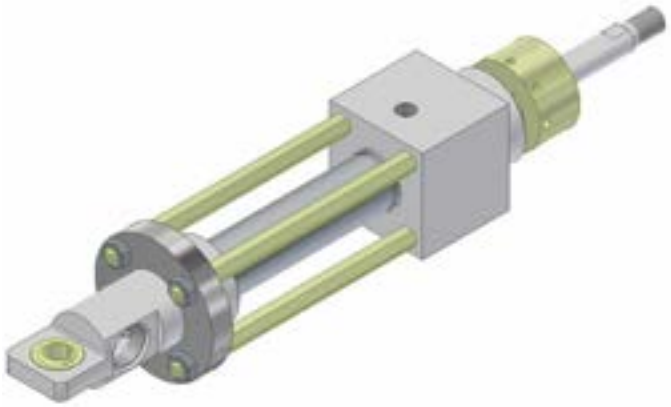


FIG 6.33

Place 1-2 drops of thread lock on the Piston Body threads and Install the Rod Adapter assembly onto the Piston Rod. (FIG 6.34)

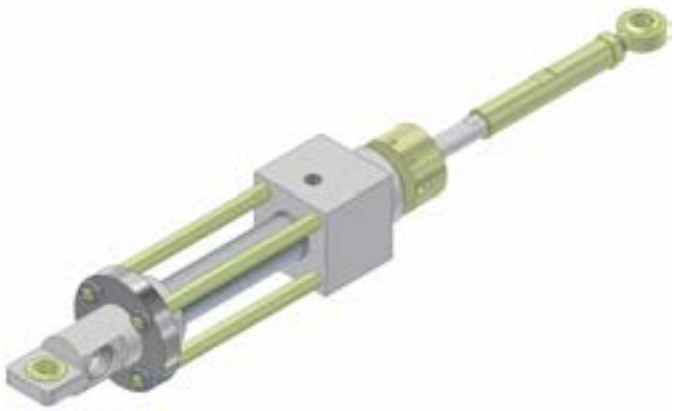


FIG 6.34

The rebuilt Fluid Section is place back on the system.

CHAPTER 6-Installation

INSTALLATION OF THE FLUID SECTION

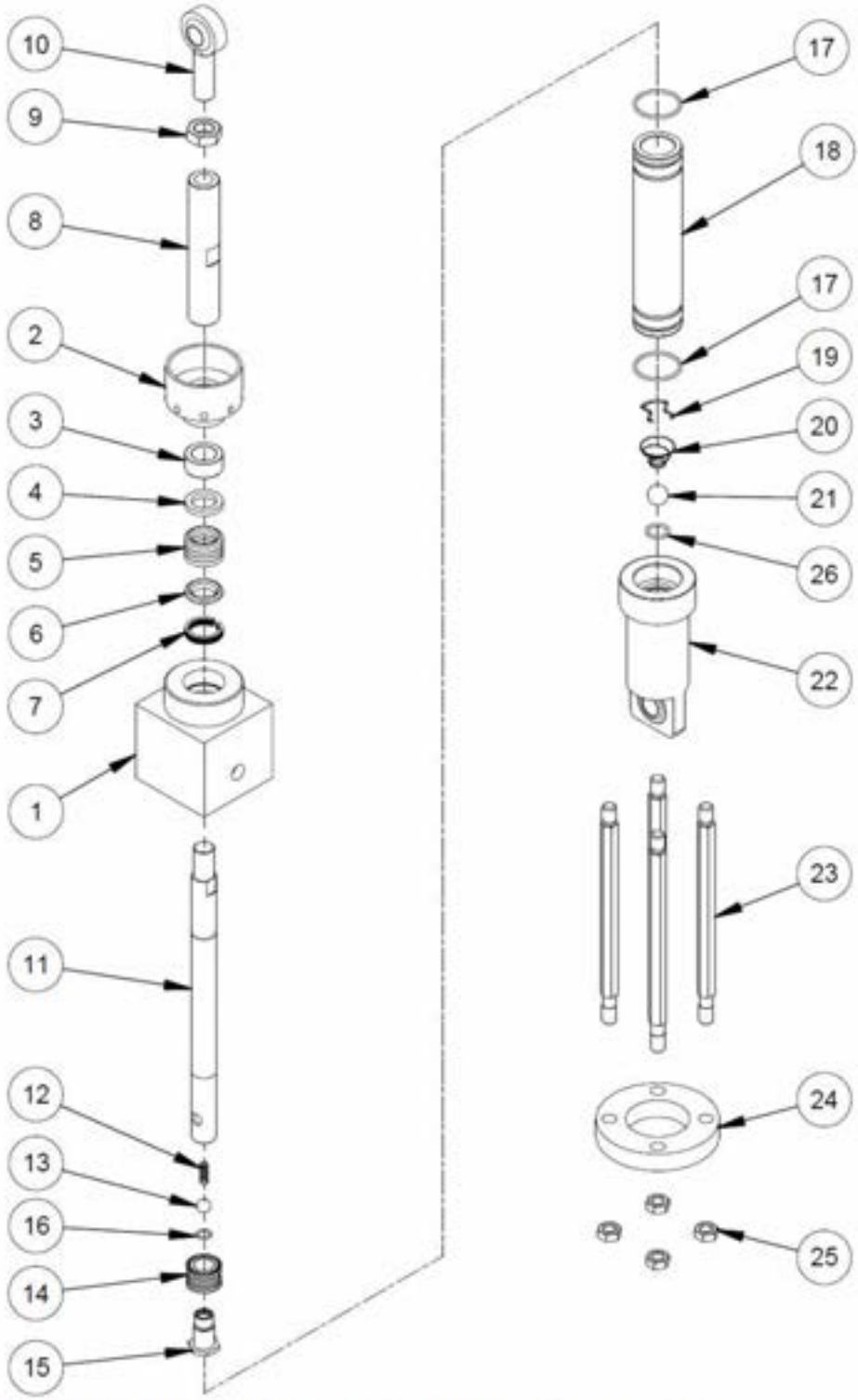
- Before installing the Fluid section, Move the Piston Rod assembly up and down a few times to make sure assembly is moving freely.
- Place the Fluid Section on the bottom mount and install the pin.
- Tilt the Fluid Section up and install the upper pin.
- Install Surge Chamber/Filter Assembly.
- Tighten Packing nut by hand.
- Turn air pressure to a very low setting, just enough to cycle the Fluid Sections.
- Cycle the Fluid Sections a few times very slowly to insure that the Fluid Section is moving freely.
- Remove Pickup Wand assembly/feed hoses from solvent.
- Install Pickup Wand assembly/feed hoses.
- Using the correct size Allen wrench, tighten the Packing Nut down. The packing nut must be tight enough to compress the packings but not so tight that it does not allow the Piston Rod to move up and down.
- Put approved lubricant into the Packing Nut reservoir.
- Set operating pressure at 0 psi.
- Put Pickup Wand back into material and /or turn the feed line back on.

The rebuilt Fluid Section is now ready for start up.

CHAPTER 7-System Start Up/Troubleshooting

- Set pressure at 0 psi and turn on pneumatic pressure from system.
- Turn on the recirculation circuit and/or open the filter bypass valves.
- Using the priming button, slowly ramp up pressure to cycle Fluid Sections until solid flow is achieved. While this is being done, observe both the up and downstrokes have a steady fluid stream.
- Close recirculation valves and/or gun.
- Using the priming/manual override circuit, pump the system up to operating pressure. Note which way the pump is traveling and measure from the top of the Packing Nut to the end of the Piston Rod.
- After 15 min, bypass some fluid to get the Fluid Section Traveling in the opposite direction. Measure from the top of the Packing Nut to the end of the Piston Rod.
- Let the system set for approx 15 min.
- If after 15 min. the Piston Rod assembly has moved then there is a problem with the one or more of the ball seats.
    - If the Fluid Section is on the upstroke, and continues to move up after the recirculation and/or gun has been closed, then the Piston Body ball seat, O-ring or Piston Seal/Cup assembly, is faulty.
    - If the Fluid Section is on the downstroke, and continues to move down after the recirculation and/or gun has been closed, then the Foot Valve ball seat and/or o-ring is faulty.
    - Please refer to the Fluid Section Troubleshooting guide for more precise information.
- Check Cylinder Seals for leakage.
- Check Packing Nut Cavity for leakage.
- Check outlet fitting for leakage.
- Check inlet fittings for leakage.

CHAPTER 8-Assembly Drawings



MAGNUM VENUS PLASTECH

LOWER SECTION	UPLS-2300-SS

REV: SHEET 1 / 2 4/6/2010

	Parts List			
	ITEM	PART NUMBER	QTY	DESCRIPTION
	1	60351-1-SS	1	OUTLET BODY
	2	VLS-2407	1	PACKING NUT
	3	VLS-2403	1	GUIDE BUSHING
	4	VLS-2404-SS	1	FEMALE COMRPESSION RING
*	5	VLS-2405	1	PISTON ROD PACKING SET
	6	VLS-2406-SS	1	MALE COMPRESSION RING
	7	VLS-2410	10	WAVE SPRING
	8	UPLS-2313	1	ROD ADAPTOR
	9	F-JN-12F	1	JAM NUT
	10	B-BJRE-.750-1-HS	1	BALL JOINT ROD END
	11	60352-1-SS	1	PISTON ROD ASSEMBLY
	12	VLS-2414	1	PISTON BALL SPRING
	13	03402	1	BALL
*	14	UPLS-2314-GFT	1	PISTON CUP SEAL
	15	UPLS-2319-SS	1	PISTON BODY
	16	O-K-013	1	O-RING
*	17	O-V-129	2	O-RING
	18	UPLS-2308-SS	1	CYLINDER TUBE
	19	VLS-2420-SS	1	BALL STOP
	20	3102-16-1	1	FOOT VALVE SPRING
	21	VLS-2427-SS	1	BALL
	22	UPLS-2302-SS	1	FOOT VALVE
	23	VLS-4623	4	CYLINDER TIE ROD
	24	87160-1	1	COLLAR
	25	F-HN-08C	4	HEX NUT
	26	O-K-115	1	O-RING

REPAIR KITS

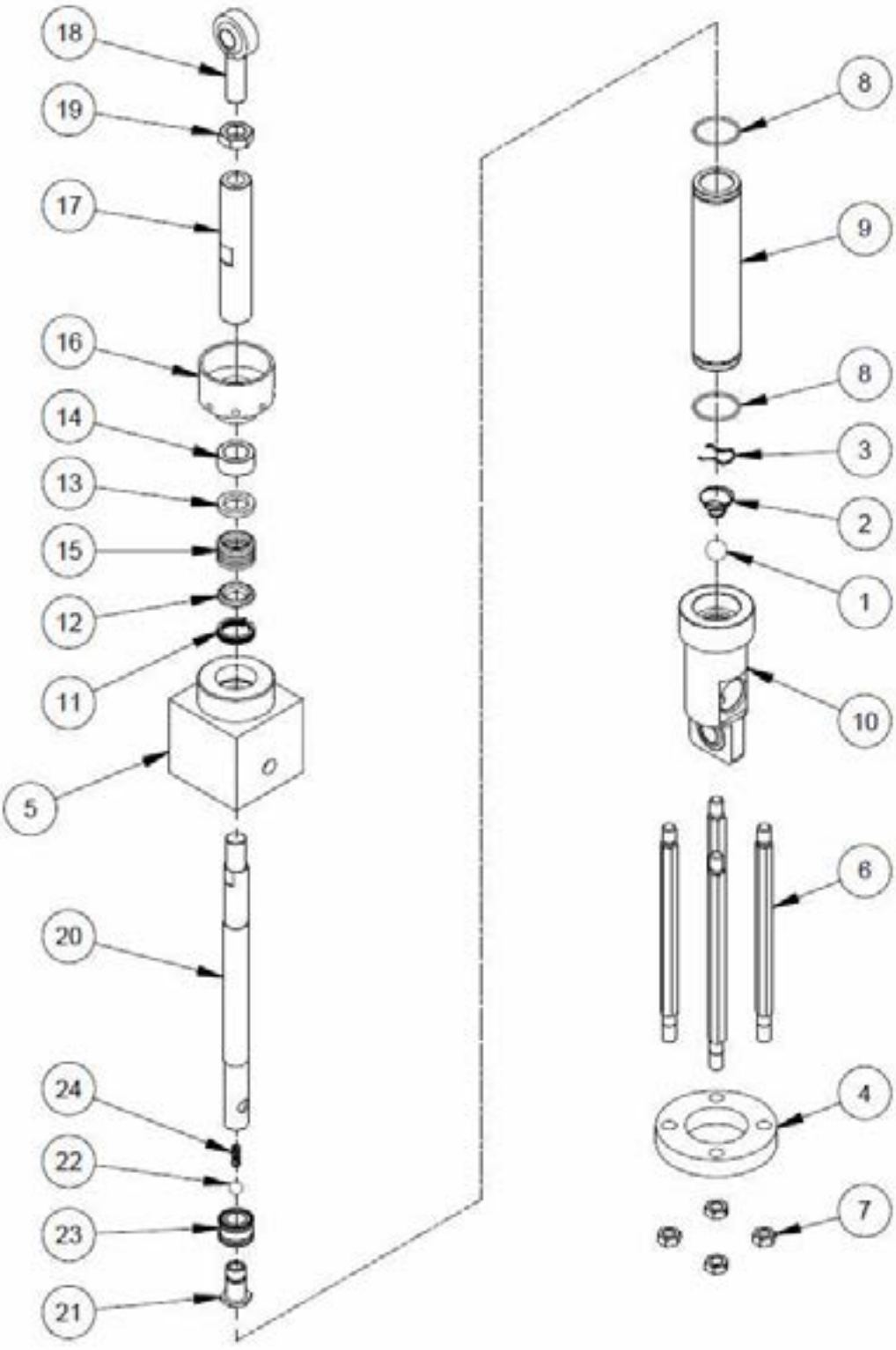
PART No.	DESCRIPTION
* UPLS-2300-SS-SK	SEAL KIT

* NOTE: ASTERISKS DENOTE PARTS USED IN SEAL KIT

MAGNUM VENUS PLASTECH

LOWER SECTION	UPLS-2300-SS

REV: SHEET 2 / 2 4/6/2010



MAGNUM VENUS PLASTECH

LOWER SECTION	UPLS-2400

REV: SHEET 1 / 2 4/8/2010

Parts List			
ITEM	PART NUMBER	QTY	DESCRIPTION
1	VLS-2427	1	3/4" CHROME BALL
2	3102-16-1	1	FOOT VALVE SPRING
3	VLS-2420	1	BALL STOP
4	87160-1	1	COLLAR
5	60351-1	1	OUTLET BODY
6	VLS-4623	4	CYLINDER TIE ROD
7	F-HN-08C	4	HEX NUT
* 8	O-V-129	2	O-RING
9	87190-1	1	CYLINDER TUBE
10	60292-1	1	FOOT VALVE
11	VLS-2410	10	WAVE SPRING
12	VLS-2406	1	MALE COMPRESSION RING
13	VLS-2404	1	FEMALE COMRPESSION RING
14	VLS-2403	1	GUIDE BUSHING
* 15	VLS-2405	1	PISTON ROD PACKING SET
16	VLS-2407	1	PACKING NUT
17	UPLS-2313	1	ROD ADAPTOR
18	B-BJRE-.750-1-HS	1	BALL JOINT ROD END
19	F-JN-12F	1	JAM NUT
20	60352-1	1	PISTON ROD ASSY
21	VLS-2419	1	PISTON BODY
22	VLS-2426	1	1/2" CHROME BALL
* 23	VLS-2433-GFT	1	PISTON CUP SEAL
24	VLS-2414	1	PISTON BALL SPRING

REPAIR KITS

PART No.	DESCRIPTION
* UPLS-24SK-4T-1GB	SEAL KIT

* NOTE: ASTERISKS DENOTE PARTS USED IN SEAL KIT

MAGNUM VENUS PLASTECH

LOWER SECTION	UPLS-2400

REV: SHEET 2 / 2 4/8/2010

Corporate HQ/Mfg.

5148 113th Ave.
Clearwater, FL 33760 USA
Ph: (727) 573-2955
Fax: (727) 571-3636
E-mail: info@mvpind.com

Manufacturing/Sales

1862 Ives Ave.
Kent, WA 98032 USA
Ph: (253) 854-2660
Fax: (253) 854-1666
Web: www.mvpind.com