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PRODUCT MANUAL

Automatic Drop Panel Kit



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PRODUCT OVERVIEW

WHAT'S INCLUDED:



1-1/16" BORE 28" STROKE DOUBLE ACTING CYLINDER



SOLENOID VALVE



QUICK EXHAUST VALVE



METAL BRACKETS AND RAILS



QUICK CONNECT WITH PUSH-ON



FITTINGS, BOLTS, SCREWS, ETC...



REGULATOR



AIRLINE

WOOD NEEDED:

You will need the following pieces of wood to complete this project.

- 1x 4' x 8' Sheet of 1/2" Plywood
- 7x 2x3's
- 1x Sheet of 3/4" Plywood at least 28" x 28"

RECOMMENDED TOOLS:

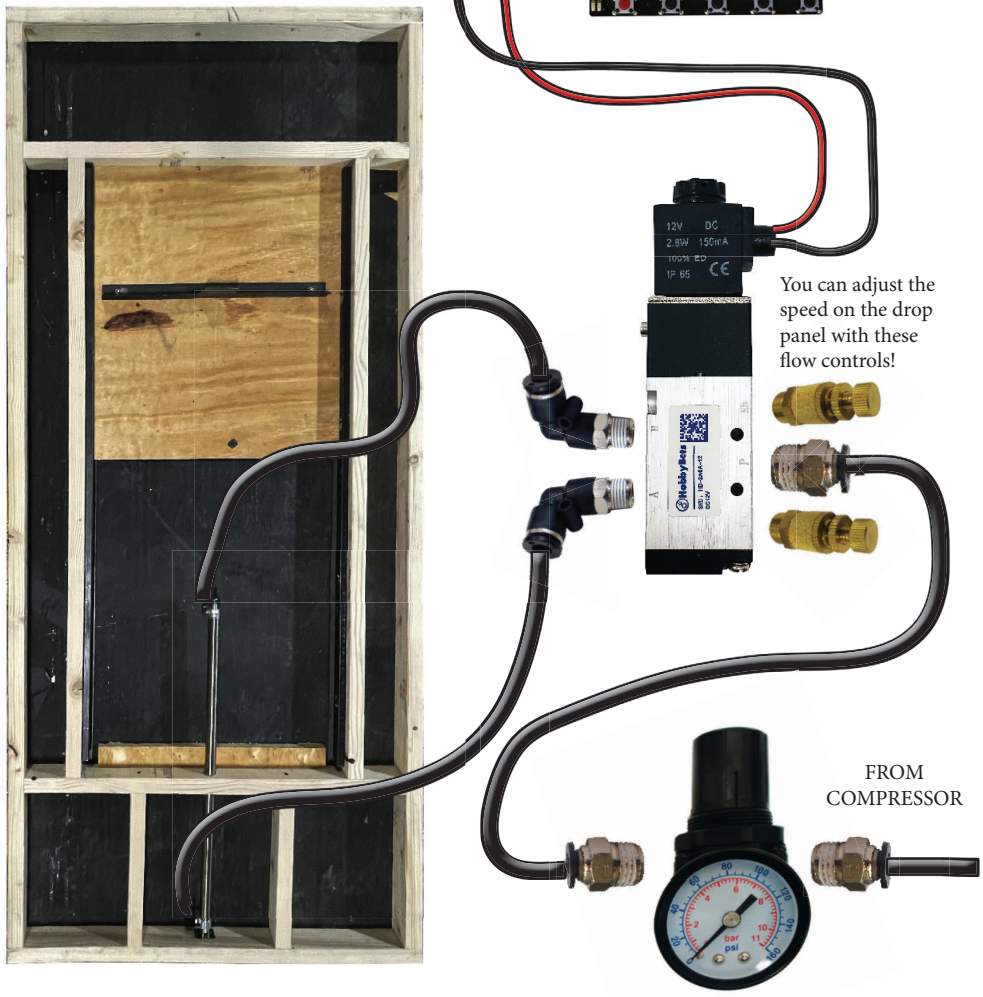
- Nail Gun
- 3" Nails
- Cordless Drill w/ Philips Bit
- 1/4" Drill Bit
- Wrenches
- Table Saw, Track Saw, or Other
- Pneumatic Stapler
- 1-3/4" Staples
- Chop Saw
- 7/16 Socket
- Tape Measure
- Pencil
- Hammer
- Wood Glue

STEP 9 - INSTALL AIRLINES AND CONTROLLER:

Run airlines from the fittings of the cylinder to your solenoid valve. An example diagram for connecting airlines, solenoid, and a controller is provided on this page.

For programming and specific connection diagrams for your controller, please see the manual included with your controller.

Your panel is now read to use and install!



Lastly, place the panel onto the Angled Side Rails and install the SQUARE TOP RAILS to secure the panel in place.

The Drop Panel should be able to slide smoothly up and down between the rails. If the wood has warped on your Drop Panel you may need to adjust the top rails to provide more space.









This is what the back of the panel should look like when finished. You can decorate the front of the panel to match your theme. We use spray adhesive to apply a printed poster to the front of the panel and then apply decorative elements as well. To the right are some examples of finished panels.



STEP 1 - BUILD THE FRAME:

We will start by building out the frame for the drop panel.

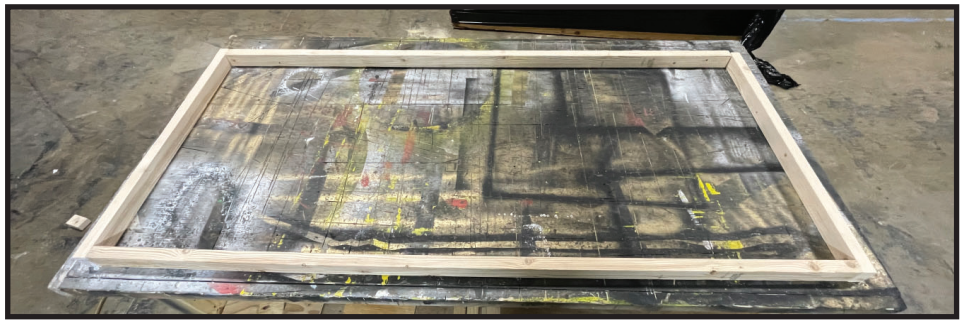


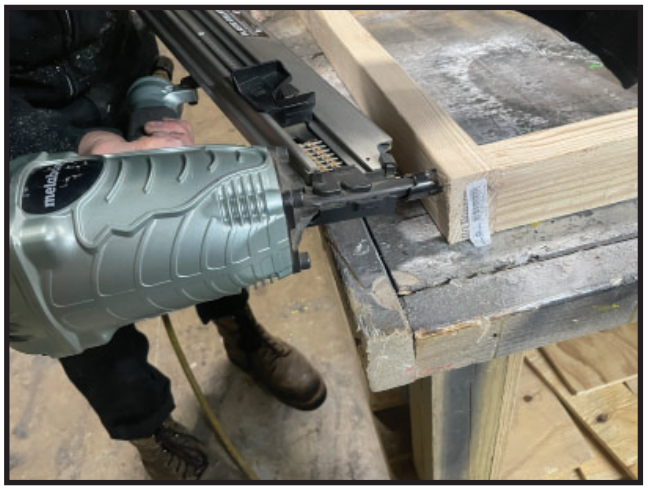




To do this we will measure and cut two 2x3's to 40" and two 2x3's to 87". Then frame up as a rectangle.

Place the 40" pieces on ends with the 87" pieces inside those. The frame should measure 40" Wide x 90" Tall.





Nail the wood frame together at the corners using two nails per corner. We use 3” nails for this.

STEP 2 - TRIM PLYWOOD:

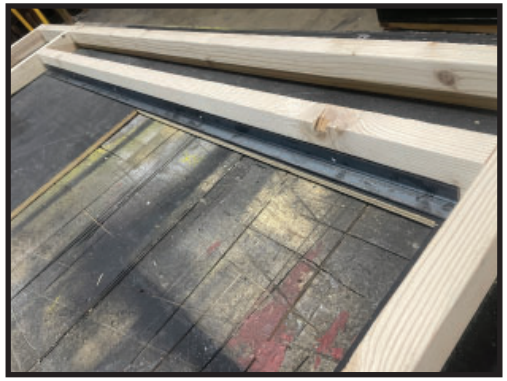
To trim our 4’ x 8’ piece of plywood down to the dimensions used for our drop panel we will need to remove 8” from the long side and 6” from the short.

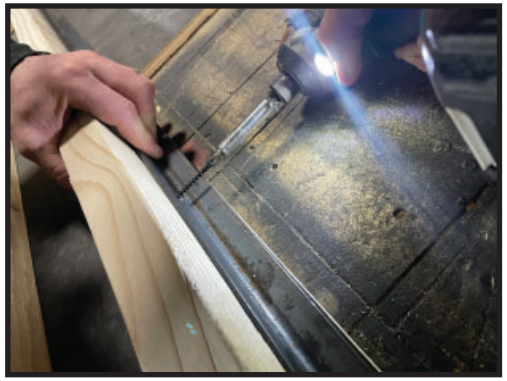


Place the plywood sheet on a table or saw horses so you can safely cut the excess wood off.

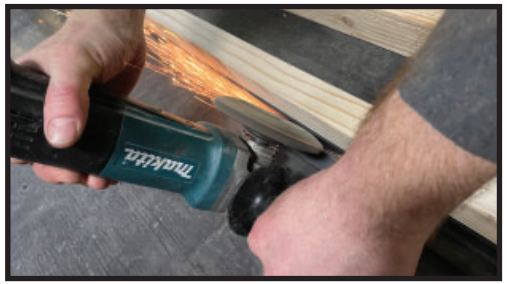
STEP 8 - INSTALL RAILS AND DROP PANEL:

Install the ANGLED SIDE RAILS on the inside long vertical supports. Screw them in with wood screws.





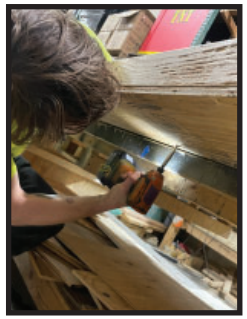
It’s a good idea to use an Angle Grinder with a Grinding and Polishing Flap Disc to grind down the screw heads so the panel will travel smoothly on the rails.



Next we’ll install a 2” x 23” piece of 3/4” Plywood as a stop at the bottom of the cylinder to brace the panel when it falls down. Apply wood glue and then screw this brace into the panel from the front.















Insert one of the carriage bolts into the front of the panel an use a washer, nut, and Loctite to secure. The head of the carriage bolt should sink into the front of the panel as shown.

Once the center bolt is installed you can remove the screws from the two outside holes, drill those out and install carriage bolts in those as well.

When finished you should have three carriage bolts holding the Cylinder Push Bracket in place. The heads should be sunk into the front of the panel. These will be covered up when you install you artwork over the panel.





Mark 8” from the long edged toward the center of the plywood sheet and cut this off. We use a circular saw with a guide for this.







Mark 6” from the short edged toward the center of the plywood sheet and trim.





Place the Drop Panel onto the back of the panel so that is covers the hole completely and equally on each side. The smoother side of the wood should face down. This will be the front of your panel.

Once it is in place, pull the cylinder rod back out and place the CYLINDER PUSH BRACKET so that the cylinder rod end rests against the bracket. **Make sure the rod is fully extended!**







To hold the bracket in place we use screws in the two outside holes so we can easily pre-drill the center hole without the bracket moving. Use a 1/4” Drill Bit to drill the holes for the Carriage Bolt.



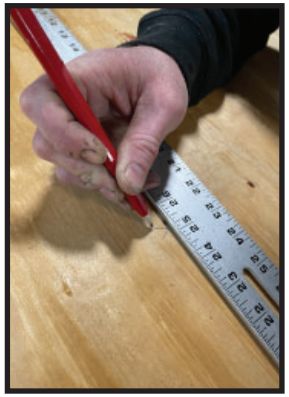
STEP 7 - CUT AND PREPARE DROP PANEL:

Time to make the Drop Panel part of our Drop Panel! For this we will first double check the size of the hole cut in the front of the panel. We want our Drop Panel to be big enough to cover this entire hole.



We will be cutting our Drop Panel out of 3/4" plywood at 28" Tall x 25.25" Wide.









We're using a track saw to cut the panel, but you can use any saw to do this.

STEP 3 - COMPLETE PANEL:

Lay the plywood onto the frame and square it up.





Make sure the plywood is square to the frame. One tip for this is to hold the plywood top and use a hammer to tap the 2x3's until they are square to the top.

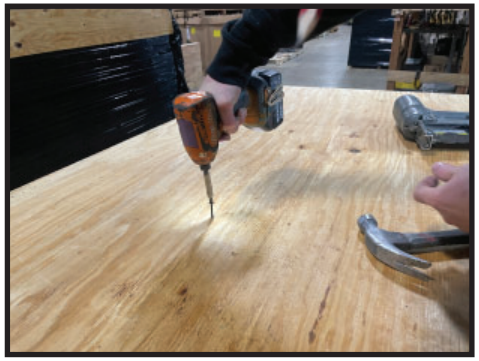


Staple the plywood to the frame. We use 1-3/4" staples for this. Place staples every 6" or so. **When you get to the long sides it is best to start with corners as the long 2x3's could be bent slightly.**



If the long 2x3's are bowed out as shown, you can use a screw and hammer to help get them flush before stapling.

To do this we put a screw in the center of the top of the plywood.





You can then grab this screw with the claw of a hammer and use that to pull the plywood true and then staple the top in place.





Screw the Quick Exhaust into the bottom port of the cylinder until it is very snug and tight. Next install one of the 1/8" NPT x 1/4" Airline fittings into the top port of the Quick Exhaust Valve.

Lastly install another 1/8" NPT x 1/4" Airline fitting into the top port of the cylinder.





You can now depress the cylinder rod. It's a good idea to keep it depressed while you finish the panel to avoid accidentally bending the cylinder rod.





Once the cylinder is positioned properly, screw the rear pivot in using 4 wood screws. You may also need to cut a small shim out of a scrap 2x3 and place this beneath the cylinder to make sure it does not sag toward the panel too much. **USE EXTREME CAUTION WHEN CUTTING SHIMS!**

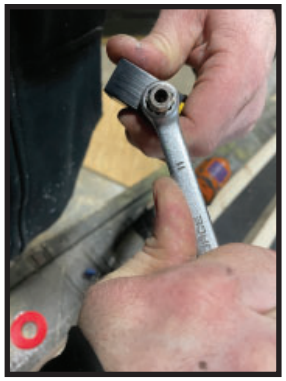




Next we will install the Quick Exhaust Valve and fittings on the cylinder. First we will apply Teflon Tap to the 1/8"NPT Nipple. Do this to both sides. Then screw this into the side port of the Quick Exhaust Valve and tighten with wrench.



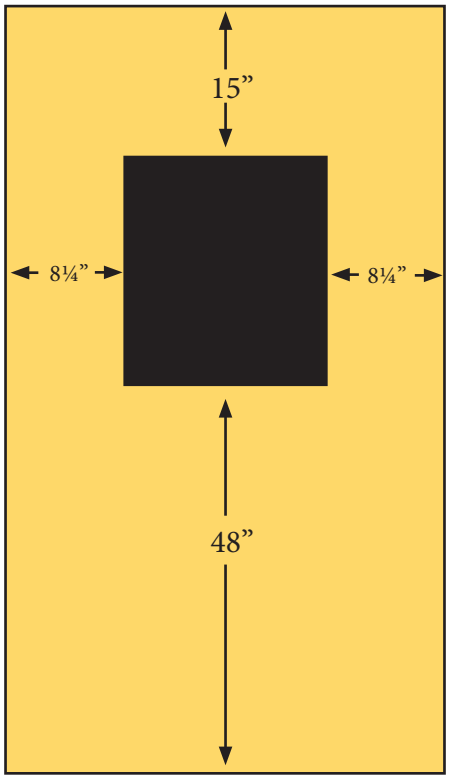




STEP 4 - CUT OPENING FOR DROP PANEL:

Next we'll cut the opening for the panel. This opening should be cut 15" from the top. The bottom of the opening should be 48" from the base of the panel and 8¼" from the sides.





Mark and cut out the opening. You can use a jigsaw, circular saw, or track saw for this. If you are planning to put a trim around the front of the opening then you don't need to be too careful about over cuts. If not, you should stop short and finish the cut with a hand saw or jigsaw.



STEP 5 - BUILD OUT FRAME ON BACK OF PANEL:

In order to reinforce the panel and provide supports for the cylinder we will be adding several 2x3's to the back. First you will need to measure and cut the following 2x3's:

- 2x at 37"
- 2x at 58.25"
- 2x at 14.75"

To save wood it is best to cut the 37" and 58.25" pieces out of one 96" 2x3.





Start with the two 14.75" 2x3's. These should be place at the base of the frame 12" from the edge. Then place one of the 37" pieces across the top of these two supports.

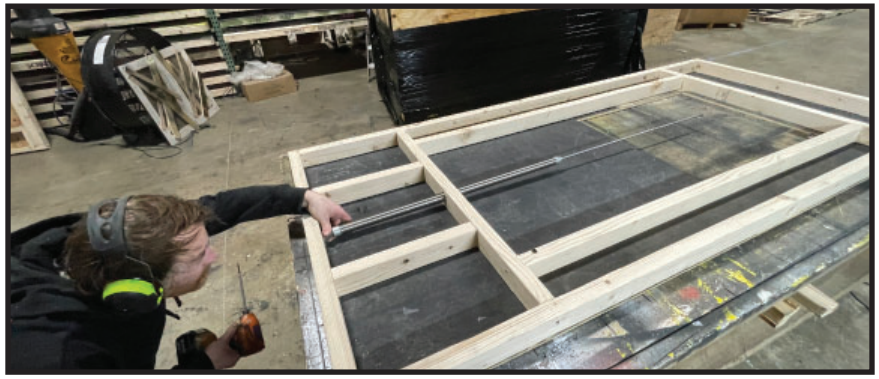




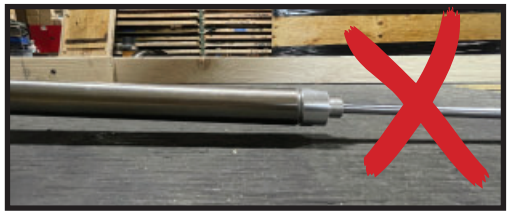
Use wood screws to secure the supports. We use two screws per 2x3 at this step.

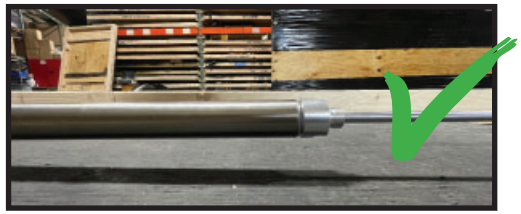
On the top cross support, mark the center of the underside of the cross beam. This will help aim the cylinder before you screw in the pivot mount. You can aim down the "sights" of the extended cylinder rod make sure you are mounting the cylinder straight.





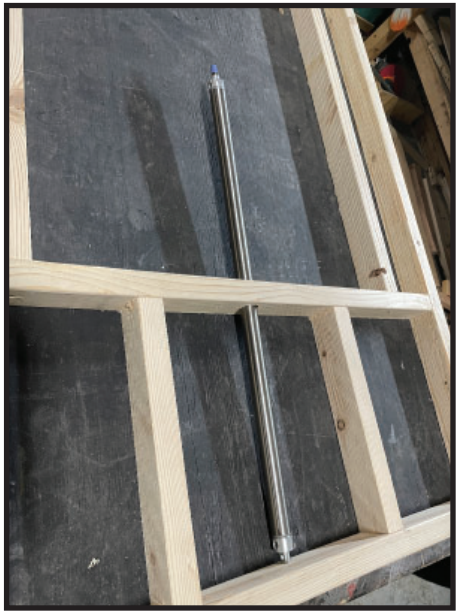
You do not want the cylinder to dip toward the panel. It should be nice and straight toward the top of the panel.





Insert the cylinder into the hole with the base toward the bottom of the panel.









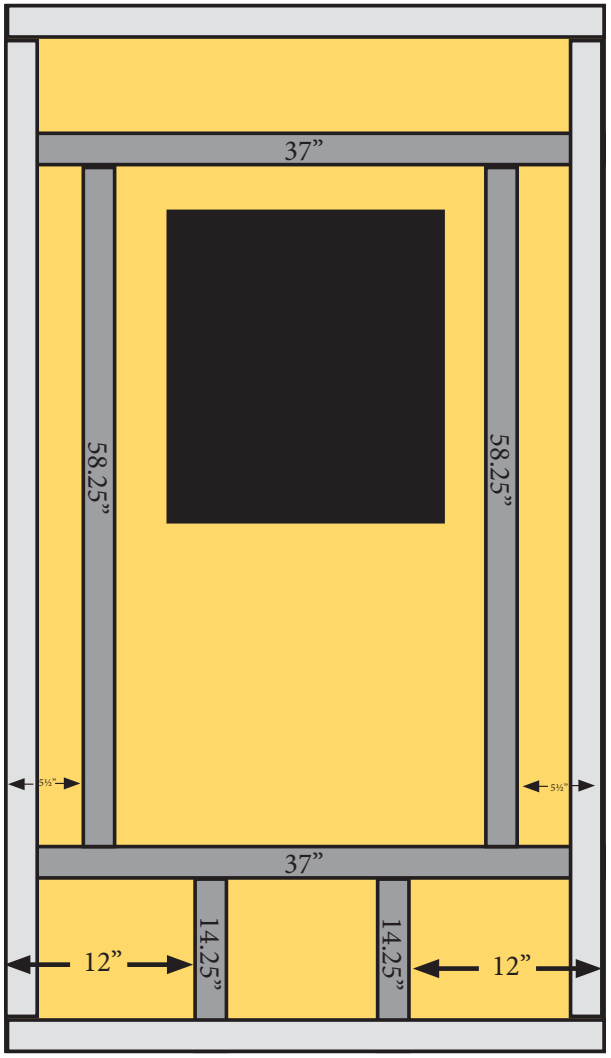


Install the rear pivot mount on the base of the cylinder using the pin and C clamp. You can use anything hard, like the end of a screw) to push the clamp onto the clevis pin so secure it in place.



On the top 37” 2x3 mark 5½” from the outside edge on each side. Place the longer 58.25” 2x3’s at these 5½” marks and then place the final 37” 2x3 on top of these. Secure all together with screws. The final frame should look like this:







Lastly we like to staple the front of the panel to the frame. To do this you will need to locate where the 2x3's are located on the reverse side of the panel. You can use a tape measure to find the distance from the edge of the frame to the center of the 2x3.

Then flip the panel over and use those measurements to help guide where you staple. **Make sure to check the next step to avoid stapling where you will be drilling the hole for the cylinder.**



STEP 6 - INSTALL CYLINDER:

Next we will install the cylinder. To do this we first drill a hole in the bottom cross support for the cylinder to run through.





Locate the center of the lower support. This should be 20" from the outside edge of the panel. Then mark the center of the long edge of the 2x3 at 1⅝". This will give your mark to center the hole for the cylinder.





Using a 1¼" Hole Saw or Forstner Bit to drill the hole for the cylinder. Start on one side and when you see the saw or drill bit start to protrude on the other side switch over and drill from that side. This can help cut down on blowouts in and rough edges on the wood.

