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Home powdercoating

No, I haven't tried getting into this yet, but I saw something interesting in my email a month or so ago. I opened up an ad for Jegs and saw a "bench top powder coating oven" on sale for \$186.99 and wondered how different it was from the cheap toaster oven I already use for baking bolts and small pieces. What I knew was that both are over 1000 watts, get to 400 degrees and have timers. After that, I looked a little closer. #1 is that it has 1500 watts vs my 1350. #2 is that it has about a 10% larger space inside than mine. I'm sure there must be other differences, but they're not bragging about them either. Lastly, you could skip both of these and just grab an ugly but working electric oven off craigslist for \$50 too, which can fit even larger pieces. So, if you're in the market, know that there's a ton of options. Just remember that when powder coating, you have to bake it for the paint to cure and harden.



Project: Shop air line system

Over the past few years I have become more and more annoyed at having to run an air hose across the garage or string 2 together just to reach far enough out in the yard for outdoor projects (air powered nailer, paint sprayer...).

Unfortunately, even though I have a lot of shop space, the only practical place for me was putting my compressor up on the workbench in a front corner. Over the years, I have read about different methods of running air around a shop: black pipe, copper tube, PVC, or one of the home kits that have come out. After pricing out black pipe, I found it was way beyond what I was willing to spend. Copper pricing is up there too, but easier to hang because of its lighter weight. I have read and heard enough scare stories of how PVC can dry out and explode under pressure. I had a PVC confetti cannon explode on me too, so that didn't sound too appealing. At SEMA, I talked to a rep from MaxLine which also produces RapidAir, and felt confident that was the way to go.

Step 2 was kit pricing. I looked at Jegs, Summit, Northern Tool, Menards, and Amazon. Apparently, this is a price-protected item because they were all the same retail price, though Northern had it on sale and Menards seems to always have the 11% off sale (15% the week I bought). I looked at the differences between MaxLine and RapidAir, finding one uses 1/2" aluminum 200 psi tubing and the other is 3/8" nylon tub good to 150psi. After looking at their comparison chart online, and availability of individual pieces, I chose the home garage kit. For what you get, it is cheaper than it's pieces and had about 90% of what I needed.

After drawing a layout on paper, I bought the kit and a few additional kit pieces I knew I would need. I also grabbed some light duty pipe/cable retainers and a whip hose



Air system upkeep

For the most part, having an air compressor and air system doesn't require too much maintenance, but there are a few things to be aware of to keep your tools running well.

- ✦ Lubrication. Make sure your air tools are oiled. You can add a couple drops right in the air inlet, or add an inline oiler. This will prolong tool life greatly.
- ✦ Clean air. Most of the tool companies recommend using something like a vacuum cap over the male air tool end to keep debris out. Also, be careful not to drag the female end through the dirt too.
- ✦ Don't use oil in paint sprayers or sandblasters. They need dry oilless air. Make sure you have a water/oil filter trap.

Other air tool considerations:

Air Tools Estimated Air Consumption

Tool	Air Consumption	Tool	Air Consumption
1/4" Die Grinder	4 - 5 cfm	Ratchet	4 - 5 cfm
Drill	4 - 5 cfm	Blow Gun	2 - 3 cfm
3/8" Impact Wrench	3 - 4 cfm	Air Hammer	4 - 5 cfm
1/2" Impact Wrench	4 - 5 cfm	Orbital Sander	6 - 9 cfm

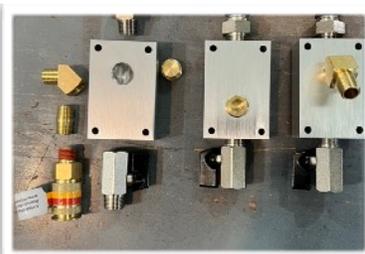
Air Tool CFM Flow Chart

Length of line	CFM Flow Chart								
	Single-Line Run				Looped Run				
	.375"	0.473"	0.500"	0.602"	0.800"	0.375"	0.473"	0.500"	0.602"
50 ft.	14.05	25.10	28.85	45.86	93.37	28.10	50.20	57.66	86.32
100 ft.	9.93	17.75	20.39	32.43	66.02	19.86	35.50	40.78	64.86
150 ft.	8.11	14.49	16.65	26.48	53.91	16.22	28.98	33.50	52.96
200 ft.	7.02	12.55	14.42	22.93	46.68	14.04	25.10	28.84	45.86
250 ft.	6.28	11.22	12.89	20.51	41.75	12.56	22.44	25.78	41.02
300 ft.	5.75	10.25	11.77	18.72	38.12	11.46	20.50	23.54	37.44



to feed the system. Over the years, I have learned that the way my brain works will lead me astray somewhere down the line, so I then laid out my pieces on the bench in their positions, partly to help visualize, but also to make sure I didn't forget anything.

As you can see, the system is pretty simple. I chose a "halo" type layout which is a complete loop that lets you use a smaller line and decreases pressure drop since it can use air from the whole line in either direction from your air port. I have 3 drops: one near the compressor, one in the front center of the garage, and the final is near the garage door. If I want to add another length or drop, it's cheap, easy, and quick to do.



Blocks for the drops, with and without hardware installed, adaptable to your own liking and layout. Plug is for a flush mounted through-wall layout.

The kit includes 100 feet of tubing, a specific tubing cutter tool, 6 hose couplers, 2 aluminum outlet blocks for the drops, 1 aluminum manifold block, 4 elbows, 2 valves, and some plugs and adapters for mounting into the blocks. I added one more outlet drop block and a couple tees, another elbow, plus those clips to hold the tubing to the wall and ceiling. All in total, I had under \$150 invested. The larger diameter line would certainly cost

more. I bought the individual fitting pieces from Northern Tool.

Stringing the hose was quite easy, even on a cold day. Instead of using the 90 degree corners as I laid it out, I opted to just curve the hose itself, figuring there would be less chance for a leak and smoother air flow. Adding the hose ends was like putting an AN fitting together, but without the blood. Essentially, you make sure the line is cut flat with the supplied tool, then just fully press into place. The fitting has little fingers that hold the hose from releasing, though manually depressing them easily pops it loose.

I followed the line along the ceiling, securing it in place every so often, until I got to my

first tee fitting and drop. Using a laser line, I did my best to keep the line straight and mounted the port block high enough to stay clear of the broom or shovels that will live in the same area. The block is designed to not only mount the air chuck on the front, but also a

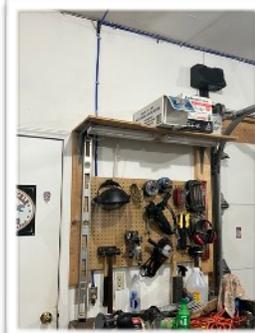


Top 10 things we learn from a gearhead when we are young

1. How to drive a stick. A rite of passage that is becoming long lost, learning how to drive a "standard" transmission almost automatically classifies someone as a gearhead.
2. Brand biases. You hear what was the "best" or stay away from whatever sucks based on what you heard growing up. You have no other basis until you actually waste money buying a Ford or Dodge.
3. How to do a burnout, donuts, or drift. I deem it necessary when hitting ice or sand on a curve in MN.
4. Good wrenching skills. Not necessarily fixing things, but how to actually use all the basic tools is a life skill everyone can use.
5. Passion for racing. It doesn't matter if you're into drag racing, circle/oval track, or road courses, gearheads love to measure themselves against others in speed and skill.
6. Basic driving skills. Not surprisingly, gearheads take pride in teaching their offspring how to drive "correctly", and we usually will add in those things they don't teach too.
7. Talking to other gearheads. It's a language all its own, and even how to carry the conversation. Unless you get the guy who talks down about your ride. He's not cool.
8. Life lessons. We all learned how (or how NOT) to hold a flashlight when helping, where not to leave tools when working under the hood, and that we need to disconnect the battery when playing with electricity.
9. Respect for someone else's stuff. Borrowing a tool? Gearheads would rather buy themselves a new one, but we certainly won't return a broken one. Gearhead kids keep their hands off cars at shows, and nobody finger wipes on a dusty car.
10. Enjoying the journey. Sometimes just hitting to road with "No particular place to go..." is the best trip you can take. Until something breaks, but that's another adventure.

valve on the bottom. You can also use the rear port for through-wall designs. The valve is for bleeding air pressure from the system or any extra moisture in the line. With a different layout you could use these valves inline to isolate parts of the system if you wanted to.

At this point, I had 2 obstacles to overcome: Garage door mounting hardware and potential future expansion. My garage door rails were hung using angle iron and to avoid an ugly jump over them entailed going wider around them, including avoiding some lights and keeping a straight line. With a little creative propping, I was able to use the laser level to keep my ceiling run straight. Here's where I "forgot" my plan when I got in a groove and was just plugging away at finishing the system....



I hid the air line port just under the pegboard. It's angled for easy access.

I originally had planned on poking a hole through the wall from the front garage into the back shop, then running a drop down the wall in there. Not thinking ahead, I missed that I would need to drill a hole directly through the same narrow space that had all the electrical wiring, and after re-evaluating where the drop would be, I bailed on that whole idea (for now...). Allowing for a change later, I used a tee coupled with a stub hose to an elbow. This then led back to my starting corner. I put the main manifold up near the ceiling because it gave me good starting and stopping points for the halo run,

plus a port for the air inlet and another port for a drop back down the wall.

Actual time to do took maybe 4 hours, plus a little bit to troubleshoot 2 air leaks. Those both turned out to be hoses not pushed all the way into the fittings. After charging the whole system to the 120psi I normally have it at, I do still see a slow pressure drop which I will focus on soon when soapy water doesn't freeze. I have a master system valve already in place so it won't constantly want to drain and refill the system, and I will replace it with an easier to use lever type one at that time too. In the future, I will pop it through to the back garage, and maybe hook it to a ceiling mounted reel, or run another full halo back there with several drops too. We'll see I guess.

By the way, what is MaxLine? It's a heavier duty version of RapidAir using 1/2"-2" aluminum hard lines and compression fittings. Starting price for a kit is double. The pipe comes in a roll and will hold the shape you unroll it into, or buy their straightener tool for \$170. Bigger. Better? Pricier.



Notice the manifold at the top, the pressure gauge and main valve from the tank, and the drop down the wall. Disregard the ugly compressor. The tank is 5th owner, the top is from another that rusted out, but it works.