GS MANUFACTURING
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SUPERFLOW / EXTERNAL MIX X-GUN[R] CHOPPER SYSTEM

IT IS THE OPERATORS RESPONSIBILITY TO INSURE THAT THIS SYSTEM IS OPERATED SAFELY. LOCAL CODES AND OPERATING INSTRUCTIONS MUST BE FOLLOWED. EQUIPMENT OPERATORS SHOULD READ AND UNDERSTAND THE LOCAL CODES AND OPERATING INSTRUCTIONS BEFORE USING THIS SYSTEM. REVIEW THE SCHEMATICS/ PART DRAWINGS BEFORE YOU READ THIS MANUAL TO FAMILIARIZE YOURSELF WITH THE PART NUMBERS USED IN THESE INSTRUCTIONS.

TO REDUCE THE CHANCES OF INJURY, SHUT OFF THE AIR VALVE ON THE BACK OF THE SPRAY GUN WHEN YOU ARE NOT SPRAYING, EVEN IF YOU STOP JUST LONG ENOUGH TO CHANGE MOLDS.

DO NOT CONNECT THE AIR TO THE SYSTEM UNTIL YOU COMPLETE THE INITIAL OPERATING INSTRUCTIONS AND IT IS SAFE TO DO SO.

WEAR EYE PROTECTION AT ALL TIMES.

ALWAYS RELIEVE PRESSURE ON SYSTEM BEFORE REMOVING ANY HOSES, FILTERS, GUN ETC.

I INTRODUCTION

Each system built by GS MFG. is completely assembled and fluid pressure checked prior to shipping. The purpose of this quality control procedure is to insure that all components of the system function properly. During the preparation for shipping, we disassemble as little as possible to make it easier for you to get the new system into production.

II SYSTEM DESCRIPTION

The Superflow System is composed of five sub systems:

1. Air System
2. Resin Pumping System
3. Catalyst Pumping System
4. X-Gun[R]
5. Superflow Chopper Motor

1. AIR SYSTEM

The air system performs two basic operations. First , it controls the air-operated trigger assembly on the gun, which permits positive and simultaneous delivery of resin and catalyst, and provides air to the chopper motor via the two-stage trigger. The air trigger requires only minimal finger pressure which allows for long periods of continuous operation without operator fatigue. Secondly, the air system provides power to the pumping system.

2. RESIN PUMPING SYSTEM

The resin pump is the heart of the Superflow System. It draws material from a drum or bulk-fed resin supply. There is an inlet filter, and an outlet filter. The pump is controlled by an air regulator which is used to establish the flow rate of resin that is required.

3. CATALYST PUMPING SYSTEM

The unique slave assembly consists of the slave arm, pump, gauge, relief valve, siphon and return lines. This assembly is attached to the air motor of the resin pump and is driven by a shaft on the top of the motor. Removal of one connecting pin that attaches the shaft to the slave arm allows each material to be pumped separately. The location of the pump on the slave arm determines the flow rate of MEKP therefore altering the ratio of catalyst. There is an inlet filter screen attached to the siphon line which connects to the base of the MEKP pump.

4. X-GUN®

The ultimate external-mix non-atomized gun is CNC machined from billet aluminum with totally independent resin and catalyst passages, each of which is terminated with a fluid valve at the head of the gun. These valves are opened using a unique dual rack and pinion design actuated by the air cylinder which provides fluid shut-off when the gun is not in operation. The valves are simultaneously operated by the air trigger assembly in the first stage (partial triggering). When the trigger is fully engaged (2nd stage), air will flow from the gun to the chopper motor.

The X800A resin head assembly consists of the X800 fluid plate, X803 catalyst fluid cap, O-rings, and the GS F9-04D non-atomized diffuser nozzle. Under normal conditions the nozzle assembly is the only part of the gun you will have to remove and dis-assemble for cleaning at the end of the day. There is an air shut off valve on the back of the gun which will deactivate the trigger.

THIS SHUT OFF VALVE IS THERE FOR YOUR PROTECTION. WHEN THE GUN IS NOT BEING USED OR IF YOU ARE REMOVING THE NOZZLE, THE VALVE SHOULD BE IN THE OFF POSITION.

THE GUN IS BASICALLY AN AIR-PISTOL WITH MODULAR PLATES ATTACHED TO THE FRONT. NEVER SUBMERGE THE GUN AND CHOPPER MOTOR IN SOLVENT.

5. SUPERFLOW CHOPPER MOTOR

GS has developed a chopper motor/cutter which is both powerful and quiet. Air is fed to the motor from the gun/trigger assembly. There is a knurled knob (X275) on the rear of the trigger housing that controls the volume of air supplied to the chopper air motor (four rotations of knob will supply max. air). Fiberglass (single or double) strands enter the rear of the cover and are drawn into the roller, idler bearing and cutting head assembly and chopped and distributed out the front into the “outlaw” chute and into the resin flow streams.

III SYSTEM ASSEMBLY

1. Remove all items from the box.
2. Mount the mast/pump to the cart using the bolts in the cart.
3. Attach the cart handle (M7) and the mast support brace to the cart using the bolts in the cart.
4. Connect the brace to the mast using bolt in the mast.
5. Lay all of the boom pieces flat on the floor.
6. Attach the spring/elbow (RB5) to the main boom (RB1) using the bolt, nut and washer in the boom.
7. Slide the front boom into the spring. (The farther in the more tension on the spring).
8. Remove and reverse the eyelet extension (RB14) on the end of the boom and attach the 2 small eyelet's.
9. Insert the pin (RB3) into the square tubing end of the main boom. Slide the hoses and pin thru the RB4-04 roving rack up to the bottom of the square tubing. Fold the front boom over and set the boom assembly on top of the mast with the pin inserting into the mast.
10. Attach the MEKP bottle rack to the mast.
11. Attach the material filter (P31) to the pump.
12. Attach the siphon hose assembly to the bottom inlet swivel on the resin pump.
13. Attach the air manifold assembly (M15-SF).
14. Screw the remaining eyelet's into the boom.
15. Mount the MEKP slave pump/arm assembly to the air motor of the resin pump.
    - **MAKE SURE THE BRACKET-ARM SHAFT IS IN LINE**-
16. Connect all hoses as marked, including the MEKP siphon hose assembly.

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PLEASE READ THE OPERATING INSTRUCTIONS
BEFORE STARTING UP THE SYSTEM

IV INITIAL OPERATING INSTRUCTIONS:

These instructions will give you step by step directions on how to bring the system up to the operating state. Please carefully follow each instruction.

1. Fill the oil cup reservoir on the resin pump 1/2 full with the Dibutyl Phthalate Lubricant.
2. Put a fresh jug of MEKP in the bottle rack and install the siphon/return lines into the jug. Screw the cap on completely.
3. Put the resin siphon hose/tube into the drum of resin or connect the transfer hose to the bulk-fed system.
4. Make sure the air regulator on the resin pump is turned off (counter-clockwise) before attaching the main air hose to the air manifold/watertrap.

AIR REQUIREMENTS: 100-120 PSI 17-25 CFM

5. Use a large (1/2 I.D. minimum) air hose as short as possible. Hard plumb the hose from your air source to the manifold water trap. **DO NOT USE QUICK-DISCONNECTS.** They will restrict the air flow volume supplied to the system. A shut-off valve (same I.D. or larger than the hose) can be used. Connect the air hose at this time.

PRIMING THE UNIT

1. Remove the F9-04D Diffuser nozzle.
2. Disconnect the stainless steel braided MEKP hose from the gun to allow for easy priming.
3. Screw the X275 chopper control knob located at the back of the trigger assembly on the gun all the way in.
4. Pull the trigger on the gun and put the lock in place so the gun is open.
5. Remove the pin that connects the slave arm to the top of the air motor.
6. Put a container with water under the gun for the initial flow of MEKP out of the gun.
7. Using short strokes, pump the slave arm by hand until there is a solid flow of MEKP out of the hose.
8. Connect the MEKP hose back on to the gun.

9. Slowly increase the resin pump air pressure regulator until the pump starts to stroke. Continue until there is a solid flow of resin out of the nozzle.
10. Unlock the trigger to stop the resin flow.
11. Pump the slave arm until there is 20-30 PSI on the catalyst gauge. The fluid pressure will stabilize at aprroximately 20 PSI when system is in operation.

NOTE: The automatic relief valve on the pump is set at approximately 50 PSI. The return line valve on the pump must be closed.

12. Reconnect the slave arm to the top of the air motor.

PREPARATION FOR SHOOTING/CHOPPING

1. **VERY IMPORTANT- NEVER OPERATE SYSTEM WITHOUT HAVING 20 PSI OF CATALYST ATOMIZING AIR FLOWING THRU THE GUN.**
2. Turn the knob on the catalyst atomizing air regulator clockwise until the guage reads 20 PSI. Air should be flowing out of the bottom hole of the X800 fluid plate. This air breaks up the catalyst into a fine mist and should remain on at all times.
3. Apply a thin layer of petroleum based lubricant to the F8-99 O-ring on the back of the F9-04D nozzle, the LW203-06 O-ring, and the threads on the X800 fluid plate. Using the X304 retaining ring attach the F9-04D nozzle and X803 catalyst fluid cap to the X800 fluid plate.
4. Trigger the gun and increase the resin pump pressure until the desired flow rate is delivered.
5. Place the RB100 roving lid on to the box or boxes of roving. String the roving up into all of the boom eyelet's and into the back of the chopper motor cover.
6. Open the X275 chopper control knob (approx. 2 full turns).
7. Pull the trigger on the gun all the way to shoot material and fiberglass. Use the X275 knob to control the speed of the motor until the desired rate of chop is delivered.

NOTE: When pulling the trigger, you can actually slow or speed up the motor slightly. Always pull the trigger completely back when using chopper motor.

"DIALING IT IN"

RESIN/MEKP RATIO

1. The resin pump air regulator controls the flow of resin.
2. Changing the location of the MEKP pump on the slave arm will alter the MEKP percentage. (Closer to the air motor will increase the MEKP flow).

RESIN/GLASS RATIO

1. Adjusting the speed of the motor and the resin pressure will give you the desired glass to resin percentage.

RESIN/GLASS PATTERN

The "outlaw" chute (RC48-04) on the chopper motor cover has been adjusted during our quality control testing, but here's a few tips to get optimum quality in your glass/resin pattern.

1. The short top "Gurney Flap" at the outlet directs the flow of glass in a downward direction to the bottom of the chute. The top flap can be bent up or down so that the glass will hit approximately 1/4 of an inch from the end of the bottom chute. If the glass hits the chute too soon the glass will clog in the cover. If the glass goes too far it will "fly" and bounce off of the resin pattern.

2. The chopper motor assembly is mounted to the gun using a pivot washer assembly. You can loosen the RC35 nut using the RC100-W wrench to move the chopper motor up and down, side to side until the glass is evenly dispersed across the resin pattern. Tighten the RC35 nut when you are satisfied with the pattern. Usually having the chute as close to the front of the gun without disturbing the flow of resin will give you the best results.

ADJUSTING THE "OUTLAW CHUTE" IS THE KEY TO EVEN GLASS DISPERSION IN YOUR RESIN PATTERN. FIBERGLASS WILL DIFFER IN THE WAY IT CUTS AND SEPARATES AND FLOWS ONTO THE RESIN STREAMS. TAKE TIME TO 'DIAL IT IN' FOR OPTIMUM RESULTS.

DAILY SHUT-DOWN

1. Turn the air valve (X215) on the gun off. It is necessary to leave the catalyst atomizing air on to prevent material from entering the catalyst port.
2. Remove the X304 retaining ring, X803 catalyst fluid cap, F9-04D diffuser nozzle and place in a suitable solvent.
3. Using a brush or rag clean the face of the X800 fluid plate with a suitable solvent. (**NEVER SUBMERGE GUN IN SOLVENTS)**
4. Insert the F1-PL night plug into the center port (material port) on X800 fluid plate. Note- port is drilled on angle. Leave gun pointing down.
5. Remove air supply.
6. Inspect the F9-04D diffuser nozzle and soak in solvent overnight.
7. Clean and blow off with air gun the X803 catalyst fluid cap and the X304 retaining ring. Place the X304 retaining ring back on the gun to protect threads from being damaged. If you soak the X803 fluid cap assembly in solvent overnight remove the LW203-06 O-ring.
8. Disconnect the air supply to the system.

DO NOT BLEED OFF THE MATERIAL PRESSURE IN THE GUN. LEAVE FLUID PRESSURE IN THE HOSES AND GUN. REMOVING THE AIR SUPPLY WILL NOT RELIEVE THE FLUID PRESSURE

MONTHLY MAINTENANCE

1. Clean all filters.

2. Check level of oil cup reservoir located on the fluid section of the material pump and add dibutyl phthalate if needed.

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CHARGING THE RESIN PUMP ACCUMULATOR

As resin viscosity's and ambient temperatures vary during the year, pulsation of the MEKP/resin flow is sometimes visible. Charging the accumulator will minimize this pulsation for a smoother overall material flow from the gun.

1. Turn the resin pump air regulator down to zero.

2. Disconnect the slave arm from the resin pump by removing the connecting pin at the top of the air motor.

3. Open the by-pass valve under the accumulator and drain the resin into a bucket.

4. Disconnect the air supply from the solvent pump and connect to the top of the accumulator. Turn on the B23 valve at the top of the accumulator. This will force resin out of the accumulator into the bucket. Resin and air will exit through the by-pass valve until the ball check (inside the accumulator) will eventually stop the flow of air as it seats to the bottom of the accumulator.

5. Turn off the by-pass valve.

6. Turn off the B23 air valve and connect the air supply back to the solvent pump.

7. Re-connect the slave arm to the top of the resin pump.

8. Pull the trigger on the gun and turn the resin pump air regulator pressure to approximately 30 PSI or to normal operating pressure.