Patriot Multi-Color Gel Coater Operations Manual

MVE-PAT-1500-X
MVE-PAT-15-746-X
MVG-PAT-1500XINT

MagnumVenusPlastech

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TABLE OF CONTENTS:

Terms & Conditions of Sale:

- Customs duties, import and export licenses and certificates, if required, and all local taxes are excluded from this offer. If US state and local taxes are applicable and not included in equipment invoice, such amount may be invoiced later.

- Delivery dates or shipping schedules are approximate and based upon the most recent information available at the time of order. Dates may be adjusted upon receipt of subsequent information or modification of order. Seller will ship prior to the delivery date if possible, but not without Buyer's consent on Advanced Equipment sales.

- All contract dates and timelines begin upon receipt at MVP of customer purchase order, signed Terms and Conditions of Sale (if applicable), and down payment per quotation (if applicable).

- If shipments are delayed by the Buyer, or because the Buyer's account is in arrears, payments shall become due on the date when the Seller is prepared to make shipment. Products held by the Seller for the Buyer shall be at the risk and expense of the Buyer.

- Damages, defects or shortages must be communicated immediately to MVP. Discrepancy in pricing and/or quantities on invoices must be reported within 30 days of the invoice date. Claims made 30 days or more following the invoice date will not be honored.

- Permission to return items must be requested and granted in advance. No credit will be given if items are returned prior to requesting and receiving permission. All returns are subject to a restocking fee. The standard 15% charges may be increased or decreased depending on the reason for the return. Special ordered items may not be returned.

- Seller warrants that the mechanical operation of the goods as specified shall be free from faults in respect to materials and workmanship for a period of 12 months for parts from the date of invoice. For systems, 12 months from start-up or, if earlier, 18 months from the date of the Bills of Lading. The warranty does not cover general wear and tear or damage due to negligence or improper use. Seller's liability under the warranty shall be limited solely to repair or replacement costs, and has no responsibility for reimbursing repair cost incurred by Buyer in connection with equipment without first giving written authorization for such charges. Seller makes no express warranties except those set forth in this agreement, and disclaims all other warranties, expressed or implied, including without limitation, implied warranties of non-infringement merchantability and fitness for a particular purpose. Seller accepts no liability for loss of production, loss of profits, or other direct or indirect damages. In any claim by the Buyer

against the Seller in respect of the goods, the liability of the Seller shall be limited to the value of the goods.

- Many factors beyond Seller's control contribute to the success of Buyer's finished products, such as raw materials used to manufacture the product. Equipment is warranted to perform to specifications detailed in quotation, but Seller is not liable for quality or quantity of finished products produced by Buyer.

- The country of origin is the United States of America. Sale, installation and all rights of the parties are governed by the laws of the state of Florida. Venue with regard to any litigation shall be in Pinellas County, Florida. The parties agree to waive all rights to trial by jury as to any and all disputes.

- The goods remain the property of the Seller until full payment is received.

- Sale of equipment is subject to application and issuance of proper US Government export license and regulations, if applicable.

- Installation of equipment is responsibility of Buyer and Seller, with cost responsibility and number of days provided as detailed in original customer Quotation. Seller will provide installation supervision personnel within 30 days of customer request. If installation is delayed by the Buyer more than six months from the date of shipment, or if customer facility or material/parts are not prepared for installation, seller will invoice full installation costs, up to $1,250 a day plus expenses, for each MVP installation technician on site. Seller has the option to waive this fee at its discretion.

- Parties shall be excused for delays caused by embargoes, acts of civil or military authorities, Acts of God, or other circumstances beyond the reasonable control of the parties. Notification of such delays must be made in writing within ten days of occurrence.

- Our agreement supersedes any previous agreement and applies in full.

SAFETY & WARNING INFORMATION:

OPERATING YOUR POLYESTER SYSTEM SAFELY

1. Introduction

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

1910.94 Pertaining to Ventilation.

1910.106 Pertaining to flammable liquids

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

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

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

NFPA No.63 Dust Explosion Prevention

NFPA No.70 National Electrical Code

NFPA No.77 Static Electricity

NFPA No.91 Blower and Exhaust System

NFPA No.654 Plastics Industry Dust Hazards

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

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

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

National Fire Protection Association
470 Atlantic Avenue
Boston, MA 02210

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

American Insurance Association
85 John Street
New York, NY 10038

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

1.2 Personal Safety Equipment

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

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

2.0 Material Safety

2.1 Hazards Associated with Laminating Operations

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

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

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

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

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

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

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

2.2 Catalyst (Methyl Ethyl Ketone Peroxide)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

2.3 Clean-Up Solvents and Resin Diluents

WARNING

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

2.4 Catalyst Diluents

Magnum Venus Plastech spray-up and gel-coat systems currently produced are designed so that catalyst diluents are not required. Magnum Venus Plastech, therefore, recommends that diluents not be used. This avoids the possible contamination which could lead to an explosion due to the handling and mixing of MEKP and 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, however, diluents are absolutely required, contact your catalyst supplier and follow his instructions explicitly. Preferable, the supplier should premix the catalyst to prevent possible "on the job" contamination while mixing.

WARNING

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

2.5 Cured Laminate, Overspray and Laminate Sandings Accumulation

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

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

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

To prevent this spillage and leakage, you should:

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

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

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

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

2.7 Toxicity of Chemicals

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

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

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

2.8 Treatment of Chemical Injuries

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

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

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

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

WARNING

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

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

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

3.0 Equipment Safety

WARNING

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

WARNING

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

3.1 Emergency Stop Procedures

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

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

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

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

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

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

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

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

3.2 Grounding

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

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

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

DANGER: Eye, skin and respiration hazard. The Catalyst, MEKP, may cause blindness, skin irritation or breathing difficulty. Keep hands away from face. Keep food and drink away from work area.
WARNING: Please refer to your catalyst manufacturer's safety information regarding the safe handling and storage of catalyst. Wear appropriate safety equipment as recommended.

Introduction:

This manual will cover the first time priming, daily start up and shut-down plus operations of the Patriot Multi-Color Gel Coat unit. It also contains repair sections for the components that make up your Multi-Color Gel Coat unit.

There are several configurations of the Patriot Multi-Color Gel Coater – External Mix (MVE-PAT-1500-X or MVE-PAT-15-746-X) which uses the ATG-3500 Gel Coat gun and Internal Mix (MVG-PAT-1500XINT). Where X is the number of colors (fluid sections) mounted on the unit. The units can be configured with 2, 3, 4, 5 and 6 colors or expanded to a total of 6 colors by adding additional colors (fluid sections) (MVG-PAT-1-15, MVE-PAT-1-15 and MVE-PAT-1-15-746).

The major components (Gun, Fluid Section, Powerhead, Catalyst Pump) referenced in this manual will vary depending on the configuration of your unit. The following illustrates the manuals used as related to unit configuration:

MVE – External Mix: "ATG-3500 Gel Coat Repair & Maintenance Manual".

MVG – Internal Mix: "Classic Pro Gun Repair Manual"

XXX-PAT-1500 is 15:1 Patriot Pump Assembly – standard output:

- Patriot Power Head Manual – PAT-PH-5000
- Patriot 1.25 Fluid Section Manual – PAT-LS-12270
- Maintenance & Repair – PAT-CP-0550 (catalyst pump)

XXX-PAT-15-746 is 15:1 HO Patriot Pump Assembly:

- Patriot Power Head Manual – PAT-PH-7000
- Patriot 1.75 Fluid Section Manual – PAT-LS-24050
- Maintenance & Repair – PAT-CP-0980 (catalyst pump)

Most of the operations procedures will be the same for all of the configurations but will be noted where there are different procedures.

Magnum Venus Plastech spray equipment provides one of the most efficient methods of quickly applying material to a surface or mold. To make the most of our low-pressure metering systems airless, internal mix or external mix guns, the operator must understand how to adjust the system for maximum efficiency**.**

One of the most important concepts is to use just enough pressure to the power head to establish a good spray fan, and no more. Then use the Air Assist to fine tune or do final adjustment to the spray pattern.

Getting Started:

Installation & Setup

1. Unpack unit & components
2. Assemble frame work as needed (note drawing PAT-TA-400 or PAT-TA-600)
3. Install the Carriage Assembly to the pump module assembly
4. Install catalyst jug
5. Install gel coat filter & surge chamber assembly
6. Install air manifold and manifold air hose to power cylinder
7. Attach hose fittings to gel coat pump, catalyst pump and gun air
8. Attach pickup hoses to the inlet of the pump
9. **Internal Mix:** Place flush tank in holder and attach air hose from manifold. Connect yellow flush tube from gun to flush tank.
10. Double check all hose fittings and connections are tight

Air supply:

1. Use minimum ½" air hose supply to the system. Air requirements: 18 CFM (510 L/Min.) at 90 -100psi (6 – 7bar)
2. Open incoming air supply ball valve all the way.

Note: the main air supply ball valve is a safety ball valve and must be all the way closed or all the way open. When the ball valve is closed the air pressure remaining in the air manifold and air system will be released.

3. Check that the system air is set at 90 to 100 psi.

Charging Accumulators:

Many applications will not require charging the accumulators; in those applications the accumulator can be used as a surge chamber. These are low pressure spray or pour applications where fluid pressures are medium to low.

In some cases only a line pressure charge on the resin accumulator will be necessary. These will be applications where a medium fluid pressure is being used, most likely a spray or a medium viscosity pour application. The line charge procedure uses the charging hose attached to the air manifold.

For high fluid pressure applications charging the accumulators to 280psi to 300psi may be required. These are applications using filled resins or spray putties. This will require a charging pump or similar device a high pressure tank and regulators can also be used.

If you do a test as described in the "Testing & Adjusting Manual" and find it necessary to charge the resin accumulator or both accumulators repeat the test after performing the charging procedure to confirm an even cure.

Note: It is not required to charge a catalyst accumulator for External Mix systems.

- **Charging Procedures: Line Charge**

1. Shut off air to the resin pump by either turning regulator to zero or turning the pump control valve to the off position.

2. Lock the gun in the on position over an appropriate container, or open the ball valve at the bottom of the resin filter if one is installed.

Note: For catalyst charging lock the gun in the open position over an appropriate container, or open the recirculation/dump valve on the manifold.

3. Relieve any existing charge by inserting a blunt object (Allen wrench) into the top of the charging valve.

4. Push the quick coupling on charging hose onto the charging valve on top of the resin accumulator. Hold the in place for approximately 5 seconds.

Note: During charging of the accumulator, if air is heard exiting the front of the gun or appropriate valve, this indicates that the polyball in the accumulator is not seating properly. Repair the accumulator as needed.

5. Remove the charging hose from the resin accumulator. Check the top of the accumulator for air leaks by applying a light fluid (water) to the top of the accumulator valve body. If air leaks remove and repair charging valve.

6. Close the gun and flush into appropriate container or close the resin return valve.

7. Normally in line charge applications the catalyst accumulator will not need to be charged. If needed follow the above procedures on the catalyst system.

- **Charging Procedures: Using Hand pump**

8. Shut off air to the resin pump by either turning regulator to zero or turning the pump control valve to off position.

9. Lock the gun in the on position over an appropriate container, or open the ball valve at the bottom of the resin filter if one is installed.

Note: For catalyst charging lock the gun in the open position over an appropriate container, or open the recirculation/dump valve on the manifold.

10. Relieve any existing charge by inserting a blunt object (Allen wrench) into the top of the charging valve.

11. Attach charging pump to the resin accumulator by connecting the black charging hose to the charging valve on top of the resin accumulator.

Note: Do not over tighten charging pump hose.

12. Pull the charging pump handle all the way out, connect air hose to male quick disconnect on charging pump.

Note: Not pulling out the handle of the charging pump before attaching the air line can cause damage to the charging pump or bodily injury.

13. Pump charging pump handle with steady even strokes until gauge on charging pump reads approximately 280psi.

Note: Gauge will only show accurate reading on the down / in stroke, while pressure is building (peak pressure). During charging of accumulator, if air is heard exiting the front of the gun or appropriate valve, this indicates that the polyball in the accumulator is not seating properly. Repair the accumulator as needed.

Note: <u>A general rule of thumb…</u>

For Spray Application:
Charge Accumulators to 280psi to 300psi.

Note: The above is a general rule of thumb… some materials and applications may require different charging pressures to achieve an even flow of material. Increase or decrease the charge by 5psi increments as required to fine tune the accumulator charge.

14. Disconnect air hose form the charging pump and remove the charging pump hose from the resin accumulator. Check the top of the accumulator for air leaks by applying a light fluid (water) to the top of the accumulator valve body. If air leaks remove and repair charging valve.

15. Close the gun and flush into appropriate container or close the appropriate. For the catalyst, close the recirculation valve on the catalyst manifold.

16. Repeat the above procedures for the catalyst accumulator.

- **Charging Procedures: Using High Pressure Tank & Regulators**

17. Shut off air to the resin pump by either turning regulator to zero or turning the pump control valve to off position.

18. Lock the gun in the on position over an appropriate container, or open the ball valve at the bottom of the resin filter.

Note: For catalyst charging lock the gun in the open position over an appropriate container, or open the recirculation/dump valve on the manifold.

19. Relieve any existing charge by inserting a blunt object (Allen wrench) into the top of the charging valve.

20. Attach charging system to the resin accumulator by connecting the black charging hose to the charging valve on top of the resin accumulator.

Note: Do not over tighten charging pump hose.

21. Open the main regulator on the top of the tank.

22. Set the desired pressure on the charging regulator attached to the charging valve.

23. Slowly open the ball valve connected to the charging hose to charge the accumulator. Allow approximately 5 seconds for charging before closing the valve again.

Note: During charging of the accumulator, if air is heard exiting the front of the gun or appropriate valve, this indicates that the polyball in the accumulator is not seating properly. Repair the accumulator as needed.

Note: A general rule of thumb…

For Spray Application:
Charge Accumulators to 280psi to 300psi.

Note: The above is a general rule of thumb… some materials and applications may require different charging pressures to achieve an even flow of material. Increase or decrease the charge by 5psi increments as required to fine tune the accumulator charge.

24. Disconnect charging hose from the resin accumulator. Check the top of the accumulator for air leaks by applying a light fluid (water) to the top of the accumulator valve body. If air leaks remove and repair charging valve.

25. Close the gun and flush into appropriate container or close the resin return valve at the bottom of the filter. For the catalyst, close the recirculation valve on the catalyst manifold.

26. Repeat the above procedures for the catalyst accumulator.

Changing Between Colors:

1. Trigger the gun or use the priming button to move the pump so that it is at the bottom of the stroke (lowest position).

2. Prepare the gun:
   External Mix – brush gel coat spray tip and catalyst tip with solvent.
   Internal Mix – flush mix chamber with solvent.

3. Turn the air motor regulator knob counter clock wise (CCW) to lower the air pressure to zero.

4. Open the ball valve at the bottom of resin filter housing. Place the appropriate container under the ball valve if a return hose is not installed. ***This will relieve resin pressure to the supply drum or container.***

Note: it is important in order to release fluid pressure in the hose that is no longer in use.

5. Release the pressure in the gel coat accumulator by pushing a small dull rod (Allen wrench) into the top of the accumulator charging valve.

6. Rotate the ball valve on the catalyst manifold to the open position. ***This will relieve catalyst pressure to the supply jug as the air motor is operated up and down to release or connect to a gel coat color pump.***

7. Close the ball valve at the quick disconnect end of the resin hose assembly.

8. Disconnect the current resin hose assembly (or color) from the gun assembly and clean the quick disconnect fittings with solvent.

Note: it is important to keep the quick disconnect fittings clean so that the o-ring in the female quick disconnect does not become damaged and leak

9. Connect the new gel coat hose assembly (or color) to the gun assembly and open the ball valve at the quick disconnect end of the gel coat hose.

10. Push up on the Sleeve holding the coupling Half Shells in place and remove the coupling Half Shells from the Rod Ends.

11. Loosen the Clamp Bolt assemblies (2) by turning counter clock wise (CCW).

12. Slide the Carriage assembly to the approximate center of the desired fluid section and align the shafts. The air motor shaft or fluid section shaft may need to be moved up or down to allow proper alignment.

13. When the shafts are properly aligned and touching end to end, push the Sleeve up and install the two coupling Half Shell connectors.

14. Tighten the Clamp Bolts (2), by turning the knobs clock wise (CW).

15. Charge the gel coat accumulator if applicable to the system.

16. Close the ball valve at the bottom of the gel coat filter body.

17. While pressing the pump prime button, adjust the pump regulator to the desired air pressure.

18. Close the ball valve on the catalyst manifold. Using the catalyst drive hand prime the catalyst pump pressure and replace the pivot pin into the slide drive assembly.

19. Adjust the spray pattern as desired. See the “Testing and Adjusting manual” for details.

Priming the Unit:

Priming Solvent: (Internal Mix Systems Only)

1. Open solvent tank lid and fill ¾ full. Install lid on tank and close the relief valve located on the top of the lid. Set flush tank pressure at 50 to 60 psi (3.5 – 4 bar).

2. Check for leaks and fix as necessary.

3. Push the flush valve on the side of the gun block to test solvent flush.

Select Gel Coat Pump Color:

1. Connect the Carriage Assembly to the desired Gel Coat fluid section / Color (see "Changing Between Colors" above).

2. Connect the accompanying gel coat hose assembly to the gun and open the ball valve at the quick disconnect end.

Priming Catalyst to Gun:

1. Gun preparations:
   Internal Mix: (Pro Gun) Tighten packing nuts on the gun and trigger the gun 10 to 15 times. Snug packing nuts again and repeat gun triggering, repeat this process three or four times. Remove nozzle and mixer from the mix chamber.
   External Mix: Remove the catalyst and spray tip from the front of the gun.

2. Tighten the catalyst packing nut – 1/8 to 1/4 of a turn to snug packing.

3. Fill the two gallon catalyst jug ¾ full, purge the air out of the catalyst feed line by slightly tilting the catalyst jug.

4. Open the recirculation valve on the catalyst manifold.

5. Remove the pivot pin for catalyst drive linkage. Using the catalyst drive hand prime catalyst back to the jug through the recirculation valve. Do this till there is no air in the tube.
6. Close the recirculation valve on the catalyst manifold.

7. Lock or hold the gun in the open position over an appropriate container. Remove the pivot pin from the catalyst drive linkage. Use the catalyst drive to hand prime catalyst out to the gun until a steady stream is achieved. ***Do not reinstall pivot pin at this time / open the catalyst recirculation valve at the catalyst manifold to prevent over pressurizing the catalyst system.***

Priming Gel Coat to Gun:

NOTE: The resin pump was tested using oil. It may require up to 1/2 gallon (1 – 2 liters) of gel coat to be run through the unit to purge any remaining oil from the system.

1. Fill the Packing Nut cavity ¾ full with TSL oil or suitable oil.

2. Insert the gel coat suction wand into container of gel coat. Clamp or tape the resin return hose coming from the bottom of the in-line filter to the resin pickup wand and into the drum.

3. With the gun locked in the open position, slowly increase pump regulator pressure until pump is running at a slow but steady rate. Allow pump to run until a steady stream of gel coat is being dispensed.

4. Close the gun:
   Internal Mix: Flush the mix chamber clean.
   External Mix: Brush the front of the gun head clean with solvent.

5. Slowly increase gel coat pump pressure to 100 psi (7 bar). Allow the unit to set under static load for 15 to 30 minutes to seat the resin packing set.

6. Turn the pump regulator to zero. Slowly open the ball valve at the bottom of the resin filter to drain the fluid pressure.

Note: the above procedures will need to be performed for each fluid section/color.

Charging the Gel Coat Surge Chamber: (If applicable)

1. Open the ball valve below inline resin filter.

2. To charge the resin surge chamber, use the air hose with the female quick disconnect (charging hose) and insert over the male quick disconnect at the top of the resin surge chamber. Push down on female quick disconnect for 5 to 10 seconds and disengage.

3. Close ball valve below in-line filter.

Pressurizing Fluids:

NOTE: On the air manifold, the blue valve is the safety override. The small brass button next to the valve is the priming button.

The Gel coater Unit is standard with a safety override valve. This valve automatically opens and closes the air supply to the pump air motor. The safety valve will be opened when the gun trigger is opened or when the priming button is pushed.

NOTE: Remove catalyst pivot pin before pressurizing gel coat to the pump. Do not reinstall pivot pin at this time / open the catalyst recirculation valve at the catalyst manifold to prevent over pressurizing the catalyst system.

1. Push on the priming button and slowly increase the gel coat pump regulator: 40 to 50 psi would be a starting point.

2. Using the catalyst drive arm, use slow up and down motion to pressurize the catalyst pump.
   External Mix: Prime a little pressure – there is no gauge on this system.
   Internal Mix: Prime to 200psi to 400psi. There should be a gain in pressure on both the up and down strokes – watch the catalyst pressure gauge.

3. Pin the catalyst drive into the pivot arm. Set desired catalyst percentage.

Gun Set-Up Internal Mix:

Note: Use a little red grease on the o-rings and threads before installing the spray tip, catalyst tip and retainer.

1. Install turbulent mixer into mix chamber. Insert static mixer and spray tip onto the air assist housing. Screw air-assist onto the gun mix housing. For longer turbulent mixer life, do not over tighten the air assist nozzle housing.

2. Attach air assist tube from needle valve on side of gun handle to air-assist head.

3. Spray test pattern; make gel coat pump pressure adjustment until a fairly uniform pattern is achieved. There should be slight horns on either side of the spray fan. Slowly open the air-assist needle valve located on the side of the gun handle until a soft uniform pattern is achieved.

Gun Set-Up External Mix:

Note: Use a little red grease on the o-rings and threads before installing the spray tip, catalyst tip and retainer.

1. Install the Gel Coat Spray Tip into the front of the gun block.

2. Install the Catalyst Tip over the Spray Tip. Use caution not to damage the o-rings on the front of the gun block.

3. Install the retainer to secure Catalyst Tip and Spray Tip in place.

4. Spray test pattern; make gel coat pump pressure adjustment until a fairly uniform pattern is achieved. There should be slight horns on either side of the spray fan. Slowly open the air-assist needle valve located on the side of the gun handle until a soft uniform pattern is achieved.

Daily Procedures:

Daily Start-Up & Shut-Down:

External Mix Daily Start-Up:

1. Check all hoses for damage.
2. Check all material supplies and fill or replace as needed.
3. Open recirculation valve on Catalyst Manifold
4. Open main inlet air valve on the manifold.
5. Remove the Pivot Pin from the catalyst drive.
6. Manually pump the catalyst pump with the catalyst drive, observe catalyst returning to the catalyst jug, pump until the stream is air free.
7. Close recirculation valve on Catalyst Manifold.
8. Manually pump the catalyst pump with the Slave Arm drive, bring catalyst pressure to operating pressure 100psi.
9. Check pump pressure, if adjustment is needed press and hold the priming button while adjusting air pressure - slowly turn up the pump air pressure to the operating pressure.
10. Replace the Pivot Pin into the catalyst pump drive.
11. Check atomizing air pressure, adjust as necessary.
12. Lubricate the nozzle o-rings, stud o-rings and gun front threads
13. Install nozzle, catalyst tip and retaining ring onto the front of the gun.

Internal Mix Daily Start-Up:

1. Check all hoses for damage.
2. Check all material supplies and fill or replace as needed.
3. Close the flush tank relief valve
4. Open recirculation valve on Catalyst Manifold
5. Open main inlet air valve on the manifold.
6. Remove the Pivot Pin from the catalyst drive.
7. Manually pump the catalyst pump with the catalyst drive, observe catalyst returning to the catalyst jug, pump until the stream is air free.
8. Close recirculation valve on Catalyst Manifold.
9. Manually pump the catalyst pump with the Slave Arm drive, bring catalyst pressure to operating pressure 100 – 200 psi.
10. Check pump pressure, if adjustment is needed press and hold the priming button while adjusting air pressure - slowly turn up the pump air pressure to the operating pressure.
11. Replace the Pivot Pin into the catalyst pump drive.
12. Insert the Distribution Ring into the Mix Chamber locating rim.
13. Place mix housing Seal into the Mix Chamber locating rim.
14. Insert the Catalyst Injector and injector seal into the aperture in the Distribution Ring. The spring goes into the gun block.
15. Place Mix Chamber and Catalyst Injector onto the front of the Pro Gun, secure it with the 2 screws.
16. Apply a small amount of Red Grease to the threads of the Mix Chamber.
17. Install mixer, seal and air assist assembly onto the mix chamber.

External Mix Daily Shut-Down:

1. Wipe the face of the nozzle and catalyst tip with solvent.
2. Turn off the main air ball valve at the air manifold.
3. Remove the nozzle and catalyst tip and clean with solvent.
4. Wipe the gun face clean with a rag or brush and solvent.
5. Hang the gun with the gun block exit holes facing downwards.

Internal Mix Daily Shut-Down:

1. Flush the Mix Housing and air assist with solvent.
2. Wipe the face of the Air Assist nozzle after flushing.
3. Turn off the main air ball valve at the air manifold.
4. Release the solvent flush tank pressure.
5. Disassemble the Air Assist and clean it with solvent.
6. Remove the Mix Housing and clean.
7. Wipe the Gun Block face with a clean rag.
8. Hang the gun with the gun block exit holes facing downwards.

Fluid Section Repair:

XXX-PAT-1500 uses 15:1 Patriot Pump Assembly – standard output:

- See Manual "**Patriot 1.25 Fluid Section Manual – PAT-LS-12270**"

XXX-PAT-15-746 uses 15:1 HO Patriot Pump Assembly:

- See Manual "**Patriot 1.75 Fluid Section Manual – PAT-LS-24050**"

Powerhead Repair:

XXX-PAT-1500 uses 15:1 Patriot Pump Assembly – standard output:

- See Manual "**Patriot Power Head Manual – PAT-PH-5000**"

XXX-PAT-15-746 uses 15:1 HO Patriot Pump Assembly:

- See Manual "**Patriot Power Head Manual – PAT-PH-7000**"

Catalyst Pump Repair:

XXX-PAT-1500 uses 15:1 Patriot Pump Assembly – standard output:

- See Manual "**Patriot Catalyst Pump Manual PAT-CP-0550**" (catalyst pump)

XXX-PAT-15-746 uses 15:1 HO Patriot Pump Assembly:

- See Manual "**Patriot Catalyst Pump Manual PAT-CP-0980**" (catalyst pump)

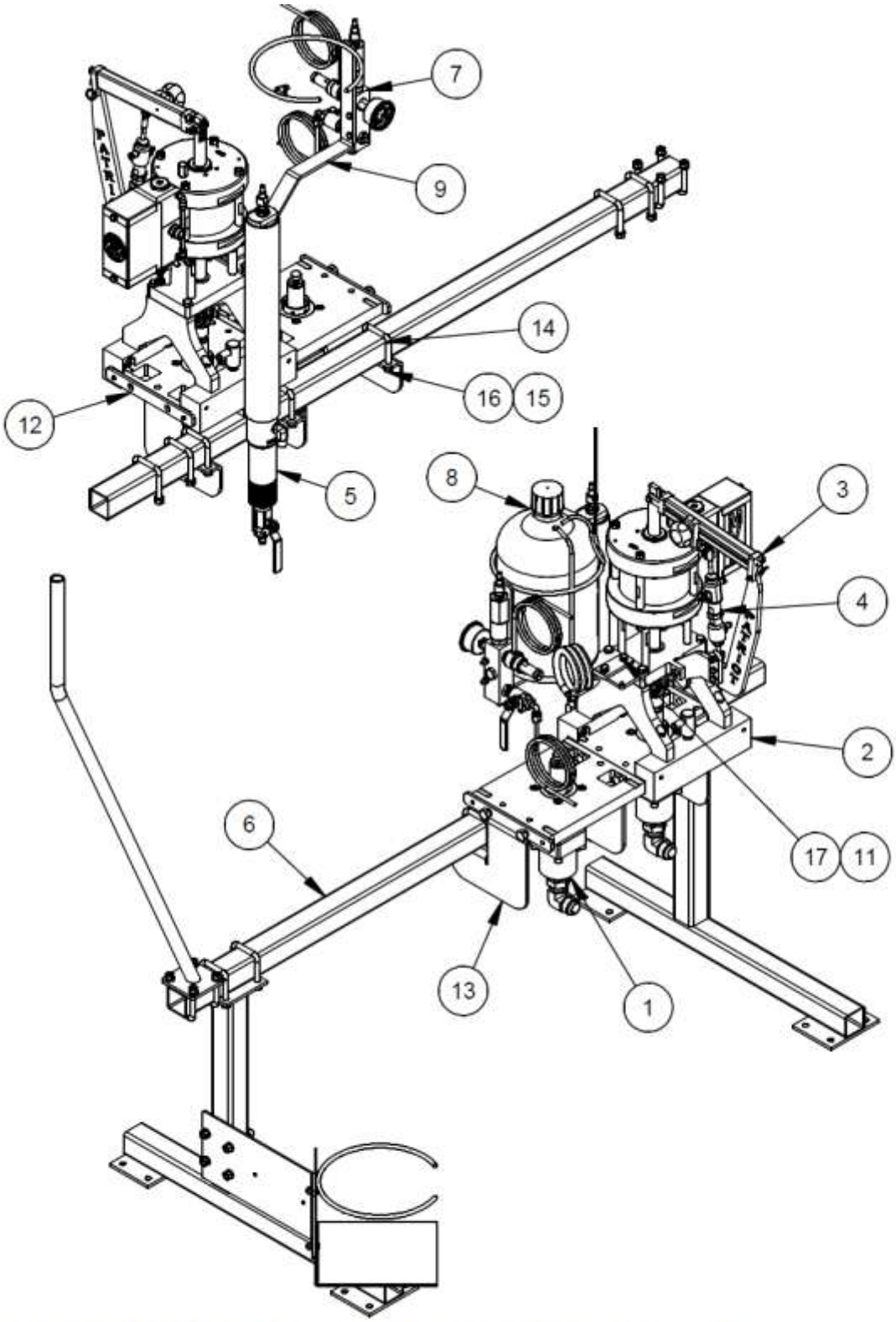
Gel Coat Gun Repair:

MVE – External Mix: “**ATG-3500 Gel Coat Repair & Maintenance Manual**”

MVG – Internal Mix: “**Classic Pro Gun Manual**”

Parts Drawings:

PAT-1550-MC-2	**PATRIOT MULTI-COLOR UNIT**
PAT-CA-5000	**PATRIOT CARRIAGE ASSEMBLY – 5”**
PAT-CA-7000	**PATRIOT CARRIAGE ASSEMBLY – 7”**
PAT-MA-MC-EM	**EXTERNAL MIX AIR MANIFOLD**
PAT-MA-MC-IM	**INTERNAL MIX AIR MANIFOLD**
PAT-TA-400	**PATRIOT 2 – 4 COLOR TRACK ASSEMBLY**
PAT-TA-600	**PATRIOT 5 OR 6 COLOR TRACK ASSEMBLY**



MAGNUM VENUS PRODUCTS

PATRIOT MULTI - COLOR UNIT	PAT-1550-MC-2

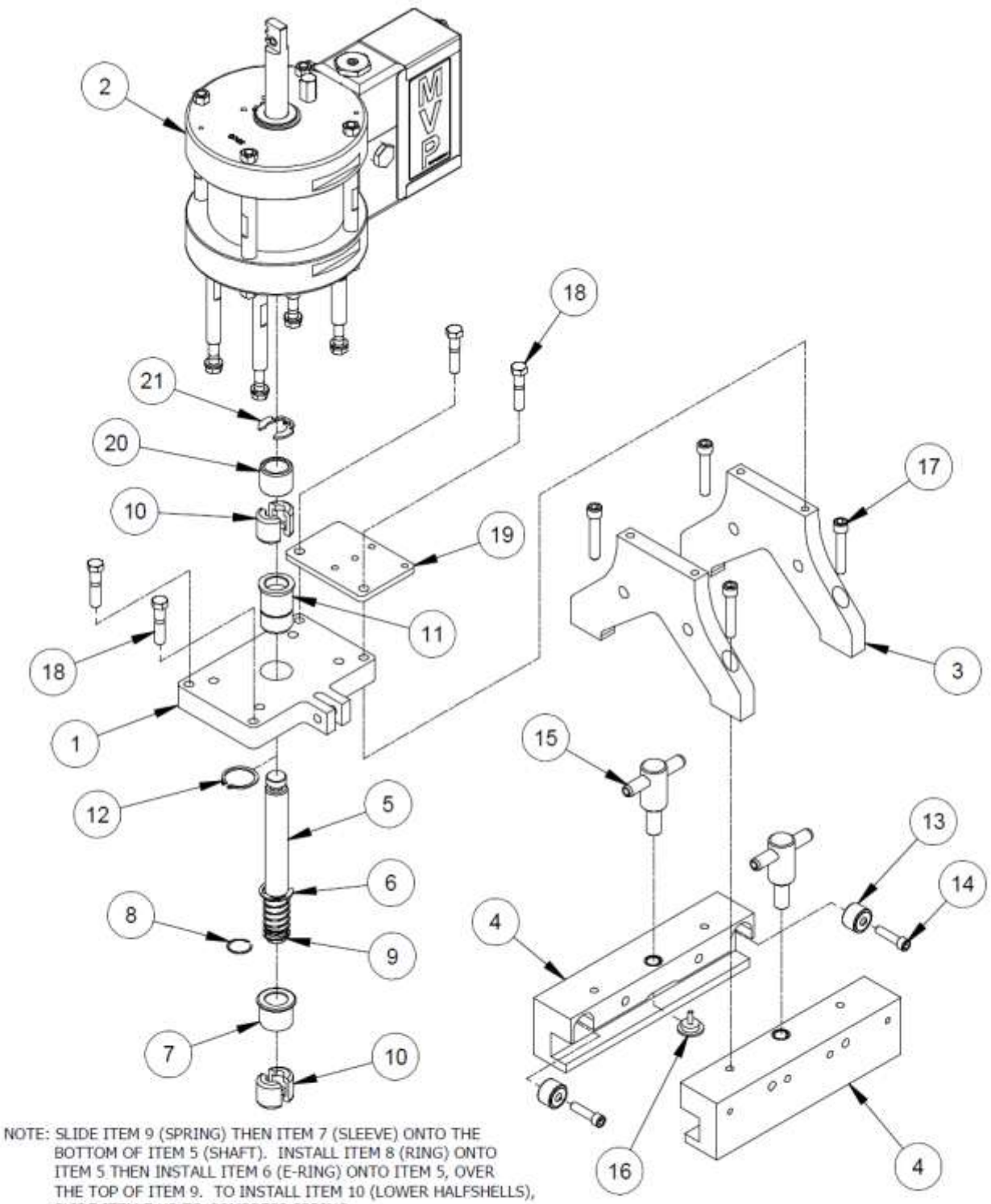
REV:

Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	PAT-LS-12270-MC	FLUID SECTION ASSY - MULTI COLOR PATRIOT
2	1	PAT-CA-5000	CARRIAGE ASSY.
3	1	PAT-SD-3100	SLAVE DRIVE ASSY
4	1	PAT-CP-0550	CAT PUMP ASSY - PAT. C72
5	1	PAT-SC-5000G-06	FILTER - SURGE CHAMBER ASSY. - CHOP
6	1	PAT-TA-400	FRAME ASSY.
7	1	PAT-CM-2	CAT MANIFOLD ASSY
8	1	PAT-CJ	CAT JUG ASSY. - 2 GAL
9	1	PAT-BRKT-CJ-4	CAT JUG WELDMENT BRACKET
11	2	F-SW-05	LOCK WASHER
12	2	1107-6-1	CARRIAGE STOP BRACKET
13	1	PAT-TA-1001	MOUNT BRACKET
14	1	F-SQUB-06C-32	U-BOLT
15	2	F-HN-06C	HEX NUT
16	2	F-SW-06	LOCK WASHER
17	2	F-HB-05C-08	HEX BOLT

MAGNUM VENUS PRODUCTS

PATRIOT MUTI-COLOR UNIT PAT-1550-MC-2

REV:



NOTE: SLIDE ITEM 9 (SPRING) THEN ITEM 7 (SLEEVE) ONTO THE BOTTOM OF ITEM 5 (SHAFT). INSTALL ITEM 8 (RING) ONTO ITEM 5 THEN INSTALL ITEM 6 (E-RING) ONTO ITEM 5, OVER THE TOP OF ITEM 9. TO INSTALL ITEM 10 (LOWER HALFSHELLS), SLIDE ITEM 7 UP TO COMPRESS SPRING.

MAGNUM VENUS PLASTECH

PATRIOT CARRIAGE ASSY.	PAT-CA-5000

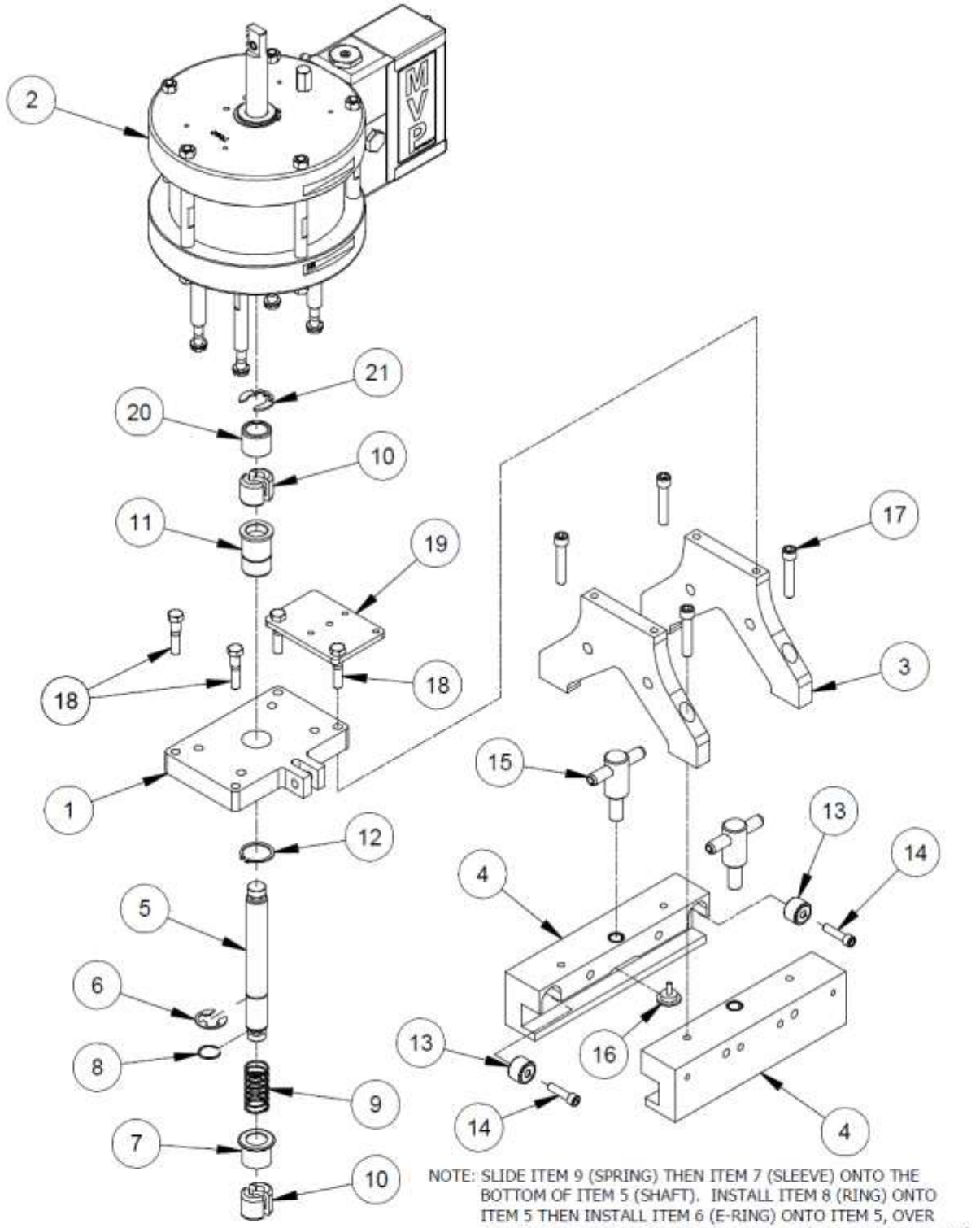
REV: 01-14-10 BT2

Parts List			
ITEM	PART NUMBER	QTY	DESCRIPTION
1	PAT-CA-8011	1	POWER HEAD PLATE
2	PAT-PH-5000-CA	1	POWER HEAD - 5"
3	PAT-CA-8013	2	TRUCK MOUNT
4	PAT-CA-8012	2	TRUCK ASSY.
5	PAT-CA-8015	1	INTERMEDIATE SHAFT
6	F-ER-56	1	E-RING
7	PAT-CA-8014	1	SLEEVE
8	F-RR-VS-87	1	RETAINING RING
9	SPR-C-1002	1	SPRING
10	APP-9096	4	HALF SHELL
11	PAT-CA-8016	1	MID BUSHING
12	MPH-3261	1	SNAP RING - EXTERNAL
13	9204-3-1	4	CAM FOLLOWER
14	F-CS-05C-20	4	CAP SCREW
15	MCTA-4256-01	2	CLAMP BOLT ASSY
16	MCTA-4257	2	CLAMP PAD
17	F-CS-06C-32	4	SOCKET CAP SCREW
18	F-HB-06C-28	4	HEX BOLT
19	PAT-CA-8021	1	UNIVERSAL BRACKET
20	PAT-PA-9109	1	SHELL RETAINER
21	F-ER-1.00-HD	1	Ø1" E-RING HEAVY DUTY

MAGNUM VENUS PLASTECH

PATRIOT CARRIAGE ASSY. PAT-CA-5000

REV: 01-14-10 BT2



NOTE: SLIDE ITEM 9 (SPRING) THEN ITEM 7 (SLEEVE) ONTO THE BOTTOM OF ITEM 5 (SHAFT). INSTALL ITEM 8 (RING) ONTO ITEM 5 THEN INSTALL ITEM 6 (E-RING) ONTO ITEM 5, OVER THE TOP OF ITEM 9. TO INSTALL ITEM 10 (LOWER HALFSHELLS), SLIDE ITEM 7 UP TO COMPRESS SPRING.

MAGNUM VENUS PLASTECH

CARRIAGE ASSEMBLY	PAT-CA-7000

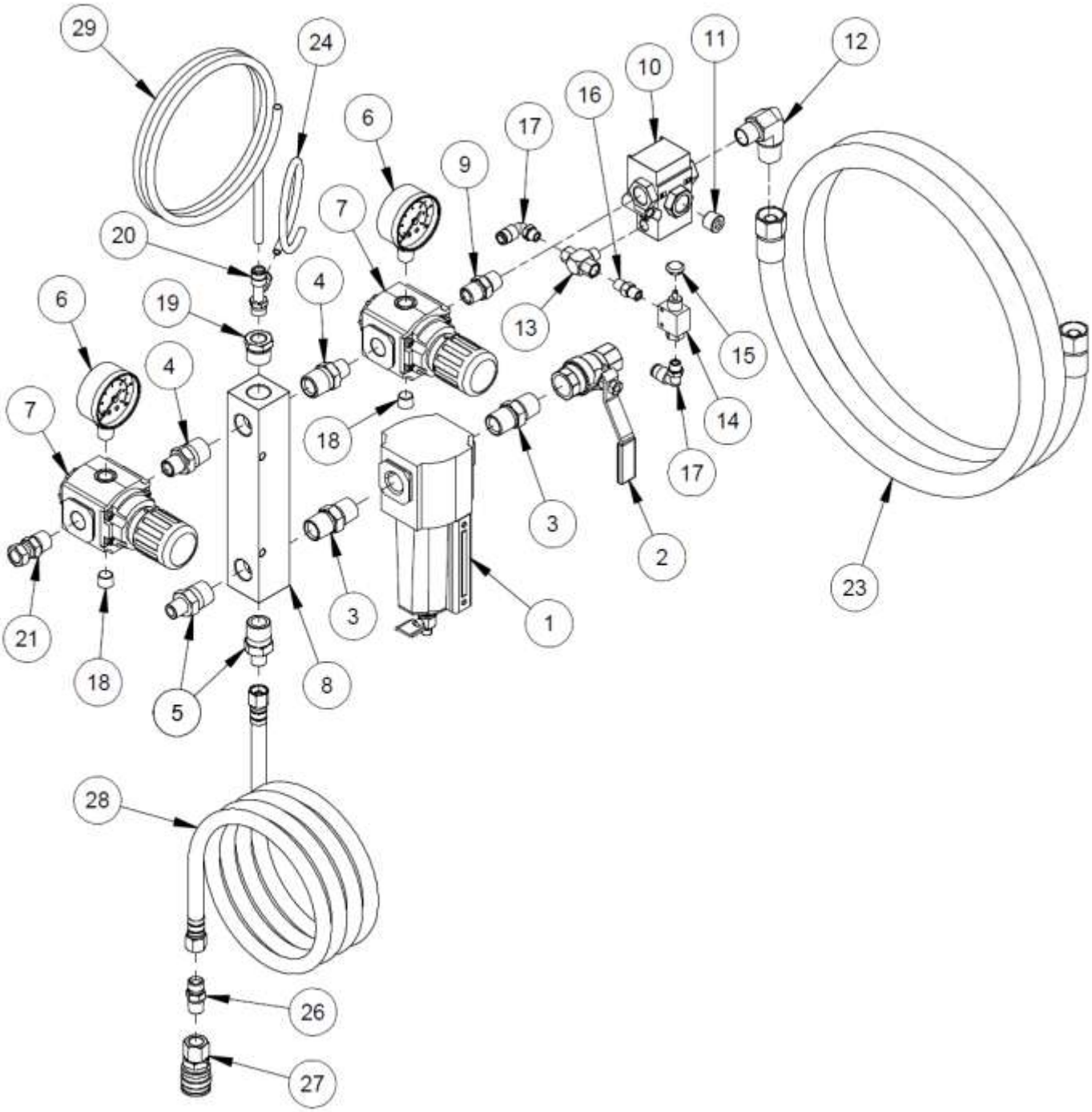
REV: 07-14-09 BT2

Parts List			
ITEM	PART NUMBER	QTY	DESCRIPTION
1	PAT-CA-8011	1	POWER HEAD PLATE
2	PAT-PH-7000-CA	1	POWER HEAD - 7"
3	PAT-CA-8013	2	TRUCK MOUNT
4	PAT-CA-8012	2	TRUCK ASSY.
5	PAT-CA-8015	1	INTERMEDIATE SHAFT
6	F-ER-56	1	E-RING
7	PAT-CA-8014	1	SLEEVE
8	F-RR-VS-87	1	RETAINING RING
9	SPR-C-1002	1	SPRING
10	APP-9096	4	HALF SHELL
11	PAT-CA-8016	1	MID BUSHING
12	MPH-3261	1	SNAP RING - EXTERNAL
13	9204-3-1	4	CAM FOLLOWER
14	F-CS-05C-20	4	SOCKET HEAD CAP SCREW
15	MCTA-4256-01	2	CLAMP BOLT ASSY
16	MCTA-4257	2	CLAMP PAD
17	F-CS-06C-32	4	SOCKET CAP SCREW
18	F-HB-06C-28	4	HEX BOLT
19	PAT-CA-8021	1	UNIVERSAL BRACKET
20	PAT-PA-9109	1	SHELL RETAINER
21	F-ER-1.00-HD	1	Ø1" E-RING HEAVY DUTY

MAGNUM VENUS PLASTECH

CARRIAGE ASSEMBLY PAT-CA-7000

REV:07-14-09 BT2



MAGNUM VENUS PLASTECH

AIR MANIFOLD, PATRIOT MULTI-COLOR PAT-MA-MC-EM

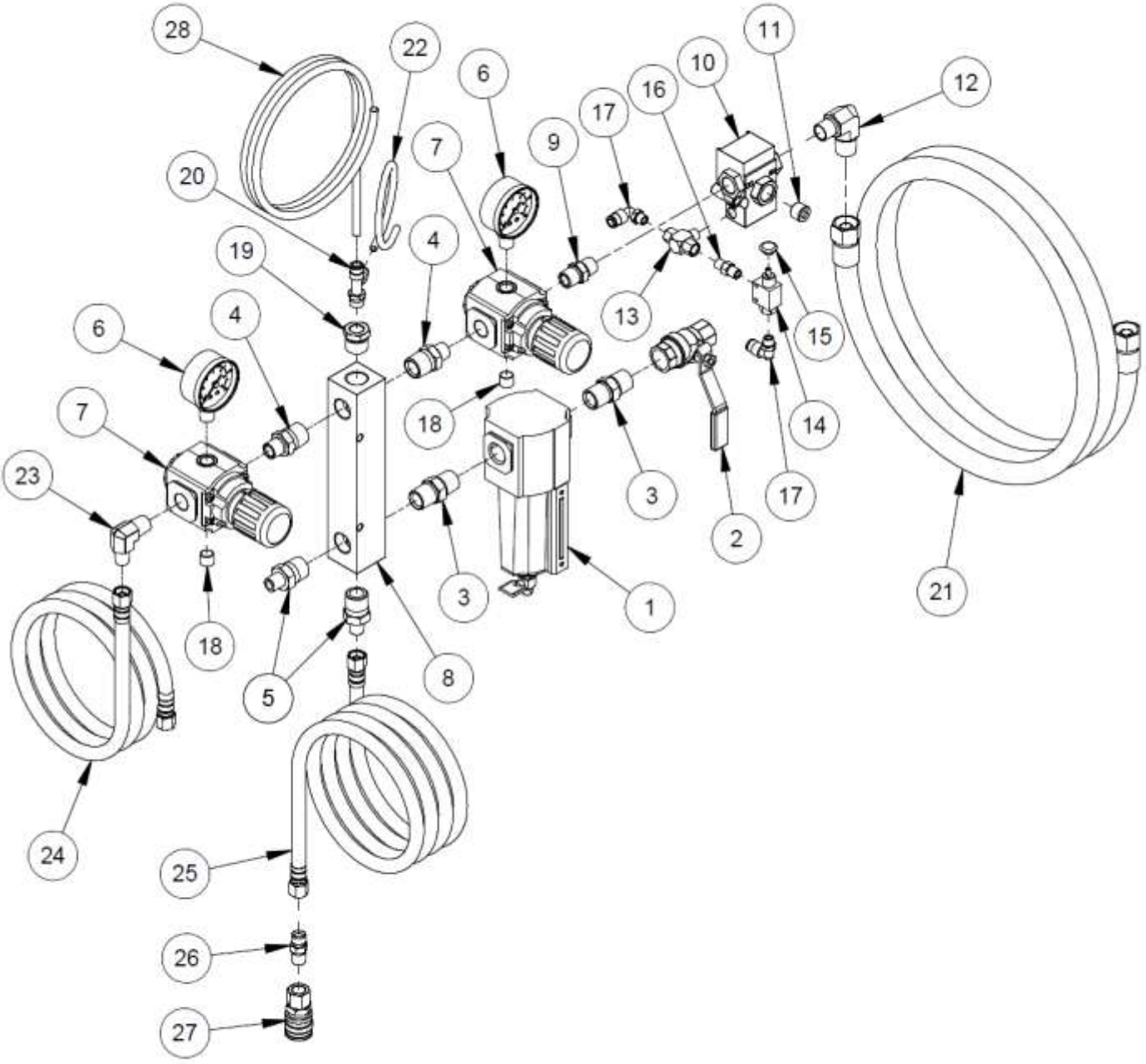
REV: 09-24-09 BT2

Parts List			
ITEM	PART NUMBER	QTY	DESCRIPTION
1	NOF-08	1	FILTER - 1/2" NPT
2	7702-2-2	1	BALL VALVE 1/2 NPT - AIR
3	PF-HN-08	2	HEX NIPPLE
4	PF-HN-08-06	2	HEX NIPPLE
5	PF-HN-08-04	2	HEX NIPPLE
6	AG-B2-100	2	2" AIR GAUGE
7	NOR-06	2	REGULATOR
8	MA-2001-1	1	MANIFOLD BLOCK
9	PF-HN-06	1	HEX NIPPLE
10	PV-101	1	PILOTED MAC VALVE 2-WAY
11	PF-AP-06	1	ALLEN PLUG
12	PF-ME-08-06	1	MALE ELBOW
13	8407-3-1	1	SHUTTLE VALVE
14	8407-4-1	1	3-WAY VALVE
15	8407-5-1	1	PUSH BUTTON
16	PF-HN-02	1	HEX NIPPLE
17	MPH-2539	2	MALE ELBOW
18	PF-AP-04	2	ALLEN PLUG
19	PF-RB-08-04	1	REDUCER BUSHING
20	06963	1	MALE RUN TEE SWIVEL
21	PF-SW-06M-04F	1	SWIVEL
23	HA-0888-8	1	AIR HOSE
24	01444	1 FT.	GREEN POLY TUBE
26	PF-HN-04-04S	1	HOSE ADAPTER
27	7701-7-1	1	FEMALE QUICK CONNECT
28	HA-0444-8	1	HOSE ASSEMBLY
29	MPM-2052-1	8 FT.	CLEAR BLUE POLY TUBE

MAGNUM VENUS PLASTECH

AIR MANIFOLD, PATRIOT MULTI-COLOR PAT-MA-MC-EM

REV: 09-24-09 BT2



MAGNUM VENUS PLASTECH

AIR MANIFOLD, PATRIOT MULTI-COLOR PAT-MA-MC-IM

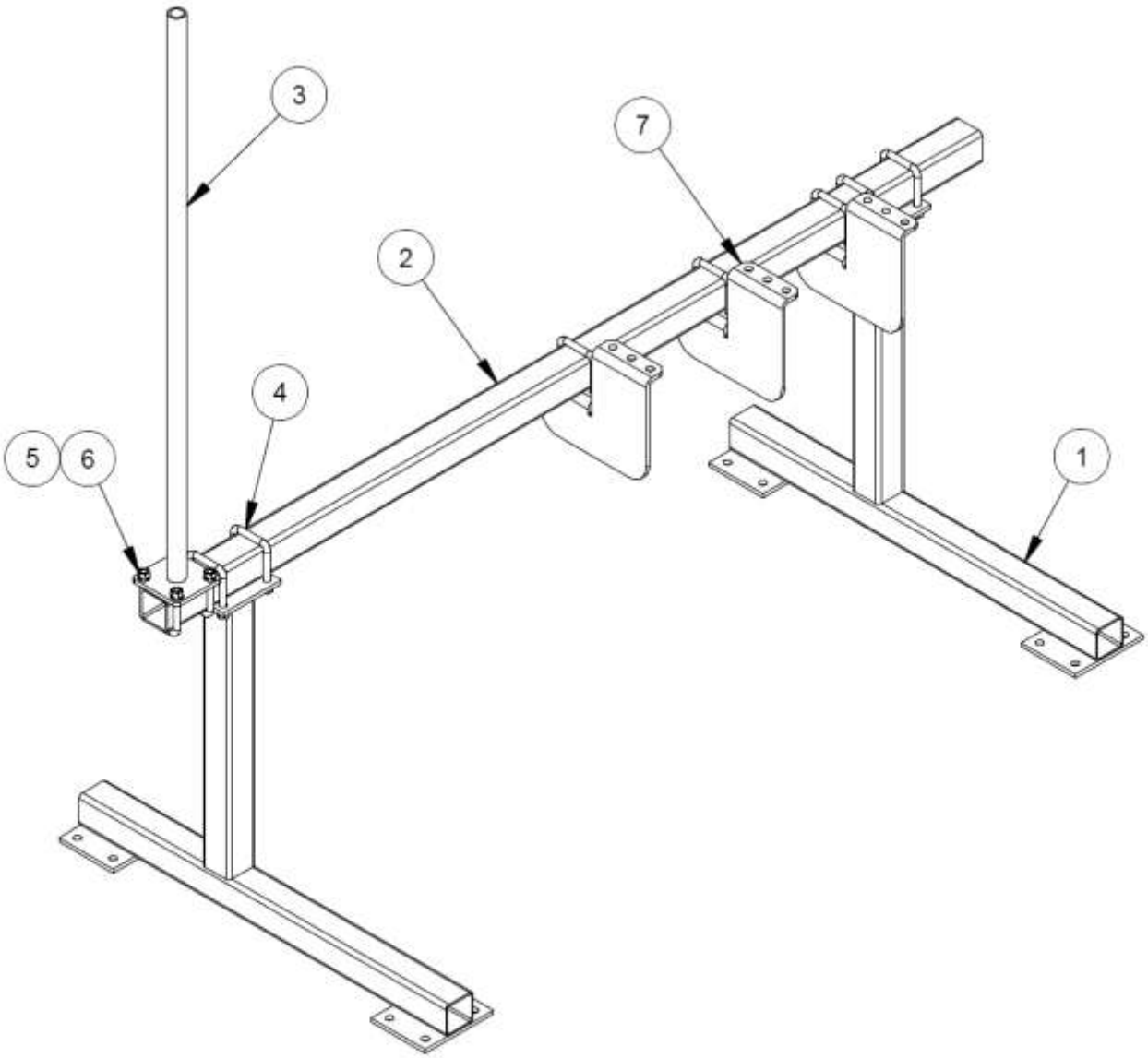
REV: 09-24-09 BT2

Parts List			
ITEM	PART NUMBER	QTY	DESCRIPTION
1	NOF-08	1	FILTER - 1/2" NPT
2	7702-2-2	1	BALL VALVE 1/2 NPT - AIR
3	PF-HN-08	2	HEX NIPPLE
4	PF-HN-08-06	2	HEX NIPPLE
5	PF-HN-08-04	2	HEX NIPPLE
6	AG-B2-100	2	2" AIR GAUGE
7	NOR-06	2	REGULATOR
8	MA-2001-1	1	MANIFOLD BLOCK
9	PF-HN-06	1	HEX NIPPLE
10	PV-101	1	PILOTED MAC VALVE 2-WAY
11	PF-AP-06	1	ALLEN PLUG
12	PF-ME-08-06	1	MALE ELBOW
13	8407-3-1	1	SHUTTLE VALVE
14	8407-4-1	1	3-WAY VALVE
15	8407-5-1	1	PUSH BUTTON
16	PF-HN-02	1	HEX NIPPLE
17	MPH-2539	2	MALE ELBOW
18	PF-AP-04	2	ALLEN PLUG
19	PF-RB-08-04	1	REDUCER BUSHING
20	06963	1	MALE RUN TEE SWIVEL
21	HA-0888-8	1	AIR HOSE
22	01444	1 FT.	GREEN POLY TUBE
23	PF-ME-06-04	1	MALE ELBOW
24	HA-0444-6	1	1/4 AIR HOSE ASSY
25	HA-0444-8	1	HOSE ASSEMBLY
26	PF-HN-04-04S	1	HOSE ADAPTER
27	7701-7-1	1	FEMALE QUICK CONNECT
28	MPM-2052-1	8 FT.	CLEAR BLUE POLY TUBE

MAGNUM VENUS PLASTECH

AIR MANIFOLD, PATRIOT MULTI-COLOR PAT-MA-MC-IM

REV: 09-24-09 BT2



MAGNUM VENUS PLASTECH

PATRIOT 2 TO 4 COLOR TRACK ASSY.	PAT-TA-400

REV: 05-08-08 BT2

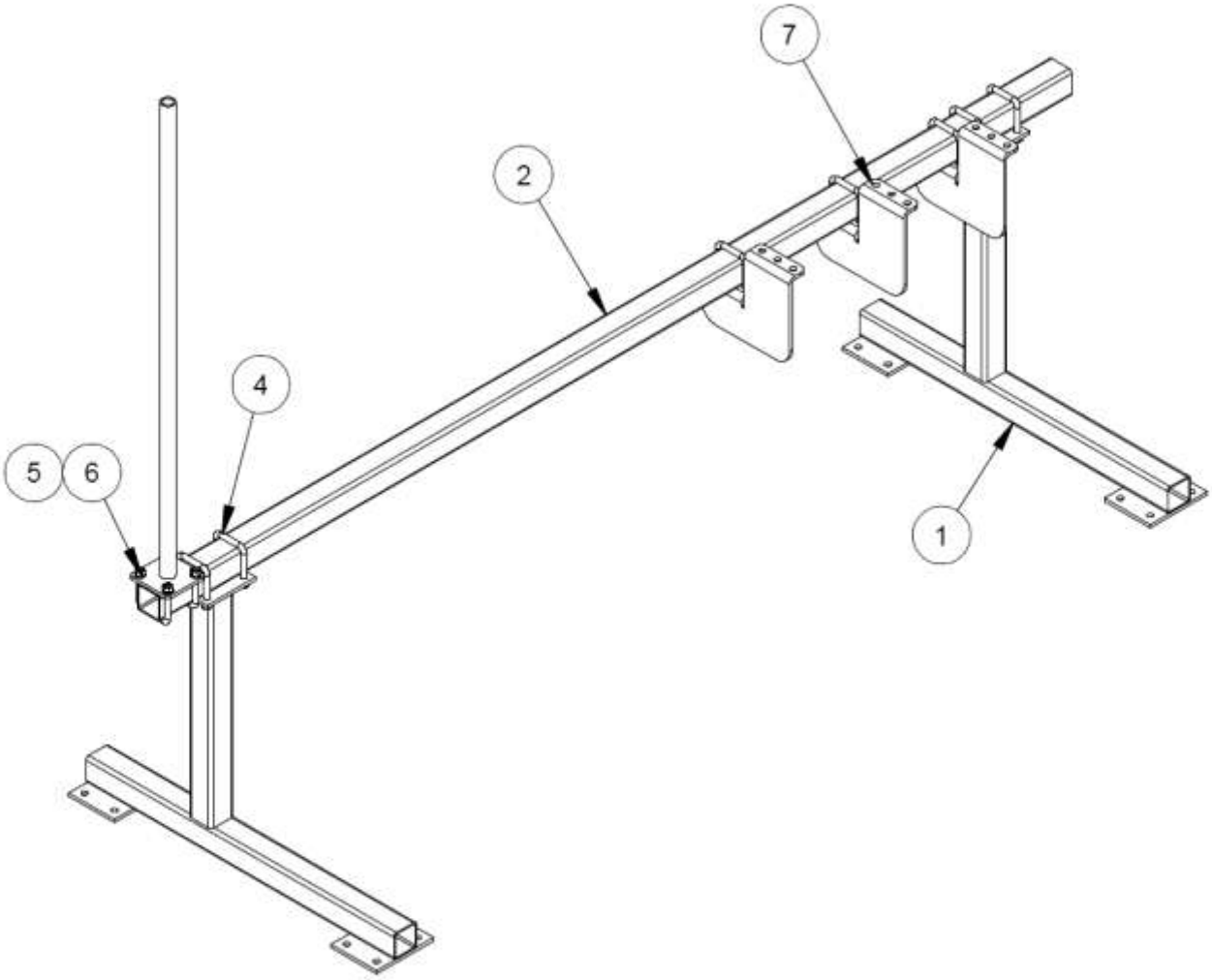
Parts List			
ITEM	PART NUMBER	QTY	DESCRIPTION
1	1101-3-01	2	END FRAME WELDMENT
2	1101-5-1	1	MOUNTING BEAM
3	1101-4-01	1	MOUNT COLUMN WELDMENT
4	F-SQUB-06C-32	9	U-BOLT
5	F-SW-06	18	LOCK WASHER
6	F-HN-06C	18	HEX NUT
7	PAT-TA-1001	3	MOUNT BRACKET

NOTE: 3 MOUNT BRACKETS ARE PROVIDED WITH THE FRAME (SUFFICIENT FOR 2 COLORS). ADD 1) PAT-TA-1001 AND, 1) F-SQUB-06C-32, 2) F-SW-06, AND 2) F-HN-06C FOR EACH ADDITIONAL COLOR.

MAGNUM VENUS PLASTECH

PATRIOT 2 TO 4 COLOR TRACK ASSY. PAT-TA-400

REV: 05-08-08 BT2



MAGNUM VENUS PLASTECH

PATRIOT 5 OR 6 COLOR TRACK ASSY.	PAT-TA-600

REV: 05-09-08 BT2

Parts List			
ITEM	PART NUMBER	QTY	DESCRIPTION
1	1101-3-01	2	END FRAME WELDMENT
2	1101-5-3	1	MOUNTING BEAM
3	1101-4-01	1	MOUNT COLUMN WELDMENT
4	F-SQUB-06C-32	9	U-BOLT
5	F-SW-06	18	LOCK WASHER
6	F-HN-06C	18	HEX NUT
7	PAT-TA-1001	3	MOUNT BRACKET

NOTE: 3 MOUNT BRACKETS ARE PROVIDED WITH THE FRAME (SUFFICIENT FOR 2 COLORS). ADD 1) PAT-TA-1001 AND, 1) F-SQUB-06C-32, 2) F-SW-06, AND 2) F-HN-06C FOR EACH ADDITIONAL COLOR.

MAGNUM VENUS PLASTECH

PATRIOT 5 OR 6 COLOR TRACK ASSY. PAT-TA-600

REV: 05-09-08 BT2

Revision Information:

Rev. 04/2010	Created Manual
Rev. 08/2012	Updated the Logo, MVP Address and the manual format, added the Terms and Conditions section.

MAGNUM VENUS PLASTECH

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Included with this operations manual are the following component manuals:

- ❑ **Patriot 1.25 Fluid Section Manual – PAT-LS-12270**
- ❑ **Maintenance & Repair – PAT-CP-0550**
- ❑ **Patriot Power Head Manual – PAT-PH-5000**

- ❑ **Patriot 1.75 Fluid Section Manual – PAT-LS-24050**
- ❑ **Maintenance & Repair – PAT-CP-0980**
- ❑ **Patriot Power Head Manual – PAT-PH-7000**

- ❑ **ATG-3500 REPAIR AND MAINTENANCE MANUAL**
  or
- ❑ **CLASSIC PRO GUN REPAIR MANUAL**