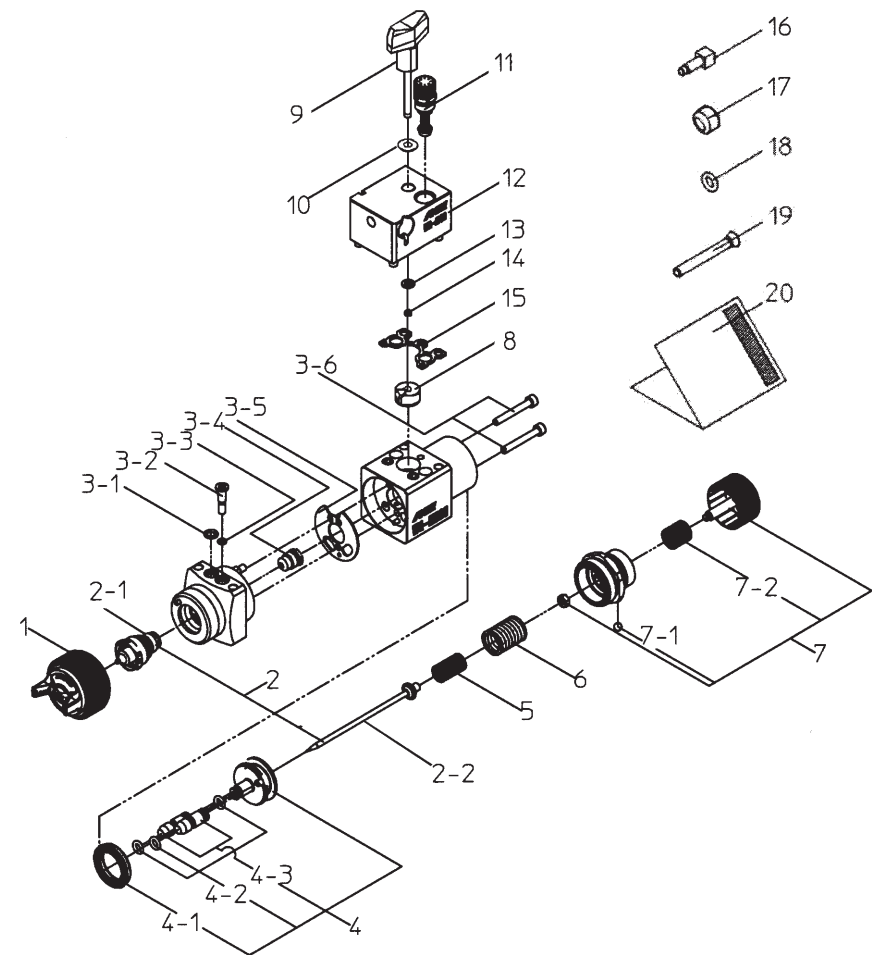




DESCRIPTION	Ref.
Air cap set	1
Fluid nozzle-needle set	2 ●
Fluid nozzle	2-1
Fluid needle	2-2
O'ring	3-1 ●
Plug	3-2
O'ring	3-3 ●
Fluid needle packing set	3-4
Gun unit seal	3-5
Hex. socket head bolt	3-6
Piston set	4
Piston packing	4-1 ●
O'ring	4-2 ●
Air valve	4-3 ●
Fluid needle valve spring	5
Piston spring	6
Fluid adj. set	7
Ball	7-1
Fluid adj. spring	7-2
Filler nut block	8
Wing bolt set	9
Washer	10
Pattern adj. set	11
Manifold set	12
Turn shaft washer	13
Retaining ring	14
Manifold seal	15
Accessories	
Hex. bolt	16
Hex. plug	17
O'ring	18
Screw	19

● Marked parts are wearable parts.

- When ordering parts, specify gun's model, part name with ref. No. and marked No. of air cap set, fluid nozzle and fluid needle set.
- When replacing fluid nozzle and/or fluid needle, please order nozzle needle set.

Fluid nozzle - fluid needle set combination

Model	Fluid nozzle		Fluid needle Mark
	Orifice ø mm (in)	Mark	
WA-M220WB-081	0.8 (0.031)	W200WB/08M	WM12
WA-M220-044	0.4 (0.015)	W200/04	WM04
WA-M220-064	0.6 (0.023)	W200/06	WM05
WA-M220-084	0.8 (0.031)	W200/08	WM12
WA-M220-104	1.0 (0.039)	W200/10	WM12
WA-M220-152G	1.5 (0.059)	W200/15	WM15
WA-M220-162	1.6 (0.063)	W400/16	WM15



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MJT182-03REV/03

WA-M220 AUTOMATIC SPRAY GUN - MANIFOLD WA-M4R



GB Before use, adjustment or maintenance, it is important to read this instruction manual very carefully. This manual must be stored in a safe place for any future reference that may be necessary.

This **ANEST IWATA** spray guns kit complies to ATEX regulations 94/9/EC, Protection level: II 2 G X Suitable for using Zones 1 and 2.
X marking: Any static electricity discharge from the spray gun is to be diverted to the ground via the conductive air hose as stipulated.



IMPORTANT

This automatic spray gun should be operated only by an adequately trained operator for safe use and maintenance of the equipment. Any misuse or handling other than those indicated in this Instruction Manual is not covered by guarantee.
ANEST IWATA disclaims all responsibility for any accident or damage caused by failure observing the operational and safety procedures in this manual. In the interest of user friendliness, this manual contains information in a brief and concise form. For any additional information you may require regarding the automatic spray gun operations, or if any missing parts or any damage during transportation is found, or details of training courses, please contact your nearest **ANEST IWATA Company** (see last cover page).

Be sure to observe warnings and cautions in this instruction manual.
If not, it can cause paint ejection and serious bodily injury by drawing organic solvent.
Be sure to observe following ⚠ marked items which are especially important.

⚠ WARNING	Indicates a potentially hazardous situation which, if not avoided, may result in serious injury or loss of life.
⚠ CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or property damage.
IMPORTANT	Indicates notes which we ask you to observe. The safety precautions in this instruction manual are the minimum necessary conditions. Follow national and local regulations regarding fire prevention, electricity and safety as well as your own company regulations.

IMPORTANT SPECIFICATIONS

Max. Pressure:	6.8 bar (98 PSI)	Max. Temperature:	
Noise Level (LAeqT):	82.4 dB (A)	Atmosphere	5 ~ 40 °C
Air & Fluid Manifold connection:	Rc 1/8"	Air and fluid	5 ~ 43 °C

* Measuring point: 1m backwards from gun, 1,6 m height

TECHNICAL SPECIFICATIONS

			Recommended conditions					
Model	Nozzle orifice mm (in)	Air Cap Set Mark	Air pressure at gun inlet bar (PSI)		Fluid output ml/m (cfm)	Air consumption mm	Pattern width	Weight g (lbs)
AUTOMATIC SPRAY GUN			Atomizing air	Fan air				
WA-M220WB-081	0.8 (0.031)	WB1	0.15 (1.5/22)	0.12 (1.2/18)	200	340 (12.0)	300 (11.7)	690 (1.51)
WA-M220-044	0.4 (0.015)	LV2			100	360 (12.7)	155 (6.0)	
WA-M220-064	0.6 (0.023)	LV2			100	360 (12.7)	155 (6.0)	
WA-M220-084	0.8 (0.031)	LV2			100	360 (12.7)	155 (6.0)	
WA-M220-104	1.0 (0.039)	LV2			100	360 (12.7)	160 (6.2)	
WA-M220-152G	1.5 (0.059)	G2P			500	530 (18.7)	400 (15.7)	
WA-M220-162	1.6 (0.063)	G2P			500	530 (18.7)	400 (15.7)	
MANIFOLD								
WA-M4R	-	-	-	-	-	-	-	375 (0.82)

Manufactured by:
ANEST IWATA Corporation 3176,Shinyoshida-cho, Kohoku-ku, Yokohama, 223-8501 Japan

SAFETY WARNINGS



FIRE OR EXPLOSION HAZARD



1. **Sparks and open flames are strictly prohibited.**
Paints can be highly flammable and can cause fire.
Avoid any ignition sources such as smoking, open flames, electrical goods, etc.
2. **Never use the following HALGOGENATED HYDROCARBON SOLVENTS**
which can cause cracks or dissolution on gun body (aluminium) by chemical reaction.
 - Unsuitable solvents: methyl chloride, dichloromethane, 1.2-dichloroethane, carbon tetra-chloride, trichloroethylene, 1.1.1- trichloroethane.
 - Be sure that all fluids and solvents are compatible with gun parts.
 - We can supply a list of materials used to manufacture the product.
3. **Securely ground spray gun.** Use air hose with built-in ground wire or use grounded gun stay.
Ground resistance : Less than 1MΩ. Check the earth stability periodically. If not, insufficient grounding can cause fire and explosion due to static electric sparking.



IMPROPER USE OF EQUIPMENT



1. **Never point gun towards people or animals.**
If done, it can cause inflammation of eyes and skin or bodily injury.
2. **Never exceed maximum operating pressure and maximum operating temperature.**
3. **Be sure to release air and fluid pressures before cleaning, disassembling or servicing.**
If not, remaining pressure can cause bodily injury due to improper operation or scattering of cleaning liquid. In order to release pressure, first stop supply of compressed air, fluid and thinner to automatic spray gun. Next, supply only piston operating air and exhaust fluid by operating fluid needle, which results in automatic supply stop of all compressed air.
4. **Tip of fluid needle set has a sharp point.**
Do not touch the tip of fluid needle during maintenance for the protection of the human body.



PROTECTION OF HUMAN BODY



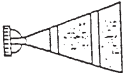
1. **Use in a well-ventilated site by using spray booth.**
If not, poor ventilation can cause organic solvent poisoning and catch fire.
2. **Always wear protective gear: safety glasses, mask, gloves.**
If not, cleaning liquid, etc., can cause inflammation of eyes and skin. If you feel something wrong with eyes or skin, immediately see a doctor.
3. **Wear earplugs if necessary.**
Noise level can exceed 85 dB(A), depending on operating conditions and painting site.



OTHER PRECAUTIONS

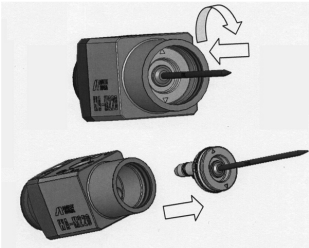
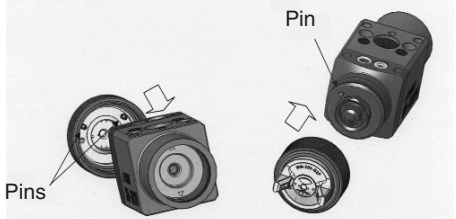
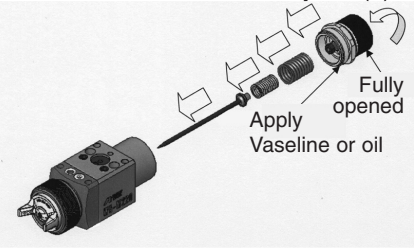
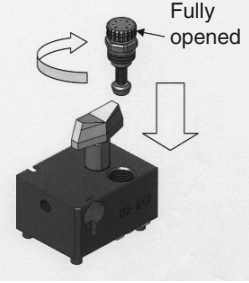
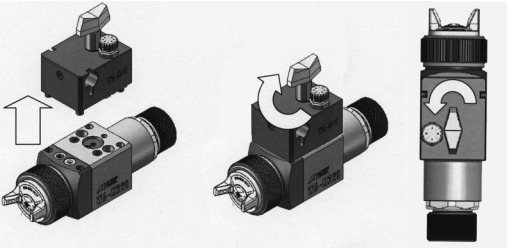
1. **Never alter this spray gun.**
If done, it can cause insufficient performance and failure.
2. **Enter working areas of other equipment (robots, reciprocators, etc.) after machines have been turned off.**
If not, contact with them can cause injury.
3. **Never spray foods or chemicals through this gun.**
If done, it can cause accident by corrosion of fluid passages or adversely affect health by mixed foreign matter.
4. **If something goes wrong, immediately stop operation and find the cause. Do not use again until you have solved the problem.**

TROUBLESHOOTING

Spray Pattern	Problems	Remedies
Fluttering 	1. Air enters between fluid nozzle (2-1) and tapered seat of gun body. 2. Air enters at fluid hose joint. 3. Air is drawn from fluid needle packing set (3-4).	1. Remove fluid nozzle (2-1) to clean seat. If it is damaged, replace nozzle. 2. Fully tighten joint section. 3. Tighten fluid needle packing set (3-4).
Crescent 	1. Paint buildup on air cap (1) partially clogs horn holes. Air pressure from both horns differs.	1. Remove obstructions from horn holes with attached brush. But do not use metal objects to clean horn holes.
Inclined 	1. Paint buildup or damage on fluid nozzle (2-1) circumference and air cap (1) centre. 2. Fluid nozzle is not properly fitted.	1. Remove obstructions. Replace if damaged. 2. Remove fluid nozzle (2-1), clean seated section.
Split 	1. Paint viscosity too low. 2. Fluid output too high.	1. Add paint to increase viscosity. 2. Tighten fluid adj. set (7) to reduce fluid output or reduce air pressure for Fan.
Heavy Centre 	1. Paint viscosity is too high. 2. Fluid output is too low.	1. Add thinner to reduce viscosity. 2. Turn fluid adj. set (7) counter-clockwise to increase fluid output.
Spit 	1. Fluid nozzle (2-1) and fluid needle set (2-2) are not seated properly. 2. Paint buildup inside air cap set (1). 3. The first-stage travel of air valve (4-3) (when only air discharges) decreases.	1. Clean or replace fluid nozzle and fluid needle set (2). 2. Clean air cap set (1). 3. Replace fluid nozzle and fluid needle set (2).

PROBLEMS AND REMEDIES

Problem	Where it occurred	Parts to be checked	Cause	Remedy			
				R1	R2	R3	R4
Paint leaks	Fluid nozzle (2-1)	Fluid nozzle (2-1) - fluid needle (2-2)	* Dirt or damage, wear on seat surface			•	•
			* Loose fluid needle adj. knob		•		
			* Wear on needle spring				•
		Fluid nozzle (2-1)- gun body	* Insufficient tightening	•			
			* Dirt or damage, wear on seat surface			•	•
		Fluid needle packing set (3-4) - fluid needle set (2-2)	* Needle does not return due to packing set too tight		•		•
			* Needle does not return due to paint buildup on fluid needle.		•	•	
	Body leak detection hole	Fluid needle packing set (3-4) - fluid needle set (2-2)	* Wear	•			•
		Packing seat	* Insufficient tightening	•			•
	Gun-manifold (12)	Quick lock-release system	* Insufficient tightening	•			
		O'ring	* Damage or deteriorated				•
	Tip of gun	Fluid adj. set (7) .	* Insufficient opening		•		
		Tip hole of nozzle (2-1)	* Clogged			•	
		Fluid needle packing set (3-4) - fluid needle set (2-2)	* Needle does not move due to paint buildup between fluid needle set and fluid needle packing set			•	•
Air leaks	Tip of air cap (1)	Air valve (piston set) (4) Gun body seat surface	* Insufficient tightening		•		
			* Dirt or damage, wear on seat			•	•
			* Wear on piston spring				•
		O rings(piston set) (4)	* Damage or deteriorated				•
		Quick lock-release system	* Insufficient tightening	•			
	Gun-manifold (12)	Manifold seal (15)	* Damage or deteriorated				•

Step-by-step procedure	Important
7. Assemble fluid nozzle (2-1) and air cap set (1). Tighten fluid nozzle (2-1) and air cap set (1) to the gun body. 	7. Fluid nozzle (2-1) should be tightened firmly in order to avoid fluid leakage and fluttering. Tools : Wrench (width 19mm) - Fluid nozzle
8. Position of the 2 horns of the air cap set (1), for easier assembly. The body side has 1 pin to determine air cap position correctly (Vertical or Horizontal). The air cap has 2 pins for the same function, so air cap can move between the 2 pins 90°. If the air cap is installed correctly, according to air cap marking, it will be possible to get the proper position. 	8. Turn air cap (1) and when 2 pins hit, tighten air cap cover and fix it. Horn position is horizontal or vertical.
9. Assemble fluid needle set (2-2), fluid needle valve spring (5), piston spring (6) and fluid adj. set (7) to gun body. Apply Vaseline or oil to thread section of fluid adj. set (7) and insert it into gun body while keeping it fully opened. 	9. If fluid adj. set (7) is not fully opened, tip seat section of it can contact and damage fluid nozzle (2-1) and cause seizure thread. Tool: Wrench (width 32mm) - Fluid adj. set
10. Turn pattern adj. set (11) counter-clockwise to fully open. And then tighten pattern adj. guide into manifold (12). 	10. If pattern adj. set (11) is not fully opened, tip of it can contact and damage tip of manifold set (12) and cause seizure of thread. Tool: Wrench (width 13mm) pattern adj. knob
11. Connect the gun to the manifold (12) Gun is adhered to manifold firmly.  1. Put gun to manifold 2. Turn wing bolt set clockwise to fix.	11. Gun should be adhered to manifold (12) to avoid air and fluid leakage.
Where to inspect - Each hole passage of air cap (1) and fluid nozzle (2-1) - Packings and O rings - Leakage from seat section between fluid nozzle (2-1) nozzle and fluid needle set (2-2).	Parts replacement standard Replace if it is crushed or deformed. Replace if it is deformed or worn out. Replace them if leakage does not stop after fully cleaning fluid (2-1) and fluid needle set (2). If you replace fluid nozzle (2-1) or fluid needle (2-2) only, fully match them and confirm that there is no leakage.

HOW TO CONNECT

CAUTION ONLY USE AUTOMATIC SPRAY GUN MODEL WA-M220 AND MANIFOLD MODEL WA-M4R COMBINATION.

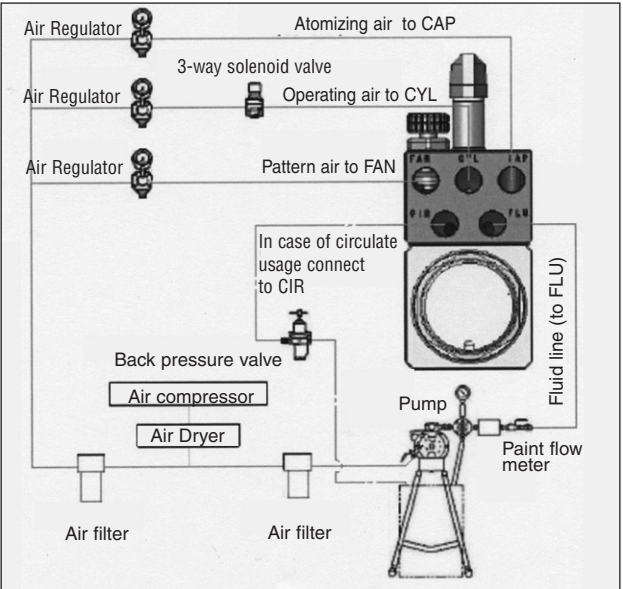


CAUTION

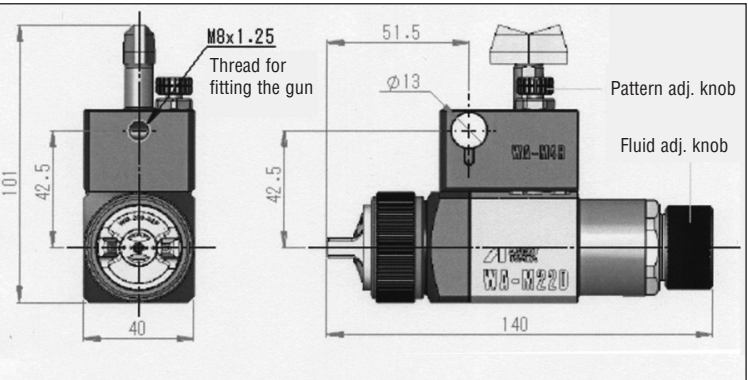
- Use clean air filtered through air dryer and air filter. If not, dirty air can cause painting failure.
- When you use this gun for the first time after purchasing, clean fluid passages spraying thinner to remove rust preventive oil. If not, remaining preventive oil can cause painting failure such as fish eyes.
- Use three-way solenoid valve of more than $\phi 4$ inner dia. cross-sectional area and air hose of over $\phi 6$ inner dia. and less than 10m length. If not, small dia. of solenoid valve and longer air hose between three-way solenoid valve and gun can cause delay in operation.
- Firmly fix hose to spray gun. If not, disconnection of hose can cause bodily injury.

1. Connect the gun to the manifold (12) by tightening wing bolt (9) then fit the manifold (12) to fitting stay, aim at spraying direction and fix it by fixing bolt.
2. Connect atomizing air hose to atomizing air inlet (CAP marked side) fan air hose to fan air inlet (FAN marked side) and operating air hose to operating air inlet (CYL marked side) tightly.
3. Connect fluid hose to fluid inlet (FLU marked side) tightly. In case of circulation usage, connect fluid hose to fluid outlet (CIR marked side) tightly, too.
4. Flush the gun fluid passages with a compatible solvent.
5. Supply paint, test spray and adjust fluid output, air volume and pattern width.

CONNECTING EXAMPLE



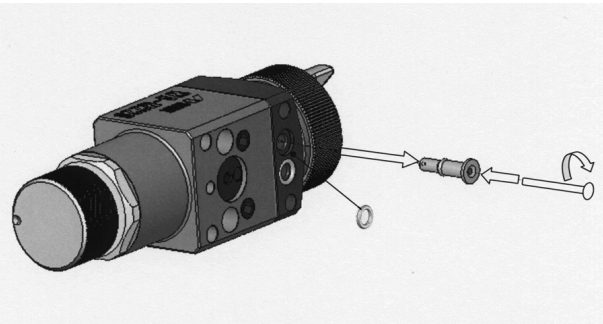
DIMENSIONS



HOW TO CHANGE UNIONS FOR CIRCULATION USAGE

IMPORTANT

1. Pull plug (3-2) out from gun body, with attached screw as standard accessory.
2. Put O'ring (3-3) as standard accessory, where plug (3-2) has been removed.
3. Connect fitting joint tightly to fluid outlet of manifold (CIR).
4. Connect fluid hose to the joint.

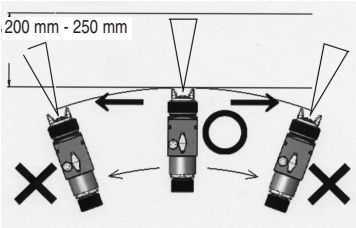


HOW TO OPERATE

Suggested operating air pressure is 4 to 5 bar (57 to 71 PSI).

NOTE: Valve orifice inside three- way solenoid valve should be minimum 4mm (0.157 in) and also operating air hose length should be within 10m (32.8ft) with the inner diameter more than 6mm (0.236in) to avoid delayed operation and any kind of failure.

Recommended paint viscosity differs according to paint property and painting conditions.
15 to 23 sec/Ford cup# 4 is recommendable.
NOTE: Using air hose 12m (39.4ft) long, the inner diameter must be a minimum 8mm (0.315) so the gun can have the correct air volume to atomize.
Set the spray distance from the gun to the work piece as near as possible within the range of 200-250 mm (7.8-9.7 in).



MAINTENANCE AND INSPECTION

WARNING - First release air and fluid pressure fully according to item No. 3 of “Improper use of equipment” of WARNING on page 2. - Tip of fluid needle set has a sharp point. Do not touch the tip of needle valve during maintenance for protection of the human body. - Be careful not to damage the tip of the fluid nozzle or not put your hand on it. - Only an experienced person who is fully conversant with the equipment can do maintenance and inspection.	
CAUTION - Never use commercial or other parts instead of ANEST IWATA original spare parts. - Never immerse the whole gun into liquid such as thinner. - Never soak air cap set in solvent for extended period even if cleaning. It can cause defective pattern. - Never damage holes of air cap, fluid nozzle or fluid needle.	

Step-by-step procedure	Important
1. Clean fluid passages and air cap set (1). Spray a small amount of thinner to clean fluid passages.	1. Incomplete cleaning can fail pattern shape and uniform particles. Especially clean fully and promptly after use with two-component paint.
2. Clean each section with brush soaked with thinner and wipe out with waste cloth.	2. Do not immerse the whole gun in thinner. If done, it can damage parts. When cleaning, never scratch any holes of air cap set, fluid nozzle, or fluid needle set.
3. Disassembling_ Before disassembling, fully clean fluid passages.	3. During disassembly, do not damage seat sections.
(A)Disassemble gun and manifold. 1. Turn wing bolt (9) counterclockwise 2. Remove gun from manifold (12)	(A) Manifold can be kept on fixing stay. Because manifold is kept on fixing stay, when spray operation continues, just connect gun to manifold without re-positioning. Hoses are kept on fixing manifold. No need to disconnect and connect again, when maintenance is carried out.
(B)Disassemble fluid adjustment set (7), piston spring (6), fluid needle valve spring (5) and fluid needle set (2-2). Remove fluid adj. set (7), piston spring (6) and fluid needle valve spring (5), then pull out fluid needle set (2-2) from gun body. Pay attention so that fluid adj. set (7) does not suddenly fly out since it is strongly pushed by fluid valve spring (5) and piston spring (6). 	(B) Pull fluid needle set (2-2) straight to protect fluid needle packing set (3-4). Tools: Wrench (width 32 mm) - Fluid adj. set Pliers - Fluid needle set

Step-by-step procedure	Important
(C) Disassemble air cap set (1) and fluid nozzle (2-1). 	(C) Remove fluid nozzle (2-1) after removing fluid needle set (2-2) or while keeping fluid needle (2-2) pulled, in order to protect seat section. Tools: Wrench (width 19 mm) - Fluid nozzle
(D) Disassemble air piston set (4). Screw rear section of fluid needle set (2-2) into piston (4) and pull out piston set (4). 	(D) Be careful not to damage piston packing (4-1) and o'rings when pulling out piston set (4).
(E) Disassemble gun body and fluid needle packing set (3-4). Disassemble front part and rear part of gun body removing 2 hex. socket head bolts (3-6) from body. Then remove fluid needle packing set (3-4) from front part of gun and remove filler block nut (8) from rear part of gun body. 	(E) Tools : Hex. Socket screw key (width 4mm) - Hex. socket head bolt. Wrench(width 10mm) - Fluid needle packing set
4. To adjust fluid needle packing set (3-4), first tighten it by hand while fluid needle set (2-2) is inserted. Then tighten it further about 1/6 turn (60-degree) by wrench. When you remove needle packing set (3-4), do not leave plastic piece of needle packing set (3-4) in the gun body. 	4. If you tighten fluid needle packing set (3-4) too much, fluid needle set (2-2) does not move smoothly, resulting in paint leakage from tip of fluid nozzle (2-1). Try to adjust it carefully while pulling and pushing fluid needle set (2-2) by hand checking its movement. If it is tightened too much, first fully loosen it, then tighten it again carefully. After, assemble gun completely while pulling piston (4) and checking movement of fluid needle set (2-2). If fluid needle set (2-2) does not move smoothly, disassemble again and try to adjust it with the same process.
5. Assemble gun body. Insert filler block nut to hole of rear part of gun body and insert pin of the front part of gun body to the hole positioned on the front of rear part of gun body as indicated. Connect front part with the rear part of gun body, tightening 2 hex. socket head bolts (3-6) equally while fluid needle (2-2) is inserted to get right centre position. While tightening the 2 hex. socket head bolts (3-6) to accurately adhere the rear part of the gun to the front part, make sure that the contact planes are at the same level. 	5. Tighten 2 hex. socket head bolts (3-6) while fluid needle set (2-2) is inserted to avoid that fluid needle set (2-2) will not move smoothly. The rear part of gun body should be adhered to front part and the 2 contact planes with manifold (12) should be at the same level, to avoid air and fluid leakage. Tighten 2 hex. socket head bolts (3-6) equally. Tool: Hex. Socket screw key (width 4mm) - Hex socket head bolt.
6. Assemble piston set (4). Screw rear section of fluid needle set (2-2) into piston (4) and insert piston set (4) into the gun body. Apply grease to piston packing (4-1) and o'rings. Δ marks are indicated on bottom side of piston. When you insert piston set (4) into the gun body, please make sure the position of Δ marks are correct. Δ marks must be positioned upper side and bottom side of gun body. 	6. Apply grease to piston packing (4-1) and o'rings to avoid that piston set (4) does not move smoothly.