



# MACH 2A Hydraulically-Assisted Automatic HVLP Spray Gun

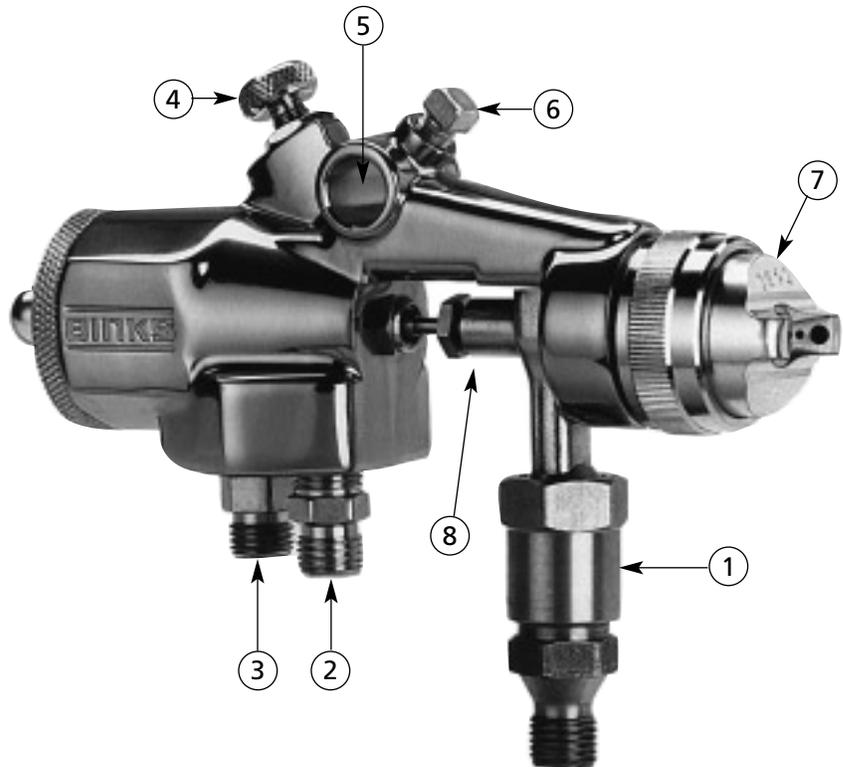
The Binks MACH 2A Hydraulically-Assisted Automatic HVLP Spray Gun combines the proven HVLP efficiency of Binks best selling MACH 1 Spray Gun with hydraulically-assisted atomization to yield a reliable, carefully engineered special-purpose spray gun. The MACH 2A provides consistent coatings with difficult materials by “preatomizing” pressurized fluid through a constrictive carbide nozzle. Specially designed air nozzles further promote material atomization and ensure consistent, even finishes.

The MACH 2A operates at high transfer efficiencies, and fully satisfies the “California South Coast Air Quality Management District” requirements for a “High Volume Low Pressure” air spray gun. The MACH 2A makes use of special features to ensure this compliance – the air inlet passage incorporates a venturi to actively limit airflow. The throat of the venturi converts dense, high pressure inlet air to high volume, low pressure atomizing air, and creates a highly efficient “soft spray.”

This Part Sheet contains an exploded drawing and a detailed parts list to enable a complete understanding of the spray gun’s construction. A summary of spray gun operation, cleaning, care and maintenance, and troubleshooting common problems is also provided.

**NOTE**  
Please be sure to read the warnings on page 2.

**NOTE**  
IMPORTANT REGULATORY NOTE regarding the use of this product appears on page 8.



- ① FLUID INLET
- ② ATOMIZING AIR INLET - 1/4 NPS
- ③ CYLINDER AIR INLET - 1/4 NPS
- ④ SIDE PORT CONTROL
- ⑤ MOUNTING HOLE (1/2" Diameter)
- ⑥ MOUNTING LOCK SCREW
- ⑦ AIR NOZZLE ASSEMBLY
- ⑧ NEEDLE COVER (Not Shown)

## PACKAGE CONTENTS

Please note your Binks MACH 2A Spray Gun package was shipped with the following contents.

If anything in the following list is missing, please call 1-800-992-4657 for a prompt shipment of the missing item.

- 1 MACH 2A Spray Gun
- 1 PART SHEET . . . . .2552R-5
- 1 GUN BRUSH . . . . .82-469
- 1 GUNNER'S MATE . . . . .54-3871

Replaces Part Sheet 2552R-4 | Part Sheet 2552R-5

## OVERVIEW OF POTENTIAL HAZARDS

POTENTIAL HAZARD	EFFECT	PREVENTION
 Flammable, Explosive and Toxic Vapors	<b>WARNING:</b> Can cause serious burns, lung damage or death	<ul style="list-style-type: none"> <li>• Use outdoors or ventilate paint area to keep vapors below explosive, flammable and toxic limits.</li> <li>• No smoking or open flames.</li> <li>• No electrical sparks. Ground all metal or conductive objects and personnel.</li> <li>• Use paints, coatings and solvents compatible with the pump and hoses.</li> <li>• Use recommended protective equipment.</li> <li>• Read Material Safety Data Sheets (MSDS) and container labels.</li> </ul>
 High Pressure Spray and Hose Leaks	<b>WARNING:</b> Can cause serious cuts or poisonous injections	<ul style="list-style-type: none"> <li>• Keep hands and body out of spray and away from hose leaks.</li> <li>• Relieve pressure before taking apart or servicing.</li> </ul>

The MACH 2A hydraulically-assisted spray gun uses high pressure to spray paints and solvents. Since liquids sprayed at high pressure can cause injuries, and some paints and solvents can be toxic or cause explosions and fires under certain conditions, your safety and the safety of others depend on your reading the information in this Part Sheet.

If you have questions or do not understand the information presented, call your nearest service representative.

In this part sheet, the words **WARNING** and **CAUTION** are used to emphasize important safety information. The word:

- **WARNING** means that severe injury or death can result from failure to follow instructions.
- **CAUTION** means that property damage or injury or death can result from failure to follow instructions.

The word **NOTE** is used to indicate important steps to be followed or important considerations.

### SAFETY INSTRUCTIONS FIRE AND EXPLOSION HAZARDS

Volatile fumes in paints, coatings and solvents can catch fire and even explode under certain conditions. Volatilization of fluids, as in paint spray operations, increases this possibility. Fires and explosions can occur from excessive heat, open flames, electrical sparks from equipment or from static conditions.

For example, paint flowing through hoses creates a potential for static charge buildup. You can reduce such

hazards by following safe practices during painting, such as maintaining good flow of fresh air through the paint area and by following these procedures:

- Use only grounded outlets and electrically conductive hoses.
- Ground all containers and collection systems.
- When spraying into a container or collection system, ground gun against a metal part.
- If you feel a static discharge or other electrical sparking, stop paint operations immediately and disconnect all electrical equipment to the paint area.
- Keep the area clean and policed of rags, paint or solvent containers and other flammables.
- Do not work around open flames, including pilot lights. Remember many solvents are heavier than air and can travel some distance along the ground.
- Do not smoke in the area.
- Do not operate light switches or gas powered engines in the area.
- Keep a good supply of fresh air moving through the area.

### TOXIC FLUIDS OR VAPORS HAZARD

Paints, coatings and solvents may contain toxins and carcinogens. They are potentially dangerous if absorbed through the skin or if the vapors are inhaled. Follow all standard safety procedures.

- Wear proper protective eyewear and clothing. Use a respirator.
- Use proper respirator filter for the paint, coating or solvent in use.

- Change filters frequently as recommended by the manufacturer.
- Check respirator frequently for proper fit and keep it clean.
- Check respirator for wear or cracking.
- Wash skin exposed to fluids immediately with soap and water. Get medical attention for broken skin exposed to paint and solvents.
- Know the contents of the paints and solvents. Read the MSDS and container labels. Follow the indicated precautions.
- Store and dispose of hazardous chemicals and wastes according to law and regulations.

### HIGH PRESSURE INJECTION HAZARDS

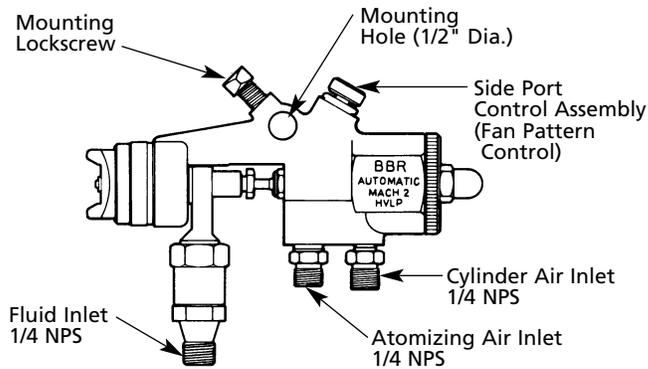
The MACH 2A Spray Gun can pressurize fluids up to 1,000 psi which is sufficient to penetrate skin.

- Do not point the gun at anyone or at equipment.
- Keep hands and other body parts away from the spray tip.
- Check all connections for tightness before starting.
- Check hoses and fittings daily. Replace damaged or worn equipment. Do not attempt to repair hose fittings.
- Do not ignore leaks in hoses, or other equipment and do not attempt temporary repairs, such as wrapping a rag around a leak. Replace broken pieces immediately.
- Follow pressure relief procedures when ever working on equipment and as otherwise indicated by good practice.

## SPRAY GUN SET-UP INSTRUCTIONS – SPRAY INSTRUCTIONS

### SPECIFICATIONS

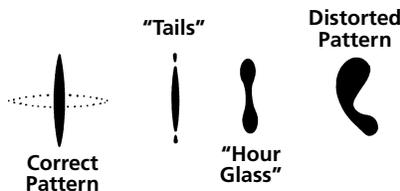
- **Maximum Fluid Pressure:** 1,000 PSI
- **Maximum Air Pressure:** 50 PSI
- **Gun Body:** Forged Aluminum Alloy
- **Fluid Path:** Stainless Steel and Tungsten Carbide Parts
- **Fluid Shut-off Type:** Ball and Seat
- **Seat Material:** Tungsten Carbide
- **Filter Element:** Edge Filter (.009" std.)
- **Gun Weight:** 23.0 Ounces (with filter)



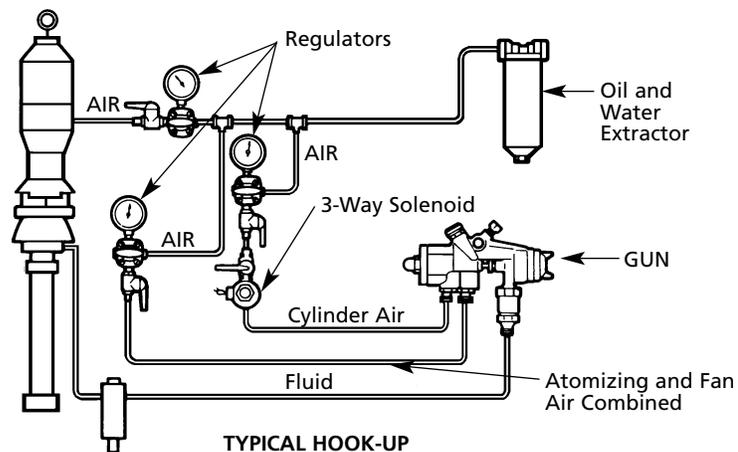
### SET-UP INSTRUCTIONS

Numbers in parentheses refer to individual items shown in the “exploded” drawing on page 6.

1. Connect high-pressure airless fluid hose to the gun fluid inlet (44) and tighten securely.
2. Connect air hoses to the gun’s double male nipples (45 & 46) and tighten both securely.
3. Set regulators to provide the gun with approximately 40 PSI inlet atomizing air pressure, 60 PSI cylinder air pressure and about 200 PSI fluid pressure.
4. Rotate the control spindle (16) fully counterclockwise to obtain maximum fan pattern width. Remove the retaining ring (1), air cap (2) and spray tip assembly (3) and aim the gun toward a container. With cylinder air on, start fluid pump slowly until fluid flows steadily from the gun.
5. Shut off the cylinder air to stop the fluid flow. Replace the spray tip assembly, air cap and retaining ring.
6. With the fan control air shut off, adjust fluid pressure until the spray pattern changes from a pattern with “tails” to a correctly atomized pattern.



7. Lower fluid pressure until the pattern with “tails” reappears.
8. Turn on the fan control air. Slowly increase atomizing air inlet pressure until the “tails” disappear and the fluid is well atomized.



If more than about 50 PSI air pressure is needed to adequately atomize the fluid, use only about 50 PSI air pressure and increase the fluid pressure to improve atomization. Increased fluid pressure will increase fluid flow as well. If this increase is unacceptable, use a smaller fluid tip to reduce fluid flow.

### GENERAL SPRAY INSTRUCTIONS

For maximum efficiency and minimum overspray, always spray with the lowest possible fluid/air pressure that will still deliver an acceptable spray pattern.

Use at least 60 PSI air pressure to operate the cylinder. Use the shortest possible air hose between the gun and 3-way solenoid to improve triggering speed.

Gun-to-target distance will depend on material choice and atomizing pressure, but is usually between 6 and 12 inches. Keep the most recent coating stroke even and wet to prevent “dry-lap.” Lap each stroke over the preceding stroke for a uniform finish.

Since small system leaks can eventually cause the gun to self-trigger, shut off all fluid and air lines if the gun is to stand idle for any length of time.

### ADJUSTING THE SPRAY PATTERN

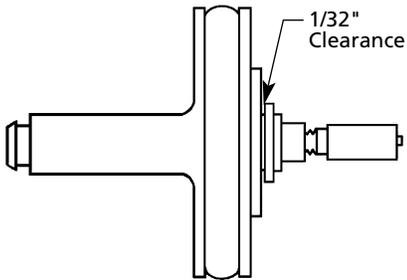
Adjust the fan spray by using the side port control assembly. Turning this control fully clockwise will give a narrow spray pattern; turning the control counterclockwise will widen the spray into a fan shape. The fan spray can be positioned anywhere through 360° by rotating the air cap assembly relative to the gun. To reposition the air cap, loosen the retaining ring slightly and rotate the air cap to the desired position, then retighten the retainer ring.

## ADJUSTMENTS

### ADJUSTING THE MATERIAL VALVE ASSEMBLY

Numbers in parentheses refer to individual items shown in the "exploded" drawing on page 6.

1. To adjust the material valve assembly (30), remove end cap (38) and 2 springs (36, 37).
2. Make sure piston (26) is pushed into gun body (13) as far as it will go.
3. Loosen wire and ball assembly (31) by unscrewing wire chuck (35) from needle body (34).
4. Push in needle body (34) until it is up against the piston (28), then pull needle body back out approx. 1/32" (see drawing below) to provide clearance between needle body and piston.



5. Being sure not to overtighten, tighten wire chuck (35) to needle body (34). This locks the entire material valve assembly in place.
6. Replace the springs and end cap.

### TO CHANGE FROM COMBINED FAN AND ATOMIZING AIR TO SEPARATE AND ATOMIZING AIR

#### NOTE

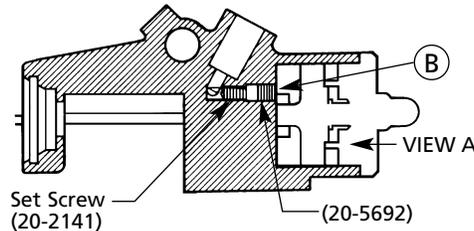
If you wish your spray gun to have separate fan and atomizing air, order set screw (20-2141) and fitting (71-28) before following this procedure.

1. Unscrew end cap (38) and remove springs (36 & 37) and material valve assembly (30) from gun rear.
2. Remove piston (28) by injecting low pressure air into cylinder air port (A).

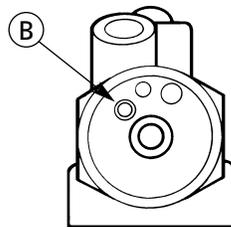
#### WARNING

Excessive pressure will eject the piston at high velocity, possibly resulting in damage to components or personal injury. Aim the gun rear in a safe direction and use only low air pressure to remove the piston.

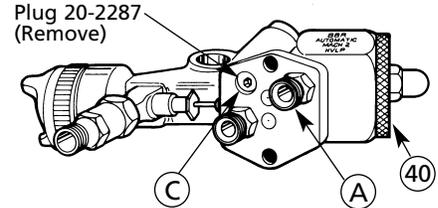
3. Remove plug (20-5692) from cylinder bore (B) with 5/32" Allen wrench.



Side Cut-Away



4. Insert set screw (20-2141) into position.
5. Reinstall plug (20-5692), material valve assembly, springs and end cap.
6. Remove plug (20-2287) from fan air port (C).



7. Install fitting (71-28) into port (C).

## SPRAY GUN CLEANING & MAINTENANCE INSTRUCTIONS

### CLEANING INSTRUCTIONS

Disassemble and thoroughly clean filter assembly (40) each time spray gun is cleaned. Before reassembly, spray gun should be blown dry and inspected to make sure debris is not lodged in any of the air and fluid passages. After reassembly of filter assembly, lightly lubricate piston assembly (26) to insure smooth trigger action.

In certain states it is illegal to spray solvents containing Volatile Organic Compounds (VOC's) into the atmosphere when cleaning a spray gun. Binks recommends that you comply with these air quality laws by following one of the two methods described below.

1. Use an enclosed clean-up station or enclosure which will condense and collect VOC vapors to prevent their atmospheric release.
2. Use a washer unit. Your gun washer should completely enclose the spray gun, filter, nozzles and other parts during wash, rinse and drain cycles to prevent the release of VOC vapors into the atmosphere.

### NOTE

**Disassemble spray gun and remove all o-rings (21), (25), (29), (33) & (48) before immersing gun in or subjecting it to a flood-wash of cleaning solvent. Contact with solvents may induce o-ring swelling beyond their specification sizes and cause subsequent malfunction of the gun.**

Lubricate all o-rings and moving parts at reassembly into the gun body.

To further protect the environment, avoid storing solvents or solvent-soaked wipes, such as those used for surface preparation and cleanup, in open or absorbent containers.

### TROUBLESHOOTING

Numbers in parentheses refer to individual items shown in the "exploded" drawing on page 6.

### CAUTION

**Never use metal instruments to clean or scrape fluid or air nozzles. These parts have been carefully machined and altering their shape will cause faulty spray.**

Uneven spray patterns are usually caused by a clogged spray tip assembly (3). To clear the tip, shut off the cylinder air and remove retainer ring (1), air cap (2) and tip. Rinse tip in solvents and clean the orifice with compressed air, then reassemble.

Intermittent or fluttering spray can be caused by a clogged filter assembly (40) or erratic fluid supply. To service the filter assembly, relieve all fluid pressure throughout the system, then disassemble and clean the filter assembly thoroughly. Always inspect the filter element (42) when cleaning the filter assembly and replace damaged elements before reassembly.

If fluid leaks from the spray tip assembly when the cylinder air is shut off, remove and inspect both the carbide seat (6) and the ball end of the material valve assembly (30). Replace any worn or damaged parts. Be sure to follow the safety precautions outlined on page 2.

If fluid leaks past the fluid cartridge assembly (32), replace the assembly. Be sure to follow the safety precautions outlined on page 2.

### MAINTENANCE INSTRUCTIONS

### WARNING

**Be sure to follow all safety precautions described on page 2 before working on the spray gun. Never work on the spray gun until fluid pressure has been relieved throughout the system and the power or air supply for the fluid pump has been disconnected. Always test the repaired gun for leaks with low pressure fluid before use.**

### CAUTION

**Never use metal instruments to clean or scrape fluid or air nozzles. These parts have been carefully machined and altering their shape will cause faulty spray.**

Numbers in parentheses refer to individual items shown in the "exploded" drawing on page 6.

### FLUID CARTRIDGE REPLACEMENT

To remove the fluid cartridge assembly (32), first remove the material needle control knob (39), end cap (38) and springs (36, 37). Loosen wire chuck (35) from needle body (34). Remove the retaining ring (1), air cap (2), spray tip assembly (3), seat retainer (4), carbide seat (6), and seal assembly (7). Unscrew the fluid nozzle body (11) with a 1/4" allen wrench. Loosen fluid cartridge assembly (32) and pull out the wire and ball assembly (31) from the front of the gun. Remove and replace cartridge assembly (32) and reassemble in reverse order.

### PISTON REMOVAL

To remove the piston assembly (26), unscrew the end cap (38), remove the two springs (36, 37) and pull out the entire material valve assembly (30). Remove the piston assembly by applying compressed air (about 5 PSI) to the cylinder air inlet. The air pressure will cause the piston assembly to pop out.

### WARNING

**Aim the gun rear in a safe direction and use only low pressure air when removing the piston assembly. Removing the piston while under pressure could result in damage to components or personal injury.**

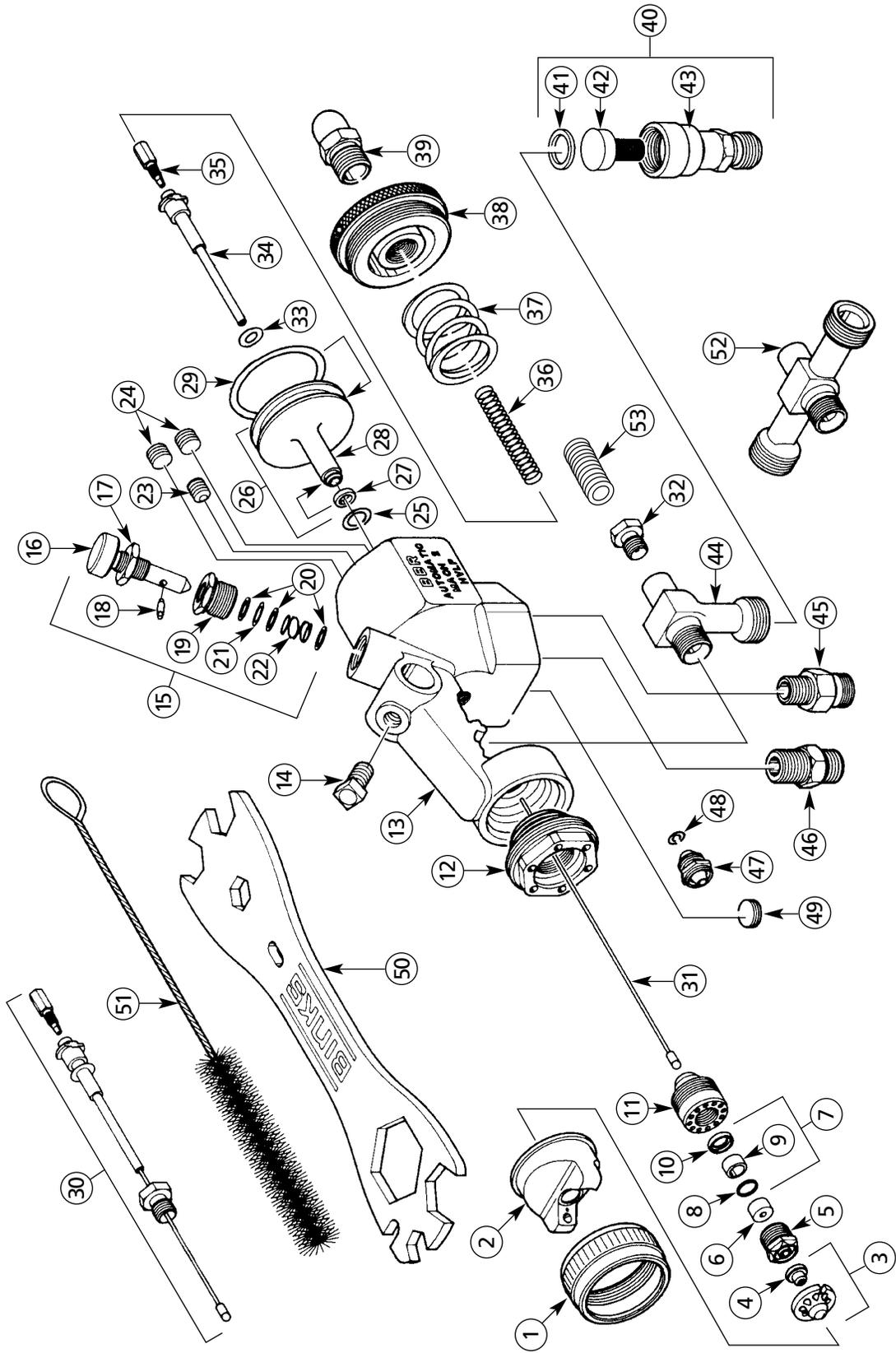
### LUBRICATION

Lubricate the gun by removing the piston (28) and lubricating the needle return spring (36) and the bore in which the piston travels with petroleum jelly. Periodically lubricate the side port control assembly (15) with oil.

### CAUTION

**Never use lubricants containing silicone since these lubricants can cause finish defects. Binks Gunners Mate (54-3871) is recommended.**

**Binks MACH 2A HYDRAULICALLY-ASSISTED AUTOMATIC HVLP SPRAY GUN**



## PARTS LIST

(Please include part number in order.)

ITEM NO.	PART NO.	DESCRIPTION	QTY.	ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	54-3531	RETAINING RING .....	1	29	20-4511	O-RING .....	1
2		AIR NOZZLE (See Chart) .....	1	30	54-4410▼	MATERIAL VALVE ASSEMBLY .....	1
3	*	SPRAY TIP ASSEMBLY .....	1	31	54-4411★▼	WIRE and BALL ASSEMBLY .....	1
4	54-3745▼●‡	TIP SEAL, Nylon.....	1	32	54-3635▼★	FLUID CARTRIDGE ASSEMBLY .....	1
	54-3782	TIP SEAL, Teflon (Optional) .....	1	33	20-3515★▼	O-RING .....	1
5	54-3779	SEAT RETAINER .....	1	34	54-3734★▼	NEEDLE BODY .....	1
6	54-3733▼	HIGH PRESSURE SEAT .....	1	35	54-3524★▼	WIRE CHUCK .....	1
7	54-3780▼	SEAL ASSEMBLY .....	1	36	54-3719	SPRING .....	1
8	54-3791▲	SMALL RING .....	1	37	54-3707	SPRING .....	1
9	54-3798▲	SEAL GASKET .....	1	38	54-3708	END CAP .....	1
10	54-3771▲	LARGE RING .....	1	39	54-3715	MATERIAL NEEDLE CONTROL KNOB .....	1
11	54-3778	FLUID NOZZLE BODY .....	1	40	54-3646	FILTER ASSEMBLY .....	1
12	54-3543	HEAD INSERT .....	1	41	54-3648▼†	FILTER BODY SEAL .....	1
13	54-3796	MACH 2A GUN BODY ASS'Y. ....	1	42	54-1836▼†	FILTER .....	1
14	20-1359	SQ. BOLT 5/16"-18 x 3/4" .....	1	43	54-3647†	FILTER BODY .....	1
15	54-3720	SIDE PORT CONTROL ASS'Y. ....	1	44	54-3743	FLUID INLET .....	1
16	54-3721♦	CONTROL SPINDLE .....	1	45	71-28	DOUBLE MALE NIPPLE 1/8" NPT x 1/4" NPS .....	1
17	54-4269♦	JAM NUT .....	1	46	57-13	DOUBLE MALE NIPPLE 1/4" NPT x 1/4" NPS .....	1
18	31-258♦	RETAINING PIN .....	1	47	54-3716	AIR VALVE GLAND ASSEMBLY ....	1
19	31-256♦	STUFFING BOX .....	1	48	20-3859▼	O-RING .....	1
20	31-259♦	INNER WASHER.....	3	49	20-2287	PLUG 1/8"-27 NPT.....	1
21	20-3620♦	O-RING.....	1	50	54-3918	WRENCH .....	1
22	31-241♦	CONTROL SPRING .....	1	51	82-469	GUN BRUSH .....	1
23	54-3987□	PLUG .....	1	52	54-4407	FLUID INLET Recirc. (Optional) .....	1
24	54-3988□	PLUG 1/16"-20 NPT .....	2	53	54-4270	NEEDLE COVER .....	1
25	20-5286▼	O-RING.....	1	54	54-4133	GUN BRUSH (Optional) .....	1
26	54-3706	PISTON ASSEMBLY .....	1				
27	54-3729■	SEAL.....	1				
28	54-3722■	PISTON.....	1				

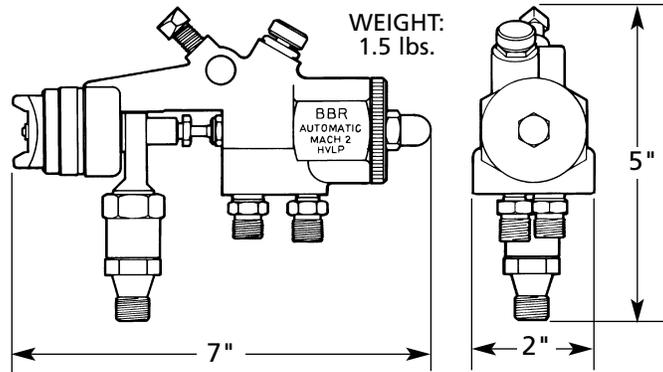
- ▼ Included in Spare parts Kit 54-4405.    ▲ Part of Item 7.
- Part of Item 3.                                ♦ Part of Item 15.
- ★ Part of Item 30.                              † Part of Item 40.
- Part of Item 26.                              □ Part of Item 13.
- ‡ Available in Spare Parts Kit 54-3745-5 (quantity of 5).

Air Nozzles Available		
93 HA	46-9309	17 PSI Max. Inlet Pressure (10 CFM) - Low Volume
95 HA	46-9509	50 PSI Max. Inlet Pressure (22 CFM) - High Volume

### SPRAY TIP ASSEMBLY TABLE – For MACH 2A HVLP SPRAY GUN

Part Number	Stamp No.	Orifice (inches)	Spray Width (at 12")	Part Number	Stamp No.	Orifice (inches)	Spray Width (at 12")
110-0904	0904	.009	4	110-1804	1804	.018	4
110-0908	0908	.009	8	110-1808	1808	.018	8
110-0910	0910	.009	10	110-1810	1810	.018	10
110-1104	1104	.011	4	110-1814	1814	.018	14
110-1108	1108	.011	8	110-1820	1820	.018	20
110-1114	1114	.011	14	110-2108	2108	.021	8
110-1304	1304	.013	4	110-2110	2110	.021	10
110-1306	1306	.013	6	110-2114	2114	.021	14
110-1308	1308	.013	8	110-2120	2120	.021	20
110-1314	1314	.013	14	110-2608	2608	.026	8
110-1504	1504	.015	4	110-2610	2610	.026	10
110-1508	1508	.015	8	110-2614	2614	.026	14
110-1510	1510	.015	10	110-2620	2620	.026	20
110-1514	1514	.015	14	110-3610	3610	.036	10

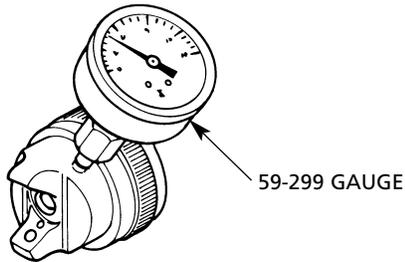
## GUN DIMENSIONS



### IMPORTANT REGULATORY NOTE

Some Regulatory Agencies prohibit the operation of HVLP Spray Guns above 10 psi air nozzle (atomizing) pressure. Gun users subject to this type of regulation should not exceed 50 psi gun inlet pressure. For further information, see *General Spray Instructions*, page 3. The nozzle test gauge (see below) should be used to confirm actual nozzle operating pressure.

Some Regulatory Agencies may require that users have this nozzle test gauge on site to verify the gun's compliance with current regulations.



#### Air Nozzle Test Gauge Assembly

- 54-3774    95 HA Air Nozzle (50 PSI Max. Inlet Pressure)
- 54-3622    93 HA Air Nozzle (17 PSI Max. Inlet Pressure)

Atomizing and Inlet Pressures 95HA Air Nozzle		
Nozzle Atomizing Pressure PSI	Nozzle Air Flow SCFM	Gun Inlet Atomizing Pressure PSI
3	11.0	23
4	12.0	27
5	13.5	31
6	15.0	36
7	17.0	40
8	17.5	42
9	18.5	45
10	20.0	50

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**Technical Support in USA / 1-888-992-4657**