MANUAL NO. 37-11 ISSUED 9/90

TRIBOMATIC®
DEMO SYSTEM

PUBLICATION P/N 108 162

Nordson®

NORDSON CORPORATION

TABLE OF CONTENTS

Data and specifications included within this manual are accurate at the time of publication. Nordson Corporation reserves the right to change the contents of this manual and/or specifications without notice. Nordson Corporation welcomes requests for information, comments and inquiries about its products.

Address all correspondence to:

Nordson Corporation
555 Jackson Street
P.O. Box 151
Amherst, OH 44001
Telephone: (216) 988-9411

TRIBOMATIC DEMO SYSTEM

DESCRIPTION

The TRIBOMATIC Demo System is a complete tribo charging powder spray system contained in a sturdy traveling case. It is available with either an automatic gun or a handgun. The systems are equipped with a removable 2 liter hopper, powder spray gun and nozzle, powder feed tubing, a powder pump and suction tube, air tubing, trigger cable assembly, ground cable, and a female metric quick disconnect fitting for supply air.

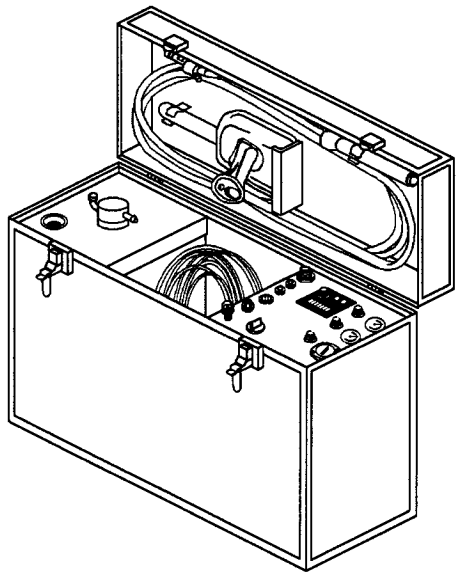

Figure 1 — TRIBOMATIC Demo System
(Handgun Version Shown)

The control console, built into the case, is equipped with air pressure regulators for pump air, diffuser air, and fluidizing air, gauges for pump air and diffuser air, LED vertical bar meter for indicating powder charge, and an adjustable low charge alarm. A voltage selector switch allows use of 100, 115, 200, 220, or 240 VAC input voltage.

The system uses electrical power to operate the charge meter and electro-pneumatic solenoid valves inside the control console. Air is routed to the fluidizing air regulator and into the plenum in the bottom of the hopper. The air is diffused through a porous plate into the powder supply, before being vented to the atmosphere through a filter screen. Air passing through the powder causes the powder to assume a fluid-like state, so that it can easily be pumped to the gun.

The powder is pumped by a venturi-type pump through the feed tubing into the diffuser, where the air-entrained powder stream is broken up before passing through the gun. As the powder passes through the gun, the particles pick up a positive charge. The gun is given a negative charge, which is returned to ground through the trigger cable assembly, control console, and console ground cable.

Weight of a complete system (with handgun) is approximately 25 lbs. (12 kg).

For more information refer to the following manuals:

- Manual No. 37-1 Automatic Gun
- Manual No. 37-6 Handgun
- Manual No. 37-7 Powder Pump

SET UP

Handgun Version

1. Open the case and remove the powder feed tubing, handgun, extension, diffuser, trigger cable assembly (gray cable with connectors, bundled with blue air tubing), black 4mm tubing, powder pump, and console ground cable.

2. Install the extension on the end of the gun. If the deflector is not already installed in the extension, insert the spider end of deflector into end of extension and press in until an approximately ¼-½ inch gap exists between the deflector and extension. This gap may be adjusted to obtain desired spray pattern during test spraying.

   Extension can be used with out deflector for small pattern and better penetration.

Note: An optional adapter is available which, when installed on the end of the handgun, allows automatic gun sprayheads to be used with the handgun. Refer to the handgun and automatic gun manuals for part numbers, or consult with your Nordson representative.

3. Install the diffuser into the gun handle until it bottoms out.

4. Remove the hopper from case. Fill the hopper ⅔ full with clean, dry powder.

5. Place the lid on the hopper. Install the blue suction tube into the pump adapter, and install the powder pump into the mounting on the hopper lid. Use a twisting motion to avoid damaging the O-rings on the pump adapter.

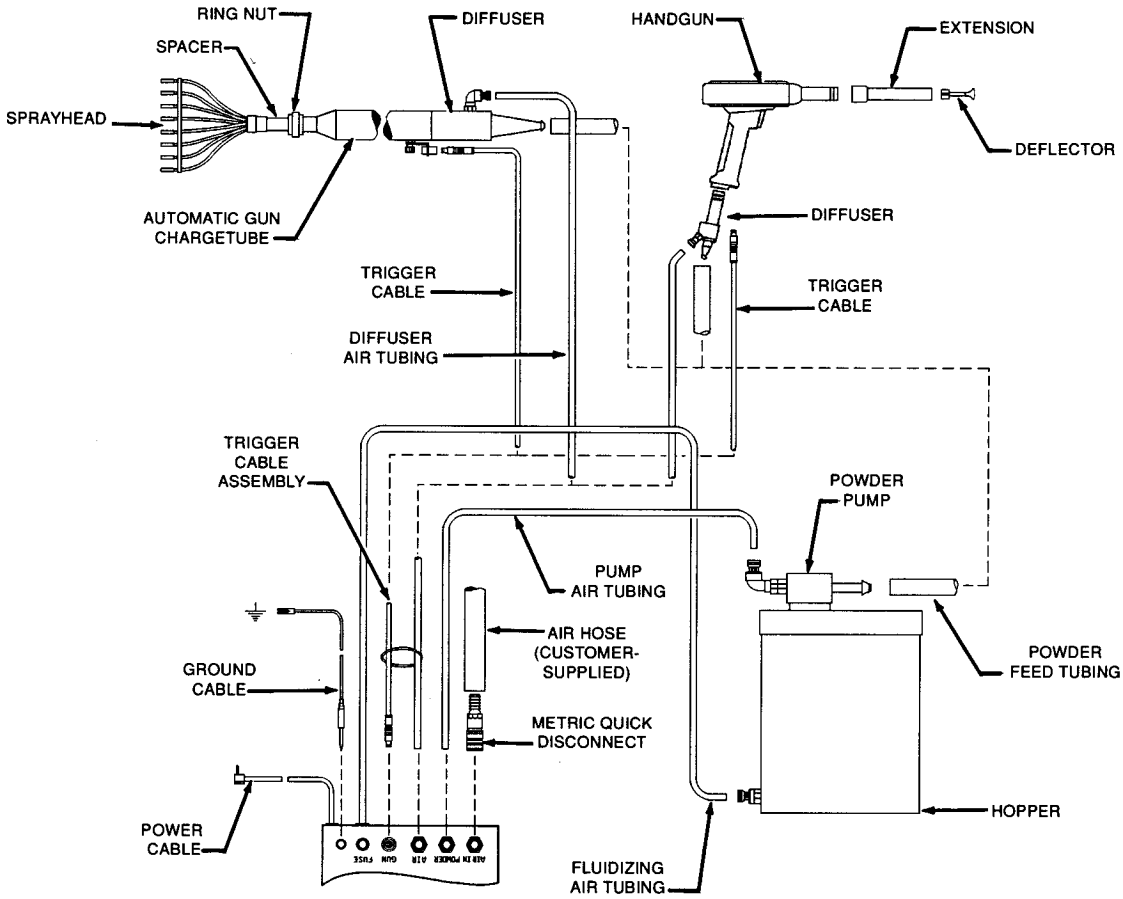

Figure 2 — Demo System Electrical & Pneumatic Connections

6. Connect a source of clean dry air, 100 PSI maximum, to the male metric quick disconnect on control console. A female metric quick disconnect is provided to install on a rubber air hose.

7. Make remainder of connections as shown in Figure 2.

- Fluidizing air tubing
- Pump air tubing
- Trigger cable assembly
- Powder feed tubing
- Power cable
- Console ground cable

8. Set the voltage selector switch to the correct input voltage and plug the power cable into an appropriate receptacle.

Automatic Gun Version

1. Install the spacer on the threaded end of the chargetube and secure in place with the ring nut.

2. Install the sprayhead on the end of the spacer.

Note: A variety of optional sprayheads and nozzles are available. Refer to the automatic gun manual.

3. Install the diffuser into the opposite end of the automatic gun.

4. Remove the hopper from the case. Fill the hopper ⅔ full with clean, dry powder.

5. Place the lid on the hopper. Install the blue suction tube into the pump adapter, and install the powder pump into the mounting on the hopper lid. Use a twisting motion to avoid damaging the O-rings on the pump adapter.

6. Make the following connections as shown in Figure 2:

- Fluidizing air tubing
- Pump air tubing
- Trigger cable assembly*
- Powder feed tubing
- Power cable
- Console ground cable

* The trigger cable assembly is used for both the handgun and the automatic gun. An adapter is provided with the automatic gun system. This adapter is secured to the automatic gun ground stud and the trigger cable is plugged into the adapter, to provide gun grounding and feedback to the charge meter. Refer to Figure 2.

7. Set the voltage selector switch to the correct input voltage and plug the power cable into an appropriate receptacle.

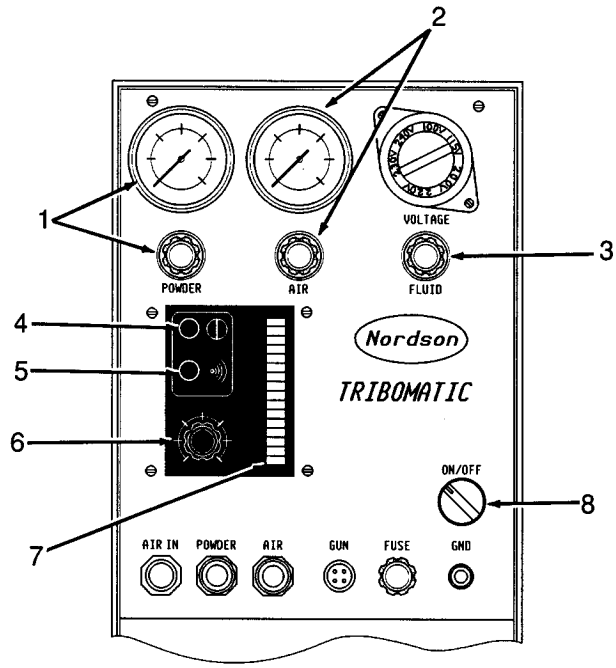

Figure 3 — Demo System Controls

OPERATION

Controls

1. Pump air pressure gauge and regulator
2. Diffuser air pressure gauge and regulator
3. Fluidizing air pressure regulator
4. Power ON indicator LED
5. Low charge alarm LED
6. Low charge alarm potentiometer
7. Vertical LED bar meter
8. Power On/Off Switch

1. Ensure air and power are available to the system.

WARNING! The console must always be grounded! If using an automatic gun, make sure the ground cable is connected from the gun to the console. If using a handgun, the operator must maintain skin contact with the metal portion of the handle. Failure to observe these warnings could result in a severe electrical shock.

2. Point the gun into powder booth, and ensure that the booth exhaust fans are on. If using an automtic gun, the gun should be clamped to a gun holder and positioned to spray into the booth. Gun holders are optional and must be ordered separately. Refer to the automatic gun manual for descriptions and part numbers.

3. Pull the air regulator knobs out to unlock and turn in a counterclockwise direction as far as possible. Do not force past the stop.

4. Turn the console on/off switch to the ON position.

5. Turn the fluidizing air regulator knob clockwise while watching the powder in hopper. The powder volume should increase and the powder should bubble slightly.

Automatic Gun:

Turn the "Powder", then "Air" regulator knobs clockwise to increase pressures to the suggested operating pressures. Powder will start flowing through the gun.

Handgun:

Turn the "Powder", then "Air" regulator knobs clockwise to increase pressures to the suggested operating pressures. Depress the gun trigger to start spraying powder.

Suggested Operating Pressures

Pump air pressure: approximately 2 bar (29 PSI)
Diffuser air pressure: approximately 3 bar (43 PSI)

Test spray the workpiece and adjust air pressures to the minimum required, while maintaining the same powder-to-air pressure ratio, to obtain the desired results. Keeping air pressures as low

as possible will minimize air consumption, powder usage, and wear of powder contact surfaces.

While spraying, adjust the low charge alarm potentiometer to set off the alarm if powder charging falls below the desired level.

MAINTENANCE

1. Remove powder from the hopper and clean with compressed air and a clean cloth. The exhaust vent may be removed from lid, soaked in a non-toxic solvent and blown clean with compressed air, if necessary.

2. Disconnect the powder feed and air tubing, disassemble the powder pump and clean all parts. Refer to the pump manual.

3. With the trigger cable assembly connected to the gun, and the console grounded, remove the diffuser and blow out the gun with compressed air.

WARNING! Do not blow out the gun without grounding the gun first. Without a ground connection, a potentially dangerous electrical charge could build up in the gun.

4. Disconnect the powder feed and air tubing, disassemble the diffuser and clean.

5. Place the end of the powder feed tubing in the booth and blow out the tubing with compressed air.

TROUBLESHOOTING

Problem:	Cause:	Correction:
Powder does not flow when gun triggered.	1. No air supply or pump air pressure set too low.	1. Check air supply to unit. Increase pump air pressure.
	2. Blockage in gun, feed tubing, or pump.	2. Disconnect feed tubing at gun, and blow out gun. Disconnect tubing at pump, and blow out tubing. Disassemble pump and clean.

Problem:	Cause:	Correction:
Powder does not flow when gun triggered (Cont.).	3. Poor trigger cable connection, trigger switch or main circuit board malfunction.	3. Check trigger cable connection. Trigger switch should click when depressed. Check, at gun handle, continuity between pins 1 & 3 with trigger depressed. If trigger switch has failed, ohmeter will show open circuit. Refer to Figure 3, Manual 37-6 for pin designations. Check for 24VDC across trigger leads at circuit board. Replace circuit board if voltage not present.
	4. Solenoid valve or main circuit board malfunction.	4. Check for air output from solenoid valves when gun triggered or, if using automatic gun, when unit is turned on. Replace valve if valve does not open. Voltage measured across solenoid leads should be 24VDC.
	5. Pump air pressure regulator malfunction.	5. Check for air output from regulator when solenoid valve is open.

Problem:	Cause:	Correction:
Powder puffing from gun.	1. Ratio of diffuser ("air") air to ejector ("pump") air is incorrect.	1. Refer to "OPERATION" for correct ratio.
	2. Diffuser filter clogged.	2. Disassemble diffuser and clean filter.
	3. Powder feed tubing too short.	3. Use longer tubing between pump and diffuser.

Problem:	Cause:	Correction:
Poor powder charging (no electrostatic wrap or adhesion).	1. Ejector pressure too high, results in high powder to air ratio, inefficient charging.	1. Reduce ejector air pressure while maintaining proper ejector-to-diffuser air pressure ratio.
	2. Workpiece not properly grounded.	2. Check workpiece ground with ohmmeter.
	3. Powder not suitable for tribocharging.	3. Consult with powder manufacturer.

Problem:	Cause:	Correction:
Inadequate powder flow.	1. Wet powder causing blockage in pump, feed tubing, diffuser or gun.	1. Check powder supply. An air dryer should be used to reduce pressure dewpoint of air. If powder is wet, remove from hopper and clean all "wetted" components.
	2. Poor fluidization of powder.	2. Increase or decrease fluidizing air pressure. Allow powder time to properly fluidize before beginning to spray.
	3. Ratio of diffuser-to-ejector air pressure incorrect.	3. Refer to "OPERATION" for correct ratio.

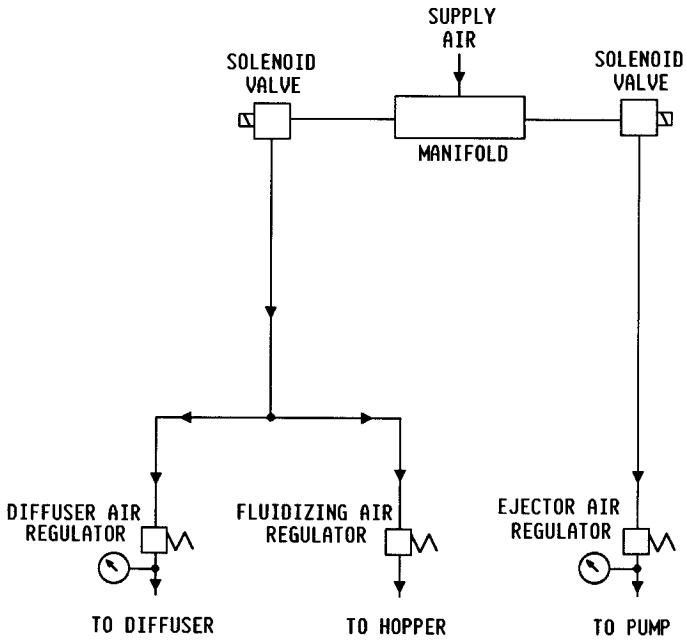

Figure 4 — Pneumatic Tubing Diagram

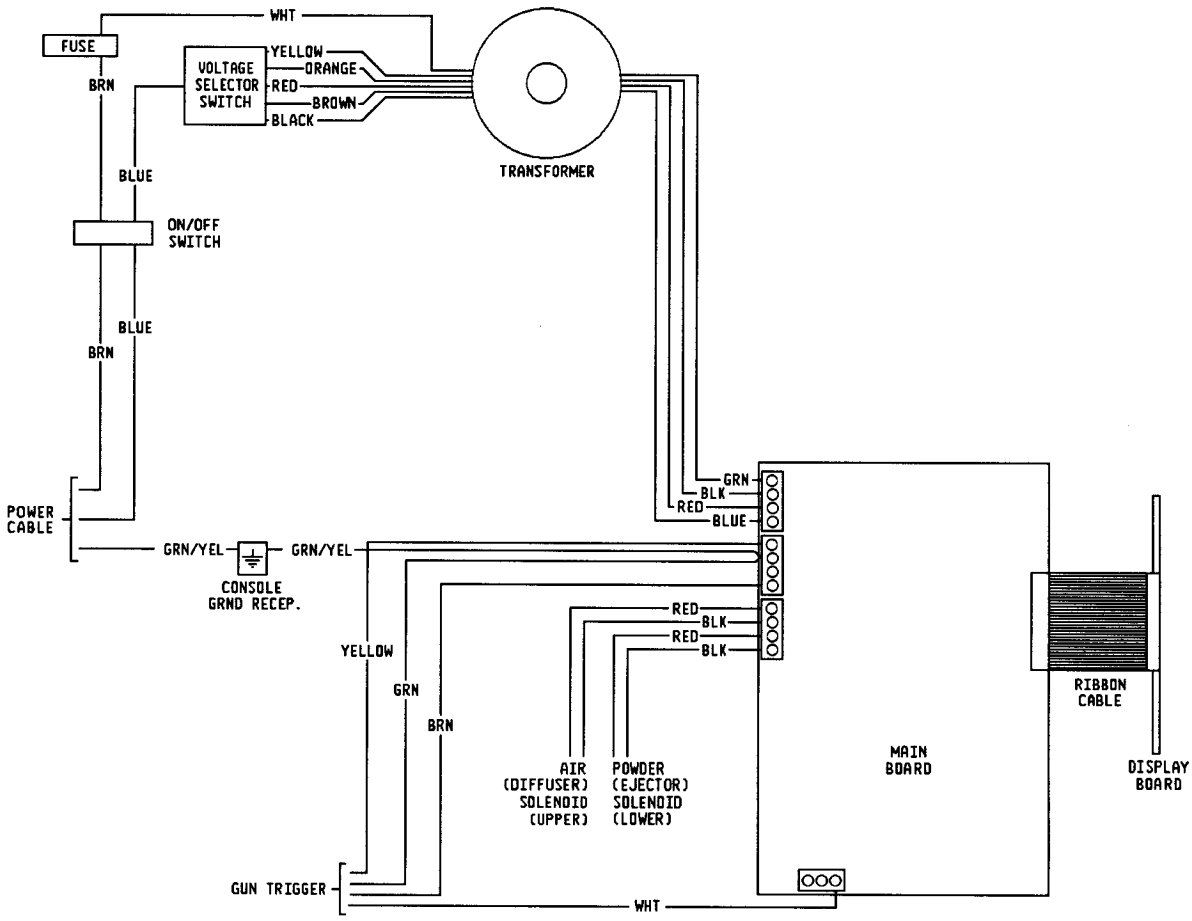

Figure 5 — Wiring Diagram

PARTS LISTS

Introduction

The parts lists included here cover the components included in each of the two systems available, and the replaceable parts of the control console. Refer to the gun and pump manuals for replacement parts for those components.

Using The Parts Lists

The number in the **REF.** column indicates the number assigned to the part in the illustration preceding the list. The code NS (Not Shown) is used for parts that are not included in the illustration. A dash (-) is used when the part number applies to all the parts in the illustration.

A letter in the **NOTE** column refers to a note below the parts list which gives additional information concerning that part. **Special attention should be given to noted parts.**

The six digit number in the **PART NO.** column is the Nordson Corporation part number assigned to that part. A series of dashes in this column means that the part cannot be ordered separately; it can only be obtained as part of the assembly or subassembly it is a component of.

The **DESCRIPTION** column gives the Nordson Corporation name of the part, together with its dimensions and other physical properties where appropriate, and is the name that should be used when ordering replacement parts. Indented parts are components of assemblies and/or subassemblies.

For example:

Ref.	Note	Part No.	Description	Qty.
-		000 000	Top Level Assembly	1
1	A	000 000	• Assembly or Part	2
2		000 000	• • Subassembly or Part	1

If you order item 1, items 2 & 3 will be included.
If you order item 2, item 3 will be included.
If you order item 3, you will receive item 3 only.

The number in the **QTY.** column is the quantity required per unit or assembly. When the quantity is not applicable, a dash will appear in the column. An "ASR" in the column means that the quantity required per installation should be ordered.

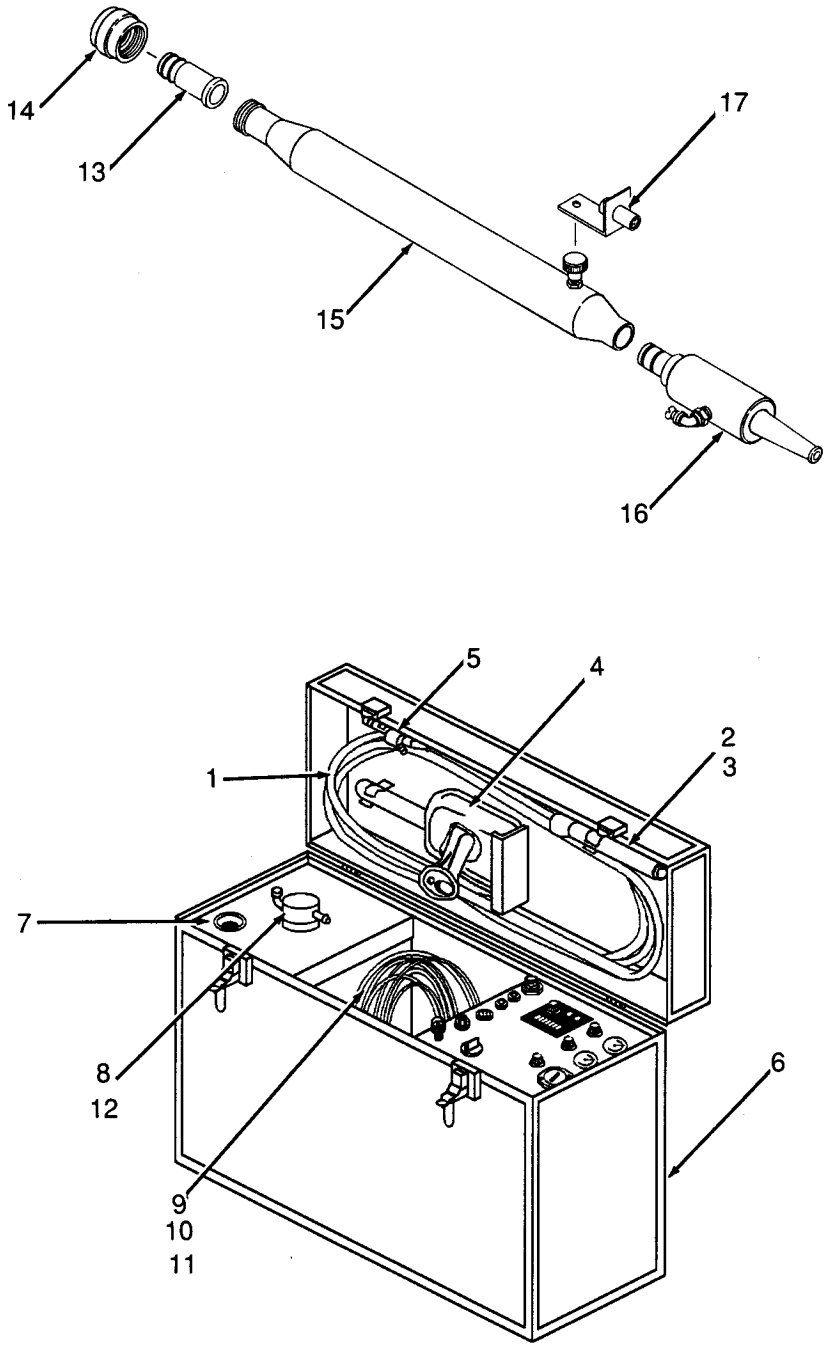

Figure 6 — Demo System Components

Demo System With Handgun

Ref.	Note	Part No.	Description	Qty.
-		630 650	System, Demo, Handgun	1
1		630 061	• Tubing, Powder Feed, 12mm(3 Meters)	1
2		630 402	• Extension, Handgun	1
NS		630 403	• Support, Deflector	1
3		630 404	• Deflector, Pen., 2,5mm	1
4		630 410	• Handgun, Gen. 2	1
5		630 425	• Diffuser, Handgun, Gen. 2	1
6		630 655	• Case, Demo Box, Complete	1
7		630 656	• Hopper, Powder, 2 Liter	1
8		630 657	• Tube, Suction, 2 Liter Hopper	1
9		630 848	• Cable, Trigger, Assembly	1
10		630 654	• Cable, Ground, w/Clamp	1
NS		630 215	• Coupling, Quick Disconnect	1
11		630 598	• Tubing, 4mm, Black (0.5 Meters)	1
12		630 034	• Pump, Powder	1

Demo System With Automatic Gun

Ref.	Note	Part No.	Description	Qty.
-		630 651	System, Demo, Automatic Gun	1
1		630 061	• Tubing, Powder Feed, 12mm (3 Meters)	1
6		630 655	• Case, Demo Box, Complete	1
7		630 656	• Hopper, Powder, 2 Liter	1
8		630 657	• Tube, Suction, 2 Liter Hopper	1
9		630 848	• Cable, Trigger, Assembly	1
10		630 654	• Cable, Ground, w/Clamp	1
11		630 598	• Tubing, 4mm, Black (0.5 Meters)	1
12		630 034	• Pump, Powder	1
NS		630 215	• Coupling, Quick Disconnect	1
13		630 011	• Spacer, L=82 mm	1
14		630 013	• Nut, Ring	1
15	A	630 014	• Chargetube, Tribomatic	1
NS		630 209	• Sprayhead, Fixed, 120mm	1
16		630 292	• Diffuser, Gun, Gen. 2	1
17		630 761	• Connector, Auto Gun, MSS	1

Note (A) - For rebuilt chargetube, order 630 015 Chargetube, RBX.

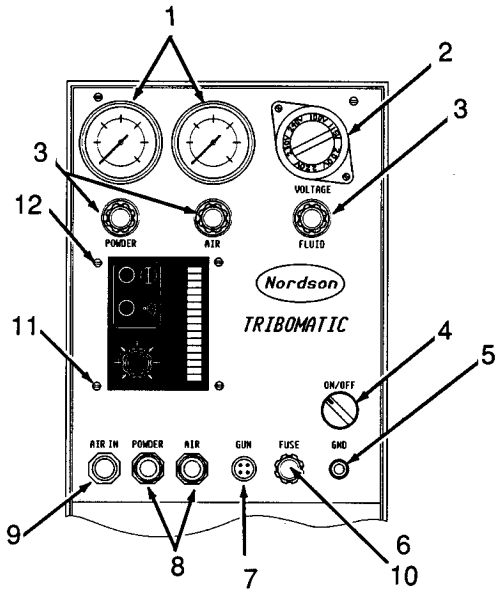

Figure 7 — Demo System Control Console

Console Parts List

Ref.	Note	Part No.	Description	Qty.
1		630 549	Gauge, 0-4 Bar, Dia. 40mm	2
2		630 577	Switch, Voltage Selector	1
3		630 570	Valve, Air Regulator	3
4		630 659	Switch, Power	1
5		630 768	Plug, Ground, Female	1
6		630 574	Holder, Fuse	1
7		630 558	Connector, Female	1
8		630 831	Union, Bulkhead, 4mm I.D.	2
9		630 521	Disconnect, Male, Supply Air	1
10		630 576	Fuse, 630 mA, 250V, Slow	1
11		630 838	Display Board Assembly	1
NS		630 840	• Knob	1
NS		630 839	• Window	1
NS		630 841	• Board, Circuit, Display	1
12		982 080	Screw, M3 x 10mm, Black	6
NS		630 573	Board, Circuit	1
NS		630 827	Solenoid Valve Assembly	1
NS		630 853	• Gasket, Valve, Base	2
NS		630 829	• Solenoid Valve	2
NS		630 852	• • Gasket, Valve	1
NS	A	630 597	Tubing, 4mm, Blue	ASR
NS	A	630 599	Tubing, 6mm, Blue	ASR

Note (A) - Bulk quantity part number. Order in 1 meter increments.