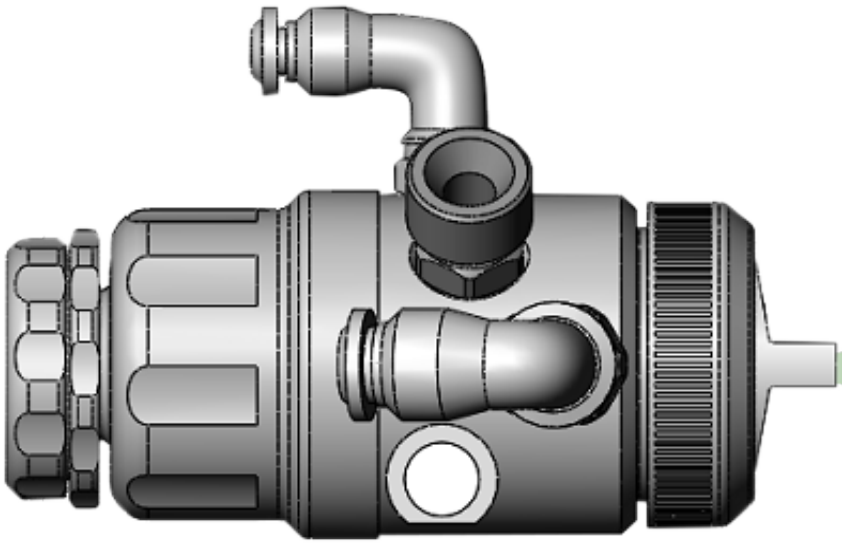
DUX Automatic



Product Manual

P.O. Box 1314 Seahurst WA 98062 | Phone 888.389.2732 | Fax 888.876.1233 | www.DuxTechnologiesInc.com

The DUX Automatic

INSPIRED BY FORMULA THREE RACE CAR ENGINES.

After more than 5 years of research and development, DUX has reinvented the spray gun from the inside out. By incorporating our patented airflow technology, originally used in Formula Three race car engines, we've developed the most innovative breakthrough in spray gun technology in nearly 80 years.

For the first time, finishers can spray nearly any type of fluid, onto nearly any surface with a single gun – while reducing coatings waste and improving finish quality.

TECHNOLOGY THAT'S EASY TO USE AND EASY ON US.

The DUX Automatic spray gun uses a patented technology to reduce overspray and booth "fog". Less paint in the air means more paint on the target and a corresponding decrease in booth filter replacement and hazardous waste disposal fees, potentially cutting the operating cost of a paint line by 50%. Since the DUX Automatic achieves atomization with a lower volume of air, you may also see a reduction in compressor energy consumption.

Patent Information

The design and technology forming the basis of this product is the confidential information of DUX Technologies Inc.,aWashington corporation. The relevant US Patent Numbers are: US 6,793,157; US 6,425,533, and U.S. 7,004,404.

DUX Technologies Inc. may have additional patents, patent applications, trademarks, copyrights, or other intellectual property rights covering subject matter in this document. Except as expressly provided in any written license agreement from DUX Technologies Inc., this document does not grant you any license to or rights in any such patents, trademarks, copyrights, or other intellectual property.

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Part No. 510003

Printed in the United States of America

Table of Contents

⚠ WARNING	
	Coatings and solvents may be extremely flammable or combustible. Always use the equipment in a properly ventilated area. Smoking must never be permitted in the spraying area. Make sure that all ignition sources are well out of range and always keep fire extinguishing equipment in the spraying area.
	Some solvents may cause eye injury during operation and/or while cleaning the equipment. Always wear eye protection when working with the equipment.
	Always read the MSDS supplied by the material manufacturer.
	Some coatings and solvents may be harmful if there is contact with the skin or if inhaled. Always make sure to read the MSDS supplied by the material manufacturer. Always use the equipment in a properly ventilated area. If there is a chance of inhalation or contact with skin, use protective gear such as a respirator and/or proper clothing as suggested by the MSDS.

Required Maintenance

- **Clean equipment after each use**
- **Lubricate spray gun before each use and/or after every cleaning**
- **Do not submerge spray gun in solvent**
- **Ensure proper handling of the gun at all times - damage due to dropping or mishandling of the spray gun is not covered by warranty**
- **Ensure air and fluid hoses are properly connected**
- **Do not apply air or fluid pressures above the maximum published inlet pressures**
- **Problems resulting from any of the above-mentioned situations will jeopardize warranty**

Automatic Safety Information

- **Use the equipment only for its intended purpose**
- **Do not point spray gun at any part of body**
- **Do not place hand or fingers over spray tip**
- **Inspect for physical damage or loose fittings before use**
- **Shut off all air sources and remove coating supply to spray gun before servicing**
- **Use fluids and solvents that are compatible with equipment wetted parts**
- **Check equipment often**
- **Do not alter or modify equipment**
- **Do not use with improperly operating equipment**
- **Always refer to the owner's manual for proper operating instructions**
- **Comply with all applicable safety regulations**
- **Read all instruction manuals, tags, and labels before operating the equipment**
- **Always read the MSDS supplied by the material manufacturer**
- **Do not exceed 75 psi for air and fluid; 50 psi for triggering air**

Quick Reference Guide

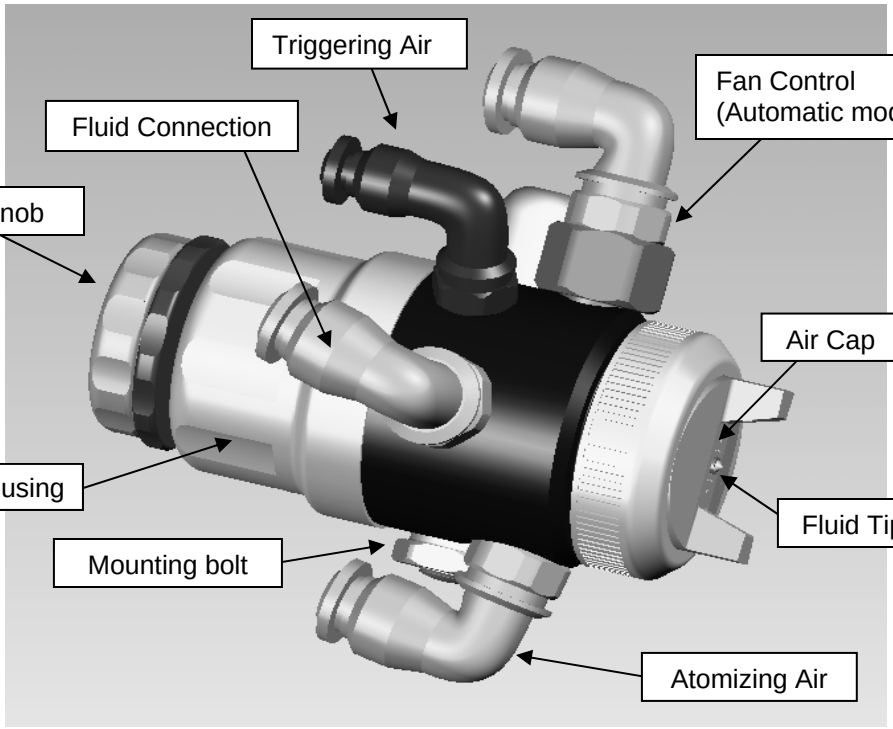


Figure 1

*See figure 4 on page 5 for manual fan control

Installation

Mounting
When using the supplied mounting bolt, install the spray gun onto a mounting rod 1/2" and tighten using the hex screw. The mounting bolt can be attached to either side of the spray gun by simply unscrewing the bolt and reversing position.

Fittings
The DUX Automatic spray gun uses push-lock style fittings as standard equipment. To attach the hoses, insert one end of the hose into the fitting until it's locked it into place. To release the lock, push the plastic locking ring toward the fitting while removing the hose (See Figure 2).

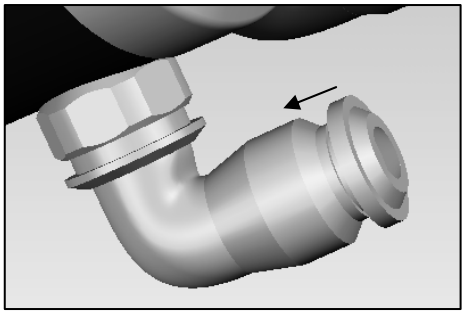


Figure 2

Setup
Prior to setting up air and fluid hose(s) please note:

- All hoses must be cut clean and straight without deformity for proper fit.
- Use an air filter to ensure a clean, dry air supply.
- Triggering air, atomizing air and fan control air (when applicable) must be supplied and regulated separately.
- The fluid hose must have a regulator, shut-off valve, and a filter prior to use.

Connections
Attach the triggering air, atomizing air, and fluid hoses to the corresponding connections on the spray gun. When applicable also attach the fan control air.

NOTE: *When using fittings other than the supplied push-lock style fittings, installation may differ.*

Operation Guide

Fluid Control Knob

The fluid control knob is located at the rear of the spray gun (See Figure 3). To increase the fluid flow, turn the fluid control knob counter-clockwise. Conversely, turn the fluid control knob clockwise to reduce the fluid flow. Once the desired settings have been achieved, turn the fluid control locking ring clockwise to lock the fluid control knob into place (See Figure 3).

NOTE: *If the fluid control knob stops offering resistance, maximum needle travel has been reached. If the flow rate is insufficient, increase the fluid tip and needle size.*

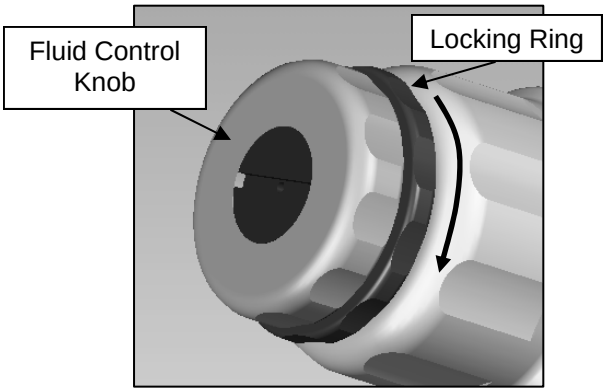


Figure 3

Fan Control Adjustment

The fan control adjustment is located on the side of the spray gun near the air cap. This adjustment controls the amount of air delivered to the horns of the air cap for spray pattern shaping (See Figure 4).

NOTE: *Applying excessive air to the air cap will result in a split pattern.*

The DUX Automatic spray gun features two methods of fan control adjustment:

Automatic Fan Adjustment: Spray guns configured for automatic fan adjustment have an additional push-lock fitting for fan control. Air is externally supplied to the air horns of the air cap to control the size and shape of the spray pattern. The more air pressure applied, the larger the fan pattern. When the optimal results are achieved, record the input pressure settings for simple future setups.

Manual Fan Adjustment: Spray guns configured for manual fan adjustment have a fan control valve with a locking ring (See Figure 4). Pattern shaping air is obtained from the main air chamber of the spray gun. With the fan control valve in the fully closed position (i.e. no threads showing), a minimum spray pattern size is achieved. Pattern size increases as the adjustment knob is rotated counter-clockwise, allowing more air to be directed to the air horns. When the optimal results are achieved, turn the locking ring clockwise to lock valve in place.

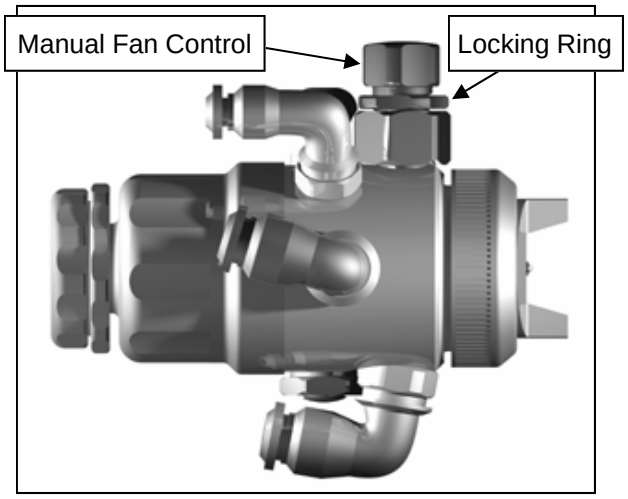
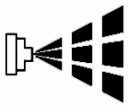


Figure 4

Operating the Automatic Spray Gun

1. Turn on the regulated triggering air at a minimum of 35 psi input pressure.
2. Turn on the regulated fluid line.
3. Trigger spray gun and observe fluid flow.
4. Turn the fluid control knob counter-clockwise until desired flow rate is achieved.
5. Turn on the regulated atomizing air at the source of supply.
6. Adjust the atomizing air pressure until desired fluid atomization is achieved.
7. Adjust fluid flow as necessary to achieve desired results.

Troubleshooting

Problem	Cause	Solution
Coating leakage out of tip of spray gun	Needle packing is too tight	1. Remove triggering assembly 2. Insert screwdriver into rear of spray gun 3. Turn fluid seal nut counter-clockwise 1/4 turn (refer to page 9 for packing adjustment) 4. Lubricate needle and reinstall
Coating leakage out of rear of spray gun or drain hole	Needle packing is too loose	1. Remove triggering assembly 2. Insert screwdriver into rear of spray gun 3. Turn fluid seal nut clockwise 1/4 turn (refer to page 9 for packing adjustment) 4. Lubricate needle and reinstall
Spray gun does not trigger	1. Insufficient triggering air 2. Piston binding	1. Increase triggering air pressure *Note: Do not exceed 50 psi* 2. Remove triggering assembly. Remove trigger piston and lubricate o-ring. Reinstall
Split pattern 	1. Air pressure too high 2. Fluid flow too low	1. Reduce atomizing air pressure 2. Turn fluid control knob counter-clockwise *Note: if fluid flow is still insufficient after adjusting, replace fluid tip with next largest size*
Heavy right or left side pattern 	Dirty or damaged air cap/holes	Clean air cap *Note: Do not use metal tools to clean air cap* *Note: If problem persists after cleaning, replace air cap*
"Orange peel" or Heavy pattern 	1. Air pressure is too low 2. Spray gun is too close to working surface 3. Fluid flow is too high	1. Increase atomizing air pressure 2. Ensure proper distance from surface is achieved, normally 6-10" from surface 3. Adjust fluid control knob clockwise to decrease fluid flow
Heavy top or bottom pattern 	1. Air cap dirty or damaged 2. Fluid tip dirty or damaged	1. Clean air cap *Note: Do not use metal tools to clean air cap* 2. Clean fluid tip *Note: If problem persists after cleaning replace air cap or fluid tip*
Will not spray 	1. Insufficient air pressure 2. Insufficient fluid flow 3. Fluid too heavy for current setup	1. Check atomizing air and triggering air pressures and increase if necessary 2. Adjust fluid control knob counter-clockwise to increase fluid flow 3. Thin coating and/or change fluid tip to next largest size
Spray gun sputtering 	1. Damaged fluid tip 2. Loose fluid tip 3. Dried material in fluid tip/ needle 4. Fluid source empty/low 5. Needle packing too loose	1. Remove and inspect for damage 2. Ensure fluid tip is tight 3. Flush with solvent 4. Check coating and refill if necessary 5. See solution: (coating leakage out of rear of gun)
Spray pattern starved or dry	1. Air pressure too high 2. Fluid adjustment too low 3. Spray too far from working surface	1. Reduce atomizing air pressure 2. Adjust fluid control knob counter-clockwise until desired results are achieved 3. Ensure proper distance from surface is achieved, normally 6-10"

Maintenance Guide

The DUX Automatic spray gun is a precision tool that delivers superior finishing results and cost savings with each use. Optimal results require good handling and maintenance processes.

Daily cleaning, lubrication, and proper maintenance are required to maintain the warranty coverage.

Lubrication

To ensure the quality and longevity of the DUX spray gun, it must be lubricated before every use and after every cleaning. Follow the diagram below to ensure proper lubrication (Use DUX lube—part # 310206).

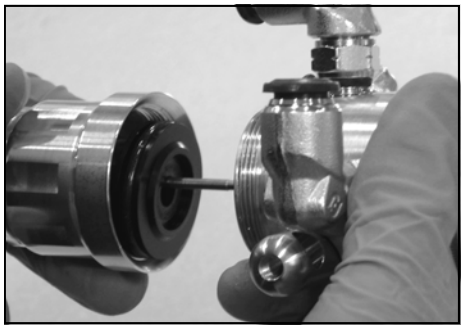


Figure 5: Unscrew trigger housing

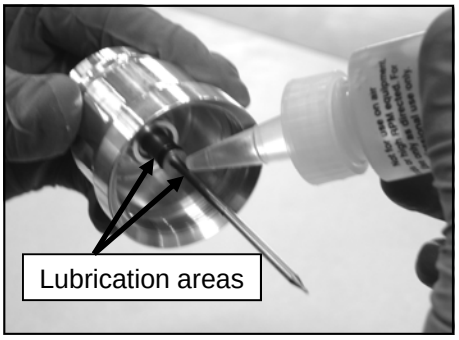


Figure 6: Lubricate thick part of needle and needle o-rings

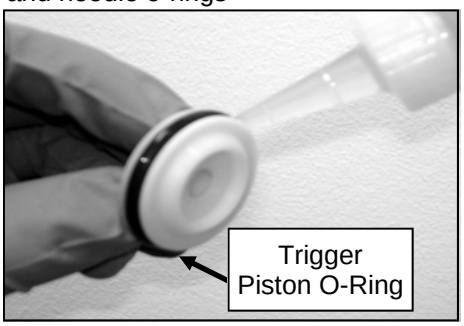


Figure 7: Lubricate the trigger piston

Fluid Needle Removal

NOTE: *Due to the self-cleaning nature of the fluid tip and needle combination; it is imperative that <u>both</u> parts are changed together when increasing or decreasing the fluid tip size.*

To replace or change the fluid needle:

1. Ensure both fluid and air are depressurized.
2. Unscrew the fluid control knob by turning counter-clockwise and completely removing it, along with the fluid needle, from the trigger housing.
3. Unscrew the spring cap from the fluid adjustment knob (See Figure 8).

CAUTION: *The needle spring is under pressure and is retained by this cap. It may spring free when the cap is removed.*

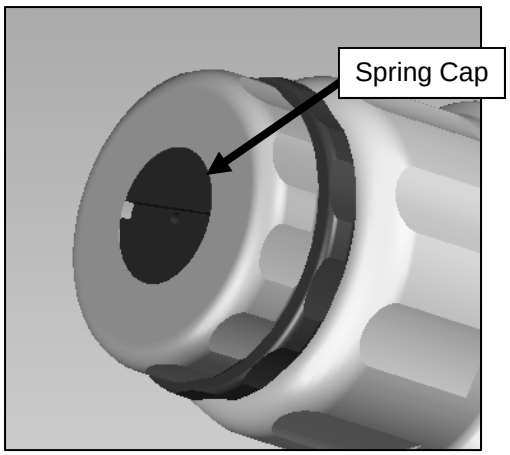


Figure 8

4. Remove the needle spring.
5. Remove and replace the needle.
6. Lubricate needle as required and reinstall needle assembly.

Maintenance (continued)

Fluid Tip Removal

NOTE: *Due to the self-cleaning nature of the fluid tip and needle combination; it is imperative that both parts are changed together when increasing or decreasing the fluid tip size.*

To replace or change the fluid tips:

1. Ensure the spray gun is depressurized.
2. Remove the air cap retaining ring and air cap.
3. Using the DUX 10mm fluid tip driver, remove the fluid tip and inspect the threads for wear or contamination.
4. Install a new fluid tip and tighten using the DUX 10mm fluid tip driver.

IMPORTANT: *Do not over-tighten. Use a maximum of 18 INCH pounds of torque or a half turn past hand tight. The precision machining of the DUX Automatic makes the use of a gasket unnecessary.*

IMPORTANT: *To maintain the precise fit and seal between the fluid tip and the stainless steel fluid barrel, paint must not be allowed to dry on the threads. The threads of both the fluid barrel and tip must be thoroughly cleaned after each use.*

5. Replace air cap and air cap retaining ring.

IMPORTANT: *Some coating leakage out of the fluid tip may indicate an adjustment of the packing is needed. This is not an indication of the spray gun failing.*

Always ensure the spray gun is depressurized before making adjustments.

Fluid Packing Adjustment

The fluid packing in all DUX spray guns is set to a pre-determined specification during assembly. Therefore, depending on the type of material being sprayed, it is possible that the packing will need adjustment upon start-up or after some amount of spraying.

Fluid leakage at the front of the spray gun is an indication that the fluid needle is not seating properly in the fluid tip. This may be caused by dried material in the tip, or if the fluid packing is too tight. If the packing is set too tightly for a particular material, the needle will not to fully seat in the fluid tip and will require adjustment.

The DUX Automatic features a leak indicator in the form of a pin hole located above the mounting bolt (See Figure 9). Fluid leakage at this pin hole indicates that the fluid packing is too loose and will need tightening.

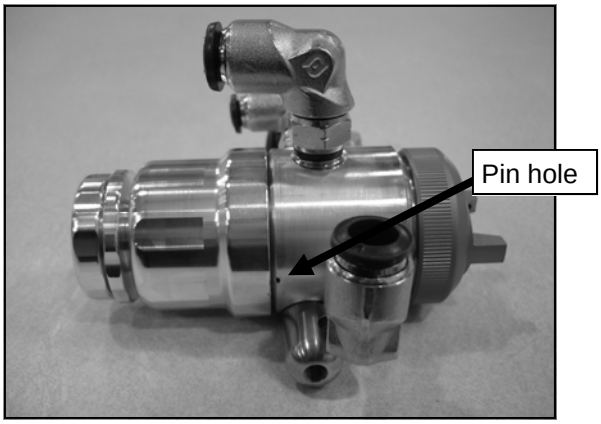


Figure 9

Maintenance (continued)

To adjust the packing:

1. Ensure the spray gun is depressurized.
2. Unscrew the trigger housing from the main body by turning counter-clockwise and completely removing it, along with the fluid needle and trigger piston (See Figure 10).

CAUTION: *The needle spring is under pressure and is retained by this cap. It may spring free when the cap is removed.*

3. Insert a thin, flat-blade screwdriver into the rear of the main spray gun body (See Figure 11) and turn the fluid seal nut 1/4 turn clockwise to tighten or counter-clockwise to loosen (See Figure 12 & 13).
4. Reinstall the trigger housing with the fluid needle and trigger piston onto the spray gun body.
5. Pressurize the spray gun and test.
6. Repeat if necessary.

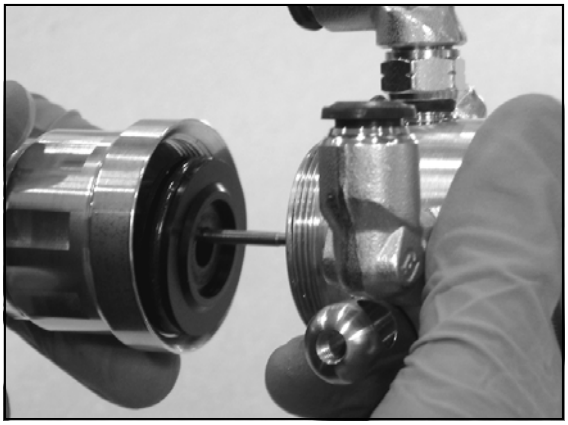


Figure 10

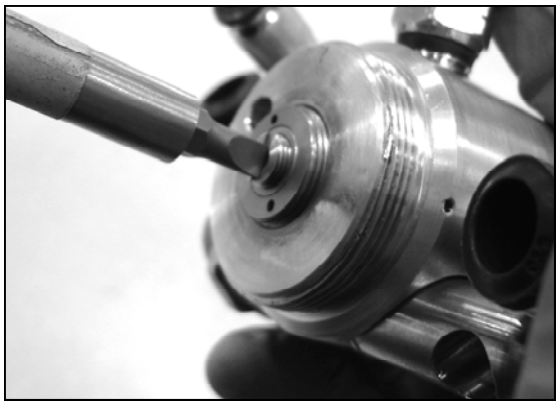


Figure 11

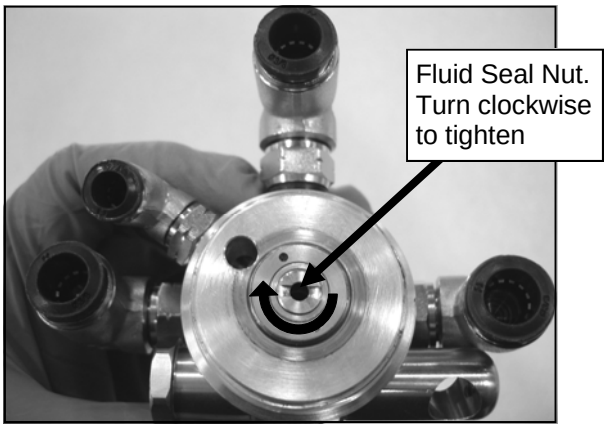


Figure 12

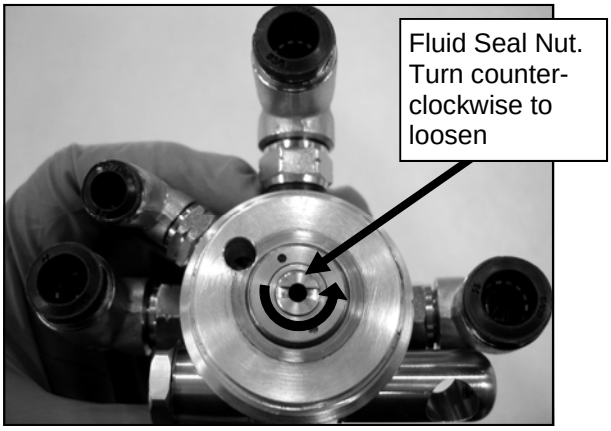


Figure 13

Maintenance (continued)

Fluid Packing Replacement

Removal

1. Ensure the spray gun is depressurized.
2. Remove the air cap retaining ring air cap.
3. Remove the fluid tip using the DUX 10mm fluid tip driver.
4. Unscrew the trigger housing and fully remove it, along with the fluid needle and trigger piston from the main spray gun body (See Figure 14).

> ⚠
>
> ***CAUTION:*** *The needle spring is under pressure and is retained by this cap. It may spring free when the cap is removed.*

5. Using a flat-blade screwdriver, remove the packing adjustment screw by turning counter-clockwise (See Figure 15).
6. Insert the DUX fluid packing tool into the stainless steel fluid barrel at the front of the spray gun.
7. Remove the fluid packing components by pushing the DUX fluid packing tool fully toward the rear of the spray gun, forcing the packing assembly out. Be sure to remove all packing contents from the fluid tube (See Figure 16).
8. Inspect and clean the packing cavity inside the spray gun. If necessary, use a spray gun cleaning brush to remove excess debris.

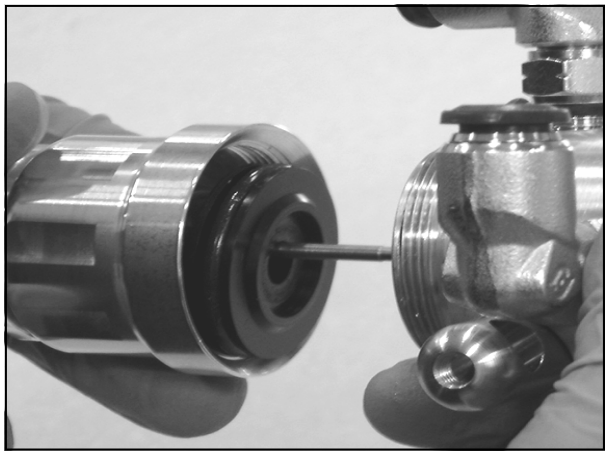


Figure 14

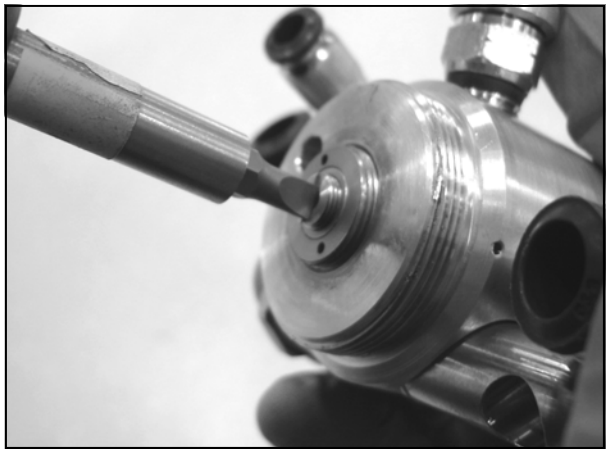


Figure 15

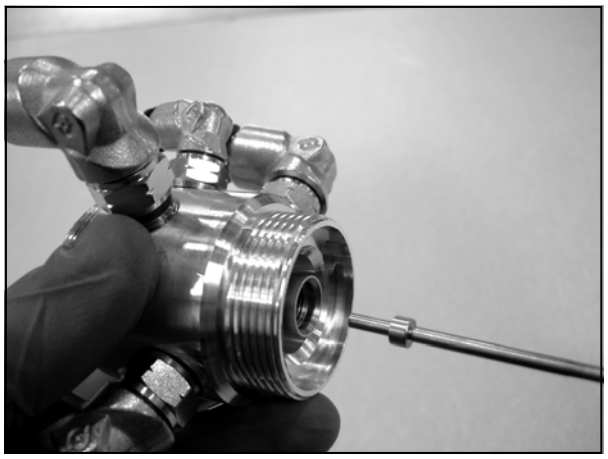


Figure 16

Maintenance (continued)

Replacement

1. Inspect the fluid packing adjustment screw for wear.
2. Place one fluid seal, two o-rings, and the fluid seal front at the tip of the fluid packing tool and gently slide the tool into the fluid tube (See Figure 17). Firmly seat the packing.
3. Next, using the same technique, insert the brass fluid seal spacer (See Figure 18).
4. Again, using the same technique, place the second fluid seal and two o-rings into the fluid tube (See Figure 19).
5. Start the packing adjustment nut into the body by hand. Tighten the fluid packing nut until it is flush with its stainless steel housing (See Figure 20).
6. Lubricate the fluid needle as indicated in figure 6 and reinstall the trigger housing, along with the fluid needle and trigger piston.
7. Replace the fluid tip using the DUX 10mm fluid tip driver.

⚠

NOTE: *See page 12 to view order of packing components.*

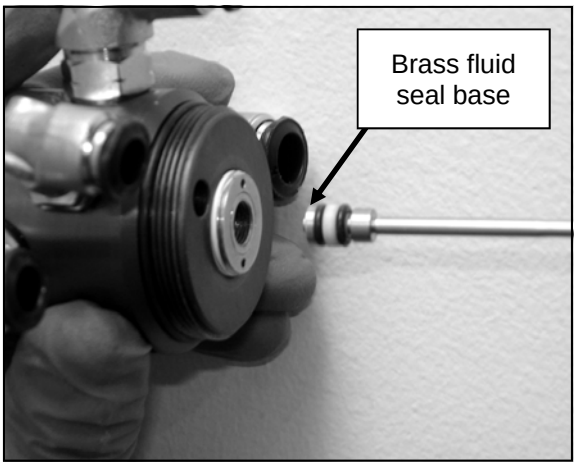


Figure 17

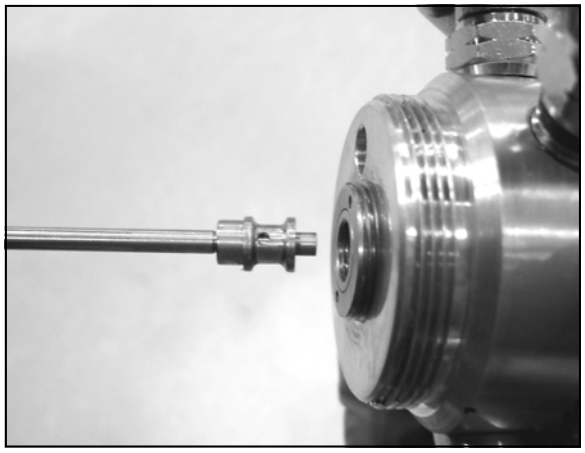


Figure 18

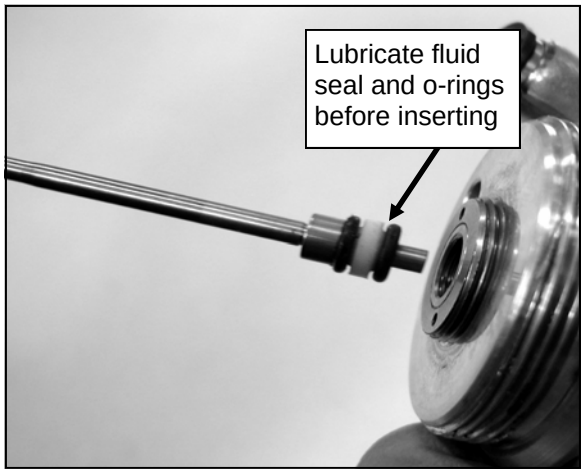


Figure 19

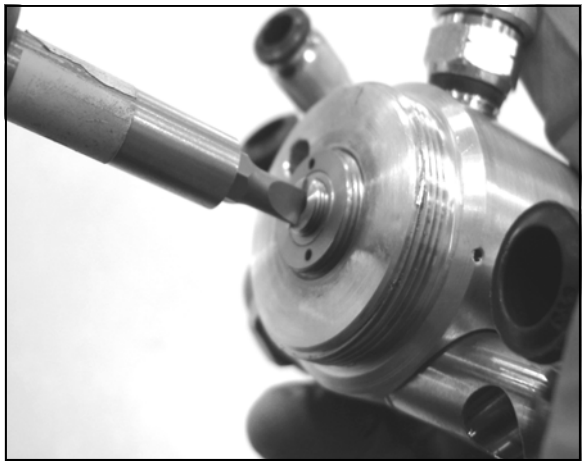
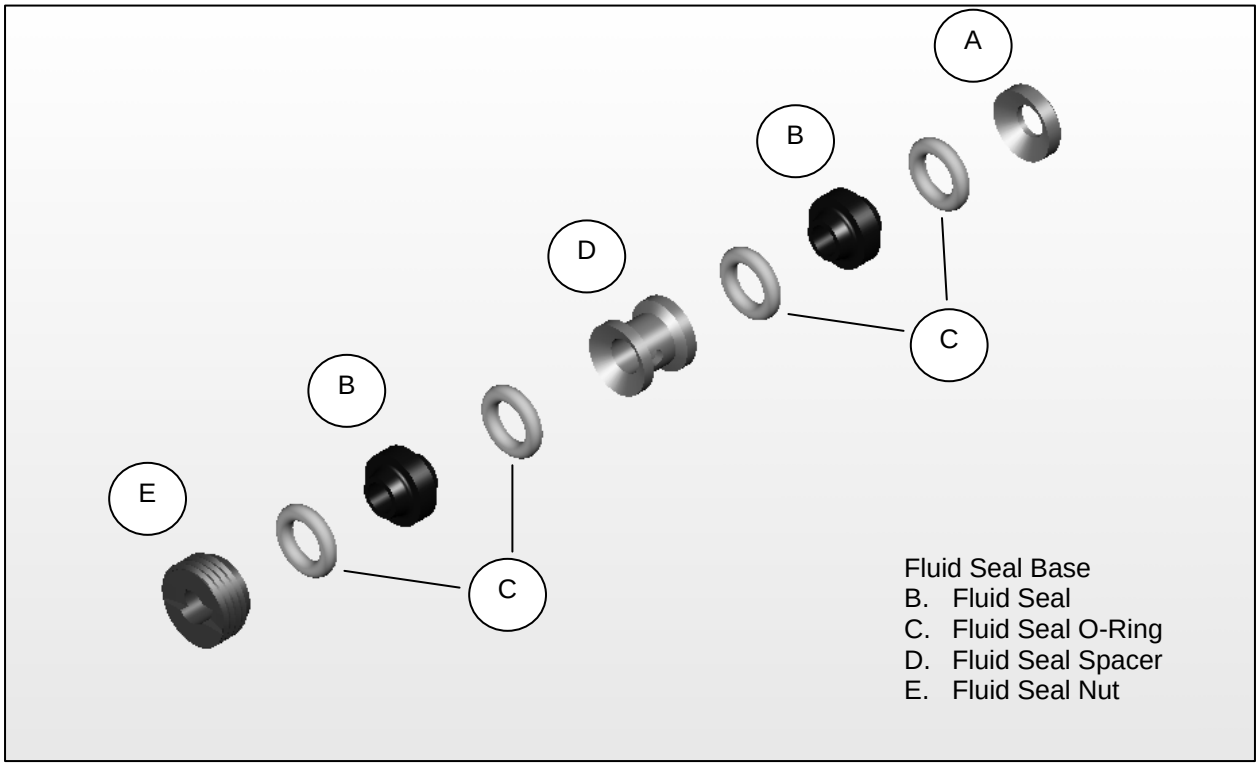


Figure 20



Cleaning Guide

Cleaning the DUX Automatic
Daily cleaning, lubrication, and proper maintenance are required to maintain the warranty coverage (See page 7 for lubrication and maintenance instructions).

CAUTION:
- *Do not fully submerge the spray gun in solvents or cleaning solutions.*
- *Do not clean air cap holes with metal tools as it could effect the spray pattern.*
- *The DUX Automatic may be cleaned in a spray gun washer.*
- *Use a cleaning solvent that is compatible.*

The DUX Automatic spray gun can easily be cleaned in the following ways:

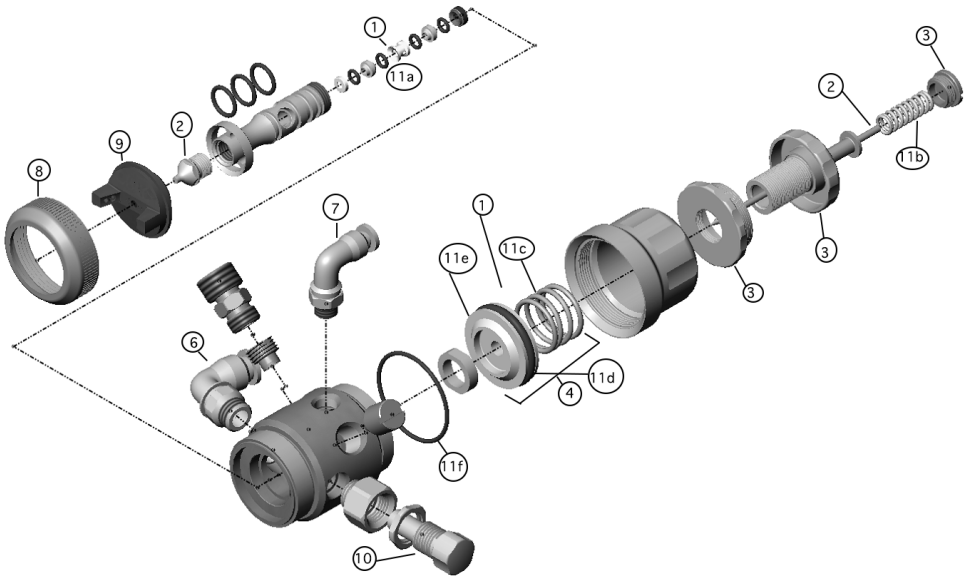
Flushing
1. Ensure the spray gun is depressurized.
2. Replace the material being sprayed with cleaning solvent.
3. Pressurize the spray gun.
4. Thoroughly clean the spray gun and fluid hose by triggering repeatedly until clean.

General Cleaning
- Remove the air cap and clean it with a soft bristle brush.

NOTE: *Do not clean air cap holes with metal tools as it could effect the spray pattern.*

- Using the DUX 10mm fluid tip driver, remove the fluid tip and inspect threads for wear or contamination. Clean with solvent.

Exploded View



No.	Part	Description
1.	310129	Fluid Needle Packing Kit
2.	310325	SC Tip/Needle Set (.6mm)
	310326	SC Tip/Needle Set (.8mm)
	310327	SC Tip/Needle Set (1.0mm)
	310328	SC Tip/Needle Set (1.2mm)
	310329	SC Tip/Needle Set (1.4mm)
	310330	SC Tip/Needle Set (1.6mm)
	310331	SC Tip/Needle Set (1.8mm)
	310332	SC Tip/Needle Set (2.0mm)
	310333	SC Tip/Needle Set (2.2mm)
3.	310115	Fluid Control Assembly
4.	310134	Trigger Kit
5.	310167	Mounting Bolt Kit
6.	410326	3/8" Push to Connect Swivel Fitting
7.	410325	1/4" Push to Connect Swivel Fitting
8.	310157	Air Cap Ring
9.	410465	Air Cap, A0, Stainless Steel
	410466	Air Cap, A1, Stainless Steel
	410467	Air Cap, A2, Stainless Steel
10.	310112	Fan Control Valve w/locking ring

No.	Part	Description
11.	310172	Wearable Parts Replacement Kit
		Includes:
	11a	(1) fluid needle packing kit
	11b	(1) needle spring
	11c	(1) trigger spring
	11d	(1) trigger piston o-ring-30mm
	11e	(1) trigger housing o-ring-36mm
	11f	(1)trigger housing

Accessories

310201	PTFE MagnaLube (.75oz)
310472	PTFE Magbelube 10PK (.75oz)
310175	Exterior Cleaning Brush
310176	Fluid Tube Cleaning Brush
310223	Air Cap Tester, A0, Stainless Steel
310233	Air Cap Tester, A1, Stainless Steel
310235	Air Cap Tester, A2, Stainless Steel

Tools

310174	Dux 10mm Fluid Tip Driver
310173	Dux Packing Tool
410606	Dux Multi-Tool Wrench
410522	Packing Driver
310310	Packing Pressure Gauge

Technical Data

Fluid Tip and Air Cap Selection Chart						
Material Type	Fluid Tip	Fluid Pressure	Fluid Flow (oz/min)	Air Cap	Air Consumption (10psi inlet pressure)	Max Usable Fan Pattern at 9" Spray Distance
Light	0.6 - 1.2	3 psi	12.5 oz./min.	A1	8.6 scfm	16.0"
Medium	1.2 - 1.6	4 psi	12.0 oz./min.	A1	8.6 scfm	14.0"
Heavy	1.6 - 1.8	5 psi	12.0 oz./min.	A1	8.6 scfm	14.0"

Fluid Viscosity Definitions			
	#2 Zahn Cup	Centipose (cP)	Examples
Light	Up to 18 seconds	Up to 20 cP	Lacquers, stains, varnishes, conventional primers, wash primers, water based acrylic basecoats
Medium	18 to 28 seconds	20 - 64 cP	Conventional solids urethanes, acrylics, alkyds
Heavy	28+ seconds	60+ cP	High solids urethanes, acrylics, alkyds

Specifications	
Body Material	Anodized Aluminum
Fluid Passage Material	Stainless Steel
Air Cap Material	Anodized Aluminum
Weight*	1.4 lbs
Maximum Atomizing Air Inlet Pressure**	10.7 psi
Maximum Inlet Fluid Pressure	75psi
Atomizing Air Inlet***	Quick Disconnect/Push Lock Swivel Fitting for 3/8” Diameter Tubing
Fluid Inlet	Quick Disconnect/Push Lock Swivel Fitting for 3/8” Diameter Tubing
Feed Type	Automatic
Fan Control	Manual adjustment or Automatic adjustment (external air supply)
Fan Control Inlet (Automatic Adjustment)	Quick Disconnect/Push Lock Swivel Fitting for 1/4” Diameter Tubing
Fan Control Inlet Pressure	2-20 psi
Triggering Pressure	Minimum 35 psi

*Weight includes fluid/air supply fittings and mounting hardware

**When operated to maintain HVLP compliance (10 psi or less at air cap)

*** When the atomizing air supplied to the DUX Automatic gun is on, atomizing air will constantly flow through the gun and out the air cap independent of triggering

DUX Standard Warranty

DUX TECHNOLOGIES INC. WARRANTS TO CUSTOMER THAT ALL DUX TECHNOLOGIES INC. PRODUCTS (A) ARE FREE FROM DEFECTS IN MATERIALS OR WORKMANSHIP AND (B) MEET ALL APPLICABLE DUX TECHNOLOGIES INC. SPECIFICATIONS. THE FOREGOING WARRANTY WILL REMAIN IN EFFECT FOR ONE YEAR FROM THE DATE OF SALE. IN THE EVENT A PRODUCT FAILS TO MEET THE FOREGOING WARRANTY, CUSTOMER SHALL NOTIFY DUX TECHNOLGOES INC. AND REQUEST A RE-TURN MATERIAL AUTHORIZATION NUMBER (RMA) BEFORE RETURNING THE PRODUCT PUR-SUANT TO DUX TECHNOLOGIES INC.'S INSTRUCTIONS. DUX TECHNOLOGIES INC. WILL REPAIR OR REPLACE, AT DUX TECHNOLOGIES INC.'s OPTION, ANY PRODUCT THAT FAILS TO MEET THE FOREGOING WARRANTY. IF DUX TECHNOLOGIES INC. DETERMINES THAT REPAIR OR REPLACEMENT IS NOT REASONABLE, DUX TECHNOLOGIES INC. MAY INSTEAD REFUND CUSTOMER'S PURCHASE PRICE FOR THE NONCONFORM-ING PRODUCT. THE ABOVE WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED. DUX TECHNOLOGIES INC. NEITHER ASSUMES NOR AUTHORIZES ANY OTHER PERSON TO ASSUME ANY OTHER LIABILITIES IN CONNECTION WITH THE SALE OR USE OF ANY PROD-UCT. EXCEPT FOR THOSE WARRANTIES EXPLICITLY DESCRIBED IN THIS PARAGRAPH, DUX TECHNOLOGIES INC. DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Please note that your Automatic Spray Gun was shipped with the following contents:

- **DUX Automatic Gun**
- **Quick Reference Guide, PTFE Grease Lubricant, and DUX 10mm Nut Driver**

If anything is missing, or you would like to order additional parts, please contact:

DUX Customer Service

DUX TECHNOLOGIES, INC.
P.O. BOX 1314
Seahurst, WA 98062
Tel: 888.389.2732
Fax: 866.876.1233
Website: www.DuxTechnologiesInc.com
Email: Customer.Service@DuxTechnologiesInc.com