



GLOBAL ELECTRONIC MIX SOLUTIONS PLURAL COMPONENT MIXING SYSTEM



In this part sheet, the words **WARNING**, **CAUTION** and **NOTE** are used to emphasize important safety information as follows:

WARNING

Hazards or unsafe practices which could result in severe personal injury, death or substantial property damage.

CAUTION

Hazards or unsafe practices which could result in minor personal injury, product or property damage.

NOTE

Important installation, operation or maintenance information.

WARNING

Read the following warnings before using this equipment.



READ THE MANUAL

Before operating finishing equipment, read and understand all safety, operation and maintenance information provided in the operation manual.



OPERATOR TRAINING

All personnel must be trained before operating finishing equipment.



EQUIPMENT MISUSE HAZARD

Equipment misuse can cause the equipment to rupture, malfunction, or start unexpectedly and result in serious injury.



LOCK OUT / TAG-OUT

Failure to de-energize, disconnect, lock out and tag-out all power sources before performing equipment maintenance could cause serious injury or death.



AUTOMATIC EQUIPMENT

Automatic equipment may start suddenly without warning.



PRESSURE RELIEF PROCEDURE

Always follow the pressure relief procedure in the equipment instruction manual.



KEEP EQUIPMENT GUARDS IN PLACE

Do not operate the equipment if the safety devices have been removed.



KNOW WHERE AND HOW TO SHUT OFF THE EQUIPMENT IN CASE OF AN EMERGENCY



WEAR SAFETY GLASSES

Failure to wear safety glasses with side shields could result in serious eye injury or blindness.



INSPECT THE EQUIPMENT DAILY

Inspect the equipment for worn or broken parts on a daily basis. Do not operate the equipment if you are uncertain about its condition.



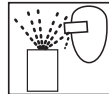
NEVER MODIFY THE EQUIPMENT

Do not modify the equipment unless the manufacturer provides written approval.



NOISE HAZARD

You may be injured by loud noise. Hearing protection may be required when using this equipment.



PROJECTILE HAZARD

You may be injured by venting liquids or gases that are released under pressure, or flying debris.



STATIC CHARGE

Fluid may develop a static charge that must be dissipated through proper grounding of the equipment, objects to be sprayed and all other electrically conductive objects in the dispensing area. Improper grounding or sparks can cause a hazardous condition and result in fire, explosion or electric shock and other serious injury.



ELECTRIC SHOCK / GROUNDING

Improper grounding or sparks can cause a hazardous condition and result in fire, explosion or electric shock and other serious injury.



PINCH POINT HAZARD

Moving parts can crush and cut. Pinch points are basically any areas where there are moving parts.



HIGH PRESSURE CONSIDERATION

High pressure can cause serious injury. Relieve all pressure before servicing. Spray from the spray gun, hose leaks, or ruptured components can inject fluid into your body and cause extremely serious injury.



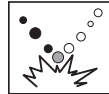
WEAR RESPIRATOR

Toxic fumes can cause serious injury or death if inhaled. Wear a respirator as recommended by the fluid and solvent manufacturer's Material Safety Data Sheet.



TOXIC FLUID & FUMES

Hazardous fluid or toxic fumes can cause serious injury or death if splashed in the eyes or on the skin, inhaled, injected or swallowed. LEARN and KNOW the specific hazards or the fluids you are using.



PLURAL COMPONENT MATERIALS HAZARD

Because of the vast number of chemicals that could be used and their varying chemical reactions, the buyer and user of this equipment must determine all facts relating to the materials used, including any of the potential hazards involved.



EXPLOSION HAZARD

Halogenated hydrocarbon solvents can cause an explosion when in contact with aluminum components of a pressurized or closed fluid system.



FIRE AND EXPLOSION HAZARD

Improper equipment grounding, poor ventilation, open flame or sparks can cause a hazardous condition and result in fire or explosion and serious injury.



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PROP 65 WARNING

WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

IT IS THE RESPONSIBILITY OF THE EMPLOYER TO PROVIDE THIS INFORMATION TO THE OPERATOR OF THE EQUIPMENT. FOR FURTHER SAFETY INFORMATION REGARDING THIS EQUIPMENT, SEE THE GENERAL EQUIPMENT SAFETY BOOKLET (77-5300).

Binks reserves the right to modify equipment specification without prior notice.

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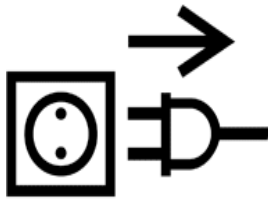
1: Safety and Best Practices

Read and understand the notes and warnings in this section to prevent personal injury or damage to equipment. Always wear appropriate Personal Protective Equipment (PPE) when operating or maintaining the system.

⚠ WARNING

To maintain non-hazardous classification of this equipment, the dispense pump and fluid panel components and assemblies **must** be monitored for leaks and serviced regularly to prevent leaks from occurring. If a leak is discovered the system **must** be immediately shut down, de-energized, and repaired to correct the problem.

⚠ WARNING



Before attempting any maintenance or repair it is necessary to ensure the system is depressurized and disconnected from power. Follow all lockout / tag out procedures applicable to this machine. The GEMS system uses electrical and pressurized fluid (air and liquid) power and material sources. Make sure all energy sources are disconnected and the machine has been de-energized before attempting work of any kind.

1.1: System Depressurization Procedure

With air and pressurized working fluids, the GEMS system is constantly under various states of fluid pressure. To perform maintenance and repair or shut down for extended periods the system should be completely depressurized. Follow the instructions below to depressurize and prevent the sudden unexpected release of fluid or air from the system.

1. Close all material supply valves for paint resin (component A) and hardener (B). Relieve material pressure from all A+B sources. Do not shut off solvent or flushing air at this time.
2. Shut off atomizing air to the gun(s).
3. Press the Prime button on the Home screen. While triggering the gun(s) into a grounded metal waste container use the Prime function to open all CCVs for the A components available.
4. Press the color change button on the HMI. Enter **Color 0** (Solvent) and press **GO**.
5. Wait for the system to complete the flush sequence and load the solvent. This will remove mixed material from the fluid lines and the mix manifold. If there is any indication of mixed material in the fluid lines, load color 0 again, or switch the system to Continuous Flush mode as long as required to clear any debris from the fluid lines. Always end with a color 0 load to remove air pockets from the fluid lines.
6. Close flushing air and solvent supply valves. Relieve pressure.
7. While triggering gun(s) return to Prime mode and open valve 0.
8. Shut off the system using the AC lockout switch.
9. Disconnect atomizing and system air pressure.
10. Trigger gun to relieve any pressure remaining in the material line.
11. If disassembling any part of the machine, be sure to verify it is disconnected and locked out from all power sources.

1.2: Cleaning and Maintenance

There are no enclosure components which should require cleaning if the enclosure door is kept shut. If material seepage occurs, be sure to correct the problem and maintain a clean work area. To avoid hardening of the paint inside the fluid lines, the system must be cleaned by a complete flushing procedure at the end of operations. See the **Operations Manual 77-2982** for more information regarding flushing.

WARNING

Never expose electrical equipment to flammable liquids or gases including solvent fumes.

Cleaning of Hoses

If gun 1 and gun 2 flush sequences are correct the mixed material line(s) will remain clean and ready for the next use. Always finish spraying operations with a color 0 load that removes all air from the fluid lines. If pot life is greatly exceeded, it is recommended the static mixer and mixed material hose be replaced and the mix manifold disassembled and cleaned.

Maintenance of CCV Valves

If a color change valve has not been used for a prolonged period, it is recommended to remove the valve and clean the fluid passages. Paint material may collect inside the valve or manifold passages. If the valves do not operate properly or if fluid leaks occur the valve must be repaired. Check the valves for proper operation regularly.

Maintenance of Flow Meters

If the flow rate graph or B pump movement appears erratic the, flow meter should be inspected for proper operation. Paint solids may collect in and around the gears, bearings, and shafts, interfering with the motion of the gears and resulting in incorrect flow measurement. The use of abrasive or pigmented fluids will lead to wear which influences the accuracy of the flow meter. Routinely calibrate the flow meter for all paints used with the system. See the **Operations Manual 77-2982** for more information

Cleaning The Enclosure Exterior and HMI

The control enclosure's exterior painted surfaces must only be cleaned with a soft damp cloth and household cleaners. Cleaning of the touch-screen-display with solvents is not allowed. If contamination of the display is expected, use disposable screen protectors 240-3187 (refill kit 240-3199).

WARNING

Read and understand all operating manuals for connected equipment. Failure to properly follow the operating instructions could result in severe injury.

2: Preventive Maintenance

The GEMS system requires periodic inspection and regular maintenance. Follow the corresponding table as a guide to perform routine maintenance at suggested intervals. These intervals are recommendations and largely depend on the material being sprayed.

Daily / Each Shift:

- Ensure mixed material is properly flushed at the end of the shift. Verify there are no air pockets in the fluid lines.
- Identify and correct air and fluid leaks on the system including fluid hoses, flow meter, dispense pump, and mix manifold.
- Ensure spray guns are functioning properly and air is not leaking from the air valve.
- Check Alarm History and review errors with operator. Verify issues have been corrected.
- Ensure material supplies are filled and pressures are correct.

Monthly

- Inspect static mixer assembly at mix manifold outlet. If static mix elements become clogged, replace the static mixer as needed. Balancing alarms or increasing outlet pressure may indicate clogging.
- Examine B pump oil reservoir tubes for presence of hardener and proper lubricant level.
- Check all air and fluid lines for kinks, cuts, or wear.
- Perform A+B Calibration to ensure flow meter and dispense pump are working properly.
- Ensure all CCVs are opening and closing properly. Remove valves and clean if needed.
- Clean and reassemble the mix manifold and check valves.
- Check fluid hoses for buildup of material. Replace if needed. With plural component coatings, buildup of material is common around the hose fittings. This is a potential source for contamination on the finished product.

As Needed

- Rebuild mix manifold – replace O-Rings and parts within the injector assembly.
- Clean and reassemble the flow meter.
- Rebuild B pump – required if “B” material begins to leak from the oil reservoirs, or if the A Only Calibration is correct, but the A+B Calibration is inaccurate.
- Rebuild Color Change Valves – monitor valves for air leaks or slow response time when triggering
- Inspect flow meter for excessive wear or buildup of material. Verify smooth dispense pump movement.
- Set limits of B Pump/ perform calibration.

NOTE

Reactive fluid properties vary greatly. If a material clogs any component more frequently than expected, adjust the maintenance schedule accordingly.

2.1: GEMS Maintenance Schedule

GEMS Daily Inspection

Description	Inspection Method	Completed By	Date
System flushed with solvent	Visual		
Check for leaks	Visual		
Clean spray guns	Visual		
Check alarm history	Visual		
Check for material supply	Visual		

GEMS Monthly Inspection

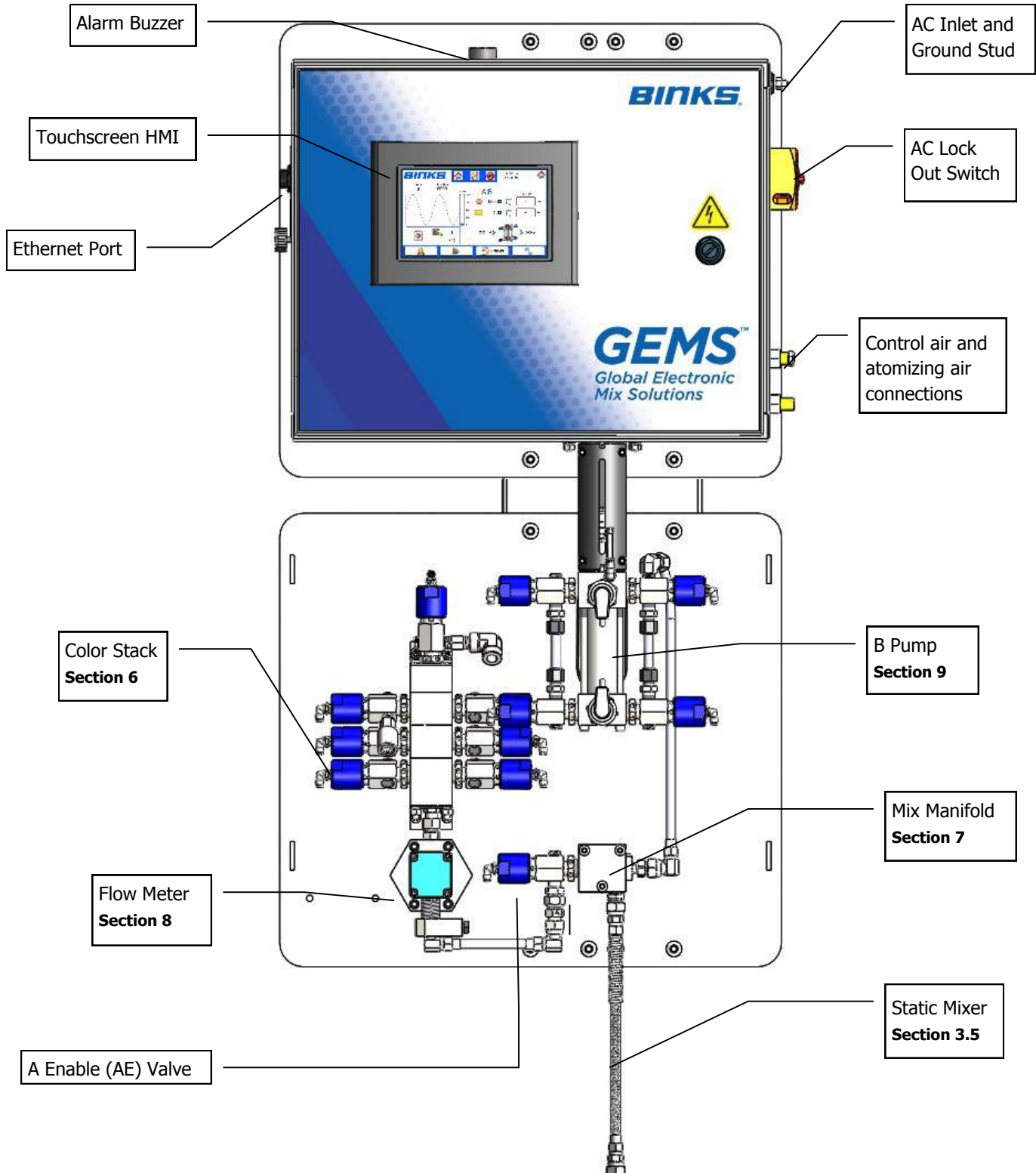
Description	Inspection Method	Completed By	Date
Check static mixer for clogs	Visual		
Examine oil reservoir	Visual		
Check all hoses for kinks and wear	Visual		
Perform flow meter calibration check	Test with Beaker		
Check CCV operation. Remove valves and clean.	Disassemble		
Clean mix manifold and check valves	Disassemble		
Check fluid hoses for material buildup	Disassemble		

GEMS As Needed Inspection

Description	Inspection Method	Completed By	Date
Clean and rebuild B pump	Disassemble		
Clean flow meter	Disassemble		
Clean and rebuild injector assembly	Disassemble		
Rebuild color change valves	Disassemble		
Set B pump limits	Visual		

3: Component Names and Locations

This maintenance and repair manual provides part number, troubleshooting, and disassembly/reassembly information for GEMS. It is important to understand the names and locations of various components for use during operation and maintenance. Major components are shown below.



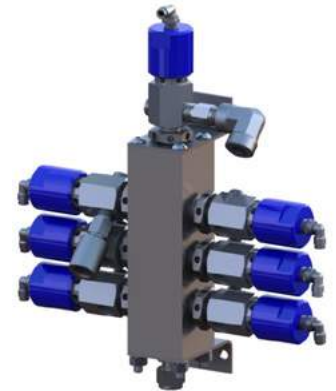
3.1: Component Descriptions

Color Change Valve, also known as “CCV” — Pneumatic valve used to open and close fluid passages on the B pump, mix manifold, and color stack. See section 5.3



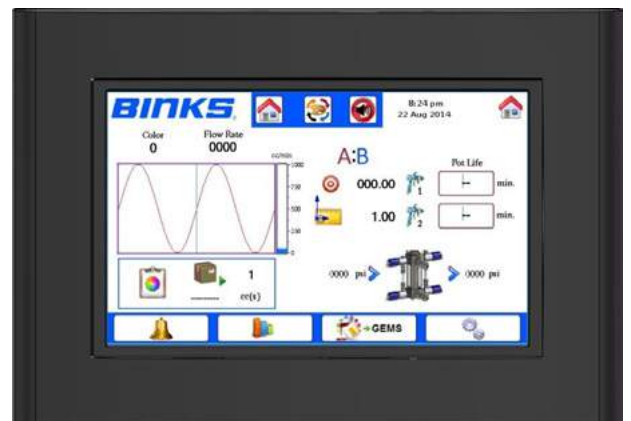
Mix Manifold — Continuously mixes paint resin (A) and hardener (B). A built-in check valve on the hardener side prevents back-up of resin into the hardener pump. Component A is controlled by a single CCV (“A” Enable/ AE).

Color Stack — Manifold blocks and CCVs for paint resin/ Component A material. Multiple colors must use the same hardener. Used as the location of solvent and flushing air for cleaning of the fluid lines.

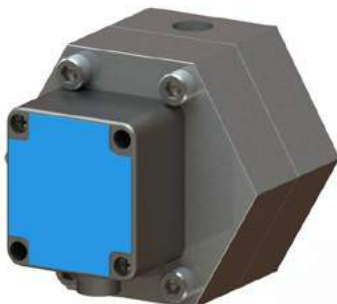


B Pump — The device used to dispense hardener or catalyst (component B) to the mix manifold. The system controls the pump’s stepper motor to precisely dispense at the required ratio.

HMI — “Human-Machine Interface”. This is used to operate and monitor the system. It has a 7” resistive touch screen and sends instruction to and receives data from the system main board.

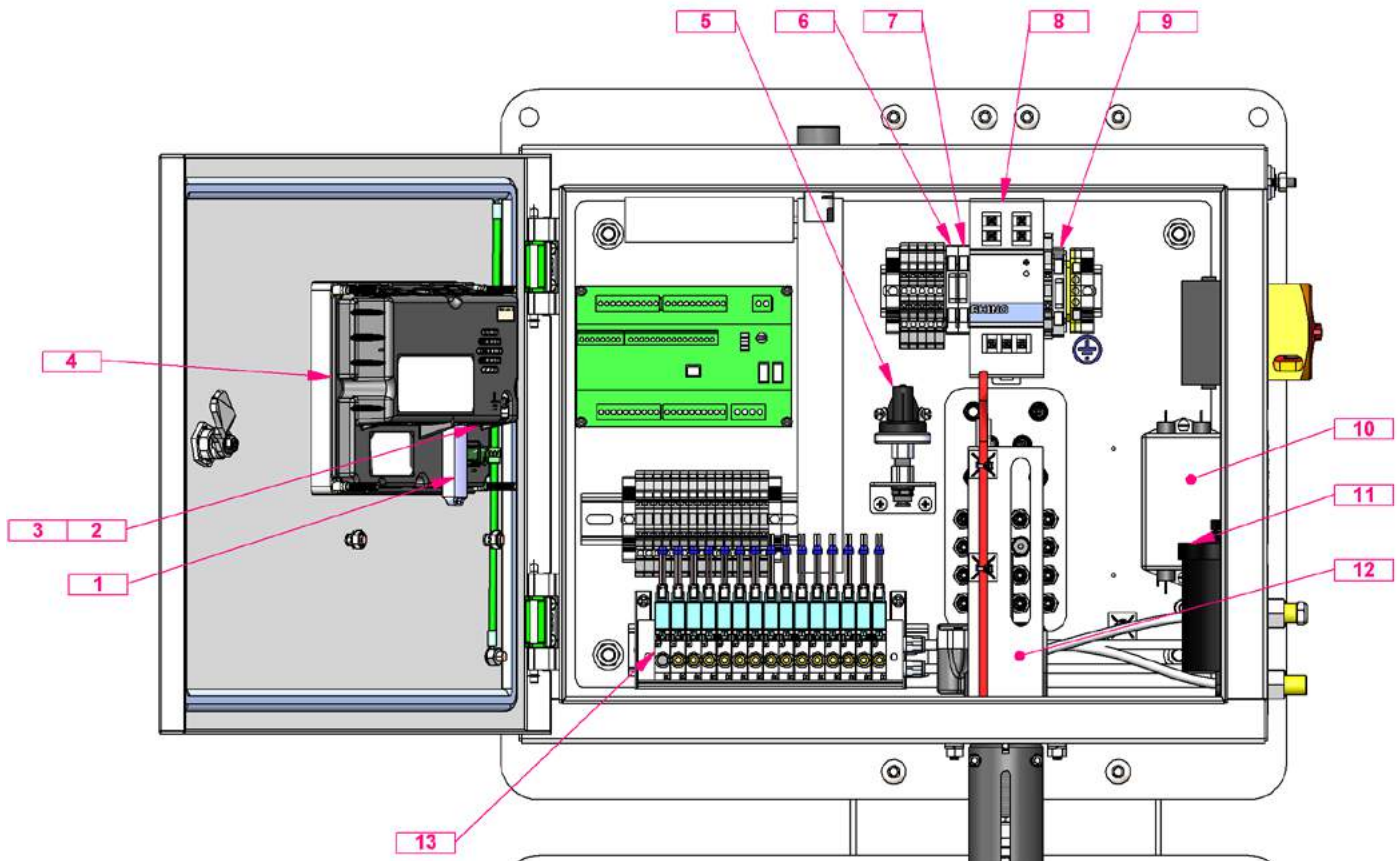


Touch Screen Protectors:
240-3187 Install Kit
240-3199 Refill Kit



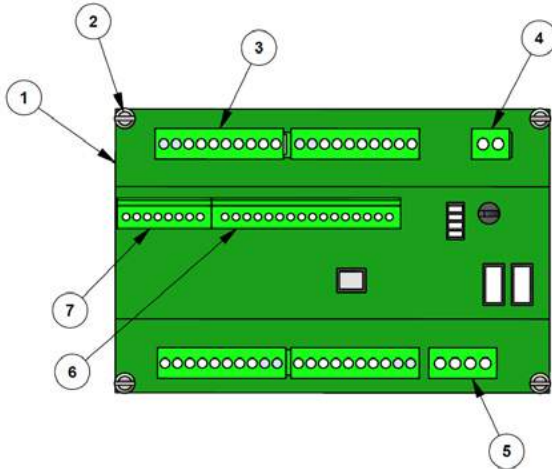
Flow Meter — Measures and communicates the flow rate of Component A material (typically paint resin) to the system control.

3.2: Control Enclosure



ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	A12464-00	USB FLASH DRIVE, 2GB	1
2	240-3175	ETHERNET CABLE, ANGLED	1
3	240-3173	HMI CABLE	1
4	240-3172	HMI	1
5	25766-106	PRESSURE SWITCH	0, 1, OR 2
6	72771-01	FUSE, 1/2A SLOW BLOW	1
7	72771-09	FUSE, 2A SLOW BLOW	1
8	240-3071	DC POWER SUPPLY	1
9	72771-07	FUSE, 1.5A SLOW BLOW	1
10	77071-04	AC LINE FILTER	1
11	13742-01	AIR FLOW SWITCH	1 OR 2
12	----	PUMP DRIVE – SEE SECTION 9.1	
13	240-3085-10	10 SOLENOID STACK	10
	240-3085-15	15 SOLENOID STACK	15

3.3: Control Board Detail



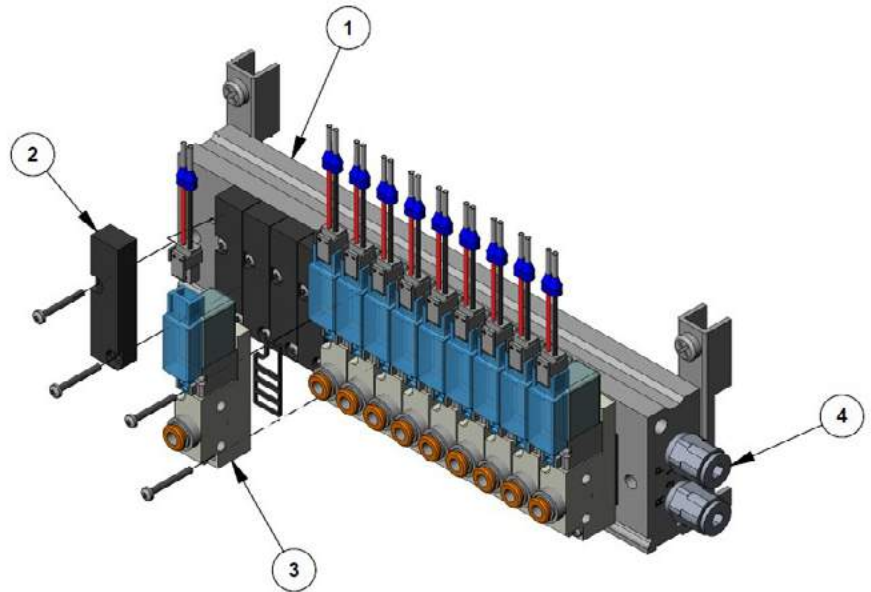
NO.	PART NO.	DESCRIPTION	QTY.
1	E21-0012	CONTROL BOARD	1
2	21643-411	SCREW #6-32 x 3/8"	4
3	240-3074	TERMINAL BLOCK, 10 POSITION	4
4	240-3073	TERMINAL BLOCK, 2 POSITION	1
5	240-3077	TERMINAL BLOCK, 4 POSITION	1
6	240-3075	TERMINAL BLOCK, 16 POSITION	1
7	240-3076	TERMINAL BLOCK, 8 POSITION	1

3.4: Solenoid Manifold Detail

- 240-3085-10 10 Solenoids
- 240-3085-15 15 Solenoids

The Solenoid valves convert electrical signals from the control board into pneumatic signals for CCV operation.

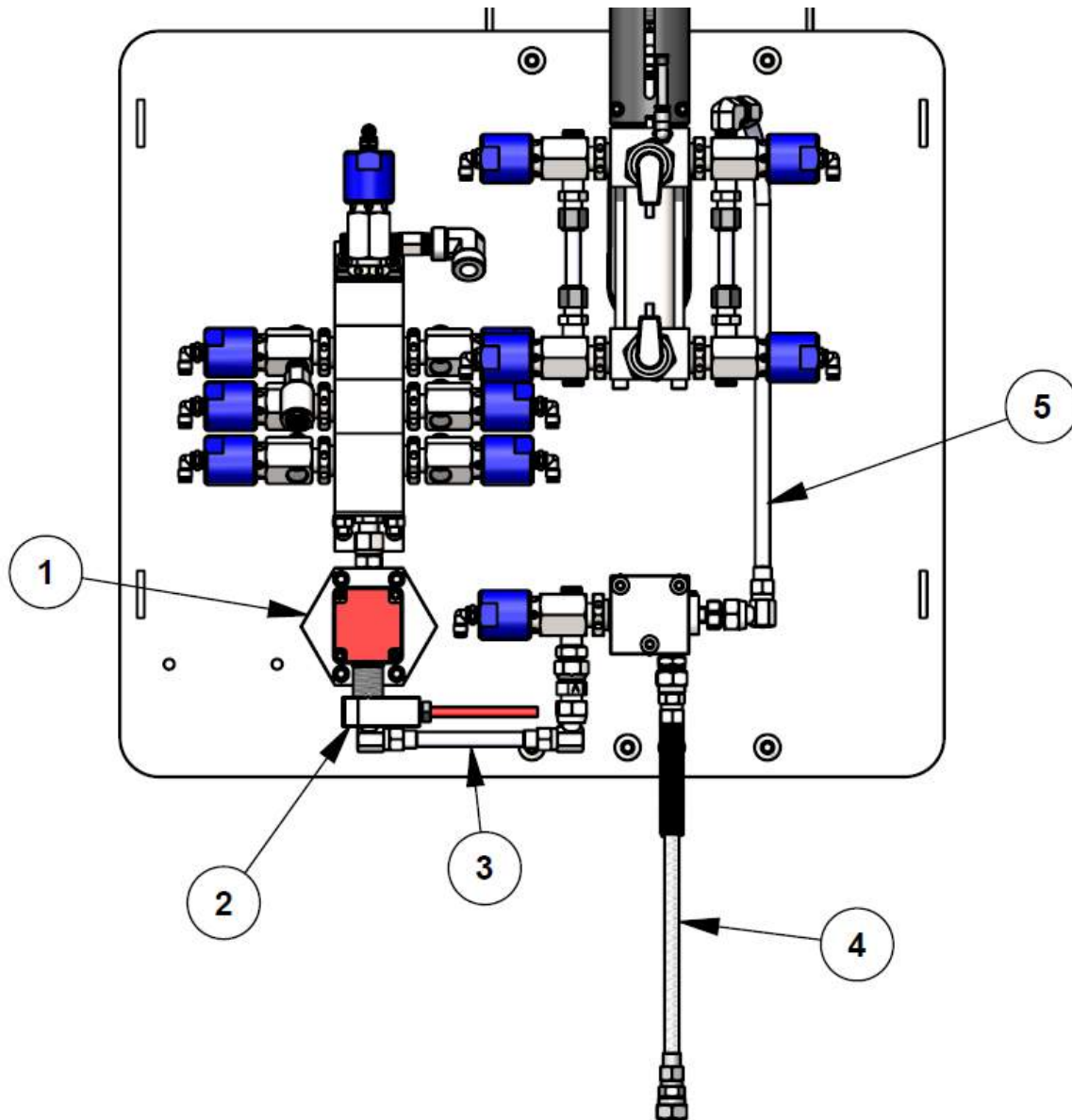
Proper gasket (part of item 3) installation is crucial to preventing faults. A fully optioned GEMS has 15 solenoids and basic system has 10. Replacement gaskets and screws may be ordered as part of a repair kit.



PART NO.	DESCRIPTION	CONTAINS
240-3092	SOLENOID REPAIR KIT	10 Screws 5 Gaskets

NO.	PART NO.	DESCRIPTION	QTY.
1	240-3087	SOLENOID MANIFOLD BODY	1
2	240-3089	SOLENOID BLANK PLATE	Up to 5
3	240-3091	SOLENOID VALVE ASSEMBLY	10 or 15
4	54-4945	1/8" NPT X 1/4" ODT FITTING	2

3.5: Fluid Panel Components



ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	A13159-01	FLOW METER	1
2	240-3114-A-6	FLOW METER CABLE (STANDARD 6 FT)	1
3	240-3121	RESIN TUBE ASSEMBLY	1
4	240-3122-300 240-3122-600	STATIC MIX ASSEMBLY (300cc) STATIC MIX ASSEMBLY (600cc)	1
5	240-3120	HARDENER TUBE ASSEMBLY	1

The static mixer is one of the most important devices on the unit when mixing at high ratios. This tube consists of small mix elements in a helical shape that create turbulence and a mixing effect. Two sizes of static mixers are available for use with GEMS, and they correspond directly to the size of pump being used.

4: Reassembly Callouts

Refer to the icons below to avoid damage and aid assembly of mating parts. Different lubricants are called out depending on the function of the part and lubricant. These triangles are placed next to the corresponding part number label on assembly views.



Gun Lubricant: Use DeVilbiss SSL-10 gun lube to lubricate O-rings and sliding parts for assembly. SSL-10 is silicone and petroleum-free and is easily washed away by typical paint solvents.



Petroleum Grease: Use Petroleum Grease to lubricate threads or other part surfaces to prevent galling or other damage upon reassembly.



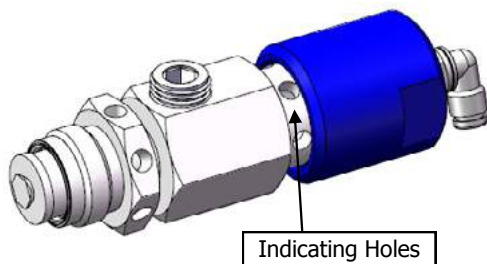
Thread Sealant: P.T.F.E tape or liquid pipe thread sealant is required on pipe threads to lubricate and prevent leaks. If using tape, wrap 2-3 times clockwise around the male threads. If using liquid, add a bead of sealant around entire 2nd male thread before tightening into female thread. Do not loosen sealed parts.

NOTE

Follow all assembly procedures and lubricant recommendations to ensure proper operation.

5: Color Change Valve (CCV)

Valve Indication



The color change valve (CCV) is used throughout the GEMS system. State of the valve may be quickly identified by a group of indicating holes. If the red indicating cup is visible through the holes the valve is open and fluid flow is permitted. Alternatively, if the red cup is not visible the valve should be closed. Paint material should not be present at the indicating holes. Immediately repair the valve if paint materials are present.

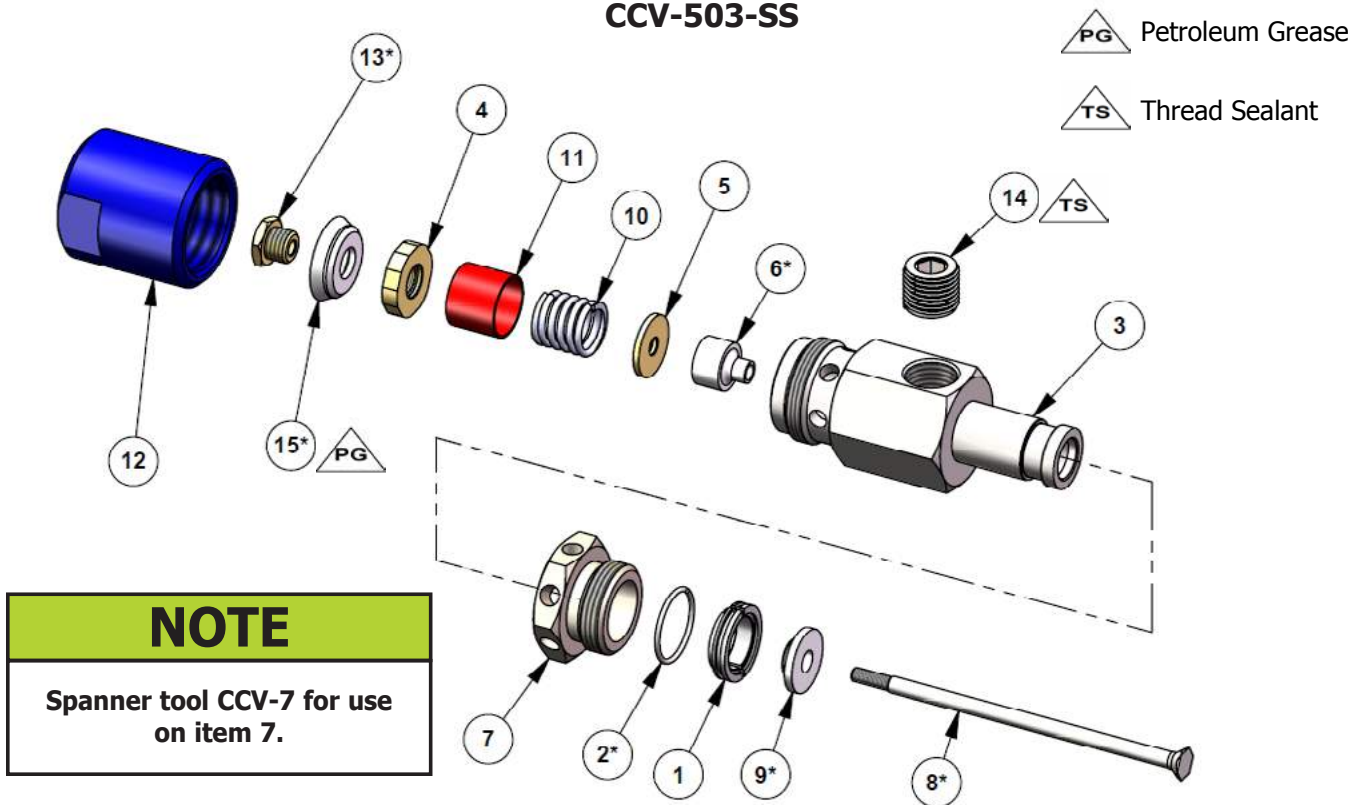
The CCV is normally closed and a 75~100 psi [5~7 bar] pneumatic signal from the controller opens the valve.

5.1: CCV Troubleshooting

1. Open Enclosure door and look for LED indicator light on solenoid responsible for valve operation. If the red light is not on when it should be on, the solenoid may be damaged or unplugged.
2. Verify pneumatic trigger signals communicate through the 5/32" tubes with no air leaks or kinked tubing.
3. Depressurize the GEMS system using 1.2 System Depressurization and remove the CCV in question.
4. Visually inspect the valve for damage or wear. Replace if necessary.
5. Disassemble the valve by following the 5.4: CCV Maintenance Instructions. Inspect for damage and replace the valve needle seal or any damaged components. Reassemble valve.

5.2: CCV Parts List

CCV-503-SS



ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	240-2030	SPLIT COLLAR	1
2	240-2032	SPRING CLIP	1*
3	240-2039	VALVE BODY	1
4	CCV-3	NUT	1
5	CCV-4	SPRING WASHER	1
6	CCV-8	VALVE NEEDLE SEAL	1*
7	CCV-13	SPANNER NUT	1
8	CCV-39	STEM	1*
9	CCV-40	POPPET SEAT	1*
10	CCV-41	SPRING	1
11	CCV-42	VALVE INDICATOR	1
12	CCV-43-1	BLUE END CAP	1
13	CCV-45	CLAMPING NUT	1*
14	SSP-1421	PIPE PLUG, 1/4"	1
15	VA-246	CUP	1*

* Items included in repair kit KK-5094

5.3: CCV Maintenance Instructions

Cleaning

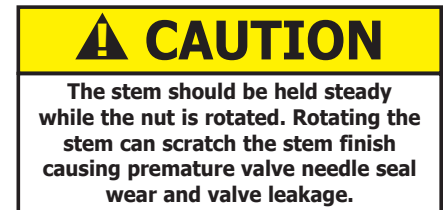
The valve should be cleaned after use by flushing with an appropriate solvent. While flushing, the valve should be triggered several times to flush particles from the seat and needle seal areas. Wear parts include the poppet seat (9), stem (8), valve needle seal (6), and piston cup (15). Wear parts should be inspected and replaced on a regular maintenance schedule. The frequency of replacement depends upon frequency of use, fluid pressure, and material abrasiveness. Weeping material visible at the indicating holes means the valve should be rebuilt. If any parts are worn, or if material leakage is evident, replace all wear parts with Valve Repair Kit KK-5094.

Removing CCV from the color stack

1. Depressurize system. Disconnect air and fluid lines from valve.
2. Insert the Spanner Tool (CCV-7) into one of the holes in the spanner nut (7) to loosen and remove the valve assembly from the manifold block. If the Spanner Tool is not available, a 1-1/16 inch (27mm) open-end wrench can also be used to loosen the spanner nut.

CCV-503-SS Valve Disassembly

1. Remove valve cap (12) from valve body (3). Hold hex valve body with 1-1/16 inch wrench while turning cap counter-clockwise with a 1-1/8 inch (29mm) wrench.
2. Hold the front end of the stem (8) steady with a 9/32" wrench. Use a 7/16 inch [11mm] socket to loosen and remove the clamping nut (13) from the stem.
3. The piston cup (15) is held onto the clamping nut by a brass nut (4). Use a 7/16" socket and an 11/16-inch wrench to disassemble the nut from the clamping nut to remove the piston cup.
4. The valve indicator (11) and piston spring (10) will be free and can be removed when the clamping nut is removed from the stem.
5. Pull stem from the front of the valve body. Use it to remove the spring washer (2) and the needle seal (3). Remove the stem and the poppet seat (6) from the valve body.




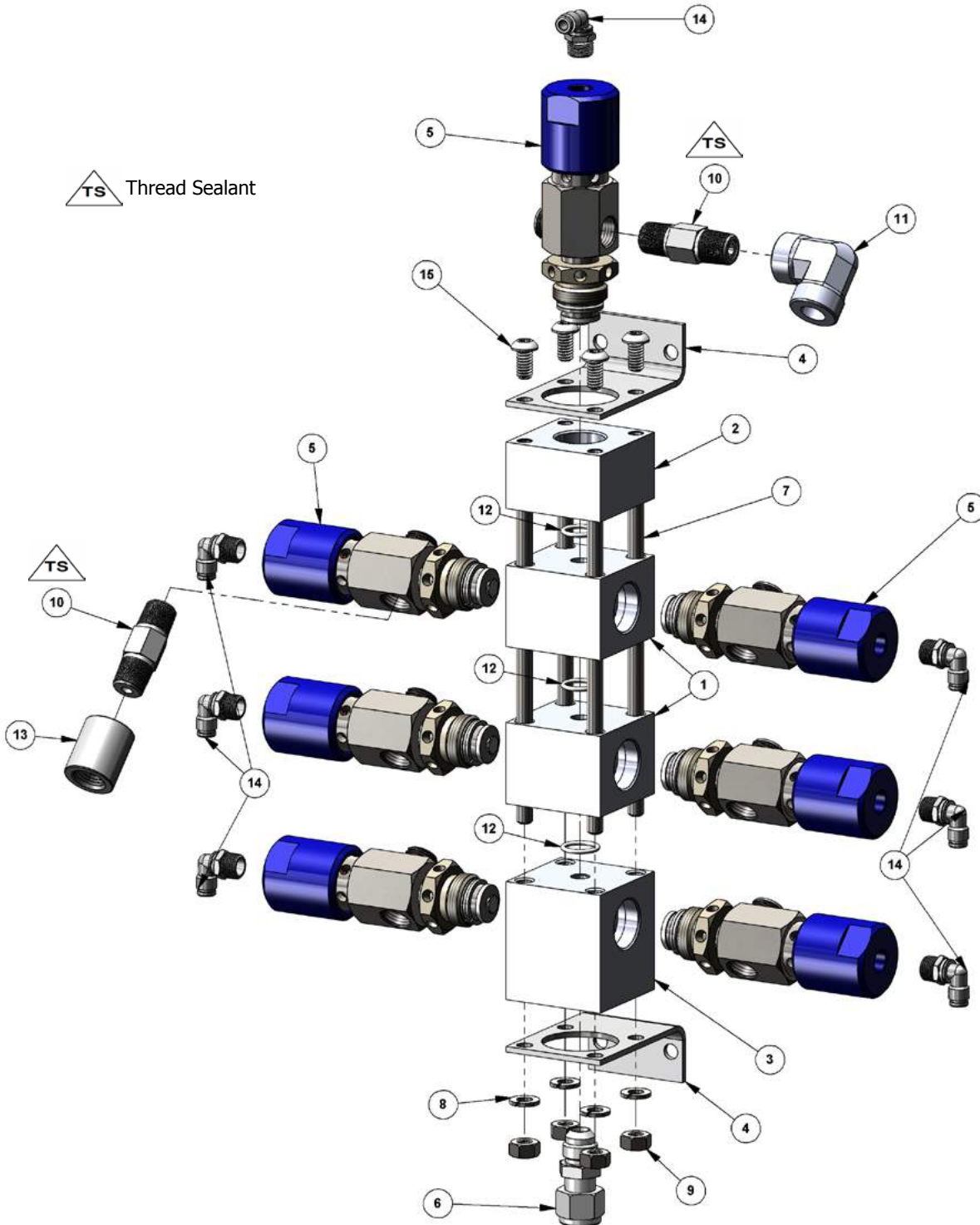
Valve Reassembly (rebuild kit KK-5094)

1. Insert a new seat (9) and stem (8) into the valve body (3). Slide a new needle seal (6) onto the stem and into the valve body until it bottoms. Install the spring washer (5), spring (10), and valve indicator (11).
2. Assemble a new cup (15) onto the new clamping nut (13) and lock in place with the nut (4).
3. Apply thread locker (medium strength, grade #242 or equivalent) to the threads of the stem (5).
4. Tighten the clamping nut (13) onto the stem and torque to 12~18 in-lbs [1.4~2.0 N-m].
5. Apply a thin film of lubricant (light grease type) to the inside of the valve cap (12) (including threads) and cup (15). Thread valve cap onto body (3) and tighten to 75-125 in-lbs [8.5~14.1 N-m].

6: Color Stack

- 240-3130-5 5 color (shown)
- 240-3130-3 3 color
- 240-3130-1 1 color

 Thread Sealant



6.1: Color Stack Parts List

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	CCV-16-SS	MANIFOLD BLOCK CENTER	Up to 2
2	CCV-17-SS	MANIFOLD BLOCK INLET	1
3	CCV-18-SS	MANIFOLD BLOCK OUTLET	1
4	CCV-37	BRACKET	2
5	CCV-503-SS	COLOR CHANGE VALVE (CCV)	3-7
6	LSFI0033-00	3/8" TUBE FITTING	1
7	SSF-6504-3" SSF-6505-4.75" SSF-6504-5.75"	1/4-20 x 3" LONG THREADED ROD (for 1 color) 1/4-20 x 4.75" LONG THREADED ROD (for 3 color) 1/4-20 x 5.75" LONG THREADED ROD (for 5 color)	4
8	SS-1505-CD	1/4" LOCK WASHER	4
9	SS-655-ZN	1/4-20 NUT	4
10	SSV-809	CHECK VALVE	2
11	20-2848	ELBOW, 90 DEGREE, 1/4" NPT	1
12	23165-430-K5	COLOR STACK O RING (5 PACK)	1-3
13	240-3133	1/4" NPT COUPLING	1
14	41-FTP-1006	1/8" NPT x 5/32" TUBE ELBOW	3-7
15	77578-16C	1/4-20 x 1/2" BHCS	4

6.2: Color Stack Disassembly / Reassembly

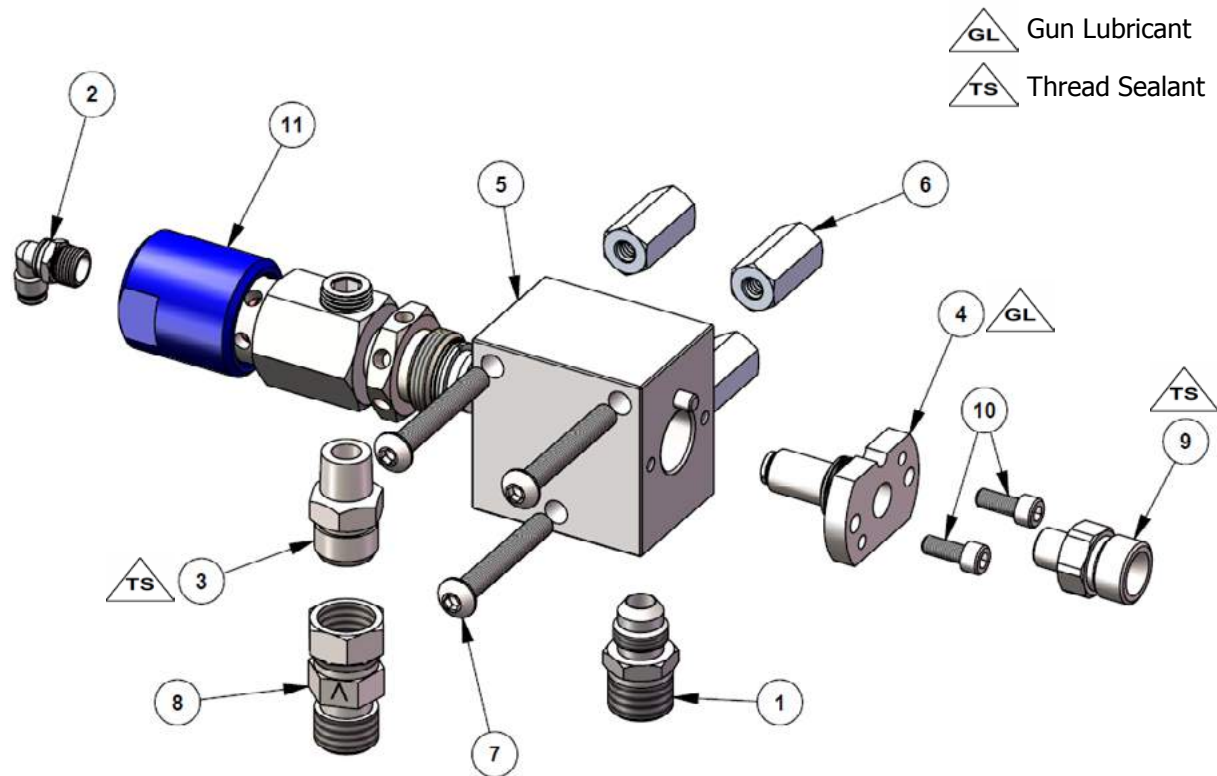
1. Color change using color 0 to flush the Color Stack.
2. Power down the system using the 3.2: System Depressurization Procedure.
3. Disconnect all air, fluid, and solvent lines connected to the Color Stack.
4. Loosen the nut on tube fitting (6) to remove the Flow Meter from the bottom of the color stack. Remove the Color Stack from the fluid panel.
5. Place the assembly on a clean work bench and remove the four retaining nuts (9) and lock washers (8).
6. Slide lower bracket (4) and manifold blocks (1, 3) off the threaded rods (7). Do not remove the threaded rods from the top block (2).
7. Use the pin tool CCV-7 to remove the CCVs (5) from the Color Stack. Optionally, use a 1 1/16" [27mm] wrench. See section 5.3 and 5.4 for CCV maintenance.
8. Replace o-rings (12). Inspect check valves for proper operation.

Reassembly

1. When reinstalling the CCV torque the spanner nut to 132~156 in-lb [15~17.6 N-m].
2. Do not reuse o-rings (12). Reuse may cause leakage.
3. Torque the four nuts (9) to 110~130 in-lb [12.4~14.7 N-m].
4. Use thread sealant on all tapered pipe threads. Avoid leaks by only turning clockwise.

7: Mix Manifold

240-3040

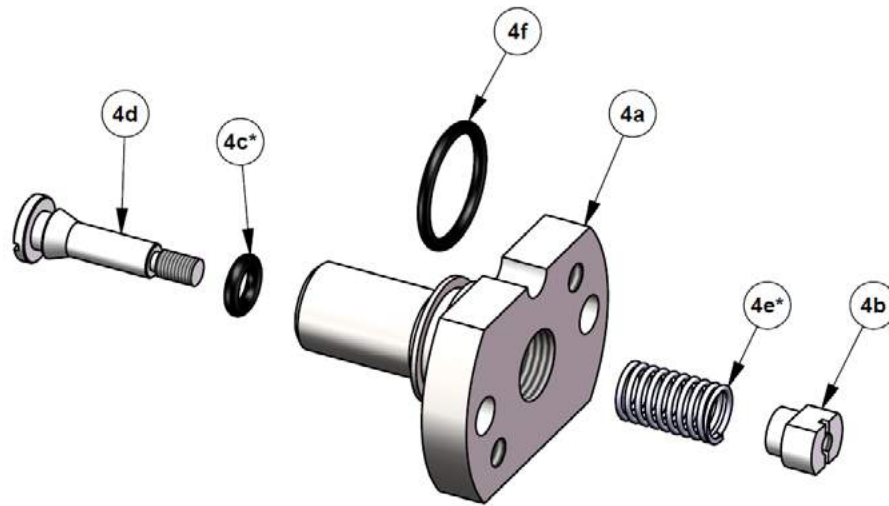


ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	6-6JIC	ADAPTER, #6 JIC X 3/8 NPSM	1
2	41-FTP-1006	1/8 NPT(m) X 5/32 (4mm) TUBE ELBOW	1
3	83-2484	DM NIPPLE, 1/4 NPT X 3/8 NPS SS	1
4	240-3047	INJECTOR ASSEMBLY	1
5	240-3049	MANIFOLD ASSEMBLY	1
6	240-3155	1/4-20 HEX STANDOFFS, ALUMINUM	3
7	77578-56C	SBHSCREW 0.25-20x1.75-HX-C	3
8	78077-00	3/8" NPSF X 3/8" NPSM CHECK VALVE	1
9	78098-00	ADAPTER, 1/8" NPT X 3/8" NPSM	1
10	A12772-01	#10-24 x 1/2" SHCS, SS	2
11	CCV-503-SS	COLOR CHANGE VALVE ASSEMBLY	1

Reduced flow through the mix manifold indicates dried or hardened paint buildup. Paint or solvent backing into the hardener tube indicates a leak or malfunction of the injector assembly. These items may have to be disassembled and cleaned to restore mixing and flow performance. Always flush system with solvent to prevent clogging in the manifold. If needed, replace or repair the injector assembly, noting the orientation and position.

7.1: Injector Assembly

240-3047



ITEM NO.	PART NO.	DESCRIPTION	QTY.
4a	240-3042	INJECTOR BODY	1
4b	240-3044	SPRING RETAINER	1
4c	79001-04	VALVE STEM O-RING	1*
4d	240-3136	VALVE STEM	1
4e	240-3045	SPRING	1*
4f	79001-08	INJECTOR O-RING	1*

* Items included in repair kit 240-3124

7.2: Injector Assembly Repair

1. Remove Adapter (9) from injector assembly (4).
2. Use two screwdrivers to disassemble the stem (4d) and spring retainer (4b). Remove and discard spring (4c) and o-rings (4e,4f). Clean stem and injector body thoroughly, inspecting parts for nicks or scratches on sealing surfaces. Replace parts if damaged.
3. Install new o-ring (4e) on valve stem. Insert stem into body (4a). Drop new spring into valve body, then use two screwdrivers to assemble spring retainer (4b) to stem. Push on spring retainer to make sure valve opens and closes freely and does not bind.
4. Apply thread sealant to adapter (9) and tighten into injector body.
5. Install new o-ring (4f). Use Gun Lubricant when reinstalling this sub assembly on to the Mix Manifold.

8: Flow Meter

A13159-01

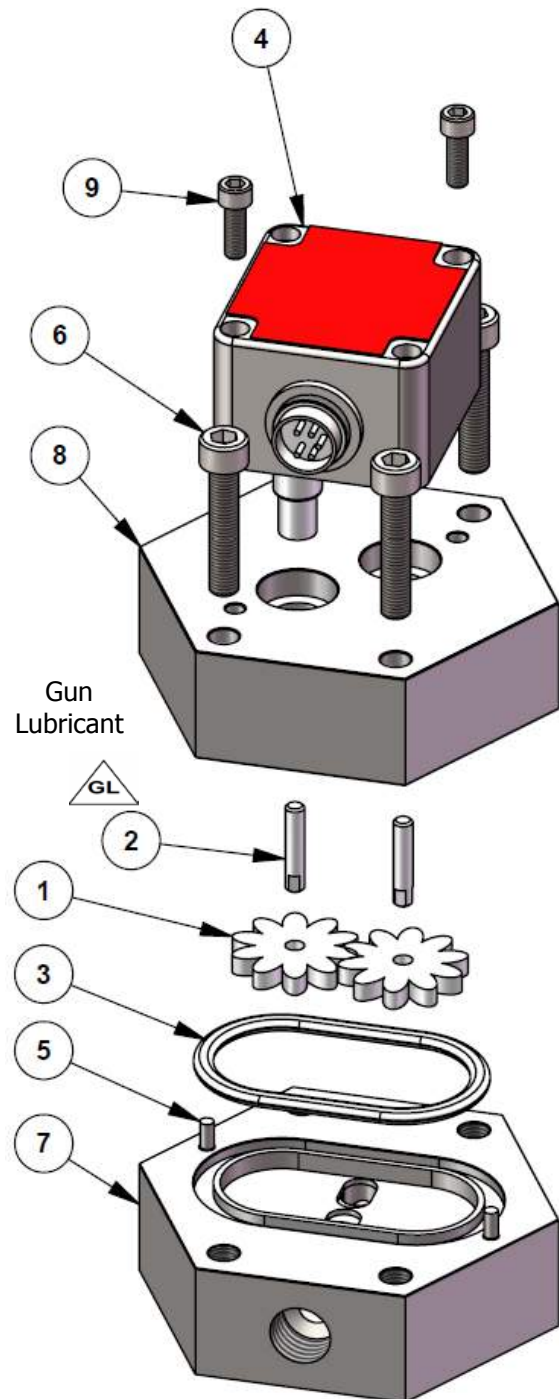
ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	A12715-00	GEAR	2
2	A12716-00	SHAFT	2
3	A13161-00	GASKET	1
4	A13256-01	SENSOR	1
5	-----	LOCATING PIN	2
6	-----	SHCS, M6 X 30	4
7	N/A	LOWER HOUSING	1
8	N/A	UPPER HOUSING	1
9	-----	SHCS, #8-32	2

8.1: Flow Meter Servicing

Disconnect sensor cable from the flowmeter sensor. Remove meter for service to a suitable clean area to perform maintenance. Use a 5mm hex wrench to remove all 4 bolts (9). Pull the upper housing STRAIGHT apart from the lower housing. If the housing halves do not pull apart easily, DO NOT pry them apart with screwdrivers, etc. Rather, replace the bolts and only thread them in a few turns, then tap the top of the bolts with a soft mallet while holding the top half of the body. Clean and replace worn parts as necessary. Install new gasket (3). Install all parts in the order they were removed. Install flattened portion of shafts toward gears as shown. Push the two covers together, aligning the pins and holes.

It may be necessary to tap the two halves of the flowmeter together with a soft mallet. DO NOT use the bolts to pull them together as it may damage the alignment pins.

Tighten the screws (6) in a crossing pattern to 13 lbf-ft [17.6 N-m] torque.



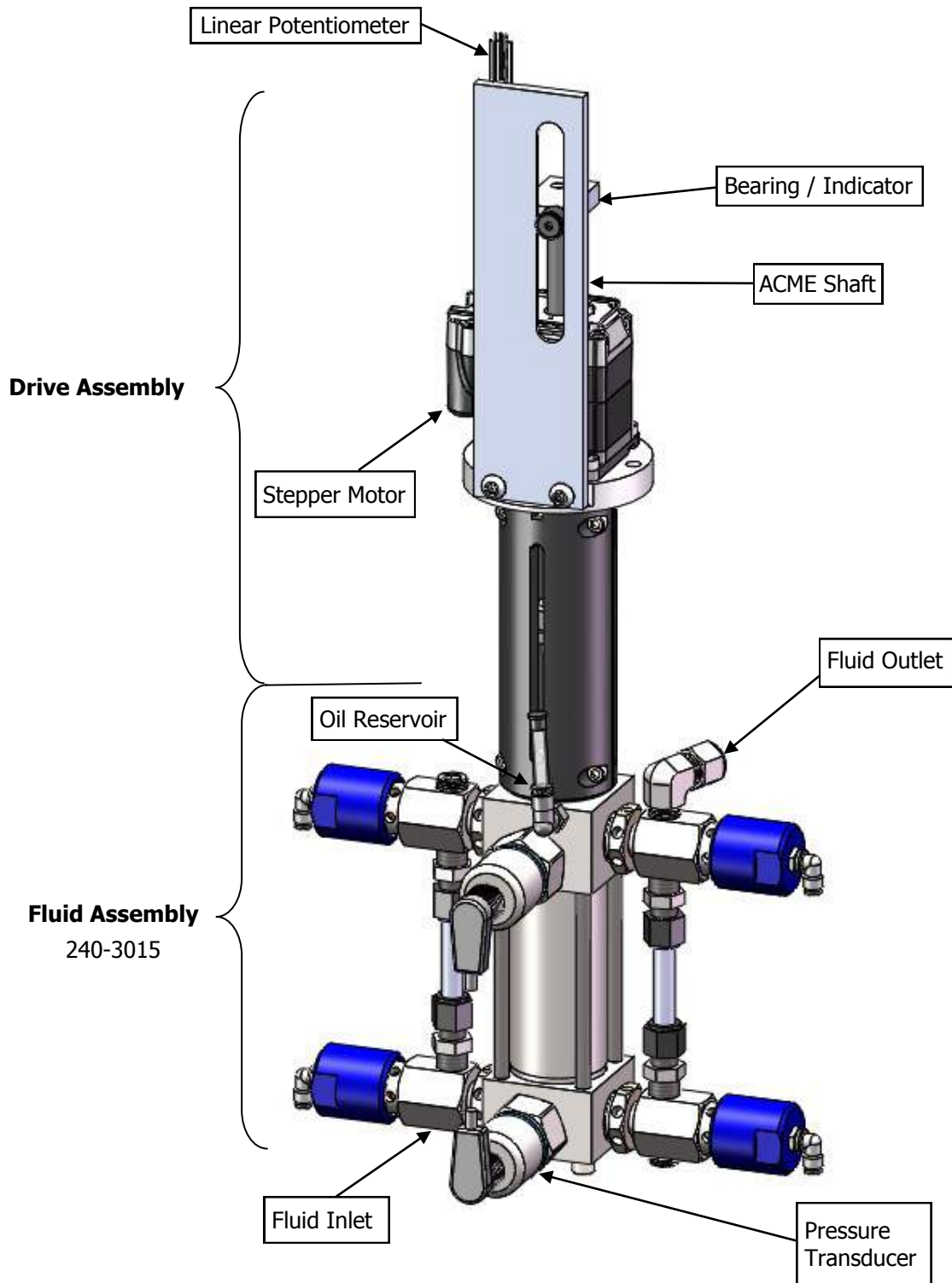
NOTE

Flow through the meter goes downward, from the color stack to the mix manifold. Ensure the arrow on the flow meter is indicating the proper direction upon reinstallation.

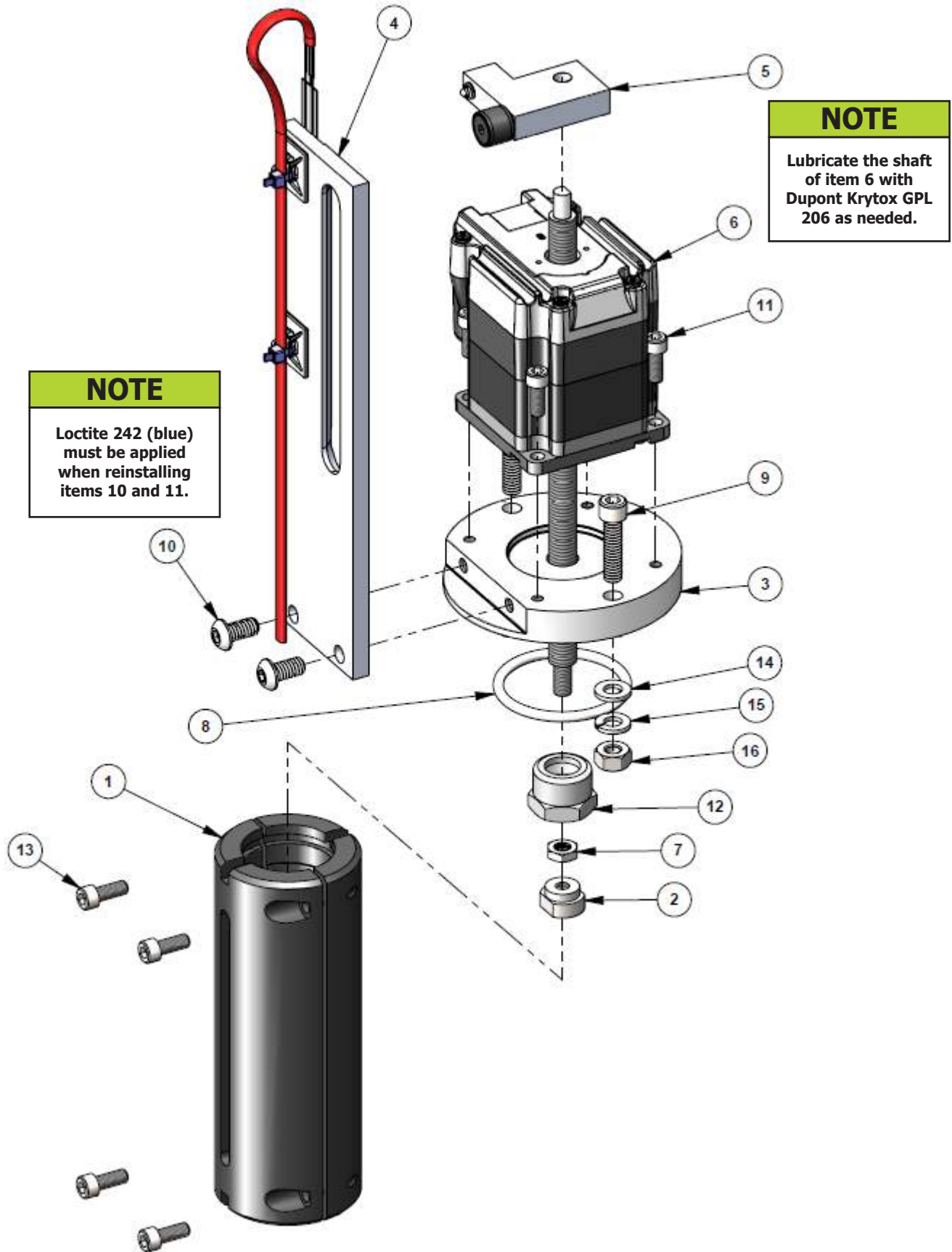
Note that flow through the accessory solvent meter travels upwards to CCV "A0".

9: B Pump

The B Pump meters B material (hardener or catalyst) to the mix manifold. The system controller uses the flow meter pulse input to direct the pump's stepper motor to precisely inject material at the required ratio. The pump can operate at a variety of mixture ratios, from 1:1 up to 100:1. The control software has a "balancing" function that provides continuous flow of B to the mix manifold if the B inlet pressure is higher than the outlet pressure. See **77-2982 Operations Manual** for more information on B Pump operation.



9.1: Drive Assembly



9.2: Drive Parts List

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	240-3014	PUMP COUPLING	1
2	240-3021	MOTOR ROD ADAPTER	1
3	240-3048	MOTOR MOUNT ASSEMBLY	1
4	240-3060	LINEAR POTENTIOMETER ASSEMBLY	1
5	240-3065	POTENTIOMETER WIPER ASSEMBLY	1
6	240-3061-P	STEPPER MOTOR WITH LEAD SCREW	1
—	240-3025	LEAD SCREW ONLY	—
7	20-6866	M6 x 1 NUT, SS	1
8	20-6952	MOTOR MOUNT ORING	1
9	76566-32C	1/4-20 x 1.25" SHCS	2
10	77578-16C	1/4-20 x 0.5" BHCS, SS	2
11	8212-16F	#10-32 x 0.5" SHCS	4
12	102-3327	SWIVEL NUT	1
13	A12772-01	#10-24 x 1/2" SHCS, SS	4
14	SS-6505-CD	1/4-20 FLAT WASHER	2
15	SS-1505-CD	1/4-20 LOCK WASHER	2
16	SS-655-ZN	1/4-20 NUT	2

NOTE

Stepper motor and lead screw (item 6) are sold and packaged together and should always be replaced together. Never mix different motors and screws.

9.3: Linear Potentiometer Replacement

The linear potentiometer is an integral part of the linear pot bracket assembly. If the potentiometer becomes worn or damaged the bracket should be replaced.

1. Be sure that the system is fully depressurized before working on it by following the **1.1: System Depressurization Procedure**. Also disconnect from power and place the AC lockout switch in the off position.
2. Remove the potentiometer wire leads from their terminals on the control main board. Make note of the terminal locations or refer to the electrical schematic to re-install the leads of the new potentiometer.
3. Inside the enclosure, remove the two screws from the potentiometer bracket so that it may be removed from the motor mount.
4. Remove the potentiometer bracket assembly and discard if worn or damaged.
5. Use the screws to re-attach the potentiometer bracket to the motor base and re-attach the wire leads to the proper terminals. Route wiring back through the wire trays.

Stepper Motor

Stepper operation causes an inner nut to rotate, resulting in linear motion of the B pump. The threaded shaft should be lubricated periodically with a small amount of Dupont Krytox GPL 206 to prevent shaft wear. The position sensor and potentiometer bracket must be removed to replace the stepper motor. The stepper motor may be removed by removing its bolts and disconnecting from pump fluid end. If ordered, Motor comes with lead screw.

NOTE

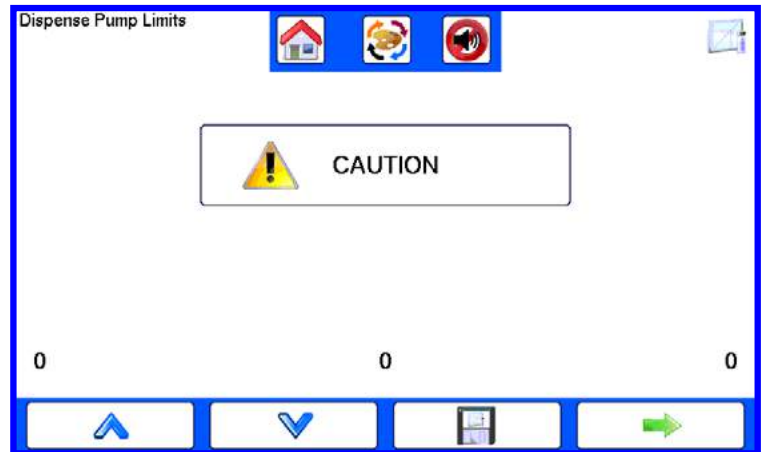
To prevent damage to the potentiometer strip, do not tighten the ball plunger that is part of the wiper assembly. It is correctly positioned as required from the factory.

9.4: Setting B Pump Limits

If the linear pot bracket is replaced, the B Pump upper and lower limits must be reset to ensure correct pump operation. Shut the machine off when replacing the linear pot bracket as described in **9.3: Linear Potentiometer Replacement**.

Use these instructions together with the operating screen detail found in **77-2982 Operation Manual**.

1. Go to the Dispense Pump limits screen by using the Administrator password for the unit.
2. Use the up arrow button to move the pump piston upwards. Press to start and stop movement.
3. To set the upper limit, the last command used must have been UP. If true, simply press the save button to set the upper limit. Typical values are .70~.85. The new value will show on the left side of the screen.
4. To set the lower limit, use the down arrow button to move the piston downwards. Lower limit values are typically 3.85~4.0. Press the button again and stop the movement. Press the save icon to set the lower limit. The new value will show on the right side of the screen.
5. The B Pump limits should now be set. To verify, go to the Home screen, and then navigate to the Prime screen. Activate the B Pump prime and verify that the pump travels up and down to the limits that you just set. If not, return and repeat the procedure.
6. While spraying, the B Pump will not change direction at the limits, but at about 0.3" before each limit. This is a function of the pressure balancing feature and is normal.

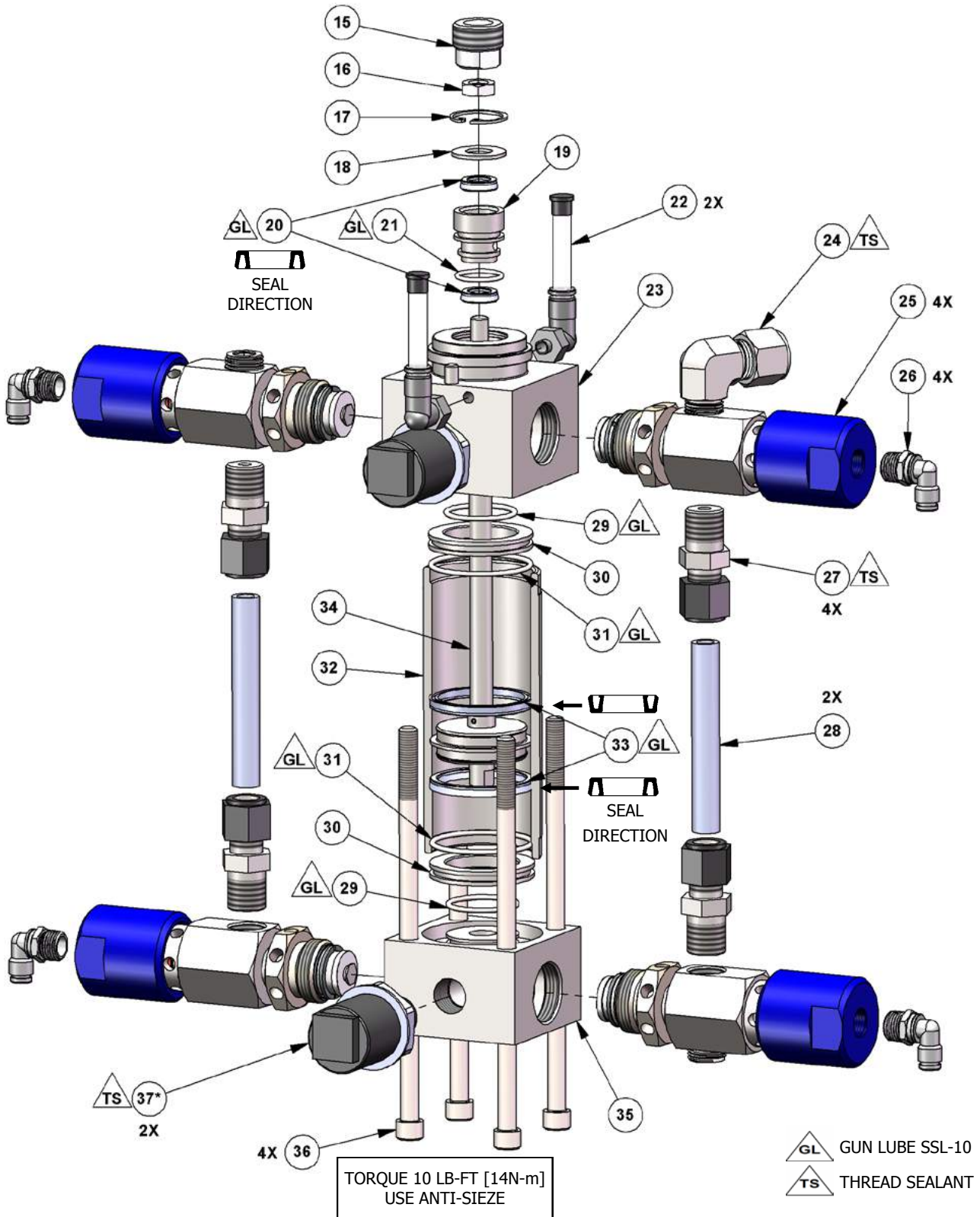


⚠ CAUTION

Do NOT allow the motor to continue running when it hits the "hard stop" at the top and bottom of the slot. Damage may occur to the motor, screw, or wiper assembly. Use caution when performing this step.

9.5: B Pump Fluid End

240-3015-300, 240-3015-600



9.6: Fluid End Parts List

ITEM NO.	PART NO.	DESCRIPTION	QTY.
15	240-3020	PUMP ROD ADAPTER	1
16	20-6953	HEX NUT	1
17	237-729	RETAINING RING	1
18	237-727	FLAT WASHER	1
19	240-3084	SEAL HOLDER ASSEMBLY	1
20	240-3211	ROD SEAL	2
21	20-6942	SEAL HOLDER ORING	1
22	240-3117	OIL RESERVOIR	2
23	240-3029	TOP BLOCK ASSEMBLY	1
24	240-3126	FLUID OUTLET ELBOW	1
25	CCV-503-SS	COLOR VALVE ASSEMBLY	4
26	41-FTP-1006	TUBE ELBOW, 5/32"	4
27	77540-06	COMPRESSION FITTING	4
28	76698-04	TUBING, 3/8 OD	2
29	20-6943	CYLINDER ORING	2
30	240-3022	CYLINDER ADAPTER (600 cc only)	2**
31	20-6944	CYLINDER ADAPTER ORING (600 cc only)	2**
32	240-3018-300 240-3018-600	300CC CYLINDER 600CC CYLINDER	1
33	240-3212-300 240-3212-600	300CC PISTON SEAL 600CC PISTON SEAL	2
34	240-3224-300 240-3224-600	300CC ROD AND PISTON ASSEMBLY 600CC ROD AND PISTON ASSEMBLY	1
35	240-3016	BOTTOM BLOCK	1
36	7959-176C	1/4-20 X 5.5" SHCS	4
37	240-3191*	PRESSURE TRANSDUCER	2
—	0114-016099	PUMP PACKING LUBE, 250mL	1

*Item 37 not included with 240-3015. Order separately.

** Item not used on 240-3015-300

Kits and Spare Parts

KIT DESCRIPTION	ITEMS INCLUDED	QTY.
Dispense Pump Rebuild Kit, 300CC Part#: 240-3170-300	20-6942	1
	20-6943	2
	102-2510 (PIN)	1
	240-3084	1
	240-3211	2
	240-3212-300	2
	0114-016099	1

KIT DESCRIPTION	ITEMS INCLUDED	QTY.
Dispense Pump Rebuild Kit, 600CC Part#: 240-3170-600	20-6942	1
	20-6943	2
	20-6944	2
	102-2510 (PIN)	1
	240-3084	1
	240-3211	2
	240-3212-600	2
0114-016099	1	

PART NO.	DESCRIPTION
240-3128-06	COMPRESSION FERRULES
240-3129-06	COMPRESSION NUTS

9.7: Rod Seal Replacement

If the fluid level in the oil reservoirs increases rapidly the rod seals should be replaced.

First ensure that the system is powered off and disconnected from the electrical power source. Completely de-pressurize the system by following the **1.1: System Depressurization Procedure**.

1. Remove the fluid panel shroud to gain access to the pump. Disconnect the hardener supply line from the Dispense Pump inlet or optional flow sensor.
2. Disconnect the nut of the compression fitting (24) from the outlet of the pump.
3. Disconnect the pressure sensor and optional flow sensor cables by unscrewing the thumb nuts and unplugging the connectors.
4. All air pressure should be removed from the system. Disconnect the 5/32" air trigger lines connected to the 4 pump color change valves.
5. Remove the 4 screws that hold the pump coupling (15) together. Remove the pump coupling halves. Support the fluid section of the pump and unscrew the swivel nut (11) connecting the piston rod (33) with the threaded rod (3).
6. Unscrew the four clamping screws (36) from the bottom block. Remove the bottom block (35).
7. Remove the cylinder (32) to access the piston. Remove the pump rod adapter (15) and jam nut (16) in order to slide the rod out of the top block (23).
8. Remove the retaining clip (17) so that the washer (18) and inner seals can be pressed out with the large dowel supplied with the unit (102-2510). Note the orientation of the two that will be removed.
9. Replace the rod seals (20) with the open end of the cup facing downward. Return the washer and retaining clip in place before reinserting the piston rod.
10. Reinstall the cylinder and screw the two blocks together. Reattach the pump rod adapter and nut so that the pump can attach to the pump drive end.
11. Replace the pump coupling, using the pins and grooves in the coupling to align the pump to the control enclosure.
12. Replace the air lines, fluid connections, and cables.

B Pump upper seal lubricant

The B Pump has an oil barrier between the top seals and the outside air. The fluid is contained between the rod seals in the top block and is visible via the clear tubes of the oil reservoirs. The oil reservoirs should be periodically refilled with lubricant that was sent with the system (reorder part # 0114-009433). This seal lubricating oil is compatible with most paint hardeners and prevents hardening of any material which may seep past the rod seal. Appearance of component B material (catalyst/ hardener) in the reservoirs is an indication of worn rod seals. Use 240-3170 pump repair kit as needed.

The seal lubricant may be flushed and re-filled by turning one of the tubes toward the ground then re-filling the tubes and reservoir from the upright tube. When enough lubricant has been added, turn the downward facing tube upright and top off fluid.

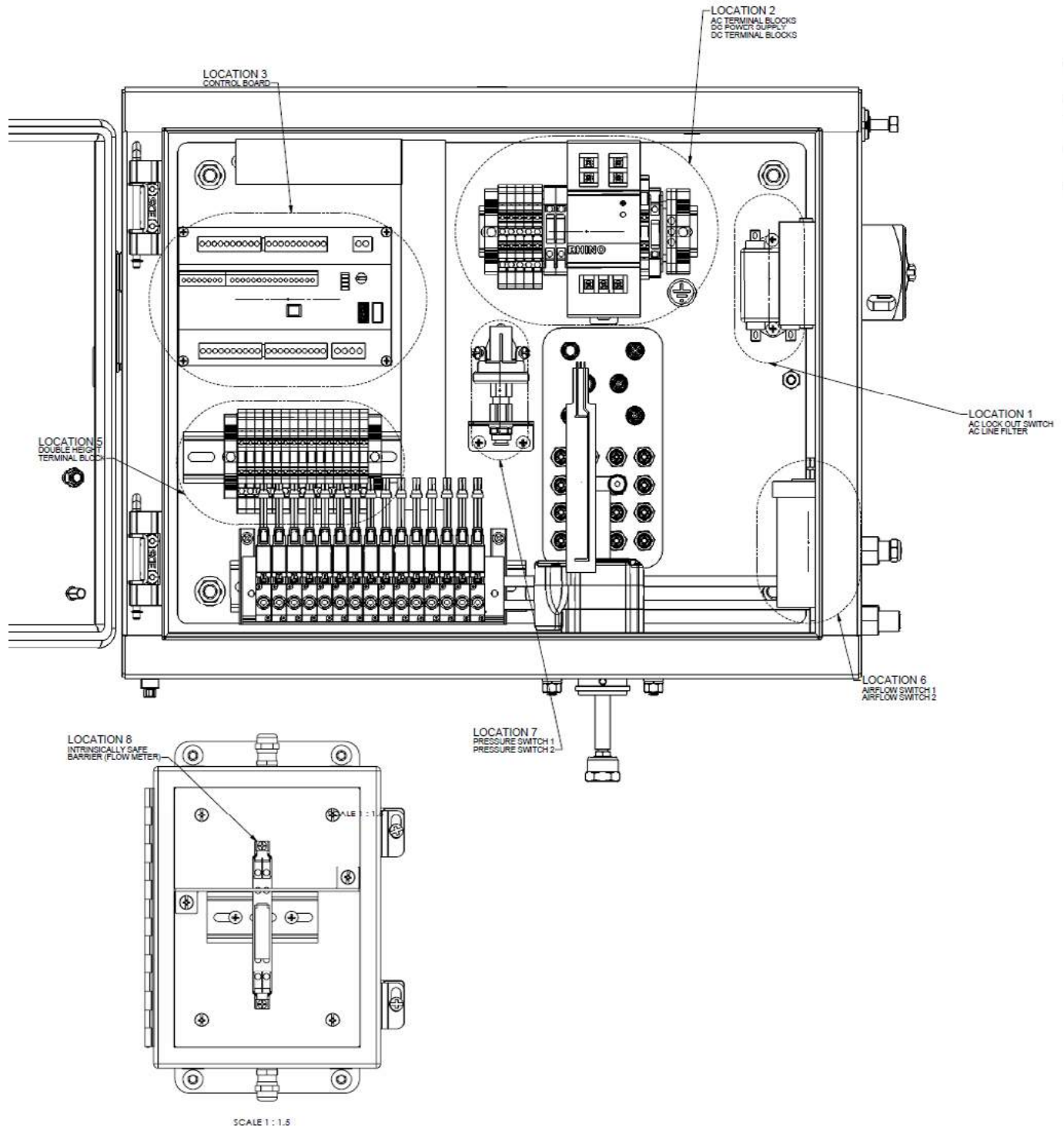
9.8: Pressure Transducers and Cables

If the pressure transducers provide inaccurate measurement they may be clogged. Remove and clean as needed. If hardener cannot be removed the transducer must be replaced. It cannot be reset or adjusted.

If a transducer cable is damaged and requires replacement order per the table below. See section 10 for electrical connection information.

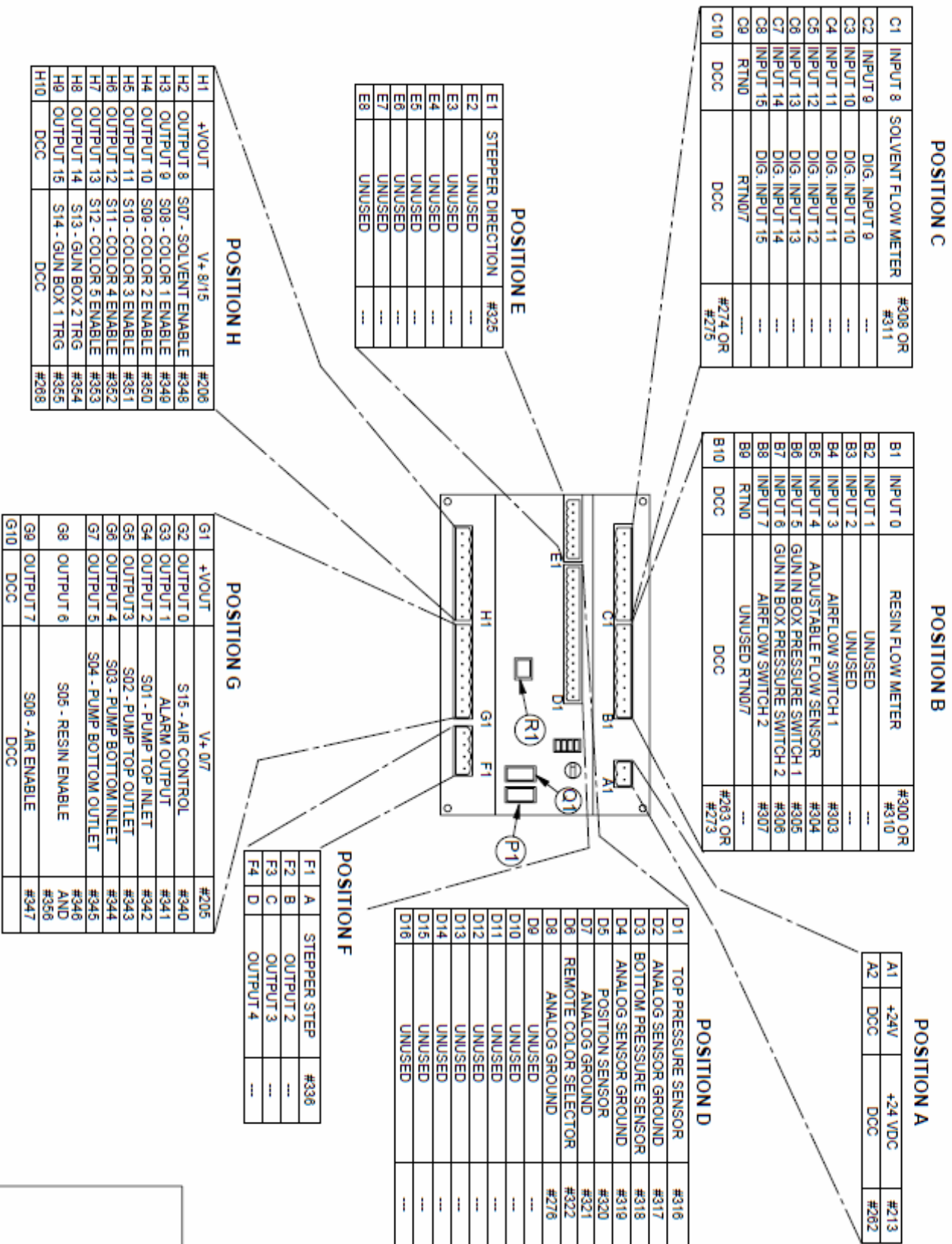
CABLE LABEL	PART NO.	DESCRIPTION	QTY.
TOP	240-3190-1	TRANSDUCER CABLE, UPPER	1
BOT	240-3190-2	TRANSDUCER CABLE, LOWER	1

10: Electrical Diagrams

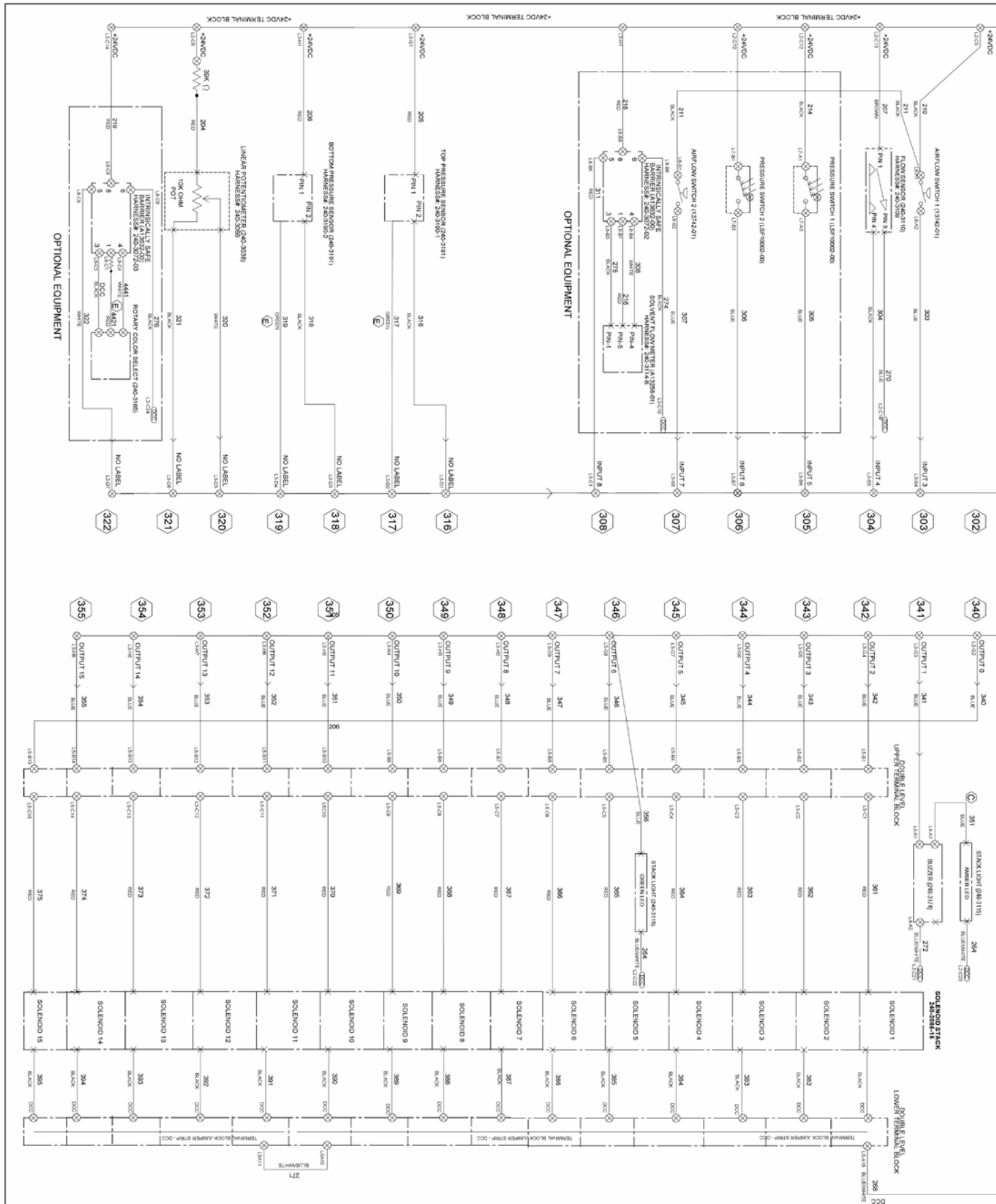


LOCATION 3 - CONTROL BOARD

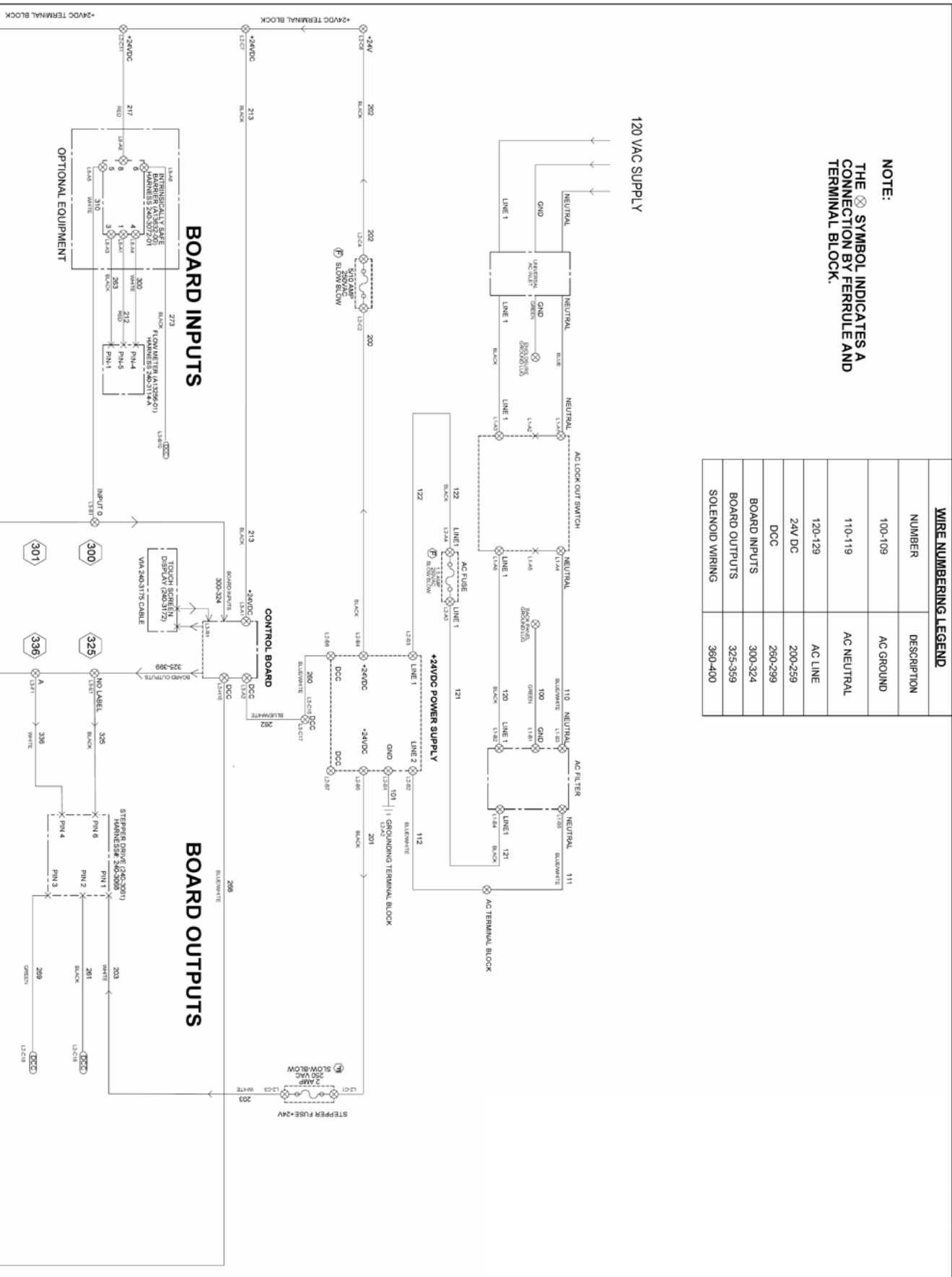
Electrical Diagrams



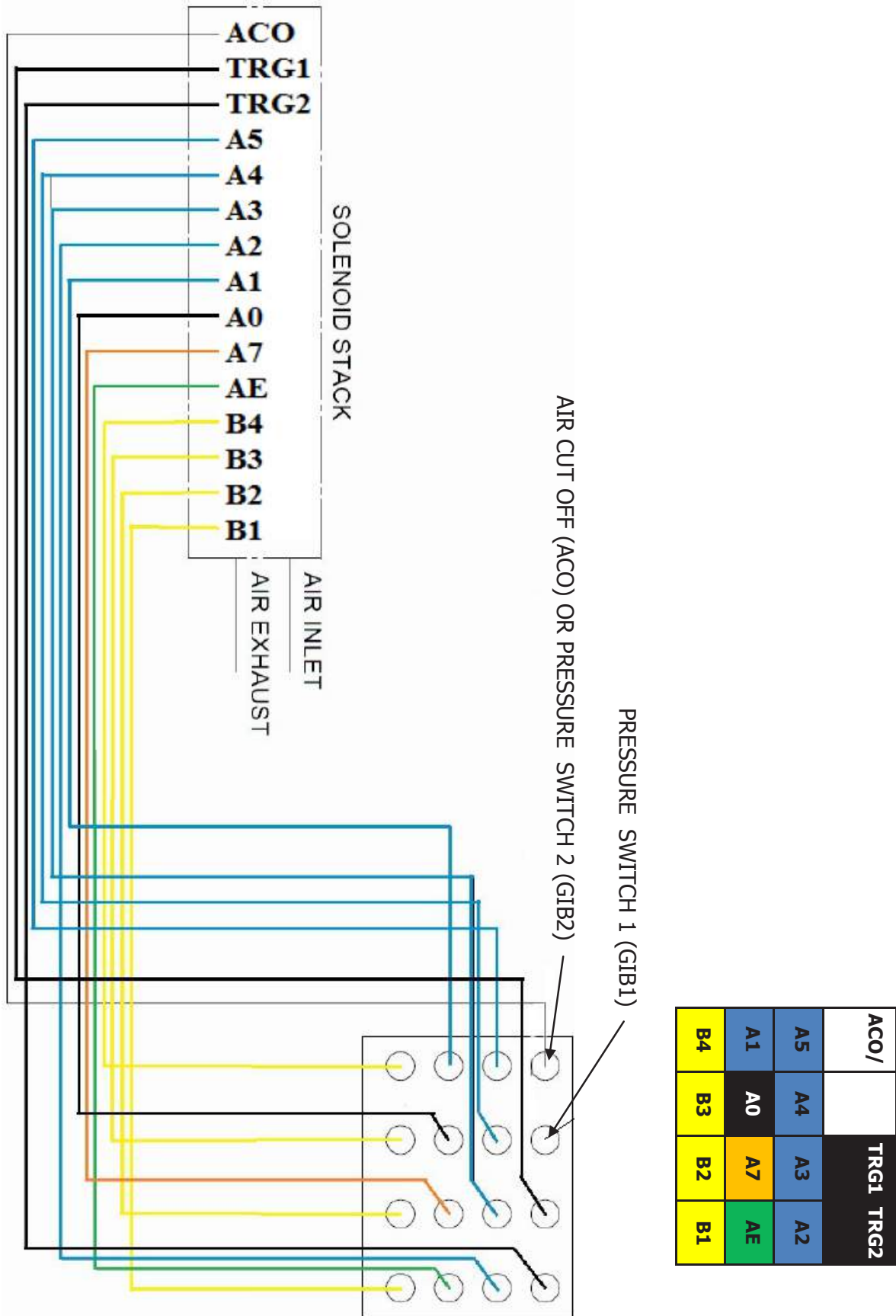
Electrical Diagrams



Electrical Diagrams



11: Pneumatic Diagrams



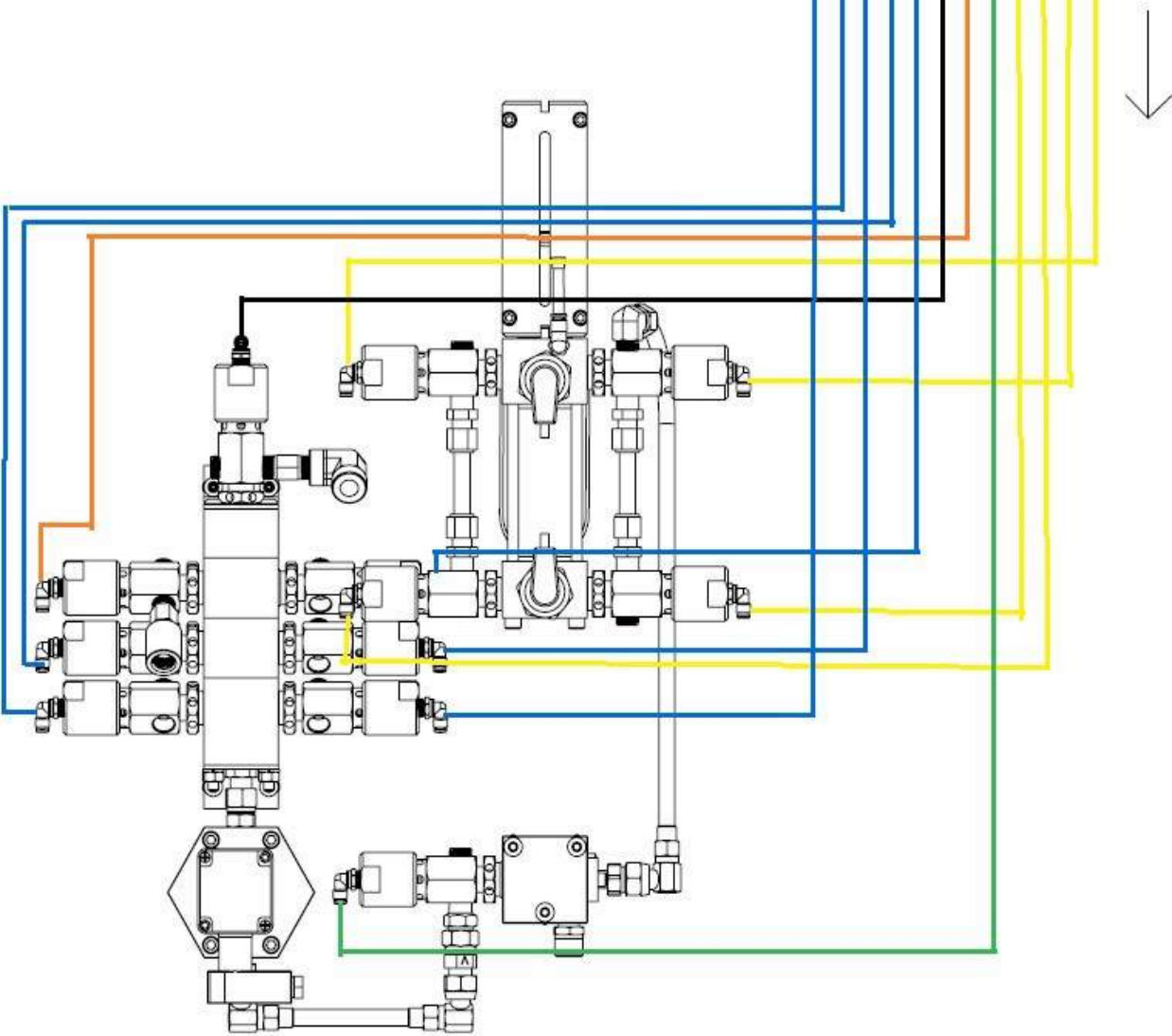
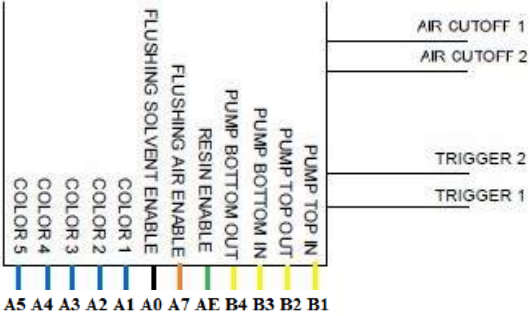
As Viewed from Front inside Enclosure:

Pneumatic Diagrams

As Viewed from Back Side of Enclosure:

TRG2	TRG1	GIB1	ACO/GIB2
A2	A3	A4	A5
AE	A7	A0	A1
B1	B2	B3	B4

BULKHEAD UNIONS



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