Tribomatic® II Demonstration Unit Control Module

1. Introduction

This instruction sheet covers the Tribomatic II demonstration unit control module. It includes unit setup and operation instructions, troubleshooting procedures, and parts lists.

If you need more information on your Tribomatic II demonstration unit, please contact your Nordson representative.

2. Setup

1. Remove the gun, powder pump, hopper, cables, hoses, and air tubing from the case.
2. Install the pump on the pump adapter as described in the pump and hopper manuals.
3. Connect the gun, pump, and hopper to the control module. Refer to Table 1 and Figure 1 for the connection points and their functions. Item numbers correspond to callouts in Figure 1.

Table 1 Control Module Connection Points and Functions

Item	Connection Points	Function
1	10-mm tubing connector	Fluidizing air to feed hopper. Use blue 10-mm tubing labeled H.
2	10-mm tubing connector	Supply air. 7 bar (100 psi) maximum pressure. Use blue 10-mm tubing.
3	6-mm tubing connector	Diffuser air to gun diffuser. Use blue 6-mm tubing labeled A.
4	6-mm tubing connector	Flow-rate air-to powder pump. Use black 6-mm tubing labeled F.
5	Threaded stud	Ground wire to earth ground.
6	6-pin receptacle	Cable from gun.
7	5-pin receptacle	Power cord to 110120 VAC, 50/60 Hz, 1∅ grounded outlet. **NOTE:** To use a different voltage, you must reset switches S3 and S4 on the circuit board. Refer to Figure 2 for the switch locations.

2. Setup *(contd.)*

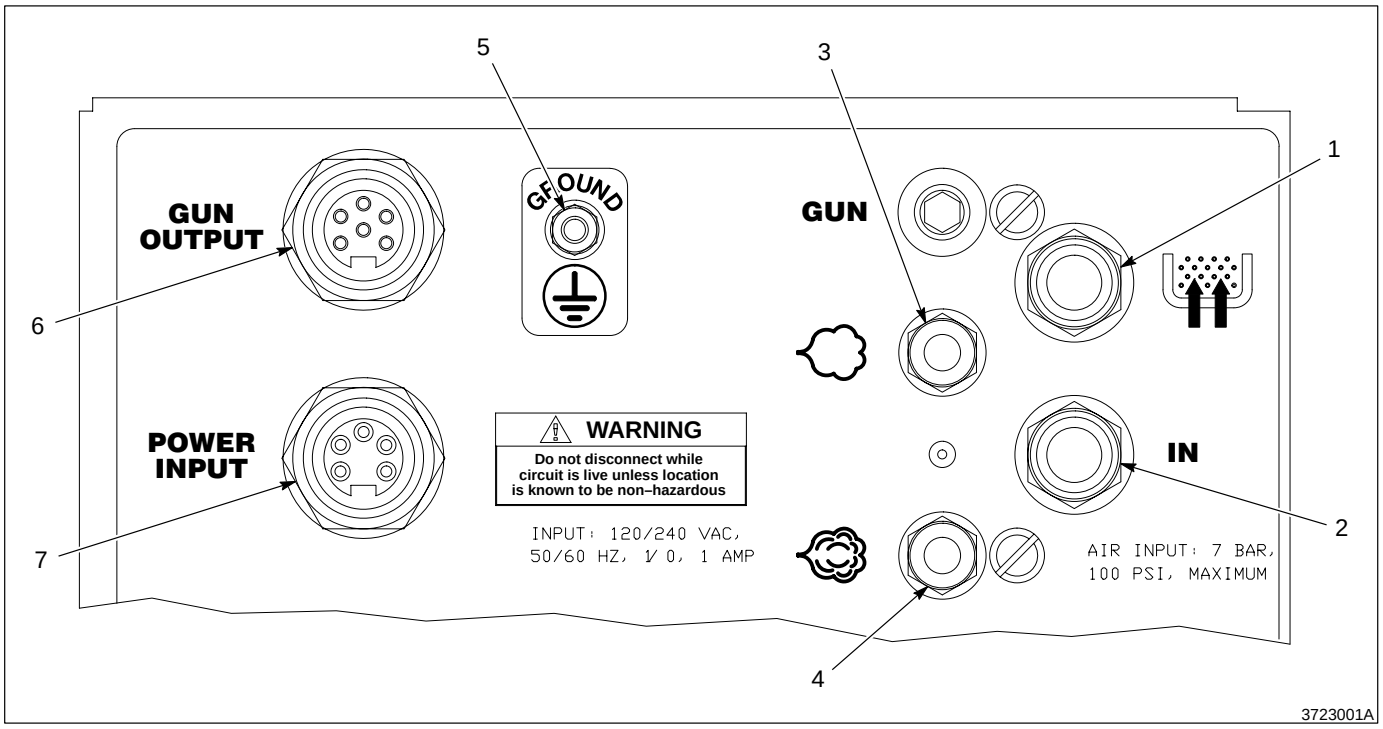

Fig. 1 Control module connections

3. Input-Voltage Switch Settings

The demonstration unit is set to use 110120 VAC at the factory. To use the unit with a different voltage, you must remove the control module and change the settings of the S3 and S4 switches on the circuit board. Refer to Table 2 and Figure 2 for the switch settings and switch locations.

Table 2 Input-Voltage Switch Settings

Input Voltage	Switch Settings
86110	S3: 115 V S4: Low
102132	S3: 115 V S4: High
170220	S3: 230 V S4: Low
220240	S3: 230 V S4: High

NOTE: Switch S5 must be set to 12V. Switch S7 must be set to TRIG (trigger). Do not change these switch settings

3. Input-Voltage Switch Settings *(contd.)*

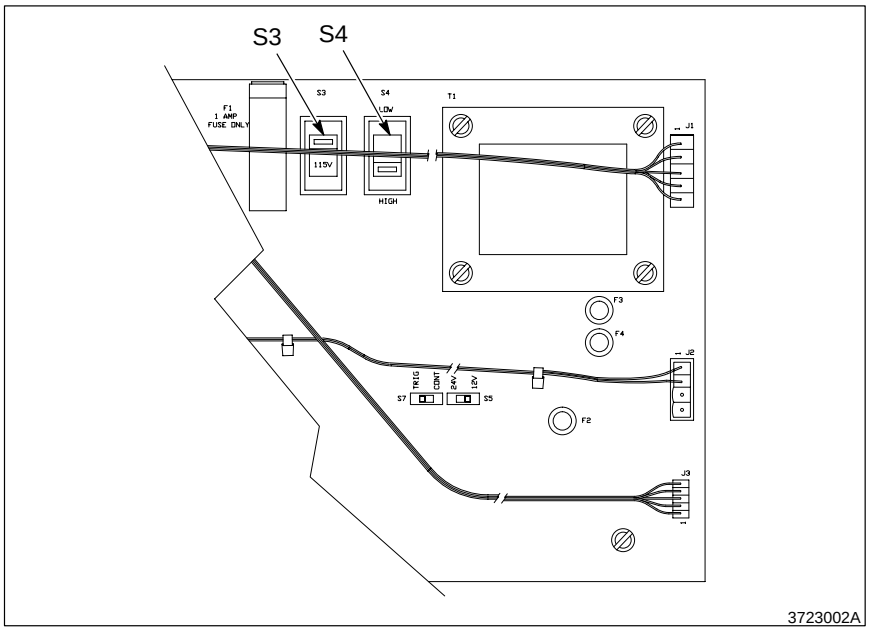

Fig. 2 Input-voltage switch settings

4. Control Functions and Settings

Refer to Figure 3 and Table 3 for control functions, locations, and initial settings. Adjust the controls until the gun is spraying powder and the parts are being coated to your satisfaction.

Table 3 Control Functions and Initial Settings.

Item	Control	Functions and Settings
1	Power switch	Energizes controls.
2	Power LED (green)	Lights when power is available and power switch is turned on.
3	Powder LED (green)	Lights when gun is triggered.
4	Low-charge alarm (red)	Flashes when powder is charging below alarm setting.
5	Digital display	Displays charge or alarm setting in microamps (µA). Polarity shown by + or –.
6	Display function switch	Changes display. Default is µA, press up to show alarm setting.
7	Low-charge alarm switch	Turns alarm on/off, changes alarm setting. Set to 0.5 µA less than normal µA level.
8	Fluidizing air controls	Controls fluidizing air pressure. Set to 0.2 bar (3 psi). Air flows when set to pressure greater than zero.
9	Diffuser air controls	Controls diffuser air pressure. Set to 1.8 bar (26 psi). Air flows when gun is triggered.
10	Flow-rate air controls	Controls flow-rate air pressure. Set to 2.5 bar (36 psi). Air flows when gun is triggered.

4. Control Functions and Settings (contd.)

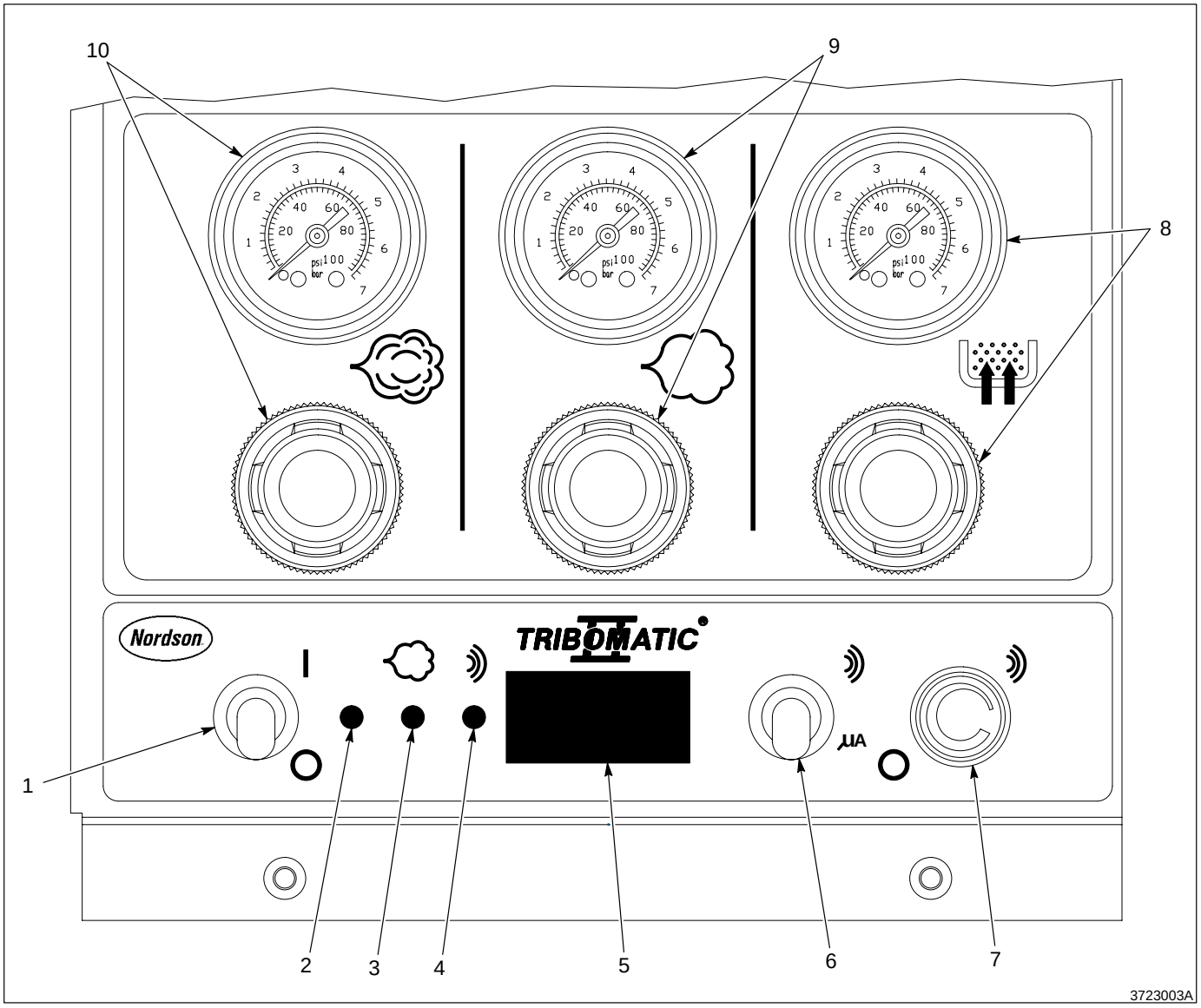

Fig. 3 Control locations

5. Troubleshooting

WARNING: Allow only qualified personnel to perform the following tasks. Follow the safety instructions in this document and all other related documentation.

WARNING: Electrical power must be on to check voltages. Perform these procedures carefully. Use insulated tools. Touching energized electrical components could be fatal.

The following illustrations will help you troubleshoot your unit:

Fig. 4 circuit board connectors, switches, and fuses
Fig. 5 electrical schematic/wiring diagram
Fig. 6 air tubing diagram

These illustrations are on the pages following Table 4.

NOTE: The troubleshooting procedures include designations such as U1, S1, or Q5. These are components on the circuit board.

Table 4 Troubleshooting Procedures

Problem	Possible Cause	Corrective Action
1. All LED's off, no display	No input power	Check for voltage at J1-1 and J1-2.
	Power switch (S1) off	Turn switch on.
	Blown fuse F1	Replace fuse with 250-volt, 0.375-amp fast-acting fuse.
2. Power LED off, powder LED lights when gun triggered	LED DS4 or regulator chip U4 failed	Replace circuit board.
3. Powder LED on, display off	Q5, U1 or U4 failed	Replace circuit board.
4. Powder LED on, powder does not spray (no air output)	Bad solenoid connection	Check for loose connection at J2. Check for broken solenoid wires.
	S5 not set for correct voltage (12V) or broken	Set S5 to 12V. Check switch action. If switch is broken, replace circuit board.
	Q2 or Q3 failed	Replace circuit board
	Solenoid coil open	Replace solenoid valve.

5. Troubleshooting (contd.)

Problem	Possible Cause	Corrective Action
5. Powder does not spray (no air output), powder LED off, power LED on	Gun cable or trigger malfunction	Check cable and trigger switch as described in gun manual.
	Blown fuse F2	Replace fuse F2 with 250-volt, 0.05-amp fast-acting fuse. Check for a bad fuse by setting S7 to CONT (continuous). If gun starts to spray, replace fuse.
6. Powder spraying, display reads 00	Gun cable malfunction	Check cable as described in gun manual.
	S2 or U1 failed	Replace circuit board.
7. No low-charge alarm	Alarm setting too low	Set alarm to 0.5 µA below normal reading.
	S6, Q1, DS5 failed	Replace circuit board.
8. Display reads 00, loss of wrap, poor transfer efficiency	Poor cable connection, or current feedback circuit in cable open	Check cable connection and connection at J3. Check cable as described in gun manual.
	Powder not suitable for tribo-charging	Contact your powder supplier.
9. Loss of wrap, poor transfer efficiency	Poorly grounded parts	Measure resistance between parts and ground with a megohm meter. Resistance should be less than 1 megohm at 500 volts.
10. Powder does not spray when gun triggered, powder LED off, display reads 00	Powder not suitable for tribo-charging	Contact your powder supplier.
	Poor cable connection, cable trigger circuit open, trigger switch failed	Check cable connection. Check cable and trigger switch as described in gun manual.
	J3 plug connector loose or incorrectly wired	Check J3 connection and wiring.

5. Troubleshooting (contd.)

Problem	Possible Cause	Corrective Action
11. Powder flows when unit is turned on, gun not triggered	S7 set to CONT (continuous)	Set S7 to TRIG (trigger).
	Gun trigger switch stuck in closed position	Check switch.
	Cable trigger wires shorted to ground	Check cable.
	J3 plug connector incorrectly wired	Check wiring. See Figure 5.
12. Powder continues to flow when power is turned off	Solenoid valve exhaust vent plugged	Make sure exhaust vent is open.
	Dirt in solenoid valve, valve stuck open	Replace valve. Check air supply for contamination.
	Solenoid valve spring broken	Replace solenoid valve.

5. Troubleshooting (contd.)

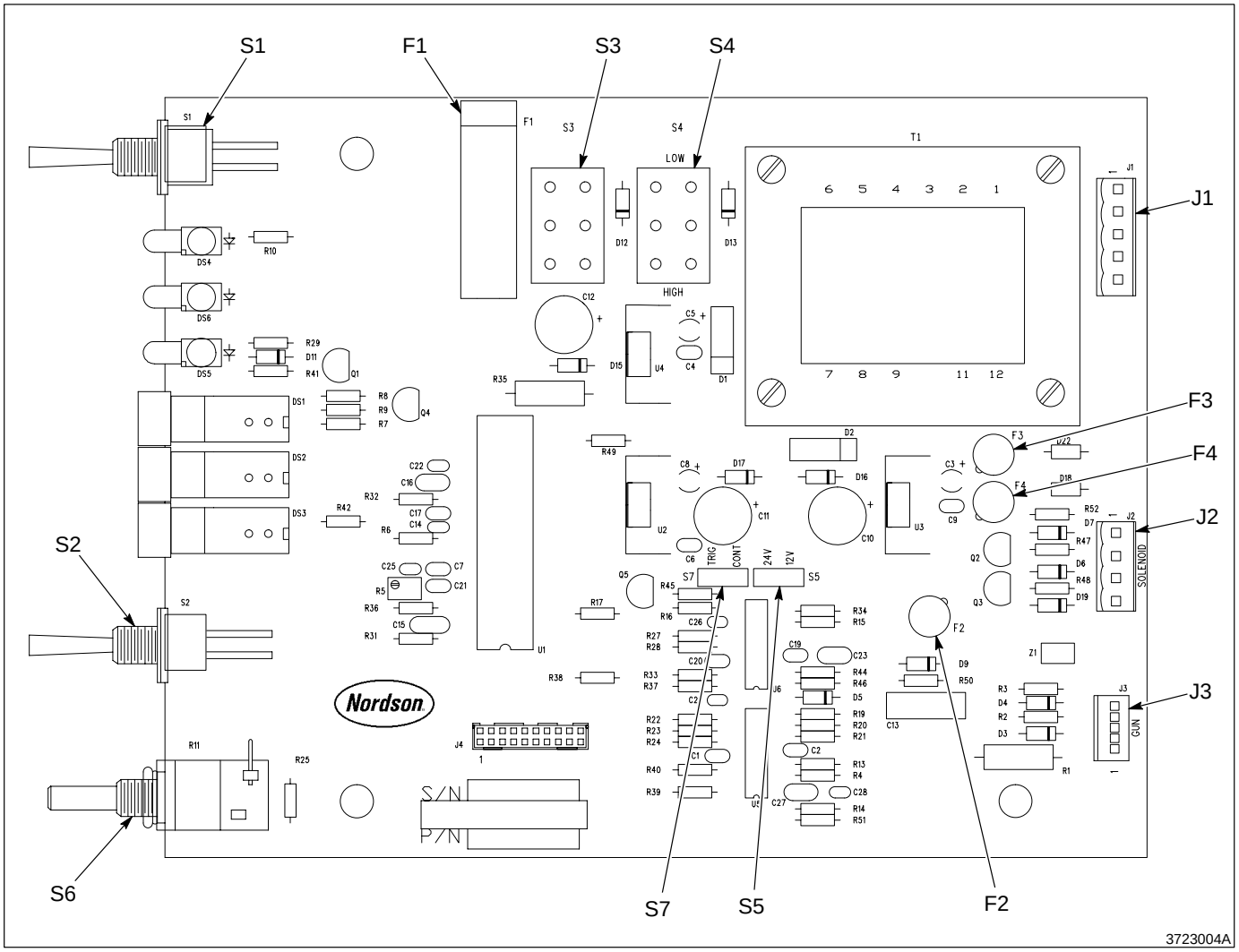

Fig. 4 Circuit board connectors, switches, and fuses

5. Troubleshooting (contd.)

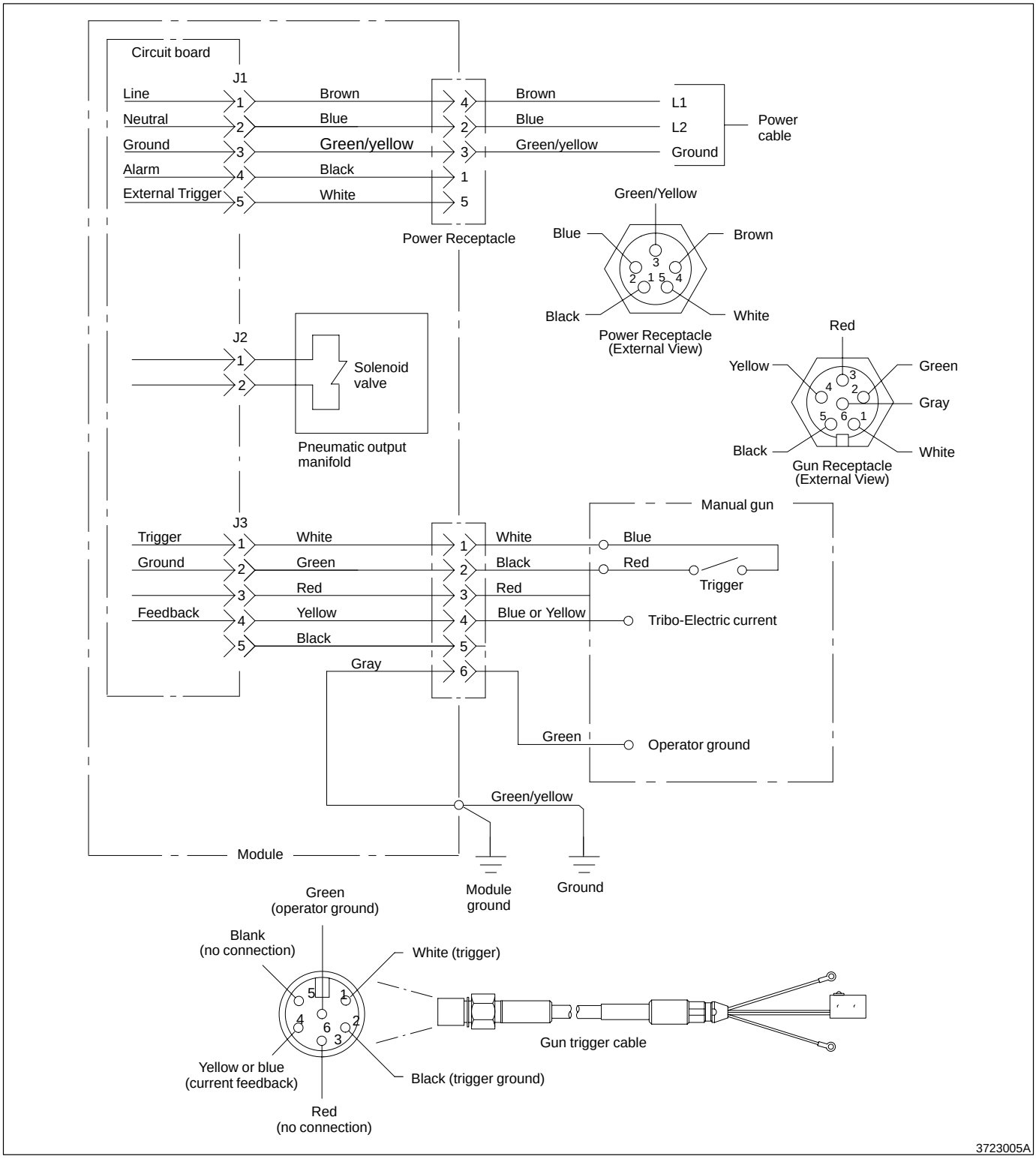

Fig. 5 Electrical schematic/wiring diagram

5. Troubleshooting (contd.)

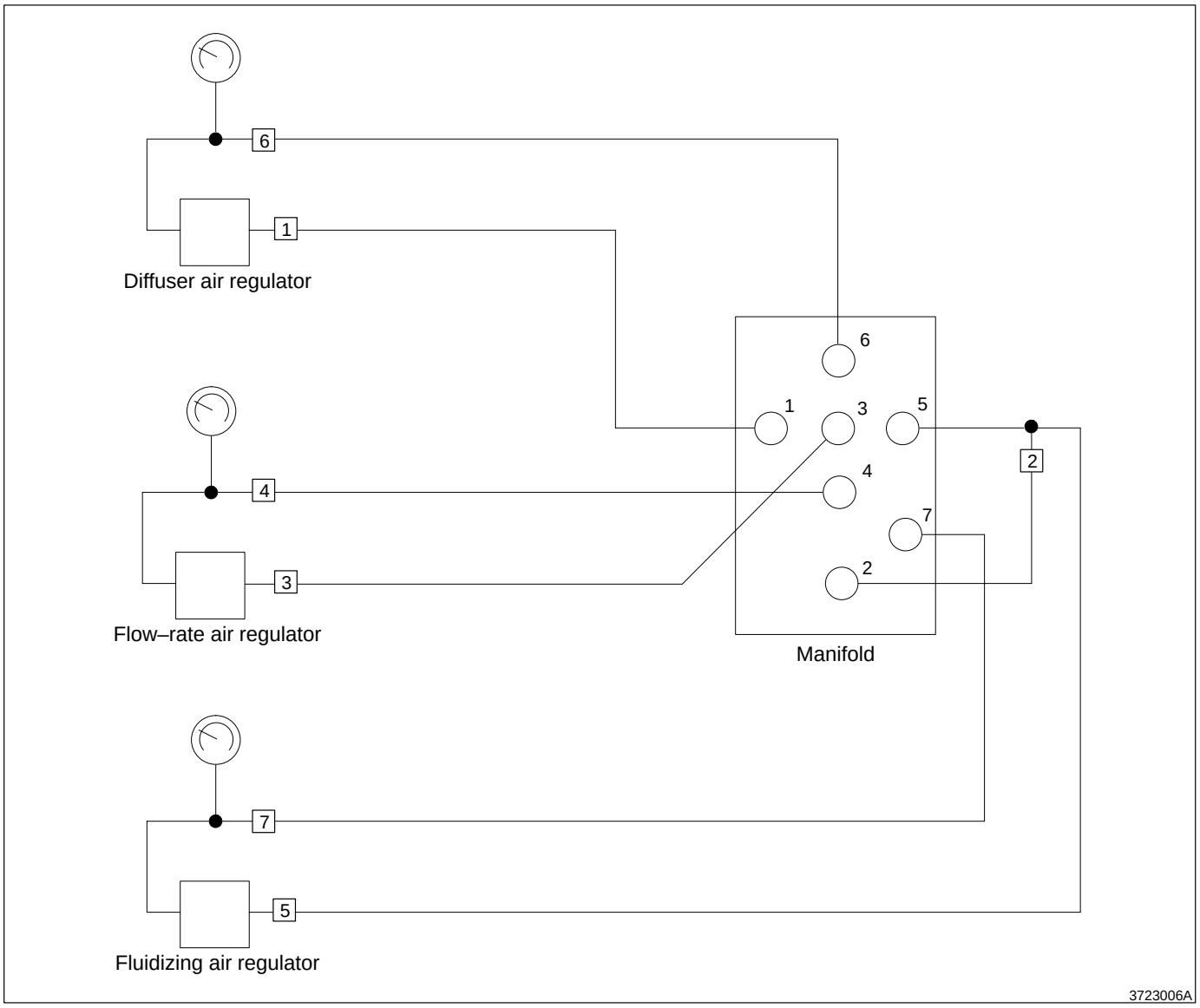

Fig. 6 Air tubing diagram

6. Parts

The following parts lists cover only the control module and the parts necessary to connect the module to the gun, pump, power supply, air supply, and ground. If you need parts for the gun, pump, or hopper, refer to the *Parts* sections in their manuals.

Miscellaneous Parts

Part	Description	Note
900 740	Tubing, polyurethane, 10-mm, blue	A
900 615	Tubing, polyethylene, 6-mm, black	A
900 586	Tubing, polyethylene, 6-mm, blue	A
900 549	Tubing, $^3/_8$-in I.D. (powder feed hose)	A
139 377	Wire, with clamp, ground	
130 629	Cable, power, 5-wire, 6.5-ft, female	B
933 050	Plug, 3-prong	B
972 125	Elbow, male, 10-mm x $^1/_4$-in BSPT	C

NOTE A: Order in 1-foot increments.
B: Cable not sold with plug installed.
C: Use to connect to air supply.

Control Module Parts

See Figure 7.

Item	Part	Description	Quantity	Note
1	173 088	Manifold, pneumatic output, 3-gauge, w/auxiliary	1	A
2	900 586	Tubing, polyethylene, 6 mm, blue	AR	B
3	972 840	Tee, male run, 6-mm tube x $^1/_8$-in. BSPT	3	
4	981 145	Screw, pan head, 1024 x 0.500 in.	2	
5	984 518	Nut, spring, type U, 1024	4	
6	163 431	Circuit board, Tribomatic II	1	
NS	939 991	• Fuse, 50-mA, 250-V, fast-acting (F2, 3, 4)	3	
NS	939 526	• Fuse, 375-mA, 250-V, fast-acting (F1)	1	
7	972 142	Elbow, male, 6-mm tube x $^1/_4$-in. BSPT	6	
8	141 603	Seal, panel, regulator	3	
9	185 298	Spacer, potentiometer, VS2/T2	1	
10	248 741	Seal, shaft, rotary	1	
11	129 593	Knob, collet, 21-mm, $^1/_4$-in shaft	1	
12	129 585	Cap, flat, 21-mm, w/curved arrow	1	
13	901 444	Regulator, air, 5125 psi, $^1/_4$-in. NPT	3	
14	901 267	Gauge, air, 07 bar, 0100 psi	3	
15	631 138	Gasket, gauge, 40-mm diameter, EPDM	3	
16	973 572	Coupling, pipe, hydraulic, $^1/_8$-in. NPT	3	
17	982 239	Screw, fillet head, slotted, M5 x 10	2	
18	983 401	Washer, lock, split, M5	5	
19	173 113	Gasket, manifold, 3-valve	3	
20	982 564	Screw, oval head, 1024 x $^5/_8$-in.	2	
21	982 428	Screw, pan head, slotted, M5 x 20	1	
22	984 702	Nut, hex, M5, brass	2	
23	983 021	Washer, flat, 0.203 x 0.406 x 0.040-in.	1	
24	185 299	Spacer, potentiometer	1	

NOTE A: See Figure 8 for parts breakdown.
B: Order in 1-foot increments.
AR: As Required
NS: Not Shown

Continued on next page

Control Module Parts *(contd.)*

Item	Part	Description	Quantity	Note
NS	130 625	Receptacle, input, 5-wire, male (power)	1	
NS	933 343	Connector, plug, 5-position (power)	1	
NS	141 497	Receptacle, input, gun	1	
NS	939 122	Seal, conduit fitting, $^1/_2$-in.	2	
NS	984 526	Nut, lock, $^1/_2$-in. conduit	2	
NS: Not Shown				

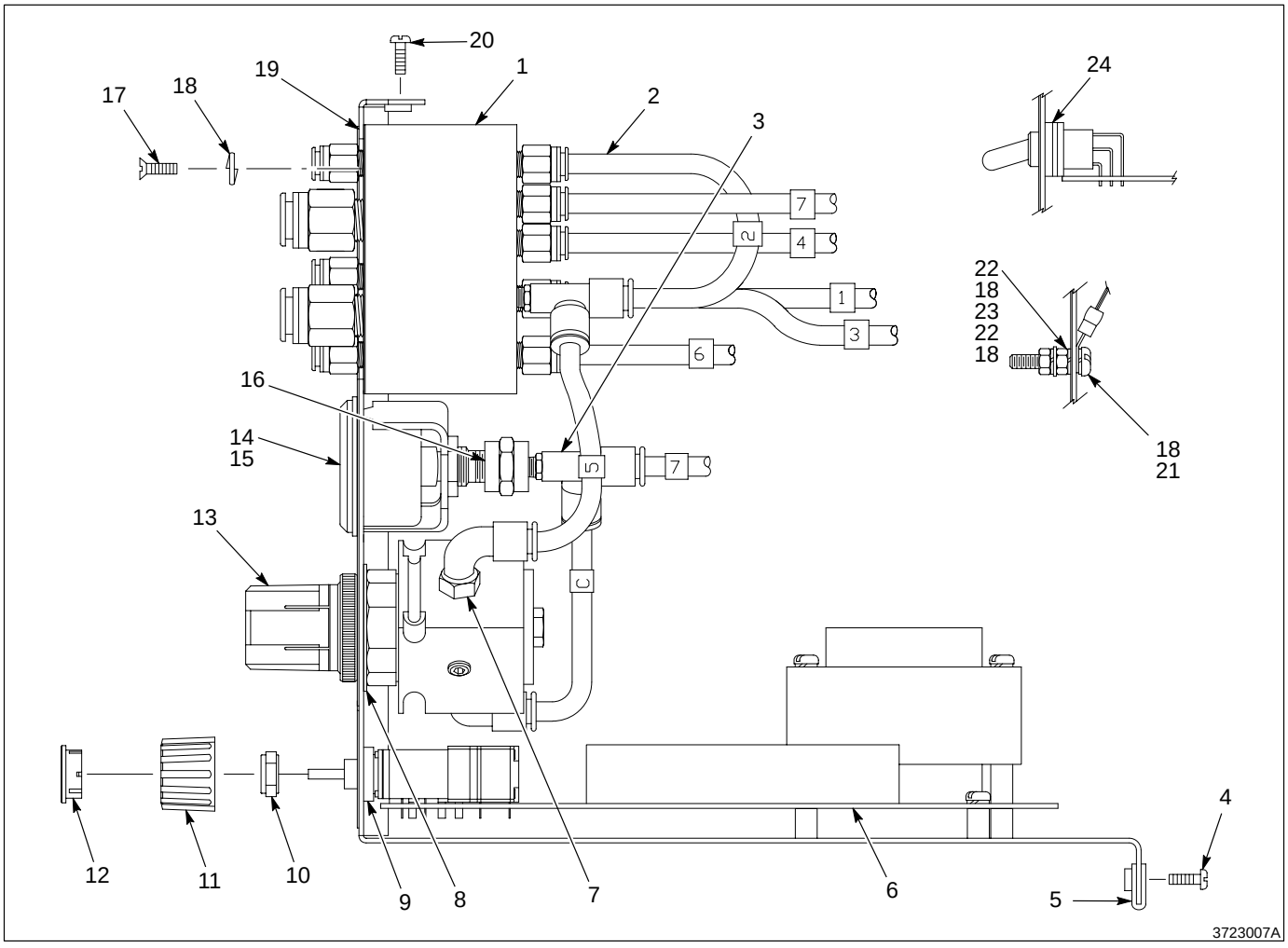

Fig. 7 Control module

Pneumatic Output Module Parts

See Figure 8.

Item	Part	Description	Quantity	Note
—	173 088	Manifold, pneumatic output, 3-gauge, w/auxiliary	1	
1	972 841	• Connector, male, 10-mm tube x $^1/_4$-in. BSPT	2	
2	173 114	• Manifold body, 3-valve	1	
3	972 141	• Connector, male, 6-mm tube x $^1/_8$-in BSPT	8	
4	972 840	• Tee, male run, 6-mm tube x $^1/_8$-in. BSPT	1	
5	248 716	• Valve, 3-way cartridge	2	
5A	173 123	• • Service kit, spring, cartridge valve, bag of 3	1	
6	173 116	• Gasket, manifold/pilot plate	1	
7	173 115	• Manifold, pilot plate	1	
8	335 241	• Connector, plug, 2-position	1	
9	129 503	• Valve, solenoid, 12-VDC, N.O.	1	
10	129 933	• Elbow, male, 1032 x $^1/_8$-in. I.D., barbed	1	
11	900 572	• Tubing, silicone, 0.093-in. ID. x 0.062-in. wall	AR	A
12	173 090	• Fitting, male, 1032 x $^1/_8$-in. I.D., barbed	1	
13	982 245	• Screw, pan head, M5 x 25	4	
14	983 401	• Washer, lock, split, M5	4	
15	973 402	• Plug, pipe, socket, flush, $^1/_8$-in. BSPT	1	

NOTE A: Order in 1-foot increments.
AR: As Required

Pneumatic Output Module
Parts (contd.)

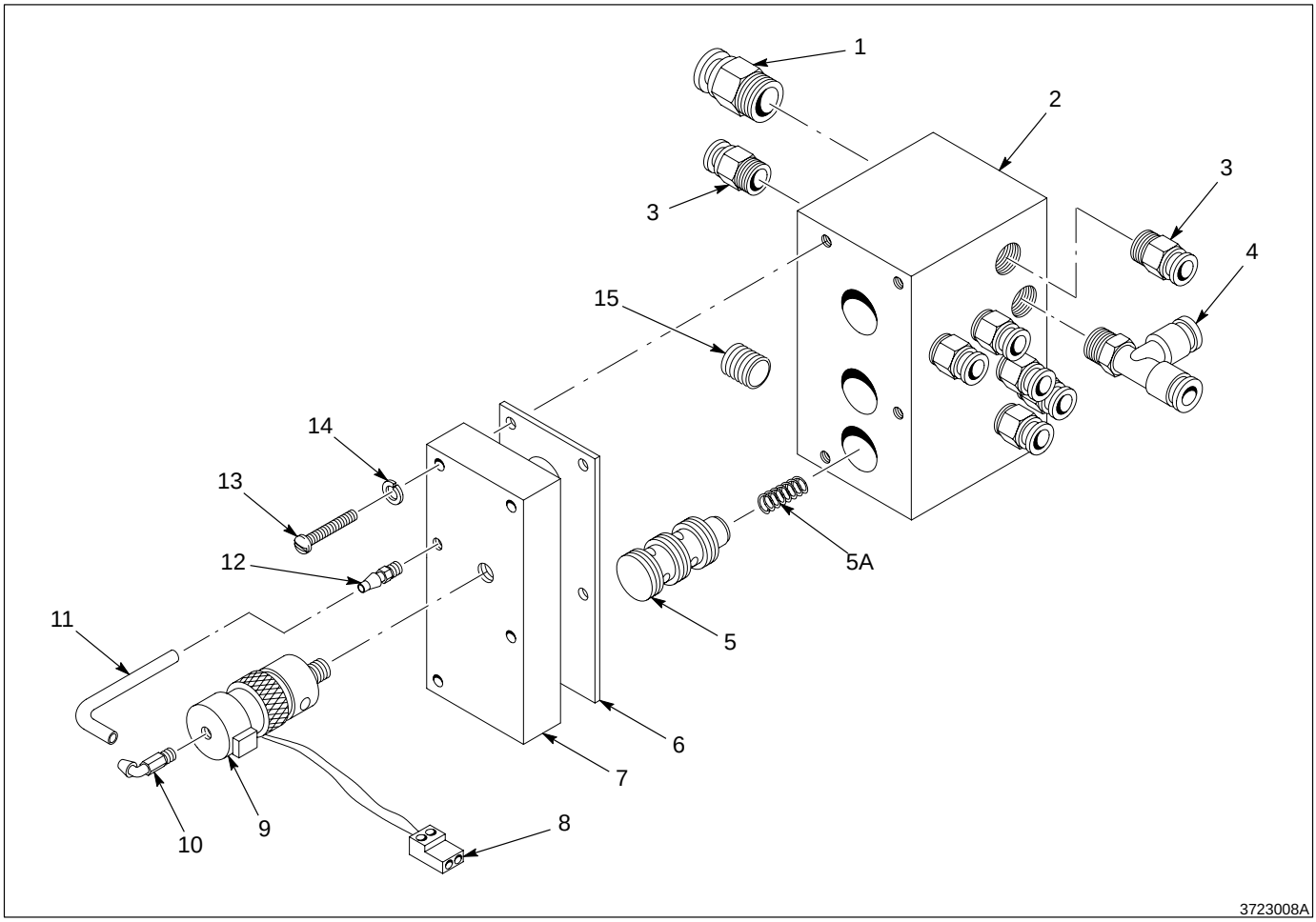

Fig. 8 Pneumatic output manifold