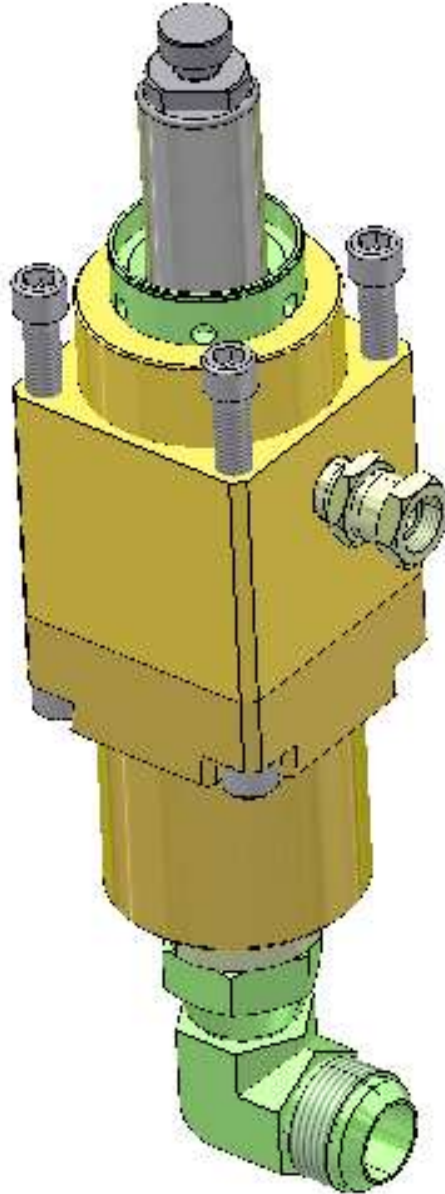


# Patriot Fluid Section

## Operations Manual

This manual is applicable to the following models:

- PAT-LS-12270
- PAT-LS-12270-3
- PAT-LS-12270-AM
- PAT-LS-12270-AM-HD
- PAT-LS-12270-D
- PAT-LS-12270-D1
- PAT-LS-12270-GL
- PAT-LS-12270-HD
- PAT-LS-12270-MC
- PAT-LS-12270-P
- PAT-LS-12270-RTM
- PAT-LS-24050
- PAT-LS-24050-AM
- PAT-LS-24050-AM-HD
- PAT-LS-24050-GL
- PAT-LS-24050-GL-HD
- PAT-LS-24050-HD
- PAT-LS-24050-HD-3
- PAT-LS-24050-MC
- PAT-LS-24050-RTM
- PAT-LS-49090





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[www.mvpind.com/mvp-international](http://www.mvpind.com/mvp-international)

*Use of this product confirms that Magnum Venus Products, Inc.'s standard terms and conditions of sale apply.*

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# Safety & Warning Information

## Warnings

Due to the vast number of chemicals that could be used and their varying chemical reactions, the buyer and user of this equipment should determine all factors relating to the fluids used, including any of the potential hazards involved. Particular inquiry and investigation should be made into potential dangers relating to toxic fumes, fires, explosions, reaction times, and exposure of human beings to the individual components or their resultant mixtures. MVP assumes no responsibility for loss, damage, expense or claims for bodily injury or property damage, direct or consequential, arising from the use of such chemical components.

The end user is responsible for ensuring that the end product or system complies with all the relevant laws in the country where it is to be used and that all documentation is adhered to.

### Recommended Occupational Safety & Health Act (OSHA) Documentation:

- 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

For Additional information, contact the Occupational Safety and Health Administration (OSHA) at <https://www.osha.gov/about.html>.

### Recommended National Fire Protection Association (NFPA) Documentation:

- 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

**Fire Extinguisher** – code ABC, rating number 4a60bc using Extinguishing Media –Foam, Carbon Dioxide, Dry Chemical, Water Fog, is recommended for this product and applications.

The following general warnings and guidelines are for the setup, use, grounding, maintenance, and repair of equipment. Additional product-specific warnings may be found throughout this manual as applicable. Please contact your nearest MVP Technical Service Representative if additional information is needed.

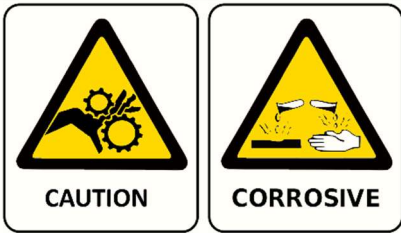
## Safety Precautions

- Avoid skin contact and inhalation of all chemicals.
- Review Material Safety Data Sheet (MSDS) to promote the safe handling of chemicals in use.
- Restrict the use of all chemicals to designated areas with good ventilation.
- Chemicals are flammable and reactive.
- Noxious fumes released when combusted.
- Operate equipment in a ventilated environment only.
- Uncured liquid resins are highly flammable unless specifically labeled otherwise.
- Cured laminate, accumulations of overspray, and laminate sandings are highly combustible.
- Do not operate or move electrical equipment when flammable fumes are present.
- Ground all equipment.
- If a spark is seen or felt, immediately halt operation. Do not operate the equipment until the issue has been identified and repaired.
- Contaminated catalyst may cause fire or explosion.
- Containers may explode if exposed to fire / heat.
- Use and store chemicals away from heat, flames, and sparks.
- Do not smoke in work areas or near stored chemicals.
- Do not mix Methyl Ethyl Ketone Peroxide (MEKP) with materials other than polyethylene.
- Do not dilute MEKP.
- Keep food and drink away from work area.



**Physical Hazards**

- Never look directly into the spray gun fluid tip. Serious injury or death can result.
- Never aim the spray gun at or near another person. Serious injury or death can result.
- Chemical compounds can be severely irritating to the eyes and skin.
- Inhalation, ingestion, or injection may damage internal organs and lead to pulmonary disorders, cancers, lymphomas, and other diseases or health conditions.
- Other potential health effects include: irritation of the eyes and upper respiratory tract, headache, light-headedness, dizziness, confusion, drowsiness, nausea, vomiting, and occasionally abdominal pain.
- Eye contact: Immediately flush with water for at least 15 minutes and seek immediate medical attention.
- Skin Contact: Immediately wash with soap and water and seek immediate medical attention.
- Inhalation: Move the person to fresh air and seek immediate medical attention.
- Do not remove shields, covers, or safety features on equipment that is in use.
- 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 shoot liquid through the skin.
- Keep hands and body parts away from any moving equipment or components.
- Do not stand under plunger
- An improperly loaded drum may lead to an imbalance, causing a unit to tip over



**Personal Protective Equipment (PPE)**

- MVP recommends the use of personal safety equipment with all products in our catalog.
- Wear safety goggles, hearing protection, a respirator, and chemical resistant gloves.
- Wear long sleeve shirts or jackets and pants to minimize skin exposure.
- PPE should be worn by operators and service technicians to reduce the risk of injury.



For Additional information, contact the Occupational Safety and Health Administration (OSHA). <https://www.osha.gov/about.html>

## Symbol Definitions



Indicates the risk of contact with chemicals that are hazardous, which may lead to injury or death.



Indicates the risk of contact with voltage / amperage that may lead to serious injury or death



Indicates that the materials being used are susceptible to combustion



Indicates the risk of contact with moving components that may lead to serious injury or death.



Indicates that the system or component should be grounded before proceeding with use or repair.



Indicates the use of lit cigarettes or cigars is prohibited, because the materials being used are susceptible to combustion.



Indicates that the materials and/or the process being performed can lead to ignition and explosion.



A recommendation for the use of Personal Protective Equipment (PPE) before using or repairing the product.

# Polymer Matrix Materials: Advanced Composites

Potential health hazards associated with the use of advanced composites can be controlled through the implementation of an effective industrial hygiene and safety program.

[https://www.osha.gov/dts/osta/otm/otm\\_iii/otm\\_iii\\_1.html#t\\_iii:1\\_1](https://www.osha.gov/dts/osta/otm/otm_iii/otm_iii_1.html#t_iii:1_1)

| <b>Resins</b>                        |  |   |
|--------------------------------------|--|---|
| <b>Composite Component</b>           | <b>Organ System Target (Possible Target)</b> | <b>Known (Possible) Health Effect</b>   |
| Epoxy resins                         | Skin, lungs, eyes                            | Contact and allergic dermatitis, conjunctivitis   |
| Polyurethane resins                  | Lungs, skin, eyes                            | Respiratory sensitization, contact dermatitis, conjunctivitis                           |
| Phenol formaldehyde                  | Skin, lungs, eyes                            | As above (potential carcinogen)   |
| Bismaleimides (BMI)                  | Skin, lungs, eyes                            | As above (potential carcinogen)   |
| Polyamides                           | Skin, lungs, eyes                            | As above (potential carcinogen)   |
| <b>Reinforcing materials</b>         |  |   |
| <b>Composite Component</b>           | <b>Organ System Target (Possible Target)</b> | <b>Known (Possible) Health Effect</b>   |
| Aramid fibers                        | Skin (lungs)                                 | Skin and respiratory irritation, contact dermatitis (chronic interstitial lung disease) |
| Carbon/graphite fibers               | Skin (lungs)                                 | As noted for aramid fibers  |
| Glass fibers (continuous filament)   | Skin (lungs)                                 | As noted for aramid fibers  |
| <b>Hardeners and curing agents</b>   |  |   |
| <b>Composite Component</b>           | <b>Organ System Target (Possible Target)</b> | <b>Known (Possible) Health Effect</b>   |
| Diaminodiphenylsulfone               | N/A  | No known effects with workplace exposure  |
| Methylenedianiline                   | Liver, skin                                  | Hepatotoxicity, suspect human carcinogen  |
| <b>Other aromatic amines</b>         |  |   |
| <b>Composite Component</b>           | <b>Organ System Target (Possible Target)</b> | <b>Known (Possible) Health Effect</b>   |
| Meta-phenylenediamine (MPDA)         | Liver, skin (kidney, bladder)                | Hepatitis, contact dermatitis (kidney and bladder cancer)                               |
| Aliphatic and cyclo-aliphatic amines | Eyes, skin                                   | Severe irritation, contact dermatitis   |
| Polyaminoamide                       | Eyes, skin                                   | Irritation (sensitization)  |
| Anhydride                            | Eyes, lungs, skin                            | Severe eye and skin irritation, respiratory sensitization, contact dermatitis           |



## Catalyst - Methyl Ethyl Ketone Peroxide (MEKP)

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.



### **WARNING**

***Contamination with promoters, materials containing promoters (such as laminate sandings), or with any readily oxidizing material (such as brass or iron) will cause exothermic redox reactions which can be explosive in nature. Heat applied to MEKP or heat buildup from contamination reactions can cause the material to reach its Self-Accelerating Decomposition Temperature (SADT).***

Researchers have reported measuring pressure rates-of-rise well over 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 from improper handling of MEKP, especially regarding 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:

- Store MEKP in a cool, dry place in original containers away from direct sunlight and away from other chemicals.
- Keep MEKP away from heat, sparks, and open flames.
- Prevent contamination or MEKP with other materials, including polyester over spray and sandings, polymerization accelerators and promoters, brass, aluminum, and non-stainless steels.

- Never add MEKP to anything that is hot, since explosive decomposition may result.
- 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. Firefighting equipment should be at hand and ready.
- Avoid spillage, which can heat up to the point of self-ignition.
- 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.
- Use only original equipment or equivalent parts from Magnum Venus Products in the catalyst system (i.e.: hoses, fitting, etc.) because a dangerous chemical reaction may result between substituted parts and MEKP.
- 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.

## Clean-Up Solvents and Resin Diluents



### **WARNING**

***A hazardous situation may be present in your pressurized fluid system! Hydro carbon 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.). An explosion could cause serious injury, death, and/or substantial property damage. Cleaning agents, coatings, paints, etc. may contain Halogenated Hydrocarbon solvents. Some Magnum Venus Products spray equipment includes aluminum or galvanized components and will be affected by Halogenated Hydrocarbon solvents.***

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

- |    |   |  |
|----|---|--|
| 1. | 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.   |
| 2. | 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.   |
| 3. | 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. |

- 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. Mixing HHC solvents with other materials or solvents such as MEKP, alcohol, or toluene may render the inhibitors ineffective.
- The use of reclaimed solvents is particularly hazardous. Reclaimers may not add any inhibitors. The possible presence of water in reclaimed solvents could also feed the reaction.
- 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 to safely prevent the chemical reaction under all circumstances.
- 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 (VOCs), 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 (HHC) solvents in pressurized fluid systems having aluminum or galvanized wetted parts. Magnum Venus Products is aware of NO stabilizers available to prevent HHC solvents from reaction under all conditions with aluminum components in closed fluid systems. HHC solvents are dangerous when used with aluminum components in a closed fluid system.***

- Consult your material supplier to determine whether your solvent or coating contains Halogenated Hydrocarbon solvents.
- Magnum Venus Products recommends that you contact your solvent supplier regarding the best non-flammable clean-up solvent with the heat toxicity for your application.
- If, however, you find it necessary to use flammable solvents, they must be kept in approved, electrically grounded containers.
- Bulk solvent should be stored in a well-ventilated, separate building, 50 feet away from your main plant.
- You should only allow enough solvent for one day's use in your laminating area.
- NO SMOKING signs must be posted and observed in all areas of storage or where solvents and other flammable materials are used.
- 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.
- Solvents should be handled in accordance with OSHA Section 1910.106 and 1910.107.

## Catalyst Diluents

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



### **WARNING**

***If diluents are not used, remember that catalyst spillage and gun, hose, and packing leaks are potentially more hazardous since each drop contains a higher concentration of catalyst and will therefore react more quickly with overspray and the leak.***

## Cured Laminate, Overspray and Laminate Sandings Accumulation

- Remove all accumulations of overspray, Fiberglass Reinforced Plastic (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.
- Floor coverings, if used, should be non-combustible.
- Spilled or leaked catalyst may cause a fire if it comes in contact with an FRP product, oversprayed chop or resin, FRP sandings or any other material with MEKP.

To prevent spillage and leakage, you should:

- |  |   |
|--|---|
| 1. Maintain your Magnum Venus Products 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. |

## Toxicity of Chemicals

- Magnum Venus Products recommends that you consult OSHA Sections 1910.94, 1910.106, 1910.107 and NFPA No.33, Chapter 14, and NFPA No.91.
- 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.
- Also determine the best methods of first aid treatment for each chemical used in your plant.

## Equipment Safety

Magnum Venus Products 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!



### CAUTION

***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 OR AN ANIMAL.***



### 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 from dirt, grease, or resin. Clean catalyst system components with clean water daily.***



### 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.***

## Treatment of Chemical Injuries



### CAUTION

***Refer to your catalyst manufacturer's safety information regarding the safe handling and storage of catalyst. Wear appropriate safety equipment as recommended.***

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 Products 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 if 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 an injury. If the product's MSDS includes first aid instructions, administer first aid immediately after contacting a doctor.**

Fast treatment of the outer skin and eyes that contact 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 may be incorrect for some chemicals; you must know the chemicals and treatment before an accident occurs. Treatment for swallowing a chemical frequently depends upon the nature of the chemical.

**Emergency Stop Procedure**

In an emergency, follow these steps to stop a system:

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.

**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.**

2. Turn all system regulators to the "OFF" position (counter-clockwise) position.
3. Verify / secure the catalyst relief line, located on the catalyst relief valve.
4. Verify / secure the resin return line, located on the resin filter.
5. Place a container under the resin pump ball valve to catch ejected resin.
6. Locate the ball valve on the resin pump.
7. Rotate the ball valve 90 degrees to the "On" or open position.

**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 Products 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 should be 1 meg ohm (10<sup>6</sup> ohms) or less.



**CAUTION**

*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 dissipate 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”.*

## Introduction

This manual provides information for the operation, maintenance, and simple repair of the MVP Patriot Fluid Section. The following procedures are included:

- Step-by-step assembly and disassembly
- Parts information



Please read this manual carefully and retain for future reference. Follow the steps in the order given, otherwise you may damage the equipment or injure yourself.

## Configurations

There are several variations of the Patriot fluid section, but most will only have small differences. The procedures for rebuilding the fluid sections are the same with slight variations in parts. It is important to have a current parts drawing specific to the fluid section you are working on available for reference.

The following fluid sections are covered by this manual:

### 1.25” Diameter by 2” Stroke Length

- |                      |                                     |
|----------------------|-------------------------------------|
| • PAT-LS-12270       | Patriot Fluid Section               |
| • PAT-LS-12270-3     | Patriot Fluid Section – 3 Component |
| • PAT-LS-12270-AM    | Patriot Fluid Section               |
| • PAT-LS-12270-AM-HD | Patriot Fluid Section – Heavy Duty  |
| • PAT-LS-12270-D     | Patriot Fluid Section – DUO Pump    |
| • PAT-LS-12270-D1    | Patriot Fluid Section               |
| • PAT-LS-12270-GL    | Patriot Fluid Section               |

- PAT-LS-12270-HD Patriot Fluid Section – Heavy Duty
- PAT-LS-12270-MC Patriot Fluid Section – Multi Color
- PAT-LS-12270-P Patriot Fluid Section – Pro Innovator
- PAT-LS-12270-RTM Patriot Fluid Section – RTM Unit

### 1.75” Diameter by 2” Stroke Length

- PAT-LS-24050 Patriot Fluid Section
- PAT-LS-24050-AM Patriot Fluid Section
- PAT-LS-24050-AM-HD Patriot Fluid Section – Heavy Duty
- PAT-LS-24050-GL Patriot Fluid Section
- PAT-LS-24050-GL-HD Patriot Fluid Section – Heavy Duty
- PAT-LS-24050-HD Patriot Fluid Section – Heavy Duty
- PAT-LS-24050-HD-3 Patriot Fluid Section – Heavy Duty – 3 Component
- PAT-LS-24050-MC Patriot Fluid Section – Multi Color
- PAT-LS-24050-RTM Patriot Fluid Section – RTM Unit

### High Volume

- PAT-LS-49090 HV Patriot Fluid Section

**Note**     ***The Heavy Duty (-HD) versions of the fluid section require the heavy duty fluid rod, which is only used with 7” or 10” heavy duty powerhead configurations. The heavy duty fluid rod can be used in other versions to convert them to heavy duty as well. The Duo fluid section uses a different fluid rod as well.***

## Seal Conversion Kits

There are two conversion kits available for either the 1.25” diameter or the 1.75” diameter fluid section. The two kits can be used together in the same fluid section.

- The PAT-LS-xxxxx-AM-CK is used to convert the existing seals to newer versions. This kit replaces the existing seal with a new version with no change to the outlet body, solvent cup, or fluid rod.
- The PAT-LS-xxxxx-GL-CK is used to convert the existing upper seals to the Glutton Seal configuration. This kit also replaces the outlet body and solvent cup. See the GL version drawing of your fluid section for details.

## Requirements

During disassembly lay out the components in the correct order and direction to assist with reassembly. You will need the following items to service the fluid section:

- Red Grease
- Gun Oil



- Removable Thread Locking Compound
- $\frac{5}{16}$ " Hex Wrench
- Hex Wrench Set
- 8" Adjustable Wrench
- 12" Adjustable Wrench
- $\frac{1}{2}$ " Wrench
- $\frac{9}{16}$ " Wrench
- PAT-GL-TOOL-1 (for GL fluid sections)
- The appropriate seal kit for your fluid section

## Removing Fluid Section



### **WARNING**

***Remove all fluid and air pressure from the system before attempting to remove or service this equipment.***

**Note** ***Flushing the pumping system with suitable cleaning agent will make cleaning, repair, and maintenance easier.***



### **CAUTION**

***Always wear proper safety equipment (glasses, gloves, respirator, etc.) when working with dispensing equipment and before startup of the unit. Refer to and follow the requirements of the Material Safety Data Sheets (MSDS) supplied by your material manufacturer(s).***

1. Relieve the system pressure and then remove suction hose, resin hose, and accumulator/filter assembly from the fluid section.
2. Using a  $\frac{1}{2}$ " wrench and a hex set, remove the shoulder bolt holding the lower arm of the slave drive to the fluid section, as applicable to your system.
3. Use a  $\frac{9}{16}$ " wrench to unscrew the hex bolts holding the fluid section to the powerhead.

**Note** ***Use caution to prevent the fluid section from dropping after the bolts are removed.***

## Disassembling Fluid Section

1. Carefully mount the fluid section vertically in a vise.

**Note**      **Use care not to damage the pump when clamping into a vise. Use a soft-jawed vise or pad with a towel or rag. Use the flats on the inlet valve or body to mount the pump vertically.**

2. With the fluid section securely mounted, use a hex wrench to remove the four socket cap screws from the inlet body.
3. Push the fluid rod assembly down into the pump as far as it will go.

## Disassemble Inlet Body

4. Carefully lift the outlet body off the top of the inlet body.

**Note**      **Use caution; the fluid rod assembly may lift out with the outlet body.**

5. Remove the fluid rod assembly and set aside.
6. Remove the piston bushing and O-ring from the inlet body (or outlet body if it stuck).
7. Remove the piston seal from the inlet body.
8. Remove the inlet valve from the inlet body.

**Note**      **If the pump is mounted in the vise by the inlet valve flats you should be able to turn the inlet body free of the inlet valve, leaving the inlet valve mounted in the vise.**

9. Using a pair of pliers, squeeze the ball stop and remove it from the inlet valve.
10. Remove the foot valve spring and ball from the inlet valve.

**Note**      **Be careful not to drop the chrome balls or they will be damaged. Do not use a ball with a scratch or flat spot. Replace all parts provided by the repair kit. Use only original MVP parts.**

## Disassemble Outlet Body

11. Unscrew the packing nut from the outlet body.
12. Remove the two piston seal assemblies from the outlet body.

**Note**      **Some fluid sections have only one rod seal.**

# Reassembling Fluid Section

## Assemble Inlet Body

1. Properly clean the inlet valve, making sure to check the ball seat area.

**Note**      **Do not use any grease in the DUO fluid sections.**

2. Lightly grease the inlet ball with red grease and place in the inlet valve.

---

**Note**      ***Use care not to drop the inlet ball or it will be damaged.***

3. Install the foot valve spring onto the inlet ball with the narrow side against the ball.
4. Place the back of the ball stop on top of the foot valve spring and into the groove in the inlet valve.
5. Using a pair of pliers, squeeze the ball stop and push the front into the groove.
6. Set the inlet valve aside for now.
7. Properly clean the inlet body.
8. Lightly lubricate the threads and seal area with red grease.

**Note**      ***Do not use grease in the DUO fluid sections.***

9. Screw the assembled inlet valve assembly into the bottom of the inlet body and lightly tighten.
10. Mount the inlet body into a vise by the flats on the inlet valve.
11. Install the piston seal assembly into the top of the inlet body with the O-ring or spring facing up.
12. Apply red grease to the inside of the piston bushing and install the piston bushing into the inlet body on top of the piston seal assembly.

**Note**      ***Do not use grease in the DUO fluid sections.***

13. Lightly lubricate a new O-ring with red grease and install over the piston bushing and into the groove on the inlet body.
14. Properly clean the piston, fluid rod, and piston valve.
15. Check the ball seat area of the piston valve for damage or debris; clean or replace as needed.
16. Lubricate a new O-ring (as appropriate) and install on the piston valve.
17. Lightly grease the threads of the piston valve with red grease.
18. Lightly lubricate the piston ball with red grease and place in the piston valve.

**Note**      ***Be careful not to drop the piston ball or it will be damaged. Do not use a scratched or dented piston ball.***

19. Install the spring onto the piston ball with the narrow side against the ball.
20. Place the back of the spring retainer on top of the spring and into the groove in the piston valve.
21. Use a pair of plier to squeeze the spring retainer and push the front into the groove.
22. Screw the piston valve assembly into the bottom of the piston and tighten firmly.
23. Check that the fluid rod is tightened onto the piston.

## Assemble Outlet Body

24. If you have a GL fluid section or are converting to one, skip to the instructions for the Special Outlet Body for GL Fluid Sections.

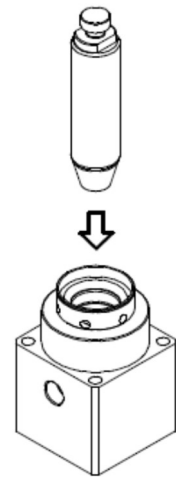
25. Properly clean the outlet body, then lightly lubricate the thread and seal areas with red grease.
26. Lightly lubricate the rod seals with red grease and install the first rod seal into the top of the outlet body with the O-ring facing down.

**Note**      ***Do not use any grease in the DUO fluid sections.***

27. Repeat the process for the second rod seal, if applicable.
28. Check the rod bushing for wear or damage and replace as necessary.
29. Lightly lubricate the rod bushing with red grease and install it into the packing nut.
30. Screw the packing nut and rod bushing into the top of the outlet body until it contacts the piston seal.

### Special Outlet Body for GL Fluid Sections

31. Install an O-ring into the outlet body.
32. Install the glutton seal and spacer into the outlet body.
33. Install the bushing and seals into the solvent cup.
34. Firmly tighten the solvent cup into the outlet body.
35. Screw the item seal tool onto the upper rod.
36. Push the shaft downward through the glutton seal, using a hard rubber or plastic mallet to form a seal.
37. Remove the seal tool from the upper rod.
38. Screw the piston to the bottom of the upper rod.
39. Connect the outlet body to the inlet body and torque the bolts properly.



**Note**      ***Nuts and bolts should always be tightened using the across method. Tighten the first to just over hand tight, then jump to the one directly opposite and tighten.***

### Reassemble Pump

40. With the assembled inlet body mounted in the vise, slowly and firmly push the piston and fluid rod assembly all the way down into the inlet body.
41. Carefully and firmly push the assembled outlet body onto the inlet body until the fluid rod extends through the packing nut.
42. Align the inlet and outlet bodies and install the four socket head cap screws.
43. Tighten the screws appropriately.

**Note**      ***Nuts and bolts should always be tightened using the across method. Tighten the first to just over hand tight, then jump to the one directly opposite and tighten.***

44. Reattach the fluid section to the power head with the hex bolts, then reconnect to the slave arm drive.

## Operating Fluid Section

1. Check the solvent cup to make sure it is ½ full of oil.
2. Check the catalyst and material levels.
3. Inspect the material spray tip and O-ring; replace as necessary.
4. Inspect the catalyst tip assembly and O-rings (on ATC gun); replace as necessary.
5. Inspect the tip pin O-rings (on ATC gun) and replace if nicked or worn.
6. Assemble catalyst tip and material tip onto the ATC gun, as applicable.
7. Lubricate threads on the retaining ring and attach to the ATC gun, as applicable.
8. Inspect hose assemblies and connections for leaks or wear; replace as necessary.

**Note**      ***Do not wait until hose is so worn it may burst.***

9. Check the roving quantity, if applicable.
10. Inspect and replace the following, as necessary:
  - Chopper blades
  - Anvil sleeve
  - Cutter head bearing
  - Idler bearing
11. Inspect and adjust the following, as necessary and applicable:
  - Cutter head to anvil sleeve tension
  - Idler bearing to anvil sleeve tension
  - Chopper position for most efficient disbursement of chop into spray pattern
12. Oil the cutter assembly air motor as necessary (normally 2 to 3 drops per day, depending on usage).
13. Operate the system according to the instructions in your system's operations manual.

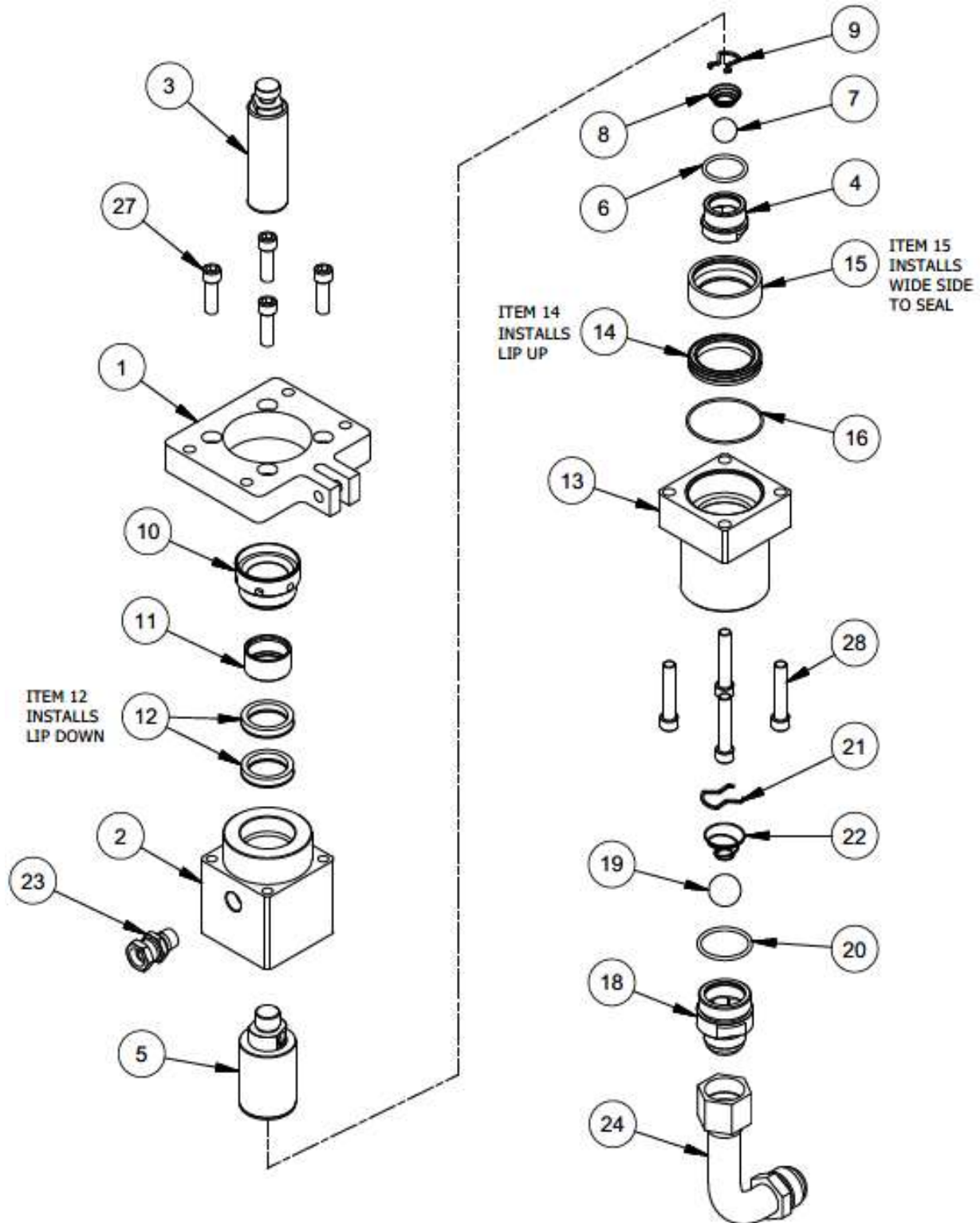
**Note**      ***Do not engage slave pump until material pump is primed.***

## Parts Drawings

The following illustrations are included for reference when repairing the unit and ordering parts. Make sure you are referring to the drawing specific to your equipment before ordering part numbers.

| Parts Drawings  |                                     |
|-----------------|-------------------------------------|
| Part Number     | Description                         |
| PAT-LS-12270    | Patriot Fluid Section               |
| PAT-LS-12270-3  | Patriot Fluid Section – 3 Component |
| PAT-LS-12270-AM | Patriot Fluid Section               |

| <b>Parts Drawings</b> |                                       |
|-----------------------|---------------------------------------|
| <b>Part Number</b>    | <b>Description</b>                    |
| PAT-LS-12270-AM-HD    | Patriot Fluid Section – Heavy Duty    |
| PAT-LS-12270-D        | Patriot Fluid Section – DUO Pump      |
| PAT-LS-12270-D1       | Patriot Fluid Section                 |
| PAT-LS-12270-GL       | Patriot Fluid Section                 |
| PAT-LS-12270-HD       | Patriot Fluid Section – Heavy Duty    |
| PAT-LS-12270-MC       | Patriot Fluid Section – Multi-Color   |
| PAT-LS-12270-P        | Patriot Fluid Section – Pro Innovator |
| PAT-LS-12270-RTM      | Patriot Fluid Section – RTM Unit      |
| PAT-LS-12270-AM-SK    | Patriot Fluid Section Seal Kit        |
| PAT-LS-12270-D-SK     | Patriot Fluid Section Seal Kit        |
| PAT-LS-12270-GL-SK    | Patriot Fluid Section Seal Kit        |
| PAT-LS-12270-R-SK     | Patriot Fluid Section Seal Kit        |
| PAT-LS-12270-SK       | Patriot Fluid Section Seal Kit        |
| PAT-LS-12270-AM-CK    | Patriot Fluid Section Conversion Kit  |
| PAT-LS-12270-GL-CK    | Patriot Fluid Section Conversion Kit  |
| PAT-LS-24050          | Patriot Fluid Section                 |
| PAT-LS-24050-AM       | Patriot Fluid Section                 |
| PAT-LS-24050-AM-HD    | Patriot Fluid Section - Heavy Duty    |
| PAT-LS-24050-GL       | Patriot Fluid Section                 |
| PAT-LS-24050-GL-HD    | Patriot Fluid Section – Heavy Duty    |
| PAT-LS-24050-HD       | Patriot Fluid Section – Heavy Duty    |
| PAT-LS-24050-HD-3     | Patriot Fluid Section – 3 Component   |
| PAT-LS-24050-MC       | Patriot Fluid Section – Multi-Color   |
| PAT-LS-24050-RTM      | Patriot Fluid Section – RTM Unit      |
| PAT-LS-24050-AM-SK    | Patriot Fluid Section Seal Kit        |
| PAT-LS-24050-GL-SK    | Patriot Fluid Section Seal Kit        |
| PAT-LS-24050-R-SK     | Patriot Fluid Section Seal Kit        |
| PAT-LS-24050-SK       | Patriot Fluid Section Seal Kit        |
| PAT-LS-24050-AM-CK    | Patriot Fluid Section Conversion Kit  |
| PAT-LS-24050-GL-CK    | Patriot Fluid Section Conversion Kit  |
| PAT-LS-49090          | Patriot Fluid Section                 |
| PAT-LS-49090-SK       | Patriot Fluid Section Seal Kit        |



# MAGNUM VENUS PLASTECH

ASSY - PATRIOT 1-1/4 dia. FLUID SECTION PAT-LS-12270

REV:A 07/18/2017

| PAT-LS-12270 PARTS LIST |                 |     |                   |
|-------------------------|-----------------|-----|-------------------|
| ITEM                    | PART NUMBER     | QTY | DESCRIPTION       |
| 1                       | PAT-LS-1003     | 1   | TRANSITION PLATE  |
| 2                       | PAT-LS-1001     | 1   | OUTLET BODY       |
| 3                       | PAT-LS-1008     | 1   | FLUID ROD 1-1/4   |
| 4                       | PAT-LS-1009     | 1   | PISTON VALVE      |
| 5                       | PAT-LS-1007     | 1   | PISTON            |
| * 6                     | O-E-3-916       | 1   | O-RING            |
| 7                       | VLS-2427        | 1   | 3/4" CHROME BALL  |
| 8                       | PAT-LS-1010     | 1   | SPRING            |
| 9                       | PAT-LS-1011     | 1   | SPRING RETAINER   |
| 10                      | PAT-LS-1004     | 1   | PACKING NUT       |
| 11                      | PAT-LS-1005     | 1   | ROD BUSHING       |
| * 12                    | PAT-LS-1016     | 2   | ROD SEAL ASSY     |
| 13                      | PAT-LS-1002     | 1   | INLET BODY        |
| * 14                    | PAT-LS-1014     | 1   | PISTON SEAL ASSY  |
| 15                      | PAT-LS-1013     | 1   | PISTON BUSHING    |
| * 16                    | O-E-035         | 1   | O-RING            |
| 18                      | PAT-LS-1015     | 1   | INLET VALVE       |
| 19                      | PAT-LS-1017     | 1   | 1" CHROME BALL    |
| * 20                    | O-E-3-920       | 1   | O-RING            |
| 21                      | VLS-2420        | 1   | BALL STOP         |
| 22                      | 3102-16-1       | 1   | FOOT VALVE SPRING |
| 23                      | PF-SW-06        | 1   | PIPE SWIVEL       |
| 24                      | PF-SE-SW-16J-LL | 1   | LONG SWIVEL ELBOW |
| 27                      | F-CS-06C-20     | 4   | CAP SCREW         |
| 28                      | F-CS-06C-32     | 4   | ALLEN CAP SCREW   |

### REPAIR KITS

| PART No.          | DESCRIPTION |
|-------------------|-------------|
| * PAT-LS-12270-SK | SEAL KIT    |

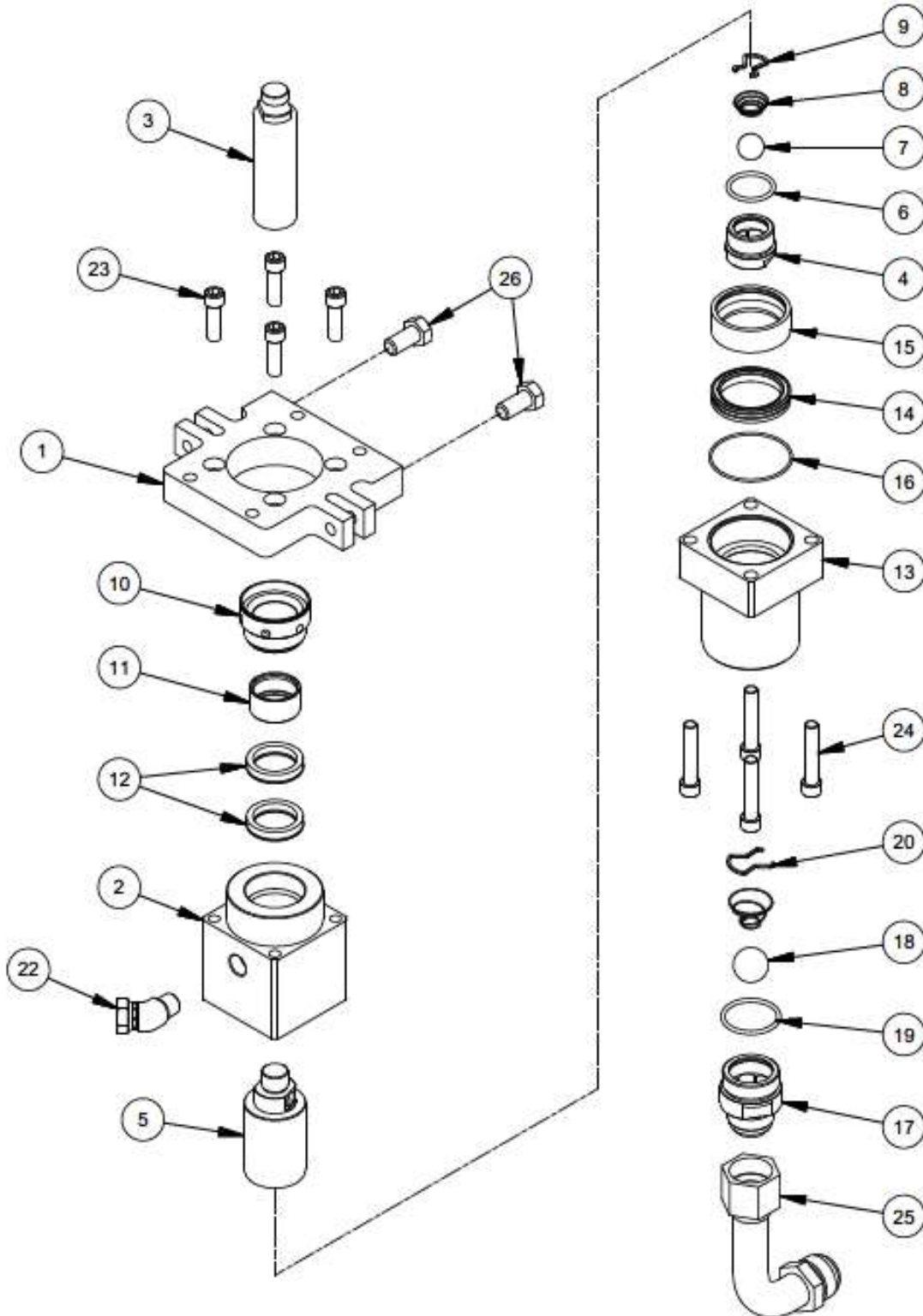
\* NOTE: ASTERISKS DENOTE PARTS USED IN SEAL KIT.

# MAGNUM VENUS PLASTECH

ASSY - PATRIOT 1-1/4 dia. FLUID SECTION PAT-LS-12270

REV:A 07/18/2017





# MAGNUM VENUS PLASTECH

FLUID SECTION ASSEMBLY - 3 COMPONENT PATRIOT

PAT-LS-12270-3

REV:

SHEET 1 / 2

6/24/2014

| Parts List |                  |     |                                |
|------------|------------------|-----|--------------------------------|
| ITEM       | PART NUMBER      | QTY | DESCRIPTION                    |
| 1          | PAT-LS-1003-DL   | 1   | TRANSITION PLATE - 3 COMPONENT |
| 2          | PAT-LS-1001      | 1   | OUTLET BODY                    |
| 3          | PAT-LS-1008      | 1   | FLUID ROD 1-1/4                |
| 4          | PAT-LS-1009      | 1   | PISTON VALVE                   |
| 5          | PAT-LS-1007      | 1   | PISTON                         |
| * 6        | O-E-3-916        | 1   | O-RING                         |
| 7          | VLS-2427         | 1   | 3/4" CHROME BALL               |
| 8          | PAT-LS-1010      | 1   | SPRING                         |
| 9          | PAT-LS-1011      | 1   | SPRING RETAINER                |
| 10         | PAT-LS-1004      | 1   | PACKING NUT                    |
| 11         | PAT-LS-1005      | 1   | ROD BUSHING                    |
| * 12       | PAT-LS-1016      | 2   | ROD SEAL ASSY                  |
| 13         | PAT-LS-1002      | 1   | INLET BODY                     |
| * 14       | PAT-LS-1014      | 1   | PISTON SEAL ASSY               |
| 15         | PAT-LS-1013      | 1   | PISTON BUSHING                 |
| * 16       | O-E-035          | 1   | O-RING                         |
| 17         | PAT-LS-1015      | 1   | INLET VALVE                    |
| 18         | PAT-LS-1017      | 1   | 1" CHROME BALL                 |
| * 19       | O-E-3-920        | 1   | O-RING                         |
| 20         | VLS-2420         | 1   | BALL STOP                      |
| 21         | 3102-16-1        | 1   | FOOT VALVE SPRING              |
| 22         | PF-SW-45-06M-06F | 1   | 45° PIPE SWIVEL                |
| 23         | F-CS-06C-20      | 4   | CAP SCREW                      |
| 24         | F-CS-06C-32      | 4   | ALLEN CAP SCREW                |
| 25         | PF-SE-SW-16J-LL  | 1   | LONG SWIVEL ELBOW              |
| 26         | F-HB-08C-16      | 2   | HEX BOLT                       |

REPAIR KITS

| PART No.          | DESCRIPTION |
|-------------------|-------------|
| * PAT-LS-12270-SK | SEAL KIT    |

\* NOTE: ASTERISKS DENOTE PARTS USED IN SEAL KIT.

# MAGNUM VENUS PLASTECH

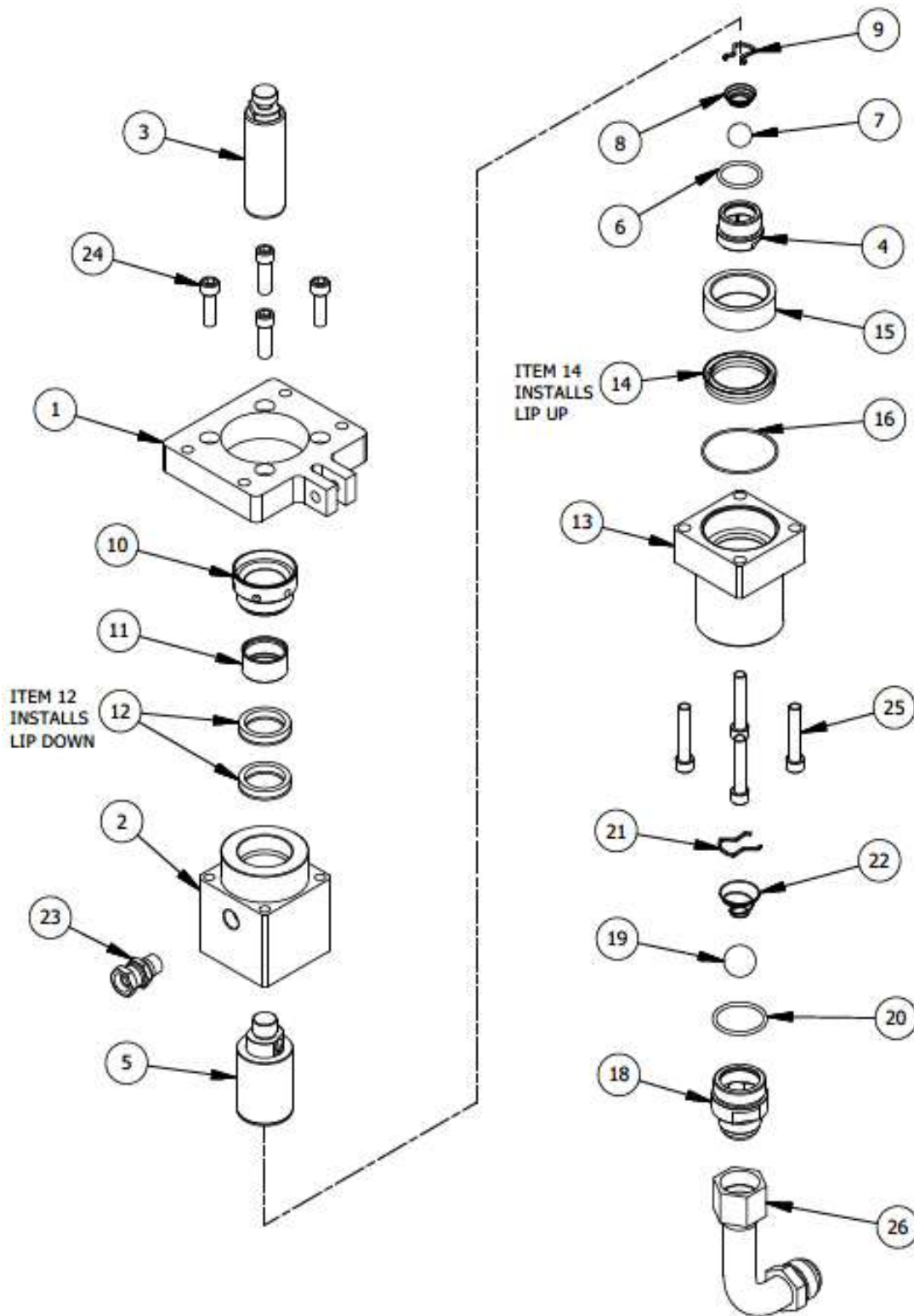
FLUID SECTION ASSEMBLY - 3 COMPONENT PATRIOT

PAT-LS-12270-3

REV:

SHEET 2 / 2

6/24/2014



# MAGNUM VENUS PLASTECH

PATRIOT 1-1/4 DIAMETER FLUID SECTION

PAT-LS-12270-AM

REV:

SHEET 1 / 2

8/18/2009

| Parts List |                 |     |                   |
|------------|-----------------|-----|-------------------|
| ITEM       | PART NUMBER     | QTY | DESCRIPTION       |
| 1          | PAT-LS-1003     | 1   | TRANSITION PLATE  |
| 2          | PAT-LS-1001     | 1   | OUTLET BODY       |
| 3          | PAT-LS-1008     | 1   | FLUID ROD 1-1/4   |
| 4          | PAT-LS-1009     | 1   | PISTON VALVE      |
| 5          | PAT-LS-1007     | 1   | PISTON            |
| * 6        | O-E-3-916       | 1   | O-RING            |
| 7          | VLS-2427        | 1   | 3/4" CHROME BALL  |
| 8          | PAT-LS-1010     | 1   | SPRING            |
| 9          | PAT-LS-1011     | 1   | SPRING RETAINER   |
| 10         | PAT-LS-1004     | 1   | PACKING NUT       |
| 11         | PAT-LS-1005     | 1   | ROD BUSHING       |
| * 12       | PAT-LS-1016-SP  | 2   | ROD SEAL          |
| 13         | PAT-LS-1002     | 1   | INLET BODY        |
| * 14       | PAT-LS-1014-SP  | 1   | PISTON SEAL       |
| 15         | PAT-LS-1013-NT  | 1   | PISTON BEARING    |
| * 16       | O-E-035         | 1   | O-RING            |
| 18         | PAT-LS-1015     | 1   | INLET VALVE       |
| 19         | PAT-LS-1017     | 1   | 1" CHROME BALL    |
| * 20       | O-E-3-920       | 1   | O-RING            |
| 21         | VLS-2420        | 1   | BALL STOP         |
| 22         | 3102-16-1       | 1   | FOOT VALVE SPRING |
| 23         | PF-SW-06        | 1   | PIPE SWIVEL       |
| 24         | F-CS-06C-20     | 4   | CAP SCREW         |
| 25         | F-CS-06C-32     | 4   | ALLEN CAP SCREW   |
| 26         | PF-SE-SW-16J-LL | 1   | LONG SWIVEL ELBOW |

**REPAIR KITS**

| PART No.             | DESCRIPTION |
|----------------------|-------------|
| * PAT-LS-12270-AM-SK | SEAL KIT    |

\* NOTE: ASTERISKS DENOTE PARTS USED IN SEAL KIT

# MAGNUM VENUS PLASTECH

PATRIOT 1-1/4 DIAMETER FLUID SECTION

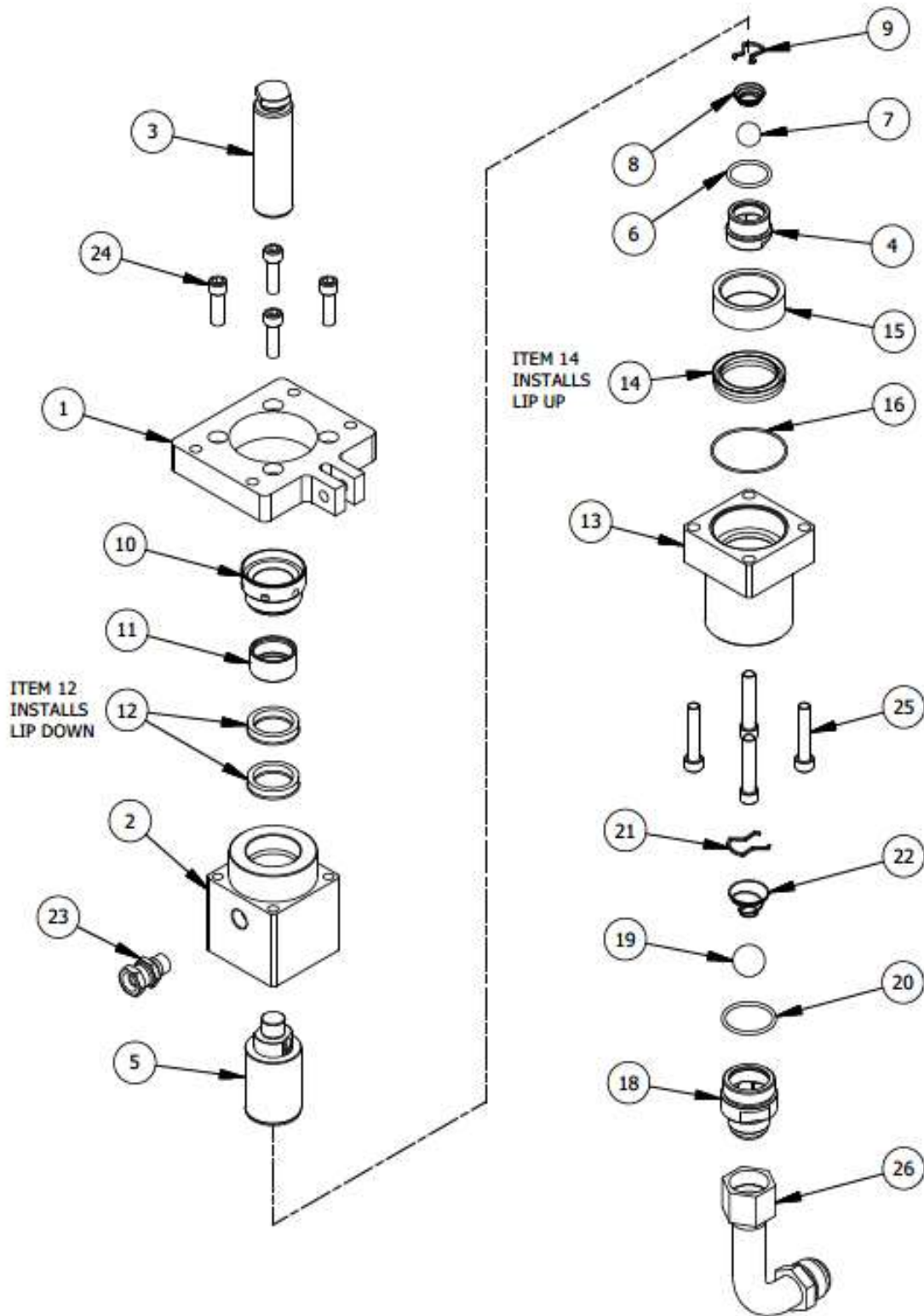
PAT-LS-12270-AM

REV:

SHEET 2 / 2

8/18/2009





# MAGNUM VENUS PLASTECH

|                                  |                    |
|----------------------------------|--------------------|
| PATRIOT 1-1/4 DIA. FLUID SECTION | PAT-LS-12270-AM-HD |
|----------------------------------|--------------------|

REV:

SHEET 1 / 2

8/13/2013

| Parts List |                 |     |                   |
|------------|-----------------|-----|-------------------|
| ITEM       | PART NUMBER     | QTY | DESCRIPTION       |
| 1          | PAT-LS-1003     | 1   | TRANSITION PLATE  |
| 2          | PAT-LS-1001     | 1   | OUTLET BODY       |
| 3          | PAT-LS-1008-HD  | 1   | FLUID ROD - HD    |
| 4          | PAT-LS-1009     | 1   | PISTON VALVE      |
| 5          | PAT-LS-1007     | 1   | PISTON            |
| *          | O-E-3-916       | 1   | O-RING            |
| 7          | VLS-2427        | 1   | 3/4" CHROME BALL  |
| 8          | PAT-LS-1010     | 1   | SPRING            |
| 9          | PAT-LS-1011     | 1   | SPRING RETAINER   |
| 10         | PAT-LS-1004     | 1   | PACKING NUT       |
| 11         | PAT-LS-1005     | 1   | ROD BUSHING       |
| *          | PAT-LS-1016-SP  | 2   | ROD SEAL          |
| 13         | PAT-LS-1002     | 1   | INLET BODY        |
| *          | PAT-LS-1014-SP  | 1   | PISTON SEAL       |
| 15         | PAT-LS-1013-NT  | 1   | PISTON BEARING    |
| *          | O-E-035         | 1   | O-RING            |
| 18         | PAT-LS-1015     | 1   | INLET VALVE       |
| 19         | PAT-LS-1017     | 1   | 1" CHROME BALL    |
| *          | O-E-3-920       | 1   | O-RING            |
| 21         | VLS-2420        | 1   | BALL STOP         |
| 22         | 3102-16-1       | 1   | FOOT VALVE SPRING |
| 23         | PF-SW-06        | 1   | PIPE SWIVEL       |
| 24         | F-CS-06C-20     | 4   | CAP SCREW         |
| 25         | F-CS-06C-32     | 4   | ALLEN CAP SCREW   |
| 26         | PF-SE-SW-16J-LL | 1   | LONG SWIVEL ELBOW |

**REPAIR KITS**

| PART No.             | DESCRIPTION |
|----------------------|-------------|
| * PAT-LS-12270-AM-SK | SEAL KIT    |

\* NOTE: ASTERISKS DENOTE PARTS USED IN SEAL KIT.

# MAGNUM VENUS PLASTECH

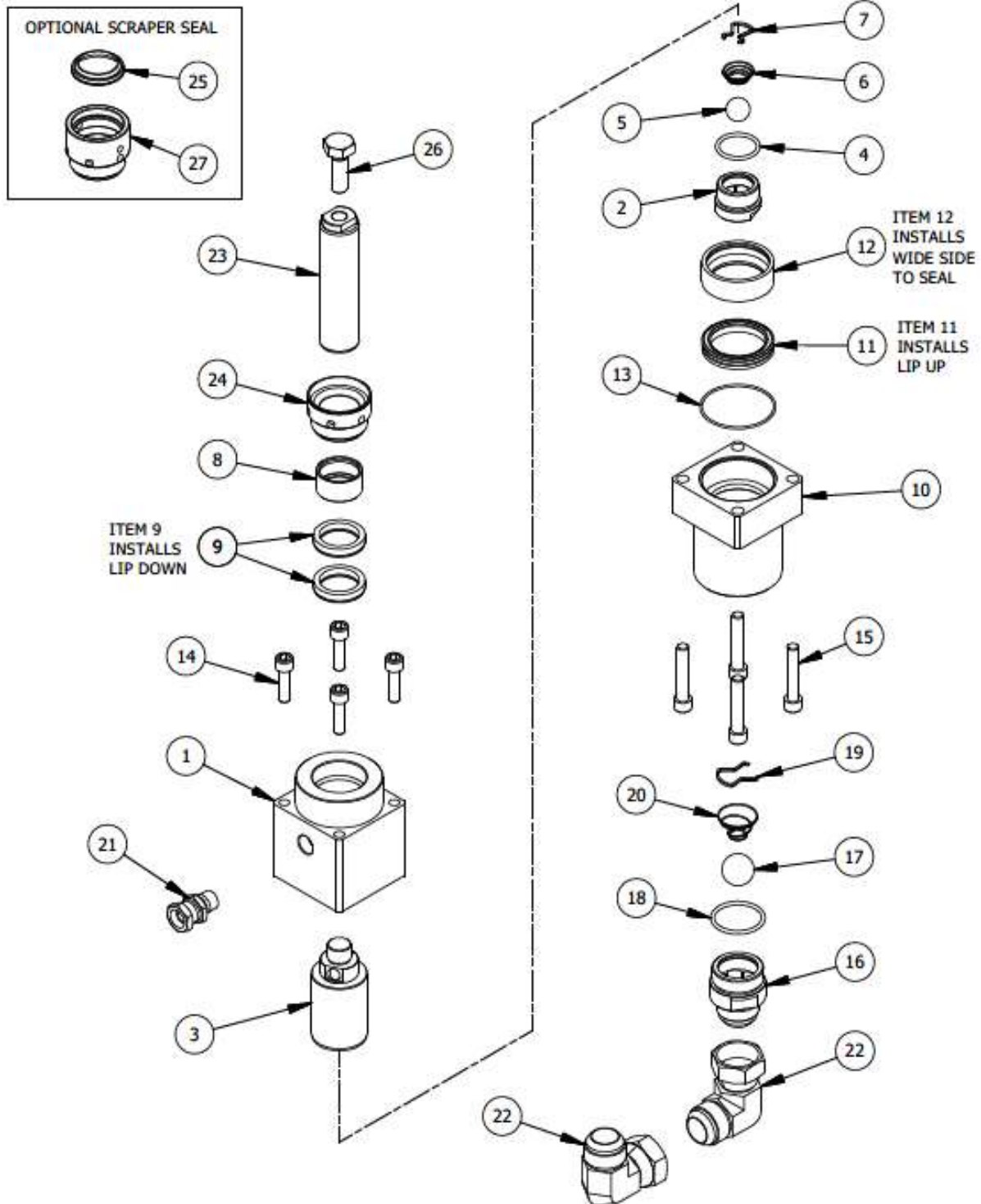
PATRIOT 1-1/4 DIA. FLUID SECTION

PAT-LS-12270-AM-HD

REV:

SHEET 2 / 2

8/13/2013



# MAGNUM VENUS PLASTECH

FLUID SECTION - DUO PUMP

PAT-LS-12270-D

REV:B 02/29/12

SHEET 1 / 2

1/28/2010

| Parts List |                 |     |                   |
|------------|-----------------|-----|-------------------|
| ITEM       | PART NUMBER     | QTY | DESCRIPTION       |
| 1          | PAT-LS-1001     | 1   | OUTLET BODY       |
| 2          | PAT-LS-1009     | 1   | PISTON VALVE      |
| 3          | PAT-LS-1007     | 1   | PISTON            |
| * 4        | O-E-3-916       | 1   | O-RING            |
| 5          | VLS-2427        | 1   | 3/4" CHROME BALL  |
| 6          | PAT-LS-1010     | 1   | SPRING            |
| 7          | PAT-LS-1011     | 1   | SPRING RETAINER   |
| 8          | PAT-LS-1005     | 1   | ROD BUSHING       |
| * 9        | PAT-LS-1016     | 2   | ROD SEAL ASSY     |
| 10         | PAT-LS-1002     | 1   | INLET BODY        |
| * 11       | PAT-LS-1014     | 1   | PISTON SEAL ASSY  |
| * 12       | PAT-LS-1013     | 1   | PISTON BUSHING    |
| * 13       | O-E-035         | 1   | O-RING            |
| 14         | F-CS-06C-20     | 4   | CAP SCREW         |
| 15         | F-CS-06C-32     | 4   | CAP SCREW         |
| 16         | PAT-LS-1015     | 1   | INLET VALVE       |
| 17         | PAT-LS-1017     | 1   | 1" CHROME BALL    |
| * 18       | O-E-3-920       | 1   | O-RING            |
| 19         | VLS-2420        | 1   | BALL STOP         |
| 20         | 3102-16-1       | 1   | FOOT VALVE SPRING |
| 21         | PF-SW-06        | 1   | PIPE SWIVEL       |
| 22         | PF-SE-SW-16J    | 2   | SWIVEL ELBOW JIC  |
| 23         | PAT-LS-1028     | 1   | FLUID ROD         |
| 24         | PAT-LS-1004     | 1   | PACKING NUT       |
| 26         | F-HB-08F-24-GR5 | 1   | HEX BOLT          |

OPTIONAL PARTS

| ITEM | PART NUMBER | QTY | DESCRIPTION  |
|------|-------------|-----|--------------|
| 25   | PAT-LS-1020 | 1   | SCRAPER SEAL |
| 27   | PAT-LS-1019 | 1   | PACKING NUT  |

REPAIR KITS

|                   |             |
|-------------------|-------------|
| PART No.          | DESCRIPTION |
| * PAT-LS-12270-SK | SEAL KIT    |

\* NOTE: ASTERISKS DENOTE PARTS USED IN SEAL KIT

# MAGNUM VENUS PLASTECH

FLUID SECTION - DUO PUMP

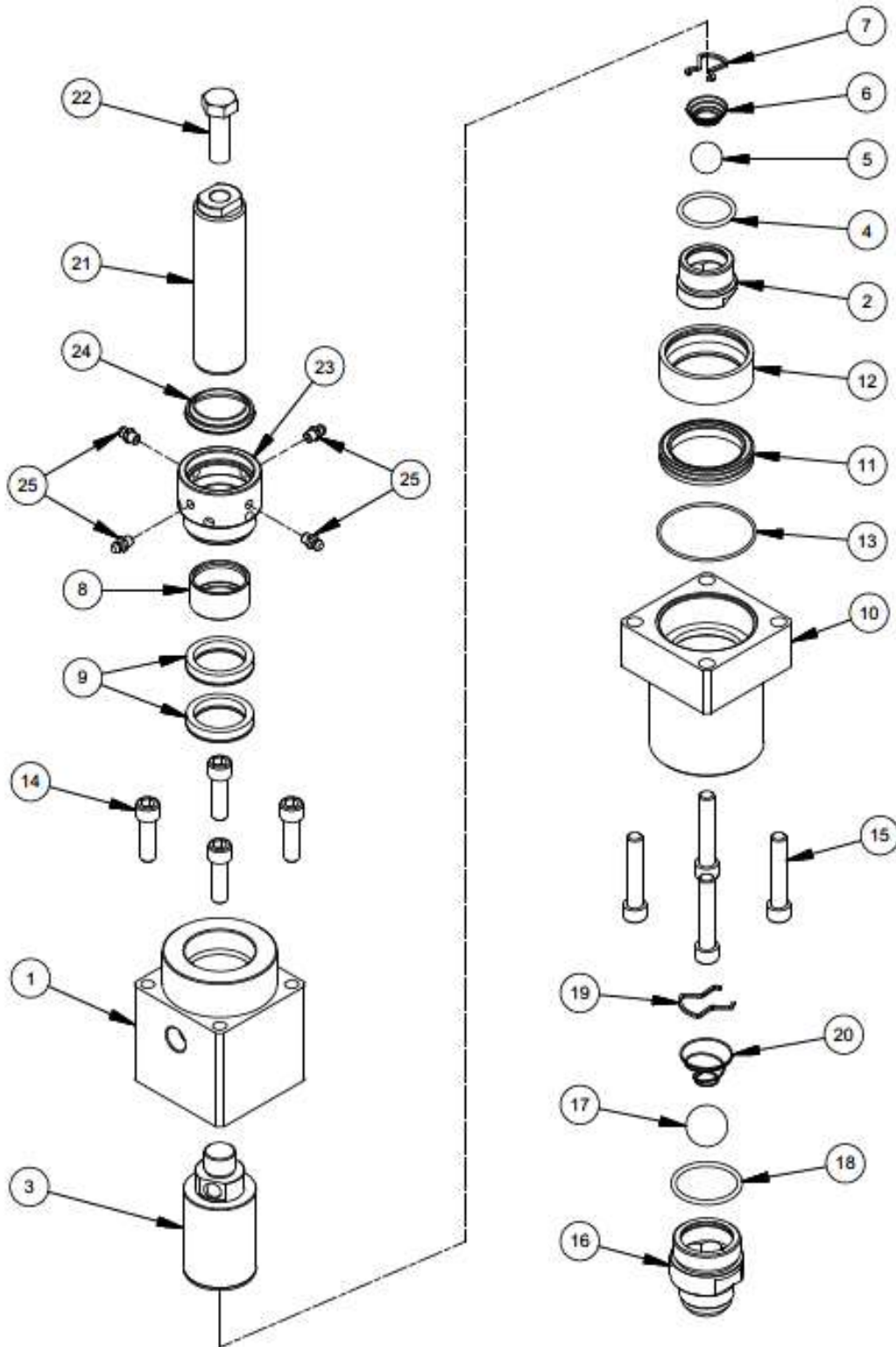
PAT-LS-12270-D

REV:B 02/29/12

SHEET 2 / 2

1/28/2010





# MAGNUM VENUS PLASTECH

FLUID SECTION ASSEMBLY

PAT-LS-12270-D1

REV: A 01/16/2013

SHEET 1 / 2

3/23/2012

| Parts List |             |     |                   |
|------------|-------------|-----|-------------------|
| ITEM       | PART NUMBER | QTY | DESCRIPTION       |
|            | 1           | 1   | OUTLET BODY       |
|            | 2           | 1   | PISTON VALVE      |
|            | 3           | 1   | PISTON            |
| *          | 4           | 1   | O-RING            |
|            | 5           | 1   | 3/4" CHROME BALL  |
|            | 6           | 1   | SPRING            |
|            | 7           | 1   | SPRING RETAINER   |
|            | 8           | 1   | ROD BUSHING       |
| *          | 9           | 2   | ROD SEAL ASSY     |
|            | 10          | 1   | INLET BODY        |
| *          | 11          | 1   | PISTON SEAL ASSY  |
|            | 12          | 1   | PISTON BUSHING    |
| *          | 13          | 1   | O-RING            |
|            | 14          | 4   | CAP SCREW         |
|            | 15          | 4   | CAP SCREW         |
|            | 16          | 1   | INLET VALVE       |
|            | 17          | 1   | 1" CHROME BALL    |
| *          | 18          | 1   | O-RING            |
|            | 19          | 1   | BALL STOP         |
|            | 20          | 1   | FOOT VALVE SPRING |
|            | 21          | 1   | FLUID ROD         |
|            | 22          | 1   | HEX BOLT          |
|            | 23          | 1   | PACKING NUT       |
| *          | 24          | 1   | SCRAPER SEAL      |
|            | 25          | 4   | GREASE FITTING    |

REPAIR KIT

| PART No.          | DESCRIPTION |
|-------------------|-------------|
| * UDS-LS-12270-SK | SEAL KIT    |

\* ASTERISKS DENOTE PARTS IN SEAL KIT

# MAGNUM VENUS PLASTECH

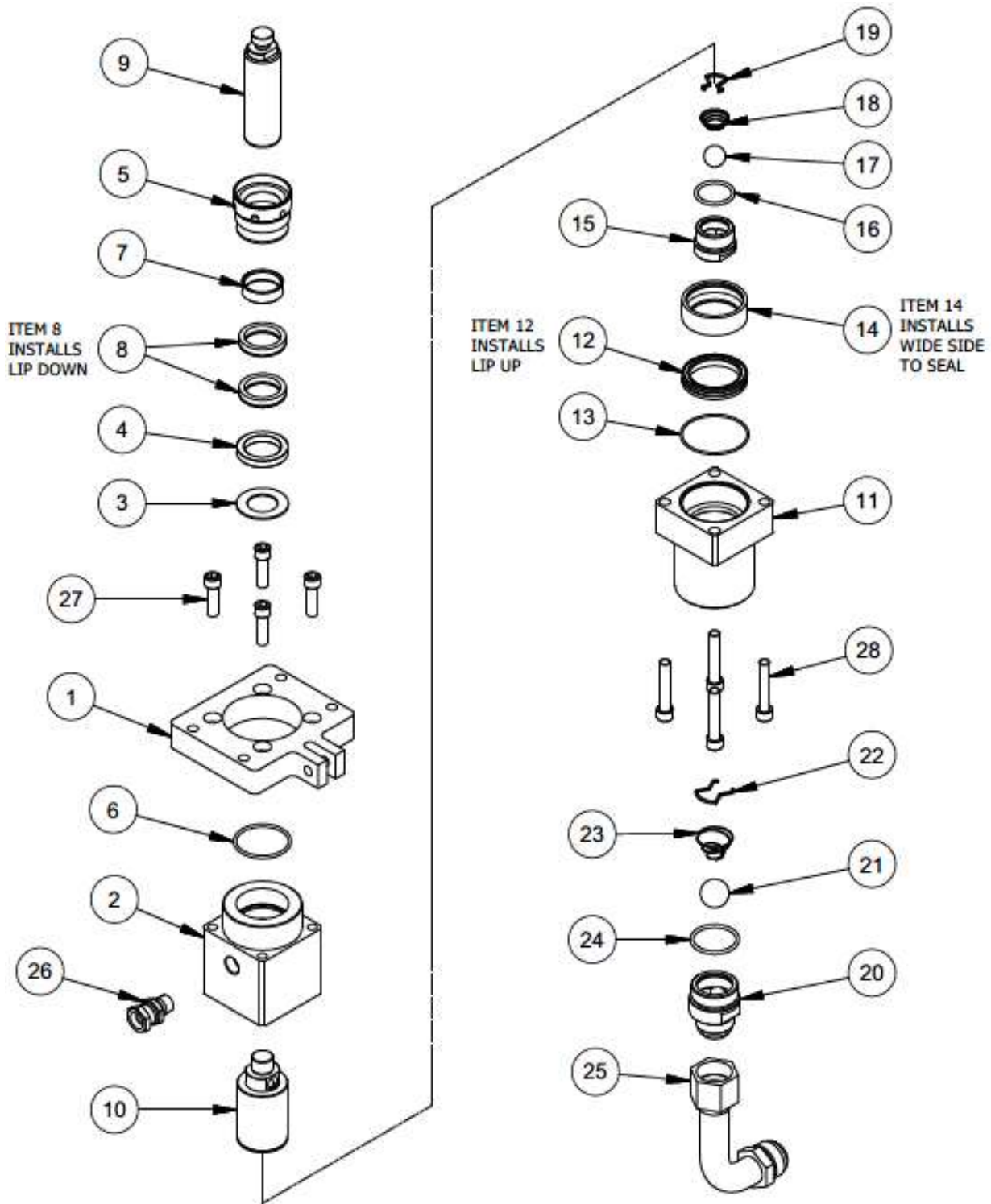
FLUID SECTION ASSEMBLY

PAT-LS-12270-D1

REV: A 01/16/2013

SHEET 2 / 2

3/23/2012



# MAGNUM VENUS PLASTECH

PATRIOT FLUID SECTION

PAT-LS-12270-GL

REV:A 07/20/2017

| Parts List |                    |     |                   |
|------------|--------------------|-----|-------------------|
| ITEM       | PART NUMBER        | QTY | DESCRIPTION       |
|            | 1 PAT-LS-1003      | 1   | TRANSITION PLATE  |
|            | 2 PAT-LS-1001-GL   | 1   | OUTLET BODY       |
| *          | 3 PAT-LS-1024      | 1   | GLUTTON SEAL      |
|            | 4 PAT-LS-1023      | 1   | SPACER            |
|            | 5 PAT-LS-1004-GL   | 1   | SOLVENT CUP       |
| *          | 6 O-E-133          | 1   | O-RING            |
|            | 7 PAT-LS-1005-GL   | 1   | ROD BUSHING       |
| *          | 8 PAT-LS-1016      | 2   | ROD SEAL ASSY     |
|            | 9 PAT-LS-1008      | 1   | FLUID ROD 1-1/4   |
|            | 10 PAT-LS-1007     | 1   | PISTON            |
|            | 11 PAT-LS-1002     | 1   | INLET BODY        |
| *          | 12 PAT-LS-1014     | 1   | PISTON SEAL ASSY  |
| *          | 13 O-E-035         | 1   | O-RING            |
|            | 14 PAT-LS-1013     | 1   | PISTON BUSHING    |
|            | 15 PAT-LS-1009     | 1   | PISTON VALVE      |
| *          | 16 O-E-3-916       | 1   | O-RING            |
|            | 17 VLS-2427        | 1   | 3/4" CHROME BALL  |
|            | 18 PAT-LS-1010     | 1   | SPRING            |
|            | 19 PAT-LS-1011     | 1   | SPRING RETAINER   |
|            | 20 PAT-LS-1015     | 1   | INLET VALVE       |
|            | 21 PAT-LS-1017     | 1   | 1" CHROME BALL    |
|            | 22 VLS-2420        | 1   | BALL STOP         |
|            | 23 3102-16-1       | 1   | FOOT VALVE SPRING |
| *          | 24 O-E-3-920       | 1   | O-RING            |
|            | 25 PF-SE-SW-16J-LL | 1   | LONG SWIVEL ELBOW |
|            | 26 PF-SW-06        | 1   | PIPE SWIVEL       |
|            | 27 F-CS-06C-20     | 4   | CAP SCREW         |
|            | 28 F-CS-06C-32     | 4   | ALLEN CAP SCREW   |

**REPAIR KITS**

| PART No.             | DESCRIPTION |
|----------------------|-------------|
| * PAT-LS-12270-GL-SK | SEAL KIT    |

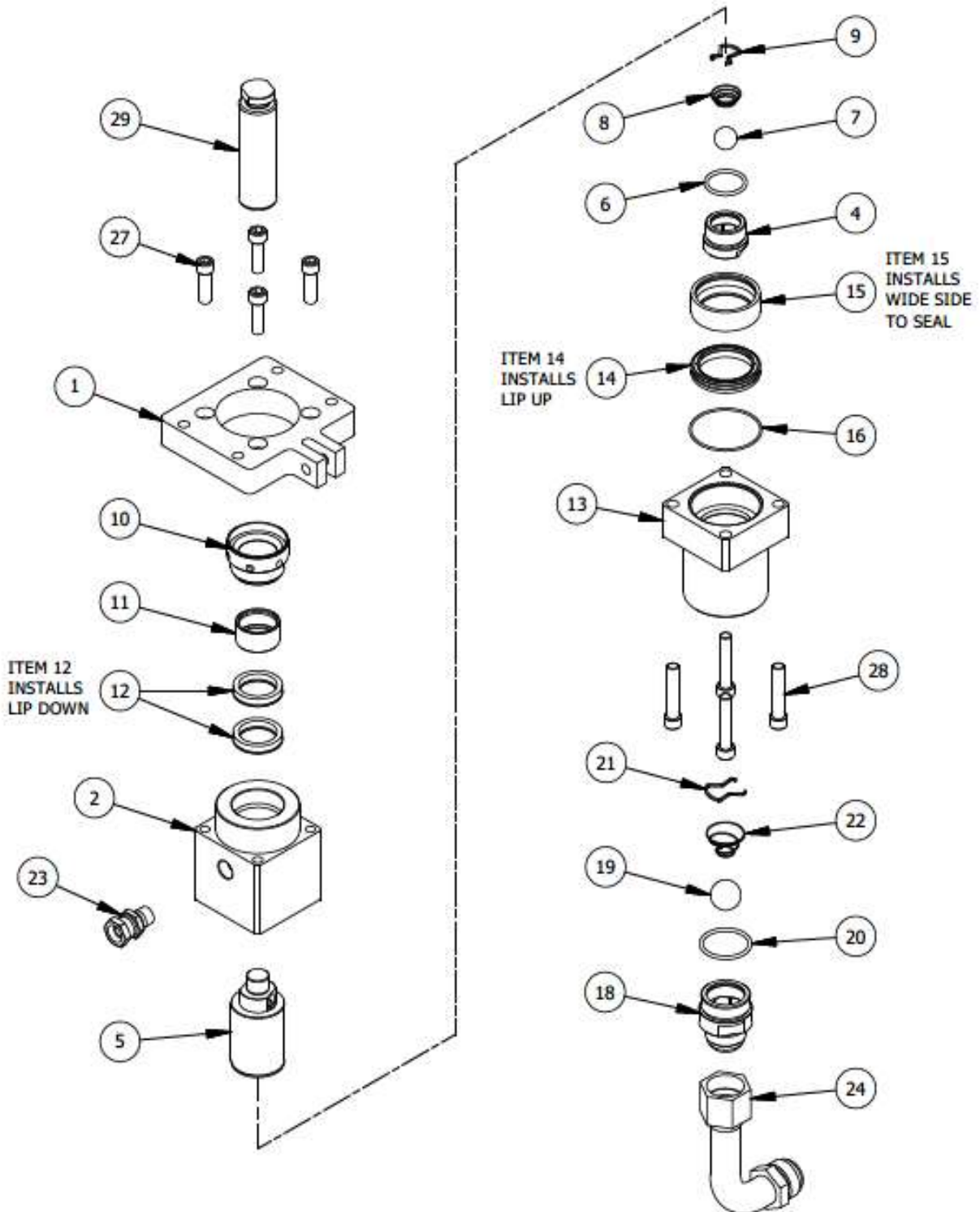
\*NOTE: ASTERISKS DENOTE PARTS USED IN SEAL KIT

**MAGNUM VENUS PLASTECH**

PATRIOT FLUID SECTION

PAT-LS-12270-GL

REV:A 07/20/2017



# MAGNUM VENUS PLASTECH

PATRIOT 1-1/4 DIA. FLUID SECTION

PAT-LS-12270-HD

REV:A 07/20/2017

| Parts List |             |                 |                     |
|------------|-------------|-----------------|---------------------|
| ITEM       | PART NUMBER | QTY             | DESCRIPTION         |
| 1          | PAT-LS-1003 | 1               | TRANSITION PLATE    |
| 2          | PAT-LS-1001 | 1               | OUTLET BODY         |
| 4          | PAT-LS-1009 | 1               | PISTON VALVE        |
| 5          | PAT-LS-1007 | 1               | PISTON              |
| *          | 6           | O-E-3-916       | 1 O-RING            |
|            | 7           | VLS-2427        | 1 3/4" CHROME BALL  |
|            | 8           | PAT-LS-1010     | 1 SPRING            |
|            | 9           | PAT-LS-1011     | 1 SPRING RETAINER   |
|            | 10          | PAT-LS-1004     | 1 PACKING NUT       |
|            | 11          | PAT-LS-1005     | 1 ROD BUSHING       |
| *          | 12          | PAT-LS-1016     | 2 ROD SEAL ASSY     |
|            | 13          | PAT-LS-1002     | 1 INLET BODY        |
| *          | 14          | PAT-LS-1014     | 1 PISTON SEAL ASSY  |
|            | 15          | PAT-LS-1013     | 1 PISTON BUSHING    |
| *          | 16          | O-E-035         | 1 O-RING            |
|            | 18          | PAT-LS-1015     | 1 INLET VALVE       |
|            | 19          | PAT-LS-1017     | 1 1" CHROME BALL    |
| *          | 20          | O-E-3-920       | 1 O-RING            |
|            | 21          | VLS-2420        | 1 BALL STOP         |
|            | 22          | 3102-16-1       | 1 FOOT VALVE SPRING |
|            | 23          | PF-SW-06        | 1 PIPE SWIVEL       |
|            | 24          | PF-SE-SW-16J-LL | 1 LONG SWIVEL ELBOW |
|            | 27          | F-CS-06C-20     | 4 CAP SCREW         |
|            | 28          | F-CS-06C-32     | 4 ALLEN CAP SCREW   |
|            | 29          | PAT-LS-1008-HD  | 1 FLUID ROD - HD    |

### REPAIR KITS

| PART No.          | DESCRIPTION |
|-------------------|-------------|
| * PAT-LS-12270-SK | SEAL KIT    |

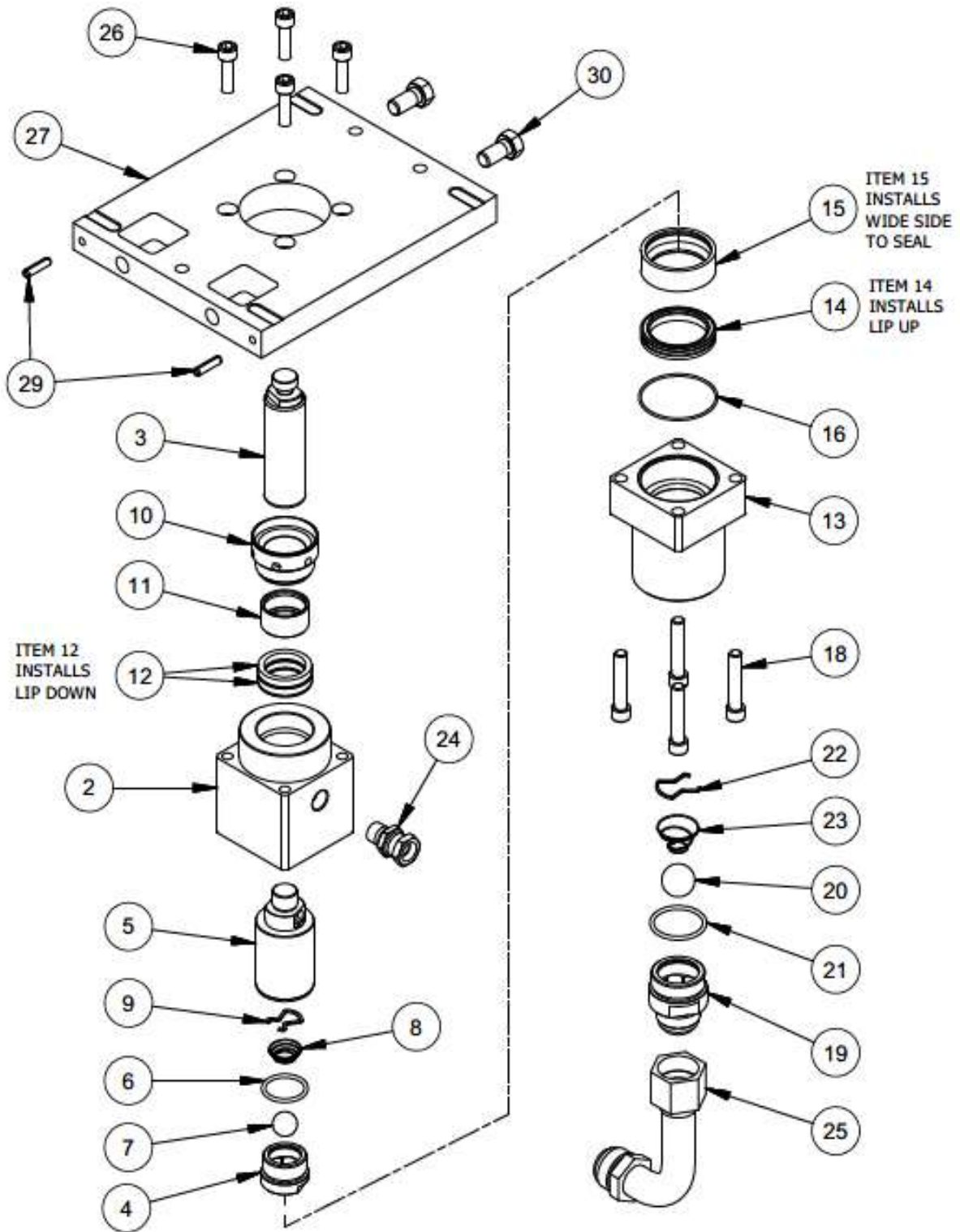
\* NOTE: ASTERISKS DENOTE PARTS USED IN SEAL KIT.

# MAGNUM VENUS PLASTECH

PATRIOT 1-1/4 DIA. FLUID SECTION

PAT-LS-12270-HD

REV:A 07/20/2017



# MAGNUM VENUS PLASTECH

FLUID SECTION ASSEMBLY

PAT-LS-12270-MC

REV:A 07/20/2017

| Parts List |                    |     |                             |
|------------|--------------------|-----|-----------------------------|
| ITEM       | PART NUMBER        | QTY | DESCRIPTION                 |
|            | 2 PAT-LS-1001      | 1   | OUTLET BODY                 |
|            | 3 PAT-LS-1008      | 1   | FLUID ROD 1-1/4             |
|            | 4 PAT-LS-1009      | 1   | PISTON VALVE                |
|            | 5 PAT-LS-1007      | 1   | PISTON                      |
| *          | 6 O-E-3-916        | 1   | O-RING                      |
|            | 7 VLS-2427         | 1   | 3/4" CHROME BALL            |
|            | 8 PAT-LS-1010      | 1   | SPRING                      |
|            | 9 PAT-LS-1011      | 1   | SPRING RETAINER             |
|            | 10 PAT-LS-1004     | 1   | PACKING NUT                 |
|            | 11 PAT-LS-1005     | 1   | ROD BUSHING                 |
| *          | 12 PAT-LS-1016     | 2   | ROD SEAL ASSY               |
|            | 13 PAT-LS-1002     | 1   | INLET BODY                  |
| *          | 14 PAT-LS-1014     | 1   | PISTON SEAL ASSY            |
|            | 15 PAT-LS-1013     | 1   | PISTON BUSHING              |
| *          | 16 O-E-035         | 1   | O-RING                      |
|            | 18 F-CS-06C-32     | 4   | HEX SOCKET CAP SCREW - Inch |
|            | 19 PAT-LS-1015     | 1   | INLET VALVE                 |
|            | 20 PAT-LS-1017     | 1   | 1" CHROME BALL              |
| *          | 21 O-E-3-920       | 1   | O-RING                      |
|            | 22 VLS-2420        | 1   | BALL STOP                   |
|            | 23 3102-16-1       | 1   | FOOT VALVE SPRING           |
|            | 24 PF-SW-06        | 1   | PIPE SWIVEL                 |
|            | 25 PF-SE-SW-16J-LL | 1   | LONG SWIVEL ELBOW           |
|            | 26 F-CS-06C-20     | 4   | CAP SCREW                   |
|            | 27 PAT-LS-1003-MC  | 1   | PUMP MOUNT PLATE            |
|            | 29 F-RP-04-16      | 2   | ROLL PIN                    |
|            | 30 F-HB-08C-16     | 2   | HEX BOLT                    |

### REPAIR KITS

| PART No.          | DESCRIPTION |
|-------------------|-------------|
| * PAT-LS-12270-SK | SEAL KIT    |

\* NOTE: ASTERISKS DENOTE PARTS USED IN SEAL KIT.

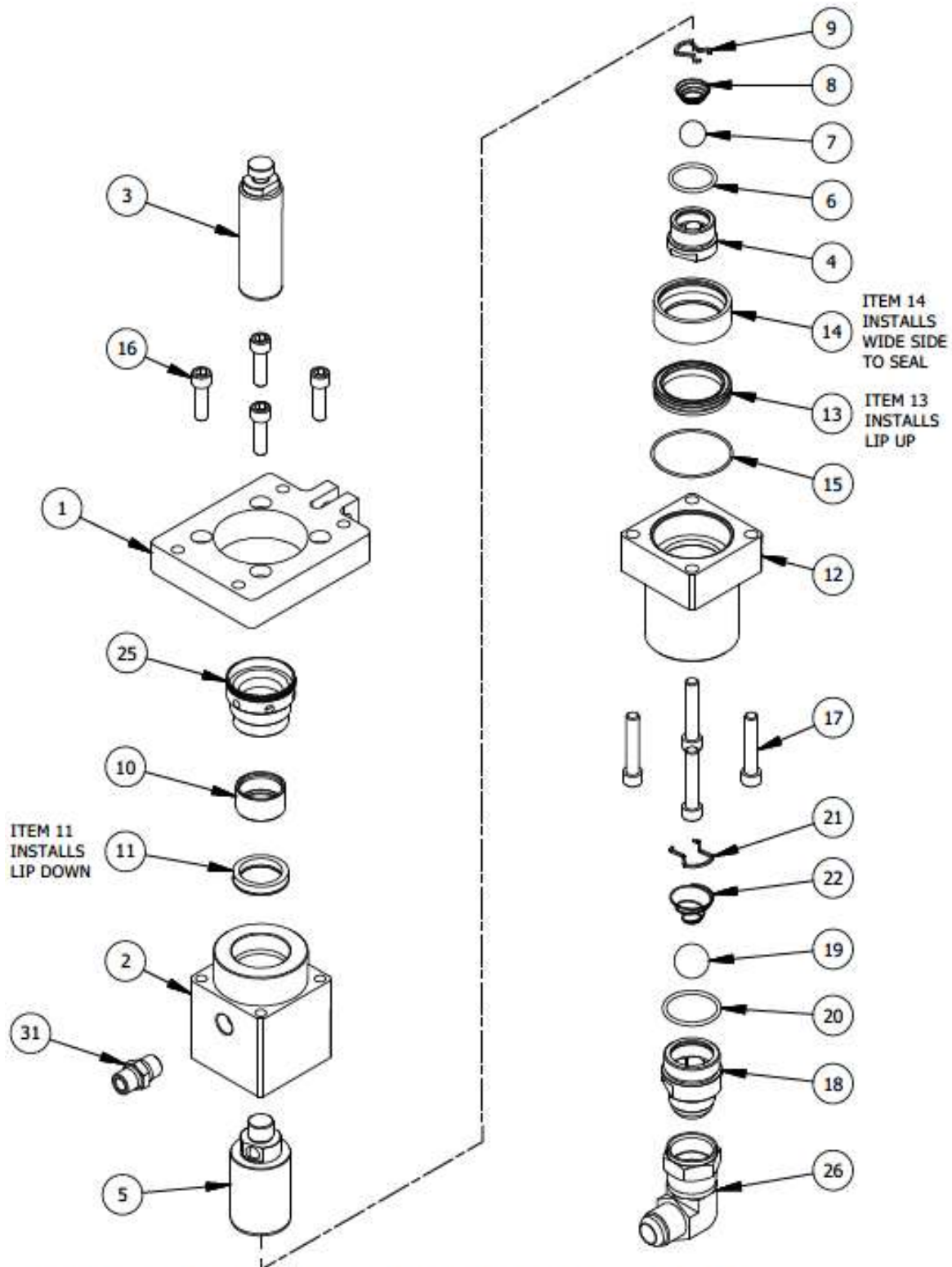
# MAGNUM VENUS PLASTECH

FLUID SECTION ASSEMBLY

PAT-LS-12270-MC

REV:A 07/20/2017





# MAGNUM VENUS PLASTECH

INNOVATOR PRO FLUID SECTION

PAT-LS-12270-P

REV:

SHEET 1 / 2

9/9/2010

| Parts List |                  |     |                   |
|------------|------------------|-----|-------------------|
| ITEM       | PART NUMBER      | QTY | DESCRIPTION       |
| 1          | PAT-TRPLT-6343   | 1   | TRANSITION PLATE  |
| 2          | PAT-LS-1001      | 1   | OUTLET BODY       |
| 3          | PAT-LS-1008      | 1   | FLUID ROD 1-1/4   |
| 4          | PAT-LS-1009      | 1   | PISTON VALVE      |
| 5          | PAT-LS-1007      | 1   | PISTON            |
| * 6        | O-E-3-916        | 1   | O-RING            |
| 7          | VLS-2427         | 1   | 3/4" CHROME BALL  |
| 8          | PAT-LS-1010      | 1   | SPRING            |
| 9          | PAT-LS-1011      | 1   | SPRING RETAINER   |
| 10         | PAT-LS-1005      | 1   | ROD BUSHING       |
| * 11       | PAT-LS-1016      | 1   | ROD SEAL ASSY     |
| 12         | PAT-LS-1002      | 1   | INLET BODY        |
| * 13       | PAT-LS-1014      | 1   | PISTON SEAL ASSY  |
| 14         | PAT-LS-1013      | 1   | PISTON BUSHING    |
| * 15       | O-E-035          | 1   | O-RING            |
| 16         | F-CS-06C-20      | 4   | CAP SCREW         |
| 17         | F-CS-06C-32      | 4   | CAP SCREW         |
| 18         | PAT-LS-1015      | 1   | INLET VALVE       |
| 19         | PAT-LS-1017      | 1   | 1" CHROME BALL    |
| * 20       | O-E-3-920        | 1   | O-RING            |
| 21         | VLS-2420         | 1   | BALL STOP         |
| 22         | 3102-16-1        | 1   | FOOT VALVE SPRING |
| 25         | PAT-LS-1006      | 1   | PACKING NUT - RTM |
| 26         | PF-SE-SW-16J-12J | 1   | SWIVEL ELBOW      |
| 31         | PF-HN-06         | 1   | NIPPLE            |

**REPAIR KITS**

| PART No.            | DESCRIPTION |
|---------------------|-------------|
| * PAT-LS-12270-R-SK | SEAL KIT    |

\* NOTE: ASTERISKS DENOTE PARTS USED IN SEAL KIT.

# MAGNUM VENUS PLASTECH

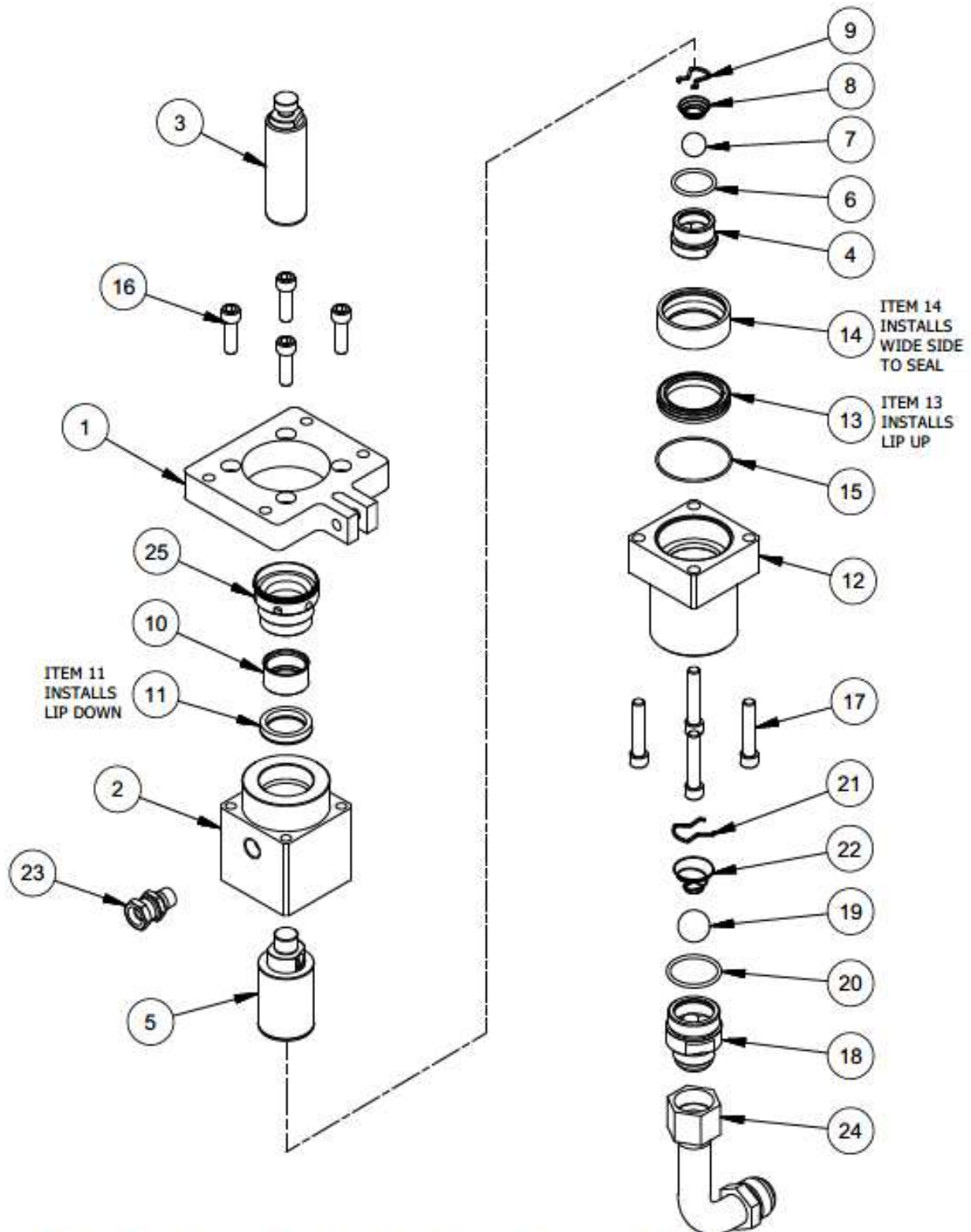
INNOVATOR PRO FLUID SECTION

PAT-LS-12270-P

REV:

SHEET 2 / 2

9/9/2010



# MAGNUM VENUS PLASTECH

PATRIOT RTM FLUID SECTION

PAT-LS-12270-RTM

REV:A 07/20/2017

| Parts List |                    |     |                             |
|------------|--------------------|-----|-----------------------------|
| ITEM       | PART NUMBER        | QTY | DESCRIPTION                 |
|            | 1 PAT-LS-1003      | 1   | TRANSITION PLATE            |
|            | 2 PAT-LS-1001      | 1   | OUTLET BODY                 |
|            | 3 PAT-LS-1008      | 1   | FLUID ROD 1-1/4             |
|            | 4 PAT-LS-1009      | 1   | PISTON VALVE                |
|            | 5 PAT-LS-1007      | 1   | PISTON                      |
| *          | 6 O-E-3-916        | 1   | O-RING                      |
|            | 7 VLS-2427         | 1   | 3/4" CHROME BALL            |
|            | 8 PAT-LS-1010      | 1   | SPRING                      |
|            | 9 PAT-LS-1011      | 1   | SPRING RETAINER             |
|            | 10 PAT-LS-1005     | 1   | ROD BUSHING                 |
| *          | 11 PAT-LS-1016     | 1   | ROD SEAL ASSY               |
|            | 12 PAT-LS-1002     | 1   | INLET BODY                  |
| *          | 13 PAT-LS-1014     | 1   | PISTON SEAL ASSY            |
|            | 14 PAT-LS-1013     | 1   | PISTON BUSHING              |
| *          | 15 O-E-035         | 1   | O-RING                      |
|            | 16 F-CS-06C-20     | 4   | HEX SOCKET CAP SCREW - Inch |
|            | 17 F-CS-06C-32     | 4   | HEX SOCKET CAP SCREW - Inch |
|            | 18 PAT-LS-1015     | 1   | INLET VALVE                 |
|            | 19 PAT-LS-1017     | 1   | 1" CHROME BALL              |
| *          | 20 O-E-3-920       | 1   | O-RING                      |
|            | 21 VLS-2420        | 1   | BALL STOP                   |
|            | 22 3102-16-1       | 1   | FOOT VALVE SPRING           |
|            | 23 PF-SW-06        | 1   | PIPE SWIVEL                 |
|            | 24 PF-SE-SW-16J-LL | 1   | LONG SWIVEL ELBOW           |
|            | 25 PAT-LS-1006     | 1   | PACKING NUT - RTM           |

### REPAIR KITS

| PART No.            | DESCRIPTION |
|---------------------|-------------|
| * PAT-LS-12270-R-SK | SEAL KIT    |

\* NOTE: ASTERISKS DENOTE PARTS USED IN SEAL KIT.

## MAGNUM VENUS PLASTECH

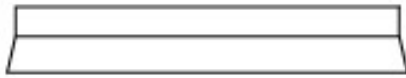
PATRIOT RTM FLUID SECTION

PAT-LS-12270-RTM

REV:A 07/20/2017

PAT-LS-12270-AM-SK  
SEAL REPAIR KIT  
PATRIOT 1.25 FLUID SECTION

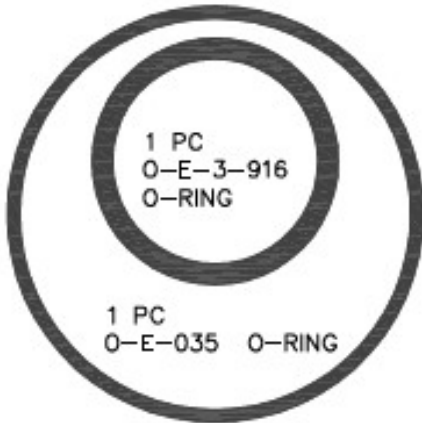
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PATRIOT 1.25 FLUID SECTION



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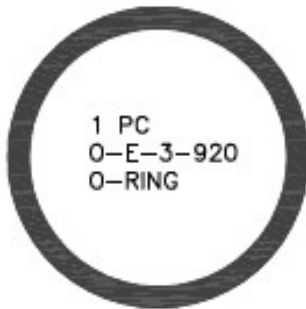


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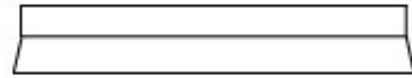


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O-RING

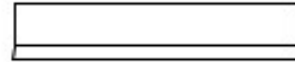
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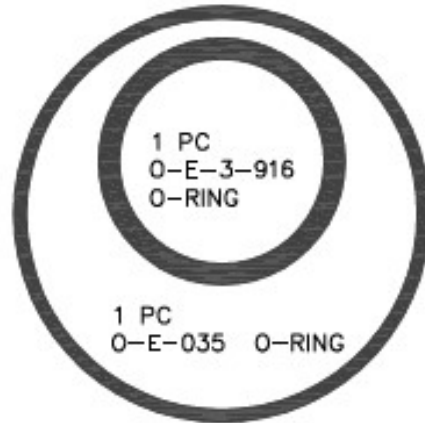
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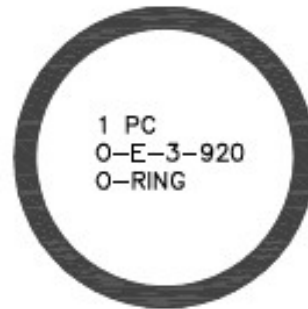


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PAT-LS-1016-SP SEAL



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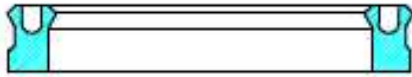
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1 PC  
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O-RING

PAT-LS-12270-D-SK  
SEAL REPAIR KIT

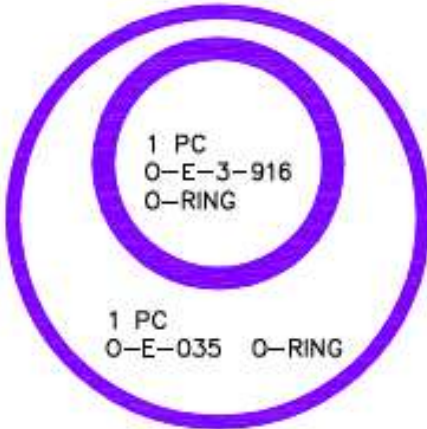
PAT-LS-12270-D-SK  
SEAL REPAIR KIT



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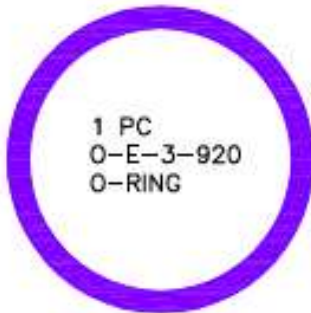


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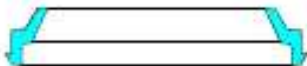


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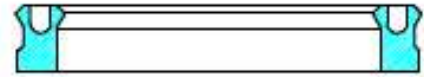
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O-RING



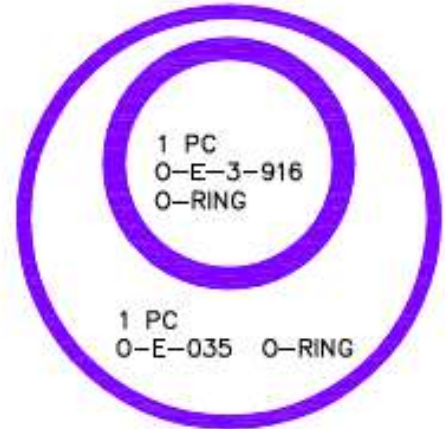
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PAT-LS-1014 SEAL ASSY

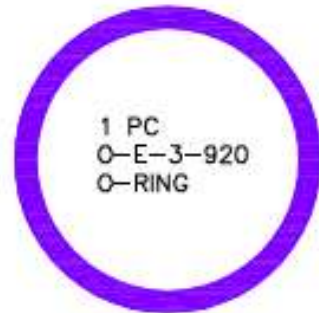


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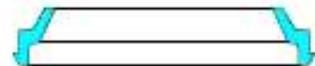


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O-RING

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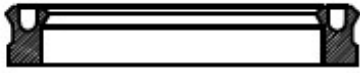


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O-RING



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PAT-LS-1020 SCRAPER SEAL

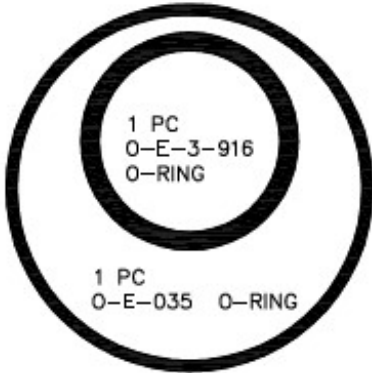
PAT-LS-12270-GL-SK  
SEAL REPAIR KIT



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PAT-LS-1014 SEAL ASSY

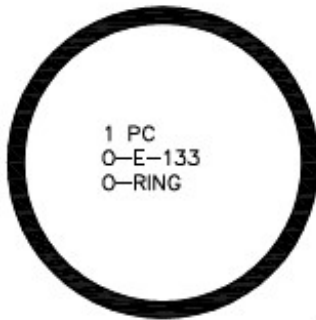


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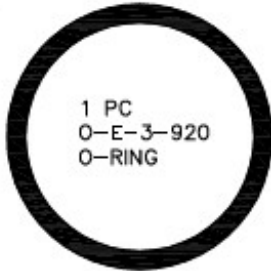


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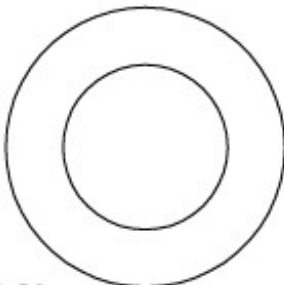
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O-RING

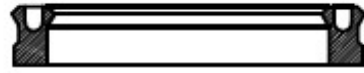


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O-E-3-920  
O-RING



1 PC  
PAT-LS-1024 GLUTTON SEAL

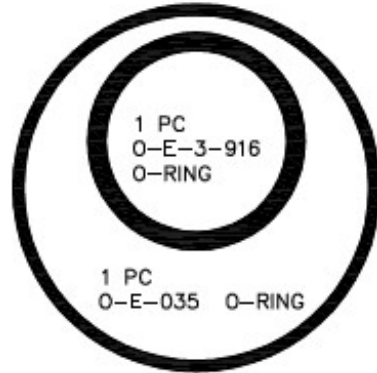
PAT-LS-12270-GL-SK  
SEAL REPAIR KIT



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PAT-LS-1014 SEAL ASSY

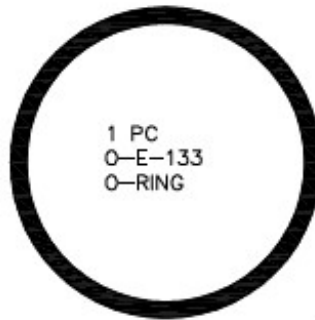


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PAT-LS-1016 SEAL ASSY

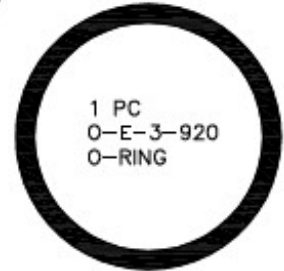


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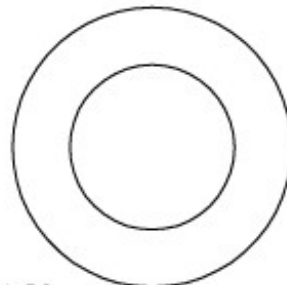
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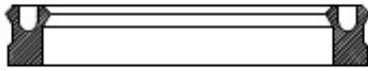
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O-E-3-920  
O-RING



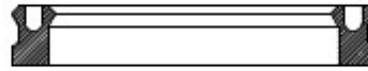
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PAT-LS-1024 GLUTTON SEAL

PAT-LS-12270-R-SK  
SEAL REPAIR KIT  
PATRIOT RTM FLUID SECTION

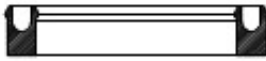
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SEAL REPAIR KIT  
PATRIOT RTM FLUID SECTION



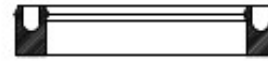
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PAT-LS-1014 SEAL ASSY



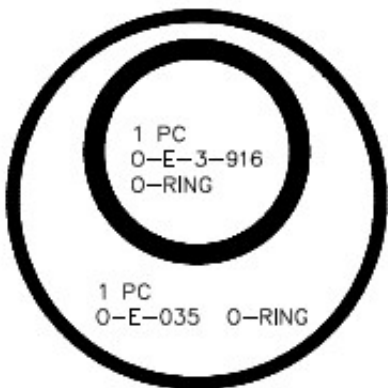
1 PC  
PAT-LS-1014 SEAL ASSY



1 PCS  
PAT-LS-1016 SEAL ASSY

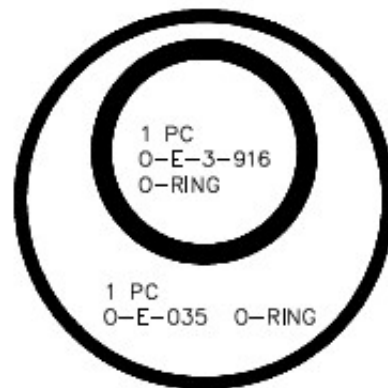


1 PCS  
PAT-LS-1016 SEAL ASSY



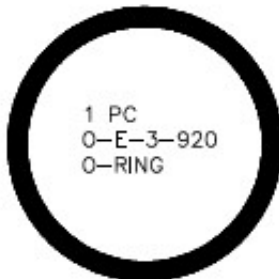
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O-E-3-916  
O-RING

1 PC  
O-E-035 O-RING

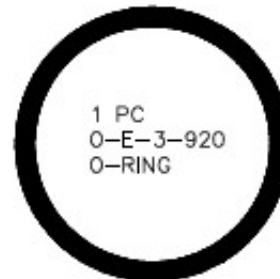


1 PC  
O-E-3-916  
O-RING

1 PC  
O-E-035 O-RING



1 PC  
O-E-3-920  
O-RING

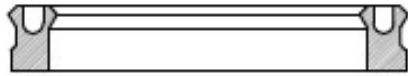


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O-RING

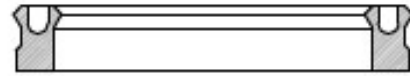


PAT-LS-12270-SK  
SEAL REPAIR KIT  
PATRIOT 1.25 FLUID SECTION

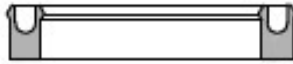
PAT-LS-12270-SK  
SEAL REPAIR KIT  
PATRIOT 1.25 FLUID SECTION



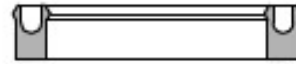
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PAT-LS-1014 SEAL ASSY



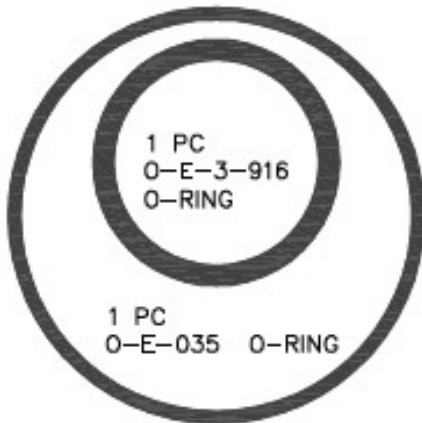
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PAT-LS-1014 SEAL ASSY



2 PCS  
PAT-LS-1016 SEAL ASSY

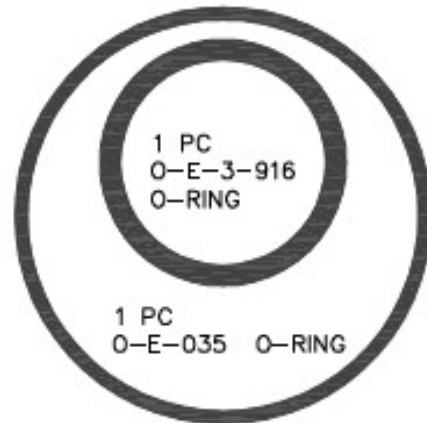


2 PCS  
PAT-LS-1016 SEAL ASSY



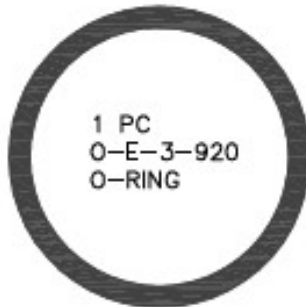
1 PC  
O-E-3-916  
O-RING

1 PC  
O-E-035 O-RING

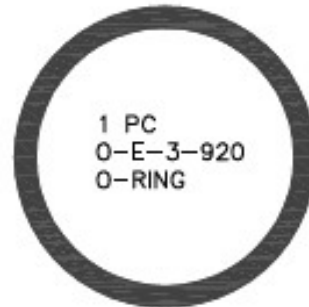


1 PC  
O-E-3-916  
O-RING

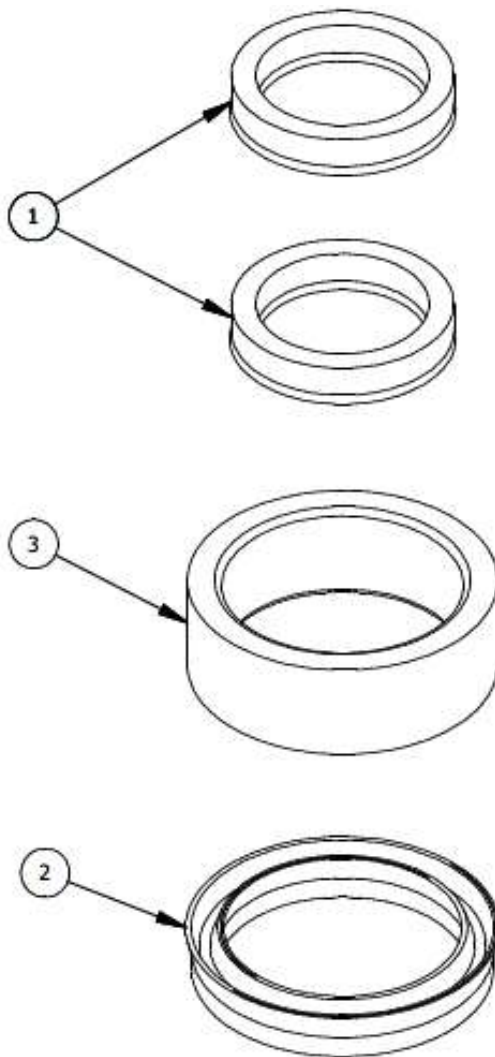
1 PC  
O-E-035 O-RING



1 PC  
O-E-3-920  
O-RING



1 PC  
O-E-3-920  
O-RING



| Parts List |                |     |                                       |
|------------|----------------|-----|---------------------------------------|
| ITEM       | PART NUMBER    | QTY | DESCRIPTION                           |
| 1          | PAT-LS-1016-SP | 2   | ROD SEAL - REPLACES PAT-LS-1016       |
| 2          | PAT-LS-1014-SP | 1   | PISTON SEAL - REPLACES PAT-LS-1014    |
| 3          | PAT-LS-1013-NT | 1   | PISTON BEARING - REPLACES PAT-LS-1013 |

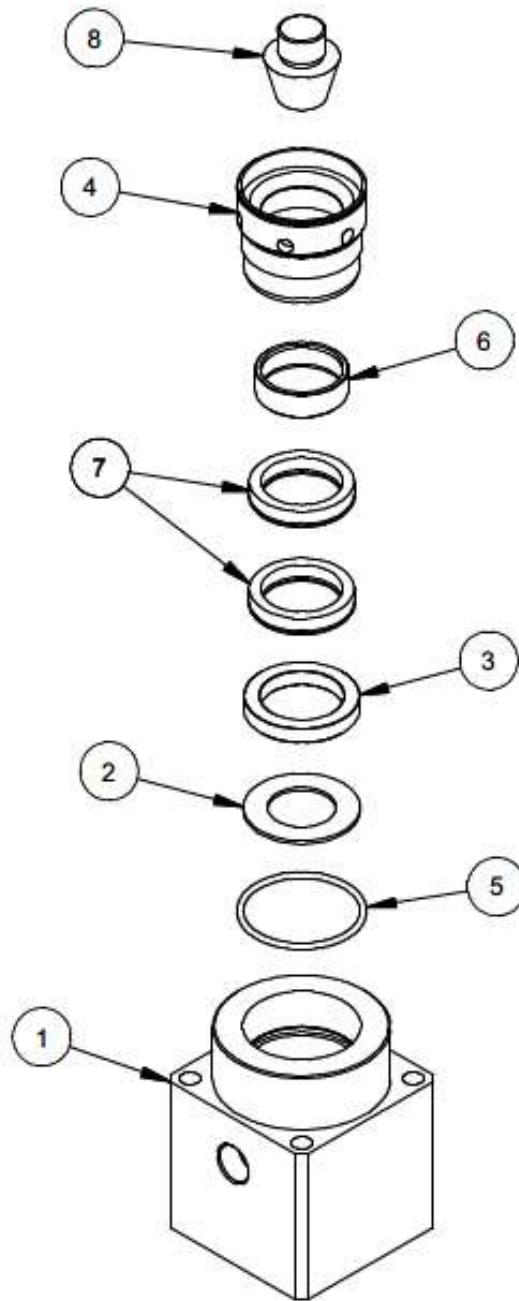
# MAGNUM VENUS PLASTECH

|                |                    |
|----------------|--------------------|
| CONVERSION KIT | PAT-LS-12270-AM-CK |
|----------------|--------------------|

REV:

SHEET 1 / 1

8/18/2009



## MAGNUM VENUS PLASTECH

GLUTTON SEAL CONVERSION KIT PAT-LS-12270-GL-CK

REV:10-18-10 BT2

| Parts List |                |     |               |
|------------|----------------|-----|---------------|
| ITEM       | PART NUMBER    | QTY | DESCRIPTION   |
| 1          | PAT-LS-1001-GL | 1   | OUTLET BODY   |
| 2          | PAT-LS-1024    | 1   | GLUTTON SEAL  |
| 3          | PAT-LS-1023    | 1   | SPACER        |
| 4          | PAT-LS-1004-GL | 1   | SOLVENT CUP   |
| 5          | O-E-133        | 1   | O-RING        |
| 6          | PAT-LS-1005-GL | 1   | ROD BUSHING   |
| 7          | PAT-LS-1016    | 2   | ROD SEAL ASSY |
| 8          | PAT-GL-TOOL-1  | 1   | SEAL TOOL     |

ASSEMBLY INSTRUCTIONS

1. DISASSEMBLE UPPER PORTION OF EXISTING FLUID SECTION, SEPARATING INLET AND OUTLET BODIES. EXISTING PAT-LS-1001 OUTLET BODY, PAT-LS-1004 PACKING NUT, PAT-LS-1005 BUSHING AND PAT-LS-1016 SEALS WILL BE REPLACED.
2. ASSEMBLE ITEMS 1 THRU 7 AS SHOWN ON PAGE 1. NOTE PAT-LS-1005-GL BUSHING AND PAT-LS-1016 SEALS GO INTO SOLVENT CUP. FIRMLY TIGHTEN PAT-LS-1004-GL SOLVENT CUP TO PAT-LS-1001-GL OUTLET BODY.
3. SCREW ITEM 8 PAT-GL-TOOL-1 ON TO EXISTING PAT-LS-1008 (OR PAT-LS-1008-HD) UPPER ROD.
4. PUSH SHAFT DOWNWARD THRU GLUTTON SEAL USING A HARD RUBBER OR PLASTIC Mallet TO FORM SEAL. (fig. 1)
5. REMOVE PAT-GL-TOOL-1 FROM PAT-LS-1008 ROD (PAT-LS-1008-HD).
6. SCREW EXISTING PAT-LS-1007 PISTON TO BOTTOM OF PAT-LS-1008 (PAT-LS-1008-HD) ROD (fig. 2)
7. CONNECT PAT-LS-1001-GL OUTLET BODY TO EXISTING INLET BODY.

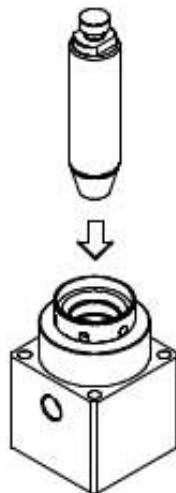


FIG. 1

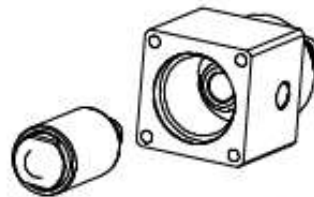
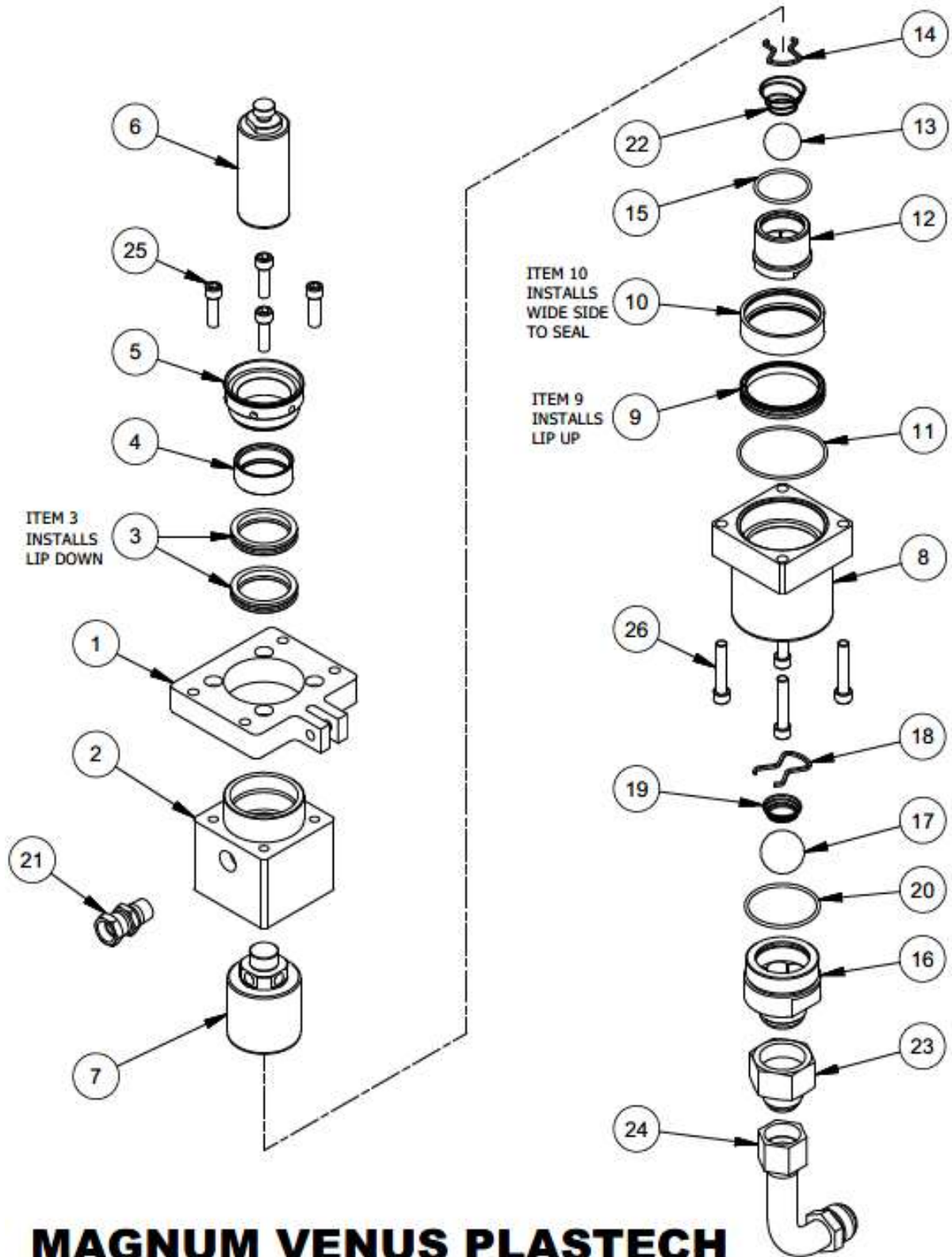


FIG. 2

## MAGNUM VENUS PLASTECH

GLUTTON SEAL CONVERSION KIT PAT-LS-12270-GL-CK

REV:10-18-10 BT2



# MAGNUM VENUS PLASTECH

FLUID SECTION ASSEMBLY - PATRIOT 1-3/4" DIA.

PAT-LS-24050

REV: C 08/28/2017

SHEET 1 / 2

5/25/2007

| 1-3/4 dia. Fluid Section Parts List |                 |     |                          |
|-------------------------------------|-----------------|-----|--------------------------|
| ITEM                                | PART NUMBER     | QTY | DESCRIPTION              |
| 1                                   | PAT-LS-1003     | 1   | TRANSITION PLATE         |
| 2                                   | PAT-LS-2001     | 1   | OUTLET BODY              |
| * 3                                 | PAT-LS-1014     | 2   | ROD SEAL ASSY            |
| 4                                   | PAT-LS-2005     | 1   | ROD BUSHING              |
| 5                                   | PAT-LS-2004     | 1   | PACKING NUT              |
| 6                                   | PAT-LS-2008     | 1   | FLUID ROD                |
| 7                                   | PAT-LS-2007     | 1   | PISTON $\phi$ 2-1/2"     |
| 8                                   | PAT-LS-2002     | 1   | INLET BODY               |
| * 9                                 | PAT-LS-2014     | 1   | PISTON SEAL ASSY         |
| 10                                  | PAT-LS-2013     | 1   | PISTON BUSHING           |
| * 11                                | O-E-150         | 1   | O-RING                   |
| 12                                  | PAT-LS-2009     | 1   | PISTON VALVE             |
| 13                                  | VLS-4622        | 1   | $\phi$ 1-1/4 CHROME BALL |
| 14                                  | PAT-LS-2011     | 1   | SPRING RETAINER          |
| * 15                                | O-E-3-924       | 1   | O-RING                   |
| 16                                  | PAT-LS-2015     | 1   | INLET VALVE 1-1/4        |
| 17                                  | PAT-LS-2017     | 1   | $\phi$ 1-1/2 CHROME BALL |
| 18                                  | VLS-4620        | 1   | BALL STOP                |
| 19                                  | VLS-4621        | 1   | FOOT VALVE SPRING        |
| * 20                                | O-E-3-932       | 1   | O-RING                   |
| 21                                  | PF-SW-08        | 1   | PIPE SWIVEL              |
| 22                                  | PAT-LS-2006     | 1   | PISTON SPRING            |
| 23                                  | PF-RA-20J-16J   | 1   | REDUCER ADAPTER          |
| 24                                  | PF-SE-SW-16J-LL | 1   | LONG SWIVEL ELBOW        |
| 25                                  | F-CS-06C-20     | 4   | CAP SCREW                |
| 26                                  | F-CS-06C-32     | 4   | ALLEN CAP SCREW          |

REPAIR KITS

| PARTS No.       | DESCRIPTION |
|-----------------|-------------|
| PAT-LS-24050-SK | SEAL KIT    |

\* NOTE: ASTERISK DENOTES PARTS USED IN SEAL KIT

# MAGNUM VENUS PLASTECH

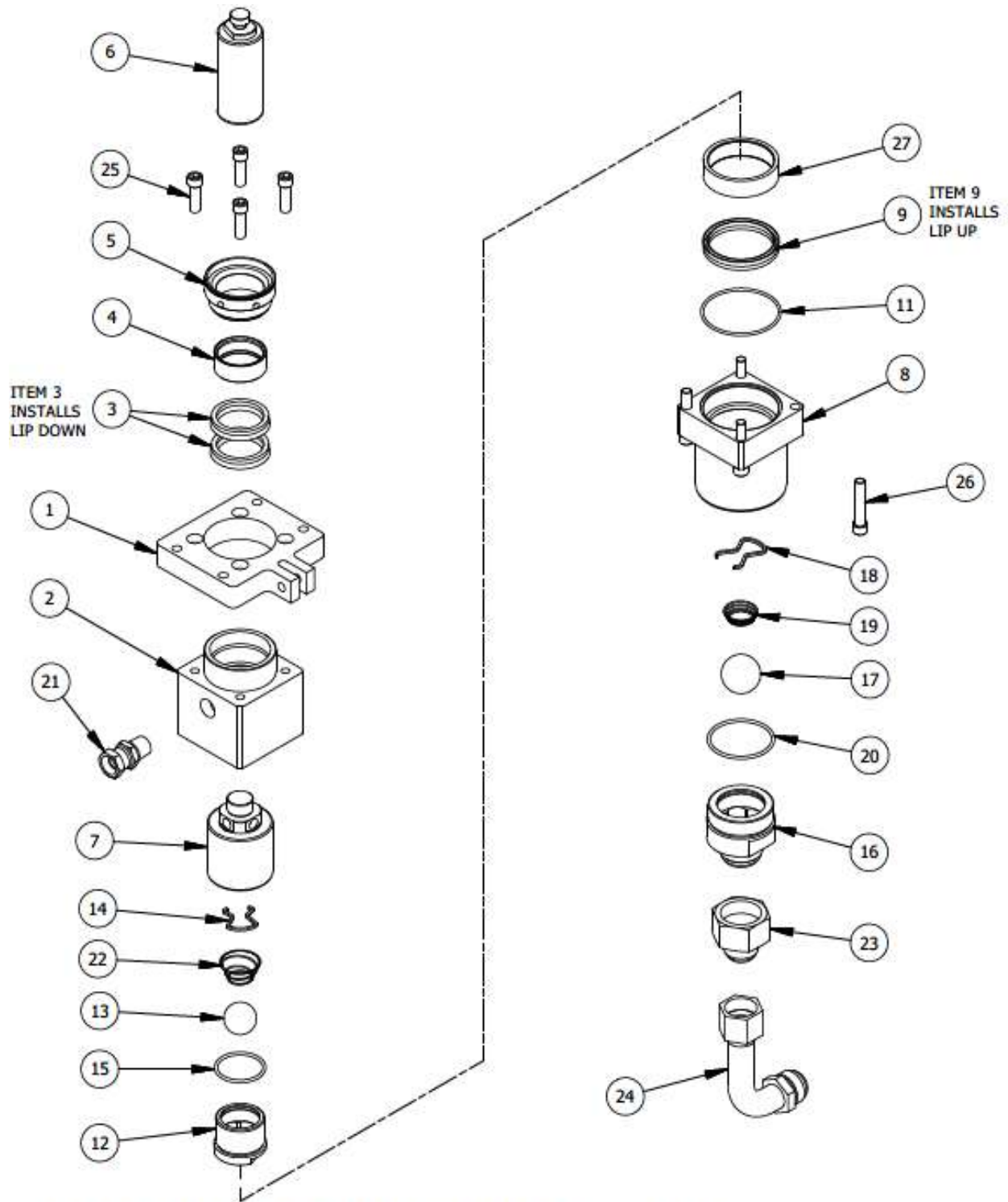
FLUID SECTION ASSEMBLY - PATRIOT 1-3/4" DIA.

PAT-LS-24050

REV:C 08/28/2017

SHEET 2 / 2

5/25/2007



# MAGNUM VENUS PLASTECH

FLUID SECTION - PATRIOT 1-3/4" DIA.

PAT-LS-24050-AM

REV:A 08/28/2017

SHEET 1 / 2

8/27/2009

| Parts List |                    |     |                          |
|------------|--------------------|-----|--------------------------|
| ITEM       | PART NUMBER        | QTY | DESCRIPTION              |
|            | 1 PAT-LS-1003      | 1   | TRANSITION PLATE         |
|            | 2 PAT-LS-2001      | 1   | OUTLET BODY              |
| *          | 3 PAT-LS-1014-SP   | 2   | PISTON SEAL              |
|            | 4 PAT-LS-2005      | 1   | ROD BUSHING              |
|            | 5 PAT-LS-2004      | 1   | PACKING NUT              |
|            | 6 PAT-LS-2008      | 1   | FLUID ROD                |
|            | 7 PAT-LS-2007      | 1   | PISTON $\phi 2-1/2"$     |
|            | 8 PAT-LS-2002      | 1   | INLET BODY               |
| *          | 9 PAT-LS-2014-SP   | 1   | PISTON SEAL              |
| *          | 11 O-E-150         | 1   | O-RING                   |
|            | 12 PAT-LS-2009     | 1   | PISTON VALVE             |
|            | 13 VLS-4622        | 1   | $\phi 1-1/4$ CHROME BALL |
|            | 14 PAT-LS-2011     | 1   | SPRING RETAINER          |
| *          | 15 O-E-3-924       | 1   | O-RING                   |
|            | 16 PAT-LS-2015     | 1   | INLET VALVE 1-1/4        |
|            | 17 PAT-LS-2017     | 1   | $\phi 1-1/2$ CHROME BALL |
|            | 18 VLS-4620        | 1   | BALL STOP                |
|            | 19 VLS-4621        | 1   | FOOT VALVE SPRING        |
| *          | 20 O-E-3-932       | 1   | O-RING                   |
|            | 21 PF-SW-08        | 1   | PIPE SWIVEL              |
|            | 22 PAT-LS-2006     | 1   | PISTON SPRING            |
|            | 23 PF-RA-20J-16J   | 1   | REDUCER ADAPTER          |
|            | 25 F-CS-06C-20     | 4   | CAP SCREW                |
|            | 26 F-CS-06C-32     | 4   | ALLEN CAP SCREW          |
|            | 27 PAT-LS-2013-NT  | 1   | PISTON BUSHING           |
|            | 24 PF-SE-SW-16J-LL | 1   | LONG SWIVEL ELBOW        |

**REPAIR KITS**

| PART No.             | DESCRIPTION |
|----------------------|-------------|
| * PAT-LS-24050-AM-SK | SEAL KIT    |

\* NOTE: ASTERISKS DENOTE PARTS USED IN SEAL KIT.

# MAGNUM VENUS PLASTECH

FLUID SECTION - PATRIOT 1-3/4" DIA.

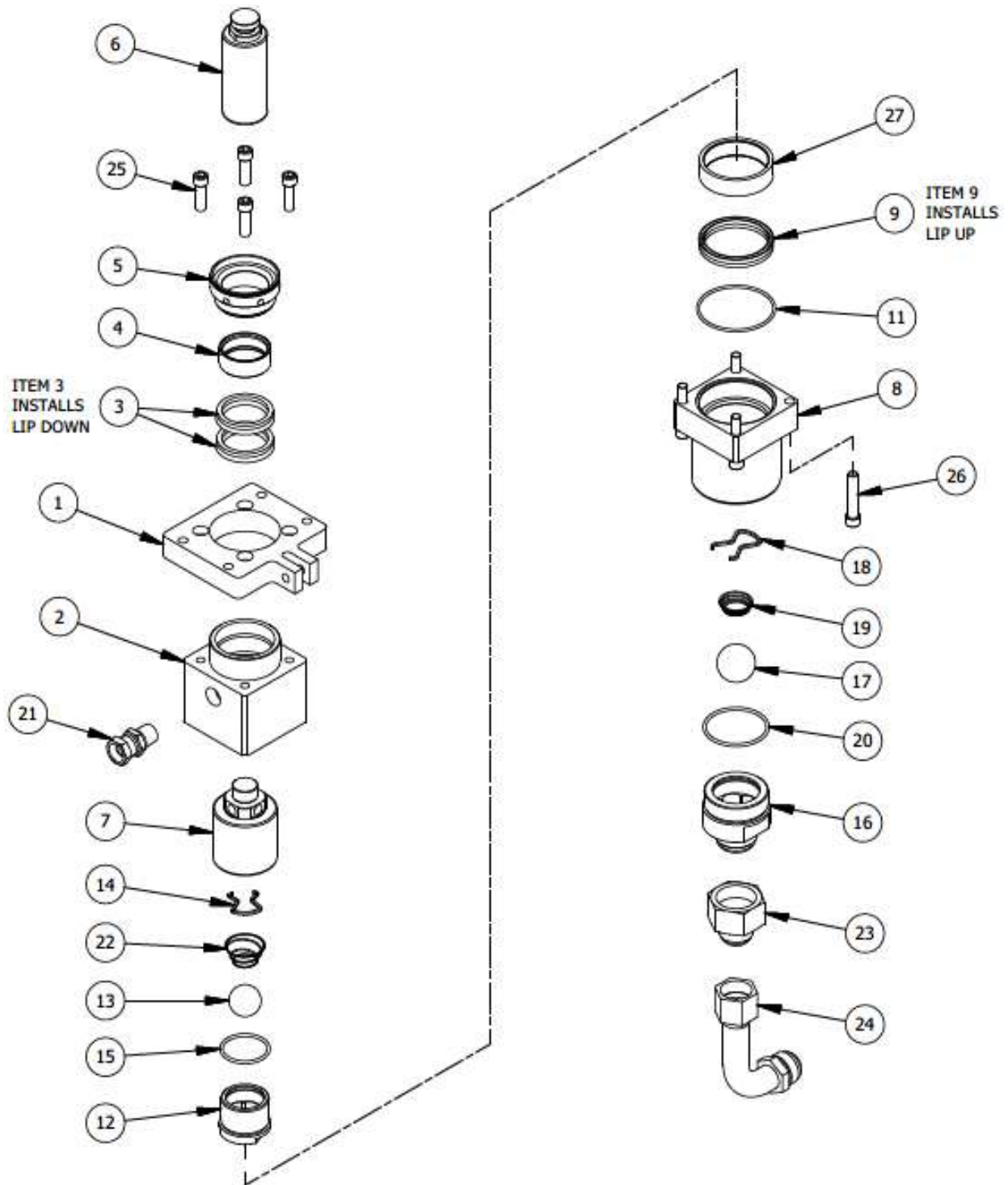
PAT-LS-24050-AM

REV:A 08/28/2017

SHEET 2 / 2

8/27/2009





# MAGNUM VENUS PLASTECH

FLUID SECTION - PATRIOT 1-3/4" DIA.

PAT-LS-24050-AM-HD

REV:A 08/29/2017

SHEET 1 / 2

1/9/2013

| Parts List |                    |     |                          |
|------------|--------------------|-----|--------------------------|
| ITEM       | PART NUMBER        | QTY | DESCRIPTION              |
|            | 1 PAT-LS-1003      | 1   | TRANSITION PLATE         |
|            | 2 PAT-LS-2001      | 1   | OUTLET BODY              |
| *          | 3 PAT-LS-1014-SP   | 2   | PISTON SEAL              |
|            | 4 PAT-LS-2005      | 1   | ROD BUSHING              |
|            | 5 PAT-LS-2004      | 1   | PACKING NUT              |
|            | 6 PAT-LS-2008-HD   | 1   | FLUID ROD - HD           |
|            | 7 PAT-LS-2007      | 1   | PISTON $\phi 2-1/2"$     |
|            | 8 PAT-LS-2002      | 1   | INLET BODY               |
| *          | 9 PAT-LS-2014-SP   | 1   | PISTON SEAL              |
| *          | 11 O-E-150         | 1   | O-RING                   |
|            | 12 PAT-LS-2009     | 1   | PISTON VALVE             |
|            | 13 VLS-4622        | 1   | $\phi 1-1/4$ CHROME BALL |
|            | 14 PAT-LS-2011     | 1   | SPRING RETAINER          |
| *          | 15 O-E-3-924       | 1   | O-RING                   |
|            | 16 PAT-LS-2015     | 1   | INLET VALVE 1-1/4        |
|            | 17 PAT-LS-2017     | 1   | $\phi 1-1/2$ CHROME BALL |
|            | 18 VLS-4620        | 1   | BALL STOP                |
|            | 19 VLS-4621        | 1   | FOOT VALVE SPRING        |
| *          | 20 O-E-3-932       | 1   | O-RING                   |
|            | 21 PF-SW-08        | 1   | PIPE SWIVEL              |
|            | 22 PAT-LS-2006     | 1   | PISTON SPRING            |
|            | 23 PF-RA-20J-16J   | 1   | REDUCER ADAPTER          |
|            | 24 PF-SE-SW-16J-LL | 1   | LONG SWIVEL ELBOW        |
|            | 25 F-CS-06C-20     | 4   | CAP SCREW                |
|            | 26 F-CS-06C-32     | 4   | ALLEN CAP SCREW          |
|            | 27 PAT-LS-2013-NT  | 1   | PISTON BUSHING           |

**REPAIR KITS**

| PART No.             | DESCRIPTION |
|----------------------|-------------|
| * PAT-LS-24050-AM-SK | SEAL KIT    |

\* NOTE: ASTERISKS DENOTE PARTS USED IN SEAL KIT.

# MAGNUM VENUS PLASTECH

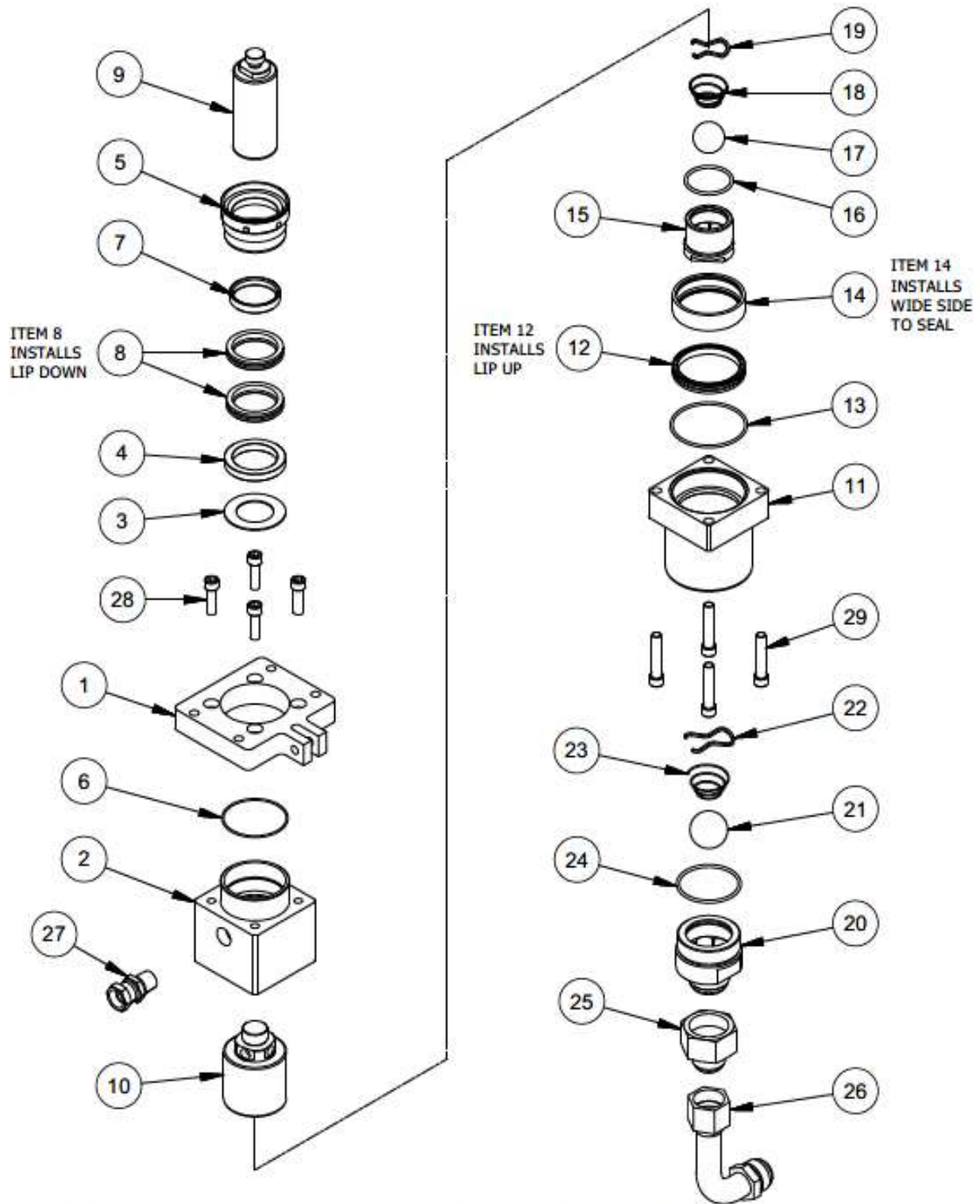
FLUID SECTION - PATRIOT 1-3/4" DIA.

PAT-LS-24050-AM-HD

REV:A 08/29/2017

SHEET 2 / 2

1/9/2013



# MAGNUM VENUS PLASTECH

FLUID SECTION - PATRIOT 1-3/4" DIA.

PAT-LS-24050-GL

REV:A 08/29/2017

SHEET 1 / 2

11/3/2008

| Parts List |             |                 |             |                                 |
|------------|-------------|-----------------|-------------|---------------------------------|
| ITEM       | PART NUMBER | QTY             | DESCRIPTION |                                 |
|            | 1           | PAT-LS-1003     | 1           | TRANSITION PLATE                |
|            | 2           | PAT-LS-2001-GL  | 1           | OUTLET BODY                     |
| *          | 3           | PAT-LS-2024     | 1           | GLUTTON SEAL                    |
|            | 4           | PAT-LS-2023     | 1           | SPACER                          |
|            | 5           | PAT-LS-2004-GL  | 1           | SOLVENT CUP                     |
| *          | 6           | O-E-037         | 1           | O-RING                          |
|            | 7           | PAT-LS-2005-GL  | 1           | ROD BUSHING                     |
| *          | 8           | PAT-LS-1014     | 2           | ROD SEAL ASSY                   |
|            | 9           | PAT-LS-2008     | 1           | FLUID ROD                       |
|            | 10          | PAT-LS-2007     | 1           | PISTON $\varnothing$ 2-1/2"     |
|            | 11          | PAT-LS-2002     | 1           | INLET BODY                      |
| *          | 12          | PAT-LS-2014     | 1           | PISTON SEAL ASSY                |
| *          | 13          | O-E-150         | 1           | O-RING                          |
|            | 14          | PAT-LS-2013     | 1           | PISTON BUSHING                  |
|            | 15          | PAT-LS-2009     | 1           | PISTON VALVE                    |
| *          | 16          | O-E-3-924       | 1           | O-RING                          |
|            | 17          | VLS-4622        | 1           | $\varnothing$ 1-1/4 CHROME BALL |
|            | 18          | PAT-LS-2006     | 1           | PISTON SPRING                   |
|            | 19          | PAT-LS-2011     | 1           | SPRING RETAINER                 |
|            | 20          | PAT-LS-2015     | 1           | INLET VALVE 1-1/4               |
|            | 21          | PAT-LS-2017     | 1           | $\varnothing$ 1-1/2 CHROME BALL |
|            | 22          | VLS-4620        | 1           | BALL STOP                       |
|            | 23          | VLS-4621        | 1           | FOOT VALVE SPRING               |
| *          | 24          | O-E-3-932       | 1           | O-RING                          |
|            | 25          | PF-RA-20J-16J   | 1           | REDUCER ADAPTER                 |
|            | 27          | PF-SW-08        | 1           | PIPE SWIVEL                     |
|            | 28          | F-CS-06C-20     | 4           | CAP SCREW                       |
|            | 29          | F-CS-06C-32     | 4           | ALLEN CAP SCREW                 |
|            | 26          | PF-SE-SW-16J-LL | 1           | LONG SWIVEL ELBOW               |

### REPAIR KITS

| PART No.             | DESCRIPTION |
|----------------------|-------------|
| * PAT-LS-24050-GL-SK | SEAL KIT    |

\*NOTE: ASTERISKS DENOTE PARTS USED IN SEAL KIT

# MAGNUM VENUS PLASTECH

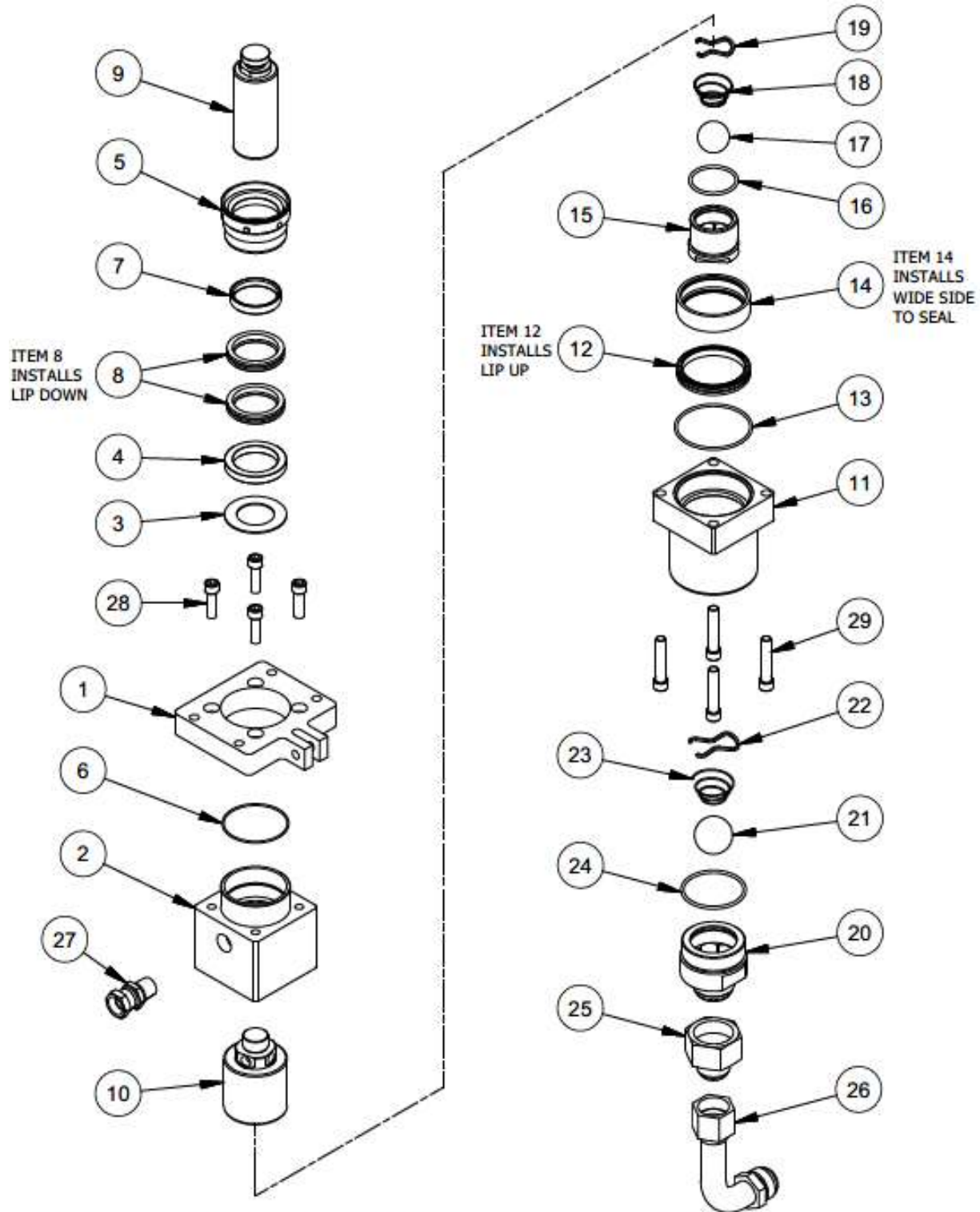
FLUID SECTION - PATRIOT 1-3/4" DIA.

PAT-LS-24050-GL

REV:A 08/29/2017

SHEET 2 / 2

11/3/2008



# MAGNUM VENUS PLASTECH

FLUID SECTION - PATRIOT 1-3/4" DIA. PAT-LS-24050-GL-HD

REV:A 08/29/2017

SHEET 1 / 2

8/23/2010

| Parts List |             |                 |             |                                 |
|------------|-------------|-----------------|-------------|---------------------------------|
| ITEM       | PART NUMBER | QTY             | DESCRIPTION |                                 |
|            | 1           | PAT-LS-1003     | 1           | TRANSITION PLATE                |
|            | 2           | PAT-LS-2001-GL  | 1           | OUTLET BODY                     |
| *          | 3           | PAT-LS-2024     | 1           | GLUTTON SEAL                    |
|            | 4           | PAT-LS-2023     | 1           | SPACER                          |
|            | 5           | PAT-LS-2004-GL  | 1           | SOLVENT CUP                     |
| *          | 6           | O-E-037         | 1           | O-RING                          |
|            | 7           | PAT-LS-2005-GL  | 1           | ROD BUSHING                     |
| *          | 8           | PAT-LS-1014     | 2           | ROD SEAL ASSY                   |
|            | 9           | PAT-LS-2008-HD  | 1           | FLUID ROD - HD                  |
|            | 10          | PAT-LS-2007     | 1           | PISTON $\varnothing$ 2-1/2"     |
|            | 11          | PAT-LS-2002     | 1           | INLET BODY                      |
| *          | 12          | PAT-LS-2014     | 1           | PISTON SEAL ASSY                |
| *          | 13          | O-E-150         | 1           | O-RING                          |
|            | 14          | PAT-LS-2013     | 1           | PISTON BUSHING                  |
|            | 15          | PAT-LS-2009     | 1           | PISTON VALVE                    |
| *          | 16          | O-E-3-924       | 1           | O-RING                          |
|            | 17          | VLS-4622        | 1           | $\varnothing$ 1-1/4 CHROME BALL |
|            | 18          | PAT-LS-2006     | 1           | PISTON SPRING                   |
|            | 19          | PAT-LS-2011     | 1           | SPRING RETAINER                 |
|            | 20          | PAT-LS-2015     | 1           | INLET VALVE 1-1/4               |
|            | 21          | PAT-LS-2017     | 1           | $\varnothing$ 1-1/2 CHROME BALL |
|            | 22          | VLS-4620        | 1           | BALL STOP                       |
|            | 23          | VLS-4621        | 1           | FOOT VALVE SPRING               |
| *          | 24          | O-E-3-932       | 1           | O-RING                          |
|            | 25          | PF-RA-20J-16J   | 1           | REDUCER ADAPTER                 |
|            | 26          | PF-SE-SW-16J-LL | 1           | LONG SWIVEL ELBOW               |
|            | 27          | PF-SW-08        | 1           | PIPE SWIVEL                     |
|            | 28          | F-CS-06C-20     | 4           | CAP SCREW                       |
|            | 29          | F-CS-06C-32     | 4           | ALLEN CAP SCREW                 |

REPAIR KITS

| PART No.             | DESCRIPTION |
|----------------------|-------------|
| * PAT-LS-24050-GL-SK | SEAL KIT    |

\* NOTE: ASTERISKS DENOTE PARTS USED IN SEAL KIT

# MAGNUM VENUS PLASTECH

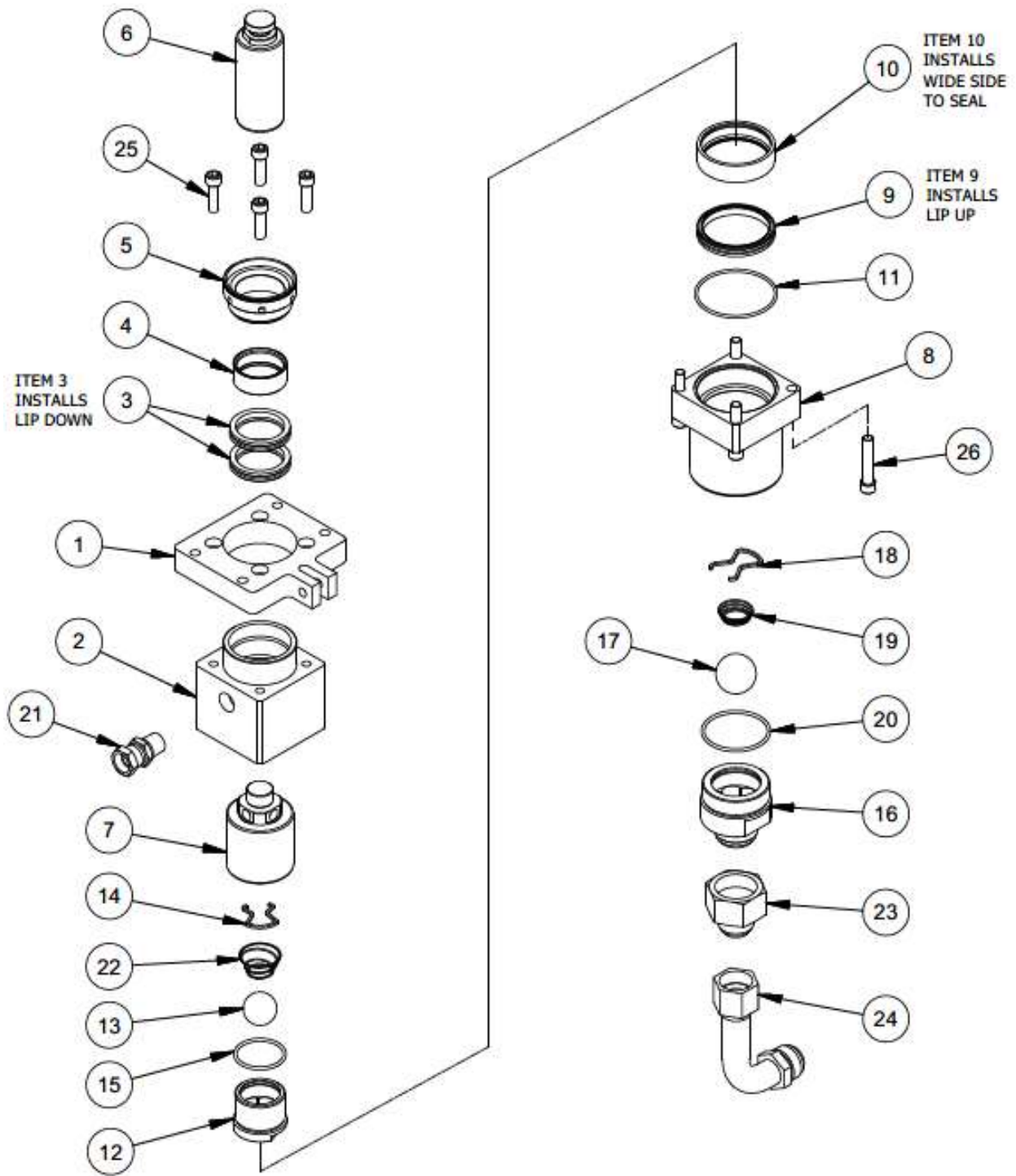
FLUID SECTION - PATRIOT 1-3/4" DIA.

PAT-LS-24050-GL-HD

REV:A 08/29/2017

SHEET 2 / 2

8/23/2010



# MAGNUM VENUS PLASTECH

|                                     |                 |
|-------------------------------------|-----------------|
| FLUID SECTION - PATRIOT 1-3/4" DIA. | PAT-LS-24050-HD |
|-------------------------------------|-----------------|

REV:A 08/29/2017

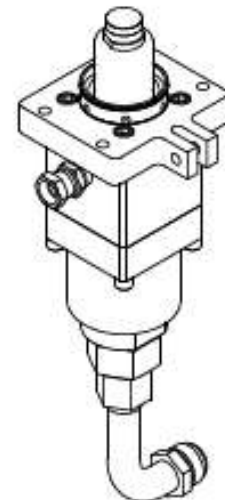
SHEET 1 / 2

2/10/2009

| Parts List |                 |     |                    |
|------------|-----------------|-----|--------------------|
| ITEM       | PART NUMBER     | QTY | DESCRIPTION        |
| 1          | PAT-LS-1003     | 1   | TRANSITION PLATE   |
| 2          | PAT-LS-2001     | 1   | OUTLET BODY        |
| * 3        | PAT-LS-1014     | 2   | ROD SEAL ASSY      |
| 4          | PAT-LS-2005     | 1   | ROD BUSHING        |
| 5          | PAT-LS-2004     | 1   | PACKING NUT        |
| 6          | PAT-LS-2008-HD  | 1   | FLUID ROD - HD     |
| 7          | PAT-LS-2007     | 1   | PISTON Ø2-1/2"     |
| 8          | PAT-LS-2002     | 1   | INLET BODY         |
| * 9        | PAT-LS-2014     | 1   | PISTON SEAL ASSY   |
| 10         | PAT-LS-2013     | 1   | PISTON BUSHING     |
| * 11       | O-E-150         | 1   | O-RING             |
| 12         | PAT-LS-2009     | 1   | PISTON VALVE       |
| 13         | VLS-4622        | 1   | Ø1-1/4 CHROME BALL |
| 14         | PAT-LS-2011     | 1   | SPRING RETAINER    |
| * 15       | O-E-3-924       | 1   | O-RING             |
| 16         | PAT-LS-2015     | 1   | INLET VALVE 1-1/4  |
| 17         | PAT-LS-2017     | 1   | Ø1-1/2 CHROME BALL |
| 18         | VLS-4620        | 1   | BALL STOP          |
| 19         | VLS-4621        | 1   | FOOT VALVE SPRING  |
| * 20       | O-E-3-932       | 1   | O-RING             |
| 21         | PF-SW-08        | 1   | PIPE SWIVEL        |
| 22         | PAT-LS-2006     | 1   | PISTON SPRING      |
| 23         | PF-RA-20J-16J   | 1   | REDUCER ADAPTER    |
| 24         | PF-SE-SW-16J-LL | 1   | LONG SWIVEL ELBOW  |
| 25         | F-CS-06C-20     | 4   | CAP SCREW          |
| 26         | F-CS-06C-32     | 4   | ALLEN CAP SCREW    |

PART No.                      DESCRIPTION  
 \*PAT-LS-24050-SK          SEAL KIT

\*NOTE: ASTERISKS DENOTE PARTS USED IN SEAL KIT



# MAGNUM VENUS PLASTECH

FLUID SECTION - PATRIOT 1-3/4" DIA.

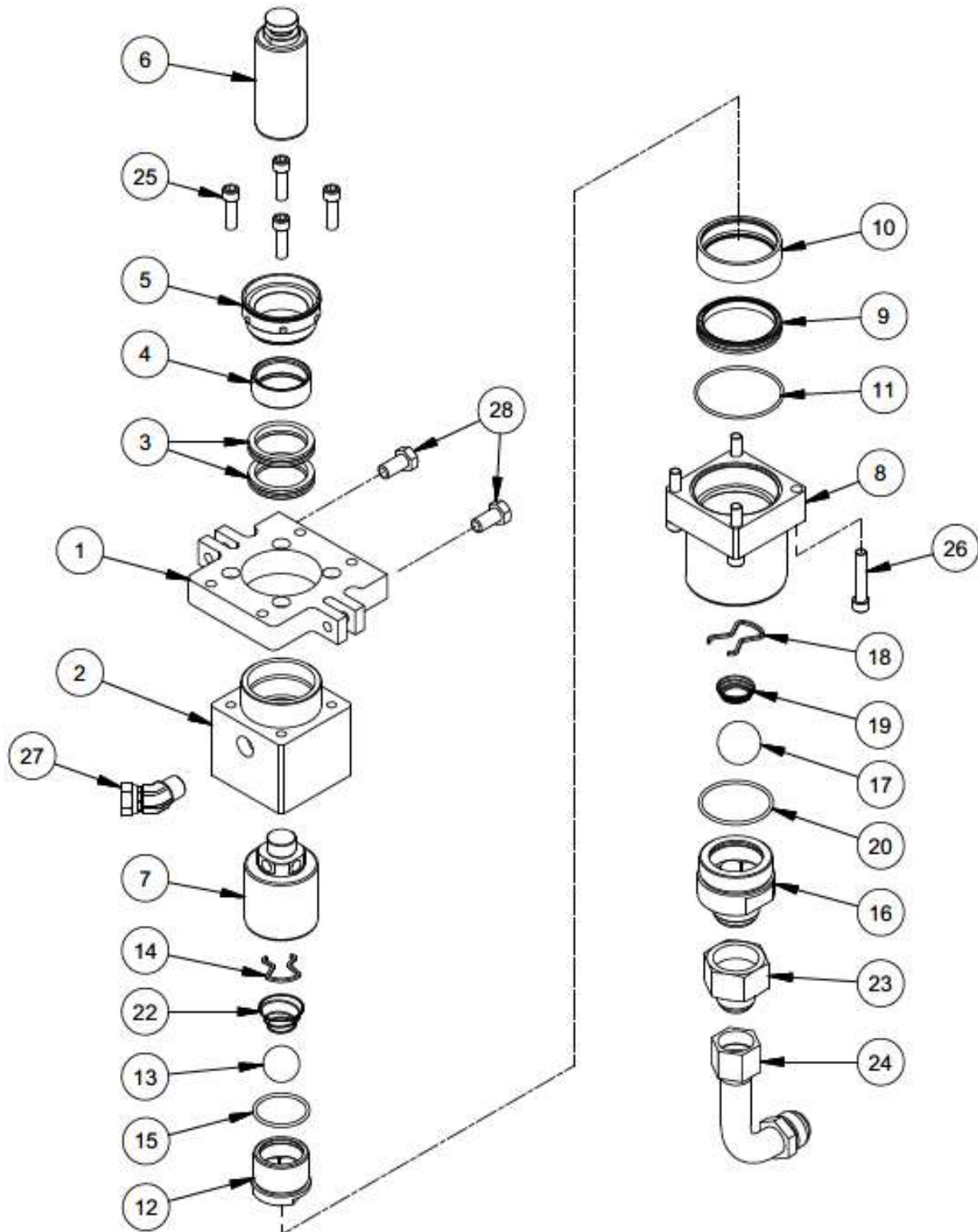
PAT-LS-24050-HD

REV:A 08/29/2017

SHEET 2 / 2

2/10/2009





# MAGNUM VENUS PLASTECH

FLUID SECTION ASSEMBLY - 3 COMPONENT PATRIOT

PAT-LS-24050-HD-3

REV: A 08/30/2017

SHEET 1 / 2

6/24/2014

| Parts List |                  |     |                                 |
|------------|------------------|-----|---------------------------------|
| ITEM       | PART NUMBER      | QTY | DESCRIPTION                     |
| 1          | PAT-LS-1003-DL   | 1   | TRANSITION PLATE - 3 COMPONENT  |
| 2          | PAT-LS-2001      | 1   | OUTLET BODY                     |
| * 3        | PAT-LS-1014      | 2   | PISTON SEAL ASSY                |
| 4          | PAT-LS-2005      | 1   | ROD BUSHING                     |
| 5          | PAT-LS-2004      | 1   | PACKING NUT                     |
| 6          | PAT-LS-2008-HD   | 1   | FLUID ROD - HD                  |
| 7          | PAT-LS-2007      | 1   | PISTON $\varnothing 2-1/2"$     |
| 8          | PAT-LS-2002      | 1   | INLET BODY                      |
| * 9        | PAT-LS-2014      | 1   | PISTON SEAL ASSY                |
| 10         | PAT-LS-2013      | 1   | PISTON BUSHING                  |
| * 11       | O-E-150          | 1   | O-RING                          |
| 12         | PAT-LS-2009      | 1   | PISTON VALVE                    |
| 13         | VLS-4622         | 1   | $\varnothing 1-1/4$ CHROME BALL |
| 14         | PAT-LS-2011      | 1   | SPRING RETAINER                 |
| * 15       | O-E-3-924        | 1   | O-RING                          |
| 16         | PAT-LS-2015      | 1   | INLET VALVE 1-1/4               |
| 17         | PAT-LS-2017      | 1   | $\varnothing 1-1/2$ CHROME BALL |
| 18         | VLS-4620         | 1   | BALL STOP                       |
| 19         | VLS-4621         | 1   | FOOT VALVE SPRING               |
| * 20       | O-E-3-932        | 1   | O-RING                          |
| 22         | PAT-LS-2006      | 1   | PISTON SPRING                   |
| 23         | PF-RA-20J-16J    | 1   | REDUCER ADAPTER                 |
| 24         | PF-SE-SW-16J-LL  | 1   | LONG SWIVEL ELBOW               |
| 25         | F-CS-06C-20      | 4   | CAP SCREW                       |
| 26         | F-CS-06C-32      | 4   | ALLEN CAP SCREW                 |
| 27         | PF-SW-45-08M-08F | 1   | PIPE SWIVEL                     |
| 28         | F-HB-08C-16      | 2   | HEX BOLT                        |

PART No.            DESCRIPTION  
 \* PAT-LS-24050-SK    SEAL KIT

\*NOTE: ASTERISKS DENOTE PARTS USED IN SEAL KIT

# MAGNUM VENUS PLASTECH

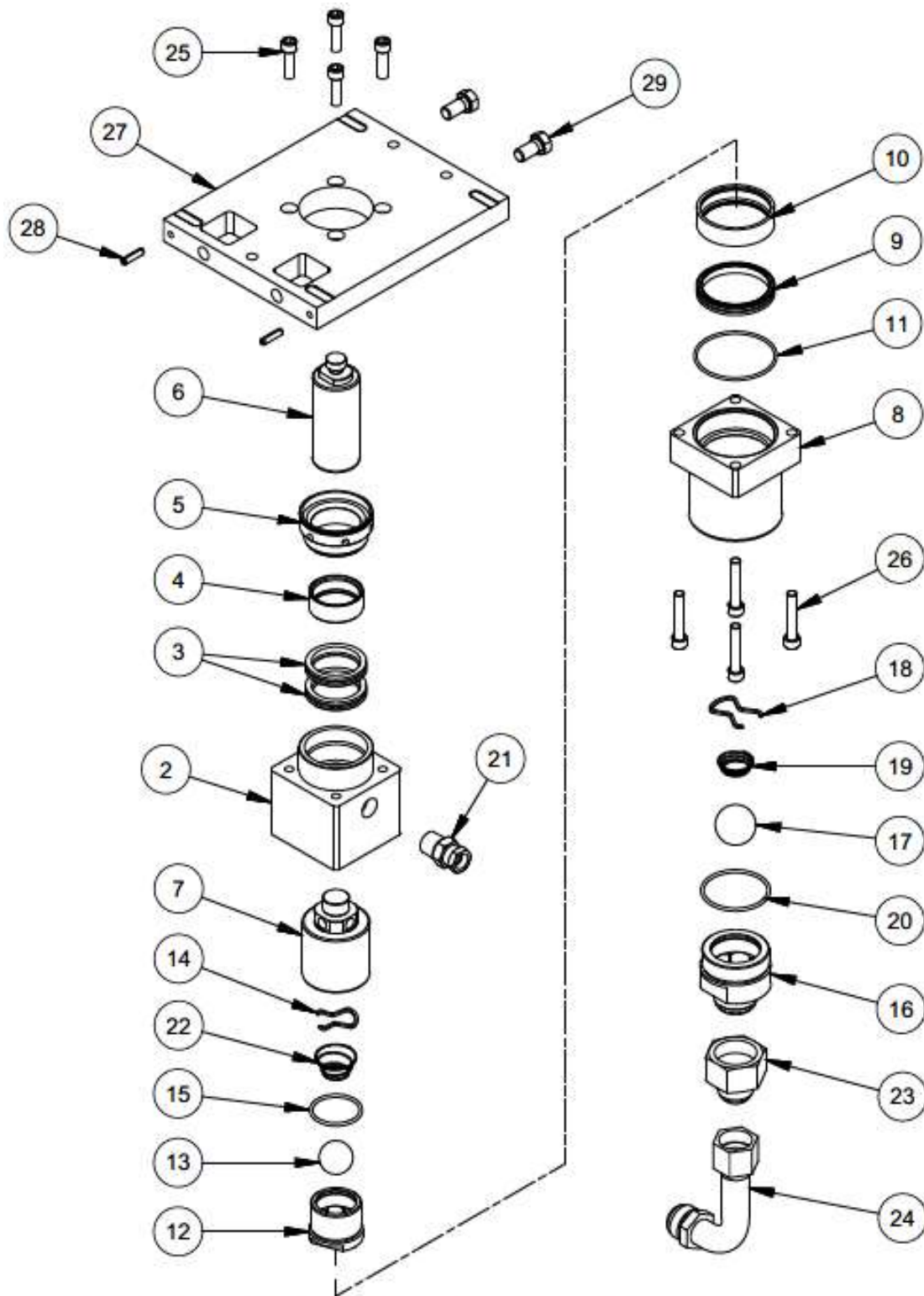
FLUID SECTION ASSEMBLY - 3 COMPONENT PATRIOT

PAT-LS-24050-HD-3

REV: A 08/30/2017

SHEET 2 / 2

6/24/2014



# MAGNUM VENUS PLASTECH

FLUID SECTION - MULTICOLOR

PAT-LS-24050-MC

REV:A 08/30/2017

SHEET 1 / 2

1/30/2009

| Parts List |             |                 |             |                                 |
|------------|-------------|-----------------|-------------|---------------------------------|
| ITEM       | PART NUMBER | QTY             | DESCRIPTION |                                 |
|            | 2           | PAT-LS-2001     | 1           | OUTLET BODY                     |
| *          | 3           | PAT-LS-1014     | 2           | PISTON SEAL ASSY                |
|            | 4           | PAT-LS-2005     | 1           | ROD BUSHING                     |
|            | 5           | PAT-LS-2004     | 1           | PACKING NUT                     |
|            | 6           | PAT-LS-2008     | 1           | FLUID ROD                       |
|            | 7           | PAT-LS-2007     | 1           | PISTON $\varnothing 2-1/2"$     |
|            | 8           | PAT-LS-2002     | 1           | INLET BODY                      |
| *          | 9           | PAT-LS-2014     | 1           | PISTON SEAL ASSY                |
|            | 10          | PAT-LS-2013     | 1           | PISTON BUSHING                  |
| *          | 11          | O-E-150         | 1           | O-RING                          |
|            | 12          | PAT-LS-2009     | 1           | PISTON VALVE                    |
|            | 13          | VLS-4622        | 1           | $\varnothing 1-1/4$ CHROME BALL |
|            | 14          | PAT-LS-2011     | 1           | SPRING RETAINER                 |
| *          | 15          | O-E-3-924       | 1           | O-RING                          |
|            | 16          | PAT-LS-2015     | 1           | INLET VALVE 1-1/4               |
|            | 17          | PAT-LS-2017     | 1           | $\varnothing 1-1/2$ CHROME BALL |
|            | 18          | VLS-4620        | 1           | BALL STOP                       |
|            | 19          | VLS-4621        | 1           | FOOT VALVE SPRING               |
| *          | 20          | O-E-3-932       | 1           | O-RING                          |
|            | 21          | PF-SW-08M-06F   | 1           | SWIVEL FITTING                  |
|            | 22          | PAT-LS-2006     | 1           | PISTON SPRING                   |
|            | 23          | PF-RA-20J-16J   | 1           | REDUCER ADAPTER                 |
|            | 24          | PF-SE-SW-16J-LL | 1           | LONG SWIVEL ELBOW               |
|            | 25          | F-CS-06C-20     | 4           | CAP SCREW                       |
|            | 26          | F-CS-06C-32     | 4           | ALLEN CAP SCREW                 |
|            | 27          | PAT-LS-1003-MC  | 1           | PUMP MOUNT PLATE                |
|            | 28          | F-RP-04-16      | 2           | ROLL PIN                        |
|            | 29          | F-HB-08C-16     | 2           | HEX BOLT - Inch                 |

### REPAIR KITS

|                   |             |
|-------------------|-------------|
| PART No.          | DESCRIPTION |
| * PAT-LS-24050-SK | SEAL KIT    |

\* NOTE: ASTERISK DENOTES PARTS USED IN SEAL KIT.

# MAGNUM VENUS PLASTECH

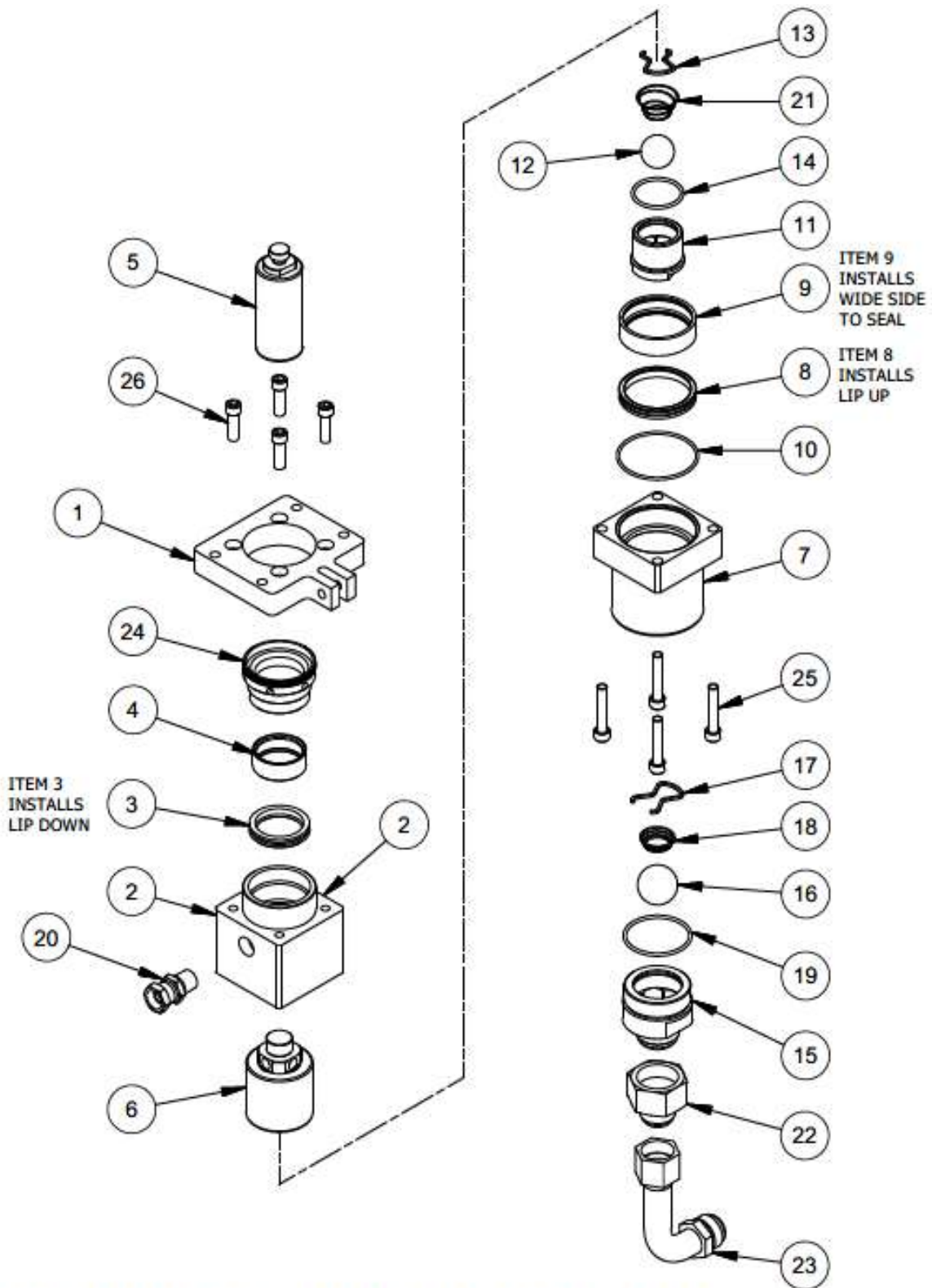
FLUID SECTION - MULTICOLOR

PAT-LS-24050-MC

REV:A 08/30/2017

SHEET 2 / 2

1/30/2009



# MAGNUM VENUS PLASTECH

FLUID SECTION - PATRIOT 1-3/4" DIA.

PAT-LS-24050-RTM

REV:B 08/30/2017

SHEET 1 / 2

5/29/2007

| FLUID SECTION PARTS LIST |                    |     |                    |
|--------------------------|--------------------|-----|--------------------|
| ITEM                     | PART NUMBER        | QTY | DESCRIPTION        |
|                          | 1 PAT-LS-1003      | 1   | TRANSITION PLATE   |
|                          | 2 PAT-LS-2001      | 1   | OUTLET BODY        |
| *                        | 3 PAT-LS-1014      | 1   | ROD SEAL ASSY      |
|                          | 4 PAT-LS-2005      | 1   | ROD BUSHING        |
|                          | 5 PAT-LS-2008      | 1   | FLUID ROD          |
|                          | 6 PAT-LS-2007      | 1   | PISTON Ø2-1/2"     |
|                          | 7 PAT-LS-2002      | 1   | INLET BODY         |
| *                        | 8 PAT-LS-2014      | 1   | PISTON SEAL ASSY   |
|                          | 9 PAT-LS-2013      | 1   | PISTON BUSHING     |
| *                        | 10 O-E-150         | 1   | O-RING             |
|                          | 11 PAT-LS-2009     | 1   | PISTON VALVE       |
|                          | 12 VLS-4622        | 1   | Ø1-1/4 CHROME BALL |
|                          | 13 PAT-LS-2011     | 1   | SPRING RETAINER    |
| *                        | 14 O-E-3-924       | 1   | O-RING             |
|                          | 15 PAT-LS-2015     | 1   | INLET VALVE 1-1/4  |
|                          | 16 PAT-LS-2017     | 1   | Ø1-1/2 CHROME BALL |
|                          | 17 VLS-4620        | 1   | BALL STOP          |
|                          | 18 VLS-4621        | 1   | FOOT VALVE SPRING  |
| *                        | 19 O-E-3-932       | 1   | O-RING             |
|                          | 20 PF-SW-08        | 1   | PIPE SWIVEL        |
|                          | 21 PAT-LS-2006     | 1   | PISTON SPRING      |
|                          | 22 PF-RA-20J-16J   | 1   | REDUCER ADAPTER    |
|                          | 23 PF-SE-SW-16J-LL | 1   | LONG SWIVEL ELBOW  |
|                          | 24 PAT-LS-2018     | 1   | PACKING NUT - RTM  |
|                          | 25 F-CS-06C-32     | 4   | ALLEN CAP SCREW    |
|                          | 26 F-CS-06C-20     | 4   | CAP SCREW          |

### REPAIR KITS

| PART No.            | DESCRIPTION |
|---------------------|-------------|
| * PAT-LS-24050-R-SK | SEAL KIT    |

\* NOTE: ASTERISKS DENOTE PARTS USED IN SEAL KIT.

## MAGNUM VENUS PLASTECH

FLUID SECTION - PATRIOT 1-3/4" DIA.

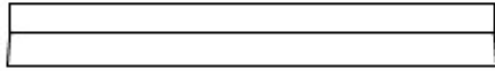
PAT-LS-24050-RTM

REV:B 08/30/2017

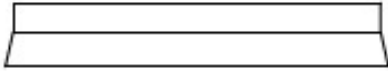
SHEET 2 / 2

5/29/2007

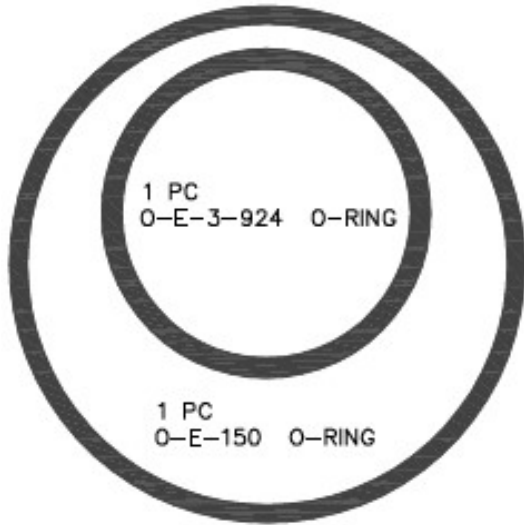
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SEAL REPAIR KIT  
PATRIOT 1.75 FLUID SECTION



1 PC  
PAT-LS-2014-SP SEAL



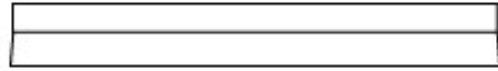
2 PCS  
PAT-LS-1014-SP SEAL



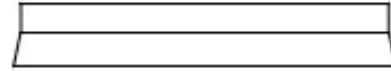
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O-E-3-924 O-RING

1 PC  
O-E-150 O-RING

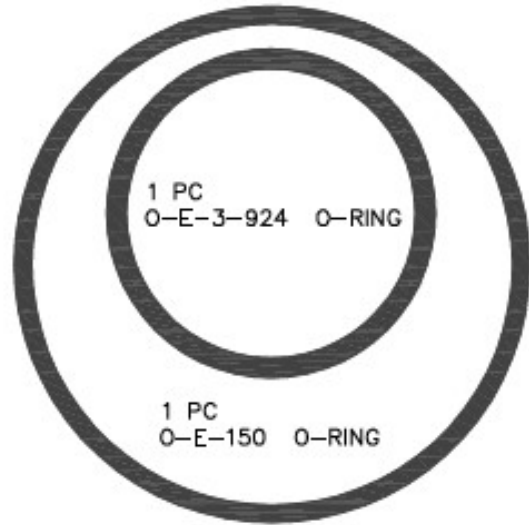
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SEAL REPAIR KIT  
PATRIOT 1.75 FLUID SECTION



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PAT-LS-2014-SP SEAL

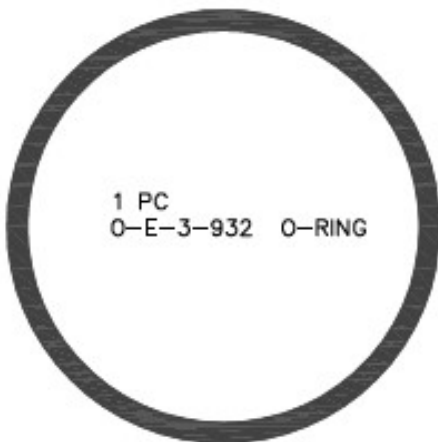


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PAT-LS-1014-SP SEAL

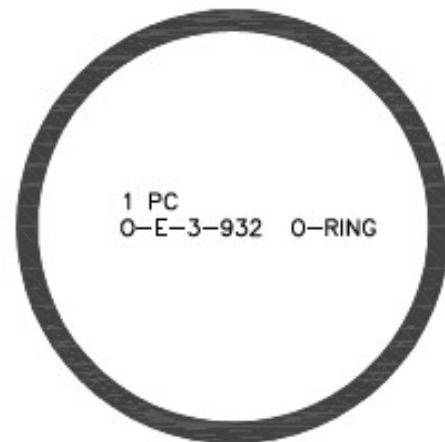


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O-E-3-924 O-RING

1 PC  
O-E-150 O-RING

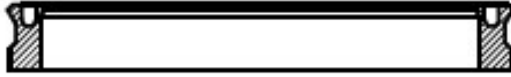


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O-E-3-932 O-RING

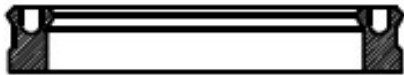


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O-E-3-932 O-RING

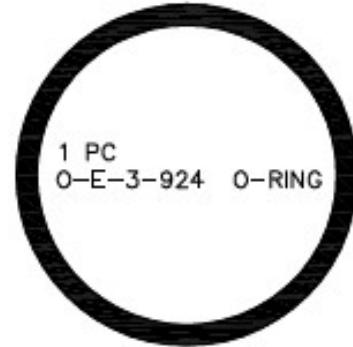
PAT-LS-24050-GL-SK  
SEAL REPAIR KIT



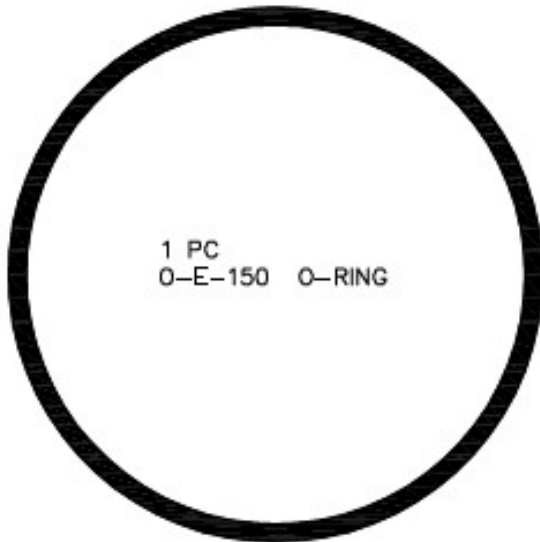
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PAT-LS-2014 SEAL ASSY



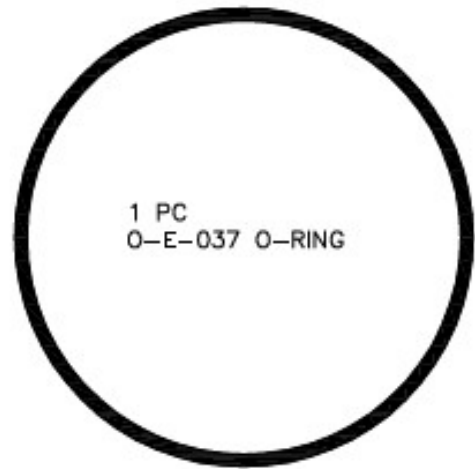
2 PCS  
PAT-LS-1014 SEAL ASSY



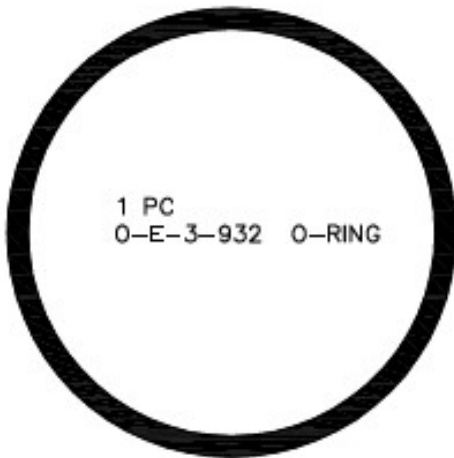
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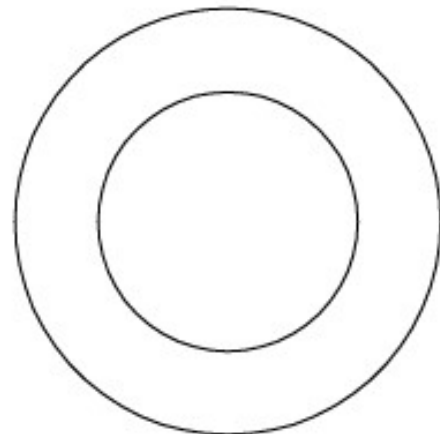
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O-E-150 O-RING



1 PC  
O-E-037 O-RING



1 PC  
O-E-3-932 O-RING

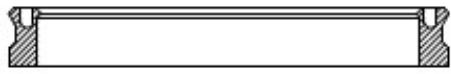


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PAT-LS-2024 GLUTTON SEAL

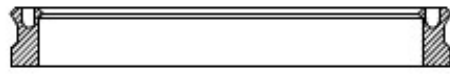


PAT-LS-24050-R-SK  
SEAL REPAIR KIT  
PATRIOT RTM FLUID SECTION

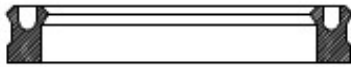
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SEAL REPAIR KIT  
PATRIOT RTM FLUID SECTION



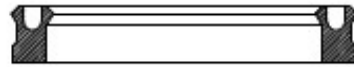
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PAT-LS-2014 SEAL ASSY



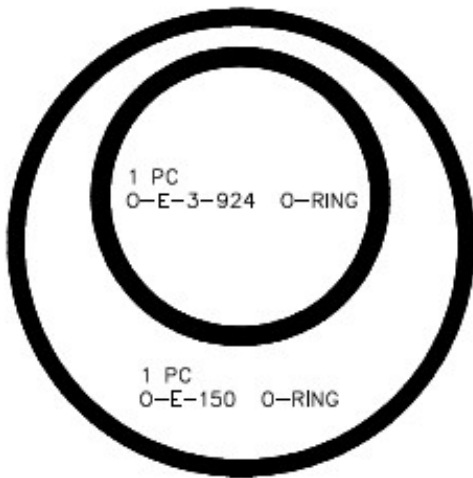
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PAT-LS-2014 SEAL ASSY



1 PCS  
PAT-LS-1014 SEAL ASSY

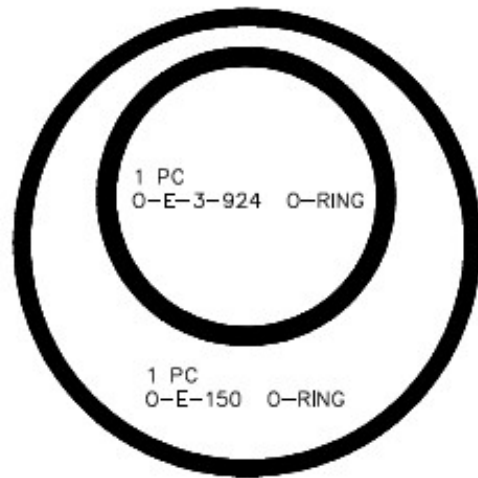


1 PCS  
PAT-LS-1014 SEAL ASSY



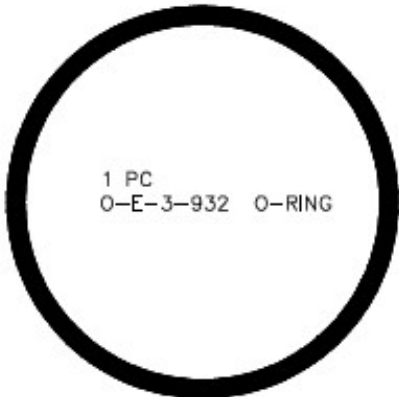
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O-E-3-924 O-RING

1 PC  
O-E-150 O-RING

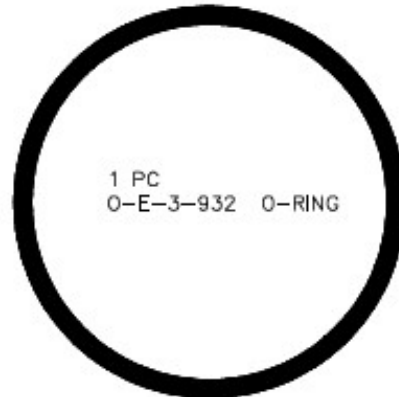


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O-E-150 O-RING

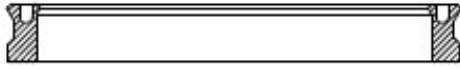


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O-E-3-932 O-RING

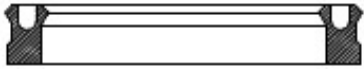


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O-E-3-932 O-RING

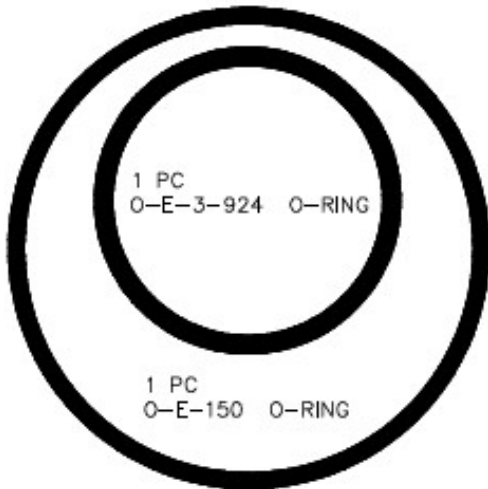
PAT-LS-24050-SK  
SEAL REPAIR KIT  
PATRIOT 1.75 FLUID SECTION



1 PC  
PAT-LS-2014 SEAL ASSY

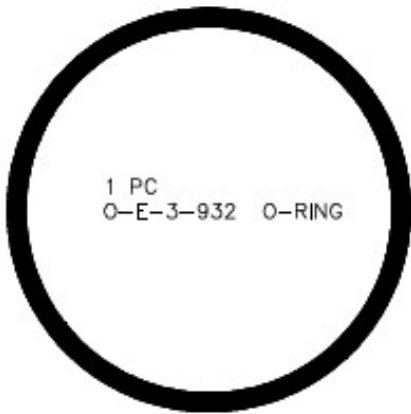


2 PCS  
PAT-LS-1014 SEAL ASSY



1 PC  
O-E-3-924 O-RING

1 PC  
O-E-150 O-RING

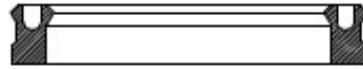


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O-E-3-932 O-RING

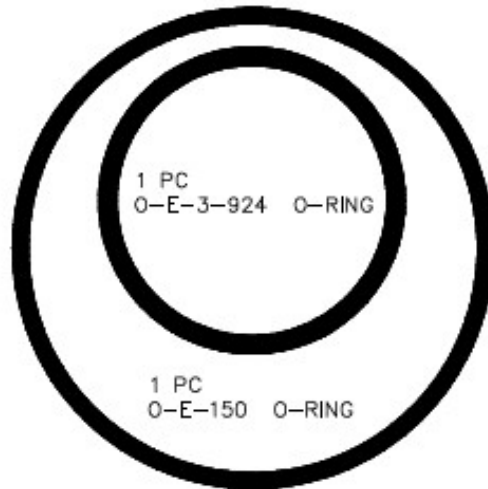
PAT-LS-24050-SK  
SEAL REPAIR KIT  
PATRIOT 1.75 FLUID SECTION



1 PC  
PAT-LS-2014 SEAL ASSY

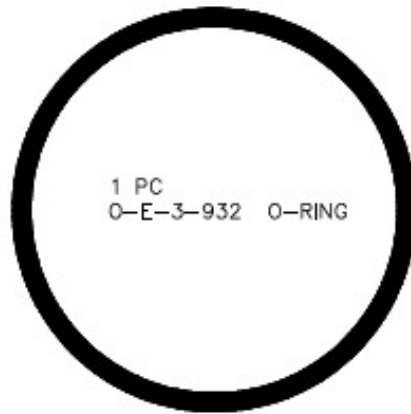


2 PCS  
PAT-LS-1014 SEAL ASSY

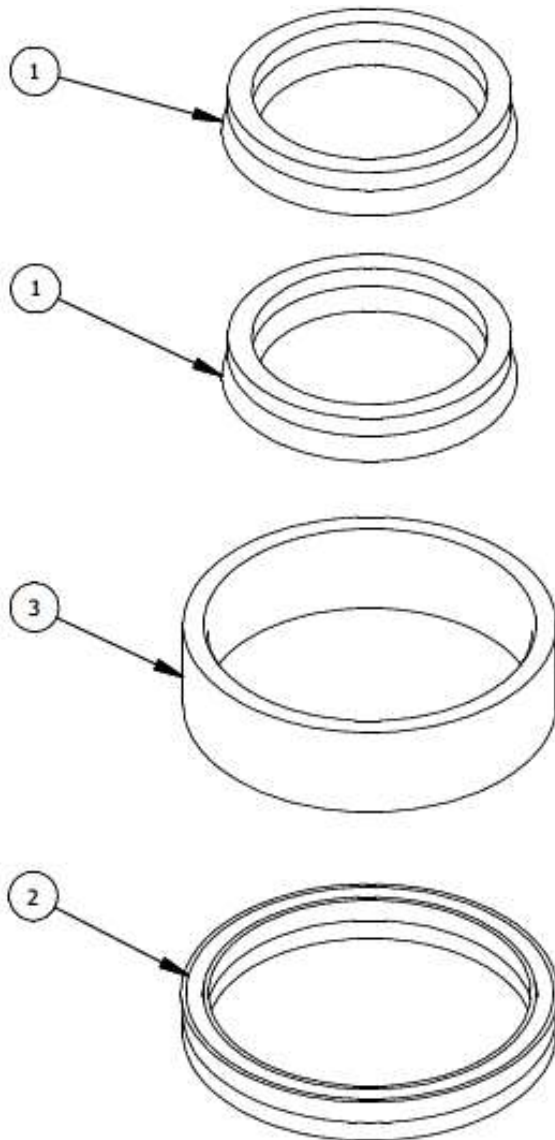


1 PC  
O-E-3-924 O-RING

1 PC  
O-E-150 O-RING



1 PC  
O-E-3-932 O-RING



| Parts List |                |     |                |
|------------|----------------|-----|----------------|
| ITEM       | PART NUMBER    | QTY | DESCRIPTION    |
| 1          | PAT-LS-1014-SP | 2   | PISTON SEAL    |
| 2          | PAT-LS-2014-SP | 1   | PISTON SEAL    |
| 3          | PAT-LS-2013-NT | 1   | PISTON BUSHING |

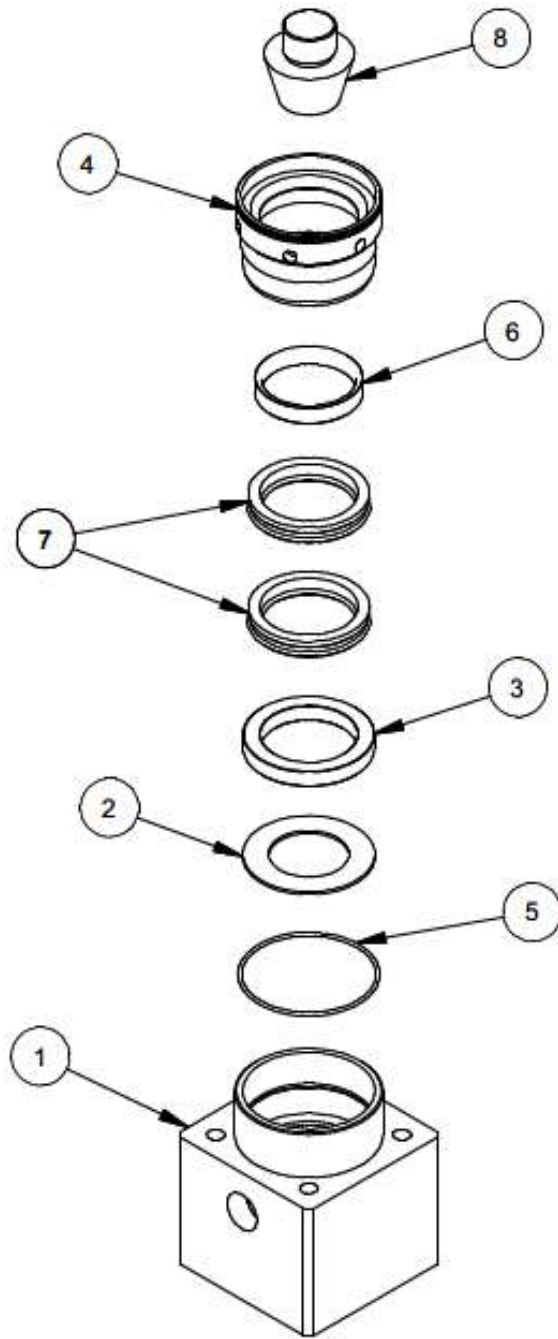
# MAGNUM VENUS PLASTECH

|                |                    |
|----------------|--------------------|
| CONVERSION KIT | PAT-LS-24050-AM-CK |
|----------------|--------------------|

REV:

SHEET 1 / 1

8/27/2009



## MAGNUM VENUS PLASTECH

GLUTTON SEAL CONVERSION KIT PAT-LS-24050-GL-CK

REV:10-18-10 BT2

| Parts List |                |     |                  |
|------------|----------------|-----|------------------|
| ITEM       | PART NUMBER    | QTY | DESCRIPTION      |
| 1          | PAT-LS-2001-GL | 1   | OUTLET BODY      |
| 2          | PAT-LS-2024    | 1   | GLUTTON SEAL     |
| 3          | PAT-LS-2023    | 1   | SPACER           |
| 4          | PAT-LS-2004-GL | 1   | SOLVENT CUP      |
| 5          | O-E-037        | 1   | O-RING           |
| 6          | PAT-LS-2005-GL | 1   | ROD BUSHING      |
| 7          | PAT-LS-1014    | 2   | PISTON SEAL ASSY |
| 8          | PAT-GL-TOOL-2  | 1   | SEAL TOOL        |

**ASSEMBLY INSTRUCTIONS**

1. DISASSEMBLE UPPER PORTION OF EXISTING FLUID SECTION, SEPARATING INLET AND OUTLET BODIES. EXISTING PAT-LS-2001 OUTLET BODY, PAT-LS-2004 PACKING NUT, PAT-LS-2005 BUSHING AND PAT-LS-1014 SEALS WILL BE REPLACED.
2. ASSEMBLE ITEMS 1 THRU 7 AS SHOWN ON PAGE 1. NOTE PAT-LS-2005-GL BUSHING AND PAT-LS-1014 SEALS GO INTO SOLVENT CUP. FIRMLY TIGHTEN PAT-LS-2004-GL SOLVENT CUP TO PAT-LS-2001-GL OUTLET BODY.
3. SCREW ITEM 8 PAT-GL-TOOL-2 ON TO EXISTING PAT-LS-2008 (OR PAT-LS-2008-HD) UPPER ROD.
4. PUSH SHAFT DOWNWARD THRU GLUTTON SEAL USING A HARD RUBBER OR PLASTIC Mallet TO FORM SEAL. (fig. 1)
5. REMOVE PAT-GL-TOOL-2 FROM PAT-LS-2008 (PAT-LS-2008-HD) ROD.
6. SCREW EXISTING PAT-LS-2007 PISTON TO BOTTOM OF PAT-LS-2008 (PAT-LS-2008-HD) ROD (fig. 2)
7. CONNECT PAT-LS-2001-GL OUTLET BODY TO EXISTING INLET BODY.

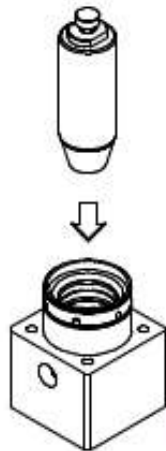


FIG. 1

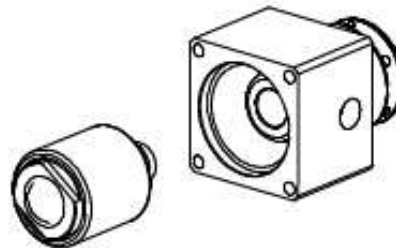
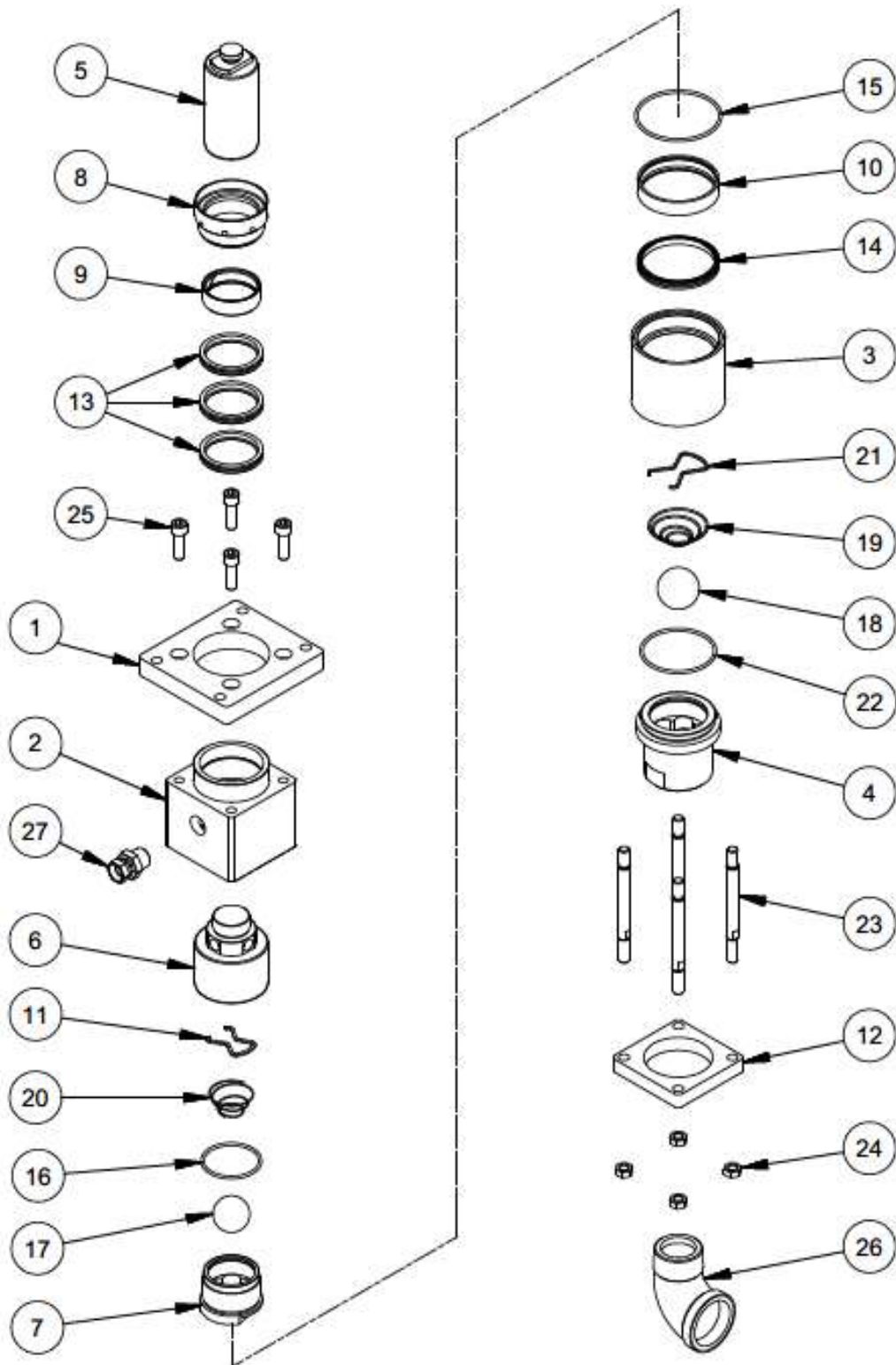


FIG. 2

# MAGNUM VENUS PLASTECH

GLUTTON SEAL CONVERSION KIT PAT-LS-24050-GL-CK

REV:10-18-10 BT2



# MAGNUM VENUS PLASTECH

FLUID SECTION ASSEMBLY

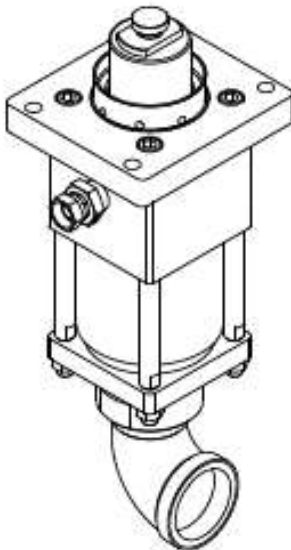
PAT-LS-49090

REV:A 03/06/2017

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4/19/2010

| Parts List |               |             |                         |             |
|------------|---------------|-------------|-------------------------|-------------|
| ITEM       | PART NUMBER   | QTY         | DESCRIPTION             |             |
| 1          | PAT-LS-4003   | 1           | TRANSITION PLATE        |             |
| 2          | PAT-LS-4001   | 1           | OUTLET BODY             |             |
| 3          | PAT-LS-4002   | 1           | INLET BODY              |             |
| 4          | PAT-LS-4015   | 1           | INLET VALVE             |             |
| 5          | PAT-LS-4008   | 1           | FLUID ROD               |             |
| 6          | PAT-LS-4007   | 1           | PISTON - 3-1/2 DIA.     |             |
| 7          | PAT-LS-4009   | 1           | PISTON VALVE            |             |
| 8          | PAT-LS-4004   | 1           | PACKING NUT             |             |
| 9          | PAT-LS-4005   | 1           | ROD GUIDE               |             |
| 10         | PAT-LS-4013   | 1           | PISTON GUIDE            |             |
| 11         | PAT-LS-4011   | 1           | PISTON BALL STOP        |             |
| 12         | PAT-LS-4029   | 1           | FOOT COLLAR             |             |
| *          | 13            | PAT-LS-4016 | 3                       | ROD SEAL    |
| *          | 14            | PAT-LS-4014 | 1                       | PISTON SEAL |
| *          | 15            | O-E-241     | 1                       | O-RING      |
| *          | 16            | O-E-231     | 1                       | O-RING      |
| 17         | PAT-LS-4026   | 1           | CHROME BALL             |             |
| 18         | PAT-LS-4027   | 1           | CHROME BALL             |             |
| 19         | 04315-1       | 1           | TAPERED SPRING          |             |
| 20         | 04072-1       | 1           | TAPERED SPRING          |             |
| 21         | 04309-1       | 1           | BALL STOP - HV HIS PUMP |             |
| *          | 22            | O-E-237     | 1                       | O-RING      |
| 23         | PAT-LS-4031   | 4           | TIE ROD                 |             |
| 24         | F-HN-08C      | 4           | HEX NUT                 |             |
| 25         | F-CS-08C-24   | 4           | CAP SCREW               |             |
| 26         | 00714         | 1           | PIPE ELBOW              |             |
| 27         | PF-SW-12M-08F | 1           | PIPE SWIVEL             |             |



PART No.            DESCRIPTION  
 \* PAT-LS-49090-SK    SEAL KIT

\* NOTE: ASTERISKS DENOTE PARTS USED IN SEAL KIT

# MAGNUM VENUS PLASTECH

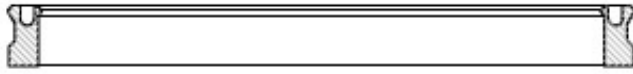
|                        |              |
|------------------------|--------------|
| FLUID SECTION ASSEMBLY | PAT-LS-49090 |
|------------------------|--------------|

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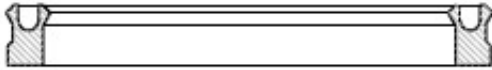
SHEET 2 / 2

4/19/2010

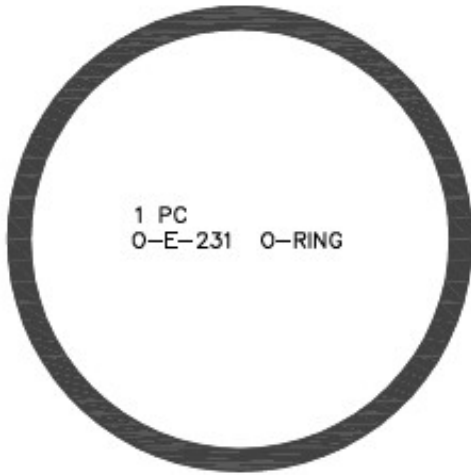
PAT-LS-49090-SK  
SEAL REPAIR KIT  
PATRIOT 2.50 FLUID SECTION



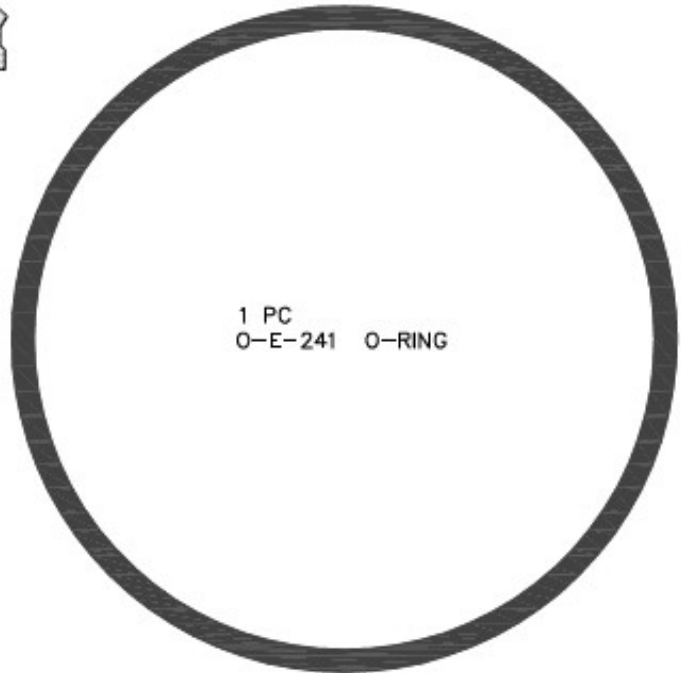
1 PCS  
PAT-LS-4014 SEAL ASSY



3 PCS  
PAT-LS-4016 SEAL ASSY



1 PC  
O-E-231 O-RING



1 PC  
O-E-241 O-RING



1 PC  
O-E-237 O-RING





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