JobMaster® Mechanical Training Bench

QUICK START GUIDE

For the New 00-1800 Series Benches

Catalog #34-8000-0016 Rev. E

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JobMaster Mechanical Bench Quick Start Guide

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Intelitek software and documentation are available at http://intelitekdownloads.com.

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1. In This Guide

1.1. OVERVIEW

Thank you for purchasing the JobMaster Mechanical Training Bench for use in your classroom or laboratory. This guide is meant to help you assemble the bench and prepare it for use with the online learning curriculum.

While the experiments, images, and videos contained in the online learning curriculum refer to an older version of the Mechanical Training Bench (00-ME10 series), **the curriculum can easily be completed using this new 00-1800 series bench**. Therefore, this guide contains general instructions for how to complete the curriculum with the newer version of the Mechanical Bench and lists the basic differences between the versions of the Mechanical Bench.

1.2. VERSION UPDATE: MAIN DIFFERENCES

The main differences between this version of the Mechanical Bench and the previous version are related to:

- **Modularity:** This version of the Mechanical Bench includes plastic containers with equipment that can be placed on the shelves of the bench. Different levels of equipment may be purchased, and containers can be moved, interchanged, or stored elsewhere. For more information about the different levels of modularity, see Section 2 List of Accessories.
- **Safety:** With the introduction of a new magnetic key/lock system, the motor can only run when the plexiglass enclosure is securely in place. See Section 3.3 Motor Controller and Safety Guard Assembly for more information.
- **Motor Controller:** The motor controller has been updated. For instructions on its use, see Section 4 Operating the Motor.
- **Materials:** The previous version of the Mechanical Bench contained rigid metal racks and an inflexible working surface. The 00-1800 series is made up of more flexible and user-friendly materials.

For additional details, see Section 5 Working with the Curriculum.

2. List of Accessories

You may have purchased additional, optional Mechanical Training Bench accessories. You can find a list of these accessories in this table.

Part	Cat. No.	Level
Working Surface	00-1800-0002	1
Coupling Kit	10-1800-0002	1
Shaft & Bearing Kit	10-1800-0003	1
Accessories Kit 1	10-1800-0004	1
Sheave, Pulley, & Sprocket Kit	10-1800-0005	2
Motor/Speed Reducer Kit	10-1800-0006	2
Accessories Kit 2	10-1800-0007	2
Gear Kit	10-1800-0008	3
C-Brake/Speed Reducer Kit	10-1800-0009	3
Gearbox Kit	10-1800-0010	3
Tool Set	10-1800-0020	1
Mobile Bench	00-1800-0001	Optional
Shelf Set	10-1800-0001	Optional
Bearing Kit	00-1800-6000	Optional

3. Mounting and Assembly

The JobMaster Mechanical Training Bench's working surface (catalog #00-1800-0002) can be mounted onto a standard table/bench or onto the JobMaster Mechanical Training Bench's mobile bench (00-1800-0001). The two sections below (3.1 Mounting onto a Table immediately below and 3.2 Mounting onto the Mobile Bench on page 9) describe how to mount the working surfaces onto the respective fixtures.

3.1. MOUNTING ONTO A TABLE

This section provides instruction for attaching the working surface onto an existing table in your work area. A fully equipped table-mounted working surface is shown in the image below.

For instructions on how to mount the working surface onto the mobile bench, see section 3.2 Mounting onto the Mobile Bench on page 9.

⚠ ***Warning:*** *The working surface should only be lifted and moved by two people, one at each side.*

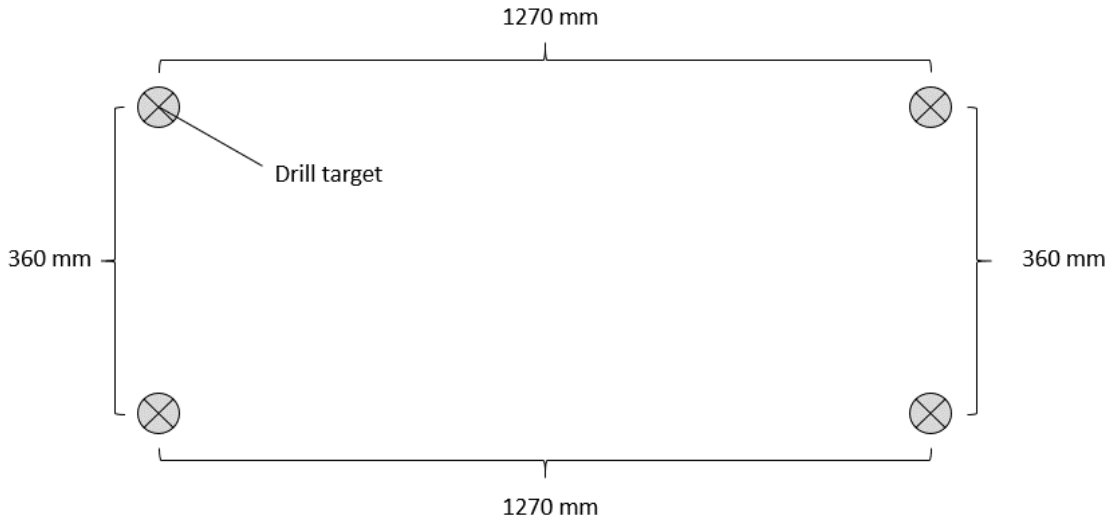
⚠ ***Warning:*** *Never drag the working surface, as dragging may damage it and/or the surface beneath it. Always lift the working surface when moving it from place to place.*

⚠ ***Warning:*** *Ensure that the table or bench that you intend to use for the mounting of the working surface is large and sturdy enough to support the working surface when it is fully loaded with equipment. When fully equipped, the working surface can collapse the table if it is not wide enough or sturdy enough to support the weight. Recommended surfaces should be rated to support at least 100 kg (220 lbs.) and have minimum dimensions of 1500 mm x 500 mm. Surface thickness must be between 20 mm and 40 mm. Read the mounting instructions in this section before selecting a table. Additional length and/or width may be required depending on the structure of the table itself. You may also want to consider the properties of the table with regard to storage space, ease of access, and mobility. You will be drilling holes into the table and then securing the working surface with screws and washers, which are included.*

To mount the working surface onto a table or bench:

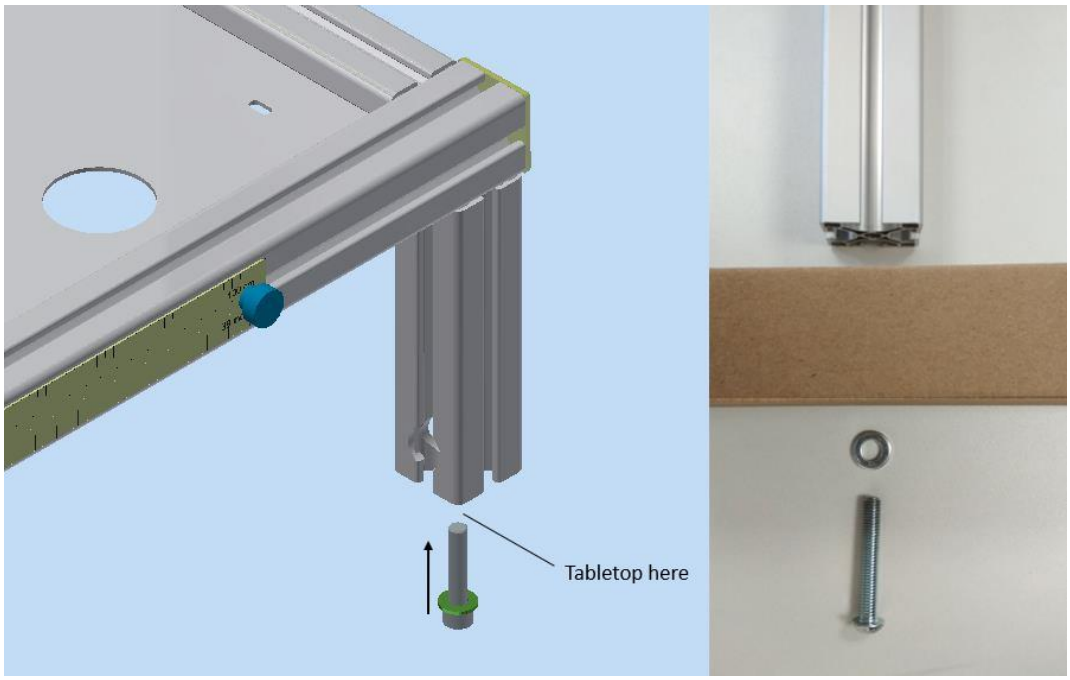
🛈 ***Note:*** *For detailed diagrams of the assembly and part numbers of the fasteners, see document 101970 (sub-document D00-1800-0002).*

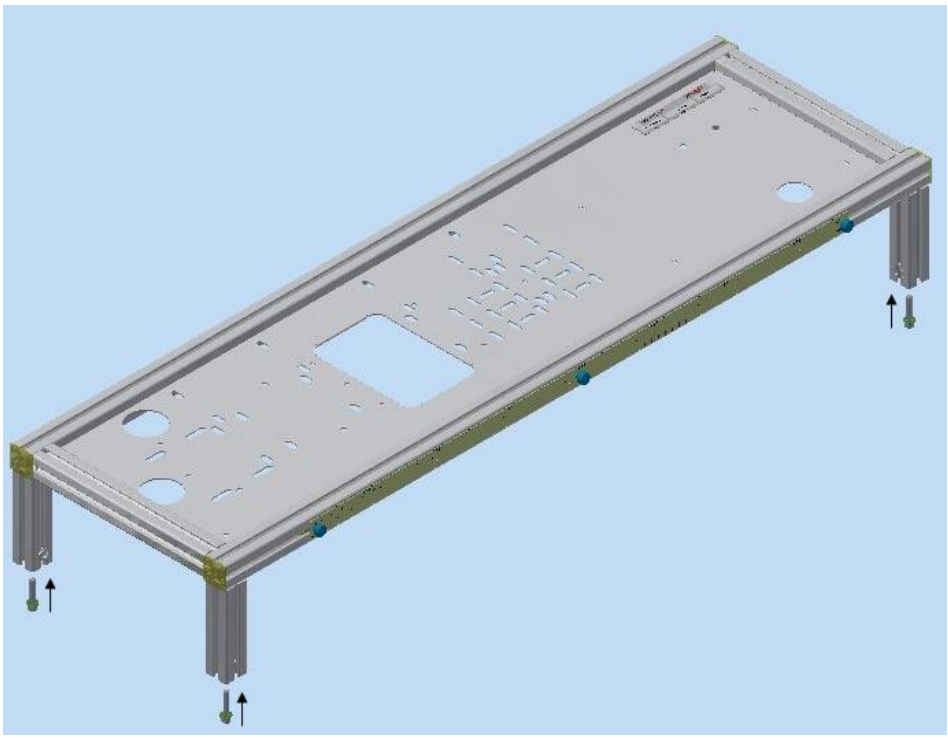
1. Choose an appropriately sized (minimum dimensions 1500 mm x 500 mm) and sturdy table.
2. Using a pencil, mark four targets for drilling, as shown in this diagram.



3. Using a power drill with the appropriately sized drill bits, drill four holes, each 12 mm in diameter, into the targets on the table.
4. Carefully lift the working surface and place it onto the table. Center each of the four legs (vertical profiles) on top of the four holes.

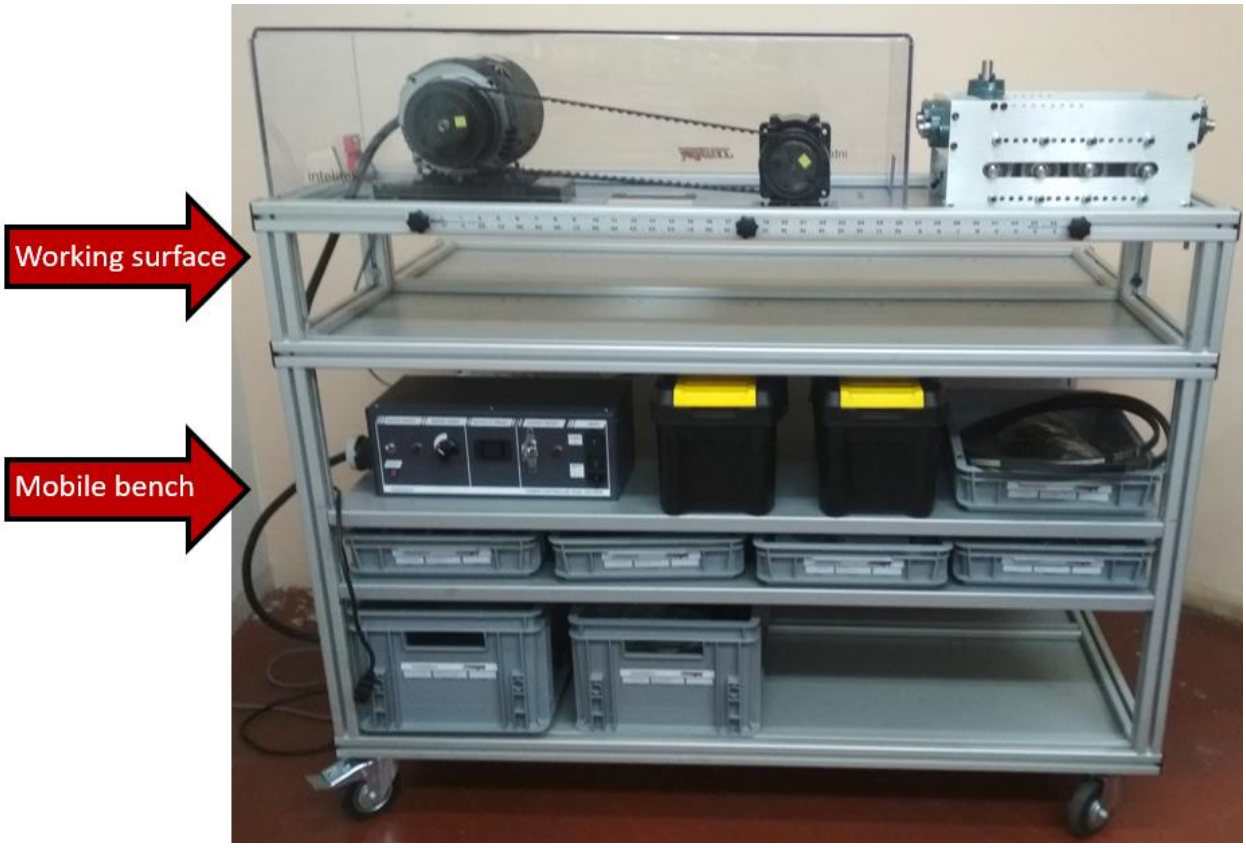
5. Use the four M8x50 socket button head cap screws and the flat washers included in the package, and a hex wrench to secure each of the working surface's legs to the table. The order of the assembly, from bottom to top, is screw head, square washer, tabletop, working surface leg (profile).





3.2. MOUNTING ONTO THE MOBILE BENCH

The JobMaster Mechanical Training Bench includes two main sections; the main mobile bench (00-1800-0001) with shelves (10-1800-0001), and the working surface (00-1800-002).



This section provides instruction for assembling the mobile bench (with shelves) and for mounting the working surface onto the mobile bench. For instructions on how to mount the mobile bench onto a pre-existing table, see above section 3.1 Mounting onto a Table on page 6.

3.2.1. Assembling the Mobile Bench

Unpack and assemble the mobile bench (00-1800-0001) according to the instructions in document 101969.

3.2.2. Assembling the Shelves

Assemble the shelve set (10-1800-0001) onto the mobile bench according to the instructions in document 101970.

3.2.3. Assembling the Working Surface

The working surface must be secured to the top of the mobile bench at all four legs of the working surface. This section provides basic instructions for the assembly. For more additional technical instructions, see document 101970.

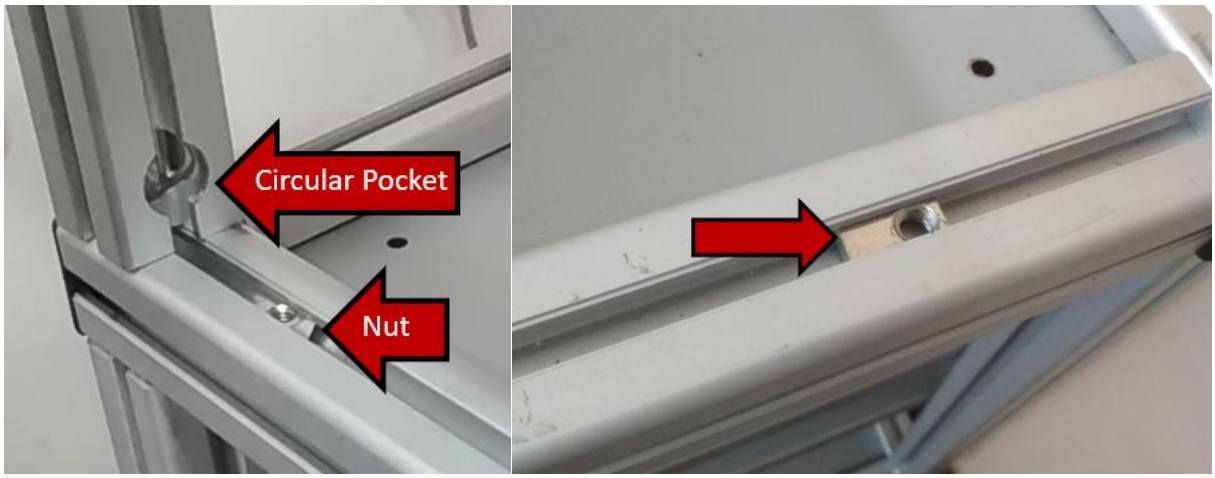
To assemble the working surface:

1. With the help of at least one other person, place the working surface on top of the mobile bench with the four legs of the working surface situated at the points indicated by the X's.

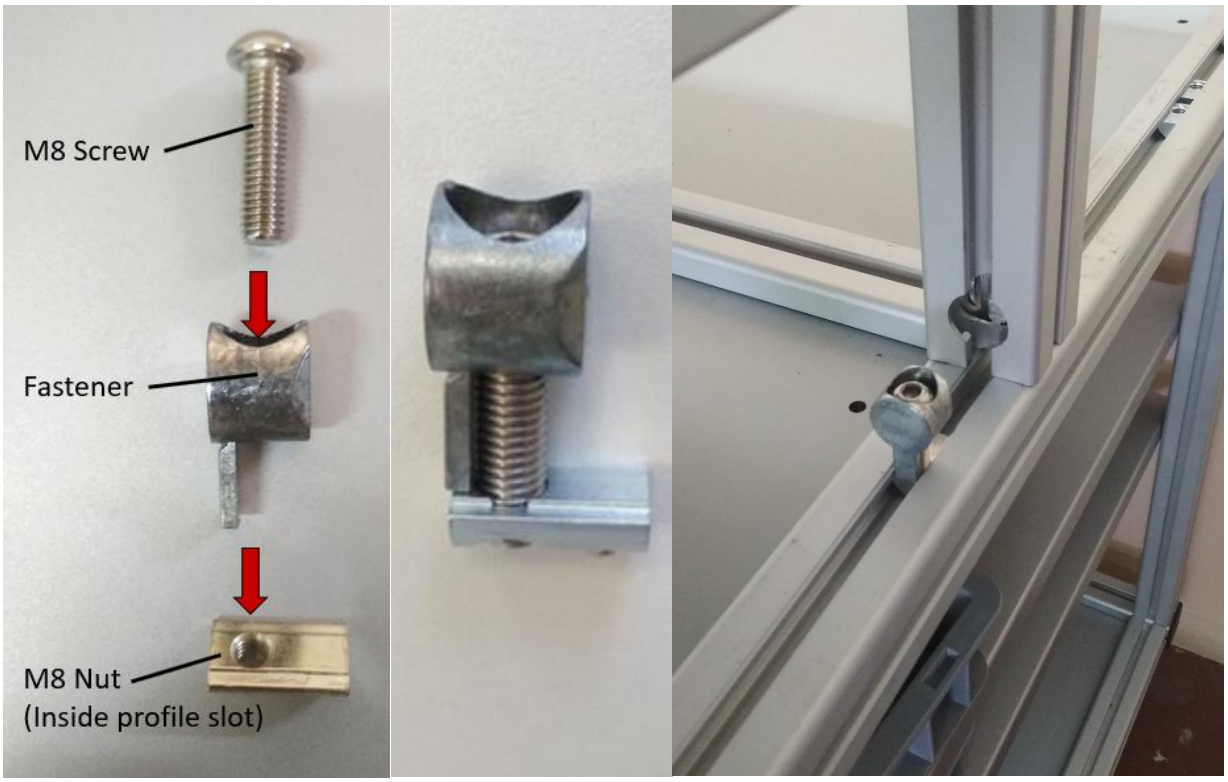
ⓘ ***Note:*** *Placement at the points shown above allows for the placement of a second working surface on top of the mobile bench.*

2. Secure each of the legs of the working surface to the mobile bench in the following manner:

   a. Slot an M8 nut into the slot of the mobile bench's profile near the location of one of the legs of the working surface (on the side of the leg's circular pocket).



b. Slide an M8 screw through a leg fastener and tighten the fastener to the nut with an appropriate hex key. Do not tighten completely.



c. Push the screw/fastener/nut assembly into the circular pocket of the working surface's leg.

d. Perform steps a-c for all four working surface legs.

3. Tighten all four M8 screws completely using the rounded end of the hex key.

3.3. MOTOR CONTROLLER AND SAFETY GUARD ASSEMBLY

The safety guard assembly (021216) and motor power controller (26-0000-0003) include a motor lock. The motor lock is a magnetic lock/key safety device. The lock has two magnetic read heads, one of which is wired to the controller, and the other is attached to the safety guard assembly. When the two read heads are separated, the controller is disabled and the motor (021217) cannot run. When the two read heads are coupled together, the controller is enabled, and the motor can run.

This section contains an overview of how to mount the controller and the safety guard assembly. For additional details, see document 101970.

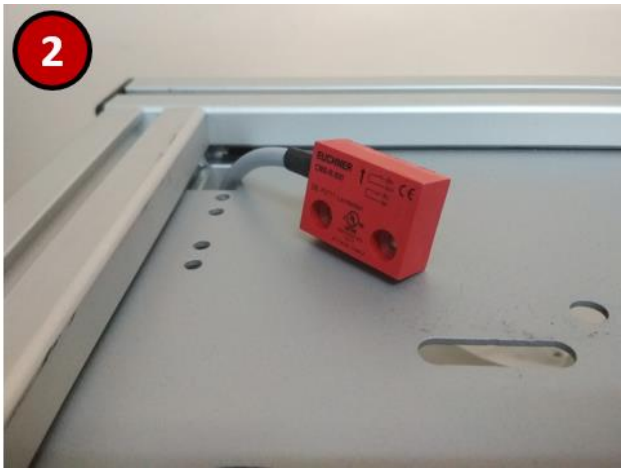
Warning

⚠ *Ensure that the motor controller is NOT connected to a power source before starting this procedure.*

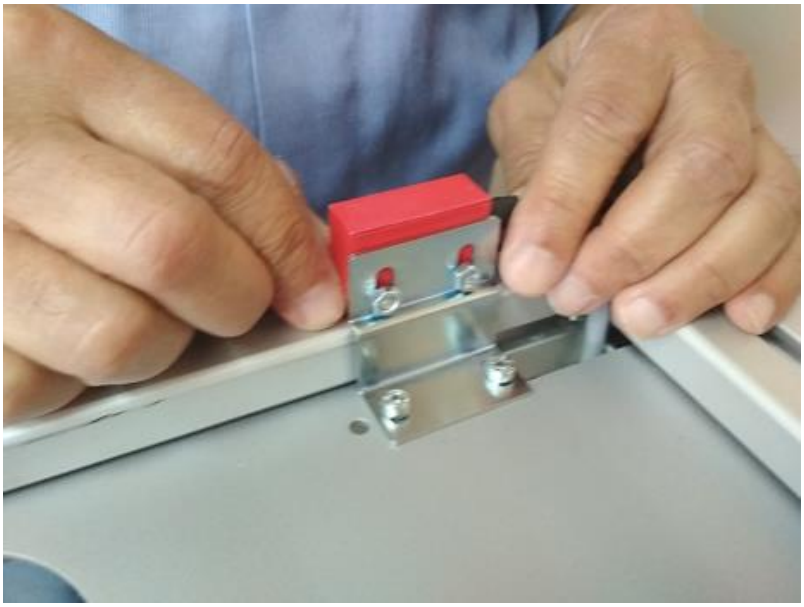
To assemble the motor power controller and safety guard assembly:

1. Place the controller on the left side of the top shelf.

2. Slide the magnetic read head that is connected to the controller around the top of the mobile bench and through the corner hole of the working surface.



3. Secure the read head to the top of the working surface using the included bracket and screws. Do not completely tighten the read head itself to the bracket at this point, as its height may have to be adjusted.



4. Place the safety guard assembly on top of the working surface. Ensure that the two read heads are touching and aligned. If they are not, remove the safety guard and adjust the height of the read head connected to the controller. Replace the safety guard to confirm alignment.

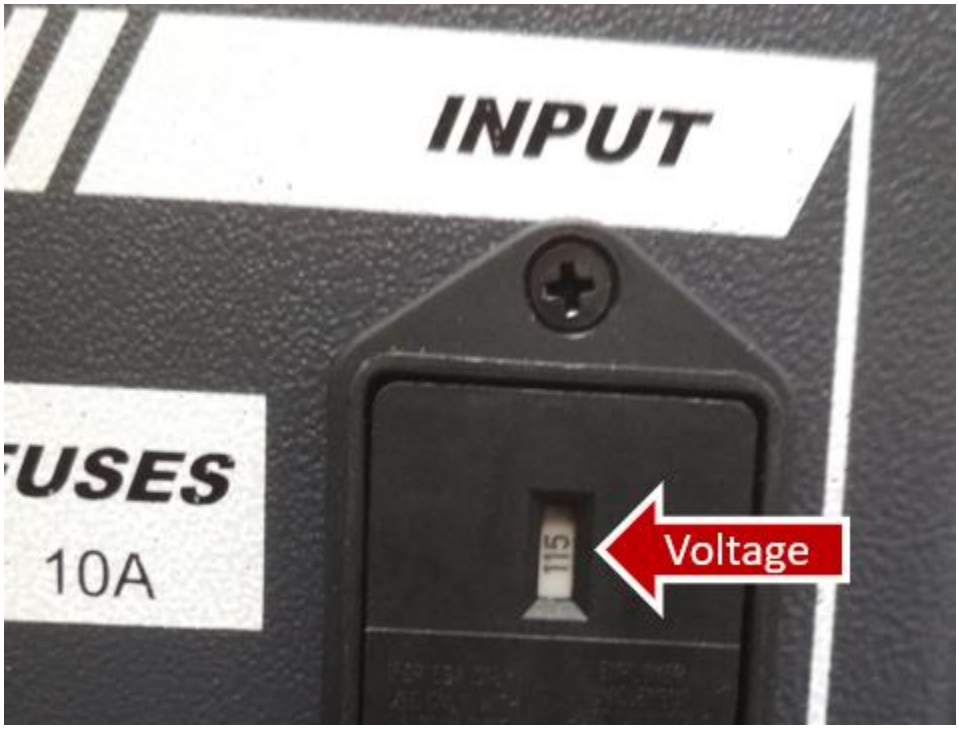
5. Remove the safety guard and completely fasten the lower magnetic read head to the bracket.

6. Secure the controller with the included M4x12 screws and M4 washers. (See document 101970 for diagrams and details.)

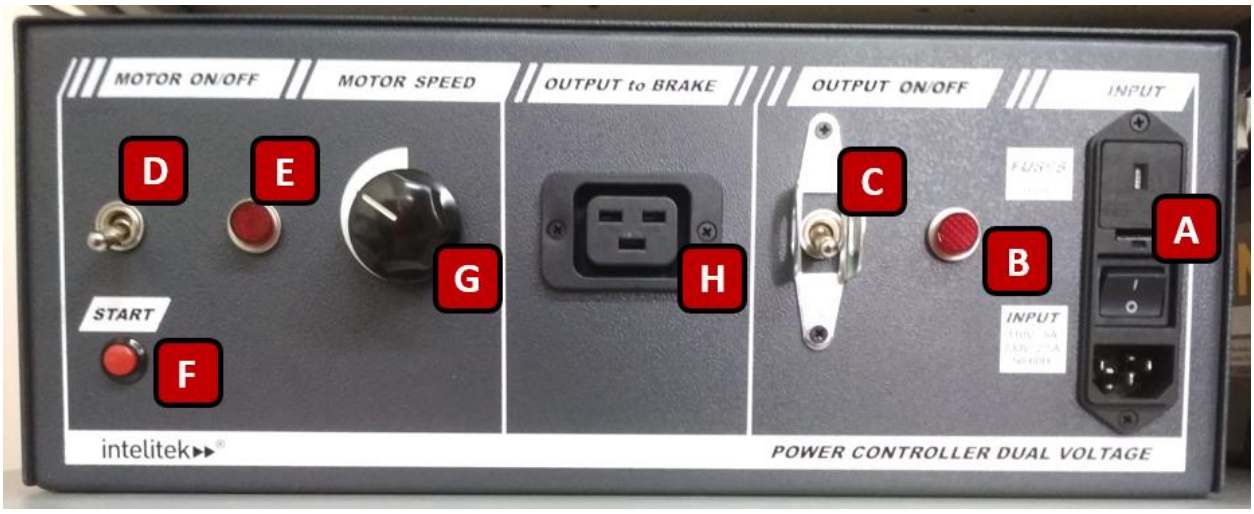
4. Operating the Motor

Motor operation is performed via the motor power controller. This section documents the basic operation of the controller.

⚠ ***Warning:*** *The controller has two voltage options. Ensure that you are using the correct voltage. To change the controller's voltage, see document 101976.*



For basic motor operation, the components labelled below are used:



Label	Component	Function
A	Controller input power switch (INPUT)	Sends single-phase power to the controller unit.
B	Controller power indicator lamp	The controller is powered with single-phase power when the lamp is illuminated.
C	Output power switch (OUTPUT ON/OFF)	Sends single-phase power brake output (middle) and motor control (left) sections of the controller.
D	Motor power on/off switch (MOTOR ON/OFF)	Sends single-phase power to the motor driver.
E	Motor power indicator lamp	The motor's driver is powered with single-phase when the lamp is on.
F	Motor start button (START)	Starts the motor. (Sends 3-phase power to the motor.)
G	Motor speed adjustment knob (MOTOR SPEED)	Adjusts the motor speed. (Adjusts the 3-phase power amplitude.)
H	Output to brake socket	Connects to the brake plug and powers the brake. The brake is locked by default. When the brake is powered (when the output power switch [C] is on), the brake is released, allowing the motor shaft to run.

Warning

⚠ *Before beginning this procedure, ensure that the controller is properly secured to the mobile bench or the worktable (depending on your setup), and that the motor is properly secured to the working surface. For instructions on how to secure the motor, see course ME05: Belt Drives, Skill Drill 2 (document SG-ME05-02) in the online curriculum.*

⚠ *Ensure that the safety guard assembly is in place.*

To start the motor:

1. Turn the controller input power switch (A) on. The controller input indicator lamp (B) is illuminated.
2. Turn the controller output switch (C) on (upwards).
3. Turn the motor on/off switch (D) on (upwards). Power is sent to the motor and the motor power indicator lamp is illuminated (E).

⚠ *Ensure that motor speed knob is turned to a low speed.*

4. Press START (F) to start the motor.
5. Adjust the motor speed dial (G) as desired.

To stop the motor without applying the brake:

- Turn the MOTOR ON/OFF switch (D) off (downwards).

To stop the motor while applying the brake:

- Turn the OUTPUT ON/OFF switch (C) off (downwards).

ⓘ *Note: After stoppage of the motor for any reason (including removal of the safety guard), the START button (F) must be pressed to restart the motor.*

5. Working with the Curriculum

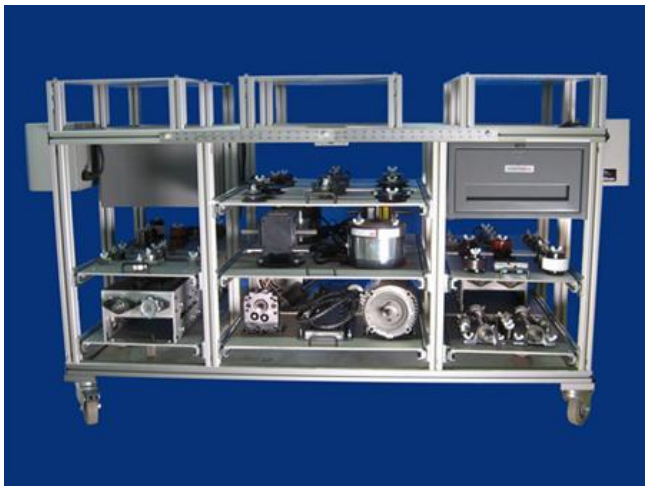
5.1. OVERVIEW

In the online learning curriculum (courses ME01 to ME13), instructions, images, and videos refer to the older version of the Mechanical Training Bench (00-ME10 series bench).

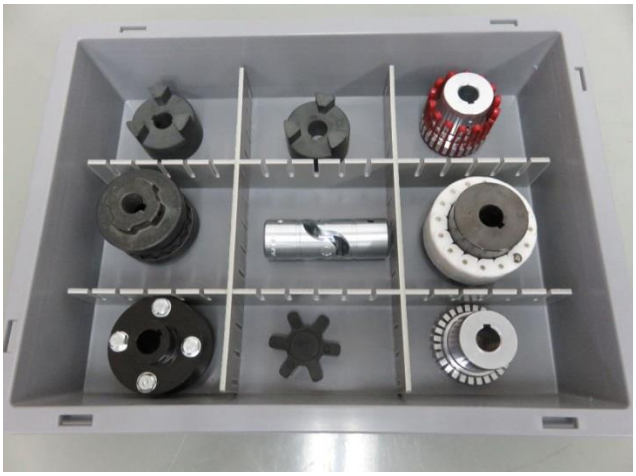
However, the principles for performing the experiments (skill drills) are the same for this newer version of the Mechanical Training Bench.

For example, instead of storing equipment on metal racks, equipment is stored in the plastic containers on the shelves.

00-1800 series with plastic containers



00-ME10 series with metal racks



00-1800 series example plastic container

00-ME10 series example metal rack

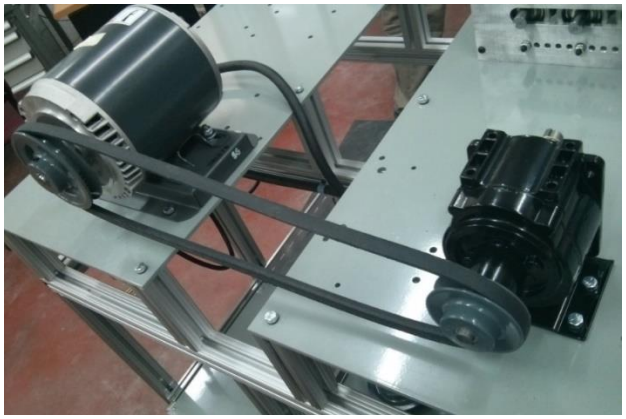
5.2. PERFORMING THE SKILL DRILLS

5.2.1. Mounting Training Bench Accessories

In the ME series skill drills (course experiments), images and videos refer to the 00-ME10 series Mechanical Training Bench. Performing the skill drills with the 00-1800 series hardware, however, is performed in the same manner atop the working surface. Parts are secured to the working surface by screwing them onto the top of the surface via the surface's holes.

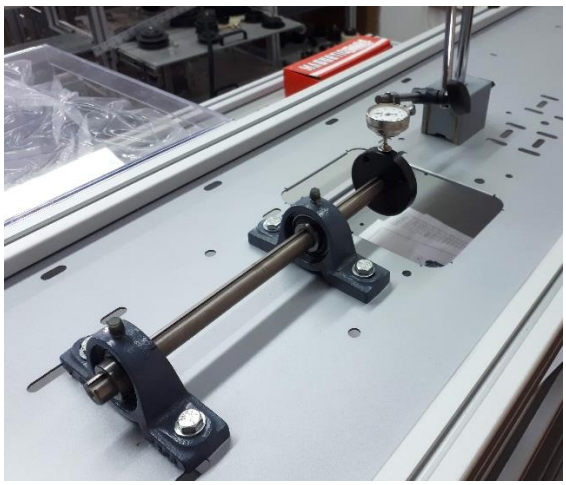
Consider this example where the motor and speed reducer are installed on the working surface. The procedure for securing and aligning the assembly is the same for both versions of the mechanical bench.

00-1800 series assembly

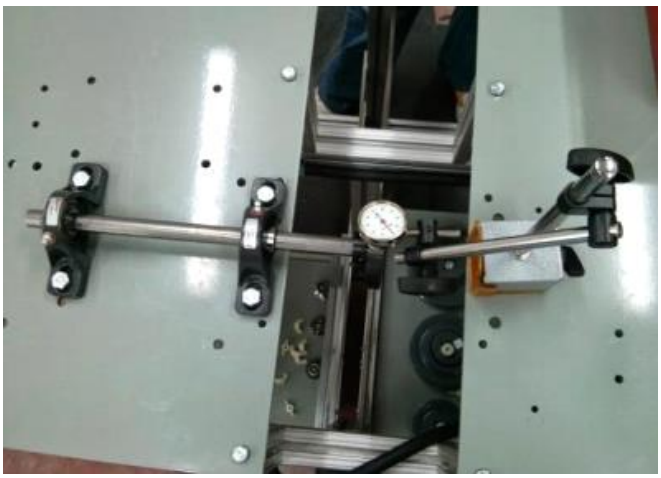


00-ME10 series assembly

An additional example with pillow blocks, shaft with coupling, and dial indicator:



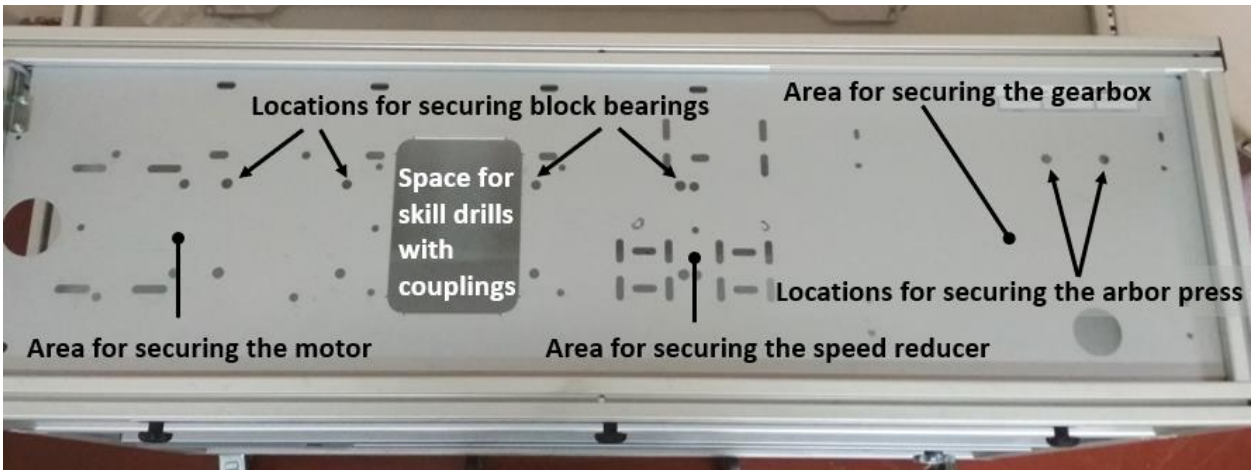
00-1800 series assembly



00-ME10 series assembly

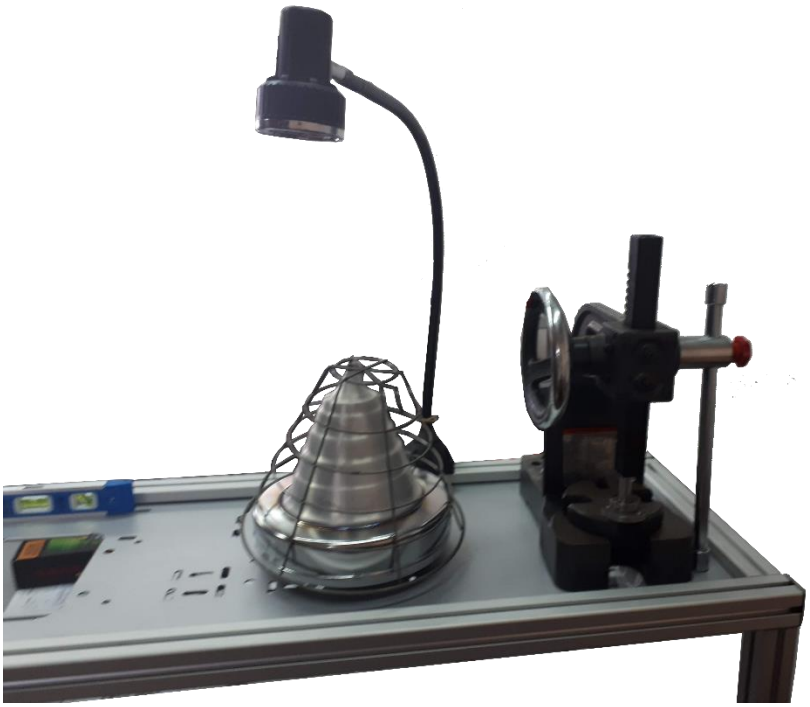
5.2.2. Map for Assembly Mounting

This high-angle image of the Mechanical Training Bench's working surface provides a general map for where to secure various assemblies when performing the skill drills.

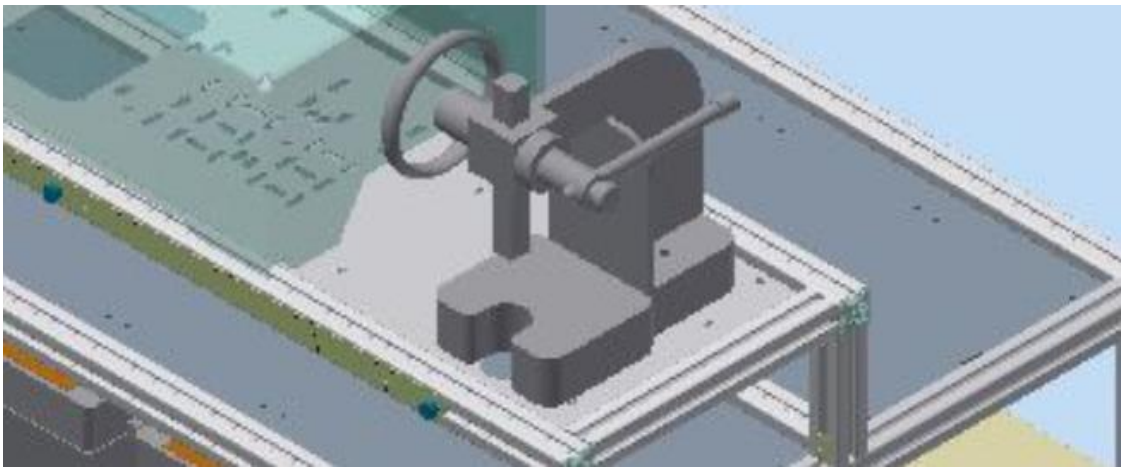


5.2.3. Mounting Bearing Kit Accessories

ME13 skill drills that do not make use of the arbor press require *any* flat working service of at least 800 mm x 600 mm. The lamp (36-9000-0038) can be clamped onto any edge of the working surface.



The arbor press (36-0900-0012) is secured to the working surface in the position and orientation shown here using the accompanying hex screws (2), hex nuts (2), flat washers (4) and lock washers (2). See the 5.2.2 Map for Assembly Mounting on page 21 for the exact location of the screw slots.

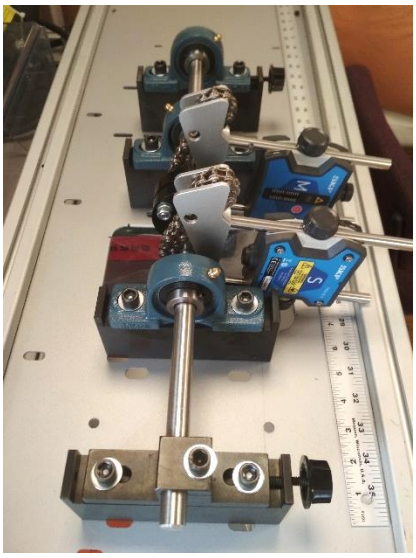


The order of part placement to secure the arbor press, from top to bottom, is:

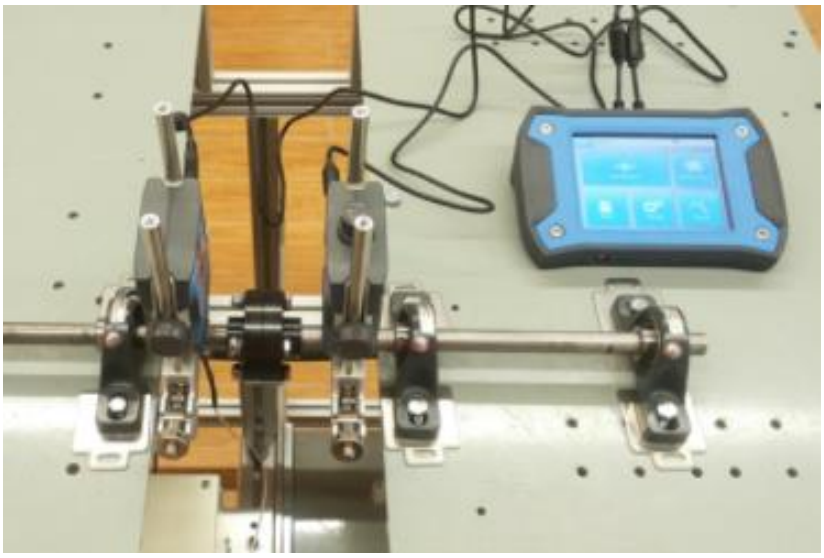
1. Hex Screw
2. Flat washer
3. Arbor press
4. Working surface (tabletop)
5. Flat washer
6. Lock washer
7. Hex nut

5.2.4. Mounting Laser Alignment Accessories

This image shows the assembly of the laser alignment kit, which is used in tandem with the pillow blocks, shafts, couplings, and shims. The laser alignment kit is used in the ME11 skill drills.



00-1800 series assembly



00-ME10 series assembly

For assembly of the laser alignment kit, all pillow blocks must be raised on mount blocks which are secured to the working surface. Full assembly instructions for assembling the pillow and mount blocks can be found in document 101982.