

LATHE VACUUM ADAPTER AND CHUCK

Robert (Bob) Salvetti

**Low Cost / Low Tech / Light Duty
(Always At Your Own Risk – repeat LIGHT DUTY)**

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**Inspired by the 3,127 or more Journal, Magazine, Catalog, Video, and Internet  
Articles, Tutorials, Tips, and Editorial Suggestions**

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**A Method of Holding Wood on a Spinning Lathe
- Without Removing the Headstock Hand wheel
- Without Making Additional Holes in the Object Wood
- Without Super-Gluing Everything in the Shop to the Lathe**

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**My sincere apologies (but with gratitude) to all those preceding vacuum device developers who may be offended at my artistic license (plagiarism, patent infringement?) in using their original (or not – you know who you are) ideas.**

**Many of those obsessive-compulsive, over-educated, spare-time-burdened, perfectionist, technical-writing, engineering types have truly inspired this neophyte woodturner with their inventiveness, and their resulting Wood-Art.**

## **INTRODUCTION.**

**Here is what I used to vacuum outfit my Jet 1014 mini. All you folks who power up those big, light-dimming, white or mustard colored lathes (Envy is one of my seven deadly sins) read no further – go look at the Gallery photos. And you, you with the Stubby-already-includes-the-vacuum-adapter – you know where you can go. I have included several color photos of the pieces and parts of this project for your use.**

## **CHAPTER I. – Low Cost**

**1.) I know that everyone who owns a wood lathe or a garage also already owns some type of vacuum cleaner / ShopVac. Therefore, additional cost to proceed onward is nada, nil, nothing, zero, no more dollars. Do not use the \$600 Dyson you bought her for you last wedding anniversary gift – say again DO NOT.**



2.) No one has a spare, available, sealed, industrial quality, motor bearing with a largish inner race opening (about 1/2 inch). Therefore, buy one at Lowe's. Go to Hardware, Aisle 16, Specialty Fasteners drawer number K-10 "Science Projects / Bearings", item 6202-ZZ, stock number 152269 for \$6.63. Really, that's where they are. Any other cheap, comparable substitute is fine – "sealed" is a must.  
Are you kidding me - "Science Projects / Bearings"?

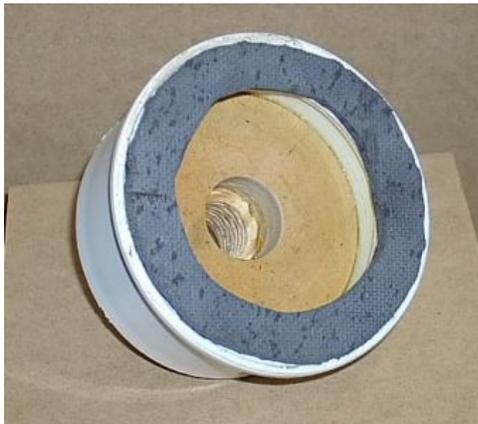
3.) If you don't have a spare 3/4 inch x 1/2 inch PVC reducing coupler, pick that up at Lowe's while shopping for the bearing – Plumbing, Aisle 14 I think, \$0.26.  
Or, turn your own bearing-to-vacuum hose fitting. (You will have to turn / modify the plastic one to fit anyway.)

4.) Gather some on-hand, leftover (scrap) 3/4 inch MDF – smallish for the adapter end, a little larger for the chuck parts. Come on, you're a woodturner. You must have some MDF or other dense hardwood board around somewhere. If you're sure you don't have anything suitable, call me at 1-800-who-cares.  
No more pesos again.

5.) Depending on how you will build the chuck, you may need a headstock faceplate. I didn't. No expense for me.

6.) Duct tape. If this item needs further clarification please see the phone number above - Item #4. not #5. You have it; don't buy a new roll.

7.) I almost forgot the most critical item. The face of the chuck (where the rubber meets the road, uhh, wood) must be some sort of sealing but slightly flexible, closed-cell foam material. Envision any of these readily available items (steal 'em from the grandkids if need be) – cloth-faced neoprene computer mouse pad; the old SCUBA divers' wet suit; foam packaging stuff (so much for the technical writing); weather stripping; inner tubes, O-rings; etc., etc. For specific, reliable sources of these materials use your imagination. No cost; I said to steal it.



## CHAPTER II. – Low Tech

Did you read Chapter I? We're using a ShopVac and plastic plumbing here. Sure, if you want to over-engineer all of this and use aircraft-grade brass or stainless fittings, carbon-fiber and Kevlar tapes then you are the guy I already apologized to.

### CHAPTER III. – LIGHT DUTY

If you are that adrenalin-junkie, high-risk, where's-the-faster-button type of woodturners you are in the wrong place. Please see the sub-title of this treatise - *(Always At Your Own Risk – repeat LIGHT DUTY)*. This contraption we're gearing up to build will not accommodate a thirty pound, out-of-balance Rosewood log. Hell, it won't safely grasp onto anything near that description.

#### <<<<< SAFETY NOTE >>>>>

My mini lathe has not injured me – yet. I aim to keep it that way. That flannel-shirted guy on the TV show always covers the liability issue with “Always read, understand, and follow the manufacturer’s instructions”. Well, I ain’t the manufacturer here – you are. Please use your head. Common sense is a must – that is to say, your vast experience plus your vast powers of logical deduction will ultimately lead you to the conclusion of “When in doubt – don’t”.

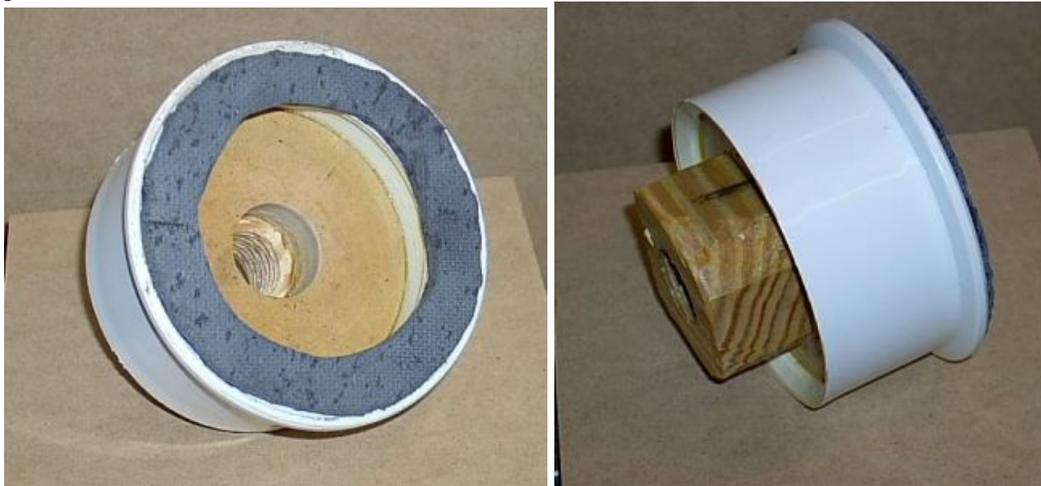
### CHAPTER IV. – Start Building

- 1.) Turn one small piece of  $\frac{3}{4}$  inch MDF into a donut shape – the outside diameter equals the inside diameter of the headstock hand wheel and the inside diameter of the doughnut equals the outside diameter of the bearing. (Spell donut however you prefer.)
- 2.) Press fit the bearing into the donut. CA glue the bearing into the donut if needed – do not glue the bearing to the bearing.
- 3.) Turn the small end of the PVC reducer to fit the inside diameter of the bearing. Press fit the fitting into the bearing. CA glue the fitting into the bearing if needed – do not glue the bearing to the bearing.





4. Build one or more chucks of various sizes that are hollow (like a bowl) and will screw onto the headstock spindle. The larger the “bowl” diameter you can use, the more holding power of the chuck - something to do with physics and atmospheric pressure. The bottom of the “bowl” needs a hole opened to the spindle. You may glue a gasket (see Item 7. of Chapter I above) to the rim of the chuck, or just place the gasket material onto the bottom of your object to be turned. Yes, this is just like a jamb-chuck. Yes, you could use a jamb-chuck and the tail stock to finish turn your bowl or platter bottom – EXCEPT for that little nubbin thing left in the middle, hidden by the live center. And anyway, this vacuum stuff is just more fun to play with, and you can always use this vacuum chuck as a jamb-chuck.



**NOTE:** Depending on your vacuum source its motor may require some fresh air for cooling under any extended use. We are essentially going to close off the end of the hose. If your finished project does not leak enough fresh air you can provide a small “bleed” hole in the hose end adapter or in the chuck itself. That hole may be regulated by covering with duct tape as required.



## CHAPTER V. – Start Using

- 1.) Press the vacuum adapter into the headstock hand wheel. If it is too loose “shim” it with some masking tape (note the blue stuff in the photos). You may also wrap some duct tape around the hand wheel to further secure the adapter. You can even drill holes through the hand wheel and screw or bolt the adapter in place. Remember the discussion on *Light Duty* above?
- 2.) Tape the end of the vacuum hose to the adapter fitting. Insure that the hand wheel will turn freely without turning the hose (that’s why you splurged for the \$7.00 bearing).
- 3.) Screw the vacuum chuck onto the headstock spindle.
- 4.) Turn on the ShopVac or whichever brand of vacuum cleaner you used.
- 5.) Place the bowl or platter to be turned onto the vacuum chuck (you may use the tail stock to help locate the center again). Adjust several times as necessary and then remove the tail stock.



- 6.) Turn on the lathe – minimum speed. Go slow. Be careful. Have fun.
- 7.) Finish turn the bottom of the bowl or platter – light cuts will help keep the thing on the lathe. This is so cool – no tail stock in the way.
- 8.) Turn off the lathe. Turn off the lathe FIRST, not the vacuum.
- 9.) Get ready to admire your work. Hold onto the now-stopped bowl or platter firmly with one hand. Turn off the vacuum with the other hand. It will take a moment for the pressures to equalize while the vacuum motor stops.

## CHAPTER VI. – The End

That wasn't too difficult. If you build one let us know how it works out for you. Experiment to see what works best – the chuck size and shape along with the gasket materials are the biggest variables. Does a Fein 5 horsepower vacuum work better than my cheap old Ridgid 2 horsepower? I guess so. Maybe if your vacuum cleaner filter is clean you will get better results also. If you tried this device and were seriously injured by a flying platter the number to call is 911 – I'm not home.

No, I don't know where to get a used wet-suit. Yes, you can use some automotive type sealed bearing. No, the chuck does not have to be finished with \$23 worth of CA glue. Do you know where I can get some free Rosewood bowl blanks?