



ROKIDE

Ceramic Rod Spray System

OPERATION AND MAINTENANCE MANUAL



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(Revision date 12/1/03)

I. OPERATING INSTRUCTIONS FOR THE ROKIDE SPRAY UNIT

NOTE : Read the following instructions carefully, and follow them completely to assure safe and efficient operation of this ROKIDE spray unit. Abide by the warning notes. They are for your protection. Failure to heed warnings may result in serious injury.

1.0 Introduction

The ROKIDE spray unit has been designed to spray ceramic rods efficiently with a minimum of controls.

The principle of the ROKIDE process is to spray molten ceramic particles by melting the end of a ceramic rod with an oxy-acetylene flame and projecting this molten material as droplets. The projection of these droplets is accomplished by a compressed air stream which surrounds the flame.

The spray unit has a number of features which makes its operation simple. However, the operator must take normal safety precautions related to the use of compressed gases and fuels, and the high temperature generated.

WARNING : The work place must have an adequate exhaust system for dust and ozone removal to protect the operator and bystanders from inhaling these contaminants. Operators and bystanders must use hearing protection (ear plugs - ear muffs) and goggles with a # 3 tinted lens to reduce the effects of noise and exposure to flying dust and other particles.

2.0 Auxiliary Equipment

A. Acetylene Tanks

The fuel used with this ROKIDE spray unit is acetylene.

Before attaching the regulator to the acetylene tank, open the tank valve very slightly and release a small amount of gas to blow out any dust or foreign material that may have collected in the valve exhaust port.

WARNING: Acetylene is a combustible gas when ignited. This operation should be done with the exhaust system on with no smoking or open flame in the area.

Next, attach the regulator to the tank with the valve closed, pulling the attaching nut up tight while holding the regulator in an upright position. The regulator adjustment screw should be turned outward counter clockwise until there is no spring pressure against the screw. Refer to Fig 1. It is recommended that two or more tanks be manifolded together to provide the optimum operating conditions.

B. Oxygen Tanks

Open the valve of the oxygen tank very carefully and release a small amount of oxygen for the same reason described in section A. Then attach the regulator to the tank, with the valve closed, pulling the attaching nut up tight while holding the regulator in an upright position. The regulator adjustment screw should be turned outward counter clockwise until there is no spring pressure against the screw. Refer to Fig .2.

WARNING: Attach all compressed gas cylinders firmly to stationary fixtures. Cylinders upon falling may release gas and cause severe injury through explosion or by being jet-driven.

Figure 1
Acetylene Tanks

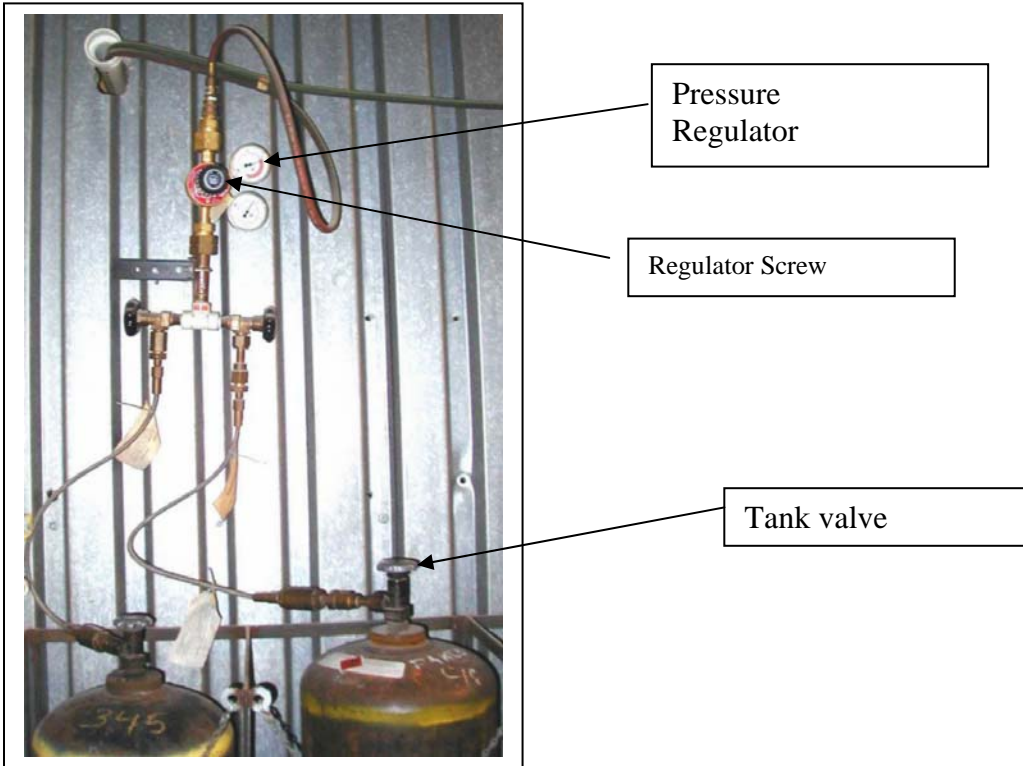
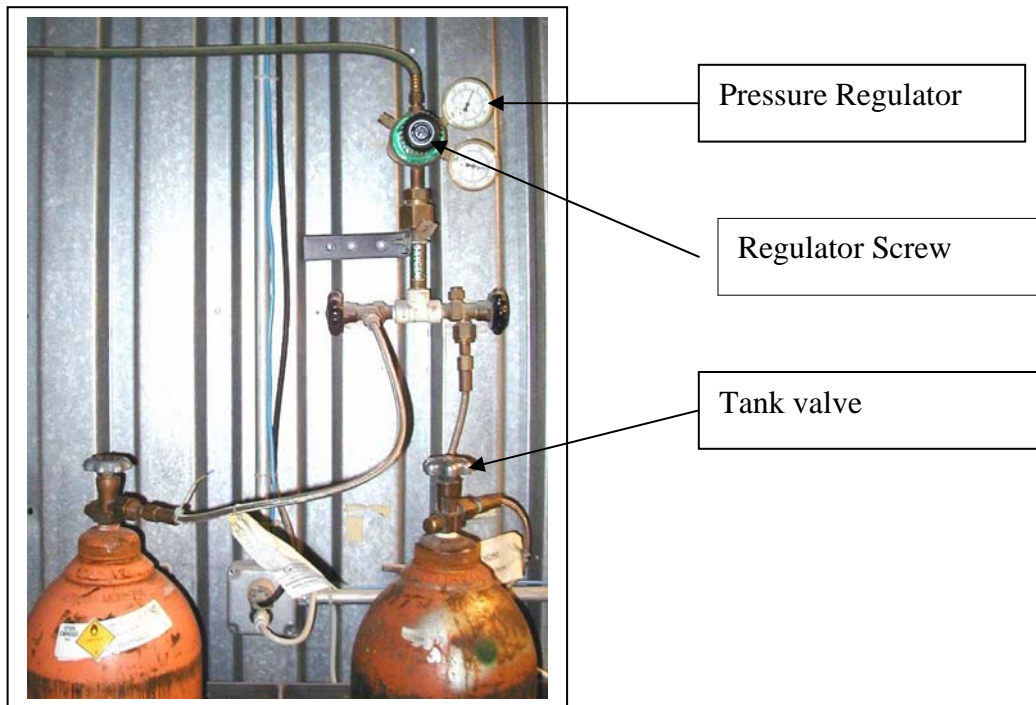


Figure 2
Oxygen Tanks



C. Hoses

Three hoses are needed to carry the gases to the spray unit.

The acetylene hose is red in color and has a left hand threaded split nut.

The oxygen hose is green with a right hand threaded full nut.

The air hose is black with a right hand threaded full nut. A 3/8 " (9.5 mm) minimum inside diameter is recommended.

CAUTION: Standard hoses are 12-1/2 ft. (3.8 M) in length. If hoses are shortened for any reason, make sure the correct fitting goes into the proper color coded hose.

D. Flow Meter

Mount the flow meter vertically with the inlet fittings at the bottom and the outlet fittings at the top. See Fig 3 . Also have the flow meter positioned close enough to the work station so that the operator can check the ball settings periodically during the coating operation.

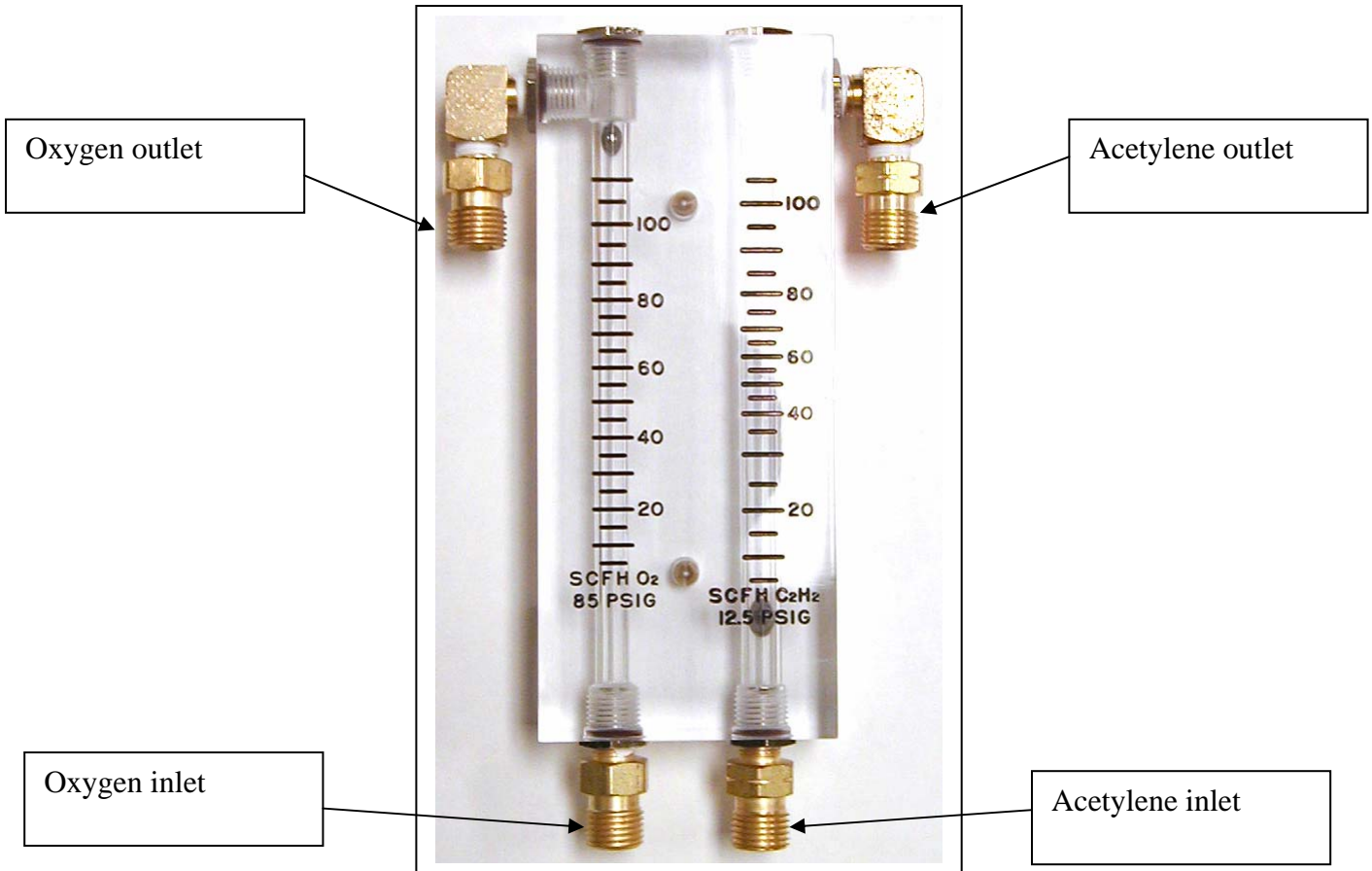
Connect one end of the oxygen hose (green) to the oxygen tank regulator and the other end to the left bottom (inlet) of the flow meter.

Then connect one end of the acetylene hose (red) to the acetylene tank regulator and the other end to the right bottom (inlet) of the flow meter.

Next, connect a new set of oxygen and acetylene hoses to the outlet sides of the flow meter (upper left for oxygen , upper right for acetylene). The acetylene hose should then be connected to the acetylene coupling at the center of the spray unit base. Then, the oxygen hose can be connected to the oxygen coupling as marked on the base of the spray unit.

WARNING: Make sure all gas connections, hoses, and equipment are leak free. Leaking gas can cause fire or possible explosion.

Figure 3



Screw size: 10-32.

E. Air

Any facility using the ROKIDE spray unit must be equipped with a source of compressed air capable of having a continuous volume at 100 cu.ft./min (2.83 ³/min) @ 85 psi (5.6 bar). Connect one end of the air hose (black) to the outlet side of an air filter and regulator, attach the other end of the air hose to the air inlet coupling as marked on the base of the spray unit. See schematic Fig. 4 and Fig. 5.

<u>Flow Meter Reading</u>		
Left Tube		Right Tube
Oxygen	read bottom of balls on flow meter	Acetylene
90+		60+

Figure 4

ASSEMBLY OF FACILITY FOR ROKIDE

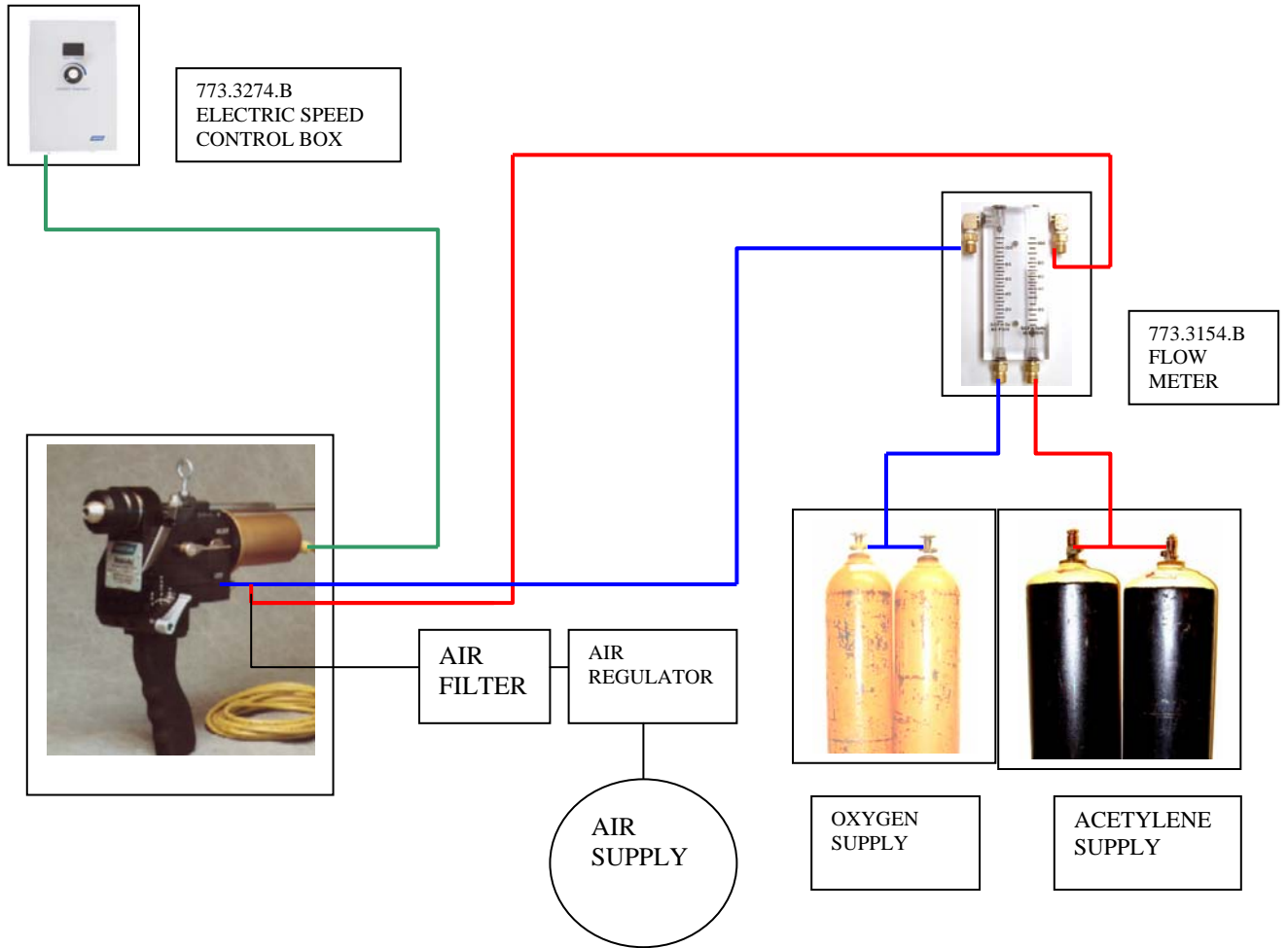


Figure 5

Warning : Only use clean dry air



F. Gas and Air Settings

Open the air, oxygen and acetylene valves; then set the regulators to the pressure values shown on the operating chart (Table A).

The acetylene valve should be opened only 1-1/2 turns.
The oxygen and air valves should be opened to their fullest extent.

WARNING: Do not use acetylene at greater than 15 psi (1.1 Bar) gauge pressure. Acetylene at higher pressures becomes dangerously unstable resulting in possible fire or explosion.

Table A

Regulator Pressure

Acetylene	Oxygen	Air
15 psi	90 psi	80 psi
(1.1 Bar)	(6.4 Bar)	(5.7 Bar)

3.0 Lighting and Operation

A. Procedure

Move trigger handle (26) to “ON” position on the spray unit fully to relieve any pressure buildup in the hose that may have taken place when turning on the tanks, then turn off by moving trigger handle to the "OFF" position. See Figure 6.

Next, insert a rod into the guide tube from the rear of the spray unit, through the drive rolls, into the gas head, continuing on until the forward end of the rod is flush with the end of the nozzle. (See Fig 7 & 8).

Now lock the rod in this position with the drive rolls and locking handle shown in Fig. 9.

CAUTION:

If a rod is not locked in, back pressure will cause rod to project backwards out of the spray unit.

WARNING: If rod is not locked in place and spray unit is lit, flame will follow the rod backward causing damage to spray unit parts and possible injury to operator. If this occurs, shut off spray unit immediately by moving trigger handle to the "OFF" position.

Figure 6



Unit shown in the “ON” Position

B. Lighting the spray Unit

1. Move Trigger Handle to the "LITE" position and you can see the acetylene ball rises off the seat in the flow meter.
2. Strike a spark lighter in front of the spray unit to light the acetylene gas.
3. Move trigger Handle to the "ON" position, in a slow and deliberate movement.

CAUTION: Do not move trigger handle to the "ON" position with a fast motion. This will cause the flame to extinguish.

Figure 7

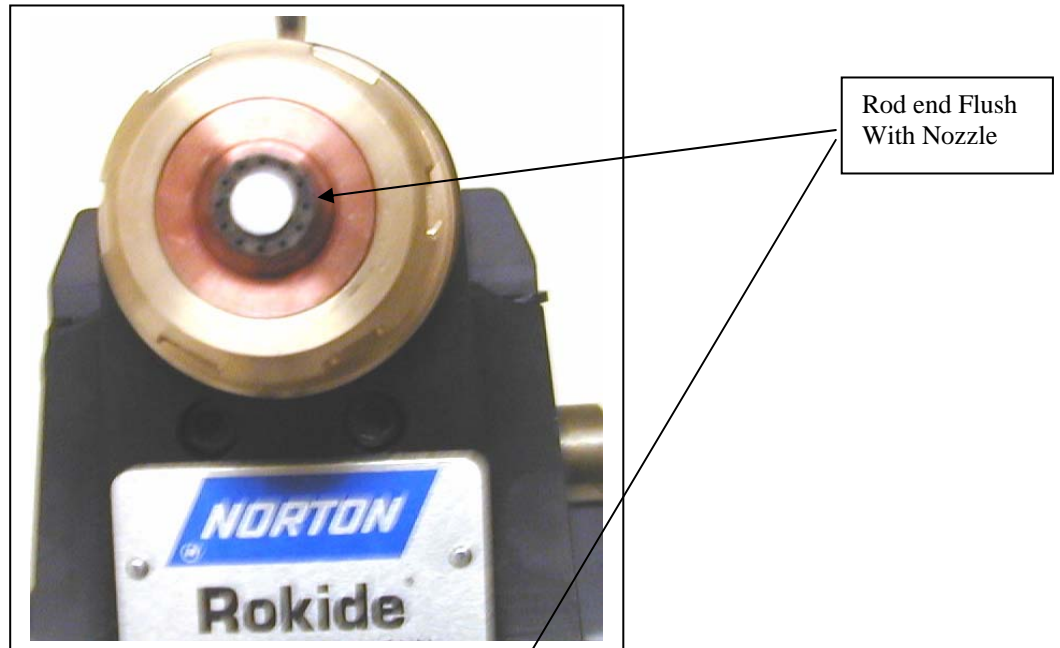
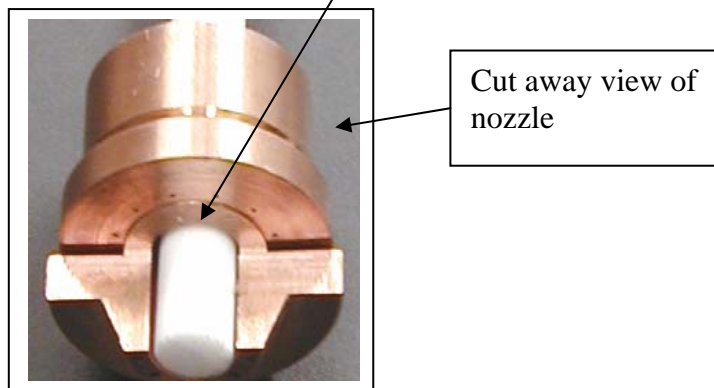


Figure 8

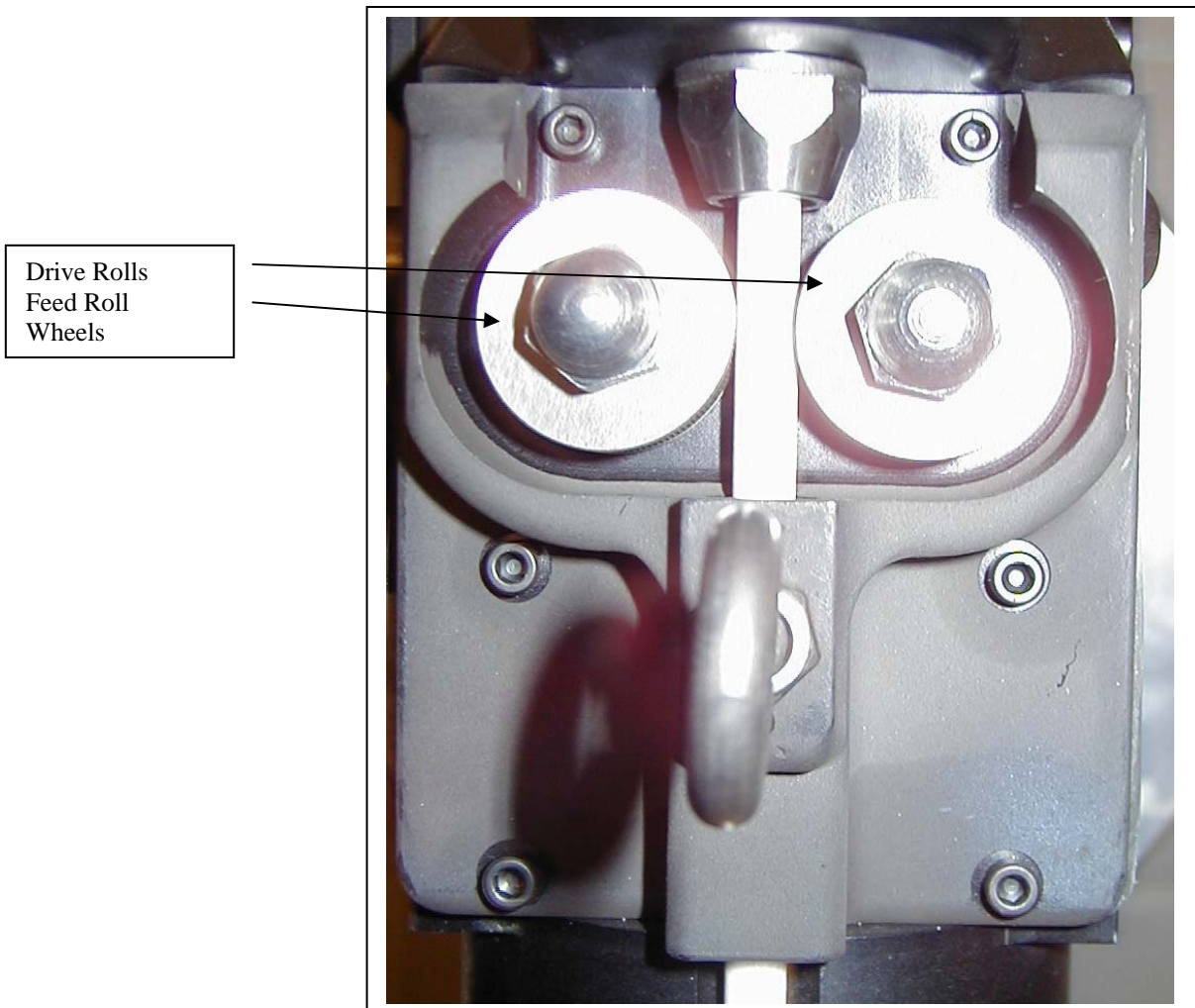


The spray unit is now in full ignition. Check the flow meter and verify the values are as described in the operating chart (Table B) below.

Table B

<u>Flow Meter Reading</u>		
Left Tube		Right Tube
Oxygen	read bottom of balls on flow meter	Acetylene
90+		60+

Figure 9

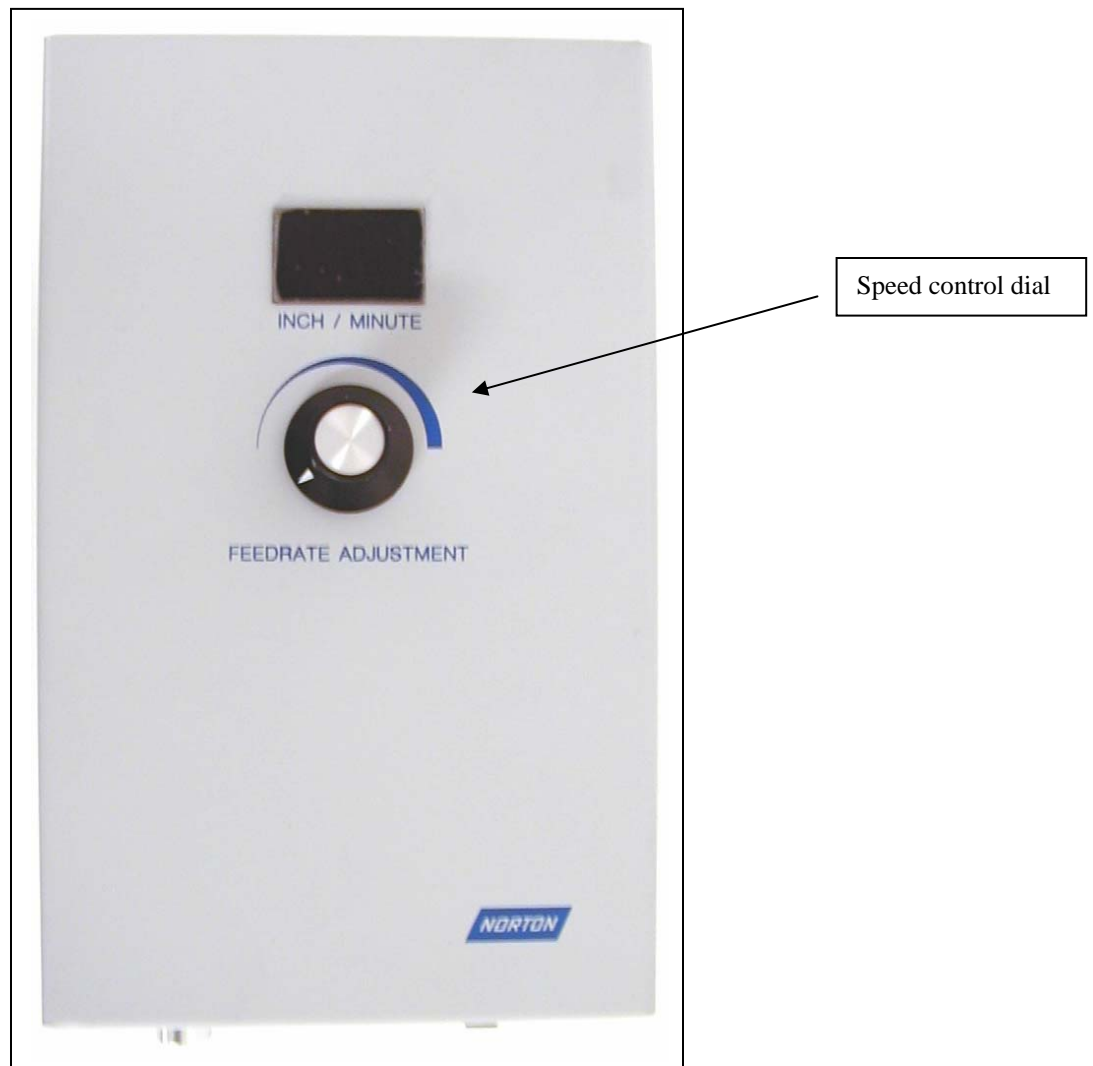


C. Rod Feed

The best coating results are obtained when the droplets in the spray stream are at their finest. This is achieved by controlling the speed of the rod as it passes through the flame, using the speed control dial. See Fig. 10.


To obtain the finest spray stream, first increase the speed of the rod through the spray unit until the first sign of spitting occurs, then reduce the speed of the spray unit until spitting stops. Now proceed to coat.

Figure 10
Speed Control Dial



Note: See ROKIDE Rod Spray Data Sheet for Rod Feed Rate on next page.

ROKIDE ROD SPRAY DATA

		Rod Feed Rate		Deposit Efficiency	Lay Down Rate		Standoff Distance	
		In./min.	Cm/min	%	Lbs./hr	Kg/hr.	inches	cm
ROKIDE A	3/16 x 24	7-8	18-20	79	1.2	.55	4	10
	1/4 x 24	6-7	15-18	73	1.6	.73	4	10
	5/16 x 24	6-7	15-18	77	1.8	.82	4	10
ROKIDE MBA	1/4 x 24	7-8	18-20	71	1.3	.59	3-3.5	8-9
ROKIDE HPA	1/4x 18	3-4	8-10	78	.50	.23	4	10
	1/4x 24	3-4	8-10	78	.50	.23	4	10
ROKIDE AZ/4	1/4x 18	3-4	8-10	78	.50	.23	4	10
ROKIDE C	3/16 x 24	5-6	13-15	55	.62	.28	4	10
	1/4 x 24	4-5	10-13	51	.75	.34	4	10
	5/16 x 24	4-5	10-13	57	1.2	.55	4	10
ROKIDE MBC	1/4x 24	8-10	20-25	48	1.25	.57	3-3.5	8-9
	5/16 x 24	8-10	20-25	58	2.1	.95	3-3.5	8-9
ROKIDE Z	3/16 x 24	5-6	13-15	52	.60	.27	4	10
	1/4 x 24	4-5	10-13	48	.60	.27	4	10
ROKIDE Zs	3/16 x 24	7-8	18-20	72	1.5	.68	4	10
	1/4 x 14	6-7	15-18	74	1.8	.82	4	10
ROKIDE MA	1/4 x 24	5-6	13-15	78	.82	.37	4	10
ROKIDE MBAT 97/3	1/4 x 24	7-8	18-20	50	.72	.33	3-3.5	8-9
ROKIDE MBAT 87/13	1/4 x 24	10-12	25-30	75	1.7	.77	3-3.5	8-9
ROKIDE MBAT 60/40	1/4 x 24	7-8	18-20	63	.82	.37	3-3.5	8-9
ROKIDE MZ	1/4 x 24	6-7	15-18	54	.62	.28	4	10
ROKIDE EZ	3/16 x 24	5-6	13-15	52	.60	.27	4	10
	1/4 x 24	4-5	10-13	48	.60	.27	4	10

WARNING:

Keep hands and other parts of the body away from flame and the metal parts at the front end of the spray unit. High temperature of flame and parts will cause burns.

Use protective goggles with a #3 tinted glass to relieve eye fatigue caused by glare of the spray, and to protect against eye injury from flying dust particles.

Proper hearing protection is a must. While operating, the ROKIDE spray unit produces a sound level of 104 - 114 dbA. Persons (operators and bystanders) exposed to sound at this level may suffer permanent hearing damage unless the sound is attenuated by use of proper hearing protectors.

WARNING:

The burning gases emit ozone which can cause nausea and severe headaches. The exhaust system at the work station must move enough air past the spray unit and the operator to remove the ozone from the work area.

4.0 Shutdown

To stop the spray unit from spraying, move the trigger handle to the "OFF" position. This action will automatically stop the flow of gases and shut off the flame. The on/off button on the back of the electric motor stops forward progress of the rod. See Figure IX.

To shut off the acetylene and oxygen gases, turn the tank valves clockwise until they are tight.

Shut the air valve off in accordance to the type in use e.g. ball valve, push button, etc.

Move trigger handle to the "ON" position to relieve the gas pressures in the lines.

When the gauges register zero, back off the regulator screws counter clockwise.

WARNING:

After continuous use and spray unit has been turned off, do not touch area around air cap. Temperature can be high enough to cause discomfort.

NOTE: This ROKIDE spray unit Maintenance Manual has been prepared to provide you with a program for maintaining a safe, reliable ROKIDE spray unit.

II. PREVENTIVE MAINTENANCE

1.0 Combustion Head

- 1.1 In Figure I - "O" Rings (7-8-9) in Mixing Head (3) should be checked whenever replacing nozzle; replace if worn or nicked.

NOTE: To avoid "O" Ring leakage or damage to the "O" Rings in mixing head, clean the outside of the gas nozzle each time it is removed before reinserting into mixing head.

CAUTION: Never use Versilube G322L silicone grease to lubricate "O" Rings. Use "O" Ring lubricant Dow #5.

2.0 Gear Case

- 2.1 Periodically (3 - 6 months dependent on number of hours spray unit is in actual operation) check grease and add if necessary.
- 2.2 Checking or adding grease can be accomplished by removing the top or bottom covers of the gear case body.
- 2.3 Prior to adding lubrication, check all worm gears and counter shafts for wear, replace when worn. Check and tighten set screws in worm gears if loose.

Use only Versilube G322L silicone grease supplied with spray unit.

3.0 Feed Rolls – Figure 9

- 3.1 Check feed rolls for damage and replace if necessary.

III. TROUBLE SHOOTING

1.0 Air Cap (brass) (1) - Figure I

Problem

- a) Whistling
- b) Coarse spark stream
- c) Melting of air cap
- d) Melting of air cap in one spot on inside diameter

Cause (s)

- a) Clogged air cap
- b) Clogged cap or lack of proper air pressure
- c) Failure to turn on air supply
- d) .019 hole (0.5 MM) in mixing head is plugged

Correction

- a) Clean air cap with double 0 steel wool. If air cap is badly pitted on the ID, replace.
- b) Same as above, use air pressure of 80 psi (5.7 Bar).
- c) Always make sure air supply is turned on prior to lighting the spray unit.
- d) Scrape out residue and unplug hole with .017 (.43 MM) drill.

2.0 Nozzle (2) - Figure I

Problem

- a) Ignites for few seconds then blows out
- b) Does not reach recommended flow meter readings
- c) Rod sticking

Cause (s)

- a) Moving trigger handle too swiftly, nozzle gas holes enlarged beyond usefulness.
- b) Blockage in gas holes.
- c) Nozzle liner worn.

Correction

- a) Move trigger handle in a slow motion; replace with new nozzle.
- b) Replace with new nozzle.
- c) Replace nozzle liner or replace with new nozzle.

3.0 Mixing Head (3) - Figure I

- 3.1 Check "O" Rings (7, 8 and 9) whenever cleaning or replacing nozzle; replace if worn or nicked. Clean "O" Ring grooves before installing new "O" Rings. No special tools are required to remove or insert mixing head "O" Rings.

IV DISASSEMBLY

1.0 Combustion Head - Figure II

The combustion head (7) can be removed from the gear case body by removing the four #10-24 socket head screws (2) located at front of Spray Unit. When the combustion head has been removed, it can then be disassembled as follows:

- 1.1 Remove the main body air cap (29) and brass air cap (35), then, remove the gas nozzle (15) with the nozzle puller supplied with Spray Unit. Next, unscrew combustion head rod guide (11), when this guide has been removed, the mixing head (10) can then be taken off the combustion head.
- 1.2 The bottom of the combustion head houses the combustion trigger body (12). This can be removed by unscrewing the four small #8-32 socket cap screws (36). As you pull the combustion trigger body away from the combustion head, remove gasket (31), valve spring (20) and the 1/8" steel ball (21). Three valves can be seen in the combustion trigger body when it is removed.

Note: Be sure not to lose the valve spring (20) and the 1/8" steel ball (21) when removing the trigger body.

- 1.3 Remove the air piston plug (24), oxygen piston plug (25) and the two piece acetylene piston made up of the inner acetylene piston pin (30) and outer acetylene piston plug w/hole (23). Once these are removed, all parts can be cleaned.
- 1.4 It is not necessary to disassemble the Combustion Head Assembly any further.

IV. DISASSEMBLY (continued)

2.0 Gear Case - Figure IV

Remove two acorn nuts (13) holding feed rolls (12), then remove feed rolls. Next, remove six - (7/64) (2.8 MM) socket screws (10) holding the gear case cover (7) to the gear case (33), then remove gear case cover and rubber gasket (6). Turn the gear case over, remove handle(1), then remove six - (9/64) (3.6 MM) socket set screws (54) along with the gear case base (49). To remove worm gears, bearings, counter shafts, etc., the following procedure should be followed:

- 2.1 Remove (3/16) (4.8 MM) button head screw (15) from side of gear case, then insert a (9/64) (3.6 MM) Allen wrench through the hole and remove the long screw (20) and feed roll springs (22).
- 2.2 Turn the gear case over. At the bottom of the feed roll shafts are two brass worm gears (14). Using a (5/64) (2.0 MM) Allen wrench, loosen the set screws (56) enough to remove the Feed Roll shafts (31 & 44), then the two worm gears.
- 2.3 To remove the feed roll control handle (53), feed roll handle shaft (46) and feed roll cam (39), remove the (3/32) (2.4 MM) set screw in the feed roll shaft collar (45) located just inside the gear case and in line with the feed roll cam. Then pull the handle and shaft out of the gear case. The cam will fall off the shaft and can be removed separately.
- 2.4 Loosen (5/64) (2.0 MM) set screw on worm gear (14) attached to feed roll counter shaft (5). If set screw is not visible, rotate turbine rotor and magnetic cup (29). Rotate by hand until set screw is visible. When worm gear is loose, remove the bearing retainer (26) from the front of the gear case. The feed roll counter shaft (5) can then be removed.
- 2.5 To remove feed roll shaft supports (32 & 38), left and right hand, first remove (5/64) (2.0 MM) socket set screw (17) and feed roll support clamp (18), then turn gear case over and loosen set screw (56) enough to remove the pivot (16) from the gear case. Both feed roll shaft supports can then be removed.
- 2.6 Remove bearing retainer (25) from top of gear case. The bottom ball bearing (4) should fall out. Then turn the gear case over, tap gently and the turbine counter shaft (28) and worm gear (23) assembly will fall out. It is not necessary to disassemble this worm gear vertical shaft combination unless you are going to replace parts.

Note: Worm Gear (23) – P/N 773.3013.C is different from other 3 worm gears. Be careful not to interchange with other worm gears. (Stamped with “C”)

- 2.7 To remove the turbine shaft assembly, insert a screw driver at base of Turbine Shaft (37), press gently but firmly against the gear case towards the rear of the spray unit. This whole assembly will then pop out of the gear case. To inspect the turbine rotor (29) and the interior of the turbine shroud (30), remove the (5/64) (2.0MM) set screw (27) from the shaft and assembly will come apart.

V. ASSEMBLY

1.0 Gear Case - Figure IV

- 1.1 To assemble the turbine rotor (29) and turbine shaft (37) to turbine shroud (30), insert the turbine rotor into the shroud, then align the holes, lock in place with (5/64) (2.0MM) socket set screw (27). Make sure ball bearing (36) is placed on turbine shaft before rotor and shroud are installed.

NOTE: Be sure that the (5/64) (2.0 MM) set screw (27) is located on the flat of the counter shaft.

Before inserting this assembly into the gear case, make sure the spring washer (34) has the fingers facing towards the top of the hole, then place ball bearing (35) in the hole on top of the finger spring washer. Now insert the turbine shroud and turbine shaft assembly into the gear case, align the shaft with the ball bearing (35), then press firmly until the turbine assembly is completely inside the gear case.

- 1.2 Insert the left and right hand feed roll shaft supports (32 & 38) into the gear case, aligning the hole in the feed roll shaft supports with the hole in the gear case. Next, insert the pivot (16) through the holes in the feed roll shaft supports, then turn gear case over and tighten (5/64) (2.0 MM) set screw (56), to hold pivot in place. Turn the gear case over to an upright position, put feed roll support clamp (18) in place and lock down with socket cap screw (17).
- 1.3 Place the gear case on its side, then insert the feed roll counter shaft (5) through the hole in the front of the gear case. As the end of the counter shaft approaches the web in the center of the gear case, slide the worm gear (14) onto the feed roll counter shaft. Align the hole in the worm gear and the counter sink in the feed roll counter shaft, apply Loctite 290 (Not Supplied) to the set screw (56) and lock in place.
- 1.4 Next, finger press ball bearing (4) onto the end of the feed roll counter shaft.
- 1.5 Take the feed roll control handle shaft (46), insert approximately 1" through the gear case, now slide the collar (45) and set screw onto the shaft. Next hold the feed roll cam (39), with needle nose pliers or tweezers, between the feed shaft supports making sure the thin section of the feed roll cam is facing the front and top of the gear case. Now slide the feed roll control handle shaft through the feed roll cam continuing on to the other side of the gear case. Now slide the collar and set screw up against the gear case and lock in place. Install feed roll control handle (53).
- 1.6 To assemble the feed roll springs (22), insert the long screw (20) through the gear case for approximately 1/4" (6.4 MM). Now slide the unthreaded spring holder (21) and spring onto the long screw. Next push the long screw through the holes in the feed roll shaft supports (32 & 38), slide the other spring and the threaded spring holder (24) onto the screw and apply tension.
NOTE: Both spring holders should be on the end of the spring facing the gear case, with the spring holder having internal threads at the end of the long screw.

V. ASSEMBLY (continued)

- 1.7 Insert two feed roll shafts (31 & 44) into feed roll shaft supports (32 & 38). Mesh worm gears (14) with feed roll counter shaft (5). Align the hole in the worm gears and the counter sink in the feed roll shafts, apply Loctite 290 (Not Supplied) to the set screw (56) and lock in place.
- 1.8 Insert the turbine counter shaft assembly (28 & 23) into the gear case aligning the bottom of the shaft into ball bearing (4). Meshing of the worm gear (23) and the turbine shaft (37) can be done by rotating the turbine until both mechanisms run free.
- 1.9 You now have two bearing retainers (25) and (26) left; one will cover the horizontal feed roll shaft located in front end of gear case, the other will cover the vertical turbine counter shaft assembly located at top of gear case. Screw the bearing retainers into the gear case until they are flush then back them out one-quarter turn.
- 1.10 Turn the gear case over, place the gear case base fiber gasket (42) and gear case base (49) against the gear case (33) and lock on with six socket cap screws (54). Now turn the gear case over, then take the neoprene gear case cover gasket (6) and put it in place on the top of the gear case. Next, place the gear case cover (7) over the neoprene gasket and lock in place with the six socket cap screws (10). Next, set the feed roll washers (11) and feed rolls (12) on the drive shafts, lock in place with acorn nuts (13).
 - 1.10.1 Feed Roll Adjustment - To adjust the feed rolls, take a 3/16" (4.8 MM) diameter rod (steel, wood or ceramic), insert through the feed rolls. Remove (7/32) (5.6 MM) button head cap screw (15) from side of gear case. Apply tension on rod by screwing in the (9/64) (3.6 MM) adjustment screw (20). You have enough tension on the rolls when the 3/16" (4.8 MM) diameter rod will not slip through the closed feed rolls when you pull to the rear. Replace button set screw in side of gear case.
 - 1.10.2 The rod guide tube is inserted through the rear of gear case cover and locked in place with a socket set screw (19).

CAUTION: Do not insert the guide tube so far it will interfere with the proper function of the drive rolls. Within 3/8" from the turning drive rolls is considered normal.
 - 1.10.3 Turn the gear case over, then take the handle (1) and riser block (2) and mount using the four socket cap screws (3). The handle, when attached to the Spray Unit, generally indicates the work to be done is a hand-held operation; however, in most operations, the ROKIDE Spray Unit is mounted in a fixed position using a tool post holder, See Figure VII. To attach the tool post holder bracket to the Spray Unit, first remove the handle then replace the handle with the bracket and mount in place with four socket cap screws. Make sure large hole in bracket faces down so tool post holder bar can be attached.

V. ASSEMBLY (continued)

2.0 Combustion Head – Figure II

2.1 Three "O" Rings .875 (22.2 MM) (5), 1.00 (25.4 MM) (4) and 1.062 (27 MM) (3) are inserted into mixing head (10). Before inserting, apply a thin film of "O" Ring lubricant. Next, fit the mixing head onto the combustion head (7) using the protruding "O" ring tubes as guides, then, screw the combustion head rod guide (11) into the mixing head locking it in place. Put the nozzle (15) into the mixing head, being sure to apply a thin film of "O" Ring lubricant to the nozzle. Then, place the brass air cap (35) into the main body air cap (29) and screw both onto the mixing head.

2.2 Combustion Trigger Body Assembly – Figure II

Install the air piston plug (24), oxygen piston plug (25), the inner acetylene piston pin (30) and outer acetylene piston plug w/hole (23). Make sure when the two piece acetylene piston made up of the inner acetylene piston pin and outer acetylene piston plug w/hole are installed into the body, the inner acetylene piston pin faces the bottom of the retrofit head. Install gasket (31) onto combustion trigger body. When the combustion trigger body is replaced, make sure that the valve spring (20) and the 1/8" steel ball (21) are in the spring hole. The purpose of this ball is to give a location when lighting the spray unit. The combustion trigger body can then be attached to the base of the Combustion Head using the four #8-32 socket head screws (36).

2.3 Attach the combustion head assembly to the gear case by aligning the holes with the small "O" ring tubes. Install the four #10-24 socket head screws (2) that hold these assemblies together.

VI. EXTENSION- Figure VIII

- 1.0 When parts require an internal coating, it may be necessary to use an auxiliary attachment known as an extension. Extensions can be manufactured in three standard lengths, 12", 24" and 36". The design consists of an outer tube with an inner assembly consisting of mixing head (3), air cap (2), base (4), angular air cap (1), nozzle and a main body air cap (5).

To attach the extension to the ROKIDE spray unit, it is first necessary to remove the combustion head from the gear case by removing four (5/32") (4.0 MM) socket cap screws. This allows for removal of the combustion head rod guide which is used to mount the extension to the combustion head.

Now align the holes in the extension base with the combustion head and lock in place with the combustion head rod guide. Remount combustion head and extension to gear case.

1.1 Straight Air Cap

In areas too deep for a standard spray unit to reach but not requiring angular spraying, an extension can be used with the standard straight air cap. Each extension is provided with a special main body air cap to allow for this type of operation. Use of the extension in this manner helps to keep the spray unit from being exposed to the reflected heat and improves the spraying environment of the operator.

- 1.2 Changing of "O" Rings in the extension mixing head is done as described in Section III under Mixing Head.

- 1.3 The operation of the extension is the same as your standard spray unit. **Always have the rod flush with the end of the gas nozzle before lighting.**

NOTE: See figure 7 & 8 on page 12.

CAUTION: The extensions must always be lighted and operated with as many rods as necessary to completely fill the rod guide tube to a point back beyond the drive rolls. If rods are not locked in place by the drive rolls and the spray unit is lit, flame can follow the rod backward causing damage to the spray unit and possible injury to the operator. If this occurs shut off the spray unit immediately by moving trigger handle to the "OFF" position.

NOTE : **The added length of an extension will cause the operator to notice additional torque during operation. Compensation by the operator may be necessary during use in a hand-held mode.**

VII. ELECTRIC MOTOR DRIVE UNIT STAGE II DESIGN

1.0 Installation

- 1.0 Remove five 6-32 x 5/8 (15.9mm) socket head cap screws (5), using a 7/64 (2.8mm) hex.
- 1.1 Remove Stage II Electric motor (3).
- 1.2 Remove any dirt or foreign debris from machined mating surface of ROKIDE Spray Unit with a clean cloth.
- 1.3 Before reinstalling motor drive unit (MDU) on ROKIDE Spray Unit, perform bearing check to see that all parts in the gear case are performing well.

NOTE: The Turbine Rotor should spin freely for a minimum of 12 seconds. If the bearing check is below 12 seconds, repair gear case by replacing damaged parts (bearings, gears, shafts, etc.).
- 1.4 Install Stage II Electric Motor (3) on ROKIDE Spray Unit, aligning rod insertion notch of MDU adapter plate with rod insertion notch of ROKIDE Spray Unit.
- 1.5 Insert five (5) 6-32 x 5/8 (15.9mm) socket head cap screws and tighten them finger tight.
- 1.6 Make sure the mounting surfaces are properly mated and aligned.
- 1.7 Tighten cap screws in a cross pattern to insure the motor is centered in the turbine wheel.

NOTE:

1. Failure to center the motor can cause excessive wear on the motor and result in premature failure.

2.0 Electric Motor Drive Operation (FIGURE IX & X)

2.1 Turning power on and off:

The on/off switch is located adjacent to the power input receptacle on the EDU or Stage II Control Box (2). When unit is on, LED display will be illuminated. (Figure X)

An on/off switch is also located on the motor. (Figure IX)

When the EDU switch and the motor switch are on, the LED display will be illuminated and indicate a feedrate.

If the EDU switch is on and the motor switch is off, the LED display will read 0.00 in/mm. This indicates the power is shut off at the motor and not at the EDU.

Both switches must be on for the unit to function.

2.2 Adjusting feed rate.

Turn feed rate control clockwise (CW) to increase feed rate.

Turn feed rate control counter-clockwise (CCW) to decrease feed rate.

2.3 Display indication:

LED display indicates linear feed rate in inches per minute.

NOTE: Refer to conversion table on side of Electric Drive Unit (EDU) for metric conversion.

Specifications:

Input voltage	100 - 260 volt AC (Auto selecting)
Input frequency	47 HZ – 440 HZ
Input current	1.0 amp @ 115 volt AC (nominal)
Operating temperature	0° - 50° C (32° - 122° F)

The control box is designed to adjust its operating output voltage to the electric motor so that control box voltage is always the same, as long as the input to control box is 100 to 260 volt AC at 41 to 440 Hz.

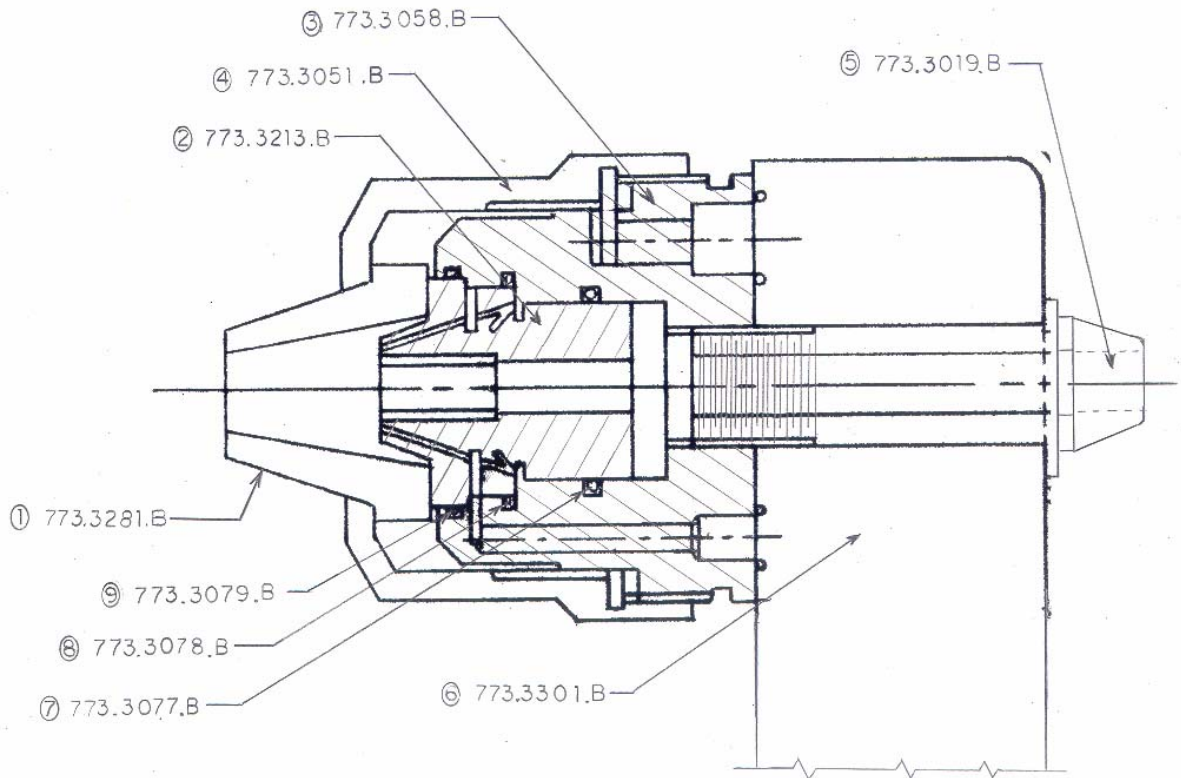
3.0 Troubleshooting – Electric Motor Drive Unit (FIGURE IX & X)

- 3.1 In the event unit fails to operate, check power source (outlet) for voltage. If voltage is present, check fuse mounted in power entry module of EDU. There is a spare fuse located in the bottom of the fuse holder.
- 3.2 Fuse replacement procedure:
 - 3.2.1 Remove A/C power supply cord (1) from power entry module to access fuse holder notch.
 - 3.2.2 Pry out fuse holder gently with a coin or small screwdriver.
 - 3.2.3 Remove fuse from spare slot and insert fuse in holder.
 - 3.2.4 Re-insert fuse holder assembly into power entry module.
 - 3.2.5 Insert A/C power supply cord.

NOTES:

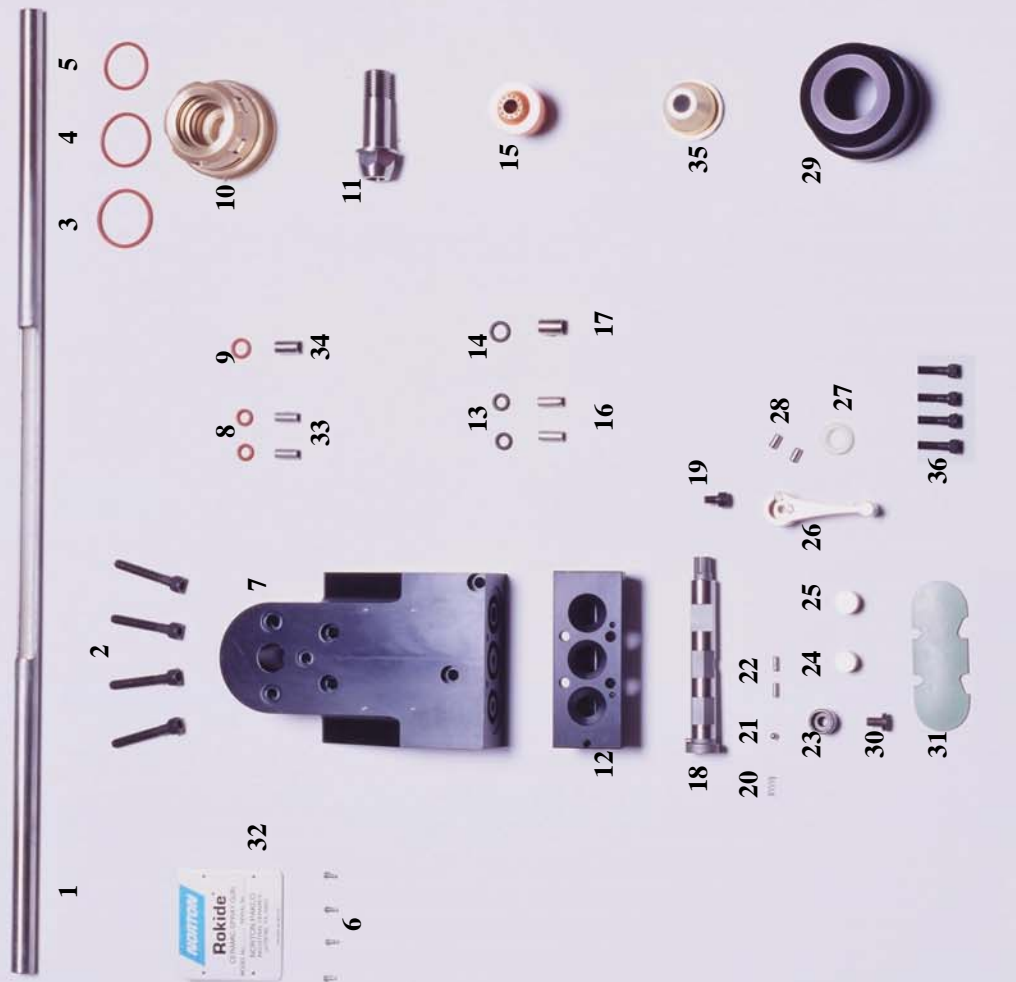
1. In the event of any problem or difficulty, contact your Saint-Gobain representative. There are no user serviceable parts in the EDU or Motor Drive Unit (MDU).
2. Disassembly or tampering with the seals on the control box (EDU) or motor (MDU) will **VOID** the warranty of these items.

FIGURE I



ROKIDE SPRAY UNIT COMBUSTION HEAD ASSEMBLY (UPPER).

COMBUSTION HEAD PARTS (FIGURE II)



COMBUSTION HEAD PARTS LIST

PICTURE NUMBER	PART NUMBER	DESCRIPTION	QUANTITY
1	773.3254.B	ROD GUIDE TUBE 1/4 FOR 5/16 GUN	1
2	773.3322.B	SHCS, ALLEN (10-24 X 1 1/4")	4
3	773.3079.B	"O" RING (1.062)S	1
4	773.3078.B	"O" RING (1.000)S	1
5	773.3077.B	"O" RING (0.875)S	1
6	773.3108.B	SELF TAPPING SCREW	4
7	773.3301.B	RETROFIT COMBUSTION HEAD	1
8	773.3082.B	"O" RING (0.312)S	2
9	773.3083.B	"O" RING (0.375)S	1
10	773.3058.B	MIXING HEAD	1
11	773.3019.B	COMBUST HEAD ROD GUIDE	1
12	773.3302.B	RETROFIT COMBUSTION TRIGGER BODY	1
13	773.3073.B	"O" RING (0.312)B	2
14	773.3074.B	"O" RING (0.406)B	1
15	773.3213.B	NOZZLE (1/4) - 12 DEGREE	1
16	773.3003.B	"O" RING TUBE (0.187)	2
17	773.3005.B	"O" RING TUBE (0.281)	1
18	773.3303.B	RETROFIT TRIGGER SHAFT	1
19	773.3320.B	SHCS, ALLEN (8-32 X 1/4")	1
20	773.3311.B	RETROFIT VALVE SPRING	1
21	773.3309.B	RETROFIT 1/8" STAINLESS STEEL BALL	1
22	773.3321.B	RETROFIT 3/32" X 1/4" DOWEL PIN	2
23	773.3306.B	OUTER ACETYLENE PISTON PLUG W/HOLE	1
24	773.3319.B	RETROFIT AIR PISTON PLUG	1
25	773.3305.B	RETROFIT OXYGEN PISTON PLUG	1
26	773.3304.B	RETROFIT TRIGGER HANDLE	1
27	773.3308.B	RETROFIT PLASTIC WASHER	1
28	773.3312.B	RETROFIT 1/8" X 1/4" DOWEL PIN	2
29	773.3051.B	MAIN BODY AIR CAP	1
30	773.3307.B	RETROFIT INNER ACETYLENE PISTON PIN	1
31	773.3310.B	RETROFIT GASKET	1
32	773.3122.B	NAME PLATE	1
33	773.3003.B	"O" RING TUBE (0.187)	2
34	773.3004.B	"O" RING TUBE (0.250)	2
35	773.3281.B	CP AIR CAP (3/16 & 1/4)	1
36	773.3092.B	SHCS, ALLEN (8-32 X 1/2)	4

GEAR CASE PARTS (FIGURE IV)



GEAR CASE PARTS LIST

PICTURE NUMBER	PART NUMBER	DESCRIPTION	QUANTITY
1	773.3040.B	HANDLE	1
2	773.3317.B	RETROFIT RISER BLOCK	1
3	773.3318.B	SOCKET HEAD CAP SCREW, ALLEN	4
4	773.3086.B	BALL BEARING	4
5	773.3039.B	FEED ROLL COUNTER SHAFT	1
6	773.3031.B	GEAR CASE COVER GASKET	1
7	773.3059.B	GEAR CASE COVER	1
8	773.3052.B	TURBINE SHROUD	1
9	773.3116.B	EYE BOLT	1
10	773.3093.B	SOCKET HEAD CAP SCREW ALLEN	6
11	773.3224.B	FEED ROLL WASHER	2
12	773.3032.B	STEEL FEED ROLL	2
13	773.3118.B	ACORN NUT	2
14	773.3013.B	WORM GEAR	3
15	773.3103.B	BUTTON SET SCREW	1
16	773.3011.B	PIVOT	1
17	773.3112.B	SOCKET HEAD CAP SCREW ALLEN	1
18	773.3014.B	FEED ROLL SUPPORT CLAMP	1
19	773.3102.B	SOCKET SET SCREW ALLEN	1
20	773.3091.B	SOCKET HEAD CAP SCREW ALLEN	1
21	773.3024.B	FEED ROLL SPRING HOLDER (L.H)	1
22	773.3007.B	FEED ROLL SPRING	2
23	773.3013.C	WORM GEAR	1
24	773.3018.B	FEED ROLL SPRING HOLDER (R.H)	1
25	773.3028.B	BEARING RETAINER	1
26	773.3028.B	BEARING RETAINER	1
27	773.3253.B	TURBINE SET SCREW	1
28	773.3038.B	TURBINE COUNTER SHAFT	1
29	773.3053.B	TURBINE ROTOR AND MAGNETIC CUP	1
30	773.3052.B	TURBINE SHROUD	1
31	773.3048.B	FEED ROLL SHAFT	1
32	773.3057.B	FEED ROLL SHAFT SUPPORT (R.H)	1
33	773.3061.B	GEAR CASE	1
34	773.3110.B	SPRING WASHER	1
35	773.3085.B	BALL BEARING	1
36	773.3084.B	BALL BEARING	1
37	773.3047.C	TURBINE SHAFT	1
38	773.3056.B	FEED ROLL SHAFT SUPPORT (L.H)	1
39	773.3045.B	FEED ROLL CAM	1
40	773.3003.B	"O" RING TUBE (.187)	2
41	773.3072.B	"O" RING (.281)B	2
42	773.3036.B	GEAR CASE BASE GASKET	1
43	773.3081.B	"O" RING (2.125)B	2
44	773.3048.B	FEED ROLL SHAFT	1
45	773.3109.B	FEED ROLL SHAFT COLLAR	1
46	773.3049.B	FEED ROLL HANDLE SHAFT	1
47	773.3126.B	"O" RING (.344) B	1
48	773.3004.B	"O" RING TUBE (.250)	1
49	773.3060.B	GEAR CASE BASE	1
50	773.3115.B	AIR FITTING	1
51	773.3114.B	ACETYLENE FITTING	1
52	773.3113.B	OXYGEN FITTING	1
53	773.3026.B	FEED ROLL CONTROL HANDLE	1
54	773.3090.B	SOCKET HEAD CAP SCREW, ALLEN	4
55	773.3090.B	SOCKET HEAD CAP SCREW, ALLEN	2
56	773.3100.B	SOCKET SET SCREW ALLEN	1

ELECTRIC DRIVE CONVERSION KIT (773.3243.B) (FIGURE VI)



<u>Picture Number</u>	<u>Part Number</u>	<u>Description</u>	<u>Quantity</u>
1	773.3250.B	STAGE II MOTOR POWER CORD	1
2	773.3274.B	STAGE II CONTROL BOX & MOUNTING BRACKET	1
3	773.3275.B	STAGE II ELECTRIC MOTOR	1
4	773.3276.B	STAGE II EXTENSION CORD (YELLOW STRAIGHT)	1
5	773.3093.B	SOCKET HEAD CAP SCREW	5

STANDARD SPRAY UNIT PACKAGE (FIGURE VII)



<u>Picture Number</u>	<u>Part Number</u>	<u>Description</u>	<u>Quantity</u>
1	773.3149.A	LIGHTER	1
2	773.3196.A	ALLEN WRENCH SET	1
3	773.3258.B	NOZZLE CLEANING KIT	1
4	773.3068.B	TOOL POST HOLDER ROD	1
5	773.3069.B	BRACKET W/LOCK PIN	1
6	773.3147.A	GEAR CASE GREASE	1
7	773.3148.A	“O” RING LUBRICANT	1
	773.3070.B	NOZZLE PULLER (NOT SHOWN)	1

FIGURE VIII

INTERNAL COATING EXTENSION

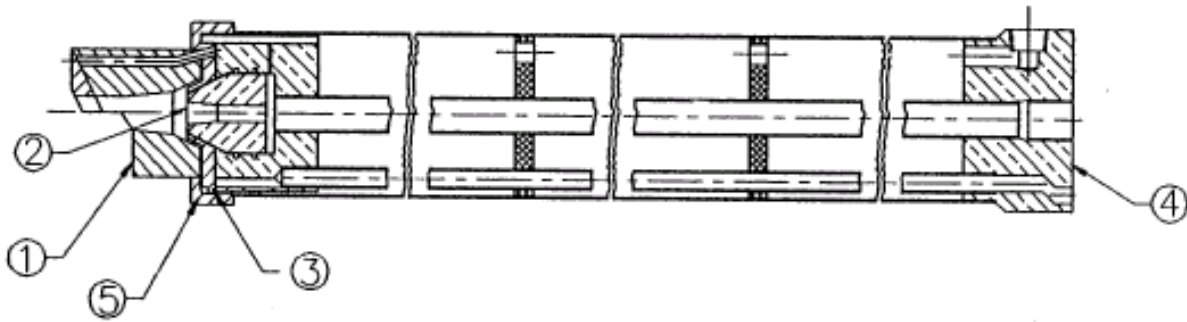
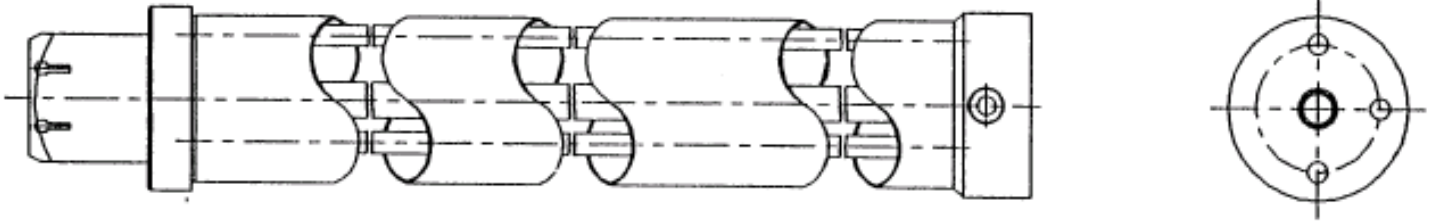
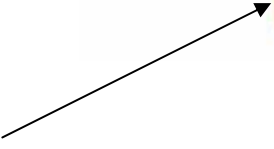


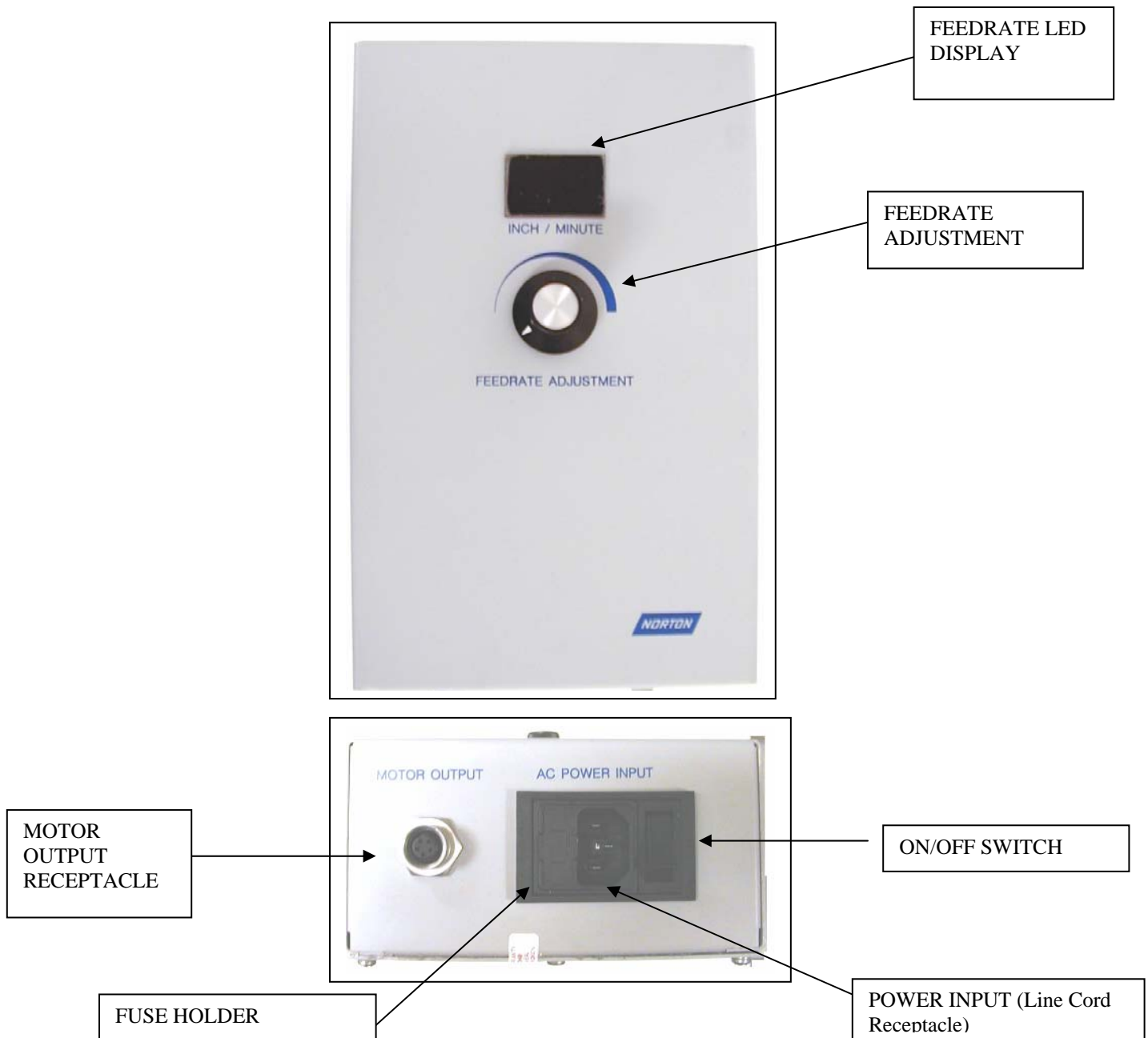
FIGURE IX
773.3275.B - (MDU) MOTOR DRIVE UNIT



Pushbutton
Switch
On/in
Off/out



SPEED CONTROL AND INDICATORS (FIGURE X)



“CAUTION”

Observe the following safety precautions when operating this unit :

- Do not use in a wet environment
- Do not use in a hazardous atmosphere
- Do not use in an explosive atmosphere
- Connect only to a properly grounded outlet