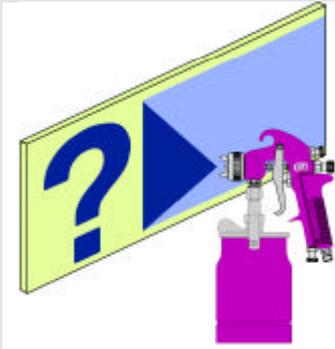


HOW DOES YOUR SPRAY GUN SHAPE UP?

No matter how experienced the sprayer, merely triggering and moving a gun in space will not reveal any of the performance characteristics vital to a top quality finish. A simple brief static spray pattern test will immediately highlight any potential problems before the gun is used on the painstakingly prepared workpiece or vehicle.

Follow the procedure explained below and compare the pattern to our examples. If your result resembles the examples then look at the corrective measures before you apply paint to the workpiece.



(1) Ensure that you have the correct Air Cap, Fluid Tip and Needle set-up on the gun to match the material being applied.

(2) Tape a piece of brown paper (approx. ½ metre / 20" square) onto the spray booth wall at shoulder height.

(3) Having set the gun at the recommended inlet or atomising air pressure, hold it at the correct target distance and spray at the paper without moving the gun.

	<p>Normal Pattern – Ready to Spray</p> <p>Good balance and uniformity</p> <ul style="list-style-type: none"> ? Symmetrical pattern shape ? Good working height and width ? Uniform distribution of material (Verify by horizontal spray-out) 	<p>Intermittent Spray Fan or Fluttering</p> <ul style="list-style-type: none"> ? Air in the fluid passageways ? Insufficient paint in the cup ? Fluid tip loose ? Fluid needle packing or packing screw loose ? Cup vent hole clogged 	
	<p>Banana Pattern</p> <ul style="list-style-type: none"> ? Air cap horn hole dirty or damaged ? Test spray pattern, rotate 180° and test again to isolate horn hole cause location ? Clean air cap thoroughly ? Replace air cap if necessary 	<p>Heavy Top or Bottom Pattern</p> <ul style="list-style-type: none"> ? Fluid tip or cap dirty or damaged ? Test spray pattern, rotate 180° and test again to isolate cause. ? Clean both items thoroughly ? Replace Fluid tip or Air cap if necessary 	
	<p>Single Split Pattern</p> <ul style="list-style-type: none"> ? Too much air for fluid quantity used ? Reduce air pressure at regulator ? Increase fluid flow by changing fluid tip size opening needle control knob 	<p>Centre Heavy Ellipse</p> <ul style="list-style-type: none"> ? Bad air or paint setting ? Viscosity too high – thin with solvent ? Fluid flow too high – reduce ? Air pressure too low – increase 	
	<p>Double Split Pattern</p> <ul style="list-style-type: none"> ? Too much air for fluid quantity used ? Reduce air pressure at regulator ? Increase fluid flow by changing fluid tip size or opening needle control knob 	<p>Ball End Heavy Pattern</p> <ul style="list-style-type: none"> ? Too much fluid flow ? Change fluid tip for smaller size ? Reduce flow using fluid needle control ? Reduce fan size using fan control 	

STATIC PATTERN TEST

Having examined the vertical spray pattern for uniformity of shape and size, now turn the air cap through 90° and static spray a horizontal pattern making sure you trigger for long enough to load the shape with material. Then watch to see the formation of the run-outs of material across the full width of the spray pattern.

This will highlight how well the material is distributed throughout the spray pattern. If the run-out is more obvious at the centre or at the ends then this indicates a problem.



TYPICAL GOOD PATTERN RUN-OUT

TYPICAL BAD PATTERN RUN-OUT

Spray gun Maintenance and Troubleshooting Guide (JGA)

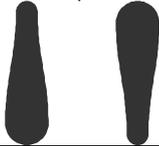
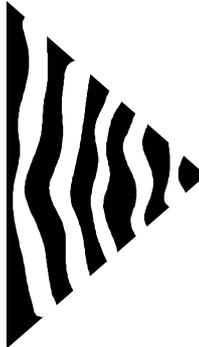


WARNING

IMPORTANT: Before using the gun for the first time, tighten the needle packing until the needle starts to bind. Then loosen the packing nut just enough so that the needle moves freely.

The following hazards may occur during the normal use of this equipment. Please read the following chart before using the equipment.

Area	Hazard	Safeguard
Tells where hazards may occur. Spray Area- Fire Hazard 	Tells where hazard is. Solvent and coatings can be highly flammable or combustible especially when sprayed.	Tells how to avoid the hazard Adequate exhaust must be provided to keep air free of accumulations of flammable vapours. Smoking must never be allowed in the spray area. Fire extinguishing equipment must be present in the spray area.
Solvent Spray	During cleaning and flushing, solvents can be forcefully expelled from fluid and air passageways. Some solvents can cause eye injury.	Wear eye protection
Toxic Substances 	Certain materials may be harmful if inhaled, or if there is contact with the skin.	Follow the requirements of the Material Safety Data Sheet supplied by your coating material manufacturer. Adequate exhaust must be provided to keep the air free of accumulations of toxic materials. Use a mask or respirator whenever there is a chance of inhaling sprayed materials. This mask must be compatible with the material being sprayed and its concentration.
Explosion Hazard- Incompatible Materials 	Halogenated Hydrocarbon solvents - for example: Methylene Chloride and 1,1,1 - Trichloroethane are not chemically compatible with the aluminium which may be used in many system components. The chemical reaction caused by these solvents reacting with aluminium can become violent and lead to an equipment explosion.	Guns with stainless steel fluid passages may be used with these solvents. However, Aluminium is widely used in other spray application equipment - such as material pumps, cups and regulators, valves, etc. Check all other equipment items before use and make sure they can also be used safely with these solvents. Read the label or data sheet for the material you intend to spray. If in doubt as to whether or not a coating or cleaning or cleaning material is compatible, contact your material supplier.

SPRAY FAULTS		
Condition	Cause	Correction
Improper spray pattern	<p>Gun Improperly adjusted.</p> <p>Dirty air cap</p> <p>Fluid tip obstructed</p> <p>Sluggish needle</p>	<p>Readjust gun, follow instructions carefully.</p> <p>Clean air cap.</p> <p>Clean</p> <p>Lubricate (see lubrication section) or loosen packing nut.</p>
<p>Heavy top or bottom pattern</p> 	<p>Material build-up on air cap, partially plugged horn holes, centre holes or jets.</p> <p>Material build-up on fluid tip or partially plugged fluid tip</p>	<p>Soak cap or tip in suitable solvent and wipe clean. To clean orifice, use a broom straw or toothpick. Never use a wire or hard instruments. This damages holes and distorts spray pattern.</p>
<p>Heavy right or left side pattern</p> 	<p>Note: To determine where material build-up is, invert cap and test spray. If pattern shape stays in same position, the condition is caused by material build-up on fluid tip. If pattern changes with cap movement, the condition is in the air cap.</p>	
<p>Heavy centre pattern</p> 	<p>Too much material</p> <p>Material too thick</p>	<p>Reduce fluid flow by turning fluid needle adjusting screw clockwise. Reduce fluid pressure or increase atomisation pressure.</p> <p>Thin</p>
<p>Intermittent or 'fluttering' spray fan</p> 	<p>Loose fluid tip</p> <p>Fluid tip not seated correctly in gun head</p> <p>Gun (with cup) tipped at excessive angle.</p> <p>Obstructed fluid passage or hose.</p> <p>Loose or cracked fluid tube in cup or tank.</p> <p>Insufficient fluid in cup or pressure tank.</p> <p>Too heavy fluid for suction feed.</p> <p>Dry or worn packing or loose packing nut.</p> <p>Plugged vent on suction feed cup.</p> <p>Gun fluid inlet loose or not sealed/seated correctly</p> <p>Fluid hose or cup not fitted correctly to gun fluid inlet connector</p>	<p>Tighten to 17 Nm (150 ibf/in)</p> <p>Remove tip, clean components, check cone seating on tip and gun for damage or contamination</p> <p>Do not tip excessively or rotate fluid tube.</p> <p>Clean</p> <p>Tighten or replace</p> <p>Fill cup or tank</p> <p>Thin material or change to pressure feed</p> <p>Lubricate or replace. Tighten</p> <p>Clean vent hole in cup lid.</p> <p>Tighten to 8 Nm (70 lbf/in)</p> <p>Remove, check mating surfaces and re-tighten</p>

SPRAY FAULTS		
Condition	Cause	Correction
Split spray pattern 	Not enough material or too high atomisation pressure	Reduce air pressure or increase fluid flow by turning fluid needle adjusting screw counterclockwise or increase fluid pressure on pressure feed container.
Excessive bounce-back	Too much atomisation air pressure Gun too far from surface Improper technique i.e. arcing, & fanning the gun	Reduce air pressure Check distance (normally 6-8") Move at moderate pace, parallel to work surface
FINISH FAULTS		
Runs and sags	Too much material flow Material too thin Gun tilted on an angle	Adjust gun or reduce fluid pressure Mix properly or apply light coats Hold gun at right angle to work and adapt to proper gun technique
Thin, sandy coarse finish drying before it flows out.	Gun too far from surface Too much air pressure Improper thinner being used	Check distance (normally 6-8") Reduce air pressure and check spray pattern Follow paint manufacturers mixing instructions
Thick dimpled finish "orange peel". Too much material coarsely atomised.	Gun too close to surface Air pressure too low Improper thinner being used Material not properly mixed Surface rough, oily, dirty	Check distance (normally 6-8") Increase air pressure or reduce fluid pressure Follow paint manufacturers mixing instructions Follow paint manufacturers mixing instructions Properly clean and prepare

GUN FAULTS			
	Condition	Cause	Correction
A	Will not spray	No air pressure at gun	Check air supply and air lines
		Internal mix or pressure feed air cap used with suction feed	Change to proper suction feed air cap
		Fluid pressure too low with internal mix cap and pressure tank	Increase fluid pressure at tank
		Fluid needle adjusting screw not open enough	Open fluid needle adjusting screw
A	Gun 'spits' paint when triggering on and off	Fluid too heavy for suction feed	Thin material or change to pressure feed.
		Incorrect needle fitted to gun	Check tip/needle selection chart and fit correct item
		Excessive needle wear	Replace with new needle
A	Small air leak from air cap when gun is not triggered	Excessive fluid tip wear	Replace with new fluid tip
		Air valve contaminated and not correctly seating	Remove valve and thoroughly clean valve shaft and seating surfaces
A	Gun 'spits' paint when triggering on due to paint build-up inside air cap between spraying operations	Air Valve seal damaged or missing	Replace
		Fluid tip not fitted correctly in gun head	Tighten to correct torque
B	Slow fluid leak from fluid tip and needle seat	Fluid tip/needle leakage	Check for damage or blockage
		Fluid Tip internal seat scored, damaged or worn	Replace
		Fluid needle external profile damaged or worn	Replace
		Contamination on needle or tip mating surfaces preventing good seal	Thoroughly clean
		Incorrect fluid tip for fluid needle fitted to gun	Check tip/needle selection chart and fit correct item
		Sluggish needle	Lubricate packing
B	Major fluid leak or fluid jetting from fluid tip and needle seat	Tight packing nut	Adjust
		Contamination on needle or tip mating surfaces preventing good seal	Remove tip and needle and thoroughly clean
		Incorrect fluid tip for fluid needle fitted to gun	Check tip/needle selection chart and fit correct item
B		Fluid needle stuck or 'binding up'	Remove and clean fluid needle shaft, or lubricate needle packing or loosen needle packing

GUN FAULTS			
	Condition	Cause	Correction
B	Paint build-up on fluid tip	Fluid tip not fitted correctly in gun head	Tighten to correct torque
		Fluid tip/needle leakage	Check for damage or blockage
B	Paint build-up on Air cap	Damaged air cap holes	Replace with new Air cap
		Gradual build-up of bounce-back on gun head	Thoroughly clean
C	Slow fluid leak from needle packing	Fluid needle packing worn or loose	Tighten or replace as necessary
D	Air valve sluggish or slow to turn on/off when trigger is pulled/released	Air valve stem bent	Replace damaged component
		Contamination on air valve stem	Remove and clean
D	Air leak from around air valve stem	Air valve seal damaged or missing	Replace
D	Air valve will not operate (air valve stem will not fully slide into valve body) when trigger is pulled	Air valve stem bent	Remove air valve and replace damaged air valve stem
		Contamination on air valve stem	Remove air valve and thoroughly clean
E	Stiff trigger action	Air valve stem bent	Replace damaged component
		Contamination on air valve stem	Remove and clean
		Contamination on trigger bearing screw	Remove and clean
		Contamination on fluid needle shaft	Remove and clean
		Fluid needle packing too tight	Loosen packing nut
F	Air leak from fluid needle exit point in top of handle	Seal damaged or missing	Replace
G	Air cap retaining ring will not rotate	Contamination on retaining threads	Soak gun head in solvent to soften paint
		Deformed or damaged retaining ring	Cut retaining ring off of gun (probably replace retaining ring and baffle)
H	Unable to turn fan control knob on top rear of gun	Internal O ring swollen or broken	Replace O ring
		Paint contamination on threads	Remove and thoroughly clean
H	Unable to get round spray	Fluid tip or air baffle incorrectly fitted	Remove, check components for damage and refit correctly
		Air baffle chinmey damaged	Replace air baffle
I	Air leak from baffle seal	Baffle seal swollen or damaged	Replace
J	Unable to turn air control valve on handle of gun	Internal O ring swollen or broken	Replace O ring
		Paint contamination on threads	Remove and thoroughly clean

Spray Gun Cleaning

Suction Feed Clean Up:

Turn off air supply. Disconnect cup from lid. Raise tube out of material and pull trigger to allow remaining material to drain back into the cup. Then empty the cup of material. Clean the cup, lid and tube. Add some thinner to cup.

Reassemble - Turn on air supply and spray with proper cleaning solvent. Repeat with clean solvent if necessary. Remove solvent, disconnect gun, remove air cap and clean. Wipe gun and cup with cleaning solvent dampened rag.

Pressure Feed Clean Up:

First, turn off air supply to material source (cup, tank or pump). Release material pressure from the system by opening relief valve or pulling trigger on gun.

On a pressure cup or tank, material in hoses may be drained back. Lid must be loose and all air pressure off. Keep gun higher than container and pull trigger. Allow material to drain back into the container. Pour off remaining material.

A hose cleaner can be used to clean inside of fluid hose, gun and fluid tube in cup or tank. Connect fluid hose to hose cleaner. Open air valve at hose cleaner. Pull trigger on gun and slowly open cleaning solvent valve on hose cleaner. Flush until clean. Shut off mixing valve when solvent and air discharge is clear. Allow air to dry passages and then shut air valve at hose cleaner. Repeat with hose to cup or tank connected to hose cleaner. Lid on cup or tank should be set to one side of the shell or on a waste container.

Note - This cannot be done with a pump. Pump must be run with proper solvent to clean.

Clean inside of container and lid. Wipe down gun with cleaning solvent dampened rag, then lubricate. Use SSL-10 spray gun lube.

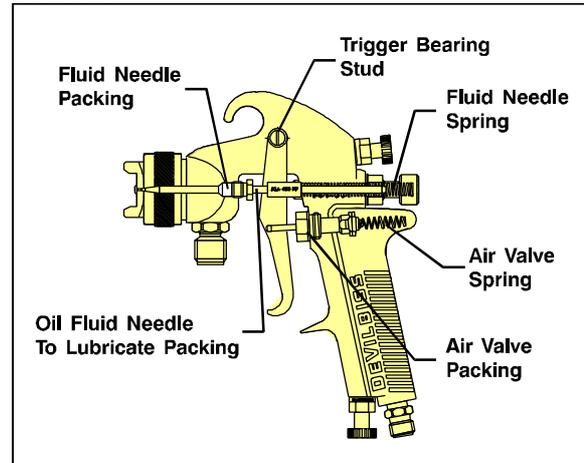
Without a hose cleaner, remove excess material from cup or tank and clean. Set up cup, tank or pump to operate with clean cleaning solvent. Turn off atomisation air to gun. Trigger gun into waste container. Continue flushing until cleaning solvent is clear. Blow air through hose to dry. Wipe hose and gun with cleaning solvent dampened rag and lubricate gun.

Cleaning the Air Cap:

Remove the air cap and, if dirtied with dry paint, let it soak in clean solvent. Later, brush and wipe off the air cap. If any holes in the cap are clogged, probe them with a whittled match-stick or tooth pick. Don't ream the air cap holes with wire, nails or metal tools. This may damage the hole and result in imperfect spray patterns.

Note - Never soak the entire gun in cleaning solvent. This will dry out the packing and remove lubrication.

Lubrication:



Daily, or after each use if intermittent, place a drop of SSL-10 gun lube on the points shown. Springs behind the fluid needle and air valve should have a light coat of petroleum jelly.

JGA Spray Gun Maintenance Schedule**A. Every Shift**

- 1) Check front air cap face and all air cap holes are free from damage. Replace if necessary
- 2) Check fluid tip external profile is undamaged. Replace if necessary
- 4) Check fluid needle is seating correctly in fluid head allowing no seepage. Replace or lap-in if necessary.
- 5) Turn off pressure tank fluid cock and/or compressed air supply to gun. Trigger gun. Apply one drop of spray gun lubricant to needle shaft immediately behind fluid needle packing screw. Release trigger. Repeatedly pull and release trigger to work lubricant into fluid needle packing.
- 6) Check trigger operates smoothly and fluid needle does not stick or bind up during movement due to damage or paint build-up.
- 7) Apply single drop of lubricant to each side of trigger pivot screw. Repeatedly pull and release trigger to work lubricant into trigger pivot.
- 8) Apply single drop of lubricant to air valve stem. Repeatedly pull and release trigger to work lubricant into air valve packing seal.
- 9) Check air valve operates smoothly without sticking. Replace valve stem if necessary.
- 10) Check needle packing for fluid leakage. If required, tighten the needle packing by rotating packing screw until the needle starts to bind, then loosen the packing nut just enough so that the needle moves freely. If screw bottoms without eliminating fluid leak, replace packing with new item.

B. Additional end of week maintenance checks

- 1) Check air cap retaining ring and gun air baffle threads are free from damage (a smear of Vaseline on the threads will help prevent binding).
- 2) Check air baffle seal is not leaking air badly or visibly damaged. Replace if necessary.
- 3) Apply smear of Vaseline to needle shaft front end for smooth operation.
- 4) Apply Vaseline to needle shaft rear end and needle spring to aid corrosion and contamination resistance.
- 5) Check Horn control valve is free to rotate with no stiff spots. Lubricate or replace O ring if necessary.
- 6) Check Air control valve, if fitted, is free to rotate with no stiff spots. Lubricate or replace O ring if necessary.
- 7) Check for air leaks from aircap when gun is not triggered. Clean or replace air valve stem or seat if necessary.
- 8) Check Trigger retaining screw is tight.
- 9) Check fluid and air inlet connectors are tight and sealed. Tighten if necessary.

C. Additional Bi-weekly maintenance checks

- 1) Check for air leakage from air valve body when trigger is pulled. Replace air valve seal if necessary.
- 2) Check fluid needle shaft is not badly worn and needle end profile and point are undamaged.
- 3) Apply a smear of Vaseline to all air O rings to aid fitting and easy rotation.
- 4) Check gun body for damage, particularly around air inlet connector port.
- 5) Check stainless steel head fluid insert, if fitted, for damage to fluid tip seat, swaging or leaks caused by rotation. This item is not removable or replaceable, and a new gun body will be necessary.
- 6) Check for damage to air baffle chimney. Replace air baffle assembly if necessary.
7. Apply Vaseline to air valve spring to aid corrosion and contamination resistance.



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