

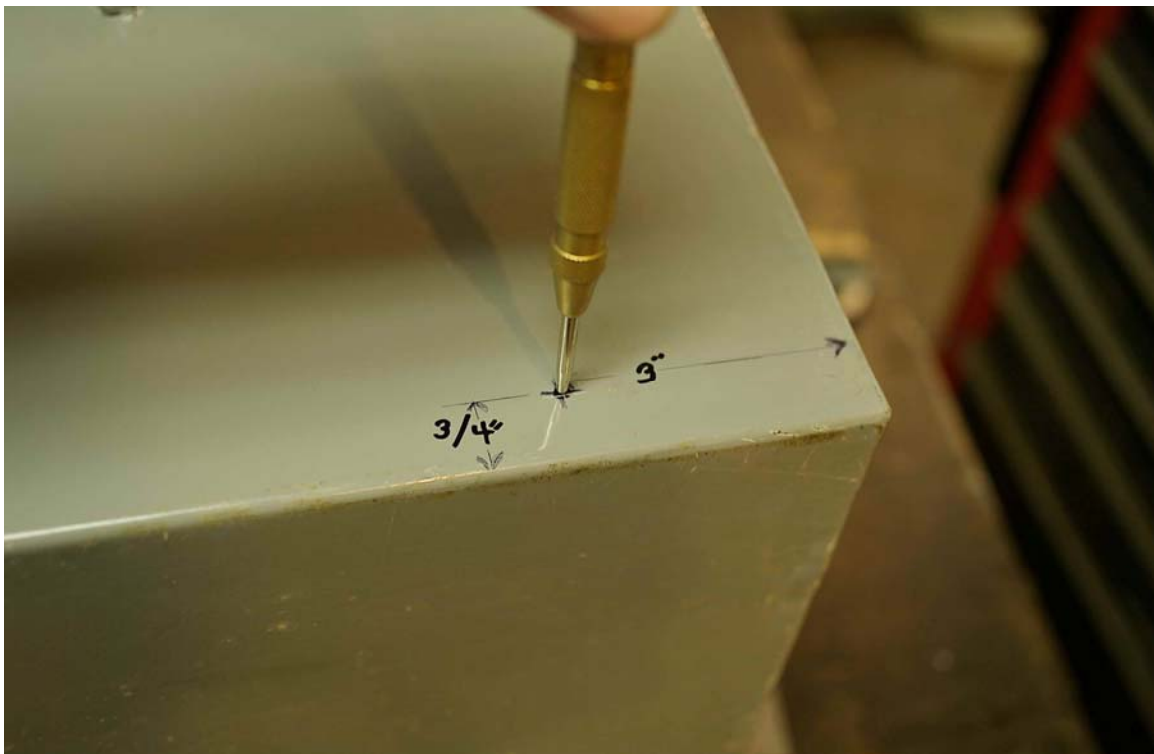
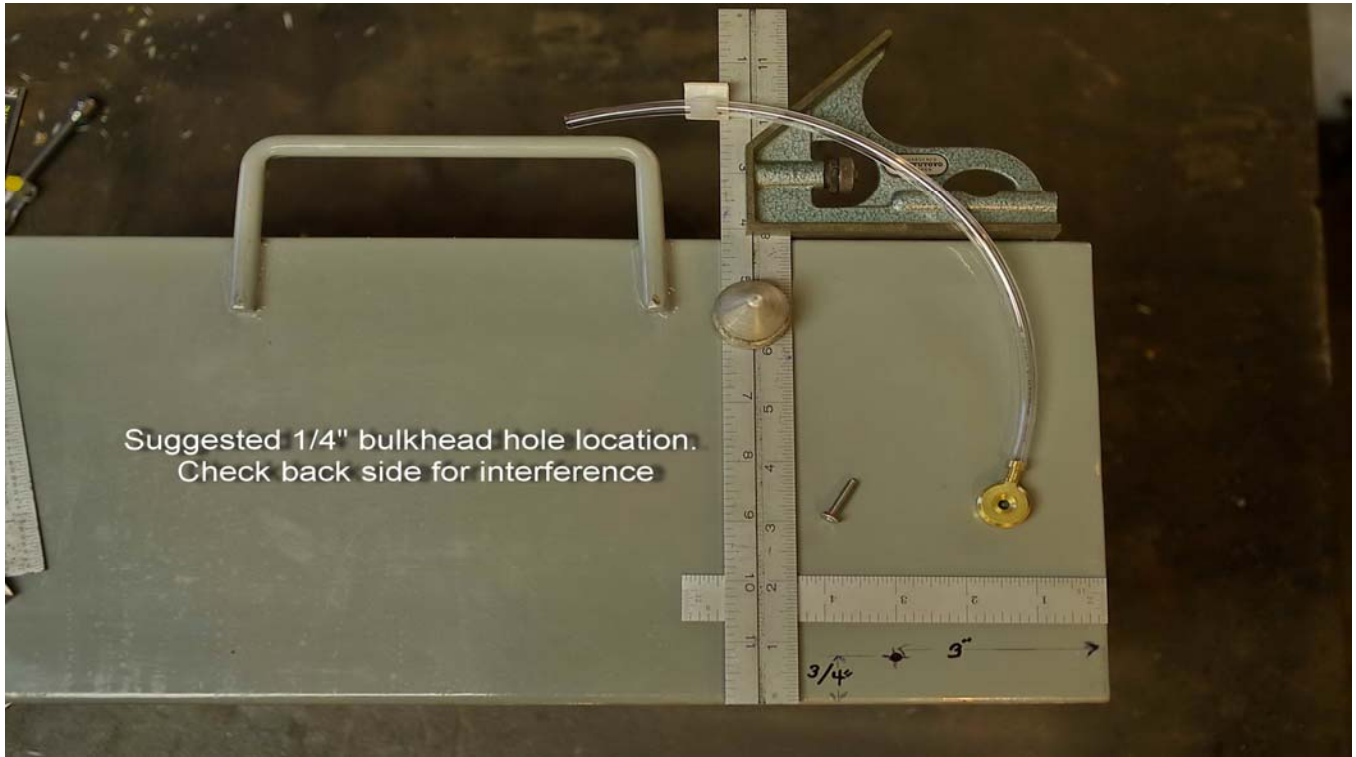
Thanks for looking at the sight gage kit to monitor coolant level for Tormach mills or any fluid system with a remote tank. The bulkhead fluid fitting is super low profile and will not interfere with the door closing or removal of the tank. The fluid fitting only requires a 1/4" hole drilled into the coolant tank. The sight gage has 8 strong magnets for attachment to the mill base and screws are included for a permanent attachment (highly recommended).

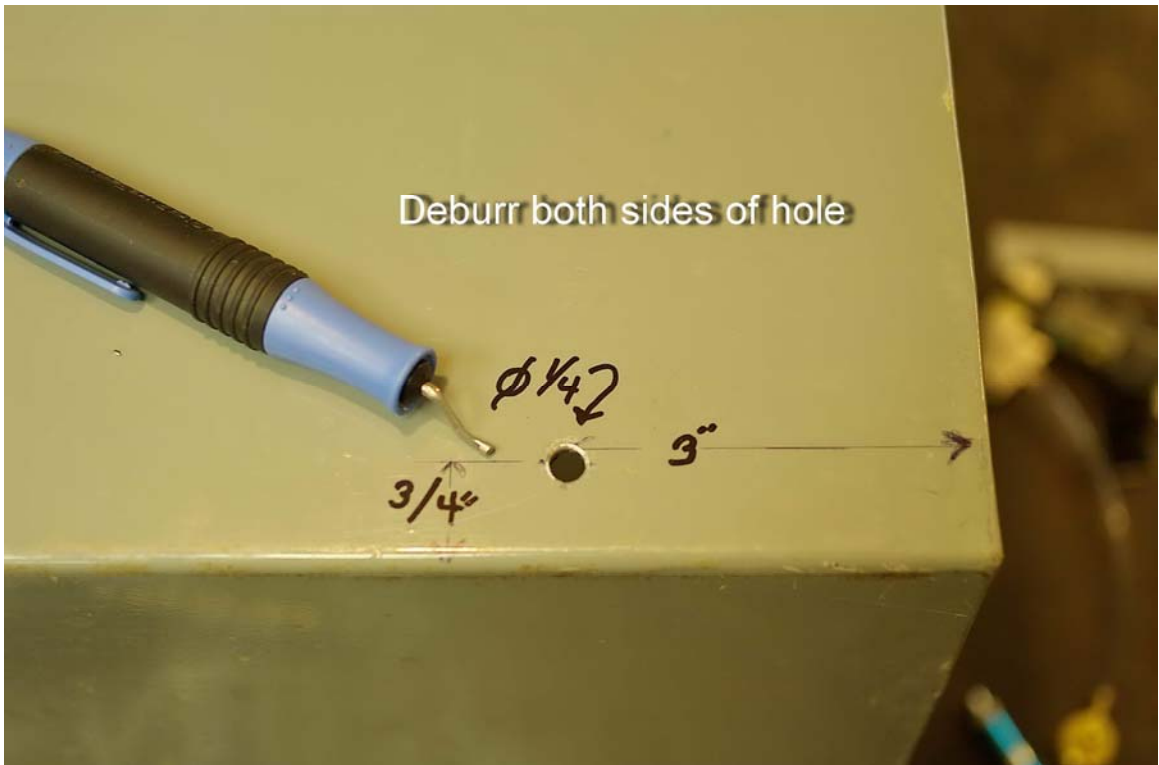
The kit contains:

- 1 sight gage with magnetic attachment and integrated tubing nipple
- 1 brass bulkhead fluid fitting with O-ring seal and SS seal screw & extra O-ring
- 2 SS 8-32 flathead machine mounting screws with locking nuts
- 2 sets of twist tube connectors with caps
- 4 feet of clear tubing
- 3 adhesive backed cable clips
- 1 fluid float for improved visibility with clear fluids



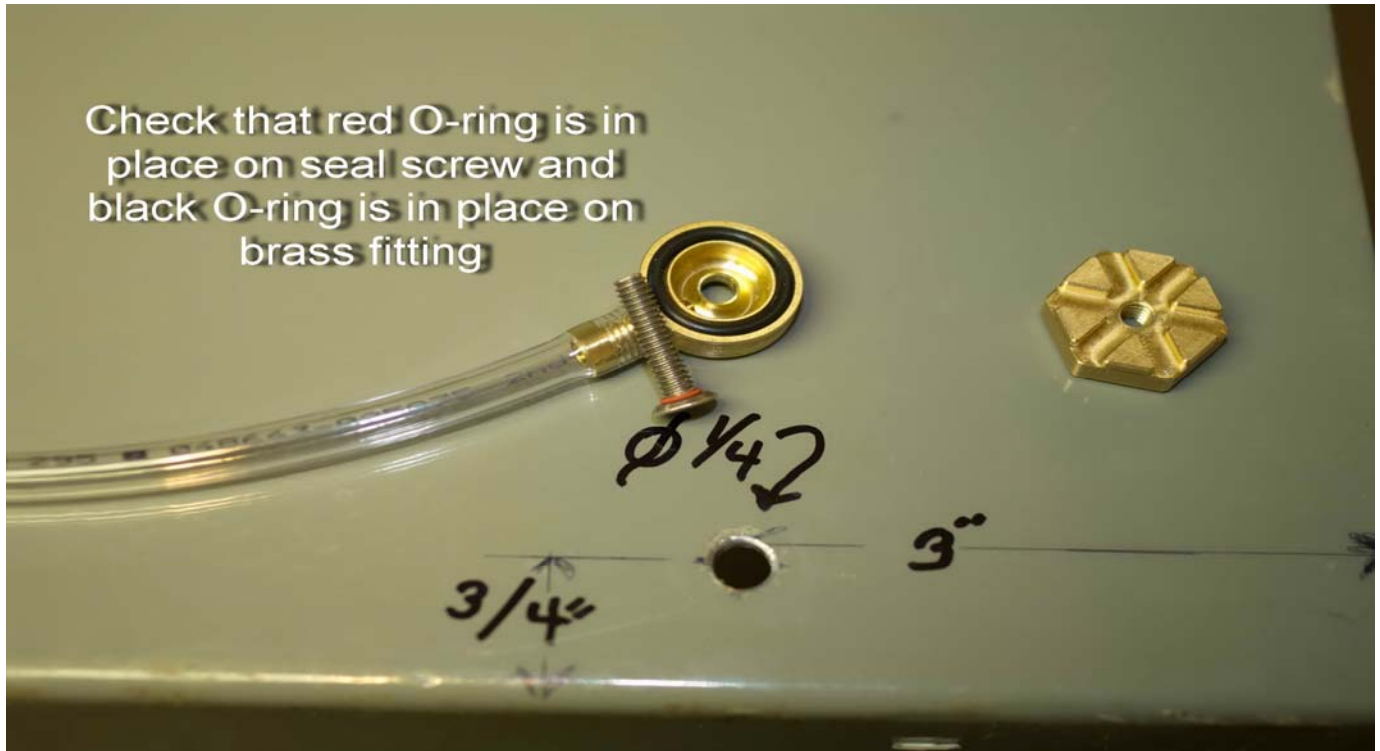
First thing is to remove the coolant tank from the mill. This is easiest if you use the coolant pump to pump as much of the coolant as possible into containers on the bed of the mill (a couple 5 gallon buckets work well). Remove the pump, cover plate, and remaining fluid. Clean and dry the tank inside and out then locate, drill, and deburr the 1/4" hole as shown in the following pictures. Make sure the surface around the hole is clean and smooth for the O-ring seal.

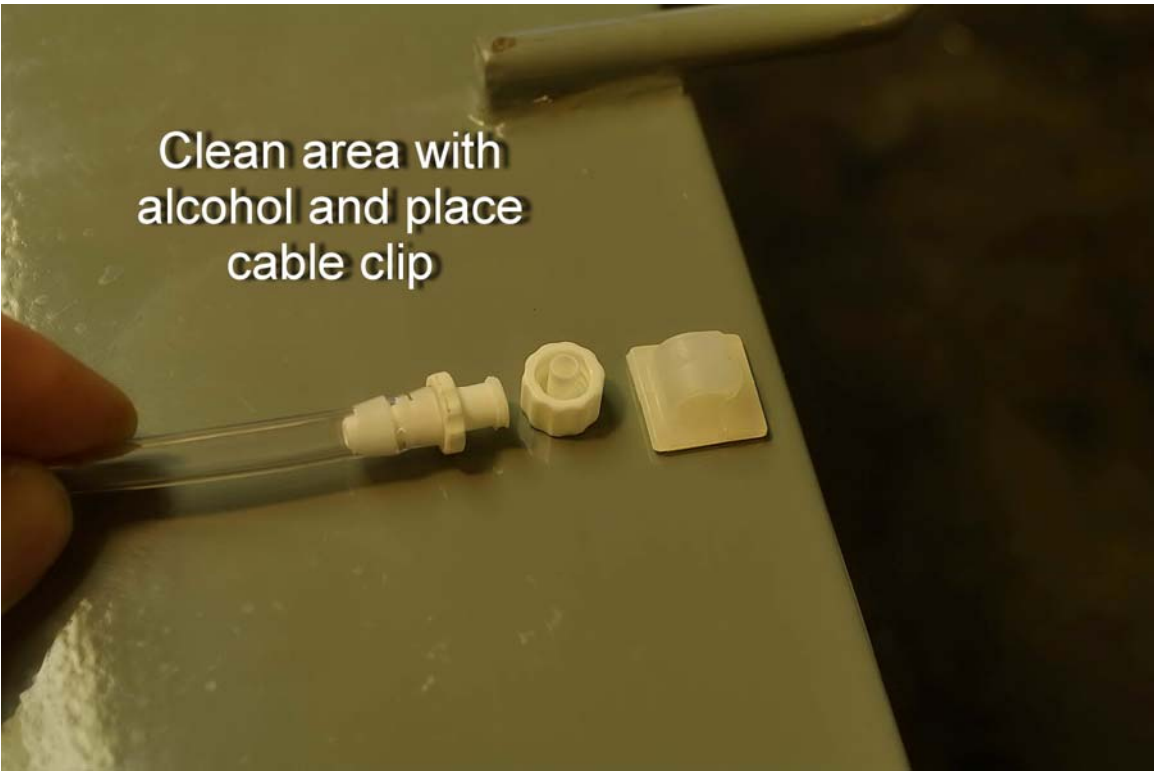






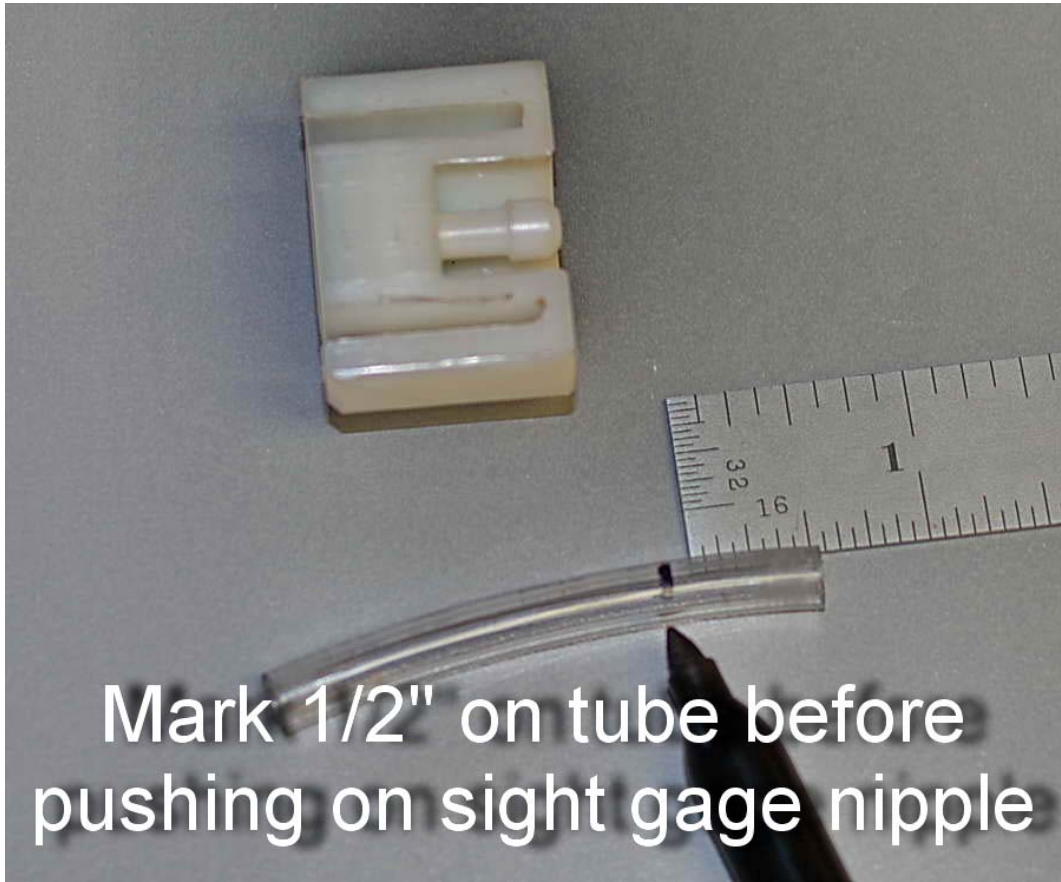
After the hole is prepped, cut 10" to 12" of tubing and press onto the fitting nipple. Check that the red O-ring is installed on the SS seal screw and the black O-ring is installed in the bulkhead fitting cap. Install the fluid fitting taking care that the inside nut is positioned so that the fluid channels are against the bulkhead, otherwise no fluid will flow. You should blow on the tube after installing the fluid fitting to insure there is a clear fluid path. Insert one of the twist tube connectors in the end of the tube and cap. Use one of the adhesive backed cable clips to secure the tube end near the top of the tank as shown.



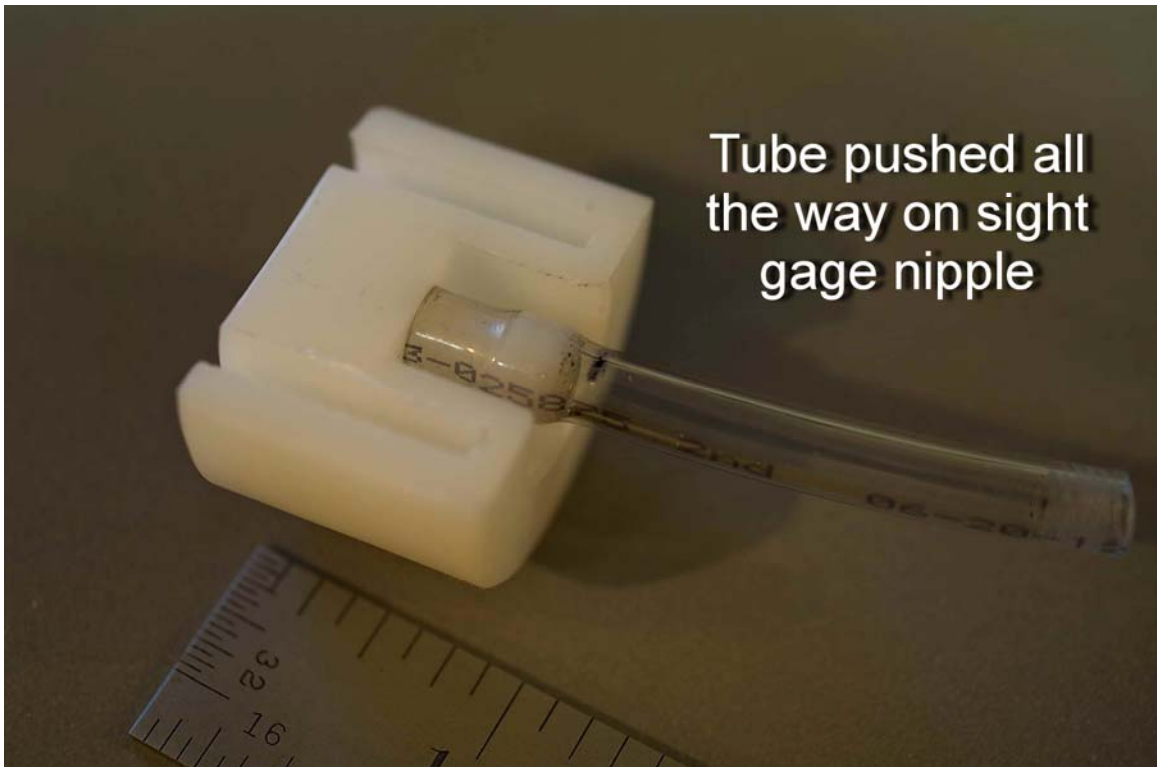




Push the remaining tubing onto the sight gage nipple. This is a tight fit and difficult to see after pushing the tubing on. Make a mark  $\frac{1}{2}$ " from the end of the tubing first with a Sharpie to assist in confirming that the tubing is pushed all the way on. The magnetic sight gage can now be placed on the corner of the mill stand where it will be free to slide up and down. Route the sight gage tubing to the coolant tank compartment and cut to length leaving enough slack so that the two tubing ends will be above the tank level when connected. Insert the twist lock tubing connector into the end of the sight gage tubing making sure it is the right gender to mate with the tank tubing connector. The bottom adhesive backed cable clip can be attached now under the front corner of the mill. Once the tubing is mated, there is a channel on the bottom inside of the mill stand where the excess tubing service loop can be tucked into.



Mark 1/2" on tube before pushing on sight gage nipple



Tube pushed all the way on sight gage nipple



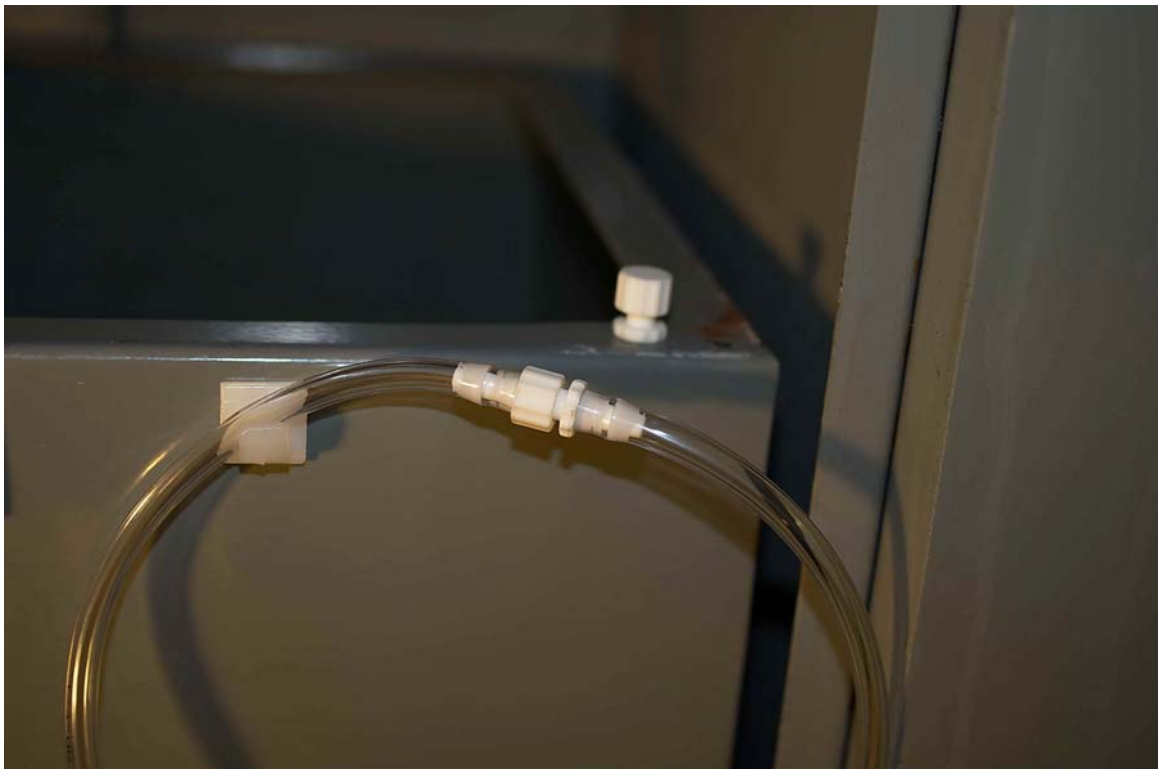


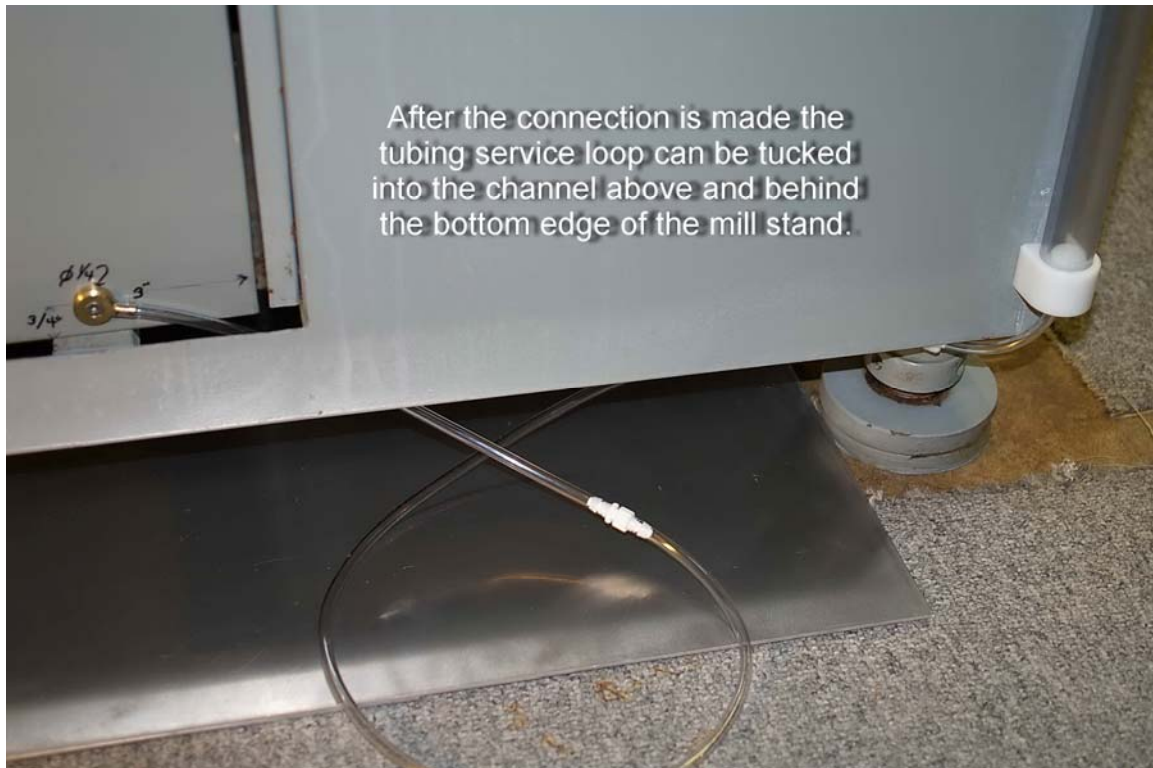
Use cable clip to secure tubing below sight gage. Clean area well with alcohol first



Leave enough hose so that the connection can be made above the top of the tank, otherwise fluid will pour out when servicing the unit in the future.







Once the coolant tank and pump assembly are re-installed and all the fluid connections are made up, fill the coolant tank with just enough fluid to cover the pump intake. The fluid level will be indicated in the sight gage. Place a container under the coolant nozzle on the mill bed and run the pump just until it starts to run out of fluid. At this point, make a mark on the mill stand that corresponds with the fluid level on the sight gage. This will be the lowest acceptable fluid level. Add exactly one gallon of fluid to the tank, giving ample time to drain completely into the tank, now make a corresponding mark on the mill stand. Repeat in one gallon increments until the tank is full. It is helpful to place the sight gage at the tank when adding the final fluid to avoid overflow.

Note that the tank fluid level will always correspond to the marks on the mill regardless of the height placement of the sight gage. For this reason be sure to determine the best vertical placement of the sight gage before attaching with the mounting screws.



Add just enough fluid to the empty tank so the pump engages. Pump fluid into a container until the pump stops pumping. Make a mark on the mill stand at the fluid level in the sight gage level. This will be the minimum acceptable level.



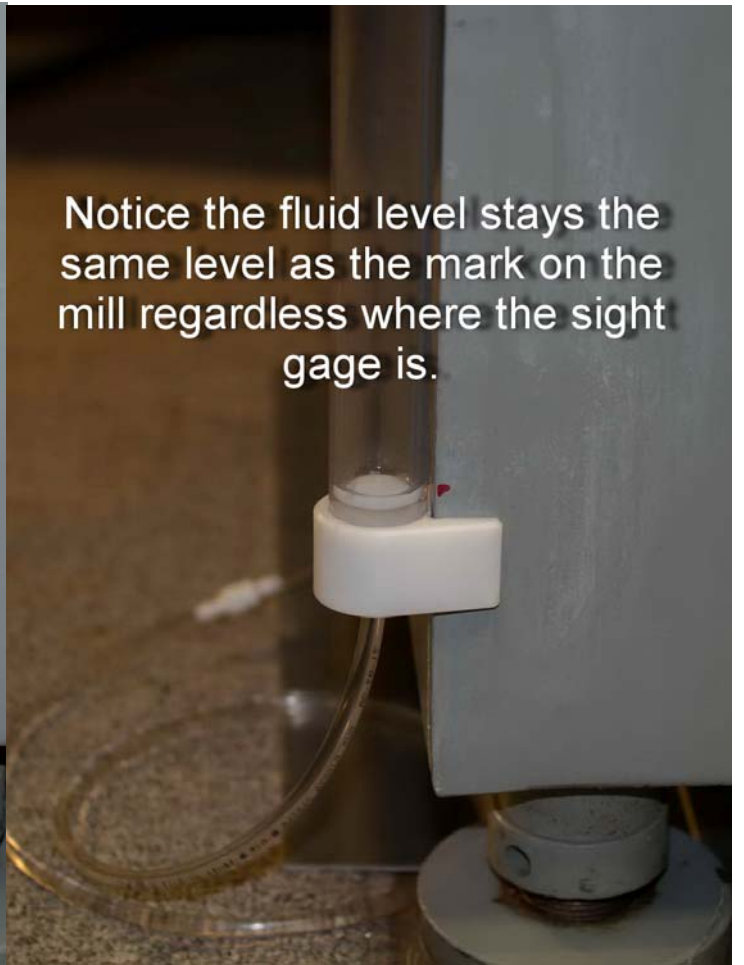
Make a mark on the mill stand at the minimum fluid level where the pump stops pumping.



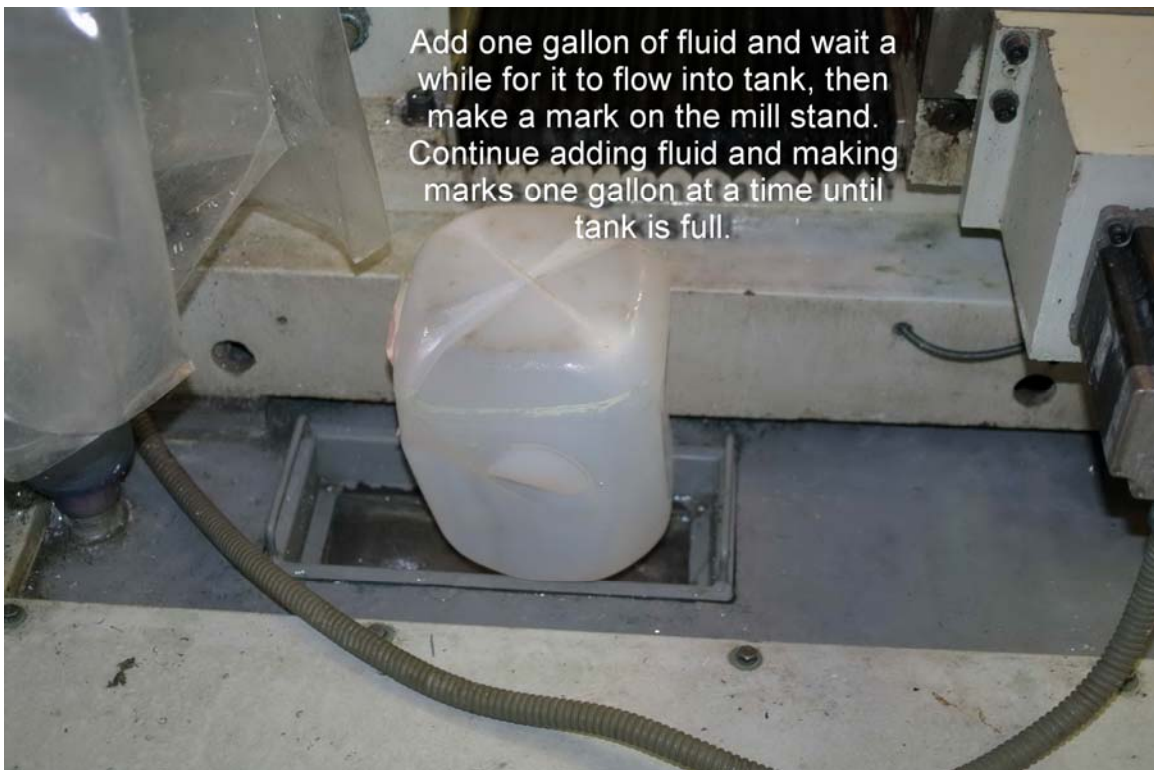
Notice the fluid level stays the same level as the mark on the mill regardless where the sight gage is.



Notice the fluid level stays the same level as the mark on the mill regardless where the sight gage is.



Add one gallon of fluid and wait a while for it to flow into tank, then make a mark on the mill stand. Continue adding fluid and making marks one gallon at a time until tank is full.





Making a mark at the one gallon level.



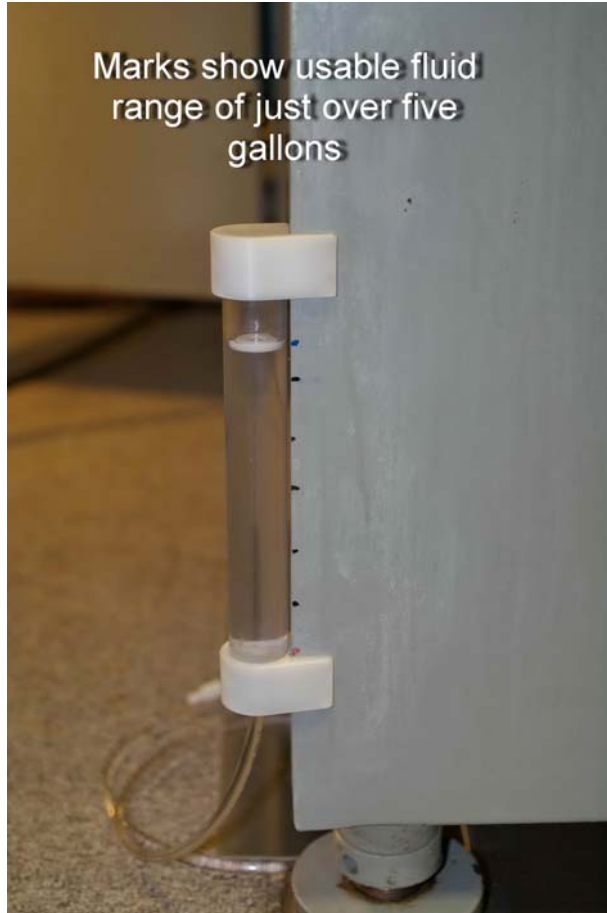
Making a mark at the two gallon level.



Using the sight gage to make sure the tank does not overflow when finding the maximum fluid level mark.



Marks show usable fluid range of just over five gallons

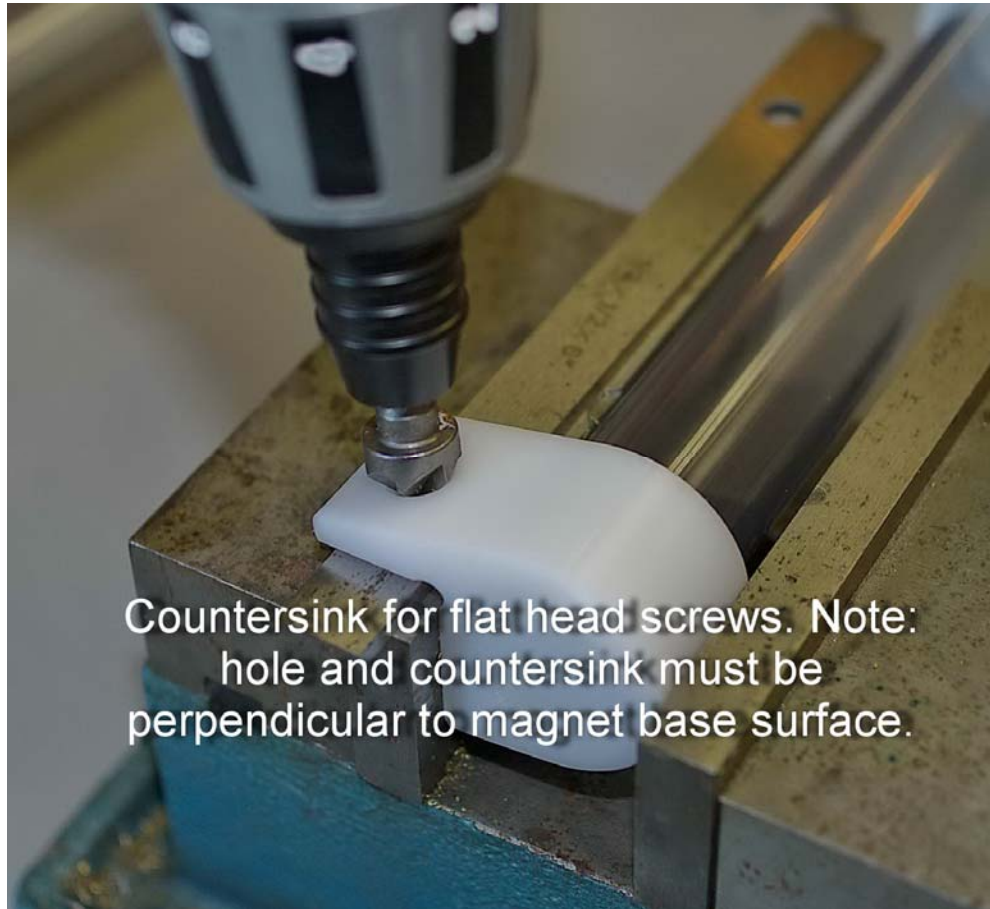


Make graduations and text to suit on mill stand.



The sight gage has eight N35 magnets to attach it to the mill, however, there is always a chance that it can be accidentally knocked off the mill for example when moving other heavy equipment around the shop. If that happens and it is not discovered right away, all the coolant will leak onto the floor. For this reason mounting screws are included and it is recommended that they are used once the best vertical location of the sight gage has been determined. The caps of the sight gage have pilot holes on the inside surface to aid in making the screw holes. If you plan on threading the mill stand holes the screws are 8-32. If you are going to drill thru holes into the mill stand, locking nuts are provided. Be advised the holes and countersinks on the caps must be drilled perpendicular to the flat surface where the magnets are.





Countersink for flat head screws. Note:  
hole and countersink must be  
perpendicular to magnet base surface.



8-32 SS flathead screw. The mill  
stand can be threaded for  
attachment or clearance drilled  
using the included lock nuts.



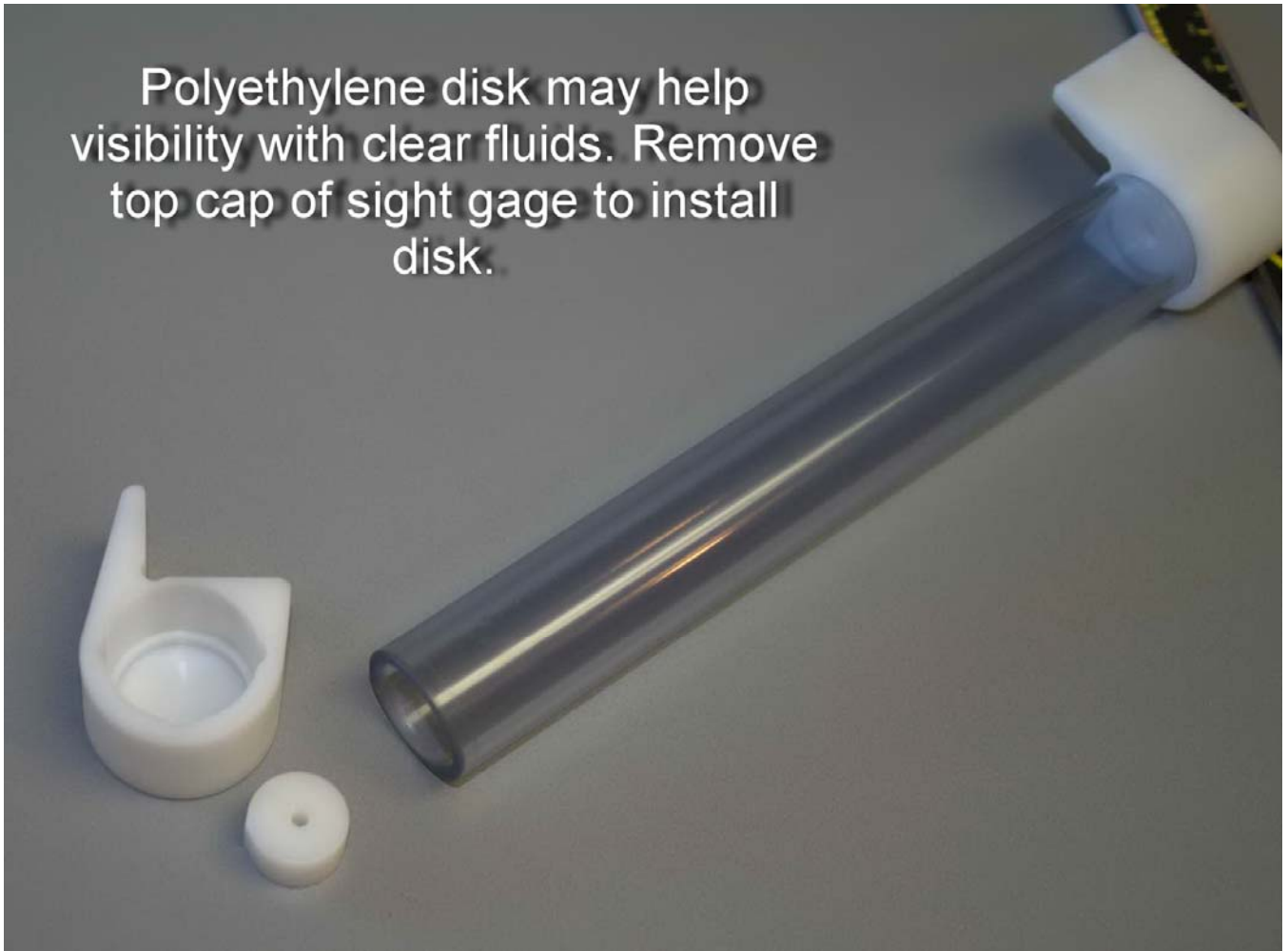
Use of a transfer punch to accurately locate hole location after positioning sight gage height.



Tap for threading mill stand (not included) and #29 tap drill.



Polyethylene disk may help visibility with clear fluids. Remove top cap of sight gage to install disk.



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The top and bottom caps on the sight gage are a slip fit on the clear PVC pipe. The top cap is vented to prevent an air lock and allows the fluid to flow into the gage. The bottom cap has an internal O-ring that provides a water tight seal on the ID of the clear pipe. The caps will turn freely on the pipe while the bottom cap will remain watertight. Check that the caps are pushed completely on the pipe before installation.

