

*Joe's Place, by
Joe Richardson*

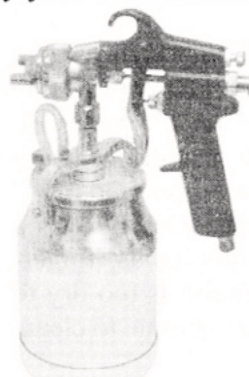
An Introduction to Paint, Painting and Equipment - Part IV

Welcome back to the series we have been featuring over the past several months covering automotive paint, materials and equipment. We have finally arrived at part IV, Paint Guns and Equipment.

With so many choices available, choosing a paint gun or paint guns can be really confusing. With so many variables and individual needs, I can't specifically tell you which gun to buy; however I will attempt to filter through the many variables and provide a better understanding of what is available and why.

For many years, paint guns were simple devices that used air flowing through small internal passages inside a metal paint gun body creating a vacuum to suck the paint through a tube, out of a canister attached to the bottom. When combined with a needle sliding in and out through an orifice or nozzle, the paint mixed with air into small droplets becoming atomized with air pres-

sure. It was then forced out of the gun, through the atmosphere and landed on a surface, hopefully your car. A bit simplistic perhaps, but basic-

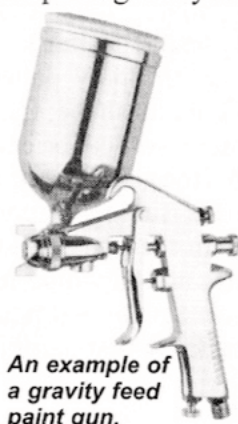


A typical siphon paint gun.

ly how it was done. These were generally known as Siphon Guns and can be readily identified by the paint canister or cup attached to the bottom of the gun body. Another similar version looked very much like a siphon gun, but instead of vacuum, it relied on supplied air to pressurize the canister, forcing the paint up through the needle and nozzle, becoming atomized, and then propelled through the atmosphere. These were known as Pressure Guns or Pressure Pots and most often were used for production work or conditions where the gun would be inverted part of the time or held at extreme angles. Although they were known for producing a beautiful finish in the hands of a knowledgeable painter, both designs required a fair amount of air pressure, usually 50 to 80 PSI to do their job, and because they discharged a great amount of atomized paint into the air, were not very efficient, generating a lot of overspray. In some areas of the

U.S. and Europe, the sale of these guns is actually prohibited. With some searching, they can still be found today, but they are considered to be old and inefficient technology.

Another configuration of paint gun layout is the Gravity Feed. Gravity Feed guns are identified by the paint canister or 'cup' being attached to the top of the gun body. The main advantage of this design is that the paint is fed to the nozzle of the gun with gravity, and since no air pressure is needed to generate suction, it requires less pressure. Added benefits are a shorter path for the paint to travel and much easier cleaning. Also, most are newer designs which take advantage of the great advances that have occurred in the past 10 years in paint gun technology.



An example of a gravity feed paint gun.

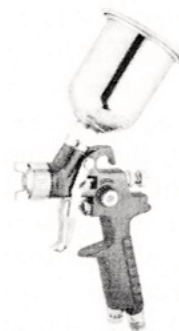
Note: It is a common misconception that if it is a gravity feed gun, it must be HVLP (High Volume, Low Pressure). Not necessarily. Some of the really inexpensive guns may be made to look like an HVLP but are in fact based on old high-pressure technology. The best advice here is to look very carefully at the gun, the box and the literature containing specifications, and don't hesitate to ask questions of the seller before forking over your hard earned money.

This leads us into the subject of HVLP guns. These are by far the most commonly available units today. Ok, you may be wondering what this High Volume Low Pressure actually means. The 'Low Pressure' refers to the air pressure required to operate the gun properly. The majority of HVLP guns today require from 15 to 30 PSI (Pounds per Square Inch) which is the force of the air needed to function adequately. The individual gun will state this in the included specifications. The 'High Volume' is the CFM (Cubic Feet per Minute) which is the amount of air needed to get the job done. Some guns require as little as 3 or 4 CFM while others will need 10 to 15 CFM. At this time it is very important to point out that the

PSI and CFM requirements are specified at the gun's inlet (I will touch on this in greater detail a little further on in this article.) In addition to your main regulator at the air compressor, it is imperative to always have a true gun regulator attached right at the gun inlet to properly measure inlet pressure. It also serves to prevent sudden pressure spikes when opening and closing the trigger.

Yet another term you may occasionally encounter is LVLP which obviously describes a Low Volume, Low Pressure gun. Although virtually identical to an HVLP, the combination of both a lower PSI and CFM requirement will earn a gun this designation. They are generally among the most efficient guns out there and waste little paint; however most of them are at the high end of the price scale.

The guns described above are available in full-size as well as smaller versions that you would use for laying a single-stage color or base-clear (see May & June issues for more information on paint) in a tighter area or over small parts. Named 'Mini Guns' by most manufacturers, their usefulness in shooting door jambs or covering small repaired areas is why they are frequently called 'Jamb Guns' or 'Spot Guns.'

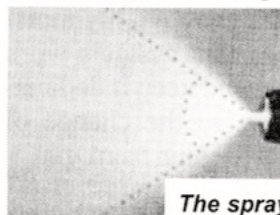


All paint guns share the same basic internal component design: internal passages designed for optimal flow, a trigger controlled, sliding 'needle' which is a metal rod with a sharp point that extends into and out of the 'nozzle' which has a corresponding size to match the needle (they are paired in sets and are always used this way) and the 'air cap' which surrounds the nozzle and injects air into the paint stream and shapes



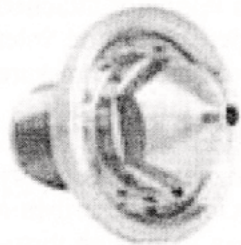
The needle, nozzle and air cap of a paint gun.

the spray pattern or 'fan'. In addition, they also have assorted springs, ferrules, bushings and seals. The



The spray pattern, or 'fan' is adjustable.

aforementioned 'needle' and 'nozzles' are sized by the hole in the nozzle through which the paint is discharged. They are measured in millimeters and can be from 1.0 to 2.0 mm with most in the 1.2



Nozzles are available in a variety of orifice sizes best suited to the type of paint being used.

mm to 1.8 range. Again, no direct rules apply here as different manufacturer's nozzle/needle sizes will work better with some materials than others. Some basics are: 1.2 mm/1.3 mm for base colors, 1.3/1.4 mm for clears and single stage urethanes and 1.5 to 1.8 for heavier-bodied primers and sealers. 1.0 mm is most often found in a mini-gun.

Earlier in this article I mentioned the air requirements at the gun inlet. This is a critical point in that all compressors have a CFM rating which will appear as this example: 16 CFM@90 PSI. I stress this as being very important since this rating is at the OUTPUT of the compressor tank, when the compressor is new. Add in half a dozen air fittings, tank regulator & filter, 50 feet of air hose, a few more fittings, and if you are lucky, you have 10 or 12 CFM at the gun. If your gun requires more CFM, the paint job will suffer, and the gun looks like the bad guy. Note: horsepower is not a good rating of a compressor. Always refer to the CFM rating. If you suspect that your compressor may not be up to the task, there are things you can do to help. First, use as short a length of a hose as possible, and go with as large of a diameter as you can. A 1/2" I.D. hose is much better than a 3/8" hose. Try to eliminate fittings if possible, especially elbows. Go with the largest tank filter/regulator unit that you can afford. If you need help, there are several excellent online sites that help you calculate air pressure and CFM loss through pipe and fittings. Another important point is that moisture and oil are probably responsible for ruining 70% of paint jobs. You MUST have clean dry air to the gun. Be sure your compressor tank is drained of water, use a good quality moisture and oil trap (in-line desiccant systems work well too). Buy a new air hose, and keep it dedicated just for painting to minimize the chance of intruding oil or contaminants to your paint gun.

(Editor's note: The September 2010 issue of SK describes the various ratings used on compres-

sors. It also illustrates the principles of siphoning, although the examples shown are for media blasters rather than spray guns. The principles, though, are the same).

The controls on most paint guns are quite similar with the air-flow, paint-flow and fan knobs. The fan knob regulates the width of the 'fan' or spray pattern that is normally a vertical elliptical shape; this is determined by the horizontal or vertical orientation of the air cap. This is set by the user. Since all guns are different in their base settings, consult the instructions supplied with the gun as a starting point. Each gun design has an individual feel. Get familiar with it, waste some paint and practice, practice, practice before tackling that paint job on your old car or truck.

There is one other type of painting system that certainly bears mention here, and that is the Turbine systems. These are great for those without a compressor or requiring portability. Basically, if you can imagine using the outlet hose of a powerful vacuum cleaner on a specially designed paint gun and you heat that air, you have

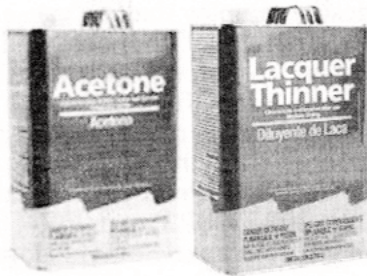


A turbine paint system is self-contained. It has its own air supply and a heater to dry the air.

the idea of a turbine paint system. Of course they are more complex and specific than that, and cost can vary widely. They provide a huge amount of CFM, the intake air is filtered and the output is heated to provide a dry air supply. I have tested several of them, and the better quality units do work quite well. The only caution is that many (but not all) are designed for painting backyard storage sheds and garage doors but not cars and trucks, so choose carefully, and take note of the included needle/nozzle set size. Some are supplied with 2.0 mm and larger needle/nozzle sets. The higher quality machines offer optional automotive painting sizes.

One final word on cleaning. Failure to take the time and effort to properly clean them has killed more innocent paint guns than any other

cause. The cheap, clean-up grade of lacquer thinner or acetone available by the gallon from one of the large discount stores works well. Another alternative is one of the aerosol gun cleaning agents available from many paint and supply houses. To avoid damage, begin cleaning as soon as you are finished painting and minimize the exposure time to the solvent. NEVER leave a paint gun to soak in solvent as it will ruin any plastic internal parts and rubber seals. Drain unused paint from the cup, and wipe out as much as you can. Pour a few ounces of the solvent into the cup, and spray it out into a rag or wad of paper towels (be careful not to have it spray back at your face, and I trust you would still be wearing protective gear at this time). Wipe off any remaining paint from the exterior, then remove the air cap and nozzle, put several more ounces into the cup then with the air disconnected, squeeze the trigger and allow the solvent to stream out until it is clear. Put



Inexpensive cans of lacquer thinner or acetone are fine for paint gun clean up.

the air cap and nozzle back on, hook the air back up, then once more spray the remaining solvent into the rag.

In summary, shop carefully and hopefully use the information I have provided. You must make the determination on how often you will use the gun, whether to buy just one and acquire the additional needle/nozzle sets, or buy two or even three separate guns. Many painters have a dedicated color gun, a clear gun and a primer gun. Generally, with the more expensive guns, a great deal of engineering and development goes into optimizing internal flow and atomization characteristics. They tend to last much longer. These are usually bought by the everyday painter. For the dedicated hobbyist, there are quite a few decent guns and sets available for \$200/\$300 or so.

This concludes the four part series on automotive paint, materials and equipment. Onto another subject next month. As always, we at SK welcome your input or hearing about your experiences.

S.K.

EVENTS

Car clubs, associations, or other nonprofit or non-commercial organizations are invited to use this column for announcing car shows, swap meets, or other car-related activities open to the general public for up to three months prior to the event. There is no charge for this service. Listings are on a space-available basis. Commercial organizations desiring to list events should remit payment at 25 cents per word along with ad copy. Because of space limitations, we must restrict notices to activities involving primarily authentic collector vehicles, thereby excluding events devoted solely to modified cars, replicas or handcrafted cars. Events are listed on a space-available basis. We will list event for up to three months including the month of the event. Deadline is the 10th of the month prior to the first month of publication (April 10th for a July event). We cannot accept any liability for printing errors, typographical errors or changes in events which are not supplied to us by issue deadline date.

CALIFORNIA

Auburn, Sept 18, Swap Meet, Auburn Fairgrounds, by Vintage Chevrolet Club. Info 916-539-3383

Paso Robles, Sept 18, Swap Meet, Paso Robles Events Center, by Early Ford V8 Club. Info Robert 805-238-7505

Galt, Sept 25, Car Show, McFrand History Ranch, by Galt Area Historical Society. Info 209-745-1477

CONNECTICUT

East Hampton, Aug 7, Vintage Motorcar Meet, Haddam Neck Fairgrounds, by Belltown Antique Car Club. Info 860-267-8394

IOWA

Monticello, Oct 9, Swap Meet, Fairgrounds. Info 319-465-5119

MINNESOTA

St. Cloud, Aug 21, Car Show, Swap Meet, Benton City Fairgrounds, by St Cloud Antique Auto Club. Info 320-290-6338

OREGON

Redmond, Sept 10, Swap Meet & Car Show, Central Oregon Old Car Club and Classic Chevy Club. Info Butch 541-548-4467

Brooks, Aug 6-7, Car Show, Antique Powerland, by NW Vintage Car Museum. Info 503-245-5444

WASHINGTON

Centralia, Aug 6, Antique Truck Show, SouthwesWashington Fairgrounds, by ATHS. Info 360-866-7716

Vancouver, Aug 14, All Buick Show, Esther Short Park, by Portland Chap Buick Club of America. Info 360-695-4993

Kent, Aug 20, Ford & Mustang Show, Bowen Scarff Ford, by Pacific Cascade Mustang Club. Info 253-582-0520

Bothell, Aug 21, Pontiac Show, Country Village Shops, by Western Washington Firebirds. Info 425-318-0449

Graham, Sept 5 Ford Car Show, Frontier Park, by Cascade Early Ford V-8 Club. Info 253-952-9344