

# Drill/Driver & Impact Driver

## The Foundry



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## DRILL/DRIVER & IMPACT DRIVER

While these two tools may look similar and can often perform similar functions, they are not the same tool! A drill/driver (often referred to as just a drill) is used for drilling holes into/through material. It can also be used to drive screws into, and remove screws from, material. On a drill/driver the torque limit can be adjusted to meet the demands of the drill bits you are using and the material you are drilling into. Drill/drivers also have adjustable chucks, which means that they can accommodate a wide variety of bits, usually up to ½” in diameter.

An impact driver is used only for driving screws into material, removing screws from material and for tightening/loosening nuts NOT for drilling holes into/through material. Impact drivers are better at driving screws into material than drill/drivers because they can provide a higher rotational torque. Impact drivers also have a hammer mechanism that provides fast-paced, rotational strikes once the torque limit has been met—this continues to drive the screws while preventing the bit from slipping from the head of the screw and/or stripping it. This same hammer mechanism is why you should not use an impact driver to drill a hole: the sudden bursts of high torque can unevenly stress your drill bit, resulting in more broken drill bits. Impact drivers have a ¼” hexagonal chuck and can only receive bits with a ¼” hexagonal shank.

## SAFETY

- **Shop Buddy:** You are not allowed to work alone in the Woodshop. A buddy is there to ensure your safety and to call for help if needed. Your buddy *does not have to be* Woodshop trained, but if untrained, they are not allowed to use the Woodshop equipment. If an untrained buddy uses the Woodshop equipment, your Woodshop access will be immediately and permanently revoked.
- **Eye Protection:** These machines can send sawdust, wood chips and other fragments flying – safety glasses protect your eyes from harmful material.
- **Close-Toed Shoes:** Tools, pieces of wood and other sharp objects can fall and close-toed shoes will protect your feet from cuts, bruises and even breaks.
- **Long Pants:** Long pants will protect your legs from cuts, bruises and splinters that might come from handling wood.
- **No Jewelry:** Rings, bracelets, dangling necklaces, watches, headphones and sweatshirt strings can all get caught in the spinning blades or bits, which can drag you into the machine.

- **Long Hair Secured:** Like jewelry, long hair can also get entangled in machines, and potentially drag you into the machine.
- **No Food or Drink:** Sawdust and woodchips, in addition to the glues and paints used on the wood, can get into your food or drink and be toxic. Residue from food or drink can also make the tools and machines messy.
- **No Metal:** Using metal on any of these machines will produce sparks, which can ignite sawdust, resulting in a fire or explosion.

## MACHINE ANATOMY

**Trigger:** Controls the speed of the spinning bit. Apply more pressure to increase the speed and release pressure to decrease speed.

**Direction Control:** Determines the rotation of the bit, i.e. if you are driving into or out of your material.

**Clutch:** Controls the output torque, which increases as the number displayed on the clutch ring increases.

**Gear Shifter:** Switches between Low or High gear.

**Adjustable Chuck:** Holds the bit in place, can accommodate various sizes of bits.

**Rechargeable Battery:** Powers the drill. Can be easily replaced when battery is low/empty.



**DRILL/DRIVER**

**Locking Sleeve:** Ensures that bit remains locked in place.

**1/4" Hexagonal Chuck:** Holds the bit, can only accommodate bits with a 1/4" hexagonal shank.



## IMPACT DRIVER

# OPERATING THE MACHINE

### Drilling a Hole with the Drill/Driver

1. Set the direction control to backwards.
2. Holding the chuck with one hand, gently squeeze the trigger with your other hand to open it wide enough to hold the bit you want to use.
3. Set the direction control to forwards.
4. Place the bit in the drill, hold the chuck again and squeeze the trigger until the chuck has grasped the bit and you hear a clicking noise.
5. Use your gear shifter to choose between low or high gear. Low gear provides high-torque and slower drilling speeds for heavy duty work or for driving screws. High gear provides faster speeds for drilling lighter work.
6. Adjust your clutch to the appropriate output torque, when drilling through thinner, more fragile materials use less torque (a lower number), when drilling through thicker, more robust materials use more torque (a higher number).
7. Line up the tip of the bit with where you want to drill your hole, hold the trigger down, and press forward gradually.
8. When the hole is deep enough, pull the drill out with the bit still moving, then release the trigger.

### **Driving a Screw with the Drill/Driver**

1. Set the direction control to backwards.
2. Holding the chuck with one hand, gently squeeze the trigger with your other hand to open it wide enough to hold the bit you want to use.
3. Set the direction control to forwards.
4. Place the bit in the drill, hold the chuck again and squeeze the trigger until the chuck has grasped the bit and you hear a clicking noise.
5. Use your gear shifter to select the low gear, which provides high-torque and slower drilling speeds and which is better for driving screws than the high gear.
6. Adjust your clutch to the appropriate output torque: when driving smaller, more delicate screws into thinner or fragile material use less torque (a lower number). When driving larger, more robust screws into thicker or denser material use more torque (a higher number).
7. Use your non-dominant hand to hold the screw in place and in line with where you want it to enter your material.
8. Fit the tip of the driver bit into the head of the screw and squeeze the trigger lightly while gently pushing the drill/driver towards the screw.
9. Once the screw finds purchase in your material, you can let go of the screw and squeeze the trigger harder until the screwhead is flush with your material.

### **Driving a Screw with the Impact Driver**

1. Insert a bit (only ones with a ¼” hexagonal shank) into the chuck by pulling the locking sleeve forward, inserting the desired bit into the chuck, and releasing the locking sleeve. Pull on the bit to test that it is properly seated in the chuck.
2. Use your non-dominant hand to hold the screw in place and in line with where you want it to enter your material.
3. Fit the tip of the driver bit into the head of the screw and squeeze the trigger lightly while gently pushing the impact driver towards the screw.
4. Once the screw finds purchase in your material, you can let go of the screw and squeeze the trigger harder until the screwhead is flush with your material.
5. To remove a bit or accessory from the chuck, pull locking sleeve forward and simply pull it out from the chuck.

## **TIPS & TROUBLESHOOTING**

1. A “pilot hole” is a hole smaller than the screw into which the screw is driven. Having a small hole drilled ahead of time makes the screw go in much more easily, and helps keep it straight.
2. Putting one hand on the back of the drill helps you keep control over it, but

leaves you with no hands free. You can use a clamp to hold your piece in place while you drill.

3. If you are using the drill/driver and hear the driver bit making rapid clicking noises against the screw, you are probably stripping the screw head. If this happens you should stop driving so that you do not continue to damage the screw or the bit and you should switch to using an impact driver to complete your project.
4. If you keep turning a screw after it's already in, it will tear material out around it, making the hold loose. In general, you should stop once the screw head is flush with your material.
5. On the other hand, clearing excess material is a good thing when you are drilling a hole instead of driving a screw. When you want to make a clean hole, you can spin the bit for a second before you pull it out.
6. When using the drill/driver, make sure your bit is in straight. You can check by looking from the side and pulling the trigger slightly. If the bit looks like it is wobbling, it's in at an angle. If this is the case, it's much easier to take the bit out and put it back in than to try and adjust it while it is in the chuck.
7. The battery will get weaker as the drill is used. If the drill feels weak, put the battery on the charger and replace it with a fully charged one. To remove a battery, pinch the sides and pull it out the bottom of the handle.