ADHESIVE SYSTEMS TECHNOLOGY CORP

PCHCD GMP-025 SERIES INSTRUCTIONAL MANUAL

MODEL

PCHCD GMP-025

RATIO

1:1

MANUFACTURED FOR

_____

SERIAL NUMBER

_____

INSTRUCTIONAL MANUAL

OPERATING INSTRUCTIONS

I. AST Warranty
II. General Description of System, with Diagrams
III. Unpacking, Set-up and Pre-Start Checks
IV. Daily Operation
V. Periodic Maintenance
VI. Trouble Shooting
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VIII. TEDs
IX. Bills of Material/Drawings

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ADHESIVE SYSTEMS TECHNOLOGY CORP

INTRODUCTION

WARRANTY INFORMATION

AST assumes that all persons operating or working on or with this system have read and understand the following operating instructions.

- AST /Adhesive Systems Technology Corp. warrants that products of its manufacture and bearing its name identification, when used in accordance with instructions and not misused or neglected, to be free from defects in workmanship or materials.
- This warranty does not apply to normal wear or to damage or wear resulting from misuse, abrasion, corrosion, negligence, accident, improper installation or tampering.
- Standard commercial components parts are excluded from this warranty and are covered under the original manufacturer's warranty.
- AST obligation under this warranty is limited to repairing or replacing at its distribution center any such product or part thereof which shall within (1) 8-hour shift daily use during six months after delivery to the original purchaser be returned to AST, transportation charges prepaid, and which upon examination reveals to have been thus defective.
- AST assumes no liability for consequential or contingent damage of any kind arising out of failure of its product, including losses caused by defective materials and workmanship.
- Damages due to causes other than defective materials or workmanship will be repaired at normal service charges.
- AST is not responsible for labor or material charges arising from removal or replacement of warranted parts
- This warranty is expressly in lieu of other warranties, obligations of liability expressed or implied by the Company or its representatives. All statutory or implied warranties, including any warranties of merchantability or fitness other than title, are hereby expressly negated or excluded.
- AST and its representatives may furnish, upon request, data and services relating to the application or use of its product. It will not be responsible, and does not assume any liability whatsoever for damages of any kind sustained, either directly or indirectly, by any person in the adoption or use of such data or services in whole or in part.
- Damages for breach of warranty are limited to the purchase price of the product. Upon repayment of such amount to the buyer/end user, the contract of sale of the equipment is cancelled without reservation of rights.

11/06

TECHNICAL VIDEOS

Each new unit includes an instructional video that details the items in this manual. Additional or replacement videos can be purchased through AST

CUSTOMER SERVICE

AST customer service & technical support is available Monday-through Friday, 8AM – 4:30PM CST. For more efficient service, have your machine's serial number ready (serial number can be found on the front page of this instructional manual AND on a silver tag mounted on the machine).

- REPLACEMENT/SPARE PARTS
  - Online: www.ast-corp.net. Click "Parts/Service"
  - Phone: 763-592-2060
  - Fax: 763-592-2075

    *Same day shipment on most parts

Other services provided by AST include:

- TRAINING: Factory and field training seminars available
- INFORMATION: Complete service & maintenance history records for each current system, complete engineering & manufacturing specifications and drawings for all equipment, and complete inventory of consumable items are kept by AST.
- SUPPORT: AST provides engineering support to work with you in maintaining equipment and increasing production. AST also provides system upgrade support along with field upgrades, repair & service (both at the factory & in the field) and preventative maintenance programs.

GENERAL DESCRIPTION OF SYSTEM

The GMP-025 Meter-Mix-Dispense system has two gerotor type gear metering pumps (GMP) that are powered with an electric motor. The system consists of seven major sections. Each of the components is described below.

1. Inlet Assembly
2. Electrical Drive Motor & Gear Reducer
3. Gear Metering Pumps and Material Outlets
4. Delivery Hoses
5. Dispense Valve
6. Mixer
7. Controls

This system is designed for use only with the material specified on the T.E.D. sheet for this system. Use of other materials is not approved without explicit factory consent and may cause poor results, damage the system, or other problems, which is considered misuse under AST warranty.

Each of the major sections is described below.

1. INLET ASSEMBLY

Each inlet assembly consists of a tank, lid, manual shut-off valve, and a pump inlet block. Typically, 5-gallon stainless steel tanks with a cone bottom are supplied with the unit (other options are available). The tanks are piped to the gear pump inlets. Each tank has three lid clamps, which may require occasional adjustment to maintain the lid seal.

Manual shut-off valves are installed between the material tanks and the gear pumps. These valves can be shut before servicing the pump to allow most of the material in the tank to remain inside. The valves should also be shut during transportation of the unit.

NOTE: Each manual shut-off valve must be open during dispensing.

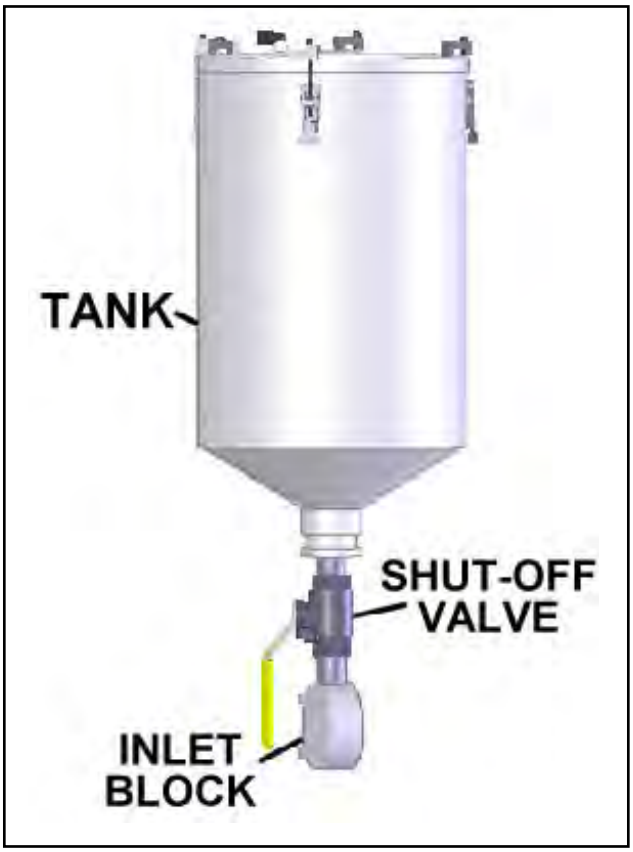
Each lid has a silicone gasket that can be scraped out when it becomes damaged over time. The shape of the lid allows the gasket to be re-made with any RTV silicone. Each lid also has a vent to allow air inside the tank as the material is pumped out. For moisture-sensitive materials, this vent is connected to an air dryer assembly

If supplied, the air dryer assembly (See BOM & Drawing #55472A) consists of a desiccant canister connected by polyurethane tubing to the bent in each tank lid. A small window on the side of the canister allows the user to view the contents. When the light blue to any other color, the canister should be replaced.

NOTE: New canisters need holes punctured in each end of the canister for the system to work properly. Failure to do so will result in problems with the dispense ratio.

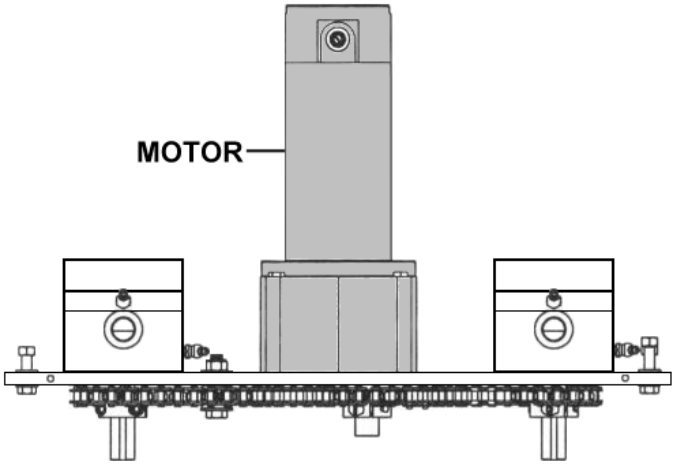
Each tank contains a screen assembly to prevent any debris or unwanted particles from entering the pump. This screen should be removed and cleaned periodically to prevent blockage inside the tank.

The inlet block connects the tank/inlet assembly to the gear pump. The block is connected by (4) 5-16”-18 x 2-1/4” bolts. Removing these 4 bolts will allow the entire inlet assembly to be removed from the machine.



2. ELECTRIC DRIVE MOTOR & GEAR REDUCER

The GMP is driven by a TEFC 90 V D.C., variable speed electric motor. The motor is fuse-protected; which is located inside the controller. The internal gear reducer is pre-lubed and sealed.



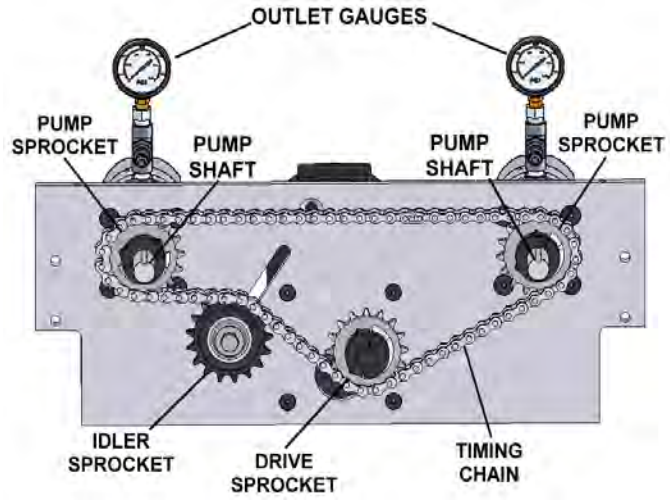
3. GEROTOR PUMPS & MATERIAL OUTLETS

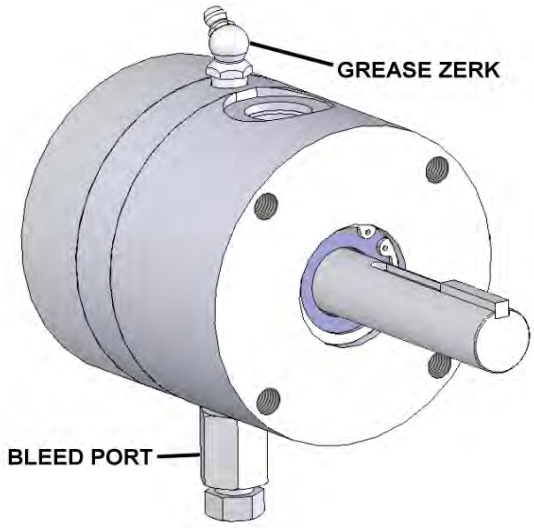
Each AST gear metering pump consists of a hardened drive shaft, lube chamber with dual shaft seals, metering gear, material inlet block with air bleed port and a material outlet assembly with gauge

In operation the pump shaft is connected to an inner drive gear which, when turned, drives an outer internal driven gear. The inner gear has one less tooth than the outer gear allowing the pump to transfer material from the inlet to the outlet of the pump, which are on opposite sides of the gears. Precise tolerances prevent material by-pass as the gears maintain a positive seal as the contours of each gear are followed. Excessive wear or physical damage to the surfaces of the working section of the pump will reduce the ratio accuracy of the system.

Ratios are simply a function of the number of teeth on either drive sprocket. Example: a 32 and a 16-tooth sprocket will dispense at a 2:1 ratio by volume. In some cases, dual stage pumps can be used on one side to obtain a wider ratio.

Gauges on the outlets of the pumps allow the operator to monitor pumping pressures. Pressure readings on the gauges will almost always be different from “A” to “B”; this is due to the difference in viscosities of the “A” and “B” materials. The operator should pay attention to the behavior over time of the gauges. Large variations often indicate problems with obstructions, empty tanks/inlets, or other problems.





Two zerks for lubrication of the pump are provided. The zerk closest to the pump shaft is provided for filling the seal chamber. The zerk closest to the pump’s side outlet is provided for lubrication of the metering gear itself. Both should be filled daily with a lubricant compatible with the material being dispensed. NOTE: The second zerk cannot be filled without opening the bleed port at the bottom of the pump. While the zerk on the top of the pump is filled, the bleed valve at the bottom of the pump must be opened. Lubrication is complete when fresh lubricant is pushed out from the bleed valve.

4. DELIVERY HOSES

"A" and "B" materials flow through their individual delivery hoses. The two material hoses plus control air lines join the main system to the dispensing applicator. The type of hose used will vary, and are specifically chosen for the application. Any replacement must be identical or of superior specifications in terms of pressure, dimensional rigidity under pressure, and porosity.

The hoses used have a teflon core with stainless steel braiding on the outside. They can be damaged if severely kinked, but are generally resistant to most solvents that may be used to flush the system.

5. DISPENSE VALVE

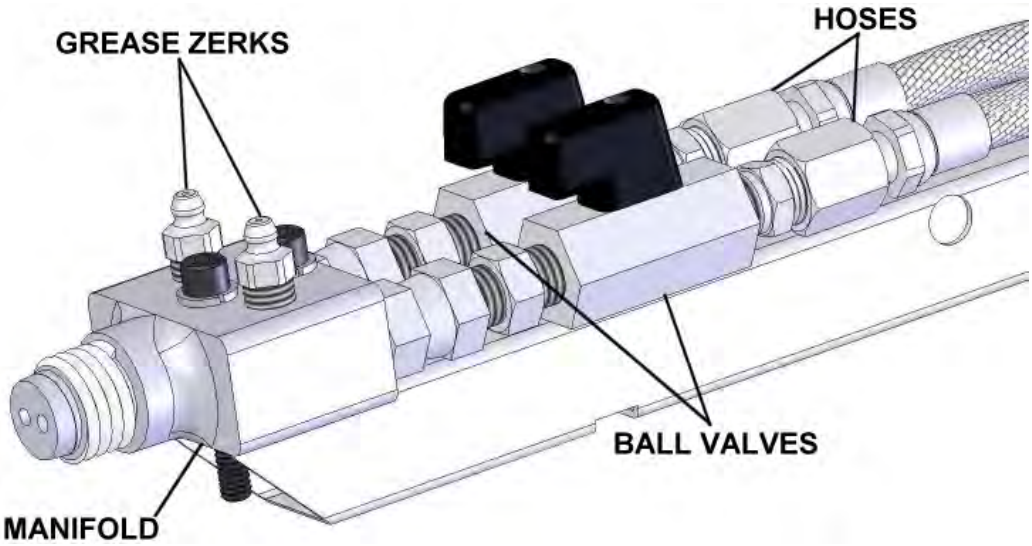
The applicator for the GMP-025 can be a manually actuated dispense applicator or an air actuated dispense valve. Please review machine components to become familiar with the dispense assembly.

If a manually actuated dispense applicator, system operating ("on" and "off") signals are given when the operator presses the applicator switch.

"A" and "B" materials are kept separated to the point where they join together inside the disposable plastic mixer at the applicator tip. A retaining nut forces a tight fit of the disposable mixer nozzle to the threaded applicator block.

Two grease zerks are located on the side of the dispense manifold. These can be used to fill the manifold with a compatible lubricant to prevent material problems inside the manifold when not in use. Only lubricants compatible with the material to be dispensed can be used. The same lubricant can be used in the pumps.

A check valve for each component is located inside the manifold. The check valves supplied are assemblies which should be disassembled and cleaned periodically. The o-ring inside the check valve can be replaced, if necessary.



6. STATIC MIXER

Sometimes referred to as a "mixer nozzle," the static mixer is a disposable tube that mixes parts "A" and "B" together as they are pumped through the elements inside the tube. Mixers are available in a variety of diameters and mixing elements (length). Field experience will determine which diameter, element quantity, and tip opening size is best. <u>The first material out of a static mixer should be discarded & not used, especially for materials that are not 1:1 ratio</u>.

NOTE: When not in use, the static mixer should be removed and discarded. Attempting to use a static mixer that has become partially cured can result in crossover, or one component being forced inside the manifold port for the other component.

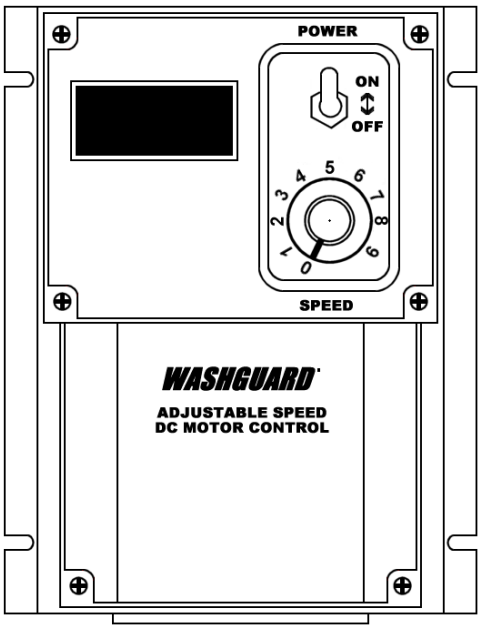
ELECTRICAL CONTROLS

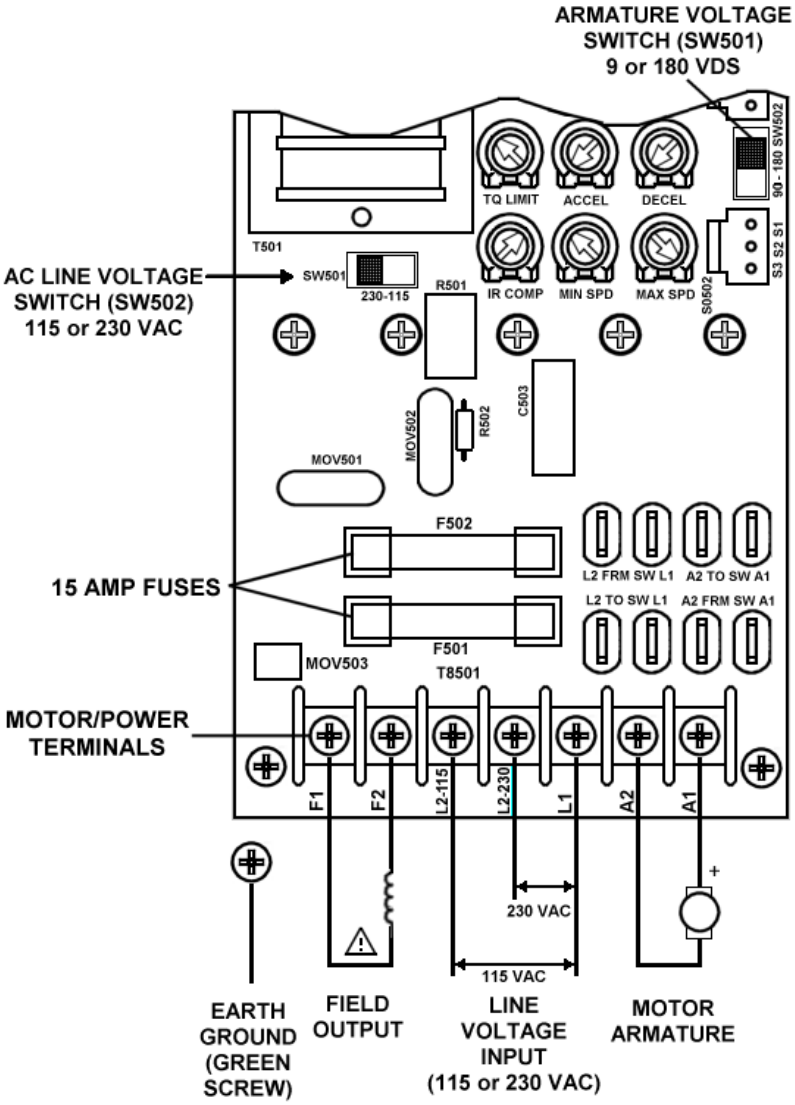
Operation signals are given by a trigger switch. This signal will start pump operation and air signals will automatically open and close the dispense valve when desired.

One control for the operator to set or adjust is the drive motor speed controller. Turning the speed control potentiometer clockwise will increase the speed of the motor & increase the output of the pumps.

FUSE: Two fuses are located inside the motor controller, one for the motor armature and one for the controller itself. USE ONLY CSA CERTIFIED FUSES with a DUAL ELEMENT (type MDL). Replacement fuses must be exact matches of the fuses originally supplied.

POWER SUPPLY: Ground fault protection is required. USE ONLY UL LISTED GFI PLUGS designed to allow portable equipment users the ability to provide ground fault protection to their equipment.





UNPACKING, SET-UP & PRE-START CHECKS

SET-UP & PRE-START CHECKS

- Check for shipping damage. File claims with the shipper for any apparent damage.
- Remove any plugs and caps from both hoses and attach hoses and tubing to main system as indicated (if hoses are shipped detached).
- Check for loose bolts, fittings, etc. which may have loosened during shipping.
- Connect motor controller to power supply (120VAC). Use a ground fault interrupter (not supplied). Using a GFI Plug will help protect the motor controller and greatly improve service life.
- If using an extension cord, it must be no longer than 100 feet, 14 gauge. Longer and/or smaller gauge supply may starve the controller, causing erratic pump performance and may cause the controller fuse to blow.
- Do a preliminary check of system before filling material containers. Actuate handle trigger & release signal to stop.
- Filling containers with material: Make sure respective materials are poured into designated containers. Fill at least ½ full & place lid on each container immediately after filling. Make sure inlet valves are open between pumps & tanks. Label both containers to assure correct filling. When filling, place lid on tank not being filled.
- Filling hoses and applicator: Actuate system and slowly run until allowing materials to flow through both hoses to the applicator. IF MIXER NOZZLE HAS BEEN ATTACHED, REMOVE TO AVOID MATERIAL CROSS-OVER.
- HOSE FILLING PRECAUTION: Any high point in hose can hold air and allow an air gap. Slope hose on a gradual upward slope away from system to applicator while filling. The dispense valve should also slope upward in a similar manner until materials flow smoothly out of both ports of the dispense manifold. In almost all cases, “A” and “B” materials behave differently and fill at different rates. Let earlier appearing material flow into waste container until other material is also flowing freely.
- Establish proper flow of both materials at dispense manifold **WITHOUT THE MIXER ATTACHED**. Hold the top into a waste container and actuate the system. Observe flow of both materials from the round ports and continue to run the system until a positive, air free flow is achieved. Wipe clean and apply compatible lubricant to the tip and the treaded area to permit easy removal later.
- Attach proper mixer to applicator tip and tighten mixer nut.
- Purge at least 3 mixer volumes of material and discard static mixer.

The system is now ready for dispensing meter/mixed materials!

TIPS, PRECAUTIONS & WARNINGS

- Keep this instruction manual
- Never permit either material tank to get below approximately 1/3 full.
- A common problem is cross-over (one material crossing over into the other material’s manifold and/or hose). Damage and cost from cross over can be avoided by carefully following instructions.
- If the gauges display pressures that “peg” the needle, immediately remove power from machine.

Do not install a disposable mixer nozzle to the dispense manifold until positive air-free flow is achieved from both outlets of the applicator block tip.

- Air can be trapped in hoses during filling of an empty system. To avoid trapping air, arrange the hoses to obtain a continuous gradual upward slope of the hoses from the pump outlet to the applicator while the system is pumping at low speed. Point the dispense assembly upward to let the material push the air out.
- Two zerks are provided on each side of the dispense manifold, where the static mixer is attached to the applicator. These are provided so that the operator can remove the mixer and fill the ports of the manifold with a compatible lubricant. This helps prevent problems with material hardening in the manifold, and should be done when the unit is left unused for any period of time.
- The gerotor pumps are lubricated in two places. Both should be lubed daily. When the zerk on the top of the pump is filled, the bleed valve at the bottom of the pump must be opened. Lubrication is complete when fresh lubricant is pushed out from the bleed valve.

  The maximum cord length that can be used is 100 feet using 14-gauge wire.

- Low material temperature raises the viscosity inside the system, greatly increasing the work required to pump. If system is to be used in a cold temperature situation, material & system should be kept as close to or above room temperature as possible. Any heating of material must be regulated no higher than maximum temperature recommended by material manufacturer.

DAILY OPERATION

START-UP

- Open “A” and “B” container supply valves.
- Check level of materials in containers, making sure level is always over ¼ filled.
- Clean off applicator dispense head with plastic mixer nozzle removed
- Verify smooth, air-free flow of both materials by dispensing material into waste container. Check for two smooth, consistent streams of material.
- Wipe head clean and coat dispense head with compatible lubricant.
- Place new plastic mixer nozzle on dispense head with retaining nut.
- Dispense approximately 2 mixer volumes of material into waste container.
- Make 2 or 3 test samples to verify performance.

SHUT-DOWN

- Remove static mixer nozzle.
- Trigger applicator to relieve any pressure in lines or system. Materials may ooze out of applicator.
- Turn off or disconnect motor controller.
- Fill dispense manifold with compatible lubricant. Fill each zerk until material inside dispense manifold is replaced with compatible lubricant.
- Lubricate each pump:
  - Open bleed valve at bottom of pump.
  - Grease zerk at top of pump until material coming out of bleed port is clean, fresh lubricant.
  - Close bleed valve & verify tanks are over 1/3 full.

ADHESIVE SYSTEMS TECHNOLOGY CORP

PERIODIC MAINTENANCE

METERING PUMP MAINTENANCE

- Remove and clean any material residue or film with compatible solvent (damp pad only – do not pour solvent)
- Lubricate with compatible lubricant.
- If leakage appears at shaft, replace seals.

DISPENSE VALVE MAINTENANCE

- Clean threads & ports of dispense manifold
- Remove & soak manifold in compatible solvent, if necessary

RATIO CHECK

- Remove retainer cap and/or mixer nozzle
- Trigger applicator; two separate beads of material will appear; compare for correct volume
- Replace o-rings, packings & seals, if necessary

TROUBLESHOOTING

VERY IMPORTANT: As soon as a problem is noticed, immediately remove disposable mixer nozzle and try dispensing material. This may prevent or purge material crossover if it has not already hardened.

After static mixer is removed, THEN check the following:

- Is the dispense manifold plugged? (Material set up)
- Is there sufficient material in the tanks?
- Is the pressure at the outlet gauges changed from normal?
- Is the machine dispensing on ratio?

If ratio is not correct:

- Check if air is entrapped in the pumps or hoses
- Check if the drive chain is loose or worn
- Check if one or both of the pump sprockets are frozen (Can the sprocket be rotate with a large pliers?)

RATIO CHECK PROCEDURE

The following is the list of items to check if the equipment is not dispensing the correct ratio. Please note that some items included in this procedure are not included with all supplied equipment. Please use all safety devices such as but not limited to gloves and eye protection. When working with solvents do so in a well-ventilated area free of combustible items. Take every effort not to mar or damage any surfaces that come in contact with materials.

If you suspect the ratio is incorrect and the dispense valve is in good condition, proceed as follows:

- Remove retainer cap and/or mixer nozzle.
- Trigger applicator; two separate beads of material will appear. Dispense each bead into separate cups; compare for correct volume. If volume is correct with mixer off, metering pumps are worn & need to be replaced.
- If volume is off, remove hoses from dispense valve and trigger applicator. Dispense each material into separate cups. Compare volume of material dispensed out of material hoses. If volume is correct, the problem is occurring in the dispense valve. Clean and/or replace seals, o-rings, & packings if necessary.
- If ratio is still not correct, remove hoses at the outlet assembly. Trigger applicator and dispense each material into separate cups. Compare volume of material dispensed out of outlet assembly. If volume is correct, the problem is occurring in the material hoses. Clean and/or replace hoses.
- If ratio is still not correct, disassembly and clean pumps. Replace seals & o-rings if necessary.

Other items of note:

- Verify that the air inlet to the tank is in good condition. The air goes into the tank through the air dryer canister. Check that the canister has holes in both ends and is not clogged with material. Next, check that the tubing from the tank to the lid is not blocked. Also, check that the crystals inside the canister (through the little window on the side) are light blue in color. Replace if pink in color.
- Check for blockages on the inlet side of the pump with the reduced output. The round inlet block will have to be taken off the back of the pump. Then, inspect the piping leading from the tank to the inlet block. If a blockage is found, it may not be necessary to go any farther.
- Clean and rebuild the pump. Check that the inner and outer gears are tight against each other. [Note: be careful not to damage the inner pump parts when disassembling or cleaning. Replacement parts for the gerotors are available only as a complete pump!] *Remove all crystallized or partially hardened material from all surfaces that contact the material.
- Check the outlet assembly (the piping between the pump and the hoses) for blockages.

*NOTE: Any material that is left in the machine that is partially or completely hardened, or foreign objects, will eventually cause a problem somewhere and should never be left in the pump.

TROUBLESHOOTING GUIDE

Problem	Possible Causes/Areas to Check	Remedy
Unit Will Not Run	Check Electrical Supply	Verify that requirements are met (115/120v, 100' extension)
	Check motor controller fuses	Replace
	Motor / Gear box failure	Replace
(ALWAYS remove power when servicing)	Switch in dispense assembly handle	Replace if unit runs when bypassed
Unit runs but no flow / low flow of materials	Improper material supply to pumps	Clear obstruction in tank bottom
	Desiccant canister	Unopened or blocked air vent holes
	Check chain drive	Tighten / replace drive chain
	Air in material supply	Tighten / seal all material fittings
	Ratio check NOT okay *Blockage of hoses *Blockage in dispense assembly *Blockage in pump	Clear / replace Clear / replace Replace Rebuild
	Plugged hoses or dispense manifold	Clear or replace
	Worn Pumps	Verify that material being used is non-abrasive
Too much flow	Motor speed control	Reduce setting
	Check motor control speed setting	Adjust per controller manual
Irregular flow	Check valves sticking / blocked	Disassemble & Clean
	Blockage at pump inlet	Remove tank & inlet; clear
	Blockage in hoses	Clear / replace
	Blockage in static mixer nozzle	Replace
Material not curing	Material off ratio	1. Check material by hand: mix a sample of A&B in the proper ratio 2. Do a system ratio check
	Timing sprockets wrong size	Correct / replace
	A or B pump seals leaking	Rebuild Pump
	A or B check valves sticking (in dispense assembly)	Disassemble, clean, & rebuild; use new o-ring
	Static mixer worn or plugged	Replace
	Static mixer does not have enough elements for proper mix	Increase mixer size
	Lead in one material coming out of dispense manifold; Air in material	Follow air bleed procedure
	Foreign object or cured material in pump or pump inlet	Remove tank & inlet, then clear or rebuild pump

SHUT-DOWN PROCEDURES

PUMP CLEANING PROCEDURE

The following is the recommended procedure for removing, inspecting, cleaning and reinstalling GMP pumps. Please use all safety devices such as but not limited to gloves and eye protection. When working with solvents do so in a well-ventilated area free of combustible items. Take every effort not to mar or damage any surfaces that come in contact with materials.

- Disassembly
  - o Remove tank & inlet [assuming all material has been removed from tanks].
    - ➢ Open bleed valve on top of inlet block, if supplied.
    - ➢ Remove tank straps, if supplied.
    - ➢ Remove (3) of the 4 bolts attaching inlet to back of pump
    - ➢ Loosen fourth bolt to allow inlet to come off pump and drain any remaining material. Remove bolt and tank after enough material is drained.
    - ➢ Discard o-ring between inlet & pump (12498).
    - ➢ Clear any foreign objects, crystallized or partially hardened material from tank & inlet block.
- Cleaning of residues from pump
  - o Partially disassemble & clean pump
    - ➢ Remove four bolts attaching inlet to back of pump. Back of pump should pull off shaft & front section. Excessive force should be used only with extreme caution to prevent damage to the pump (Be careful to not lose the two alignment pins, which prevent incorrect assembly of pump. Clean pins if necessary).
    - ➢ Clean bolts of any material.
    - ➢ Prevent any damage to all interior surfaces of pump.
    - ➢ Carefully remove outer stator ring housing. Assuming that any crystallized material is located between stator (internal teeth) and rotor (external teeth), soak area in contact with material in a compatible solvent to soften.
    - ➢ Gently remove & clean stator. Rotor should be carefully cleaned at this time while still mounted on pump shaft. Use nylon brushes instead of steel if possible to preserve surface finished.
    - ➢ Keep all parts, except for o-rings.
    - ➢ All residues of old material are to be removed from all internal surfaces of the pump parts.
    - ➢ Test to see if pump shaft can be turned.
      - ❑ Check to see if motor will turn by turning on the machine briefly.
      - ❑ Remove chain and turn sprocket. Use a wrench, if necessary.
      - ❑ If pump shaft will turn, further disassembly is unnecessary unless material is leaking from shaft seals (check behind drive sprocket).
    - ➢ Once completely clean, re-assemble pumps. *Note: Mechanical side of pumps cannot be assembled incorrectly if the two (2) guide pins are in place. Use new o-rings. The use of petrolatum grease is recommended to lubricate all internal surfaces immediately before installation and may make re-assembly easier along with future servicing of pump.
    - ➢ Lubricate pumps using zerks supplied. Use only petrolatum grease for this purpose.
- Load Material into machine per operator's manual.
- Test machine per operator's manual.
  - o Check cured material for uniform cure and consistency.
  - o See "Troubleshooting" section in operator's manual if any problems are observed.
- Restock any items used in procedure.

SHORT-TERM SHUTDOWN PROCEDURE

The following is the recommended procedure for storing equipment for a shot period of time. Please note that some items included in this procedure are not included with all supplied equipment. Please use all safety devices such as but not limited to gloves and eye protection. When working with solvents do so in a well-ventilated area free of combustible items. Take every effort not to mar or damage any surfaces that come in contact with materials.

- Pump Unit Dry
  - o Pump remaining material.
    - ➢ Remove static mixer and/or spray attachment.
    - ➢ Operate machine until no material is being dispensed. Check that hoses are allowed to drain completely (hoses should lead "downhill" towards dispense valve).
    - ➢ Clean dispense valve & reapply layer of compatible lubricant.
  - o Flush System
    - ➢ Use only a cleaning solution most effective for removing your material. Consult manufacturer for recommendations. Carefully observe all health and safety precautions listed on all labeling.
    - ➢ Fill each tank a minimum of 1/3 with a compatible cleaning solution.
    - ➢ Set pump speed control to slow setting.
    - ➢ Operate machine until cleaning solution begins to come out of the machine.
    - ➢ Allow machine to sit for a period of time, depending on the effectiveness of the cleaning solution, not more than one hour. Most solvents will not damage any component unless allowed to remain in system.
    - ➢ Continue pumping cleaning solution into container until machine is again empty. Observe cleaner as it is being pumped. As solution is pumped, it should appear to become clean. If this is not observed, the same cleaner, after impurities have settled, can be re-loaded into machine and procedure repeated – if it is pumped out immediately. Do not allow any settled material back into system.

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- Tank/Material Feed System
  - Clean & inspect tank lid sealing gaskets. Repair with RTV Silicone as necessary.
  - Check desiccant canister. Verify that crystals are blue in color through window in side of canister. Replace if crystals are not blue.
  - Check makeup air lines from desiccant canister to tank. Remove or repair any blockages.
  - Clean inside of tanks, concentrating on any material built up that might wind up in pumps.

- Start-up Procedure
  - Prepare system for loading
    - Pre-season startup checks outlined below should be performed in advance of any intended use.
    - AST assumes previous shut-down procedure was followed.
      - ❑ Connect electrical power.
      - ❑ Open ball valves under tanks
      - ❑ Test operation of machine. Verify that oil loaded into machine comes out both ports on the dispense valve when triggered.
      - ❑ Operate system until empty.
  - Flush system with compatible solvent
    - Fill each tank a minimum of 1/3 full with a compatible cleaning solution.
    - Operate and observe behavior of system.

    *NOTE: Gauges will not read normal pressures while pumping solvent due to the fact that solvents are less viscous, therefore requiring less pressure to pump.

    - Verify that flow is coming out of both ports in dispense valve.
    - Operate system until empty. Please not that it is not harmful to run machine dry.
    - If available, open ball valve under pump inlet block to verify that all solvent is drained from tanks.
    - If possible, temporarily disconnect material hoses from dispense valve and allow any trapped solvent to drain.
    - Fill zerks on dispense valve with petrolatum grease until lubricant coming out of ports is clean.
  - Load & Test Material
    - Load each material into correct tank. Remember to keep one lid on while filling the other tank.
    - Verify that ball valves above each pump and at outlet assembly are open.
    - Set motor speed to low (30%) and actuate trigger, operating system until correct material comes out both ports of dispense valve.
    - Observe pressure gauges while filling system. A spike in pressure would indicate a blockage downstream from pump.
    - Operate system until two streams of material come out of dispense valve. Release trigger and wipe manifold.
    - Attach static mixer to dispense valve. Make several test shots of material in small cups or on aluminum foil and allow curing.
    - Discard static mixer, wipe manifold clean, and re-fill manifold with petrolatum grease.
    - Check cured material for flaws and inconsistencies.
    - See “Troubleshooting” section in operator’s manual if any problems are observed.

END OF SEASON SHUTDOWN PROCEDURE

The following is the recommended procedure for storing equipment for an extended period of time. Please note that some items included in this procedure are not included with all supplied equipment. Please use all safety devices such as but not limited to gloves and eye protection. When working with solvents do so in a well-ventilated area free of combustible items. Take every effort not to mar or damage any surfaces that come in contact with materials.

- Pump Unit Dry
  - Pump remaining material.
    - Remove static mixer and/or spray attachment.
    - Operate machine until no material is being dispensed. Check that hoses are allowed to drain completely (hoses should lead “downhill” towards dispense valve).
    - Clean dispense valve & reapply layer of petrolatum grease.
  - Flush System
    - Use only a cleaning solution most effective for removing your material. Consult material manufacturer for recommendations. Carefully observe all health and safety precautions listed on all labeling.
    - Fill each tank a minimum of 1/3 with a compatible cleaning solution.
    - Set pump speed control to slow setting.
    - Operate machine until cleaning solution begins coming out of machine.
    - Allow machine to sit for a period of time, depending on effectiveness of cleaning solution, not more than one hour. Most solvents will not damage any component unless allowed to remain in system.
    - Continue pumping cleaning solution into container until machine is again empty. Observe cleaner as it is being pumped. As solution is pumped, it should appear to become clean. If this is not observed, the same cleaner, after impurities have settled, can be reloaded into machine and procedure repeated – if it is pumped out immediately. Do not allow any settled material back into system.
  - Tank/Material Feed System
    - Clean & inspect tank lid sealing gaskets. Repair with RTV Silicone as necessary.

(CONTINUED ON PAGE #12)

(CONTINUED FROM PAGE #11)

- Check desiccant canister. Verify that crystals are blue in color through window in side of canister. Replace if crystals are not blue.
- Check makeup of air lines from desiccant canister to tank. Remove or repair any blockages.
- Clean inside of tanks, concentrating on any material built up that might wind up in pumps.

o Re-fill System for Storage

- Fill tanks with compatible oil/lubricant and trigger.
- Close ball valves.

▪ Start-up Procedure

o Prepare system for loading

- Pre-season startup checks outlined below should be performed in advance of any intended use.
- AST assumes previous shut-down procedure was followed.
  - Connect air supply & electrical power.
  - Open ball valves under tanks
  - Test operation of machine. Verify that oil loaded into machine comes out both ports on the dispense valve when triggered.
  - Operate system until empty.

o Flush system with compatible solvent

- Fill each tank a minimum of 1/3 with a compatible cleaning solution.
- Operate and observe behavior of system.

*NOTE: Gauges will not read normal pressures while pumping solvent due to the fact that solvents are less viscous, therefore requiring less pressure to pump.

- Verify that flow is observed coming out of both ports in dispense valve.
- Operate system until empty. Please note that it is not harmful to pump machine dry.
- If available, open ball valve under pump inlet block to verify that all solvent is drained from tanks.
- If possible, temporarily disconnect material hoses from dispense manifold and allow any trapped solvent to drain.
- Fill zerks on dispense valve with petrolatum grease until lubricant coming out of ports is clean.

o Load & Test Material

- Load each material into correct tank. Remember to keep one lid on while filling the other tank.
- Verify that ball valves above each pump and at outlet assembly are open.
- Set motor speed to low (30%) and actuate trigger, operating system until correct material comes out both ports of dispense valve.
- Observe pressure gauges while filling system. A spike in pressure would indicate a blockage downstream from pump.
- Operate system until two streams of material come out of dispense valve. Release trigger and wipe manifold.
- Attach static mixer to dispense valve. Make several test shots of material in small cups or on aluminum foil and allow material to cure.
- Discard static mixer; wipe manifold clean, and re-fill manifold with petrolatum grease.
- Check cured material for flaws and inconsistencies.
- See “Troubleshooting” section in operator’s manual if any problems are observed.

TECHNICAL ENGINEERING DATA SHEETS

ADHESIVE SYSTEMS TECHNOLOGY CORP

SERIAL #	PO NUMBER

BILL TO:	SHIP TO:

Phone	Fax	Company ID	Engineer	Quotation #

Material	Meter Type	Ratio	Shot Size	Viscosity	Shot Rate
	PCHCD GMP-025	1 : 1			

Additional Comments	Application
90069D	

Type	Qty.	Part #	Description
Frame	1	26284	FRAME WELDMENT, GMP-025, WELDED HANDLES AND AXELS
	2	11123	GRIP, HANDLE, 1” ID
Shroud	1	25392	SHROUD, PUMP DRIVE, GMP / GRP-025 2003
Main Fr. Plates	1	55916-02E	ASSEMBLY, MAINFRAME, CHAIN DRIVE, PCH GRP/GMP-025, 26191 PLATE
			[SEE 55916-03E BILL OF MATERIALS]
Air Cyl/Drive(s)	1	12842A	GEAR MOTOR, 1/4 HP, 90 VDC, 30:1 PARALLEL SHAFT, (83 RPM)
Timing Chain	3.25	33674	CHAIN, #40, STEEL, ROLLER, FOOT
	1	14333	CONNECTING LINK, #40 CHAIN, STEEL
	1	14516-1216	SPROCKET, #40 CHAIN, 3/4” BORE, 16 TEETH, TYPE “B”
Pneu / Controls	1	55625-01B	SCHEMATIC, ELECTRICAL, GMP-025/050, 14644 MOTOR CONTROLLER
		14644	CONTROLLER, MOTOR, NEMA 4, 1 HP, 90 VDC
Fuses		13006-15	FUSE, TIME DELAY, (MDL) 15 AMP
Start Signal		12905A	SWITCH, PUSHBUTTON, SPST, MOMENTARY, N / O, #6-32

BILL TO:	SERIAL #	PO NUMBER

Engineer

Type	Qty.	Part #	Description
Meter A	1	55477E	PUMP ASSEMBLY, GEROTOR, .594 CU IN / REV, LUBER, EXTENDED SHAFT
	1	14516-1216	SPROCKET, #40 CHAIN, 3/4" BORE, 16 TEETH, TYPE "B"
Pressure Seal	2	12637-12	SEAL, FLOUROCARBON (VITON), 3/4" ID, 3/16" CROSS SECTION
Tef. Bushings	2	13594	BUSHING, TEFLON LINED STEEL, 3/4" ID, 7/8" OD x 3/4" L
Shaft	1	25157-01A	SHAFT, GEROTOR PUMP, .59 CU. IN. / REV, SINGLE ELEMENT, EXTENDED
O-ring(s)	1	11651	O-RING, 1-026, EP
	1	12498	O-RING, 1-035, EP
	2	13811	O-RING, 1-039 EP
			[SEE 55477D BILL OF MATERIALS & DRAWING]
Meter B	1	55477E	PUMP ASSEMBLY, GEROTOR, .594 CU IN / REV, LUBER, EXTENDED SHAFT
	1	14516-1216	SPROCKET, #40 CHAIN, 3/4" BORE, 16 TEETH, TYPE "B"
Pressure Seal	2	12637-12	SEAL, FLOUROCARBON (VITON), 3/4" ID, 3/16" CROSS SECTION
Tef. Bushings	2	13594	BUSHING, TEFLON LINED STEEL, 3/4" ID, 7/8" OD x 3/4" L
Shaft	1	25157-01A	SHAFT, GEROTOR PUMP, .59 CU. IN. / REV, SINGLE ELEMENT, EXTENDED
O-ring(s)	1	11651	O-RING, 1-026, EP
	1	12498	O-RING, 1-035, EP
	2	13811	O-RING, 1-039 EP
			[SEE 55477D BILL OF MATERIALS & DRAWING]
Outlet Asmbly A	1	55617A	OUTLET ASSEMBLY, PUMP, GMP-025, 3/8", VERTICAL GAUGE
Adaptor			[SEE 55617A BILL OF MATERIALS]
Cross/Tee			[SEE 55617A BILL OF MATERIALS]
Gauge		11083	GAUGE, 0-1000 PSI, 2-1/2" FACE, 1/4" M NPT BOTTOM MOUNT, LIQUID FILLED
Outlet Fitting			
Outlet Asmbly B	1	55617A	OUTLET ASSEMBLY, PUMP, GMP-025, 3/8", VERTICAL GAUGE
Adaptor			[SEE 55617A BILL OF MATERIALS]

BILL TO:	SERIAL #	PO NUMBER

Engineer

Type	Qty.	Part #	Description
Cross/Tee			[SEE 55617A BILL OF MATERIAL]
Gauge		11083	GAUGE, 0-1000 PSI, 2-1/2" FACE, 1/4" M NPT BOTTOM MOUNT, LIQUID FILLED
Outlet Fitting			[SEE 55617A BILL OF MATERIAL]
Inlet Asmbly A	1	55913-01B	INLET ASSEMBLY, GMP-025/GMP-075, 5 GALLON TANK
Screen Asmbly A	1	55917-05	ASSEMBLY, SCREEN, TANK BOTTOM, 5-GALLON
			CONTAINS:
	1	24013-01	SCREEN, TANK BOTTOM, 5 GALLON, PERFORATED STEEL
	1	11285	BOLT, 1/4"-20 x 3", HEX, GR5
	2	11047	NUT, 1/4"-20, HEX, NYLOCK
Lid	1	55645-01	LID ASSEMBLY, SILICONE GROOVE GASKETED, 5 GAL
			CONTAINS:
		23512-01	LID, 9-3/4", STAINLESS SPINNING WITH GASKET GROOVE
		11465-16	FITTING, BULKHEAD, 1/4" NPT x 1" LONG, NICKEL PLATED
		33005	ADHESIVE, SILICONE RTV, 10 OZ TUBE
		11303	TUBE FITTING, 1/4" M NPT x 3/8" TUBE, 90 DEGREE
Inlet Asmbly B	1	55913-01B	INLET ASSEMBLY, GMP-025/GMP-075, 5 GALLON TANK
Screen Asmbly A	1	55917-05	ASSEMBLY, SCREEN, TANK BOTTOM, 5-GALLON
			CONTAINS:
	1	24013-01	SCREEN, TANK BOTTOM, 5 GALLON, PERFORATED STEEL
	1	11285	BOLT, 1/4"-20 x 3", HEX, GR5
	2	11047	NUT, 1/4"-20, HEX, NYLOCK
Lid	1	55645-01	LID ASSEMBLY, SILICONE GROOVE GASKETED, 5 GAL
			CONTAINS:
		23512-01	LID, 9-3/4", STAINLESS SPINNING WITH GASKET GROOVE
		11465-16	FITTING, BULKHEAD, 1/4" NPT x 1" LONG, NICKEL PLATED
		33005	ADHESIVE, SILICONE RTV, 10 OZ TUBE
		11303	TUBE FITTING, 1/4" M NPT x 3/8" TUBE, 90 DEGREE
Hose A	1	11299-15	HOSE, TEFLON, 3/8" ID x 15', #6 JIC SWIVEL ENDS
Hose B	1	11299-15	HOSE, TEFLON, 3/8" ID x 15', #6 JIC SWIVEL ENDS
Lid Retaining	2	55672	CLAMPING ASSEMBLY, GROOVED TANK LID
			CONTAINS:
		12825	CLAMP, DRAW LATCH, ADJUSTABLE, LID RETAINING
		23625	BLOCK, LID CLAMP
		11671	BOLT, #10-32 x 3", SHCS
		13433	NUT, #10-32, HEX
		14280	RIVET, SEALING, 3/16", 1/8"-1/4" GRIP RANGE, ALUMINUM BODY

BILL TO:	SERIAL #	PO NUMBER

Engineer

Type	Qty.	Part #	Description
Dispense Valve(s)	1	55615-01B	VALVE ASSEMBLY, 1/4” DCP, HEX LUBER, -01 2-PORT MANIFOLD, ZERKS
			[SEE 55615-01B BILLOF MATERIALS]
Manifold	1	55696-01B	MANIFOLD ASSEMBLY, 7/8-9, INTERNAL BALL CHECK VALVE, .100” PORTS, 3/8” HOSE
			[SEE 55696-01B BILLOF MATERIALS]
	1	56392	MANUAL BALL VALVE SHUT-OFF ASSEMBLY, FOR 55696-01
			CONTAINS:
	2	11288	ADAPTER, 1/4" M NPT x #6 M JIC
	2	11127	VALVE, BALL, 1/4" NPT, LP
	2	11032	NIPPLE, 1/4” NPT, HEX
	2	26233	UNION, MANIFOLD SEAT, 9/16-18 SAE X 1/4 F NPT
	2	23837-01	SEAT, INTERNAL CHECK DISPENSE MANIFOLD, UHMW, GMP 025
O-Rings	2	12681	O-RING, 1-906, EP
Inlet Fitting A	1	11601	ELBOW, 9/16"-18 M SAE, O-RING x #6 M JIC, 90 DEGREE
Inlet Fitting B	1	11601	ELBOW, 9/16"-18 M SAE, O-RING x #6 M JIC, 90 DEGREE
Mount/Handle	1	55914-06	ASSEMBLY, HOLSTER, PCH EXTENSION, PNEUMATIC PANEL MOUNTED, 1” SPACERS
			CONTAINS:
	1	23912-01	HOLSTER, WELDMENT, PCH EXTENSION ASSEMBLY, 55615 / 55474
	2	22937-01	SPACER, 1” OD x 11/32” ID x 1” L, ALUMINUM
	2	11913	BOLT, 5/16"-18 x 3-1/4", HEX, GR 5
	4	11052	WASHER, 5/16" SAE FLAT, STEEL
	2	11053	NUT, 5/16"-18, HEX, NYLOCK
Wheels	1	55918-03A	ASSEMBLY, WHEEL/HARDWARE, GMP-025, W/ WELDED AXLES
			CONTAINS:
	2	11198	COLLAR, SHAFT, 5/8" ID, SET SCREW LOCKING
	2	11217	WHEEL, 10” x 2.75”, 5/8” BORE
	2	13228A	CASTER, 5" DIAMETER x 6-1/4” OAH, SWIVEL, GREY, 1/2" THREADED STEM
	2	11009	WASHER, 1/2” SAE FLAT, STEEL
	2	11050	NUT, 1/2"-13, HEX, NYLOCK

ADHESIVE SYSTEMS TECHNOLOGY CORP

BILL TO:	SERIAL #	PO NUMBER

Engineer

Type	Qty.	Part #	Description
Spare Parts		56184-025B	KIT, SPARE PARTS, GMP-025 (DVD)
Meter Pump A		55528-07A	KIT, PUMP REPAIR, GEROTOR, FLOUROCARBON, 55477
Meter Pump B		55528-07A	KIT, PUMP REPAIR, GEROTOR, FLOUROCARBON, 55477
Dispense Valve(s)		55691-01	KIT, REPAIR, SPRING BALL CHECK DISP. MANIFOLD, W/INTEG. SEAT (#5569-01)
Mixers/		56155-1	MIXER/NUT ASSORTMENT, STATIC, CONSTRUCTION MACHINES
Mixer Nuts			
Misc.	1	13357	GUN, GREASE, 14 OZ TUBE SIZE
	1	33421	GREASE, PETROLATUM, 14 OZ GREASE TUBE
	1	13006-15	FUSE, TIME DELAY, (MDL) 15 AMP
Temp. Control	1	55472A	DRYER ASSEMBLY, DESSICANT CARTRIDGE WITH BRACKET
		12046	DRYER, MOISTURE FILTER / DESSICANT CANISTER
Tank Heater			
Hose Heater			
General Heater			
Custom Info.	1	13574	INVERTER, POWER, 12VDC TO 120VAC, 750 WATT
(Custom Items			
not available on			
all Machines)			

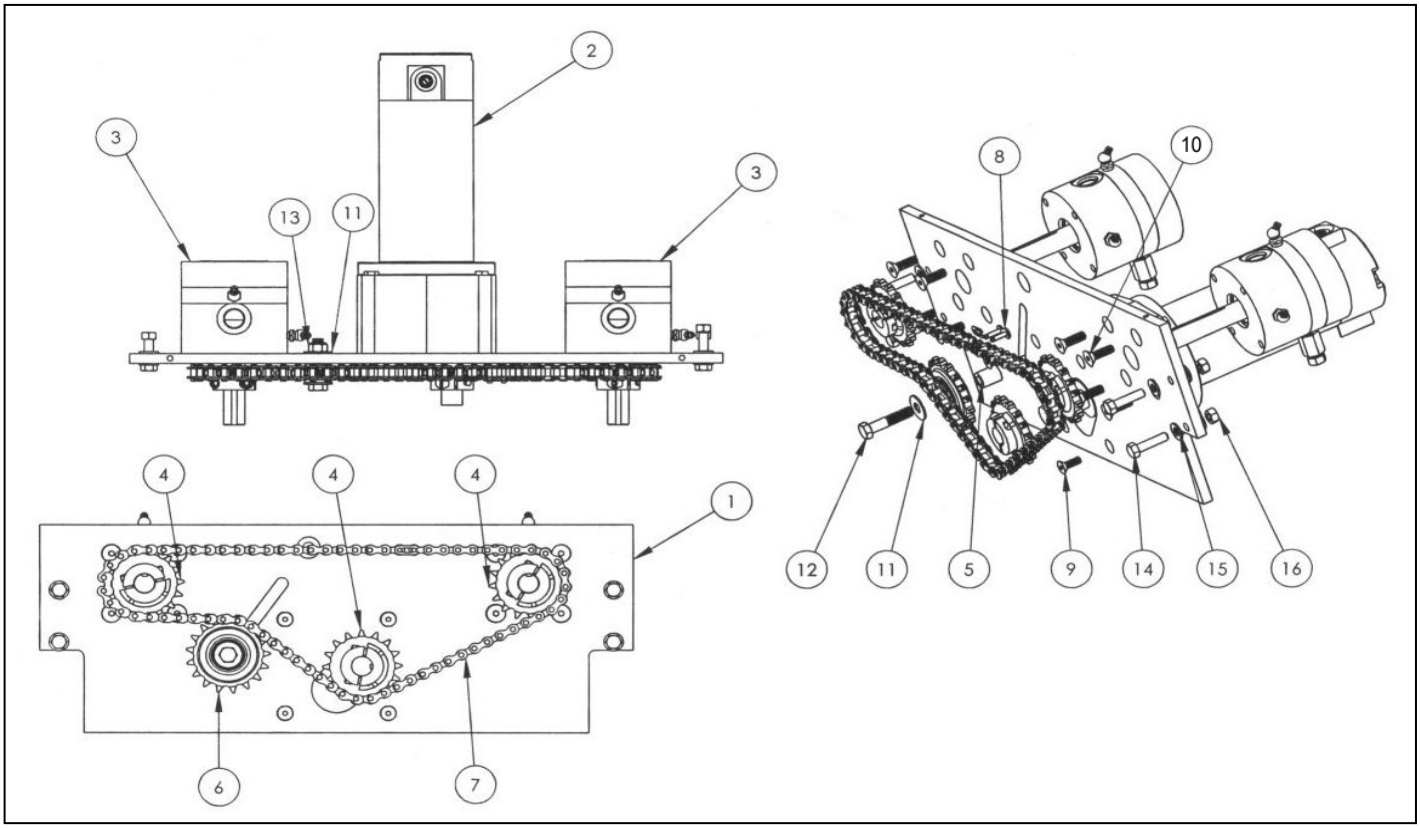
ADHESIVE SYSTEMS TECHNOLOGY CORP

BILL OF MATERIALS

ORIG DATE	# OF ITEMS	ENGINEER
	16	

PRODUCT #	PRODUCT NAME
55916-02E	ASSEMBLY, MAINFRRAME, CHAIN DRIVE, PCH GRP/GMP-025, 26191 PLATE

Item	Part #	Qty	Item Description
1	26191	1	PLATE, MAINFRAME, PUMP MOUNTING, GMP, LOW MOUNT
2	12842A	1	GEAR MOTOR, 1/4 HP, 90 VDC, 30:1 PARALLEL SHAFT, (83 RPM)
3	55477D	2	PUMP ASSEMBLY, GEROTOR, .594 CU IN / REV, LUBER, EXTENDED SHAFT
4	14516-1216	3	SPROCKET, #40 CHAIN, 3/4” BORE, 16 TEETH, TYPE “B”
5	26277-12	1	SPACER/ HUB, IDLER SPROCKET, .638” O.D. x .39” I.D. x 3/4” LONG
6	14495	1	IDLER SPROCKET, #40 CHAIN, 17 TOOTH, 5/8 BORE, BALL BEARING
7	33674	3.25	CHAIN, #40, STEEL, 1/2” PITCH, ROLLER, FT
8	14333	1	CONNECTING LINK, #40 CHAIN, STEEL
9	13891	4	BOLT, 1/4”-28 X 3/4”, FHCS
10	11932	8	BOLT, 5/16"-18 x 1", FHCS
11	11177	1	WASHER, 3/8" SAE FLAT, STEEL
12	14043	1	BOLT, 3/8”-16 X 1-3/4”, HEX, GRADE 5
13	14488	1	NUT, T- SLOT, 3/8”-16, 7/16” WIDE SLOT, 7/8” OAL
14	11460	4	BOLT, 5/16"-18 x 1-1/4", HEX, GR5
15	11052	8	WASHER, 5/16" SAE FLAT, STEEL
16	11053	4	NUT, 5/16"-18, HEX, NYLOCK



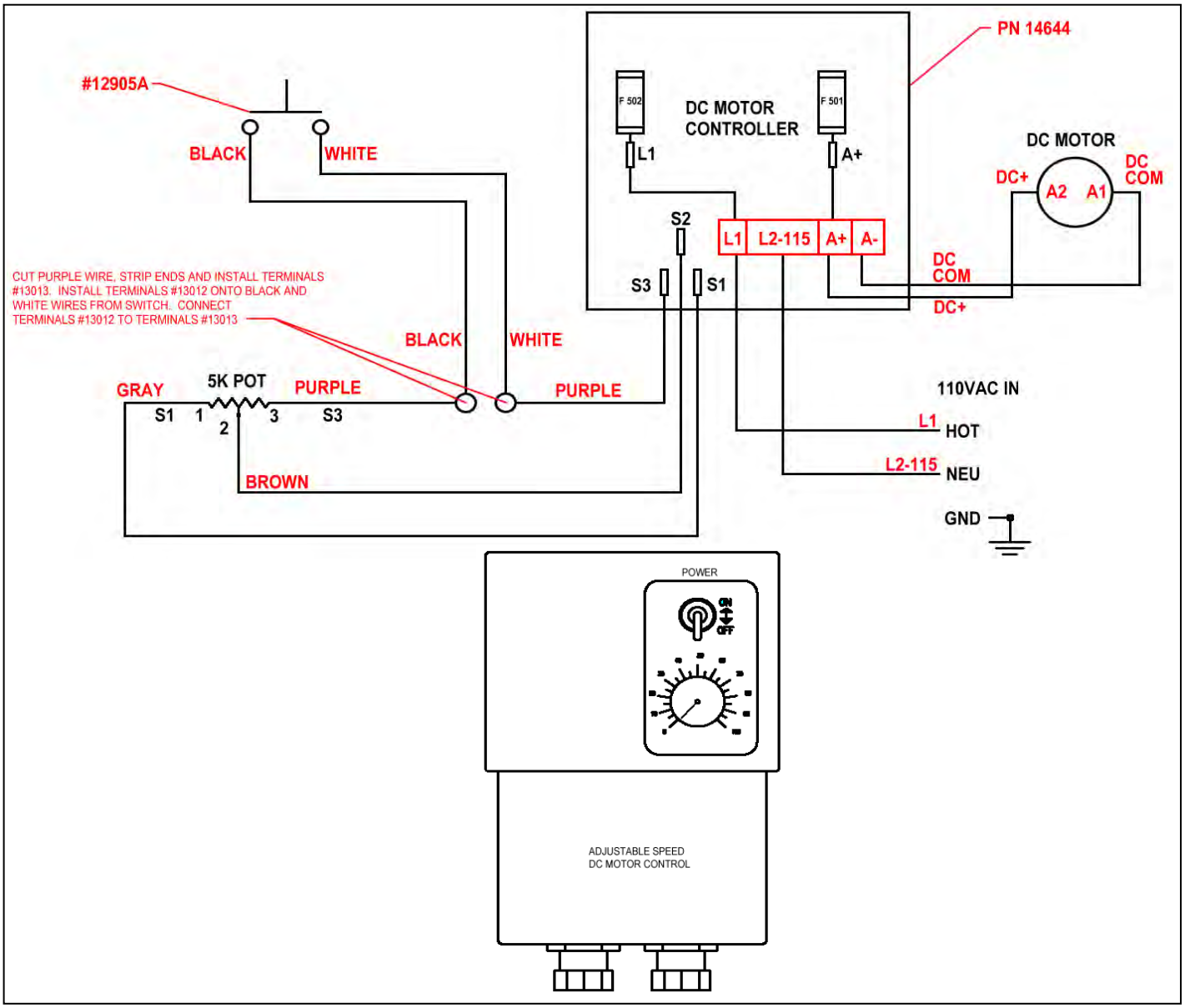
ADHESIVE SYSTEMS TECHNOLOGY CORP

BILL OF MATERIALS

ORIG DATE	# OF ITEMS	ENGINEER
	2	

PRODUCT #	PRODUCT NAME
55625-01B	SCHEMATIC, ELECTRICAL, GMP-025/050, 14644 MOTOR CONTROLLER

Item	Part #	Qty	Item Description
1	14644	1	CONTROLLER, MOTOR, NEMA 4, 1 HP, 90 VDC
2	14702	1	CORD, POWER, 3 PRONG, MOLDED PLUG, 125 V, 6FT LONG



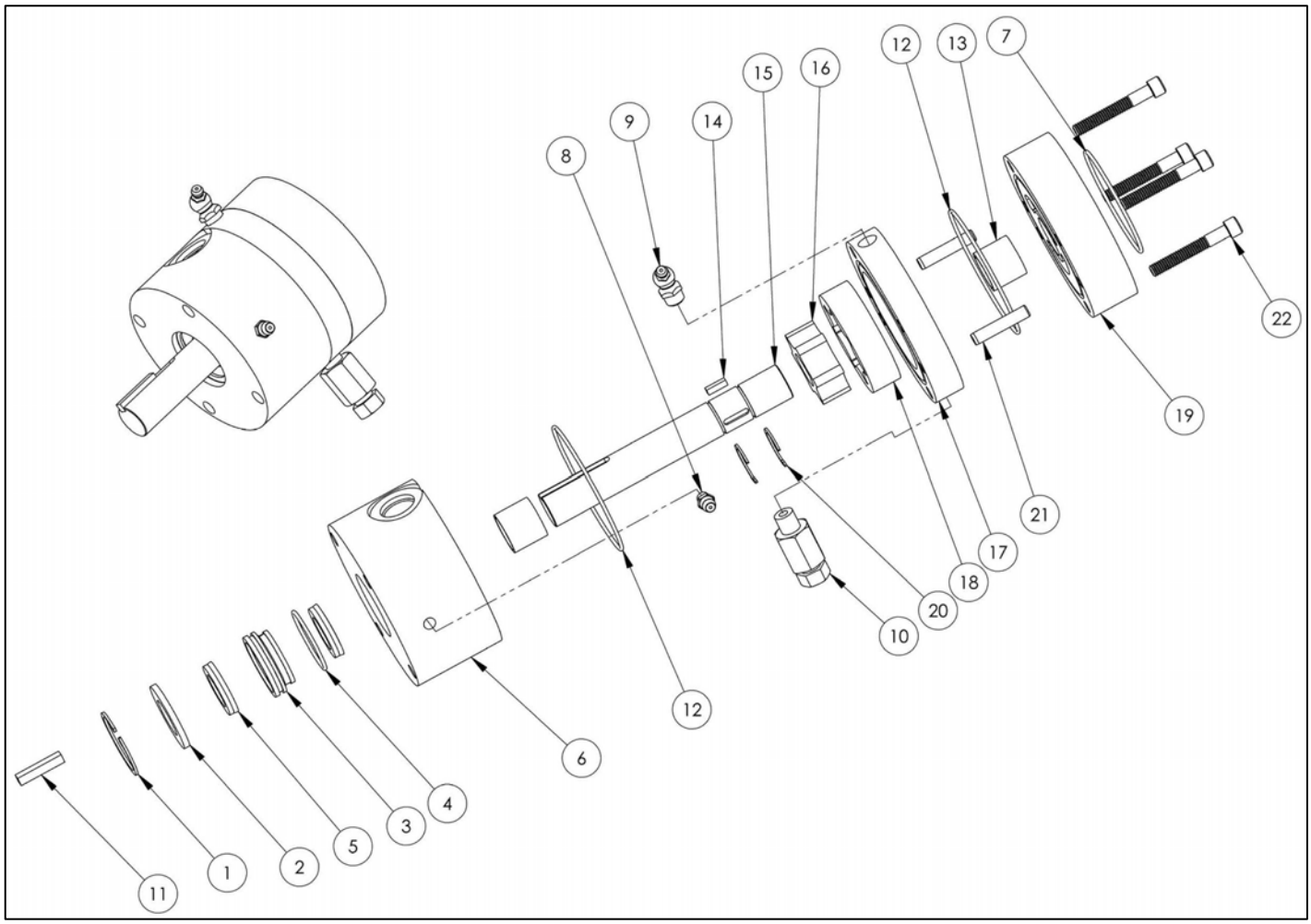
ADHESIVE SYSTEMS TECHNOLOGY CORP

BILL OF MATERIALS

ORIG DATE	# OF ITEMS	ENGINEER
	23	

PRODUCT #	PRODUCT NAME
55477E	GEROTOR PUMP ASSEMBLY, 0.594 CU IN / REV, W/ STATOR LUBER, EXTENDED SHAFT

Item	Part #	Qty	Item Description
1	12640	1	RING, RETAINING, 1-7/16", INTERNAL
2	23514	1	RING, SEAL RETAINING, GEROTOR
3	23515	1	ADAPTOR, SEAL RETAINING, GEROTOR
4	11651	1	O-RING, 1-026, EP
5	12637-12	2	SEAL, FLOUROCARBON (VITON), 3/4" ID, 3/16" CROSS SECTION
6	GER OUT		PUMP OUTLET, GEROTOR
7	12498	1	O-RING, 1-035, EP
8	11756	1	ZERK, GREASE, 45 DEGREE, 1/4"-28 UNF
9	13211	1	ZERK, GREASE, BUNA SEAL, 30 DEGREE 1/8" NPT
10	11433	1	VALVE, BLEED, 1/8" M NPT
11	23666-03	1	KEY, 1" L x 3/16" SQUARE
12	13811		O-RING, 1-039 EP
13	13594		BUSHING, TEFLON LINED STEEL, 3/4" ID, 7/8" OD x 3/4" L
14	14097-07		KEY, 1/8" SQUARE, 7/16" LONG
15	25157-01A		SHAFT, GEROTOR PUMP, .59 CU. IN. / REV, SINGLE ELEMENT, EXTENDED
16	IN EL		INNER ELEMENT, GEROTOR PUMP
17	MID SEC		MIDDLE SECTION, GEROTOR PUMP
18	OUT EL		OUTER ELEMENT, GEROTOR PUMP
19	GER IN		PUMP INLET, GEROTOR PUMP
20	12914		RING, RETAINING, 3/4", EXTERNAL, LOW-CLEARANCE C-STYLE, STAINLESS
21	12084		PIN, DOWEL, STEEL, 1/4" DIAMETER x 1-1/4" LONG
22	11923		BOLT, 1/4"-20 x 1-3/4", SHCS



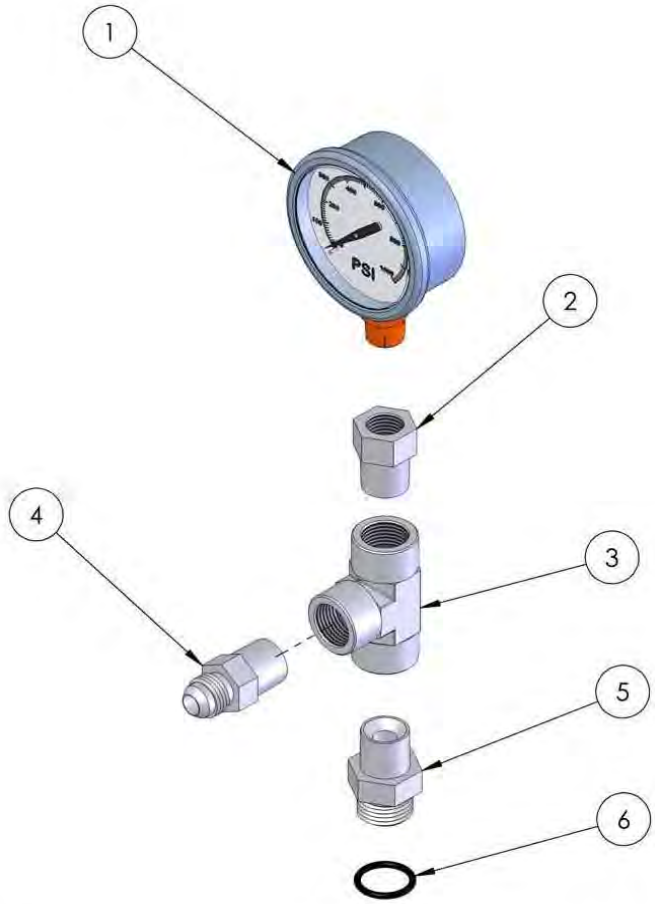
ADHESIVE SYSTEMS TECHNOLOGY CORP

BILL OF MATERIALS

ORIG DATE	# OF ITEMS	ENGINEER
	6	

PRODUCT #	PRODUCT NAME
55617A	OUTLET ASSEMBLY, GMP-025, 3/8"

Item	Part #	Qty	Item Description
1	11083	1	GAUGE, 0-1000 PSI, 2-1/2" FACE, 1/4" M NPT BOTTOM MOUNT, LIQUID FILLED
2	11214	1	BUSHING, 3/8" M NPT x 1/4" F NPT
3	11663	1	TEE, 3/8" NPT, 3 F
4	11322	1	ADAPTER, 3/8" M NPT x #6 M JIC
5	12823	1	ADAPTER, 3/4"-16 M SAE O-RING x 3/8" M NPT
6	12209	1	O-RING, 1-908, EP



NOTES :
1. APPLY TEFLON TAPE TO ALL TAPERED THREADS BEFORE ASSEMBLY.
2. APPLY PETROLATUM GREASE TO O-RING (6), SAE THREADS ON (5), AND JIC THREADS ON (4) BEFORE ASSEMBLY TO PUMP AND HOSE.
3. FILL PORT OF GAUGE WITH PETROLATUM GREASE BEFORE ASSEMBLY.

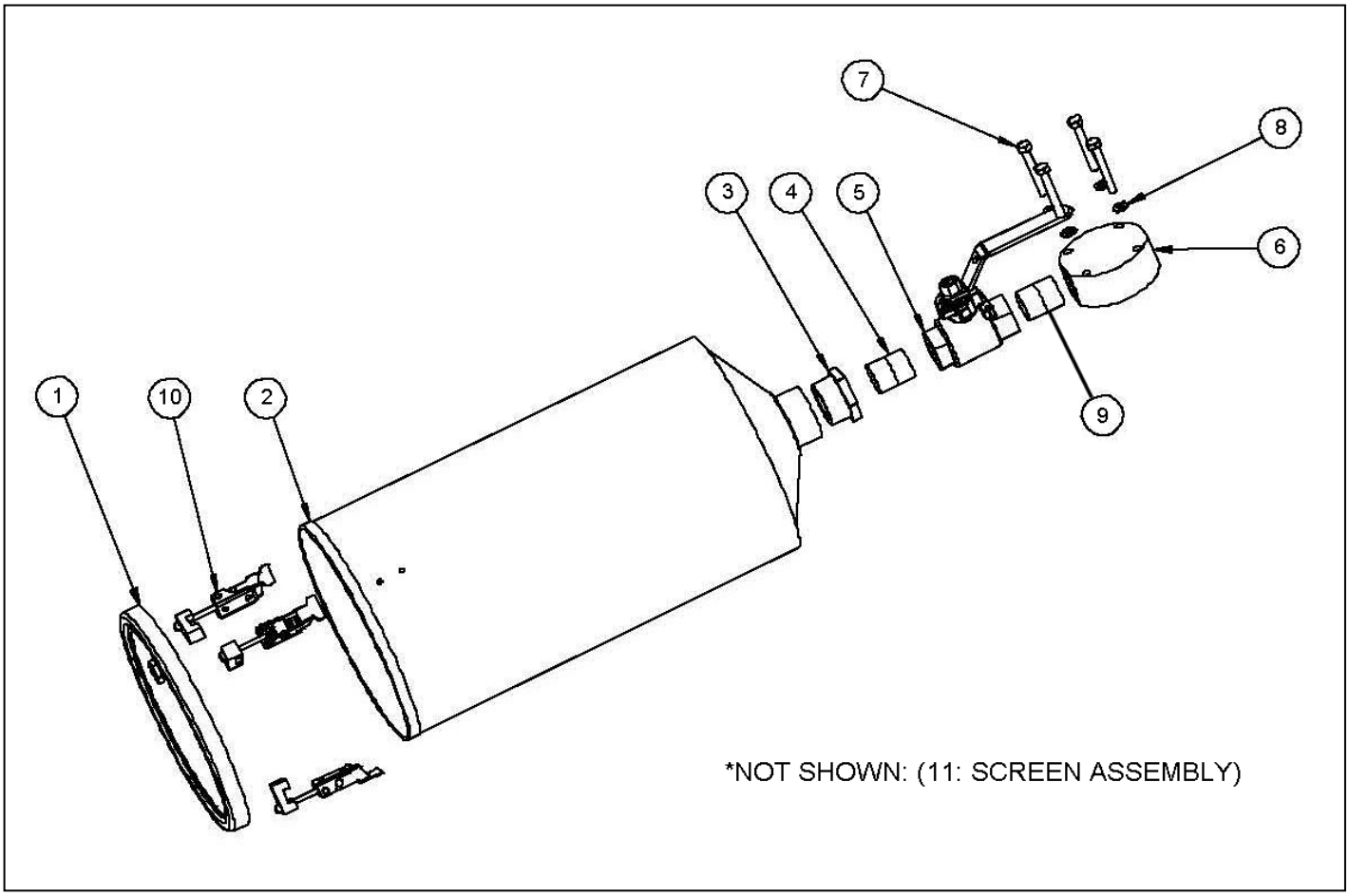
ADHESIVE SYSTEMS TECHNOLOGY CORP

BILL OF MATERIALS

ORIG DATE	# OF ITEMS	ENGINEER
	11	

PRODUCT #	PRODUCT NAME
55913-01B	INLET ASSEMBLY, GMP, 5 GALLON TANK W/ SCREEN

Item	Part #	Qty	Item Description
1	55645-01	1	LID ASSEMBLY, SILICONE GROOVE GASKETED, 5 & 2-1/2 GALLON
2	22246-16A	1	TANK, 5 GALLON, STAINLESS, CONED BOTTOM, 1-1/2” OUTLET
3	11280	1	BUSHING, 1-1/2" M NPT x 1" F NPT, CAST
4	12171	1	NIPPLE, 1" NPT x CLOSE, STAINLESS
5	14251	1	VALVE, BALL, 1” NPT, BRASS, CHROME-PLATED, 600 PSI WOG
6	23675A	1	INLET, GEROTOR PUMP, TOP FEED, GMP, ALUMINUM
7	11843	4	BOLT, 5/16"-18 x 2-1/4", HEX, GR5
8	11305	4	WASHER, 5/16" LOCK, INTERNAL TOOTH
9	12170-02	1	NIPPLE, 1” NPT x 2” LONG, STAINLESS
10	55672	1	CLAMPING ASSEMBLY, GROOVED TANK LID
11	55917-05	1	ASSEMBLY, SCREEN, TANK BOTTOM, 5-GALLON



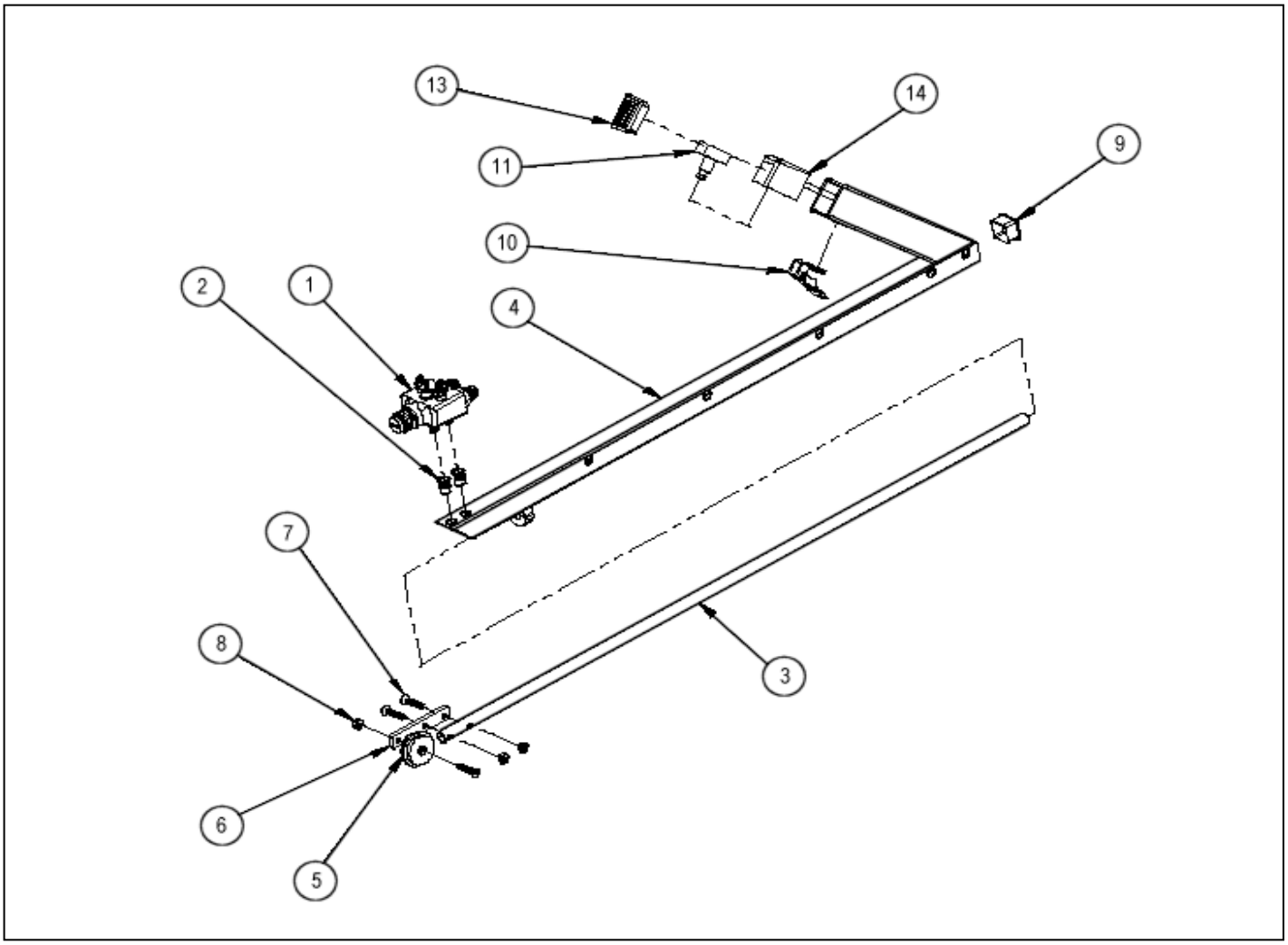
ADHESIVE SYSTEMS TECHNOLOGY CORP

BILL OF MATERIALS

ORIG DATE	# OF ITEMS	ENGINEER
	18	

PRODUCT #	PRODUCT NAME
55615-01B	ASSEMBLY, DISPENSE VALVE HANDLE

Item	Part #	Qty	Item Description
1	55696-01B	1	MANIFOLD ASSEMBLY, 7/8-9, INTERNAL BALL CHECK VALVE, .100" PORTS, 3/8" HOSE
2	11972	2	RIVNUT, 1/4"-20, STEEL
3	23701	1	TUBE, EXTENSION, 30", WITH HOLES
4	24036A	1	HANDLE WELDMENT, EXTENSION, FOR 55696
5	23848	1	WHEEL, CRACK GUIDING, PCH EXTENSION
6	23849	1	MOUNT, WHEEL, EXTENSION ASSEMBLY, PCH
7	13277	3	BOLT, #10-32 x 1", FHCS
8	11462	3	NUT, #10-32, HEX, NYLOCK
9	11563	1	PLUG, PLASTIC, SQUARE, 1", 16 GA TUBE
10	12718	1	ACTUATOR, PUSH BUTTON, LEVER ACTING
11	12905	1	SWITCH, PUSHBUTTON, SPST, MOMENTARY, N / O, #6-32
12	13025	1	GRIP, CORD, SNAP-IN, NYLON, 3/8" ID, 3/4" OD
13	14428	1	PLUG, PLASTIC, RECTANGULAR, RIBBED, 1-1/2" x 1", 14-16 GA TUBE
14	23761A	1	COVER, ELECTRICAL SWITCH, GMP-025
15	12216	1	SCREW, #8 x 3/8", SHEET METAL, PHPS
	13272	2	TERMINAL, WIRE, RING, 16-14 AWG, #8 STUD, NYLON INS
	33010		WIRE, ELECTRIC, #16/2 SO
	33442	5	TIE, CABLE, BLACK, 11" x .300", 120 LBS



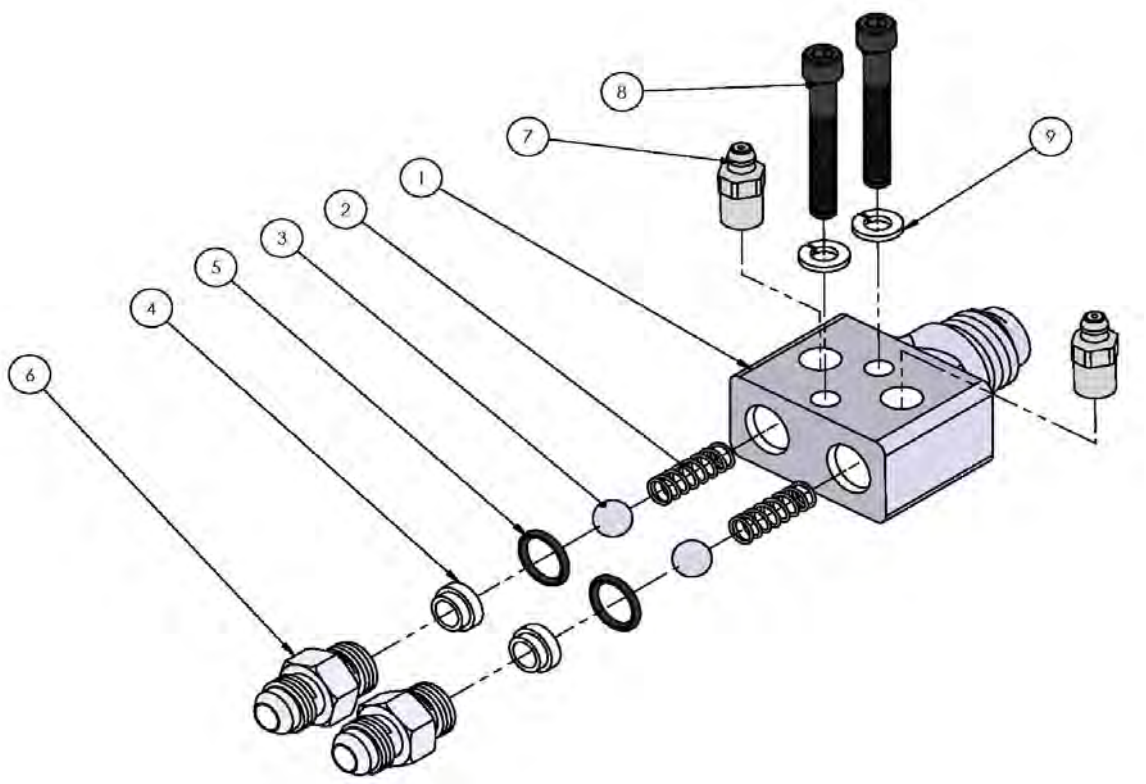
ADHESIVE SYSTEMS TECHNOLOGY CORP

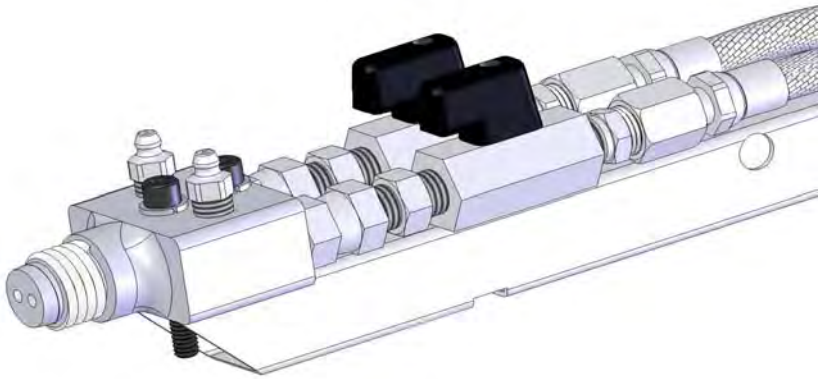
BILL OF MATERIALS

ORIG DATE	# OF ITEMS	ENGINEER
	10	

PRODUCT #	PRODUCT NAME
55696-01B	MANIFOLD ASSEMBLY, 7/8-9, INTERNAL BALL CHECK VALVE, .100” PORTS, 3/8 HOSE

Item	Part #	Qty	Item Description
1	23836-01B	1	MANIFOLD, DISPENSE, DUAL COMPONENT, INTERNAL CHECK, .10” PORTS
2	13108	2	SPRING, COMPRESSION, .300” DIA x 7/8” L X 0.032 C/S, GMP
3	12013	2	BALL, 3/8” DIAMETER, CHROME STEEL
4	23837-01	2	SEAT, INTERNAL CHECK DISPENSE MANIFOLD, UHMW, GMP 025
5	12681	2	O-RING, 1-906, EP
6	26013	2	ADAPTOR, MANIFOLD SEAT, 9/16-18 SAE X #6 JIC
7	13212	2	ZERK, GREASE, BUNA SEAL, STRAIGHT, 1/8” NPT
8	11923	2	BOLT, 1/4”-20 x 1-3/4", SHCS
9	13606	2	WASHER, 1/4", LOCK, SPLIT
	55691-01		KIT, REPAIR, SPRING BALL CHECK DISP. MANIFOLD, W/INTEG. SEAT (#5569-01)





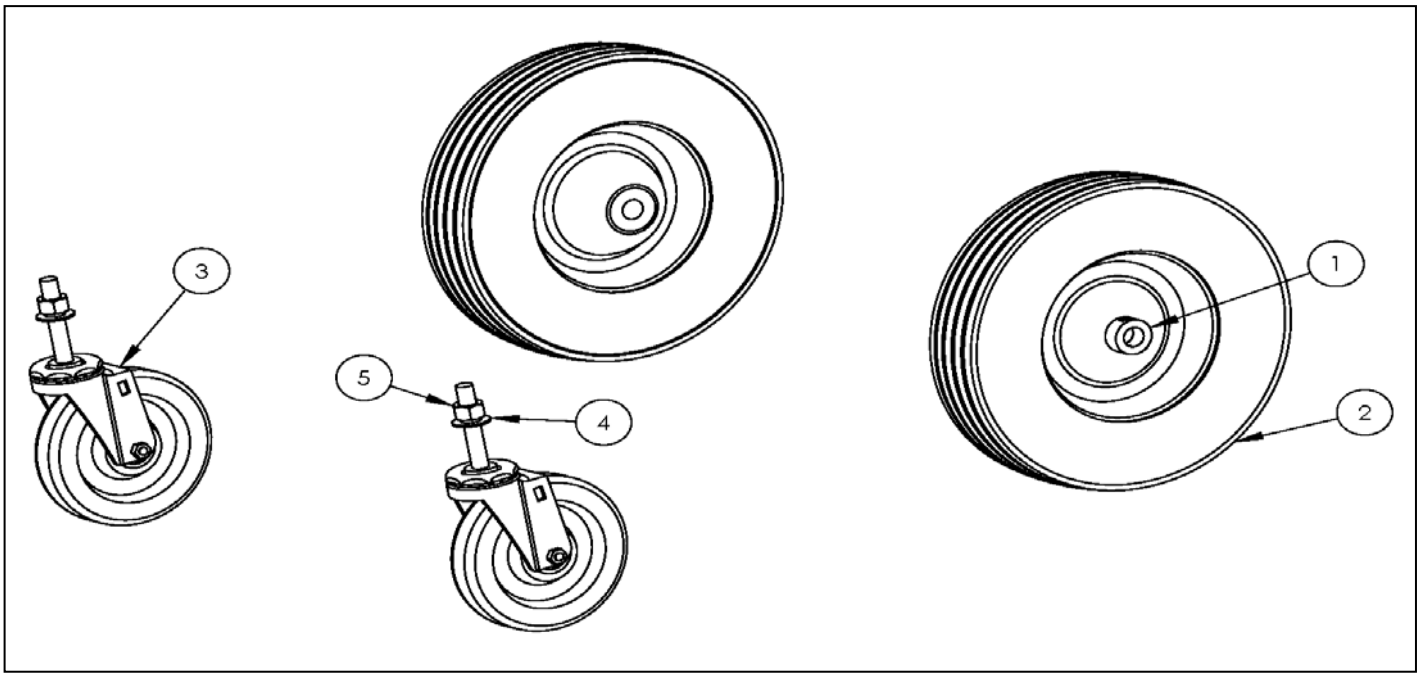
ADHESIVE SYSTEMS TECHNOLOGY CORP

BILL OF MATERIALS

ORIG DATE	# OF ITEMS	ENGINEER
	5	

PRODUCT #	PRODUCT NAME
55918-03A	ASSEMBLY, WHEEL/HARDWARE, GMP-025, W/ WELDED AXLES

Item	Part #	Qty	Item Description
1	11198	2	COLLAR, SHAFT, 5/8" ID, SET SCREW LOCKING
2	11217	2	WHEEL, 10” x 2.75”, 5/8” BORE
3	13228A	2	CASTER, 5" DIAMETER x 6-1/4” OAH, SWIVEL, GREY, 1/2" THREADED STEM
4	11009	2	WASHER, 1/2” SAE FLAT, STEEL
5	11050	2	NUT, 1/2"-13, HEX, NYLOCK



ADHESIVE SYSTEMS TECHNOLOGY CORP

BILL OF MATERIALS

ORIG DATE	# OF ITEMS	ENGINEER
	7	

PRODUCT #	PRODUCT NAME
55528-07A	KIT, PUMP REPAIR, GEROTOR/ GEROLLER, FLOUROCARBON, 55477

Item	Part #	Qty	Item Description
4	11651	1	O-RING, 1-026, EP
5	12637-12	2	SEAL, FLOUROCARBON (VITON), 3/4” ID, 3/16” CROSS SECTION
7	12498	1	O-RING, 1-035, EP
8	11756	1	ZERK, GREASE, 45 DEGREE, 1/4"-28 UNF
9	13211	1	ZERK, GREASE, BUNA SEAL, 30 DEGREE 1/8” NPT
12	13811	3	O-RING, 1-039 EP
	60047A	1	REPAIR KIT DRAWING, 55528-XXA, (55477 GEROTER PUMP)

ADHESIVE SYSTEMS TECHNOLOGY CORP

BILL OF MATERIALS

ORIG DATE	# OF ITEMS	ENGINEER
	6	

PRODUCT #	PRODUCT NAME
55691-01	KIT, REPAIR, SPRING BALL CHECK DISP. MANIFOLD, W/ INTEG SEAT (#55696-01B)

Item	Part #	Qty	Item Description
2	13108	2	SPRING, COMPRESSION, .300” DIA x 7/8” L X 0.032 C/S, GMP
3	12013	2	BALL, 3/8” DIAMETER, CHROME STEEL
4	23837-01	2	SEAT, INTERNAL CHECK DISPENSE MANIFOLD, UHMW, GMP 025
5	12681	2	O-RING, 1-906, EP
6	26013	2	ADAPTOR, MANIFOLD SEAT, 9/16-18 SAE X #6 JIC
	60117	REF	REPAIR KIT DRAWING, #55691-01 (#55696-01B MANIFOLD ASSEMBLY)

ADHESIVE SYSTEMS TECHNOLOGY CORP

BILL OF MATERIALS

ORIG DATE	# OF ITEMS	ENGINEER
	6	

PRODUCT #	PRODUCT NAME
56155-1	MIXER/NUT ASSORTMENT, STATIC, CONSTRUCTION MACHINES

Item	Part #	Qty	Item Description
	11081-624	3	MIXER, STATIC, 3/8” x 24 ELEMENT
	11081-632	3	MIXER, STATIC, 3/8” x 32 ELEMENT
	11081-824	3	MIXER, STATIC, 1/2” x 24 ELEMENT
	11081-830	3	MIXER, STATIC, 1/2” x 30 ELEMENT
	11189-06	2	NUT, MIXER, 7/8”-9, POLYPROPYLENE, 3/8” ID
	11189-08	2	NUT, MIXER, 7/8"-9, POLYPROPYLENE, 1/2” ID

ADHESIVE SYSTEMS TECHNOLOGY CORP

BILL OF MATERIALS

ORIG DATE	# OF ITEMS	ENGINEER
	9	

PRODUCT #	PRODUCT NAME
55472A	DRYER ASSEMBLY, DESSICANT CARTRIDGE WITH BRACKET

Item	Part #	Qty	Item Description
1	12552	1	COUPLING, PVC TO PIPE, 2” TO 1-1/2”, (FOR DESICCANT)
2	23629	1	BRACKET WELDMENT, DRYER / DESICCANT MOUNT (FOR 12046)
3	12503	1	TUBE FITTING, 1/4” M NPT x 3/8” TUBE, “Y”
4	23392	1	OUTLET DISC, DESICCANT CARTRIDGE
5	12046	1	DRYER, MOISTURE FILTER / DESICCANT CANISTER
	33536	3	TUBING, 3/8” OD, POLYURETHANE, CLEAR, FT
6	12030	2	BOLT, #10-24 x 5/8”, BHCS
7	13481	2	WASHER, SPLIT LOCK, #10
8	11973	2	RIVNUT, 10-24, STEEL