

## PRECISION TOOLS FOR PRECISE PERFORMANCE

Sioux Tools are known around the world for quality, durability and performance. Our extensive array of industrial power tools are engineered and built to make jobs easier, safer and more efficient. Sioux tools are designed to stand up to the demanding



specifications required by today's industrial manufacturing, assembly and finishing needs. Sioux offers a wide array of pneumatic drills.

**Let's take a look.**

## PNEUMATIC DRILLS

### A HEADS-UP ABOUT SAFETY

Any discussion of drills should begin with an understanding of safety. While these tools have amazing capabilities, certain precautions should be followed without exception.

#### KEEP THE EYES PROTECTED: YOURS AND THOSE AROUND YOU.

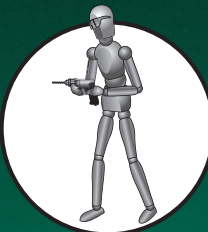
Drilling creates chips that fly off of the drilled material. These chips can cause eye injury, so it is essential that the operator and those in the surrounding area wear proper eye protection at all times.



Drill bits themselves can break and cause eye injury—another reason to keep operator and bystander eyes protected.

#### MAINTAIN A SOLID BODY POSITION AND SECURE FOOTING.

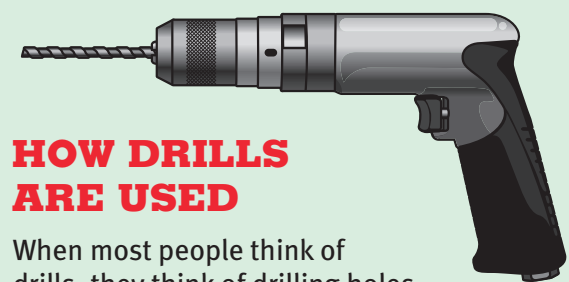
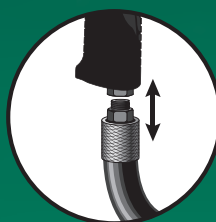
Pneumatic drills are powerful tools. Sudden and unexpected drill movements can happen and can cause injury. The operator needs to maintain control of the drill, which requires a little knowledge of physics and a lot of common sense. The body should always be well positioned with secure footing when operating a drill.



#### KNOW WHEN TO DISCONNECT DRILLS.

Drills can start up unexpectedly when connected to an air supply. Before doing any adjustments, maintenance or service – including changing accessories – be sure to do the following:

- Turn off air supply to the drill
- Activate the trigger to release air pressure
- Disconnect the drill from the air supply



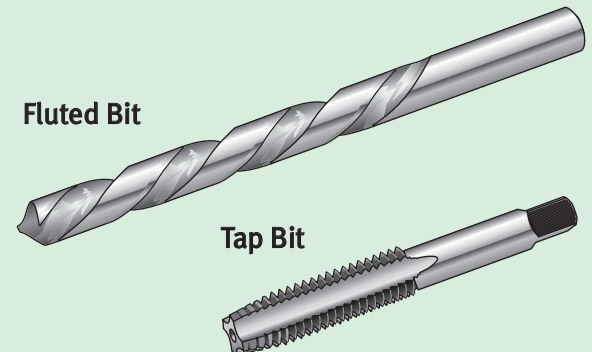
### HOW DRILLS ARE USED

When most people think of drills, they think of drilling holes in wood, metal or plastic. But drills actually perform a much more extensive range of functions.

**Drilling** – Creating a hole in material using a fluted (twisted groove) bit.

**Reaming** – Expanding or creating a specific sized hole from an existing drilled hole, or aligning two or more offset holes.

**Tapping** – Cutting threads in a drilled hole so it can accept threaded fasteners.



## HOW PNEUMATIC DRILLS WORK – THE BASICS

A pneumatic drill is powered by compressed air. Inside the drill, the compressed air is directed over the vanes of the drill motor, rotating the motor and providing the energy needed to power the drill when at work. A gear reduction system adjusts this output to an appropriate RPM range and torque for the application. Moving down the barrel of the drill, the gearing is then connected to the spindle and drill chuck. The chuck holds one of any number of bits or other accessories for drilling, reaming, tapping and hole sawing. These bits are affixed to the drill chuck (“chucked”) by the operator. How do you know which type of drill to use? Motor output power (HP), free-speed RPMs, chuck capacity/drill bit size and handle style are all key factors.

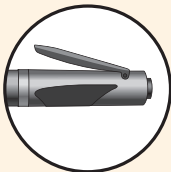
### UNDERSTANDING DRILL COMPONENTS

**Body** – Drills come in four basic handle configurations: Pistol Grip, Inline, D-Handle and T-Handle. The body’s handle serves several purposes. The drill body provides the operator with a place to hold the drill during operation, absorbs vibrations, and provides access to manipulate the throttle. Higher-quality drills have handles that are soft, textured and ergonomically shaped for a firm and easy grip. Many have multiple adjustments to fit the palm and fingers of users. The body is typically made of lightweight and durable material such as aluminum, and may have a rubberized handle.

### BASIC DRILL CONFIGURATIONS



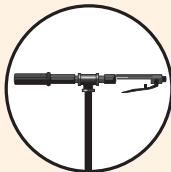
Pistol Grip



Inline



D-Handle



T-Handle

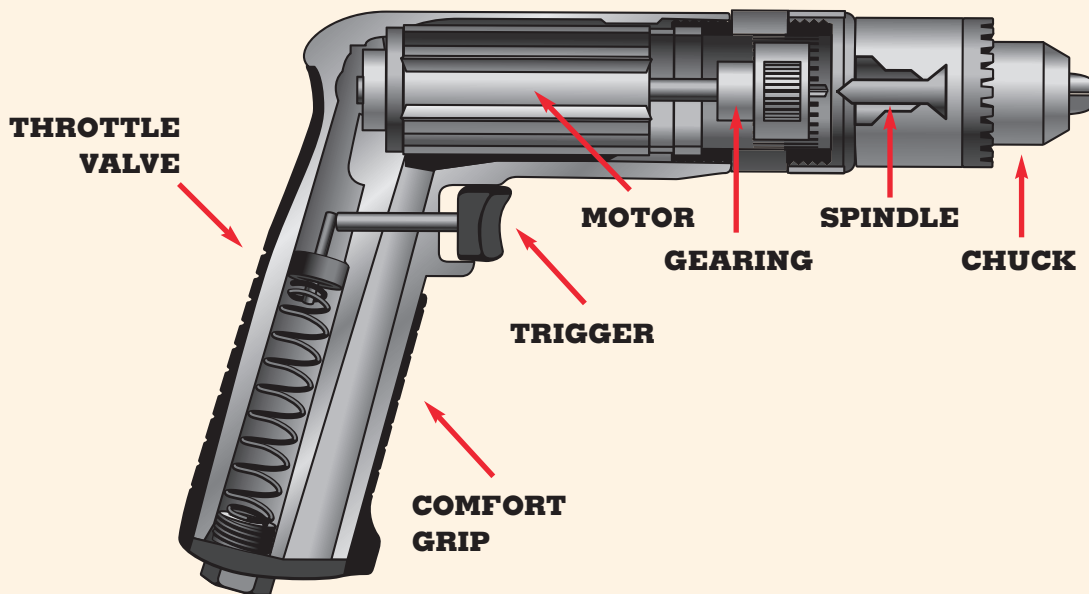
**Gearing** – Gear assemblies are used to control the RPM range (and torque) in order to suit the application at hand. Pneumatic drill gearing consists of a set of bearings, pinions, washers and other parts designed and engineered for durability and reliable performance under extreme conditions.

**Motor** – The heart of the drill, the motor converts compressed air into rotational power that drives various drilling applications. Pneumatic drill motors are offered with both reversible and non-reversible configurations, and in a wide range of unique RPM and torque settings.

**Throttle Valve** – The stream of incoming compressed air is controlled by the throttle valve, which is located in the drill handle. Using the trigger, the operator can open and close this valve to adjust the RPM to suit the application.

**Trigger** – Much like in a pistol, the trigger of a pneumatic drill controls the action of the tool. As the trigger is pulled, compressed air enters the handle and is fed into the motor via the Throttle Valve. This jet of air turns the motor, which ultimately rotates the attached bit within a predefined RPM range.

**Chuck** – Located on the barrel of the drill, the chuck clamps down and secures the bit or other attachment being used and is mechanically connected to the spindle. There are 2 basic types of chucks: keyed and keyless. Keyed chucks require the use of a chuck key to affix the bit to the drill. Keyless chucks perform this without the need for a chuck key. Chucks are often categorized by their capacity, as measured by the outside diameter of the bit to be inserted.





## PNEUMATIC DRILLS COVER A WIDE RANGE OF INDUSTRIAL NEEDS

**Production drilling** – Continuous, heavy-duty usage, such as preparing holes on an airframe, drilling pilot holes for furniture assembly, or drilling holes for attachment points on fabricated steel or fiberglass.

**Tapping and Chasing Threads** – Preparing a hole to receive a fastener (e.g., a bolt) by creating threads (tapping) and cleaning threads (chasing).

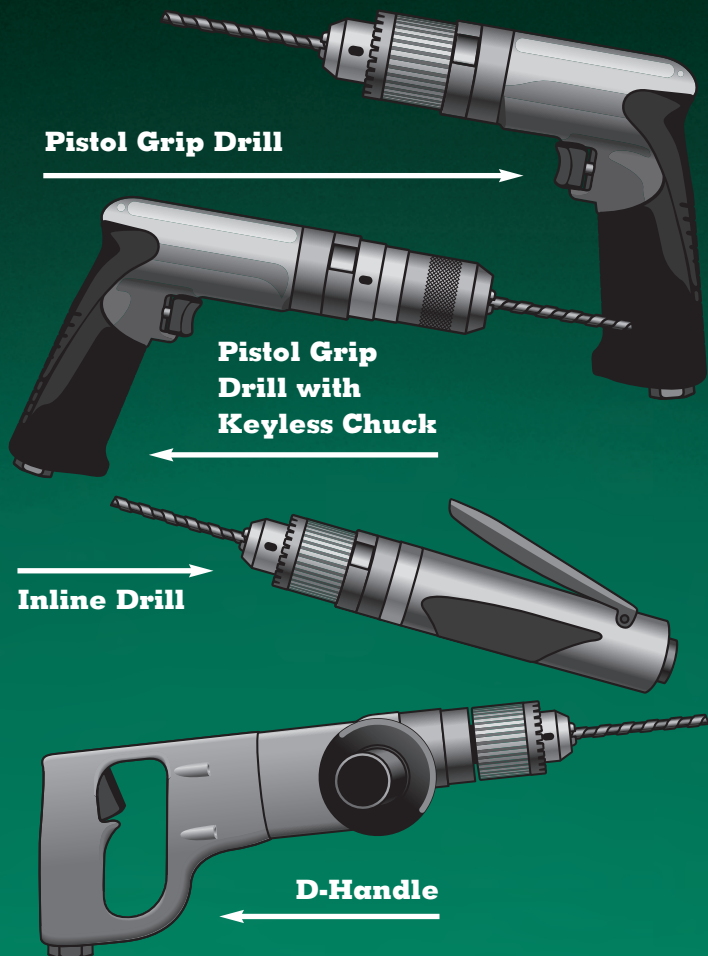
**Wire Brushing** – Cleaning metals or removing rust using a special drill bit having a wire brush affixed at the tip.

**Deburring** – Removing “burrs” or unwanted pieces of material.

**Screwdriving** – Drills are often used to install and remove screws.

**Hole Sawing** – Creating a hole by cutting out a circular section of material using a special drill bit.

## PNEUMATIC DRILL TYPES



## SERVICEABILITY

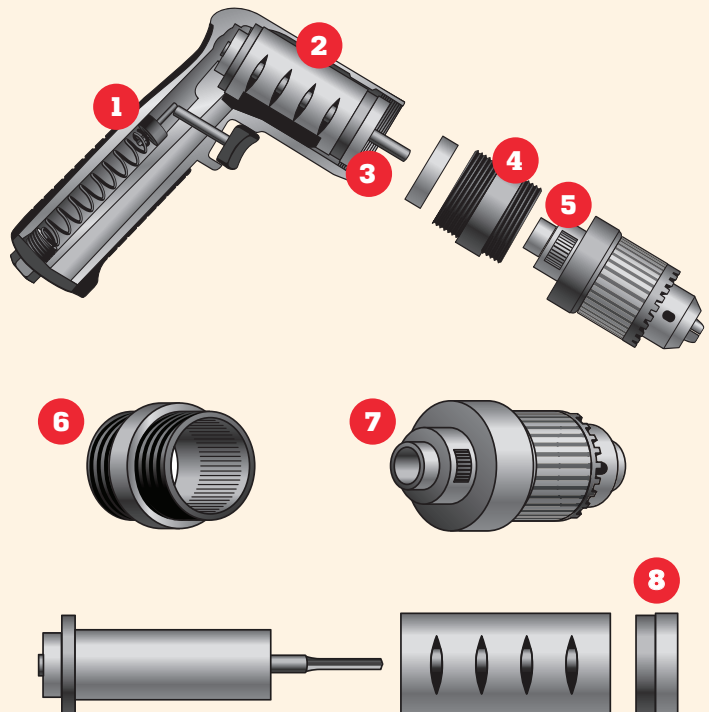
Serviceability is a key factor in managing operating costs for industrial pneumatic tools. Sioux Tools manufactures its drills so that they can be serviced on-site, dramatically reducing total cost of ownership. Review the key components and the detailed drill diagram below to see how Sioux engineers design for serviceability.

- 1 Tipper valve and valve seat are easily accessible.
- 2 Drop-in motor can be replaced without the need for alignment (non-reversing motors only).
- 3 Rotor pinion is case hardened to resist wear.
- 4 Grease zerk allows convenient lubrication without disassembly.
- 5 Planetary reduction gearing can be serviced without removing the chuck.
- 6 Ring gear is integrated with motor retainer. Machined-in design makes assembly and disassembly easy.
- 7 Planetary gear pins are slip-fit designed for easy assembly and disassembly.
- 8 Front endplate bearing is slip-fit designed for easy access to the motor without disturbing rotor spacing.



The use of many interchangeable parts reduces stocking requirements for spare parts and cribs.

**GETTING A HANDLE ON DRILL MAINTENANCE** – The parts above need regular inspection, cleaning and lubrication. Contact your Sioux representative for specific details.



## HOW TO CHOOSE THE RIGHT DRILL FOR THE JOB

The table below should be used when selecting a drill for a particular job type. This is accomplished by identifying the appropriate range of cutting speeds (as measured by RPM) when the material and size of hole being drilled are known. Different material types are shown in the left column. Various hole sizes are shown on the top row. Using these two pieces of information, the appropriate cutting speed range for the application is displayed in RPMs.

<b>DRILL SPEED GUIDE</b>									
Material	Surface Ft./Min.	Size of Hole to be Drilled (mm)							
		1/16 (1.5)	1/8 (3.0)	3/16 (5.0)	1/4 (6.0)	5/16 (8.0)	3/8 (9.5)	7/16 (11.0)	1/2 (13.0)
Recommended Cutting Speed Range (rpm)									
<b>Steel Alloy 300-400 Brinell</b>	20-30	1200 1800	600 900	400 600	300 450	250 350	200 300	175 250	150 225
<b>Stainless Steel Cast Iron, Hard</b>	30-40	1800 2500	900 1200	600 800	450 600	350 500	300 400	250 350	225 300
<b>Steel Forgings</b>	40-50	2500 3100	1200 2500	800 1000	600 750	500 600	400 500	350 425	300 400
<b>Steel, Tool Annealed, .90 - 1.20 Carbon</b>	50-60	3100 3700	1500 1800	1000 1200	750 900	600 700	500 600	425 525	400 450
<b>Steel .40 - .50 Carbon</b>	70-80	4300 6000	2100 3000	1400 2000	1000 1200	850 1000	700 1000	600 900	500 800
<b>Cast Iron Medium Hard</b>	70-100	4300 9000	2100 3000	1400 2000	1000 1500	850 1200	700 1000	600 900	500 800
<b>Bronze, High Tensile Strength</b>	70-150	4300 9000	2100 4500	1400 3000	1000 2300	850 1200	700 1530	600 1300	500 1200
<b>Malleable Iron</b>	80-90	5000 5500	2500 2800	1600 1800	1200 1400	950 1100	800 900	700 800	600 700
<b>Steel, Mild .20 - .30 Carbon</b>	80-110	5000 6700	2500 3400	1600 2300	1200 1700	950 1350	800 1150	700 1000	600 850
<b>Cast Iron, Soft / Plastic</b>	100-150	6000 9000	3000 4500	2000 3000	1500 2300	1200 1800	1000 1530	900 1300	800 1200
<b>Aluminum / Brass Bronze</b>	200-300	12000 18000	6000 9000	4000 6000	3000 4500	2400 3700	2000 3000	1700 2600	1500 2300
<b>Magnesium</b>	250-400	15500 25000	7500 12000	5000 8200	3800 6100	3000 4900	2500 4000	2200 3500	1900 3000
<b>Fiberglass / Wood</b>	300-400	18000 25000	9000 12000	6000 8200	4600 6100	3700 4900	3000 4000	2600 3500	2300 3000

Actual drilling or cutting RPM will be approximately 80% of rated spindle speed of tool.

Surface Feet Per Minute = .26 x RPM x Drill Diameter in Inches.

SIoux offers innovative, high quality pneumatic tools for a wide array of industrial manufacturing, assembly and finishing applications.

For an in-depth look at other applications, ask your SIoux salesperson or distributor for our companion brochures.

Snap-on Power Tools, Inc.  
250 Snap-on Drive  
Murphy, NC 28906

**Customer Service: 866-259-7291**  
**Email: [sttechsup@siouxtools.com](mailto:sttechsup@siouxtools.com)**

See the full line of SIoux products:  
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