HEAVY-DUTY WORKBENCH
What makes a great workbench? Most of us would agree it has to have a number of key features.

For starters, the base must be sturdy — no wobbling allowed. And it must have a large, flat worksurface that’s rugged enough to stand up to years of hard use.

Storage would be helpful. And to keep the cost down, it should be built out of materials that you can get anywhere. Finally, it would be great if you could put it together in a short time, like a weekend.

Sound too good to be true? I thought so, too — but all these must-have features are built into the workbench pictured above.

The secret to the strength of the workbench is selecting the right materials. The base is built from “two-by” stock, and the top, shelf, and end panels are made from MDF. I chose these materials for their sturdiness, low cost, and ready availability. This means you can get everything you need in just one trip to your local home center.

The joinery is about as simple as it gets — glue and screws. But each piece builds on the previous one to create a rock-solid bench that will stand up to heavy use. This construction also means that building the bench won’t take a lot of time.

Finally, as good as this bench is, you can make it even more versatile by adding a bolt-on woodworking vise that’s easy to install as well. This is one workbench that’s sure to give you years of hard-working service.
OVERALL DIMENSIONS:
32" D x 88" W x 36" H

BENCHTOP IS BUILT UP FROM FOUR LAYERS OF MDF FOR STRENGTH

MDF SHELF ADDS RIGIDITY AND PROVIDES EASY-ACCESS STORAGE

MDF SHELF RESTS ON CLEATS ATTACHED TO LOWER RAIL

END ASSEMBLIES ARE BUILT BY "WRAPPING" LEGS AROUND MDF PANELS

WOODSCREWS AND GLUE ATTACH MDF PANEL TO END LEG ASSEMBLY

WOODSCREWS AND GLUE HOLD CLEAT TO RAIL

CARRIAGE BOLTS ATTACH FACE FRAME RAILS TO END LEG ASSEMBLIES

VISE BOLTS TO UNDERSIDE OF BENCHTOP

FACE FRAME OVERLAPS END ASSEMBLIES TO STRENGTHEN BASE

TO INCREASE RIGIDITY, BLOCKS FORM SHOULDERS FOR RAILS

BASE FRAME IS CONSTRUCTED OF "TWO-BY" LUMBER

FACE FRAME STEMS ATTACHED TO LOWER RAIL

CARRIAGE BOLTS LOCK RAILS TO BASE

LOWER LAYERS ARE ASSEMBLED BEFORE ATTACHING TO TOP

END TOFIT END FILLERS BEEF UP ENDS OF BENCHTOP

CHAMFER ON TOP AND BOTTOM SOFTENS EDGES TO PREVENT SPLINTERING

CHAMFER SOFTENS CORNERS AND EDGES OF FRAMES

WOODSCREWS AND GLUE ATTACH MDF PANEL TO END LEG ASSEMBLY

BENCHTOP IS ATTACHED TO BASE WITH SCREWS

MDF PANELS REINFORCE LEGS TO PREVENT RACKING

EDGING STRIP

FOR ASSEMBLING TOP, SEE SHOP SHORT CUTS ON PAGE 7

LEG

FACE FRAME

END SECTION VIEW

TOP SECTION VIEW
As you can see in Figure 1 above, the base consists of two end assemblies connected by four rails. And to keep things simple, the base is built in sections. I started with the end assemblies first.

**End Assemblies.** Unlike a traditional workbench with four legs, the two end assemblies act as the bench’s legs. This does two things: First, it gives the bench a rigid base, and second, the joinery is simple.

Each end assembly is made up of a pair of corner posts connected by an MDF panel, as shown in Figure 2. Each post consists of two identical pieces that wrap around the MDF panel. To make the posts, all you have to do is line up the parts along the edge and glue them together. When the glue is dry, the corner posts will then be ready for the MDF panels (Figure 2a). Adding the panels is a good way to ensure the assemblies stay square and stable. The panels run the full length of the corner posts and are glued and screwed in place. With that done, you’re ready to attach the rails.

**Rails.** The rails connect the end assemblies to create a sturdy base. After cutting them to size, line up the rails flush with the edges of the end assemblies. Some glue and a pair of carriage bolts hold each end of the rail to the end assemblies (Figures 1 and 1a). To provide a flat, solid
surface for the benchtop, the upper rails are even with the tops of the corner posts (Figure 1b).

**FACE BLOCKS.** Carriage bolts reinforce the joints pretty well, but for even more stability, I added face blocks between the rails. The blocks act like the shoulders of a mortise and tenon joint to give the framework more stability and prevent it from rocking side to side.

With the base assembled, you can soften the outside edges by routing a ¼” chamfer along the edges, as shown in the lower right photo. When you get near the carriage bolts with the router, you should take the bolts out temporarily so they won’t interfere with your router.

**CLEATS.** At this point, the base is almost complete. So now’s the time to add the cleats that will hold the benchtop and lower shelf in place.

After cutting the cleats to size, I drilled and countersunk two sets of holes in them (Figure 3). The first set of holes is for the screws that hold the cleats to the rails. And the second set is used for the screws that attach the benchtop and shelf to the cleats.

The top cleats align flush with the rail’s top edges. But the lower pair of cleats is set below the top edge of the lower rails. This allows the shelf to sit flush with the lower rails and helps protect the edges of the MDF shelf. You can see this illustrated in Figure 3b. To get the cleats positioned correctly along the rail, I used a scrap piece of MDF as a spacer.

**BOTTOM SHELF.** There’s a couple of final details to complete before moving on to the benchtop. The bottom shelf has to be cut to size, and the corners need to be notched to fit around the posts, as shown in Figure 3a. Then, you can attach the shelf by installing screws through the cleats into the shelf.

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**Materials & Hardware**

<table>
<thead>
<tr>
<th>BASE</th>
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<tbody>
<tr>
<td>A End Posts (4)</td>
<td>1½ x 3½ - 33</td>
</tr>
<tr>
<td>B End Post Faces (4)</td>
<td>1½ x 3½ - 33</td>
</tr>
<tr>
<td>C End Panels (2)</td>
<td>20 x 33 - ¼ MDF</td>
</tr>
<tr>
<td>D Upper Rails (2)</td>
<td>1½ x 3 - 58</td>
</tr>
<tr>
<td>E Lower Rails (2)</td>
<td>1½ x 5 - 58</td>
</tr>
<tr>
<td>F Upper Face Blocks (4)</td>
<td>1½ x 5 - 16</td>
</tr>
<tr>
<td>G Lower Face Blocks (4)</td>
<td>1½ x 5 - 9</td>
</tr>
<tr>
<td>H Cleats (4)</td>
<td>1½ x 1½ - 48</td>
</tr>
<tr>
<td>I Shelf (1)</td>
<td>23 x 53½ - ¼ MDF</td>
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<thead>
<tr>
<th>TOP</th>
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</thead>
<tbody>
<tr>
<td>J Top Layers (2)</td>
<td>29 x 85 - ¾ MDF</td>
</tr>
<tr>
<td>K Top Edge Fillers (4)</td>
<td>6 x 85 - ¼ MDF</td>
</tr>
<tr>
<td>L Top End Fillers (4)</td>
<td>17 x 17¼ - ¼ MDF</td>
</tr>
<tr>
<td>M Front/Back Edging (2)</td>
<td>1½ x 3 - 88</td>
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<tr>
<td>N End Edging (2)</td>
<td>1½ x 3 - 32</td>
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<table>
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<tr>
<th>VISE</th>
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<tbody>
<tr>
<td>O Vise Spacer (1)</td>
<td>4¼ x 9 - ¼ Hdbd.</td>
</tr>
<tr>
<td>P Vise Faces (2)</td>
<td>¼ x 4¼ - 9</td>
</tr>
</tbody>
</table>

- (16) #8 x 1½” Fh Woodscrews
- (45) #8 x 1¼” Fh Woodscrews
- (40) #8 x 2¼” Fh Woodscrews
- (16) ¾” x 3½” Carriage Bolts
- (1) 9” Bolt-on Vise
- (4) ¾” x 3” Lag Screws
- (2) ¾” x 1” Lag Screws
- (2) Machine Screws (For Vise Face)
- (20) ¼” Flat Washers
- (16) ¼” Hex Nuts

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*Chamfer the Edges.* You can temporarily remove the carriage bolts when you’re routing the chamfer along the edges of the base.
**adding the Top**

All the effort put into building a strong base for the workbench would be wasted if it didn’t have a sturdy, flat benchtop to match.

The first thing to note is that the top is made from “two-by” stock and MDF. Why MDF? For starters, it provides a smooth, flat surface. Second, it’s heavy, which adds to the stability of the workbench. And finally, MDF is affordable.

**LAYERS.** Four layers of MDF are used to create a thick top (Figure 4). But not all the layers are full pieces of MDF. Only the two top layers are full size. The bottom two layers are made from pieces of MDF.

By using pieces, I was able to get these extra “layers” from a single sheet of MDF. Installing these pieces just along the edges of the benchtop provides the extra thickness right where it’s needed the most for clamping workpieces or adding accessories.

**BENCHTOP ASSEMBLY.** Just like I built the base in sections, I also assembled the benchtop in sections. The top two layers were cut to size and then glued and screwed together. In the same way, the bottom two layers (assembled from pieces) were completed. Once that’s done, you can assemble the entire benchtop. The only trick here is keeping all the edges flush. To see how I did this, turn to Shop Short Cuts on page 7.

**EDGING.** MDF edges aren’t all that durable. So to protect the edges of the benchtop and to give the workbench a more finished look, I attached edging made from “two-by” stock, as in Figures 4 and 4a. And to provide a clean, finished look, this edging is wrapped around the top with mitered corners.
The challenge here is clamping the edging in place across the long top. Shop Short Cuts on page 7 shows a handy way of doing this if you don’t have long clamps available.

**INSTALLING A VISE.** The workbench is ready to use at this point. But to make it even more versatile, you can add a bolt-on vise like the one shown on page 5.

This type of vise only requires four lag screws to attach it to the benchtop (Figure 5a). Depending on the size of the vise, you may have to install a spacer between the rear jaw and the benchtop.

The spacer keeps the metal edge of the vise lower than the benchtop (Figure 5a), preventing any interference with a workpiece or possible damage to a tool. My spacer was simply a piece of ¼" hardboard.

I also added a set of wood faces to the metal jaws. These faces provide a more secure grip without damaging the workpiece.

For a cleaner vise installation, there’s another mounting option that buries the rear jaw of the vise behind the front edging strip of the benchtop. To learn more about how to do this, see the box below.

And that’s it. Your new workbench is ready for many years of serious woodworking.

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### Optional Vise Mounting

Another way to mount a woodworking vise is to bury the rear jaw behind the edging, like you see in the above photo. This allows you to clamp long pieces flat against the front of the workbench.

Installing the vise this way requires a little planning. Before you attach the edging, you’ll need to rout a “pocket” in the edging that will house the rear jaw, as shown in detail ‘a.’

Once the edging is installed, you can slip the rear jaw of the vise into the pocket and bolt it securely to the benchtop from underneath with lag screws. Here again, you’ll need to place a spacer between the vise and benchtop (detail ‘a’).

The final detail is to add a wood face to the front jaw. To match the look of the edging, the thickness of the wood face is the same thickness as the edging. The face is also longer in order to provide more clamping surface against the edge of the bench.
Building a Large Benchtop

A large, heavy-duty workbench can present a couple big challenges — building the layered top and then adding the edging.

**Layering the Top.** The trick with the top is keeping all the layers flush with each other as you glue them up. To do this, I used screws to keep everything aligned and act as “clamps.” Plus, working in stages makes things less hectic.

I started by cutting the top two layers to final size. Then, after clamping them together with the edges flush, I pre-drilled all of the holes for the screws.

With the screw holes complete, you can separate the two layers and spread on some glue. A slow-set glue works best here. Then it’s just a matter of “clamping” the two layers together using the screws.

To build up the other layers, I followed a similar process. First, I glued up and installed the two long strips along the outside edges of the top. Then, I sized a filler block to fit in between, gluing and screwing them in place. Be sure to stagger the screws to avoid interfering with the screws in the top.

**Add the Edging.** At this point, you’re ready to add the edging. My problem was none of the clamps I had spanned the length of the top. If you have pipe couplers, you can simply “make” longer clamps.

For my top, I tried something different (above photo). Instead, I connected the clamps in a series to create “longer” clamps that reached from one end to the other.
Project Sources

You can find almost all of the materials needed to build the heavy-duty workbench at your local hardware store or lumberyard. But the vise I used to complete the project is a 9" quick-release wood vise (27838) from Rockler.

For the finish, I used a stain mixture of 8 oz. of boiled linseed oil, 1 tsp. of Raw Sienna, 1 tsp. of Burnt Sienna, 1 tsp. of Van Dyke Brown, 3 tsp. of Yellow Ochre and the finish was General Finishes One-Step. The project was built using Douglas fir and MDF.