DEVILBISS

SB-E-2-695-B

CE

Operation Manual:
AGGC Electrostatic Spray Gun

Important:

Read and follow all instructions and SAFETY PRECAUTIONS before using this equipment

DESCRIPTION

The AGGC-501/502 is a production spray gun suitable for use with automatic and semi-automatic machines to atomise finishing materials by means of compressed air and to deposit them, in the presence of an electrostatic field between the charged gun and an earthed part being coated.

To handle a wide range of coating materials the material passages are manufactured from high grade stainless steel. The Pressure fed material supply can be re-circulating or direct.

A removable spray head simplifies maintenance and cleaning of material wetted components. The gun is triggered by compressed air to a single acting cylinder by a remotely positioned 3 way valve (supplied by user).

IMPORTANT: These guns are not designed for use with highly corrosive or highly abrasive materials and if used with such materials it must be expected that the need for thorough cleaning and/or the necessity for replacement parts will be increased. If there is any doubt regarding the suitability of a specific material, advise what material is to be used and/or submit a sample for test.

MODELS AND SPECIFICATIONS

EXAMPLE:

GUN MODEL	AIR & FLUID INLET THREADS	*APPROX FLUID FLOW RATE FL.OZ/MIN	ELECTRODE LOCATION	FLUID TIP MATERIAL	NEEDLE MATERIAL	USAGE
AGGC-501	1/4 NPSM	2–6	AIR CAP	Stainless Steel with Carbide insert	Stainless Steel with Carbide tip	For abrasive and/or water based materials such as Porcelain Enamel ROUND SPRAY PATTERN
AGGC-502	1/4 NPSM	2–6	NEEDLE	Stainless Steel	Stainless Steel	For most common materials except hose of a abrasive or corrosive nature ROUND SPRAY PATTERN

Due to the wide range of coating materials available, the approximate flow rates many may vary above or below those shown.

SPECIFICATIONS

MINIMUM Cylinder operating pressure: 4.5 bar (65 lbf/in^2)

MAXIMUM RECOMMENDED WORKING PRESSURES
Air Supply: : P_1 = 9 bar (130 lbf/in^2)
Material Supply: : P_2 = 14 bar (200 lbf/in^2)

DIMENSIONS: See Figure 2

WEIGHT: 1000g

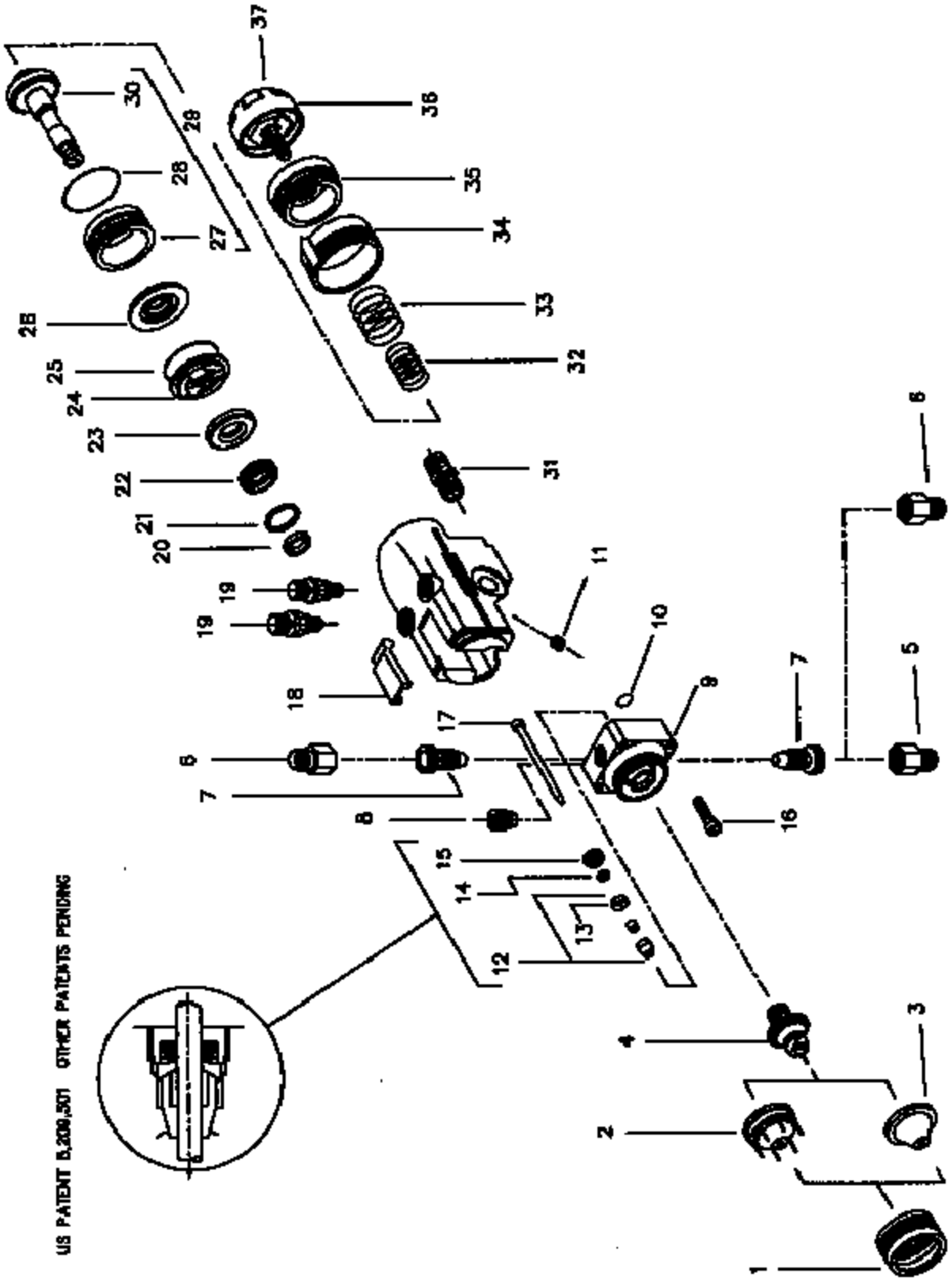


CHART 1

REF.	ORDER No.	DESCRIPTION	QTY
1	MBC-368	RETAINING RING	1
2	CHART 2	AIR CAP (AGGC-501)	1
3	CHART 2	AIR CAP (AGGC-502)	1
4	CHART 2	FLUID TIP	1
5	41241-020	RESRTICTOR(AGGC-502)	1
6	AD-404	ADAPTOR(AGGC-501)	2
7	AGG-57	FLUID INSERT(AGGC-501)	2
		FLUID INSERT(AGGC-502)	1
8	AGG-59	PLUG	1
9	AGG-435	SPRAY HEAD	1
10	SSG-8099-K10	'O' RING	2
11	SSF-2048-K5	'O' SCREW	1
12	AGG-444	PACKING SET	1
13	AGGS-31	PACKING PIECE	1
14	SSN-1023-K6	DISC SPRING	6
15	AGGS-32-K5	RETAINING SCREW	1
16	SSF-3120-K4	SCREW	4
17	CHART 2	FLUID NEEDLE	1
18	AGG-33	COVER	1
19	AGG-403	CONTROL VALVE	2

REF.	ORDER No.	DESCRIPTION	QTY
20	SST-7711	SEAL	1
21	AGG-39	SEAL RING	1
22	AGGS-29	LOCKING RING	1
23	AGG-4	VALVE SEAT	1
24	AGG-5	SPACER	1
25	SSG-8102-K5	'O' RING	1
26	AGG-415-K	SEAL AND SPACER	1
27	AGG-8	CYLINDER SLEEVE	1
28	SSG-8083-K5	'O' RING	1
29	AGG-410	PISTON ASSEMBLY	1
30	SST-7713	PISTON SEAL	1
31	CT-317	AIR INLET CONNECTOR 1/4 NPS	2
32	AGG-35-1	SPRING (OUTER)	1
33	AGG-12-1	SPRING (INNER)	1
34	AGG-36	ZERO SLEEVE	1
35	AGG-9	END CAP	1
36	AGG-402-1	RATCHET ADJUSTER KNOB	1
37	SSF-2047	SCREW	1

CHART 2

GUN MODEL	AIR CAP REF No.3 & 2	FLUID TIP REF No.4	FLUID NEEDLE REF No 17	LAPPED TIP & NEEDLE
AGGC-501 AGGC-502	41722-108 31718-109	41545-741 81526-732	AGGC-401 AGGC-402	AGGC-404 AGGC-405

INSTALLATION

IMPORTANT: In order to ensure that this equipment reaches you in first class condition, protective coatings, rust inhibitors, etc., have been used. Flush all equipment through with a suitable solvent before use to remove these agents from material passages.

See figures 1 and 2
Mount gun using the 12.7mm (1/2") diameter hole 'X' and secure (11) with screw (see accessories for spare studs). An additional 10mm diameter 12.5mm deep dowel hole 'Y' has been provided to enable users to centre the spray gun with mounting fixtures of their own design.

HOSING
Use separate filtered regulated air supplies for atomising and cylinder air.

Connect the cylinder air 'A' via a control valve. For fast cylinder operation the control valve should be fitted as close to the gun as possible or an additional quick exhaust valve installed in the line.

Attach atomising air hose to connector 'B'

Connect material hose(s) 'C' to the spray head. If material recirculation is not required, remove one of the connectors and fit plug supplied with the gun.

WARNING: See instructions under "Replacement of Parts".

Recommended hose sizes up to 10m (34ft) long:

Atomisation Air: 8mm (5/16") bore
Cylinder Air: 6mm (1/4") bore
Material: 9.5mm (3/8") bore

REPLACEMENT OF PARTS

NOTE: Order numbers shown in parts list for figure 1 with suffix "-K5" etc. at the end of the number indicates a kit of parts.
Example: Ref 5. AGG-89-K5 is a kit of five gaskets.

TO REMOVE SPRAY HEAD ASSEMBLY See Figure 1.

Disconnect material hose(s). Unscrew the retaining ring and remove the air cap.

1. Using a small screwdriver remove the black plastic cover (18) at the top of the spray gun. Check that the slot in the piston (29) is uppermost so that the fluid needle (17) can be removed. If the slot is not in the correct position remove knob (36) and use a screwdriver in the centre hole of the end cap (35) to rotate the piston (29) to its correct position.
2. Remove the 4 hexagon socket screws (16) holding the spray head (9) to the body.
3. Pull the spray head (9) forward to disengage the locating pin.
4. Slide the spray head (9) up to disengage fluid needle (17) from piston (29). With spray head removed all components can easily be removed and replaced.

Material Connectors/Plug (5,6,7,8)

WARNING: To provide protection from the ingress of Halogenated Hydrocarbon materials, the spray head material passages are sealed. It is essential when fitting connector/plug (8, 16) that sealing compound is applied and it is tightened to the recommended torque. Do not remove or tighten fluid tip (4) if connector(s) are not fitted to the spray head, as it may loosen the spray head insert and cause irreparable damage.

Remove connector(s)/plug with a 6mm hexagon key and clean threads in the spray head. Apply a medium strength thread locking/sealing compound to the external chamfer and threads of the new connector. Screw into spray head and tighten. Recommended Torque : 8Nm (70lbf in).

Fluid tip (4)

Unscrew the fluid tip (4). It is recommended that when changing a Fluid Tip the Fluid Needle (17) is also replaced. (See lapped tip and needle sets on Chart 2).

Re-assemble ensuring that the fluid tip seats correctly in the spray head. Tighten fluid tip. Recommended torque 16Nm (140lbf in).

Fluid Needle (17) and Packing Set (12)

To overcome problems experienced with needles jamming, follow this procedure to ensure correct needle movement and needle packing adjustment.

Remove Spray Head Assembly, Fluid Tip (4).

4.1. Remove needle (17).

4.2. Remove retaining screw (15) using a hexagon key, remove disc springs (14), packing piece (13) and needle packing set (12).

Refer to enlarged view on Figure 1.

4.3. Fit new retaining screw (15), disc springs (14), packing piece (13) and needle packing set (12) over needle (17).

4.4. Insert assembly into Spray Head and screw in retaining screw (15) by hand.

4.5. Remove needle (17) and re-insert from opposite end (See Figure 3).

4.6. Draw needle (17) back until the hexagon key fits into the retaining screw without touching the end of the needle (See Figure 4).

4.7. Fully tighten retaining screw then back off approximately half a turn – check the needle movement. The needle should not require excessive force to be moved or be loose – adjust if necessary.

4.8. Remove needle (17).

4.9. Re-assemble fluid tip (4).

4.10 Re-fit needle (17) in correct orientation.

5. Re-assemble spray head to gun. Check 'O' rings (10) are in position. Engage fluid needle (17) into piston. Push spray head in and align with location pin, tighten screws (16). Refit air cap and material hose(s).

Note: When refitting Needle, take care not to damage the electrode on front of the needle on AGGC-502 guns.

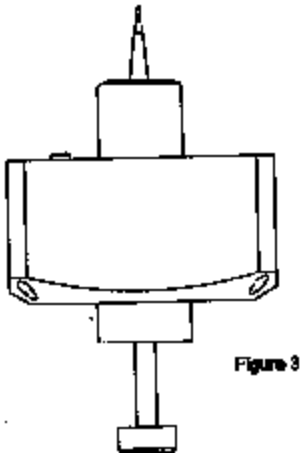


Figure 3

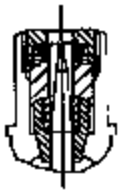


Figure 4

SAFETY WARNINGS

FIRE AND EXPLOSION

Solvents and coating materials can be highly flammable or combustible, especially when sprayed.
- Work stations must be provided with adequate ventilation/exhaust to prevent the build-up of flammable vapours.
- Smoking and naked flames must not be allowed in the spraying or mixing areas.
- Fire extinguishing equipment must be provided in the spraying and mixing areas.

Users must comply with all local and national codes of practice and insurance company requirements governing ventilation, fire precautions, operation, maintenance and housekeeping of work stations.

HALOGENATED HYDROCARBON SOLVENTS - for example 1,1,1-Trichloroethane and Methylene Chloride can chemically react with aluminium and galvanised or zinc coated parts and cause an explosion hazard. Read the label and data sheet of the material you intend to spray.

This equipment, as supplied, is suitable for use with Halogenated Hydrocarbons and the user must ensure that all other equipment in the system is also suitable for use with these materials. DO NOT SPRAY MATERIALS CONTAINING THESE SOLVENTS EXCEPT WITH EQUIPMENT SPECIFICALLY DESIGNATED BY THE MANUFACTURER AS BEING SUITABLE FOR SUCH USE.

SPRAY AREA - HIGH VOLTAGE EQUIPMENT - This is a high voltage , unearthed device that can produce electrical arcs capable of igniting coating materials. Parts being coated must be supported on conveyors or hangers and be earthed. The resistance between the part and the earth must not exceed 1 megohm. A safe distance must be maintained between the parts being coated and the spray gun electrode. A power distance of at least 1 inch for each 10kv of power supply output voltage is required at all times. Parts must be supported so that they cannot swing and reduce the clearance specified. All electrically conductive objects required by the process to be at high voltage, must be earthed.

READ ALL SAFETY WARNING INFORMATION BEFORE INSTALLATION OR USE OF THIS EQUIPMENT: If improperly located, certain electrical equipment may become a source of ignition. The power supply and other electrical equipment, with the exception of the high voltage grid, electrodes and electrostatic gun, must be located outside of zone 1 Hazardous Areas as defined in BS5345 Part 11/1976.

Electrical discharge may cause fire or explosion. If the use of a particular coating material results in a disruptive electrical discharge, such as arcing or sparking, from the gun, stop using material immediately and notify your local DeVilbiss Representive After the initial set-up, no air or fluid adjustments are required at the gun. The atomisation and fluid pressures will be entirely dependent on the material being sprayed and the fluid flow rate required.

SPRAY AREA - FIRE HAZARD - Improper or inadequate operations and maintenance procedures can cause a fire hazard. Spray areas must be kept clean to prevent accumulation of combustible residues. When using solvent for cleaning:
- Those used for equipment flushing should have flash points equal to or higher than that of the coating material.
- Those using for general cleaning must have flash points points above 100° (37.8°C)

Booth ventilation must be capable of removing flammable vapours from the area in accordance with BASEEFA recommendations

PERSONNEL SAFETY - ELECTRICAL HAZARDS - The high voltage equipment used in this application creates a hazard for personnel. The high voltage can cause injury and a spark from the equipment to a person is capable of igniting coating materials. High voltage equipment must be isolated from personnel. Booths, fencing, railings and other means must be placed around the equipment and maintained to assure safe isolation of this process.

PERSONAL PROTECTION

WARNING: Fire or explosion hazard - Electrically charged components may ignite solvents. The power supply voltage MUST be turned OFF prior to adjusting controls, cleaning or maintenance.
TOXIC VAPOURS - when sprayed, certain materials may be poisonous, create irritation or otherwise be harmful to health. Always read carefully all labels and safety/performance data for the material being sprayed and follow any recommendations. IF IN DOUBT, CONSULT THE MATERIAL SUPPLIER.
- The use of respiratory protective equipment is recommended at all times when spraying. The type of respiratory protective equipment used must be compatible with the material being sprayed and the level of concentration.
- Always wear eye protection when spraying or cleaning the equipment.
- Gloves must be worn for spraying or cleaning the equipment when certain coating materials and solvents are used.

TRAINING

Personnel should be given adequate training in the safe use and maintenance of this equipment. Training courses on all aspects of the equipment are available. For details contact your local representative. The instructions and safety precautions contained in this literature and the literature supplied with the coating material should be read and understood before the equipment is used.

MISUSE

- All spray guns project particles at high velocity and must never be aimed at any part of the body.
- Never exceed the recommended safe working pressures for any of the equipment used.
- The fitting of non-recommended or non-original accessories or spare parts may create hazardous conditions.
- Before dismantling the equipment for cleaning or maintenance, all pressures, air and material, must be isolated and released.

The disposal of non-metallic materials must be carried out in an approved manner. Burning may generate toxic fumes. The removal of waste solvents and coating materials should be carried out by an authorised local waste disposal service.

The materials used in the construction of this equipment are (bearing in mind the warning on Halogenated Hydrocarbons) solvent resistant enabling the equipment to be cleaned using gun washing machines. However, this equipment must not be left inside the gun washing machine for prolonged periods of time after the automatic cleaning cycle has been completed.

The solvents used in the gun washing machine should be regularly checked to ensure that the equipment is not flushed through with contaminated material. Follow the recommendations of the machine manufacturer.

NOISE LEVELS

The continuous A-weighted sound pressure level of this spray gun may exceed 85 dB(A) depending on the air cap/fluid tip set-up being used. Sound levels are measured using an impulse sound level meter and analyser, when the gun is being used in a normal spraying application. Details of actual noise levels produced by the various air cap/fluid tip set-ups are available on request.

OPERATION

See figure 2.

1. Mix, prepare and strain the material to be sprayed according to the paint manufacturers instructions. Use a lint free mesh to strain the material.
2. Adjust the spray gun controls and atomising pressure before turning material supply on.

2.1. Open valves ‘D’ marked FAN and ‘E’ marked ATOM by turning counter-clockwise.

2.2. To adjust fluid needle for full travel. Close fluid needle adjusting knob ‘F’ clockwise until resistance is felt, then open by turning 5 to 6 full turns counter clockwise.

2.3. Regulate cylinder air pressure to 4.5 bar (65lbf/in^2).

2.4. Adjust atomising air pressure. Start with a regulated pressure of 3.5-4 bar (50-60lbf/in^2).

3. Turn on material supply and adjust material pressure to 0.7 bar (10 lbf/in^2).
4. Test spray and observe spray pattern. Adjust material or air atomisation pressures until the desired pattern is obtained. If it is not practical to control the material flow by pressure regulation, the fluid needle adjusting knob has ratchet stops and zero sleeve to aid fine material adjustment by restricting the fluid needle movement. Close knob by turning clockwise and gradually open using ratchet stops until the correct material flow is achieved.

Note: On the AGGC-501 & -502 models, which have a round spray pattern, there is no internal division of the atomising air creating a separate spreader “FAN” line. Therefore the degree of atomisation of the material being sprayed is controlled by adjusting both of these valves.

PREVENTATIVE MAINTENANCE

FLUSHING THE SYSTEM.

1. Turn off atomising air supply and material supply.
2. Relieve system pressures, open material relief valve and trigger gun into booth or container.
3. Remove air cap.
4. Replace material with a suitable solvent.
5. Turn on solvent supply and flush hose and gun by triggering gun or recirculation.

   NOTE: It may be necessary to fit a shut-off valve to the return line on circulating systems and trigger the gun to clean front portion of the spray head and fluid tip.

Air cap, clean by immersing in solvent, brush or wipe clean. If any holes in the air cap are blocked use a toothpick or broom straw to remove obstruction. Never use a steel wire or hard implement which will damage the air cap and result in a distorted pattern.

TO DISMANTLE GUN BODY, See Figure 1.

Disconnect hoses and release screw (11).

6. Remove spray head assembly see steps 1 to 4 and ratchet knob (36).
7. Piston (29) and Seals (20, 26 and 30).

7.1. Remove end cap (35) using pin spanner which is part of the accessory tool kit AGG-412.

7.2. Remove springs (32 and 33) and piston (29). Care must be taken when removing the piston (29) from the gun to ensure that the front forks do not damage the front seal (20).

7.3. Remove the cylinder sleeve (27), accessory tool J-24728 can be used to extract it from the body.

7.4. Remove the seal and spacer (26), 'O' ring (25), spacer (24) and valve seat (23).

7.5. Using the hexagon key tool provided in the AGG-412 accessory tool kit, remove the seal locking ring (22), front seal (20) and seal ring (21).

7.6. Fit new front seal (20) into the locking ring (22) and using the hexagon key re-assemble, with seal ring (21) into body.

7.7. To replace piston seal (30), clamp accessory tool J-24708 into vice jaws, pins upwards. Position holes in piston (29) onto tool locating pins.

Remove piston end cap and seal (30), clean end cap threads and end of piston. Fit new seal to piston, wipe clean the bore of the cylinder sleeve (27) and apply a light coating of soft petroleum jelly, remove 'O' ring (28) and replace with a new one.

Push cylinder sleeve over piston seal (30) ensuring the end of the cylinder sleeve with the identification groove is pushed on first.

Apply one drop of medium strength thread locking/sealing compound to the threads of the piston end cap and assemble to piston. Carefully tighten piston end cap, compressing seal (30) until end cap makes contact with the back face of the piston. Recommended torque: 3.5Nm (30lbf in).

NOTE: This assembly should be left standing upright for 1 hour to allow to compound to cure.

7.8. Re-assemble valve seat (23) ensuring lip is facing out towards the back of the gun body.

7.9. Re-assemble spacer (24) and 'O' ring (25).

7.10. Remove piston and cylinder sleeve assembly from tool and carefully push seal and spacer (26) onto piston with lips of seal facing away from cylinder sleeve.

7.11. Fit complete assembly into gun.

7.12. Refit springs (32 and 33), zero sleeve (34) and end cap (35) and tighten down to ensure all inner components have been securely compressed into position. Recommended torque 21-24Nm (190-210lbf in).

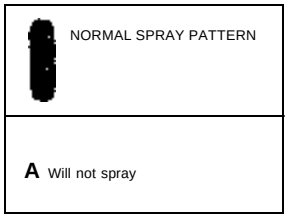
7.13. Using a screwdriver rotate piston (29) so that forks are facing upwards to allow spray head to be fitted.

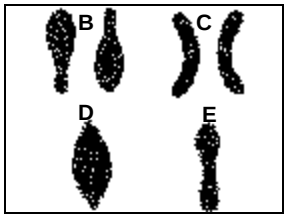
7.14. Re-assemble spray head and knob (36). See step 5.

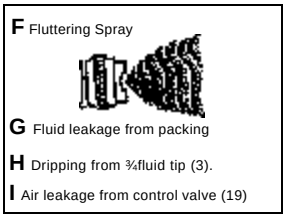
8. Connectors (31), remove connector and clean threads in the gun body. Apply a medium strength thread locking/sealing compound to the new connector's thread and screw into gun body, do not over tighten leave approximately 2mm of thread visible above the gun body face. Recommended torque 17–18Nm (150–160lbf in).

SERVICE CHECKS

CONDITION







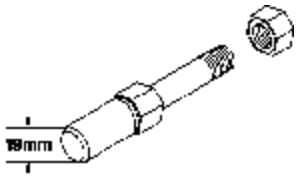
	CAUSE	CORRECTION
A	1. No pressure at the gun	1. Check air/material lines
	2. Piston stops moving	2. Check adjusting knob (36) and/or cyl air supply
B+C	1. Material build-up on air cap/fluid tip	1. Clean air cap/fluid tip
D	1. Material too thick or too much	1. Thin or reduce material flow
E	1. Not enough material	1. Reduce air pressure or increase material flow
F	1. Insufficient material in tank or an obstruction in the hose.	1. Fill tank or clear obstruction
	2. Gun material passage blocked	2. Clean.
	3. Worn packing (12)	3. Replace.
	4. Loose or damaged fluid tip	4. Tighten or replace
G	1. Packing worn (12)	1. Replace packing
	2. Rough needle shaft (17)	2. Polish needle shaft or replace
H	1. Worn packing (12)	1. Replace
	2. Worn or damaged fluid tip (4) or needle (17)	2. Replace
I	1. Worn seals	1. Replace valve (19)

ACCESSORIES

SERVICE KIT: Order KK-4501 add fluid tip size required. Example: KK-4501-**FFH**. Parts marked with * are included in the kit.

GUN MOUNTING STUD KIT: Order KK-4573.

AGGS-33



INTERNAL STUD: Order 32742-124

TOOL KIT: Order AGG-412. Comprising 4mm hexagon key for (11,16). Key Wrench for (22). Pin spanner for (35). 1.5mm hexagon key for (37).

EXTRACTOR TOOL: Order J-24728 for (27).

PISTON ASSEMBLY FIXTURE: Order J-24708, for seal (30) replacement.

REMOTE 'FAN' CONTROL ADAPTOR Order AGG-75.
For an independently regulated fan air supply, remove 'FAN' valve (D) and fit adaptor.

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