

Spartan

RTM Injection System

USER MANUAL

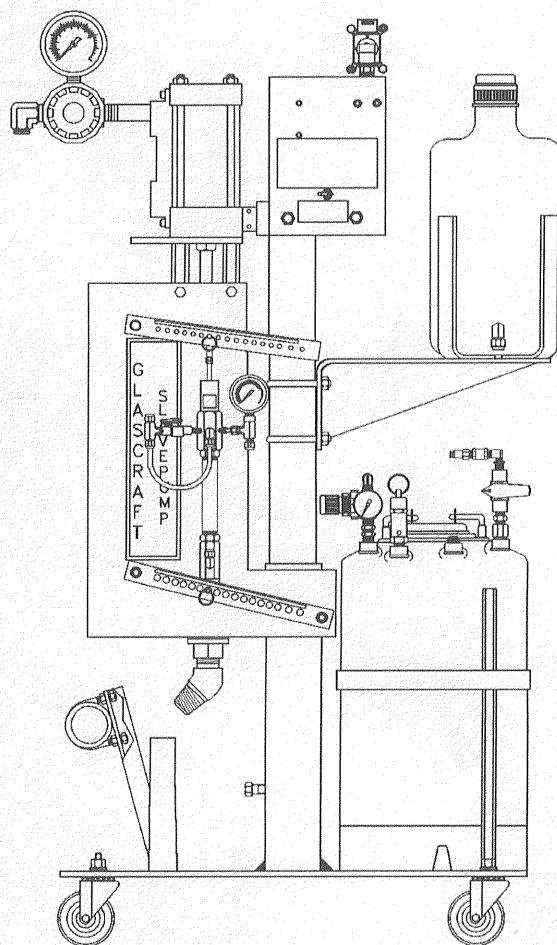
INCLUDES:

21668-00
DISPENSE GUN
ASSEMBLY

19813-01
11:1 MATERIAL PUMP
ASSEMBLY

SSP-160-05
CATALYST SLAVE PUMP
ASSEMBLY

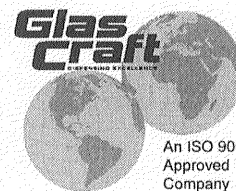
21654-00
SOLVENT POT
ASSEMBLY



GlasCraft
DISPENSING EXCELLENCE

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An ISO 9001
Approved
Company

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INTRODUCTION

About This Manual

Before operating, maintaining or servicing any **Glas-Craft** system, read and understand all of the technical and safety literature provided with **Glas-Craft** products. If you do not have the manuals and safety literature for your **Glas-Craft** system, contact your **Glas-Craft** distributor or **Glas-Craft, Inc.**

In this **Glas-Craft** technical and safety publication, the following advisories will be provided where appropriate:

NOTE

Is information about the procedure in progress.

CAUTION

Is imperative information about equipment protection.

WARNING

Is imperative information about personnel safety.

The information in this document is intended only to indicate the components and their normal working relationship typical use. Each assembly should be directed by a **Glas-Craft** distributor or made from the **Glas-Craft** assembly instructions provided.

This manual provides information for the assembly, operation, maintenance and service of this **Glas-Craft** product as used in a typical configuration. While it lists standard specifications and procedures, some deviations may be found.

In order to provide our users with the most up-to-date technology possible, we are constantly seeking to improve products. If technological change occurs after a product is on the market, we will implement that technology in future production and, if practical, make it available to current users as a retrofit, up-date or

supplement. If you find some discrepancy between your unit and the available documentation, contact your **Glas-Craft** distributor to resolve the difference. **Glas-Craft, Inc.** reserves the right to change or modify this product as it deems necessary.

Careful study and continued use of this manual will provide a better understanding of the equipment and process, resulting in more efficient operation, longer trouble-free service and faster, easier trouble-shooting.

Related Manuals

For detailed component installation, operation and maintenance, refer to the following component manuals:

	COMPONENT	MANUAL NUMBER
SP-85	Catalyst Slave Pump	GC-1025
18913-00	Material Pump	GC-1032

Technical Video Tapes

Glas-Craft offers a Technical Video Series detailing Set-Up, Operation, Maintenance and Troubleshooting for each major system component. These videos were produced to aid in component training, operation and service, for any fabricator.

	COMPONENT	VIDEO NUMBER
SP-85	Catalyst Slave Pump	G-135
18913-00	Material Pump	G-141

Video numbers shown are in NTSC format, international formats available, contact Glas-Craft.

Contact your local authorized **Glas-Craft** distributor for more information on these and other manuals and video tapes available from **Glas-Craft**.

PARTS & ILLUSTRATIONS

Spartan RTM System

Internal Mix Resin Transfer Molding System

Portable Cart Mounted

Factory Assembled

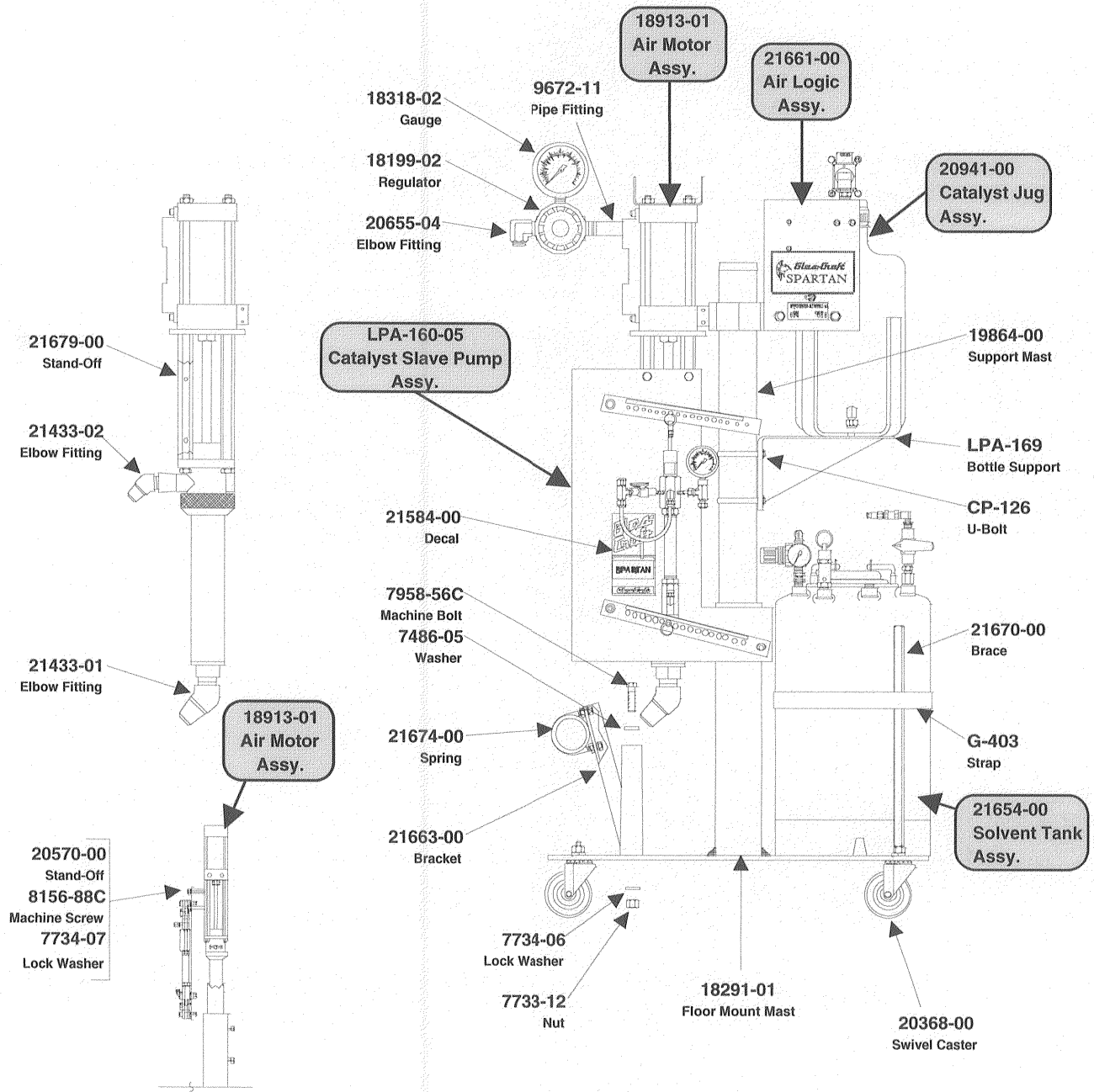
Includes

21668-00	DISPENSE HEAD ASSEMBLY
18913-01	5" MATERIAL PUMP ASSEMBLY, 11:1 RATIO
LPA-160-05	CATALYST SLAVE PUMP ASSEMBLY
21654-00	SOLVENT POT ASSEMBLY
20195-30	MATERIAL HOSE ASSEMBLY, 3/8 ID, 30 FT.
20195-25	MATERIAL HOSE ASSEMBLY, 1/2 ID, 25 FT.
20190-30	CATALYST HOSE ASSEMBLY, 30 FT.
20190-35	CATALYST HOSE ASSEMBLY, 35 FT.
18291-00	FLOOR MOUNT BASE
17440-00	GROUNDING CLAMP ASSEMBLY
	USER MANUALS

Options

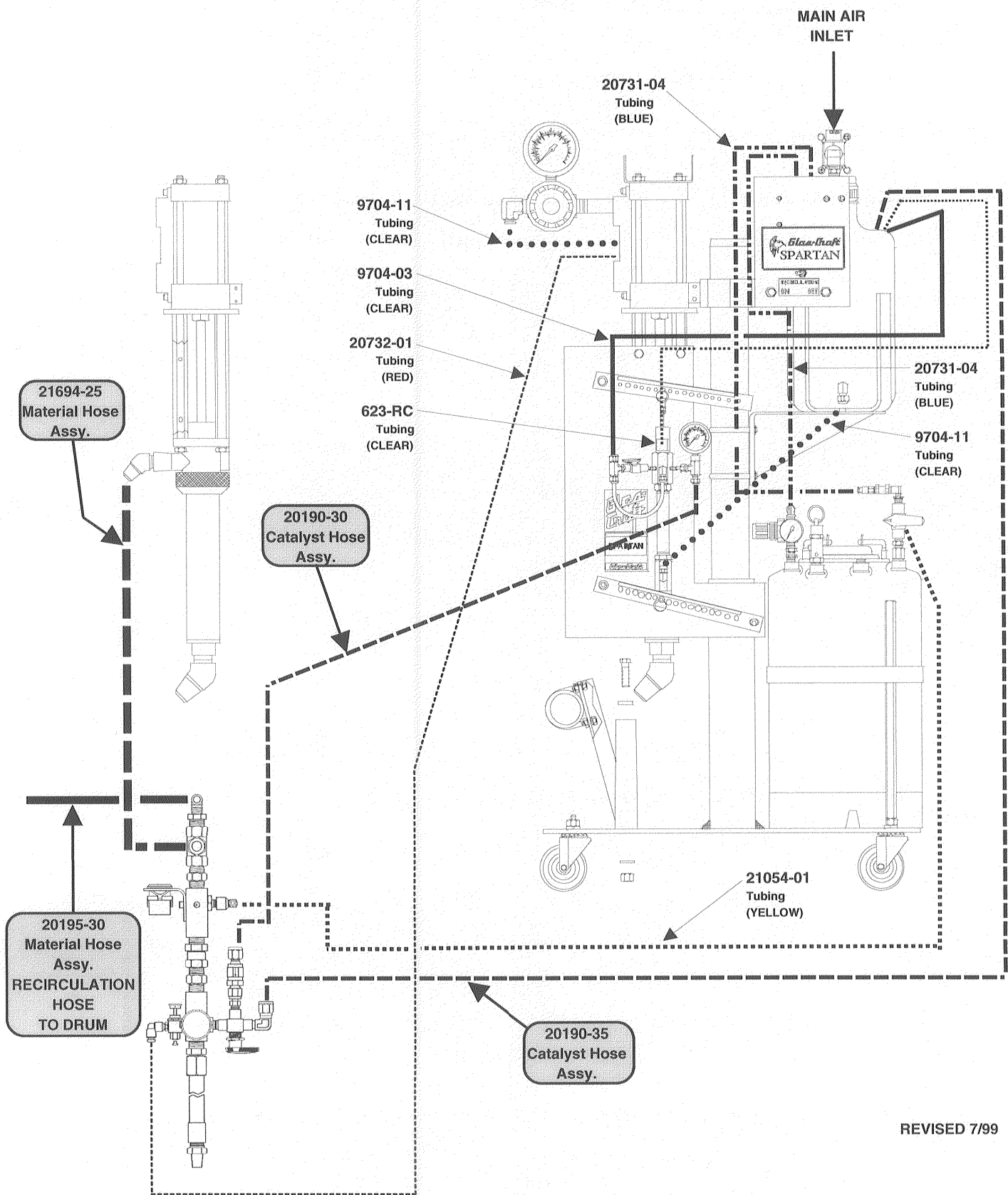
20864-00	3 1/4" MATERIAL PUMP, 4:1 ratio MODULINKS: 1. ACCU-FLUSH - Flush Sequencer 2. ACCU-SHOT - Predetermined Counter 3. ACCU-VAC - Vacuum Generator 4. ACCU- MASTER - Automated Module MAST
21695-00	L.C.D. STROKE COUNTER RESIN HEATER CE GUARDS

21650-00 SPARTAN SYSTEM



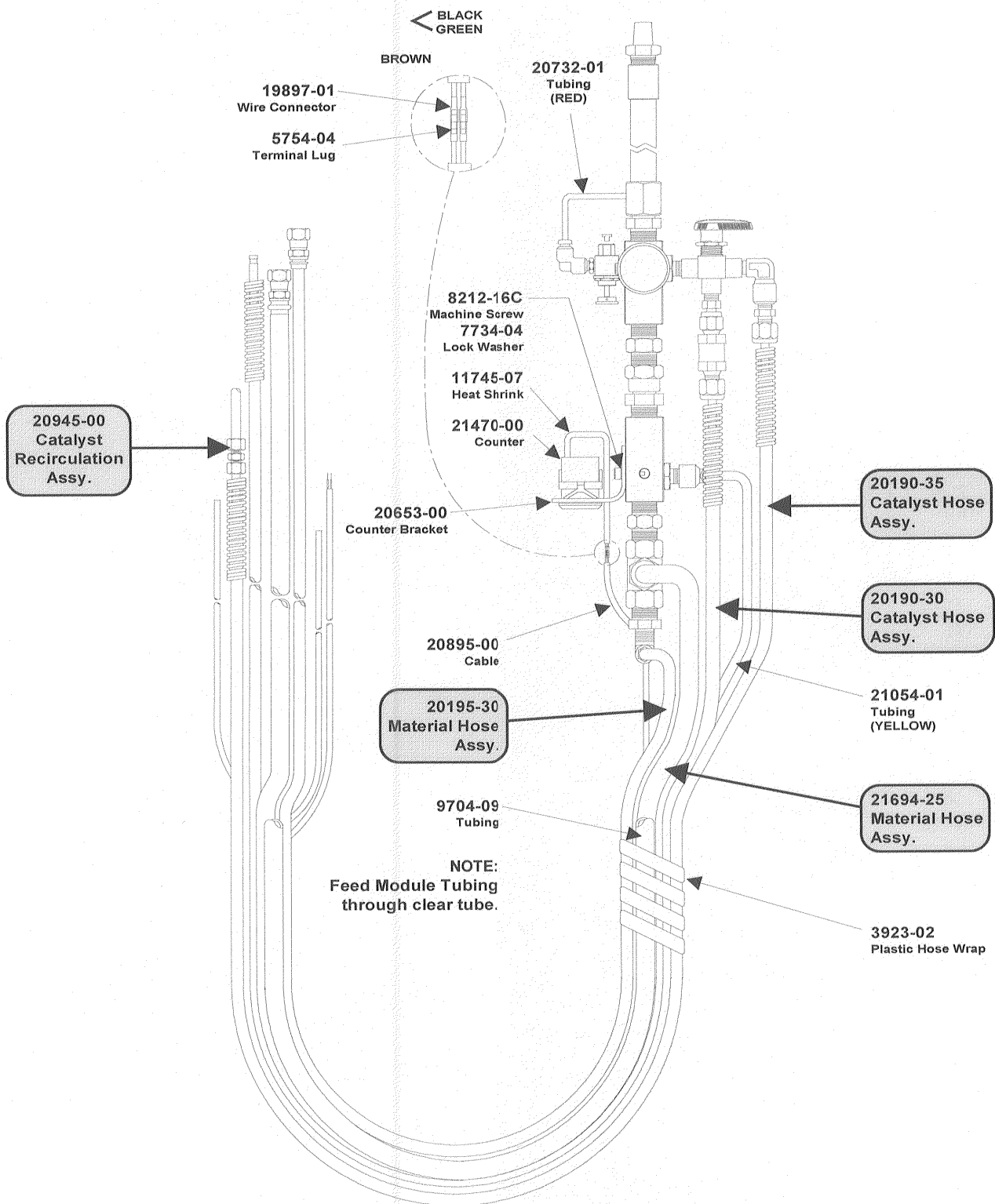
REVISED 7/99

21650-00 SPARTAN SYSTEM HOSE CONNECTIONS



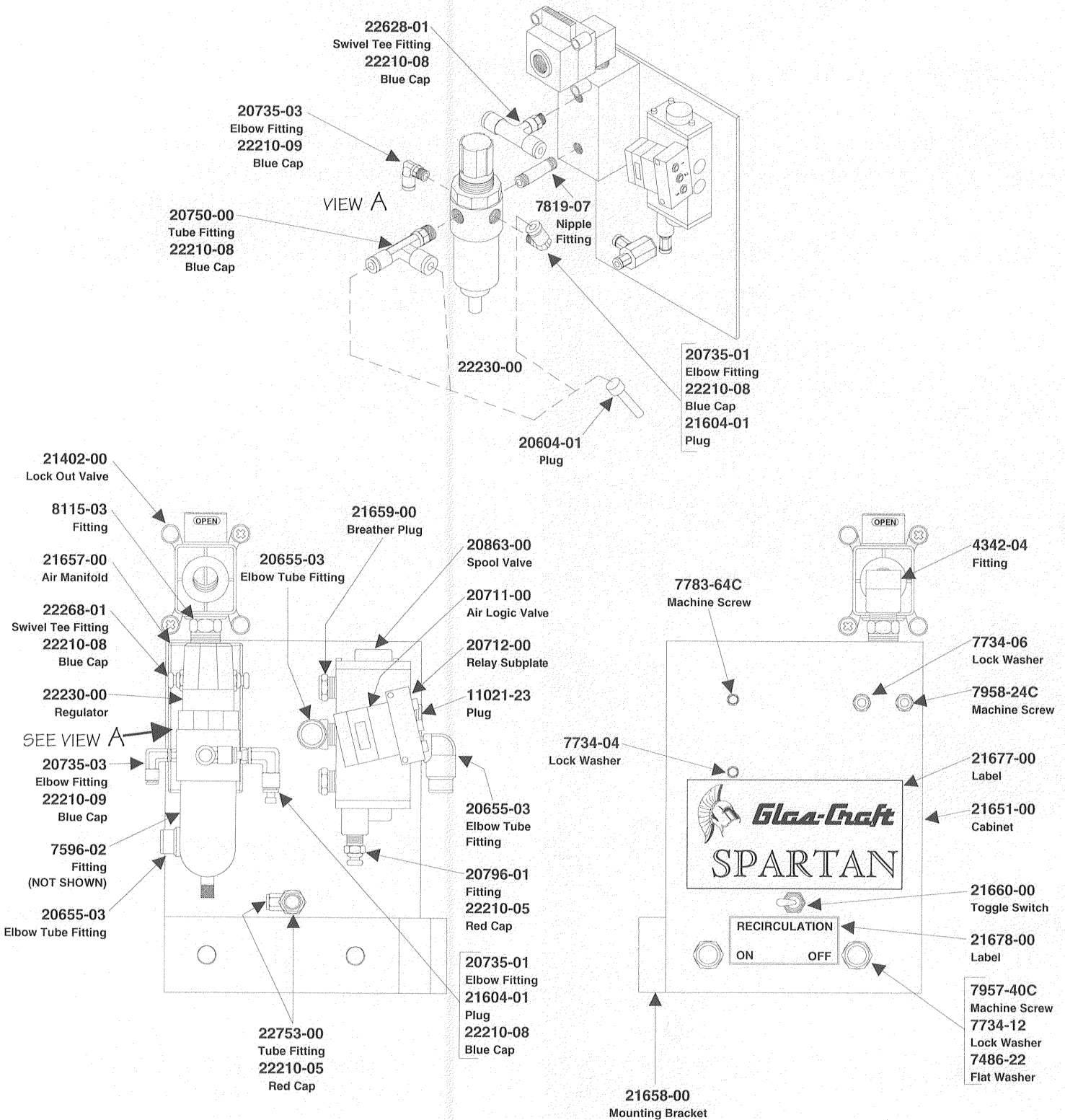
REVISED 7/99

HOSE CONNECTION DIAGRAM



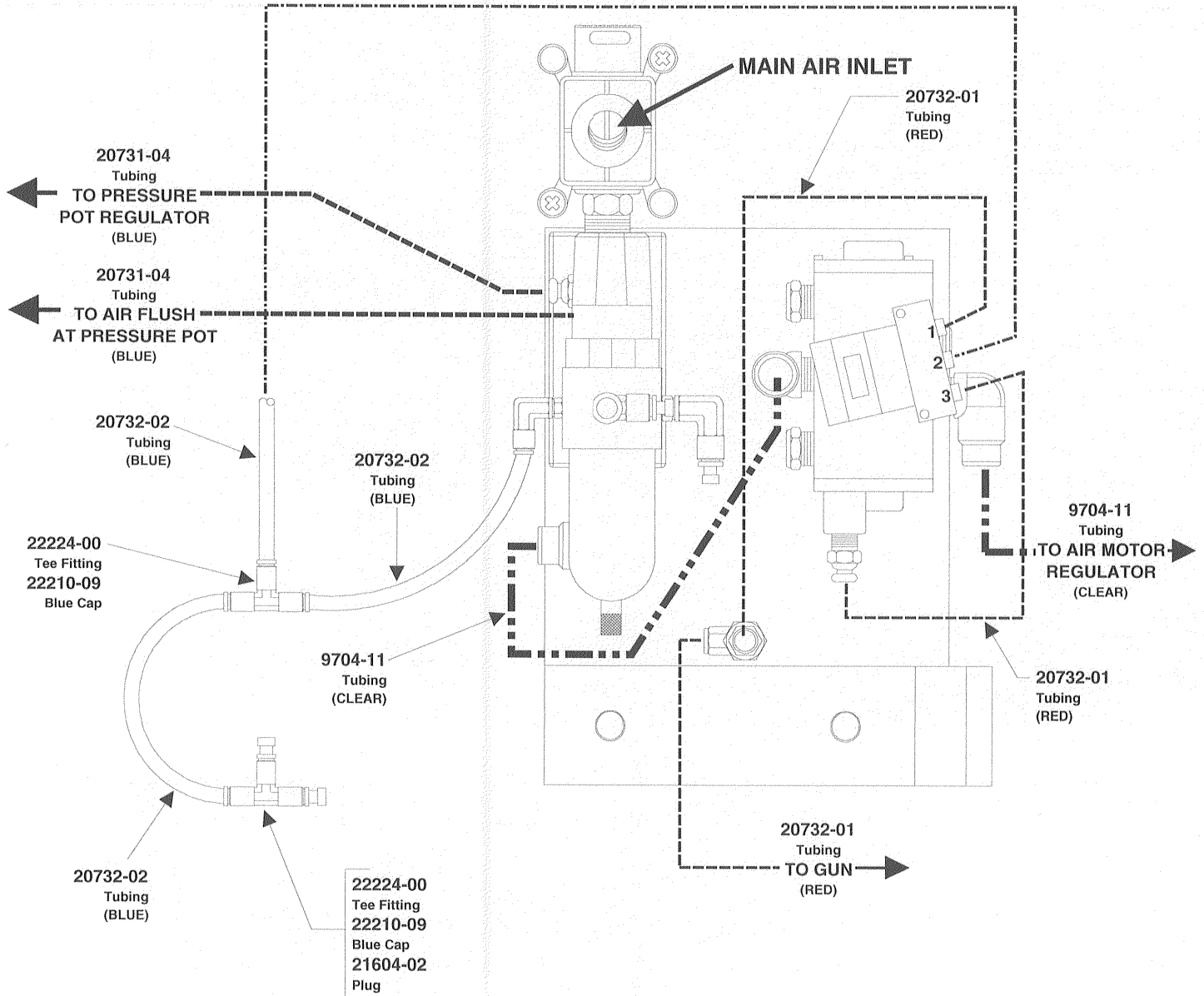
REVISED 7/99

21661-00 AIR LOGIC ASSEMBLY



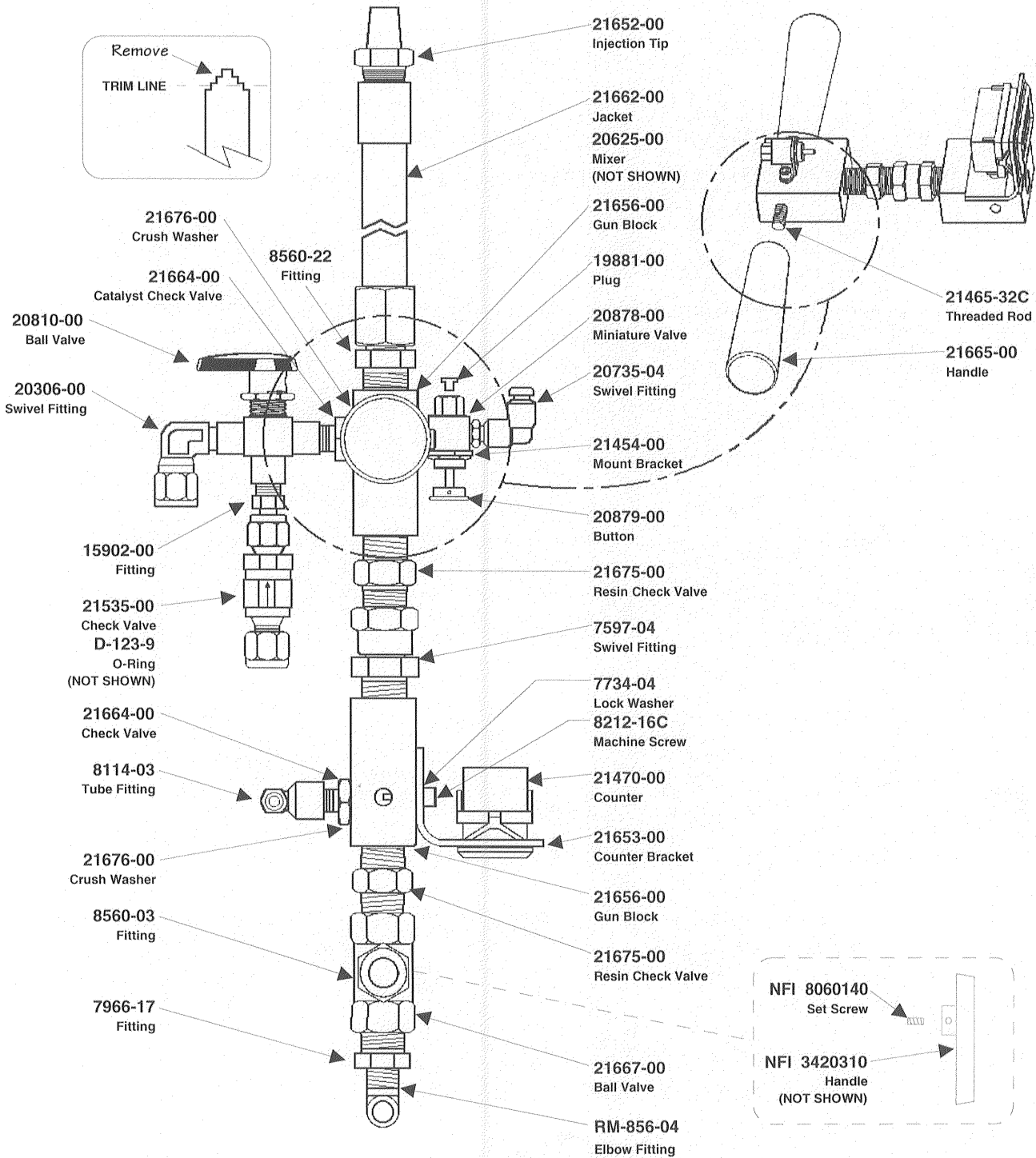
REVISED 1/99

21650-00 AIR LOGIC HOSE DIAGRAM



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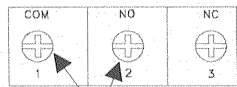
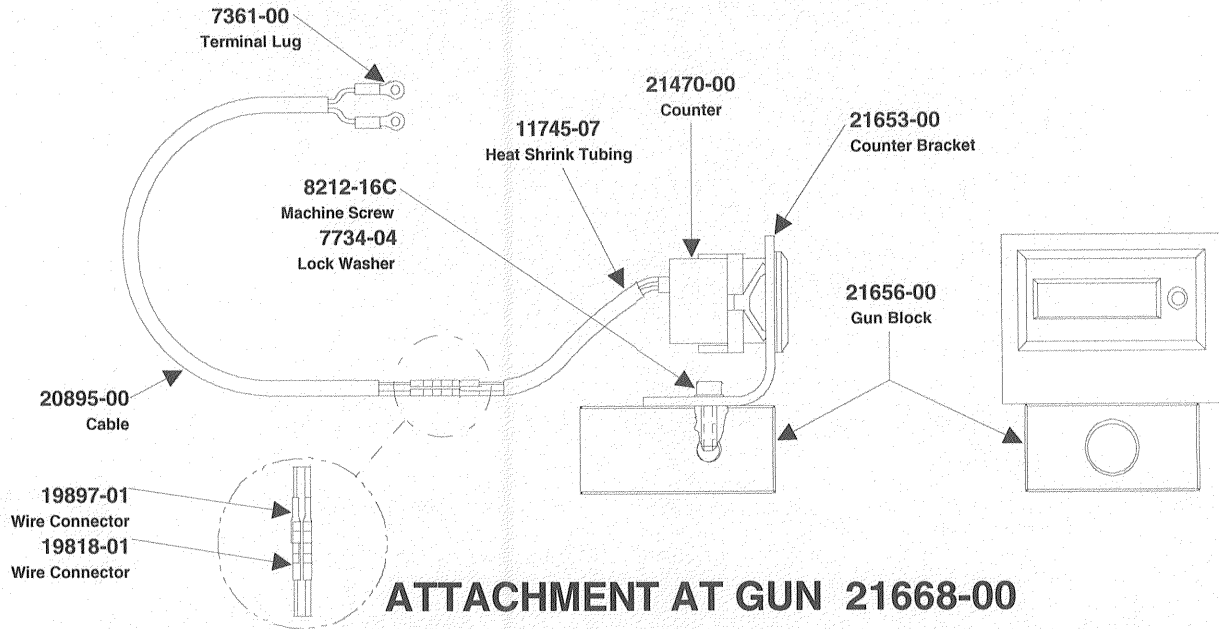
21668-00 DISPENSE GUN ASSEMBLY



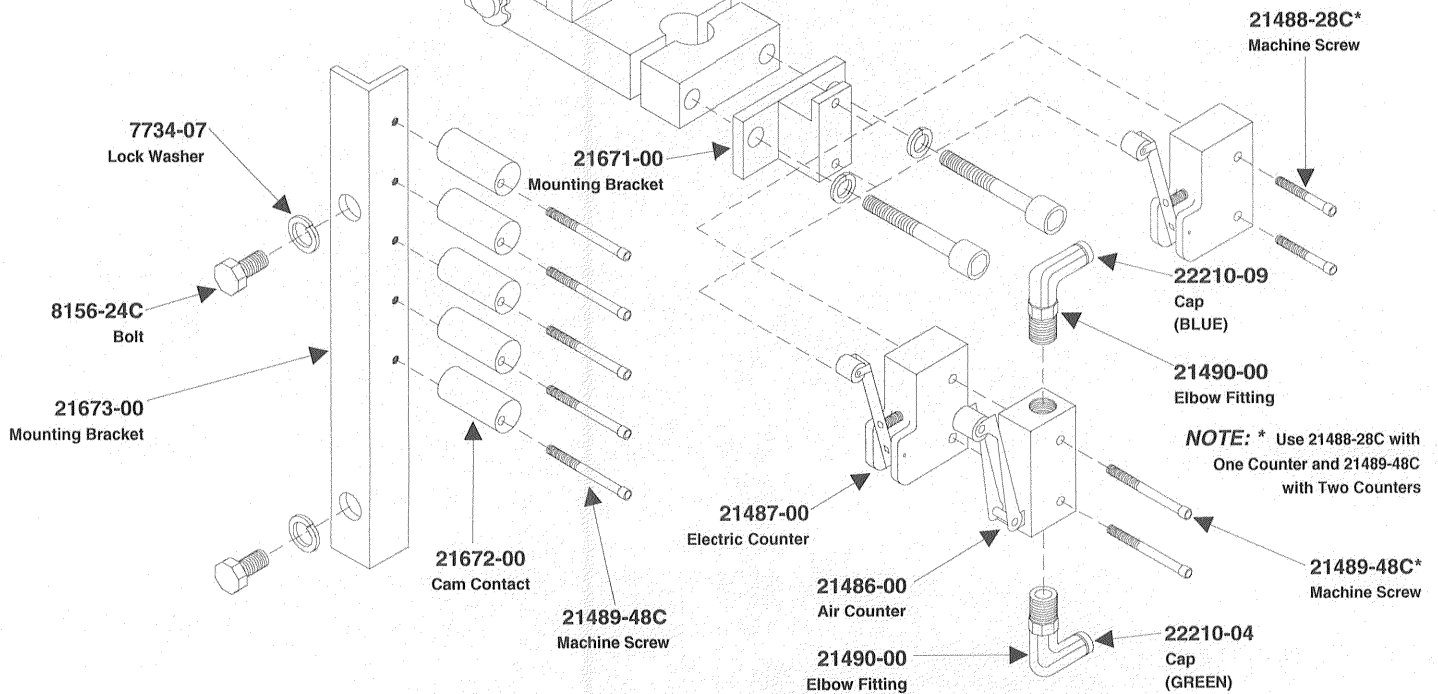
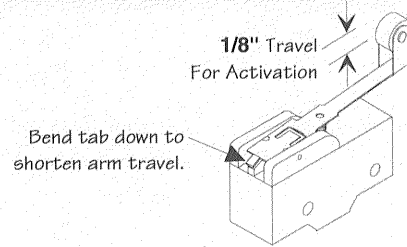
NOTE: For an extended mixer, Add
21662-00 Jacket
8560-22 Fitting
20625-00 Mixing Element
To Existing Mixer

REVISED 8/98

21695-00 COUNTER ASSEMBLY

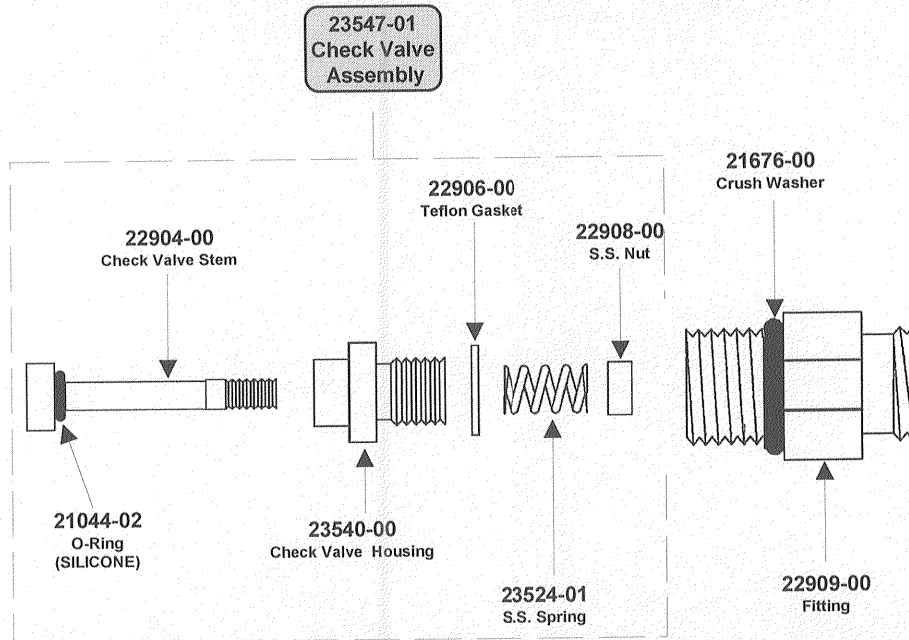


WIRE CONNECTIONS



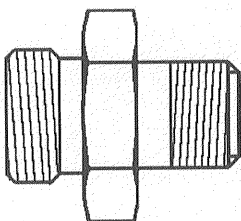
ATTACHMENT AT FLUID SECTION 20864-00

CATALYST BACK PRESSURE VALVE ASSEMBLY

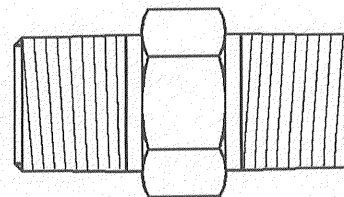
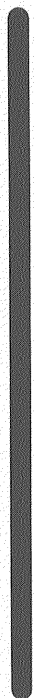


**21664-00
SOLVENT/AIR PURGE
CHECK VALVE ASSY.**

**21675-00
RESIN
CHECK VALVE ASSY.**



NOTE: Set Cracking Pressure at 15 PSIG.



NOTE: Set Cracking Pressure at 45 PSIG.

REVISED 7/04

18913-01 MATERIAL PUMP ASSEMBLY

See Detail B

GAM-141
Stand-Off

See Detail A

8156-32C
Machine Screw
381
Flat Washer

AM-500-02
Air Motor

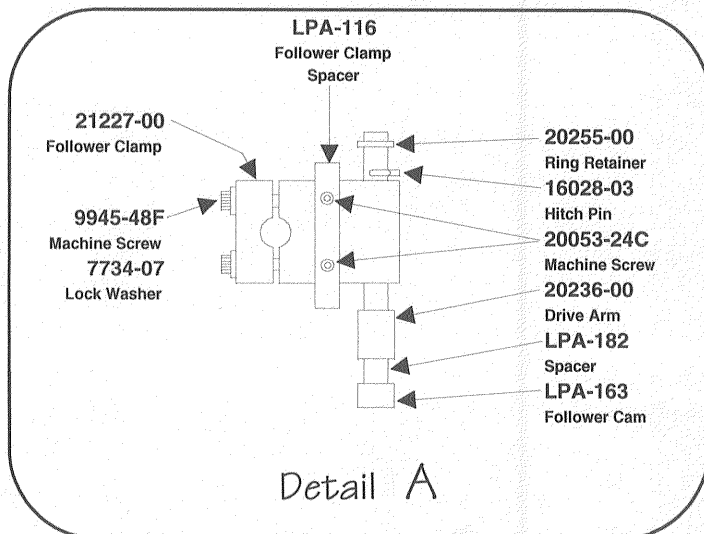
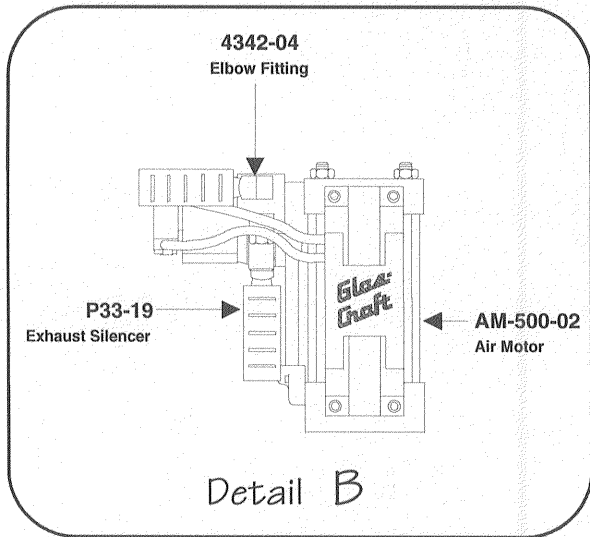
21679-00
Stand-Off

LPA-158
Stand-Off
(FRONT)

21433-02
Elbow Fitting

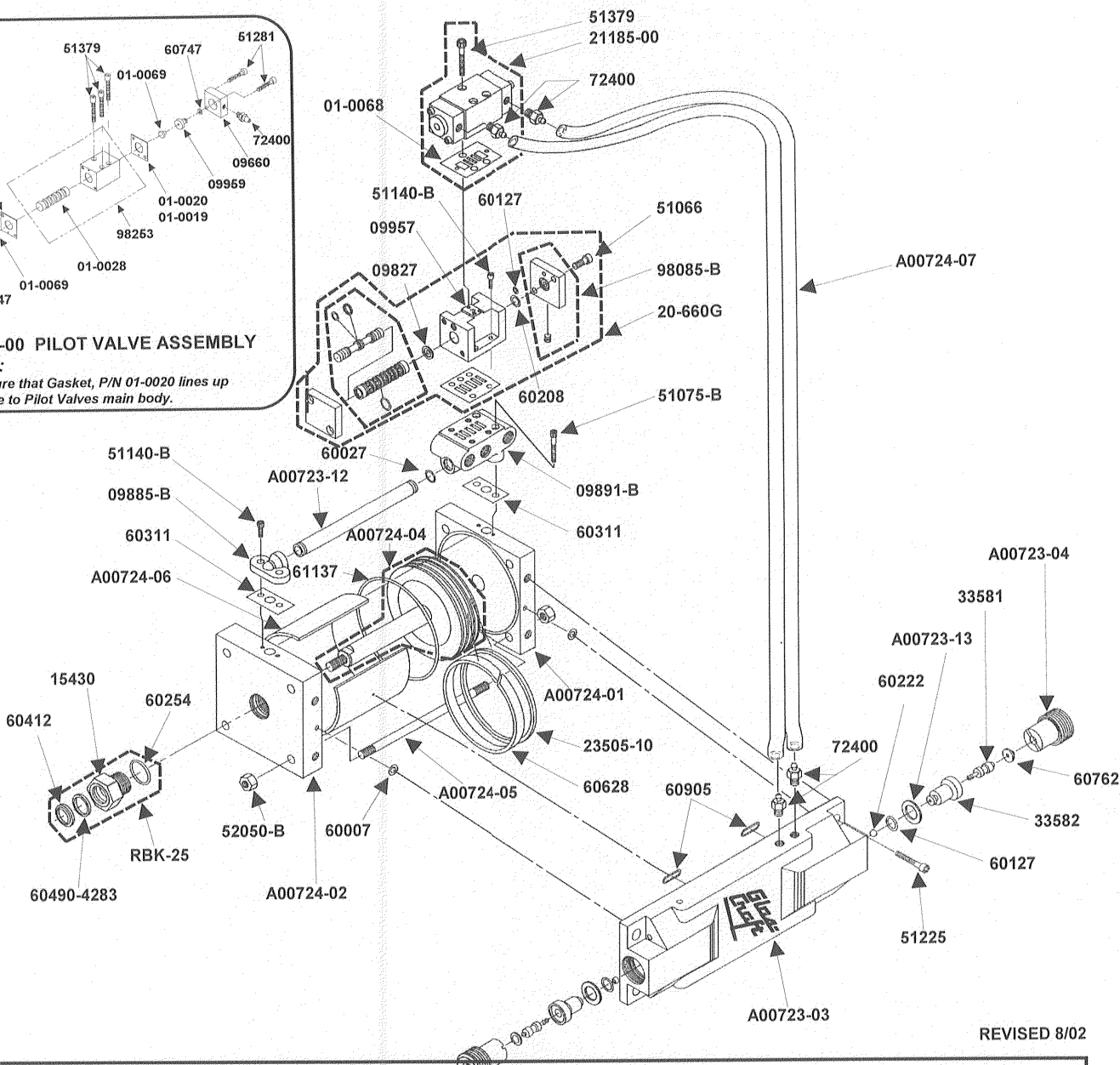
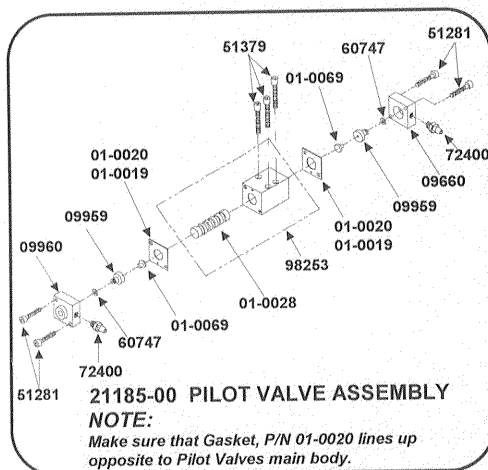
20287-00
Fluid Pump Assy.

21433-01
Elbow Fitting



REVISED 9/99

AM-500-02 AIR MOTOR ASSEMBLY



REVISED 8/02

REPAIR KITS

20102-00	PISTON SEAL KIT	60327
		60628
		60325

20103-00	ROD SEAL KIT	60254
		60490-57
		60412

20104-00	STROKE SIGNAL KIT	60126
		60222
		60127
		33581
		60762
		60062
		60007

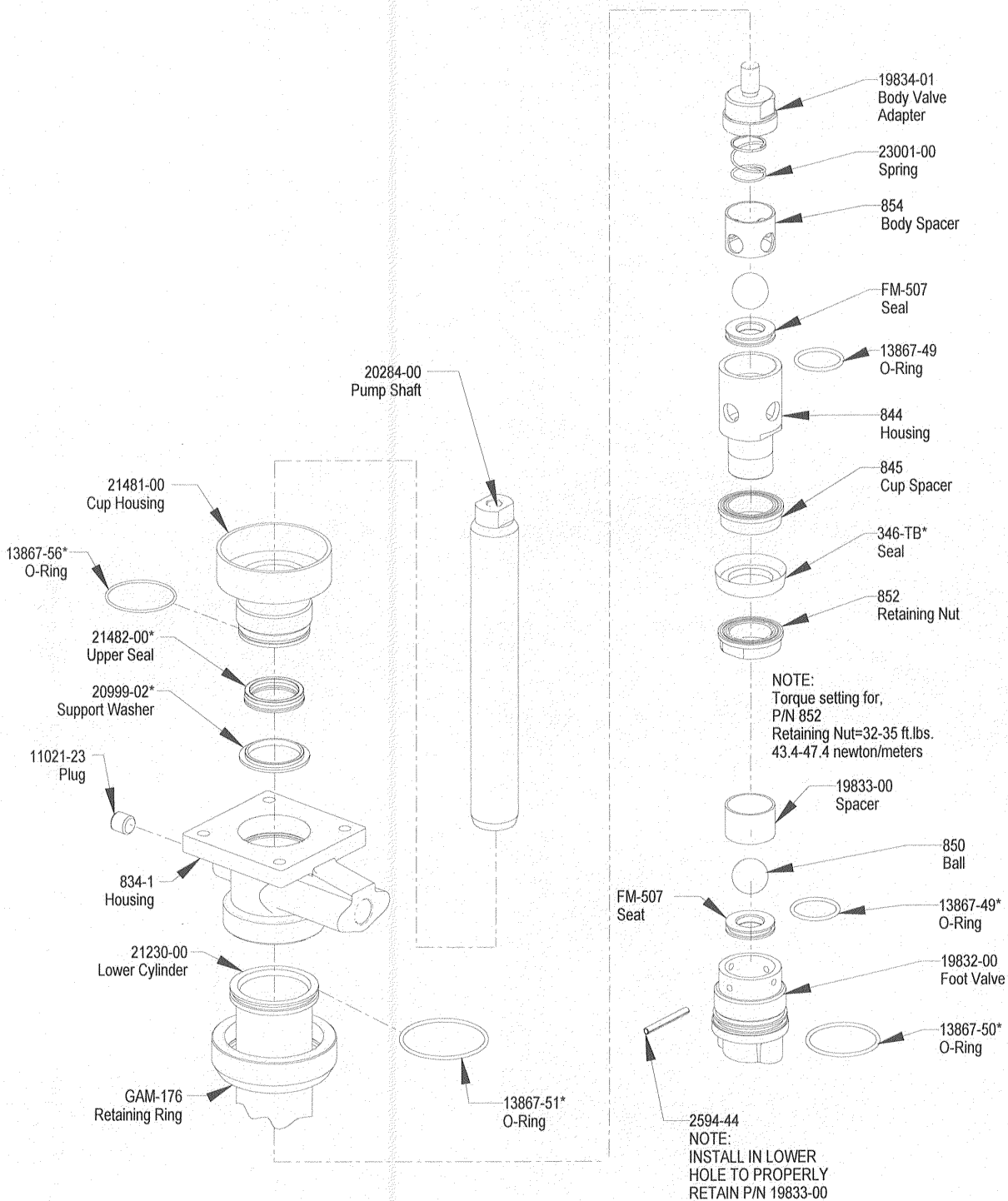
20105-00	GASKET KIT	60311 (2)
		09834
		01-0068
		60011 (2)

20106-00	MAIN VALVE KIT	09808
		09827
		60007 (2)
		60208 (2)

20107-00	PILOT VALVE ASSY.	01-0020
		01-0028
		01-0069
		60747

20101-00	COMPLETE SERVICE KIT	20102-00
		20103-00
		20104-00
		20105-00
		20106-00
		20107-00

20287-00 FLUID SECTION

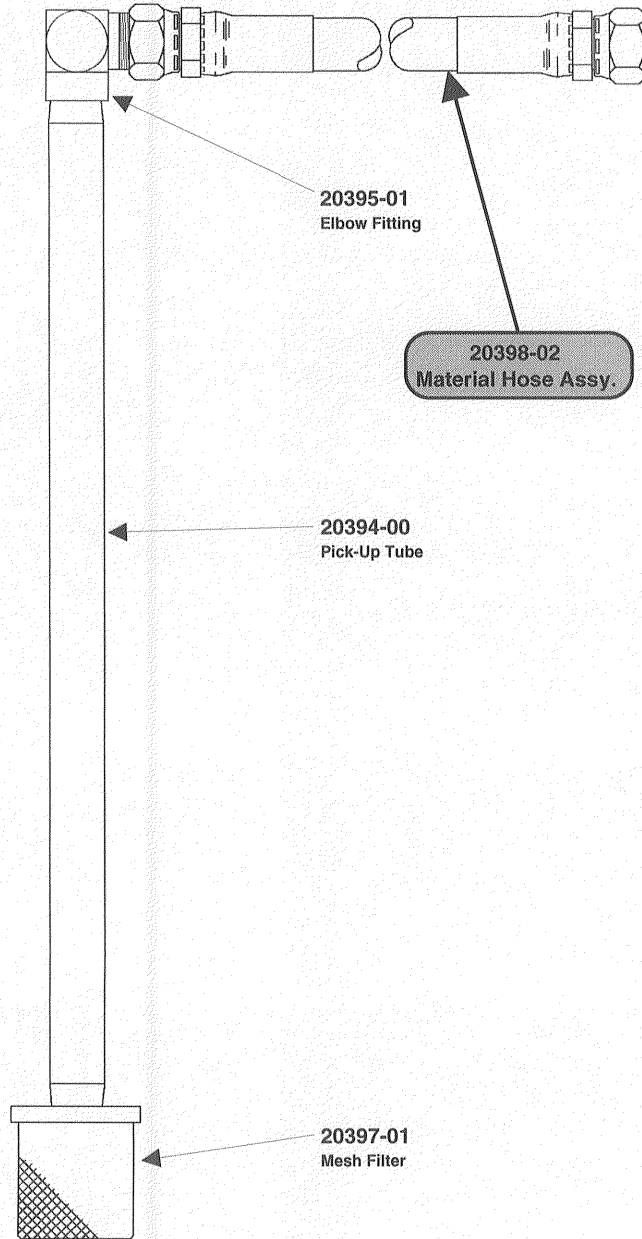


REVISION W

REPAIR KIT: 21570-00

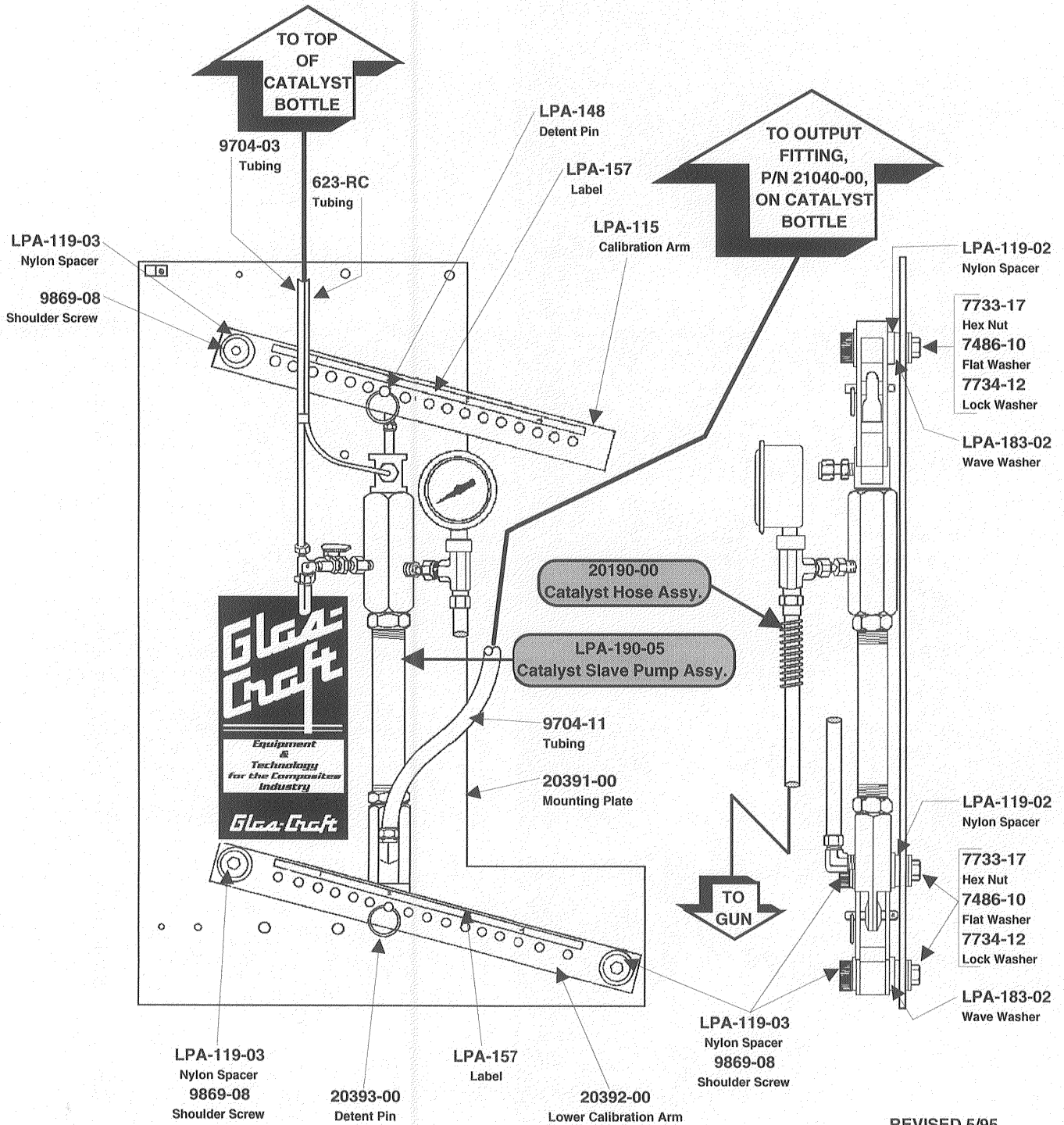
(*) Indicates parts included in Repair Kit. [Included, but not shown: 21044-04 O-Ring, 909 Filter Screen]

GAM268-01 MATERIAL PUMP PICK-UP KIT

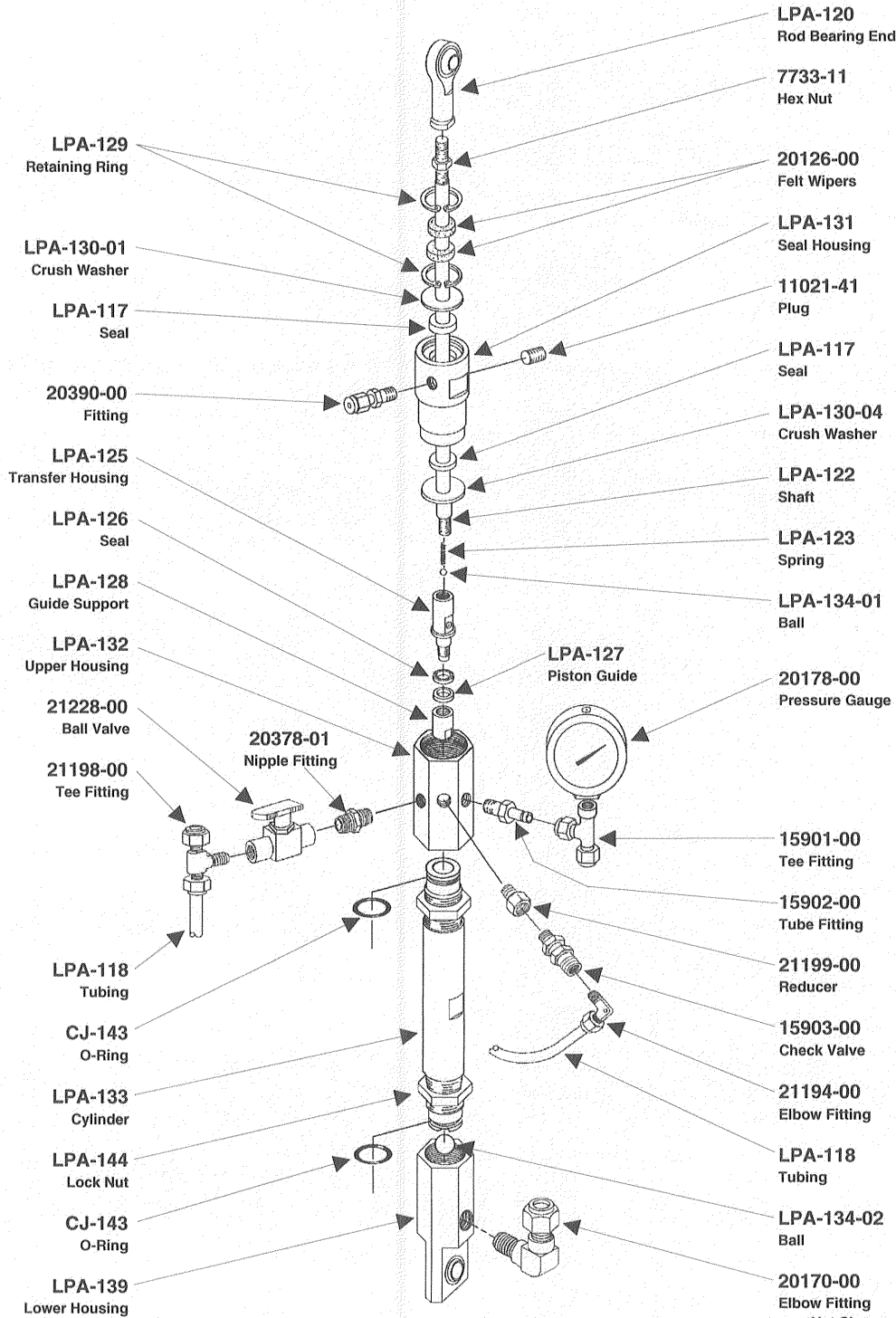


REVISED 5/96

LPA-160-05 CATALYST SLAVE PUMP



LPA-190-05 CATALYST PUMP



NOTE: Do not attempt to remove teflon insert in P/N LPA-131.

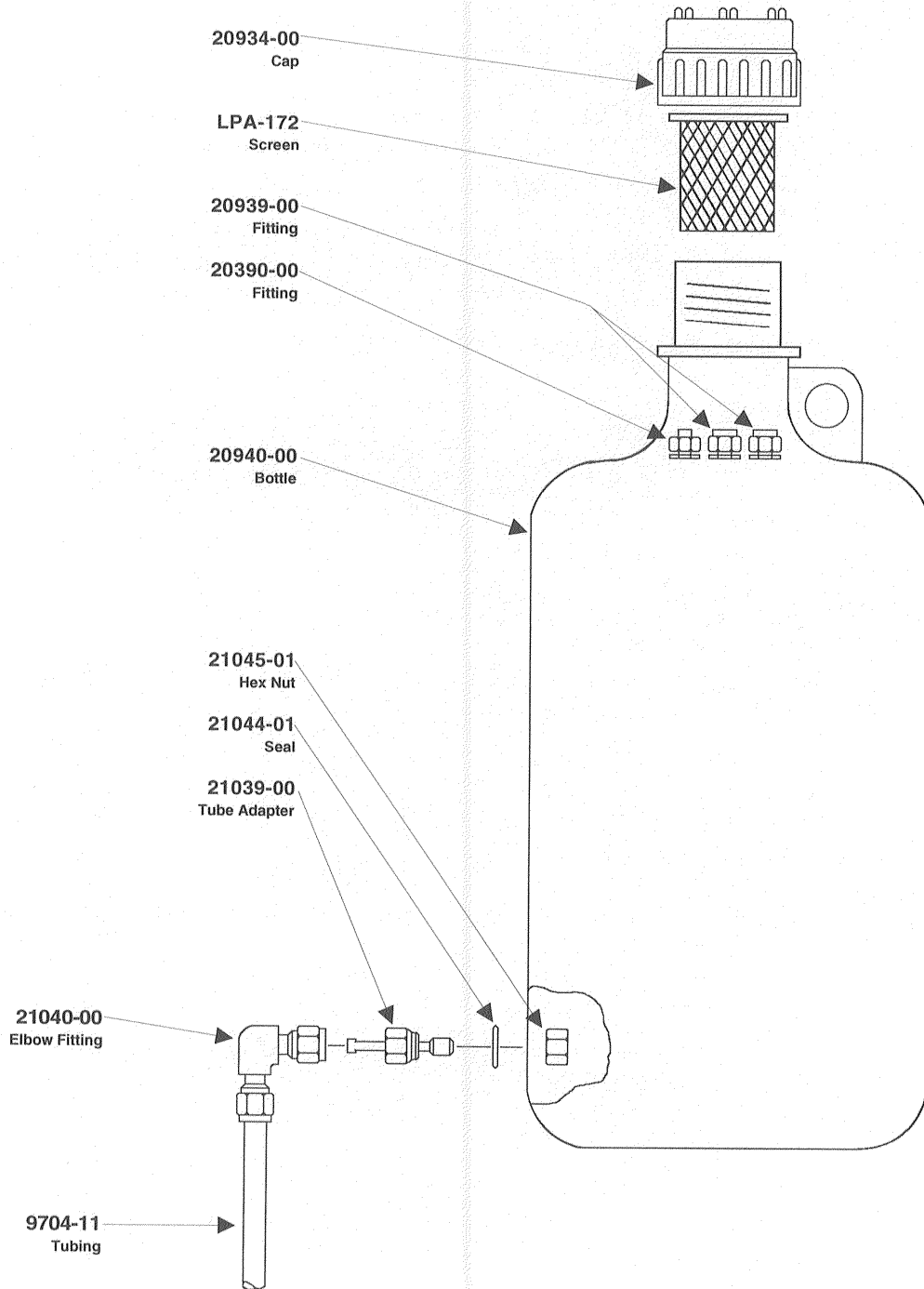
SEAL KIT: LPA-190-SK

REVISED 5/97

Not Shown:
REPLACEMENT FERRULES

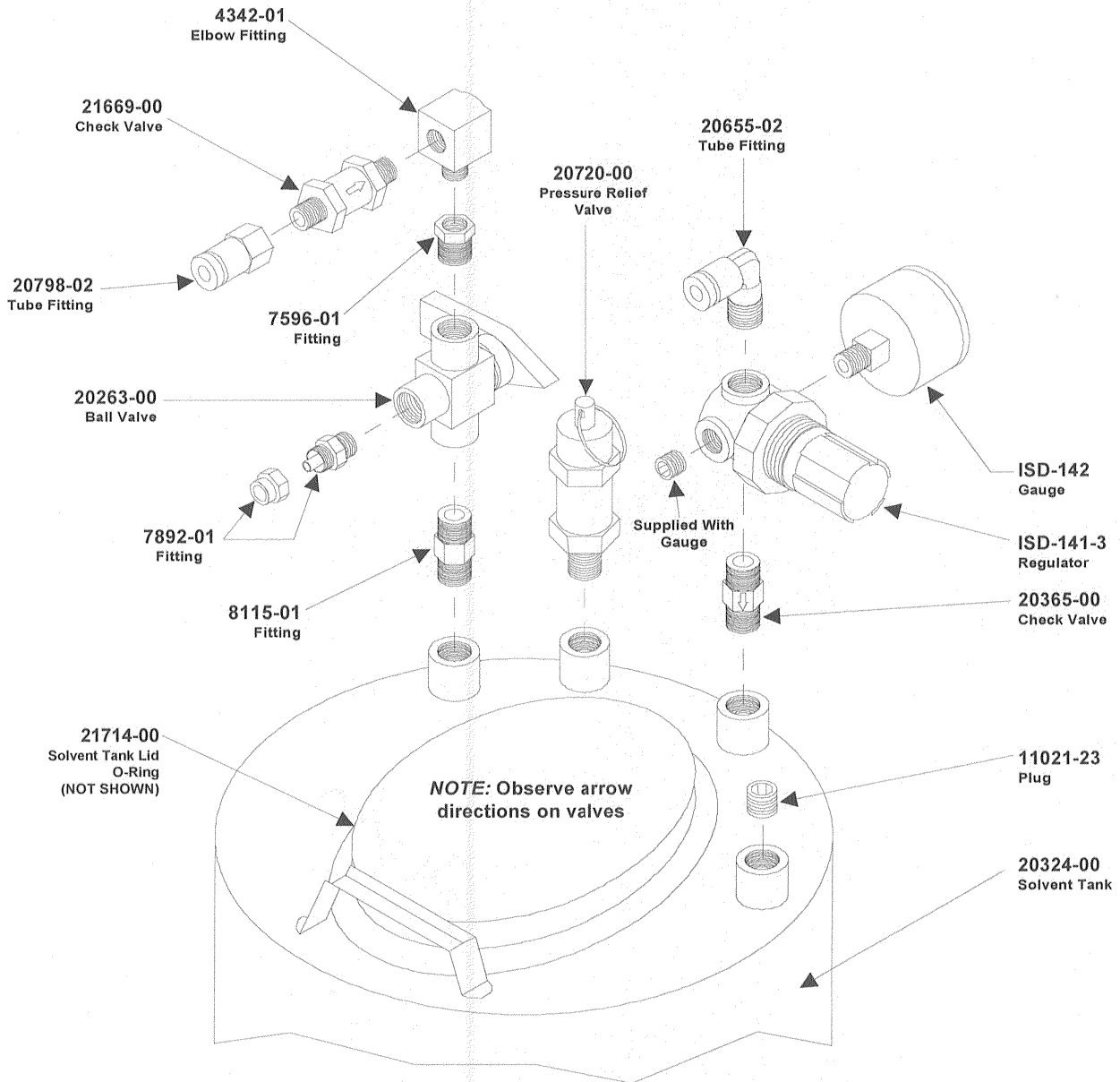
17653-02 Front
17653-27 Rear

20941-00 CATALYST BOTTLE ASSEMBLY



REVISED 3 / 96

21654-00 SOLVENT TANK ASSEMBLY



REVISED 9/03

SAFETY

Operating Your Spartan Resin Transfer Molding System Safely

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 RTM operations safely.

All personnel involved in RTM operations should read and understand this manual. It is most important that equipment operators, maintenance and supervisory personnel understand the requirements for safe operation.

This manual cannot answer every circumstance; each user should examine his own operation, develop his own safety program and be assured that his equipment operators follow correct procedures. Glas-Craft hopes that this manual is helpful to the user and recommends that the precautions in this manual be included in any such program.

In addition to the manual, Glas-Craft 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.

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
- 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 deals with "Fire, Explosion and Health Hazards of Organic Peroxides". It is published by
American Insurance Association
85 John Street
New York, New York 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.

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 (consult manufacturer's Safety Data sheets).
2. The flammability dangers of clean-up solvents sometimes used, and of resin diluents used, such as styrene.
3. The flammability dangers of catalyst diluents, if used.
4. The flammability dangers of the uncured liquid resins used.
5. The combustibility dangers of the cured laminate, accumulations of overspray, and laminate sandings.
6. The toxicity dangers of all the chemicals used in RTM operations with respect to ingestion, inhalation and skin and eye hazards.

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 not 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 the 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 oxidizable 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 nay closed container, be it a pressure vessel, surge chamber, or pressure accumulator, could explode under certain conditions. There is no engineering substitute for care by the user in handling organic peroxide catalysts.

If, at any time, the pressure relieve valve on top of the catalyst tank should vent, the area should be evacuated at once and the fire department called. The venting could be the first indication of a heat, and therefore, pressure build-up that could eventually lead to an explosion. Moreover, if a catalyst tank is sufficiently full when the pressure relief valve vents, some catalyst may spray out, which could cause eye injury. For this reason, and many others, anyone whose job puts them in an area where this vented spray might go, should always wear full eye protection even when laminating operations are not taking place.

Safety in handling MEKP depends to a great extent on employee education, proper safety instructions and safe use of the chemicals and equipment. Workers should be thoroughly informed of the hazards that may result from improper handling of MEKP, especially 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 overspray 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 Glas-Craft in the catalyst system (i.e.: hoses, fittings, etc.) because a dangerous chemical reaction may result between substituted parts and MEKP.
- i. Catalyst accumulated from the purging of hoses or the measurement of fluid output deliveries should never be returned to the supply tank. such catalyst should be diluted with copious quantities of clean water and disposed of in accordance with the catalyst manufacturer's instructions.

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

Clean-Up Solvents

- A. Flammable solvents must be kept in approved, electrically grounded containers.
- B. Bulk solvent should be stored in a well-ventilated, separate building, 50 feet away from your main plant.
- C. You should allow only enough solvent for one day's use in your laminating area.
- D. "NO SMOKING" signs must be posted and observed in all areas of storage or where solvents and other flammable materials are used.
- E. 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.
- F. Solvents should be handled in accordance with OSHA Section 1910.106 and 1910.1907.

Uncured Liquid Resin

- A. Resin should be stored in a well-ventilated building at least 50 feet from your main plant. In addition, the storage temperature should not exceed 75 degrees F.
- B. In your main plant, store only enough resin for one day's production.
- C. "NO SMOKING" signs must be posted and observed in all areas where resin is stored and/or used.
- D. Refer to OSHA Section 1910.94, 1910.106, 1910.107 and consult resin suppliers for more detailed information.
- E. 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.
- F. Resin must never be stored in an area where MEKP is stored or used.
- G. Open top drums should not be used, due to possible contamination and possible catalyzation from overspray or spillage of MEKP into drum, which could not only severely damage the polyester spray system, but might also cause the drum of resin to ignite.
- H. When spraying test patterns or purging the gun, always remove the test samples and waste from the building immediately and dispose of them in accordance with your material supplier's recommendations.

Toxicity Of Chemicals

- A. Glas-Craft 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

Treatment of Chemical Injuries

Great care should be used in handling the chemicals (resins, catalysts and solvents) used in RTM 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, Glas-Craft recommends the use of protective clothing and eye wear in using RTM 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 yes, 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 may have.

WARNING

Contact a 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 the 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.

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Fax (317) 875-5456

OPERATION

The Spartan comes complete and fitted with all resin hoses, catalyst bottle and filters. The injection head is fully connected to the machine circuit and tested and secured against leaks prior to dispatch.

NOTE

The following instructions are to be used as a guide for consistent and continual operation. Any deviation from the "standard operation", usually requires more maintenance to the equipment and material formulation to assure consistent results. For example: the use of fillers in resins.

NOTE

Refer to specific user manuals (if available) for detailed component start-up and shut-down instructions.

Start-Up Instructions

1. Select a clean, dry air supply.
2. Attach a 3/8" or larger air hose to the Air Inlet on the yellow air lock-out valve.

NOTE

It is suggested that a quick disconnect fitting not be used for attaching air. Quick disconnect fittings can severely limit air flow.

CAUTION

Before turning on main air, check all fittings, making certain they are securely tightened. This should be done before air or material of any kind is introduced into the system.

3. Attach Grounding Clamp Assembly, P/N 17440-00, to System. Use a convenient Nut and Bolt to secure Lug, P/N 13193-00, to system. (see Fig. 1)

4. Securely attach Clamp, P/N 7749-00 to permanently grounded rod or pipe. (see Fig. 1)

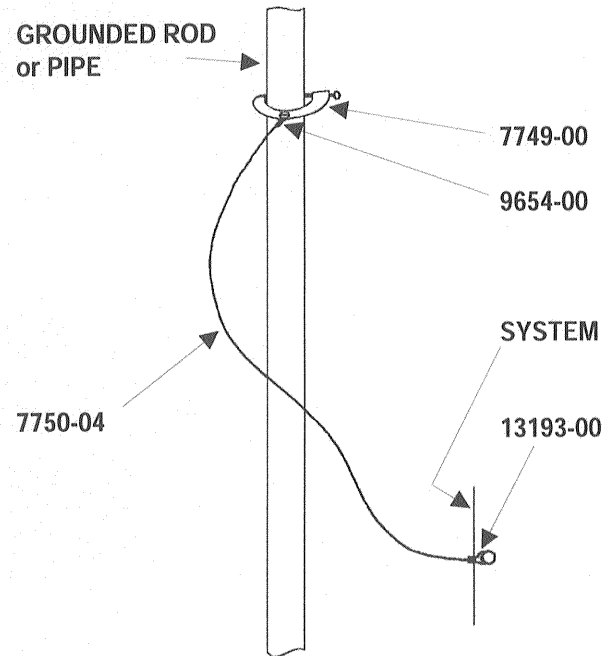


Fig. 1

CAUTION

Whenever flammable or combustible liquids are transferred from one container to another, **both** containers shall be effectively bonded and grounded to dissipate static electricity.

For further information see...

NFPA 77, Recommended Practice on Static Electricity.

Solvent

1. Make certain Solvent Regulator is in the "OFF" or reduced pressure setting. Turn Regulator Knob fully counter-clockwise.
2. Carefully relieve any pressure in Solvent Tank by slowly pulling Relief Valve.

3. After all pressure is released from tank, open lid and fill tank with a suitable, clean flushing solvent and close lid securely.

4. Turn Solvent Regulator clockwise to approximately 65 psi.

NOTE

If system has ACCU-FLUSH option...

See Flushing Instructions in Accu-Flush Manual.

5. Place injection nozzle over a proper waste container. Turn three-way valve on top of the solvent tank so the arrow is pointing up for air purge, for solvent turn valve so arrow is pointing down. Repeat air purge to blow solvent through gun head.

6. Exhaust air through the gun head until all traces of solvent have been dissipated.

NOTE

Since the system is an internal mix system, the mixer requires flushing with air/solvent/air after each dispense or before the mixed material starts to gel.

Resin

1. Detach Catalyst Slave Pump from Material Pump. Remove Pin, P/N 16028-03, and retract Slave Pump Drive Pin, P/N 20236-00. Re-insert Pin, P/N 16028-03 into hole on back side of Drive Pin to prevent drive pin from engaging Pump during priming procedures. (see Fig. 2)

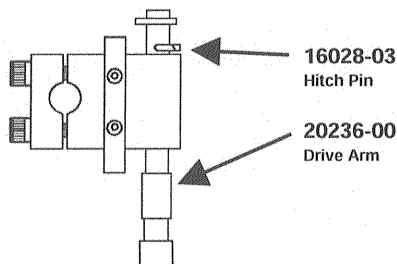


Fig. 2

2. Assemble Material Pump Pick-Up Kit, P/N GAM-268, to Material Pump Inlet Fitting, P/N 10009-02 and tighten securely.

3. Fill Material Pump Lube Cup, P/N 21481-00, with proper pump lube.

4. Before operating Material Pump, flush thoroughly with a clean, suitable solvent to remove test fluid.

NOTE

Glas-Craft uses test fluid that may not be compatible with some resins. Then, it is recommended that the test fluid be flushed from the material pump fluid section.

NOTE

Make sure hose fittings on the pick-up hoses are tight.

5. Place the Material Pump Pick-Up tube into a container of clean, suitable solvent.

6. Place material recirculation hose into a suitable container.

7. Turn main valve on the gun head to the recirculation position (handle should be pointing up.)

8. Turn the air regulator on the air motor fully counter-clockwise.

9. Switch machine to recirculation.

10. Turn the material injection regulator slowly clockwise until gauge indicates 10 PSI or until pump cycles slowly.

11. Pump should cycle clean solvent through the system and out the recirculation hose.

12. End recirculation when solvent appears reasonably clean.

13. Remove material pump pick-up tube from solvent container and dry thoroughly.

14. Turn machine to recirculation.

15. When solvent has stopped exiting the recirculation hose, end recirculation.

16. Place material pump pick-up tube in desired container of material.

17. Turn machine to recirculation.

18. Let material pump cycle slowly until a steady stream of clean material is seen exiting the recirculation hose.

19. Secure recirculation hose in the material supply container.

NOTE

Dispose of resin in the waste container in a proper manner.

Catalyst

1. Safely fill the Catalyst Supply Bottle, P/N LPA-165, (maximum two gallons) with preferred MEKP catalyst, to a minimum level of at least two inches above the Catalyst Bottle Outlet Fitting.

WARNING

Remove Catalyst Bottle, P/N 20941-00 from Catalyst Bottle bracket, P/N LPA-169 for filling. Bottle should be placed at or below lowest level for safe filling. Never fill Catalyst bottle while mounted in bracket as personal injury from catalyst spillage could result.

2. Turn Catalyst Valve on the dispense gun to recirculation position (arrow on valve should point away from gun block).
3. Grasp Catalyst Slave Pump Arm P/N LPA-115, and stroke by hand until catalyst appears out of return tube in catalyst supply bottle. Continue to stroke until a steady stream of catalyst appears and is free of air bubbles.
4. Re-attach Catalyst Slave Pump to material pump. Remove pin, P/N 16028-03, from the backside of drive pin and slide the slave pump drive pin forward until it connects into the groove of the slave arm, P/N LPA-115. Re-insert pin, P/N 16028-03 in front hole to keep pin from retracting backwards from slave arm.
5. Set percentage of slave pump to the 4.5% position by removing both the top pin and the bottom pin. Re-install pins.

NOTE

It is usually a general practice when starting up the system to let the system recirculate with the Catalyst Slave Pump set at 4.5%. This ensures good catalyst volume movement through the system to remove air in the catalyst system.

Recirculation Mode (Start-Up)

1. Both Catalyst Valve and Material Valve on the Dispense Gun should be in the Recirculation position.
2. Switch machine to recirculation.
3. Turn air motor pressure regulator slowly clockwise until pump cycles slowly.

NOTE

The Recirculation Mode should be used in initial start-up or when air bubbles are observed coming through the ends of the Recirculation Hoses.

Injection Instructions

1. Switch machine to injection.
2. Turn valves on gun head to injection.
3. Select desired percentage of catalyst and position the catalyst slave pump to that setting.
4. Depress air switch button trigger on gun head to dispense mixed material.

NOTE

When starting a new machine, it is recommended to dispense a couple of strokes of resin into a suitable container to ensure a proper flow of materials. This is not required once the machine has been properly wet-out.

5. Release air switch button trigger to stop material flow.
6. Flush gun head thoroughly.
7. When finished, turn valves on gun head to recirculation position.

CAUTION

When making test material dispenses or during flushing operation, make certain that dispensed material and/or solvent is contained in a suitable container and that this material and/or solvent is disposed of properly.

Shut Down Procedure

The purpose of the shut down procedure is to verify that all critical parts of the system, i.e., the mixing area, have been checked and cleaned to assure trouble-free start-up the next time the system is to be operated.

1. Turn both ball valves on gun head to recirculation.

NOTE

If using a filled resin it is suggested that the material pump and hoses be flushed with a "neat" resin and that the neat resin is flowing through the system and exiting the material recirculation hose thoroughly before shut down procedures are completed.

2. Flush gun head with solvent and air purge thoroughly.
3. Material pump should be stopped with pump shaft in up position and shaft should be cleaned of any contaminants.
4. Material pump lube cup should be cleaned of old lube and refilled with new pump lube.
5. Material pump should now be cycled so that shaft is left in down position during shut-down period.
6. If you are using fillers mixed into the resin, remember on periods of shut-down, the fillers can settle to the bottom of the pump and pipe-works.
7. Shut down main air supply by closing yellow lock out valve.
8. Slowly bleed the air pressure from the tank by lifting the ring on the relief valve.

CAUTION

Failure to cycle Pump Shaft to DOWN position may result in contaminants to dry or harden on shaft. When pump is next operated, severe damage may be done to upper pump seals.

Routine Care

It is recommended that the following service be performed on a weekly basis.

1. Inspect and lubricate Catalyst Slave Pump Linkage. (See Catalyst Slave Pump User Manual.)
2. Inspect Pump Shafts on Material and Catalyst Pumps, making certain they are clean and free of overspray or foreign material. Clean and lubricate as required.

For long term storage of your injection system, it is recommended that the following procedures be followed.

1. Place dry nitrogen in the material drums and secure drum.
2. Make certain all air and material valves are in their "OFF" position.

NOTE

Glas-Craft recommends that you contact your gel-coat and/or resin supplier concerning material pot-life during extended periods of shut-down. The decision as to whether or not to leave material in your system should be based on information from your material suppliers as well as Glas-Craft.

Consult your local authorized Glas-Craft distributor for more information concerning system storage.

Operation Notes

NOTE

Before altering catalyst percentage by moving the catalyst pump to a new desired location on the ratio arm ALWAYS ensure that the catalyst recirculation valve is turned to the recirculation position, and the air pressure is removed from the system.

It is absolutely essential that both streams of material are pumped to the head without air or gas entrapped. For example, if air is drawn into the resin stream through the resin pump inlet system, i.e., via bad connection or filter end coming out of resin surface, then this air if not purged out of the machine by recirculating on by-pass will naturally go to the head through the mixer and into the RTM mold. This fault condition will manifest itself in the molded part having very small bubbles; almost in a froth like state, on the upper side of the molded part once the mold is opened. The reason for these bubbles being so small is due to the fact that air coming through the mixer with the resin is mixed and frothed before finally entering the mold.

Air or gas in the catalyst stream, leads to a different type of fault in the molded part. This condition will be manifest by observing when opening the mold after injection and supposed cure, that there are wet patches of uncured or semi-gelled resin in the molded part. The causes attributed to this are:

1. Air is drawn in by the catalyst pump through a bad connection on the inlet stream from the catalyst container or pump inlet connection.

2. Catalyst contamination in the pump system causing oxidation resulting in peroxide gas bubbles being generated within the supposedly hydraulic sealed system of the catalyst.

3. The catalyst pump has faulty seals or is contaminated with particles.

To ensure that the catalyst system is totally hydraulically tight, it is expedient after a period of shut-down that the procedures in the instructions for commissioning the catalyst stream should be repeated.

MAINTENANCE

A. Fluid Section, P/N 20287-00 Disassembly Procedure

NOTE

If Fluid Section, P/N 20287-00 is still connected to Air Motor, P/N AM-500-02, disassemble as follows.

1. Loosen and remove Screws, P/N 8156-32C and Washers, P/N 381.
2. Place an open end wrench on the flats of Pump Shaft, P/N 20284-00 and another wrench on the flats of the Air Motor Shaft. Turning in opposite directions so as to loosen the shaft, remove Fluid Section from Air Motor.
3. Place Fluid Section in a vise by clamping the Adapter, P/N 834-1, in the vise with the cylinder extending horizontally to the right. Place a large waste container underneath the fluid section to catch residual fluid.

CAUTION

Do not use a Pipe Wrench or Vise on the Pump Cylinder. Irreparable damage may be cause to the Cylinder.

4. Unscrew and remove Lower Cylinder Retaining Ring, P/N GAM-176. You may have to lightly tap the Retaining Ring with a plastic or wooden mallet to loosen.
5. Grip pump Cylinder, P/N 21230-00, with both hands and gently twist to the left as you slowly pull Cylinder straight back.
6. Remove the Upper Ball Check Section. Use an open-wrench on the flats of the Pump Shaft, P/N 20284-00 and an adjustable wrench on the Valve Body Adapter Nut, P/N 19834-00. Loosen Nut with the wrenches and then unscrew entire Upper Ball Check Section by hand.
7. Using a strap wrench, loosen Lube Cup, P/N 21481-00 and remove from Adapter, P/N 834-1.
8. Remove Adapter from vise. using a clean cloth and TGC cleaner, clean, dry and set aside the Adapter.

9. Remove O-Ring, P/N 13867-56; Upper Housing Seal, P/N 21482-00; and Support Washer, P/N 20999-02, from Lube Cup, P/N 21481-00. Clean with TGC cleaner, inspect for damage and replace if required, and set aside for re-assemble.

CAUTION

Do not use a Pump Cylinder with visible vertical lines, scratches or scoring on the Cylinder walls. Seals will be quickly damaged if used in a worn cylinder.

10. Usually vertical lines, scratches or scores may be removed with the se of a Glas-Craft P/N RK-5 Cylinder Hone Kit. This Kit will speed the honing operation and produce the required 30-40 micro finish. The cylinder Hone Kit is available from your local authorized Glas-Craft distributor.
11. Clean and inspect all parts for wear and/or damage. Replace worn or damaged parts with genuine Glas-Craft replacement parts.

B. Cup Section Disassembly Procedure

1. Place Valve Body Adapter, P/N 19834-00, in vise.
2. Using a large adjustable wrench, remove Lower Cup Retaining Nut, P/N 852.
3. Remove and discard Seal, P/N 346-TB.
4. Remove and clean Lower Cup Spacer, P/N 845.
5. Place the flats of Lower Cup Valve Body, P/N 844 in vise.
6. Using a large adjustable wrench, remove Valve Body Adapter, P/N 19834-00.
7. Remove Valve Spacer, P/N 854, and Valve Ball, P/N 850.

CAUTION

Be very careful to not drop or damage Valve Ball, P/N 850. Nicks, scratches or flats could prevent the Ball from sealing properly.

8. If Valve Seat, P/N FM-507, remains in Lower Cup Valve Body, use a 7/8" wooden dowel rod to push the Valve Seat out of the Body.

9. Remove and discard O-Ring, P/N 13867-49 from Valve Seat.

10. Clean and inspect all parts for wear and/or damage. Replace worn or damaged parts with genuine Glas-Craft replacement parts.

C. Cup Section Assembly Procedure

NOTE

When "Lubricate" reference is stated, Glas-Craft recommends the use of lithium grease as a lubricant. Petroleum jelly can be used as a lubricant coating for O-Rings and Seals to ease assembly only.

1. Place flats of Lower Cup Valve Body, P/N 844 in vise.

2. Lubricate and assemble new O-Rings, P/N 13867-49 onto Valve Seat, P/N FM-507.

3. Lubricate and install Valve Seat into Lower Cup Valve Body.

4. Install Valve Body Spacer, P/N 854, into Lower Cup Valve Body.

NOTE

Make certain that the "holes" in the Valve Body Spacer are properly aligned with the "holes" in the Lower Cup Valve Body.

5. Insert Valve Ball, P/N 850 into Lower Cup Valve Body and assemble Valve Body adapter Nut, P/N 19834-00. Check alignment of "holes" between Valve Body Spacer and Lower Cup Valve Body while tightening Valve Body Adapter Nut securely.

6. Remove assembly from vise, turn around and place Valve Body Adapter Nut in vise.

7. Assemble Lower Cup Spacer, P/N 845, and new Seal, P/N 346-TB onto Lower Cup Valve Body.

CAUTION

Make certain that the Material Cup is assembled properly as shown in 20287-00 Fluid Section illustration. Pump will leak if Cup is not installed correctly.

8. Assemble Lower Cup Retaining Nut, P/N 852 onto Lower Cup Valve Body.

9. Tighten Lower Cup Retaining Nut to 32-35 foot pounds of torque.

D. Foot Valve Section Disassembly Procedure

NOTE

If symptoms clearly indicate that the Foot Valve is the problem, you can check it without removing the Pump from the Unit.

Failure of the Pump to stall on the down stroke would indicate improper functioning of the Foot Valve.

WARNING

Before attempting to perform any maintenance on this Pump - Relieve All Fluid and Air Pressures!

To relieve fluid and air pressures:

1. Turn OFF main air supply.
2. Trigger Gun until all fluid pressures have been relieved.
3. OPEN Pump By-Pass Valve, turn Valve Knob counter-clockwise.

1. Using a pipe wrench, carefully loosen the Foot Valve Housing, P/N 19832-00 from Pump Cylinder, P/N 21230-00. Turn wrench counter-clockwise just enough to break the Housing free of the Cylinder. Remove the final threads by hand.

CAUTION

Do not use a Pipe Wrench or Vise on the Pump Cylinder. Irreparable damage may be caused to the Cylinder.

2. Remove Ball Retainer Pin, P/N 387, and disassemble Lower Ball check Assembly.

3. Remove and discard O-ring, P/N 13867-50 from Foot Valve Housing.

4. Remove Foot Valve Spacer, P/N 19833-00, and Valve Ball, P/N 850.

CAUTION

Be very careful to not drop or damage Valve Ball, P/N 850. Nicks, scratches or flats could prevent the Ball from sealing properly.

5. If Valve Seat, P/N FM-507, remains in Foot Valve Housing, use a 7/8" wooden dowel rod to push to Valve Seat out of the Housing.
6. Remove and discard O-Ring, P/N 13867-49 from Valve Seat.

NOTE

If only one side of the Valve Seat is damaged, you may simply turn it over and reassemble Foot Valve Assembly.

7. Clean and inspect all parts for wear and/or damage. Replace worn or damaged parts with genuine Glas-Craft replacement parts.

E. Foot Valve Section Assembly Procedure

NOTE

When "Lubricate" reference is stated, Glas-Craft recommends the use of lithium grease as a lubricant. Petroleum jelly can be used as a lubricant coating for O-Rings and Seals to ease assembly only.

1. Place Foot Valve Housing, P/N 19832-00 in vise.
2. Lubricate and assemble new O-Ring, P/N 13867-49 onto Valve Seat, P/N FM-507.
3. Lubricate and install Valve Seat into Foot Valve Housing.
4. Install Foot Valve Spacer, P/N 19833-00, into Foot Valve Housing.
5. Insert Valve Ball, P/N 850 into Foot Valve Housing.
6. Using a 5/32" punch, carefully reinstall Ball Retainer Pin into Foot Valve Housing.

F. Fluid Section, P/N 20287-00 Assembly Procedure

NOTE

When "Lubricate" reference is stated, Glas-Craft recommends the use of lithium grease as a lubricant. Petroleum jelly can be used as a lubricant coating for O-Rings and Seals to ease assembly only.

1. Place Adapter, P/N 834-1, horizontally in the vise with the external threads extending to the right.
2. Assemble Pump Shaft, P/N 20284-00, into Valve Body Adapter, P/N 19834-00. Tighten securely.
3. Lubricate O-Ring, P/N 13867-51 and Inner Cup Seal, P/N 346TB.
4. Holding the Pump Cylinder with the flange-end to the left, carefully assemble Cylinder over Cup Assembly and gently twist to the right as you slowly push the Cylinder into the Adapter, P/N 834-1.
5. Secure Cylinder to Adapter with Cylinder Retaining ring, P/N GAM-176. Tighten securely.
6. Thread Foot Valve Assembly into bottom of Cylinder, P/N 877. Tighten securely.
7. Re-assemble O-Ring, P/N 13867-56; Upper Housing Seal, P/N 21482-00; and Support Washer, P/N 20999-02, to Lube Cup, P/N 21481-00.

CAUTION

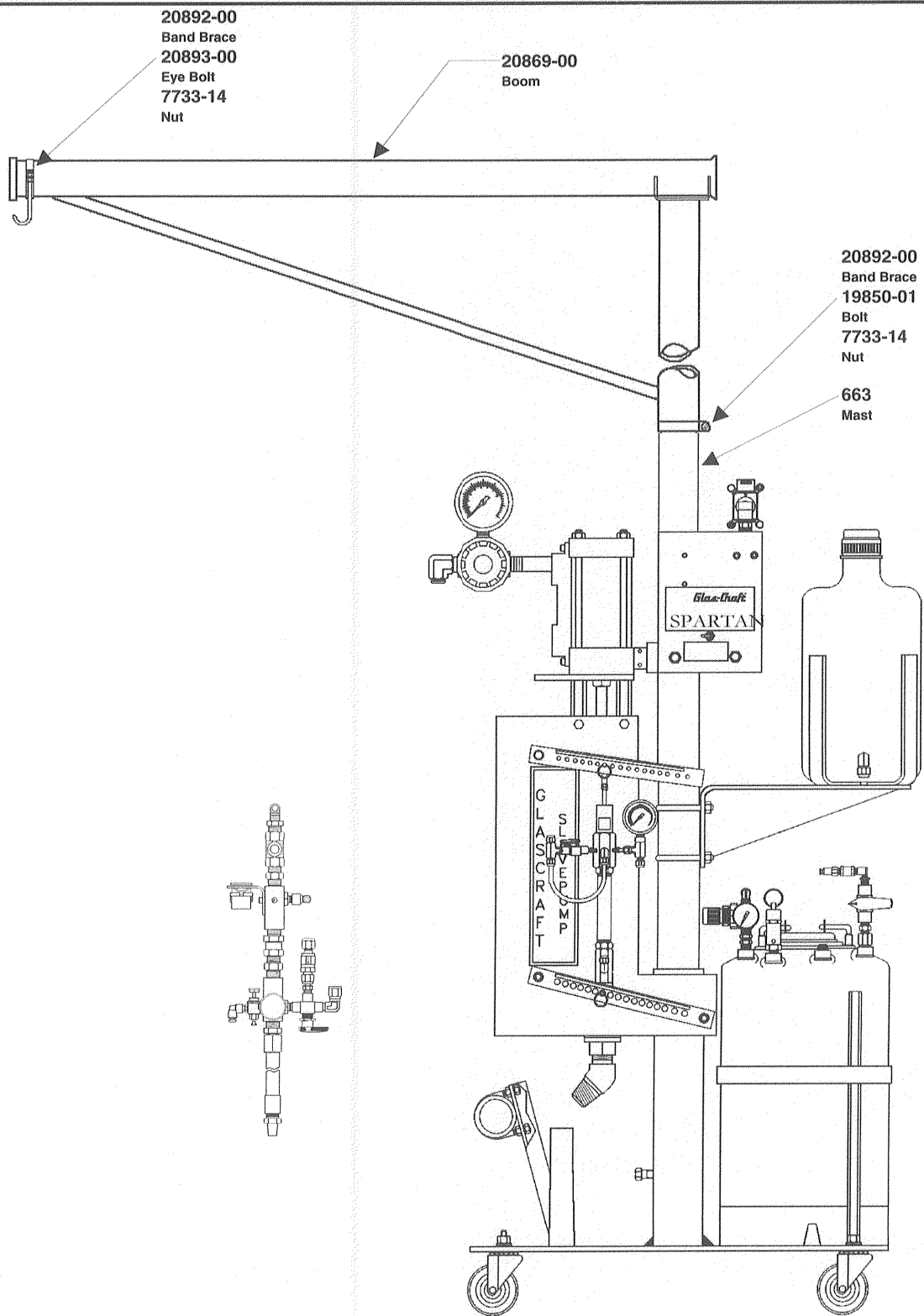
Exercise caution when installing Upper Housing Seal, P/N 21482-00, making sure that Seal is not nicked or scratched when installing over Pump Cylinder, P/N 20284-00.

8. Re-assemble Fluid Section and Air Motor by placing an open end wrench on the flats of Pump Shaft, P/N 20284-00 and another wrench on the flats of the Air Motor Shaft. Turning in opposite directions so as to tighten the shafts, returning the Fluid Section to the Air Motor.
9. Install Screws, P/N 8156-32C and Washers, P/N 381, finger-tight only. Check Shaft alignments before tightening Screws securely.
10. Screws should be tightened in a sequence opposite each other.

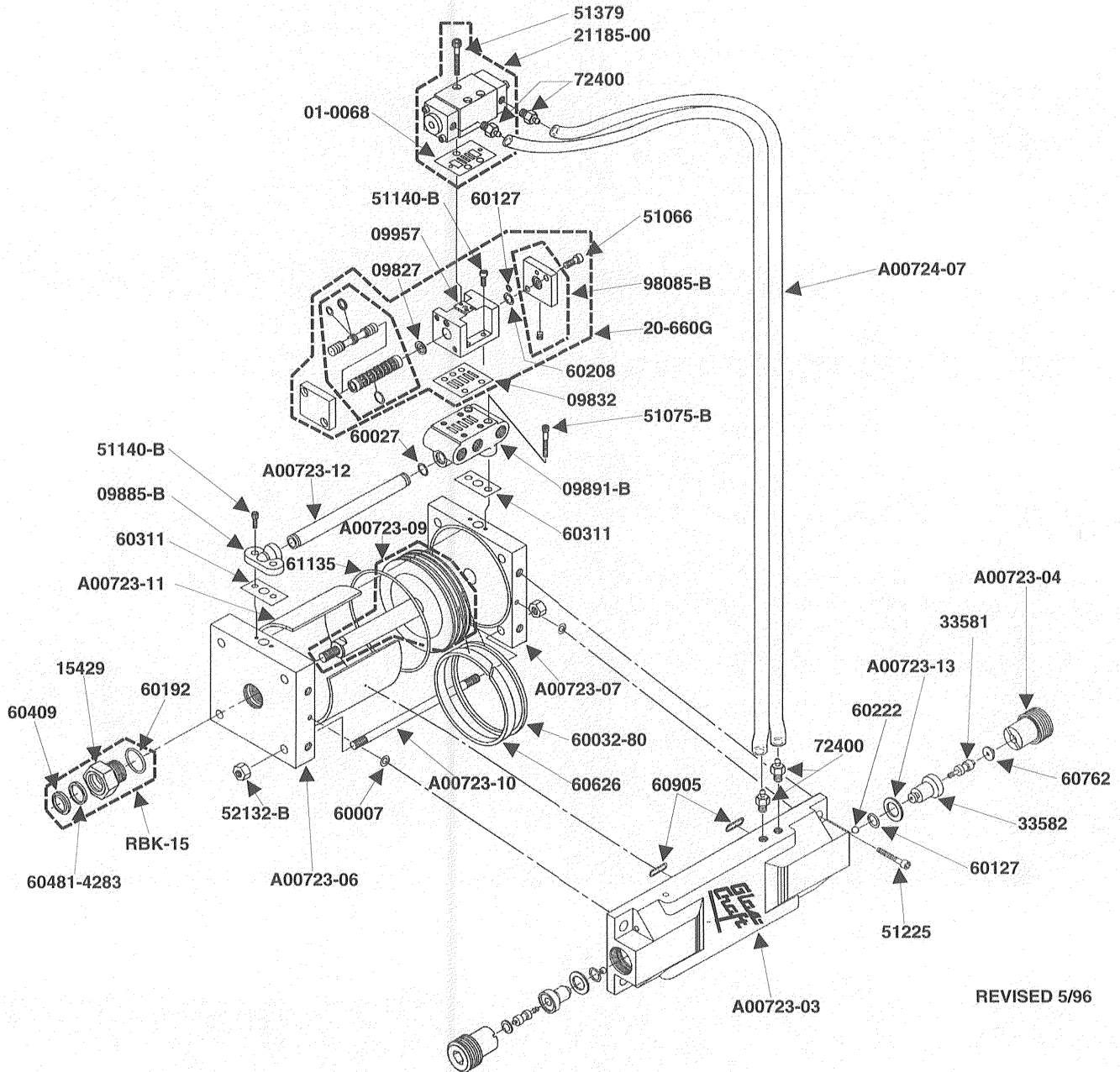
11. Lube Cup should be filled with clean, suitable lubricant. Pump is now ready to be returned to operation.

OPTION

HOSE BOOM



AM-325 AIR MOTOR ASSEMBLY



REVISED 5/96

REPAIR KITS

- | | |
|---|--|
| <p>20840-00
20104-00
20841-00
20842-00
20843-00</p> | <p>COMPLETE SERVICE KIT
STROKE SIGNAL VALVE KIT
CYLINDER REPAIR KIT
RECIPROCATING VALVE KIT
AIR VALVE KIT</p> |
|---|--|

LIMITED WARRANTY POLICY

GLAS-CRAFT, INC. ("Glas-Craft") warrants to the original Purchaser of Glas-Craft manufactured equipment and parts, that all Glas-Craft manufactured equipment and parts will conform to their published written specifications and be free of defects in workmanship and material for a period of one (1) year from the original date of installation. Glas-Craft makes no warranty to anyone other than the original Purchaser.

If any Glas-Craft manufactured part or equipment is found to be defective in workmanship or material within the one-year period from the date of installation, as determined solely by Glas-Craft, Glas-Craft, in its sole discretion, will either repair or replace the defective part or equipment at Glas-Craft's cost, including freight charges both ways, or credit or refund the purchase price for the defective equipment or part.

A warranty claim will be honored only when:

1. Glas-Craft has been informed, in writing, of any such defect in workmanship or material within ten (10) days after discovery by the original Purchaser;
2. An official of Glas-Craft has issued a return authorization number; and
3. The claimed defective equipment or part has been returned to Glas-Craft by the original Purchaser, freight prepaid (with proper return authorization number(s) attached), to: Glas-Craft, Inc., 5845 West 82nd Street, Suite 102, Indianapolis, IN 46278, U.S.A.

This warranty shall not apply to any equipment or parts that have been altered or repaired by anyone other than Glas-Craft or to defects or damage resulting from improper installation, misuse, negligence, accident, or use not specified by Glas-Craft. This warranty shall not apply to any equipment where any parts or components were replaced by any parts or components not manufactured or supplied by Glas-Craft. The decision by Glas-Craft shall be conclusive and binding on Purchaser.

Glas-Craft does not warrant that any equipment or parts sold to Purchaser meet or comply with any local, state, federal, or other jurisdiction's regulations or codes. Glas-Craft does not warrant that any equipment or part sold to Purchaser, when used individually or in concert with any other part, equipment, device, component or process, does not infringe on any patent rights of any third party. Glas-Craft only warrants that it has no specific knowledge of any such infringement.

Glas-Craft makes no warranty as to any parts or equipment manufactured by others. Purchaser shall look solely and only to the manufacturer of such parts or equipment with respect to any warranty claims. Glas-Craft hereby assigns to Purchaser the original manufacturer's warranties to all such equipment and parts, to the full extent permitted.

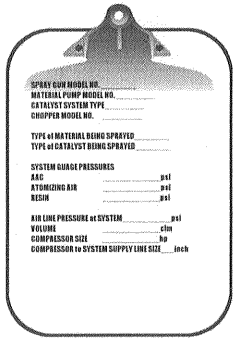
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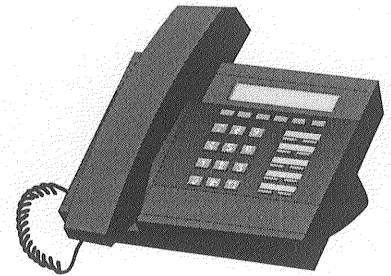
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IF YOU HAVE AN EQUIPMENT PROBLEM...



If you have a problem that requires Distributor or Glas-Craft Service Department help, gather the following information ***BEFORE*** you pick-up the telephone.



	Model No.	Serial No.
SYSTEM		
MATERIAL PUMP		
CATALYST DELIVERY SYSTEM		
TYPE of MATERIAL BEING SPRAYED		
TYPE of CATALYST BEING SPRAYED		
CATALYST PERCENTAGE		%
SYSTEM GUAGE PRESSURES		
MATERIAL PUMP		PSI
		PSI
		PSI
MAIN AIR LINE PRESSURE at SYSTEM		PSI
MAIN AIR LINE VOLUME		CFM
COMPRESSOR SIZE		HP
COMPRESSOR to SYSTEM SUPPLY LINE SIZE		INCHES

Have a general equipment or operation question? You can contact Glas-Craft Service Department via E-Mail at gciservice@glascraft.com

FOR YOUR REFERENCE

DATE PURCHASED _____

DISTRIBUTOR _____

CONTACT _____

PHONE _____

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