



Assembly & Instruction Manual

45 PC.TAP AND DIE SET

Model **5181**



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THANK YOU FOR BUYING CUMMINS INDUSTRIAL TOOLS
Your new And Die Set has been engineered and manufactured to Cummins tools high standards for dependability, ease of operation, and operator safety. properly cared for, it will give you years of rugged, trouble-free performance

CAUTION: Carefully read through this entire operator's manual before using your new machine

Pay close attention to the Rules for Safe Operation, Warnings, and Cautions. If you use your machine properly and only for what it is intended, you will enjoy years of safe, reliable service.

SAVE THIS MANUAL FOR FUTURE REFERENCE



WARNING

To reduce risk of injury, everyone using, installing, repairing, maintaining, or changing accessories on your working gear this tool must read and understand these instructions before performing any work task.

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You can purchase additional items at www.cumminstools.com

Specifications

This heavy duty tap and die set will make it possible for you to quickly and accurately cut threads onto rods and screws, as well as into holes and nuts. This set includes taps and dies for 20 of the most frequently used sizes. Four adjustable tap or die wrenches in the sizes you will need, a small screw driver and case are also included.

These cutting tools are made of heat-treated, hardened tungsten steel. They are suitable for cutting most metals and plastics, except certain specially-hardened materials.

Save This Manual

You will need the manual for the safety warnings and precautions, assembly instructions, operating and maintenance procedures, parts list and diagram. Keep your invoice with this manual. Write the invoice number on the inside of the front cover. Keep the manual and invoice in a safe and dry place for future reference.

Safety Warnings and Precautions

WARNING: When using tool, basic safety precautions should always be followed to reduce the risk of personal injury and damage to equipment.

Read all instructions before using this tool!

1. **Keep work area clean.** Cluttered areas invite injuries.
2. **Observe work area conditions.** Do not use machines or power tools in damp or wet locations. Don't expose to rain. Keep work area well lighted.
3. **Keep children away.** Children must never be allowed in the work area. Do not let them handle machines, tools, or extension cords.
4. **Store idle equipment.** When not in use, tools must be stored in a dry location to inhibit rust. Always lock up tools and keep out of reach of children.
5. **Use the right tool for the job.** Do not attempt to force a small tool or attachment to do the work of a larger industrial tool. There are certain applications for which this tool was designed. It will do the job better and more safely at the rate for which it was intended. Do not modify this tool and do not use this tool for a purpose for which it was not intended.
6. **Dress properly.** Do not wear loose clothing or jewelry as they can be caught in moving parts. Protective, electrically non-conductive clothes and non-skid footwear are recommended when working. Wear restrictive hair covering to contain long hair.
7. **Use eye protection.** Always wear ANSI approved impact safety glasses underneath a full face shield during use. Also, wear heavy duty work gloves.
8. **Do not overreach.** Keep proper footing and balance at all times. Do not reach over or across running machines.

9. **Maintain tools with care.** Keep tools sharp and clean for better and safer performance. Follow instructions for lubricating and changing accessories. The handles must be kept clean, dry, and free from oil and grease at all times.
10. **Remove adjusting keys and wrenches.** Check that keys and adjusting wrenches are removed from the tool or machine work surface before starting work.
11. **Stay alert.** Watch what you are doing, use common sense. Do not operate any tool when you are tired.
12. **Check for damaged parts.** Before using any tool, any part that appears damaged should be carefully checked to determine that it will operate properly and perform its intended function. Check for cracks or chips in the taps and dies. Any part that is damaged should be replaced.
13. **Replacement parts and accessories.** When servicing, use only identical replacement parts. Use of any other parts will void the warranty. Only use accessories intended for use with this tool. Approved accessories are available from Cummins Industrial Tools.
14. **Do not operate tool if under the influence of alcohol or drugs.** Read warning labels on prescriptions to determine if your judgment or reflexes are impaired while taking drugs. If there is any doubt, do not operate the tool.
15. **The flutes on these tools are sharp and may cut you.** Handle with care.
16. **Do not use any high-speed means, such as a lathe or drill press, to cut threads with these Taps and Dies.** High-speed use may overheat the tool, causing loss of heat-treatment and premature failure. Use of high-speed means will void the warranty.
17. **Taps and Dies are heat-treated, and not designed to be sharpened.** After considerable use, corrosion, or high-speed use these tools may lose their cutting edge. They will then be less effective and may break. Replacement Taps and Dies are available from Cummins Industrial Tools.

Warning: The warnings, cautions, and instructions discussed in this instruction manual cannot cover all possible conditions and situations that may occur. It must be understood by the operator that common sense and caution are factors which cannot be built into this product, but must be supplied by the operator.

unpacking

When unpacking, check to make sure the following parts are included.

<i>20 Taps</i>	<i>Adjustable Tap Holder</i>
<i>20 Dies</i>	<i>Adjustable Die Holder</i>
<i>Flat Tip Screwdriver</i>	<i>Small Die Adapter</i>
<i>Fitted Steel Storage Case</i>	<i>T-handle Tap Handle</i>

If any parts are missing or broken, please call Cummins Industrial Tools at the number on the cover of this manual.

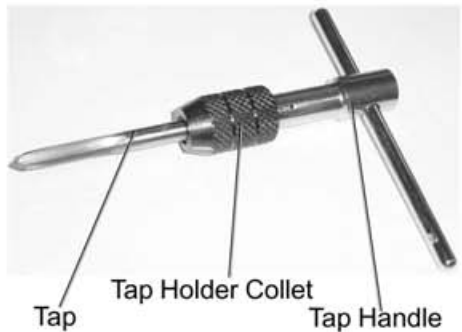
Operation

The Taps and Dies contained in this set are precision tools. They are manufactured from hardened, heat-treated, high-quality steel. As with all precision tools, proper use and care is required to ensure proper threading and longest tool life. For best results, and safe use, carefully read the safety warnings and these instructions.

Using the Taps

TAPS are used to cut internal threads, such as in a nut or component part.

NOTE: Before beginning work, test the material to determine that it is not specially hardened. You can easily test the hardness by attempting to mark it with a file. If the material cuts with a file, you should have no difficulty in cutting threads. If the material will not mark with a file, do not attempt to cut threads, as you may damage the tool.



1. To cut an internal thread, first select the tap of the desired size, tap wrench, proper drill size or existing hole size, and lubricating or cutting oil.
2. The proper hole size is very important to successfully making good threads. An oversized hole will result in shallow threads, and poor holding power. An undersized hole will put undue strain on the tap, and may cause the tap to wear prematurely or to break. The correct hole size is marked on the shank of each tap.
3. A drill, drill press, or drill bits are not included in this set. If needed, you may purchase these tools from Cummins Industrial Tools. When using these tools please follow manufacturer's recommendations, and best safety practices for drilling. Pay attention to the correct alignment of the hole as it is being drilled. Whenever drilling, be sure that the area being drilled is free of electrical components or any other obstructions.
4. Select the appropriate size Tap Handle for the Tap being used. For the T-Handle Tap Handle, insert the square end of the Tap into the Handle, and tighten the Tap Handle Collet hand-tight onto the Tap. On the larger Tap Holder, simply twist the handle to tighten.
5. Position the Tap in the hole, being careful that the Tap is aligned with the direction of the hole. The first cut will help determine the accuracy of the finished thread.
6. Start turning the Tap clockwise, taking care to keep the Tap aligned with the hole. As the Tap turns, it bites into the metal and progresses into the hole.

7. During the cutting operation, chips are formed by the cutting edges of the Tap. After every $\frac{1}{4}$ to $\frac{1}{2}$ clockwise turn, depending on material hardness, rotate the Tap counterclockwise an equal amount to allow the chips to fall through the flutes on the side of the Tap into the hole.
8. *During the cutting operation, use ample lubrication using a recommended cutting oil, which is available from Cummins Industrial Tools. Proper lubrication will result in smoother threads, and increased tool life. Continue the cutting process until the Tap passes through the work piece, or the desired thread depth is reached.*

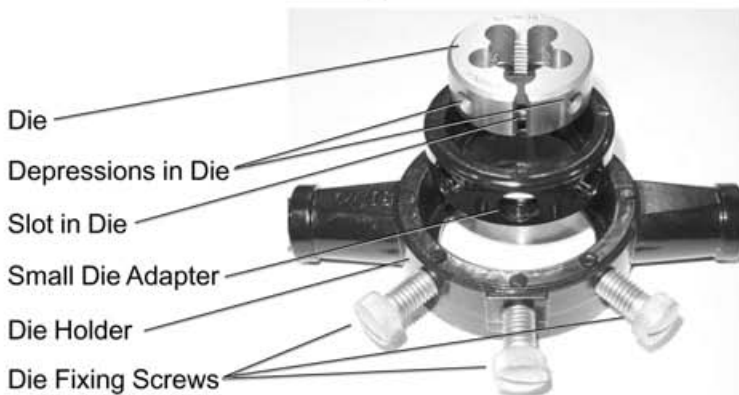
NOTE: When tapping a "blind hole" (one which does not pass all the way through the work piece) it is important to allow space at the bottom of the hole for the chips to accumulate during the tapping process. When clearing these chips, wear ANSI-certified eye protection to protect yourself from injury. Also be careful these chips do not fall into other tools or machinery where they may cause damage.

NOTE: The Taps in this set are "Plug Style" Taps which have 3 to 5 chamfered* threads at the tip. This is the most commonly required and used type.

*"Chamfer" is the term used to describe a bevel or taper on the end or edge of an item.

Using the Dies

DIES are used to cut external threads, such as on a screw or threaded rod.



NOTE: Before beginning work, test the material for hardness using a file, as discussed on page 4. Do not attempt to thread a rod which is specially-hardened.

NOTE: It will be easier to start the Die correctly, if the end of the work material is slightly chamfered. Do this with a grinder or file (not included in this set).

1. First select the proper Die size for the rod to be threaded. Selection of the proper size for the rod stock being threaded is very important. The Die can be no larger than the rod stock, and should be .005" to .010" undersized. Oversized rod stock for the die selected may damage the die, and will make turning it difficult. Slightly undersized rod stock makes turning the die easier, and will result in good threads for most applications.

2. Secure the work piece in a vise or other fixture (not included). Ensure that the work piece will not move or turn in the vise as it is being threaded. Note that the work piece may be damaged by the vise during the threading process. It is a good idea to thread the workpiece before cutting it to its final length, to eliminate this damaged area.
3. Insert the Die into the Die Holder. Align the slot or recesses on the side of the Die with the Die Fixing Screws on the Die Holder. Tighten the Die in place using the Screwdriver which is included in this set. Note: The recess and slot pattern on these Dies are designed to work with several popular varieties of Die Wrenches.
4. Place the chamfered side of the Die onto the work piece, being careful to align the Die perpendicularly to the rod.
5. Begin turning the Die clockwise. The cutting edges will begin to bite into the material, and the Die will begin to thread itself onto the rod.

WARNING: Always wear ANSI-approved eye protection when creating metal chips or filings.

6. *As you progress, apply liberal lubrication, using a recommended cutting oil.* As with the Tap, you should turn the Die clockwise $\frac{1}{4}$ to $\frac{1}{2}$ turn, depending on the hardness of the material, then reverse the Die as discussed in step 7 on page 5. Continue this forward and back process, using proper lubrication, until you have cut the desired length of threads. The Die may then be turned counterclockwise completely off the rod.

Thread Renewing: Damaged or rusty threads may easily be renewed using the Taps and Dies in this set. Select the proper sized Tap or Die, and proceed as discussed above.

Maintenance

1. Steel tools, especially those with cutting edges, are susceptible to corrosion. Even light corrosion may damage sharp cutting edges, reducing the effectiveness of these tools. Clean each tool immediately after use, and apply a light layer of oil or grease to prevent corrosion.
2. Store tools in the provided case to prevent loss, and to protect them from moisture or contamination.